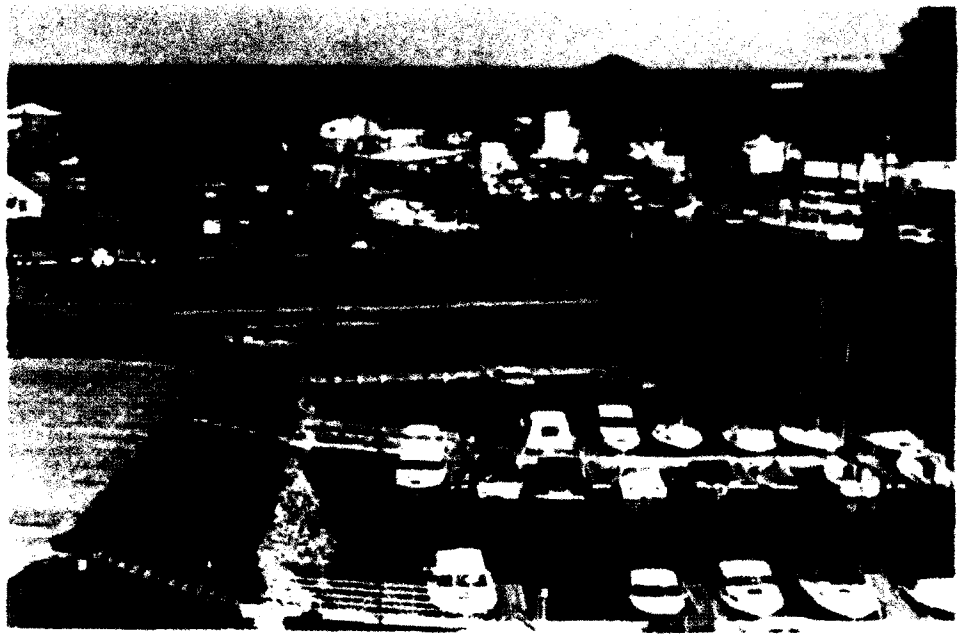
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# Preconstruction Engineering and Design Phase Reevaluation Report

# Olcott Harbor Project Olcott, NY

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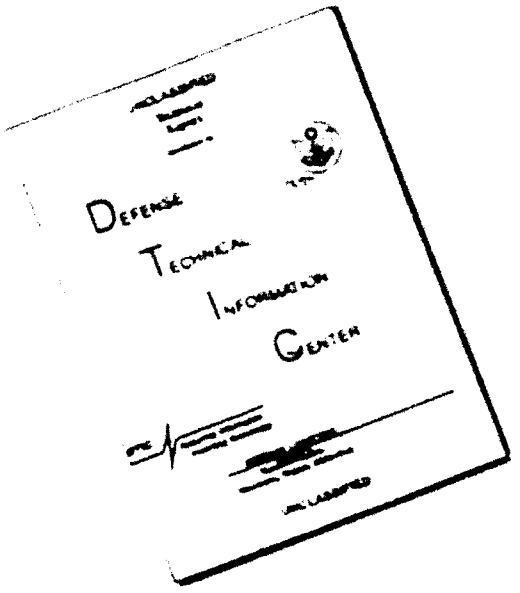
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|---|---|
| 1. REPORT NUMBER / 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER |
| 4. TITLE (and Subtitle) Preconstruction Engineering and Design Phase Reevaluation Report: Olcott Harbor Project, Olcott, NY VOLUME 2 | 5. TYPE OF REPORT & PERIOD COVERED Final<br>6. PERFORMING ORG. REPORT NUMBER |
| 7. AUTHOR(s) Buffalo District, Corps of Engineers | 8. CONTRACT OR GRANT NUMBER(s) |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Engineer District, Buffalo 1776 Niagara Street Buffalo, NY 14207 | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS |
| 11. CONTROLLING OFFICE NAME AND ADDRESS Engineering and Planning Division Plan Formulation and Technical Management Buff. Dist., 1776 Niagara St., Buff., NY 14207 | 12. REPORT DATE 1992<br>13. NUMBER OF PAGES 972 |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) | 15. SECURITY CLASS (of this report) Unclassified<br>15a. DECLASSIFICATION DOWNGRADING SCHEDULE |

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

The Reevaluation Report and Supplement EIS were posted in the Federal Register, Vol. 57, No. 220, Fri., Nov. 13, 1992

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

VOLUME 2 - SUPPORTING DOCUMENTATION

Technical and Correspondence Appendices

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Olcott Harbor is located in Olcott, a village of the town of Newfane, NY, at the mouth of Eighteenmile Creek at Lake Ontario. A report, completed in 1978, recommended modifications to the harbor, including the construction of various lakeshore facilities. Construction was authorized to begin in 1986, but due to legislative, technical, and physical changes the project was reevaluated. This General Reevaluation Report documents technical studies. As a result of the reevaluation a plan called the

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Refined Plan 10A Modified was selected. This plan met all economic, engineering, and enviornmental criteria. However, due to current policy constraints the plan could not be approved and the current recommended plan is no Federal action.

# OLCOTT HARBOR, NEW YORK

## PERTINENT DATA

**Project Authorization:** Section 601(a) of the Water Resources Development Act of 1986, Public Law 99-662, dated 17 November 1986.

**Project Purpose:** The purpose of the project is to provide a safe harbor for small boats and recreational fishing facilities, and enhance the development of Olcott Harbor, consistent with the demand of the area.

## PROJECT FEATURE SUMMARY

| Feature | Description |
|---|---|
| 1. Rubble-Mound Breakwaters: | |
| a. West Detached Breakwater | 960 feet long by 13.5 feet wide at the top; crest elevation at +13 Low Water Datum (LWD, El. 242.8 IGLD). |
| b. East Detached Breakwater | 1545 feet long by 16 feet wide at the top; crest elevations are +14 LWD for the 500-foot section over the buried river channel and +13 LWD for the remainder of the breakwater. |
| c. East Shore-Conn. Breakwater | 323 feet long by 12 feet wide at the top; crest elevation at +12 LWD. |
| 2. Lake Channel Entrance Width & Depth: | 150 feet wide. Existing depth (Minimum) is -13.2 LWD. No dredging required at this time. |
| 3. Mooring Access Channel Width & Depth: | 75 feet wide by 1200 feet long. Existing depth (Minimum) is -9.0 LWD. No dredging required at this time. |
| 4. Navigational Aids: | Two (2) battery-operated navigational lights at the channel entrance. |
| 5. Old Bridge Abutment Removal: | Excavate to -9.0 LWD bridge abutment in Eighteenmile Creek. |

6. Recreational Fishing Facilities:

| | |
|---|---|
| a. Pedestrian Bridge | Single-span pre-cast concrete, 95 feet long by 8 feet wide with curbs and railings. |
| b. Walkway | Approximately 1900 feet long by 7 feet wide on the E. Shore-Conn. and E. Det. breakwaters; a 63 foot long by 6 foot wide walkway from the existing steps to the shore-connected breakwater. |
| c. Access Ramp for the Physically Handicapped | Eight (8), 30 feet long by 7 feet wide ramps at 8.3% grade; 8 level landings, handrailings. |

(Note: The design and construction of car parking spaces and sanitary facilities associated with this project will be the responsibility of the local sponsor.)

7. Estimated Stone Quantities (Tons): Armor Stone, 123,000; Underlayer Stone 52,300; Core Stone 88,000.

8. Land Area Required: Temporary Easement .05 acres; Permanent Easement 0.44 acres.

9. Navigational Servitude Area Required: 32.42 acres.

# Appendix A

## GENERAL DESIGN ANALYSIS
## SUB-APPENDICES A, B, & C


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OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

GENERAL DESIGN ANALYSIS

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OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

GENERAL DESIGN ANALYSIS

## 1. INTRODUCTION

The existing harbor at Olcott in the town of Newfane, New York is only safe for use during calm weather. At the entrance to the harbor are two parallel steel sheet pile piers which are frequently overtopped by waves during winds from the northerly quadrant which causes extremely rough waters in the inner harbor at the mouth of Eighteenmile Creek. The plan of improvement refined in this design analysis would provide a safe harbor for small boats as well as recreational fishing facilities; and enhance the development of other water-related opportunities at Olcott Harbor, consistent with the demands of the area.

The primary purpose of this General Design Analysis (GDA) is to present the detailed design of the project features that fall under the Corps responsibility to construct. The plan of improvement used in this design is based on Plan 10A Modified, the current NED Plan (Plate 1) evaluated in Volume 1 of this Reevaluation Report. The features of the authorized plan, as presented in the 1978 Feasibility Report, are shown in Table 4 of this appendix for comparison purposes. Plan 10A Modified reflects engineering refinements, environmental concerns, and the results of the physical model studies conducted at the Corps of Engineers Waterways Experimental Station (WES), Vicksburg, Mississippi.

Refined Plan 10A Modified (Plate 2) would serve as the basis for preparation of the project's construction Plans and Specifications.

## 2. PHYSICAL MODEL STUDIES

Three physical model studies were conducted to obtain data in support of the harbor design effort. The first two studies were a 3-dimensional physical model of the harbor's response to the storm waves. The third study was a 2-dimensional physical model to primarily investigate wave transmission characteristics of the breakwaters.

### a. Three-Dimensional Model Study.

Two 3-dimensional, 1:60 scale physical model studies of Olcott Harbor were conducted at WES in 1989 to satisfy small boat marina design wave criteria, and specific environmental

requirements. The authorized Plan 10 from the 1978 Feasibility Report was used as the basic plan configuration upon which basic Plan 10A and Plan 10B configurations were developed.

(1) Wave Height Criteria - The acceptable maximum wave height criteria established for the study was 3 feet in the entrance and 1 foot in the proposed mooring areas for wave conditions occurring during the spring, summer, and fall boating seasons.

(2) Study Conclusions:

(a) Under existing conditions, wave heights up to 6.5 feet will occur in the entrance during boating season. This is in excess of the 3.0 foot maximum wave height criteria established for the study.

(b) Under the authorized plan configuration (sub-appendix B), wave heights well within the established criteria of 3.0 feet at the entrance channel and 1.0 foot in the proposed mooring area, will occur during the boating season.

(c) The following modifications to the breakwater configuration of the authorized plan will meet boating season wave height criteria.

*reduction of east breakwater elevation from +16.2 LWD to +14.5 LWD

*reduction of west breakwater elevation from +15.3 LWD to +14.5 LWD

*reduction of the shoreward end of the east breakwater length by 125 feet

*reduction of the west breakwater length from 1110 feet to 960 feet as a result of WES 26 December 1990 letter stating that: "based on the angle of wave approach and the orientation of NCB's Plan 10A Modified structure, the shoreward end of the breakwater may be reduced up to 150 feet in length and conservatively still provide adequate wave protection for waves approaching from northwesterly disrections."

*construction of the authorized plan configuration would have minimal impact on water surface elevations and creek current velocities in the lower reaches of Eighteenmile Creek.

*sediment accumulation could occur on the western sides of the existing groins east of the harbor and should remain relatively stable and not move from one cell to another.

(d) Results of the Coastal physical model study as adopted in this General Design Analysis (GDA) are summarized below:

*Applicable test data of Test Plans 13, 16, and 19; based on 150 feet wide lake entrance channel and a West Breakwater with a 130-degree dogleg angle, and 550 feet lakeward and 410 feet shoreward lengths;

*Applicable test data confirming that the alignment of the West Breakwater with respect to the East Shore-Connected Breakwater will meet tranquility criteria in the mooring area.

*Lowering of the West Breakwater crown elevation by 0.8 foot from +15.3 to +14.5 LWD.

*Lowering of the East Detached Breakwater crown elevation by 1.7 feet from +16.2 to +14.5 LWD.

*Reduction of the West Breakwater length from 1110 feet to 960 feet by removing 150 feet from the shoreward end.

*Reduction of the shoreward end of the East Breakwater by 125 feet.

*Applicable test data confirming that a minimum of a 70 foot wide opening at the bridge will be adequate for water circulation. The opening was increased to 90 feet due to the bridge abutment cell design.

A detailed discussion of the 3-dimensional model study test results is contained in the WES model report (CERC-90-1).

(e) Study Limitation - It is essential that the breakwater allow only minimal wave transmission and wave overtopping since they are the only barrier between the mooring basin and the open lake. However, the 3-dimensional Coastal physical model study is not adequate for model testing wave transmission. Therefore, a 2-dimensional flume test was undertaken to provide additional data concerning the structural stability and wave transmission characteristics of the breakwater.

b. Two-Dimensional Model Study.

In September 1990, a large scale (1:20) two-dimensional flume test was conducted at WES. The purpose of the flume test was to simulate wave conditions in the entrance channel and mooring area and wave transmission through the voids of the rubblemound breakwaters. The flume test was also used to check the structural stability of the typical breakwater cross sections. Two breakwater design cross sections were tested by subjecting

them to irregular waves in a 3-foot wide flume. A detailed discussion of the 2-dimensional model study test results is contained in the WES Technical Reports (CERC-90-1 and CERC-90-3).

(1) The first section tested (referred to in the Flume Test Report as Plan 1 had a toe elevation at -10 feet LWD, a crest elevation at +14 LWD, and armor slopes of 1V on 2H on both lake and harbor sides. The crest width was 16.2 feet, equivalent to two armor stone diameters plus a 7-foot wide walkway. The lake side slope was armored with two layers of 4- to 11-ton stone, whereas the harbor side slope consisted of one layer of 4- to 11-ton stone. Large armor stones were placed at the toe of each slope to preclude toe slippage.

(2) The second section tested (referred in the Flume Test Report as Plar 1A had a toe elevation at -11 LWD, a crest elevation at +12.5 LWD, and the same armor slopes as Plan 1. The size of the armor stone was also similar to Plan 1. Conclusions from the test results are summarized as follows:

*Both Plans 1 and 1A are stable designs for maximum design wave heights that can be expected to occur for 6-second to 10-second waves at still water levels (swl) of +4.3 and +5.1 LWD.

*Maximum transmitted wave heights for the range of wave heights tested were 0.9 foot and 1.5 feet for Plans 1 and 1A, respectively.

*Minor rocking of a few armor units was observed, but none was significant enough to jeopardize the breakwater structural integrity.

The flume tests demonstrated that potential cost savings with the least probable impact on functionality can be achieved by further lowering the crest elevation 1.5 feet from elevation +14.5 to elevation +13.0 for both West and East Breakwaters. Furthermore, the East Shore-Connected Breakwater crest elevation can be lowered 1.0 foot from +13 to +12 LWD. Results of the flume tests were incorporated in the detailed design of Refined Plan 10A Modified.

## 3. FIELD SURVEYS

Hydrographic surveys obtained in May 1988 and July 1989 were used in developing the physical model study and in computation of quantity estimates for the breakwaters. In June 1990, additional hydrographic surveys were taken to cover an 8-acre area in the vicinity of the old hotel pier and walkway not covered in previous surveys. Topographic surveys were also taken on the landscaped bluff at the foot of Franklin Street to locate

existing sidewalks, walls, and concrete steps. The bluff was cross-sectioned at 50-foot intervals for use in the design of the access ramp for the physically handicapped.

4. GEOLOGY AND SOILS

a. Geologic Setting.

The basic natural characteristics of the area were formed during the Glacial Ages which ended about 12,000 years ago. The bedrock of the Olcott area is the Queenston Shale Formation of Upper Ordivician Age. This formation is characteristically dark reddish brown and massive; is believed to be in excess of 1000 feet thick and dips to the south about 50 feet per mile.

b. Surficial Geology.

During the geologic development of Olcott Harbor which occurred at the time of continental glaciation of the northeast (Wisconsin Stage), ice sheets scoured the area leaving an irregular topography that subsequently was filled with glacial and glaciothuvial materials. Thus at Olcott, there is a rather uneven silt-topped sand plain that stretches along the coast and inland at least 1 mile to a low ridge, 10 to 20 feet high.

c. Seismicity.

The project site is located in seismic zone 2. In the event of an earthquake, damage would be moderate. The seismic coefficient is 0.10 for zone 2.

d. Geotechnical Design.

Subsurface exploration programs for this project were conducted in July 1973, April 1989, and July 1990. The explorations revealed that the lake bottom consists primarily of Queenston shale bedrock. The shale bedrock is moderately hard and massive.

(1) East Shore-Connected Breakwater - Granular lake sediments were encountered at 0.30 foot to 1.1 feet below lake bottom during the April 1989 probes alongside the existing pier off the beach area near Franklin Street. The East Shore-Connected Breakwater will be constructed on these granular deposits overlying bedrock foundation, hence, settlement and foundation shear failure are not anticipated.

(2) East Detached Breakwater - This breakwater will also be generally constructed on thin granular deposits that overlie bedrock. The exception is an approximately 400 lineal feet section (at approximately the middle third) that will be constructed over a buried river channel. Laboratory test results

of samples taken at the buried river channel indicates cohesion strengths of c=0.6 tsf (1200 psf) for triaxial unconsolidated undrained tests, and consolidated undrained strength of c=0.3 tsf (600 psf) and angles of internal friction of 0 degrees and 15 degrees, respectively. The breakwater stability was analyzed using design criteria recommendations contained in EM 1110-2-1902, "Stability of Earth and Rockfill Dams." Table below shows the design parameters for this breakwater.

Table 1 - East Breakwater Stability Design Parameters

| Material Type | Unit Weight (pcf) | End of Cons't c (psf) | End of Cons't 0 (deg) | Long Term c' (psf) | Long Term 0' (deg) |
|---|---|---|---|---|---|
| Armor Stone | 110 (mst)<br>68 (sub) | 0 | 40 | 0 | 40 |
| Loose sandy gravel foundation (SP) | 90 (sat) | 0 | 32 | 0 | 32 |
| Very soft organic clay (OH, CL) | 100 (sat) | Su = 207 | + 37.6z | 0 | 28 |

Based on the parameters in Table 1, the critical failure surface (which passes through the loose sandy gravel and into the very soft organic clay deposits) has a factor of safety of 1.52 (long-term case) which is well above the required minimum of 1.0. Settlement of the breakwater constructed over the very soft organic clay deposits in the buried river channel is anticipated. Using the settlement design parameters in Table 2 as inputs to computer program CSETT (based on Terzaghi's one-dimensional consolidation theory), the maximum ultimate settlement at the center line of the breakwater was estimated to be 2.18 feet over a period of 79 years. Based on the time rate of consolidation, it is estimated that about 50 percent of the ultimate settlement of 1.1 feet is expected to occur within 10 years after construction. Thus in anticipation of this settlement, the East Detached Breakwater portion to be constructed in the buried river channel will be overbuilt to mitigate the effects of settlement. The overbuilt section will consist of a crest elevation at +14.0 LWD and berms 9 feet and 5 feet wide at the lake side and harbor side, respectively. Overbuilding will be accomplished by increasing the core stone thickness. At each end of the section, the concrete walkway will be sloped at 8.3 percent grade to transition from El. +13.0 to El. +14.0. A typical section of the overbuilt breakwater is shown on Plate 3.

Table 2 - Settlement Design Parameters

| Layer No. | Material Type | Insitu Pressure: Po (psf) | Max past Pressure: Pc (psf) | Void Ratio | Comp Index: Cc | Comp Index Cr |
|---|---|---|---|---|---|---|
| 1. | Loose sandy gravel (Incompressible) | 110 (D = 4') | - | - | - | - |
| 2. | Very soft organic clay (OH, CL) | 395 (D = 13') | 2060 | 1.72 | 0.62 | 0.06 |
| 3. | Very soft organic clay (OH, CL) | 771 (D = 23') | 2060 | 1.54 | 0.62 | 0.06 |
| 4. | Very soft organic clay (OH, CL) | 1079 (D = 33') | 2060 | 1.45 | 0.62 | 0.06 |
| 5. | Very soft organic clay (OH, CL) | 1692 (D = 39') | 2060 | 1.33 | 0.62 | 0.06 |

Coefficient of Consolidation, Cv = 50 $ft^2$/yr (layers 2 thru 5)

(3) West Detached Breakwater - The subsurface condition along the West Breakwater shows foundation consisting of Queenston shale bedrock. The bedrock has considerable shearing resistance and therefore instability due to shear failure is not expected to occur. Also considering the bedrock stiffness, deformation of the bedrock foundation will be insignificant.

(4) Pedestrian Bridge - A probe at the south end of the proposed pedestrian bridge encountered refusal at 0.8 foot below the lake bottom. The probe point had red pulverized Queenston shale bedrock. A boring at the north end of the bridge encountered 14 feet of overburden and shale bedrock. The overburden consisted of 3.5 feet of gravelly sand and cobbles over very soft sandy organic clay and silt. The soil and rock design parameters used in the design of the bridge are shown in the table below. The basis for selection of these parameters is discussed in Attachment A1 of Sub-Appendix A.

Table 3 - Pedestrian Bridge Soil and Rock Design Parameters

| Material Type | Unit Weight (pcf) | Shear Strength c (psf) | Shear Strength 0 (deg) |
|---|---|---|---|
| 1. Sandy gravel and cobbles lake bottom (SP-SM) | 110 (saturated) | 0 | 38 |
| 2. Organic clay and silt (OL) | 85 (saturated) | 0 | 26 |
| 3. Cell Fill (crushed stone) | 110 (moist)<br>68 (submerged) | 0 | 32 |
| 4. Breakwater Armor Stone | 110 (moist)<br>68 (submerged) | 0 | 40 |
| 5. Queenston Shale bedrock | unconfined compressive strength qu = 6,000 psi | | |

## 5. PROJECT FEATURES FOR FINAL DESIGN

### a. Breakwaters.

The project includes construction of a 960 foot long west detached (dogleg shaped) breakwater, a 1545 foot long cast detached breakwater, and a 323 feet long east shore-connected breakwater (Plate 2). The breakwaters typically consist of a trunk segment, a head segment, and a transition segment which joins the head to the trunk. The breakwater lengths were generally based on the results of the model study in coordination with WES where adjustments were made. All breakwaters are of rubblemound construction with quarry stone armor designed with side slopes of 1V on 2H, except for the head sections where side slopes of 1V on 2.5H are used. Larger armor stone will be placed along the lakeward side of the breakwater for toe protection against slippage. In order to minimize transmission of bottom fines through the rubblemound structure, underlayer stones will be placed over a well graded core stone as shown on Plate 3.

The breakwater crest widths were designed so that the amount of wave overtopping that would occur would not regenerate a wave height in excess of the established tranquility criteria of 3 feet in the entrance channel and 1 foot in the mooring area. A minimum crest width equal to the combined widths of three armor stones, meets this criteria. The crest widths of the East Detached Breakwater and the Shore-Connected Breakwater were slightly increased in order to accommodate the 7 foot wide concrete walkway for recreational fishing and maintenance access. Thus, the crest widths vary from 12 feet to a maximum of 16 feet.

The crest elevation of the East and West Detached Breakwaters have been established at +13 LWD and +12 LWD for the East Shore-Connected Breakwater based on the results of the two-dimensional flume tests in Sub-Appendix B - "Coastal Design Analysis." A 400-foot section of the East Detached Breakwater to be built over a buried river channel will be overbuilt to elevation +14 LWD to mitigate an anticipated 1 foot settlement 10 years after construction.

### b. Navigation Channels.

As part of the overall development of Olcott Harbor Small-Boat Harbor project, two navigation channels are required. The lake entrance channel entrance provides access from the lake; the mooring access channel provides access to the mooring area. Adequate channel depths and widths are required for safe and efficient navigation of small crafts. The minimum required channel depths and widths as determined in Sub-Appendix B - "Coastal Design Analysis" are:

Lake Entrance Channel (at LWD) - 150 feet wide and a depth of 10 feet.

Mooring Access Channel (at LWD) - 75 feet wide and a depth of 7 feet.

Based on soundings taken in May 1988 and July 1989, several locations in the lake entrance channel have a minimum of -11 feet LWD and -6 feet LWD at the eastern end of the mooring access channel. A substantial portion of the entrance channel is within the existing Federal harbor limit which is authorized under the Rivers and Harbors Act of 1913 to be maintained at a project depth of 12 feet. Current records of Lake Ontario levels show +2 to +3 LWD during the boating season and according to current forecast is expected to remain at these levels (during the boating seasons) for many years. Therefore at these lake levels, the channel depths are within the authorized and/or minimum required project depths as stated above. Thus, no dredging in the channels is required at the present time but may be required in the future to maintain them at their minimum required depths.

c. Navigational Aids.

Navigation lights are required on the head sections of the East and West Detached Breakwaters. The lights are battery operated and will be provided and installed by the U.S. Coast Guard. The lights will be affixed to a navigation light standard pole which will be anchored to a concrete base foundation on the East and West Detached Breakwater crests. The light standards will be provided by the Coast Guard for installation by the Corps on the concrete base foundations. The cost of installation of the light standards and the concrete base foundations will be borne by the Coast Guard. A Corps permit will be required for installation of the navigation lights. Upon completion of the harbor improvement, sufficient number of channel marker buoys will be provided and installed by the Coast Guard to delineate the entrance and access channels.

d. Access for the Physically Handicapped.

A 346 feet long by 7 foot wide concrete ramp (Plate 4) will be constructed to provide access for the physically handicapped from Franklin Street to the East Shore-Connected Breakwater, at a drop of about 20 feet. The ramp will be sloped at 1V on 12H (8.3%) with 8 level landings at 30 foot intervals for rest and safety. Railings will be provided at the top and bottom landings and on both sides of the ramp for safety and locomotion-assistance for wheel chairs as recommended by the Eastern Paralyzed Veterans Association of Western New York. A checklist of items governing design of the ramp for the physically handicapped is included in sub-appendix C - "Structural Design Analysis."

e. Pedestrian Bridge.

A single span precast concrete bridge (Plate 5) 95 feet long by 6 feet wide (usable width) will provide public access to the East Detached Breakwater. Two 23-foot diameter steel sheet pile

cells provides support to the bridge. Both cells will be filled with granular material and capped with concrete to elevations matching those of the breakwater walkway. A 90-foot clear opening underneath the bridge will allow water circulation and movement of migrating fish from the inner harbor to the lake. The low point of the bridge is at elevation +9.75 LWD.

f. Walkway.

A concrete walkway will be provided throughout the entire length of the East Shore-Connected Breakwater and the East Detached Breakwater. The walkway will be 7 feet wide to provide a 6-foot clear width for two-way passage of wheel chairs. The top of the walkway will be generally flush with the top of the stones. There will be no walkway on the West Detached Breakwater. Concrete curbs and railings will be provided along the walkways. The railings will consist of galvanized structural steel posts 42 inches high, spaced at 15 feet, and wire rope railing 1/2 inch diameter polyvinylchloride (PVC) coated wire rope anchored to the steel posts by clamps.

g. Old Bridge Abutment Removal.

The existing bridge abutment at the foot of Main Street in Eighteenmile Creek poses a hazard to navigation. It will be excavated to elevation -9.0 LWD and the material removed will be hauled off to a designated landfill site.

Table 4 provides a comparative summary of the project features between the authorized plan (Plan 10) and Refined Plan 10A Modified as described above.

6. ENVIRONMENTAL CONSIDERATIONS

The project includes removal of an old bridge abutment at the end of Main Street at Eighteenmile Creek upstream of the Federal Harbor limit. The abutment consists of stone and concrete and will be excavated to 9 feet below LWD. This work will be restricted to the months of July and August in order to minimize the effects on local fisheries. All materials removed will be hauled off site.

The environmental windows for in-water construction of the breakwaters are specified in Paragraph 7 - "Construction Procedures." Construction of the West Breakwater will be allowed from mid-May through October 6, and from mid-May through November 10 for the East Detached and East Shore-Connected Breakwaters.

Table 4 Design Comparative Summary of Project Features

| Features | Auth. Proj. 78 FFR | Final Design Plan | Remarks/Justifications |
|---|---|---|---|
| 1. Breakwaters: | | | |
| a. West Detached Breakwater | | | |
| Lakeward Length | 550' | 550' | No change |
| Shoreward Length | 560' | 410' | 150' decrease meets tranquility criteria per WES ltr 26 DEC 90. |
| Crest Elev. (LWD) | +16 | +13 | 3' decrease meets wave transmission criteria per 9/90 Flume Test results. |
| Crest Width | 15 | 13.5 | 1.5' decrease meets tranquility criteria per 9/90 Flume Test results. |
| Side Slopes | 1V:1.5H | 1V:2H trunk<br>1V:2.5 head | To meet stability, wave transmission and overtopping criteria. |
| b. East Detached Breakwater | | | |
| Length | 1575' | 1545' | 30' decrease reflects more accurate plotting of breakwater terminals. |
| Crest Elev. (LWD) | +16 | +13 & +14 | 3' decrease meets wave transmission criteria per 9/90 Flume Test results. (Note: Crest El. at +14 for settlement on 400' section over the buried river channel) |
| Crest Width | 15' | 16' | 1' increase to meet space required for walkway. |
| Side Slopes | 1V:1.5H | 1V:2H trunk<br>1V:2.5 head | To meet stability, wave transmission, and overtopping criteria. |
| c. East Shore-Connected Breakwater | | | |
| Length | 340' | 323' | 17' decrease reflects more accurate plotting of breakwater terminals. |
| Crest Elev. (LWD) | +11 | +12 | Per WES Coastal model and Flume Test results. |
| Crest Width | 15' | 12' | 3' decrease can accommodate walkway. |
| Side Slopes | 1V:1.5H | 1V:2H | Changed to meet stability, wave transmission, and overtopping criteria. |
| 2. Channel Entrance Width: | 100' wide | 150' wide | Increased for safe/efficient 2-way navigation. |
| 3. Mooring Access Channel: | 100' x 1200' | 75' x 1200' | 25' width decrease based on more refined analysis of requirements. |
| 4. Navigational Aids: | yes | 2 | Battery-Operated lights. |
| 5. Recreational (Fishing) Facilities: | | | |
| a. Pedestrian Bridge | 150' long | 95' long | Use of St. Sht. pile cell abutments allows shortening span by 55'. |
| b. Walkway | Undefined | 1900' lg x 7' wide | To enhance recreational usage. |
| c. Handicapped Ramp | Undefined | 346 lg x 7' wide | Provides handicapped access to the East Shore-Connected Breakwater. |
| 6. Channel Dredging: | yes | No | Channels at lake entrance and mooring access are presently at depths adequate for navigation in the harbor. Future maintenance dredging will be required. |
| 7. Old Bridge Abutment Removal: | yes | yes | Excavate old bridge abutment in Eighteenmile Creek off Main Street. |

Construction of the access ramp for the physically handicapped involves localized excavation which will have relatively minor impact on the topography of the area. Air quality could be temporarily affected by dust, noise, odors, and vehicle emissions from the operation of construction equipment. The Contractor will be required to control such emissions and effects to meet environmental standards.

7. CONSTRUCTION PROCEDURES

a. General.

The main project features for construction consists of two offshore detached breakwaters (East and West), an east shore-connected breakwater, a pedestrian footbridge, an access ramp for the physically handicapped, and a concrete breakwater walkway. The following construction procedures illustrates one feasible method of accomplishing project construction at a reasonable cost. All material will be delivered by truck, or barge and stockpiled for use during construction. Construction of the breakwaters will require use of a flat barge to transport the large armor stone from the quarry, and a barge crane at the site for stone placement.

b. West Detached Breakwater.

The West Detached Breakwater will be constructed basically using marine-based operations and completed during the first construction season in order to provide protection during construction of the East Detached Breakwater. A construction staging area will be provided at the foot of Jackson Street as shown on Plate 5 for material and equipment storage if the Contractor chooses to do so. A construction crew is required from mid-May through October 6 to build the West Detached Breakwater. Construction of the breakwater will not be allowed beyond October 6 to minimize the effect on local fisheries.

c. East Detached and the East Shore-Connected Breakwaters.

The East Detached and Shore-Connected Breakwaters will be constructed during the second and third construction seasons. A crew will be required from mid-May to November 10 to build these breakwaters. Construction of the Shore-Connected Breakwater will involve demolition and/or removal of existing concrete pier material along the proposed East Shore-Connected Breakwater alignment to allow for placement of the core material, underlayer stone, and armor stone. The concrete material will be broken-up to allow embedment in the core of the breakwater cross section. Steel, timber, and other unsuitable materials will be removed and hauled off the site to a designated landfill.

8. REAL ESTATE REQUIREMENTS

a. Permanent Easement.

The permanent easement is comprised of 0.44 acre of land above the High Water Mark (HWM) El. 246.8, IGLD consisting of the area for the handicapped access ramp and a portion of the East Shore-Connected Breakwater at the foot of Franklin Street.

b. Navigational Servitude.

The navigational servitude area is comprised of 32.42 acres of underwater land consisting of the breakwaters, the lake entrance channel, the access channel, and the area required for removal of the existing bridge abutment off Main Street at Eighteenmile Creek which is a hazard to navigation.

c. Fee Simple.

This area is comprised of 1.30 acres for the 150-car parking space associated with the authorized Olcott Harbor improvement project which will be designed and constructed by the locals. It is located south of East Main Street across Krull Park as shown on the Real Estate Requirement drawing on Plate 6.

d. Temporary Easement.

This area is comprised of 2.05 acres of abovewater lands required to allow construction of the project. It consists of the access road through Krull Park off East Main Street, a small area 20 feet wide east of and including the existing concrete steps at the foot of Franklin Street, and a portion of the temporary construction staging area off Jackson Street.

The easement rights were developed from an evaluation of the land requirements needed for the project features and the areas necessary to construct and maintain those features. The gross appraisal for permanent and temporary easements are discussed in more detail in Sub-Appendix D.

9. SCHEDULES FOR CONSTRUCTION IMPLEMENTATION

a. Responsibility for Implementation.

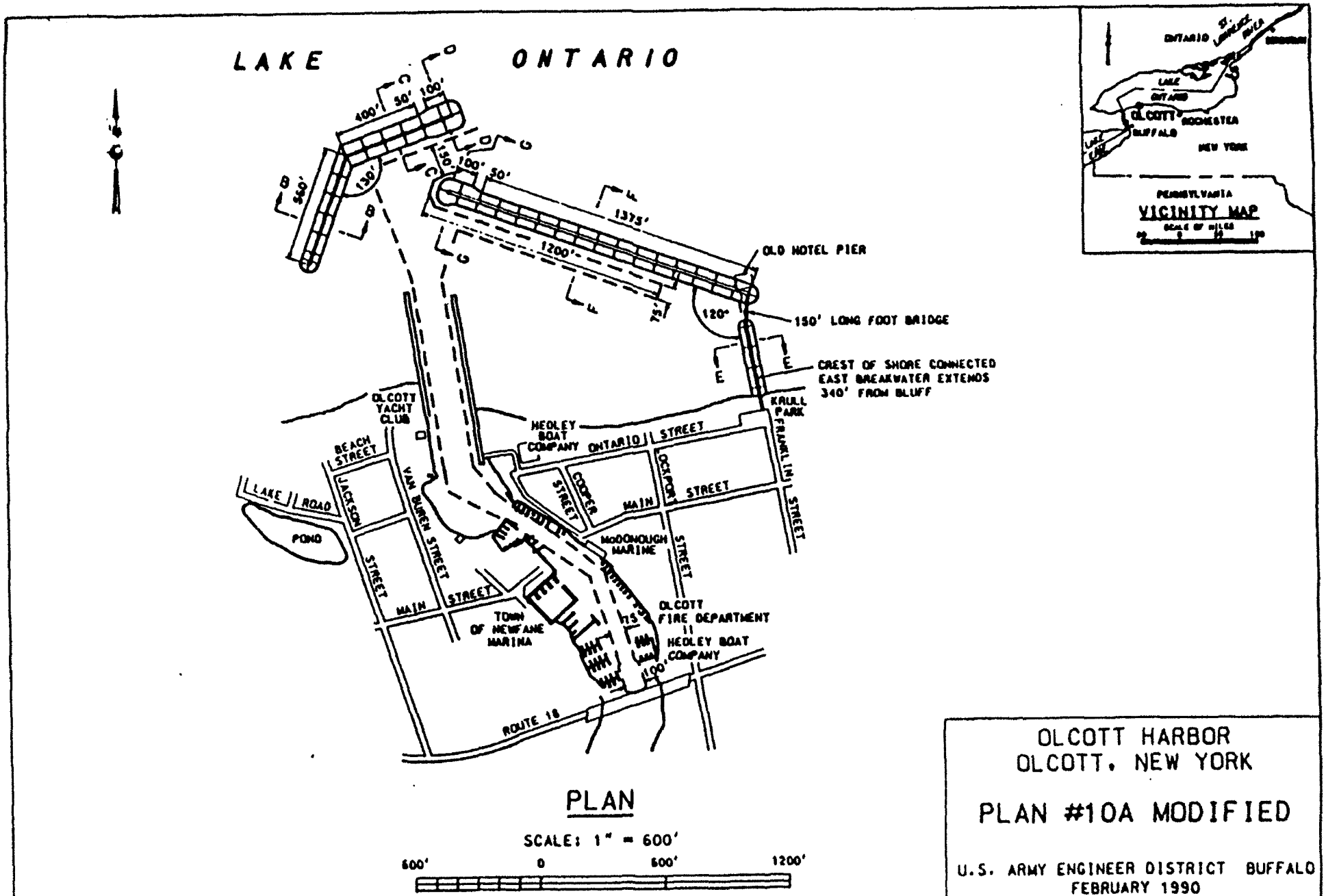
Implementation of the recommended plan will require a Local Cooperation Agreement in accordance with Section 221 of Public Law 91-611, between the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP), as the local sponsor, and the Federal Government. The design and construction of the breakwaters, pedestrian bridge, and the handicapped access ramp will be undertaken by the Corps, but cost-shared by the NYSOPRHP in accordance with the Local Cooperation Agreement. The design and construction of the 150-car parking area will be undertaken by the local sponsor but cost-shared by the Corps in accordance with the Agreement.

b. The project schedule from preparation of the Plans and Specifications through construction implementation is as follows:

| | |
|---|---|
| Complete Plans and Specifications | December 92 |
| Advertise for Construction | August 93 |
| Award | September 93 |
| Start Construction | May 94 |
| Complete Construction | November 95 |

10. CONCLUSION

The design of the project features as presented in this General Design Analysis should be the basis for preparation of the contract Plans and Specification for the Olcott Small-Boat Harbor improvement project.




PLAN

SCALE: 1" = 600'

600' 0 600' 1200'

# OLCOTT HARBOR
## OLCOTT, NEW YORK

## PLAN #10A MODIFIED

U.S. ARMY ENGINEER DISTRICT BUFFALO
FEBRUARY 1990

PLATE 1

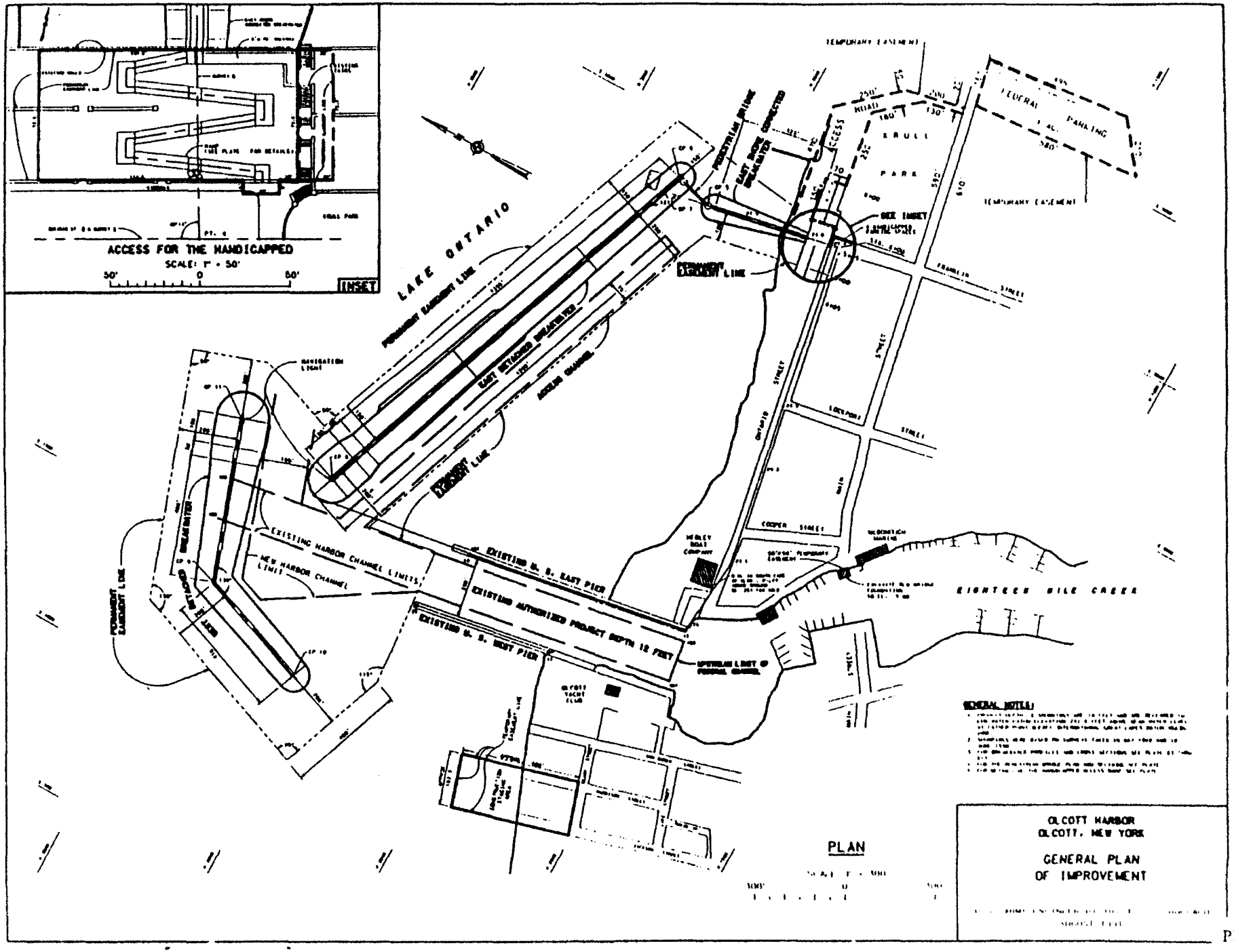
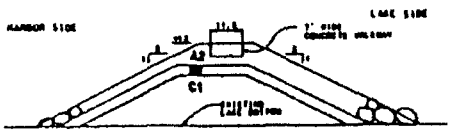
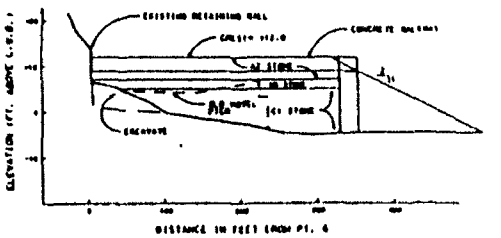

ACCESS FOR THE HANDICAPPED
SCALE: 1" = 50'
INSET
LAKE ONTARIO
PERMANENT EASEMENT LINE
EAST DETACHED BREAKWATER
ANCHOR CHANNEL
EXISTING HARBOR CHANNEL LIMITS
NEW HARBOR CHANNEL LIMIT
EXISTING U. S. EAST PIER
EXISTING AUTHORIZED PROJECT DEPTH 18 FEET
EXISTING U. S. WEST PIER
PEDESTRIAN BRIDGE
EAST SIDE RELOCATED
TEMPORARY EASEMENT
FEDERAL PARKING
KRULL PARK
FRANKLIN STREET
OSWEGO STREET
COOPER STREET
SEE INSET
EIGHTEEN MILE CREEK
PLAN
OLCOTT HARBOR
OLCOTT, NEW YORK
GENERAL PLAN
OF IMPROVEMENT

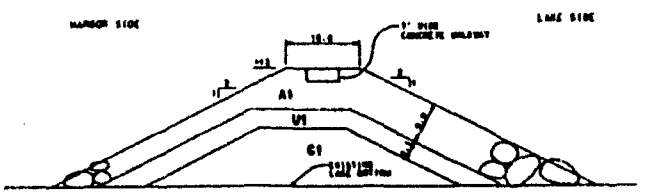
PLATE 2



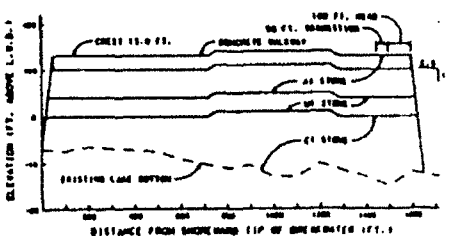

EAST SHORE CONNECTER BREAKWATER
TYPICAL SECTION



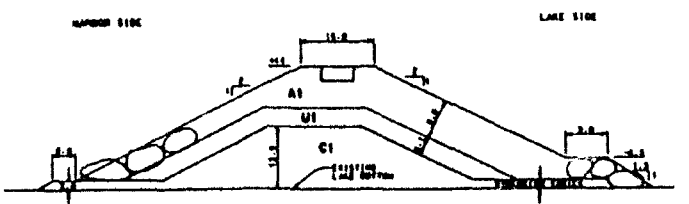

EAST SHORE-CONNECTER
BREAKWATER PROFILE




EAST DETACHED BREAKWATER
TYPICAL SECTION




EAST DETACHED BREAKWATER PROFILE



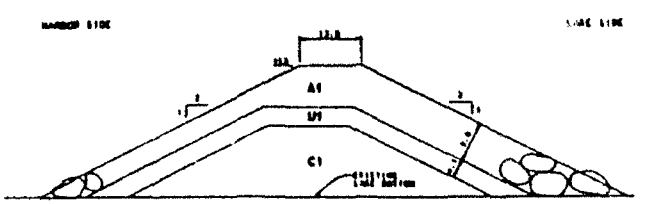

EAST DETACHED BREAKWATER
OVERBUILT SECTION

LEGEND:

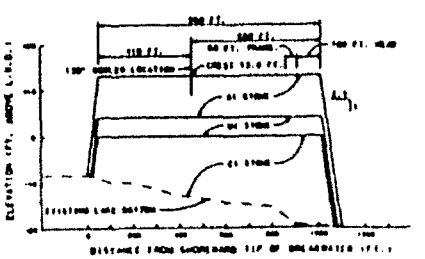
| | |
|---|---|
| A1 | ARMOR STONE 8000-12000 LBS. |
| A2 | ARMOR STONE 1400-3000 LBS. |
| C1 | CORE STONE 2-120 LBS. |
| U1 | UNDERLAYER STONE 600-2200 LBS. |
| U2 | UNDERLAYER STONE 150-350 LBS. |

NOTES:

1. STONE WEIGHTS DETERMINED BY USING A SPECIFIC GRAVITY OF 2.6




WEST DETACHED BREAKWATER
TYPICAL SECTION



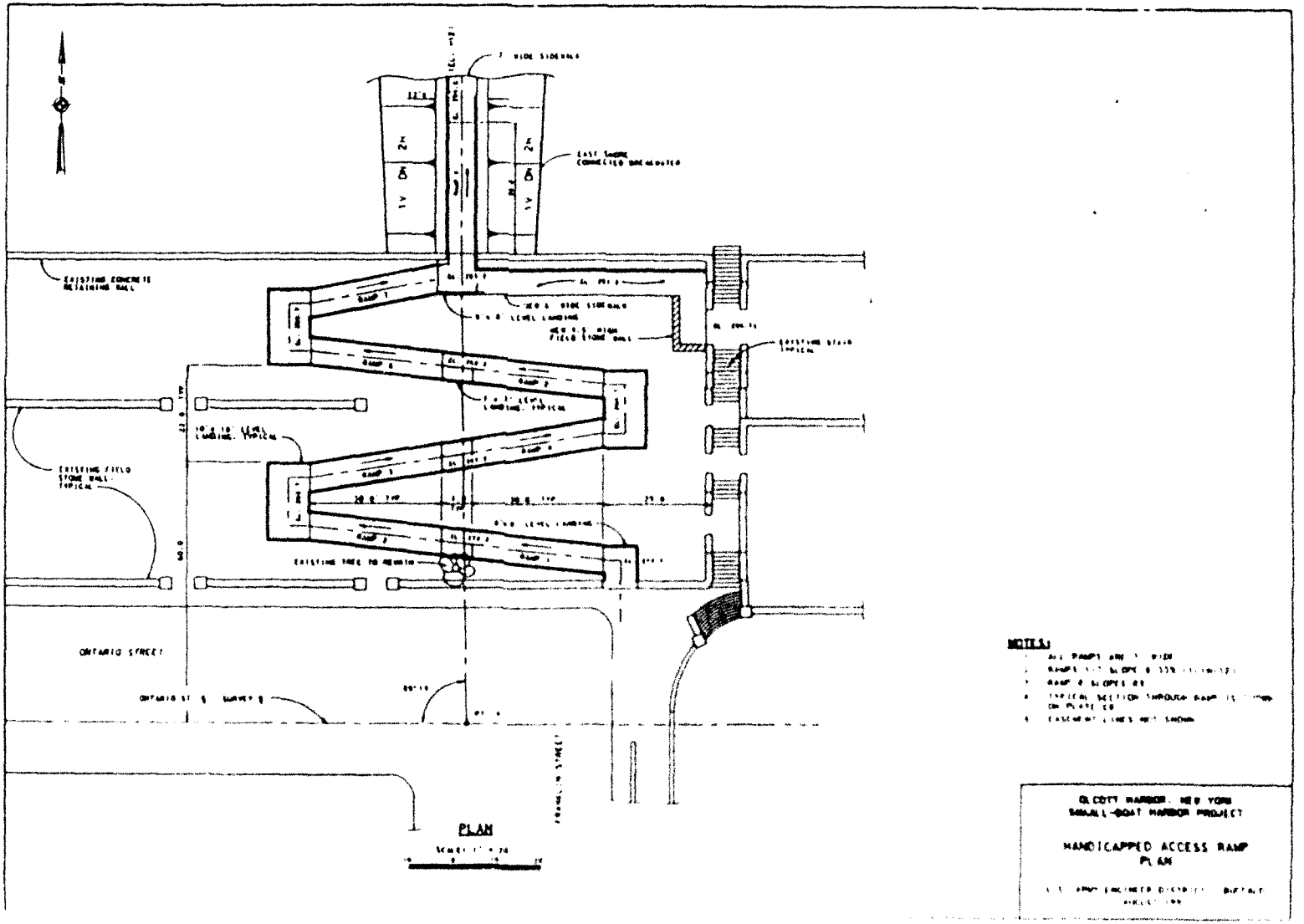

WEST DETACHED BREAKWATER PROFILE

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

BREAKWATER PROFILES AND
TYPICAL SECTIONS

U.S. ARMY ENGINEER DISTRICT BUFFALO
AUGUST 1991

PLATE 3




NOTES:

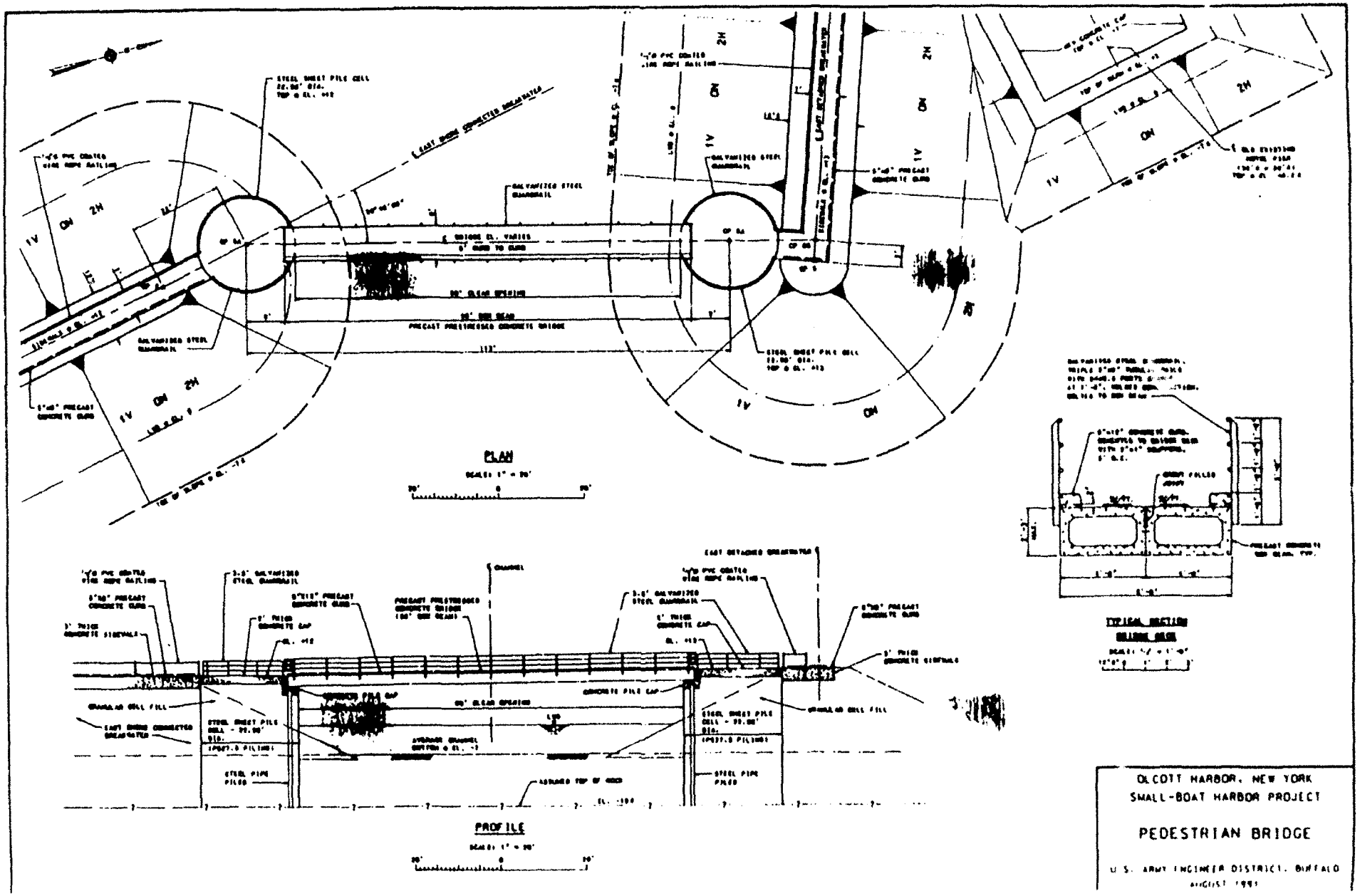
1. ALL RAMPS ARE 5' WIDE
2. RAMPS 1-3 SLOPE @ 5.5% (1:18.18)
3. RAMP 4 SLOPES @
4. TYPICAL SECTION THROUGH RAMP IS SHOWN ON PLATE 10
5. EASEMENT LINES NOT SHOWN

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

HANDICAPPED ACCESS RAMP
PLAN

U.S. ARMY ENGINEER DISTRICT, BUFFALO
BUFFALO, NEW YORK

PLATE 4




OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

PEDESTRIAN BRIDGE

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUGUST 1991

PLATE 5

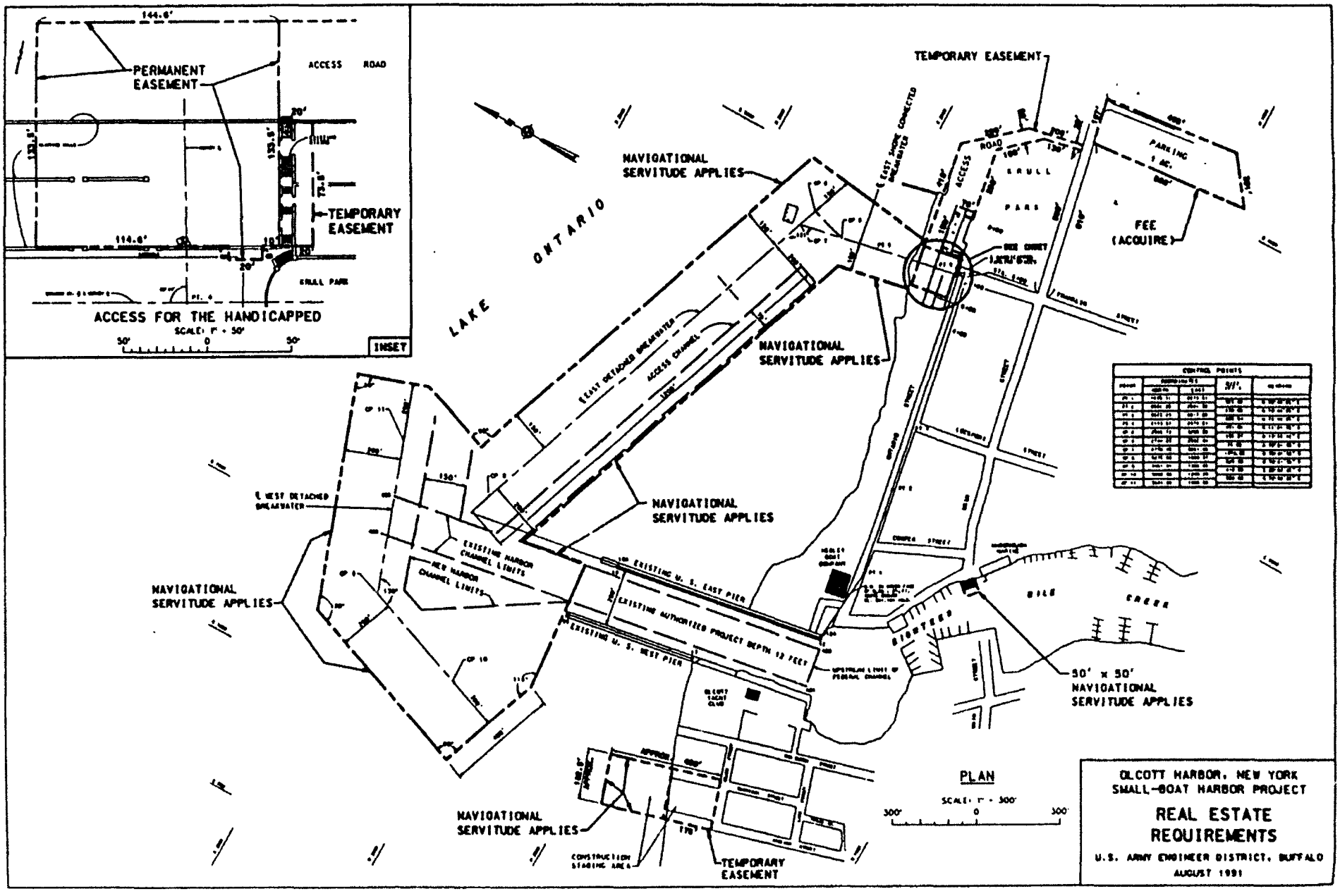

PERMANENT EASEMENT
ACCESS ROAD
TEMPORARY EASEMENT
ACCESS FOR THE HANDICAPPED
INSET
TEMPORARY EASEMENT
NAVIGATIONAL SERVITUDE APPLIES
LAKE ONTARIO
EAST DETACHED BREAKWATER
ACCESS CHANNEL
EXISTING U. S. EAST PIER
EXISTING AUTHORIZED PROJECT DEPTH 12 FEET
EXISTING U. S. WEST PIER
WEST DETACHED BREAKWATER
EXISTING HARBOR CHANNEL LIMITS
NEW HARBOR CHANNEL LIMITS
FEE (ACQUIRE)
PARKING 1 AC.
ERULL PARK
50' x 50' NAVIGATIONAL SERVITUDE APPLIES
CONSTRUCTION STAGING AREA
PLAN
SCALE: 1" = 300'
OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
REAL ESTATE REQUIREMENTS
U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUGUST 1991

PLATE 6

# Sub-Appendix A

## GEOTECHNICAL DESIGN ANALYSIS

OLCOTT HARBOR, NEW YORK

GENERAL DESIGN

SUB-APPENDIX A

GEOTECHNICAL DESIGN


| Paragraph | Subject | Page |
|---|---|---|
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| A2(b) | Bedrock Geology | 1 |
| A2(c) | Surficial Geology | 1 |
| A2(d) | Seismicity | 4 |
| A3 | LOCAL GEOTECHNICAL INFORMATION | 4 |
| A3(a) | Subsurface Explorations | 4 |
| A3(a)(1) | 1973 Exploration Program | 4 |
| A3(a)(2) | April 1989 Exploration Program | 4 |
| A3(a)(3) | July 1990 Exploration Program | 7 |
| A3(b) | Laboratory Testing Programs | 7 |
| A3(b)(1) | September 1990 Testing Program | 7 |
| A3(c) | Surficial Geology | 11 |
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| A4 | GEOTECHNICAL DESIGN | 11 |
| A4(a) | East Shore Connected Breakwater | 11 |
| A4(a)(1) | Subsurface Conditions | 11 |
| A4(a)(2) | Stability Analysis | 12 |
| A4(a)(3) | Settlement Analysis | 12 |
| A4(b) | Footbridge | 12 |
| A4(b)(1) | Subsurface Conditions | 12 |
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| A4(d) | West Breakwater | 20 |
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| A4(d)(2) | Stability Analysis | 20 |
| A4(d)(3) | Settlement Analysis | 21 |

| Paragraph | Subject | Page |
|---|---|---|
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FIGURES


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|---|---|---|
| A1 | Sketch Map of Physiographic Divisions Lake Erie-Ontario Region | 2 |
| A2 | Bedrock Geology of Northwestern New York | 3 |
| A3 | Glacial Geology of Western New York | 5 |
| A4 | Seismic Risk Map | 6 |
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| A4 | Settlement Design Parameters | 18 |
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## PLATES

| Number | Description |
|---|---|
| A1 | Plan of Subsurface Explorations |
| A2 | Geologic Profile A-A |
| A3 | Geologic Profile B-B and C-C |
| A4 | Strip Logs of Borings |
| A5 | Strip Logs of Borings |

## ATTACHMENTS

| Number | Description |
|---|---|
| A1 | Soil and Rock Design Parameter Selection |
| A2 | Laboratory Soil Test Reports |
| A3 | Stability Computer Program Input and Output |
| A4 | Stability Hand Computations |
| A5 | Settlement Computer Program Input and Output |
| A6 | Settlement Hand Computations |

# OLCOTT HARBOR, NEW YORK

## GENERAL DESIGN

## SUB-APPENDIX A

## GEOTECHNICAL DESIGN

### A1. GENERAL

This appendix summarizes information on the regional and local geology, presents results of the subsurface explorations, geotechnical design analyses of the various project features and, sources of construction materials. A description of the various project features is presented in Appendix A, Section 5.

### A2. REGIONAL GEOTECHNICAL INFORMATION

#### a. Physiography.

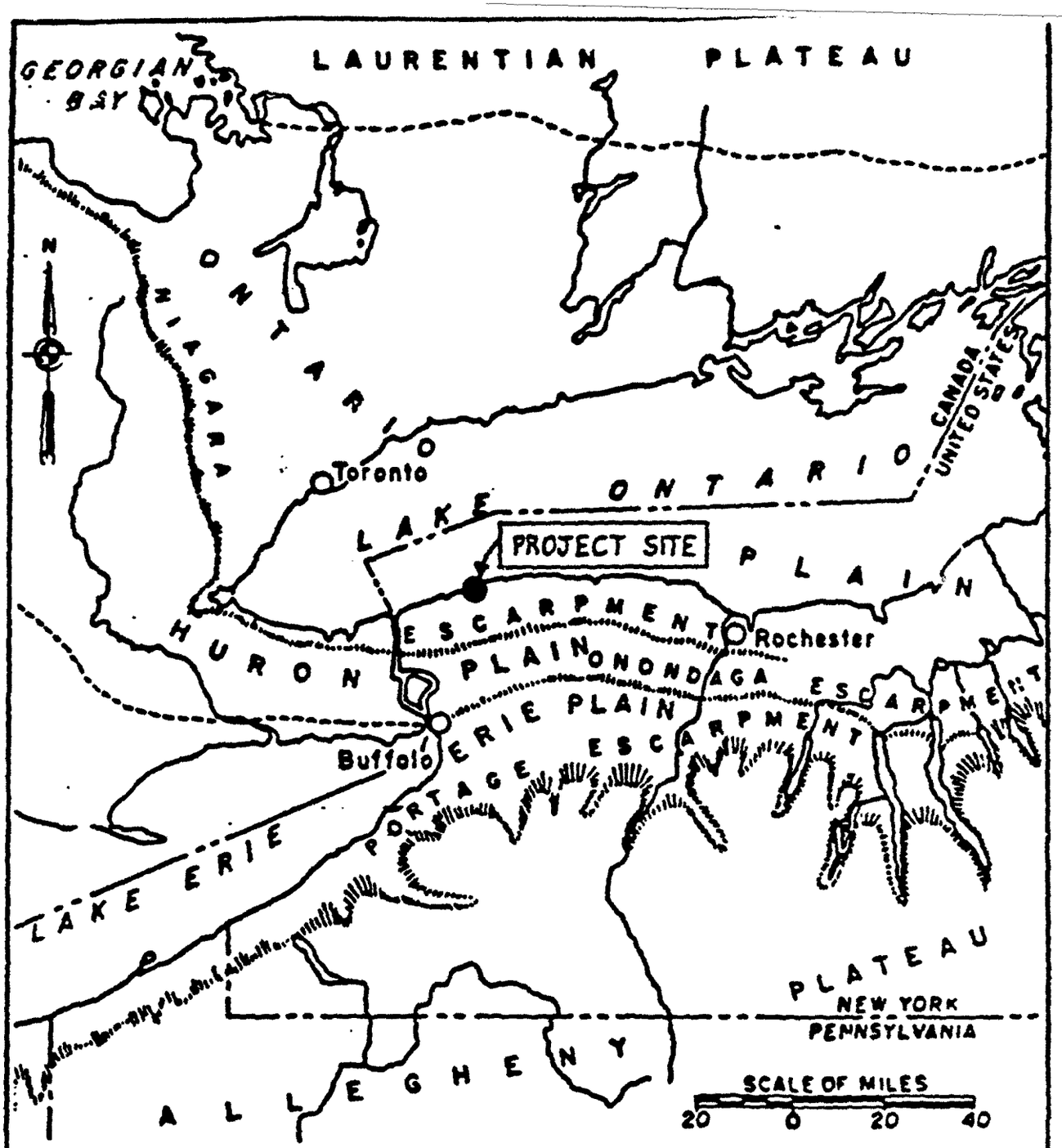
Olcott Harbor, New York is located in the town of Newfane on the south shore of Lake Ontario. It is approximately 30 miles northeast of Buffalo, New York. The town of Newfane and Olcott Harbor are located on the east-west tending Ontario Plain of the eastern section of the Coastal Lowland Province. The topography is generally flat but, hummocked drumlins and morains are scattered throughout the local area. The basic natural characteristics of the area were formed during the Glacial Ages which ended about 12,000 years ago. See Figure A1 for a sketch map of physiographic divisions in the Lake Erie-Ontario region.

#### b. Bedrock Geology.

The bedrock of the Olcott area is the Queenston Formation. The rock is sedimentary shale which locally grades to siltstone. The rock was originally deposited in a calm marine environment during the Upper Ordivician Period about 450 million years ago. The Queenston shale is characteristically dark reddish brown and massive.

#### c. Surficial Geology.

The surface geology of the Olcott area is relatively complex. Continental glaciation from the northeast during the Wisconsin Stage covered the area. Development of various lake stages resulted from the advance and retreat of the glaciers. These ice sheets scoured the area leaving an irregular topography that subsequently was filled with



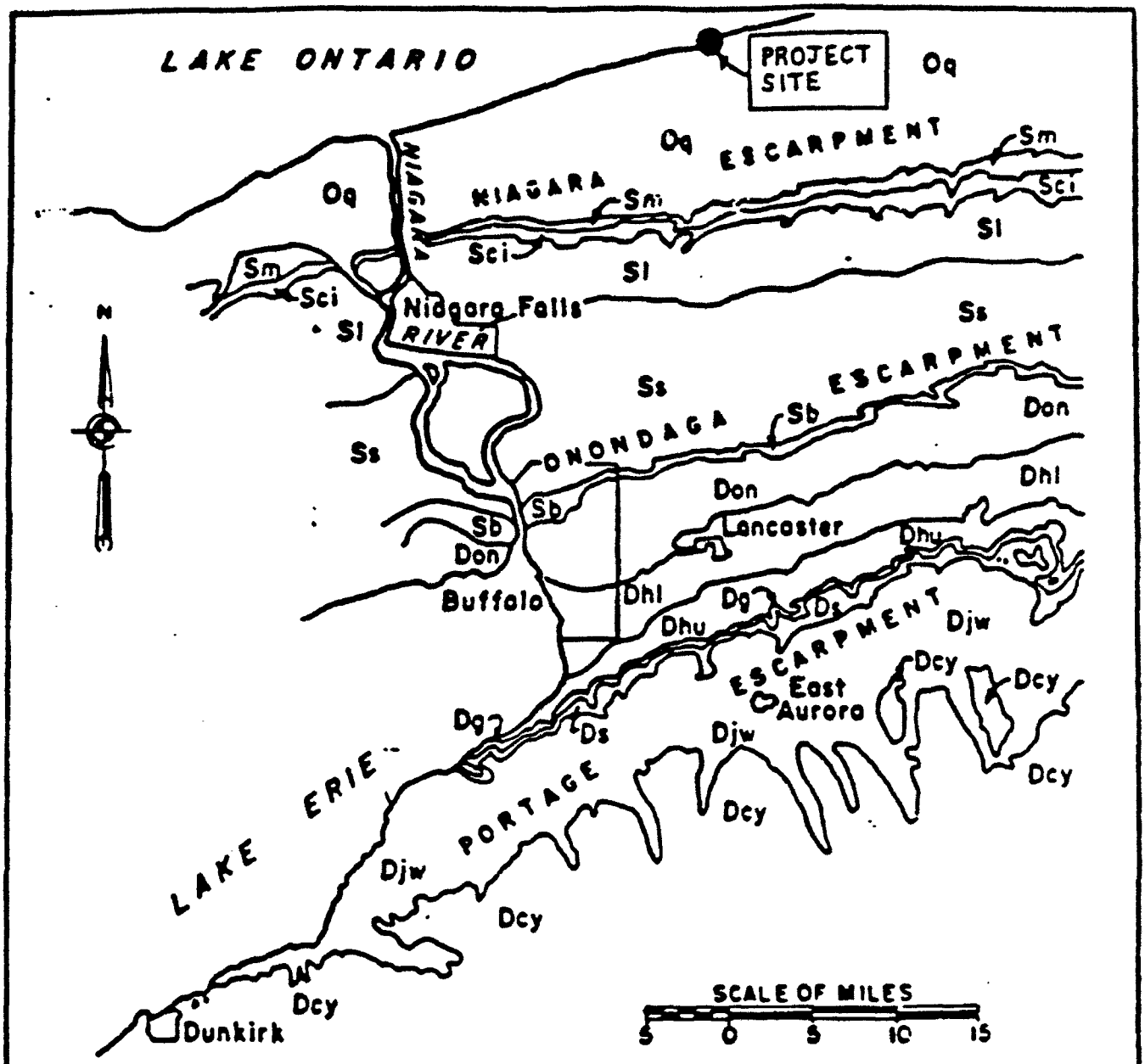

SOURCE:

KINDLE, E M AND TAYLOR, F B, 1913,
DESCRIPTION OF THE NIAGARA QUADRANGLE (N Y)
U S GEOLOGIC SURVEY GEOLOGY ATLAS, FOLIO 190

OLCOTT HARBOR, NEW YORK
SMALL BOAT HARBOR
SECTION 107
SKETCH MAP
OF PHYSIOGRAPHIC DIVISIONS
LAKE ERIE-ONTARIO REGION
U S ARMY ENGINEER DISTRICT BUFFALO



FIGURE A1




SOURCE:

CALKIN, PARKER E., 1966, LATE PLEISTOCENE HISTORY OF NORTHWESTERN NEW YORK IN GUIDEBOOK, GEOLOGY OF WESTERN NEW YORK NEW YORK STATE GEOLOGY ASSOCIATION, 38th ANNUAL MEETING, 1966

OLCOTT HARBOR, NEW YORK
SMALL BOAT HARBOR
SECTION 107

BEDROCK GEOLOGY
OF NORTHWESTERN NEW YORK

US ARMY ENGINEER DISTRICT BUFFALO



FIGURE A2

glacial and glaciofluvial materials. The topography now presents little relief and reflects the presence of former beaches and lake shorelines. At Olcott there is a rather uneven silt-topped sand plain that stretches along the coast and inland at least one mile to a low ridge, 10 to 20 feet high and correlates with the Carlton Moraine. Seeps near base of the stratified drift induce mass wasting which now largely obscures stratigraphic relationships at this site. The glacial geology of western New York is shown in Figure A3.

d. Seismicity.

Olcott, New York and the project site are located in seismic zone 2 according to the seismic risk map on Figure A4. In the event of an earthquake, damages would be moderate. The seismic coefficient is 0.10 for zone 2.

## A3. LOCAL GEOTECHNICAL INFORMATION

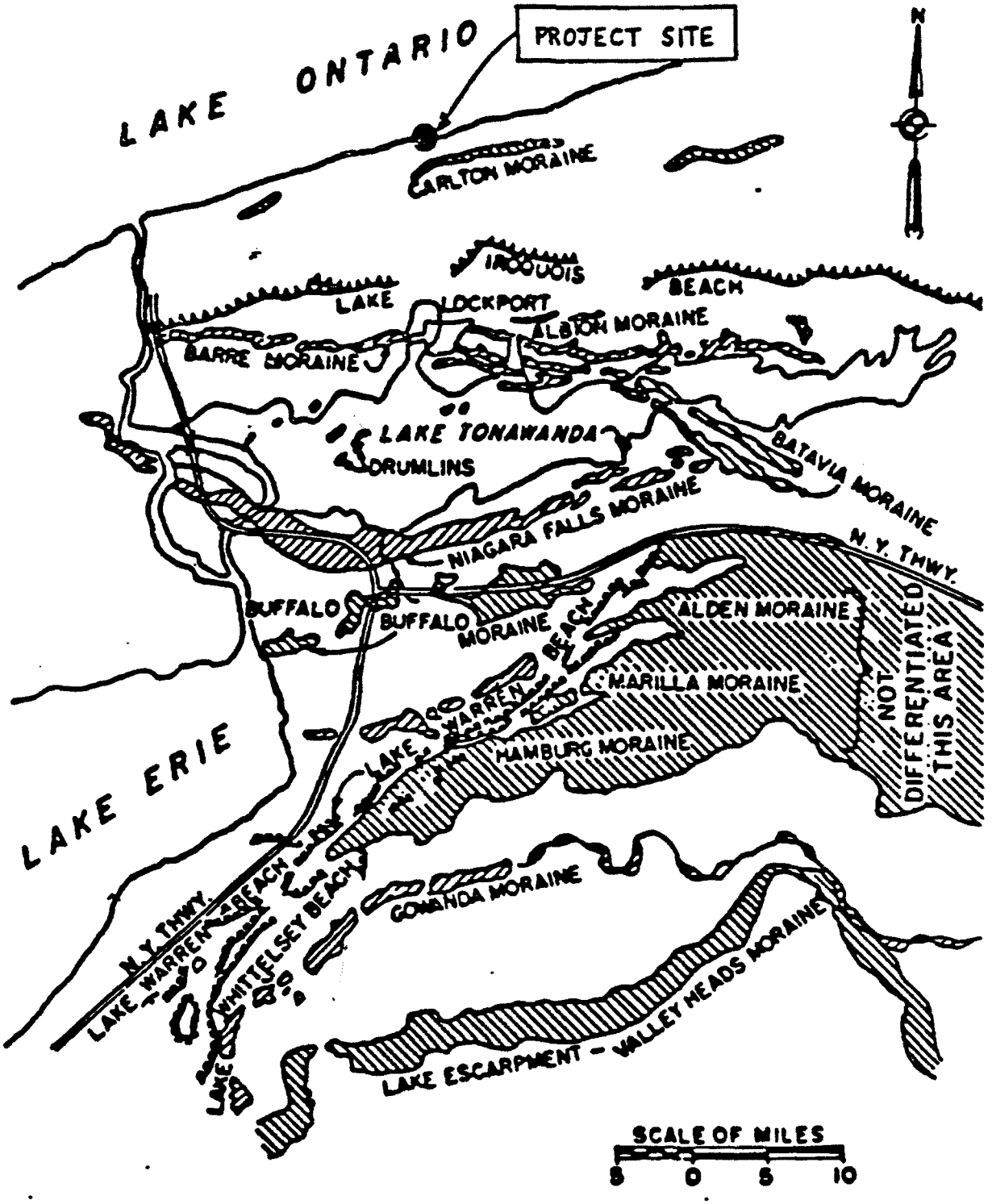
a. Subsurface Explorations.

(1.) 1973 Exploration Program.

In July 1973 the Buffalo District conducted a subsurface exploration program for this project. The location of these explorations are presented in Plate A1. The exploration program consisted of one drive sample boring (D73-3) and two drive sample and rock core borings (DC73-1 and DC73-2). The drive sample borings used a standard 1-3/8 inch ID split spoon sampler. The rock core borings used an NX double tube core barrel. The rock core drilling logs did not identify the type of drilling bit (i.e. carbide or diamond bit). Drive sample boring D73-3 was driven 57.3 feet below the lake bottom before terminating 76.2 feet below low water datum (LWD el. 242.8 feet). This boring encountered eight feet of clayey sand (SC) and, sand and gravel (GP). Followed by 49.3 feet of very soft to medium silty clay (CL) and, very loose to loose clayey silt (CL-ML). Bedrock is at elevation 166.6 feet. Drive core boring DC73-1 encountered 12 feet of Queenston shale bedrock before terminating 21.6 feet below low water datum. Drive core boring DC73-2 encountered 9.2 feet of Queenston shale before terminating 21.4 feet below low water datum. Core recovery averaged 99.1 percent in DC73-1 and DC73-2. The shale bedrock is moderately hard and massive and weathered at the surface.

(2.) April 1989 Exploration Program.

In April 1989 Buffalo District personnel conducted a total of 31 probes in the near shore area both east and west of Eighteen Mile Creek. Plate A1 presents the locations of these probes and depths driven. The probing used a six foot long by 5/8 inch diameter steel rod with a pointed tip. The probe was hammered by hand into lake sediments and bedrock using a 5 pound sledge.




SOURCE:

CALKIN, PARKER E., 1970 "STRAND LINES AND CHRONOLOGY OF THE GLACIAL GREAT LAKES IN NORTHWESTERN NEW YORK", OHIO JOURNAL OF SCIENCE.

MULLER, ERNEST H., 1978 QUATERNARY GEOLOGY OF THE NIAGARA 1 250,000 MAP SHEET, NEW YORK STATE MUSEUM SERVICE

OLCOTT HARBOR, NEW YORK
SMALL BOAT HARBOR
SECTION 107

GLACIAL GEOLOGY
OF WESTERN NEW YORK

U.S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE A3

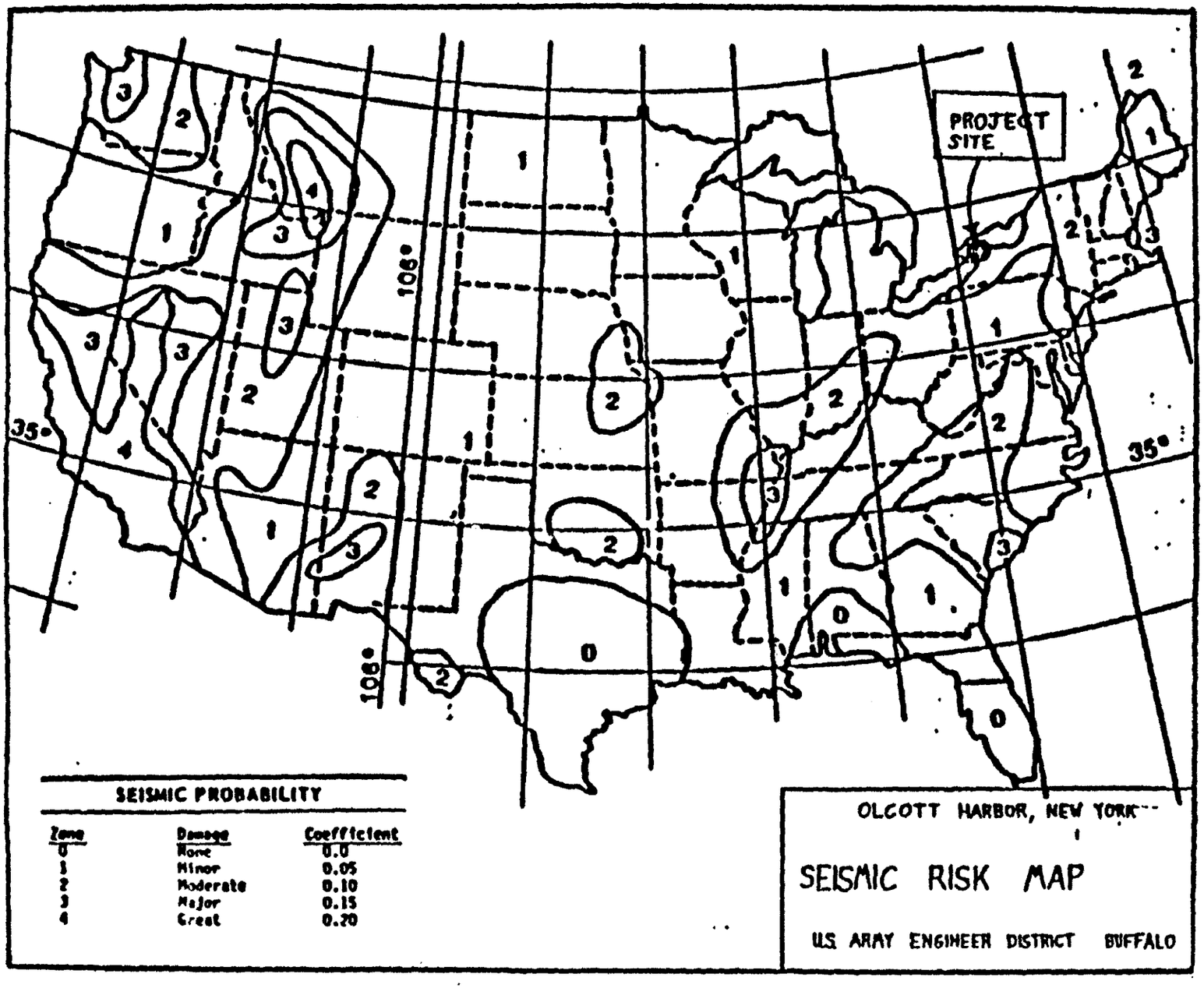

PROJECT SITE
108°
35°
SEISMIC PROBABILITY
Zone | Damage | Coefficient
0 | None | 0.0
1 | Minor | 0.05
2 | Moderate | 0.10
3 | Major | 0.15
4 | Great | 0.20
OLCOTT HARBOR, NEW YORK
SEISMIC RISK MAP
U.S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE A4

(3.) July 1990 Exploration Program.

In July 1990 Buffalo District conducted a subsurface exploration program for this project. Plate A1 presents the locations of these explorations. The exploration program consisted of 6 drive sample borings, 8 probes, 4 drive sample and rock core borings, 1 drive sample and undisturbed boring and, 1 offset undisturbed boring. Three of the drive sample borings used a standard 1-3/8 inch ID split spoon sampler (D90-2, D90-4 and, D90-7). The standard split spoon sampler had poor sample recovery. The poor sample recovery may be caused by gravel larger than 2 inch in diameter plugging the sampler. To improve sample recovery the remaining borings used a 3.0 inch diameter split spoon sampler. The probes used a NW (2-1/4 inch ID) drill rod driven by a 140 pound hammer. The rock core borings used a double tube 2-1/8 inch diameter ID core barrel with a diamond bit. The undisturbed samples used a 3 inch diameter Shelby tube. In general, the explorations reveal that the lake bottom consists primarily of Queenston shale bedrock. A 400 foot portion of the detached east breakwater will be constructed over a buried river channel. The buried river channel consists of; 8 feet of gravelly sand (SP) overlying very soft sandy organic clay (CL, OH). Near the location of the proposed foot bridge 3-1/2 feet of cobbles and gravelly sand overlie 10-1/2 feet of soft organic clay (OL, OH) with 2 inch diameter pieces of wood. Queenston shale bedrock is at 14 feet below the lake bottom. In addition the exploration program included six test pits. Four test pits (TP90-1 thru TP90-4) were dug along the beach west of Eighteen Mile Creek. The purpose of these pits is to determine the composition and thickness of the beach materials as part of the beach adjustment study contained in the Coastal Sub-Appendix B. These explorations encountered sand, gravel and, cobbles to depths of 5.5 to 8.0 feet. It is believed that one of the test pits (TP90-1) encountered bedrock at a depth of 5.5 feet below the ground surface. However, due to hole caving it could not be confirmed that this was bedrock. Two test pits (TP90-5 and TP90-6) were dug into the bluff along the proposed axis of the East Shore Connected Breakwater. The purpose of these test pits is to determine the composition of the bluff materials that the East Shore Connected Breakwater will be tied into. These explorations reveal that red-brown sand overlies grey, silty clay (CL). The silty clay had a stiff consistency and had pebbles embedded in it.

b. Laboratory Testing Programs.

(1.) September 1990 Testing Program.

The Ohio River Division Laboratory in Cincinnati, Ohio tested the July 1990 subsurface exploration program soil samples. The tests included: visual classifications, Atterberg limits, triaxial unconsolidated undrained tests, triaxial consolidated undrained tests with pore water pressure measurements and, consolidation tests. A summary of the test results is on Table A1. Only one undisturbed sample obtained from the July 1990 exploration program provided a good enough sample for laboratory testing. Thus, only one triaxial Q, R and , consolidation test were performed.

# TABLE AI - TEST DATA SUMMARY

PROJECT [illegible]

SHEET 1 OF 2

| SOURCE NO. | SAMPLE NO. | DEPTH OR ELEV OF SAMPLE | LABORATORY CLASSIFICATION | MECHANICAL ANALYSIS: GRAVEL % | SAND % | FINES % | $D_{10}$ | ATTERBERG LIMITS: LL | PL | SPECIFIC GRAVITY G | NAT. WATER CONT. % | NATURAL DRY DENSITY LBS/CU FT | COMPACTION DATA: OPT. MOISTURE % | MAXIMUM DRY DENSITY LBS/CU FT | INITIAL e | DRY DENSITY LBS/CU FT | $\sigma_1$ % | $\sigma_2$ % | $\sigma_3$ % | TYPE TEST | SPECIMEN DATA: DIAMETER | HEIGHT | TEST: $\sigma_3$ LBS/SQ FT | $\sigma_1$ LBS/SQ FT | $\sigma_2$ LBS/SQ FT | $\sigma_3$ LBS/SQ FT | $\Delta\sigma$ LBS/SQ FT | PERMEABILITY: k | k CM/MIN | CONSOLIDATION DATA: $\sigma_0$ LBS/SQ FT | $\sigma_f$ LBS/SQ FT | $C_c$ | $C_{ur}$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BPP-7 | 1 | 13.5-14.0 | [illegible] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 20.5-21.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BPP-8 | 1 | 22.5-24.0 | [illegible] (SP-SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 24.5-26.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 27.5-28.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | 30.5-31.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BPP-9 | 1 | 24.5-25.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 29.5-30.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | 34.5-35.0 | [illegible] (SC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | 7 | [illegible] (SP-SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BPP-10 | 1 | 22.0-22.5 | [illegible] (SP-SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 25.5-26.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BPP-11 | 1 | 25.5-26.0 | [illegible] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BPP-12 | 1 | 18.5-19.0 | [illegible] (SP-SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BPP-13 | 1 | 24.5-25.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 26.5-27.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | 31.5-32.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | 35.5-36.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | 39.5-40.0 | [illegible] (SP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7 | 42.5-43.0 | [illegible] (SM) | | | | | 24 | 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8 | 43.5-44.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12 | 49.5-50.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 13 | 7 | [illegible] (SM) | | | | | 20 | 20 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 17 | 7 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19 | 60.5-61.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 21 | 65.5-66.0 | [illegible] (SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

FORM [illegible] EDITION OF 1 MAR 63 IS OBSOLETE

P - Preferred, Ideal Test Method

NP - Non-Plastic, Liquid Limit Not Determined

A - [illegible]

S - [illegible]

C - [illegible]

U - [illegible]

# TABLE A1 - TEST DATA Summary

PROJECT ELCOTT HARBOR, N.Y.

| BORING NO. | SAMPLE NO. | DEPTH OR ELEV. OF SAMPLE | LABORATORY CLASSIFICATION | MECHANICAL ANALYSIS: GRAVEL % | SAND % | FINES % | $D_{10}$ | ATTERBERG LIMITS: LL | PL | SPECIFIC GRAVITY | NAT. WATER CONT. % | NATURAL DRY DENSITY LBS/CU FT | COMPACTION DATA: OPT. WATER CONT. % | MAXIMUM DRY DENSITY LBS/CU FT | SHEAR DATA: INITIAL | DRY DENSITY LBS/CU FT | $\phi_1$ | $\phi_2$ | $I_1$ | TYPE TEST | SPECIMEN SIZE INCHES | TEST | $\phi_m$ TSF | $\phi_r$ TSF | $I_r$ TSF | DEGREES | PERM. VALUES: e | k FT/MIN | CONSOLIDATION DATA: $P_o$ TSF | $P_c$ TSF | $C_c$ | $C_v$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B00-B3C | 0 | 28.5-30.0 | SANDY CLAY (CL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B00-730 | 1 | 10.5-12.0 | SILTY SAND (SP-SM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | 27.5-29.0 | SANDY INORGANIC CLAY (CL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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1 JAN 73

T - TRIAXIAL COMPRESSION
UC - UNCONFINED COMPRESSION

DS - DIRECT SHEAR
C - UNCONSOLIDATED UNDRAINED

# TABLE A1 TEST DATA SUMMARY

PROJECT _____, N.Y.

| BORING NO | SAM NO. | DEPTH OR ELEV. OF SAMPLE | LABORATORY CLASSIFICATION | MECHANICAL ANALYSIS: GRAVEL % | SAND % | FINES % | $D_{10}$ | ATTERBERG LIMITS: LL | PL | SPECIFIC GRAVITY G | NAT. WATER CONT % | NATURAL DRY DENSITY LBS/CU FT | COMPACTION DATA: DRY DENSITY LBS/CU FT | OPT. MOISTURE % | LINEAR DATA: INITIAL | DRY DENSITY LBS/CU FT | $w_c$ % | $w_s$ % | $S_r$ % | TYPE TEST | SPECIMEN SIZE INCHES | TEST | $\sigma_m$ TSF | $c_u$ TSF | $\phi_u$ | $c$ TSF | $\phi$ | PERM. RESULTS: k | k FT/MIN | CONSOLIDATION DATA: $P_o$ TSF | $C_c$ | $C_c$ | $t_{50}$ | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | 22 | ? | SANDY CLAY (CL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 23 | 23.0-26.5 | SANDY SILTY CLAY (CL-ML) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 24 | 26.5-40.0 | SANDY ORGANIC CLAY (OL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | 26.0-40.0 | SANDY ORGANIC CLAY (OL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 26 | [illegible] | SANDY ORGANIC CLAY (OL) | | | | | 75 | 46 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 27 | 49.0-56.5 | SANDY ORGANIC CLAY (OL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 28 | 51.5-52.0 | SANDY ORGANIC CLAY (OL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 29 | 52.0-60.5 | SANDY ORGANIC CLAY (OL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 31 | 56.5-57.0 | SANDY ORGANIC CLAY (OL) | | | | | 74 | 49 | | | | | | | | | | | | | | | | | | | | | | | | |
| | ST-2 | 52.5-56.5 | ORGANIC SILT (OH) | | | | | 53 | 35 | 2.62 | 63.7 | | | | | | | | | | | | | | | | | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | 1.867 | 63.7 | 99.3 | 98.0 | 100. | 0 | 1.02357.930 | | 1 | 1 | .84 | | | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | 1.73 | 80.0 | 64.6 | 66.0 | 96 | 0 | 1.02583.03 | | 2 | 1 | .16 | 2 | 0.6 | 0 | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | 1.731 | 80.0 | 63.6 | 63.0 | 98.5 | 0 | 1.02583.99 | | 3 | 2 | .12 | | | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | 1.746 | 80.0 | 62.9 | 58.0 | 100 | 0 | 1.02583.934 | | 1 | 1 | .16 | | | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | 1.735 | 80.0 | 63.6 | 58.0 | 100 | 0 | 1.02583.997 | | 2 | 2 | .72 | 0.3 | 15 | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | | | | | | | | | 1 | .319 | .272 | | | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | | | | | | | | | 2 | 1.336 | .636 | 0.3 | 55 | | | | | | |
| | ST-1 | 56.5-56.5 | ORGANIC SILT (OH) | | | | | | | | | | | | | | | | | | | | | | | | | | | 0.56 | 1.02 | 0.52 | | |
| [illegible] | ST-1 | 20.0-20.5 | GRAVELLY CLAYEY ORGANIC SAND (SM-OL) | | | | | 79 | 52 | | | | | | | | | | | | | | | | | | | | | | | | |
| 000-230 | 1 | ? | SANDY ORGANIC CLAY (OL) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 000-23C | 1 | 20.5-22.0 | GRAVELLY SAND (SP-SC) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | 22.5-23.5 | SANDY SILTY CLAY (CL-ML) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3 | 22.5-22.5 | SANDY SILT (ML) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | 22.5-22.5 | SANDY SILT (ML) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4 | 23.5-25.0 | CLAYEY SILTY SAND (SC-SM) | | | | | 30 | 20 | | | | | | | | | | | | | | | | | | | | | | | | |

ENG FORM 7086 EDITION OF 1 MAR 58 IS OBSOLETE
1 JAN 73

T - TRIAXIAL COMPRESSION
UC - UNCONFINED COMPRESSION
DS - DIRECT SHEAR
Q - UNCONSOLIDATED UNDRAINED
S - CONSOLIDATED DRA...
R - CONSOLIDATED U...

c. Surficial Geology.

The geologic development of Olcott Harbor is closely related to the glacial and post-glacial history of the Lake Ontario Basin. Prior to the last period of glaciation (Late Pleistocene) Eighteen Mile Creek occupied a deep channel which underlies the harbor area. This channel, first hypothesized from the analysis of the nearshore bathymetry now has been confirmed by the probes and drive cores of the most recent subsurface exploration program (Plate A2). Pleistocene glaciation and de-glaciation of this area resulted in several lake level fluctuations and widespread deposition of ground and end morains in the landward areas south of Olcott Harbor. As recently as 12,000 years B.P., an ice front retreated from the southern edge of the Ontario Basin and allowed for glacial Lake Iroquois to form. It is believed that at this time the course of the ancestral Eighteen Mile Creek was diverted to its present position. About 5,000 years B.P., the Ontario Basin reached a low level of about 150 feet above sea level and then began rising as coastal rebound raised its outlet. As lake levels rose to near present levels (about 2,000 years B.P.) the mouth of Eighteen Mile Creek was drowned and development of a buried channel began. The 1990 subsurface exploration defined the nature of the surface deposits underlying the proposed project breakwater. Generally, the channel consists of gravely sand overlying a high fibrous, organically rich, moist clay. Presentation of the geologic soil stratification and classification from the 1990 exploration program is presented on Plates A2 and A3.

d. Local Bedrock Geology.

The project is underlain by the Queenston Shale of Upper Ordivician age. This formation is believed to be in excess of 1000 feet thick and dips to the south about 50 feet per mile. The Queenston shale at Olcott is generally red but does contain minor green shale zones, it's massive, moderately hard and displays prominent ripple marks.

A4. GEOTECHNICAL DESIGN

a. East Shore Connected Breakwater.

(1.) Subsurface Conditions.

In April 1989 Buffalo District drove six probes along side of the existing east pier. The probes encountered granular lake sediments and met refusal between 0.3 feet and 1.1 feet below lake bottom. The granular lake bottom deposits consisted of sand, gravel and, cobbles. The probes refused on shale bedrock. In July 1990 Buffalo District dug two test pits into the bluff that the breakwater will be tied into (See Plate A1 for locations). These test pits reveal that approximately 13 feet of fill over lie glacial till. The fill consisted of red brown sand with roots. The glacial till consisted of grey silty clay (CL) with pebbles embedded.

(2.) Stability Analysis.

The bedrock foundation will have a high shearing resistance. Therefore, foundation shear failure should not occur. The existing east pier has deteriorated over the years. At approximately 213 feet lakeward from the concrete retaining wall the concrete cap drops off. From this point to the existing conrete pad (550 feet from the retaining wall) the structure is submerged with isolated portions of the structure observable at the lake level. An underwater field reconnaisance of the structure in this area reveals that the existing wood cribbing is rotted or is missing. At several locations voids were observed beneath the existing concrete cap. The new shore connected east breakwater will be constructed over the existing structure. The deteriorated condition of the existing structure will be considered in the design and construction of the new structure to insure that it is structurally stable.

(3.) Settlement Analysis.

The breakwater will be constructed over thin granular deposits and bedrock. Therefore settlement is of no concern.

b. Footbridge.

(1.) Subsurface Conditions.

Geologic profile B-B (Plate A3) shows the subsurface conditions along the proposed alignment of the footbridge. A probe at the shore connected breakwater (P90-1) encountered refusal at 0.8 feet below the lake bottom. The bottom of the probe point was coated with some red pulverized Queenston shale bedrock. A boring at the north end of the footbridge (D90-23, D) encountered 14 feet of overburden and shale bedrock. The overburden consisted of 3.5 feet of gravelly sand (SP-SM) and cobbles over very soft sandy organic clay and silt (OL). The sandy organic clay deposits contained several pieces of wood 2 inches in diameter. The organic clay deposits are derived from an old buried river channel or a man made channel that has since filled in.

(2.) Soil and Rock Design Parameters.

The soil and rock design parameters used in the design of the footbridge are in Table A2. These design parameters are presumptive values based upon typical values found in literature. A further discussion of the basis for selection of these parameters is in Attachment A1.

Table A2 - Footbridge Soil and Rock Design Parameters

| Material Type | Unit Weight (pcf) | Shear Strength c' (psf) | Shear Strength ø' (deg) |
|---|---|---|---|
| 1. Sandy gravel and cobbles lake bottom (SP-SM) | 110 (saturated) | 0 | 38 |
| 2. Organic clay and silt (OL) | 85 (saturated) | 0 | 26 |
| 3. Cell Fill (crushed stone) | 110 (moist)<br>68 (submerged) | 0 | 32 |
| 4. Breakwater Armor Stone | 110 (moist)<br>68 (submerged) | 0 | 40 |
| 5. Queenston Shale bedrock | unconfined compressive strength qu = 6,000 psi | | |

(3.) Stability Analysis.

The footbridge design and stability analysis is contained in Sub-Appendix C.

c. East Detached Breakwater.

(1.) Subsurface Conditions.

Geologic profile A-A shows the subsurface conditions along the proposed alignment of the East Detached Breakwater. Generally, the breakwater will be constructed over thin granular deposits and bedrock. The exception is an approximately 400 foot section (Station 6+00 to 10+00) that will be constructed over the remnants of an old buried channel. The maximum boring depth of 33.5 feet within this section (DU90-22, A) did not encounter bedrock. The deposits within this section consist of 8 feet of gravelly sand (SP) underlain by very soft sandy organic clay (OH) and clay (CL).

(2.) Soils Laboratory Test Results.

A summary of the laboratory tests conducted on samples of the buried channel deposits is in Table A1. The actual test reports are contained in Attachment A2. Liquid limits for the organic clay and clay deposits varied from 53 to 84 percent with plasticity indices of 18 to 42 percent. The triaxial unconsolidated undrained test resulted in a strength envelope having a cohesion intercept of c = 0.6 tsf (1200 psf) and an angle of internal friction of 0 degrees. The triaxial consolidated undrained test resulted in a total strength envelope

having a cohesion intercept of c = 0.3 tsf (600 psf) and an angle of internal friction of $\phi$ = 15 degrees. The consolidated undrained effective strength envelope based upon maximum deviator stress stress difference resulted in a cohesion intercept of c = 0.5 tsf (1000 psf) and an angle of internal friction of 16 degrees. The consolidated undrained effective stress p versus q plot is based upon maximum principal stress ratio. The p versus q strength envelope had a cohesion intercept of 0 tsf and slope angle $\alpha$ = 33.5 degrees (equivalent to Mohr Coulomb strength of c' = 0 tsf, $\phi'$ = 41.4 degrees). The consolidated undrained effective p versus q stress plots show that the organic silt/clay specimen exhibits transitional behavior with dilation at low confining pressures and contraction at high confining pressures. Consolidation test results reveal that the organic silt/clay is slightly over consolidated (OCR = 1.9) with a maximum past pressure of 1.03 tsf. The virgin compression and recompression indices are 0.62 and 0.06 respectively.

(3.) Stability Analysis.

The Geotechnical breakwater stability analysis considered shear through the foundation soils as the potential failure mode. It was assumed in the analysis that the failure surface would be circular in shape. Computer program UTEXAS 2 was used to find the critical (minimum factor of safety) circular failure surface. Bishop's method of analysis was used to compute the factor of safety against shear failure.

The stability was analyzed for the end of construction and long term design cases. The stability design criteria for the end of construction case is based upon the recommendations contained in EM1110-2-1902, " Stability of Earth and Rockfill Dams ". The required minimum factor of safety for the end of construction case is 1.3. The required minimum factor of safety for the long term case is 1.0.

The design parameters used in the Geotechnical stability analysis is presented in Table A3. These parameters are based upon laboratory test results, field descriptions and, typical values found in literature. A further discussion of the basis for selection of these parameters is contained in Attachment A1.

Table A3 - East Breakwater Stability Design Parameters

| Material Type | Unit Weight (pcf) | End of Cons't | | Long Term | |
|---|---|---|---|---|---|
| | | c (psf) | $\phi$ (deg) | c' (psf) | $\phi'$ (deg) |
| Armor Stone | 110 (mst)<br>68 (sub) | 0 | 40 | 0 | 40 |
| Loose sandy gravel foundation (SP) | 90 (sat) | 0 | 32 | 0 | 32 |
| Very soft organic clay (OH, CL) | 100 (sat) | Su = 207 + 37.6z | | 0 | 28 |

The results of the stability analysis for the end of construction case is presented in Figure A5. The critical failure surface passes through the loose sandy gravel and into the very soft organic clay deposits. The critical failure surface has a computed factor of safety of 1.269 that is slightly below the required minimum of 1.3. The required minimum factor of safety of 1.3 in EM1110-2-1902 provides a margin of safety against failure of an earth or rock fill dam. Failure of the subject breakwater is considered not to be as critical or life threatening as a failure of a dam that impounds water. Therefore, the above criteria was relaxed with the computed factor of safety of 1.269 is considered to be sufficient.

The results of the stability analysis for the long term case is presented in Figure A6. The critical failure surface passes through the loose sandy gravel and into the very soft organic clay deposits. The critical failure surface has a factor of safety of 1.518 that is well above the required minimum of 1.0.

The data input into the UTEXAS 2 stability computer program and corresponding output is contained in Attachment A3. A hand calculation verifying the computer based results is contained in Attachment A4.

(4.) Settlement Analysis.

The very soft organic clay deposits in the buried channel are very compressible and could result in considerable settlement of the breakwater. Computer program CSETT was used to compute the magnitude and time rate of settlement of the breakwater. This computer program uses Terzaghi's one dimensional consolidation theory.

The design parameters used in the settlement analysis is presented in Table A4. The compression indices (Cc, Cr) and maximum past pressure (Pc) are based upon the laboratory consolidation test results. The coefficient of consolidation (Cv) is a presumptive value based upon typical values found in literature. It was not possible to determine the coefficient of consolidation from the shape of the laboratory deformation vs time curves. The laboratory deformation vs time curves appear to show the lower portion of the standard S curve (i.e. near the end of primary consolidation) indicating a rapid rate of consolidation. A further discussion of the basis for selection of these parameters is contained in Attachment A1.

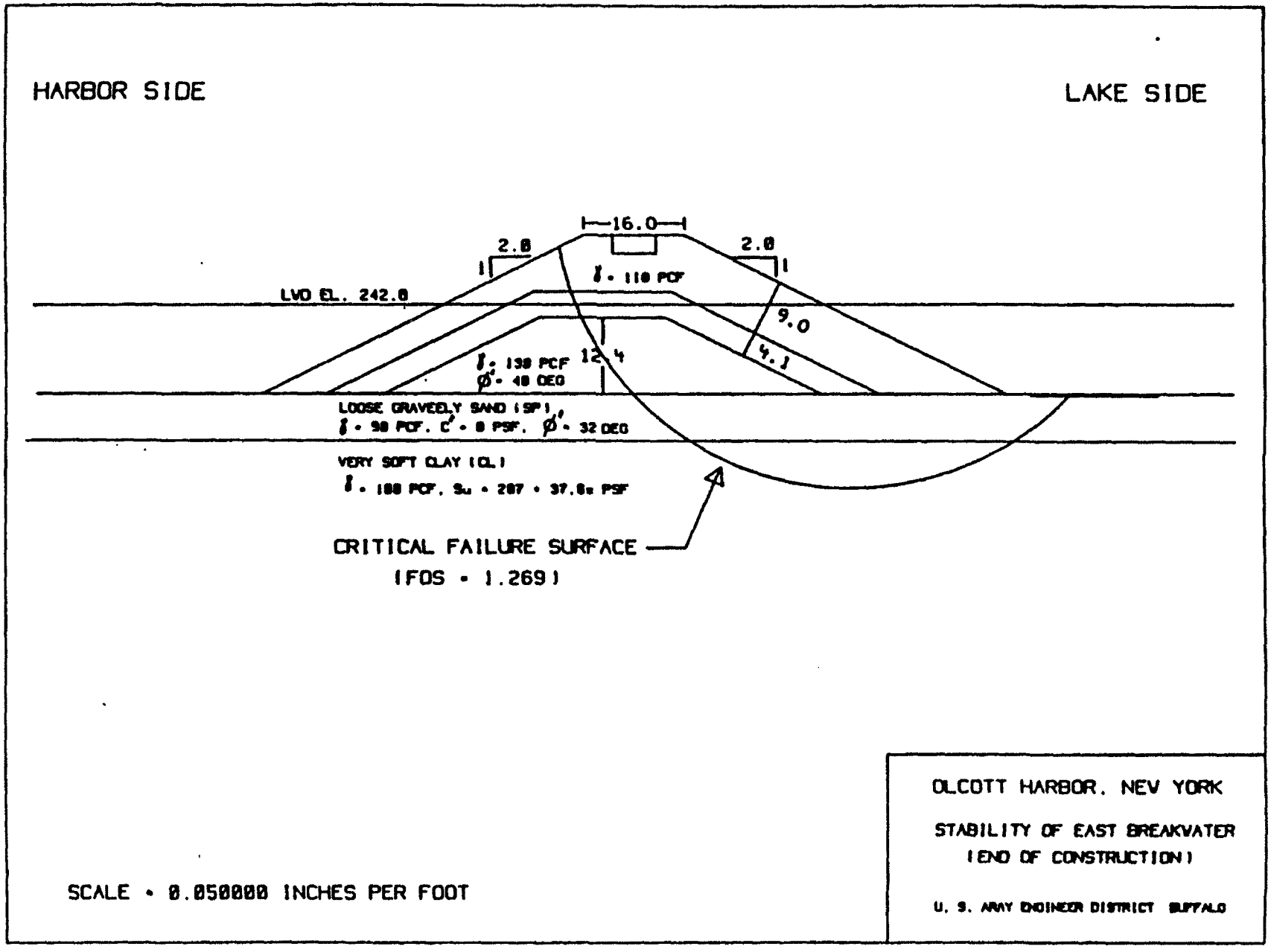

HARBOR SIDE
LAKE SIDE
16.0
2.8
2.8
1
1
γ = 110 PCF
LWD EL. 242.0
9.0
4.1
12.4
γ = 130 PCF
φ' = 40 DEG
LOOSE GRAVELLY SAND (SP)
γ = 90 PCF, c' = 0 PSF, φ' = 32 DEG
VERY SOFT CLAY (CL)
γ = 100 PCF, Su = 287 + 37.8z PSF
CRITICAL FAILURE SURFACE
(FOS = 1.269)
SCALE = 0.050000 INCHES PER FOOT
OLCOTT HARBOR, NEW YORK
STABILITY OF EAST BREAKWATER
(END OF CONSTRUCTION)
U. S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE A9

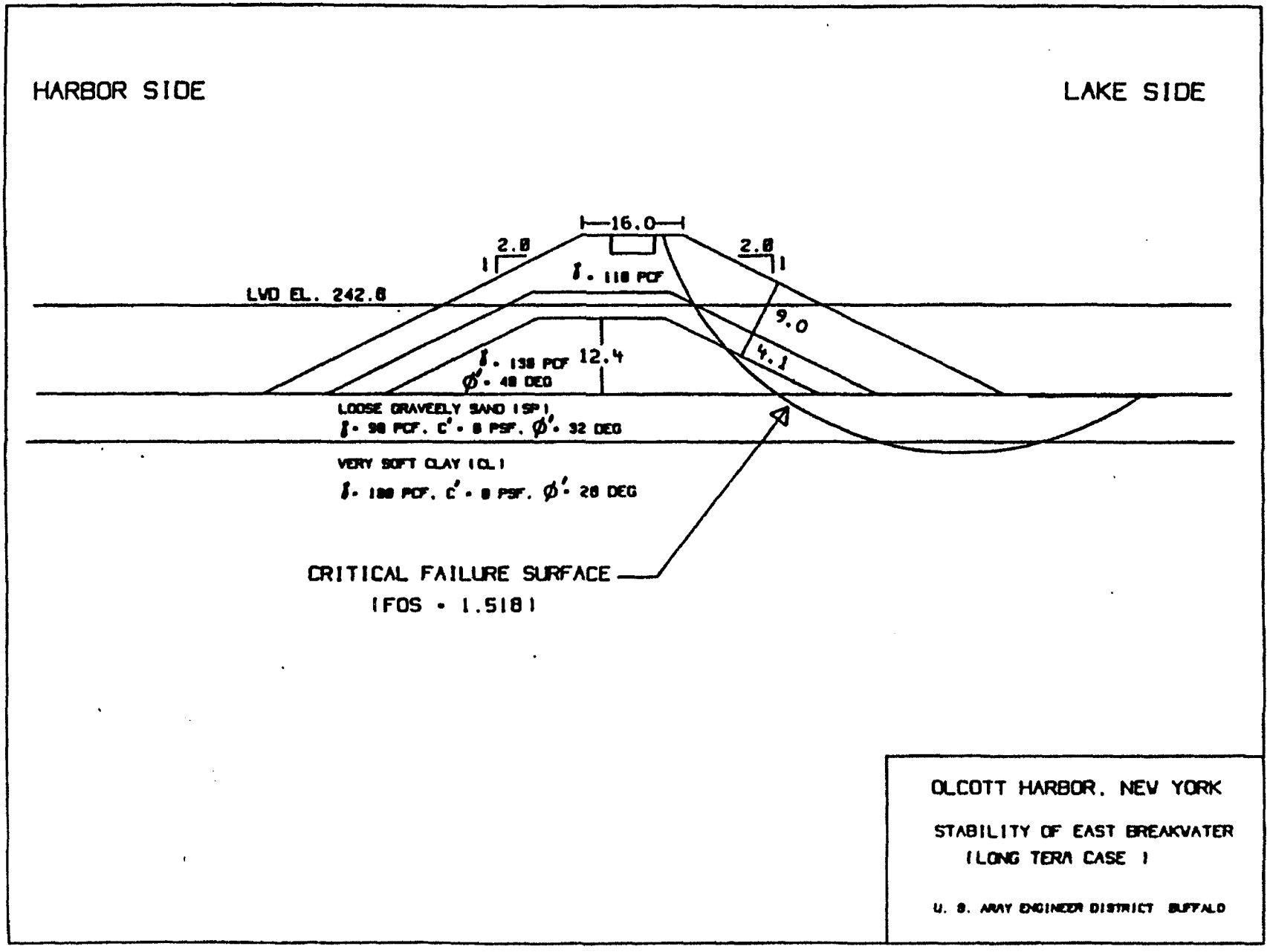

HARBOR SIDE
LAKE SIDE
16.0
2.8
2.8
γ = 118 PCF
LWD EL. 242.8
9.0
4.1
12.4
γ = 138 PCF
φ' = 48 DEG
LOOSE GRAVELLY SAND (SP)
γ = 98 PCF, C' = 0 PSF, φ' = 32 DEG
VERY SOFT CLAY (CL)
γ = 100 PCF, C' = 0 PSF, φ' = 28 DEG
CRITICAL FAILURE SURFACE
(FOS = 1.518)
OLCOTT HARBOR, NEW YORK
STABILITY OF EAST BREAKWATER
(LONG TERM CASE 1)
U. S. ARMY ENGINEER DISTRICT BUFFALO

FIGURE A6

Table A4 - Settlement Design Parameters

| Layer No. | Material Type | Insitu Pressure Po (psf) | Max past Pressure Pc (psf) | Void Ratio $e_o$ | Comp Index Cc | Comp Index Cr |
|---|---|---|---|---|---|---|
| 1. | Loose sandy gravel (incompressible) | 110 (D = 4') | - | - | - | - |
| 2. | Very soft organic clay (OH, CL) | 395 (D = 13') | 2060 | 1.72 | 0.62 | 0.06 |
| 3. | Very soft organic clay (OH, CL) | 771 (D = 23') | 2060 | 1.54 | 0.62 | 0.06 |
| 4. | Very soft organic clay (OH, CL) | 1079 (D = 33') | 2060 | 1.45 | 0.62 | 0.06 |
| 5. | Very soft organic clay (OH, CL) | 1692 (D = 39') | 2060 | 1.33 | 0.62 | 0.06 |
| Coefficient of Consolidation, Cv = 50 ft /yr (layers 2 thru 5) | | | | | | |

The laboratory consolidation test results show that organic clay deposits are slightly over-consolidated with an over-consolidation ratio of about 2.0. Other data indicates that the deposits may be normally consolidated (i.e. natural water contents greater than the liquid limit, void ratios greater than 1.0). However, this relationship is empirical whereas consolidation tests show the actual behavior of the soil. Thus, it is more reasonable to use the laboratory consolidation test data to estimate the settlement. To account for sample disturbance the laboratory void ratio vs effective stress curve was reconstructed to produce the theoretical field curve (See Attachment A1). Using the field void ratio vs effective stress curve as input into the computer program the maximum ultimate settlement of 2.176 feet occurs at the center line of the structure. The time rate of consolidation show that it will take over 79 years to obtain the ultimate settlement with 98% consolidation within this time period. At the end of 1.25 and 2.5 years after construction the settlement is estimated to be .4 and .6 feet respectively. Approximately 50% of the ultimate (1.1 feet) is expected to occur within 10 years after construction. If the organic clay deposits are normally consolidated with a compression index of 0.62 the maximum ultimate settlement will increase to 5.281 feet over the same interval of time. Table A5 summarizes the time rate of settlement.

Table A5 - East Breakwater Time Rate of Settlement

| Number of Years | Settlement (feet) | |
|---|---|---|
| | Use Curve Data | Assume N.C. |
| .02 | .056 | .138 |
| .04 | .074 | .178 |
| .08 | .100 | .245 |
| .31 | .197 | .477 |
| .61 | .278 | .675 |
| 1.23 | .393 | .953 |
| 2.45 | .555 | 1.348 |
| 4.91 | .786 | 1.906 |
| 9.82 | 1.109 | 2.692 |
| 19.64 | 1.534 | 3.720 |
| 39.28 | 1.943 | 4.714 |
| 78.55 | 2.144 | 5.207 |

The settlement input data and computer output is contained in Attachment A5. A hand computation verifying the computer based results is contained in Attachment A6.

Several alternatives were considered to minimize the amount of post construction settlement. The selected alternative is the most practical based upon costs and utility of the structure. The various alternatives considered are listed below.

* Ground Improvement Techniques:

  - Remove soft soil and replace with granular material.
  - Displace soft soil by blasting.
  - Inject grout or lime into soft soils to improve its stiffness.
  - Dynamic compaction (densification of soft soil).
  - Stone columns (load transfer over soft soil).
  - Sand drains (to accelerate consolidation).

- Preconsolidation (to remove virgin compression of soft soils).

* Structural Improvement Techniques:

  - Use lighter breakwater stone materials (reduce induced stresses in soft foundation soil).

  - Use geogrids or geofabric reinforcement at base of structure.

  - Replace rigid concrete sidewalk with flexible material.

  - Overbuild structure to compensate for the anticipated settlement.

* Do Nothing:

  Allow breakwater and rigid sidewalk to settle and replace and bring back up to grade in future rehabilitations.

The selected alternative is to overbuild the structure by 1 foot to compensate for settlement along a 500' reach between stations 5+15 to 10+15 (profile A-A). The above ground improvement techniques would be cost prohibitive for this type of structure. Using lighter weight construction materials would be undesirable with respect to stability of the structure from wave attack. The use of geogrids or geofabrics was determined to be impractical as published research indicates that the total settlement would not be appreciably reduced by using geogrids or geofabrics. The do nothing alternative is undesirable as the predicted settlement would reduce the structure design crest height to a level that would cause excessive wave overtopping and deformation of the proposed walkway on the crest of the structure. A typical cross section showing the selected alternative design is shown on Plate 2 of Appendix A. The criteria used to determine the amount of overbuild considered aesthetics of the structure and its structural integrity. It is felt that a 1 foot overbuild would meet both of these criteria. The time rate of consolidation indicates that 10 years after the structure is built 1 foot of settlement would have occurred thus, bringing the structure back to it's design grade. At about 20 years the structure is expected to settle another 0.5 feet (crest at +12.5 feet) however, this is still within construction grade tolerances. At 50 years the total settlement is expected to be about 2 feet in which the crest will be 1 foot below the design crest level. Although a loss of crest height of 1 foot is undesirable it is expected that within this period rehabilitation of the breakwater will be necessary at which point the structure will be rebuilt to it's design grade level. Furthermore, an overbuilt of greater than 1.0 ft. would likely not be economically justified since it would provide no benefit until after 10 years.

d. <u>West Breakwater.</u>

(1.) Subsurface Conditions.

Geologic profile C-C (Plate A3) shows the subsurface conditions along the West Breakwater. This profile reveals that the breakwater will have favorable foundation conditions consisting of Queenston shale bedrock.

(2.) Stability Analysis.

The breakwater will be constructed on bedrock that has considerable shearing resistance. Therefore, instability caused by foundation shear failure is not expected to occur.

(3.) Settlement Analysis.

The bedrock has a higher stiffness than soil deposits. Considering the bedrock stiffness and magnitude of applied loads deformation of the bedrock foundation will be insignificant.

A5 CONSTRUCTION MATERIALS

(a.) General.

A materials survey was conducted in December 1990 to determine the potential sources of stone for the construction of the Olcott Harbor breakwaters at Olcott, New York. The survey includes construction material sources for the rubble-mound breakwater structures.

The stone survey consisted of a detailed file search in which the following factors were considered: the analysis of the results of quarry investigations, results of laboratory testing, the evaluation of available service record information and the determination of interest on the part of the quarry operators.

(b.) Material Types.

Stone materials required for this design consist of two sizes of armor, two sizes of underlayer and bedding stone. The various stone sizes and the sources listed to produce these are summarized in the paragraph "Material Types and Sources". The four larger stone sizes will need to be hand picked at the quarry site, but the bedding stone shall consist of a quarry run material. A specific gravity of 2.60 was used to compute the stone sizes for all stone types. Variations in stone weights will be adjusted to stone specific gravity being used on the job. The stone types will be composed of durable rock materials and will be free from significant fractures and weak, easily weathered seams.

(c.) Material Guidelines.

Armor, underlayer and bedding can be produced from the indicated sources listed on the following pages. A map showing quarry locations is displayed in Plate A6. A map summary sheet of potential material sources is presented on Plate A7. The listed sources have been separated into two categories as suggested by the new revised pamphlet 1110-2-1. The Category I sources are those that have passed pre-qualification criteria and require only a final Government inspection before approval for use. Category II sources are those that have been utilized in the past but because questions arise as to the stone quality the Government believes stone testing is deemed necessary. Of the ten sources listed as capable of producing some or

all of the required stone materials, three have supplied most of the armor stone on previous CENCB Lake Ontario breakwater projects. These quarries are: Dolomite Product's Penfield Quarry, Medina Sandstone Quarry in Hulberton, N.Y., and Frontier Quarry in Lockport.

Presently, there are no (A1) sized armor stone producers in the Category I listing because each is missing one, all, or any combination of the following prequalification criteria: quarry inspection and evaluations by a geologist within the last 3 to 5 years, updated armor stone durability testing within the last 3 to 5 years and complete service record evaluations of stone durability for appropriate projects. Of the three most used Category II armor stone suppliers, two were used on Corps projects between 5 and 10 years ago (the

Penfield Quarry and the Lockport Quarry) and thus may not require extensive testing. The degree of testing and the types of tests performed will depend on our future investigations and evaluations into these sources.

Funds were only available during the GDM phase to conduct a very limited effort to ensure that adequate stone was available for this project. Upgrading the material source investigatio to the extent deemed appropriate for the advertising of such a large stone contract as this is estimated to cost $20,000. Presently, a request for funds has been made to accomplish this work.

The draft 1990 CENCD Pamphlet 1110-2-1 Appendix E, "Guide Specifications for Stone and Aggregate Rock Usage in Breakwater Construction" written definitions for Category I and II listed sources shall be incorporated into the Olcott Project's final Plans and Specifications, when the pamphlet becomes official.

(d.) Material Sources.

The materials required for the proposed design consist of two types of armor stone, two types of underlayer and bedding stone. Every stone size excluding bedding shall be hand picked.

LISTED STONE SOURCES FOR OLCOTT HARBOR

| TYPE | DESCRIPTION | SIZE RANGE |
|---|---|---|
| A1 | Armor Stone | 4 to 11 tons |
| A2 | Small Armor | 1,400 to 3,000 lbs |
| U1 | Underlayer | 600 to 2,200 lbs |
| U2 | Small Underlayer | 100 to 300 lbs |
| B1 | Bedding Stone | 2 to 125 lbs |

CATEGORY I

1. Buffalo Crushed Stone, Main Office at 2544 Clinton Street, Buffalo, N.Y. 14004; (716) 826-7310; Quarry at Wehrle Drive, Clarence, N.Y.; rock formation, Onondaga limestone; B1. Inspected 11/82 and Tested 4/83, by the Buffalo District.

2. Buffalo Crushed Stone, Main Office at 2544 Clinton Street, Buffalo, N.Y. 14004; (716) 826-7310; Como Park Quarry in Cheektowaga, N.Y.; rock formation, Onondaga Limestone; B1. Inspected 11/82 and Tested 4/83, by the Buffalo District.

3. County Line Stone Co., County Line Road, Akron, N.Y. 14001, (716) 542-5435; quarry at Akron, N.Y.; rock formation, Onondaga Formation; U1,U2,B1. Inspected 7/84 and Tested 9/84, by the Buffalo District.

4. Dolomite Products, 1150 Penfield Road, Rochester, N.Y. 14625; (716) 381-7010, quarry at Penfield, NY; Formation, Lockport Dolomite, only Penfield member acceptable; A2,U1,U2,B1. Inspected 8/84 and Tested 9/84, by the Buffalo District.

5. Dolomite Products, Inc., 1150 Penfield Road, Rochester, N.Y. 14625, (716) 381-7010, quarry at Walworth, N.Y.; Lockport Dolomite; U1,U2,B1. Inspected 2/87 and Tested 3/87 by the Buffalo District.

6. Frontier Stone Products, 400 Hinman Road, Lockport, NY 14094; (716) 625-9424; quarry at Lockport, NY; rock formation; Lockport Dolomite; Gasport member: U1 and smaller; Goat Island member (layers "D" and "E" only), U2,B1. Inspected 9/87 and Tested 1/85, by the Buffalo District.

7. Genesee Stone Products, P.O. Box 363, Batavia, NY 14020; (716) 343-1868; quarry at Stafford, N.Y.; rock formation, Onondaga Limestone, only the first and second lift acceptable U1,U2,B1. Inspected 9/79 and Tested 1/80, by the Buffalo District.

8. Genesee Leroy Stone Co., P.O. Box 58, Leroy, N.Y. 14482; (716) 768-6460; rock formation, Onondaga Limestone; U1,U2, B1. Inspected 7/88 and Tested 6/76, by the Buffalo District.

9. Medina Sandstone,. 8875 Quarry Rd., Niagara Falls, NY; (716) 694-8292; quarry at Hulberton, NY; rock formation, Medina Sandstone; A2,U1,U2,B1. Inspected 7/80 and tested 8/80, by the Buffalo District.

10. Niagara Stone Corporation, 8875 Quarry Rd., Niagara Falls NY (716) 694-8292; quarry at Pletchers Corners, NY; rock formation, Lockport Dolomite; U1,U2,B1. Inspected 9/82 and Tested 5/83 by the Buffalo District.

CATEGORY II

1. County Line Stone Co., County Line Road, Akron, N.Y. 14001, (716) 542-5435; quarry at Akron, N.Y.; rock formation, Onondaga Formation; A2. Inspected 7/84 and Tested 9/84, by the Buffalo District.

2. Dolomite Products, 1150 Penfield Road, Rochester, N.Y. 14625; (716) 381-7010, quarry at Penfield, NY; Formation,

Lockport Dolomite, only Penfield member acceptable for A1. Inspected 8/84 and Tested 9/84, by the Buffalo District.

3. Dolomite Products, 1150 Penfield Road, Rochester, N.Y. 14625; (716) 381-7010, quarry at Walworth, NY; Formation, Lockport Dolomite, only Penfield member acceptable; A2. Inspected 8/84 and Tested 9/84, by the Buffalo District.

4. Frontier Stone Products, 400 Hinman Road, Lockport, NY 14094; (716) 625-9424; quarry at Lockport, NY; rock formation; Lockport Dolomite; Gasport member only acceptable for A1 and A2 Armor Stone. Inspected 9/87 and Tested 1/85, by the Buffalo District.

5. Medina Sandstone, 8875 Quarry Rd., Niagara Falls, NY; (716) 694-8292; quarry at Hulberton, NY; rock formation, Medina Sandstone acceptable for A1. Inspected 7/80 and tested 8/80, by the Buffalo District.

A6. GEOTECHNICAL SUMMARY

In July 1991 a subsurface exploration program was performed to determine the foundation conditions for this project. The explorations consisted of probes and drive sample, undisturbed sample and, rock core borings. Soil samples from this exploration program were sent to the Ohio River Division Laboratory in Cincinnati, Ohio for identification, strength determination and, consolidation testing. Results of the exploration program revealed that the proposed structures will have a shale bedrock foundation except for a 400 foot section of the East Detached Breakwater and the footbridge. Between Stations 6+00 to 10+00 of the East Detached Breakwater the foundation consists of 8 feet of gravelly sand (SP) overlying very soft sandy organic clay (OH) and clay (CL). At the north end of the proposed footbridge the foundation consists of 3.5 feet of gravelly sand (SP-SM) and cobbles overlying very soft organic clay and silt (OL).

The geotechnical stability analysis of the proposed structures considered shear failure through the foundation soils. Since bedrock generally has high compressive strengths foundation shear failure is not expected to occur for portions of the structures founded on bedrock. A stability analysis was performed at station 6+70 of the East Detached Breakwater where the foundation consisted of very soft clay. It was assumed in the analysis that the failure surface would be circular in shape. Computer program UTEXAS2 was used to find the critical (minimum factor of safety) failure surface. The soil design parameters were based upon laboratory test results, field descriptions and, typical values found in literature. The proposed structure has a crest height of about 26.5 feet (+ 13.0 ft. LWD) above the lake bottom and a side slope of 1V on 2H. For the end of construction case the critical failure surface passed through the very soft clay deposits with a computed factor of safety of 1.269. In accordance with EM1110-2-1902, " Stability of Earth and Rock Fill Dams", the required minimum factor of safety for the end of construction case is 1.3. Since failure of the proposed breakwater is considered not to be as critical (i.e. endanger lives) as a dam that impounds water, the criteria in EM110-2-1902 was relaxed with the computed factor of safety of 1.269 providing an adequate margin of safety. For the long term case the

critical failure surface again passes through the very soft clay deposits with a computed factor of safety of 1.518. The required factor of safety is 1.0.

The footbridge design analysis was not performed by Coastal/Geotechnical section. Results of the footbridge design analysis is presented in Sub-Appendix C. Geotechnical input into the footbridge design analysis consisted of providing soil design parameters. These parameters are summarized in Table A2. The soil design parameters are presumptive values based upon field descriptions and typical values found in literature.

Significant consolidation settlement could occur along a 500 foot reach of the East Detached Breakwater between Stations 5+15 to 10+15 (Profile A-A) where the structure will be constructed over the very soft compressible clay deposits. The breakwater section at Station 6+70 was selected to be the critical section in the settlement analysis. Computer program CSETT was used to compute the magnitude and time rate of settlement. This computer program uses Terzaghi's one dimensional consolidation theory. The settlement soil design parameters were based upon laboratory testing, field descriptions and, typical values found in literature. The laboratory consolidation test data shows that the organic clay deposits are slightly over-consolidated with an over-consolidation ratio of about 2.0. Other data indicates that the deposits may be normally consolidated (i.e. natural water contents greater than the liquid limit, void ratios greater than 1.0). Since this relationship is empirical and the laboratory consolidation tests show the actual behavior of the soil, it is more reasonable to expect that the settlement will be more accurately predicted using the laboratory data. The maximum ultimate settlement was computed to be 2.176 feet and occurs at the center of the cross section. The time rate of settlement shows that it will take over 79 years to obtain the ultimate settlement with 98% consolidation within this time period. At the end of the 50 year project life the total settlement is estimated to be 2.0 feet. To compensate for settlement the structure will be overbuilt by 1 foot in this reach. The criteria used to determine the amount of overbuild is aesthetics of the structure by overbuilding by 1 foot as opposed to overbuilding by 2 feet in this reach.

A materials survey was conducted in December 1990 to determine the potential sources of stone for the Olcott Harbor Project. For this survey, the results of existing laboratory test results, and existing service record evaluations were assessed. Results of this survey reveal that a sufficient number of potential sources exist to supply stone for this project.

A7. REFERENCES.


1. Bowles, J.E., " Foundation Analysis and Design ", 2nd Edition, 1977, McGraw-Hill Inc.

2. Holtz, R.D., Kovacs, W.D., " An Introduction to Geotechnical Engineering ", 1981, Prentice-Hall, Inc.

3. Hough, B.K., " Basic Soils Engineering ", 2nd edition, 1969, John Wiley and Sons.

4. Lambe, T.W., Whitman, R.V., " Soil Mechanics ", 1969, John Wiley and Sons.

5. Pitts, John, " A Manual of Geology For Civil Engineers ", 1984, World Scientific Publishing Co.

6. U.S. Army Corps of Engineers, Coastal Engineering Research Center, " Shore Protection Manual " , Volume II, 1984.

7. U.S. Army Corps of Engineers, EM1110-2-1902, " Engineering and Design. Stability of Earth and Rock Fill Dams ", April 1970.

OLCOTT HARBOR, NEW YORK

GENERAL DESIGN

SUB-APPENDIX A

# ATTACHMENT A1

# SOIL AND ROCK DESIGN PARAMETER SELECTION

OLCOTT HARBOR, NEW YORK

ATTACHMENT A1

# SOIL AND ROCK DESIGN PARAMETER SELECTION

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OLCOTT HARBOR, NEW YORK

ATTACHMENT A1

SOIL AND ROCK DESIGN PARAMETER SELECTION

A. STABILITY ANALYSIS DESIGN PARAMETERS

1. Gravelly Sand Lake Bottom (SP).

(a.) Unit Weight.

Field penetration test results vary from 2 to 18 blows per foot. Select lower 1/3 test value (see page 2) of 8 blows per foot. Table 7-2 of Hough, the saturated weight for a loose sand and gravel is 90 psf.

(b.) Shear Strength.

Table 7-2 Hough, for a loose sand and gravel $\emptyset' =$ 32 degrees.

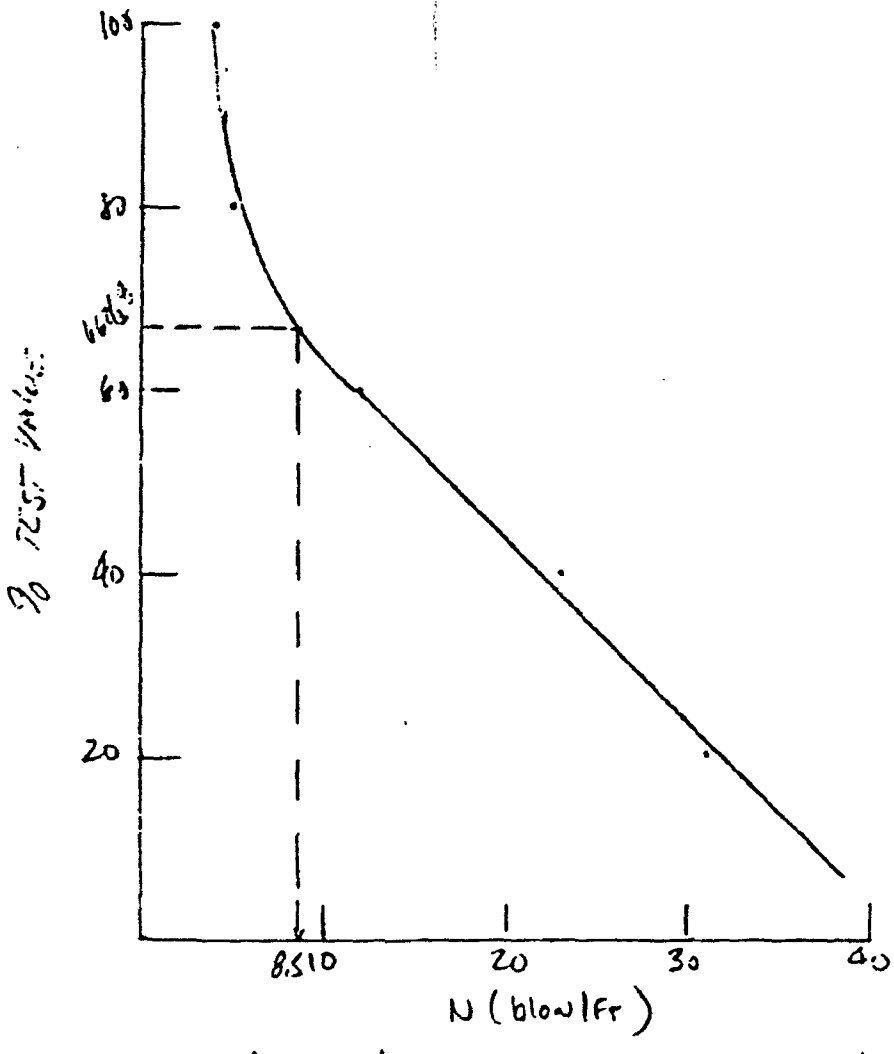
**TABLE 7-2**
**Typical Values of Unit Weights, Equivalent Fluid**

| Classification | Friction Angle $\phi$ (deg.) | Density or Consistency | Unit Soil Weight, $\gamma$ (lb./cu. ft.) | Unit Wt. of Equivalent Fluid, $\gamma_e$ (lb./cu. ft.) | |
|---|---|---|---|---|---|
| | | | | Active Case | Passive Case |
| Coarse sand or sand and gravel | 45 | Compact | 140 | 24 | 820 |
| | 38 | Firm | 120 | 29 | 510 |
| | 32 | Loose | 90 | 28 | 290 |
| Medium sand | 40 | Compact | 130 | 28 | 600 |
| | 34 | Firm | 110 | 31 | 390 |
| | 30 | Loose | 90 | 30 | 270 |
| Fine sand | 34 | Compact | 130 | 37 | 460 |
| | 30 | Firm | 100 | 33 | 300 |
| | 28 | Loose | 85 | 31 | 280 |
| Fine, silty sand or sandy silt | 32 | Compact | 130 | 40 | 420 |
| | 30 | Firm | 100 | 33 | 300 |
| | 28 | Loose | 85 | 31 | 280 |
| Fine, uniform silt | 30 | Compact | 135 | 45 | 400 |
| | 28 | Firm | 110 | 38 | 300 |
| | 26 | Loose | 85 | 33 | 220 |
| Clay-silt | 20 | Medium | 120 | 59 | 245 |
| | | Soft | 90 | 44 | 183 |
| Silty clay | 15 | Medium | 120 | 71 | 204 |
| | | Soft | 90 | 53 | 153 |
| Clay | 10 | Medium | 120 | 84 | 170 |
| | | Soft | 90 | 63 | 153 |
| Clay | 0 | Medium | 120 | 120 | 120 |
| | | Soft | 90 | 90 | 90 |

REF: Hough, B.K., "Basic Soil Engineering"

# OLCOTT HARBOR, NEW YORK
## SOIL DESIGN PARAMETERS

| N | # ≥ = | % TEST VALUE |
|---|---|---|
| 4 | 5 | 5/5 x 100 = 100% |
| 5 | 4 | 4/5 x 100 = 80% |
| 12 | 3 | 3/5 x 100 = 60% |
| 23 | 2 | 2/5 x 100 = 40% |
| 31 | 1 | 1/5 x 100 = 20% |




Lower 1/3 = 8.5 blow/Ft. Say 8 blow/Ft.

2. Organic Clay (OH, CL).

(a.) Unit Weight.

Field penetration test results vary between 1 to 2 blows per foot. From Table 7-2 of Hough, soft clay $\gamma_{sat}$ = 90 pcf. Table 3-4 of Bowles, $\gamma_{sat}$ = 100 pcf. Laboratory triaxial test results had an average dry density of 62.5 pcf and average water content of 60.6 percent. The saturated unit weight using the above laboratory data is computed below;

$$\gamma_{sat} = (1+w)\ \gamma_{dry}$$

$$\gamma_{sat} = (1+.606) \times 62.5 \text{ pcf} = 100 \text{ pcf}$$

Use the higher saturated unit weight of **100** pcf (more conservative).

(b.) Shear Strength (End of Construction Case).

The laboratory unconsolidated undrained triaxial test (DU90-22A , ST-1) resulted in a total strength envelope with a cohesion intercept of c = 0.6 tsf (1,200 psf) and angle of internal friction of 0 degrees.

The undrained shear strength can also be determined from an empirical relationship between plasticity index and depth as shown in Figure 29.19, page 452 of Lamb and Whitman (page 5). The laboratory consolidated undrained p,q stress paths show that the organic clay exhibits dilative behavior at low confining pressures and slight contractive behavior at high confining pressures. Since the confining pressures in the field (0.25 to 0.5 tsf) are in the lower range we can expect that the clay deposits will slightly dilate during shear. The upper curve in Figure 29.19 of Lambe and Whitman is for materials that exhibit dilative behavior. This curve has the undrained shear strength decreasing with increasing plasticity index. The laboratory plasticity indices varied from 18 to 42. Taking the upper 2/3 percentile test value on page 4 (more conservative) a plasticity index of 37 percent is obtained. From Figure 29.19 of Lamb and Whitman, $Su/\bar{\sigma}v$ = 0.58 assuming soil is normally consolidated. However, the laboratory consolidation test results show that the organic clay deposits are slightly over-consolidated with an OCR = 2.0. Equation 11-10 of Holtz and Kovacs is a relationship of the undrained shear strength and over-consolidation ratio. Using this relationship the undrained shear strength is computed as follows:

$$(Su/\bar{\sigma}v)\ O.C. = (OCR) \times (Su/\bar{\sigma}v)\ N.C.$$

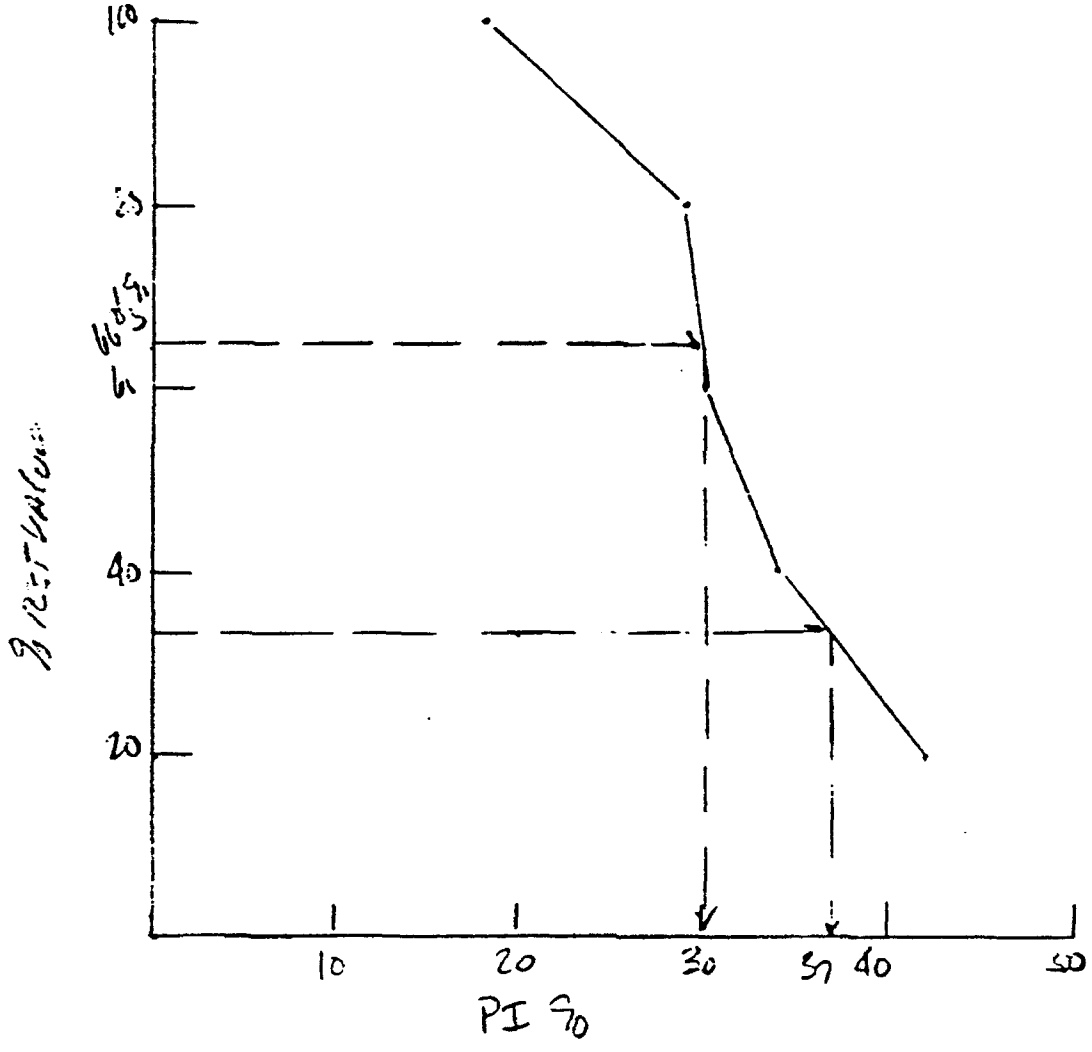
$$(Su/\bar{\sigma}v)\ O.C. = (2.0) \times (.58) = 1.0$$

$$\text{or}\quad (Su)\ O.C. = 1.0 \times \bar{\sigma}v = [(90-62.4)\times 7.5] + [(100-62.4)Z]$$

$$(Su)\ O.C. = 207 + 37.6Z \text{ psf}$$

Olcott Harbor, New York
Soil Design Parameters

| PI | #> = | % retained |
|---|---|---|
| 18 | 5 | 5/5 x 100 = 100% |
| 29 | 4 | 4/5 x 100 = 80% |
| 30 | 3 | 3/5 x 100 = 60% |
| 34 | 2 | 2/5 x 100 = 40% |
| 42 | 1 | 1/5 x 100 = 20% |




Lower 1/3 = 30%

Upper 2/3 = 37%

At depth 30.7 feet below lake bottom where the undisturbed sample was obtained for triaxial testing, the above relationship results in an undrained shear strength of 1,087 psf which is very close to the laboratory strength of 1,200 psf.

REF: "Soil Mechanics", Lambe & Whitman

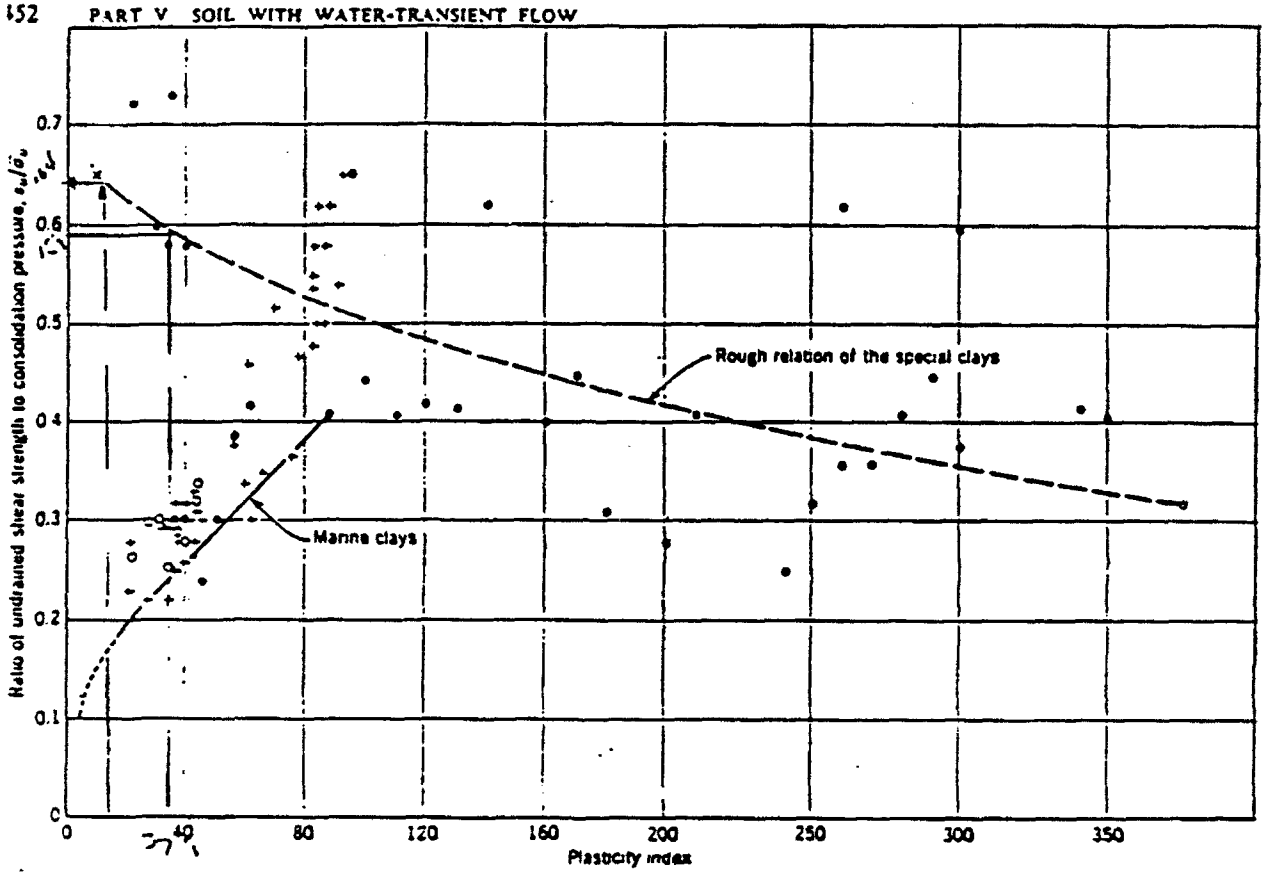
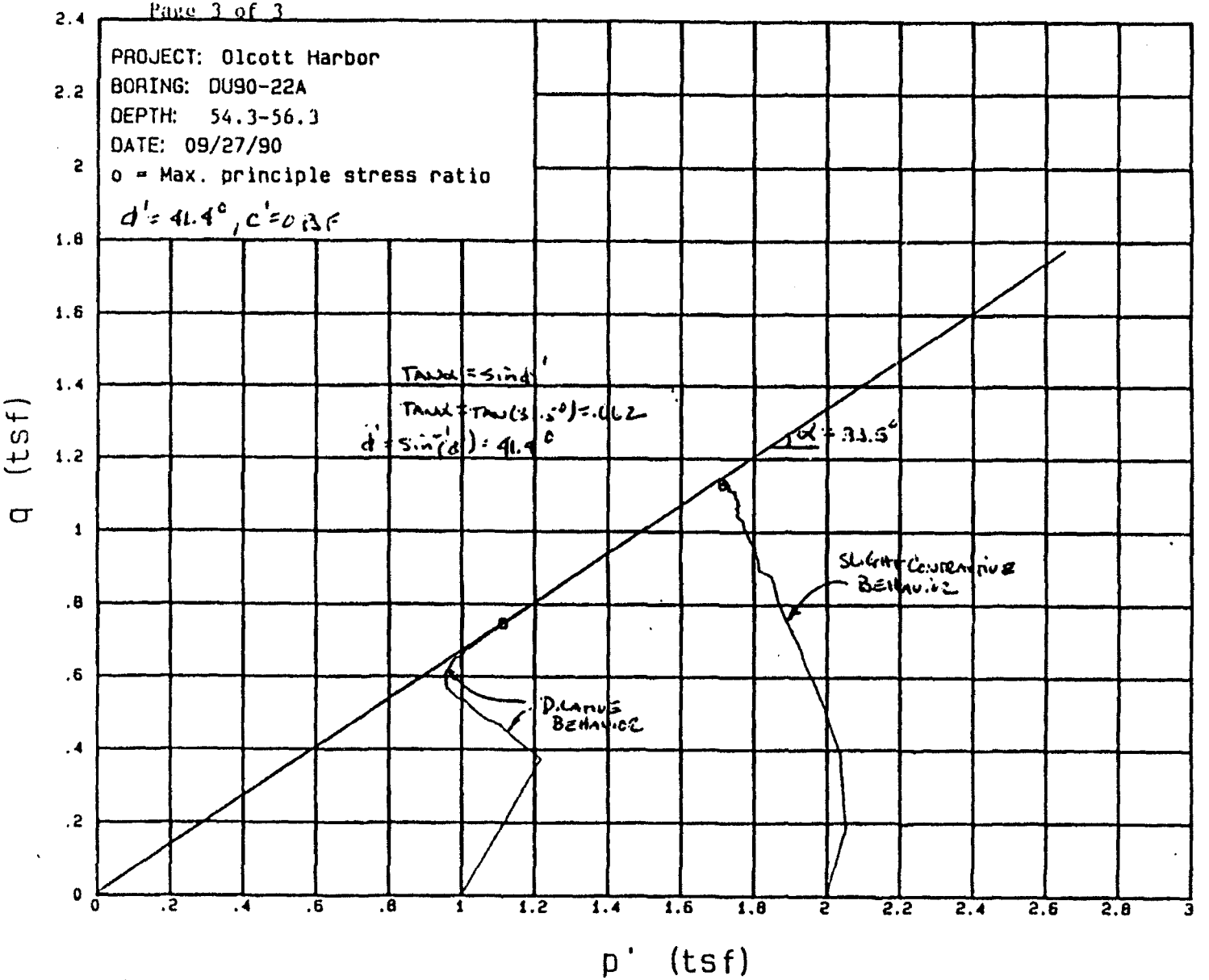



Fig. 29.19 $s_u/\bar{\sigma}_{10}$ ratio as a function of plasticity index (from Osterman, 1959).

(c.) Organic Clay (Long Term Case).

Triaxial R-bar consolidated undrained tests p,q stress plot results in a failure envelope having an angle of $\alpha = 33.5$ degrees (see page 6). This is equivalent to a Mohr-Coulomb angle of internal friction $\phi' = 41.4$ degrees ($\tan\alpha = \sin\phi'$).

Figure 11.27 (below) of Holz and Kovacs is an empirical relationship between the plasticity index and effective friction angle. Using a plasticity index of 37 percent a effective friction angle of 28 degrees is obtained. This is for a normally consolidated clay. Since the organic clays at Olcott Harbor are fibrous and slightly over-consolidated we would expect the effective friction angle to be higher as shown by the laboratory test results. To be conservative we will use the lower friction angle of 28 degrees.


PROJECT: Olcott Harbor
BORING: DU90-22A
DEPTH: 54.3-56.3
DATE: 09/27/90
σ = Max. principle stress ratio
φ' = 41.4°, c' = 0 tsf
TAN α = sin φ'
TAN α = TAN (33.5°) = .662
φ' = sin⁻¹ (α) = 41.4°
α = 33.5°
SLIGHTLY CONTRACTIVE BEHAVIOR
PLANE BEHAVIOR
q (tsf)
p' (tsf)
0
.2
.4
.6
.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

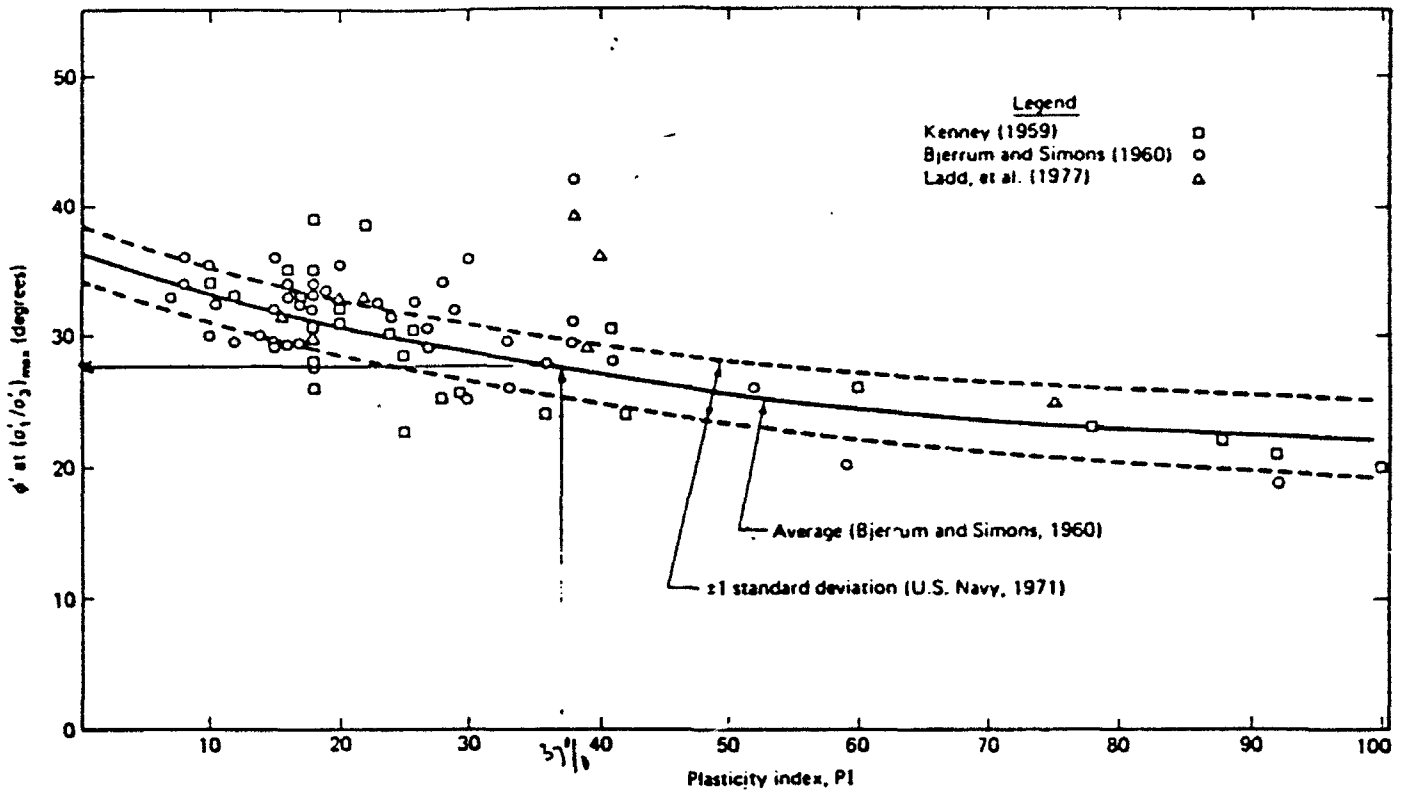



Fig. 11.27 Empirical correlation between $\phi'$ and PI from triaxial compression tests on normally consolidated undisturbed clays (after U.S. Navy, 1971, and Ladd, et al., 1977).

3. Breakwater Properties.

(a.) Unit Weight.

The highest specific gravity of all material sources in the area is 2.75. From the Shore Protection Manual, Table 7-13, rough quarry stone the porosity is n = 37 percent. Assume that the water content (w) in the voids of the rock above the lake level is 2 percent. Using these values the moist unit weight is computed as follows:

$$\gamma_{mst} = (1+w) \times Gs \times 62.4 \times (1 - n)$$

or $$\gamma_{mst} = (1+.02) \times 2.75 \times 62.4 \times (1 - .37)$$

$$\gamma_{mst} = \underline{110} \text{ pcf}$$

The submerged unit weight is computed by the following relationship:

$$\gamma_{sub} = (Gs - 1) \times 62.4 \times (1 - n)$$

or $$\gamma_{sub} = (2.75 - 1) \times 62.4 \times (1 - .37)$$

$$\gamma_{sub} = \underline{68.6} \text{ pcf}$$

(b.) Shear Strength.

For dumped loose quarry stone, Sherard (Earth and Rock Fill Dams) states that the angle of internal friction could vary between 40 to 45 degrees. To be more conservative use the lower bound friction angle of 40 degrees.

Table 7-13. Layer coefficient and porosity for various armor units.

| Armor Unit | n | Placement | Layer Coefficient $k_\Delta$ | Porosity (P) % |
|---|---|---|---|---|
| Quarrystone (smooth)[1] | 2 | Random | 1.02 | 38 |
| Quarrystone (rough)[2] | 2 | Random | 1.00 | 37 |
| Quarrystone (rough)[2] | >3 | Random | 1.00 | 40 |
| Quarrystone (parallepiped)[6] | 2 | Special | — | 27 |
| Cube (modified)[1] | 2 | Random | 1.10 | 47 |
| Tetrapod[1] | 2 | Random | 1.04 | 50 |
| Quadripod[1] | 2 | Random | 0.95 | 49 |
| Hexipod[1] | 2 | Random | 1.15 | 47 |
| Tribar[1] | 2 | Random | 1.02 | 54 |
| Dolos[4] | 2 | Random | 0.94 | 56 |
| Toskane[5] | 2 | Random | 1.03 | 52 |
| Tribar[1] | 1 | Uniform | 1.13 | 47 |
| Quarrystone[7] | Graded | Random | — | 37 |

[1] Hudson (1974).

[2] Carver (1983).

[3] Hudson, (1961a).

[4] Carver and Davidson (1977).

[5] Carver (1978).

[6] Layer thickness is twice the average long dimension of the parallelepiped stones. Porosity is estimated from tests on one layer of uniformly placed modified cubes (Hudson, 1974).

[7] The minimum layer thickness should be twice the cubic dimension of the $W_{50}$ riprap. Check to determine that the graded layer thickness is $\geq 1.25$ the cubic dimension of the $W_{max}$ riprap (see eqs. 7-123 and 7-124 below).

REF: U.S. Army Corps of Engineers, Coastal Engineering Research Center, "Shore Protection Manual", Vol III.

B. SETTLEMENT ANALYSIS DESIGN PARAMETERS

1. Gravelly Sand Lake Bottom (SP).

(a.) Compression Index.

The gravelly sand layer is expected to have an insignificant amount of settlement. Therefore, this layer is considered to be in-compressible in this analysis.

2. Organic Clay (OH, CL).

(a.) Compression Indices.

From the laboratory consolidation test void ratio versus effective pressure curve (see page 10 ), the virgin compression index Cc = 0.62. From the same curve the re-compression index Cr = .06.

(b.) Maximum Past Overburden Pressure.

From the laboratory void ratio versus effective pressure curve using the Casagrande construction, the maximum past pressure Pc is equal to 1.03 tsf. The present overburden pressure at the undisturbed sample depth is computed as follows:

Po (depth 30.7') = [(90 - 62.4) x 7.5'] + [(100 - 62.4) x 23.2']

Po (depth 30.7') = 1079 psf (.54 tsf)

The over-consolidation ratio OCR = Pc/Po = 1.03/.54 = 1.9.

(c.) Void Ratio at Layer Midpoint.

The void ratio at the layer midpoints was obtained by using the void ratio determined in the laboratory (at depth 30.7') and then determining the void ratio at respective depths using the following relationship:

$$Cc = [e\ (midpoint) - e\ (30.7')] / [Log\ (P(30.7')/ P(midpoint)]$$

Layer No. 4 (Depth 33'): From lab consolidation test e = 1.45

Layer No.3 (Depth 23'):

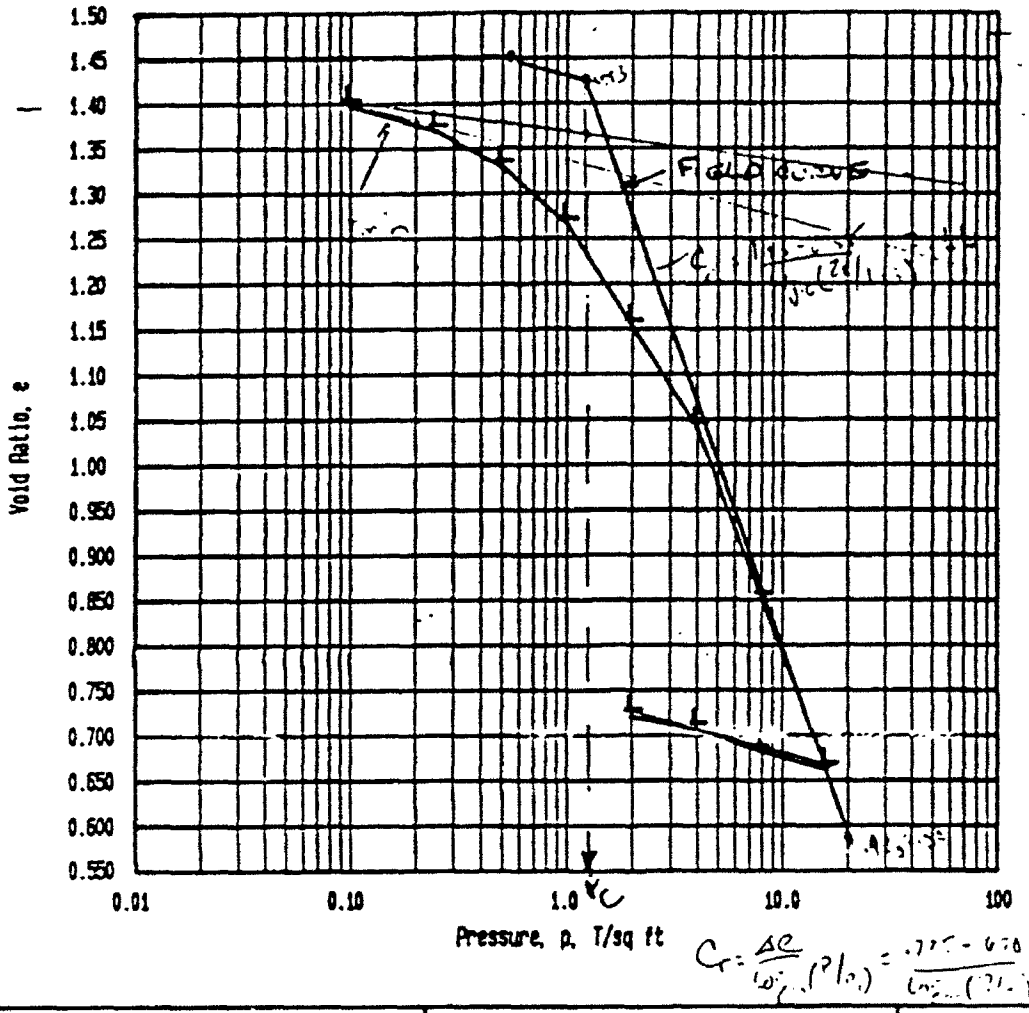
e (23') = [0.62 x Log (1079/771)] + 1.45 = 1.54

Layer No.2 (Depth 13'):

e (13') = [0.62 x Log (771/395)] + 1.54 = 1.72

Layer No.5 (Depth 39'):

e (39') = 1.45 - [ 0.62 x Log (1692/1079)] = 1.33




$C_c = \frac{\Delta e}{\log_{10}(p_2/p_1)} = \frac{.77 - .70}{\log_{10}(\quad)} = .06$

| Type of Specimen UNDISTURBED | | Before Test | | After Test | |
|---|---|---|---|---|---|
| Dia. 2.5 in. | ht .5 in. | Water Content, $w_0$ | 54.7 % | $w_f$ | 33 % |
| Overburden Pressure, Po, | T/sq ft | Void Ratio, $e_0$ | 1.45 | $e_f$ | .721 |
| Preconsol. Pressure, Pc. 1.03 T/sq ft | | Saturation, $S_0$ | 98.8 % | $S_f$ | 100 % |
| Compression Index, Cc 0.62 $C_r$=.06 | | Dry Density | 66.5 pcf | | 94.9 pcf |
| Classification Organic SILT (OH) | | $k_{20}$ at $e_0$ | | | |
| LL 53 | Gs 2.62 | Project Olcott Harbor | | | |
| PL 35 | $D_{10}$ | | | | |
| Remarks: $\gamma_{sat} = (1+w)\gamma_{d,y}$ | | Area: | | | |
| $\gamma_{sat} = (1+.547)66.5$ pcf | | Boring No. DU90-22A | | Sample No. ST-1 | |
| $\gamma_{sat} = 103$ pcf | | Depth 54.3-56.3 | | Date 9-27-90 | |
| Page 1 of 2 | | CONSOLIDATION TEST REPORT | | | GS |

(d.) Void Ratio Versus Stress Relationship.

To account for sample disturbance the laboratory void ratio versus effective stress curve is reconstructed as shown on page 10. Use this field curve as input into the computer program for void ratio versus stress relationship.

(e.) Coefficient of Consolidation.

The coefficient of consolidation (Cv) could not be determined from laboratory consolidation tests due to the shape of the deformation versus time curve. These curves indicate that consolidation is rapid and show the last portion (near the end of primary consolidation) of the S curve. As a result the time for 50% consolidation can not be determined from these curves. A presumptive value based upon Atterberg limits was used to determine the coefficient of consolidation. The consolidation test specimens has a liquid limit of 53 percent. Figure 5-18 of Hough below is an empirical relationship between coefficient of consolidation (Cv) and liquid limit. The coefficient of consolidation $\underline{Cv} = \underline{50}\ \underline{ft^2/yr}$ at a liquid limit of 53 percent.

REF: Hough, B.K., "Basic Soil Engineering"

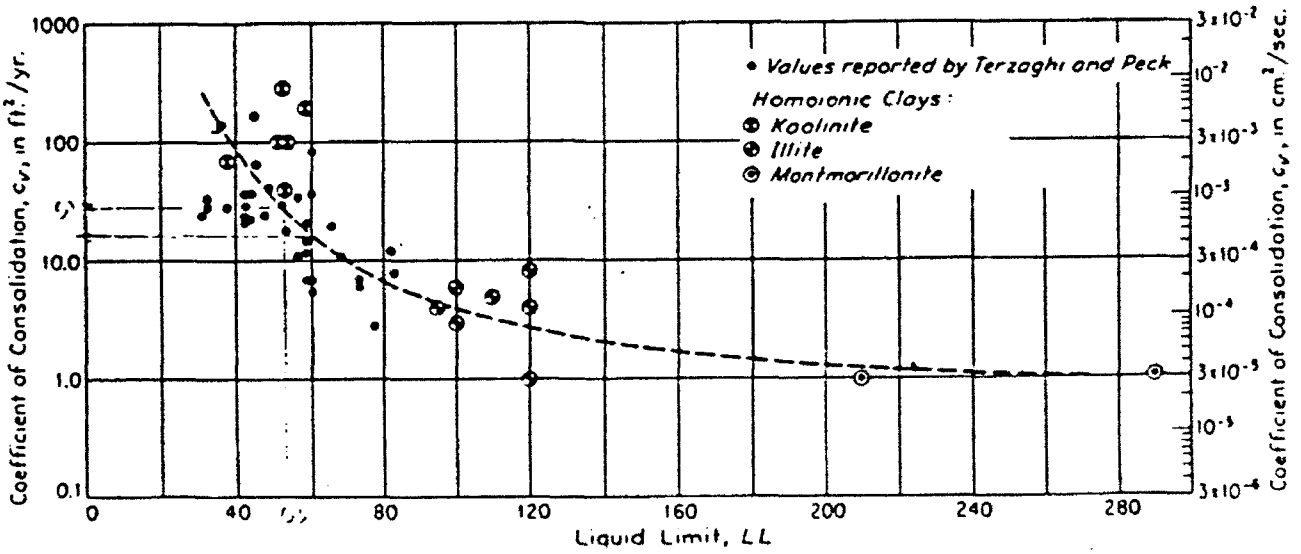



Fig. 5–18. Variation of $c_v$ with $LL$.

C. FOOTBRIDGE DESIGN PARAMETERS

1. Sandy Gravel and Cobbles.

(a.) Unit Weight.

Standard penetration test results from 6 to 11 blows per foot. This has a relative density of loose to medium dense. Table 3-3 Bowles below shows that the unit weight is between 110 to 130 pcf for a medium sand. Table 7-2 Hough below shows that the unit weight for a loose to firm sand and gravel varies from 90 to 120 pcf. Select a value of **110** pcf for this analysis.

(b.) Shear Strength.

Table 7-2 of Hough shows that the friction angle for a loose to firm sand and gravel varies from 32 to 38 degrees. Table 2-2 of Bowles below shows that the friction angle varies from 35 to 50 degrees for a sandy gravel. A friction angle of **38** degrees falls within the range of typical values.

2. Sandy Organic Clay and Silt (OL).

(a.) Unit Weight.

Standard penetration test results vary from 1 to 3 blows per foot which is equivalent to a soft consistency or very loose relative density. Table 7-2 of Hough shows that for a loose silt the unit weight is **85** pcf. Use this value as the saturated unit weight.

(b.) Shear Strength.

Table 7-2 of Bowles shows a friction angle of **26** degrees for a loose silt.

**Table 3-3. Empirical values for $\phi$, $D_r$, and unit weight of granular soils based on the standard penetration number with corrections for depth and for fine saturated sands**

| Description | Very loose | Loose | Medium | Dense | Very dense |
|---|---|---|---|---|---|
| Relative density $D_r$* | 0 0.15 | 0.35 | 0.65 | 0.85 | 1.00 |
| Standard penetration no. $N$ | 4 | 10 | 30 | 50 | |
| Approx. angle of internal friction $\phi$† | 25°–30° | 27–32° | 30–35° | 35–40° | 38–43° |
| Approx. range of moist unit weight ($\gamma$) pcf (kN m$^3$) | 70–100‡ (11–16) | 90–115 (14–18) | 110–130 (17–20) | 110–140 (17–22) | 130–150 (20–23) |

* USBR [Gibbs and Holtz (1957)].

† After Meyerhof (1956). $\phi = 25 + 2.5D_r$ with more than 5 percent fines and $\phi = 30 + 2.5D_r$ with less than 5 percent fines. Use larger values for granular material with 5 percent or less fine sand and silt.

‡ It should be noted that excavated material or material dumped from a truck will weigh 70 to 90 pcf. Material must be quite dense and hard to weigh much over 130 pcf. Values of 105 to 115 pcf for nonsaturated soils are common.

REF: Bowles, J.E., "Foundation Analysis and Design"

3. Cell Fill.

(a.) Unit Weight.

The cell fill will most likely consist of uniform crushed quarry stone with a maximum size of about 2-1/2 inches. Assuming the same porosity of 37 percent and specific gravity of 2.75 as used for the breakwater quarry stone, the moist unit weight is **110 pcf.**

(b.) Shear Strength.

The maximum size of the fill will be about 2-1/2 inches which is equivalent to a coarse gravel. This will be a crushed product which would make the individual stones angular in shape. The stone will be loosely dumped into the cells. Table 7-2 of Hough shows a friction angle of **32** degrees for a loose gravel.

4. Queenston Shale.

(a.) Unconfined Compressive Strength.

The July 1990 exploration program attempted to obtain rock cores of the Queenston shale for laboratory testing. Adequate samples were not obtained due to the very poor rock core recovery. A unconfined compression test on a Queenston shale sample conducted in 1963 resulted in a strength of 6,675 psi. Table 2.7 of Pitts shows that the unconfined compressive strength of a mudrock could vary between 10 to 100 MN/m (1451 to 14,500 psi). The 1963 compression test result falls within the typical range of values therefore, use an unconfined compressive strength of **6,675 psi.**

Table 2.7 Comparison of uniaxial compressive and uniaxial tensile strengths of rocks.

| Rock Type | UCS (MN/m²) | UTS (MN/m²) |
|---|---|---|
| Granite | 100-250 | 7-25 |
| Dolerite | 200-350 | 15-35 |
| Basalt | 150-300 | 10-30 |
| Sandstones | 20-170 | 4-25 |
| Mudrocks | 10-100 | 2-10 |
| Limestones | 30-250 | 5-25 |
| Gneisses | 50-200 | 5-20 |

REF: P. [illegible]. "[illegible]"

# OLCOTT HARBOR, NEW YORK

## GENERAL DESIGN

## SUB-APPENDIX A

## ATTACHMENT A2

## SOIL TEST REPORTS

## OHIO RIVER DIVISION LABORATORIES – SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor 102/90.519B DATE: Sept. 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.I. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D90 2A | | 1 | 19.0 19.5 | Highly Weathered SHALE, red-brown,gray | | | | | | | |
| | | | | | | | | | | | |
| | | 2 | 20.5 21.0 | Gravelly Sandy CLAY (CL) red-brown, fine angular gravel, coarse to fine sand; medium high plasticity | | | | 3/8" | 20 | 20 | 60 |
| | | | | | | | | | | | |
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## OHIO RIVER DIVISION LABORATORIES – SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor | DATE: Sept.90 | SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | gravel | sand | fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D90 4 | | 1 | 22.6 24.6 | Gravelly SAND (SP-SM) brown, coarse to fine subrounded gravel, coarse to fine sand; nonplastic | | | | 1" | 40 | 55 | 5 |
| | | 2 | 24.6 26.6 | Sandy GRAVEL (GP) brown, fine subrounded gravel, coarse to fine sand; nonplastic (very small sample) | | | | 3/4" | 70 | 26 | 4 |
| | | 3 | 29.6 31.6 | Gravelly Silty SAND (SM) brown, fine subrounded gravel, coarse to fine sand; nonplastic w/organics | | | | 1/2 | 20 | 45 | 35 |
| | | 4 | 34.6 35.8 | Sandy CLAY (CL) red-brown, fine subrounded gravel, coarse to fine sand; medium plasticity w/organics | | | | 1/2 | 10 | 30 | 60 |

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* Actual %

SITE: Olcott Small Boat Harbor DATE: Sept. 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | grav | sand | fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D90 7 | | 1 | 24.5 26.5 | Gravelly SAND(SP) gray, coarse to fine subrounded gravel, coarse to fine sand; nonplastic | | | | 1½" | 30 | 66 | 4 |
| | | 2 | 29.5 30.5 | Gravelly SAND (SP) red-brown-gray, fine subrounded gravel, coarse to fine sand; nonplastic w/free water | | | | 3/8" | 35 | 61 | 4 |
| | | 3 | 34.5 36.5 | Sandy Clayey GRAVEL (GC) brown-gray, fine subrounded gravel, coarse to fine sand; very low plasticity | | | | 3/4" | 35 | 30 | 35 |
| | | 4 | ? | Sandy GRAVEL (GP-GM) brown-gray, fine subrounded gravel,coarse to fine sand; nonplastic (small sample) | | | | 3/4" | 70 | 25 | 5 |

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* Actual%

SITE: Olcott Small Boat Harbor — DATE: Sept. 90 — SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | grav | sand | fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D90 10 | | 1 | 22.0 23.0 | Sandy GRAVEL (GP-GM) red-brown, coarse to fine subangular to subrounded gravel, coarse to fine sand; non-plastic | | | | 1½" | 50 | 40 | 10 |
| | | 2 | 24.5 24.7 | Sandy CLAY (CL) red-brown, fine subangular gravel, coarse to fine sand; medium plasticity | | | | 1/2" | 5 | 30 | 65 |

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SITE: Olcott Small Boat Harbor DATE: Sept. 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D90 13 | | 1 | 26.25<br>26.45 | Highly Weathered SHALE, red-brown | | | | | | | |

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* Actual %

SITE: Olcott Small Boat Harbor Project | DATE: Sept. 90 | SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DC90 20 | | 1 | 18.9 19.2 | Sandy GRAVEL (GP-GM) red-brown, coarse to fine angular to subrounded gravel, coarse to fine sand; nonplastic w/free water | | | | 1½" | 50 | 40 | 10 |

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## OHIO RIVER DIVISION LABORATORIES — SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor Project — DATE: Sept. 90 — SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DU90 22A | | 1 | 24.3 24.8 | Silty Gravelly SAND (SM) brown-gray, coarse to fine angular to subrounded gravel, coarse to fine sand; non-plastic | | | | 1" | 30 | 45 | 25 |
| | | 2 | 24.8 25.3 | Gravelly SAND (SP) brown-gray, coarse to fine angular to subrounded gravel, coarse to fine sand; nonplastic | | | | 1½" | 40 | 56 | 4 |
| | | 3 | 25.8 27.3 | Same as sample no.2 | | | | 1½" | 40 | 56 | 4 |
| | | 4 | 28.8 30.3 | SAND (SP) gray, coarse to fine sand; nonplastic | | | | | | 96 | 4 |
| | | 5 | 30.3 31.8 | SAND(SP) gray, fine subrounded gravel, coarse to fine sand; nonplastic | | | | 3/4" | 10 | 86 | 4 |
| | | 7 | 32.6 33.3 | Sandy Organic CLAY (OH) brown-gray, coarse to fine sand; high plasticity | | 72 | 42 | | | 30 | 70 |

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* Actual %

SITE: Olcott Small Boat Harbor Project DATE: Sept 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DU90 22A | | 9 | 33.8 34.3 | Same as sample no.7 | | | | | | 30 | 70 |
| | | 12 | 35.3 35.8 | Sandy Silty Organic CLAY (OH) gray-brown, coarse to fine high plasticity | | | | | | 30 | 70 |
| | | 15 | ? | Same as sample no.12 | | 84 | 42 | | | 30 | 70 |
| | | 17 | ? | Sandy CLAY (CL) gray-brown, fine sand; medium plasticity w/organics | | | | | | 30 | 70 |
| | | 19 | 39.8 40.3 | Same as sample no.17 | | | | | | 30 | 70 |
| | | 21 | 40.8 42.3 | Sandy CLAY (CL) brown, medium to fine sand; medium plasticity, w/organics | | | | | | 40 | 60 |
| | | 22 | ? | Same as sample no.21 | | | | | | 40 | 60 |

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* Actual %

SITE: Olcott Small [illegible]t Harbor Project DATE: Sept. 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DU90 22A | | 23 | 43.8 45.3 | Sandy Silty CLAY (CL-ML) gray-brown, medium to fine sand; very low plasticity, w/organics | | | | | | 30 | 70 |
| | | 24 | 45.3 46.8 | Sandy Organic CLAY (OH) gray-brown, coarse to fine sand; high plasticity | | | | | | 35 | 65 |
| | | 25 | 46.8 48.3 | Same as sample no.24 | | | | | | 35 | 65 |
| | | 26 | 48.3 49.8 | Same as sample no.24 | | 73 | 44 | | | 35 | 65 |
| | | 27 | 49.8 51.3 | Same as sample no.24 | | | | | | 35 | 65 |
| | | 28 | 51.3 52.8 | Sandy Organic CLAY (OL) brown, fine sand: low plasticity | | | | | | 40 | 60 |
| | | 29 | 52.8 54.3 | Sandy Organic CLAY (OL) gray, medium to fine sand; low plasticity | | | | | | 40 | 60 |

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## OHIO RIVER DIVISION LABORATORIES — SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor Project DATE: Sept. 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | max size | grav | sand | fine |
| DU90 22A | | 31 | 56.3 57.8 | Sandy Organic CLAY (OH) gray, fine sand; high plasti- city | | 74 | 40 | | | 30 | 70 |

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## OHIO RIVER DIVISION LABORATORIES – SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor Project DATE: SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE: max size | gray | sand | fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DC90 23B | | 1 | ? | Sandy Organic CLAY (OL) dark gray-brown, coarse to fine | | | | | | 30 | 70 |
| | | | | sand; medium plasticity | | | | | | | |
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## OHIO RIVER DIVISION LABORATORIES — SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor Project | DATE: Sept.90 | SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DC90 23C | | 1 | 20.5 22.0 | Gravelly SAND (SP-SM) brown, coarse to fine subrounded gravel, coarse to fine sand; nonplastic w/free water | | | | 1" | 35 | 60 | 5 |
| | | 2 | 22.0 23.5 | Sandy Silty CLAY (CL-ML) gray, coarse to fine sand; very low plasticity | | | | | | 40 | 60 |
| | | 3 | 22.0 23.5 | Sandy SILT (ML) gray, coarse to fine sand; nonplastic Note: Samples 2,3 and 4 have the same depths ? | | | | | | 40 | 60 |
| | | 4 | 22.0 23.5 | Same as sample no.3 | | | | | | 40 | 60 |
| | | 6 | 23.5 25.0 | Clayey Silty SAND (SC-SM) gray, coarse to fine sand; very low plasticity w/organics | | 39 | 28 | | | 55 | 45 |
| | | 9 | 25.5 26.0 | Sandy CLAY (CL) gray, coarse to fine sand; low plasticity w/organics | | | | | | 45 | 55 |

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## OHIO RIVER DIVISION LABORATORIES – SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor Project DATE: Sept. 90 SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DC90 23D | | 1 | 18.5 19.0 | Gravelly SAND (SP-SM) red-brown, coarse to fine subrounded gravel, coarse to fine sand; nonplastic | | | | 1½" | 20 | 70 | 10 |
| | | 2 | 20.0 21.5 | Sandy Organic CLAY (OL) dark gray, coarse to fine sand; low plasticity | | | | | | 40 | 60 |
| | | 3 | 21.5 22.2 | Same as sample no.2 | | | | | | 40 | 60 |
| | | 4 | 22.2 23.0 | Sandy Organic CLAY (OH) gray-dark brown, fine sand; high plasticity | | 81 | 57 | | | 30 | 70 |
| | | 5 | 23.0 24.5 | Same as sample no.4 | | | | | | 30 | 70 |
| | | 6 | 24.5 26.0 | Sandy Organic SILT (OL) dark gray, medium to fine sand; very low plasticity | | | | | | 45 | 55 |

ORD Form 867
1 Mar 75

(Previous edition obsolete)

## OHIO RIVER DIVISION LABORATORIES — SOILS LABORATORY

* Actual %

SITE: Olcott Small Boat Harbor Project | DATE: Sept. 90 | SHEET OF

| HOLE NO. | ELEV. TOP | SAMPLE NO. | DEPTH FT. | VISUAL SOIL CLASSIFICATION | W.C. % | L.L. | P.L. | ESTIMATE max size | ESTIMATE grav | ESTIMATE sand | ESTIMATE fine |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DC90 23D | | 7 | 26.0 27.5 | Silty Gravelly SAND (SM) brown-gray, coarse to fine subrounded gravel, coarse to fine sand; nonplastic w/organics | | | | 1" | 35 | 50 | 15 |
| | | 8 | 27.5 29.0 | Sandy Organic CLAY (OL) brown-gray, coarse to fine sand; very low plasticity, w/silt | | 36 | 28 | | | 45 | 55 |
| | | 9 | 29.5 29.7 | Gravelly Clayey Organic SAND (SC) brown-gray, fine subangular gravel w/shale, coarse to fine sand; low plasticity | | | | 3/4" | 20 | 35 | 45 |

ORD Form 867
1 Mar 75

(Previous edition obsolete)

ED-GL

* Actual 7 Sept 90

# VISUAL CLASSIFICATION UNDISTURBED SAMPLES

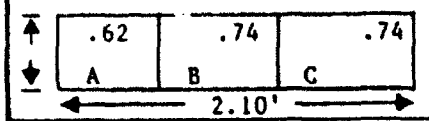
LAB No. 102/90.519B

PROJECT: Olcott Small Boat Harbor Project

SITE:

HOLE NO: DU90-22A

| SAMPLE NO | DEPTH (Ft) | ESTIMATED PERCENT Max. Size | Gr. | S | F | M. C. | CLASSIFICATION AND DESCRIPTION |
|---|---|---|---|---|---|---|---|
| ST-1 | 54.3-56.3 | | | 6 | 94 | 63.7 | Organic SILT (OH) brown-gray, fine sand; high plasticity, medium consistency w/clay LL-53, PL-35, PI-18 * |

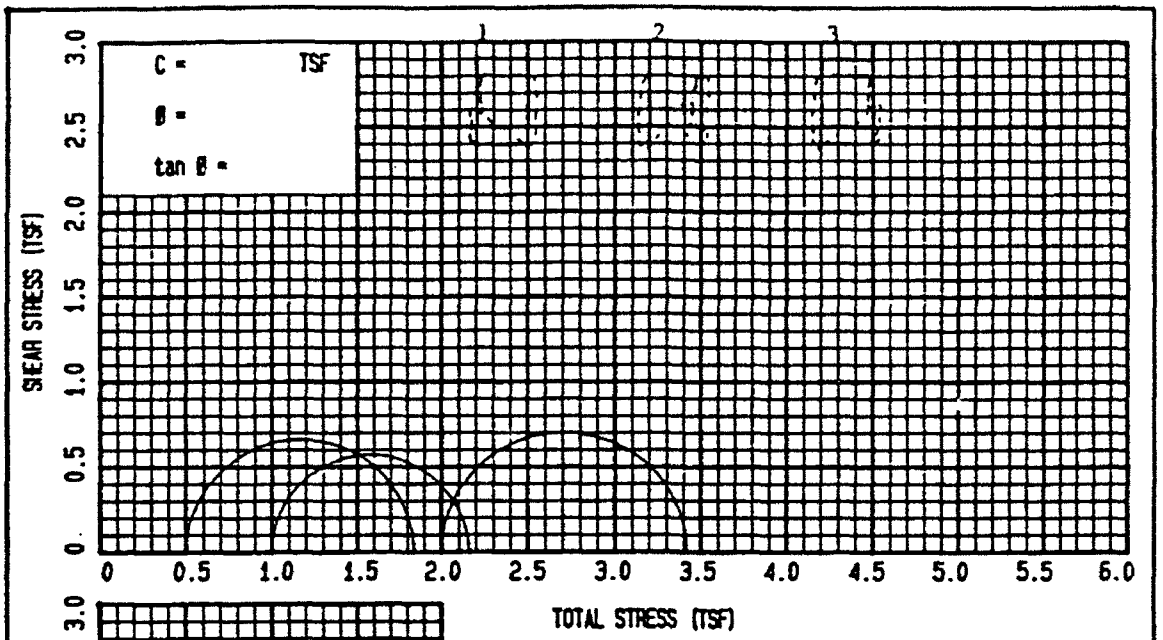


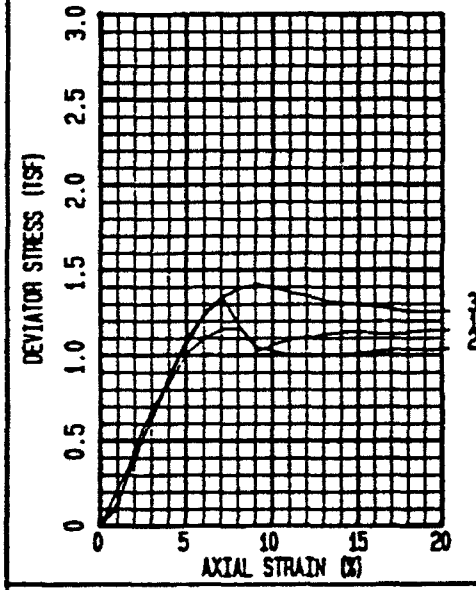

GS

ORD Form 705
1 Mar 75

(Previous edition obsolete)

ED-FL




| SPECIMEN NUMBER | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| BEFORE SHEAR | WATER CONTENT (%) | 59.3 | 64.6 | 63.6 | |
| | DRY DENSITY (PCF) | 63.7 | 59.9 | 59.9 | |
| | SATURATION (%) | 100 | 96 | 98.5 | |
| | VOID RATIO | 1.567 | 1.73 | 1.731 | |
| AFTER SHEAR | WATER CONTENT (%) | 58.9 | 64.4 | 63.4 | |
| | DRY DENSITY (PCF) | 63.7 | 59.9 | 59.9 | |
| | SATURATION (%) | 100 | 96 | 98.5 | |
| | VOID RATIO | 1.567 | 1.73 | 1.731 | |
| | FINAL BACK PRESSURE (TSF) | 0 | 0 | 0 | |
| MINOR PRINICIPAL STRESS (TSF) | | .5 | 1 | 2 | |
| MAX DEVIATOR STRESS (TSF) | | 1.34 | 1.16 | 1.42 | |
| TIME TO FAILURE (MIN) | | 7 | 8 | 9 | |
| ULTIMATE DEVIATOR STRESS (TSF) | | 1.14 | 1.04 | 1.26 | |
| INITIAL DIAMETER (IN) | | 1.423 | 1.423 | 1.428 | |
| INITIAL HEIGHT (IN) | | 2.958 | 3.03 | 2.99 | |

CONTROLLED STRAIN TEST

DESCRIPTION OF SPECIMENS: Organic SILT (OH) brown-gray, fine sand; high plasticity, w/clay

| LL 53 | PL 35 | PI 18 | Gs 2.62 |
|---|---|---|---|

TYPE OF SPECIMEN: UNDISTURBED | TYPE OF TEST: Ø-TEST

REMARKS: Each specimen taken at a different depth, due to 3" dia. of tube samples.

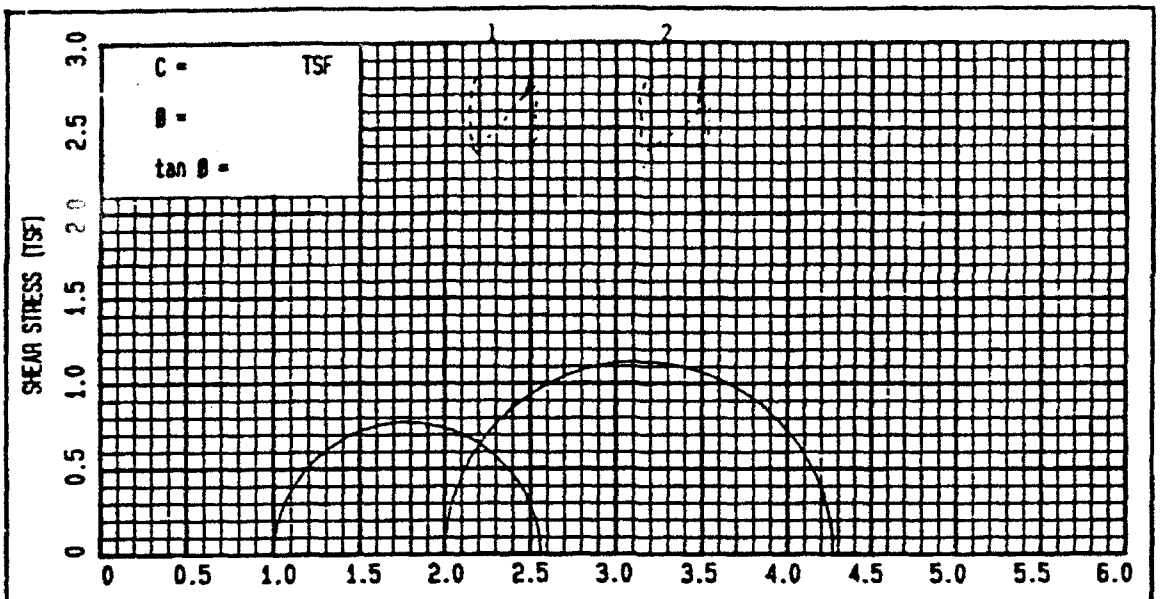
PROJECT: Olcott Harbor

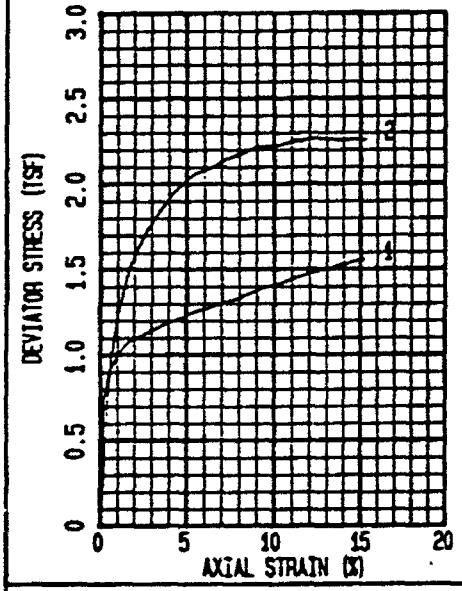
BORING NO DU90-22A | SAMPLE NO ST-1

DEPTH/ELEV. 54.3-56.3

LABORATORY: CEORD | DATE 09/27/90

TRIAXIAL COMPRESSION TEST REPORT GS




| SPECIMEN NUMBER | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| BEFORE SHEAR | WATER CONTENT (%) | 62.4 | 65.4 | | |
| | DRY DENSITY (PCF) | 59.5 | 60 | | |
| | SATURATION (%) | 100 | 100 | | |
| | VOID RATIO | 1.746 | 1.725 | | |
| AFTER SHEAR | WATER CONTENT (%) | 55 | 56 | | |
| | DRY DENSITY (PCF) | 66.7 | 66.9 | | |
| | SATURATION (%) | 100 | 100 | | |
| | VOID RATIO | 1.453 | 1.442 | | |
| | FINAL BACK PRESSURE (TSF) | 0 | 7 | | |
| MINOR PRINICIPAL STRESS (TSF) | | 1 | 2 | | |
| MAX DEVIATOR STRESS (TSF) | | 1.56 | 2.27 | | |
| TIME TO FAILURE (MIN) | | 1150 | 1131 | | |
| ULTIMATE DEVIATOR STRESS (TSF) | | 1.56 | 2.26 | | |
| INITIAL DIAMETER (IN) | | 1.421 | 1.405 | | |
| INITIAL HEIGHT (IN) | | 2.931 | 2.992 | | |

CONTROLLED STRAIN TEST

DESCRIPTION OF SPECIMENS: Organic SILT (OH) brown-gray, fine sand; high plasticity, w/clay, medium consistency

| LL 53 | PL 35 | PI 18 | Gs 2.62 |
|---|---|---|---|

TYPE OF SPECIMEN: UNDISTURBED | TYPE OF TEST: R-BAR

REMARKS: Insufficient mat'l for testing 3rd pt. Each specimen taken at a different depth, due to 3" dia. of tube samples.

PROJECT: Olcott Harbor

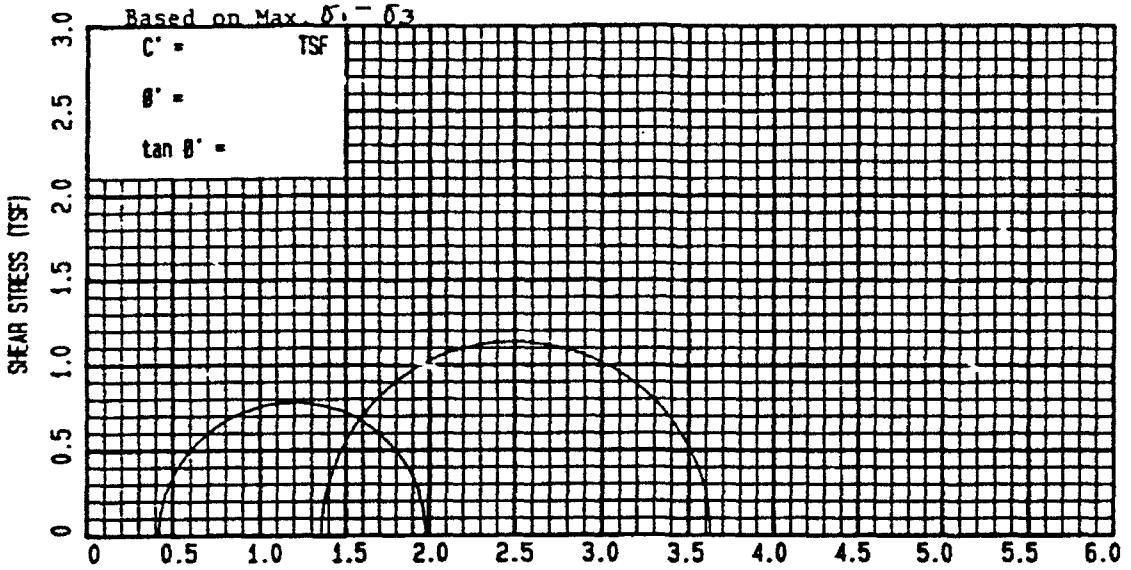
BORING NO DU90-22A | SAMPLE NO ST-1

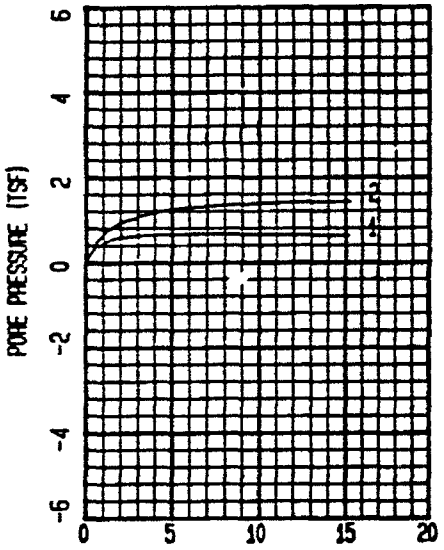
DEPTH/ELEV. 54.3-56.3

LABORATORY: CEORD | DATE 09/27/90



TRIAXIAL COMPRESSION TEST REPORT GS




| SPECIMEN NUMBER | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| BEFORE SHEAR | WATER CONTENT (%) | 62.4 | 65.4 | | |
| | DRY DENSITY (PCF) | 59.5 | 60 | | |
| | SATURATION (%) | 100 | 100 | | |
| | VOID RATIO | 1.746 | 1.725 | | |
| AFTER SHEAR | WATER CONTENT (%) | 55 | 56 | | |
| | DRY DENSITY (PCF) | 66.7 | 66.9 | | |
| | SATURATION (%) | 100 | 100 | | |
| | VOID RATIO | 1.453 | 1.442 | | |
| | FINAL BACK PRESSURE (TSF) | 7 | 7 | | |
| MINOR PRINICIPAL STRESS (TSF) $\sigma_3$ | | .419 | 1.356 | | |
| MAX DEVIATOR STRESS (TSF) | | 1.56 | 2.27 | | |
| TIME TO FAILURE (MIN) | | 1150 | 1131 | | |
| ULTIMATE DEVIATOR STRESS (TSF) | | 1.56 | 2.26 | | |
| INITIAL DIAMETER (IN) | | 1.421 | 1.405 | | |
| INITIAL HEIGHT (IN) | | 2.931 | 2.992 | | |

CONTROLLED STRAIN TEST

DESCRIPTION OF SPECIMENS: Organic SILT (OH) brown-gray, fine sand; high plasticity, w/clay, medium consistency

| LL 53 | PL 35 | PI 18 | Gs 2.62 |
|---|---|---|---|

TYPE OF SPECIMEN: UNDISTURBED | TYPE OF TEST: A-BAR

REMARKS: Insufficient mat'l for testing 3rd pt. Each specimen taken at a different depth, due to 3" dia. of tube samples.

PROJECT: Olcott Harbor

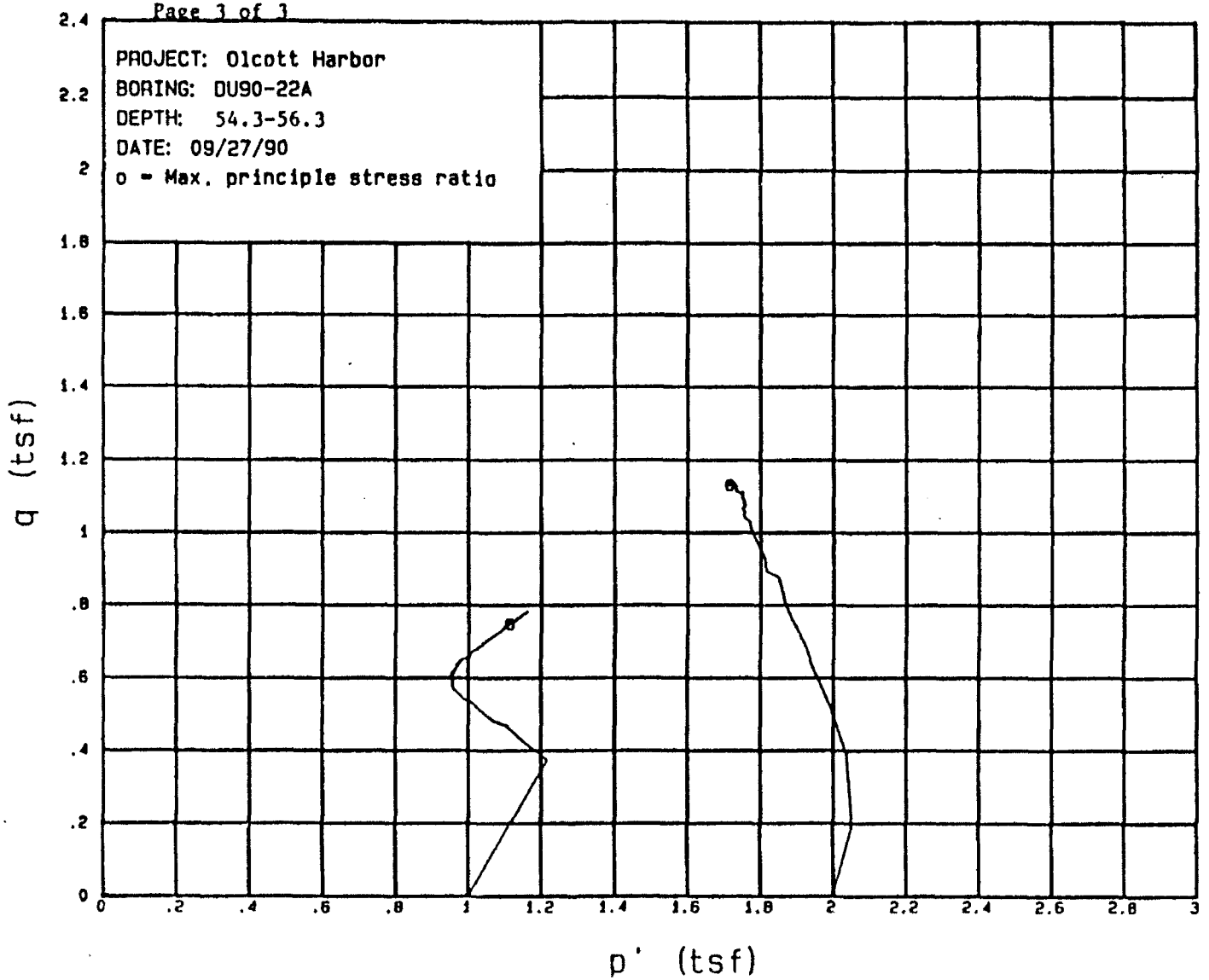
BORING NO DU90-22A | SAMPLE NO ST-1

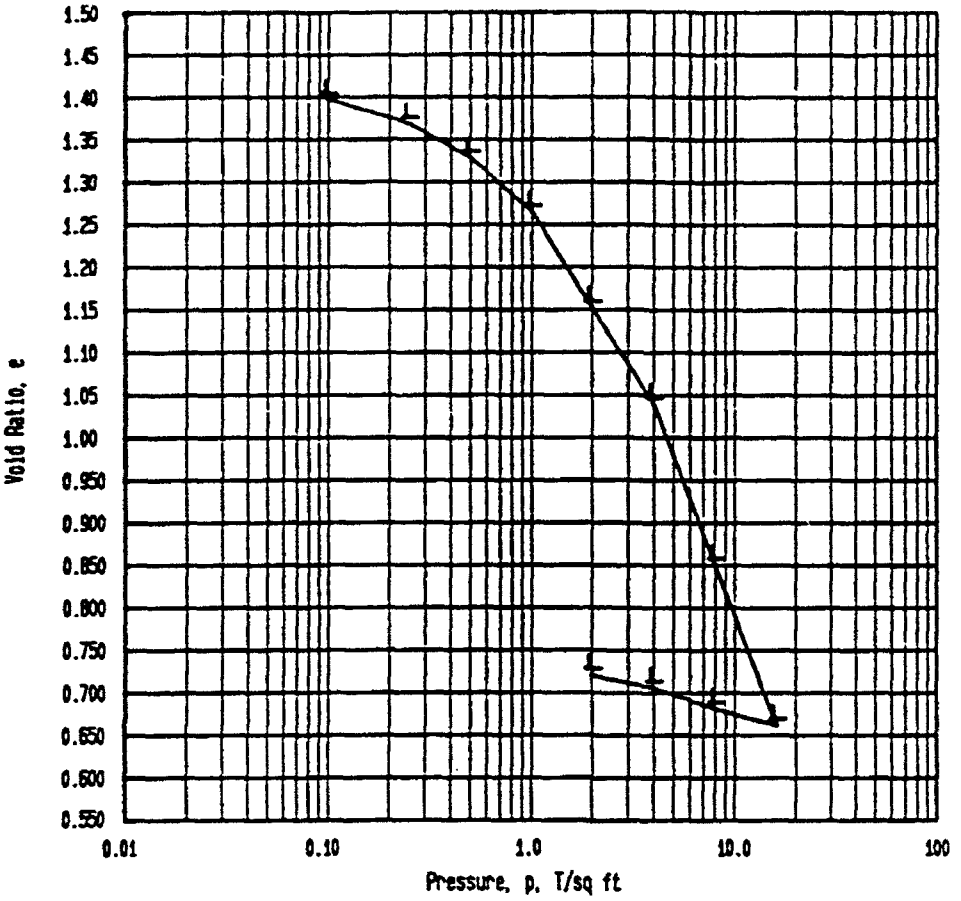
DEPTH/ELEV. 54.3-56.3

LABORATORY: CEORD | DATE 09/27/90

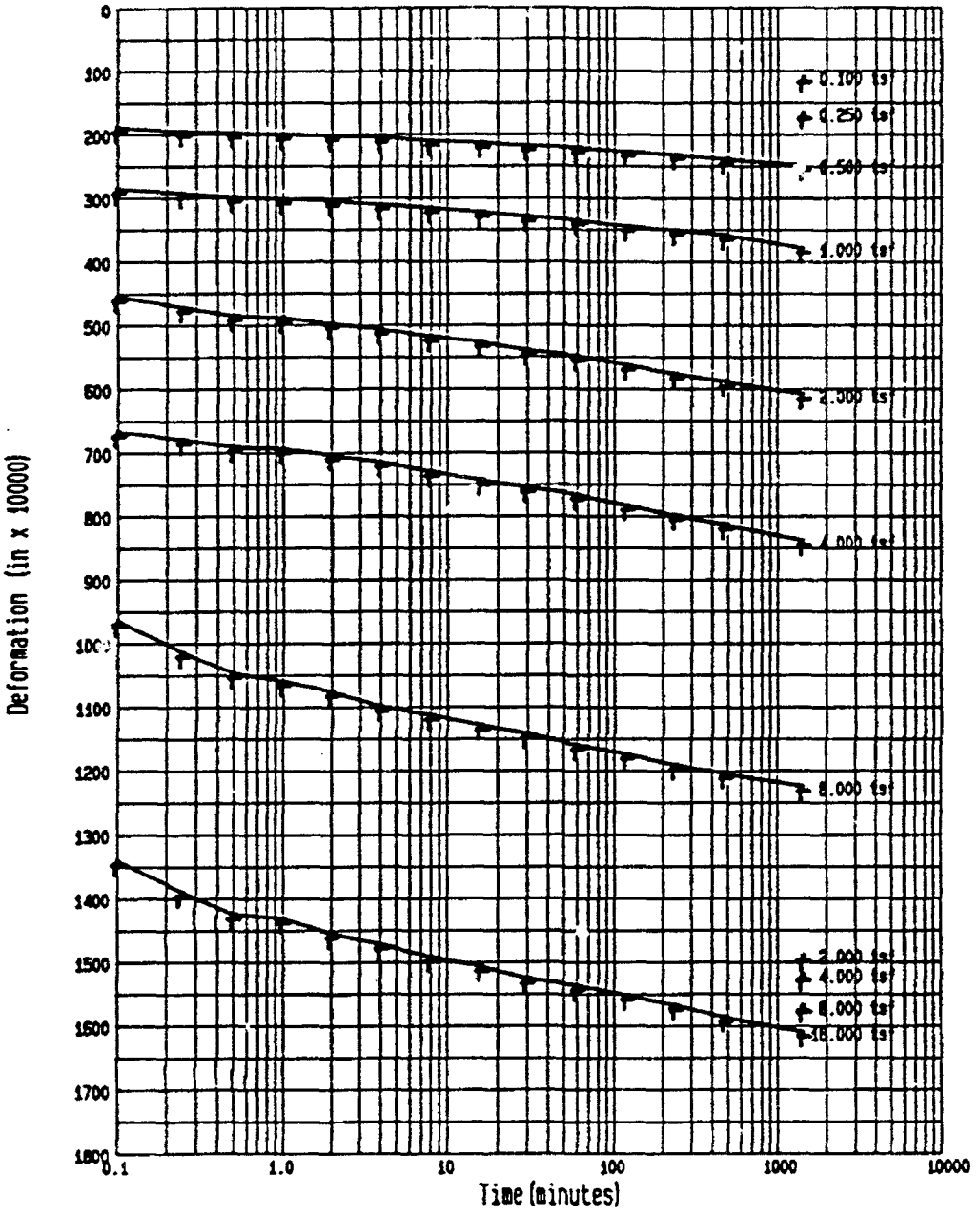


TRIAXIAL COMPRESSION TEST REPORT GS

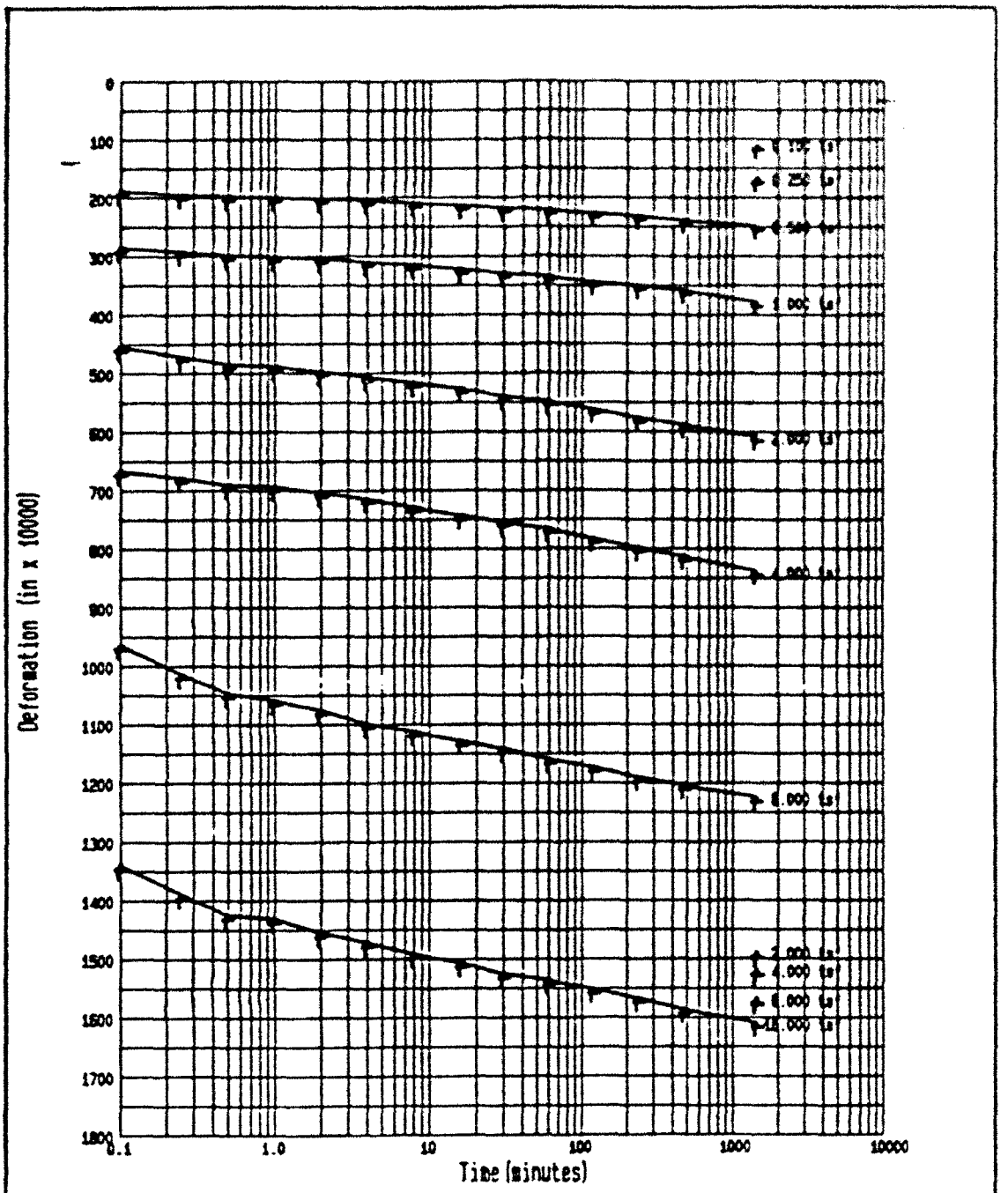

PROJECT: Olcott Harbor
BORING: DU90-22A
DEPTH: 54.3-56.3
DATE: 09/27/90
o = Max. principle stress ratio
q (tsf)
p' (tsf)
0
.2
.4
.6
.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3




| Type of Specimen UNDISTURBED | | Before Test | | After Test | |
|---|---|---|---|---|---|
| Dia. 2.5 in. | ht .5 in. | Water Content, $w_0$ | 54.7 % | $w_f$ | 33 % |
| Overburden Pressure, Po, T/sq ft | | Void Ratio, $e_0$ | 1.45 | $e_f$ | .721 |
| Preconsol. Pressure, Pc, T/sq ft | | Saturation, $S_0$ | 98.8 % | $S_f$ | 100 % |
| Compression Index, Cc 0.62 | | Dry Density | 66.5 pcf | | 94.9 pcf |
| Classification Organic SILT (OH) | | $k_{20}$ at $e_0$ | | | |
| LL 53 | Gs 2.62 | Project Olcott Harbor | | | |
| PL 35 | $D_{10}$ | | | | |
| Remarks: | | Area: | | | |
| | | Boring No. DU90-22A | | Sample No. ST-1 | |
| | | Depth 54.3-56.3 | | Date 9-27-90 | |
| Page 1 of 2 | | CONSOLIDATION TEST REPORT | | | GS |




| | | | |
|---|---|---|---|
| Project Olcott Harbor | | | |
| Area | | | |
| Boring No. DU90-22A | Sample No. ST-1 | Depth 54.3-56.3 | Date 09-27-1990 |
| Page 2 of 2 | CONSOLIDATION TEST - TIME CURVES | | GS |




| | | | |
|---|---|---|---|
| Project Olcott Harbor | | | |
| Area | | | |
| Boring No. DU90-22A | Sample No. ST-1 | Depth 54.3-56.3 | Date 09-27-1990 |



CONSOLIDATION TEST - TIME CURVES

GS

* Actual %

# VISUAL CLASSIFICATION UNDISTURBED SAMPLES

LAB No. 102/90.5198

PROJECT: Olcott Small Boat Harbor Project

SITE:

BOCE NO: DU90-22B

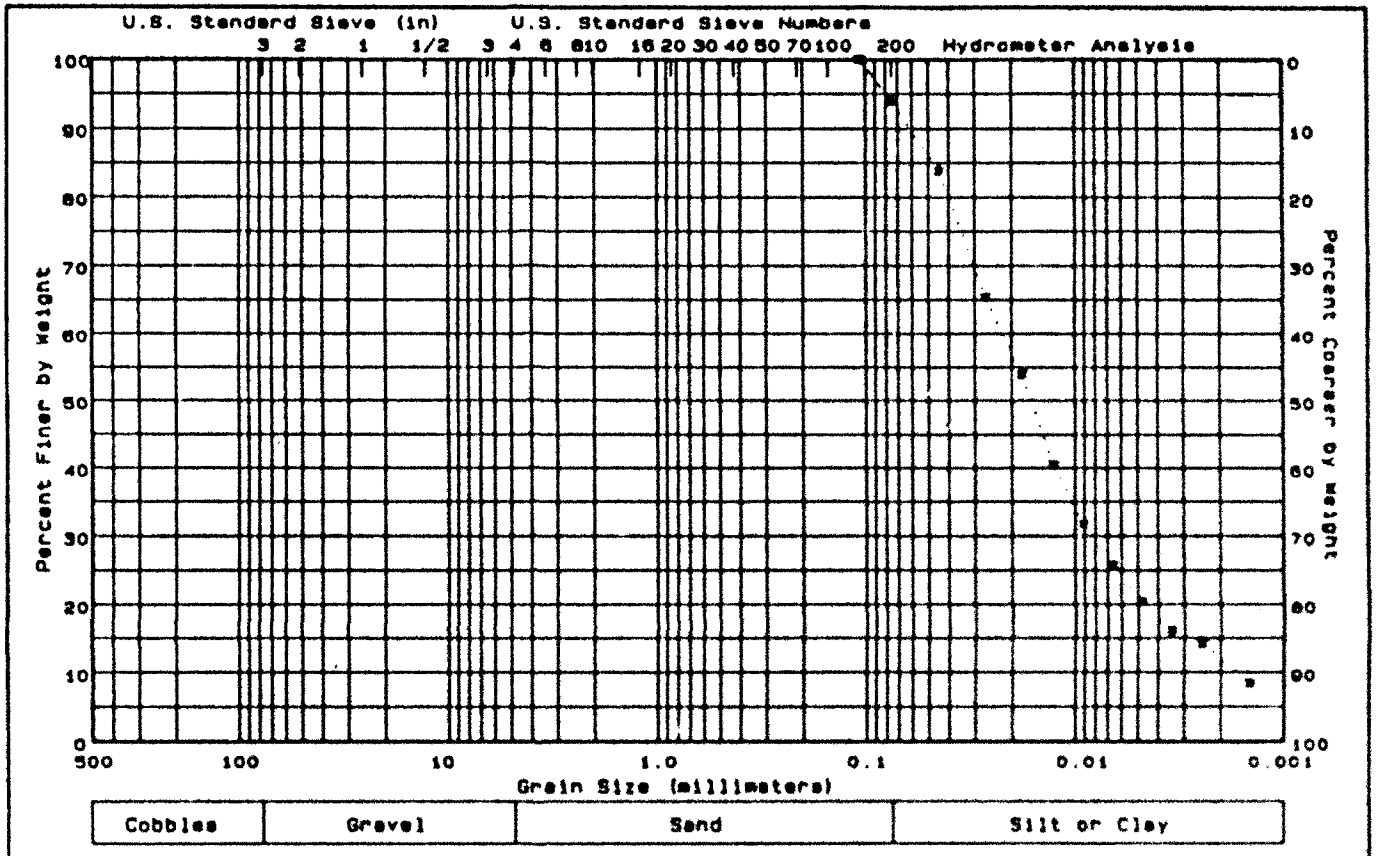
| SAMPLE NO | DEPTH (Ft) | ESTIMATED PERCENT Max. Size | Gr. | S | F | M. C. | CLASSIFICATION AND DESCRIPTION |
|---|---|---|---|---|---|---|---|
| ST-2 | 28.0-30.33 | 1" | 16 | 38 | 46 | 40.6 | Gravelly Clayey Silty Organic SAND (SM-SC) brown, fine subrounded gravel, coarse to fine sand; high plasticity, very soft and loose consistency LL-79, PL-52, PI-27 (No Q-test run due to gravel) * |
| | 0.36' | | | | | | |

GS

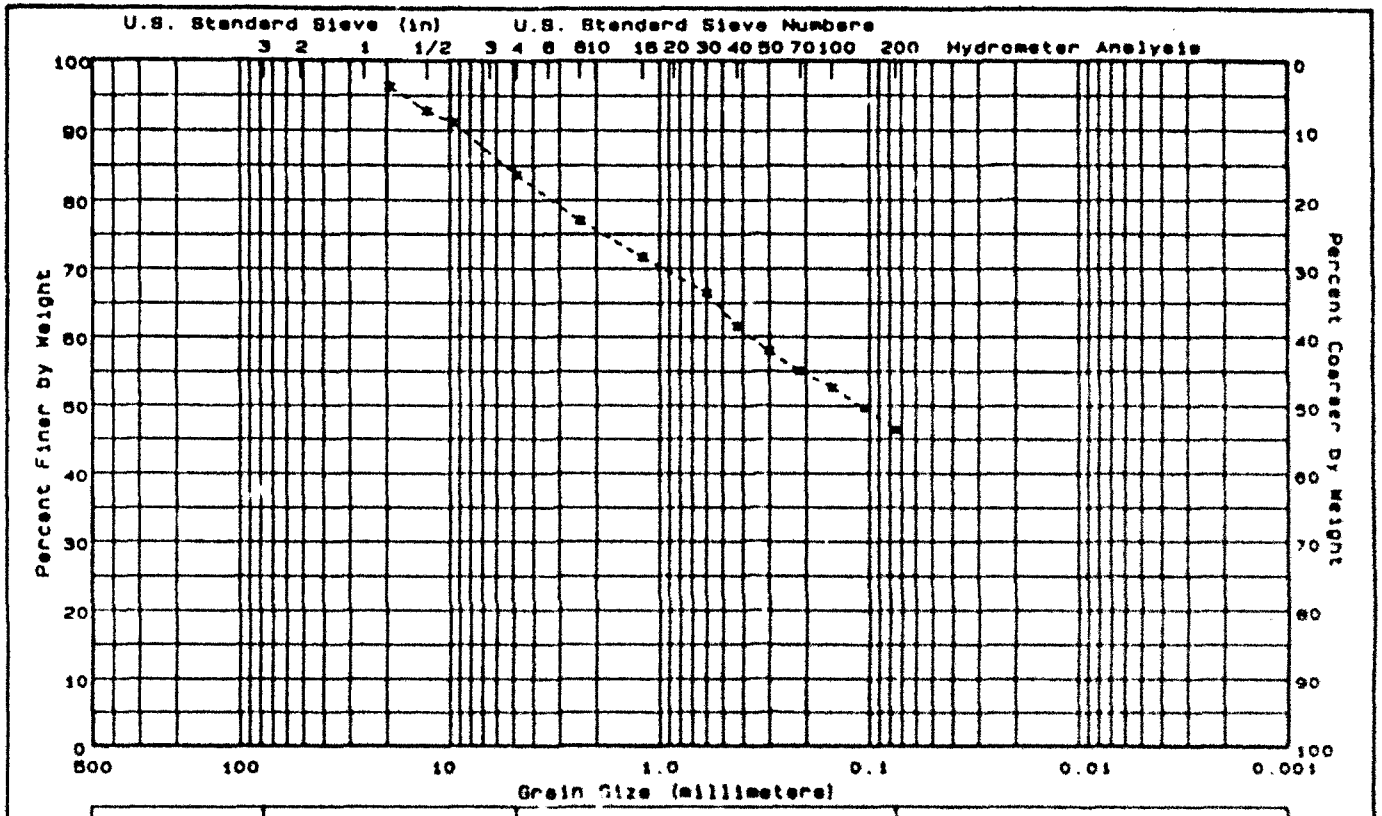
ORD Form 705
1 Mar 75

(Previous edition obsolete)

EP-EL




| Sam No | Elev | Classification | w% | LL | PL | PI | Project Olcott Harbor |
|---|---|---|---|---|---|---|---|
| ST-1 | 54.3-56.3 | Organic SILT (OH) | 63.7 | 53 | 35 | 18 | |
| | | | | | | | Area |
| | | | | | | | Boring No. DU90-22A |
| GRADATION CURVES | | | | | | | Date 09-27-90 GS |




| Sam No | Elev | Classification | w% | LL | PL | PI | Project Olcott Harbor |
|---|---|---|---|---|---|---|---|
| ST-2 | 28.0-30.3 | Gravelly Clayey | 40.6 | 79 | 52 | 27 | |
| | | Silty Organic | | | | | Area |
| | | SAND (SM-SC) | | | | | Boring No. DU90-228 |
| GRADATION CURVES | | | | | | | Date 09-27-90 GS |

OLCOTT HARBOR, NEW YORK

GENERAL DEBIGN

SUB-APPENDIX A

# ATTACHMENT A3

# STABILITY COMPUTER PROGRAM INPUT AND OUTPUT

OLCOTT HARBOR, NEW YORK

ATTACHMENT A3

STABILITY COMPUTER PROGRAM INPUT AND OUTPUT

TABLE OF CONTENTS


| Number | Description | Page |
|---|---|---|
| 1. | End of Construction Case | 1. |
| 2. | Long Term Case | 11. |

1 of 10

```
C:\ISLP
C:\ISLP\TYPE OLCOTT
HEADING
OLCOTT HARBOR, NEW YORK
STABILITY OF EAST BREAKWATER, STA 6+78
END OF CONSTRUCTION
PROFILE LINES
 1 1 MOIST BREAKWATER STONE
-34.0 42.8
 -9.0 55.3
  9.0 55.3
 34.0 42.8

 2 2 SATURATED BREAKWATER STONE
-61.0 29.3
-34.0 42.8
 34.0 42.8
 61.0 29.3

 3 3 SANDY GRAVEL FOUNDATION (LOOSE)
-150.0 29.3
 -61.0 29.3
  61.0 29.3
 150.0 29.3

 4 4 VERY SOFT ORGANIC CLAY FOUNDATION
-152.0 21.6
 152.0 21.6


HEADING
  END OF CONSTRUCTION
  ASSUME FULL HEIGHT OF STRUCTURE INSTANTLY APPLIED

MATERIAL PROPERTY
  1 MOIST BREAKWATER STONE
  110 = MOIST UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  0 40
  NO PORE PRESSURE
  2 SATURATED BREAKWATER STONE
  132 = SATURATED UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  0 42
  PIEZOMETRIC LINE
  1
  3 SANDY GRAVEL FOUNDATION (LOOSE)
  98 = SATURATED UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  0 32
  PIEZOMETRIC LINE
  1
  4 VERY SOFT ORGANIC CLAY FOUNDATION
  122 = SATURATED UNIT WEIGHT
  LINEAR STRENGTH INCREASE
  227 37.6
  PIEZOMETRIC LINE
  1

PIEZOMETRIC LINE DATA
  1 62.4 LOW WATER DATUM
-150.0 42.8
 -34.0 42.8
```

**SLOPE STABILITY SUMMARY**

PROJECT: Olcott Harbor, N.Y.
RUN NO.: 3 CASE: End of Const
DATE OF RUN: 11/26/86 BY: GR
MINIMUM FACTOR OF SAFETY: 1.269 (Slope to E)
REMARKS: 1V:2H slope, Undrained Shear
Strength vs. Soil Depth Su = 227+37.6 Z psf

(1.)

```
 34.0 42.0
 152.0 42.0

SURFACE PRESSURES
-152.0 29.3 848.6 0
 -61.0 29.3 848.6 0
 -34.0 42.0   0.0 0
  34.0 42.0   0.0 0
  61.0 29.3 848.6 0
 152.0 29.3 848.6 0

HEADING
  CIRCULAR SEARCH FOR CRITICAL FAILURE SURFACE
  BISHOP'S METHOD OF ANALYSIS
  END OF CONSTRUCTION
ANALYSIS/COMPUTATION
  CIRCULAR SEARCH
  42.0 62.0 0.5 0
  TANGENT
  15
  PROCEDURE
  BISHOP'S METHOD

PLOT
COMPLTE
```

24-10

```
C:\ISLP\0
C:\ISLP\UTEIAS2
##################################
#  CORPS PROGRAM  #  18229      #
#       VERSION  # 87/11/23   #
##################################


   ######################:###
   #                      #
   #   U T E I A S 2      #
   #                      #
   #      W I T H         #
   #                      #
   #   G R A P H I C S    #
   #                      #
   ##########################

COMPUTER PROGRAM DESIGNATION - UTEIAS2
CODED BY S. G. WRIGHT
VERSION NO. 1.209
LAST REVISION DATE 11/23/87
SERIAL NO. 02004
(C) COPYRIGHT 1985 STEPHEN G. WRIGHT - ALL RIGHTS RESERVED
SEE PRINTED OUTPUT FOR DISCLAIMER

ENTER INPUT FILE NAME:
OLCOTT

ENTER OUTPUT FILE NAME:
OLCOUT
FILE NAME :OLCOUT
FILE ALREADY EXISTS. USE IT ANYWAY ? (Y/N)
Y

DO YOU WANT TO PLOT THE INPUT PROBLEM?  (Y/N)
Y

SEARCH FOR CRITICAL CIRCLE BEGUN

SEARCH WITH MODE =  2 STARTED

        TABLE NO. 12
        INFORMATION FOR CURRENT MODE OF SEARCH - ALL CIRCLES ARE TANGENT
        TO A HORIZONTAL LINE AT   Y =   215.000
        ---------------------------------------------------------------

        CENTER COORDINATES              FACTOR  SIDE FORCE
                                          OF    INCLINATION
             X        Y       RADIUS   SAFETY   (DEGREES)   ITERATIONS
            25.00   265.00    50.00   1.444     HORIZ.        14
            40.00   265.00    50.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.342     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            55.00   265.00    50.00   1.625     HORIZ.        14
            25.00   280.00    65.00   1.524     HORIZ.        18
```

| | | | | | |
|---|---|---|---|---|---|
| 42.00 | 282.00 | 65.00 | 1.391 | HORIZ. | 15 |
| 55.00 | 282.00 | 65.00 | 1.585 | HORIZ. | 12 |
| 25.00 | 295.00 | 80.00 | 1.666 | HORIZ. | 8 |
| 40.00 | 295.00 | 80.00 | 1.528 | HORIZ. | 10 |
| 55.00 | 295.00 | 80.00 | 1.641 | HORIZ. | 11 |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 37.50 | 277.50 | 62.50 | 1.362 | HORIZ. | 16 |
| 40.00 | 277.50 | 62.50 | 1.372 | HORIZ. | 16 |
| 42.50 | 277.50 | 62.50 | 1.387 | HORIZ. | 16 |
| 37.50 | 280.00 | 65.00 | 1.382 | HORIZ. | 15 |
| 42.50 | 280.00 | 65.00 | 1.405 | HORIZ. | 15 |
| 37.50 | 282.50 | 67.50 | 1.403 | HORIZ. | 14 |
| 40.00 | 282.50 | 67.50 | 1.411 | HORIZ. | 14 |
| 42.50 | 282.50 | 67.50 | 1.424 | HORIZ. | 14 |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 35.00 | 275.00 | 60.00 | 1.348 | HORIZ. | 17 |
| 37.50 | 275.00 | 62.00 | 1.343 | HORIZ. | 21 |
| 40.00 | 275.00 | 60.00 | 1.354 | HORIZ. | 16 |
| 35.00 | 277.50 | 62.50 | 1.360 | HORIZ. | 15 |
| 35.00 | 280.00 | 65.00 | 1.382 | HORIZ. | 14 |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 32.50 | 272.50 | 57.50 | 1.327 | HORIZ. | 17 |
| 35.00 | 272.50 | 57.50 | 1.328 | HORIZ. | 19 |
| 37.50 | 272.50 | 57.50 | 1.326 | HORIZ. | 26 |
| 32.50 | 275.00 | 60.00 | 1.347 | HORIZ. | 16 |
| 32.50 | 277.50 | 62.50 | 1.369 | HORIZ. | 15 |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 32.50 | 270.00 | 55.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.333 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 35.00 | 270.00 | 55.00 | 1.303 | HORIZ. | 28 |
| 37.50 | 270.00 | 55.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.310 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 32.50 | 267.50 | 52.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.322 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 35.00 | 267.50 | 52.50 | 1.289 | HORIZ. | 27 |
| 37.50 | 267.50 | 52.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.306 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

5 of 10

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 32.50 | 265.00 | 50.00 | 1.283 | HORIZ. | 20 |
| 35.00 | 265.00 | 50.00 | 1.277 | HORIZ. | 31 |
| 37.50 | 265.00 | 50.00 | 1.288 | HORIZ. | 19 |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 32.50 | 262.50 | 47.50 | CENTER OF CIRCLE FALLS OUTSIDE OF CURRENT GRID - GRID RE-INITIALIZED | | |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 32.50 | 262.50 | 47.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.312 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 35.00 | 262.50 | 47.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.312 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 37.50 | 262.50 | 47.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.312 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 32.50 | 265.00 | 50.00 | 1.283 | HORIZ. | 20 |
| 37.50 | 265.00 | 50.00 | 1.298 | HORIZ. | 19 |
| 32.50 | 267.50 | 52.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.328 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 35.00 | 267.50 | 52.50 | 1.269 | HORIZ. | 27 |
| 37.50 | 267.50 | 52.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.326 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |

| CENTER COORDINATES | | | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| X | Y | RADIUS | | | |
| 33.50 | 263.50 | 48.50 | 1.273 | HORIZ. | 18 |
| 35.00 | 263.50 | 48.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.292 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 36.50 | 267.50 | 48.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.292 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 33.50 | 265.00 | 50.00 | 1.278 | HORIZ. | 20 |
| 36.50 | 265.00 | 50.00 | 1.282 | HORIZ. | 31 |
| 33.50 | 266.50 | 51.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.299 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |

```
            35.00    266.50     51.50   1.284     HORIZ.        16
            36.50    266.50     51.50 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.323     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS


       CENTER COORDINATES              FACTOR  SIDE FORCE
                                         OF    INCLINATION
            X         Y       RADIUS   SAFETY   (DEGREES)   ITERATIONS
            32.00    262.00     47.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.333     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            33.50    262.00     47.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.289     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            35.00    262.00     47.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.266     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            32.00    263.50     48.50 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.298     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            32.00    265.00     50.00   1.286     HORIZ.        22

       CENTER COORDINATES              FACTOR  SIDE FORCE
                                         OF    INCLINATION
            X         Y       RADIUS   SAFETY   (DEGREES)   ITERATIONS
            33.00    263.00     48.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.301     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            33.50    263.00     48.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.303     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            34.00    263.00     48.00   1.271     HORIZ.        22
            33.00    263.50     48.50   1.275     HORIZ.        18
            34.00    263.50     48.50 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.322     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            33.00    264.00     49.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.282     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            33.50    264.00     49.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.282     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

            34.00    264.00     49.00 SEE MESSAGE ON NEXT LINE(S)
                 LAST TRIAL VALUES =   1.282     HORIZ.        41
                 VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS
```

[illegible]

[illegible]

[illegible]

***** CAUTION ***** FACTOR OF SAFETY COULD NOT BE COMPUTED FOR SOME
OF EXIT POINTS ALONG THE PERIMETER
***** RESULTS MAY BE ERRONEOUS *****

SEARCH WITH MODE = 3 STARTED

TABLE NO. 13
INFORMATION FOR CURRENT MODE OF SEARCH - ALL CIRCLES HAVE THE
SAME RADIUS - RADIUS = 46.000

| CENTER COORDINATES X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 19.50 | 246.00 | 46.00 | 2.336 | HORIZ. | 6 |

MESSAGE ON THE FOLLOWING LINE(S) APPLIES TO THE ABOVE CIRCLE
DENOMINATOR IN EQUATIONS FOR FACTOR OF SAFETY WAS SMALL FOR 3 SLICES
FIRST AND LAST SLICES WHERE DENOMINATOR WAS LOW - 55 61

| | | | | | |
|---|---|---|---|---|---|
| 34.50 | 246.00 | 46.00 | 1.886 | HORIZ. | 8 |

MESSAGE ON THE FOLLOWING LINE(S) APPLIES TO THE ABOVE CIRCLE
DENOMINATOR IN EQUATIONS FOR FACTOR OF SAFETY WAS SMALL FOR 3 SLICES
FIRST AND LAST SLICES WHERE DENOMINATOR WAS LOW - 59 60

| | | | | | |
|---|---|---|---|---|---|
| 49.50 | 246.00 | 46.00 | 2.285 | HORIZ. | 7 |

MESSAGE ON THE FOLLOWING LINE(S) APPLIES TO THE ABOVE CIRCLE
DENOMINATOR IN EQUATIONS FOR FACTOR OF SAFETY WAS SMALL FOR 2 SLICES
FIRST AND LAST SLICES WHERE DENOMINATOR WAS LOW - 58 59

| | | | | | |
|---|---|---|---|---|---|
| 19.50 | 261.00 | 46.00 | 1.739 | HORIZ. | 9 |
| 49.50 | 261.00 | 46.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| | LAST TRIAL VALUES = | | 1.693 | HORIZ. | 41 |

VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 19.50 | 276.00 | 46.00 | 3.949 | HORIZ. | 6 |
| 34.50 | 276.00 | 46.00 | 2.767 | HORIZ. | 8 |
| 49.50 | 276.00 | 46.00 | 1.842 | HORIZ. | 12 |

| CENTER COORDINATES X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 32.00 | 259.50 | 46.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| | LAST TRIAL VALUES = | | 1.295 | HORIZ. | 41 |

VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 34.50 | 256.50 | 46.00 | 1.297 | HORIZ. | 22 |
| 37.00 | 256.50 | 46.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| | LAST TRIAL VALUES = | | 1.306 | HORIZ. | 41 |

VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 32.00 | 261.00 | 46.00 | 1.279 | HORIZ. | 19 |
| 37.00 | 261.00 | 46.00 | 1.279 | HORIZ. | 28 |
| 32.00 | 262.50 | 46.00 | 1.352 | HORIZ. | 12 |
| 34.50 | 267.50 | 46.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| | LAST TRIAL VALUES = | | 1.317 | HORIZ. | 41 |

VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 37.00 | 267.50 | 46.00 | 1.302 | HORIZ. | 15 |

| CENTER COORDINATES X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 32.00 | 259.50 | 46.00 | SEE MESSAGE ON NEXT LINE(S) | | |

```
                LAST TRIAL VALUES =   1.220     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          34.50    259.50     46.00 SEE MESSAGE ON NEXT LINE(S.
                LAST TRIAL VALUES =   1.316     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          36.00    259.50     46.00 SEE MESSAGE ON NEXT LINE(S.
                LAST TRIAL VALUES =   2.000     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          33.00    261.00     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.265     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          36.00    261.00     46.00   1.272     HORIZ.        26
          33.00    262.50     46.00   1.298     HORIZ.        27
          34.50    262.50     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.288     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          36.00    262.50     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.287     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS


     CENTER COORDINATES              FACTOR  SIDE FORCE
                                       OF    INCLINATION
          X         Y       RADIUS   SAFETY   (DEGREES)   ITERATIONS
          34.00    260.50     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.282     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          34.50    260.50     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.280     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERSE WITHIN  40 ITERATIONS

          35.00    260.50     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.282     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          34.00    261.00     46.00   1.269     HORIZ.        37
          35.00    261.00     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =   1.269     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          34.00    261.50     46.00 SEE MESSAGE ON NEXT LINE(S)
                LAST TRIAL VALUES =    .981     HORIZ.        41
                VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN  40 ITERATIONS

          34.50    261.50     46.00   1.271     HORIZ.        21
          35.00    261.50     46.00   1.271     HORIZ.        20

     AT THE END OF THE CURRENT MODE OF SEARCH THE MOST CRITICAL
     CIRCLE WHICH WAS FOUND HAS THE FOLLOWING VALUES -
```

X-CENTER = 34.58 Y-CENTER = 261.82 RADIUS = 46.22
FACTOR OF SAFETY = 1.269 SIDE FORCE INCLINATION = HORIZ.

10 of 10

***** CAUTION ***** FACTOR OF SAFETY COULD NOT BE COMPUTED FOR SOME
OF GRID POINTS AROUND THE MINIMUM
***** RESULTS MAY BE ERRONEOUS *****

TABLE NO. 15
***** FINAL CRITICAL CIRCLE INFORMATION *****

| | |
|---|---|
| X COORDINATE OF CENTER - - - - - - - - | 34.522 |
| Y COORDINATE OF CENTER - - - - - - - - | 261.822 |
| RADIUS - - - - - - - - - - - - - - - - | 46.822 |
| FACTOR OF SAFETY - - - - - - - - - - - | 1.269 |
| SIDE FORCE INCLINATION - - - - - - - - | HORIZ. |
| NUMBER OF CIRCLES TRIED - - - - - - - | 113 |
| NO. OF CIRCLES F CALC. FOR - - - - - - | 68 |

***** CAUTION ***** FACTOR OF SAFETY COULD NOT BE COMPUTED FOR SOME
OF GRID POINTS AROUND THE MINIMUM
***** RESULTS MAY BE ERRONEOUS *****

FACTOR OF SAFETY = 1.269
SIDE FORCE INCLINATION = HORIZ.
ITERATIONS = 34

run-time error M6101: MATH
- floating-point error: invalid

(10.)

```
CORNELL TYPE CLOSIT
HEADING
OLCOTT HARBOR, NEW YORK
STABILITY OF EAST BREAKWATER, STA 6+78
LONG TERM CASE
PROFILE LINES
 1 1 MOIST BREAKWATER STONE
-34.0 242.0
 -9.0 255.3
  9.0 255.3
 34.0 242.0

 2 2 SATURATED BREAKWATER STONE
-61.0 229.3
-34.0 242.0
 34.0 242.0
 61.0 229.3

 3 3 SANDY GRAVEL FOUNDATION (LOOSE)
-152.0 229.3
 -61.0 229.3
  61.0 229.3
 152.0 229.3

 4 4 VERY SOFT ORGANIC CLAY FOUNDATION
-152.0 221.0
 152.0 221.0


HEADING
  LONG TERM CASE
  ASSUME FULL HEIGHT OF STRUCTURE INSTANTLY APPLIED

MATERIAL PROPERTY
  1 MOIST BREAKWATER STONE
  118 = MOIST UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  2 42
  NO PORE PRESSURE
  2 SATURATED BREAKWATER STONE
  132 = SATURATED UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  2 42
  PIEZOMETRIC LINE
  1
  3 SANDY GRAVEL FOUNDATION (LOOSE)
  98 = SATURATED UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  2 32
  PIEZOMETRIC LINE
  1
  4 VERY SOFT ORGANIC CLAY FOUNDATION
  102 = SATURATED UNIT WEIGHT
  CONVENTIONAL SHEAR STRENGTH
  2 26
  PIEZOMETRIC LINE
  1

PIEZOMETRIC LINE DATA
  1 62.4 LOW WATER DATUM
-152.0 242.0
 -34.0 242.0
  34.0 242.0
 152.0 242.0
```

**SLOPE STABILITY SUMMARY**

PROJECT: Olcott Harbor, N.Y.
RUN NO.: 4 CASE: Long Term
DATE OF RUN: 11/26/90 BY: G.L.
MINIMUM FACTOR OF SAFETY: 1.518 (Slope 9WS)
REMARKS: 1½:1H slope, Case=Bkwt=R.S. Foundation
Silty sand of organic clay C=.05t, ϕ'=26°

2.f 9

```
SURFACE PRESSURES
-158.0 229.3 848.6 0
-61.2 229.3 848.6 0
 -34.0 242.6   0.0 0
  34.2 241.8   0.0 0
  61.0 229.3 848.6 0
 158.0 229.3 848.6 0

HEADING
  CIRCULAR SEARCH FOR CRITICAL FAILURE SURFACE
  BISHOP'S METHOD OF ANALYSIS
  LONG TERM CASE
ANALYSIS/COMPUTATION
  CIRCULAR SEARCH
  40 250 0.5 200
  TANGENT
  215
  PROCEDURE
  BISHOPS METHOD

PLOT
COMPUTE
```

```
C:\XSLP>
C:\XSLP UTEXAS2
################################
#  CORPS PROGRAM  # 10029     #
#       VERSION  # 87/11/23   #
################################
```

```
   ######################
   #                    #
   #   U T E X A S 2    #
   #                    #
   #      W I T H       #
   #                    #
   #   G R A P H I C S  #
   #                    #
   ######################
```

```
COMPUTER PROGRAM DESIGNATION - UTEXAS2
CODED BY S. G. WRIGHT
VERSION NO. 1.209
LAST REVISION DATE 11/23/87
SERIAL NO. 00224
(C) COPYRIGHT 1985 STEPHEN G. WRIGHT - ALL RIGHTS RESERVED
SEE PRINTED OUTPUT FOR DISCLAIMER

ENTER INPUT FILE NAME:
OLDCUT

ENTER OUTPUT FILE NAME:
OLDOUT
FILE NAME :OLDOUT
FILE ALREADY EXISTS. USE IT ANYWAY ? (Y/N)
Y

DO YOU WANT TO PLOT THE INPUT PROBLEM? (Y/N)
N

SEARCH FOR CRITICAL CIRCLE BEGUN

SEARCH WITH MODE =  2 STARTED

        TABLE NO. 12
        INFORMATION FOR CURRENT MODE OF SEARCH - ALL CIRCLES ARE TANGENT
        TO A HORIZONTAL LINE AT   Y =   215.000
        ------------------------------------------------------------

        CENTER COORDINATES              FACTOR  SIDE FORCE
                                          OF    INCLINATION
            X         Y       RADIUS   SAFETY   (DEGREES)   ITERATIONS

           25.00    245.00     50.00    2.396     HORIZ.         6
           42.00    265.00     50.00    1.677     HORIZ.        11
           55.00    265.00     50.00    1.599     HORIZ.        16
           25.00    282.00     65.00    2.585     HORIZ.         6
           40.00    282.00     65.00    1.786     HORIZ.        10
           55.00    282.00     65.00    1.681     HORIZ.        13
           25.00    295.00     80.00    2.893     HORIZ.         4
           42.00    295.00     80.00    1.961     HORIZ.         8
```

| | | | | | |
|---|---|---|---|---|---|
| 55.00 | 270.00 | 68.00 | 1.[illegible] | [illegible] | [illegible] |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 48.00 | 250.00 | 35.00 | 1.784 | HORIZ. | 11 |
| 55.00 | 250.00 | 35.00 | 1.844 | HORIZ. | 13 |
| 70.00 | 250.00 | 35.00 | 2.998 | HORIZ. | 3 |
| 70.00 | 265.00 | 50.00 | 2.212 | HORIZ. | 6 |
| 70.00 | 280.00 | 65.00 | 1.865 | HORIZ. | 10 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 52.50 | 262.50 | 47.50 | 1.591 | HORIZ. | 15 |
| 55.00 | 262.50 | 47.50 | 1.620 | HORIZ. | 14 |
| 57.50 | 262.50 | 47.50 | 1.669 | HORIZ. | 15 |
| 52.50 | 265.00 | 50.00 | 1.579 | HORIZ. | 24 |
| 57.50 | 265.00 | 50.00 | 1.639 | HORIZ. | 14 |
| 52.50 | 267.50 | 52.50 | 1.573 | HORIZ. | 12 |
| 55.00 | 267.50 | 52.50 | 1.587 | HORIZ. | 17 |
| 57.50 | 267.50 | 52.50 | 1.618 | HORIZ. | 16 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 50.00 | 265.00 | 50.00 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.575 | HORIZ. | 41 |

VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 50.00 | 267.50 | 52.50 | 1.573 | HORIZ. | 13 |
| 50.00 | 270.00 | 55.00 | 1.577 | HORIZ. | 14 |
| 52.50 | 270.00 | 55.00 | 1.573 | HORIZ. | 15 |
| 55.00 | 270.00 | 55.00 | 1.582 | HORIZ. | 14 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 47.50 | 265.00 | 52.00 | 1.582 | HORIZ. | 20 |
| 47.50 | 267.50 | 52.50 | 1.585 | HORIZ. | 15 |
| 47.50 | 270.00 | 55.00 | 1.592 | HORIZ. | 14 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 46.50 | 266.00 | 51.00 | 1.577 | HORIZ. | 15 |
| 50.00 | 266.00 | 51.00 | 1.573 | HORIZ. | 15 |
| 51.50 | 266.00 | 51.00 | 1.573 | HORIZ. | 15 |
| 48.50 | 267.50 | 52.50 | 1.579 | HORIZ. | 13 |
| 51.50 | 267.50 | 52.50 | 1.572 | HORIZ. | 13 |
| 48.50 | 269.00 | 54.00 | 1.591 | HORIZ. | 15 |
| 50.00 | 269.00 | 54.00 | 1.575 | HORIZ. | 15 |
| 51.50 | 269.00 | 54.00 | 1.572 | HORIZ. | 16 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 53.00 | 266.00 | 51.00 | 1.578 | HORIZ. | 15 |
| 53.00 | 267.50 | 52.50 | 1.575 | HORIZ. | 12 |
| 53.00 | 269.00 | 54.00 | 1.574 | HORIZ. | 16 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 51.00 | 267.00 | 52.00 | 1.572 | HORIZ. | 15 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| | | | | | |
|---|---|---|---|---|---|
| 52.00 | 267.00 | 52.00 | 1.573 | HORIZ. | 15 |
| 51.00 | 267.50 | 52.50 | 1.572 | HORIZ. | 13 |
| 52.00 | 267.50 | 52.50 | 1.572 | HORIZ. | 17 |
| 51.00 | 268.00 | 53.00 | SEE MESSAGE ON NEXT LINE(S) | | |

LAST TRIAL VALUES = 1.594 HORIZ. 41
VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 51.50 | 268.00 | 53.00 | SEE MESSAGE ON NEXT LINE(S) | | |

LAST TRIAL VALUES = 1.589 HORIZ. 41
VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 52.00 | 268.00 | 53.00 | SEE MESSAGE ON NEXT LINE(S) | | |

LAST TRIAL VALUES = 1.603 HORIZ. 41
VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 50.50 | 267.00 | 52.00 | 1.572 | HORIZ. | 16 |
| 50.50 | 267.50 | 52.50 | 1.572 | HORIZ. | 13 |
| 50.50 | 268.00 | 53.00 | SEE MESSAGE ON NEXT LINE(S) | | |

LAST TRIAL VALUES = 1.624 HORIZ. 41
VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES
SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

AT THE END OF THE CURRENT MODE OF SEARCH THE MOST CRITICAL
CIRCLE WHICH WAS FOUND HAS THE FOLLOWING VALUES -
X-CENTER = 51.00 Y-CENTER = 267.50 RADIUS = 52.50
FACTOR OF SAFETY = 1.572 SIDE FORCE INCLINATION = HORIZ.

***** CAUTION ***** FACTOR OF SAFETY COULD NOT BE COMPUTED FOR SOME
OF GRID POINTS AROUND THE MINIMUM
***** RESULTS MAY BE ERRONEOUS *****

SEARCH WITH MODE = 3 STARTED

TABLE NO. 13
INFORMATION FOR CURRENT MODE OF SEARCH - ALL CIRCLES HAVE THE
SAME RADIUS - RADIUS = 52.500

---

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 36.00 | 253.50 | 52.50 | 2.155 | HORIZ. | 7 |
| 51.00 | 252.50 | 52.50 | 2.070 | HORIZ. | 9 |
| 66.00 | 253.50 | 52.50 | 2.142 | HORIZ. | 5 |
| 36.00 | 267.50 | 52.50 | 1.790 | HORIZ. | 11 |
| 66.00 | 267.50 | 52.50 | 1.867 | HORIZ. | 12 |
| 36.00 | 282.50 | 52.50 | 2.362 | HORIZ. | 8 |
| 51.00 | 282.50 | 52.50 | 1.816 | HORIZ. | 12 |
| 66.00 | 282.50 | 52.50 | 1.795 | HORIZ. | 12 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 48.50 | 265.00 | 52.50 | 1.625 | HORIZ. | 15 |
| 51.00 | 265.00 | 52.50 | 1.624 | HORIZ. | 15 |
| 53.50 | 265.00 | 52.50 | 1.636 | HORIZ. | 15 |

| | | | | | |
|---|---|---|---|---|---|
| 53.50 | 267.52 | 52.52 | 1.577 | HORIZ. | 14 |
| 48.50 | 270.22 | 52.50 | 1.551 | HORIZ. | 15 |
| 51.00 | 270.00 | 52.50 | 1.537 | HORIZ. | 16 |
| 53.50 | 270.00 | 52.50 | 1.536 | HORIZ. | 16 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 56.00 | 267.52 | 52.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.610 | HORIZ. | 41 |

VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 56.00 | 270.00 | 52.50 | 1.549 | HORIZ. | 15 |
| 51.00 | 272.50 | 52.50 | 1.538 | HORIZ. | 16 |
| 53.50 | 272.50 | 52.50 | 1.522 | HORIZ. | 16 |
| 56.00 | 272.50 | 52.50 | 1.529 | HORIZ. | 16 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 51.00 | 275.00 | 52.50 | 1.584 | HORIZ. | 15 |
| 53.50 | 275.00 | 52.50 | 1.565 | HORIZ. | 15 |
| 56.00 | 275.00 | 52.50 | 1.564 | HORIZ. | 15 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 52.00 | 271.00 | 52.50 | 1.527 | HORIZ. | 15 |
| 53.50 | 271.00 | 52.50 | 1.526 | HORIZ. | 15 |
| 55.00 | 271.00 | 52.50 | 1.530 | HORIZ. | 15 |
| 52.00 | 272.50 | 52.50 | 1.525 | HORIZ. | 16 |
| 55.00 | 272.50 | 52.50 | 1.524 | HORIZ. | 16 |
| 52.00 | 274.00 | 52.50 | 1.548 | HORIZ. | 15 |
| 53.50 | 274.00 | 52.50 | 1.541 | HORIZ. | 16 |
| 55.00 | 274.00 | 52.50 | 1.541 | HORIZ. | 16 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 53.00 | 272.00 | 52.50 | 1.522 | HORIZ. | 18 |
| 53.50 | 272.00 | 52.50 | 1.521 | HORIZ. | 18 |
| 54.00 | 272.00 | 52.50 | 1.522 | HORIZ. | 18 |
| 53.00 | 272.50 | 52.50 | 1.522 | HORIZ. | 16 |
| 54.00 | 272.50 | 52.50 | 1.522 | HORIZ. | 16 |
| 53.00 | 273.00 | 52.50 | 1.525 | HORIZ. | 16 |
| 53.50 | 273.00 | 52.50 | 1.524 | HORIZ. | 16 |
| 54.00 | 273.00 | 52.50 | 1.524 | HORIZ. | 16 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 53.00 | 271.50 | 52.50 | 1.523 | HORIZ. | 15 |
| 53.50 | 271.50 | 52.50 | 1.523 | HORIZ. | 16 |
| 54.00 | 271.50 | 52.50 | 1.523 | HORIZ. | 28 |

AT THE END OF THE CURRENT MODE OF SEARCH THE MOST CRITICAL
CIRCLE WHICH WAS FOUND HAS THE FOLLOWING VALUES -
X-CENTER = 53.50 Y-CENTER = 272.00 RADIUS = 52.50
FACTOR OF SAFETY = 1.521 SIDE FORCE INCLINATION = HORIZ.

SEARCH WITH MODE = 2 STARTED

TABLE NO. 12
INFORMATION FOR CURRENT MODE OF SEARCH - ALL CIRCLES ARE TANGENT
TO A HORIZONTAL LINE AT Y = 219.50

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 38.50 | 257.00 | 37.50 | 1.746 | HORIZ. | 14 |
| 53.50 | 257.00 | 37.50 | 1.685 | HORIZ. | 16 |
| 68.50 | 257.00 | 37.50 | 2.334 | HORIZ. | 7 |
| 38.50 | 272.00 | 53.50 | 1.748 | HORIZ. | 12 |
| 68.50 | 272.00 | 52.50 | 1.905 | HORIZ. | 10 |
| 38.50 | 287.00 | 67.50 | 1.902 | HORIZ. | 10 |
| 53.50 | 287.00 | 67.50 | 1.681 | HORIZ. | 13 |
| 68.50 | 287.00 | 67.50 | 1.715 | HORIZ. | 12 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 51.00 | 269.50 | 50.00 | 1.522 | HORIZ. | 16 |
| 53.50 | 269.50 | 50.00 | 1.520 | HORIZ. | 17 |
| 56.00 | 269.50 | 50.00 | 1.536 | HORIZ. | 15 |
| 51.00 | 272.00 | 52.50 | 1.520 | HORIZ. | 17 |
| 56.00 | 272.00 | 52.50 | 1.530 | HORIZ. | 17 |
| 51.00 | 274.50 | 55.00 | 1.539 | HORIZ. | 15 |
| 53.50 | 274.50 | 55.00 | 1.520 | HORIZ. | 15 |
| 56.00 | 274.50 | 55.00 | 1.530 | HORIZ. | 16 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 51.00 | 267.00 | 47.50 | 1.520 | HORIZ. | 16 |
| 53.50 | 267.00 | 47.50 | 1.525 | HORIZ. | 14 |
| 56.00 | 267.00 | 47.50 | 1.549 | HORIZ. | 20 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 52.00 | 268.00 | 48.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.532 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 53.50 | 268.00 | 48.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.532 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 55.00 | 268.00 | 46.50 | 1.532 | HORIZ. | 19 |
| 52.00 | 269.50 | 50.00 | 1.519 | HORIZ. | 17 |
| 55.00 | 269.50 | 50.00 | 1.527 | HORIZ. | 16 |
| 52.00 | 271.00 | 51.50 | 1.521 | HORIZ. | 16 |
| 53.50 | 271.00 | 51.50 | 1.520 | HORIZ. | 16 |
| 55.00 | 271.00 | 51.50 | 1.525 | HORIZ. | 15 |

| CENTER COORDINATES | | | FACTOR OF | SIDE FORCE INCLINATION | |
|---|---|---|---|---|---|
| X | Y | RADIUS | SAFETY | (DEGREES) | ITERATIONS |
| 50.50 | 268.00 | 45.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| LAST TRIAL VALUES = | | | 1.532 | HORIZ. | 41 |
| VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | | |
| SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS | | | | | |
| 50.50 | 269.50 | 50.00 | 1.524 | HORIZ. | 16 |
| 50.50 | 271.00 | 51.50 | 1.520 | HORIZ. | 15 |

CENTER COORDINATES FACTOR SIDE FORCE
OF INCLINATION

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 51.50 | 269.00 | 49.50 | 1.519 | HORIZ. | 18 |
| 52.00 | 269.00 | 49.50 | 1.519 | HORIZ. | 16 |
| 52.50 | 269.00 | 49.50 | 1.516 | HORIZ. | 18 |
| 51.50 | 269.50 | 50.00 | 1.520 | HORIZ. | 17 |
| 52.50 | 269.50 | 50.00 | 1.519 | HORIZ. | 17 |
| 51.50 | 270.00 | 50.50 | 1.521 | HORIZ. | 17 |
| 52.00 | 270.00 | 50.50 | 1.520 | HORIZ. | 17 |
| 52.50 | 270.00 | 50.50 | 1.519 | HORIZ. | 17 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 52.00 | 268.50 | 49.00 | 1.518 | HORIZ. | 22 |
| 52.50 | 268.50 | 49.00 | 1.519 | HORIZ. | 22 |
| 53.00 | 268.50 | 49.00 | 1.519 | HORIZ. | 22 |
| 53.00 | 269.00 | 49.50 | 1.519 | HORIZ. | 18 |
| 53.00 | 269.50 | 50.00 | 1.519 | HORIZ. | 17 |

AT THE END OF THE CURRENT MODE OF SEARCH THE MOST CRITICAL
CIRCLE WHICH WAS FOUND HAS THE FOLLOWING VALUES -
X-CENTER = 52.50 Y-CENTER = 269.00 RADIUS = 49.50
FACTOR OF SAFETY = 1.518 SIDE FORCE INCLINATION = HORIZ.

SEARCH WITH MODE = 3 STARTED

TABLE NO. 13
INFORMATION FOR CURRENT MODE OF SEARCH - ALL CIRCLES HAVE THE
SAME RADIUS - RADIUS = 49.500

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 37.52 | 254.00 | 49.50 | 1.969 | HORIZ. | 8 |
| 52.50 | 254.00 | 49.50 | SEE MESSAGE ON NEXT LINE(S) | | |
| | LAST TRIAL VALUES = | | 1.942 | HORIZ. | 41 |
| | VALUES SHOWN ABOVE ARE NOT CORRECT FINAL VALUES | | | | |

SOLUTION FOR FACTOR OF SAFETY DID NOT CONVERGE WITHIN 40 ITERATIONS

| | | | | | |
|---|---|---|---|---|---|
| 67.52 | 254.00 | 49.50 | 2.612 | HORIZ. | 6 |
| 37.52 | 269.00 | 49.50 | 1.755 | HORIZ. | 12 |
| 67.52 | 269.00 | 49.50 | 1.985 | HORIZ. | 10 |
| 37.52 | 284.00 | 49.50 | 2.125 | HORIZ. | 9 |
| 52.50 | 284.00 | 49.50 | 1.691 | HORIZ. | 13 |
| 67.50 | 284.00 | 49.50 | SEE MESSAGE ON NEXT LINE(S) | | |

CIRCLE DOES NOT INTERSECT SLOPE

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 50.00 | 266.50 | 49.50 | 1.543 | HORIZ. | 16 |
| 52.50 | 266.50 | 49.50 | 1.543 | HORIZ. | 16 |
| 55.00 | 266.50 | 49.50 | 1.559 | HORIZ. | 17 |
| 50.00 | 269.00 | 49.50 | 1.526 | HORIZ. | 17 |
| 55.00 | 269.00 | 49.50 | 1.528 | HORIZ. | 17 |
| 50.00 | 271.50 | 49.50 | 1.582 | HORIZ. | 15 |
| 52.50 | 271.50 | 49.50 | 1.564 | HORIZ. | 15 |
| 55.00 | 271.50 | 49.50 | 1.566 | HORIZ. | 15 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 51.03 | 267.50 | 49.50 | 1.570 | HORIZ. | 17 |

| | | | | | |
|---|---|---|---|---|---|
| 52.50 | 267.50 | 49.50 | 1.529 | HORIZ. | 13 |
| 54.00 | 267.50 | 49.50 | 1.535 | HORIZ. | 18 |
| 51.00 | 269.00 | 49.50 | 1.521 | HORIZ. | 17 |
| 54.00 | 269.00 | 49.50 | 1.522 | HORIZ. | 16 |
| 51.00 | 272.50 | 49.50 | 1.531 | HORIZ. | 14 |
| 52.50 | 270.50 | 49.50 | 1.526 | HORIZ. | 17 |
| 54.00 | 270.50 | 49.50 | 1.527 | HORIZ. | 17 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 52.00 | 268.50 | 49.50 | 1.520 | HORIZ. | 34 |
| 52.50 | 268.50 | 49.50 | 1.521 | HORIZ. | 34 |
| 53.00 | 268.50 | 49.50 | 1.521 | HORIZ. | 30 |
| 52.00 | 269.00 | 49.50 | 1.519 | HORIZ. | 18 |
| 53.00 | 269.00 | 49.50 | 1.519 | HORIZ. | 18 |
| 52.00 | 269.50 | 49.50 | 1.519 | HORIZ. | 17 |
| 52.50 | 269.50 | 49.50 | 1.518 | HORIZ. | 17 |
| 53.00 | 269.50 | 49.50 | 1.519 | HORIZ. | 17 |

CENTER COORDINATES

| X | Y | RADIUS | FACTOR OF SAFETY | SIDE FORCE INCLINATION (DEGREES) | ITERATIONS |
|---|---|---|---|---|---|
| 52.00 | 270.00 | 49.50 | 1.521 | HORIZ. | 16 |
| 52.50 | 270.00 | 49.50 | 1.520 | HORIZ. | 16 |
| 53.00 | 270.00 | 49.50 | 1.521 | HORIZ. | 16 |

AT THE END OF THE CURRENT MODE OF SEARCH THE MOST CRITICAL
CIRCLE WHICH WAS FOUND HAS THE FOLLOWING VALUES -
X-CENTER = 52.50 Y-CENTER = 269.50 RADIUS = 49.50
FACTOR OF SAFETY = 1.518 SIDE FORCE INCLINATION = HORIZ.

TABLE NO. 15
***** FINAL CRITICAL CIRCLE INFORMATION *****
X COORDINATE OF CENTER - - - - - - - - 52.500
Y COORDINATE OF CENTER - - - - - - - - 269.522
RADIUS - - - - - - - - - - - - - - - - 49.500
FACTOR OF SAFETY - - - - - - - - - - - 1.518
SIDE FORCE INCLINATION - - - - - - - - HORIZ.

NUMBER OF CIRCLES TRIED - - - - - - - 173
NO. OF CIRCLES F CALC. FOR - - - - - - 162

FACTOR OF SAFETY = 1.518
SIDE FORCE INCLINATION = HORIZ.
ITERATIONS = 17
run-time error M6101: MATH
- floating-point error: invalid

# OLCOTT HARBOR, NEW YORK

## GENERAL DESIGN

## SUB-APPENDIX A

## ATTACHMENT A4

## STABILITY HAND COMPUTATION CHECK

OLCOTT HARBOR, NEW YORK

ATTACHMENT A4

STABILITY HAND COMPUTATION CHECK

TABLE OF CONTENTS


| Number | Description | Page |
|---|---|---|
| 1. | End of Construction Case | 1. |
| 2. | Long Term Case | 5. |

# OLCOTT HARBOR, NEW YORK
## HAND CHECK OF STABILITY ANALYSIS
## (END OF CONSTRUCTION CASE)

COMPUTED BY: G.L 12/21/90

F = 1.3

| SLICE | $\Delta X_i$ | $W_i$ | $\theta_i$ | $W_i \sin\theta_i$ | $U_i$ | $U_i \Delta X_i$ | $\bar{C}_i$ | $C_i \Delta X_i$ | $\tan\theta_i$ | $M_i(\phi)$ | $\frac{[C\Delta X_i + (W_i - U_i \Delta X_i)\tan\phi]}{M_i(\phi)}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | 968 | 77 | 943 | 0 | 0 | 0 | 0 | .839 | .854 | 951 |
| 2 | 1.5 | 1,757 | 69 | 1,640 | 0 | 0 | 0 | 0 | .839 | .961 | 1534 |
| 3 | 4.0 | 7,372 | 62 | 6,509 | 225 | 900 | 0 | 0 | .839 | 1.04 | 5221 |
| 4 | 5.0 | 13,603 | 50 | 10,421 | 646 | 3230 | 0 | 0 | .839 | 1.14 | 7634 |
| 5 | 7.8 | 26,660 | 39 | 16,778 | 1045 | 8151 | 0 | 0 | .625 | 1.08 | 10,711 |
| 6 | 3.5 | 12,990 | 30 | 6,490 | 1310 | 4585 | 0 | 0 | .625 | 1.11 | 4733 |
| 7 | 7.7 | 27,751 | 23 | 10,843 | 1466 | 11,288 | 267 | 2056 | 0 | .921 | 2232 |
| 8 | 10.0 | 33,900 | 12 | 7,027 | 1632 | 16,320 | 369 | 3690 | 0 | .978 | 3773 |
| 9 | 4.0 | 12,540 | 3 | 656 | 1719 | 6876 | 412 | 1648 | 0 | .999 | 1650 |
| 10 | 6.0 | 17,542 | -4 | -1,224 | 1716 | 10,296 | 409 | 2454 | 0 | .998 | 2459 |
| 11 | 10.0 | 24,937 | -13 | -5,610 | 1629 | 16,290 | 362 | 3620 | 0 | .974 | 3717 |
| 12 | 6.5 | 12,802 | -24 | -5,207 | 1466 | 9529 | 264 | 1716 | 0 | .914 | 1878 |
| 13 | 4.7 | 7,255 | -32 | -3,845 | 1285 | 6040 | 0 | 0 | .625 | .593 | 1281 |
| 14 | 6.8 | 7,564 | -40 | -4,862 | 1020 | 6936 | 0 | 0 | .625 | .457 | 859 |
| | | | | $\Sigma = 49,559$ | | | | | | | $\Sigma = 48,693$ |

$$F_{CALC} = \frac{48,693}{40,559} = 1.20 \qquad \frac{F_{CALC}}{F_{ASSUME}} = \frac{1.2}{1.3} = .92$$

SEE slipcircle slices (SHEET 4 of 4)

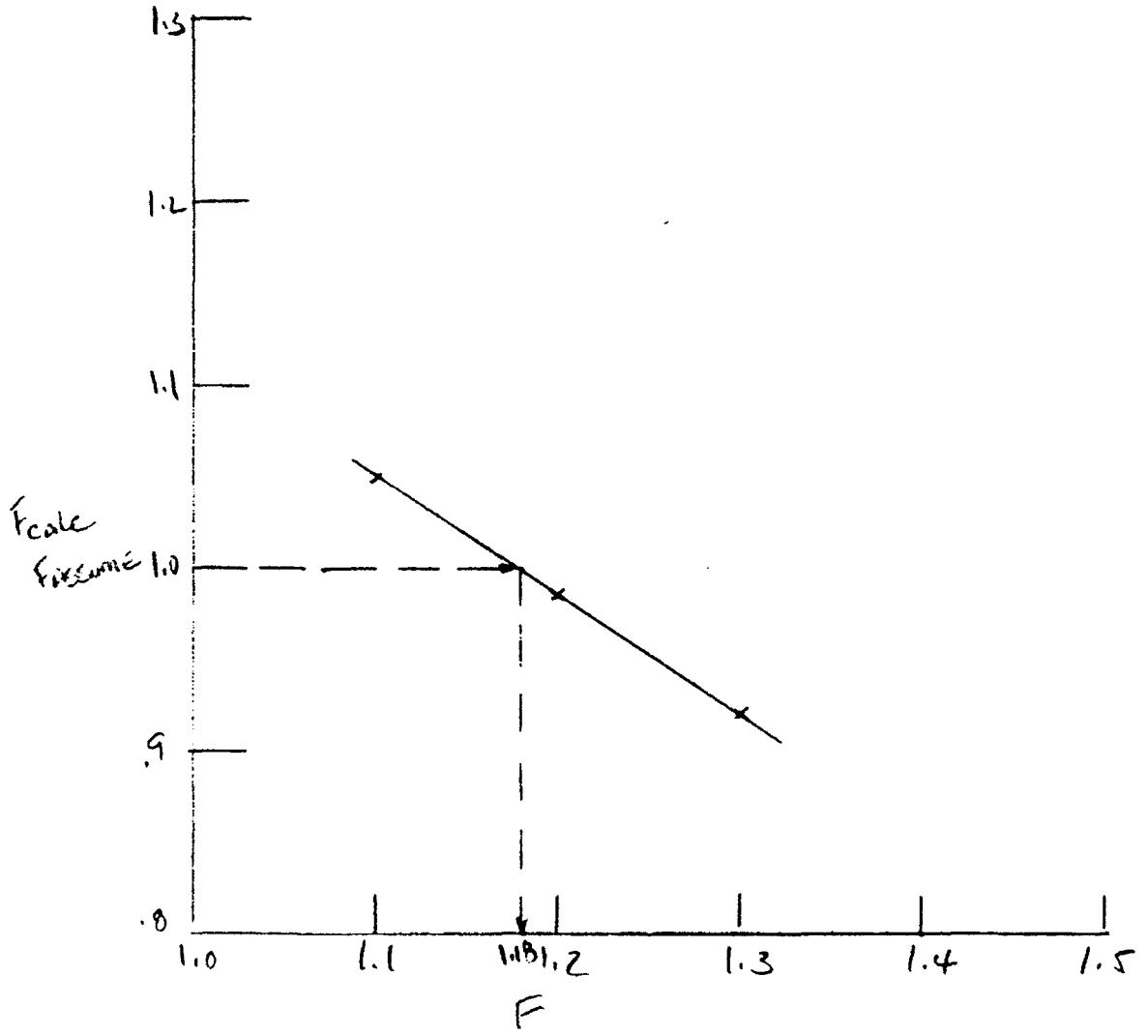
| | F=1.2 | | F=1.1 | |
|---|---|---|---|---|
| SLICE | $M_i(\alpha)$ | $\frac{cox_i+(w_i-uox_i)\tan\phi}{M_i(\alpha)}$ | $M_i(\alpha)$ | $\frac{cox_i+(w_i-uox_i)\tan\phi}{M_i(\alpha)}$ |
| 1 | .906 | 896 | .968 | 839 |
| 2 | 1.01 | 1460 | 1.07 | 1378 |
| 3 | 1.09 | 4982 | 1.14 | 4763 |
| 4 | 1.18 | 7375 | 1.23 | 7076 |
| 5 | 1.10 | 10,516 | 1.13 | 10,237 |
| 6 | 1.13 | 4649 | 1.15 | 4568 |
| 7 | .921 | 2232 | .921 | 2232 |
| 8 | .978 | 3773 | .978 | 3773 |
| 9 | .999 | 1650 | .999 | 1650 |
| 10 | .998 | 2459 | .998 | 2469 |
| 11 | .974 | 3717 | .974 | 3717 |
| 12 | .914 | 1878 | .914 | 1878 |
| 13 | .572 | 1328 | .547 | 1383 |
| 14 | .431 | 911 | .401 | 979 |
| | $\Sigma =$ | 47,326 | $\Sigma =$ | 46,937 |

$F_{CALC} = \frac{826}{.59} = 1.18$

$F_{CALC} = \frac{46,937}{40,559} = 1.16$

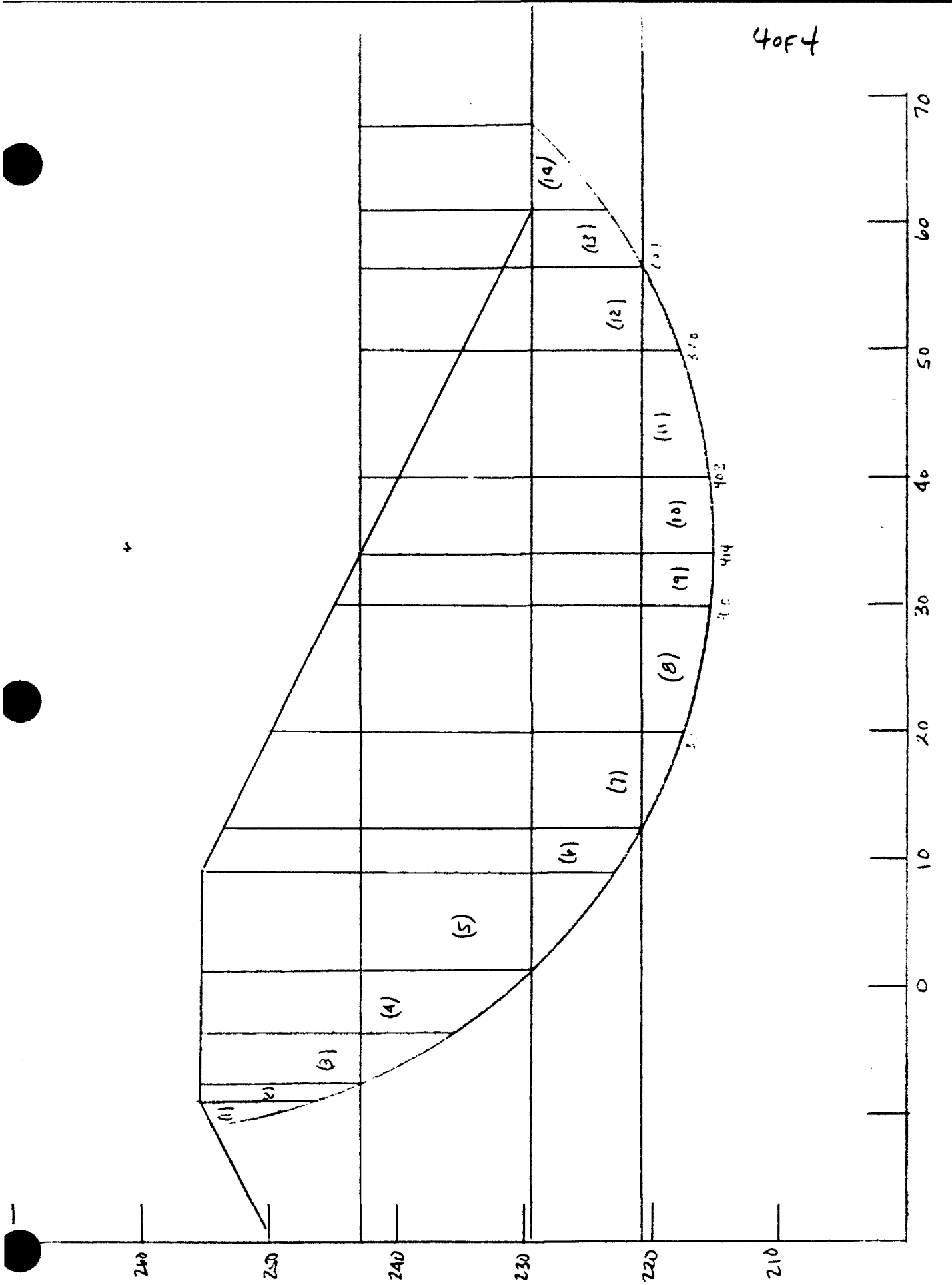
$\frac{F_{CALC}}{F_{ASSUME}} = \frac{1.18}{1.20} = .983$

$\frac{F_{CALC}}{F_{ASSUME}} = \frac{1.16}{1.10} = 1.05$




$F_{HAND} = 1.18$ , $F_{COMPUTER} = 1.269$

$F_{COMPUTER} - F_{HAND} = 1.269 - 1.18 = .089 < .10 \therefore$ OK!


240
230
220
210
0
10
20
30
40
50
60
70
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
402
414

(4.)

OLCOTT HARBOR, N.Y.

HAND CHECK OF STABILITY ANALYSIS

(LONG TERM CASE)

COMPUTED BY: G.L. 12/17/90

$M(\theta_i) = \cos\theta_i \left[1 + \frac{\tan\phi_i \tan\alpha}{F}\right]$

SEE FAILING SURFACE W/SLICES SHEET 3 OF 3.

F = 1.5

| SLICE NO. | $W_i$ | $\theta_i$ | $W_i \sin\theta_i$ | $U_i$ | $\Delta x_i$ | $U_i \Delta x_i$ | $\tan\phi$ | $M_i(\theta)$ | $(W_i - U_i\Delta x_i)\tan\phi \div M_i(\theta)$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,733 | 68 | 1607 | 0 | 3.6 | 0 | .839 | .893 | 1628 |
| 2 | 2481 | 58 | 2104 | 0 | 2.2 | 0 | .839 | 1.00 | 2082 |
| 3 | 14,614 | 49 | 11,075 | 312 | 8.8 | 2746 | .839 | 1.08 | 9266 |
| 4 | 9188 | 37 | 5529 | 733 | 4.2 | 3079 | .839 | 1.14 | 4496 |
| 5 | 22,640 | 29 | 10,976 | 1014 | 10.0 | 10,140 | .625 | 1.08 | 7234 |
| 6 | 13,350 | 18 | 4125 | 1248 | 6.0 | 7488 | .625 | 1.08 | 3392 |
| 7 | 25,999 | 7 | 3168 | 1357 | 12.5 | 16,963 | .532 | 1.04 | 4622 |
| 8 | 14,565 | -5 | -1269 | 1382 | 8.2 | 11,332 | .532 | .965 | 1,777 |
| 9 | 6,793 | -12 | -1412 | 1335 | 4.2 | 5607 | .532 | .904 | 698 |
| 10 | 11,167 | -19 | -3636 | 1217 | 8.0 | 9734 | .625 | .810 | 1106 |
| 11 | 8,467 | -30 | -4234 | 983 | 3.0 | 7864 | .625 | .658 | 572 |

$\Sigma = 28,033$ $\Sigma = 36,813$

$F_1 = \frac{36,873}{28,033} = 1.32$ $\frac{F_{CALC}}{F_{ASSUME}} = 0.88$

F = 1.20

| SLICE NO. | $M_i(\theta)$ | $(W_i - U_i\Delta x_i)\tan\phi \div M_i(\theta)$ |
|---|---|---|
| 1 | 1.02 | 1425 |
| 2 | 1.12 | 1858 |
| 3 | 1.18 | 8481 |
| 4 | 1.22 | 4201 |
| 5 | 1.13 | 6914 |
| 6 | 1.11 | 3301 |
| 7 | 1.05 | 4578 |
| 8 | .960 | 1786 |
| 9 | .886 | 712 |
| 10 | .776 | 1154 |
| 11 | .606 | 622 |

$\Sigma = 35,032$

$F_2 = \frac{35032}{28023} = 1.25$ $F_{CALC} = 1.04$

$F_{ASSUME}$ (?)

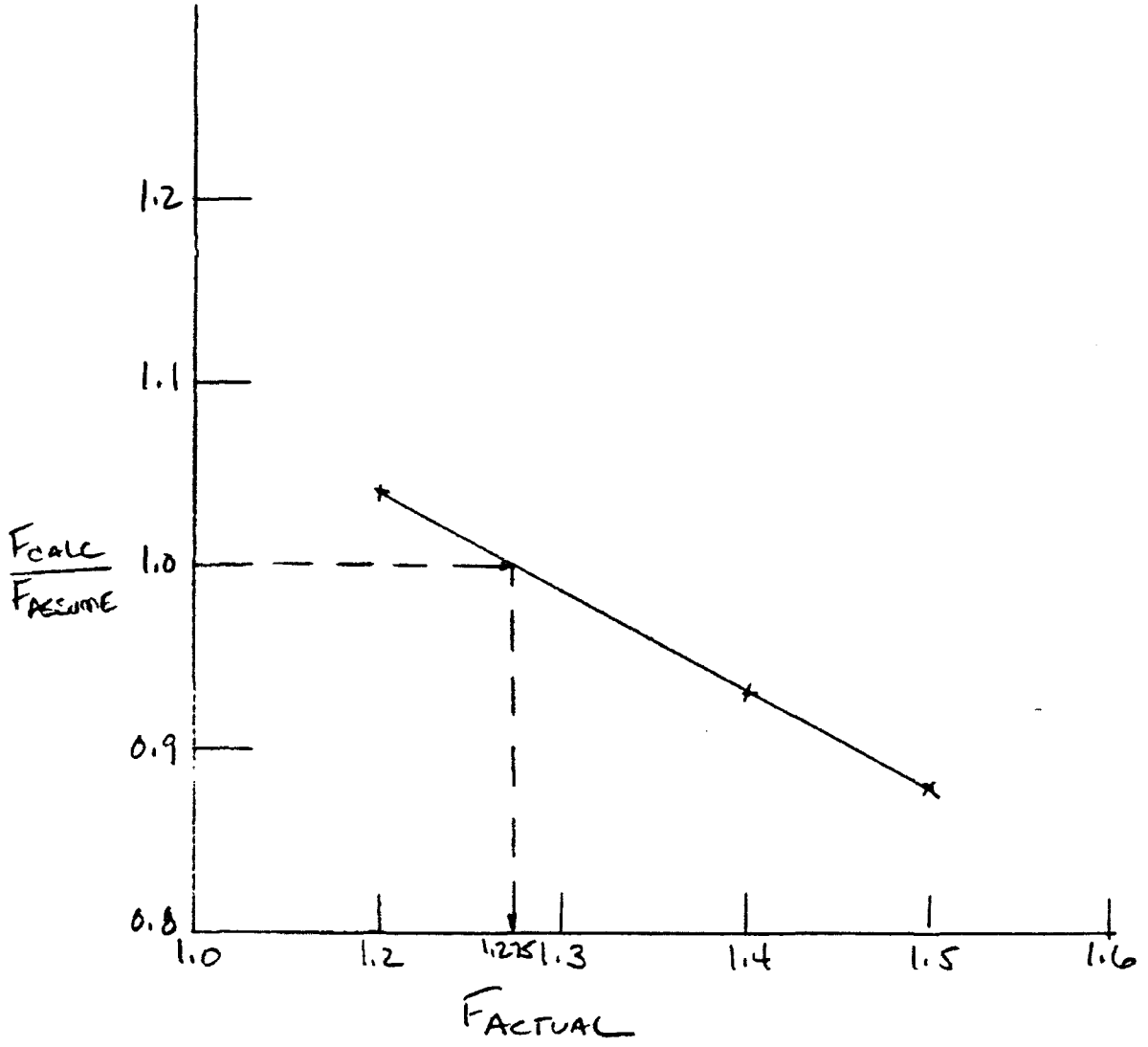
F = 1.4

| SLICE NO. | $M_i(\theta)$ | $(W_i - U_i\Delta x_i)\tan\phi \div M_i(\theta)$ |
|---|---|---|
| 1 | .93 | 1563 |
| 2 | 1.04 | 2001 |
| 3 | 1.11 | 9016 |
| 4 | 1.16 | 4418 |
| 5 | 1.09 | 7167 |
| 6 | 1.09 | 3361 |
| 7 | 1.04 | 4622 |
| 8 | .963 | 1781 |
| 9 | .899 | 702 |
| 10 | .800 | 1120 |
| 11 | .643 | 586 |

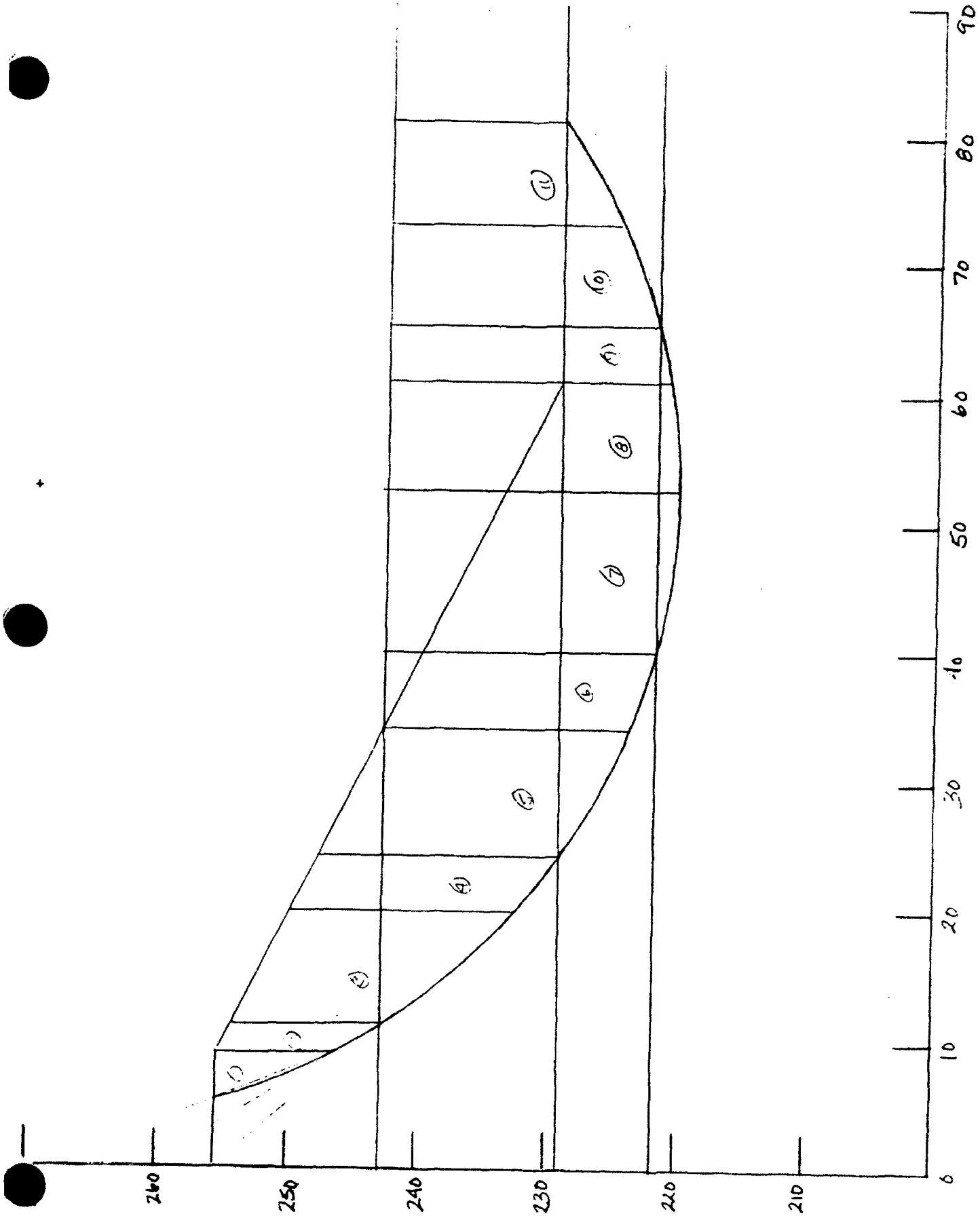
$\Sigma = 36,337$

$F_3 = \frac{36337}{28033} = 1.30$ $F_{CALC} = .93$

$F_{ASSUME}$




$F_{ACTUAL} = 1.275$ COMPARE $F_{COMPUTER} = 1.518$
SHOULD BE WITHIN 0.1 BUT OK
MANUAL COMPUTATION F=1.275 STILL
WELL ABOVE REQUIRE F=1.0 !




(1.)

OLCOTT HARBOR, NEW YORK

ATTACHMENT A4

STABILITY HAND COMPUTATION CHECK

TABLE OF CONTENTS


| Number | Description | Page |
|---|---|---|
| 1. | End of Construction Case | 1. |
| 2. | Long Term Case | 5. |

# OLCOTT HARBOR, NEW YORK
## HAND CHECK OF STABILITY ANALYSIS
## (END OF CONSTRUCTION CASE)

COMPUTED BY: G.L 12/21/90

F=1.3

| SLICE | $\Delta Y_i$ | $W_i$ | $\theta_i$ | $W_i \sin\theta_i$ | $U_i$ | $U_i \Delta L_i$ | $\bar{C}_i$ | $C_i \Delta L_i$ | $\tan\phi_i$ | $M_i(\phi)$ | $\frac{[C\Delta L_i + (W_i - U_i \Delta L_i)\tan\phi]}{M_i(\phi)}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | 968 | 77 | 943 | 0 | 0 | 0 | 0 | .839 | .854 | 951 |
| 2 | 1.5 | 1,757 | 69 | 1,640 | 0 | 0 | 0 | 0 | .839 | .961 | 1534 |
| 3 | 4.0 | 7,372 | 62 | 6,509 | 225 | 900 | 0 | 0 | .839 | 1.04 | 5221 |
| 4 | 5.0 | 13,603 | 50 | 10,421 | 646 | 3230 | 0 | 0 | .839 | 1.14 | 7634 |
| 5 | 7.8 | 26,660 | 39 | 16,778 | 1045 | 8151 | 0 | 0 | .625 | 1.08 | 10,711 |
| 6 | 3.5 | 12,990 | 30 | 6,490 | 1310 | 4585 | 0 | 0 | .625 | 1.11 | 4733 |
| 7 | 7.7 | 27,751 | 23 | 10,843 | 1466 | 11,288 | 267 | 2056 | 0 | .921 | 2232 |
| 8 | 10.0 | 33,900 | 12 | 7,027 | 1632 | 16,320 | 369 | 3690 | 0 | .978 | 3773 |
| 9 | 4.0 | 12,540 | 3 | 656 | 1719 | 6876 | 412 | 1648 | 0 | .999 | 1650 |
| 10 | 6.0 | 17,542 | -4 | -1,224 | 1716 | 10,296 | 409 | 2454 | 0 | .998 | 2459 |
| 11 | 10.0 | 24,937 | -13 | -5,610 | 1629 | 16,290 | 362 | 3620 | 0 | .974 | 3717 |
| 12 | 6.5 | 12,802 | -24 | -5,207 | 1466 | 9529 | 264 | 1716 | 0 | .914 | 1878 |
| 13 | 4.7 | 7,255 | -32 | -3,845 | 1285 | 6040 | 0 | 0 | .625 | .593 | 1281 |
| 14 | 6.8 | 7,564 | -40 | -4,862 | 1020 | 6936 | 0 | 0 | .625 | .457 | 859 |

$\Sigma = 49,559$ $\Sigma = 48,693$

$$F_{CALC} = \frac{48,693}{40,559} = 1.20 \qquad \frac{F_{CALC}}{F_{ASSUME}} = \frac{1.2}{1.3} = .92$$

SEE SLIPCIRCLE SLICES (SHEET 4 OF 4)

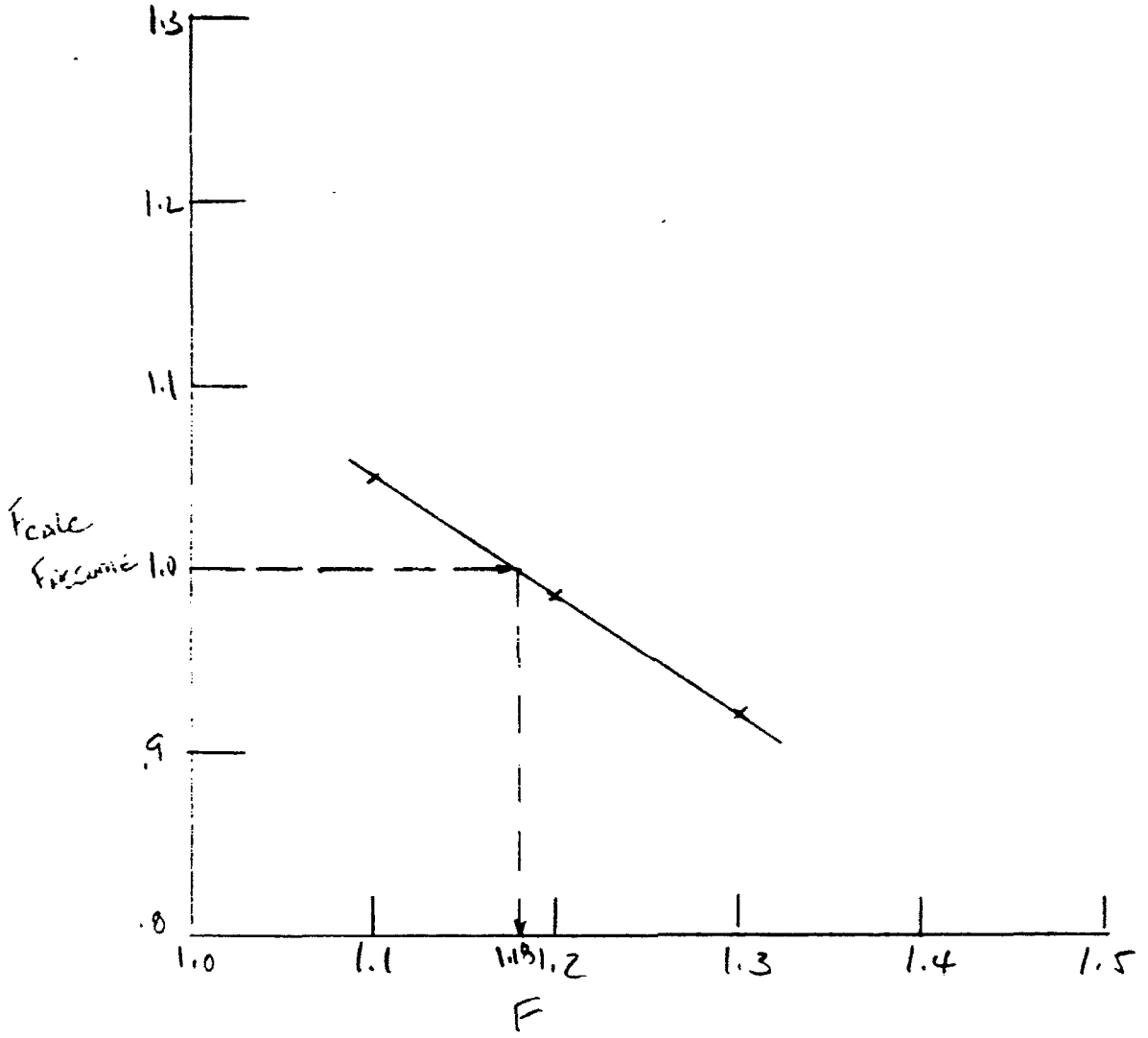
| | F=1.2 | | F=1.1 | |
|---|---|---|---|---|
| SLICE | $M_i(\alpha)$ | $\frac{c\alpha_i + (w_i - u\alpha_i)\tan\phi}{M_i(\alpha)}$ | $M_i(\alpha)$ | $\frac{c\alpha_i + (w_i - u\alpha_i)\tan\phi}{M_i(\alpha)}$ |
| 1 | .906 | 896 | .968 | 839 |
| 2 | 1.01 | 1460 | 1.07 | 1378 |
| 3 | 1.09 | 4982 | 1.14 | 4763 |
| 4 | 1.18 | 7375 | 1.23 | 7076 |
| 5 | 1.10 | 10,516 | 1.13 | 10,237 |
| 6 | 1.13 | 4649 | 1.15 | 4568 |
| 7 | .921 | 2232 | .921 | 2232 |
| 8 | .978 | 3773 | .978 | 3773 |
| 9 | .999 | 1650 | .999 | 1650 |
| 10 | .998 | 2459 | .998 | 2469 |
| 11 | .974 | 3717 | .974 | 3717 |
| 12 | .914 | 1878 | .914 | 1878 |
| 13 | .572 | 1329 | .547 | 1383 |
| 14 | .431 | 911 | .401 | 979 |
| | $\Sigma =$ | 47,326 | $\Sigma =$ | 46,937 |

$F_{CALC} = \frac{47,326}{40,559} = 1.18$

$F_{CALC} = \frac{46,937}{40,559} = 1.16$

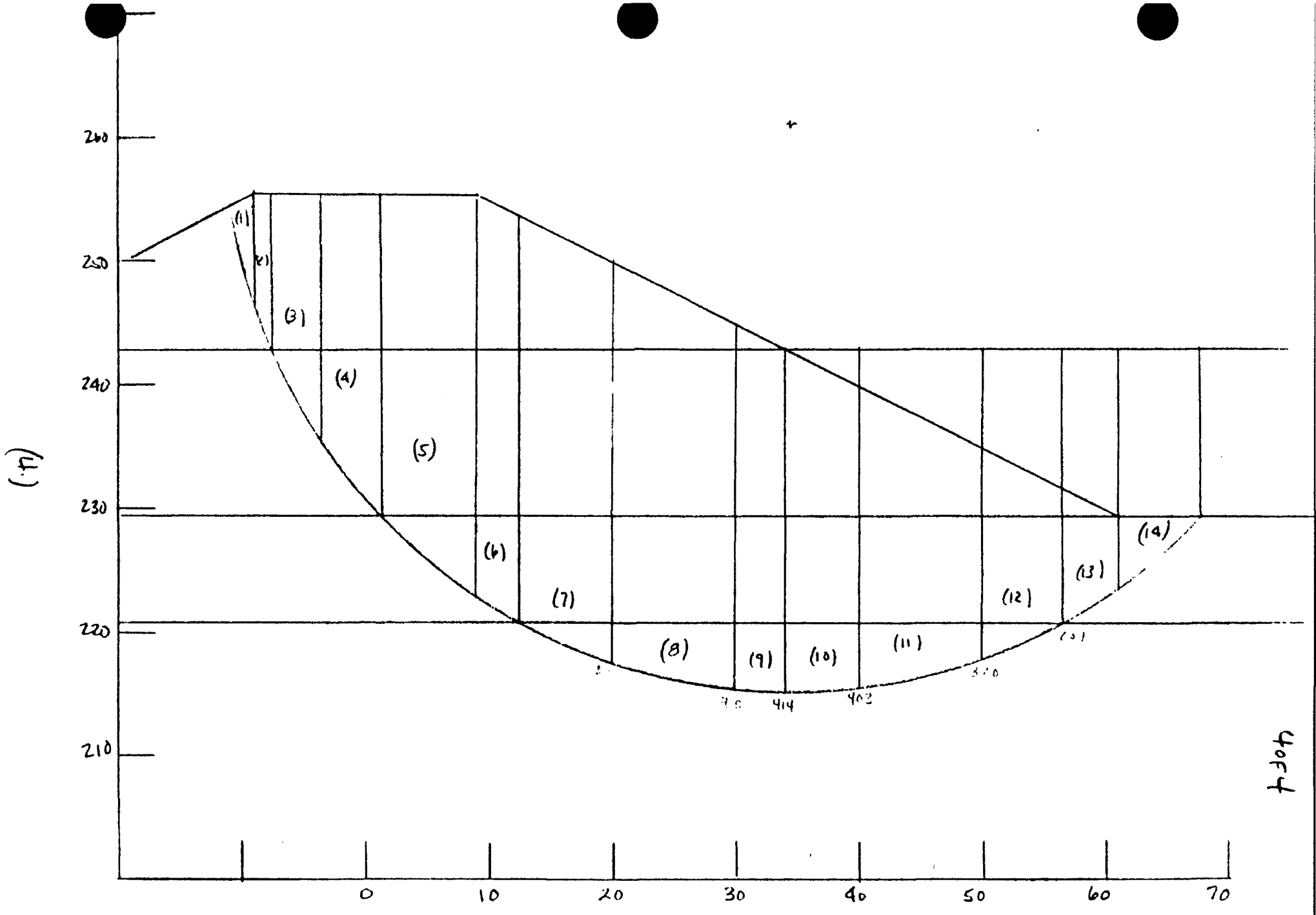
$\frac{F_{CALC}}{F_{ASSUME}} = \frac{1.18}{1.20} = .983$

$\frac{F_{CALC}}{F_{ASSUME}} = \frac{1.16}{1.10} = 1.05$




$F_{HAND} = 1.18$ , $F_{COMPUTER} = 1.269$

$F_{COMPUTER} - F_{HAND} = 1.269 - 1.18 = .089 < .10 \therefore$ OK!


260
250
240
230
220
210
(ft)
(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
(14)
414
403
0
10
20
30
40
50
60
70
top of

OLCOTT HARBOR, N.Y.

HAND CHECK OF STABILITY ANALYSIS

(LONG TERM CASE)

COMPUTED BY: G.L. 12/17/90

$M(\theta_i) = \cos\theta_i \left[1 + \frac{\tan\phi \tan\alpha}{F}\right]$

SEE FAILING SURFACE W/SLICES SHEET 3 OF 3.

F = 1.5

| SLICE NO. | $W_i$ | $\theta_i$ | $W_i \sin\theta_i$ | $u_i$ | $\Delta\ell_i$ | $u_i \Delta\ell_i$ | TAN$\phi'$ | $M_i(\theta)$ | $(W_i - u\Delta\ell_i)\tan\phi / M_i(\theta)$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1733 | 68 | 1607 | 0 | 3.6 | 0 | .839 | .893 | 1628 |
| 2 | 2481 | 58 | 2104 | 0 | 2.2 | 0 | .839 | 1.00 | 2082 |
| 3 | 14,674 | 49 | 11,075 | 312 | 8.8 | 2746 | .839 | 1.08 | 9266 |
| 4 | 9188 | 37 | 5529 | 733 | 4.2 | 3079 | .839 | 1.14 | 4496 |
| 5 | 22,640 | 29 | 10,976 | 1014 | 10.0 | 10,140 | .625 | 1.08 | 7234 |
| 6 | 13,350 | 18 | 4125 | 1248 | 6.0 | 7488 | .625 | 1.08 | 3392 |
| 7 | 25,999 | 7 | 3168 | 1357 | 12.5 | 16,963 | .532 | 1.04 | 4622 |
| 8 | 14,555 | -5 | -1269 | 1382 | 8.2 | 11,332 | .532 | .965 | 1,777 |
| 9 | 6,793 | -12 | -1412 | 1335 | 4.2 | 5607 | .532 | .904 | 698 |
| 10 | 11,167 | -19 | -3636 | 1217 | 8.0 | 9734 | .625 | .810 | 1106 |
| 11 | 8,467 | -30 | -4234 | 953 | 3.0 | 7864 | .625 | .658 | 572 |

$\Sigma = 28,033$ $\Sigma = 36,873$

$F_1 = \frac{36,873}{28,033} = 1.32$ $\frac{F_{CALC}}{F_{ASSUME}} = 0.88$

F = 1.20

| SLICE NO. | $M_i(\theta)$ | $(W_i - u\Delta\ell)\tan\phi \div M_i(\theta)$ |
|---|---|---|
| 1 | 1.02 | 1425 |
| 2 | 1.12 | 1858 |
| 3 | 1.18 | 8481 |
| 4 | 1.22 | 4201 |
| 5 | 1.13 | 6914 |
| 6 | 1.11 | 3301 |
| 7 | 1.05 | 4578 |
| 8 | .960 | 1786 |
| 9 | .886 | 712 |
| 10 | .776 | 1154 |
| 11 | .606 | 622 |

$\Sigma = 35,032$

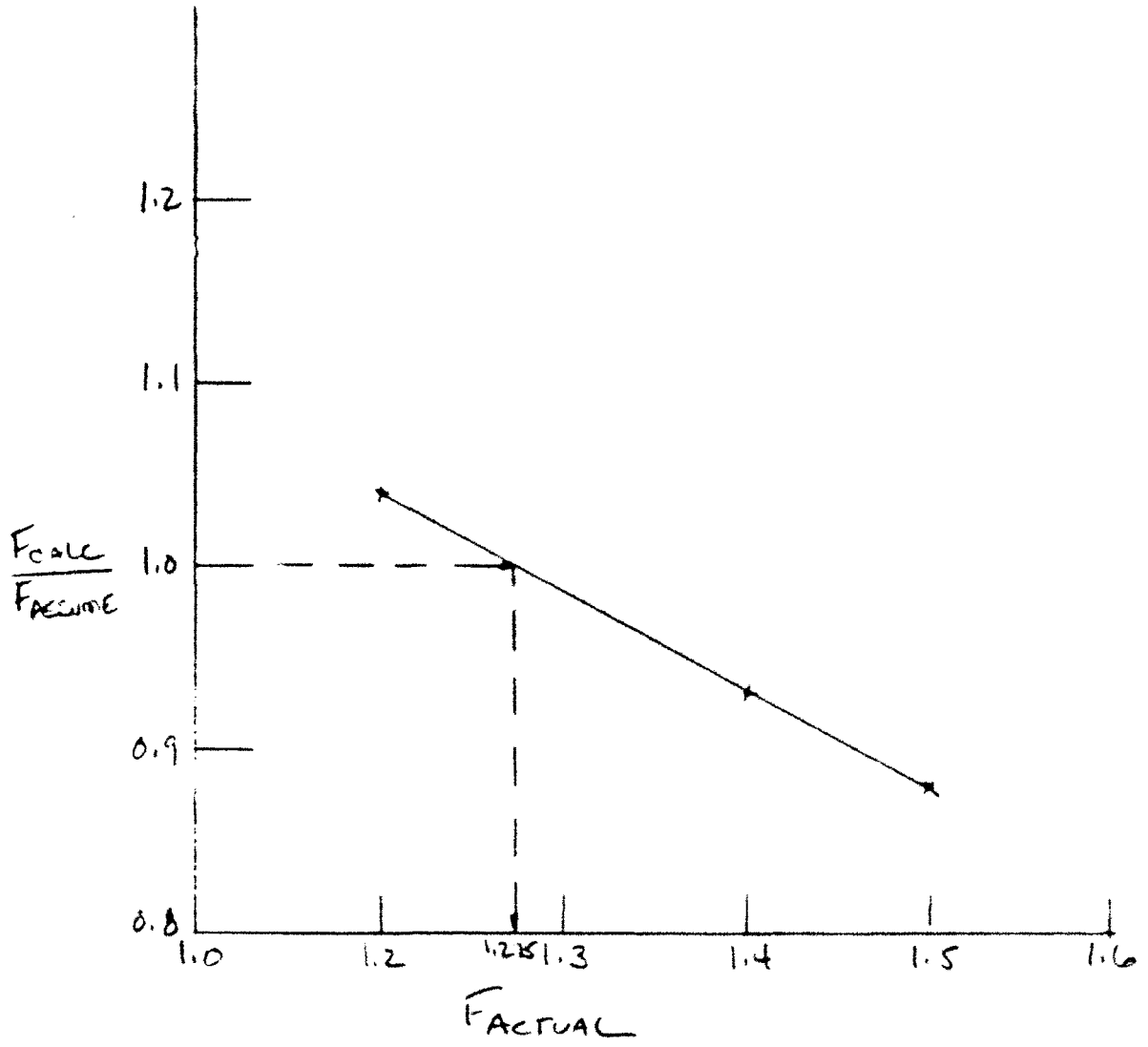
$F_2 = \frac{35032}{28033} = 1.25$ $F_{CALC} = 1.04$ $F_{ASSUM}$

F = 1.4

| SLICE NO. | $M_i(\theta)$ | $(W_i - u\Delta\ell)\tan\phi \div M_i(\theta)$ |
|---|---|---|
| 1 | .93 | 1563 |
| 2 | 1.04 | 2001 |
| 3 | 1.11 | 9016 |
| 4 | 1.16 | 4418 |
| 5 | 1.09 | 7167 |
| 6 | 1.09 | 3361 |
| 7 | 1.04 | 4622 |
| 8 | .963 | 1781 |
| 9 | .899 | 702 |
| 10 | .800 | 1120 |
| 11 | .643 | 586 |

$\Sigma = 36,337$

$F_3 = \frac{36337}{28033} = 1.30$ $F_{CALC} = .93$ $F_{ASSUM}$




$F_{ACTUAL} = 1.275$ COMPARE $F_{COMPUTER} = 1.518$
SHOULD BE WITHIN 0.1 BUT OK
MANUAL COMPUTATION $F = 1.275$ STILL
WELL ABOVE REQUIRE $F = 1.0$ !

OLCOTT HARBOR, NEW YORK

GENERAL DESIGN

SUB-APPENDIX A

ATTACHMENT A5

SETTLEMENT COMPUTER INPUT AND OUTPUT

OLCOTT HARBOR, NEW YORK

ATTACHMENT A5

SETTLEMENT COMPUTER PROGRAM INPUT AND OUTPUT

TABLE OF CONTENTS


| Number | Description | Page |
|---|---|---|
| 1. | Settlement Using Laboratory Consolidation Test Curve Data | 1. |
| 2. | Settlement Assuming Normally Consolidated Soil | 10. |

```
C:\CSETT>
C:\CSETT>I0219
##################################
#  CORPS PROGRAM  #  I0219       #
#  MICRO VERSION  #  84/09/19    #
##################################

PROGRAM CSETT - VERTICAL STRESS INDUCTION AND CONSOLIDATION
SETTLEMENT ANALYSIS OF SINGLE OR MULTIPLE CLAY STRATA
UNDER SIMPLE AND COMPLEX LOADING CONDITIONS.  INDUCED
STRESSES ARE COMPUTED BY WESTERGAARD OR BOUSSINESQ
POINT LOAD FORMULAE. RESULTING SETTLEMENTS ARE
COMPUTED BY TERZAGHI'S CLASSICAL ONE DIMENSIONAL
CONSOLIDATION THEORY.


IS INPUT FROM TERMINAL OR A FILE
ENTER 'T' OR 'F'
F


ENTER DATA FILE NAME (64 CHAR. MAX)
OLCOTT


INPUT COMPLETE. DO YOU WANT INPUT DATA
ECHOPRINTED TO YOUR TERMINAL, A FILE,
BOTH, OR NEITHER? (ENTER 'T', 'F', 'B' OR 'N')
T


PROGRAM CSETT - VERTICAL STRESS INDUCTION AND SETTLEMENT PROGRAM
DATE: 90/12/10                                  TIME: 12.28.39


I.  INPUT DATA


1. TITLE - OLCOTT HARBOR SETTLEMENT OF EAST BREAKWATER


2. BOUSSINESQ SOLUTION WILL BE USED TO COMPUTE INDUCED STRESSES.
   THE MAXIMUM DEPTH TO WHICH THE ANALYSIS WILL BE EXTENDED
   IS   50.00 FEET.


3. 2-DIMENSIONAL PRESSURE LOAD DATA
   NONE
```

Olcott Harbor N.Y.
Settlement Detailed East Breakwater
Sta. 6+70 (Buffalo Channel)

Following Field Compression Curve Determined In Laboratory w/ $C_r = .06$, $C_c = 0.166$

Maximum Settlement at X=0 (Centerline)
$S_{ULT} = 2.176$ ft. (Sheet 2 of 9)

Run By: G.L. 12/10/90

4. 2-DIMENSIONAL SOIL LOAD DATA

PROFILE NUMBER 1 :NUMBER OF POINTS= 8
BEGINNING TIME OF APPLICATION = .0000 YRS.
ENDING TIME OF APPLICATION = .0220 YRS.
EFFECTIVE UNIT WEIGHT OF SOIL LOAD= 112.00 PCF

| POINT NO. | X (FT.) | Y (FT.) |
|---|---|---|
| 1 | -9999.00 | 29.30 |
| 2 | -61.00 | 29.30 |
| 3 | -34.00 | 42.00 |
| 4 | -9.00 | 55.30 |
| 5 | 9.00 | 55.30 |
| 6 | 34.00 | 42.00 |
| 7 | 61.00 | 29.30 |
| 8 | 9999.00 | 29.30 |

PROFILE NUMBER 2 :NUMBER OF POINTS= 6
BEGINNING TIME OF APPLICATION = .0220 YRS.
ENDING TIME OF APPLICATION = .0222 YRS.
EFFECTIVE UNIT WEIGHT OF SOIL LOAD= 69.00 PCF

| POINT NO. | X (FT.) | Y (FT.) |
|---|---|---|
| 1 | -9999.00 | 29.30 |
| 2 | -61.00 | 29.30 |
| 3 | -34.00 | 42.00 |
| 4 | 34.00 | 42.00 |
| 5 | 61.00 | 29.30 |
| 6 | 9999.00 | 29.30 |

5. 3-DIMENSIONAL RECTANGULAR LOAD DATA
NONE

6. 3-DIMENSIONAL IRREGULAR LOAD DATA
NONE

7. EXCAVATION DATA
NONE

8. SOIL DATA

| STRATA NO. | EL. OF TOP OF STRATUM (FEET NGVD) | DRAINAGE CONDITION | EFF UNIT WEIGHT (PCF) | RECOMPR. INDEX | COEF.OF CONSOL. (SQFT/YR) | POISSON'S RATIO |
|---|---|---|---|---|---|---|
| 1 | 29.30 | N | 27.60 | | | |
| 2 | 21.30 | S | 37.60 | .06000 | 50.00000 | .32000 |
| 3 | 11.30 | S | 37.60 | .06000 | 50.00000 | .32000 |
| 4 | 1.30 | C | 37.60 | .06000 | 50.00000 | .32000 |
| 5 | -8.70 | C | 37.60 | .06000 | 50.00000 | .32000 |

5. STRESS-STRAIN DATA

STRATUM NO. 1

INCOMPRESSIBLE STRATUM

STRATUM NO. 2

| VOID RATIO | PRESSURE (PSF) |
|---|---|
| 1.4500 | 20.0000 |
| 1.4500 | 1079.0000 |
| 1.4300 | 2050.0000 |
| .5000 | 40000.0000 |

STRATUM NO. 3

| VOID RATIO | PRESSURE (PSF) |
|---|---|
| 1.4500 | 20.0000 |
| 1.4500 | 1079.0000 |
| 1.4300 | 2050.0000 |
| .5000 | 40000.0000 |

STRATUM NO. 4

| VOID RATIO | PRESSURE (PSF) |
|---|---|
| 1.4500 | 20.0000 |
| 1.4500 | 1079.0000 |
| 1.4300 | 2050.0000 |
| .5000 | 40000.0000 |

STRATUM NO. 5

| VOID RATIO | PRESSURE (PSF) |
|---|---|
| 1.4500 | 20.0000 |
| 1.4500 | 1079.0000 |
| 1.4300 | 2050.0000 |
| .5000 | 40000.0000 |

10. TIME SEQUENCE FOR CONSOLIDATION CALCULATIONS

A GEOMETRIC PROGRESSION WITH AN INITIAL TIME PERIOD OF .0192
YEARS AND A MULTIPLICATIVE FACTOR OF 2.0000 WILL BE USED IN
THE TIME RATE OF CONSOLIDATION CALCULATIONS.

11. OUTPUT CONTROL DATA

XXL= -60.0000 FT.
XUL= 60.0000 FT.
DELX= 30.0000 FT.

DO YOU WANT TO EDIT DATA? ENTER 'Y' OR 'N'.
N

DO YOU WANT TO CONTINUE SOLUTION?
ENTER 'Y' OR 'N'
Y

WILL OUTPUT GO TO TERMINAL, FILE, OR BOTH?
ENTER 'T', 'F' OR 'B'
B

ENTER NAME FOR OUTPUT FILE (64 CHAR. MAX)
OLCOUT
FILE OLCOUT
ALREADY EXISTS. DO YOU WANT TO WRITE OVER IT?
Y

WILL OUTPUT TO THE TERMINAL BE A FULL
OR ABBREVIATED LISTING ?
ENTER 'F' OR 'A'.
F

WILL OUTPUT TO THE FILE BE A FULL
OR ABBREVIATED LISTING ?
ENTER 'F' OR 'A'.
F

PROGRAM CSETT - VERTICAL STRESS INDUCTION AND SETTLEMENT PROGRAM
DATE: 90/12/10 TIME: 12.25.42

II. OUTPUT SUMMARY.

1. TITLE- OLCOTT HARBOR SETTLEMENT OF EAST BREAKWATER

POSITION: X= -60.0
**********

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 64.07 | .000 |
| 2 | 13.00 | 400.60 | 156.45 | .000 |
| 3 | 23.00 | 784.60 | 261.23 | .005 |
| 4 | 33.00 | 1160.00 | 350.38 | .031 |
| 5 | 47.50 | 1706.00 | 442.36 | .191 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | (SETTLEMENT IN FEET AT SPECIFIED TIMES) .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 3 | .005 | .000 | .000 | .000 | .000 | .000 | .001 |
| 4 | .031 | .002 | .002 | .002 | .003 | .004 | .004 |
| 5 | .191 | .005 | .006 | .006 | .013 | .018 | .024 |
| TOTALS: | .227 | .005 | .008 | .008 | .016 | .022 | .029 |

| STRATA NO | (SETTLEMENT IN FEET AT SPECIFIED TIMES) 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|

(5.)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | .022 | .022 | .022 | .022 | .022 | .022 | .022 |
| 2 | .022 | .022 | .022 | .022 | .022 | .022 | .022 |
| 3 | .021 | .021 | .021 | .022 | .024 | .025 | .025 |
| 4 | .025 | .026 | .211 | .015 | .022 | .026 | .031 |
| 5 | .035 | .048 | .069 | .056 | .134 | .169 | .187 |
| TOTALS: | .041 | .057 | .081 | .113 | .161 | .202 | .223 |

POSITION: X= -30.0
**********

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 1144.30 | .022 |
| 2 | 13.00 | 408.00 | 1167.15 | .045 |
| 3 | 23.00 | 784.00 | 1163.05 | .076 |
| 4 | 33.00 | 1160.00 | 1126.90 | .194 |
| 5 | 47.50 | 1706.00 | 1245.29 | .698 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | (SETTLEMENT IN FEET AT SPECIFIED TIMES) .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .022 | .002 | .002 | .002 | .002 | .002 | .002 |
| 2 | .045 | .002 | .022 | .023 | .024 | .024 | .026 |
| 3 | .076 | .021 | .024 | .024 | .024 | .027 | .029 |
| 4 | .194 | .025 | .027 | .029 | .012 | .017 | .025 |
| 5 | .698 | .016 | .033 | .032 | .044 | .062 | .078 |
| TOTALS: | 1.035 | .024 | .034 | .040 | .064 | .090 | .130 |

| STRATA NO | (SETTLEMENT IN FEET AT SPECIFIED TIMES) 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .022 | .022 | .022 | .022 | .022 | .022 | .022 |
| 2 | .029 | .032 | .037 | .026 | .033 | .043 | .045 |
| 3 | .043 | .032 | .027 | .039 | .055 | .069 | .076 |
| 4 | .035 | .046 | .072 | .099 | .127 | .172 | .192 |
| 5 | .124 | .175 | .252 | .350 | .486 | .615 | .681 |
| TOTALS: | .151 | .255 | .364 | .514 | .711 | .899 | .995 |

POSITION: X= .0
**********

2. SUMMARY OF ULTIMATE SETTLEMENTS.

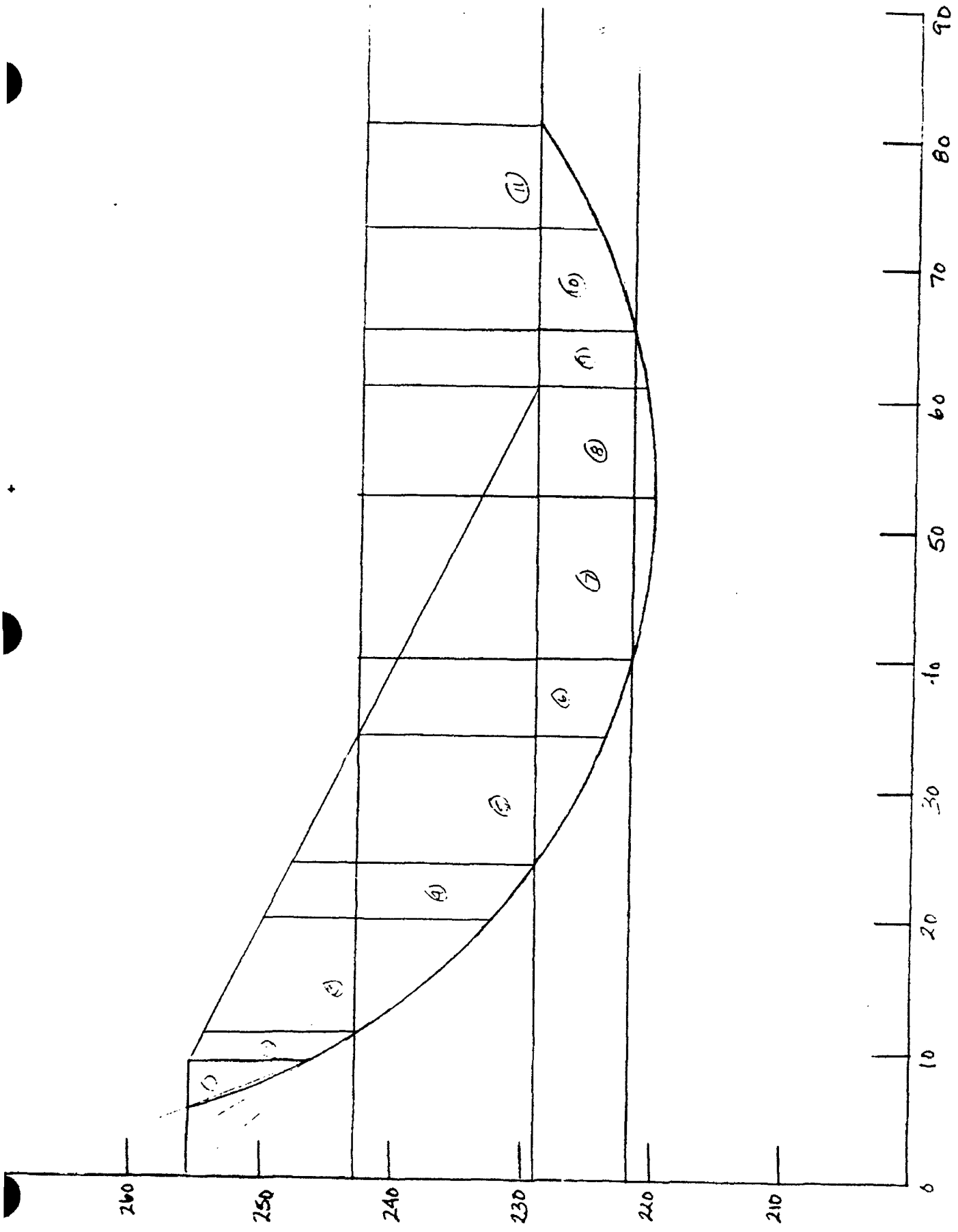
| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 2200.00 | .000 |
| 2 | 13.00 | 406.60 | 2150.65 | .336 |
| 3 | 23.00 | 764.60 | 1924.45 | .402 |
| 4 | 33.00 | 1160.00 | 1700.30 | .455 |
| 5 | 47.50 | 1706.00 | 1420.10 | .983 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| | (SETTLEMENT IN FEET AT SPECIFIED TIMES) | | | | | | |
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .336 | .026 | .012 | .016 | .022 | .030 | .043 |
| 3 | .402 | .011 | .013 | .019 | .026 | .037 | .052 |
| 4 | .455 | .012 | .016 | .022 | .029 | .041 | .058 |
| 5 | .983 | .025 | .033 | .045 | .064 | .089 | .125 |
| TOTALS: | 2.176 | .056 | .074 | .102 | .141 | .197 | .278 |

| STRATA NO | 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| | (SETTLEMENT IN FEET AT SPECIFIED TIMES) | | | | | | |
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .061 | .085 | .121 | .171 | .237 | .299 | .338 |
| 3 | .072 | .102 | .145 | .204 | .283 | .359 | .396 |
| 4 | .082 | .116 | .165 | .233 | .322 | .407 | .449 |
| 5 | .178 | .252 | .355 | .501 | .692 | .878 | .969 |
| TOTALS: | .393 | .555 | .786 | 1.109 | 1.534 | 1.943 | 2.144 |

POSITION: X= 38.0
**********


240
250
240
230
220
210
0
10
20
30
40
50
60
70
80
90
1
2
3
4
5
6
7
8
9
10
11

(7.)

8 of 9

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 1144.30 | .000 |
| 2 | 13.00 | 406.60 | 1167.15 | .046 |
| 3 | 23.00 | 764.00 | 1163.05 | .076 |
| 4 | 33.00 | 1160.00 | 1126.90 | .194 |
| 5 | 47.50 | 1706.00 | 1045.29 | .690 |

3. TIME-SETTLEMENT SUMMARY.

| | (SETTLEMENT IN FEET AT SPECIFIED TIMES) | | | | | | |
|---|---|---|---|---|---|---|---|
| STRATA NO | ULT | .02 (YRS.) | .04 (YRS.) | .06 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .046 | .000 | .000 | .003 | .004 | .004 | .006 |
| 3 | .076 | .001 | .004 | .004 | .004 | .007 | .009 |
| 4 | .194 | .005 | .007 | .009 | .012 | .017 | .025 |
| 5 | .690 | .010 | .023 | .032 | .044 | .062 | .090 |
| TOTALS: | 1.009 | .016 | .034 | .048 | .064 | .090 | .130 |

| | (SETTLEMENT IN FEET AT SPECIFIED TIMES) | | | | | | |
|---|---|---|---|---|---|---|---|
| STRATA NO | 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.83 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .009 | .012 | .017 | .022 | .033 | .043 | .048 |
| 3 | .013 | .020 | .027 | .039 | .055 | .069 | .076 |
| 4 | .035 | .048 | .070 | .099 | .137 | .172 | .190 |
| 5 | .124 | .175 | .250 | .350 | .486 | .615 | .681 |
| TOTALS: | .181 | .255 | .364 | .514 | .711 | .899 | .995 |

POSITION: X= 60.0
!!!!!!!!!!!!!!!!!!!!!!

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 64.07 | .002 |
| 2 | 13.00 | 400.80 | 156.45 | .020 |
| 3 | 23.00 | 704.80 | 261.23 | .005 |
| 4 | 33.00 | 1160.60 | 350.30 | .031 |
| 5 | 47.50 | 1706.00 | 442.36 | .191 |

9a-9

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | (SETTLEMENT IN FEET AT SPECIFIED TIMES) .02 (YRS.) | .04 (YRS.) | .06 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 3 | .005 | .002 | .000 | .000 | .000 | .002 | .001 |
| 4 | .031 | .000 | .000 | .000 | .003 | .004 | .004 |
| 5 | .191 | .005 | .006 | .000 | .013 | .018 | .024 |
| TOTALS: | .227 | .005 | .006 | .000 | .016 | .022 | .029 |

| STRATA NO | (SETTLEMENT IN FEET AT SPECIFIED TIMES) 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 3 | .001 | .001 | .001 | .002 | .004 | .005 | .005 |
| 4 | .025 | .008 | .011 | .015 | .023 | .026 | .031 |
| 5 | .035 | .046 | .059 | .074 | .134 | .169 | .187 |
| TOTALS: | .041 | .057 | .051 | .113 | .161 | .202 | .223 |

DO YOU WANT TO EDIT THE CURRENT DATA AND
RERUN THIS PROBLEM? ENTER 'Y' OR 'N'.

```
D:\CSETT>18019
**********************************
*  CORPS PROGRAM  #  18019       *
*  MICRO VERSION  #  84/09/19    *
**********************************

PROGRAM CSETT - VERTICAL STRESS INDUCTION AND CONSOLIDATION
SETTLEMENT ANALYSIS OF SINGLE OR MULTIPLE CLAY STRATA
UNDER SIMPLE AND COMPLEX LOADING CONDITIONS.  INDUCED
STRESSES ARE COMPUTED BY WESTERGAARD OR BOUSSINESQ
POINT LOAD FORMULAE. RESULTING SETTLEMENTS ARE
COMPUTED BY TERZAGHI'S CLASSICAL ONE DIMENSIONAL
CONSOLIDATION THEORY.


IS INPUT FROM TERMINAL OR A FILE
ENTER 'T' OR 'F'
F


ENTER DATA FILE NAME (64 CHAR. MAX)
OLCOTT


INPUT COMPLETE. DO YOU WANT INPUT DATA
ECHOPRINTED TO YOUR TERMINAL, A FILE,
BOTH, OR NEITHER? (ENTER 'T', 'F', 'B' OR 'N')
B


ENTER NAME FOR INPUT ECHOPRINT FILE (64 CHAR. MAX)
OLCOUT
FILE OLCOUT
ALREADY EXISTS.  DO YOU WANT TO WRITE OVER IT?
Y


PROGRAM CSETT - VERTICAL STRESS INDUCTION AND SETTLEMENT PROGRAM
DATE: 90/12/07                                  TIME: 16 43.05


1.  INPUT DATA


1. TITLE - OLCOTT HARBOR SETTLEMENT OF EAST BREAKWATER


2. BOUSSINESQ SOLUTION WILL BE USED TO COMPUTE INDUCED STRESSES.
   THE MAXIMUM DEPTH TO WHICH THE ANALYSIS WILL BE EXTENDED
```

OLCOTT HARBOR, N.Y.
SETTLEMENT DETACHED EAST BREAKWATER
STA 6+70 (BREECHWAVE)
ASSUMING NORMALLY CONSOLIDATED $C_c = 0.62$

MAXIMUM SETTLEMENT AT $X=0$ (CENTERLINE)
$S_{MT} = 5.28$ FT

RUN BY: G.L 12/7/90

[illegible] [illegible] FEET.

2.4-91

3. 2-DIMENSIONAL PRESSURE LOAD DATA
NONE

4. 2-DIMENSIONAL SOIL LOAD DATA

PROFILE NUMBER 1 :NUMBER OF POINTS= 8
BEGINNING TIME OF APPLICATION = .0000 YRS.
ENDING TIME OF APPLICATION = .0000 YRS.
EFFECTIVE UNIT WEIGHT OF SOIL LOAD= 110.00 PCF

| POINT NO. | X (FT.) | Y (FT.) |
|---|---|---|
| 1 | -9999.00 | 29.50 |
| 2 | -61.00 | 29.50 |
| 3 | -24.00 | 42.00 |
| 4 | -9.00 | 55.50 |
| 5 | 9.00 | 55.50 |
| 6 | 24.00 | 42.00 |
| 7 | 61.00 | 29.50 |
| 8 | 9999.00 | 29.50 |

PROFILE NUMBER 2 :NUMBER OF POINTS= 6
BEGINNING TIME OF APPLICATION = .0000 YRS.
ENDING TIME OF APPLICATION = .0000 YRS.
EFFECTIVE UNIT WEIGHT OF SOIL LOAD= 65.00 PCF

| POINT NO. | X (FT.) | Y (FT.) |
|---|---|---|
| 1 | -9999.00 | 29.50 |
| 2 | -61.00 | 29.50 |
| 3 | -24.00 | 42.00 |
| 4 | 24.00 | 42.00 |
| 5 | 61.00 | 29.50 |
| 6 | 9999.00 | 29.50 |

5. 3-DIMENSIONAL RECTANGULAR LOAD DATA
NONE

6. 3-DIMENSIONAL IRREGULAR LOAD DATA
NONE

7. EXCAVATION
NONE

3 of 9

8. SOIL DATA

| STRATUM NO. | EL. OF TOP OF STRATUM (FEET MSVD) | DRAINAGE CONDITION | EFF UNIT WEIGHT (PCF) | RECOMPR. INDEX | COEF.OF CONSOL. (SQFT/YR) | POISSON'S RATIO |
|---|---|---|---|---|---|---|
| 1 | 29.30 | N | 37.60 | | | |
| 2 | 21.30 | S | 37.60 | .06000 | 50.00000 | .30000 |
| 3 | 11.30 | D | 37.60 | .06000 | 50.00000 | .30000 |
| 4 | 1.30 | D | 37.60 | .06000 | 50.00000 | .30000 |
| 5 | -8.70 | D | 37.60 | .06000 | 50.00000 | .30000 |

9. STRESS-STRAIN DATA

STRATUM NO. 1
---
INCOMPRESSIBLE STRATUM

STRATUM NO. 2
---
COMPRESSION INDEX= .62000
RECOMPRESSION INDEX= .06000
INSITU VOID RATIO= 1.72000
INSITU OVERBURDEN= 795.00 PSF

STRATUM NO. 3
---
COMPRESSION INDEX= .62000
RECOMPRESSION INDEX= .06000
INSITU VOID RATIO= 1.54000
INSITU OVERBURDEN= 771.00 PSF

STRATUM NO. 4
---
COMPRESSION INDEX= .62000
RECOMPRESSION INDEX= .06000
INSITU VOID RATIO= 1.43000
INSITU OVERBURDEN= 1079.00 PSF

STRATUM NO. 5
---
COMPRESSION INDEX= .62000
RECOMPRESSION INDEX= .06000
INSITU VOID RATIO= 1.33000
INSITU OVERBURDEN= 1692.00 PSF

10. TIME SEQUENCE FOR CONSOLIDATION CALCULATIONS

A GEOMETRIC PROGRESSION WITH AN INITIAL TIME PERIOD OF .0192
YEARS AND A MULTIPLICATIVE FACTOR OF 2.0000 WILL BE USED IN
THE TIME RATE OF CONSOLIDATION CALCULATIONS.

11. OUTPUT CONTROL DATA

XIL= -60.0000 FT.
XUL= 60.0000 FT.
DEL_X= 30.0000 FT.

DO YOU WANT TO EDIT DATA? ENTER 'Y' OR 'N'.
N

DO YOU WANT TO CONTINUE SOLUTION?
ENTER 'Y' OR 'N'
Y

WILL OUTPUT GO TO TERMINAL, FILE, OR BOTH?
ENTER 'T', 'F' OR 'B'
T

WILL OUTPUT TO THE TERMINAL BE A FULL
OR ABBREVIATED LISTING ?
ENTER 'F' OR 'A'.
F

PROGRAM CSETT - VERTICAL STRESS INDUCTION AND SETTLEMENT PROGRAM
DATE: 90/12/07 TIME: 16.43.55

II. OUTPUT SUMMARY.

1. TITLE- OLCOTT HARBOR SETTLEMENT OF EAST BREAKWATER

POSITION: X= -60.0
**********

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 64.27 | .000 |
| 2 | 13.00 | 408.80 | 156.45 | .232 |
| 3 | 23.00 | 784.90 | 261.23 | .254 |
| 4 | 33.00 | 1160.80 | 350.38 | .280 |
| 5 | 47.50 | 1706.00 | 442.36 | .409 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .232 | .006 | .006 | .011 | .015 | .021 | .029 |
| 3 | .254 | .007 | .007 | .012 | .016 | .023 | .034 |
| 4 | .280 | .008 | .008 | .012 | .019 | .026 | .035 |
| 5 | .409 | .012 | .012 | .018 | .027 | .036 | .052 |
| TOTALS: | 1.175 | .033 | .033 | .053 | .077 | .106 | .150 |

| STRATA NO | 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.29 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | .022 | .022 | .022 | .022 | .022 | .022 | .022 |
| 2 | .042 | .058 | .083 | .116 | .164 | .227 | .229 |
| 3 | .046 | .064 | .091 | .129 | .179 | .226 | .250 |
| 4 | .050 | .072 | .101 | .143 | .197 | .249 | .276 |
| 5 | .074 | .104 | .147 | .209 | .287 | .365 | .403 |
| TOTALS: | .212 | .298 | .422 | .599 | .837 | 1.047 | 1.158 |

POSITION: X= -30.0
**********

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.42 | 1144.32 | .022 |
| 2 | 13.00 | 425.00 | 1167.15 | 1.274 |
| 3 | 23.00 | 764.00 | 1163.05 | .924 |
| 4 | 33.00 | 1160.00 | 1126.90 | .743 |
| 5 | 47.50 | 1706.00 | 1045.29 | .963 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .022 | .022 | .022 | .022 | .022 | .022 | .022 |
| 2 | 1.274 | .232 | .342 | .462 | .603 | .114 | .163 |
| 3 | .924 | .024 | .031 | .043 | .059 | .054 | .119 |
| 4 | .743 | .019 | .025 | .034 | .047 | .067 | .095 |
| 5 | .963 | .024 | .033 | .045 | .062 | .087 | .121 |
| TOTALS: | 3.984 | .099 | .132 | .181 | .251 | .350 | .498 |

| STRATA NO | 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .022 | .022 | .022 | .022 | .022 | .022 | .022 |
| 2 | .231 | .325 | .459 | .650 | .896 | 1.137 | 1.256 |
| 3 | .166 | .236 | .333 | .471 | .651 | .824 | .911 |
| 4 | .134 | .189 | .267 | .378 | .523 | .662 | .731 |
| 5 | .174 | .246 | .347 | .492 | .682 | .862 | .949 |
| TOTALS: | .785 | .996 | 1.428 | 1.991 | 2.753 | 3.487 | 3.847 |

POSITION: X= .0
**********

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 2280.00 | .000 |
| 2 | 13.00 | 403.00 | 2150.60 | 1.761 |
| 3 | 23.00 | 784.90 | 1924.45 | 1.276 |
| 4 | 33.00 | 1160.00 | 1700.30 | .992 |
| 5 | 47.50 | 1706.20 | 1426.10 | 1.254 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | LAT | .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| | | (SETTLEMENT IN FEET AT SPECIFIED TIMES) | | | | | |
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | 1.761 | .045 | .068 | .092 | .114 | .159 | .225 |
| 3 | 1.276 | .034 | .043 | .059 | .081 | .116 | .163 |
| 4 | .992 | .026 | .034 | .046 | .065 | .090 | .127 |
| 5 | 1.254 | .033 | .041 | .059 | .081 | .112 | .160 |
| TOTALS: | 5.281 | .139 | .176 | .245 | .341 | .477 | .675 |

| STRATA NO | 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| | (SETTLEMENT IN FEET AT SPECIFIED TIMES) | | | | | | |
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .318 | .449 | .635 | .898 | 1.241 | 1.573 | 1.736 |
| 3 | .230 | .326 | .461 | .651 | .899 | 1.139 | 1.259 |
| 4 | .180 | .253 | .357 | .505 | .698 | .884 | .976 |
| 5 | .225 | .320 | .453 | .639 | .882 | 1.118 | 1.236 |
| TOTALS: | .957 | 1.348 | 1.906 | 2.692 | 3.722 | 4.714 | 5.207 |

POSITION: X= 32.0
**********

8 of 9

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 1144.30 | .000 |
| 2 | 13.00 | 406.60 | 1167.15 | 1.274 |
| 3 | 23.00 | 784.80 | 1163.05 | .924 |
| 4 | 33.00 | 1160.80 | 1126.90 | .743 |
| 5 | 47.50 | 1705.00 | 1045.29 | .963 |

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | (SETTLEMENT IN FEET AT SPECIFIED TIMES) .02 (YRS.) | .04 (YRS.) | .08 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | 1.274 | .032 | .043 | .060 | .083 | .114 | .163 |
| 3 | .924 | .024 | .031 | .043 | .059 | .084 | .119 |
| 4 | .743 | .019 | .025 | .034 | .047 | .067 | .095 |
| 5 | .963 | .024 | .033 | .045 | .062 | .087 | .121 |
| TOTALS: | 3.904 | .099 | .132 | .182 | .251 | .352 | .498 |

| STRATA NO | (SETTLEMENT IN FEET AT SPECIFIED TIMES) 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .231 | .325 | .455 | .650 | .898 | 1.137 | 1.256 |
| 3 | .166 | .236 | .333 | .471 | .651 | .824 | .911 |
| 4 | .134 | .189 | .267 | .379 | .523 | .662 | .731 |
| 5 | .174 | .246 | .347 | .492 | .680 | .860 | .949 |
| TOTALS: | .705 | .996 | 1.406 | 1.991 | 2.752 | 3.483 | 3.847 |

POSITION: X= 60.0
!!!!!!!!!!!!!!!!!!!!!!!

2. SUMMARY OF ULTIMATE SETTLEMENTS.

| STRATA NO. | MID-DEPTH OF STRATA (FEET) | IN-SITU OVERBURDEN (LB/SQ FT) | DELTA SIGMA (LB/SQ FT) | ULTIMATE SETTLEMENT (FEET) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | 4.00 | 110.40 | 64.07 | .000 |
| 2 | 13.00 | 403.00 | 156.45 | .232 |
| 3 | 23.00 | 784.00 | 261.23 | .254 |
| 4 | 33.00 | 1162.00 | 350.36 | .292 |
| 5 | 47.50 | 1706.00 | 442.36 | .409 |

9009

3. TIME-SETTLEMENT SUMMARY.

| STRATA NO | ULT | (SETTLEMENT IN FEET AT SPECIFIED TIMES) .02 (YRS.) | .04 (YRS.) | .05 (YRS.) | .15 (YRS.) | .31 (YRS.) | .61 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .232 | .006 | .009 | .011 | .015 | .021 | .029 |
| 3 | .254 | .007 | .009 | .012 | .016 | .022 | .034 |
| 4 | .292 | .008 | .009 | .012 | .019 | .026 | .035 |
| 5 | .409 | .012 | .012 | .018 | .027 | .036 | .052 |
| TOTALS: | 1.175 | .033 | .037 | .053 | .077 | .106 | .150 |

| STRATA NO | 1.23 (YRS.) | 2.45 (YRS.) | 4.91 (YRS.) | 9.82 (YRS.) | 19.64 (YRS.) | 39.28 (YRS.) | 78.55 (YRS.) |
|---|---|---|---|---|---|---|---|
| 1 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 2 | .042 | .056 | .063 | .115 | .164 | .207 | .229 |
| 3 | .046 | .064 | .091 | .129 | .179 | .226 | .252 |
| 4 | .058 | .072 | .101 | .143 | .197 | .249 | .276 |
| 5 | .074 | .104 | .147 | .209 | .287 | .365 | .403 |
| TOTALS: | .212 | .298 | .422 | .599 | .827 | 1.047 | 1.159 |

DO YOU WANT TO EDIT THE CURRENT DATA AND
RERUN THIS PROBLEM? ENTER 'Y' OR 'N'.
N

DO YOU WANT TO MAKE ANOTHER RUN?
ENTER 'Y' OR 'N'
N
! ! ! ! ! NORMAL TERMINATION ! ! ! ! !
Stop - Program terminated.

OLCOTT HARBOR, NEW YORK

GENERAL DESIGN

SUB-APPENDIX A

# ATTACHMENT A6

# HAND COMPUTATION CHECK OF SETTLEMENT

OLCOTT HARBOR, N.Y.
MANUAL HAND COMPUTATION CHECK OF SETTLEMENT
COMPUTED BY: GLL. 12/14/90

A. ULTIMATE SETTLEMENT AT X=0 (CENTERLINE)

$$S_{ULT} = \frac{C_c H}{1+e_0} \log_{10}\left(\frac{P_0+\Delta P}{P_0}\right) \quad \text{(VIRGIN COMPRESSION)}$$

$$S_{ULT} = \frac{C_r H}{1+e_0} \log_{10}\left(\frac{P_0+\Delta P}{P_0}\right) \quad \text{(RECOMPRESSION)}$$

FROM VOID RATIO VS PRESSURE CURVE (SHEET 2 OF ):
MAX PAST PRESSURE $P_c$ = 2060 PSF, $e_c$ = 1.43, $C_r$ = .07, $C_c$ = .66

(1.) LAYER NO. 1 – SANDY GRAVEL, INCOMPRESSIBLE, NO APPRECIABLE SETTLEMENT

(2) LAYER NO. 2 – ORGANIC CLAY, H = 10 FT, $P_0$ (MIDPOINT) = 409 PSF
$\Delta P$ = 2151 PSF, $P_0 + \Delta P$ = 2560 PSF, $e_0$ = 1.45

- FROM VOID RATIO VS PRESSURE CURVE SETTLEMENT FROM $P_0$ = 409 PSF TO P = 1079 PSF S ≈ 0 FT.
- FROM P = 1079 PSF TO $P_c$ = 2060 PSF (RECOMPRESSION PORTION OF CURVE)

$$S_r = \frac{.07(10\text{ FT})}{1+1.45} \log_{10}\left(\frac{2060\text{ PSF}}{1079\text{ PSF}}\right) = .08\text{ FT}$$

- FROM $P_c$ = 2060 PSF TO $P_0$ TOP = 2560 PSF (VIRGIN COMPRESSION)

$$S_c = \frac{.66(10\text{ FT})}{1+1.43} \log_{10}\left(\frac{2560}{2060}\right) = .26\text{ FT}$$

- $S_{TOT\,(LAYER\,2)} = S_r + S_c$ = .08 FT + .26 FT = .34 FT (.336 FT COMPUTER)

(3.) LAYER NO. 3 – ORGANIC CLAY, H = 10 FT, $P_0$ (MIDPOINT) = 785 PSF
$\Delta P$ = 1924 PSF, $P_0 + \Delta P$ = 2709 PSF, $e_0$ = 1.45

- FROM $P_0$ = 785 TO P = 1079 PSF, S ≈ 0 FT
- FROM P = 1079 PSF TO $P_c$ = 2060 PSF, $S_r$ = .08 FT (CALC BEFORE FOR LAYER NO. 2)
- FROM $P_c$ = 2060 PSF TO $P_0$ TOP = 2709 PSF

$$S_c = \frac{.66(10\text{ FT})}{1+1.43} \log_{10}\left(\frac{2709}{2060}\right) = .32\text{ FT}$$

- $S_{TOT\,(LAYER\,NO.3)} = S_r + S_c$ = .08 FT + .32 FT = .40 FT (.402 COMPUTER)

(4.) LAYER NO. 4 – ORGANIC CLAY, $H = 10$ FT., $P_0$ (MIDPOINT) $= 1161$ PSF
$\Delta p = 1700$ PSF, $P_0$ TOP $= 2861$ PSF

- FROM $P_0 = 1161$ PSF TO $P_c = 2060$ PSF (RECOMPRESSION)

$$e_{1161} = e_{1079} - C_r \log_{10}\left(\frac{P_{1161}}{P_{1079}}\right) = 1.45 - .07 \log_{10}\left(\frac{1161}{1079}\right) = 1.447 \text{ or } \simeq 1.45$$

$$S_r = \frac{.07(10\text{FT})}{1+1.45} \log_{10}\left(\frac{2060}{1161}\right) = .07\text{FT}$$

- FROM $P_c = 2060$ PSF TO $P = 2861$ PSF

$$S_c = \frac{.66(10\text{FT})}{1+1.43} \log_{10}\left(\frac{2861}{2060}\right) = .39\text{FT}$$

- $S_{TOT(LAYER\ NO.4)} = S_r + S_c = .07\text{FT} + .39\text{FT} = \underline{\underline{.46\text{FT}}}$ (.455FT Computed)

(5.) LAYER NO. 5 – ORGANIC CLAY, $H = 19.0$ FT, $P_0$ (MIDPOINT) $= 1706$ PSF
$\Delta p = 1428$ PSF, $P_0 + \Delta p = 3,134$ PSF

- FROM $P_0 = 1706$ TO $P_c = 2060$ PSF (RECOMPRESSION)

$$e_{1706} = e_{1079} - C_r \log_{10}\left(\frac{P_{1706}}{P_{1079}}\right) = 1.45 - .07 \log_{10}\left(\frac{1706}{1079}\right) = 1.44$$

$$S_r = \frac{.07(19.0\text{FT})}{1+1.44} \log_{10}\left(\frac{2060}{1706}\right) = .05\text{FT}.$$

- FROM $P_c = 2060$ PSF TO $P = 3134$ PSF

$$S_c = \frac{.66(19.0\text{FT})}{1+1.43} \log_{10}\left(\frac{3134\text{PSF}}{2060\text{PSF}}\right) = .94\text{FT}.$$

- $S_{TOT(LAYER\ 5)} = S_r + S_c = .05\text{FT} + .94\text{FT} = \underline{\underline{.99\text{FT}}}$ (.983 Computed)

(6.) TOTAL ULTIMATE SETTLEMENT, $x = 0$

$$S_{ULT} = S_{LAYER1} + S_{LAYER2} + S_{LAYER3} + S_{LAYER4} + S_{LAYER5}$$
$$S_{ULT} = 0\text{FT} + .34\text{FT} + .40\text{FT} + .46\text{FT} + .99\text{FT}$$
$$S_{ULT} = \underline{\underline{2.19\text{FT}}} \text{ COMPARE } 2.176\text{FT Computer OK!}$$

B. TIME RATE OF SETTLEMENT CHECK

ASSUMING SINGLE DRAINAGE TO TAL DRAINAGE
PATH THICKNESS IS EQUAL TO TOTAL THICKNESS
OF ORGANIC CLAY DEPOSIT OR $H = 10_{FT} + 10_{FT} + 10_{FT} + 19_{FT} = 49_{FT}$

$C_v = 50 FT^2/YR$

TIME FACTOR $T = \frac{C_v t}{(H)^2}$ WHERE $t$ = TIME YRS.

AT $t = 4.91$ YRS

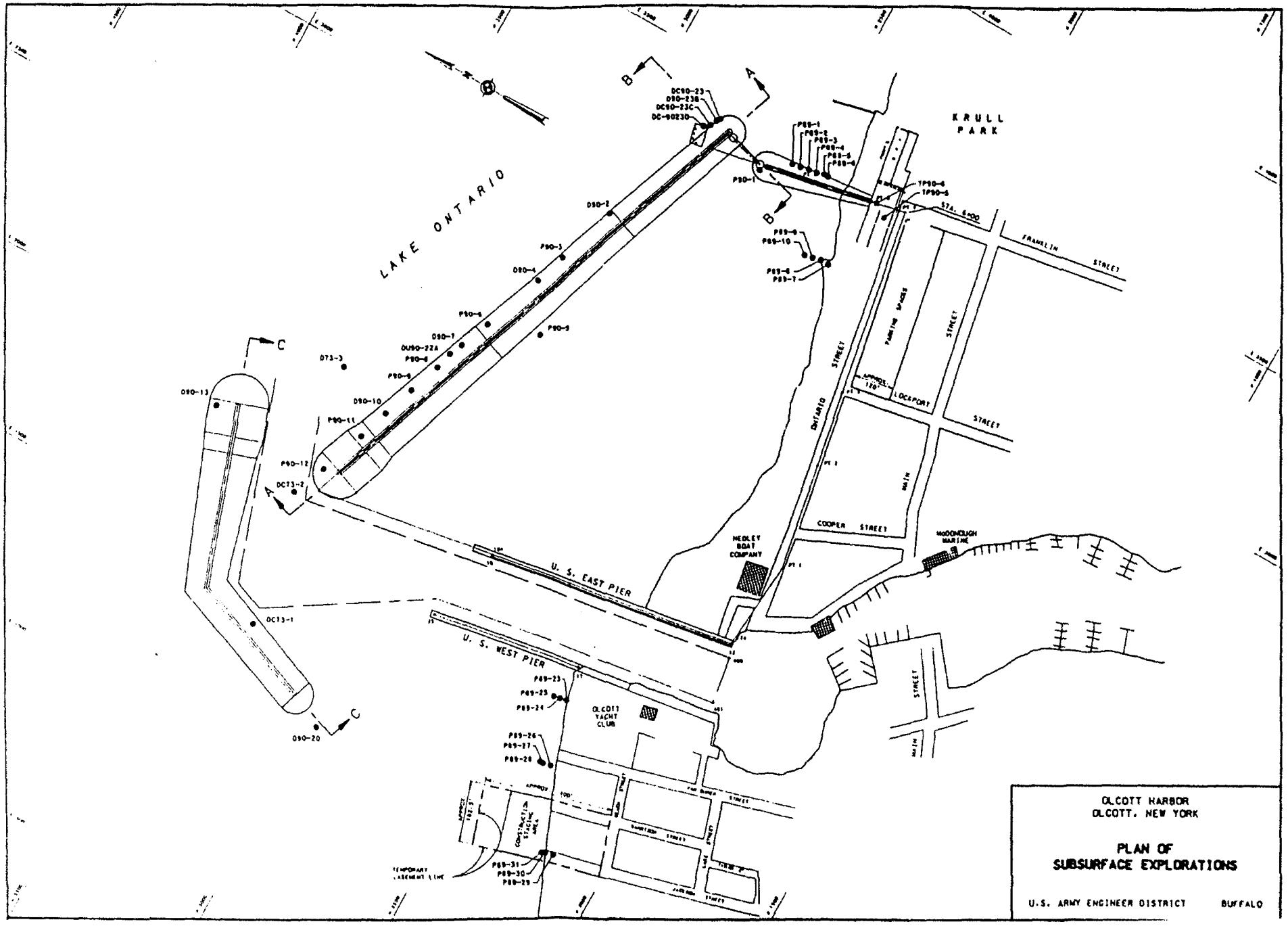
$$T = \frac{(50 FT^2/YR)(4.91 YRS)}{(49 FT)^2} = .102$$

FROM TIME FACTOR VS PERCENT CONSOLIDATION CURVE (SHEET 54S)

FOR $T = .102$, $U\%_0 = 36\%$

$S_{ULT} = 2.176_{FT}$

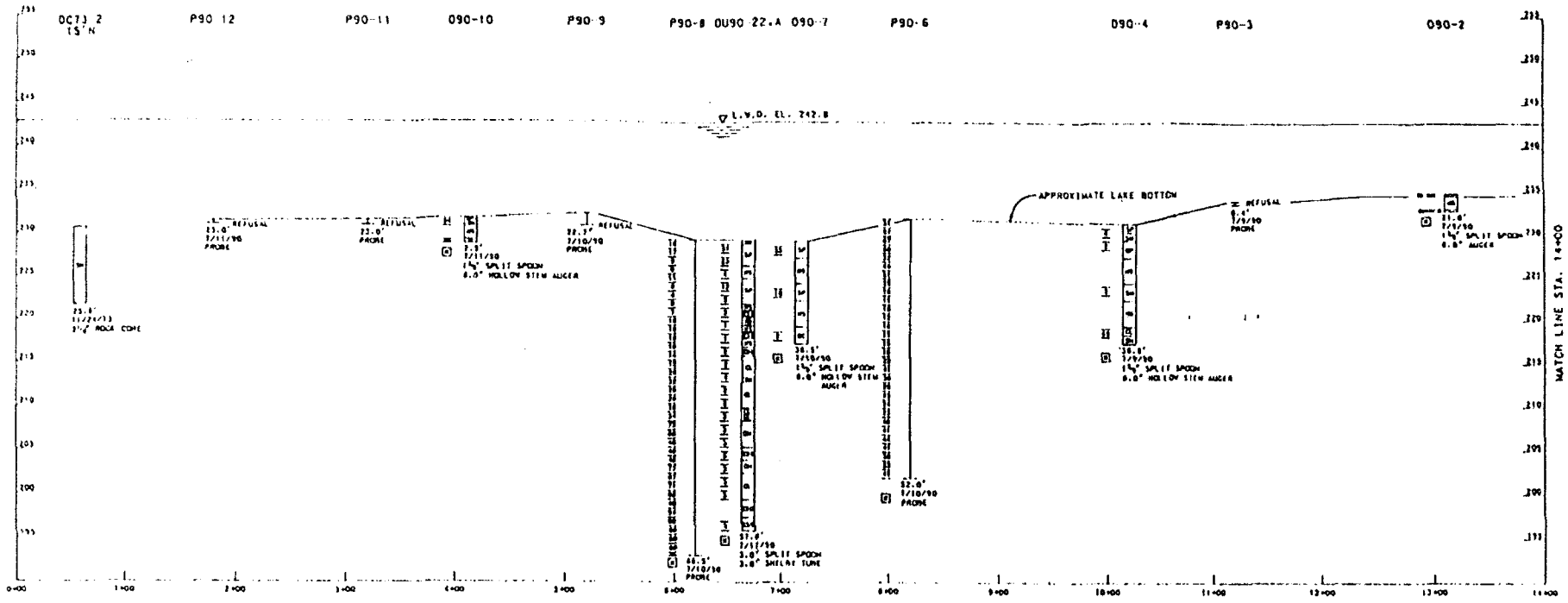
$S_{t=4.91 YRS} = 2.176_{FT} \times .36 = .783_{FT}$ COMPARE .786 FT
COMPUTER
= OK!



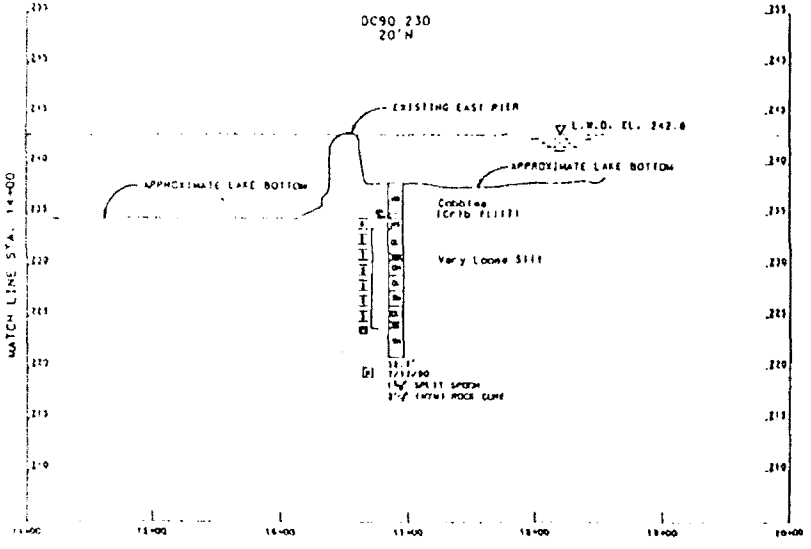

OLCOTT HARBOR
OLCOTT, NEW YORK

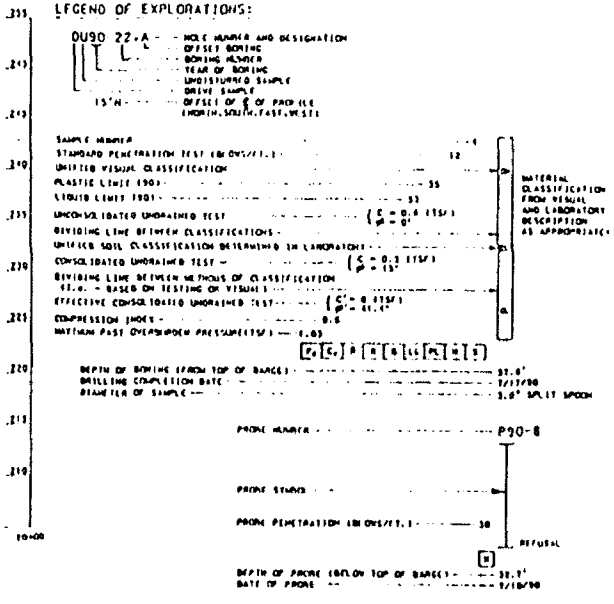
**PLAN OF SUBSURFACE EXPLORATIONS**

U.S. ARMY ENGINEER DISTRICT BUFFALO




GEOLOGIC PROFILE A-A



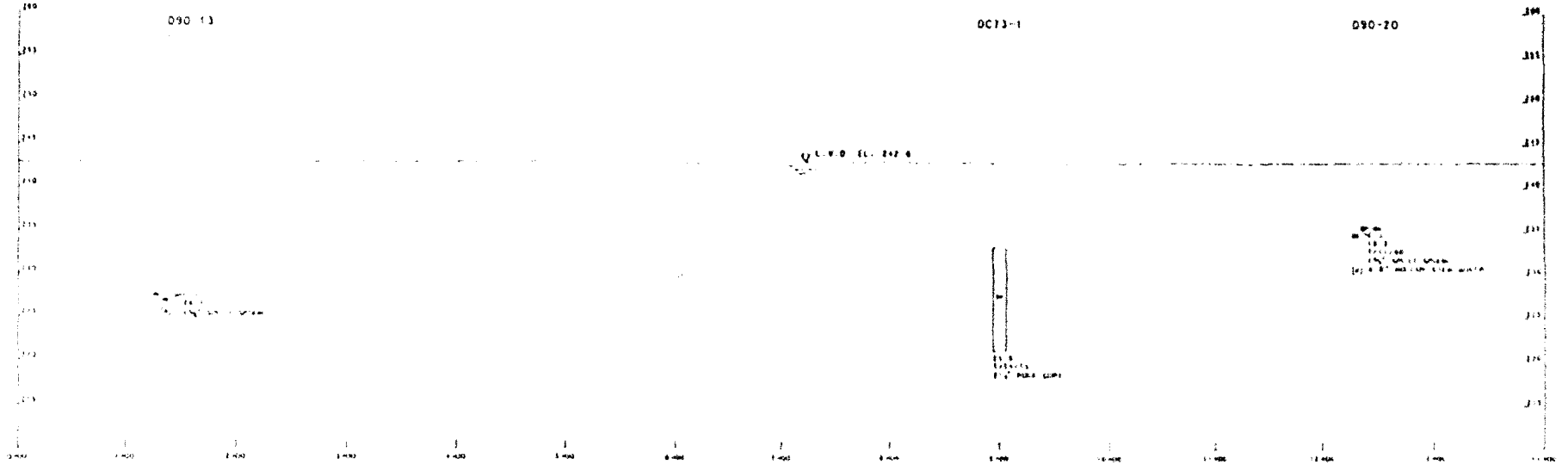

NOTES:

1. FOR PLAN OF EXPLORATIONS SEE PLATE 61.
2. FOR TERMS OF RELATIVE DENSITY AND CONSISTENCY, SEE PLATE 63.
3. FOR UNIFIED SOILS CLASSIFICATION SYSTEM, SEE PLATE 62.
4. FOR STRIPLOGS OF BORINGS, SEE PLATES 64 AND 65.

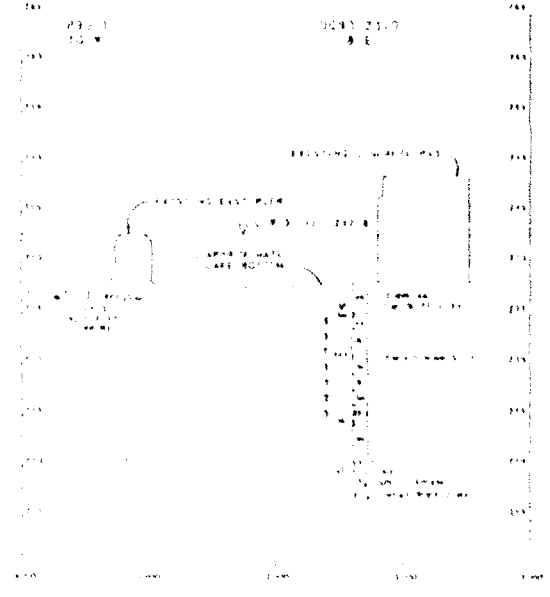
OLCOTT HARBOR, NEW YORK
SMAALL-BOAT HARBOR PROJECT

GEOLOGIC PROFILE A-A

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUGUST 1991




GEOLOGIC PROFILE C-C



GEOLOGIC PROFILE B-B

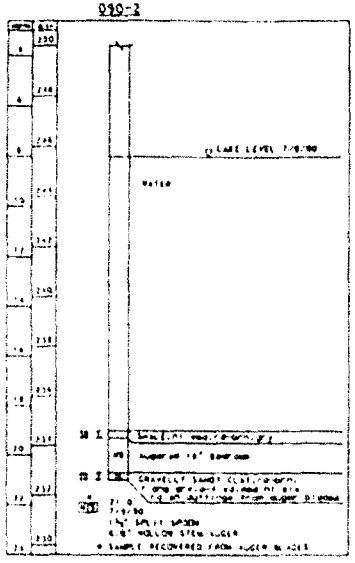
TERMS AND RELATIVE DENSITY AND CONSISTENCY

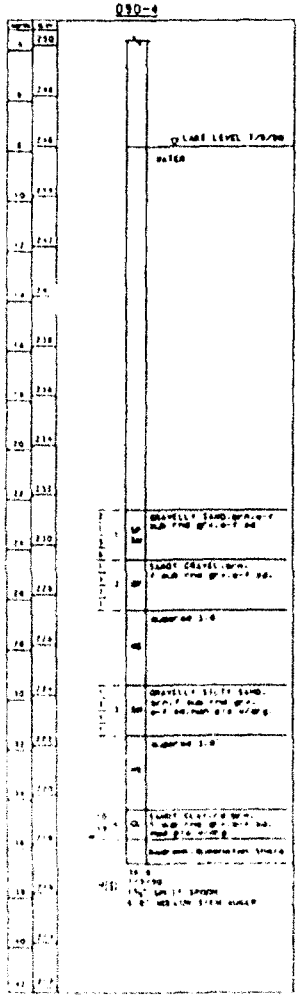
TERMS AND RELATIVE DENSITY AND CONSISTENCY

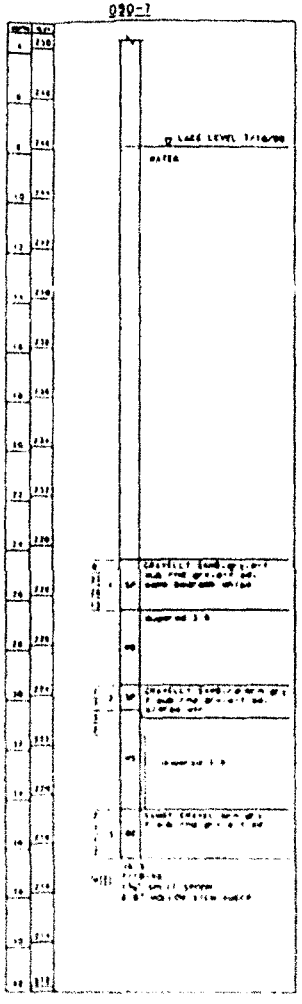
LEGEND (UNIFIED SOIL CLASSIFICATION SYSTEM)

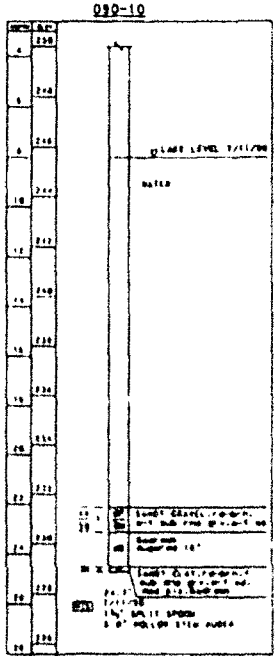
NOTES:

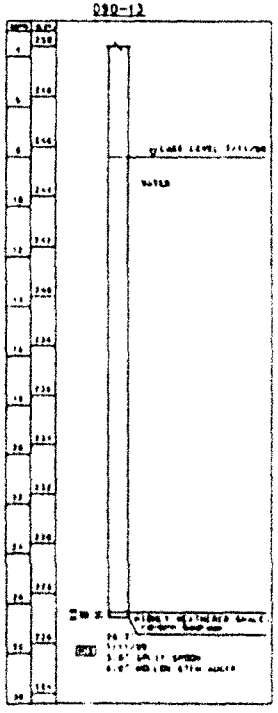
1.
2.
3.

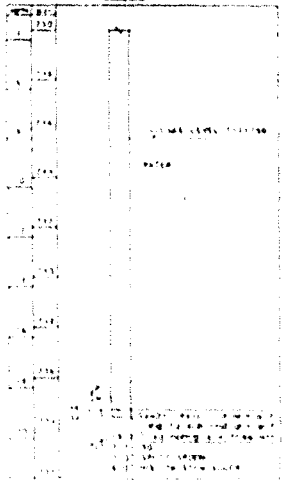


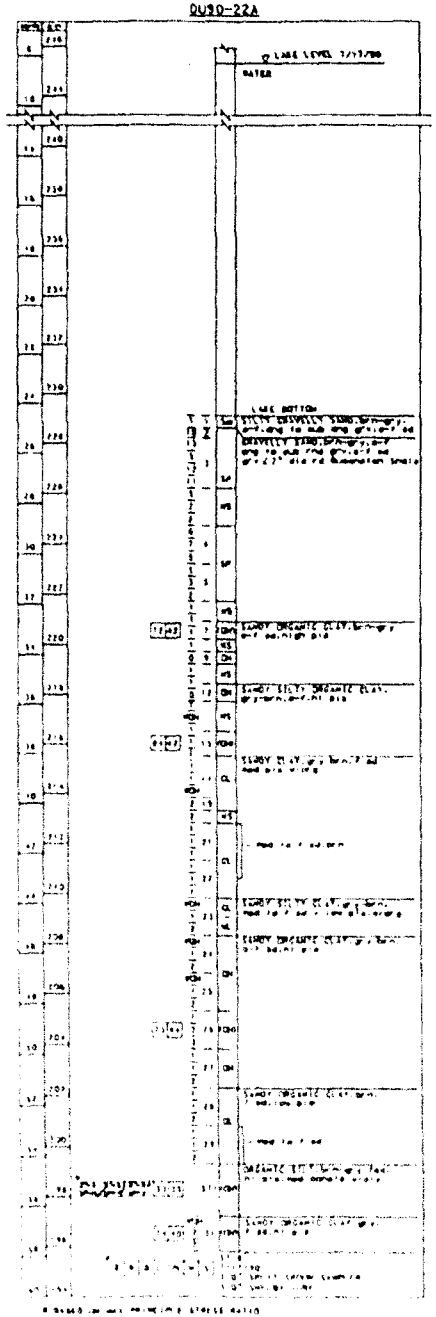

Abbreviations

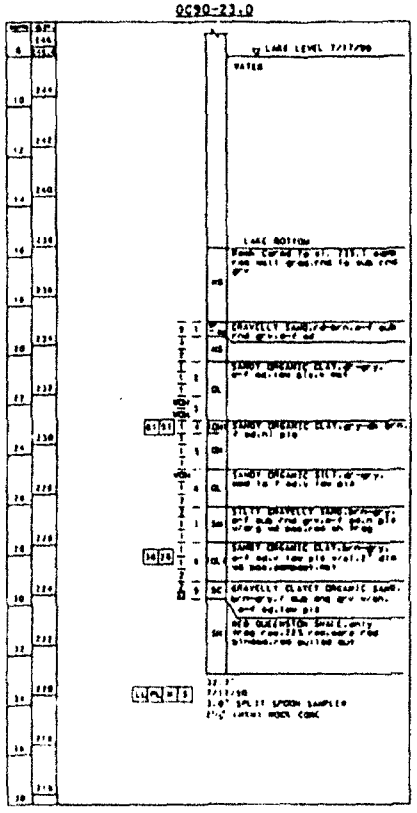
NOTES:

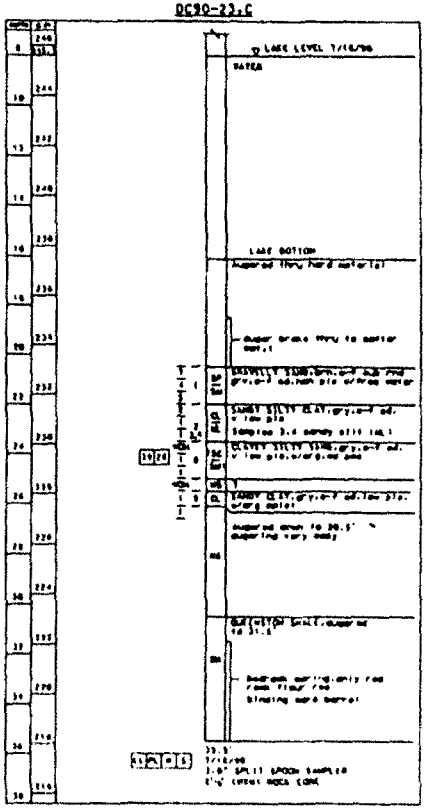
OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

STRIP LOGS OF BORINGS

U.S. ARMY ENGINEER DISTRICT, BUFFALO
FEBRUARY 1991




NOTES:

1. FOR PLAN OF EXPLORATIONS, SEE PLATE A1.
2. FOR LEGEND OF EXPLORATIONS, SEE PLATE A2.
3. FOR TERMS OF RELATIVE DENSITY AND CONSISTENCY, SEE PLATE A3.
4. FOR UNIFIED SOILS CLASSIFICATION SYSTEM, SEE PLATE A3.
5. FOR ABBREVIATIONS, SEE PLATE A4.

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

STRIP LOGS OF BORINGS

U.S. ARMY ENGINEER DISTRICT, BUFFALO
FEBRUARY 1991

# Sub-Appendix B

## COASTAL DESIGN ANALYSIS

**OLCOTT HARBOR, NEW YORK**
**GENERAL DESIGN ANALYSIS**

**COASTAL DESIGN**
**SUB-APPENDIX B**

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SUB-APPENDIX B
COASTAL DESIGN

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|---|---|---|
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OLCOTT HARBOR, NEW YORK
GENERAL DESIGN ANALYSIS

SUB-APPENDIX B:
COASTAL DESIGN

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# OLCOTT HARBOR, NEW YORK

## SUB-APPENDIX B
## COASTAL DESIGN

### B1. INTRODUCTION

This appendix contains the coastal engineering design for a small-boat harbor in the Village of Olcott, Town of Newfane, New York. The selected plan (Refined Plan 10A Modified) evolved from several other plans that were investigated throughout the design process. The major plans investigated are briefly discussed in Paragraph B2 but for details of these plans refer to the **Olcott Harbor, Re-Evaluation Study** report dated February 1990.

### B2. DEVELOPMENT OF SELECTED PLAN (Refined Plan 10A Modified)

The three primary plans that led up to the selected plan are known as Plans 10A, 10B and 10A Modified. Plans 10A and 10B were initially evaluated during execution of a three dimensional hydraulic model investigation conducted at the Waterways Experiment Station entitled "Olcott Harbor, New York, Design for Harbor Improvements" (Bottin, R.R. 1989). They are both referred to in that report as Plans 16 and 19, respectively. Plan 10A Modified is a refinement of both Plans 10A and 10B and the selected plan (Refined Plan 10A Modified) is a further refinement of Plan 10A Modified. The major elements of the plans and the evolution of the selected plan are described below.

**a.** **Plan 10A** - Plan 10A as shown on Plate B1 consisted of a dog-leg shaped west detached breakwater, a straight east detached breakwater and an east shore connected breakwater. The lakeward leg of the west detached breakwater would be 500 feet long and the shoreward leg 260 feet long. The two legs formed an interior angle of 120 degrees. The east detached breakwater had a crest length of 1525 feet. Both the west and east detached breakwaters had a crest height of +14.5 feet above LWD. The two detached breakwaters provided an entrance gap of 100 feet. The east shore connected breakwater was 340 feet long with a crest height of +12.9 feet.

**b.** **Plan 10B** - This plan, as shown on Plate B2, was similar to Plan 10A except the west detached breakwater had a lakeward leg of 550 feet and a shoreward leg of 970 feet, both at +14.5 feet above LWD. The two legs formed an interior angle of 130 degrees with an entrance gap widened to 150 feet. This plan also included a west shore connected breakwater with a length of 270 feet and height of +12.7 feet. This configuration provided additional mooring space in the area between the west detached breakwater and the existing west harbor pier. The east detached and east attached breakwaters were the same configuration as Plan 10A.

c. Plan 10A Modified - This plan (Plate B3) consisted of a west detached dog-leg shaped breakwater with a lakeward leg of 550 feet and a shoreward leg of 560 feet which formed an interior angle of 130 degrees. The west detached and east detached breakwater provide an entrance gap of 150 feet. The east detached and east attached breakwater remained at 1525 feet and 340 feet respectively.

Of the three plans, Plan 10B, which provided two separate mooring areas, was the most expensive plan but created concerns with regard to water circulation and fisheries. Plan 10A was more economical but allowed extensive overtopping of the existing west pier. Plan 10A Modified was then perceived as a combination of the positive features of both 10A and 10B in that: 1) an extension of the west detached shoreward leg from that of Plan 10A would prevent the overtopping at the west pier and 2) the interior angle of the west detached breakwater would remain 130 degrees with an entrance gap of 150 feet as in Plan 10B. This wider gap would provide safer boating conditions when entering and exiting the harbor. The 130 degree angle would allow for future expansion of the harbor into a west basin as was the case in Plan 10B. This became the NED plan in the Olcott Harbor Reevaluation Study and was selected for detailed design studies and further refinement during this study phase.

d. Refined Plan 10A Modified - A second series of tests by WES (Oct. 90) known as the two dimensional Flume Tests (Attachment B-1) provided data which resulted in the selected plan now called Refined Plan 10A Modified (Plate B4). Flume tests served as an investigation to insure proper wave transmission characteristics of the breakwaters. As a result of these tests it was concluded that the east and west detached breakwater height could be reduced by 1.5 feet and the east attached breakwater could be reduced 0.9 feet. Also by WES endorsement the shoreward leg of the west detached breakwater was reduced by 150 feet. Some minor adjustments were also made to the lengths of the East attached and detached breakwaters to reflect more accurate survey information. Table B-1 is provided to summarize the physical features of the various plans.

## B3. SELECTED PLAN DESCRIPTION

a. General. Refined Plan 10A Modified (Plate B4), the selected plan for final design, consists of breakwaters and navigation channels which will provide a safe entrance to the harbor, create a mooring basin in Lake Ontario, and provide wave protection for the existing inner harbor. A pedestrian walkway with guardrail and curbs runs atop the entire length of both the detached and shore-connected east breakwaters. The walkways are joined by a foot bridge so that pedestrian access is provided along the entire length of the east breakwaters. A breakwater gap under the footbridge facilitates passage of water and fish between the harbor and Lake Ontario.

Table B-1 Physicial Characteristics of Considered Plans

| Breakwater Features | PLAN NUMBER 10A | 10B | 10A Mod. | Refined 10A Mod. |
|---|---|---|---|---|
| Length: (feet) | | | | |
| West Detached | 760 | 1520 | 1110 | 960 |
| Lakeward End | 500 | 550 | 550 | 550 |
| Shoreward End | 260 | 970 | 560 | 410 |
| West Attached | - | 270 | - | - |
| East Detached | 1525 | 1525 | 1525 | 1545 |
| East Attached | 340 | 340 | 340 | 323 |
| Height: (LWD) | | | | |
| West Detached | +14.5 | +14.5 | +14.5 | +13.0 |
| West Attached | - | +12.7 | - | - |
| East Detached | +14.5 | +14.5 | +14.5 | +13.0 |
| East Attached | +12.7 | +12.7 | +12.9 | +12.0 |
| Entrance Channel Width (feet) | 100 | 150 | 150 | 150 |
| Angle of West Detached (Deg.) | 120 | 130 | 130 | 130 |

b. Breakwaters.

The west detached breakwater has a dogleg shape. It consists of a shoreward leg with a 410 ft-long crest and a lakeward leg with a 550-ft-long crest. The two legs form an interior angle of 130 deg. Side slopes of the shoreward leg are 1V:2H. Section A-A (see Plate B5) is a typical cross section through the shoreward leg. Crest elevation of the shoreward leg is 13.0 ft[1]. The lakeward leg consists of a trunk segment, a head segment, and a transition segment which joins the head to the trunk. Side slopes of the trunk segment are 1V:2H. Section B-B (see Plate B6) is a typical cross section through the trunk. Side slopes of the head segment are 1V:2.5H. Section C-C (see Plate B7) is a typical cross section through the head. Crest elevation of the lakeward leg is also 13.0 ft. There is no pedestrian walkway atop the west breakwater. A profile of the west breakwater is shown in Plate B8.

The east detached breakwater has a crest length of 1545 ft. It consists of a trunk segment, a head segment, and a transition segment which joins the head to the trunk. Side slopes of the trunk segment are 1V:2H. Sections D-D, E-E, and F-F (see Plates B9 through B11) are typical cross sections through the shoreward end, center, and lakeward end, respectively, of the trunk. Side slopes of the head segment are 1V:2.5H. Section G-G (see Plate B12) is a typical cross section through the head. Crest elevation of the east detached breakwater is 13.0 ft. One test boring and a series of probings indicate the presence of an old river bed underlying a portion of the east detached breakwater. Because of this condition it is necessary to overbuild a 500 foot section of this structure by one foot to allow for future settlement. This overbuilt section would be increased in height from 13.0 to 14.0 feet above LWD and would be built between 790 and 1290 feet from the shoreward end of the breakwater. Plates B4 and B13 indicate the location of the section. A 9 foot berm is also provided on the lake side breakwater toe to protect against scour of the soft sandy clay bottom existing in this area. This berm is comprised of a single layer of armor stone over approximately 2 feet of core stone. On the harbor side an armor berm is not required but an approximate 2 foot layer of core stone will be placed to separate the armor stone from the soft clay bottom. The core stone will also extend 5 feet beyond the armor for constructability and to insure adequate support to the armor. The transition of the berms back to the breakwater will require 30 feet on each end of the 500 foot section. A more detailed analysis of the soils and underwater features can be found in the Geotechnical Section of this report. A profile of the east detached breakwater is shown in Plate B13.

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(1) All elevations and depths in this appendix are relative to low water datum (LWD). LWD on Lake Ontario is 242.8 ft. above International Great Lakes Datum (IGLD) of 1955.

The east shore-connected breakwater is to be constructed over the remains of the old hotel pier. It has a crest length of 323 ft, side slopes of 1V:2H, and a crest elevation of 12.0 ft. Section H-H and I-I (see Plates B14 and B15) are typical cross sections through the shoreward end and lakeward end, respectively, of the east shore-connected breakwater. A profile of the east shore-connected breakwater is shown in Plate B16.

The existing old hotel pier consists of approximately 200 feet of relatively stable concrete which remains in use by the public. This section is 8± feet wide and varies in height. The construction consists of stone filled timber cribs with a concrete cap. Beyond the usable end of the pier is a series of rubble piles consisting of the remains of crib material and monolithic concrete piers, some of which project above the water surface. Lying in various positions on the lake bottom are concrete slabs that spanned the piers. The spans are approximately 8 feet wide by 25 feet long and generally lie 10 - 50 feet west of the piers. All of the material located between the proposed east offshore breakwater and the east shore connected breakwater will be removed. All this material except the timbers will be utilized in the construction of the new proposed breakwaters. The end portion of the existing hotel pier consists of a rectangular platform 38 feet wide by 59 feet long and surface elevation of approximately +6.2 feet above LWD. Plate B4 shows the location of the end portion of the pier with a general profile of the pier shown on Plate B17.

An underwater investigation in November of 1990 revealed that, although some vertical perimeter sections of the cribbing have deteriorated, the integrity of the structure as a whole generally remains reasonably sound. A major portion of this structure will remain exposed to serve as a fishing platform and will be accessible from the east detached breakwater. For improved safety purposes a concrete cap will be constructed to provide a more uniform top surface. Stone protection around the base of the structure will also be installed to protect against further deterioration of the cribbing. More detail about this structure and how it is tied into the east detached breakwater can be found in the Structural Design Analysis, sub appendix C.

Stone size calculations are presented in Section B6(a) Design lengths and crest heights of the breakwaters are presented in Section B6(b). They are designed to provide tranquil harbor conditions.

c. <u>Channels.</u> The layout of the channels is shown in Plate B4. A 150-ft-wide, 10-ft-deep entrance channel between the east and west breakwaters connects deep water in Lake Ontario with an irregularly shaped maneuvering basin immediately inside the breakwaters. A 75-ft-wide, 7-ft-deep, 1200-ft-long access channel provides access from the maneuvering basin to the mooring basin. No dredging is required to obtain the stated channel depths. Details of the channel designs are presented in Section B6(c).

## B4. PHYSICAL MODEL STUDIES

Three physical model studies were conducted in support of the harbor design effort to meet design criteria and evaluate project impact on fishery parameters. The first two studies were three-dimensional model studies of the harbor's response to storm waves, current, creek flow conditions and sediment patterns. The third study was a two-dimensional model study of the transmission characteristics of the breakwaters. It is useful to provide a brief description of these studies in this section before proceeding to subsequent sections which discuss design conditions and details of the design.

The two main aspects of breakwater design are selection of stone sizes and design for harbor tranquility. Selection of stone sizes primarily involves calculating the armor stone size which will be stable when exposed to the design storm waves. Design for harbor tranquility involves (1) minimizing breakwater lengths without allowing unacceptably high diffraction-induced wave heights inside the harbor and (2) minimizing breakwater heights without allowing unacceptably high transmission and overtopping induced wave heights in the harbor.

Two major purposes of the three-dimensional physical model studies (the layout of the model is shown in Plate B18) were to: (1) to study the harbor's response to diffracted waves so as to determine optimum breakwater lengths (Section B6(b)(1) provides a further discussion); and (2) to obtain design wave conditions for sizing armor stones (Section B6(b) provides a further discussion). Details of the study are presented by Bottin and Acuff (1990). The 1:60 scale of this model is adequate for modeling diffraction and reflections but is not adequate for modeling transmission and overtopping. It is essential that the breakwaters allow only minimal transmission and overtopping since they are the only barrier between the mooring basin and the open lake.

A 1:20-scale, two-dimensional physical model study (the experimental setup is shown in Plate B19) of a typical breakwater cross section was used to study transmission and overtopping characteristics of the breakwaters and ultimately to determine optimum breakwater height. The model was also used to check the structural stability of the breakwaters. Section B6(b)(3) discusses how the two-dimensional physical model was used to accomplish these tasks. Details of the study are presented by Carver (1991).

Since the overall response of the harbor is dictated by a complex interaction of the effects of diffraction, reflection, transmission and overtopping, engineering judgment plays an important role in analyzing and using results from the two models to design the breakwaters.

## B5. DESIGN CONDITIONS

Stone size calculations are based on a 10-year high water level and a 20-year wave with all seasons of the year considered. Design for harbor tranquility is based on a 10-year high water level and a 20-year wave but only for the boating season, which runs from April through the end of October, is considered. This combination of waves and water levels was used opposed to a 20-year water level and 10-year wave due to the more conservative wave height that is generated.

Specification of the wave height and a low water level to be used for determining appropriate channel depths is relegated to Section B6(c).

### a. Design Water Levels.

Table B-2 lists by season the 10-year mean lake level of Lake Ontario, the 1-year peak rise at Olcott Harbor, and a combined water level which is the sum of the two. Values are listed for four seasons: winter (January - March), spring (April - June), summer (July - September), and fall (October - December). The mean lake levels are from U.S. Army Corps of Engineers (USACE), Detroit District (1979a). The peak rises are from USACE, Detroit District (1979b). Combined water levels from Table B-2 were used in the three-dimensional physical model study. Specifically, a +2.8 ft water level was used for studying fall and winter conditions, and a +4.0 ft water level was used for studying spring and summer conditions.

Only boating season conditions are relevant to the two-dimensional physical model study. In this study, tests were conducted using the 10-year open-coast flood level of +4.3 ft (USACE, Detroit District, 1988). Since seasonal high water levels occur during the boating season, and since the magnitude of storm-induced water level fluctuations at Olcott are small compared to the magnitude of seasonal and long-term fluctuations, the open-coast flood levels represent events which occurred during the boating season. Open-coast flood levels were not used in the three-dimensional model study only because they were not yet published at the time of the three-dimensional tests. At any rate, it is not surprising that the combination of a 1-year, boating-season peak rise plus a 10-year, boating-season lake level yields a total water level of 4.0 ft which is approximately equal to the 10-year open-coast flood level of +4.3 ft.

A secondary series of tests was conducted in the two-dimensional model using the 50-year open coast flood level of +5.1 ft. These tests were used to examine the sensitivity of transmission- and overtopping-induced wave heights to water level.

Table B-2. Water levels and peak rises at Olcott, New York

| Season | 10-yr mean lake level (ft) | 1-yr peak rise (ft) | 10-yr mean lake level plus 1-yr peak rise (ft) |
|---|---|---|---|
| Winter | +2.5 | 0.3 | +2.8 |
| Spring | +3.8 | 0.2 | +4.0 |
| Summer | +3.7 | 0.2 | +3.9 |
| Fall | +2.3 | 0.3 | +2.6 |

b. Design Waves.

The basis of the wave analysis is the deepwater wave information presented by Resio and Vincent (1976). They carried out numerical wave hindcasts for Lake Ontario based on historical wind data and then performed frequency analyses on the resulting wave data. Table B-3 lists by season and angle class the 5-, 10-, 20-, 50-, and 100-year deepwater significant wave heights offshore of Olcott. Table B-4 lists the wave period associated with each significant wave height and angle class. The four seasons are: winter (January - March), spring (April - June), summer (July - September), and fall (October - December). Angle classes include deepwater waves approaching from directions between the limits shown in Plate B20.

The transformation of each 20-year wave in Table B-3 as it propagates from deep water to shallow water at the breakwaters was investigated using the RCPWAVE numerical wave propagation model (Ebersole, Prater, and Cialone; 1986) and a three-dimensional physical model. The RCPWAVE model was used to model wave transformation from deep water to intermediate water depth approximately 3000 ft offshore. Water level and deepwater wave conditions used as input for each of twenty RCPWAVE runs are listed in Table B-5. Shoreward of this point, shallow depths induce wave breaking and white capping and thereby cause a significant decrease in wave height. These processes are not modeled by RCPWAVE. To model wave transformation shoreward of the 3000 ft mark for the existing conditions and to model wave propagation into the proposed harbor, the three-dimensional physical model was used. For each run, RCPWAVE model results at the location of the wave maker were used to determine an appropriate spectrum to be generated by the wave maker.

Model wave heights from the three-dimensional physical model tests on the existing conditions were used to determine design wave heights for stone size calculations. During these tests wave heights were recorded at 7 gages in the vicinity of the proposed breakwaters (see Plate B21) and at 6 other gages. Significant wave heights, $H_{1/3}$, were reported by Bottin and Acuff

**Table B-3. Deepwater significant wave heights (in feet) offshore of Olcott, NY**

**WINTER**

| Return Period (Years) | ANGLE CLASSES | | | |
|---|---|---|---|---|
| | 30° right of normal | Shore Normal | 30° left of normal | |
| | 1 | 2 | 3 | All |
| 5 | 6.6 | 8.9 | 9.2 | 10.5 |
| 10 | 7.5 | 9.8 | 9.5 | 11.6 |
| 20 | 8.9 | 12.1 | 9.8 | 12.6 |
| 50 | 9.2 | 13.1 | 10.5 | 14.1 |
| 100 | 9.8 | 14.4 | 13.1 | 15.2 |

**SPRING**

| Return Period (Years) | ANGLE CLASSES | | | |
|---|---|---|---|---|
| | 30° right of normal | Shore Normal | 30° left of normal | |
| | 1 | 2 | 3 | All |
| 5 | 3.9 | 4.9 | 5.6 | 5.7 |
| 10 | 4.3 | 5.6 | 6.2 | 6.7 |
| 20 | 4.9 | 5.9 | 6.9 | 7.7 |
| 50 | 5.6 | 7.9 | 8.5 | 9.0 |
| 100 | 6.6 | 8.5 | 9.2 | 10.1 |

**SUMMER**

| Return Period (Years) | ANGLE CLASSES | | | |
|---|---|---|---|---|
| | 30° right of normal | Shore Normal | 30° left of normal | |
| | 1 | 2 | 3 | All |
| 5 | 3.6 | 4.9 | 4.9 | 6.6 |
| 10 | 5.2 | 5.6 | 5.2 | 7.4 |
| 20 | 7.5 | 6.2 | 6.9 | 8.2 |
| 50 | 8.9 | 7.2 | 7.9 | 9.6 |
| 100 | 10.5 | 7.5 | 8.2 | 10.7 |

Table B-3. continued

FALL

| Return Period (Years) | ANGLE CLASSES | | | |
|---|---|---|---|---|
| | 30° right of normal | Shore Normal | 30° left of normal | |
| | 1 | 2 | 3 | All |
| 5 | 4.9 | 9.8 | 8.5 | 9.5 |
| 10 | 5.6 | 10.2 | 8.9 | 10.3 |
| 20 | 5.9 | 10.8 | 9.2 | 11.1 |
| 50 | 7.2 | 12.5 | 9.8 | 12.2 |
| 100 | 8.2 | 12.8 | 10.8 | 13.0 |

**Table B-4. Deepwater significant wave periods offshore of Olcott, NY**

| WAVE HEIGHT (FT) | ANGLE CLASS 1 | 2 | 3 |
|---|---|---|---|
| 1 | 2.2 | 2.1 | 2.3 |
| 2 | 3.5 | 3.3 | 3.6 |
| 3 | 4.4 | 4.2 | 4.5 |
| 4 | 5.1 | 4.9 | 5.2 |
| 5 | 5.7 | 5.4 | 5.8 |
| 6 | 6.0 | 5.7 | 6.1 |
| 7 | 6.3 | 6.0 | 6.4 |
| 8 | 6.6 | 6.2 | 6.8 |
| 9 | 6.9 | 6.5 | 7.1 |
| 10 | 7.3 | 6.8 | 7.4 |
| 11 | 7.6 | 7.1 | 7.7 |
| 12 | 7.9 | 7.4 | 8.0 |
| 13 | 8.2 | 7.6 | 8.4 |
| 14 | 8.5 | 7.9 | 8.7 |
| 15 | 8.8 | 8.2 | 9.0 |
| 16 | 9.1 | 8.5 | 9.3 |
| 17 | 9.4 | 8.8 | 9.6 |
| 18 | 9.7 | 9.0 | 10.0 |
| 19 | 10.0 | 9.3 | 10.3 |
| 20 | 10.3 | 9.6 | 10.6 |
| 21 | 10.7 | 9.9 | 10.9 |
| 22 | 11.0 | 10.2 | 11.2 |
| 23 | 11.3 | 10.4 | 11.6 |
| 24 | 11.6 | 10.7 | 11.9 |
| 25 | 11.9 | 11.0 | 12.2 |

**Table B-5. Deepwater wave conditions and water levels for RCPWAVE model runs**

| Run No. | Water Level (ft) | Deepwater Wave Direction* (deg) | Deepwater Significant Wave Height (ft) | Wave Period (sec) |
|---|---|---|---|---|
| 1 | 4.0 | -60.0 | 4.9 | 5.7 |
| 2 | 4.0 | -30.0 | 4.9 | 5.7 |
| 3 | 4.0 | 00.0 | 5.9 | 5.7 |
| 4 | 4.0 | 30.0 | 6.9 | 6.4 |
| 5 | 4.0 | 60.0 | 6.9 | 6.4 |
| 6 | 3.9 | -60.0 | 7.5 | 6.4 |
| 7 | 3.9 | -30.0 | 7.5 | 6.4 |
| 8 | 3.9 | 00.0 | 6.2 | 5.8 |
| 9 | 3.9 | 30.0 | 6.9 | 6.4 |
| 10 | 3.9 | 60.0 | 6.9 | 6.4 |
| 11 | 2.6 | -60.0 | 5.9 | 6.0 |
| 12 | 2.6 | -30.0 | 5.9 | 6.0 |
| 13 | 2.6 | 00.0 | 10.8 | 7.0 |
| 14 | 2.6 | 30.0 | 9.2 | 7.2 |
| 15 | 2.6 | 60.0 | 9.2 | 7.2 |
| 16 | 2.8 | -60.0 | 8.9 | 6.9 |
| 17 | 2.8 | -30.0 | 8.9 | 6.9 |
| 18 | 2.8 | 00.0 | 12.1 | 7.4 |
| 19 | 2.8 | 30.0 | 9.8 | 7.4 |
| 20 | 2.8 | 60.0 | 9.8 | 7.4 |

* Wave directions are "from which they came," measured counter clockwise from a line normal to shore.

and are listed in Table B-6. To calculate stone size from Hudson's formula $H_{1/10}$ is used. For the depths and wave conditions under consideration the wave height probability density is well described by the Rayleigh distribution, hence, $H_{1/10} = 1.27H_{1/3}$.

Since wave heights at different locations along the proposed breakwaters vary considerably, different design wave heights were selected for (1) the shoreward leg of the west breakwater, (2) the lakeward leg of the west breakwater, (3) the east detached breakwater, and (4) the east shore-connected breakwater. The procedure used to select a design wave height from Table B-6 for each of these four locations is as follows:

(1) **Shoreward leg of west breakwater.** $H_{1/3}$ is the maximum of all values listed for Gages 1 and 2.

(2) **Lakeward leg of west breakwater.** $H_{1/3}$ is the maximum of all values listed for Gages 2 and 3.

(3) **East detached breakwater.** $H_{1/3}$ is the maximum of all values listed for Gages 4, 5, 6, and 7.

(4) **East shore-connected breakwater.** $H_{1/3}$ is the maximum of values listed for Gage 7, except that the only directions considered are 24 and 42 deg.

Directions of 313, 334, and 343 deg are not considered when selecting a design wave for the east shore-connected breakwater since it is sheltered from these waves by the detached breakwaters. Table B-7 lists $H_{1/3}$ and $H_{1/10}$ for each of the four locations. In the Section B6(a), $H_{1/10}$ is used in Hudson's formula to calculate stone sizes at each of the four locations.

**Table B-7. $H_{1/3}$ and $H_{1/10}$ for four breakwater segments**

| Breakwater Segment | $H_{1/3}$ (ft) | $H_{1/10}$ (ft) |
|---|---|---|
| West Breakwater, Shoreward Leg | 9.9 | 12.6 |
| West Breakwater, Lakeward Leg | 9.9 | 12.6 |
| East Detached Breakwater | 8.0 | 10.2 |
| East Shore-Connected Brkwtr. | 5.1 | 6.5 |

# Table B6

## Wave Heights for Existing Conditions

| Direction deg | Test Wave Period sec | Test Wave Height ft | Wave Height, ft Gage 1 | Gage 2 | Gage 3 | Gage 4 | Gage 5 | Gage 6 | Gage 7 | Gage 8 | Gage 9 | Gage 10 | Gage 11 | Gage 12 | Gage 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | swl = +2.8 ft | | | | | | | | | |
| 313 | 7.2 | 7.6 | 6.4 | 6.4 | 7.3 | 6.4 | 6.5 | 6.9 | 5.0 | 6.1 | 5.7 | 3.7 | 1.1 | 0.5 | 0.4 |
| | 7.4 | 8.0 | 6.7 | 7.0 | 7.7 | 6.5 | 6.4 | 6.7 | 5.0 | 6.6 | 5.9 | 3.7 | 1.2 | 0.5 | 0.4 |
| | | | | | | swl = +4.0 ft | | | | | | | | | |
| | 6.4 | 6.3 | 4.9 | 5.3 | 5.4 | 5.8 | 4.2 | 5.9 | 4.2 | 4.9 | 4.1 | 3.0 | 1.2 | 0.6 | 0.4 |
| | | | | | | swl = +2.8 ft | | | | | | | | | |
| 334 | 7.2 | 8.4 | 5.6 | 7.4 | 7.9 | 7.6 | 5.7 | 6.8 | 4.8 | 6.5 | 5.8 | 3.4 | 1.2 | 0.4 | 0.4 |
| | 7.4 | 8.8 | 6.1 | 7.7 | 8.3 | 7.8 | 6.1 | 7.4 | 4.6 | 6.6 | 6.0 | 3.7 | 1.4 | 0.5 | 0.5 |
| | | | | | | swl = +4.0 ft | | | | | | | | | |
| | 6.4 | 6.5 | 4.9 | 5.3 | 6.2 | 6.0 | 3.5 | 5.9 | 4.4 | 4.9 | 4.8 | 3.6 | 1.1 | 0.6 | 0.4 |
| | | | | | | swl = +2.8 ft | | | | | | | | | |
| 343 | 7.0 | 9.9 | 4.3 | 9.6 | 7.8 | 7.6 | 6.3 | 5.6 | 4.2 | 6.5 | 5.2 | 3.3 | 1 2 | 0.4 | 0.4 |
| | 7.4 | 11.0 | 4.5 | 9.9 | 8.6 | 8.0 | 7.2 | 5.8 | 4.4 | 6.7 | 5.1 | 3.3 | 1.3 | 0.5 | 0.4 |
| | | | | | | swl = +4.0 ft | | | | | | | | | |
| | 5.7 | 5.8 | 4.3 | 5.7 | 5.9 | 5.7 | 3.3 | 4.7 | 3.7 | 5.4 | 5.0 | 3.5 | 1.1 | 0.4 | 0.4 |
| | 5.8 | 6.1 | 4.6 | 6.8 | 6.2 | 6.1 | 3.5 | 4.8 | 3.7 | 5.5 | 4.9 | 3.4 | 1.3 | 0.5 | 0.4 |
| | | | | | | swl = +2.8 ft | | | | | | | | | |
| 24 | 6.0 | 5.5 | 5.1 | 6.5 | 3.9 | 3.6 | 4.7 | 5.9 | 4.8 | 4.0 | 3.2 | 2.6 | 0.8 | 0.2 | 0.3 |
| | 6.9 | 7.9 | 6.5 | 8.6 | 5.9 | 5.5 | 7.0 | 6.8 | 5.1 | 5.4 | 5.5 | 3.2 | 1.5 | 0.6 | 0.5 |
| | | | | | | swl = +4.0 ft | | | | | | | | | |
| | 5.7 | 4.7 | 4.4 | 4.6 | 3.2 | 3.1 | 3.1 | 5.3 | 4.1 | 2.5 | 2.5 | 2.5 | 0.8 | 0.2 | 0.2 |
| | 6.4 | 6.9 | 5.0 | 5.8 | 3.9 | 3.9 | 4.7 | 5.4 | 4.9 | 3.1 | 3.4 | 2.6 | 0.9 | 0.3 | 0.3 |

(Continued)

# Table B6 (Concluded)

| Direction deg | Test Wave Period sec | Test Wave Height ft | Wave Height, ft Gage 1 | Gage 2 | Gage 3 | Gage 4 | Gage 5 | Gage 6 | Gage 7 | Gage 8 | Gage 9 | Gage 10 | Gage 11 | Gage 12 | Gage 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | swl = +2.8 ft | | | | | | | | | | | | |
| 42 | 6.0 | 4.7 | 3.1 | 4.7 | 3.4 | 3.9 | 4.8 | 5.5 | 4.6 | 4.9 | 3.4 | 4.0 | 1.1 | 0.3 | 0.3 |
| | 6.9 | 6.4 | 4.4 | 6.1 | 4.1 | 4.9 | 5.4 | 6.0 | 4.5 | 6.5 | 5.7 | 4.4 | 1.3 | 0.5 | 0.3 |
| | | | swl = +4.0 ft | | | | | | | | | | | | |
| | 5.7 | 4.0 | 1.9 | 2.7 | 2.2 | 2.8 | 3.0 | 3.3 | 3.1 | 2.9 | 3.0 | 2.9 | 1.0 | 0.3 | 0.3 |
| | 6.4 | 5.8 | 2.8 | 3.9 | 2.8 | 3.5 | 4.2 | 5.0 | 4.0 | 4.0 | 3.8 | 3.9 | 1.1 | 0.4 | 0.3 |

c. Littoral Processes.

(1) General. Bluffs in the vicinity of Olcott Harbor generally range from 12 to 45 feet in height consisting primarily of glaciolacustrine sand, silt and clay from glacial Lake Iroquois. West of Olcott, the silt and clay content of the bluff materials increases and lacustrine deposits over the till become thicker. East of Olcott, glaciolacustrine deposits over the till are less continuous but sand and gravel contents of the bluff material are higher (Drexhage and Calkin 1981). However, the percentage of sand and gravel in the bluffs is relatively small as is evident by the narrow and discontinuous beaches along the Niagara County shoreline. Beaches that exist are generally less than 20 feet wide with the widest beaches in embayments and adjacent to shore perpendicular structures. At Olcott Harbor the only significant beaches are located adjacent to the groins at Krull Park and near the Federal West pier. These beaches have historically been very stable and are comprised of coarse sands and gravels. The beaches in the groin field are maintained for swimming purposes but consist of a relatively thin layer of sediments which taper off to bedrock approximately 50 feet offshore. The existing beach deposits at this location are estimated to average only two to three feet thick. The beach west of the west pier is approximately 800 feet in length and extends westerly to the west bank of a previous river outlet. At this location the beach tapers off and the bluff rises to 20 - 25 feet in height. In July 1990 four test pits were dug along the westerly beach to determine the thickness and type of sediments in this area. All of the test pits were dug to a depth of between 5.5 and 8.0 feet after which it was not possible to dig any deeper due to the high water table and collapsing of material into the holes. It is believed that bedrock was encountered in one hole near the waters edge although this could not be confirmed. Material in the test pits as well as that on the beach surface was irregular in composition and consisted of a mixture of sand, gravels and cobbles. Even though this showed that a relatively thick layer of sediments existed on the beach a homeowner, during excavation of the pits, indicated that a smooth layer of bedrock was exposed just offshore in about 5 feet of water. The predominant direction of littoral transport in the vicinity of Olcott is from west to east, however the net transport rate is very low as evidenced by the small amount of littoral material trapped by area groins. Observation of sediment movement between the existing groins at Krull Park indicate that sediments periodically move shoreward and then either easterly or westerly depending on the incident wave direction.

(2) Tracer Study. In order to verify the above observations and to determine potential impacts of the project on the littoral system, a tracer study (using coal dust) was performed as part of the three dimensional physical model investigation. The general movement of tracer material and subsequent deposits on each side of the harbor for pre-project conditions was tested using a range

of wave heights from each of three different angle classes and water levels of +2.8 to +4.0 feet. For test waves from the northwest, sediment located west of2 the existing entrance channel migrated easterly adjacent to the Federal West Pier and at the same time material east of the entrance moved easterly to and over the remnants of the existing hotel pier and deposited along the shoreline and adjacent to the west most groin at Krull Park. In general, tracer material between groins at Krull Park moved shoreward and then either easterly or westerly depending on the incident wave direction. For all wind directions, the tracer material remained between the groins in which it was originally placed. It did not move around the heads of the groins nor was it washed over the top. These findings appear to accurately reflect actual conditions.

For post-project conditions, model test number 16 (Plan 10A) was considered to most closely approximate the configuration of the selected plan, relative to tracer material travel.

Tracer test results on the harbor east side revealed that material placed within the groin field at Krull Park would remain between the structures for various test wave directions. It may move east or west between the groins but as with the existing condition tests, did not move from one cell to an .er. Since the harbor breakwater structures protect the groin field from the westerly wave direction, sediment in the groin field will be exposed predominately to waves from the north and east and will likely accumulate on the west side of each cell.

Tests conducted on the harbor west side indicated that sediment deposits would not occur in the navigation channel for test waves from the westerly direction. Tracer material moved towards the existing Federal West Pier and deposited against it, but did not move to its lakeward end and into the navigation channel. Since the actual beach consists of sand, gravel and cobbles, deposition of this material against the pier, if significant, may have some benefit in that it will help minimize any large waves from overtopping the pier as is known to occasionally happen. This accretion however, would be at the expense of material from the west end of the existing pocket beach since northeasterly storm events will not easily move material back to maintain the existing equilibrium position. As a result, beach widths at the west end of the pocket beach will likely decrease with a widening of the beach at its east end. The degree of this adjustment and the impact on the adjacent properties is difficult to predict. As a means to measure anticipated post construction beach realignment changes a small scale monitoring program will be recommended as part of the operation and maintenance of the project. This should consist primarily of ground level surveys to be specified in the project's O & M Manual which will be furnished by the Corps to the local sponsor upon completion of the project.

## B6. DETAILED DESIGN

### a. Stone Sizes and Layer Thicknesses.

Stone sizes were calculated for each breakwater segment. Armor, underlayer, and bedding stones were sized as follows:

| | |
|---|---|
| Armor: | 0.9W to 2.0W |
| Underlayer: | 0.06W to 0.2W |
| Bedding: | 0.00015W to 0.01W |

where W is calculated using Hudson's formula (SPM, 4th ed., 1984):

$$W = \frac{\sigma_r H_{des}^3}{K_D (S_r - 1)^3 \cot\theta} \qquad (1)$$

In Eq. 1 $\sigma_r$ is the specific weight of the stone; $H_{des}$ is design wave height; $K_D$ is a stability coefficient; $S_r$ is the specific gravity of the stone; and $\cot\theta$ is the inverse of the side slope of the breakwater.

Calculations were made using a specific weight of 162 lbs/ft$^3$, specific gravity of 2.6, side slopes of 1/2.0 for trunk sections and 1/2.5 for head sections. Design wave heights for each breakwater segment were selected from the $H_{1/10}$ column of Table B-7. Stability coefficients were selected from Table B-8 which is excerpted from SPM, 3rd ed., (1977); for trunk sections $K_D$ = 3.5, for head sections $K_D$ = 2.3. Stability coefficients from the SPM 3rd ed. were used based on guidance from North Central Division and based on successful use of these coefficients on a large number of previous coastal projects.

Armor and underlayer thicknesses were calculated using (SPM, 4th ed., 1984):

$$t = nk_\delta \left[ \frac{W_{ave}}{\sigma_r} \right]^{1/3} \qquad (2)$$

where n is the number of stones comprising the layer thickness; $k_\delta$ is a layer coefficient equal to 1.0 for randomly placed quarry stone; and $W_{ave}$ is the average weight of stones in the layer. Results of the stone size and layer thickness calculations for each breakwater segment are listed in Table B-9.

It is impractical to use the many stone sizes listed in Table B-9; therefore only five sizes, as listed in Table B-10, were actually selected for the final design. The sizes selected

# Table B8 - Stability Coefficients for Hudsons Formula

Suggested $K_D$ Values for Use in Determining Armor Unit Weight

| No-Damage Criteria and Minor Overtopping | | | | | | | |
|---|---|---|---|---|---|---|---|
| Armor Units | n * | Placement | Structure Trunk | | Structure Head | | |
| | | | $K_D$ § | | $K_D$ | | Slope |
| | | | Breaking wave | Nonbreaking wave | Breaking wave | Nonbreaking wave | cot θ |
| Quarrystone | | | | | | | |
| Smooth rounded | 2 | random | 2.1 | 2.4 | 1.7 | 1.9 | 1.5 to 3.0 |
| Smooth rounded | >3 | random | 2.8 | 3.2 | 2.1 | 2.3 | ‖ |
| Rough angular | 1 | random † | † | 2.9 | † | 2.3 | ‖ |
| Rough angular | 2 | random | 3.5 | 4.0 | 2.9<br>2.5<br>2.0 | 3.2<br>2.8<br>2.3 | 1.5<br>2.0<br>3.0 |
| Rough angular | >3 | random | 3.9 | 4.5 | 3.7 | 4.2 | ‖ |
| Rough angular | 2 | special ‡ | 4.8 | 5.5 | 3.5 | 4.5 | ‖ |
| Tetrapod and Quadripod | 2 | random | 7.2 | 8.3 | 5.9<br>5.5<br>4.0 | 6.6<br>6.1<br>4.4 | 1.5<br>2.0<br>3.0 |
| Tribar | 2 | random | 9.0 | 10.4 | 8.3<br>7.8<br>7.0 | 9.0<br>8.5<br>7.7 | 1.5<br>2.0<br>3.0 |
| Dolos | 2 | random | 22.0 ¶ | 25.0 ¶ | 15.0<br>13.5 | 16.5<br>15.0 | 2.0 £<br>3.0 |
| Modified Cube | 2 | random | 6.8 | 7.8 | — | 5.0 | ‖ |
| Hexapod | 2 | random | 8.2 | 9.5 | 5.0 | 7.0 | ‖ |
| Tribar | 1 | uniform | 12.0 | 15.0 | 7.5 | 9.5 | ‖ |
| Quarrystone ($K_{RR}$) Graded angular | – | random | 2.2 | 2.5 | | | |

* n is the number of units comprising the thickness of the armor layer.

† The use of single layer of quarrystone armor units subject to breaking waves is not recommended, and only under special conditions for nonbreaking waves. When it is used, the stone should be carefully placed.

‡ Special placement with long axis of stone placed perpendicular to structure face.

§ Applicable to slopes ranging from 1 on 1.5 to 1 on 5.

‖ Until more information is available on the variation of $K_D$ value with slope, the use of $K_D$ should be limited to slopes ranging from 1 on 1.5 to 1 on 3. Some armor units tested on a structure head indicate a $K_D$-slope dependence.

¶ Data only available for 1 on 2 slope.

£ Slopes steeper than 1 on 2 not recommended at the present time.

for the armor layer, underlayer, and bedding of each breakwater segment are listed in Table B-11.

Table B-9. Preliminary stone sizes and layer thicknesses for four breakwater segments

| Section | Armor Layer | | | Underlayer | | Bedding |
|---|---|---|---|---|---|---|
| | Weight (tons) | 1-Layer Thickness (ft.) | 2-Layer Thickness (ft.) | Weight (lbs.) | 2-Layer Thickness (ft.) | Weight (lbs.) |
| East Detached Brkwtr. (trunk section) | 2.7 to 6.0 | 3.8 | 7.5 | 360 to 1200 | 3.3 | 1 to 60 |
| East Detached Brkwtr. (head section) | 3.2 to 7.2 | 4.0 | 8.0 | 430 to 1440 | 3.6 | 1 to 70 |
| East Shore-Connected Breakwater | 0.7 to 1.56 | 2.4 | 4.8 | 90 to 310 | 2.2 | 1 to 50 |
| West Breakwater, Lakeward Leg (trunk section) | 5.0 to 11.2 | 4.6 | 9.3 | 670 to 2240 | 4.2 | 1 to 110 |
| West Breakwater, Lakeward Leg (head section) | 6.2 to 13.8 | 5.0 | 10.0 | 830 to 2760 | 4.5 | 2 to 140 |
| West Breakwater, Shoreward Leg | 5.0 to 11.2 | 4.6 | 9.3 | 670 to 2240 | 4.2 | 1 to 110 |

### b. Design for Harbor Tranquility.

**(1) General.** Designing for harbor tranquility involves adjusting the breakwater configuration and the breakwater crest elevations so that the harbor is not excessively disturbed by storm waves during the boating season. The goal is to minimize stone quantities while still providing adequate wave protection. The following criteria were used to define an acceptable level of wave action in the harbor: (1) for the design conditions discussed in Section 4b, significant wave heights in the mooring basin should be less than 1 ft and significant wave height in the entrance channel should be less than 3 ft. and (2) excessive overtopping of the existing Federal piers should be avoided.

Harbor tranquility can be disturbed by wave diffraction through breakwater gaps, by waves overtopping the breakwaters, and by wave transmission through the porous structure of the

**Table B-10. Selected stone sizes and corresponding layer thicknesses**

| Stone Type | Weight (lbs.) | 1-Layer Thickness (ft.) | 2-Layer Thickness (ft.) |
|---|---|---|---|
| A1 | 8000 to 22000 | 4.5 | 9.0 |
| A2 | 1400 to 3000 | 2.4 | 4.8 |
| U1 | 600 to 2200 | NA | 4.1 |
| U2 | 100 to 350 | NA | 2.2 |
| B1 | 2 to 125 | NA | NA |

**Table B-11. Final design stone sizes for four breakwater segments**

| | Armor Layer Stone Type | Underlayer Stone Type | Bedding Stone Type |
|---|---|---|---|
| East Detached Brkwtr. (trunk section) | A1 | U1 | B1 |
| East Detached Brkwtr. (head section) | A1 | U1 | B1 |
| East Shore-Connected Breakwater | A2 | U2 | B1 |
| West Breakwater, Lakeward Leg (trunk section) | A1 | U1 | B1 |
| West Breakwater, Lakeward Leg (head section) | A1 | U1 | B1 |
| Detached Hotel Pier | A1 | U1 | -- |

breakwaters. Once waves propagate into the harbor, tranquility is further disturbed by reflections from the highly reflective steel sheet pile wall of the existing pier and to a lesser extent by weak reflections from the shoreline. The resulting complex wave pattern in the harbor was studied using the three-dimensional and two-dimensional physical models. The manner in which the model results were used to design the breakwaters is described in the remainder of this section.

**(2) Three-Dimensional Physical Model Study.** Results of the three-dimensional model study were used to determine a breakwater configuration which would meet the stated wave-height criteria. In the model study two basic harbor configurations (10A and 10B) were considered. Sixteen different plans--each plan a variation of the basic configuration--were tested for the first basic configuration. These are Plans 1 through 16 as shown in Plates B22 through 25. Seven different plans were tested for the second configuration. These are plans 17 through 23 as shown in Plates B26 and B27. The first basic configuration provides a 100-ft-wide entrance channel and a single mooring basin to the east of the existing piers. The second basic configuration differs from the first mainly in that the entrance channel is 150 ft wide and that an additional mooring basin is provided to the west of the existing piers.

For the first basic configuration, Plan 16 met the wave-height criteria. For the second basic configuration, Plan 19 also met the wave-height criteria. The plan selected for detailed design during the Reevaluation Study (Plan 10A Modified) was a combination of these two plans. It is therefore necessary to discuss how Plan 10A Modified was developed.

The east breakwaters are the same in both of these plans. Hence, for Plan 10A Modified the location of the east breakwaters is given by both Plan 16 and Plan 19. Plan 10A Modified also incorporates a 130 degree dogleg of Plan 19 rather than the 120 degree angle of Plan 16 to better accommodate any future harbor expansion. Per Section B6(c) (Channel Design) the entrance channel will be 150 feet wide hence the lakeward leg of the west breakwater will be similar to Plan 19 (550 feet long). However, the shoreward leg as determined by Plan 16 of the model study was determined to be only 260 feet long to provide adequate protection against extreme storm waves from the northwest. However, based on the possibility of nearly shore parallel waves entering the basin and to minimize overtopping of the West Pier, the shoreward leg of the west breakwater was set at 560 feet.

A follow-up letter from the Waterways Experiment Station dated 6 December 1990 suggested a less conservative length could be used for the shoreward leg. A length of 410 feet was finally selected. The final breakwater configuration (Refined Plan 10A Modified) is shown in Plate B4.

The three-dimensional model tests showed that diffraction through the breakwater gaps was a much greater contributor to wave heights in the mooring basin than were overtopping and transmission. The tests also showed that wave heights were largest near the breakwater gaps and decreased rapidly towards the middle of the mooring basin. Since the criterion for maximum wave height in the mooring basin is 1 ft, and since diffracted wave heights in the basin are less than 1 ft (except in the immediate vicinity of the breakwater gaps), it is reasonable to allow a wave height due to overtopping and transmission of approximately ½ ft during the boating season. The two-dimensional physical model study was used to find the lowest crest elevation which would satisfy this criteria.

**(3) Two-Dimensional Physical Model Study.** A two dimensional flume test was conducted by the Coastal Engineering Research Center (CERC) in October of 1990. This report is provided in its entirety as an attachment to this appendix.

The experimental setup is shown in Plate B19. Details of the study are given by Carver (1990). A typical section through the east detached breakwater was modeled. This particular section was chosen (as opposed to a section of the west breakwater) since waves generated by overtopping of the west breakwater will decay as they propagate towards the mooring basin and because the east breakwater and the existing piers shelter the mooring basin to some extent from waves generated by overtopping of the west breakwater.

Two plans were tested--Plan 1 and Plan 1A. The cross section of Plan 1 is shown in Plate B28. Plan 1A is the same as Plan 1 except that the crest elevation is lowered from +14 ft to +12.5 ft. Plan 1 was tested using water levels of +4.3 ft (the 10-year open-coast flood level) and +5.1 ft (the 50-year open coast flood level). Plan 1A was tested only for the +5.1 ft water level; but the trend of transmitted wave heights at the +4.3 ft water level being 0.1 to 0.2 ft smaller than transmitted wave heights at the +5.1 ft water level which was observed for Plan 1 is expected to hold for Plan 1A. Test results are presented in Tables B-12 through B-14.

**Table B-12. Flume test results for Plan 1 cross section, water level = +4.3 ft LWD**

| Wave Period (sec) | Wave Height at Structure (feet) | Transmitted Wave Height (feet) |
|---|---|---|
| 6.0 | 2.7 | 0.2 |
| 6.0 | 4.1 | 0.3 |
| 6.0 | 5.2 | 0.4 |
| 6.0 | 6.2 | 0.4 |
| 7.0 | 3.5 | 0.3 |
| 7.0 | 5.2 | 0.4 |
| 7.0 | 6.6 | 0.5 |
| 7.0 | 7.3 | 0.6 |
| 8.0 | 3.6 | 0.4 |
| 8.0 | 5.4 | 0.5 |
| 8.0 | 6.8 | 0.5 |
| 8.0 | 7.8 | 0.6 |

To make use of this transmission data, a design incident wave was selected from the three dimensional model tests that corresponds to the transmission test data. The design incident wave was selected from Table B-6 which lists results from the three-dimensional model tests on existing conditions. Since only the boating season is of concern, the design incident wave was selected by considering only those tests which were conducted using the spring/summer water level of +4.0 ft. Furthermore, since concern is with the east detached breakwater and since this breakwater is sheltered from northwesterly waves by the west breakwater, only those tests conducted using directions of 343 deg, 24 deg, and 42 deg were considered. Gages 4, 5, and 6 lie along the east detached breakwater. Hence the design incident wave from Table B-6 is a 6.1 ft, 5.8 sec wave as measured at Gage 6 for the 343 degree direction.

The transmitted wave heights corresponding to this incident wave were extracted from Tables B-12 through B-14 and are listed in Table B-15.

**Table B-13. Flume test results for Plan 1 cross section, water level = +5.1 ft LWD**

| Wave Period (sec) | Wave Height at Structure (feet) | Transmitted Wave Height (feet) |
|---|---|---|
| 6.0 | 2.8 | 0.2 |
| 6.0 | 4.1 | 0.3 |
| 6.0 | 5.3 | 0.4 |
| 6.0 | 6.3 | 0.5 |
| 7.0 | 3.6 | 0.3 |
| 7.0 | 5.4 | 0.5 |
| 7.0 | 6.8 | 0.6 |
| 7.0 | 7.8 | 0.6 |
| 8.0 | 3.6 | 0.4 |
| 8.0 | 5.6 | 0.5 |
| 8.0 | 7.0 | 0.7 |
| 8.0 | 7.9 | 0.8 |

**Table B-14. Flume test results for Plan 1A cross section, water level = +5.1 ft LWD**

| Wave Period (sec) | Wave Height at Structure (feet) | Transmitted Wave Height (feet) |
|---|---|---|
| 6.0 | 2.8 | 0.4 |
| 6.0 | 4.2 | 0.5 |
| 6.0 | 5.5 | 0.6 |
| 6.0 | 6.6 | 0.7 |
| 7.0 | 3.6 | 0.6 |
| 7.0 | 5.3 | 0.8 |
| 7.0 | 6.7 | 0.9 |
| 7.0 | 7.7 | 1.0 |
| 8.0 | 3.8 | 0.6 |
| 8.0 | 5.7 | 0.8 |
| 8.0 | 7.3 | 0.9 |
| 8.0 | 8.3 | 1.1 |

**Table B-15. Transmitted wave heights for a 6.1-ft, 5.8-sec incident wave.**

| Cross Section | Water Level (ft above LWD) | Transmitted Wave Height (ft) |
|---|---|---|
| 1 | +4.3 (10-yr) | 0.4 |
| | +5.1 (50-yr) | 0.5 |
| 1A | +4.3 (10-yr) | 0.6 |
| | +5.1 (50-yr) | 0.7 |

For Plan 1, transmitted wave heights at both the 10-year and 50-year water levels were less than or equal to the 1/2-ft criteria. Plan 1A yielded a transmitted wave height at the +4.3-ft water level that is only 0.1 ft greater than the desired 1/2-ft criteria; and even at the +5.1-ft water level the transmitted wave height was only 0.2 ft greater than the desired 1/2-ft criteria. Based on these test results, a crest elevation for the east and west detached breakwaters of +13.0 ft, which is 1/2 ft higher than the Plan 1A crest elevation, was chosen for the final design. Finally, it is reassuring to note that transmitted wave heights are not sensitive to water level fluctuations of the magnitude of those which occur at Olcott.

c. Channel Design

An entrance channel is provided between the west and east detached breakwaters to allow sufficient width and depth for safe, efficient passage of vessels into and out of the harbor.

**(1) Channel Width.** Channel width is determined based on the design procedure in Engineer Manual (EM) 1110-2-1615, "Hydraulic Design of Small-Boat Harbors" (Headquarters, U.S. Army Corps of Engineers (HQUSACE), 1984). Eq. 3 is used to calculate the required channel width:

$$CW = BD * [\ 2(BC) + (N)(ML) + (N - 1)(VC)\ ] \quad (3)$$

where CW is channel width, BD is beam of the design vessel, BC is the width required for safe bank clearance expressed as a fraction of BD, N is the number of maneuvering lanes, ML is the width of a single maneuvering lane expressed as a fraction of BD, and VC is the width required between maneuvering lanes expressed as a fraction of BD. Values for BC, ML, and VC are taken from Table B-16 which is excerpted from EM 1110-2-1615.

Average beam is 12 ft which is typical for sailboats in the Olcott fleet. Hence 12 ft is used for BD.

**Table B-16. Channel Width Design Factors**

| Location | Minimum Channel Width Needed in % of Beam<br>Vessel Controllability<br>Very Good | Good | Poor |
|---|---|---|---|
| Maneuvering Lane, Straight Channel | 160 | 180 | 200 |
| Bend, 26-deg Turn | 325 | 370 | 415 |
| Bend, 40-deg Turn | 385 | 440 | 490 |
| Vessel Clearance | 80 | 80 | 80 |
| Bank Clearance | 60 | 60 | 60 |

**Entrance Channel.** In the entrance channel, high waves can result in poor vessel controllability. Hence, from EM 1110-2-1615 BC equals 0.8, ML equals 2.0, and VC equals 0.8. To provide smooth traffic flow during heavy use periods and during storms or emergencies, two lanes of traffic are provided in each direction. Hence, N equals 4 and the channel width is

$$CW = (12) * [\ (2)(0.8) + (4)(2.0) + (4-1)(0.8)\ ]$$
$$= 144 \text{ ft, say } 150 \text{ ft.}$$

This width will provide three safe lanes of traffic for even the largest boats in the Olcott fleet.

**Access Channel.** Traffic in the access channel is less congested than in the entrance channel; hence, it is sufficient to provide one lane of traffic in each direction. Vessel controllability is good since the wave climate in the harbor is very mild. Hence, BC = 0.8, ML = 1.8, VC = 0.8, and N = 2. The channel width is

$$CW = (12) * [\ (2)(0.8) + (2)(1.8) + (1)(0.8)\ ]$$
$$= 72 \text{ ft, say } 75 \text{ ft.}$$

**(2) Channel Depth.** Channel depths are designed to be adequate for vessel draft and squat, wave conditions, and safety clearance. Hence,

channel bottom elevation = design low water level - design vessel draft - squat - wave allowance - safety clearance

The design low water level is +0.7 ft which is the lowest daily mean recorded at Olcott during the boating season since regulation of Lake Ontario was begun in 1954.

Sailboats are expected to comprise a large portion of the fleet at Olcott. The design vessel draft is 6.0 ft which is a typical keel depth for the Olcott fleet. Squat equals zero since squat does not affect keel depth.

**Entrance Channel.** Wave allowance is one-half the design boating season wave height. Since the harbor is designed to meet the 3-ft wave height criteria in the entrance channel, the wave allowance is 1.5 ft.

The lake bottom in the vicinity of the entrance channel is bedrock. The recommended safety clearance over hard lake bottoms is 3.0 ft (Engineer Manual 1110-2-1615, 1984). Hence, the minimum required

channel bottom elevation = 0.7 ft - 6.0 ft - 1.5 ft - 3.0 ft
= -9.8 ft, say -10 ft LWD

Note that the authorized depth at Olcott is presently -12.0 feet LWD. This is the depth at which the existing Olcott Harbor entrance channel is to be maintained to facilitate its use by draft vessels as authorized under the River and Harbor Act of 1913.

**Access Channel.** Wave allowance is one-half the design boating season wave height. Since the harbor is designed to meet the 1-ft wave height criteria in the mooring basin, the wave allowance is 0.5 ft.

The safety clearance provides a non-zero bottom clearance the primary purpose of which is to accommodate infrequent, unusually large heave and pitch motions of the vessel. Since the wave climate is very mild in the harbor, such vessel motions will not occur and a 3-ft safety clearance is not warranted. For the access channel, a 1-ft safety clearance is sufficient. Hence, the minimum required

channel bottom elevation = 0.7 ft - 6.0 ft - 0.5 ft - 1.0 ft
= -6.8 ft, say -7 ft LWD

## B7. REFERENCES


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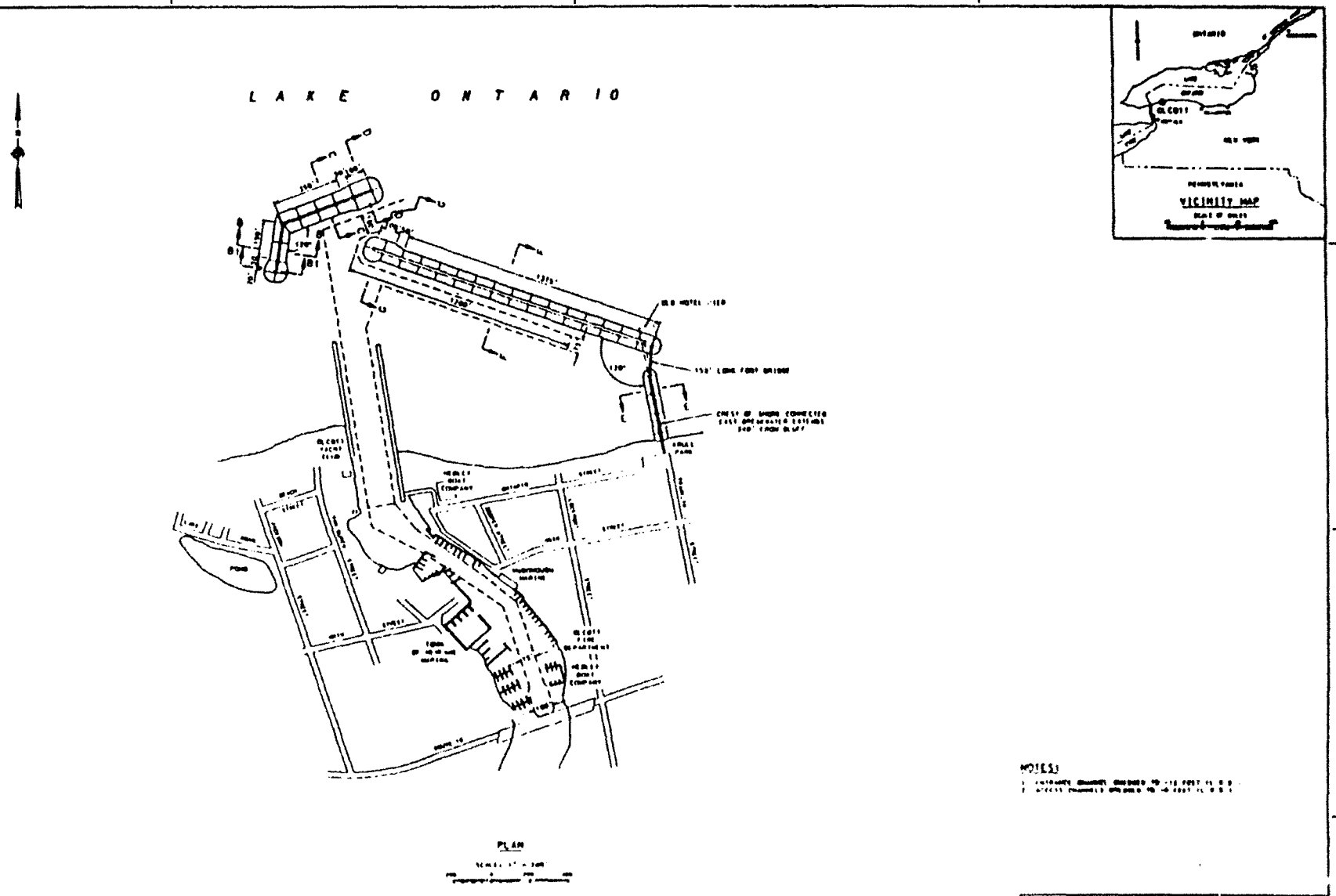
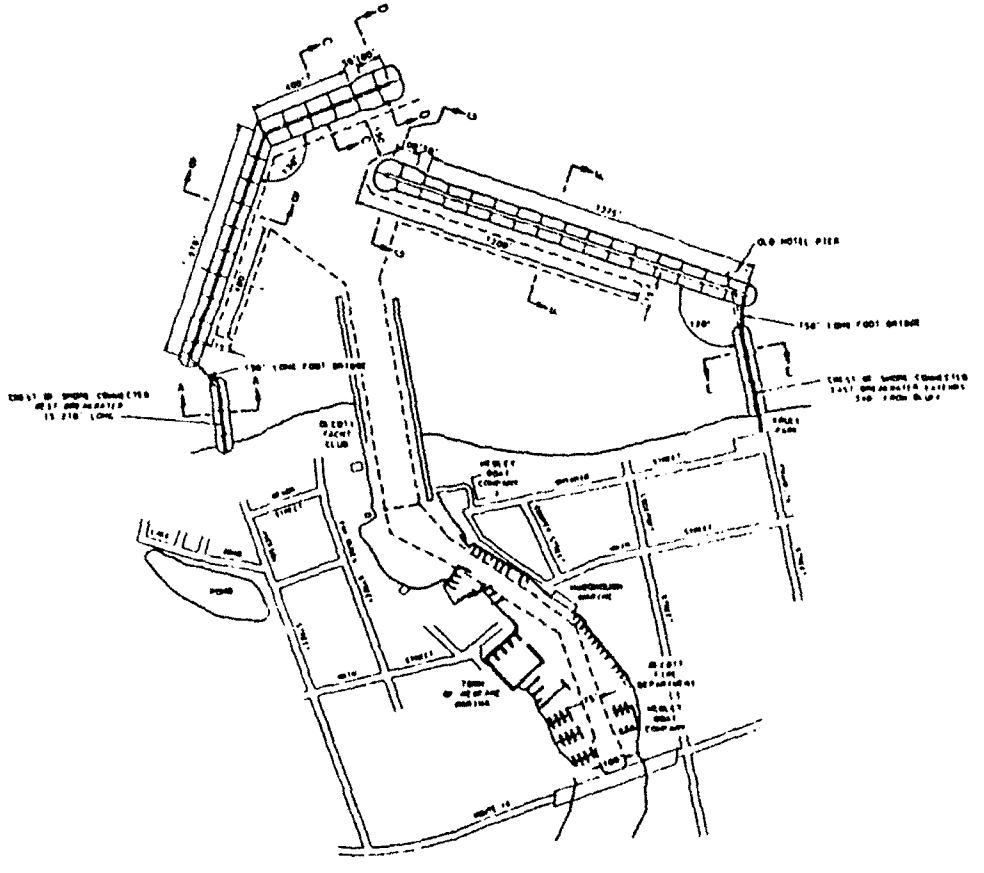
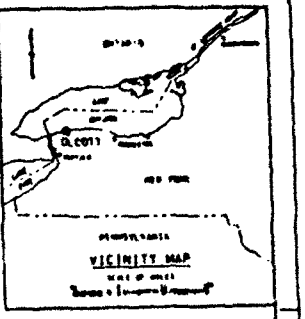

LAKE ONTARIO
VICINITY MAP
PLAN
NOTES:
OLCOTT HARBOR
OLCOTT, NEW YORK
PLAN #10A
U.S. ARMY ENGINEER DISTRICT BUFFALO
OCTOBER 1984

Plate B-1



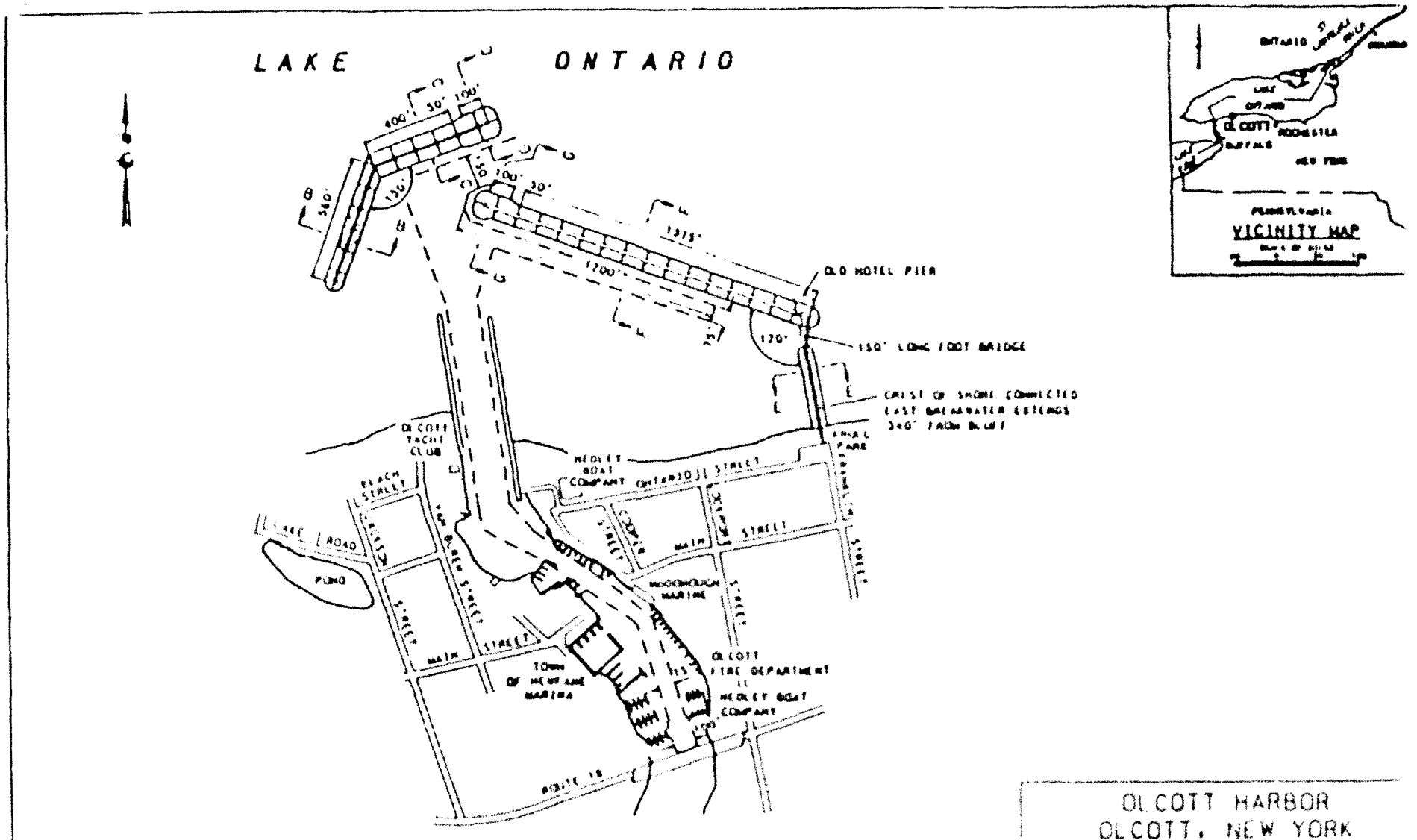

NOTES:

OLCOTT HARBOR
OLCOTT, NEW YORK

PLAN #108

U.S. ARMY ENGINEER DISTRICT BUFFALO
OCTOBER 1989

Plate B-2




OLCOTT HARBOR
OLCOTT, NEW YORK

PLAN #10A MODIFIED

U.S. ARMY ENGINEER DISTRICT BUFFALO
FEBRUARY 1990

PLATE B-3

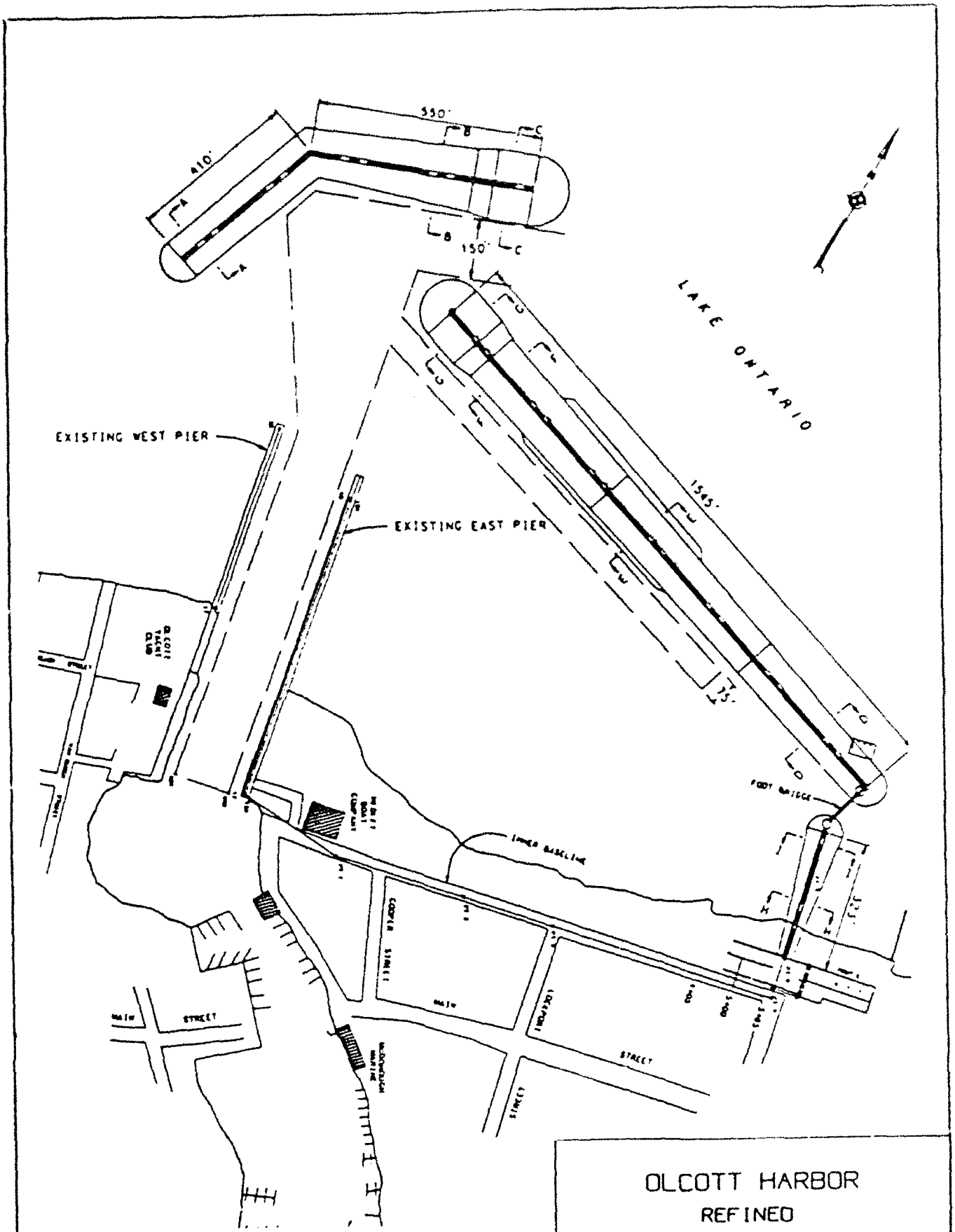
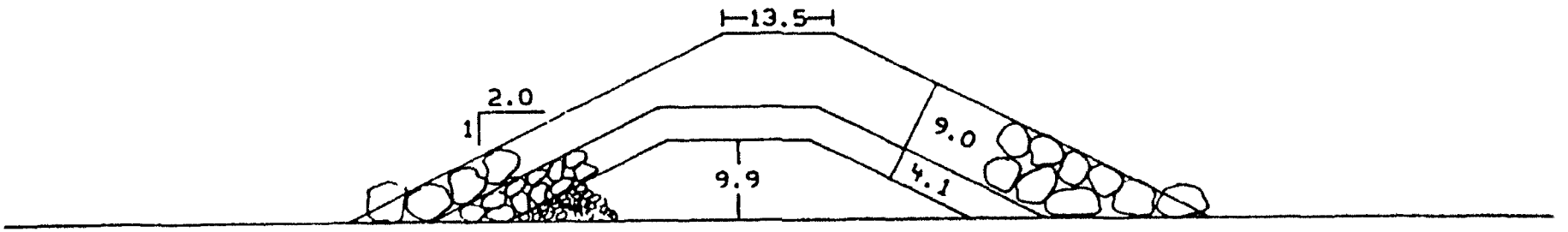

550'
410'
150'
LAKE ONTARIO
EXISTING WEST PIER
EXISTING EAST PIER
1565'
75'
OLCOTT HARBOR
REFINED
PLAN 10A MODIFIED
U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B -4

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... ) 13.0
BOTTOM ELEVATION (FT.) ..... ) -10.0

ARMOR STONE (LBS.) ..... ) 8000. TO 22000.
UNDERLAYER STONE (LBS.) ... ) 600. TO 2200.
BEDDING STONE (LBS.) ..... ) 2.0 TO 125.

Notes

1. SPECIFIC GRAVITY OF STONE = 2.6
2. NO WALKWAY ON WEST BREAKWATER
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

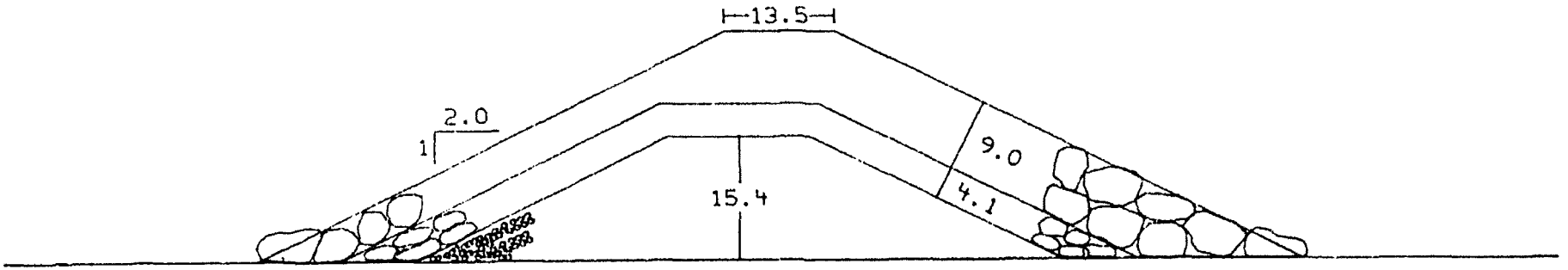
SCALE = 0.050000 INCHES PER FOOT

OLCOTT HARBOR
W. DETACHED BREAKWATER
SHORE TRUNK SECTION
SECTION A-A
U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-21

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... 13.0

BOTTOM ELEVATION (FT.) ..... -15.5

| | | |
|---|---|---|
| ARMOR STONE (LBS.) ..... | 8000. TO | 22000. |
| UNDERLAYER STONE (LBS.) ... | 600. TO | 2200. |
| BEDDING STONE (LBS.) ..... | 2.0 TO | 125. |

Notes

1. SPECIFIC GRAVITY OF STONE = 2.6
2. NO WALKWAY ON WEST BREAKWATER.
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

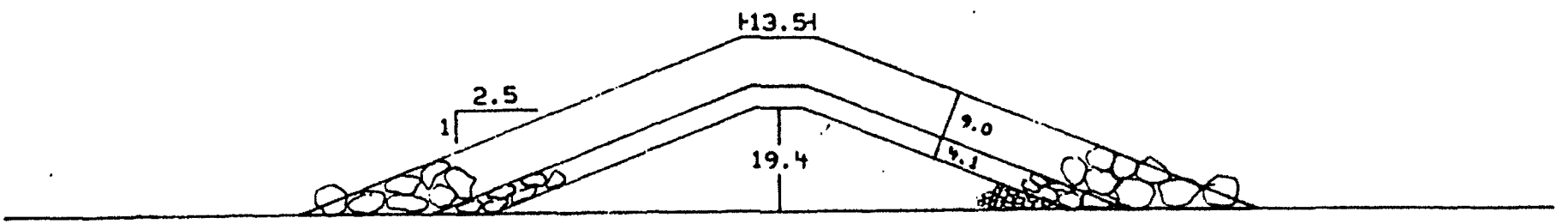
OLCOTT HARBOR
W. DETACHED BREAKWATER
LAKEWARD TRUNK SECTION

U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-6

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... ) 13.0
BOTTOM ELEVATION (FT.) ..... ) -19.5

| | | |
|---|---|---|
| ARMOR STONE (LBS.) ..... ) | 8000. TO | 22000. |
| UNDERLAYER STONE (LBS.) ... ) | 600. TO | 2200. |
| BEDDING STONE (LBS.) ..... ) | 2.0 TO | 125. |

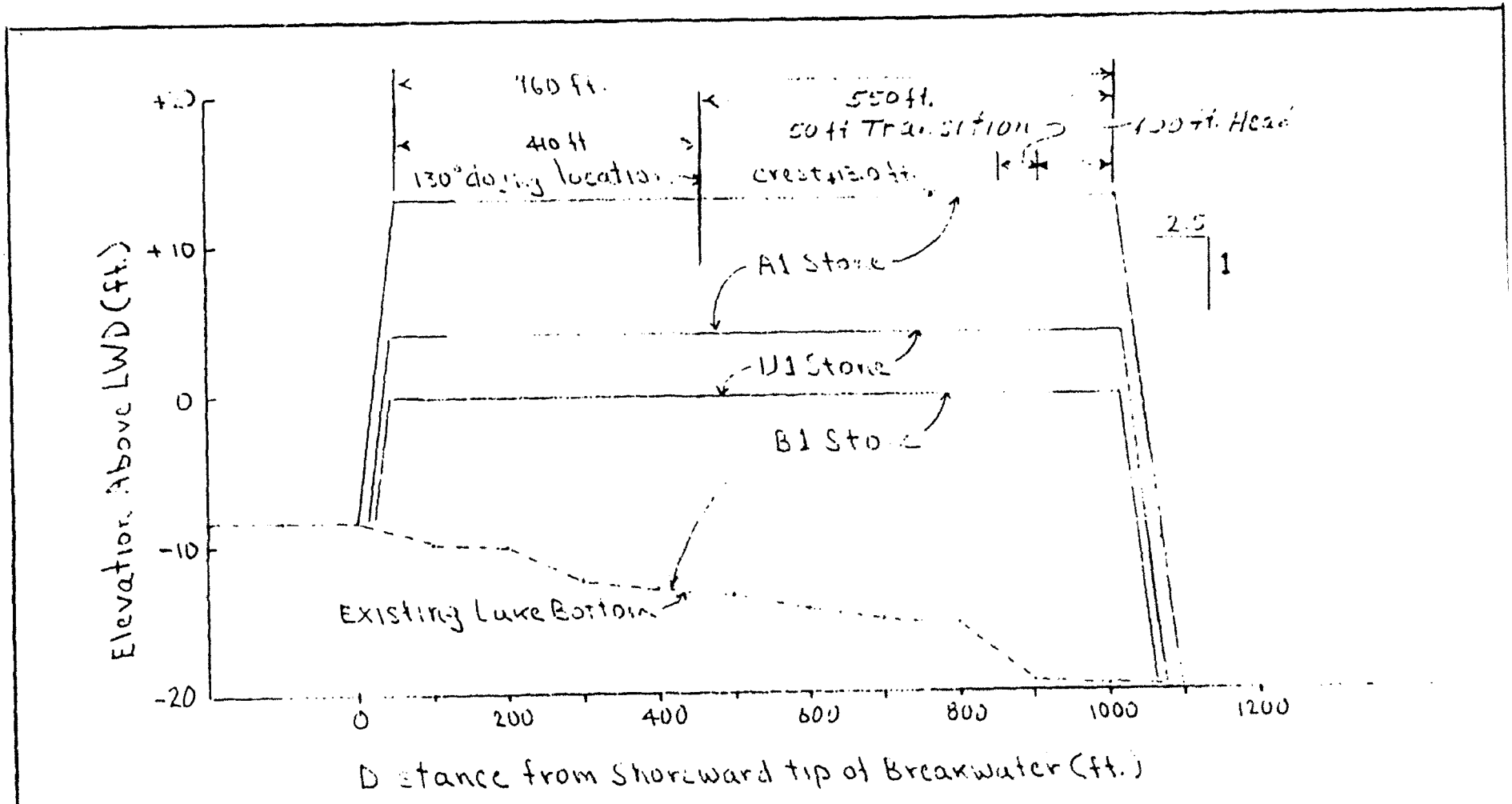
Notes

1. SPECIFIC GRAVITY OF STONE = 2.8
2. NO WALKWAY ON WEST BREAKWATER
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

SCALE = 0.033333 INCHES PER FOOT

OLCOTT HARBOR
W. DETACHED BREAKWATER
HEAD SECTION
SECTION C-C
U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-7



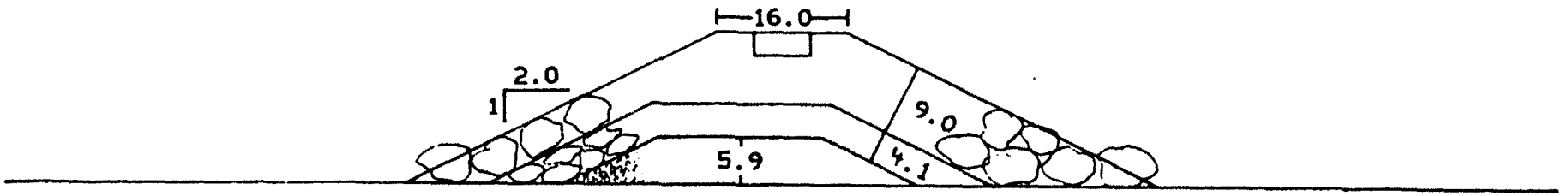

OLCOTT HARBOR, NY
REFINED PLAN 10A MODIFIED
WEST DETACHED BRKWTR.
PROFILE

U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-2

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... 13.0
BOTTOM ELEVATION (FT.) ..... -6.0

ARMOR STONE (LBS.) ..... 8000. TO 22000.
UNDERLAYER STONE (LBS.) ... 600. TO 2200.
BEDDING STONE (LBS.) ..... 2.0 TO 125.

Notes

1. SPECIFIC GRAVITY OF STONE = 2.8
2. WALKWAY IS 7 FT WIDE BY 3 FT THICK
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

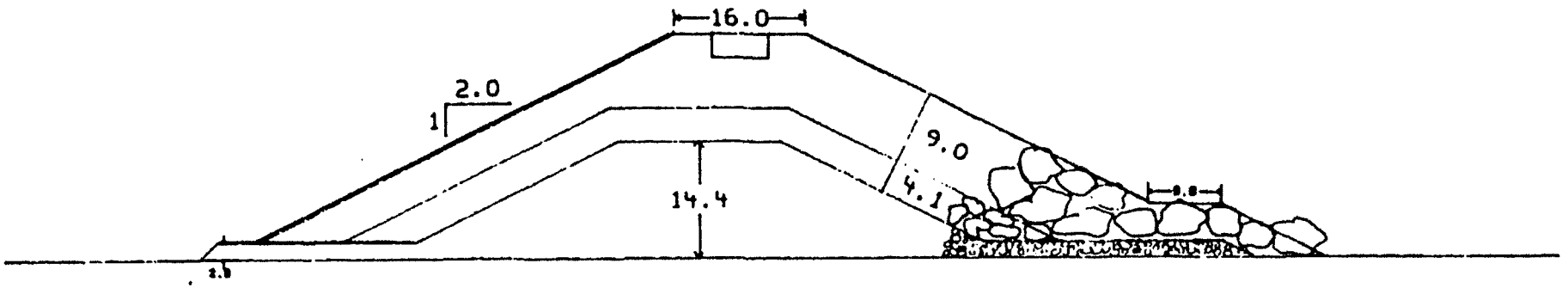
SCALE = 0.050000 INCHES PER FOOT

OLCOTT HARBOR
E. DETACHED BREAKWATER
SHOREWARD TRUNK SECTION
SECTION D-D
U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-9

HARBOR SIDE

LAKE SIDE




| | |
|---|---|
| CREST ELEVATION (FT.) | 14.0 |
| BOTTOM ELEVATION (FT.) | -13.5 |

| | | |
|---|---|---|
| ARMOR STONE (LBS.) | 8000. TO | 22000. |
| UNDERLAYER STONE (LBS.) | 600. TO | 2200. |
| BEDDING STONE (LBS.) | 2.0 TO | 125. |

Notes

1. SPECIFIC GRAVITY OF STONE-2.8
2. WALKWAY IS 7 FT. WIDE BY 3 FT. THICK
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.
4. OVERBUILT SECTION

SCALE - 0.050000 INCHES PER FOOT

OLCOTT HARBOR

E. DETACHED BREAKWATER

CENTER TRUNK SECTION

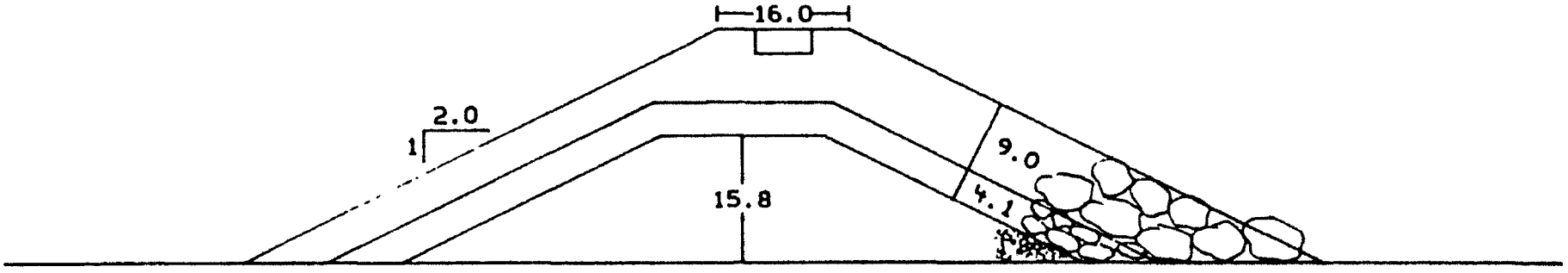
SECTION EE

U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-10

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... ) 13.0
BOTTOM ELEVATION (FT.) ..... ) -15.9

ARMOR STONE (LBS.) ..... ) 8000. TO 22000.
UNDERLAYER STONE (LBS.) ... ) 600. TO 2200.
BEDDING STONE (LBS.) ..... ) 2.0 TO 125.

Notes

1. SPECIFIC GRAVITY OF STONE = 2.8
2. WALKWAY IS 7 FT WIDE BY 3 FT THICK
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

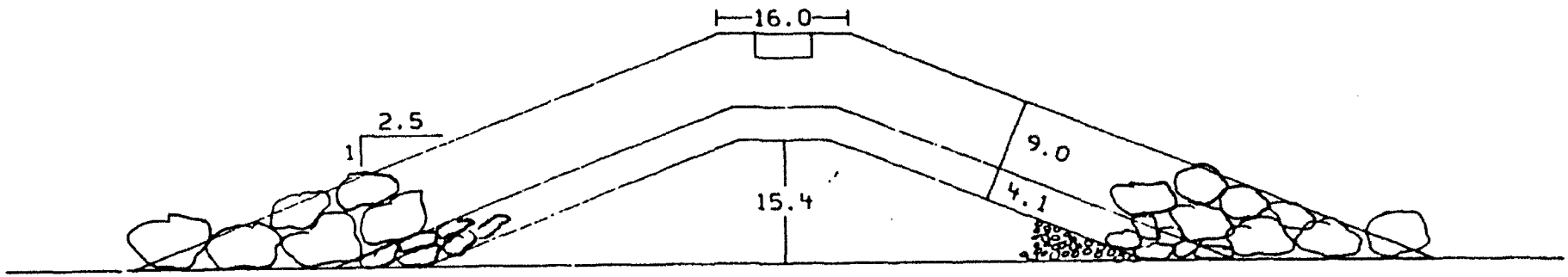
SCALE = 0.050000 INCHES PER FOOT

OLCOTT HARBOR
E. DETACHED BREAKWATER
LAKEWARD TRUNK SECTION
SECTION F-F
U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-11

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... ) 13.0

BOTTOM ELEVATION (FT.) ..... ) -15.5

| | | |
|---|---|---|
| ARMOR STONE (LBS.) ..... ) | 8000. TO | 22000. |
| UNDERLAYER STONE (LBS.) ... ) | 600. TO | 2200. |
| BEDDING STONE (LBS.) ..... ) | 2.0 TO | 125. |

Notes

1. SPECIFIC GRAVITY OF STONE = 2.8
2. WALKWAY IS 7 FT WIDE BY 3 FT THICK
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

SCALE = 0.050000 INCHES PER FOOT

OLCOTT HARBOR

E. DETACHED BREAKWATER

HEAD SECTION

SECTION G-G

U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B-12

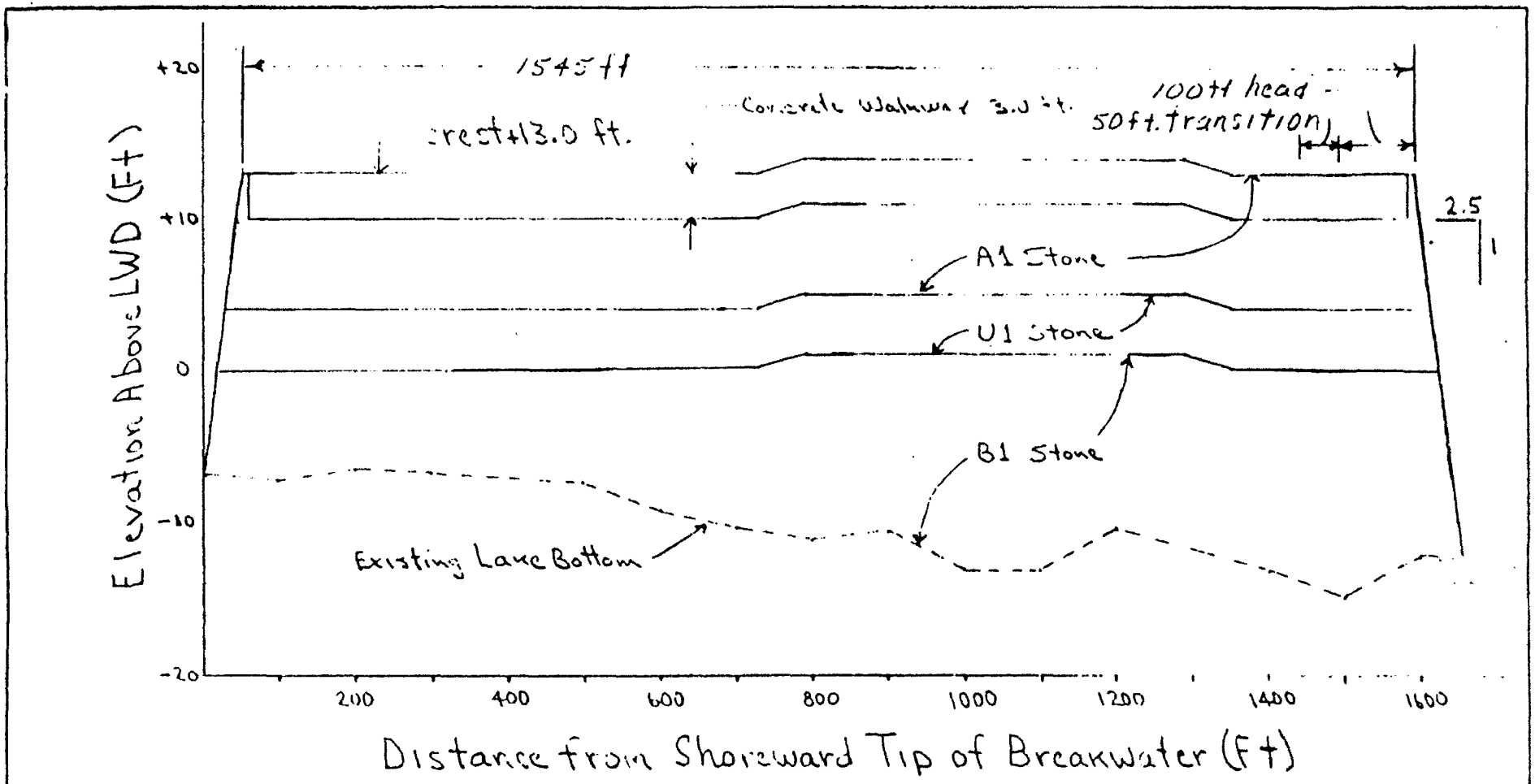


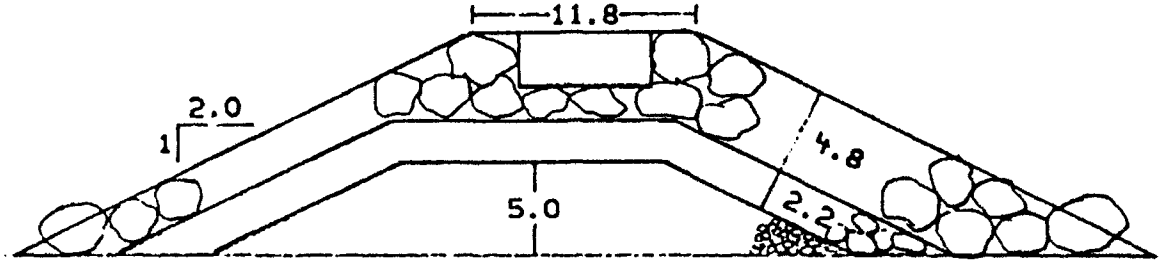

PLATE B-13

OLCOTT HARBOR, NY
REFINED PLAN 10A MODIFIED
EAST DETACHED BRKWTR.
PROFILE

U. S. ARMY ENGINEER DISTRICT BUFFALO

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... ) 12.0
BOTTOM ELEVATION (FT.) ..... ) 0.0

ARMOR STONE (LBS.) ..... ) 1400. TO 3000.
UNDERLAYER STONE (LBS.) ... ) 100. TO 350.
BEDDING STONE (LBS.) ..... ) 2.0 TO 125.

Notes

1. SPECIFIC GRAVITY OF STONE = 2.8
2. WALKWAY IS 7 FT WIDE BY 3 FT THICK
3. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

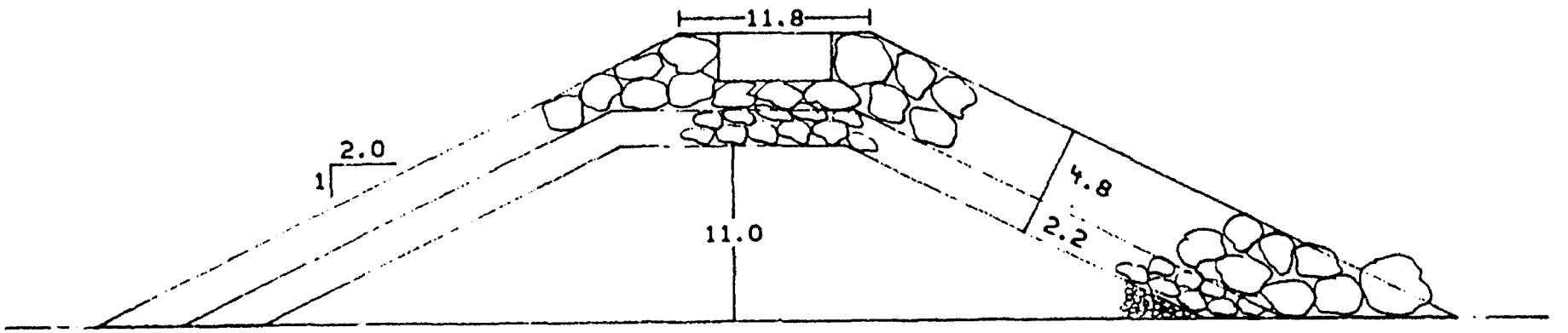
PLATE B14

SCALE = 0.100000 INCHES PER FOOT

OLCOTT HARBOR
E. SHORE CONNECTED BREAKWATER
SHOREWARD SECTION
SECTION H-H
U. S. ARMY ENGINEER DISTRICT BUFFALO

HARBOR SIDE

LAKE SIDE




CREST ELEVATION (FT.) ..... ) 12.0

BOTTOM ELEVATION (FT.) ..... ) -6.0

| | | |
|---|---|---|
| ARMOR STONE (LBS.) ..... ) | 1400. TO | 3000. |
| UNDERLAYER STONE (LBS.) ... ) | 100. TO | 350. |
| BEDDING STONE (LBS.) ..... ) | 2.0 TO | 125. |

Notes

1. SPECIFIC GRAVITY OF STONE = 2.8
2. VALLEYWAY IS 9 FT WIDE BY 3 FT THICK
3. DIMENSIONS SHOWN REFLECT AVERAGE [illegible] WILL VARY ACCORDING TO STONE USED.

SCALE = 0.100000 INCHES PER FOOT

OLCOTT HARBOR

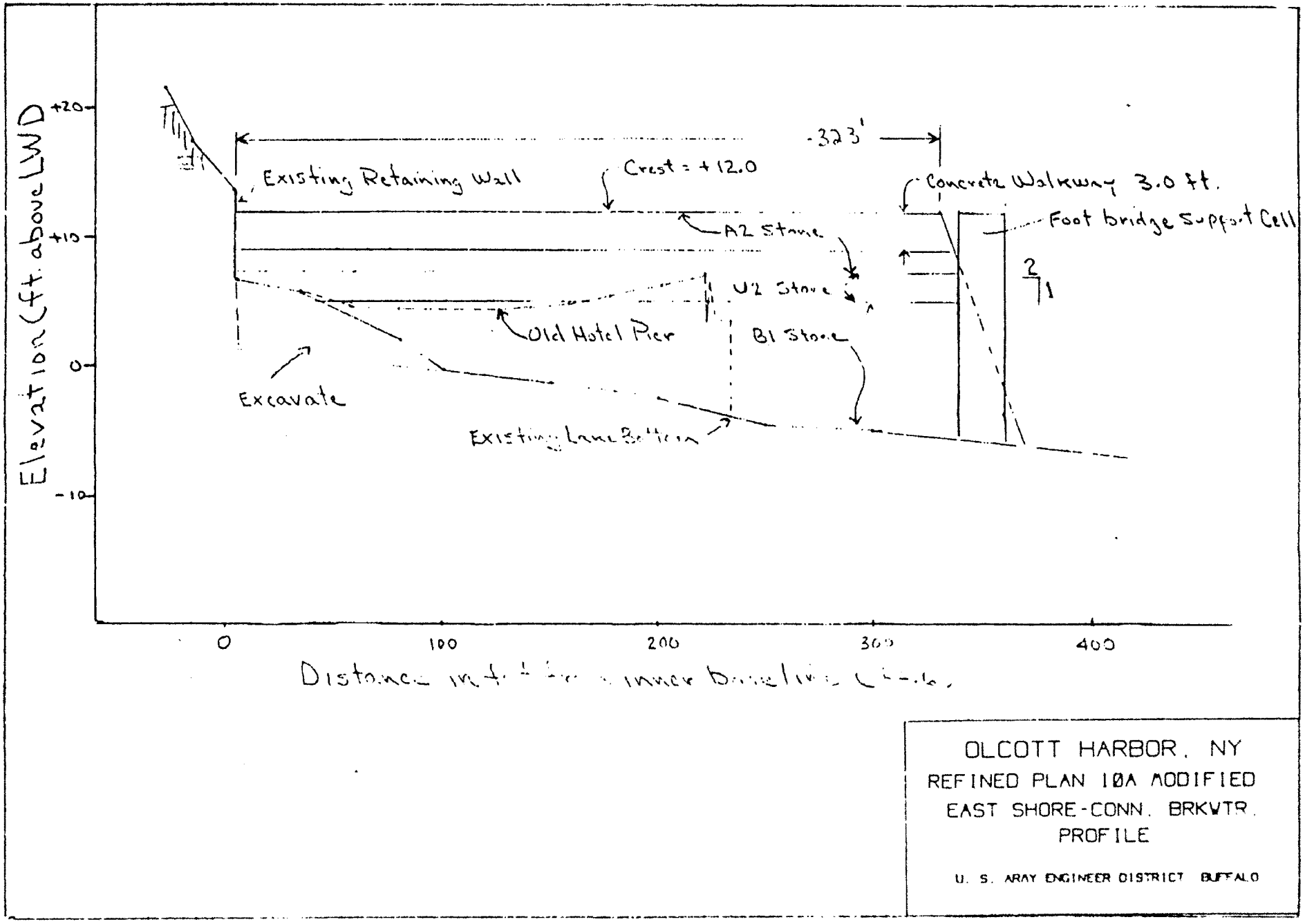
E. SHORE CONNECTED BREAKWATER

LAKE TRUNK SECTION

SECTION I-I

U. S. ARMY ENGINEER DISTRICT BUFFALO

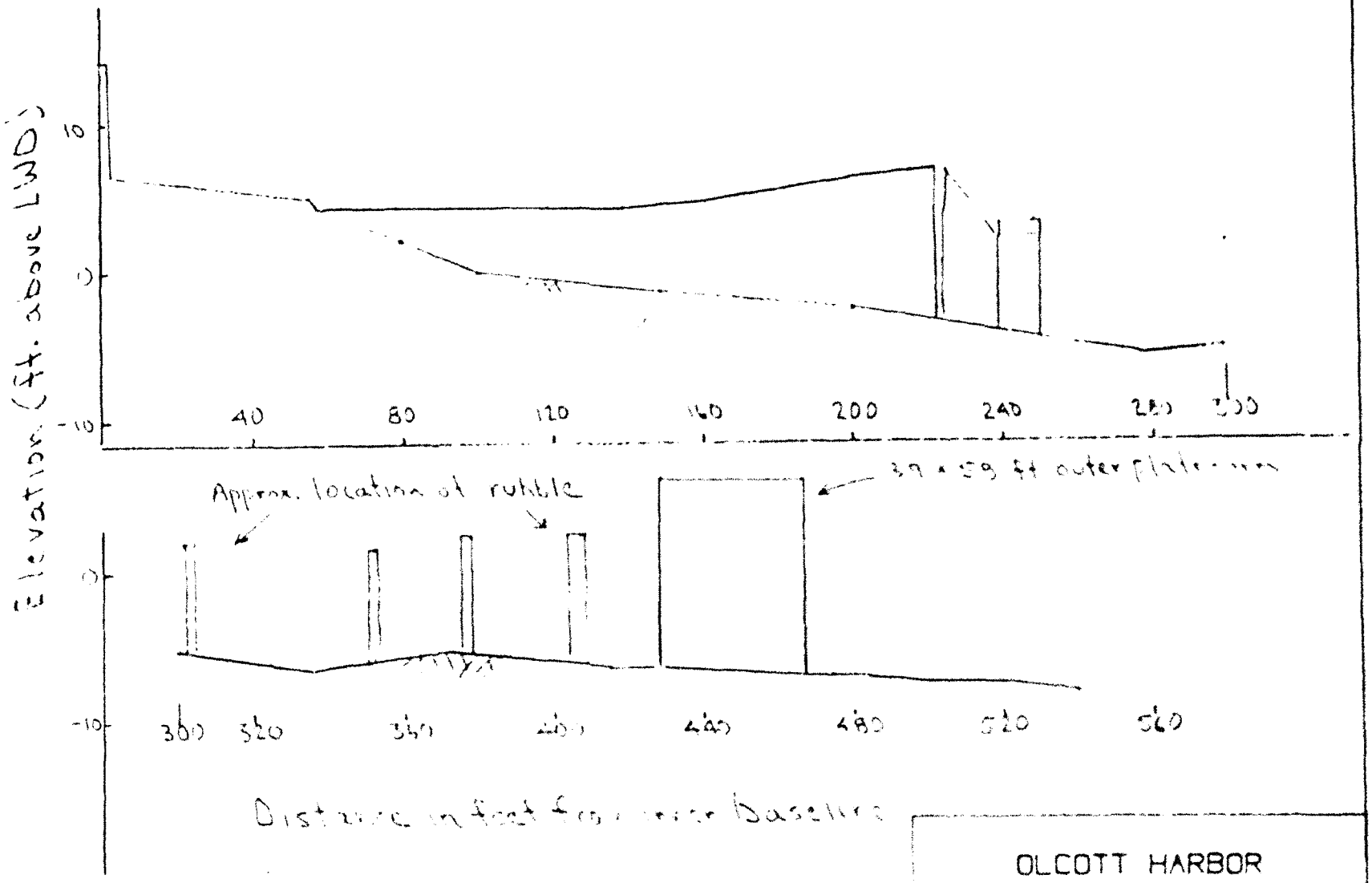
PLATE B15




OLCOTT HARBOR, NY
REFINED PLAN 10A MODIFIED
EAST SHORE-CONN. BRKWTR.
PROFILE

U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B16




OLCOTT HARBOR
EXISTING
OLD HOTEL PIER

U. S. ARMY ENGINEER DISTRICT BUFFALO

PLATE B17

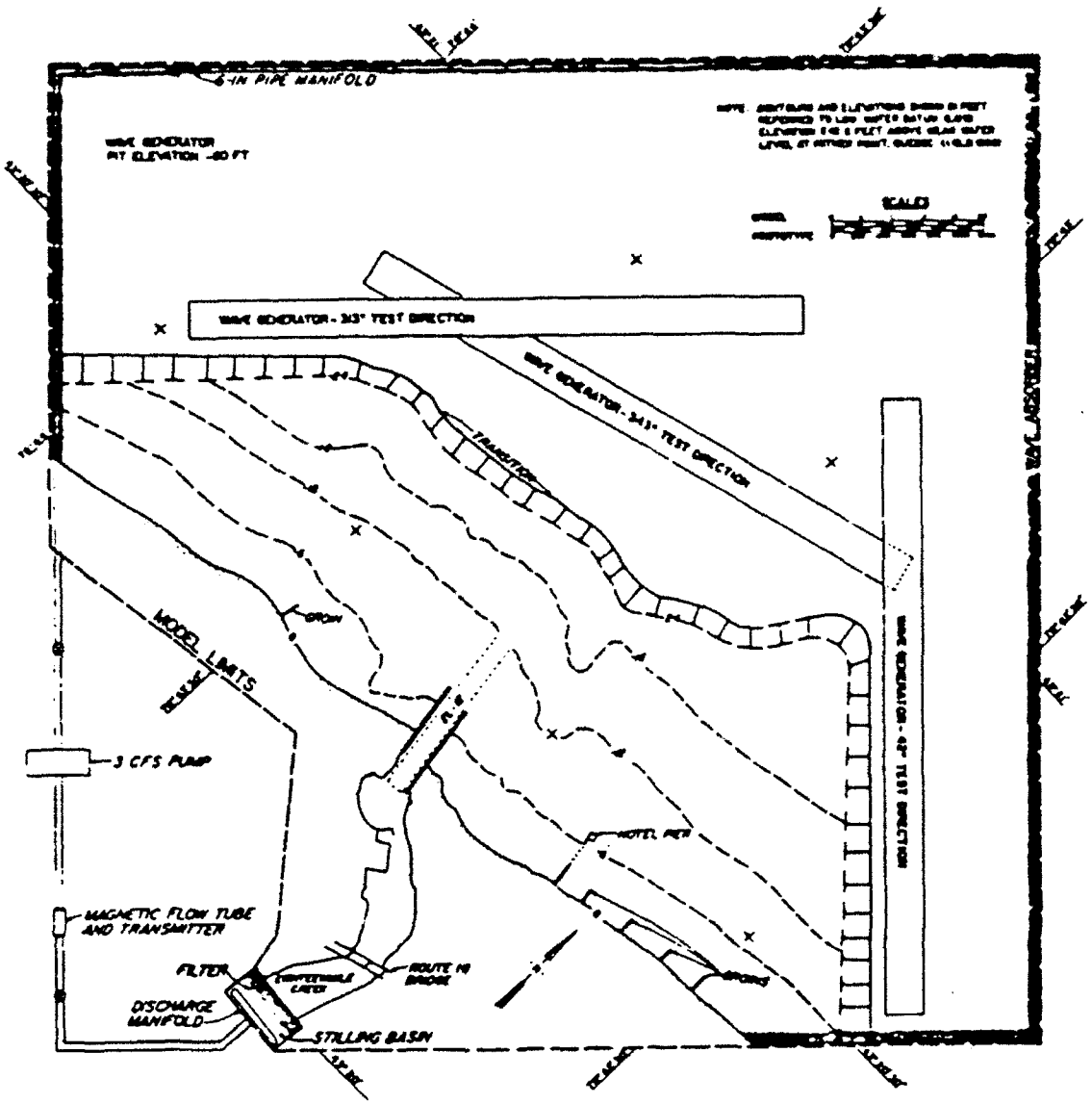
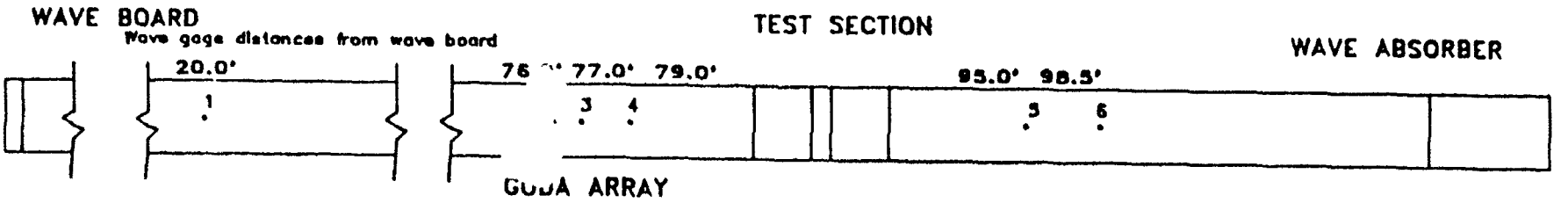

6-IN PIPE MANIFOLD
WAVE GENERATOR
PIT ELEVATION -60 FT
SCALE
WAVE GENERATOR - 343° TEST DIRECTION
WAVE GENERATOR - 341° TEST DIRECTION
TRANSITION
GRID
MODEL LIMITS
3 CFS PUMP
WAVE GENERATOR - 49° TEST DIRECTION
MAGNETIC FLOW TUBE AND TRANSMITTER
FILTER
ROUTE 19 BRIDGE
DISCHARGE MANIFOLD
STILLING BASIN

PLATE B18


WAVE BOARD
Wave gage distances from wave board
20.0'
1
TEST SECTION
76
77.0'
79.0'
3
4
GUJA ARRAY
95.0'
98.5'
5
6
WAVE ABSORBER

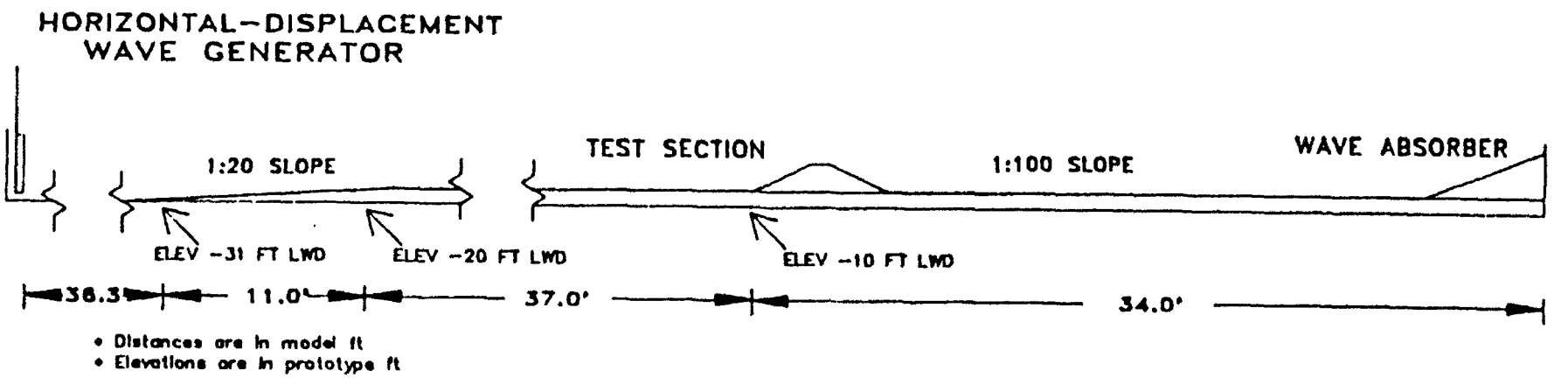
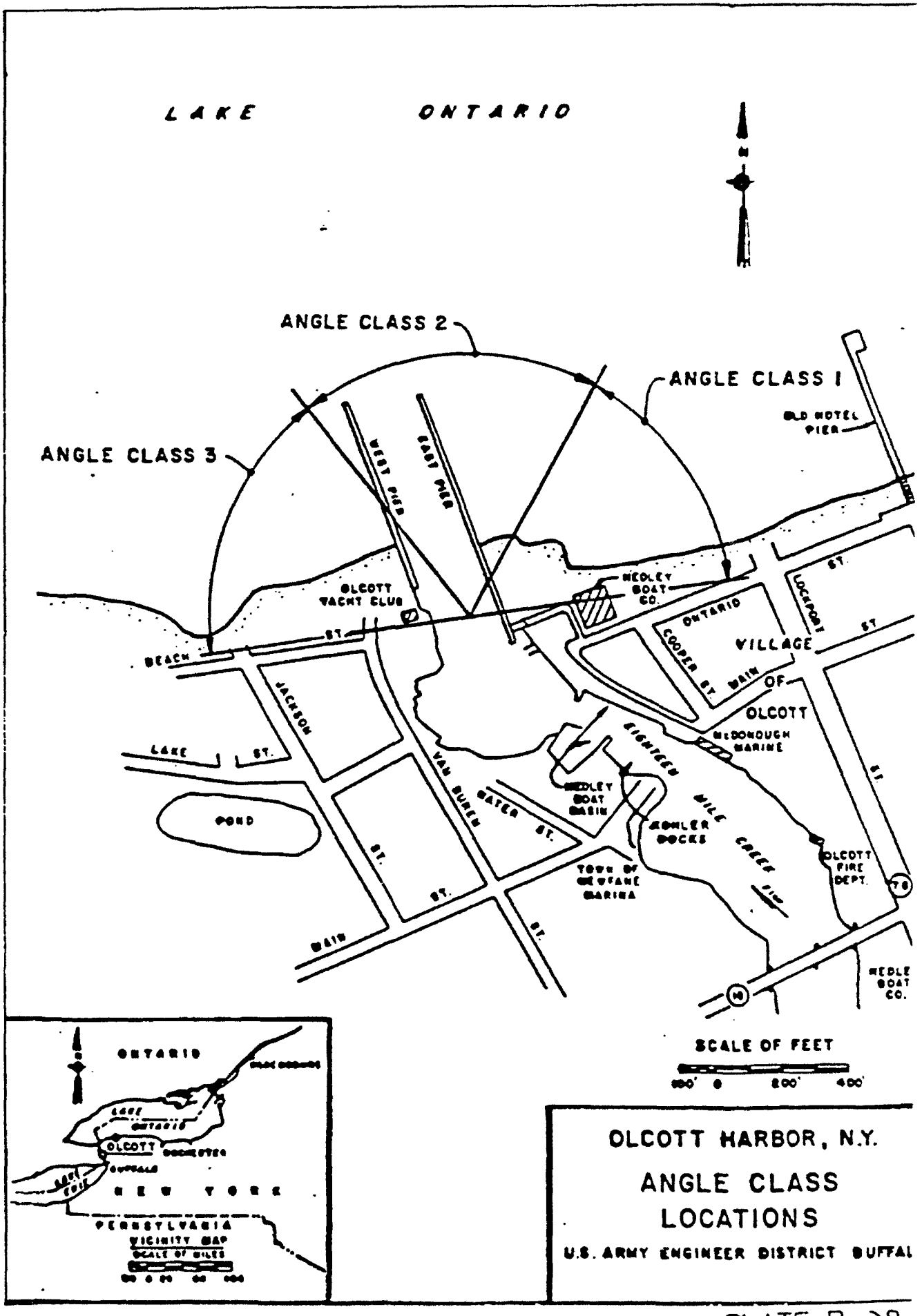

HORIZONTAL-DISPLACEMENT
WAVE GENERATOR
1:20 SLOPE
TEST SECTION
1:100 SLOPE
WAVE ABSORBER
ELEV -31 FT LWD
ELEV -20 FT LWD
ELEV -10 FT LWD
36.3'
11.0'
37.0'
34.0'
• Distances are in model ft
• Elevations are in prototype ft

PLATE B19




# OLCOTT HARBOR, N.Y.

## ANGLE CLASS LOCATIONS

U.S. ARMY ENGINEER DISTRICT BUFFAL

PLATE B-20

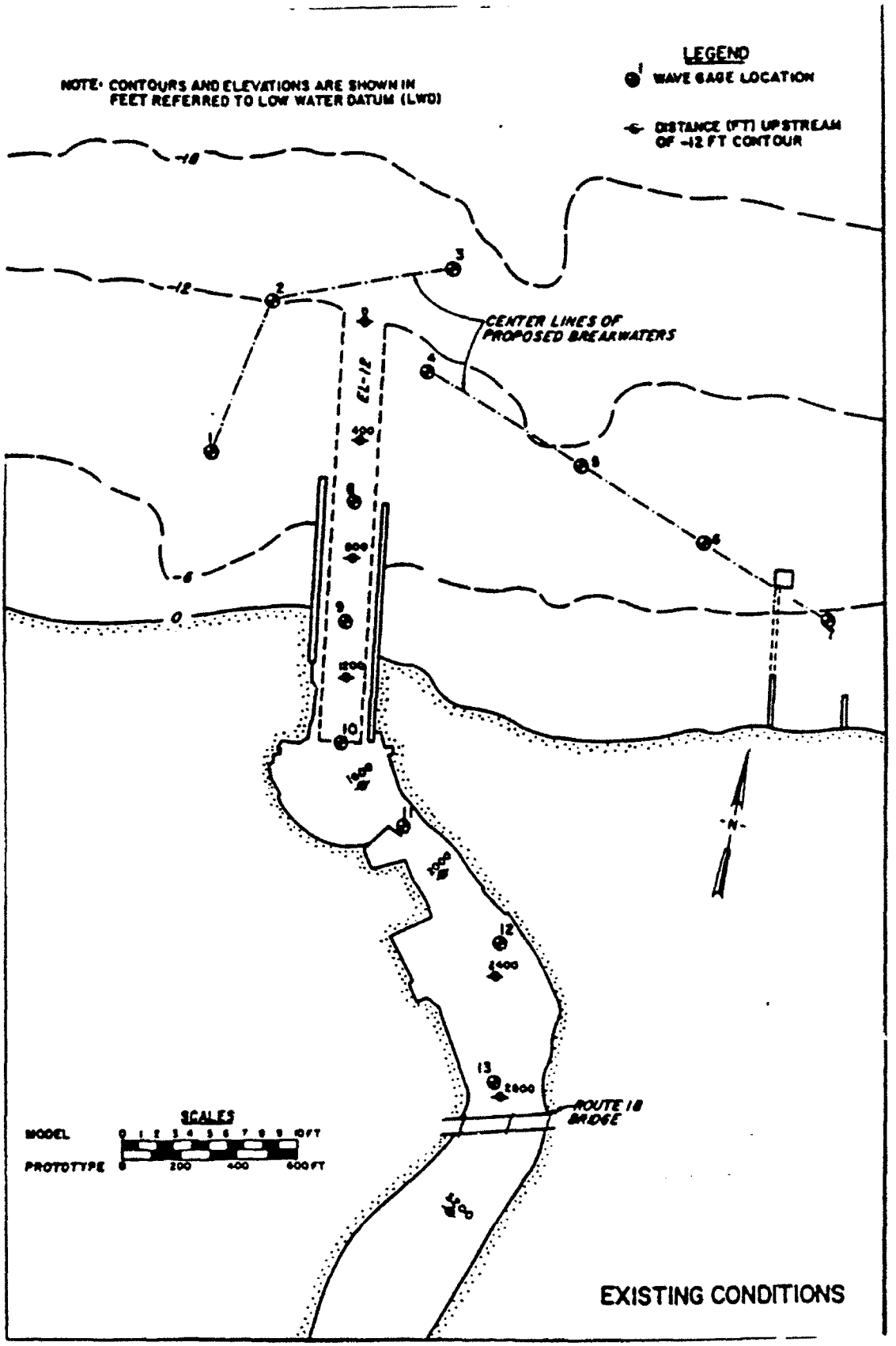

LEGEND
WAVE GAGE LOCATION
DISTANCE (FT) UPSTREAM OF -12 FT CONTOUR
NOTE: CONTOURS AND ELEVATIONS ARE SHOWN IN FEET REFERRED TO LOW WATER DATUM (LWD)
-18
-12
-6
0
EL-12
CENTER LINES OF PROPOSED BREAKWATERS
ROUTE 18 BRIDGE
N
SCALES
MODEL
PROTOTYPE
0 200 400 600 FT
EXISTING CONDITIONS

PLATE B-21

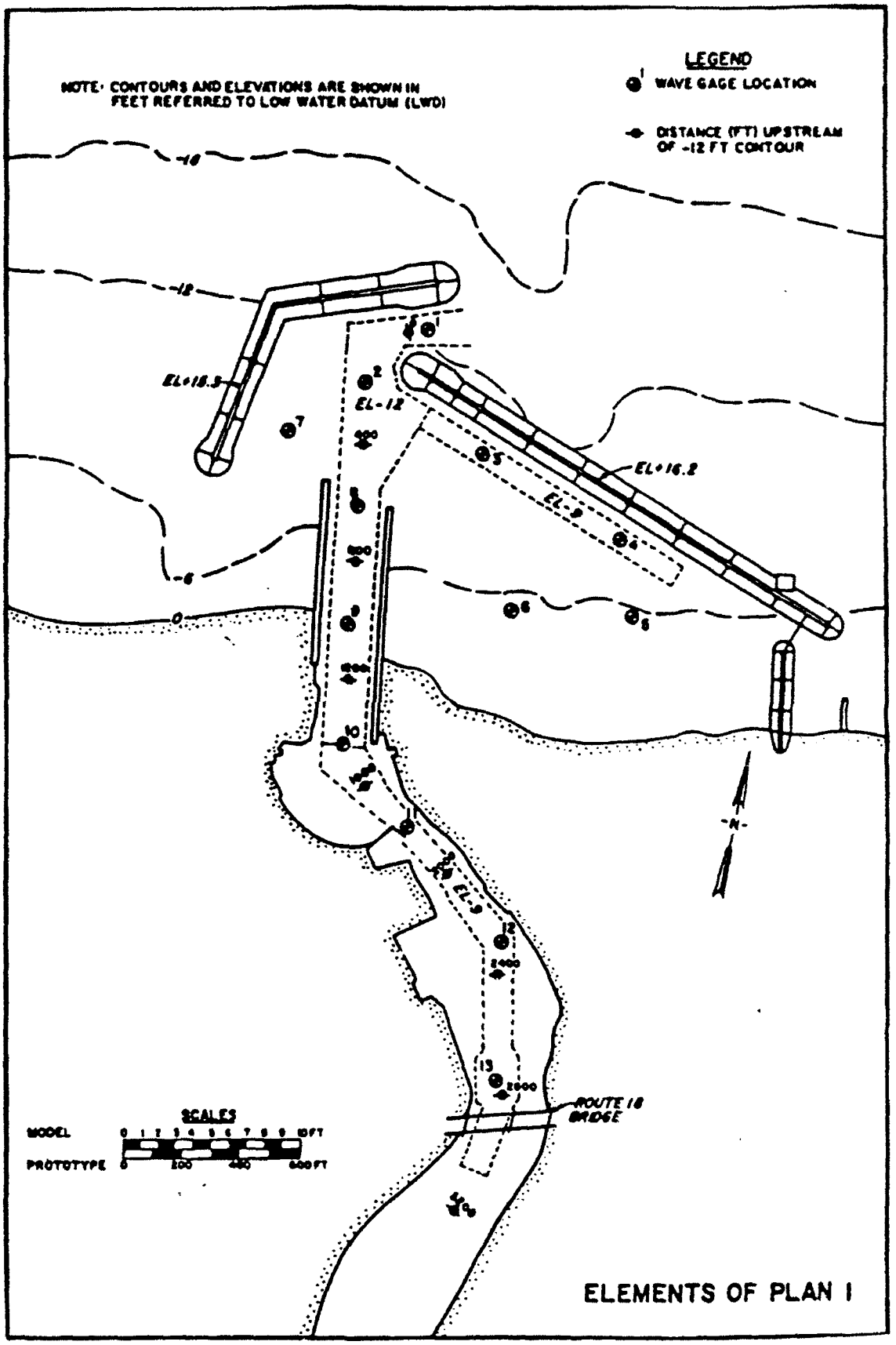
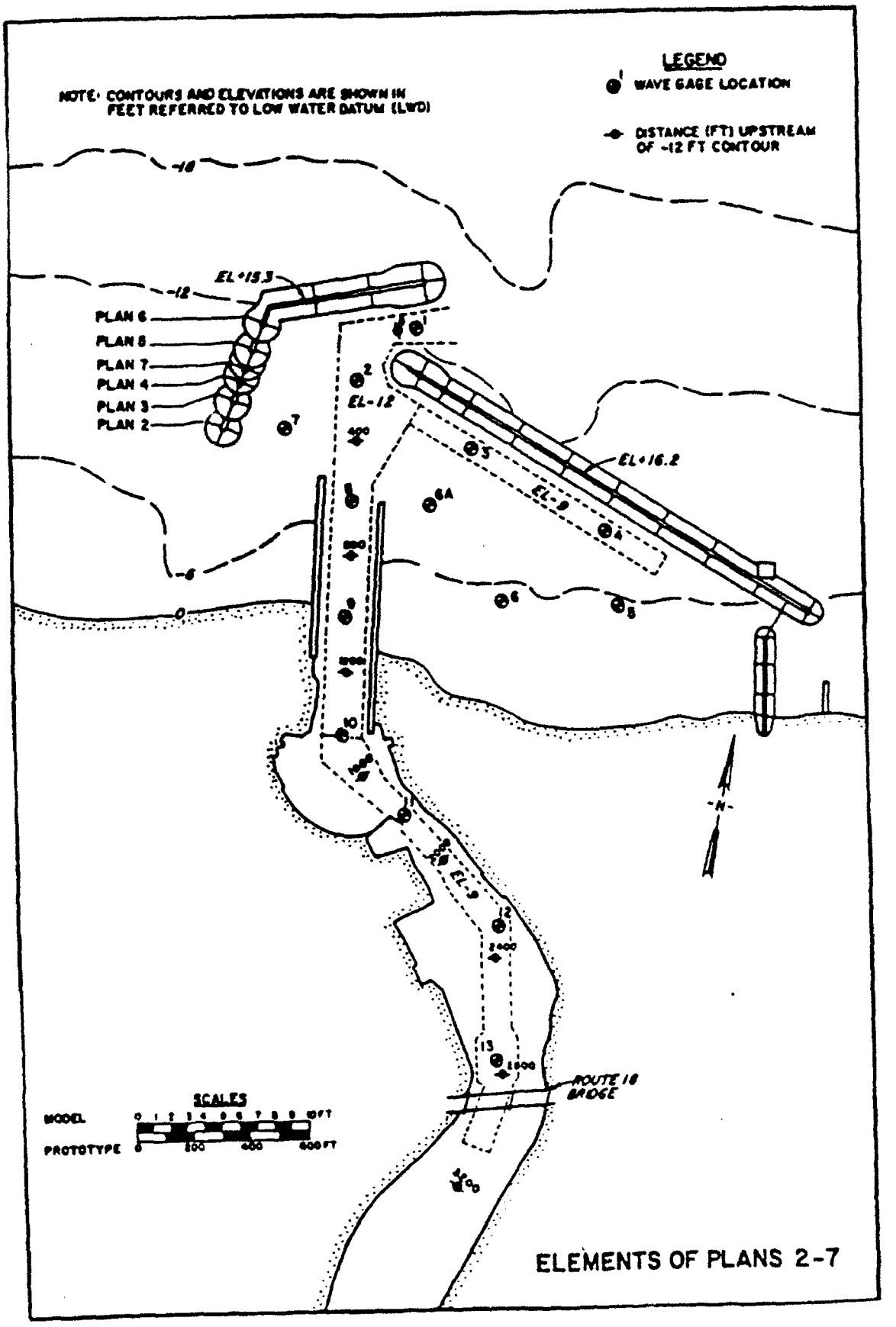
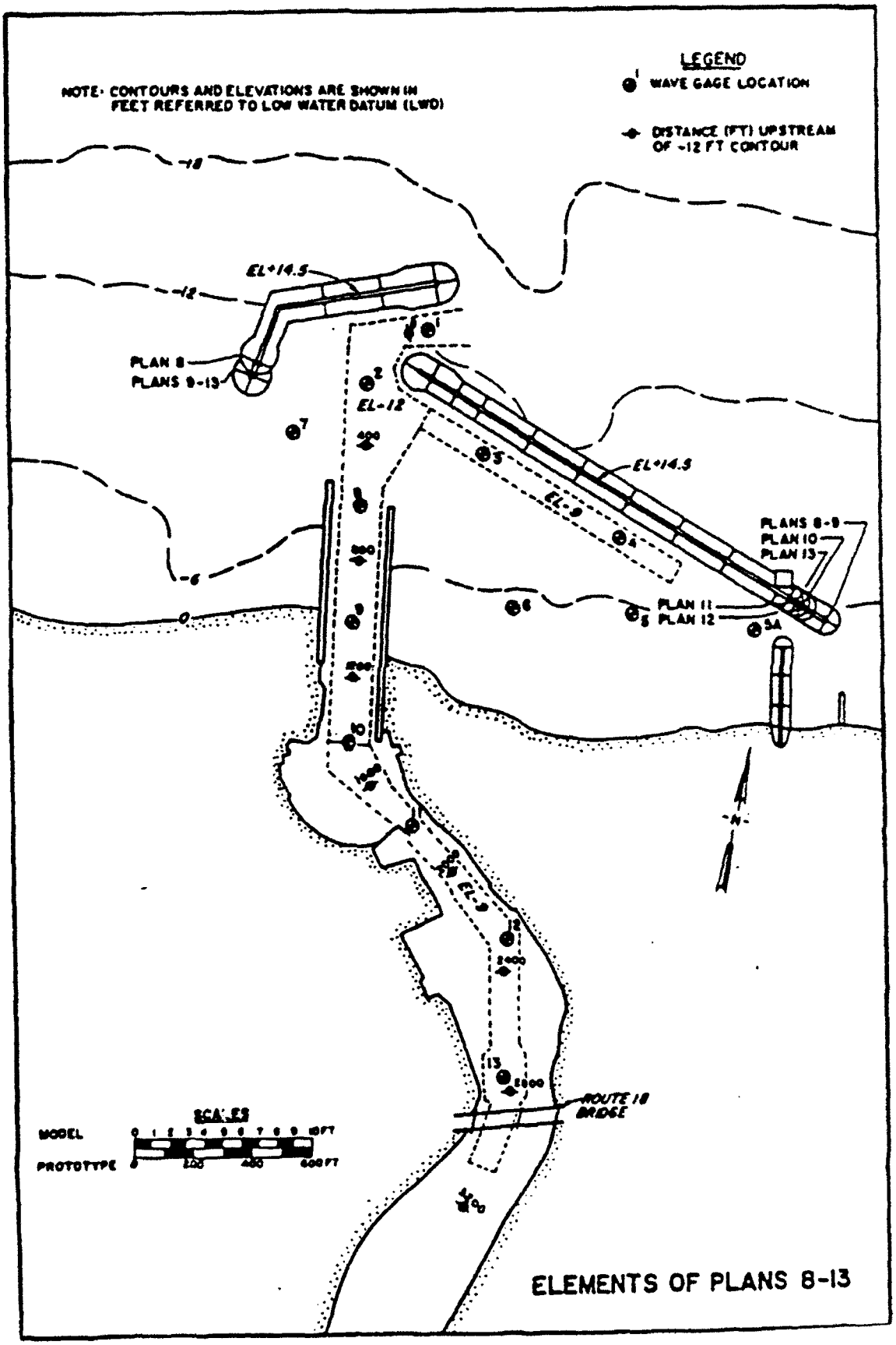

LEGEND
WAVE GAGE LOCATION
DISTANCE (FT) UPSTREAM OF -12 FT CONTOUR
NOTE: CONTOURS AND ELEVATIONS ARE SHOWN IN FEET REFERRED TO LOW WATER DATUM (LWD)
-18
-12
-6
0
EL+18.5
EL-12
EL+16.2
EL-9
EL-9
1
2
3
4
5
6
7
8
9
10
11
12
13
2400
2000
2000
N
SCALES
MODEL
PROTOTYPE
0 1 2 3 4 5 6 7 8 9 10FT
0 200 400 600FT
ROUTE 18 BRIDGE
ELEMENTS OF PLAN I

PLATE B22



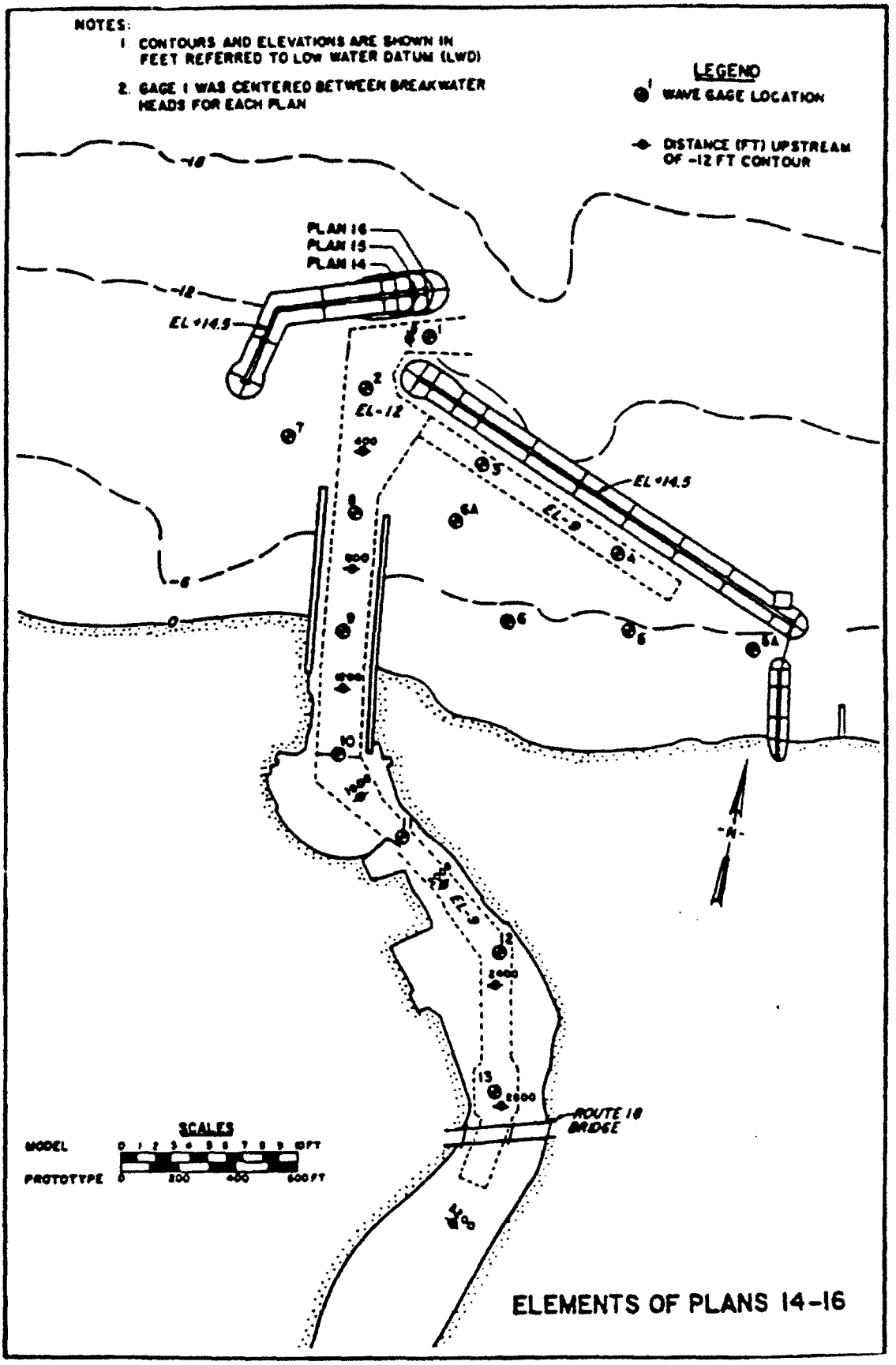

ELEMENTS OF PLANS 2-7

PLATE B23




ELEMENTS OF PLANS 8-13

PLATE B24




ELEMENTS OF PLANS 14-16

PLATE B25

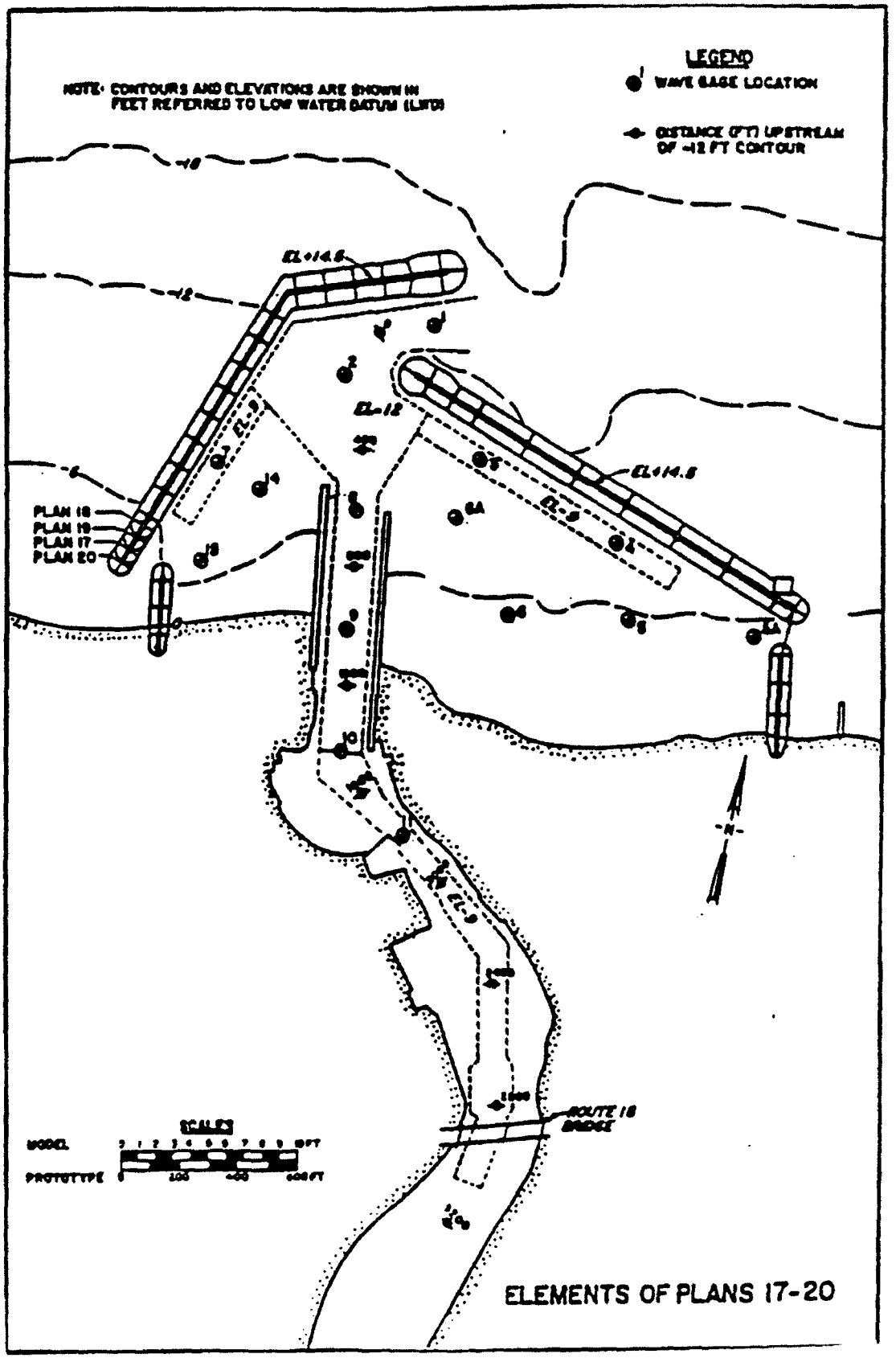
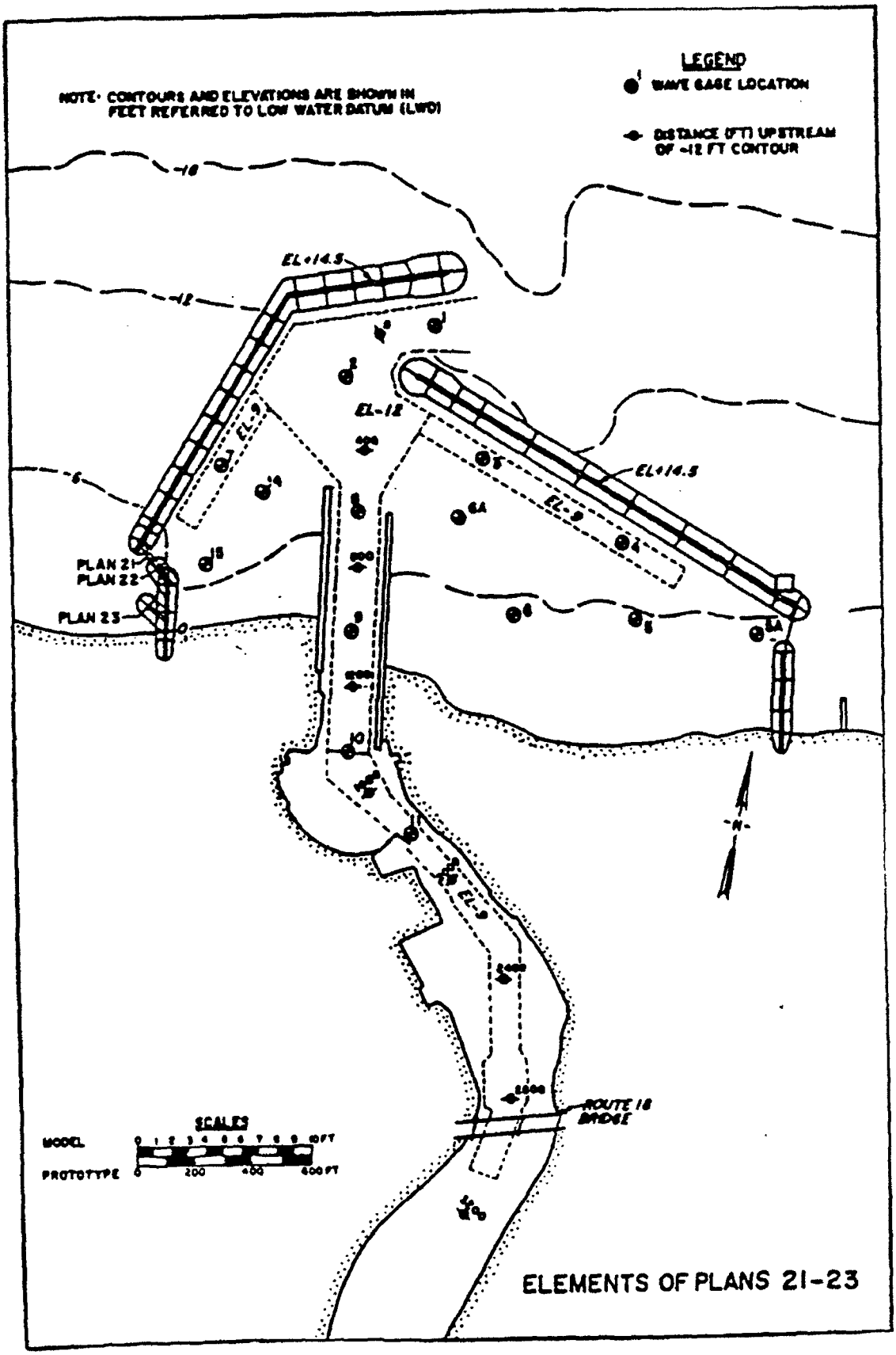
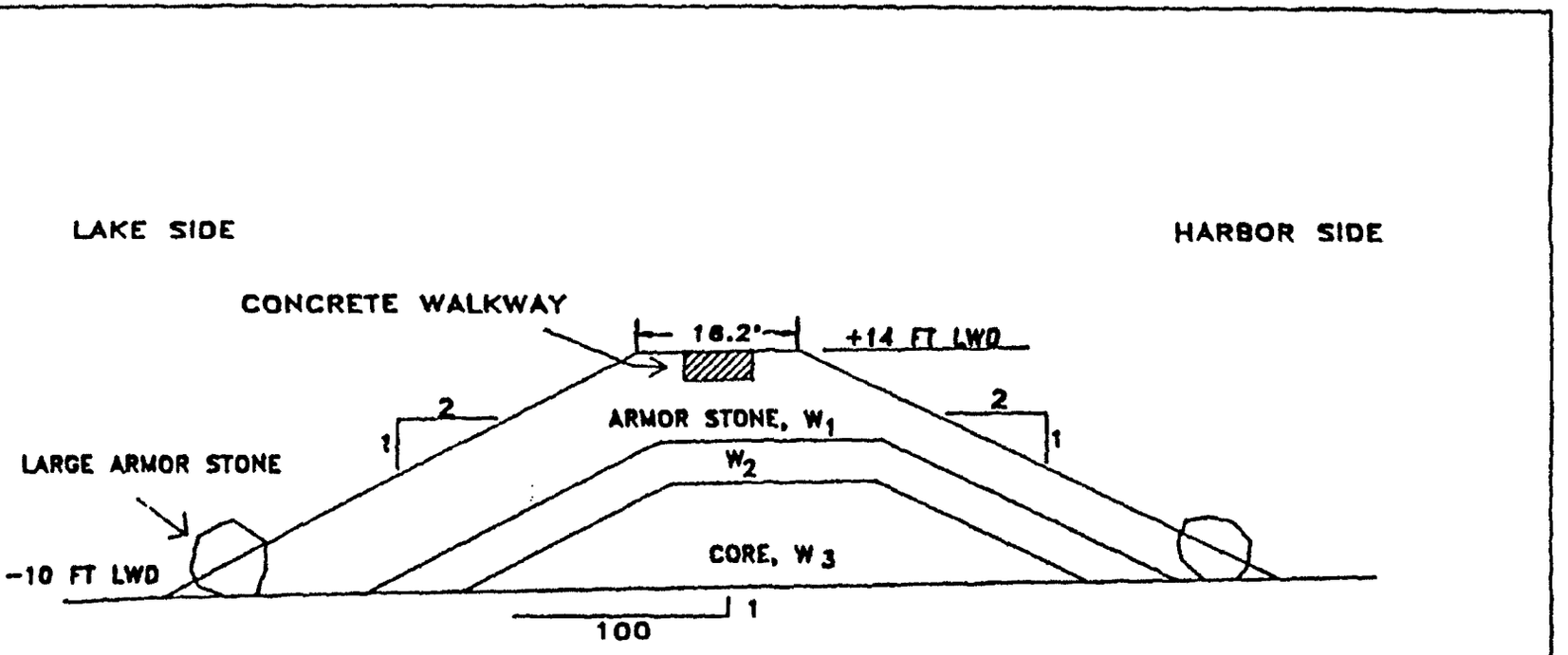

LEGEND
WAVE GAGE LOCATION
DISTANCE (FT) UPSTREAM OF -12 FT CONTOUR
NOTE: CONTOURS AND ELEVATIONS ARE SHOWN IN FEET REFERRED TO LOW WATER DATUM (LWD)
EL +14.5
EL -12
EL +14.5
PLAN 18
PLAN 19
PLAN 17
PLAN 20
ROUTE 18 BRIDGE
SCALES
MODEL
PROTOTYPE
N
ELEMENTS OF PLANS 17-20

PLATE B26




ELEMENTS OF PLANS 21-23

PLATE B27




MATERIAL CHARACTERISTICS

$W_1$ = 4-11 TON STONE

$W_2$ = 600-2200 LB STONE

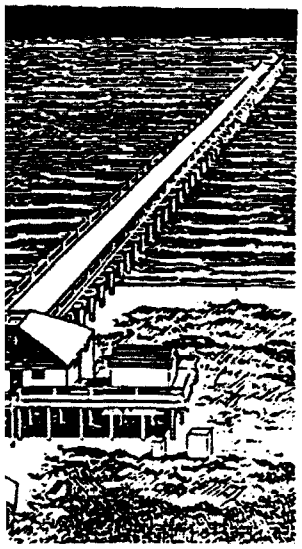
$W_3$ = 2-125 LB STONE

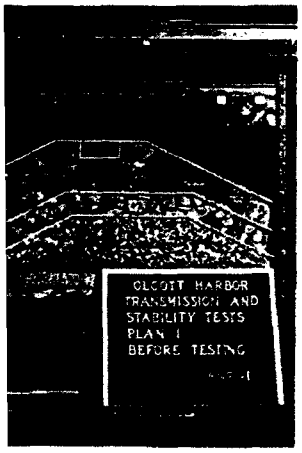
TYPICAL BREAKWATER CROSS SECTION
MODEL SCALE 1:20

PLAN 1

PLATE B28

US Army Corps of Engineers






COASTAL ENGINEERING RESEARCH CENTER

TECHNICAL REPORT CERC-91-5

# RUBBLE-MOUND BREAKWATER WAVE-ATTENUATION AND STABILITY TESTS, OLCOTT HARBOR, NEW YORK

## Coastal Model Investigation

by

Robert D. Carver

Coastal Engineering Research Center

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
3909 Halls Ferry Road, Vicksburg, Mississippi 39180-6199

July 1991
Final Report

Approved For Public Release; Distribution Unlimited

Prepared for US Army Engineer District, Buffalo
Buffalo, New York 14207

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| 1. AGENCY USE ONLY (Leave blank) | 2. REPORT DATE | 3. REPORT TYPE AND DATES COVERED |
|---|---|---|
| | July 1991 | Final report |

**4. TITLE AND SUBTITLE**

Rubble-Mound Breakwater Wave-Attenuation and Stability Tests, Olcott Harbor, New York; Coastal Model Investigation

**5. FUNDING NUMBERS**

Intra-Army Order No. NCB-IA-90-27EJ

**6. AUTHOR(S)**

Robert D. Carver

**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**

USAE Waterways Experiment Station, Coastal Engineering Research Center, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199

**8. PERFORMING ORGANIZATION REPORT NUMBER**

Technical Report CERC-91-5

**9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)**

US Army Engineer District, Buffalo
Buffalo, NY 14207

**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**

**11. SUPPLEMENTARY NOTES**

Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

**12a. DISTRIBUTION/AVAILABILITY STATEMENT**

Approved for public release; distribution unlimited

**12b. DISTRIBUTION CODE**

**13. ABSTRACT** (Maximum 200 words)

A 1:20-scale experimental model investigation was conducted to investigate the wave transmission response of a breakwater proposed for Olcott Harbor, New York. A check of the structure's stability showed the proposed section to be conservatively stable. Therefore, an alternate plan also was investigated in an attempt to reduce construction costs for the breakwater.

Based on model tests results, it was concluded that:

*a.* Both plans tested are stable designs for the maximum wave heights that can be expected to occur (6- to 10-sec waves at still-water levels of +4.3 and +5.1 ft low-water datum).

*b.* Maximum transmitted wave heights were 0.9 and 1.5 ft for Plans 1 and 1A, respectively.

**14. SUBJECT TERMS**

Armor stability
Breakwaters
Rubble mound
Stone armor
Wave transmission

**15. NUMBER OF PAGES**

28

**16. PRICE CODE**

| 17. SECURITY CLASSIFICATION OF REPORT | 18. SECURITY CLASSIFICATION OF THIS PAGE | 19. SECURITY CLASSIFICATION OF ABSTRACT | 20. LIMITATION OF ABSTRACT |
|---|---|---|---|
| Unclassified | Unclassified | Unclassified | |

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# Preface

The model investigation described herein was requested by the US Army Engineer District, Buffalo (NCB), in a letter to the US Army Engineer Waterways Experiment Station (WES) dated 5 June 1990. Funding authorization was granted by NCB in Intra-Army Order No. NCB-IA-90-27EJ, dated 5 June 1990.

The study was conducted by personnel of the Coastal Engineering Research Center (CERC), WES, under the general direction of Dr. James R. Houston, Chief, CERC, and Mr. Charles C. Calhoun, Jr., Assistant Chief, CERC. Direct guidance was provided by Messrs. C. E. Chatham, Chief, Wave Dynamics Division (WDD), and D. Donald Davidson, Chief, Wave Research Branch (WRB), WDD. Tests were conducted by Ms. Brenda J. Wright and Messrs. Willie G. Dubose and C. Ray Herrington, Engineering Technicians, under the direction of Mr. Robert D. Carver, Principal Investigator. This report was prepared by Mr. Carver.

COL Larry B. Fulton, EN, was the Commander and Director of WES during report publication. Dr. Robert W. Whalin was Technical Director.

# Conversion Factors, Non-SI to SI Units of Measurement

Non-SI units of measurement used in this report can be converted to SI units as follows:

| Multiply | By | To Obtain |
|---|---|---|
| cubic feet | 0.02831685 | cubic metres |
| degrees (angle) | 0.01745329 | radians |
| feet | 0.3048 | metres |
| pounds (mass) | 0.4535924 | kilograms |
| pounds (mass) per cubic foot | 16.01846 | kilograms per cubic metre |
| square feet | 0.09290304 | square metres |
| tons (2,000 pounds, mass) | 907.1847 | kilograms |

# 1 Introduction

## Prototype

Olcott Harbor, New York, is situated at the mouth of Eighteen Mile Creek on the southern shore of Lake Ontario (Figures 1 and 2). Construction of an 850-ft[1]-long east pier and an 873-ft-long west pier was completed in 1918. The piers were originally of stone-filled timber crib construction with timber decks. In 1930, both piers were capped with stone and concrete. Repairs were made to the east pier in 1949 by driving rows of sheetpiling on each side of the pier, filling the voids with granular fill, and capping the structure with concrete. A similar repair procedure was performed on the west pier in 1963.

Presently, the entrance channel to the harbor area inside the mouth of the creek is safe only during calm weather. Proposed channel improvements will provide an urgently needed all weather entrance channel and additional berthing area for local craft. A feasibility study was prepared by the US Army Engineer District, Buffalo (NCB), and recommended construction of breakwater, jetty, and channel improvements.

Bottin and Acuff[2] conducted a three-dimensional physical model study to develop the optimum plan for harbor improvements to meet small boat harbor wave height criteria. Improvements were designed to protect against waves entering through the new proposed harbor entrance and from waves overtopping the breakwater sections.

---

[1] A table of factors for converting non-SI units of measurement to SI units is presented on page vii.

[2] Bottin, R. R., and Acuff, H. F. 1990. Olcott Harbor, New York, design for harbor improvements. Technical Report CERC-90-1. Vicksburg, MS: US Army Engineer Waterways Experiment Station.

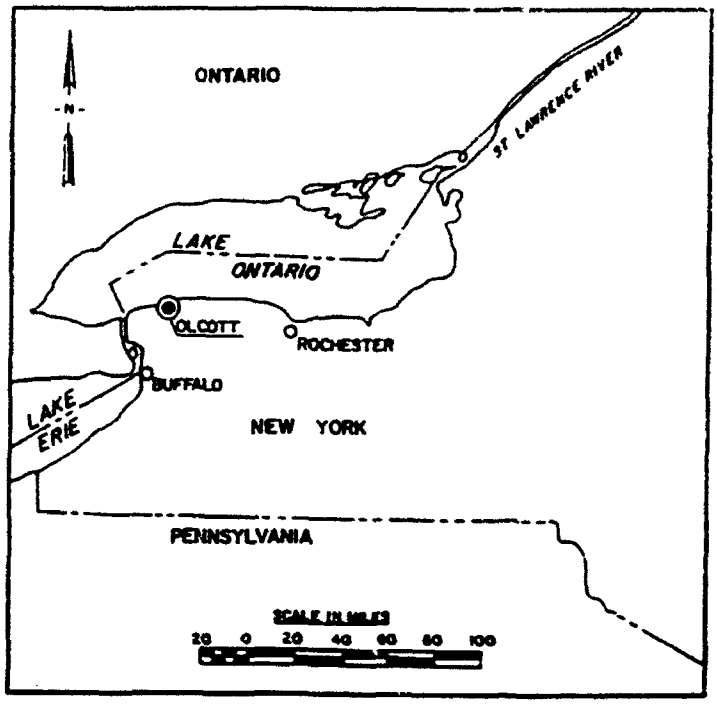



Figure 1. Project location

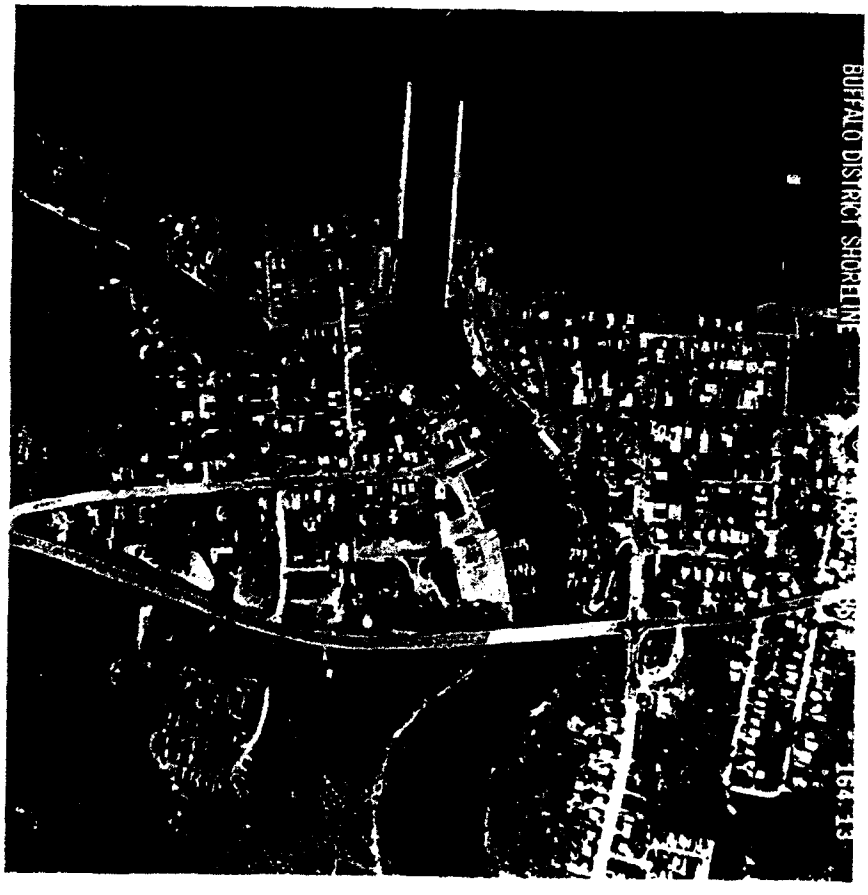



Figure 2. Aerial view of harbor

## Purpose of Model Investigation

The initial objective of this study was to investigate the wave transmission response of the proposed breakwater. A secondary benefit of tests conducted herein, a check of the structure's stability, showed the proposed section to be conservatively stable. Therefore, an alternate plan also was investigated in an attempt to reduce construction costs for the breakwater.

# 2 The Model

## Model-Prototype Scale Relationships

Tests were conducted at a geometrically undistorted scale of 1:20, model to prototype. Scale selection was based on the sizes of model armor available compared with the estimated size of prototype armor required for stability, elimination of wave transmission scale effects, preclusion of stability scale effects,[1] and capabilities of the available wave tank. Based on Froude's model law[2] and the linear scale of 1:20, the following model-prototype relations were derived. Dimensions are in terms of length (L)[3] and time (T).

| Characteristic | Dimension | Model-Prototype Scale Relation |
|---|---|---|
| Length | L | $L_r = 1{:}20$ |
| Area | $L^2$ | $A_r^2 = L_r = 1{:}400$ |
| Volume | $L^3$ | $V_r^3 = L_r = 1{:}8000$ |
| Time | T | $T_r^{1/2} = L_r = 1{:}4.47$ |
| where<br>r = ratio of model quantities to prototype quantities<br>A = area, $ft^2$<br>V = volume, $ft^3$ | | |

[1] Hudson, R. Y. 1975 (Jun). Reliability of rubble-mound breakwater stability models. Miscellaneous Paper H-75-5. Vicksburg, MS: US Army Engineer Waterways Experiment Station.

[2] Stevens, J. C. 1942. Hydraulic Models. Manuals of Engineering Practice No. 25. New York: American Society of Civil Engineers.

[3] For convenience, symbols and abbreviations are listed in the Notation (Appendix A).

The specific weight of water used in model tests was assumed to be the same as the prototype and equal to 62.4 pcf. However, specific weights of model breakwater construction materials were not the same as their prototype counterparts. These variables were related using the following transference equation:

$$\frac{(W_a)_m}{(W_a)_p} = \frac{(\gamma_a)_m}{(\gamma_a)_p}\left(\frac{L_m}{L_p}\right)^3\left[\frac{(S_a)_p - 1}{(S_a)_m - 1}\right]^3 \quad (1)$$

where

$W_a$ = weight of individual armor unit, lb

a = armor stone

m = model quantities

p = prototype quantities

$\gamma_a$ = specific weight of armor unit, pcf

$S_a$ = specific weight of individual armor unit relative to water in which breakwater is constructed

## Test Equipment and Facilities

All tests were conducted in a concrete wave flume 3 ft wide and 150 ft long (Figure 3). A 1V-on-100H slope, representative of the existing prototype lake bottom, was molded lakeward of the test section. Irregular waves were generated by a hydraulically actuated piston-type wave machine. The test section was installed approximately 84.3 ft from the wave board.

Wave data were collected on electrical capacitance wave gages. Wave signal generation and data acquisition were controlled using a DEC Micro-Vax I computer. Wave data analyses were accomplished using a DEC VAX 3600.

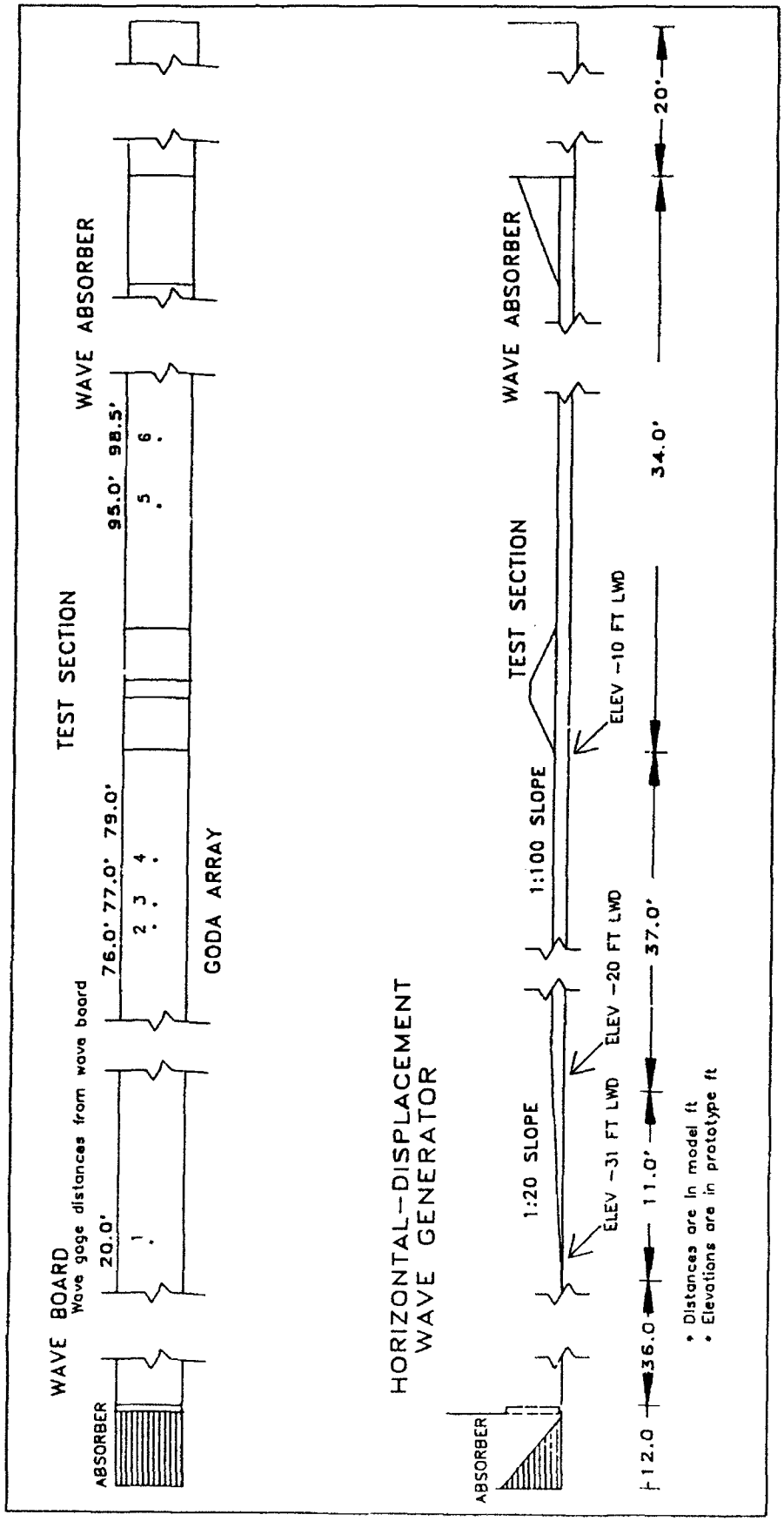



Figure 3. Wave flume cross section

# 3 Tests and Results

## Method of Constructing Test Sections

All experimental breakwater sections were constructed to reproduce as closely as possible results of the usual methods of constructing full-scale breakwaters. The core material was dampened as it was dumped by bucket or shovel into the flume and was compacted with hand trowels to simulate natural consolidation resulting from wave action during construction of the prototype structure. Once the core material was in place, it was sprayed with a low-velocity water hose to ensure adequate compaction of the material. The underlayer stone then was added by shovel and smoothed to grade by hand or with trowels. Armor units used in the cover layers were placed in a random manner corresponding to work performed by a general coastal contractor; i.e., they were individually placed but were laid down without special orientation or fitting. After each test, the armor units were removed from the breakwater, all of the underlayer stones were replaced to the grade of the original test section, and the armor was replaced.

## Description of Plan 1

Plan 1 (Figure 4 and Photos 1 and 2) was constructed to a crown elevation of +14 ft low-water datum (lwd) and used armor slopes of 1V on 2H both lakeside and harbor side. A crown width of 16.2 ft, equivalent to two armor-stone diameters plus a 7-ft-wide walkway, was used. The lakeside slope was armored with two layers of 4- to 11-ton stone, whereas the harbor-side slope used only one layer of 4- to 11-ton stone. In an effort to preclude toe slippage, the first row of armor stone at the toe of each slope used the largest size stone that was available in the specified armor stone range.

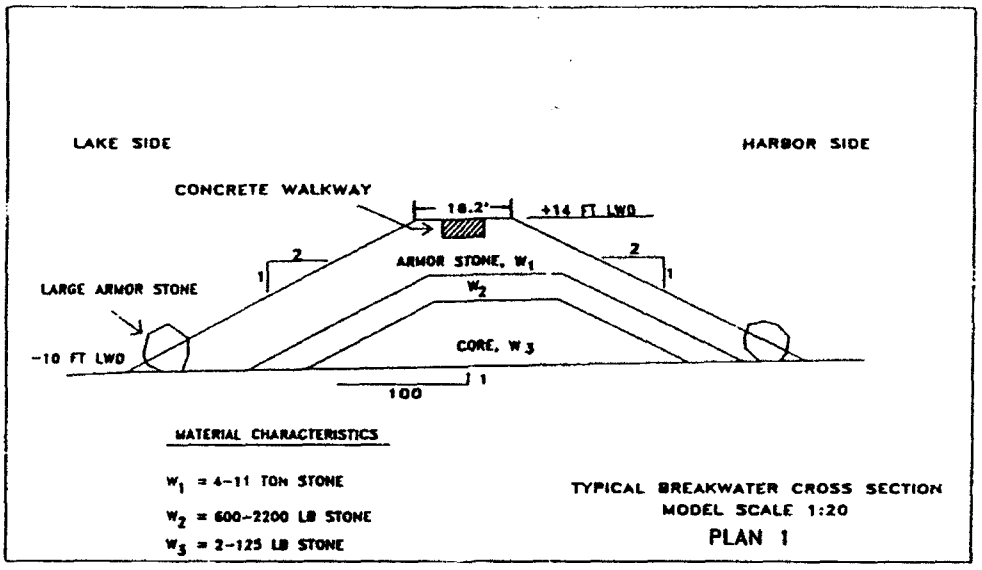



Figure 4. Cross section of Plan 1

## Selection of Test Conditions

Based on siting of the breakwater in shallow water, tests were conducted with a Texel, Marsen, Arsloe (TMA) spectrum using peak wave periods ($T_p$) of 6, 7, 8, 9, and 10 sec. The wave basin was calibrated for wave heights ($H_{mo}$ values) of 3 to 12 ft measured in front of the wave generator and in front of the structure. Transmitted wave heights were measured 100 and 150 ft shoreward of the breakwater. Goda and Suzuki's[1] method was used to resolve the incident and reflected spectra.

## Test Results of Plan 1

Wave-attenuation test results are presented in Tables 1 and 2. Transmission coefficients ($H_t/H_i$) are based on incident wave heights measured at the wave generator because these wave heights relate to the percent time of occurrence wave tables used in the harbor model.[2] In general, the data show that (a) there is little difference between transmitted wave heights measured at 100 to 150 ft shoreward of the structure and (b) if

[1] Goda, Y., and Suzuki, Y. 1976. Estimation of incident and reflected waves in random wave experiments. In *Proceedings, 15th international conference on coastal engineering.* Honolulu, Hawaii.

[2] Bottin and Acuff, op. cit.

the incident wave height is held constant and the wave period is increased, transmitted wave heights increase. Maximum transmitted wave heights of 0.9 ft were observed at the 9- and 10-sec wave periods.

Observations of incident wave forms, made during the wave attenuation tests, showed that the most severe wave conditions which experimentally could be made to attack the section for the selected conditions occurred at the 10-sec peak period with maximum wave height of about 11 ft. Therefore, it was decided the stability response of the proposed section could be adequately evaluated by subjecting the structure to the following storm-surge hydrograph:

| Step | Swl ft, lwd | Wave Period $T_p$, sec | Wave Height $H_{mo}$, ft | Prototype Duration, hr |
|---|---|---|---|---|
| 1 | +4.3 | 10 | 11.1 | 4 |
| 2 | +5.1 | 10 | 11.2 | 4 |
| 3 | +4.3 | 10 | 11.1 | 4 |

Note: Swl = still-water level.

As evidenced in Photos 3 and 4, Plan 1 exhibited an excellent stability response. Minor rocking of a few armor stones was observed; however, none were displaced.

## Rationale and Description of Plan 1A

Based on the excellent stability response of Plan 1, it was decided to investigate alternative schemes that might reduce the structure's cost without significantly affecting its functional performance. Some of the factors that govern material volumes and costs are elevation and width of the crown, type and weight of armor, and slope on which the armor is placed. Based on discussions between NCB and US Army Engineer Waterways Experiment Station, it was decided that, in this particular study, the greatest cost savings with the least probable impact on functionality could probably be achieved by lowering the crown elevation.

Plan 1A was the same as Plan 1 except a toe elevation of -11.5 ft lwd and crown elevation of +12.5 ft lwd were used. This simulation was achieved by simply increasing the water depth 1.5 ft and assuming the new depth also represented an swl of +5.1 ft lwd. This approach reduced the freeboard by 1.5 ft and effectively achieved the same results (relative to transmission) as would have been achieved by lowering the model structure 1.5 ft.

# Test Results of Plan 1A

Wave attenuation test results are presented in Table 3. These data show the same general trends as those observed with Plan 1. As would be expected with the reduced crown elevation, Plan 1A showed increased wave transmission. A maximum transmitted wave of 1.5 ft was observed for the 10-sec wave period. Figure 5 shows average wave transmission coefficient for the 150-ft spacing versus peak wave period for Plans 1 and 1A.

Plan 1A was stable. Minor rocking of a few armor units was observed; however, none were displaced, and the integrity of the section was not jeopardized. Photos 5 and 6 show the structure at the conclusion of testing.

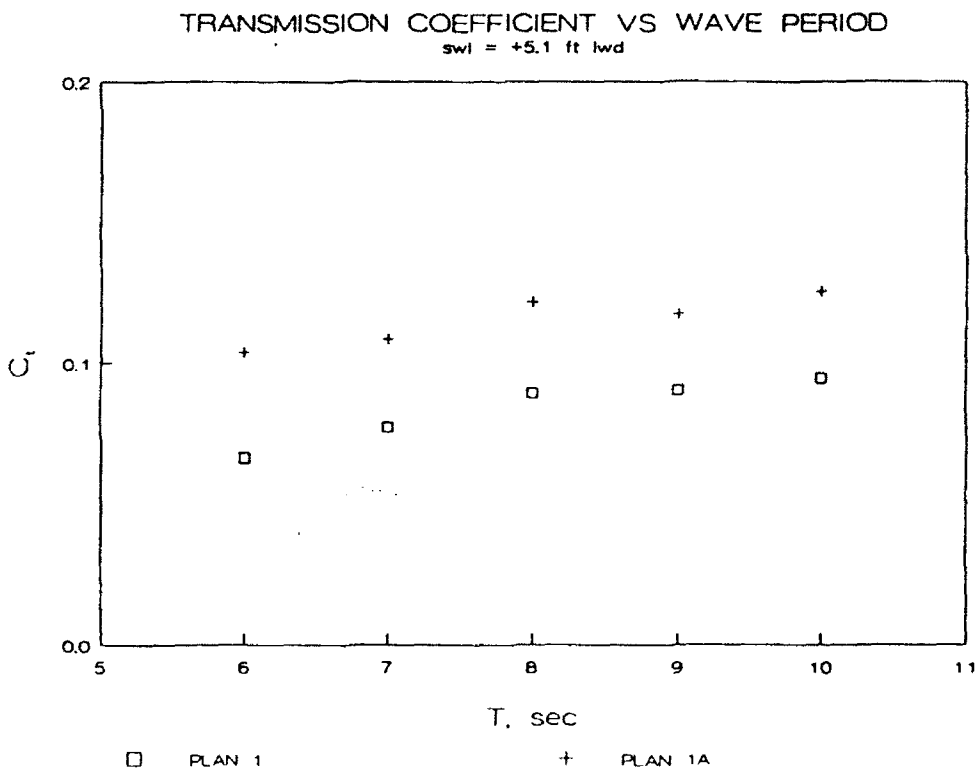



Figure 5. Coefficient of transmission ($C_t$) versus wave period ($T_p$)

**Table 1**
**Incident and Transmitted Wave Heights: Plan 1, swl = +4.3 ft lwd**

| Wave Period sec | Incident Wave Height ft[1] | Incident Wave Height ft[2] | Transmitted Wave Height, ft 100 ft shoreward | $C_t$[3] | Transmitted Wave Height, ft 150 ft shoreward | $C_t$[3] |
|---|---|---|---|---|---|---|
| 6.0 | 2.7 | 3.1 | 0.2 | 0.06 | 0.2 | 0.06 |
| 6.0 | 4.1 | 4.6 | 0.3 | 0.07 | 0.3 | 0.07 |
| 6.0 | 5.2 | 6.1 | 0.4 | 0.07 | 0.4 | 0.07 |
| 6.0 | 6.2 | 7.4 | 0.4 | 0.05 | 0.4 | 0.05 |
| | | | | $\bar{C}_t$[4] = 0.06 | | $\bar{C}_t$ = 0.06 |
| 7.0 | 3.5 | 3.9 | 0.3 | 0.08 | 0.3 | 0.08 |
| 7.0 | 2.5 | 5.8 | 0.4 | 0.07 | 0.4 | 0.07 |
| 7.0 | 6.6 | 7.6 | 0.5 | 0.07 | 0.5 | 0.07 |
| 7.0 | 7.3 | 9.1 | 0.6 | 0.07 | 0.5 | 0.05 |
| | | | | $\bar{C}_t$ = 0.07 | | $\bar{C}_t$ = 0.07 |
| 8.0 | 3.6 | 3.9 | 0.4 | 0.10 | 0.4 | 0.10 |
| 8.0 | 5.4 | 5.9 | 0.5 | 0.08 | 0.5 | 0.08 |
| 8.0 | 6.8 | 7.7 | 0.5 | 0.06 | 0.6 | 0.08 |
| 8.0 | 7.8 | 9.4 | 0.6 | 0.06 | 0.7 | 0.07 |
| | | | | $\bar{C}_t$ = 0.08 | | $\bar{C}_t$ = 0.08 |
| 9.0 | 4.4 | 4.8 | 0.4 | 0.08 | 0.5 | 0.10 |
| 9.0 | 6.5 | 7.1 | 0.6 | 0.08 | 0.6 | 0.08 |
| 9.0 | 7.7 | 9.1 | 0.7 | 0.08 | 0.7 | 0.08 |
| 9.0 | 8.3 | 11.0 | 0.7 | 0.06 | 0.7 | 0.06 |
| | | | | $\bar{C}_t$ = 0.08 | | $\bar{C}_t$ = 0.08 |
| 10.0 | 4.5 | 4.6 | 0.5 | 0.11 | 0.5 | 0.11 |
| 10.0 | 6.5 | 7.0 | 0.6 | 0.09 | 0.6 | 0.09 |
| 10.0 | 7.9 | 9.4 | 0.7 | 0.07 | 0.7 | 0.07 |
| 10.0 | 8.3 | 11.1 | 0.8 | 0.07 | 0.8 | 0.07 |
| | | | | $\bar{C}_t$ = 0.09 | | $\bar{C}_t$ = 0.09 |

[1] Measured at Goda array in front of structure.
[2] Measured at wave generator.
[3] Transmission coefficient ($H_t/H_i$) based on incident wave heights measured at the wave generator.
[4] $\bar{C}_t$ = average $C_t$.

# 4 Conclusions

Based on assumptions, tests, and results reported herein, it is concluded that:

*a*. Plans 1 and 1A are stable designs for the maximum wave heights that can be expected to occur (6- to 10-sec waves at swl's of +4.3 and +5.1 ft lwd.)

*b*. Maximum transmitted wave heights were 0.9 and 1.5 ft for Plans 1 and 1A, respectively.

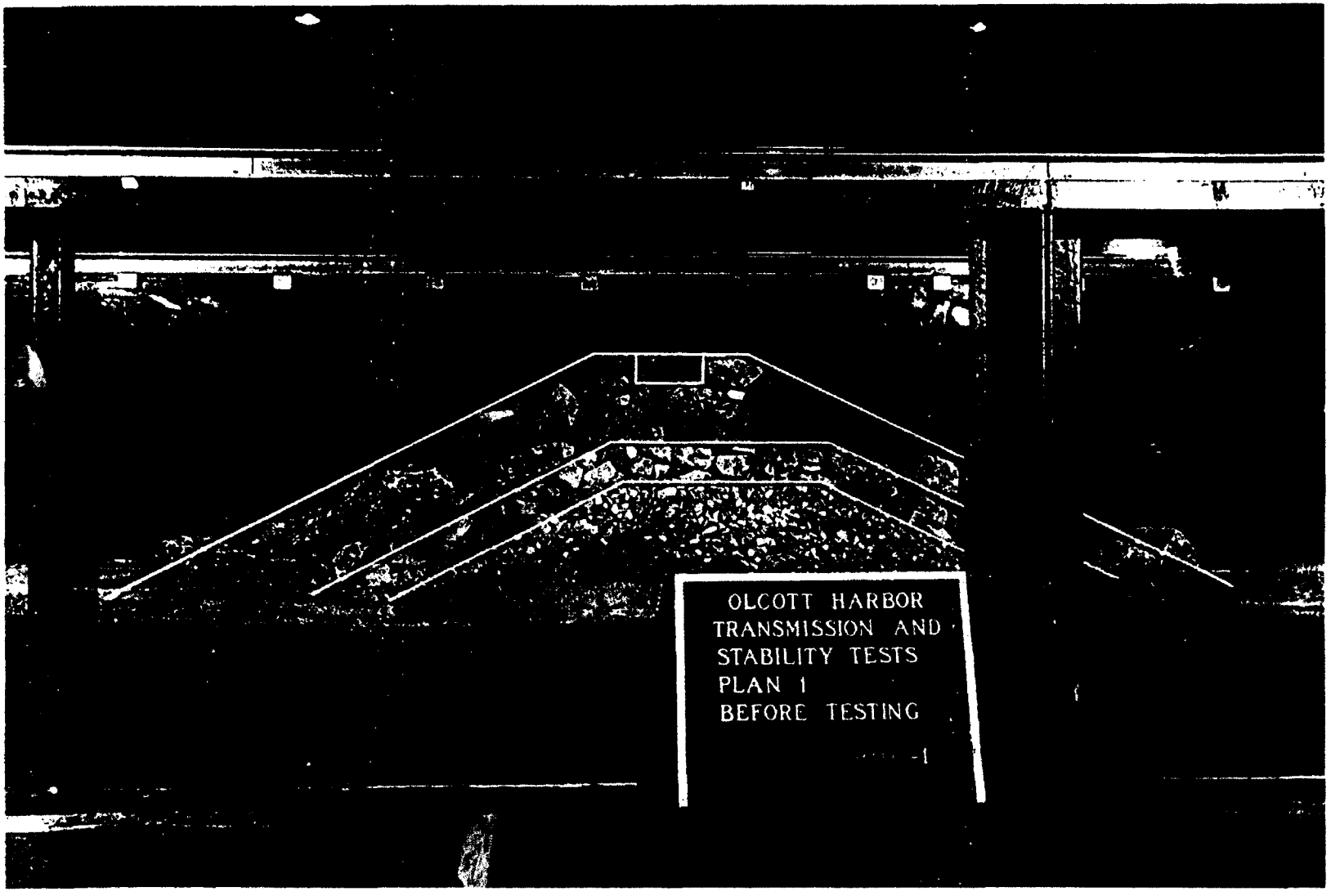



Photo 1. Side view of Plan 1 before wave attack

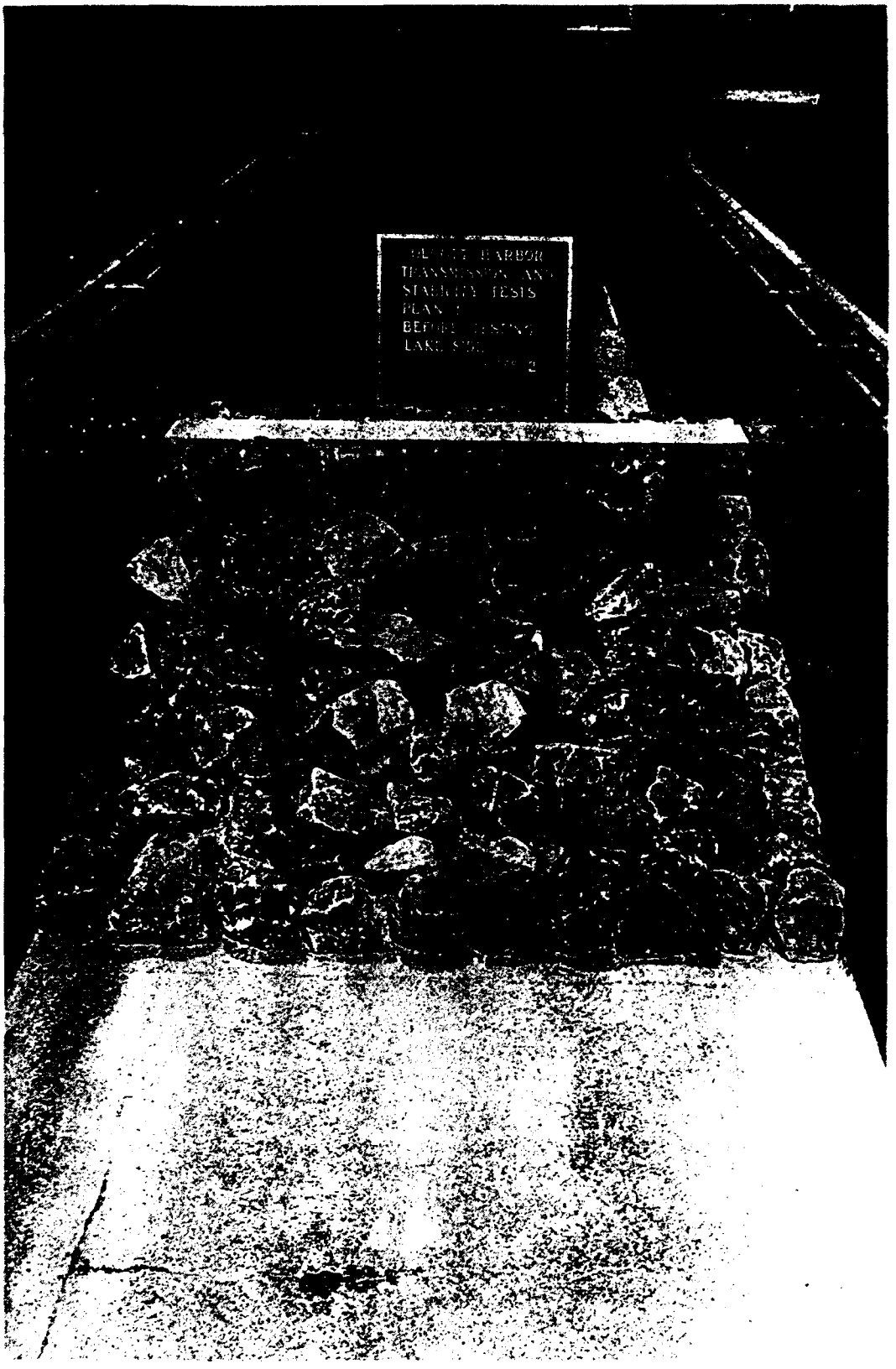


Photo 2. Lakeside view of Plan 1 before wave attack

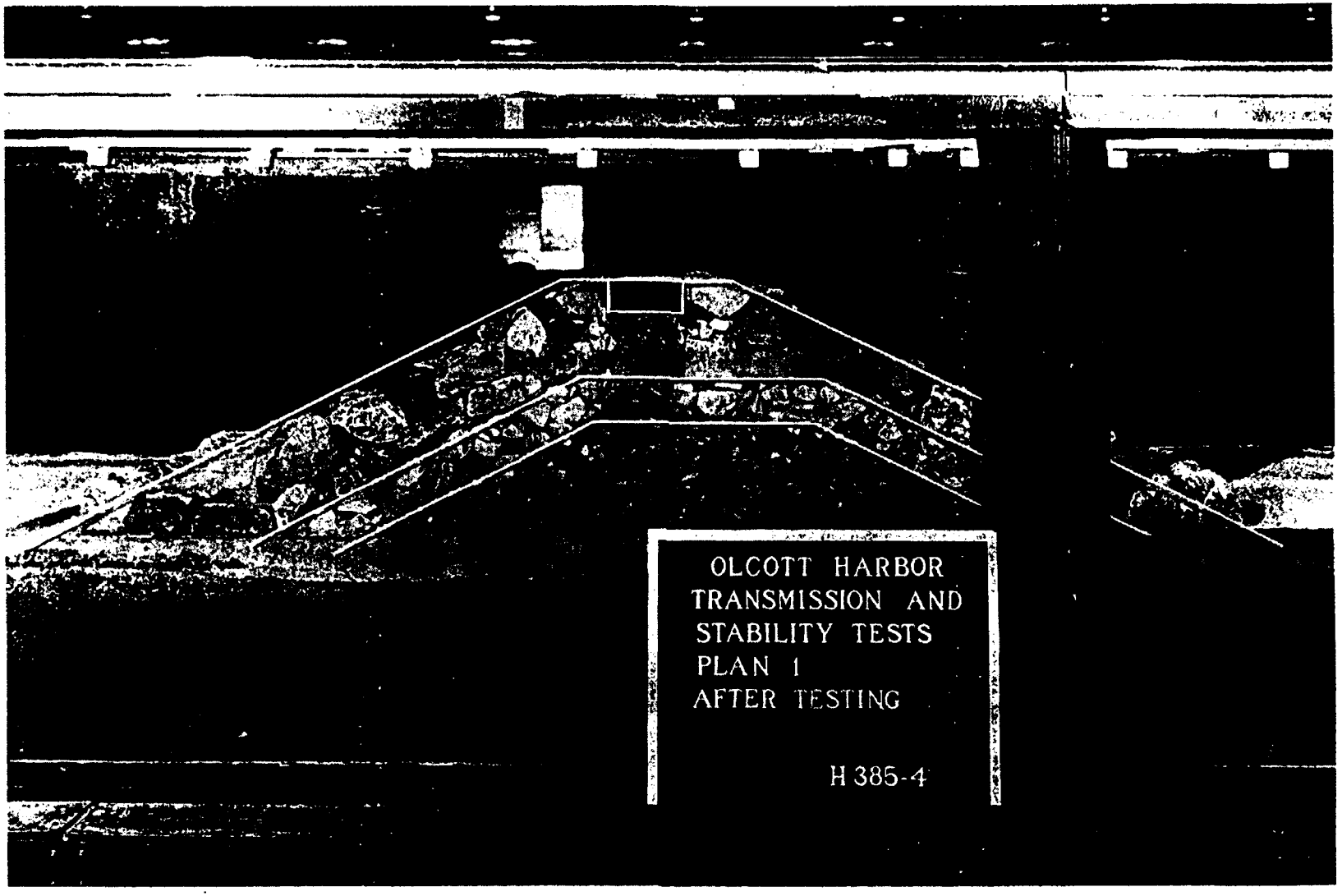



Photo 3. Side view of Plan 1 after wave attack

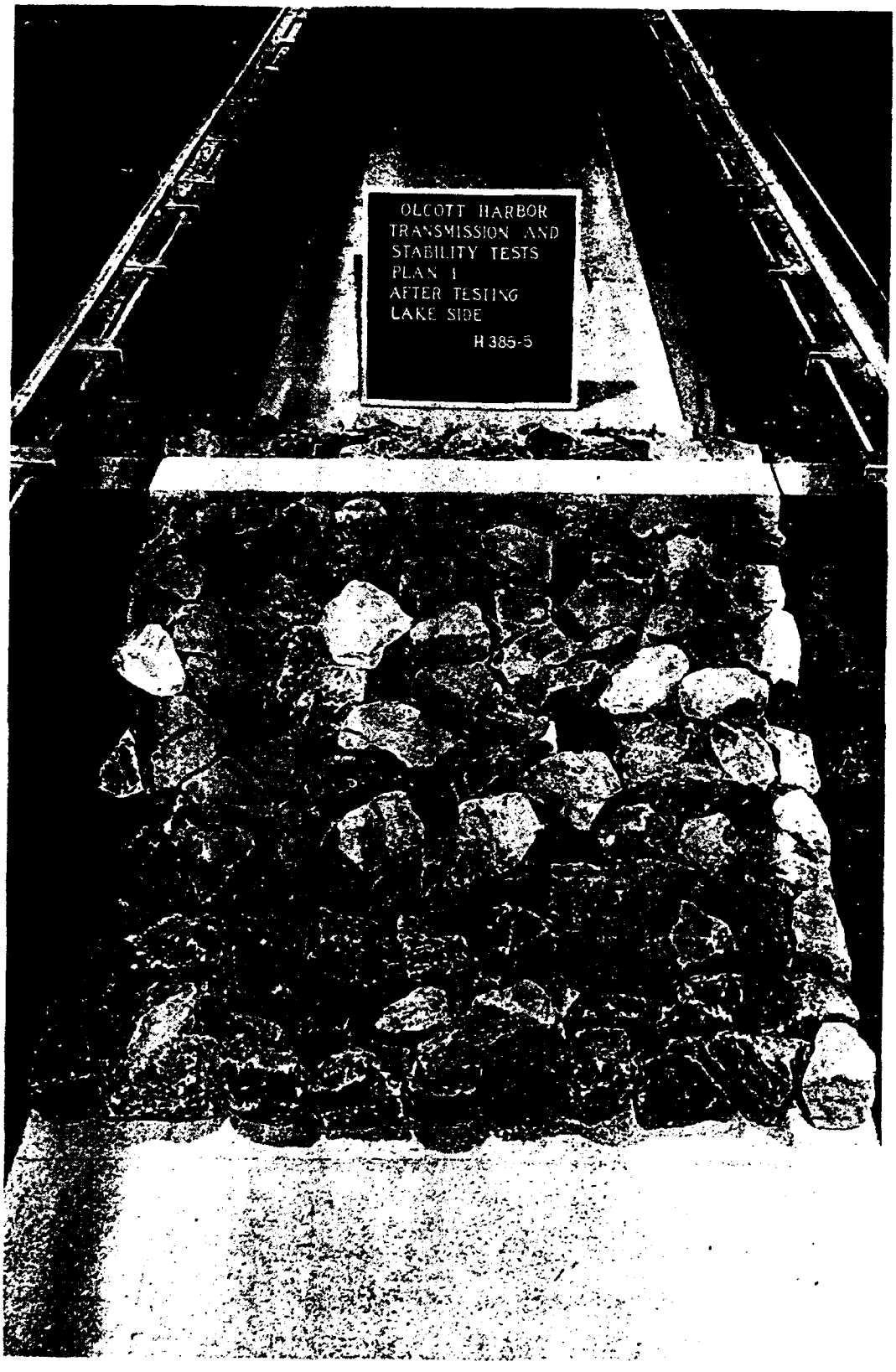



Photo 4. Lakeside view of Plan 1 after wave attack

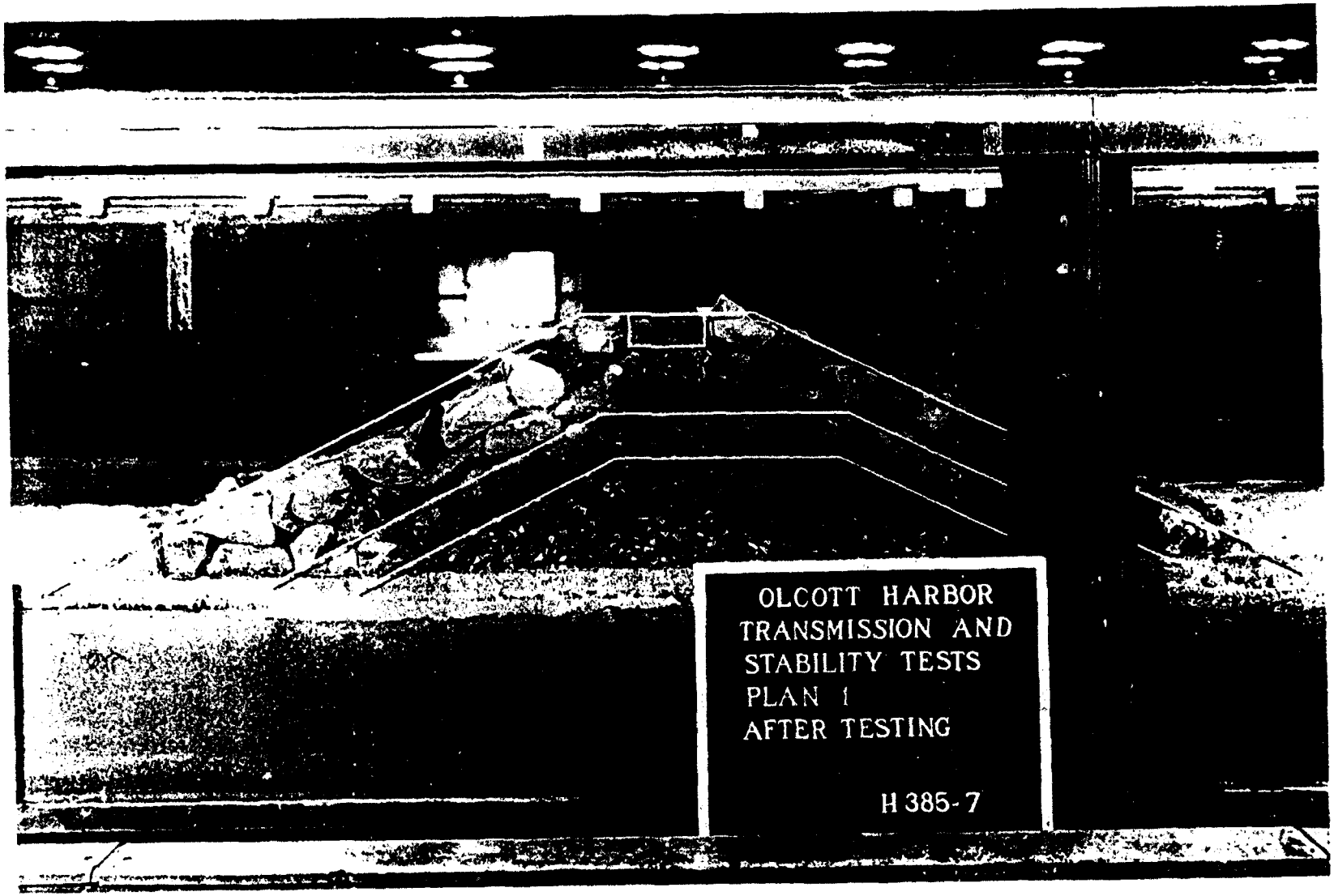



Photo 5. Side view of Plan 1A after wave attack

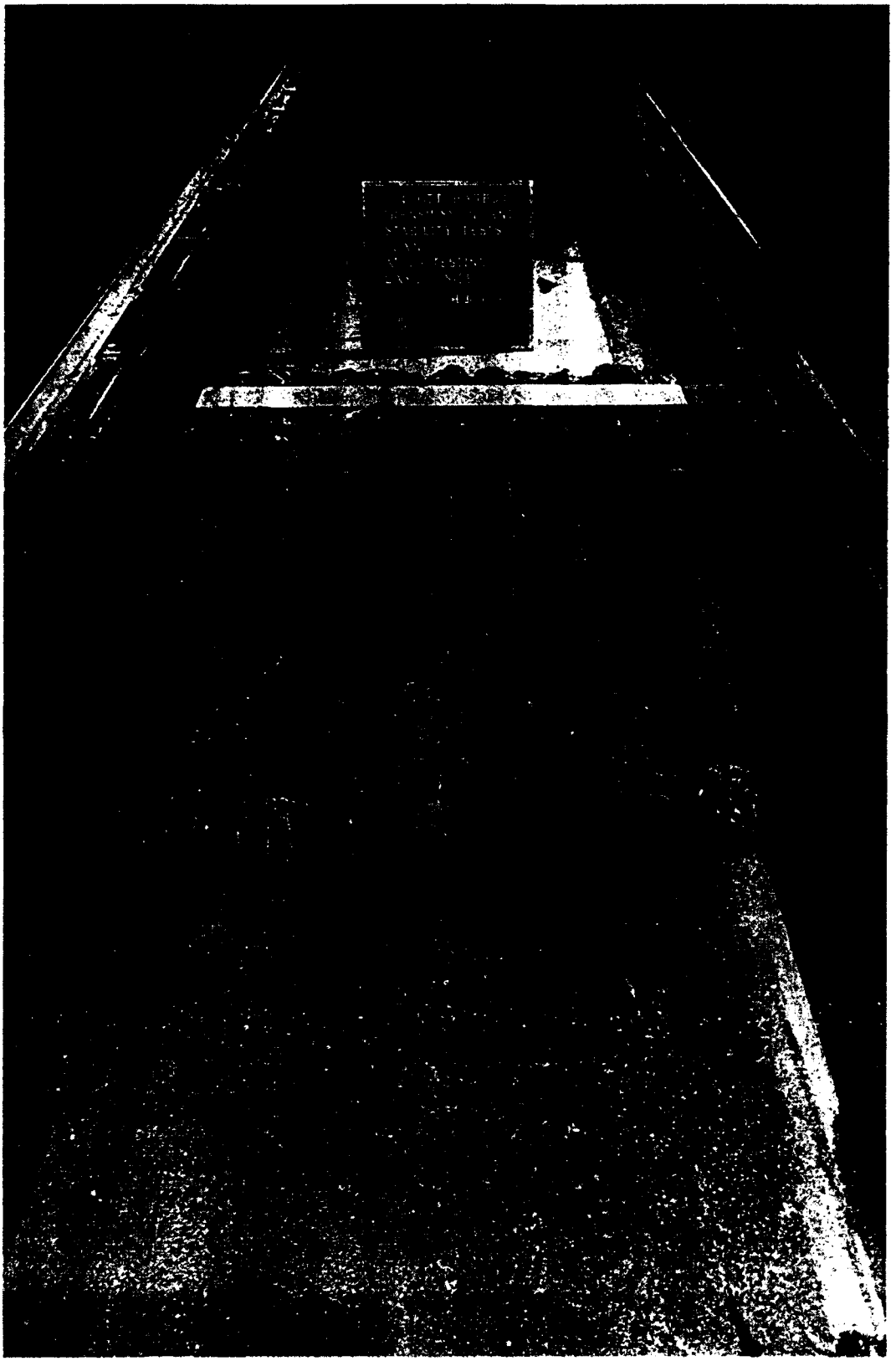


Photo 6. Lakeside view of Plan 1A after wave attack

# Appendix A
# Notation

| | |
|---|---|
| $A$ | Area, $ft^2$ |
| $C_t$ | Transmission coefficient ($H_t/H_i$) |
| $\overline{C}_t$ | Average $C_t$ |
| $H_i$ | Incident wave height |
| $H_t$ | Transmitted wave height |
| $H_{mo}$ | Zero-moment wave height, ft |
| $L$ | Length, linear scale, ft |
| $S_a$ | Specific weight of an individual armor relative to the water in which the breakwater is constructed, i.e., $S_a = \gamma_a/\gamma_w$ |
| $T$ | Time |
| $T_p$ | Wave period of peak energy density of spectrum, sec |
| $V$ | Volume, $ft^3$ |
| $W_a$ | Weight of individual armor, lb |
| $\gamma_a$ | Specific weight of armor unit, pcf |

Subscripts

| | |
|---|---|
| a | Refers to armor stone |
| m | Refers to model quantities |
| p | Refers prototype quantities |
| r | Refers to ratio of model quantities to prototype quantities |
| w | Refers to water |

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# Sub-Appendix C

## STRUCTURAL DESIGN ANALYSIS

# OLCOTT HARBOR, NEW YORK
# SMALL-BOAT HARBOR PROJECT

## APPENDIX A
## GENERAL DESIGN MEMORANDUM

## SUB-APPENDIX C

## STRUCTURAL DESIGN ANALYSIS

AUGUST 1991

US Army Engineer District, Buffalo
1776 Niagara Street, Buffalo, NY 14207

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
APPENDIX A
GENERAL DESIGN MEMORANDUM

SUB-APPENDIX C
STRUCTURAL DESIGN ANALYSIS

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| C5 | Concrete Walkway - Details |
| C6 | Rehabilitation of Old Existing Hotel Pier |
| C7 | Handicapped Access Ramp - Plan |
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OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
APPENDIX A
GENERAL DESIGN MEMORANDUM

SUB-APPENDIX C
STRUCTURAL DESIGN ANALYSIS

## C1. INTRODUCTION

This appendix discusses the structural design of project features necessary to meet public access, recreational and navigational safety requirements of the Olcott Harbor Small-Boat Harbor Project. Project features associated with public access include a pedestrian bridge and handicapped access facilities. Recreational features include concrete walkways atop the east shore-connected and east detached breakwaters, and rehabilitation of the old existing hotel pier off Franklin Street. Safety features involve the harbor entrance navigation lights as required by the U.S. Coast Guard. A brief description of each feature and the required structures are included along with design criteria, basic data, assumptions and loading conditions to show the general design procedures. Design computations for the pedestrian bridge deck and abutments are included as Enclosures Nos. 1 and 2.

## C2. DESIGN CRITERIA

Working stresses, loading conditions, design assumptions and other required criteria are based on the applicable parts of the following references:

a. EM 1110-1-103. Design for the Physically Handicapped

b. EM 1110-1-2101. Working Stresses for Structural Design

c. EM 1110-2-2503. Design of Sheet Pile Cellular Structures

d. Building Code Requirements for Reinforced Concrete (ACI 318-89) by American Concrete Institute

e. Manual of Steel Construction (AISC Ninth Edition) by American Institute of Steel Construction

f. Standard Specifications for Highway Bridges (AASHO Thirteen Edition) by American Association of State Highway Officials.

g. Precast Prestressed Concrete, Short Span Bridges, Spans to 100 Feet (PCI Second Edition) by Prestressed Concrete Institute

h. NAVFAC DM-7.2. Foundations and Earth Structures (May 1982) by Naval Facilities Engineering Command

C2.1 Material Strengths and Design Stresses

a. Concrete

The compressive strength of concrete for the precast, prestressed bridge deck, f'c, is 5,000 pounds per square inch; and for all other concrete, f'c, is 4,000 pounds per square inch. All other stresses are in accordance with the ACI 318 Building Code.

b. Reinforcement

The ultimate strength of ASTM A416 Grade 270 prestressing steel for the precast, prestressed bridge deck, f's, is 268,000 pounds per square inch. The yield strength of ASTM A615 Grade 60 reinforcing bars for all other reinforced concrete, fy, is 60,000 pounds per square inch. The yield strength of ASTM A185 welded wire fabric for the access ramp, fy, is 65,000 pounds per square inch.

c. Structural Steel

The yield strength of ASTM A328 steel for the sheet pile cells, fy, is 38,500 pounds per square inch. The yield strength of ASTM A53 Grade B steel for the pipe piles and pipe guard rails, fy, is 36,000 pounds per square inch. The yield strength of ASTM A36 steel for the guardrail posts, fy, is 36,000 pounds per square inch. The yield strength of ASTM A500 Grade B steel for the guardrail tubular rails, fy, is 46,000 pounds per square inch. The allowable working stresses are in accordance with provisions provided in the various references cited in paragraph C2, above.

d. Minimum Factor of Safety

The minimum factor of safety for sheet pile cell design is 1.5 for normal loading conditions and 1.25 for temporary loading conditions.

## C3. BASIC DATA AND ASSUMPTIONS

The following data are used in the structural design and layout of the various project features.

C3.1 Survey Datum. Vertical survey control is referenced to a U.S. Lake Survey Monument (Hedley 1942), located on the southwest wide of the Hedley Boat Co. storage building near the west end of Ontario Street. All elevations are in feet and tenths of feet and are referenced to the International Great Lakes Datum (IGLD 1955). Horizontal survey control is referenced to U.S.A. Corps of Engineers monuments numbered 10 and 12, located along the U.S. East Pier. Coordinates for project control points are referenced to a local grid system that assumes Monument No. 12 to be N 2000 and E 2000.

C3.2 Water Level Fluctuations. The low water datum (LWD) for Lake Ontario is 242.8 feet above mean sea level (IGLD 1955) and is referred to as elevation 0. Water levels and elevations associated with marine structures are measured in feet above (+) or below (-) LWD. Lake Ontario water levels have fluctuated between +5.2 and -1.2 based on the extreme levels for the 1900-1989 period of record. The average water level for the same period of record has fluctuated between +3 and +1. In the future Lake Ontario water levels can be expected to fluctuate about one foot above or below the long-term average water levels, producing a maximum 4 foot fluctuation.

C3.3 Design Parameters. The following parameters are used in the structural design of the pedestrian bridge and bridge abutments.

a. Weights of materials

| | |
|---|---|
| Water | 62.5#/cu. ft. |
| Concrete | 150# /cu. ft. |
| Moist granular cell fill | 110# /cu. ft. |
| Saturated granular cell fill | 115# /cu. ft. |
| Saturated earth (lake bottom silt) | 85# /cu. ft. |
| Moist breakwater stone | 110# /cu. ft. |
| Saturated breakwater stone | 130# /cu. ft. |
| Ice | 57.5#/cu. ft. |
| Structural Steel | 490# /cu. ft. |

b. Internal friction angles ($\phi$)

| | |
|---|---|
| Granular cell fill | $32^{o}$ |
| Saturated earth (lake bottom silt) | $26^{o}$ |
| Breakwater stone | $40^{o}$ |

c. Wall friction angles ($\delta$)

| | |
|---|---|
| Granular cell fill | $16.7^{o}$ |
| Saturated earth (lake bottom silt) | $11.3^{o}$ |
| Breakwater stone | $21.8^{o}$ |

d. Loads

| | |
|---|---|
| Concentrated | 10,000# |
| Live weight (pedestrian traffic) | 85#/sq. ft. |
| Ice | 30#/sq. ft. |
| Wind | 30#/sq. ft. |

C3.4 Foundation Bearing Capacity. The allowable bearing pressure of rock is 20 tons per square foot. This is a presumptive value for medium hard sound sedimentary rock similar to the Queenston shale found in Olcott Harbor during the 1990 foundation exploration program. Due to monetary restraints and the contractor's inability to obtain suitable rock core samples, laboratory test data is not available. Refer to NAVFAC DM-7.2, Chapter 4, Table 1, referenced above, for additional information relative to presumptive values of allowable bearing pressures for rock.

C3.5 Loading Conditions. The following loading conditions are used in the structural design of the pedestrian bridge sheet pile cellular abutments.

a. Case I, Initial Filling Condition. Balanced water level around the outside of the sheet pile cellular structure; for determination of maximum interlock stress, cell fill is assumed to be completely saturated to the top of fill at El.+11 and water level around outside of structure is assumed to be at low water datum, El.0. This water level is one foot below the long-term average low water level of Lake Ontario.

b. Case II, Construction Condition. Balanced water level around the outside of the sheet pile cellular structure with moderate wave action; for determination of maximum overturning stress during sudden onset of storm conditions, cell is assumed

to be filled to El.+11 and saturated to El.+2, the water level around outside of structure is assumed to be at El.+3.6, and a presumptive 4,000 pounds per linear foot wave force with a 5-10 year recurrence interval is assumed to act at El.+2.

c. Case III, Normal Condition. Balanced water level around the outside of the sheet pile cellular structure with breakwater stone in place and surcharge load on cell fill; cell is filled to El.+11 and capped with concrete to El.+13, cell fill is assumed to be saturated to El.+2, the water level around outside of structure is assumed to be at El.+2, breakwater stone is assumed to settle one foot into lake bottom, and surcharge load is assumed to include a dead load of 300 pounds per square foot for concrete cap and a live load of 85 pounds per square foot for pedestrian traffic.

C4. SITE WORK

The following preparatory work is necessary before construction operations can commence.

C4.1 Construction Access. A suitable site along the lake shore west of the harbor entrance will be developed by the contractor to provide a staging area for equipment mobilization and material handling. Access through an existing county park (Krull Park) east of the harbor entrance will be available to facilitate equipment and material movements during construction of the east shore-connected breakwater and pedestrian bridge. The contractor will be required to make necessary improvements and/or repairs to the existing dirt road between the county park and the lake shore. Delivery of the long-span precast concrete beams for the pedestrian bridge will be via water through Rochester Harbor to facilitate shipping and handling.

C4.2 Removal of Old Existing Hotel Pier Walkway. An old existing hotel pier off Franklin Street, 38 feet by 59 feet, was connected to the shore by a walkway approximately 8 feet wide by 475 feet long. This walkway was constructed using massive concrete blocks supported intermittently by rock filled timber cribs. About 195 feet of the walkway has been destroyed by weather and time. The timber cribs have failed, causing the concrete blocks to settle and become dislodged. Many of the concrete blocks are laying on the lake bottom, some are still visible slightly above or below normal water levels. Some of the debris from the walkway has been scattered over a wide area of the lake bottom to the east of the walkway. A 120 foot long

reach of lake bottom between the end of the east shore-connected breakwater and the east detached breakwater will be cleared of all walkway structures and/or debris to facilitate construction of the pedestrian bridge shoreward abutment and to provide an unobstructed water circulation channel between the breakwater structures. Additional clearing will be required to permit placement of breakwater armor stone and underlayer stone to their full design layer dimensions. All concrete blocks, broken concrete and rock debris, removed from the cleared areas, will be disposed of within the limits of the east detached breakwater core stone. All timber and other degradable debris will be placed in an approved upland disposal area.

C5. PROJECT FEATURES

The description, layout and structural design of the various project features are discussed in the following paragraphs along with associated design considerations and alternatives. The design of the breakwater structures is addressed in the Coastal Design Sub-appendix B.

C5.1 Pedestrian Bridge. The following subparagraphs will discuss the need for a bridge and the range of alternatives considered. A description of the selected bridge is also provided along with the overall design rationale.

a. Project Overview. Improving and enlarging Olcott Harbor requires construction of a west detached breakwater and an east shore-connected breakwater to provide safe entrance channel conditions and protected mooring facilities for an additional 800 small boats. Due to its location at the mouth of Eighteenmile Creek, a prime fishery has developed in and around Olcott Harbor. Construction of an east shore-connected breakwater over 1,900 feet long would adversely affect this fishery by restricting water circulation and fish migration. For this reason, the selected plan of improvement recommends construction of an east detached breakwater and an east shore-connected breakwater, separated by a trapezoidal shaped open flow channel. The selected channel dimensions will provide for adequate water circulation within the harbor and unrestricted fish migration. A pedestrian bridge will be constructed to connect the two sections of the east breakwater. Provision for public access to the east detached breakwater is essential to developing the full recreational potential of the Olcott Harbor project.

b. Alternatives Considered. Several alternative bridge

designs were studied. These alternatives considered single and multiple spans, span lengths varying from 50 feet to 150 feet, precast prestressed concrete and structural steel truss bridges, and pile supported and sheet pile cell abutments. The recommended bridge design should consider anticipated heavy recreational activity both on and around the bridge, environmental concerns related to water circulation and fish migration, foundation problems, safety concerns, and future maintenance requirements. Based on these criteria, a single span precast prestressed concrete bridge with a span length less than 100 feet and sheet pile cell abutments was selected as the most feasible alternative. Due to the anticipated high cost of any bridge alternative, a system of submerged pipe bypass culverts was also studied. This alternative satisfied most of the criteria except for safety considerations and environmental concerns related to fish migration through 90 foot long submerged culverts. The system of bypass culverts was judged to be an unacceptable alternative to an open flow channel and pedestrian bridge.

c. Selected Bridge Design. The selected pedestrian bridge design will require construction of two 23 foot diameter circular steel sheet pile cells in the open lake either prior to or in conjunction with breakwater construction. The sheet pile cells will function as bridge abutments and will be located within the breakwater sideslopes. The clear opening between the cells will be 90 feet. The cells will be driven to bedrock, filled with granular material, and capped with concrete. The heavy concentrated loads due to the bridge reactions will be supported by 12 3/4 inch O.D. steel pipe piles, filled with concrete and driven to bedrock. A 2 foot thick reinforced concrete pile cap will distribute the bridge reaction over 4 pipe piles located along the perimeter of each cell. The sheet pile cells will be covered with 2 foot thick reinforced concrete caps. Triple rail galvanized steel pipe guardrails will be installed around the perimeter of each cell. An 8 foot wide by 95 foot long precast prestressed concrete bridge will be installed with marine cranes. The bridge will be constructed off-site and shipped to Olcott Harbor by truck and barge. Two precast concrete box beams will be joined together to form an integral bridge deck. Each 4 foot wide box beam will be 27 inches deep. Each box beam will be constructed with 2 formed alignment holes at each end to match steel dowels cast into the pile caps. The top of each box beam will be finished with a non-slip surface and sloped to drain. Precast concrete curbs, 8 inches high by 12 inches wide, will be cemented to the box beams along both sides of the bridge deck.

The clear distance between curbs will be 6 feet. Galvanized structural steel guardrails with triple tubular rails will be bolted to the sides of the box beams. A plan and profile of the pedestrian bridge are shown on Plates C1 and C2. Bridge abutment and bridge deck details are shown on Plates C3 and C4.

d. Basis of Design. The alignment of the pedestrian bridge and the structural design of the various bridge components are discussed below.

(1) The alignment of the pedestrian bridge including the locations of the cellular bridge abutments are referenced to a local coordinate grid system for Olcott Harbor. The bridge alignment is part of the overall alignment of the proposed Olcott Harbor breakwaters. Coordinates for pertinent control points related to the bridge alignment are shown on Plate C1.

(2) The structural design of the pedestrian bridge abutments utilizes circular steel sheet pile cells to provide overturning and sliding stability and steel pipe piles to support the heavy bridge reactions. The selection of sheet pile cells resolved several problems associated with the pedestrian bridge and its location. A trapezoidal shaped channel with a 60 foot minimum bottom width and 1V on 2H sideslopes is required to provide adequate water circulation through the east breakwater. Using these dimension and conventional pile supported concrete bridge abutments, a bridge with a single span of approximately 140 feet would be required. The cellular design permits the use of a 95 foot single span bridge. A single span bridge could minimize safety hazards to small boat traffic that may use the water circulation channel as a short cut when weather permits. The reduced bridge length allows greater design flexibility in the selection of bridge components. In addition, the available subsurface information in the vicinity of the pedestrian bridge is incomplete. During the 1990 foundation exploration program the contractor was unable to obtain rock core samples suitable for laboratory testing. The poor core recovery was probably caused by the contractor's drilling methods and equipment rather than the integrity of the Queenston shale on site. The exploration program did reveal the presence of a submerged rock trough filled with silt in the immediate vicinity of the pedestrian bridge. Monetary restraints have prevented any further foundation explorations to verify the integrity and strength of the rock and to define the extent of the submerged rock trough. Bedrock in the vicinity of the bridge abutments could be overlaid with 1 foot to 12 feet of silt and could be

either sloping or stepped. These unresolved subsurface conditions complicate the foundation design for the pedestrian bridge. The cellular design concept is more readily adaptable to varying foundation conditions and can be adjusted during construction as needed. The selected sheet pile cells are designed in accordance with EM 1110-2-2503 and satisfy both construction and normal loading conditions as described in paragraph C3.5. The sheet pile cells were analyzed with an electronic computer program entitled "CCELL - Design/Analysis of Sheet Pile Cells (X0040)," furnished by the U.S. Army Engineer Waterways Experiment Station. Design computations including input files for three loading conditions and the corresponding computer output are enclosed as part of Attachment C1. The sheet pile cells will provide handicapped users with rest and recreation areas at both ends of the pedestrian bridge as discussed in paragraph C5.5, b.

(3) The sheet pile cells will not be required to support the heavy concentrated loads due to the bridge reactions. Four steel pipe piles, filled with concrete and driven to bedrock, will support the bridge reaction at each cellular abutment. A reinforced concrete pile cap will join the pipe piles together to form a bridge seat and distribute the bridge reaction. Lateral loads due to wind acting on the bridge components will be transferred to the pile cap through steel alignment dowels and resisted by the mass of the cellular abutment. Each pipe pile is designed to support approximately 35 kips. This design load includes a 26 kip portion of the 104 kip bridge reaction, a 4 kip portion of the pile cap weight and a 5 kip pile weight. The pile design neglects the positive effect of the concrete fill inside the pipe pile and the lateral support provided by granular cell fill around the pile. Each pile is designed as a hollow pipe column with an unsupported length equal to its full height. The pipe piles were analyzed for buckling in accordance with allowable stress design methods recommended in the Manual of Steel Construction (A.I.S.C. Ninth Edition). The end bearing load was checked and found to be less than the allowable 20 tons per square foot bearing capacity of the foundation rock. Design computations for the pipe piles are enclosed as part of Attachment C1.

(4) The selection of a precast prestressed concrete bridge with integral deck components fulfills the need for a low profile bridge capable of serving as a multipurpose recreational facility. The use of standard box beam construction will provide an economical short span bridge of shallow depth. The bridge

will have long term durability and low maintenance. Heavy seasonal usage is anticipated not only as an access bridge to the east detached breakwater but also as a prime location for fishing. The bridge will span a natural fish migration route to and from the inner harbor. Due to the probability of heavy pedestrian traffic, the bridge will be designed for a live load of 85 pounds per square foot rather than the 60 pounds per square foot normally used for pedestrian bridges. The bridge design will also consider an ice load of 30 pounds per square foot, a wind load of 30 pounds per square foot and a presumptive concentrated load of 10,000 pounds. Thermal contraction and expansion will be accommodated by the use of flexible material around the steel alignment dowels at one end of the bridge. The bridge will utilize pre-engineered standard box beams. The final bridge design will be accomplished by the bridge manufacturer based on the load requirements furnished by the Corps of Engineers. Design methods will follow recommendations of the Prestressed Concrete Institute and will be in accordance with the Standard Specifications for Highway Bridges (AASHO Thirteen Edition). Discussions with a local precast concrete manufacturer have confirmed the use of box beam sections rather than lighter weight double stemmed bridge sections. Based on a cursory review of load and span requirements for the pedestrian bridge, the manufacturer recommends the use of a 4 foot wide by 27 inch deep standard box beam known as Type B I-48. This box beam section weighs 722 pounds per linear foot. Design computations for the pedestrian bridge reactions are enclosed as part of Attachment C1.

C5.2 Concrete Walkway. A concrete walkway will be constructed on both the east shore-connected breakwater and the east detached breakwater to provide safe access for fishermen and other public activities. The walkway will be 7 feet wide and will have a wire rope railing on the harbor side and precast concrete walkway barrier blocks on the lakeward side. The walkway concrete will be finished with a non-slip surface and sloped to drain. The use of either cast-in-place or precast concrete walkway blocks will be optional. The compressive strength of concrete for the walkway blocks and precast barrier blocks will be 4,000 pounds per square inch. Construction details for the concrete walkway are shown on Plate C5.

C5.3 Navigation Light. Navigation lights will be provided at the harbor entrance on both the east and west detached breakwaters in accordance with U.S. Coast Guard requirements. A 5 foot diameter steel light tower will be installed on the west

end of the east detached breakwater. A 12 inch diameter steel light pole with a battery platform will be installed on the east end of the west detached breakwater. The light tower and light pole will be either fabricated in accordance with U.S. Coast Guard standard design drawings or furnished by the U.S. Coast Guard. Massive reinforced concrete trapezoidal shaped foundations will be constructed on the breakwater underlayer stone and will extend through the armor stone, a height of approximately 9 feet. The light tower foundation dimensions will be 7'-0" by 7'-0" at the top and 10'-6" by 10'-6" at the bottom. The light pole foundation dimensions will be 4'-6" by 4'-6" at the top and 8'-0" by 8'-0" at the bottom. The sloping sides of the foundations will be reinforced with #6@12" each way. The compressive strength of concrete for the light foundations will be 4,000 pounds per square inch. These navigation light foundations are similar in size and shape to other light foundations that have performed well on comparable projects in recent years.

C5.4 Rehabilitation of Old Existing Hotel Pier. An old existing hotel pier, off Franklin Street, is located approximately 420 feet offshore near the east end of the east detached breakwater. The pier is 38 feet wide by 5) feet long and consists of a massive concrete cap placed over rock filled timber cribs. The overall condition of the pier is poor based on site inspections that included a cursory underwater inspection. The pier encroaches on the proposed alignment of the east detached breakwater. Demolition and complete removal of the pier could cost in excess of $100,000. Utilization of the existing pier as an integral part of the breakwater is considered an economically feasible alternative. The breakwater alignment has been slightly altered to relocate the existing pier in the lakeward sideslope of the breakwater. The revised alignment will permit construction of the breakwater without placement of any heavy armor stone on top of the pier. Some rehabilitation of the pier will be necessary to improve its structural integrity and appearance and to extend its life expectancy to approximate overall project life. Stone protection will be placed around the exposed sides of the pier to El. +3, so that the existing timber cribs are fully supported. The stone protection will consist of a layer of armor stone placed over a core of underlayer stone and will have a 5 foot wide top berm and 1V on 2H sideslopes. Deteriorated concrete on the top of the existing pier will be replaced with a new reinforced concrete cap to extend its life expectancy and improve safety and appearance. The new cap will have a 10 inch minimum thickness and will be reinforced with #4 @

12" each way. The compressive strength of concrete for the new pier cap will be 4,000 pounds per square inch. Existing mooring posts will remain but will no longer be functional. Construction details for the rehabilitation of the existing detached pier are shown on Plate C6. Public access to the rehabilitated pier will not be provided. In the future, local interests could consider the construction of either steps or a ramp to facilitate access to the pier if public usage of the breakwater walkway warrants.

C5.5 Handicapped Facilities. All project features associated with public access to the east breakwater are designed to be accessible to and usable by handicapped persons in compliance with Public Law 90-480 and requirements outlined in EM 1110-1-103, Design for the Physically Handicapped. A completed checklist of items governing design for the physically handicapped is enclosed as Attachment C2. This signed checklist certifies compliance with criteria set forth in EM 1110-1-103. The following subparagraphs discuss specific project features that are provided for the primary use of handicapped persons.

a. Access Ramp. Public access to the east breakwater will begin at Ontario and Franklin Streets. The street elevation is approximately 20 feet higher than the top of the east shore-connected breakwater. A serpentine ramp, 346 feet long, will descend along the existing sloping bank to provide access to the breakwater for handicapped persons. The serpentine ramp will include eight sloping ramps and eight level landings. Seven ramps will be 7 feet wide by 30 feet long and will slope 1-in-12 (8.33 percent). An 8 foot wide by 8 foot long top landing will be level with the existing sidewalk along Ontario Street. Three straight-through intermediate landings will be 7 feet wide by 7 feet long. Three intermediate landings, requiring 180° U-turns. will be 10 feet wide by 18 feet long. An 8 foot wide by 9 foot long bottom landing will be adjacent to the concrete walkway on the breakwater. An eighth ramp will be constructed as part of the breakwater walkway. This ramp will be 7 feet wide by 30 feet long and will have an 8 percent slope. The alignment of the serpentine ramp was designed to minimize cut and fill quantities and to preserve existing trees and decorative stone walls. A double rail galvanized steel handrail, 34 inches high, will be provided along both sides of all ramps and along all sides of landings as needed. Handrail posts will be embedded into the concrete ramps and landings and will have an 8 foot maximum post spacing. A 6 foot minimum clear distance will be provided between the handrails along the ramps. All ramps and landings will be finished with a non-slip surface. The compressive

strength of concrete for the ramps and landings will be 4,000 pounds per square inch. A plan of the handicapped access ramps is shown on Plate C7. Cross sections through the serpentine ramp and typical construction details are shown on Plate C8. A 6 foot wide concrete walkway, shown on Plate C7, will connect the existing public stairway with the east shore-connected breakwater for general public access. This walkway is not intended for use by handicapped persons.

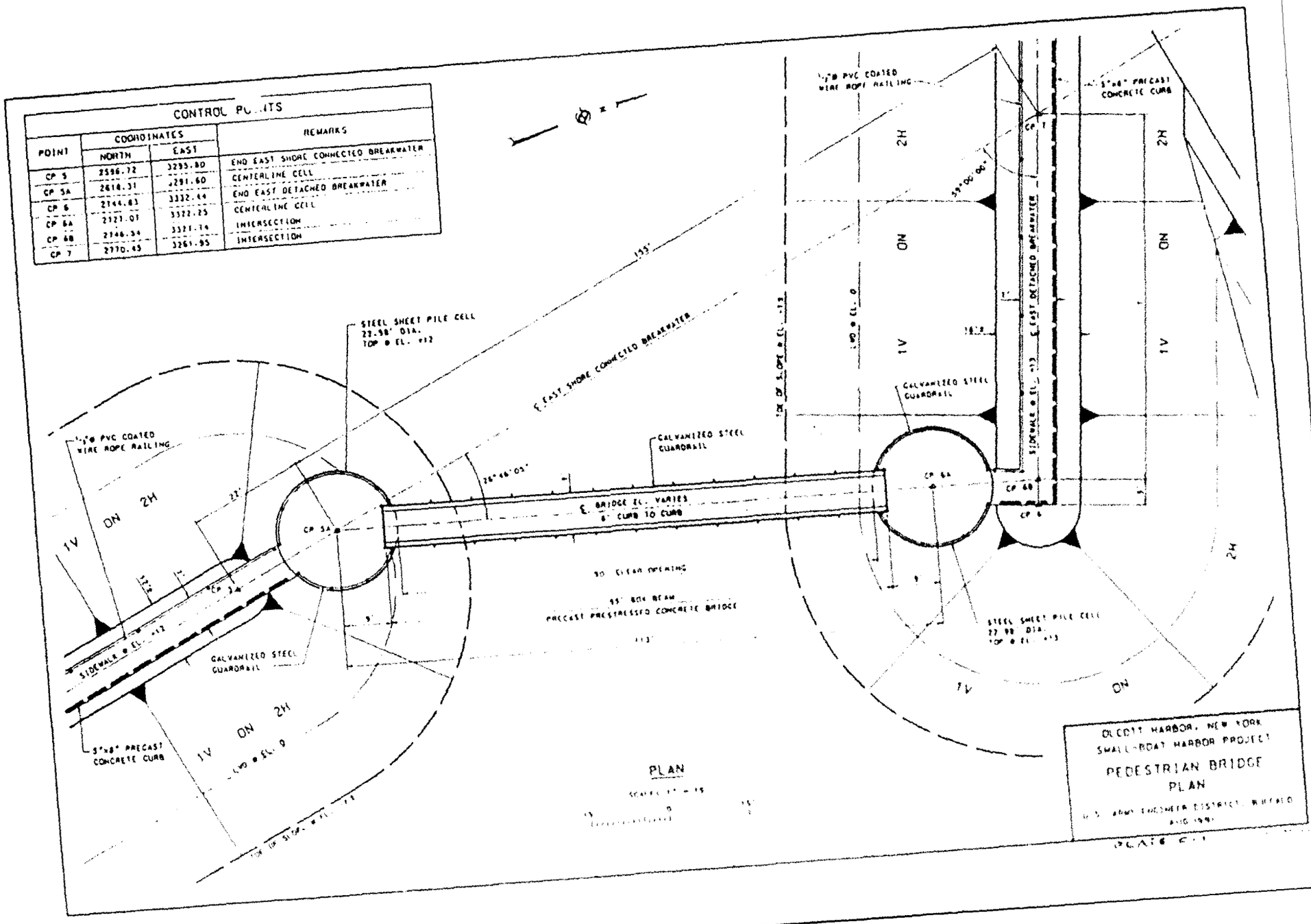
b. Rest Area. Rest areas are provided at both ends of the pedestrian bridge that joins the east shore-connected breakwater and the east detached breakwater. The rest areas occupy the top surface of the circular steel sheet pile cells that function as bridge abutments. Each 23 foot diameter cell will have a 2 foot thick concrete cap and a triple rail galvanized steel guardrail around its perimeter to permit handicapped access. These improvements are provided at a minimal cost increase when compared with the 7 foot wide concrete walkway, guardrails and cell cap armor stone protection that would be required in a normal design. The addition of these rest areas will provide a unique opportunity for handicapped persons to enjoy an up close view of harbor activities and safely participate in pier fishing without obstructing the pedestrian bridge. In the future, local interests could consider the addition of park benches, trash containers and fish cleaning stations that would serve the general public. These facilities could be maintained by using a small motorized vehicle that could negotiate the handicapped access ramp and turn around on the cell caps. A plan of the rest areas and pedestrian bridge is shown on Plate C1. Pertinent construction details are shown on Plate C3.

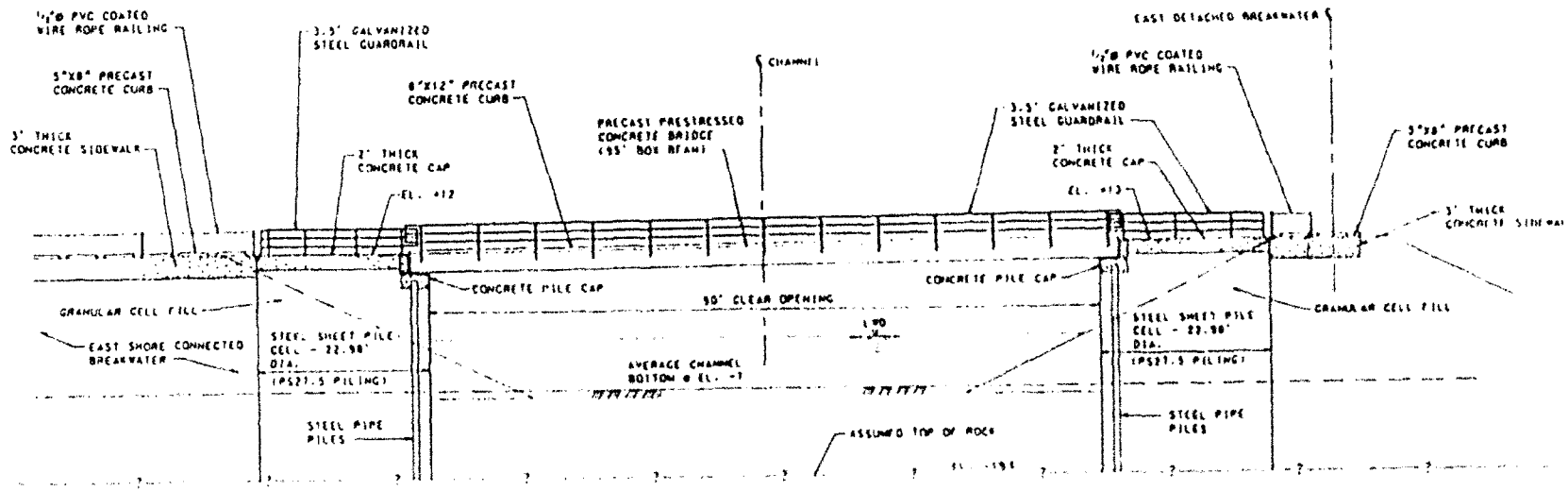
c. Parking Area. A parking area for approximately 150 cars will be constructed by others to accommodate users of the east breakwater walkway. In accordance with the latest Uniform Federal Accessibility Standards five parking spaces will be provided for physically handicapped usage and located along either Franklin Street or Ontario Street within 100 feet of the entrance to the handicapped access ramp leading to the east breakwater walkway. These spaces will be reserved and marked with suitable above ground signs for handicapped usage only.

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
APPENDIX A
GENERAL DESIGN MEMORANDUM

SUB-APPENDIX C
STRUCTURAL DESIGN ANALYSIS

# PLATES


CONTROL POINTS
POINT | COORDINATES NORTH | COORDINATES EAST | REMARKS
CP 5 | 2596.72 | 3295.80 | END EAST SHORE CONNECTED BREAKWATER
CP 5A | 2618.31 | 3291.60 | CENTERLINE CELL
CP 6 | 2744.83 | 3332.44 | END EAST DETACHED BREAKWATER
CP 6A | 2727.07 | 3322.25 | CENTERLINE CELL
CP 6B | 2746.34 | 3321.74 | INTERSECTION
CP 7 | 2770.45 | 3261.95 | INTERSECTION
STEEL SHEET PILE CELL 22.98' DIA. TOP @ EL. +12
℄ EAST SHORE CONNECTED BREAKWATER
155'
1/2" Ø PVC COATED WIRE ROPE RAILING
5"x8" PRECAST CONCRETE CURB
2H
1V
ON
TOP OF SLOPE @ EL. +13
TOP @ EL. 0
CALVANIZED STEEL GUARDRAIL
℄ BRIDGE EL. VARIES 8' CURB TO CURB
26°46'05"
CP 5A
CP 6A
CP 6B
CP 7
SIDEWALK @ EL. +13
℄ EAST DETACHED BREAKWATER
30' CLEAR OPENING
95' BOX BEAM PRECAST PRESTRESSED CONCRETE BRIDGE
+13'
STEEL SHEET PILE CELL 27.98' DIA. TOP @ EL. +13
PLAN
OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
PEDESTRIAN BRIDGE
PLAN
U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG 1991
PLATE E-1




PROFILE

SCALE: 1" = 15'

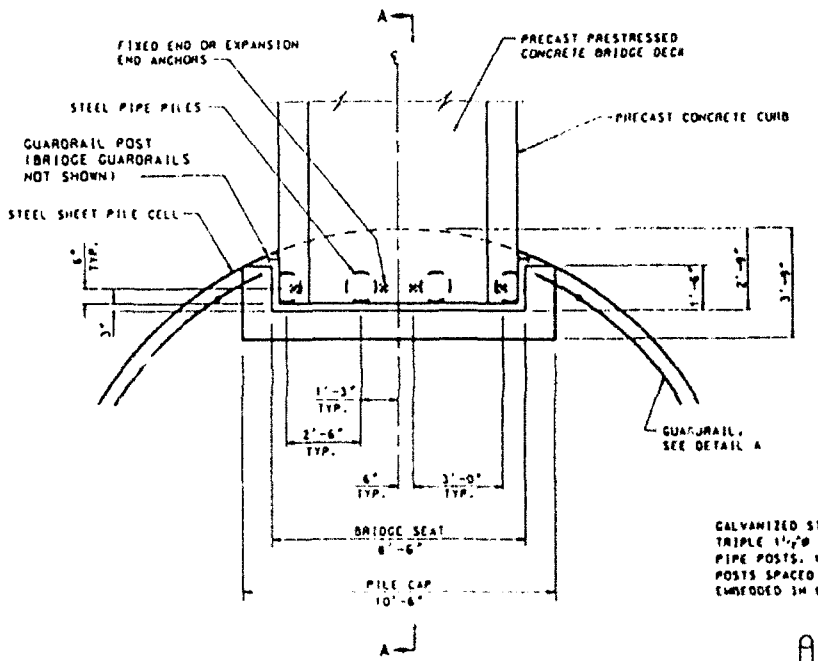
15' 0 15'

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

PEDESTRIAN BRIDGE
PROFILE

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG 1991

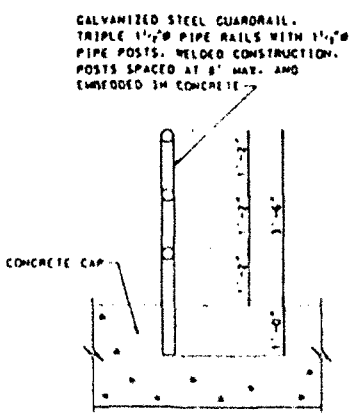
C2




PLAN

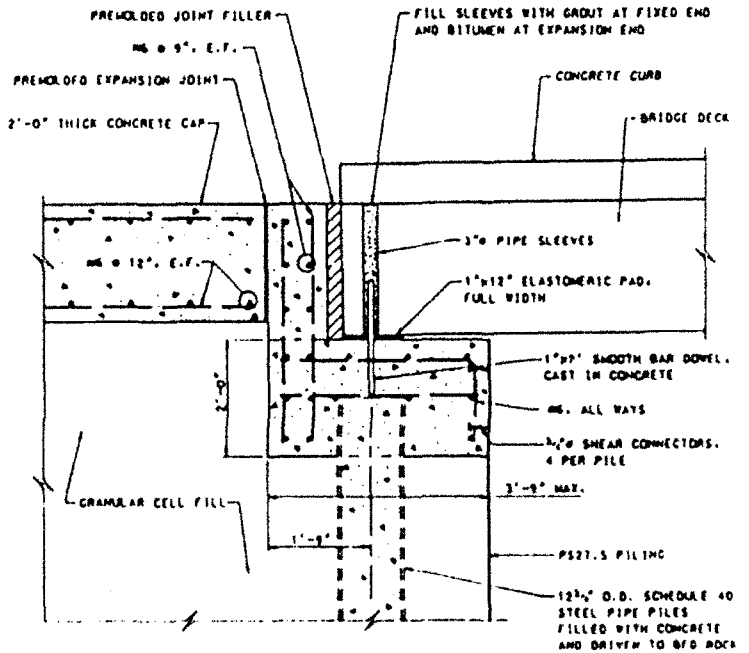
SCALE: 1/2" = 1'-0"

12" 0 3'




DETAIL A

NOT TO SCALE




NOTE: GUARDRAILS NOT SHOWN

SECTION A-A

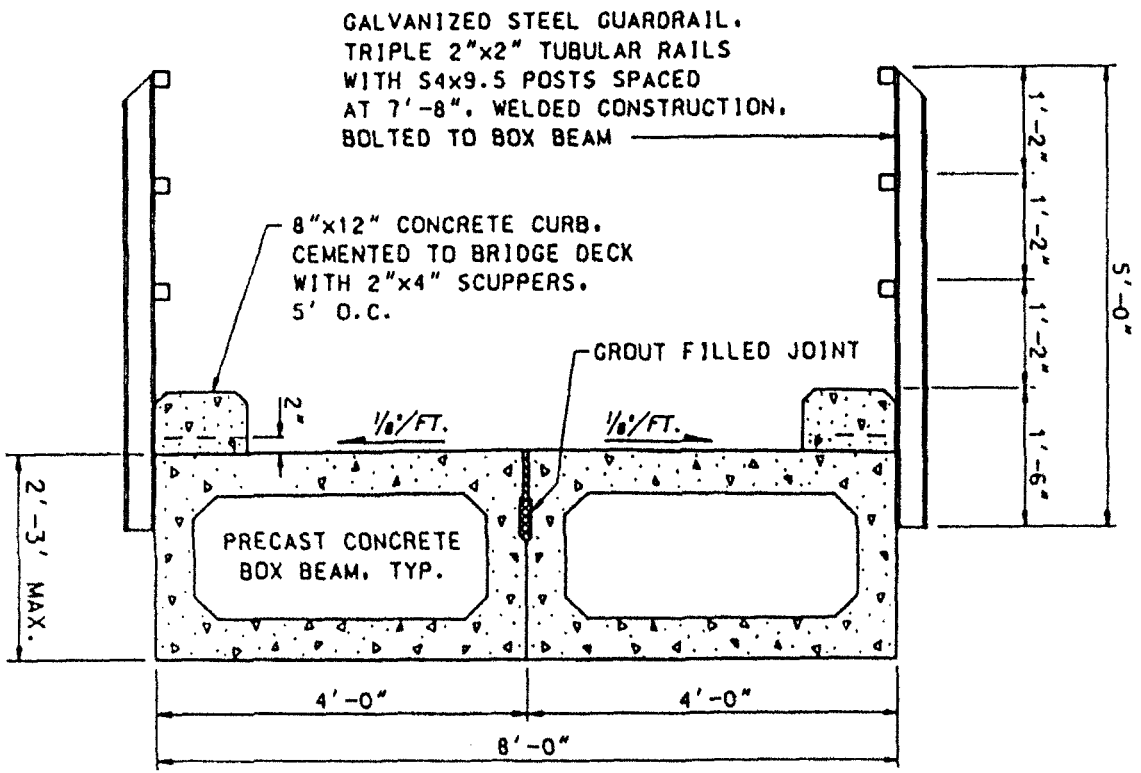
SCALE: ½" = 1'-0"

12" 0 1' 2' 3'

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

# PEDESTRIAN BRIDGE ABUTMENT DETAILS

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG 1991




## TYPICAL SECTION

SCALE: ½" = 1'-0"

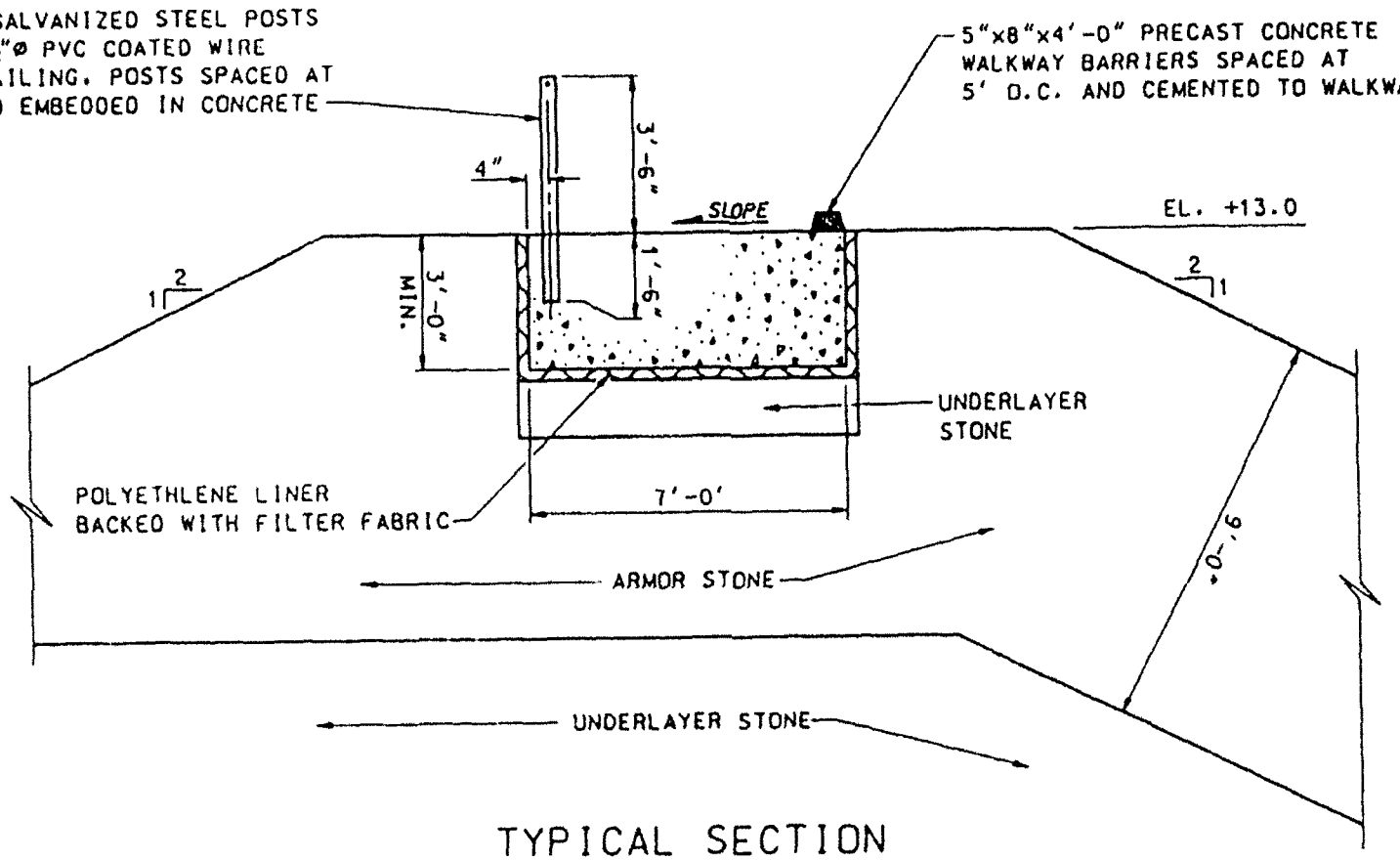
12" 6" 0 1' 2' 3'

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

PEDESTRIAN BRIDGE
BRIDGE DECK

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG. 1991

PLATE C4




# TYPICAL SECTION

EAST DETACHED BREAKWATER SHOWN

EAST SHORE CONNECTED BREAKWATER SIMILAR

SCALE: ¼" = 1'-0"

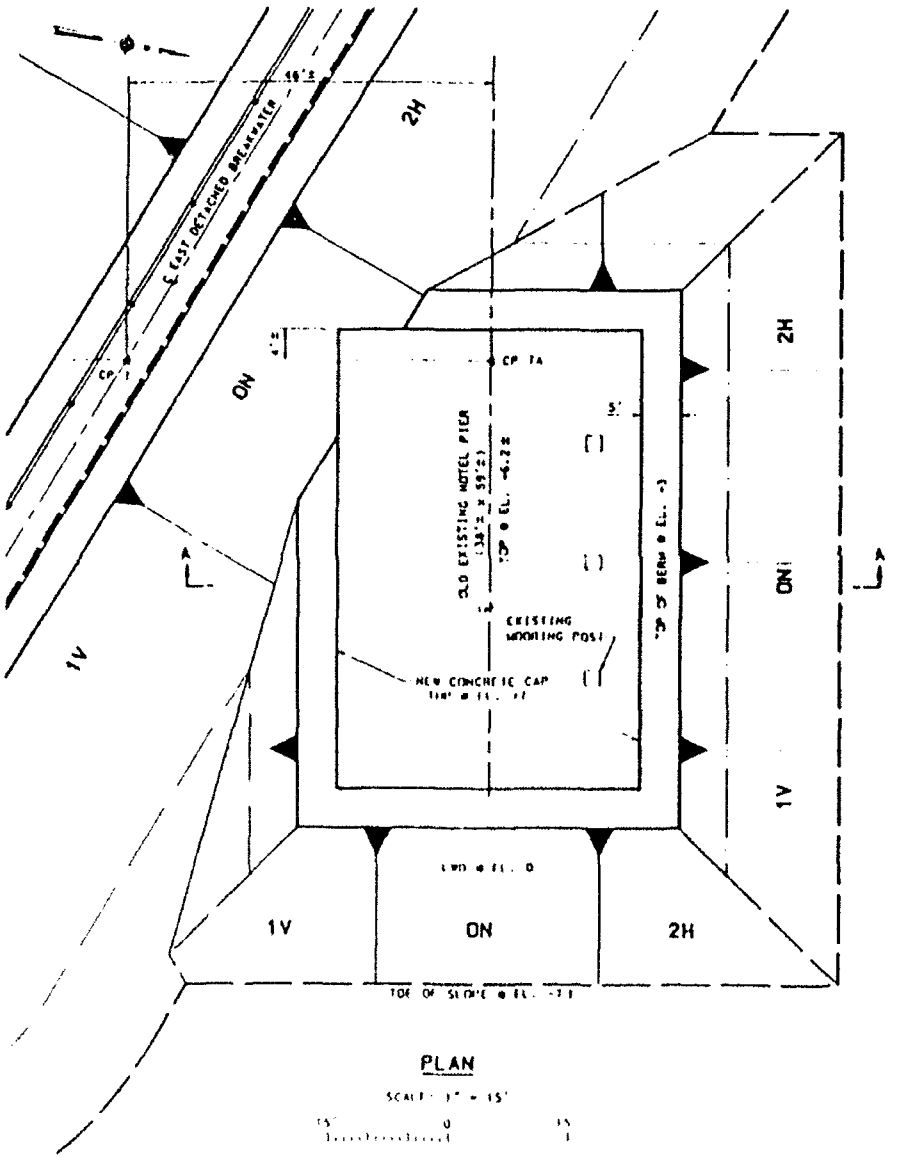
12" 0 5'

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

## CONCRETE WALKWAY DETAILS

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG. 1991

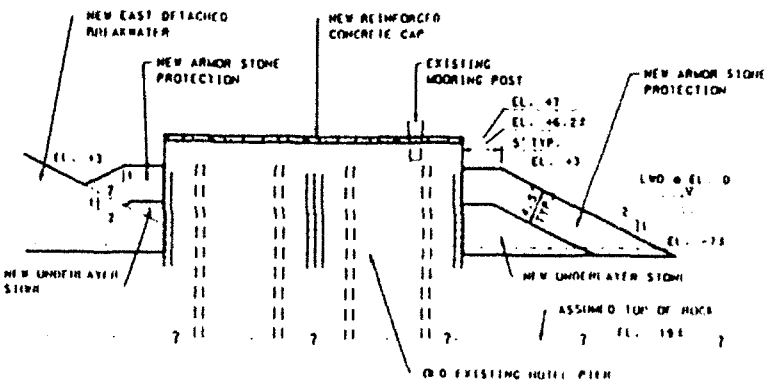
PLATE C5




PLAN

SCALE: 1" = 15'

| CONTROL POINTS | | | |
|---|---|---|---|
| POINT | COORDINATES | | REMARKS |
| | NORTH | EAST | |
| CP 7 | 2770.45 | 3261.95 | INTERSECTION |
| CP 7A | 3253.15 | 2815.60 | INTERSECTION ON EXISTING PIER |




SECTION A-A

SCALE: 1" = 15'

NOTES:

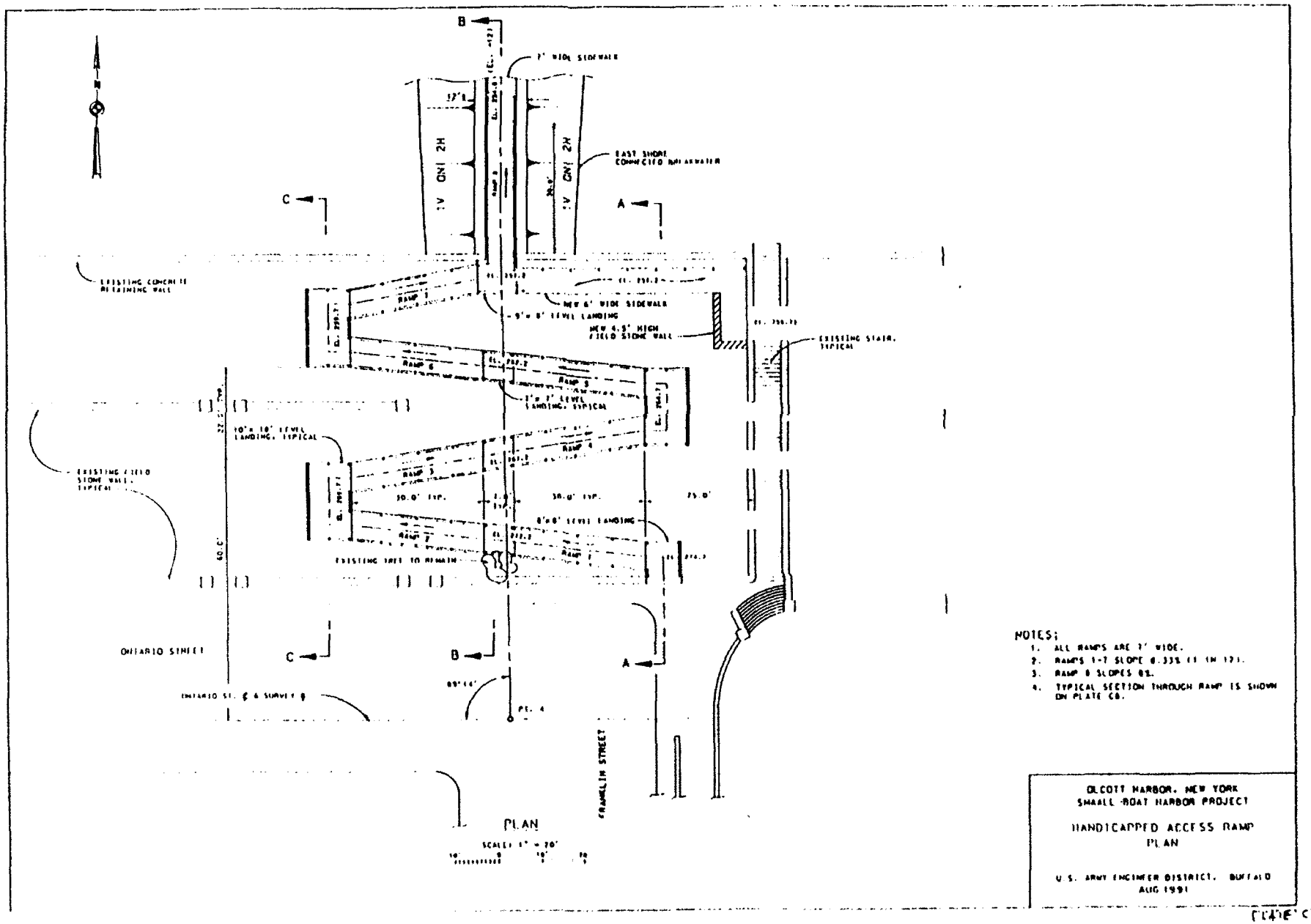
1. SPECIFIC GRAVITY OF STONE = 2.6
2. DIMENSIONS SHOWN REFLECT AVERAGE THEORETICAL SOLUTIONS. ACTUAL SIZE WILL VARY ACCORDING TO STONE USED.

ARMOR STONE (LBS.) 8000 TO 22000

UNDERLAYER STONE (LBS.) 600 TO 2200

IN CLIFF HARBOR, NEW YORK
SMALL BOAT HARBOR PROJECT
REHABILITATION OF OLD EXISTING HOTEL PIER
U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUGUST 1991

PLATE 6A




NOTES;

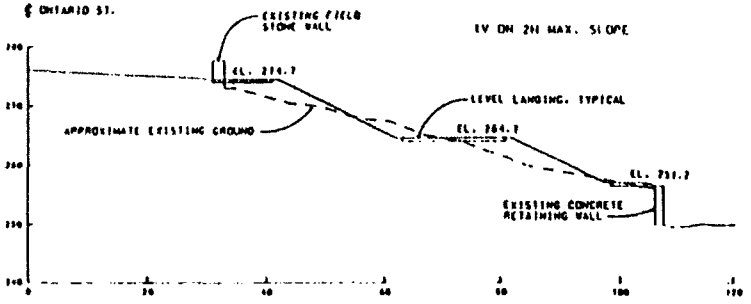
1. ALL RAMPS ARE 5' WIDE.
2. RAMPS 1-7 SLOPE 8.33% (1 IN 12).
3. RAMP 8 SLOPES 8%.
4. TYPICAL SECTION THROUGH RAMP IS SHOWN ON PLATE C8.

OLCOTT HARBOR, NEW YORK
SMALL BOAT HARBOR PROJECT

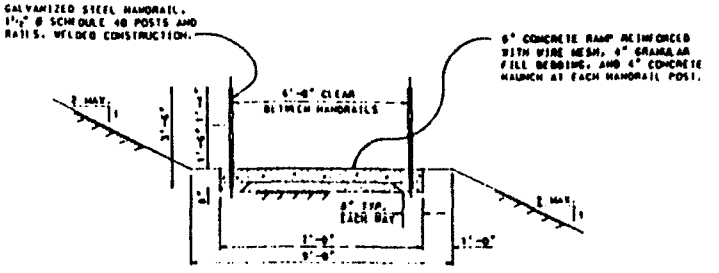
HANDICAPPED ACCESS RAMP
PLAN

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG 1991

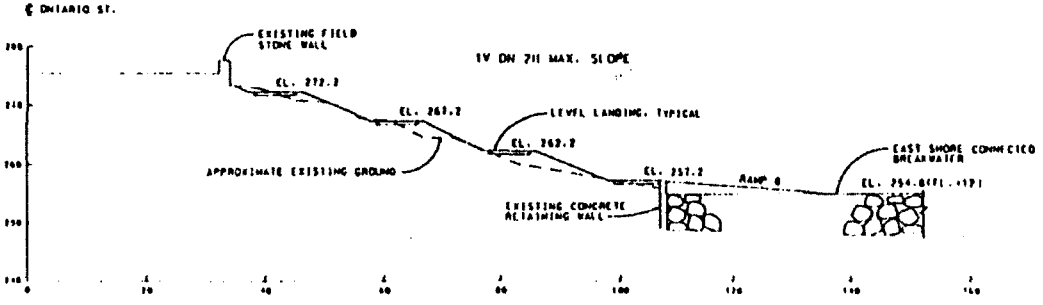
PLATE C7



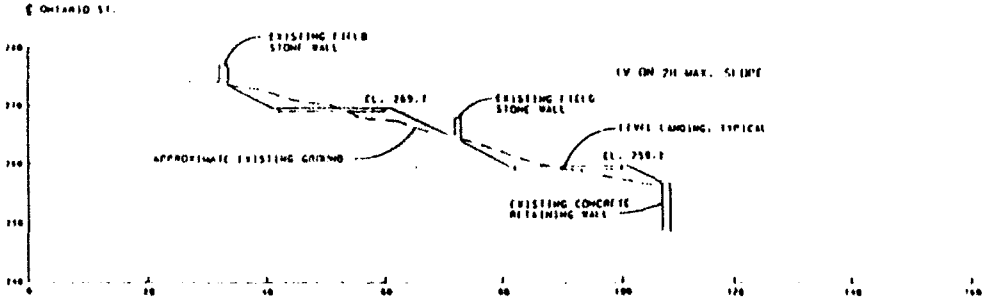

SECTION A-A




TYPICAL SECTION
HANDICAPPED ACCESS RAMP




SECTION B-B




SECTION C-C

NOTES:
1. RAMP B SLOPES 8%.
2. HANDRAILS ARE NOT SHOWN ON SECTIONS A-A, B-B AND C-C.

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT

HANDICAPPED ACCESS RAMP
SECTIONS

U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUG 1991

PLATE C8

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
APPENDIX A
GENERAL DESIGN MEMORANDUM

SUB-APPENDIX C
STRUCTURAL DESIGN ANALYSIS

# ATTACHMENT C1

# DESIGN COMPUTATIONS

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
APPENDIX A
GENERAL DESIGN MEMORANDUM

SUB-APPENDIX C
STRUCTURAL DESIGN ANALYSIS

**ATTACHMENT C1**
**DESIGN COMPUTATIONS**

TABLE OF CONTENTS


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| Pedestrian Bridge Reactions | C1-1 |
| Pedestrian Bridge Abutment Design | |
| a. Steel Sheet Pile Cells | C1-3 |
| b. Steel Pipe Piles | C1-10 |

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT

Computation of PEDESTRIAN BRIDGE REACTIONS

Computed by JNE Checked by FTL Date FEB 1991

## Assumptions :

1. Bridge dimensions - 8' wide by 95' long.
2. Precast prestressed concrete bridge with integral box beam deck components - standard 4' wide box beam (Type B I-48) with a weight of 722 PLF.
3. Full length precast concrete curbs on each side of bridge - 8" high by 12" wide curb blocks with a weight of 100 PLF.
4. Galvanized structural steel guardrails with triple 2" by 2" Tubular Rails and S4x9.5 posts.
5. Heavy pedestrian traffic produces a live load of 85 PSF.

## Compute Bridge Dead Load :

Integral box beam deck -
2 (722 PLF x 95') = 137,180 #

Precast concrete curbs -
2 (100 PLF x 95') = 19,000 #

Guardrail -

| | | |
|---|---|---|
| 3 posts x 5' x 9.5 PLF | = 618 # | |
| 3 rails x 96' x 4.32 PLF | = 1,244 # | |
| 2 ends x 2' x 4.32 PLF | = 17 # | |
| Misc. hardware | = 31 # | |
| Total per side | = 1,910 # x 2 | = 3,820 # |

Total Dead Load = 160,000 #

## Compute Bridge Live Load :

Assume 6' width between curbs

Total Live Load = 6' x 95' x 85 PSF = 48,450 #

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT
Computation of PEDESTRIAN BRIDGE REACTIONS
Computed by JNE Checked by FTL Date FEB 1991

## Compute Total Bridge Load:

| | | |
|---|---|---|
| Dead Load | = | 160,000 # |
| Live Load * | = | 48,450 # |
| Total Bridge Load | = | 208,450 # |

* Live load is based on pedestrian traffic load that exceeds any reasonable ice load. Since pedestrian traffic load and ice load would never occur at the same time, ice load is neglected.

## Compute Bridge Reactions:

End Reaction = 208,450# / 2 = 104,225 #

Say Bridge Reaction = 104,000 # OR 104 Kips

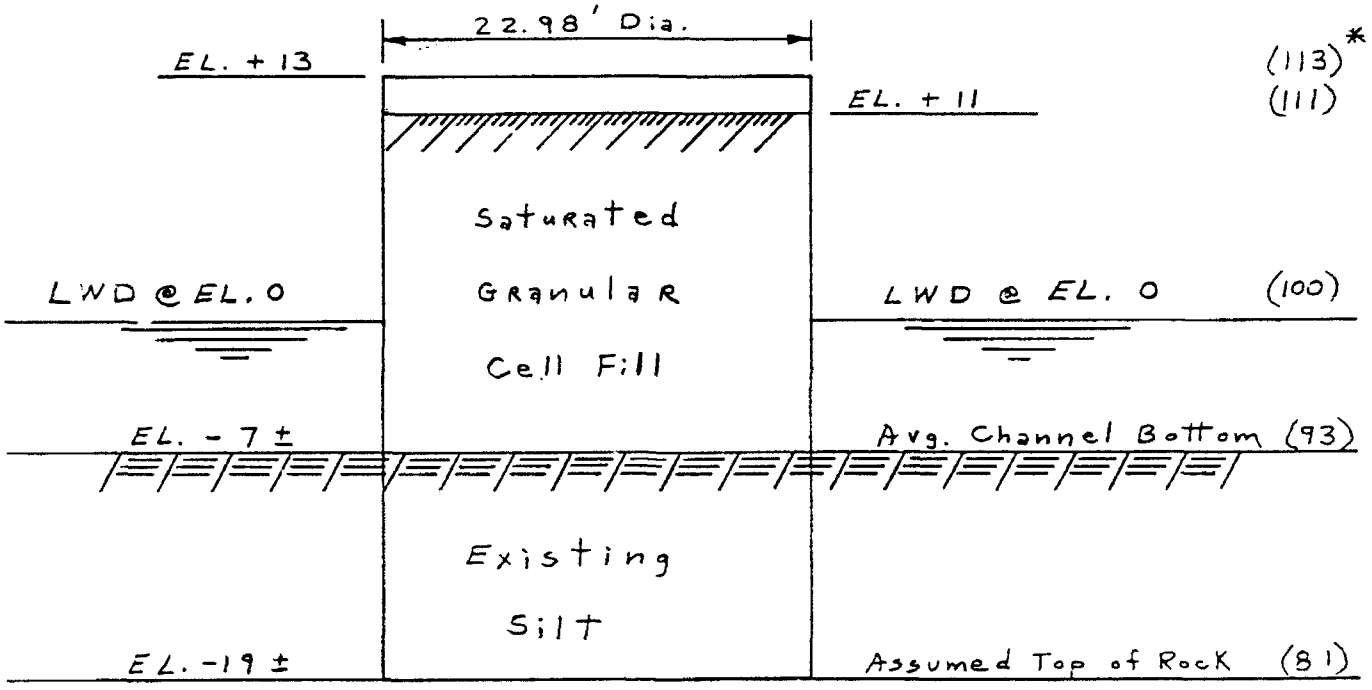
Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT

Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN

Computed by JNE Checked by FTL Date FEB 1991

Steel Sheet Pile Cells - Loading Conditions

Case I - Initial Filling Condition




TYPICAL SECTION

LAKEWARD CELL SHOWN

Scale: 1" = 10'

* Elevations used in computer program.

```
2000 OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 1
2010 A R M
2020   113.000     81.000     18.050       .000
2030    22.980       .000    192000.00
2040   2      111.000   40000.000
2050     115.000       32.000          .000       16.700       93.000
2060      85.000       26.000          .000       11.300
2070         .430         .562          .300
2080   1   1
2090   93.0
2100      85.000       26.000          .000       11.300
2110   1   1
2120   93.0
2130      85.000       26.000          .000       11.300
2140     100.000      100.000      111.000      111.000       62.500
2150      .488        .488
2160   0 N
2170   0 N
2180   N
2190   0   0
2200   0   0
```

PROGRAM CELL - ANALYSIS/DESIGN OF CIRCULAR CELL
COFFERDAMS OR MOORINGS FOUNDED ON ROCK OR SOIL
(SAND OR HARD CLAY) USING CLASSICAL METHODS.
DATE: 91/02/13 TIME: 16.57.09

1. INPUT DATA

1.A.--HEADING

OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 1

1.B.--MODE,FOUNDATION TYPE,CELL TYPE
MODE-ANALYSIS
FOUNDATION TYPE-ROCK
TYPE-MOORING CELL

1.C.--CELL DESCRIPTION

| | | |
|---|---|---|
| ELEVATION OF TOP OF CELL | = | 113.00 (FT) |
| ELEVATION OF LEFTSIDE BOTTOM OF CELL | = | 81.00 (FT) |
| ELEVATION OF RIGHTSIDE BOTTOM OF CELL | = | 81.00 (FT) |
| EFFECTIVE BASE WIDTH OF CELL | = | 18.05 (FT) |
| SLOPE OF THE ROCK FOUNDATION | = | .00(DEG) |
| CENTER TO CENTER OF CELL | = | 22.98 (FT) |
| ANGLE TO INTERSECT. OF CELL AND ARC | = | .00 (DEG) |
| ULTIMATE INTERLOCK TENSION | = | 192000.00 (LBS/FT) |

1.D.--CELL FILL MATERIAL DESCRIPTION

| | | |
|---|---|---|
| NUMBER OF FILL LAYERS | = | 2 |
| ELEVATION OF SURFACE OF CELL FILL | = | 111.00 (FT) |

ULTIMATE BEARING CAPACITY OF ROCK = 40000.00 (PCF)

CELL FILL MATERIAL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) |
|---|---|---|---|---|---|
| 1 | 115.00 | 32.00 | .00 | 16.70 | 93.00 |
| 2 | 85.00 | 26.00 | .00 | 11.30 | .00 |

| | |
|---|---|
| COEFF. OF PRESS. FOR INTERLOCK TENSION= | .430 |
| COEFF. OF PRESS. FOR CENTERLINE SHEAR = | .562 |
| COEFF. OF PRESS. FOR INTERLOCK SLIDING= | .300 |

1.E.--LEFT SIDE SOIL DESCRIPTION
NUMBER OF LEFT SIDE SURFACE POINTS = 1
NUMBER OF LEFT SIDE SOIL LAYERS = 1

LEFT SIDE SURFACE POINT COORDINATES

| POINT NO. | ELEVATION (FT) | X-COORD (FT) |
|---|---|---|
| 1 | 93.00 | .00 |

LEFT SIDE SOIL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) | BOTTOM SLOPE (FT/FT) |
|---|---|---|---|---|---|---|
| 1 | 85.00 | 26.00 | .00 | 11.30 | ******* | 1: .0 |

1.F.--RIGHT SIDE SOIL DESCRIPTION
NUMBER OF RIGHT SIDE SURFACE POINTS = 1
NUMBER OF RIGHT SIDE SOIL LAYERS = 1

RIGHT SIDE SURFACE POINT COORDINATES

| POINT NO. | ELEVATION (FT) | X-COORD (FT) |
|---|---|---|
| 1 | 93.00 | .00 |

RIGHT SIDE SOIL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) | BOTTOM SLOPE (FT/FT) |
|---|---|---|---|---|---|---|
| 1 | 85.00 | 26.00 | .00 | 11.30 | ******* | 1: .0 |

1.G.--WATER DATA
ELEVATION OF WATER ON LEFT OUTSIDE CELL = 100.00 (FT)
ELEVATION OF WATER ON RIGHT OUTSIDE CELL = 100.00 (FT)
ELEVATION OF WATER ON LEFT INSIDE CELL = 111.00 (FT)
ELEVATION OF WATER ON RIGHT INSIDE CELL = 111.00 (FT)
UNIT WEIGHT OF WATER = 62.50 (PCF)

1.G1.-SLIDING FRICTION COEFFICIENTS
COEFF. OF FRICTION OF BERM ON ROCK = .488
COEFF. OF FRICTION OF CELLFILL ON ROCK= .488

1.H.--SURCHARGE LOADS ON RIGHT SIDE
NUMBER OF LINE LOADS = 0
NO DISTRIBUTED LOAD

1.I.--SURCHARGE LOADS ON LEFT SIDE
NUMBER OF LINE LOADS = 0
NO DISTRIBUTED LOAD

1.Il.-SURCHARGE LOAD ON CELL FILL
NO UNIFORM LOAD

1.J.--HORIZONTAL LOADS ON RIGHT
NUMBER OF HORIZONTAL LINE LOADS = 0
NUMBER OF HORIZONTAL PRESSURE POINTS = 0

1.K.--HORIZONTAL LOADS ON LEFT
NUMBER OF HORIZONTAL LINE LOADS = 0
NUMBER OF HORIZONTAL PRESSURE POINTS = 0

PROGRAM CELL - ANALYSIS/DESIGN OF CIRCULAR CELL
COFFERDAMS OR MOORINGS FOUNDED ON ROCK OR SOIL
(SAND OR HARD CLAY) USING CLASSICAL METHODS.
DATE: 91/02/13 TIME: 16.57.09

2. RESULTS

2.A.--HEADING

OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 1
F.S.-VERTICAL SHEAR ON THE CENTERLINE = -7.15 *
F.S.-HORIZONTAL SHEAR OF THE CELL FILL = 132.11
F.S.-SLIDING ALONG THE BASE = 28.58
F.S.-PULLOUT OF THE OUTBOARD SHEETING = 33.22
F.S.-BEARING CAPACITY OF THE FOUNDATION = 32.92
F.S.-INTERLOCK TENSION (INBOARD) = 14.75

* NEGATIVE VALUE INDICATES A VERY LARGE F.S.

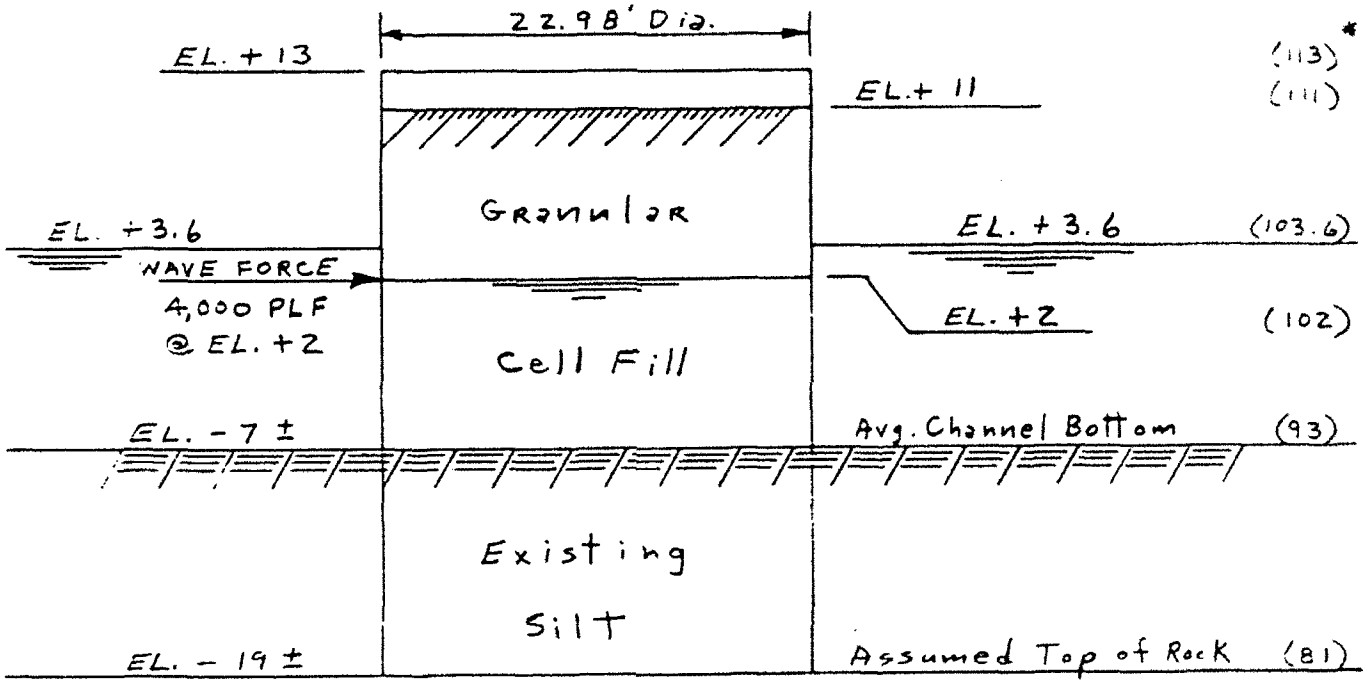
Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT

Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN

Computed by JNE Checked by FTL Date FEB 1991

Steel Sheet Pile Cells - Loading Conditions

Case II - Construction Condition




TYPICAL SECTION

LAKEWARD CELL SHOWN

Scale: 1" = 10'

* Elevations used in computer program.

```
2000 OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 2
2010 A R M
2020   113.000    81.000    18.050      .000
2030    22.980      .000    192000.00
2040   3     111.000   40000.000
2045     110.000      32.000         .000      16.700     102.000
2050     115.000      32.000         .000      16.700      93.000
2060      85.000      26.000         .000      11.300
2070        .430        .562         .300
2080   1   1
2090   93.0
2100      85.000      26.000         .000      11.300
2110   1   1
2120   93.0
2130      85.000      26.000         .000      11.300
2140     103.600     103.600      102.000     102.000      62.500
2150      .488       .488
2160   0 N
2170   0 N
2180   N
2190   1   0
2195   102 4000
2200   0   0
```

PROGRAM CELL - ANALYSIS/DESIGN OF CIRCULAR CELL
COFFERDAMS OR MOORINGS FOUNDED ON ROCK OR SOIL
(SAND OR HARD CLAY) USING CLASSICAL METHODS.
DATE: 91/02/13 TIME: 17.47.57

1. INPUT DATA

1.A.--HEADING

OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 2

1.B.--MODE,FOUNDATION TYPE,CELL TYPE
MODE-ANALYSIS
FOUNDATION TYPE-ROCK
TYPE-MOORING CELL

1.C.--CELL DESCRIPTION

| | | |
|---|---|---|
| ELEVATION OF TOP OF CELL | = | 113.00 (FT) |
| ELEVATION OF LEFTSIDE BOTTOM OF CELL | = | 81.00 (FT) |
| ELEVATION OF RIGHTSIDE BOTTOM OF CELL | = | 81.00 (FT) |
| EFFECTIVE BASE WIDTH OF CELL | = | 18.05 (FT) |
| SLOPE OF THE ROCK FOUNDATION | = | .00(DEG) |
| CENTER TO CENTER OF CELL | = | 22.98 (FT) |
| ANGLE TO INTERSECT. OF CELL AND ARC | = | .00 (DEG) |
| ULTIMATE INTERLOCK TENSION | = | 192000.00 (LBS/FT) |

1.D.--CELL FILL MATERIAL DESCRIPTION

| | | |
|---|---|---|
| NUMBER OF FILL LAYERS | = | 3 |
| ELEVATION OF SURFACE OF CELL FILL | = | 111.00 (FT) |

ULTIMATE BEARING CAPACITY OF ROCK = 40000.00 (PCF)

CELL FILL MATERIAL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) |
|---|---|---|---|---|---|
| 1 | 110.00 | 32.00 | .00 | 16.70 | 102.00 |
| 2 | 115.00 | 32.00 | .00 | 16.70 | 93.00 |
| 3 | 85.00 | 26.00 | .00 | 11.30 | .00 |

| | | |
|---|---|---|
| COEFF. OF PRESS. FOR INTERLOCK TENSION | = | .430 |
| COEFF. OF PRESS. FOR CENTERLINE SHEAR | = | .562 |
| COEFF. OF PRESS. FOR INTERLOCK SLIDING | = | .300 |

1.E.--LEFT SIDE SOIL DESCRIPTION
NUMBER OF LEFT SIDE SURFACE POINTS = 1
NUMBER OF LEFT SIDE SOIL LAYERS = 1

LEFT SIDE SURFACE POINT COORDINATES

| POINT NO. | ELEVATION (FT) | X-COORD (FT) |
|---|---|---|
| 1 | 93.00 | .00 |

LEFT SIDE SOIL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) | BOTTOM SLOPE (FT/FT) |
|---|---|---|---|---|---|---|
| 1 | 85.00 | 26.00 | .00 | 11.30 | ******* | 1: .0 |

1.F.--RIGHT SIDE SOIL DESCRIPTION
NUMBER OF RIGHT SIDE SURFACE POINTS = 1
NUMBER OF RIGHT SIDE SOIL LAYERS = 1

RIGHT SIDE SURFACE POINT COORDINATES

| POINT NO. | ELEVATION (FT) | X-COORD (FT) |
|---|---|---|
| 1 | 93.00 | .00 |

RIGHT SIDE SOIL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) | BOTTOM SLOPE (FT/FT) |
|---|---|---|---|---|---|---|
| 1 | 85.00 | 26.00 | .00 | 11.30 | ******* | 1: .0 |

1.G.--WATER DATA
ELEVATION OF WATER ON LEFT OUTSIDE CELL = 103.60 (FT)
ELEVATION OF WATER ON RIGHT OUTSIDE CELL = 103.60 (FT)
ELEVATION OF WATER ON LEFT INSIDE CELL = 102.00 (FT)
ELEVATION OF WATER ON RIGHT INSIDE CELL = 102.00 (FT)
UNIT WEIGHT OF WATER = 62.50 (PCF)

1.G1.-SLIDING FRICTION COEFFICIENTS
COEFF. OF FRICTION OF BERM ON ROCK = .488
COEFF. OF FRICTION OF CELLFILL ON ROCK= .488

1.H.--SURCHARGE LOADS ON RIGHT SIDE
NUMBER OF LINE LOADS = 0
NO DISTRIBUTED LOAD

1.I.--SURCHARGE LOADS ON LEFT SIDE
NUMBER OF LINE LOADS = 0
NO DISTRIBUTED LOAD

1.I1.-SURCHARGE LOAD ON CELL FILL
NO UNIFORM LOAD

1.J.--HORIZONTAL LOADS ON RIGHT
NUMBER OF HORIZONTAL LINE LOADS = 0
NUMBER OF HORIZONTAL PRESSURE POINTS = 0

1.K.--HORIZONTAL LOADS ON LEFT
NUMBER OF HORIZONTAL LINE LOADS = 1
NUMBER OF HORIZONTAL PRESSURE POINTS = 0

HORIZONTAL LINE LOADS ON WALL

| LOAD NO. | ELEVATION (FT) | LOAD (PLF) |
|---|---|---|
| 1 | 102.00 | 4000.00 |

PROGRAM CELL - ANALYSIS/DESIGN OF CIRCULAR CELL
COFFERDAMS OR MOORINGS FOUNDED ON ROCK OR SOIL
(SAND OR HARD CLAY) USING CLASSICAL METHODS.
DATE: 91/02/13 TIME: 17.47.57

2. RESULTS

2.A.--HEADING

OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 2
F.S.-VERTICAL SHEAR ON THE CENTERLINE = 2.59 > 1.25 REQD.
F.S.-HORIZONTAL SHEAR OF THE CELL FILL = 4.01
F.S.-SLIDING ALONG THE BASE = 4.60
F.S.-PULLOUT OF THE OUTBOARD SHEETING = 1.41 > 1.25 REQD.
F.S.-BEARING CAPACITY OF THE FOUNDATION = 18.87
F.S.-INTERLOCK TENSION (INBOARD) = 29.44

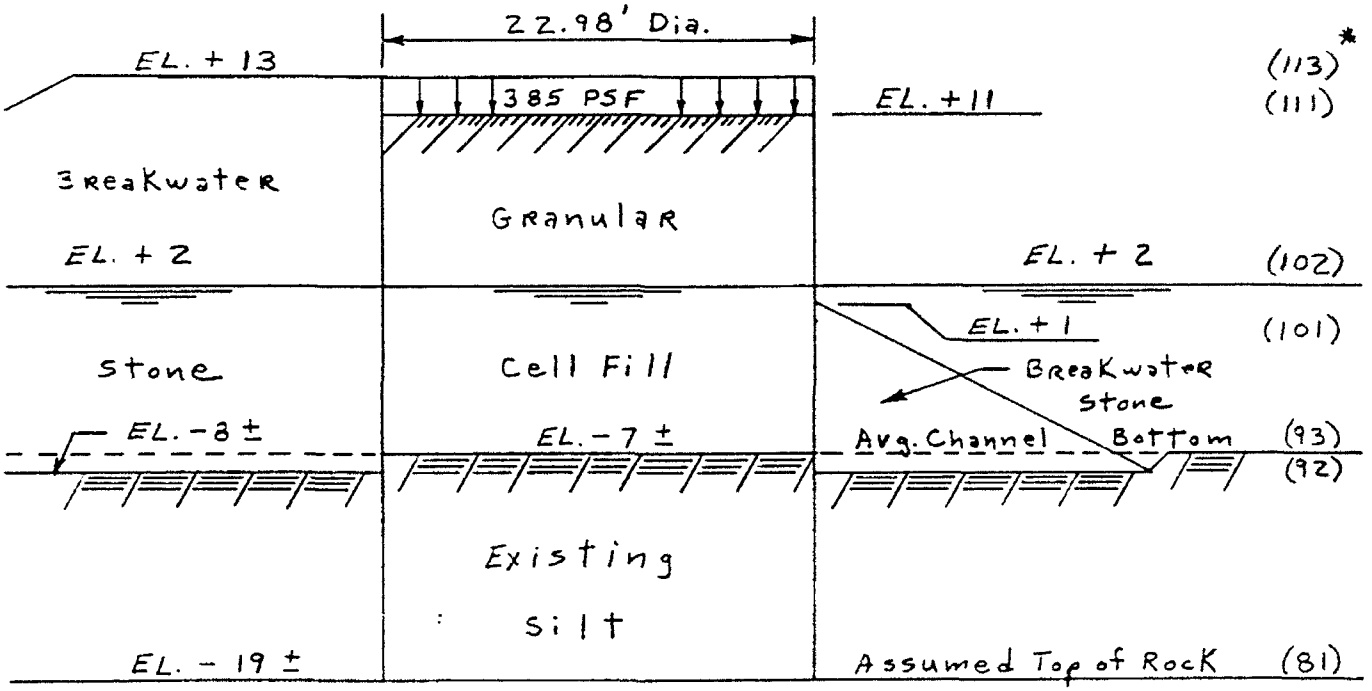
Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT

Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN

Computed by JNE Checked by FTL Date FEB 1991

Steel Sheet Pile Cells - Loading Conditions

Case III - Normal Condition




TYPICAL SECTION

LAKEWARD CELL SHOWN

Scale: 1" = 10'

* Elevations used in computer program.

```
2000 OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 3
2010 A R M
2020    113.000     81.000     18.050       .000
2030     22.980       .000    192000.00
2040    3      111.000    40000.000
2050      110.000       32.000         .000       16.700      102.000
2055      115.000       32.000         .000       16.700       93.000
2060       85.000       26.000         .000       11.300
2070         .430         .562         .300
2080    1    3
2090    113.0
2095      110.000       40.000         .000       21.800      102.000 0
2096      130.000       40.000         .000       21.800       92.000 0
2100       85.000       26.000         .000       11.300
2110    3    2
2120    101.0 92.0 92.0
2125    18.0    100.0
2126      130.000       40.000         .000       21.800       93.000 0
2130       85.000       26.000         .000       11.300
2140      102.000      102.000      102.000      102.000       62.500
2150       .488        .488
2160    0 N
2170    0 N
2180 U      385.000
2190    0    0
2200    0    0
```

PROGRAM CELL - ANALYSIS/DESIGN OF CIRCULAR CELL
COFFERDAMS OR MOORINGS FOUNDED ON ROCK OR SOIL
(SAND OR HARD CLAY) USING CLASSICAL METHODS.
DATE: 91/04/23 TIME: 17.44.47

1. INPUT DATA

1.A.--HEADING

OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 3

1.B.--MODE,FOUNDATION TYPE,CELL TYPE
MODE-ANALYSIS
FOUNDATION TYPE-ROCK
TYPE-MOORING CELL

1.C.--CELL DESCRIPTION

| | | |
|---|---|---|
| ELEVATION OF TOP OF CELL | = | 113.00 (FT) |
| ELEVATION OF LEFTSIDE BOTTOM OF CELL | = | 81.00 (FT) |
| ELEVATION OF RIGHTSIDE BOTTOM OF CELL | = | 81.00 (FT) |
| EFFECTIVE BASE WIDTH OF CELL | = | 18.05 (FT) |
| SLOPE OF THE ROCK FOUNDATION | = | .00(DEG) |
| CENTER TO CENTER OF CELL | = | 22.98 (FT) |
| ANGLE TO INTERSECT. OF CELL AND ARC | = | .00 (DEG) |
| ULTIMATE INTERLOCK TENSION | = | 192000.00 (LBS/FT) |

1.D.--CELL FILL MATERIAL DESCRIPTION

| | | |
|---|---|---|
| NUMBER OF FILL LAYERS | = | 3 |
| ELEVATION OF SURFACE OF CELL FILL | = | 111.00 (FT) |

ULTIMATE BEARING CAPACITY OF ROCK = 40000.00 (PCF)

CELL FILL MATERIAL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) |
|---|---|---|---|---|---|
| 1 | 110.00 | 32.00 | .00 | 16.70 | 102.00 |
| 2 | 115.00 | 32.00 | .00 | 16.70 | 93.00 |
| 3 | 85.00 | 26.00 | .00 | 11.30 | .00 |

| | |
|---|---|
| COEFF. OF PRESS. FOR INTERLOCK TENSION= | .430 |
| COEFF. OF PRESS. FOR CENTERLINE SHEAR = | .562 |
| COEFF. OF PRESS. FOR INTERLOCK SLIDING= | .300 |

1.E.--LEFT SIDE SOIL DESCRIPTION

NUMBER OF LEFT SIDE SURFACE POINTS = 1
NUMBER OF LEFT SIDE SOIL LAYERS = 3

LEFT SIDE SURFACE POINT COORDINATES

| POINT NO. | ELEVATION (FT) | X-COORD (FT) |
|---|---|---|
| 1 | 113.00 | .00 |

LEFT SIDE SOIL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) | BOTTOM SLOPE (FT/FT) |
|---|---|---|---|---|---|---|
| 1 | 110.00 | 40.00 | .00 | 21.80 | 102.00 | 1: .0 |
| 2 | 130.00 | 40.00 | .00 | 21.80 | 92.00 | 1: .0 |
| 3 | 85.00 | 26.00 | .00 | 11.30 | ******* | 1: .0 |

1.F.--RIGHT SIDE SOIL DESCRIPTION

NUMBER OF RIGHT SIDE SURFACE POINTS = 3
NUMBER OF RIGHT SIDE SOIL LAYERS = 2

RIGHT SIDE SURFACE POINT COORDINATES

| POINT NO. | ELEVATION (FT) | X-COORD (FT) |
|---|---|---|
| 1 | 101.00 | .00 |
| 2 | 92.00 | 18.00 |
| 3 | 92.00 | 100.00 |

RIGHT SIDE SOIL LAYER DATA

| LAYER NO. | UNIT WEIGHT (PCF) | INTERNAL FRICTION ANGLE (DEG) | COHESION (PSF) | WALL FRICTION ANGLE (DEG) | BOTTOM ELEV AT WALL (FT) | BOTTOM SLOPE (FT/FT) |
|---|---|---|---|---|---|---|
| 1 | 130.00 | 40.00 | .00 | 21.80 | 93.00 | 1: .0 |
| 2 | 85.00 | 26.00 | .00 | 11.30 | ******* | 1: .0 |

1.G.--WATER DATA

ELEVATION OF WATER ON LEFT OUTSIDE CELL = 102.00 (FT)
ELEVATION OF WATER ON RIGHT OUTSIDE CELL = 102.00 (FT)
ELEVATION OF WATER ON LEFT INSIDE CELL = 102.00 (FT)
ELEVATION OF WATER ON RIGHT INSIDE CELL = 102.00 (FT)
UNIT WEIGHT OF WATER = 62.50 (PCF)

```
1.G1.-SLIDING FRICTION COEFFICIENTS
     COEFF. OF FRICTION OF BERM ON ROCK     =       .486
     COEFF. OF FRICTION OF CELLFILL ON ROCK=       .488


1.H.--SURCHARGE LOADS ON RIGHT SIDE
     NUMBER OF LINE LOADS         =  0
     NO DISTRIBUTED LOAD


1.I.--SURCHARGE LOADS ON LEFT SIDE
     NUMBER OF LINE LOADS      =  0
     NO DISTRIBUTED LOAD


1.I1.-SURCHARGE LOAD ON CELL FILL
     UNIFORM SURCHARGE LOAD
     LOAD                 =  385.00 PSF


1.J.--HORIZONTAL LOADS ON RIGHT
     NUMBER OF HORIZONTAL LINE LOADS         =  0
     NUMBER OF HORIZONTAL PRESSURE POINTS    =  0


1.K.--HORIZONTAL LOADS ON LEFT
     NUMBER OF HORIZONTAL LINE LOADS        =  0
     NUMBER OF HORIZONTAL PRESSURE POINTS   =  0


PROGRAM CELL - ANALYSIS/DESIGN OF CIRCULAR CELL
COFFERDAMS OR MOORINGS FOUNDED ON ROCK OR SOIL
(SAND OR HARD CLAY) USING CLASSICAL METHODS.
DATE:   91/04/23                          TIME:   17.44.47


2. RESULTS


2.A.--HEADING


OLCOTT HARBOR - SHEET PILE CELL FOR PEDESTRIAN BRIDGE - CASE 3
     F.S.-VERTICAL SHEAR ON THE CENTERLINE      =    7.18
     F.S.-HORIZONTAL SHEAR OF THE CELL FILL     =    5.41
     F.S.-SLIDING ALONG THE BASE                =    2.79 > 1.5 REQD.
     F.S.-PULLOUT OF THE OUTBOARD SHEETING      =    1.79 > 1.5 REQD.
     F.S.-BEARING CAPACITY OF THE FOUNDATION    =   14.96
     F.S.-INTERLOCK TENSION (INBOARD)           =   25.03
```

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT

Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN

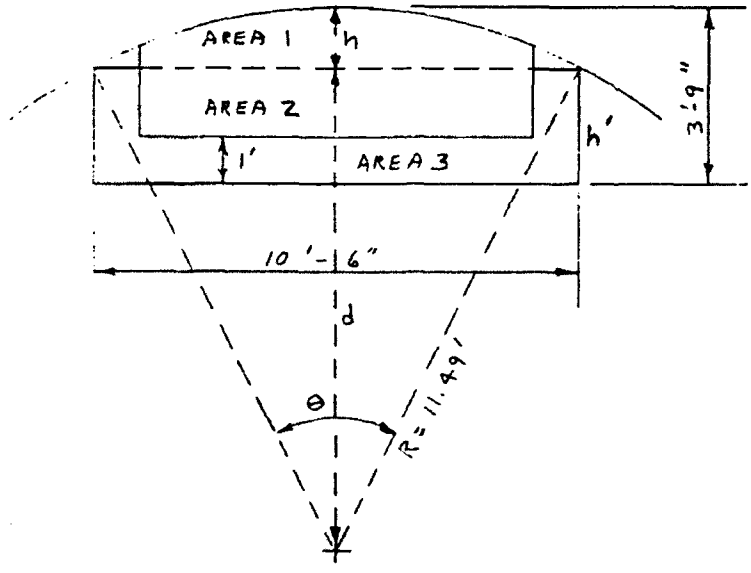
Computed by JNE Checked by FTL Date FEB 1991

## Steel Pipe Piles

### Assumptions :

1. Standard 12" diameter pipe piles, concrete filled.
2. Total bridge reaction equals 104 kips.
3. Allowable rock bearing capacity equals 20 ton per sq. foot.
4. Four pipe piles, driven to bedrock, will support the bridge reaction at each abutment.
5. Positive effect of concrete fill is neglected for buckling design.
6. Lateral support provided by granular fill around the pipe piles is neglected.
7. Unsupported column length equals full height of pipe pile.
8. Reinforced concrete pile cap, 3'-9" wide (max) by 10'-6" long x 2' thick.
9. Pile design load equals percentage of total bridge reaction and weight of pile cap plus weight of pile.
10. Buckling design is in accordance with A.I.S.C. allowable stress design methods.

### Compute Weight of Pile Cap :




$\sin \frac{1}{2}\theta = 5.25'/11.49' = 0.4569$

$\frac{1}{2}\theta = 27.1885°$

$\theta = 54.3770°$

$d = 5.25'/\tan \frac{1}{2}\theta = 10.22'$

$h = R - d = 11.49' - 10.22' = 1.27'$

$h' = 3.75' - h = 2.48'$

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT
Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN
Computed by JNE Checked by FTL Date FEB 1991

## Steel Pipe Piles

### Compute Weight of Pile Cap Cont'd :

Area of pile cap -

Area 1 = $\frac{1}{2} R^2 (\theta - \sin\theta) = \frac{1}{2}(11.49')^2 (0.9491 - 0.8129)$ = 8.99 SF

Area 2 = $h' \times 10.5' = 2.48'(10.5')$ = 26.05 SF

Total Area of Pile Cap = 35.04 SF

Area of pile cap back wall -

Area 3 = $1'(1.5' + 10.5' + 1.5')$ = 13.50 SF

Volume of pile cap -

Vol. = 35.04 (2' ht.) + 13.5 (2.33' ht.) = 101.54 CF

Weight of pile cap -

Wt. = 101.54 CF (150 PCF) = 15,231 # Say 16,000 #

### Compute Weight of Pile :

Assume : 12" dia. pipe pile weighs 49.56 PLF (Schedule 40)
Max. column height is 31' (includes 2' embedment in rock)

Wt. of pipe pile = 31' (49.56 PLF) = 1,536 #
Wt. of concrete fill = $\pi(6)^2/144\,(30')(150\ PCF)$ = 3,534 #

Total Weight of Pile * = 5,070 #

Say 5,000 #

* Neglect buoyancy of pile

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT
Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN
Computed by JNE Checked by FTL Date FEB 1991

## Steel Pipe Piles

### Compute Pile Design Load :

Design load per pile @ cap -

| | |
|---|---|
| Bridge reaction = 104,000 / 4 | = 26,000 # |
| Wt. of pile cap = 16,000 / 4 | = 4000 # |
| Total Pile Design Load | = 30,000 # |
| | OR 30 kips |

Design load per pile @ tip -

| | |
|---|---|
| Bridge reaction = 104,000/4 | = 26,000 # |
| Wt. of pile cap = 16,000/4 | = 4,000 # |
| Wt. of pile | = 5,000 # |
| Total Pile Design Load | = 35,000 # |
| | OR 35 kips |

∴ Use 35 kip pile load for design analyses

### Analyse Pile for Allowable Buckling Load :

Assume : 12" dia schedule 40 pipe, OD = 12.75", t = 0.375",
A = 14.6 SI, r = 4.38

End conditions for selecting factor K -

Top - Rotation fixed and translation free
Bottom - Rotation free and translation fixed

From AISC Table C-C2.1 (page 5-135)

Use K = 2.0

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT
Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN
Computed by JNE Checked by FTL Date FEB 1991

Steel Pipe Piles

Analyse Pile for Allowable Buckling Load Cont'd :

Determine unsupported column length -

Assume: 2' pile embedment into weathered rock
Top of cell @ +13
Top of rock @ -19

$$\text{Length} = (+13 - 2.33' - 2') + (19' + 2') = 29.67'$$

Say $L = 30'$

Determine $KL/r$ -

$$\frac{KL}{r} = \frac{2.0\,(30')(12)}{4.38} = 164.4 \quad \text{Say } 165$$

Determine allowable stress, $F_a$ -

From AISC Table C-36 (page 3-16)

If $KL/r = 165$ $F_a = 5.49$ KSI

Compute allowable pile load -

$$P_{allowable} = f_a \times A = 5.49\ \text{KSI}\,(14.6\ \text{SI}) = 80.2\ \text{Kips}$$

Say 80 Kips per pile

$P_{allowable}$ (80 K.ps) > $P_{actual}$ (35 K.ps)

∴ Pipe pile is not critical as a compression member

Subject OLCOTT HARBOR, NY - SMALL-BOAT HARBOR PROJECT
Computation of PEDESTRIAN BRIDGE ABUTMENT DESIGN
Computed by JNE Checked by FTL Date FEB 1991

## Steel Pipe Piles

### Analyse Pile for Rock Bearing Capacity :

Assume : Allowable rock bearing capacity = 20 ton per sq. foot
Fabricated rock points for pipe piles with 13" O.D.

Determine end bearing area @ pile tip —

$$\text{Area} = \pi d^2/4 = \pi(13)^2/4 = 132.73 \text{ SI} = 0.92 \text{ SF}$$

Determine end bearing stress @ pile tip —

$$F_{actual} = \frac{\text{Pile Design Load}}{\text{Area of Pile Tip}} = \frac{35 \text{ Kips}}{0.92 \text{ SF}} = 38.0 \text{ KSF}$$

$F_{allowable}$ (40 KSF) > $F_{actual}$ (38 KSF)

∴ Rock bearing capacity is OK.

OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
APPENDIX A
GENERAL DESIGN MEMORANDUM

SUB-APPENDIX C
STRUCTURAL DESIGN ANALYSIS

**ATTACHMENT C2**

**CHECKLIST**

**ITEMS GOVERNING DESIGN FOR THE PHYSICALLY HANDICAPPED**

APPENDIX A

CHECKLIST OF ITEMS GOVERNING DESIGN
FOR THE PHYSICALLY HANDICAPPED

FOR USE IN PROJECT DESIGN AND DESIGN REVIEW

PROJECT ~~NUMBER~~ OLCOTT HARBOR IMPROVEMENT TYPE OF FACILITY SMALL-BOAT HARBOR

LOCATION TOWN OF NEWFANE, NIAGARA COUNTY, NEW YORK

OPEN TO THE PUBLIC: YES ✓ NO ____ ESTIMATED NUMBER OF VISITORS: OVER 200

DESTINATIONS: TO THE BREAKWATERS

CIVILIAN OPERATING PERSONNEL: YES N/A NO ____ ESTIMATED NUMBER: N/A

TYPES OF FUNCTIONS THEY WILL PERFORM: N/A

ESTIMATED NUMBER OF PARKING SPACES: VISITOR 150 (INCLUDES 4 SPACES FOR THE PHYSICALLY HANDICAPPED) STAFF ____ OTHERS ____

| | YES | NO* |
|---|---|---|
| 1. Identification of Accessible Facilities (Chapter 3, EM 1110-1-103) | | |
| a. Areas and features identified by International Symbol | ✓ | |
| b. Proper specification of International Symbol | ✓ | |
| c. Proper location of the symbol, between 32" to 42" high | ✓ | |
| d. Adequate directional and supplemental information | ✓ | |
| 2. Identification for the Visually Handicapped | | |
| a. Facilities identified by sight and touch signs | | N/A |
| b. Proper specification of signs | | |
| c. Lighted inside, and outside in areas accessible after dark | | |
| d. Proper location of signs, between 40" and 52" high | | |
| e. Raised lettering for interpretative material | | |
| f. Tactile door hardware to identify hazards | | |
| g. Textured warning strips at head of stairs and ramps | | N/A |

*MARK YES OR NO AS APPROPRIATE, OR WRITE IN N/A UNDER NO FOR NON-APPLICABLE

ENG Form 4604-R (Temporary), 1 Sep 76 (To be reproduced from directive at same size - all entries to be hand written)

| | YES | NO* |
|---|---|---|
| h. Proper specification of elevator arrival signals, controls and call buttons | | N/A |
| i. Raised numbers on inner-facing elevator door jambs | | |
| 3. Signals for Persons with Auditory Handicaps | | |
| a. Elevator signals to visually identify arrival of cars | | |
| b. Warning signals with visual as well as audible devices | | N/A |
| 4. Site Design, General (Chapter 4, EM 1110-1-103) | | |
| a. Access to at least one primary entrance | ✓ | |
| b. Access to outdoor areas used by general public | ✓ | |
| c. Grading to attain level access and egress to and from entrance | ✓ | |
| d. Directional signs at major points of entry to the site | ✓ | |
| e. Access-egress routes lighted to 5 foot-candles if used after dark | | N/A |
| f. Accessible toilets, water dispensers and phones where such facilities are provided in public areas | | |
| g. Solutions with minimal impact on environmental features | | |
| h. Proper location of interpretative displays | | |
| 5. Drop-off and Pick-up Zones | | |
| a. One zone provided where high rate of pedestrain traffic will occur | | |
| b. Zone within 50' maximum of a primary entrance | | |
| c. Zone width 13', length for one car minimum, level except for drainage | | |
| d. Vertical posts to separate functions, or at least one curb-ramp | | |
| e. Sign to limit use to pedestrian functions | | N/A |
| 6. Parking spaces | | |
| a. One space in areas having up to 20, one additional space for each 50 additional spaces or increment | ✓ | |
| b. Spaces within 100' of one accessible entrance | ✓ | |
| c. Spaces 13' wide, on common level except for drainage | ✓ | |
| d. Access to walk does not go behind parked cars or across driveway | ✓ | |
| e. Wheelstops to separate functions, or one curb-ramp per car | ✓ | |
| f. 6' clear walkway in front of parked cars | ✓ | |
| g. Spaces identified and reserved with signs above ground | ✓ | |

| | YES | NO |
|---|---|---|
| 7. Curb-Ramps | | |
| a. Provided where walks and curbs are being constructed or reconstructed in accessible areas | ✓ | |
| b. 40" wide with slope of 1-in-12, blending to common level with street and walk | ✓ | |
| c. Sides flared with slope approximating 1-in-6 | ✓ | |
| d. 4' clear walkway at head clear of obstructions | ✓ | |
| e. Properly located at street intersections and elsewhere to assure safety | ✓ | |
| f. Marked cross-walk and traffic warnings to insure unobstructed passage | ✓ | |
| g. Firm, non-slip surface | ✓ | |
| 8. Walks | | |
| a. Provided for access and egress to and from usable entrances | ✓ | |
| b. 6' wide with slope no greater than 1-in-24 blending to common level with other surfaces | ✓ | |
| c. Continuous surface uninterrupted by abrupt changes | ✓ | |
| d. 6'x6' level rest areas at 60' intervals when slopes exceed 1-in-30 | | N/A |
| e. At doorways, 6'x6' level landing extending 18" beyond strike jamb | | N/A |
| f. Fixed, firm and non-slip surfaces, crowned for drainage | ✓ | |
| g. If grates are used, no openings between bearing bars greater than 3/8" with bars set perpendicular to path of travel | | N/A |
| h. Ground surface graded up to walk and compacted to prevent drop-off | | N/A |
| i. Guards where grounds drop-off or recede at greater than 1-in-6 slope | | N/A |
| j. Lighting, signs and other elements set back at least 1' | ✓ | |
| k. Landscape elements planted to allow 1' clearance on side, 7' vertical clearance | | N/A |
| l. Adjacent rest areas where walks exceed 200' in length | | N/A |
| 9. Ramps | | |
| a. Provide where changes in level exceed allowable slope for walks | ✓ | |
| b. 6' wide with slope no greater than 1-in-12 blending to common level with landings | ✓ | |
| c. 6'x6' level landing at top and bottom | ✓ | |
| d. Like landings at 30' intervals for rest and safety | ✓ | |

| | YES | NO |
|---|---|---|
| 9. Ramps (cont'd) | | |
| e. At doorways 6'x6' level landing extending 18" beyond strike jamb | ___ | N/A |
| f. Fixed, firm and non-slip surfaces*, with adequate drainage | ✓ | ___ |
| g. Protection for ramps exposed to freezing weather | ___ | N/A |
| h. Textured or color surface to aid identification in addition to warning strips * Broom finished concrete | ___ | N/A |
| 10. Stairs | | |
| a. Provided in addition to ramps (preferred) | ___ | N/A |
| b. Minimum 4' wide with no less than 3 consecutive risers | ___ | |
| c. 6' maximum rise between landings, 4' where exposed to the elements and unprotected | ___ | |
| d. Risers between 5" and 7", treads between 17" and 11" | ___ | |
| e. Proportions uniform throughout any one stair | ___ | |
| f. Solid risers or risers with nosing having 45° bevel below | ___ | |
| g. Non-slip nosings of contrasting color, 1" wide on both riser and tread edge | ___ | |
| h. Treads exposed to weather pitched for drainage | ___ | |
| i. Protection for stairs exposed to freezing weather | ___ | N/A |
| 11. Guards and Handrails | | |
| a. Guards 42" high along open-sided floor or walk areas | ✓ | ___ |
| b. Guards 32" high along open-sided stairs and ramps | ___ | N/A |
| c. 4" high curbs in open guards with intermediate filler to prevent fall-through | ___ | N/A |
| d. Viewports in solid guards 30" to 40" high | ___ | N/A |
| e. Handrails on both sides of ramps and stairs, 32" to 34" high | ✓ | ___ |
| f. In outdoor areas, handrails on at least one side where ramps and stairs have no drop-off on sides | ___ | N/A |
| g. Intermediate handrail for children | ___ | N/A |
| h. Handrails extended 18" beyond top and bottom of stair or ramp at 36" high where possible | ___ | N/A |
| i. Round or oval handrails, 1 1/4" to 1 1/2" outside diameter with 1 1/2" clear between wall or guard | ✓ | ___ |
| j. Handrails terminate into wall, guard or newel | ___ | N/A |
| k. Handrails mounted to withstand 200 lbs applied in any direction | ✓ | ___ |

| | YES | NO |
|---|---|---|
| 12. Trails | | |
| a. Trails made accessible where provided for general public | ____ | N/A |
| b. Warning signs and level turn-a-round space where hazards cannot be avoided | ____ | ____ |
| c. Loop-backs and level terrain used | ____ | ____ |
| d. Access identified at head of trail with directional information along route | ____ | N/A |
| 13. Building Design, General (Chapter 5, EM 1110-1-103) | | |
| a. At least one primary entrance accessible | ____ | N/A |
| b. Other entrances accessible (preferred) | ____ | ____ |
| c. Identification of all entrances (and exits) or signs to indicate location of accessible entrance | ____ | ____ |
| d. Elevator, when provided, accessible from entrance | ____ | ____ |
| e. Toilets, drinking water dispensers and phones near entrances and assembly areas | ____ | ____ |
| f. Spaces open to the public designed to accommodate the handicapped | ____ | ____ |
| g. Accessible work stations based on functions to be performed | ____ | ____ |
| h. Directional information within primary entrance to locate accessible areas and features | ____ | N/A |
| 14. Doors and Doorways | | |
| a. Minimum door width, 36" | ____ | N/A |
| b. Maximum push-pull on exterior doors, 15 lbs; interior 5 lbs. | ____ | ____ |
| c. 4-6 second closing delay for automatic operators used to compensate for high pressures | ____ | ____ |
| d. Level type handles or horizontal push bars centered 36" to 42" high | ____ | ____ |
| e. Vision panels with bottom 36" above floor when provided | ____ | ____ |
| f. 16" kickplates on doors or materials to withstand abuse | ____ | ____ |
| g. Door pulls on doors without self-closing devices | ____ | ____ |
| h. Level floor, extending 6' on pull side, 4' on opposite side | ____ | ____ |
| i. Level floor extending 18" beyond strike jamb on pull side | ____ | ____ |
| j. Series doors 7' apart, minimum | ____ | ____ |
| k. 1/4" maximum threshold on exterior, eliminated where possible on interior | ____ | ____ |
| l. Doormats no more than 1/4" high, grate bearing bar openings 3/8" maximum, set perpendicular to path of travel | ____ | N/A |

| | YES | NO |
|---|---|---|
| **15. Corridors, Floors and Lobbies** | | |
| a. Corridor width, 5' clear | ____ | N/A |
| b. Lobbies large enough to allow manuverability | ____ | |
| c. Corridors free of protruding hazards | ____ | |
| d. Floors on common level or connected by ramps and stairs blending to a common level | ____ | |
| e. Ramps, stairs and railings in accordance with respective criteria | ____ | |
| f. Proper specification of carpet, when used | ____ | |
| g. Information/checkout counters 36" high; writing counters, 31" high | ____ | |
| h. Lock boxes between 18" and 48" high with space in front | ____ | |
| i. Proper location of interpretative material | ____ | |
| **16. Toilet Rooms** | | |
| a. One room for each sex on each applicable floor | ____ | |
| b. No travel in excess of 150' with directional information | ____ | |
| c. Vestibule clearance for wheelchair passage | ____ | |
| d. Floor level with corridor | ____ | |
| e. One toilet compartment to accommodate wheelchair inside with door closed | ____ | |
| f. Out-swinging door no less than 32" wide (34" preferred) | ____ | |
| g. 48" between front of compartment and opposite wall | ____ | |
| h. Proper location and specification of grab bars | ____ | |
| i. Wall-mounted toilet (preferred) with rim 19" above floor for front transfer, 15" to 19" for side transfer, and with hand control | ____ | |
| J. One wall-mounted lavatory 29 1/2" clear underneath, extending 24", free of restriction 18" on each side, and with wrist-action handles | ____ | |
| k. Hot water line and drain insulated, temperature held to 120°F | ____ | |
| l. Shelf, towel dispenser and disposal unit, and bottom of mirror 40" high, maximum | ____ | |
| m. Sanitary napkin dispenser at 40", disposal units inside toilet compartment | ____ | |
| n. One wall-mounted urinal with rim at 16" above floor, free of restriction 18" on each side, and with hand control no more than 40" high | ____ | N/A |

| | YES | NO |
|---|---|---|
| 16. Toilet Rooms (cont'd) | | |
| o. Clear floor area, 60" square for turn-a-round | ____ | N/A |
| p. Single toilet room usable by handicapped | ____ | ____ |
| q. Identification of toilet room and features | ____ | ____ |
| 17. Drinking Water Dispensers | | |
| a. One accessible dispenser on each applicable floor | ____ | ____ |
| b. Wall-mounted dispenser 30 to 34" high | ____ | ____ |
| c. Rim from wall; 6" for side approach, 20" for frontal approach with 27" clearance underneath | ____ | ____ |
| d. Dispensers centered in alcove; 60" wide for side approach, 36" wide for frontal | ____ | ____ |
| e. Up-front spouts and controls, hand-operated | ____ | ____ |
| 18. Public Telephones | | |
| a. One accessible phone with hearing aid where phones are provided | ____ | ____ |
| b. Volume control or inductive coil in receiver with instructions | ____ | ____ |
| c. 32" to 36" cord, push-button dial | ____ | ____ |
| d. Highest operating mechanism, 48" above floor, maximum | ____ | ____ |
| e. 24" clear of restriction on each side | ____ | ____ |
| f. Alcoves 48" deep, 48" wide with 34" door or opening width | ____ | ____ |
| 19. Elevators | | |
| a. One elevator for 2 or more operating levels used by public | ____ | ____ |
| b. Stop within 1/4" to 1/2" maximum of facility floor levels | ____ | ____ |
| c. Cab 60" deep, 68" wide with handrails at 36" | ____ | ____ |
| d. Door clear opening, 36" minimum, 6 to 10 second closing delay with safety reversing devices | ____ | ____ |
| e. Cab controls between 30" and 54" high, emergency call box no higher than 40" | ____ | ____ |
| f. Lobby call buttons 48" high, maximum | ____ | ____ |
| g. Symbol, sight-touch identification and signals in accordance with criteria | ____ | ____ |
| 20. Switches and Controls | | |
| a. Switches and controls, between 40" and 48" above floor | ____ | ____ |
| b. Same for thermostats and fire alarms in areas subject to handicapped use | ____ | N/A |

| | YES | NO |
|---|---|---|
| 20. Switches and Controls (cont'd) | | |
| c. Controls operable by 8 lbs. pressure, maximum | ____ | N/A |
| d. Electrical outlets and adjustable vents 18" above floor, minimum | ____ | |
| 21. Assembly Seat Accommodations | | |
| a. One wheelchair space and one wide-seat in areas having up to 20, one additional space and seat for each 60 additional seats or increment | ____ | |
| b. Additional spaces in high use areas | ____ | |
| c. Integral part of assembly area floor plan with choice of viewing positions | ____ | |
| d. Wheelchair spaces 34" wide, 48" deep, on level floors with access | ____ | |
| e. Seats 24" wide with 28" clear in front for persons with crutches or braces | ____ | |
| f. Tables, 31" high overall, 29 1/2" clear underneath extending 24" deep by 36" wide | ____ | |
| g. Identification of designated handicapped space keyed to directional sign at entrance | ____ | |
| 22. Dining Areas | | |
| a. Passage lanes, 42" clear through food service area with 60" square turn-a-round spaces | ____ | |
| b. 6' passage lanes between table without chairs | ____ | |
| c. Display shelves and dispensers within reach, tray slide at 34" maximum | ____ | |
| d. Dining area spaces provided on minimum basis prescribed for assembly areas. | ____ | |
| e. Tables 29 1/2" clear underneath for use by everyone | ____ | |
| f. Identification of accessibility and sign describing features in food service and dining area | ____ | |
| 23. Shop and Craft Areas | | |
| a. Work tables 29 1/2" clear underneath | ____ | |
| b. Passage lanes 42" clear of projections | ____ | |
| c. Work space between parallel tables, 60" wide | ____ | |
| d. Additional requirements investigated | ____ | |
| 24. Library and Office Areas | | |
| a. 42" passage lanes between bookstacks or files with 60" square turn-a-round space at aisle ends | ____ | |
| b. Major passage lanes, 60" wide | ____ | N/A |

| | YES | NO |
|---|---|---|
| 24. Library and Office Areas (cont'd) | | |
| c. Wheelchair spaces provided on minimum basis prescribed for assembly areas | ____ | N/A |
| d. Proper specification of accessible tables and carrels | ____ | ____ |
| e. Reference stacks between 18" and 48" high | ____ | ____ |
| f. Card files and other files, used by persons in wheelchairs, between 18" and 42" high | ____ | ____ |
| g. Information or checkout counters, 36" high; writing counters, 31" high | ____ | ____ |
| 25. Locker Rooms, Showers and Pools | | |
| a. 1 in 15 lockers between 18" and 48" high and designated | ____ | ____ |
| b. 60" square clear floor area in front of lockers | ____ | ____ |
| c. Adjacent dressing area with bars and seats (preferred) | ____ | ____ |
| d. 42" clear passage lanes | ____ | ____ |
| e. In shower areas, one accessible space 3' wide, 4' deep with bevel at floor edge, 1/4" high maximum | ____ | ____ |
| f. Proper location and specification of controls, accessories and grab bars | ____ | ____ |
| . Civilian pools made accessible. Stairs, ramps and handrails, if used, in accordance with criteria | ____ | ____ |
| h. Adjoining floors non-slip, firm and with smooth transitions | ____ | ____ |
| i. Vestibule clearance for wheelchair passage | ____ | ____ |
| 26. Vending Areas | | |
| a. 34" clear opening, 42" passage way in front of machines | ____ | ____ |
| b. 60" square clear floor area identified for turn-a-round | ____ | ____ |
| c. Operating parts within 18" to 48" high | ____ | ____ |
| d. Counters 34" high maximum, allowing side or under-the-counter approach | ____ | ____ |
| 27. Guesthouse Bedrooms | | |
| a. At least one accessible room | ____ | ____ |
| b. 42" clear passage between interior elements | ____ | ____ |
| c. Clothes rod 48" high with partial access into closet | ____ | ____ |
| d. Phone located next to bed | ____ | ____ |
| e. Accessible toilet room and shower accommodations in accordance with respective criteria | ____ | N/A |

LIST ANY WAIVERS, UNUSUAL REQUIREMENTS AND ADDITIONAL FEATURES PROVIDED

NONE

ATTACH ADDITIONAL PAGES IF REQUIRED

CERTIFICATION OF COMPLIANCE WITH CRITERIA SET FORTH IN EM 1110-1-103

~~AE CONTRACTOR~~ CE RESPONSIBLE FOR DESIGN:

SIGNATURE _____ DATE 7/1 1/09/81

CE OFFICIAL RESPONSIBLE FOR DESIGN REVIEW:

SIGNATURE _____ DATE _____

OTHER OFFICIAL(S) INVOLVED WITH REVIEW:

SIGNATURE _____ DATE _____

FILE ALL PAGES OF COMPLETED FORM IN PERMANENT PROJECT FILE

DATE FILED _____

# Appendix B

## COST ENGINEERING ANALYSIS

## B1. PURPOSE

This appendix contains the summaries of the cost estimates prepared for the plans of considered improvement for the modification to the existing Federal project at Olcott Harbor, New York. Additional supporting information to assist in review of the estimates is also presented.

## B2. THE PROJECT

The existing project at Olcott Harbor provides a pier (jetty) protected entrance channel 12 feet deep and 140 feet wide into the mouth of Eighteen Mile Creek. The Water Resources Development Act of 1986 (PL 99-662) authorized construction of a modification to the project as described in the Olcott Harbor, New York: Report of the Chief of Engineers, dated June 11, 1980.

This modification consists of construction of two offshore breakwaters, an additional jetty along the existing west jetty (pier), dredging of an access channel upstream of the existing project in Eighteen Mile Creek, a dredged channel off the existing entrance channel providing access to the protected mooring area enclosed by the new east detached breakwater, and provision for fishing access to the detached east breakwater via a timber footbridge and concrete walkway with guardrail along the crest of the detached east breakwater.

This was the recommended plan, known as Plan 10, resulting from the Olcott Harbor Feasibility Study, and discussed in the study report dated November, 1978.

Subsequent study and design efforts have produced variations and refinements of this plan. These variations and refinements are the subject of this report.

## B3. GENERAL

Five estimates are presented in this appendix. These are the estimates for the original Plan 10 as authorized, and four derivatives; Plan 10A Modified, Plan 10A Modified Without Dredging, Plan 10B and the Refined Plan 10A Modified.

Estimates for the first four plans were prepared for the reevaluation process and are presented at August 1989 price levels. Plan 10A Modified was the subject of the General Design Analysis and the estimate for the resulting Refined Plan 10 A Modified is presented at June 1991 price levels.

These plans are briefly described below.

### B3.1 Plan 10

As mentioned, Plan 10 is the authorized plan. It includes construction of detached east and west breakwaters, a jetty

adjacent to the existing west pier, an extension of the Eighteen Mile Creek Channel upstream of the existing project, an access channel for the mooring area formed behind the east breakwater, and a footbridge connecting the shore to a concrete walkway along the crest of the east breakwater which provides access for fishing. Parking and sanitary facilities for the use of recreational fishermen are also included.

The authorized cost for this plan was $12,600,000 at October 1985 price levels.

B3.2 Plan 10A Modified

This plan is a modification to one of the variations hydraulically modeled at the Waterways Experiment Station; specifically, Variation 1 of Plan 10A.

This variation, and the others modeled, moved the east breakwater footbridge to a location at the dogleg of the breakwater rather than at the shore in order to reduce sedimentation in the harbor, improve water quality and reduce the negative impact on the fishery.

As a result of the model study, the crest elevations of both detached breakwaters were lowered by 1.5 feet to +14.5 LWD, the crest elevation of the East Breakwater shoreward leg (now attached to shore) was raised 1.9 feet to +12.9 LWD and the west jetty was deleted.

Subsequent to completion of the model study, the interior angle formed by the two legs of the west breakwater was increased to 130 degrees to increase water circulation, and the width of the Entrance Channel was increased to 150 feet to better accommodate the anticipated traffic.

This plan also provides for the construction of sanitary facilities and 150 parking spaces for use by east breakwater fishermen, (including five spaces for the physically handicapped).

B3.3 Plan 10A Modified Without Dredging

This plan is identical to the plan described immediately above with the exception of deletion of the new channel in the Eighteen Mile Creek upstream of the existing project.

B3.4 Plan 10B

This plan was also one of the variations hydraulically modeled. The plan features east of the entrance channel, both navigation and recreation, are identical to those in Plan 10A Modified.

The west breakwater of Plan 10B is extended shoreward and linked to a west shore connected breakwater by a second footbridge. A concrete walkway like that on the east, follows the crest of the west breakwaters.

A second access channel is provided for the mooring basin formed behind the west breakwater.

B3.5 Refined Plan 10A Modified

This plan is substantially similar to Plan 10A Modified, as described above, with the exception of flatter breakwater sideslopes, lower crest elevations and a shorter shoreward leg on the

west breakwater. This plan is described in greater detail in paragraph B5.

## B4. REEVALUATION ESTIMATES

Estimates for plans 10, 10A Modified, 10A Modified Without Dredging and 10B were completed for the reevaluation process. These are presented at August 1989 price levels.

The principle items of work in each of the plans is essentially the same; dredging of earth and rock, rubblemound stone construction, and construction of facilities associated with recreational fishing from the structures.

Material quantities for plans 10A Modified and 10B are based on 1988 hydrographic surveys. Rock excavation quantities were developed utilizing information from an extensive program of wash borings performed in 1931.

Plan 10 has been carried over intact as authorized from the feasibility study. No further refinement has been made to the design. The material quantities used in the estimate are those developed for the feasibility report, (in some cases conversions have been made for changes to the units of measure). The stone materials have been renamed to agree with the terminology used in the other plans. The unit costs for plan 10 have not been updated by use of cost indices but rather the estimate has been repriced using the unit costs developed in the estimates for plans 10A Modified and 10B at August 1989 price levels.

Further discussion on specific activities follows.

### B4.1 Dredging

Most of the material to be dredged is earth. The rock excavation occurs in a narrow crown crossing the entrance channel between the breakwaters.

Unit costs for earth dredging were developed from the bid prices received for the 1984 construction of the Irondequoit Bay Small Boat Harbor, approximately 55 miles to the east. The unit cost for rock dredging was developed from bid prices received for the minor 1984 modification to Ogdensburg Harbor New York, located on the St. Lawrence River, approximately 210 miles to the east.

In addition to the channel dredging, the structural debris from the old hotel pier and the submerged remains of the east abutment from the now removed Main Street Bridge must be removed. This is a relatively minor amount of work and the estimated cost is based on work of a similar nature performed at the Michigan Avenue Bridge over the Buffalo Ship Canal in 1981.

### B4.2 Rubblemound Construction

Stone material quantities for plans 10A Modified and 10B were developed based on applying actual bottom elevations along the proposed alignments to the design cross sections.

Existing quarries have been identified which are capable of

producing the required stone products. Two quarries are within 45 miles of the project site. Unit costs for the breakwater construction were developed considering the bid prices of similar materials from the Irondequoit Bay Project and the more recent 1988 construction of the Sturgeon Point (NY) Small Boat Harbor, located on Lake Erie approximately 50 miles to the southwest.

B4.3 Recreational Facilities

The footbridges estimated for the three plans are pile supported, concrete double t-beams, as constructed for the Dunkirk Small Boat Harbor project.

The costs for walkways and protective guardrails for all the plans are based on the design used, and the bids received for the Sturgeon Point project.

The sanitary and parking facilities costs were estimated using standard published cost data.

B4.4 Engineering and Design

The lump sum value used in the estimates for Engineering and Design was the current estimate (Aug 89), supplied by the project manager.

B4.5 Construction Management

The estimated amounts for the supervision and administration of the construction contract were based on recorded requirements for projects of similar scope and scale.

B4.4 Contingencies

With one exception, the contingency applied to the estimated amounts is approximately 20% for all construction items in each of the estimates. A contingency of 25% has been used for the stone breakwater construction in the estimate for plan 10 due to the manner used to calculate quantities. As described in the Design Appendix of the 1978 feasibility report, quantities were computed using limited hydrographic survey data and assumed typical sections.

B4.5 Annual Maintenance

A review of previous investigations indicates an annual maintenance cost equal to two per cent of the first cost of construction has traditionally been used during the reevaluation phase for the purpose of evaluating alternative plans. This procedure has been found to be conservative for projects of this nature and was employed here.[1]

## B5. THE SELECTED PLAN OF IMPROVEMENT

The selected plan is known as Refined Plan 10A Modified. This plan is the product of the work performed during the General

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1. A detailed estimate of the average annual maintenance cost associated with the selected plan is discussed in paragraph B7.0.

Design Analysis. The refinements are described below.

B5.1 Breakwaters

The length of the shoreward leg of the west breakwater has been reduced from 560 feet to 410 feet. The breakwater's orientation is unchanged. The crest elevation has been reduced an additional 1.5 feet to +13.0 LWD. The crest width has been reduced from 17.1 feet to 13.5 feet. The sideslopes have been flattened on the head section from 1 on 2.0 to 1 on 2.5 and on the trunk from 1 on 1.5 to 1 on 2.0.

The length of the east detached breakwater has been increased from 1525 feet in plan 10A Modified to 1545 feet. The crest elevation has been reduced from +14.5 LWD to +13.0 LWD, with the exception of the 500 foot long "overbuilt" section which has a crest elevation of +14.0 LWD. The crest width has been reduced from 17.4 feet to 16.0 feet. The sideslopes have been flattened the same as on the west breakwater. A berm has also been added to the lakeside of the overbuilt breakwater section.

The east shorearm has increased in length by 10 feet to 350 feet. The crest height is reduced by 0.5 feet to +12.0 LWD. The crest width is decreased one foot to 11.8 feet. The sideslopes have been flattened from 1 on 1.5 to 1 on 2.0.

The design specific gravity for the breakwater stone has changed from 2.48 to 2.60.

B5.2 Channels

The depth of the entrance and access channels has been reduced to -10.0 LWD and -7.0 LWD respectively. No dredging of these channels is necessary during initial project construction. The channel in Eighteen Mile Creek upstream of the existing project has been eliminated. The removal of the obstruction remaining from the old Main Street Bridge pier/abutment is retained.

B5.3 Recreation Facilities

The pedestrian bridge connecting the east shorearm and detached breakwaters has changed from concrete double t-beams supported on pile bents, to a concrete box beam design founded on piles enclosed within steel sheet pile cells. The breakwater walkways are unchanged but the design of the ramp through Krull Park has been refined. In addition, since it is less costly than demolition and removal, the detached pierhead from the old hotel pier is being rehabilitated for use by fishermen.

B6. CURRENT ESTIMATE

The estimate for the cost shared features of the selected plan has been prepared in the format of the LCPM Chart (Code) of Accounts using the MCACES GOLD 5.0 software.[2] The Project Break-

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2. The estimate presented herein was reviewed by WLRC and was "found...to be satisfactory."

down Structure incorporates two contracts; one Federal and one non-Federal. All items with the exception of the parking and the sanitary facilities will be constructed under the Federal contract. The price levels of the estimate are June 1991.

The following narrative provides further definition of the anticipated construction and assumptions made in the estimate.

B6.1 Project Schedule

Award of the Federal construction contract is scheduled for September 1993, with completion of construction in December 1995. Construction under the non-Federal contract will also be completed during this period.

B6.2 Environmental Constraints

Significant environmental constraints have been placed on the "in-water construction" activities of this project. In-water construction is defined as placement of materials in the water column.

The window for in-water construction was established as 15 May through 15 September. With this limited season, construction of the breakwaters was anticipated to require a portion of an additional construction season beyond the two plus seasons scheduled. (It is anticipated no breakwater construction will occur in the fall months immediately following award of the contract due to the seasonal restrictions placed on stone quarrying.)

Due to the negative impact on project cost created by this restriction and the anticipated adverse impacts to the fishery which three consecutive construction seasons would create, representatives of this District, the United States Fish and Wildlife Service and the New York State Department of Environmental Conservation met in June of 1990, to attempt to find a favorable solution.

This meeting and subsequent correspondence resulted in a negotiated extension of the window through 6 October for the first full (1994) construction season and an extension through 10 November during the second full (1995) construction season.

Review of records of prior construction had concluded that the construction of the west breakwater could reasonably be completed within the period of time allowed by the first extended season. Similarly, the east breakwater could reasonably be built during the second extended season. The east shorearm could be constructed by land plant, concurrently with the east detached breakwater. All parties found this alternative preferable to a third construction season.[3]

Other "out of water activities" such as walkway and railing construction can be performed at any time.

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3. Even though stone material quantities have since increased for the refined design, the results of the current estimate indicate that the negotiated periods are still adequate to complete construction of the project.

B6.3 Quantities

Material quantities for this estimate have been based on the design as detailed in the General Design Analysis. Detailed takeoffs were made for all features. Additional sections were prepared using 1988 and 1990 surveys to compute the breakwater stone quantities and the cut and fill for the Krull Park access ramp. The design specific gravity for the breakwater stone is 2.60.

B6.4 Plant

Breakwater construction will require almost exclusive use of marine plant. Only the east shorearm can be built with land plant. The demolition of the old hotel pier and the construction of the pedestrian bridge will also require marine plant.

The project site is 55 miles west of Irondequoit Bay Small Boat Harbor and 155 miles west of Port Ontario Small Boat Harbor. These projects were constructed by this district in the mid 1980's. The methods used for material transportation and placement at these projects was reviewed, and it was determined that similar techniques would likely be employed on this project.

Specific plant costs are based on the rates developed for the 1991 maintenance dredging of Oak Orchard and Wilson Harbors; both harbors are located within 30 miles of the Olcott project site.

Construction of the parking access ramp and sanitary facilities will be performed with conventional equipment.

B6.5 Labor

Rates for marine labor are those developed for the 1991 maintenance dredging contract at Wilson and Oak Orchard Harbors. The rates for other trades in the labor database were reviewed and considered appropriate for use in this estimate.

B6.6 Materials

Current price quotes (June 1991), were obtained for the stone products required and the precast pedestrian bridge. Concrete and steel sheet pile prices were updated from price quotes for recent work. Prices in the Unit Price Book were reviewed for other required items and adjusted where appropriate.

B6.7 Construction Contingencies

Contingencies for the construction items have been assigned at the lowest title levels of the project breakdown structure. This produces line item contingencies at or below the subfeature level throughout the estimate. The values assigned are the cost estimator's judgment of the uncertainty associated with quantity, productivity and material costs.

B6.8 Non-Federal Construction and Associated Costs

An estimate of the non-Federal and associated costs was received from the local sponsor. The associated cost of the marina development is displayed in Table B1.

The 150 parking spaces for recreational fishermen will be provided within a 330 space lot to be constructed at East Main Street and Krull Park. The cost of these cost shared spaces was

Table B1

**MARINA DEVELOPMENT COST ESTIMATES**
(June 1991 Price Levels)

| | ITEM | | ESTIMATED COST |
|---|---|---|---|
| 1. | 860 Marina Slips/Moorings (includes water & sewer) | | $5,360,000 |
| | Buildings (control tower) | | 480,000 |
| | Access Improvement and Other Amenities | | 220,000 |
| | Boardwalk | | 1,100,000 |
| | Launch Ramp | | 100,000(1) |
| 2. | Tour Boat and Dock | | 300,000(2) |
| | Winter Storage | | 318,300 |
| 3. | INFRASTRUCTURE: | | |
| | Access Roads | | 300,000 |
| | Water | | 40,000 |
| | Shuttle Service | | 34,500(3) |
| | Parking: | | |
| | (Location) | (# Spaces) | |
| | Ontario & Franklin Sts. | (102) | 426,000 |
| | Ontario & Cooper Sts. | ( 50) | 342,000 |
| | E. Main St. & Krull Park | (180) | 327.000(4) |
| | Ball diamond at Krull Park | (318) | 200,000 |
| | Total Parking Spaces .... | (650) | |
| 4. | Land for Associated Project | | 257,700 |
| | **TOTAL FIRST COST .....** | | **$9,805,500** |

SOURCE: Wendel Engineers, 1991

Notes:

(1) Source: "Fiscal Impact, Olcott Harbor Project," Development Planning Services, Nov. 1990 (revised July 1991).
(2) Includes $100,000 for dock.
(3) In addition to this first cost of $34,500, annual operating cost for the shuttle service was estimated at $33,000.
(4) Excludes the cost ($273,000) of 150 cost shared spaces.

prorated from the total cost of construction for this lot.

The cost of the sanitary facilities was estimated using standard published cost data for a facility comparable to that constructed for the Dunkirk Harbor project, where a similar requirement was identified.

B6.9 Non-Construction Features

Estimated costs and contingencies for the 01. Lands and Damages, 30. Engineering and Design and 31. Construction Management accounts were furnished through the project manager by the functional elements responsible for the feature costs.

B6.10 Navigation Aids

By letter dated 28 January 1991, the Commander of the United States Coast Guard Ninth District provided an estimated cost for the required aids to navigation for the project of $30,000. These aids consist of a Standard Cylindrical Light Tower at the east end of the west breakwater and a Standard Aid to Navigation Pole at the west end of the east detached breakwater.

This cost, while included in the economic analysis, is not included in the project estimate as it is not a Federal (Corps of Engineers) cost. The cost of the necessary foundations for the structures is a Federal (COE) cost and has been included under the 10. account, Breakwaters and Seawalls.

## B7.0 OPERATION AND MAINTENANCE COSTS

The maintenance history of this District's small boat harbors of similar (random rubblemound) design was reviewed to gain insight into what maintenance costs could be anticipated for the cost shared features of the Olcott project. The projects reviewed were Port Ontario, Irondequoit Bay and Oak Orchard harbors on Lake Ontario, and Sturgeon Point, Cattaraugus Creek, Dunkirk and West harbors on Lake Erie.

While no one of these projects completely resembles the scope and scale of the Olcott Project, their features were designed to similar standards. All of these projects are still relatively early in their project life; ranging in age from two to sixteen years.

Other than channel dredging, little or no maintenance has been required at these projects. Signs of distress to the stone structures such as breakage or movement are few, and none have been identified for repairs with the exception of Irondequoit Bay where the development of a scour hole adjacent to the west breakwater endangered the stability of the head section.

Similarly, the recreational features (walkways and cable railings) at these projects have required little maintenance.

Conservative assumptions of the maintenance requirements for the Olcott project have been made and are discussed below.

B7.1 Breakwaters

It is assumed that repairs are required after 20 and 40 years. On these occasions, a single layer of armor stone will be

placed over 20% of the lakeside face and head sections of the breakwaters. This will require placement of 5200 tons of stone each time. Using the unit costs developed in the current estimate ($42.46/ton for armor stone), and including mobilization costs, this equates to a contract cost of $320,000. Adding appropriate amounts for engineering and design, construction management and contingency brings the total cost to $500,000 for each event.

B7.2 Dredging

Tracer tests performed during the model study indicated little potential for alongshore material to be deposited behind the breakwaters. Under the selected plan, the Federal navigation channels will approximately double in area. Currently, approximately 5,000 cubic yards of material are removed from the existing Federal project every ten years. For our purposes, it will be assumed that a like amount will be removed from the new channels within the project, on the same frequency.

It is also anticipated some dredging will be required to maintain depths in the marina. Since the east basin mooring areas are not directly in the line of sediment flow from Eighteen Mile Creek, a shoaling rate of half that found in the navigation channel will be assumed. This rate equates to an accumulation of 10,000 cubic yards over a ten year period. Since the local sponsor is responsible for maintenance of both the marina mooring area and the new channels, it is logical that this work would be completed coincidentally.

Using the average price bid for the 1991 maintenance dredging of nearby Wilson Harbor ($9.34/cy), and again including mobilization, E&D, CM, and contingency brings the total cost to $350,000 per event, ($115,000 for the navigation channels and $235,000 for dredging of the marina).

B7.3 Recreational Facilities

Although the "overbuilt" reach of the east detached breakwater was designed to accommodate future anticipated settlement, it may be necessary at some point in time to restore a level walkway after settlement occurs.

Complete removal and replacement of the walkway and handrail over the entire 400 foot overbuilt reach, including all indirect costs and contingency is estimated to cost $200,000. This has been scheduled to occur in year 20.

Per conversation with the design elements and project experience at Dunkirk Harbor, no significant maintenance will be required for the footbridge. Costs for minor maintenance, cable repair/replacement on the rest of the walkway, and repairs to the Krull park ramp are assumed to be $25,000 every ten years.

Depending on project security, maintenance of the sanitary facilities could become high relative to the initial construction cost. It is assumed expenditures will total 20% of the initial construction cost every ten years ($18,000), and that the facility will be replaced after 25 years at a total cost of $100,000.

It is also assumed that 20% of the initial cost of constructing the parking area will be spent in maintenance over each ten year period ($27,000), with complete replacement after 25 years at a total cost of $300,000.

B7.4 Average Annual Maintenance Cost

A detailed listing of the maintenance events discussed above for the cost shared features is provided in Table B2. This schedule of expenditures equates to an average annual cost of approximately $29,000.

While a contingency has been included in the cost of each item, it is possible that additional minor costs will be incurred. For this reason, a value of $35,000 will be used for the estimated average annual maintenance cost of the cost shared project.

The estimated cost for annual operation and maintenance of the project's associated features presented in Table B3 ($351,000), has been provided by the local sponsor with the exception of the estimated cost presented there for maintenance dredging of the marina. This amount is the annualized value of the work discussed in paragragh B7.2.

Periodically, the project's two navigation aids will require inspection and maintenance. These costs, and the aids operating costs are assumed not to exceed $1,000 on an average annual basis and are funded by the Coast Guard.

**Table B2**

Schedule of Maintenance Expenditures
for Cost Shared Features

All Costs at June 1991 Price Levels

| Year | Description | Cost |
|---|---|---|
| 10 | Dredging | $235,000 |
| " | Misc. Walkway and Railing Repairs | 25,000 |
| " | Maintenance of Parking Lot | 27,000 |
| " | Maintenance of Sanitary Facilities | 18,000 |
| 20 | Dredging | $235,000 |
| " | Misc. Walkway and Railing Repairs | 25,000 |
| " | Maintenance of Parking Lot | 27,000 |
| " | Maintenance of Sanitary Facilities | 18,000 |
| " | Walkway Settlement Repairs | 200,000 |
| " | Breakwater Repairs | 500,000 |
| 25 | Replacement of Parking Lot | 300,000 |
| " | Replacement of Sanitary Facility | 100,000 |
| 30 | Dredging | $235,000 |
| " | Misc. Walkway and Railing Repairs | 25,000 |
| " | Maintenance of Parking Lot | 27,000 |
| " | Maintenance of Sanitary Facilities | 18,000 |
| 40 | Dredging | $235,000 |
| " | Misc. Walkway and Railing Repairs | 25,000 |
| " | Maintenance of Parking Lot | 27,000 |
| " | Maintenance of Sanitary Facilities | 18,000 |
| " | Breakwater Repairs | 500,000 |

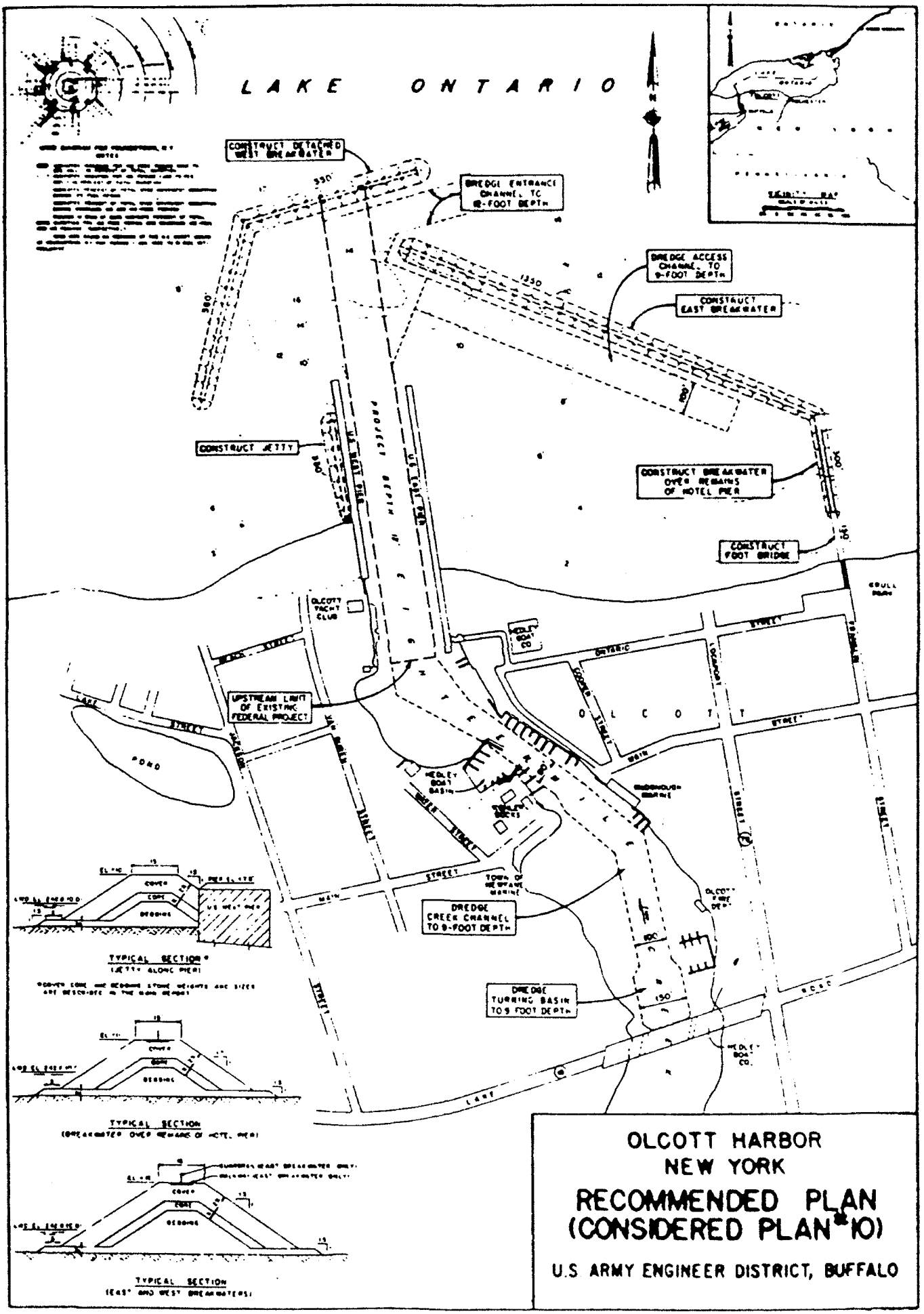
Table B3

**ESTIMATED ANNUAL OPERATION AND MAINTENANCE COSTS OF ASSOCIATED FEATURES**

| | |
|---|---|
| Payroll and Benefits | $125,000 |
| Maintenance (docks, parking, boardwalk, etc.) | 50,000 |
| Marina Dredging | 15,000 |
| Utilities | 25,000 |
| Insurance | 35,000 |
| Administrative(1) | 25,000 |
| Security | 25,000 |
| Miscellaneous(2) | 10,000 |
| Building Maintenance | 8,000 |
| Shuttle Service Operating Costs | $ 33,000 |
| **TOTAL** | **$351,000** |

(1) Includes office supplies, phone, advertising and promotion, etc.

(2) Includes reserves for replacement and other miscellaneous.




# OLCOTT HARBOR
## NEW YORK
# RECOMMENDED PLAN (CONSIDERED PLAN #10)

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE B1

Olcott Harbor, NY
Reevaluation Study Estimate - Plan 10
By: JW Checked By: JP PL: Aug. 89

| | ESTIMATED COST | CONTINGENCY (In acct. -.-.2.-) | TOTAL COST |
|---|---|---|---|
| 10.-.-.- BREAKWATERS AND SEAWALLS | 7,702,899 | 1,927,101 | 9,630,000 |
| 12.-.-.- NAVIG. PORTS & HARBORS | 265,500 | 54,500 | 320,000 |
| 14.-.-.- RECREATION FACILITIES | 966,327 | 193,673 | 1,160,000 |
| Total Construction Cost | $8,930,000 | $2,180,000 | $11,110,000 |
| 01.-.-.- LANDS AND DAMAGES | 56,000 | 14,000 | 70,000 |
| 30.-.-.- PLAN, ENGR, AND DESIGN | | | 1,400,000 |
| 31.-.-.- CONST. MANAGEMENT | | | 906,000 |
| Total Project Costs | | | 13,486,000 |

PROJECT: Olcott Harbor, NY
SUBJECT: Reevaluation Study Estimate - Plan 10
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

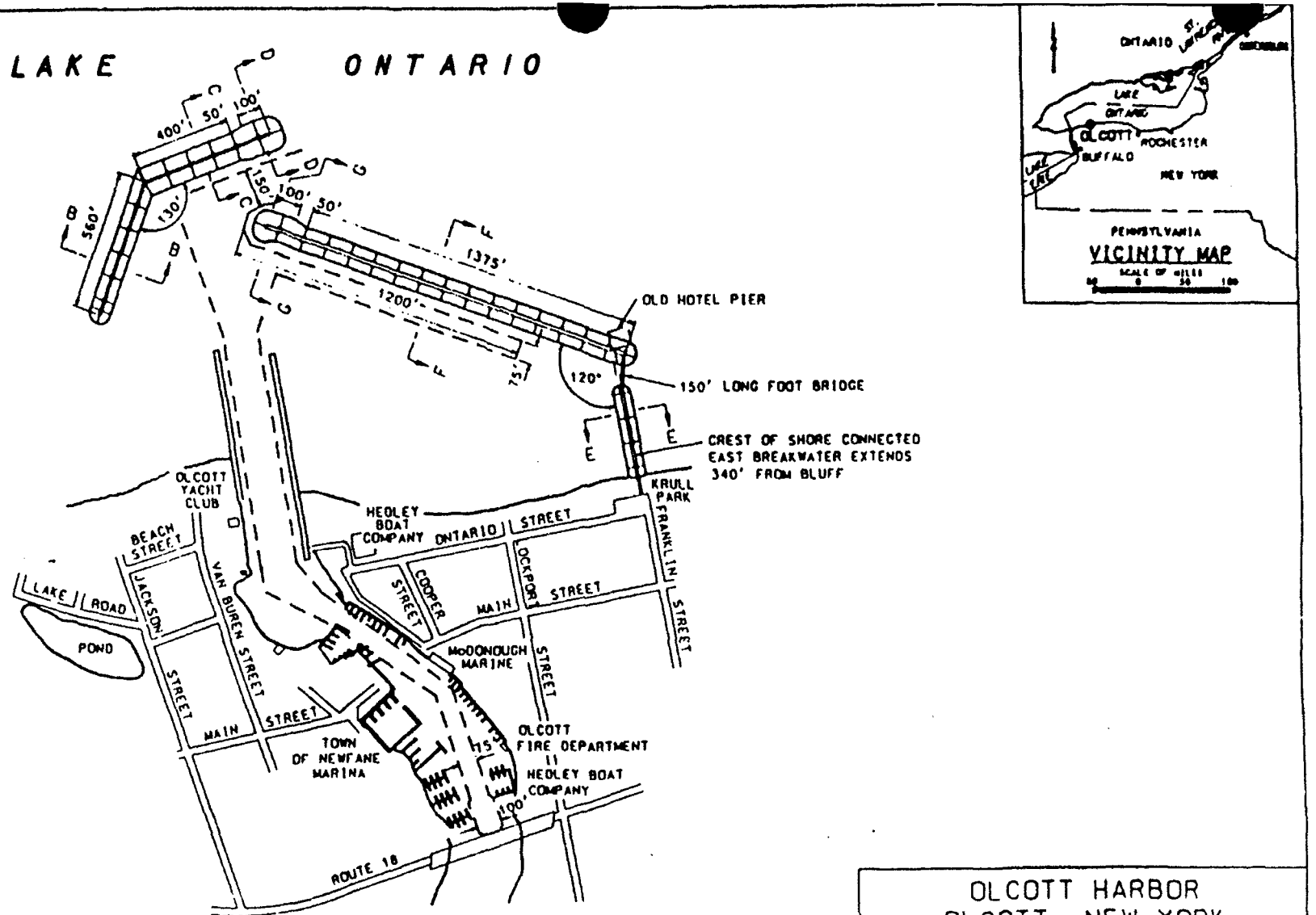
| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | PROJECT COST |
|---|---|---|---|---|---|---|---|
| 10.-.-.-. | BREAKWATERS AND SEAWALLS | | | | | | |
| 10.0.1.- | Breakwaters: | | | | | | |
| 10.0.1.B | West Breakwater | | | | | | |
| 10.0.1.B | Armor Stone | 44,926 | Ton | $43.00 | $1,931,818 | $484,182 | $2,416,000 |
| 10.0.1.B | Underlayer Stone | 13,657 | Ton | $44.50 | $607,737 | $152,263 | $760,000 |
| 10.0.1.B | Bedding Stone | 22,754 | Ton | $33.00 | $750,882 | $188,118 | $939,000 |
| 10.0.1.B | West Jetty | | | | | | |
| 10.0.1.B | Armor Stone | 2,459 | Ton | $43.00 | $105,737 | $26,263 | $132,000 |
| 10.0.1.B | Underlayer Stone | 706 | Ton | $44.50 | $31,417 | $7,583 | $39,000 |
| 10.0.1.B | Bedding Stone | 805 | Ton | $33.00 | $26,565 | $6,435 | $33,000 |
| 10.0.1.B | East Breakwater | | | | | | |
| 10.0.1.B | Armor Stone | 54,416 | Ton | $43.00 | $2,339,888 | $586,112 | $2,926,000 |
| 10.0.1.B | Underlayer Stone | 17,276 | Ton | $44.50 | $768,782 | $193,218 | $962,000 |
| 10.0.1.B | Bedding Stone | 32,881 | Ton | $33.00 | $1,085,073 | $271,927 | $1,357,000 |
| 10.0.R.- | Associated General Items: | | | | | | |
| 10.0.R.B | Navigation Light Foundations | 1 | JOB | | $55,000 | $11,000 | $66,000 |
| | Subtotal, Construction Costs: | | | | $7,702,899 | | |
| 10.0.Z.- | Contingincies @ average of | 25.0% | | | | $1,927,101 | |
| 10.-.-.- | Breakwater Total: | | | | | | $9,630,000 |

PROJECT: Olcott Harbor, NY
SUBJECT: Reevaluation Study Estimate - Plan 10
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | PROJECT COST |
|---|---|---|---|---|---|---|---|
| 12.-.-.- | Navigation Ports & Harbors | | | | | | |
| 12.0.4.- | Mechanical Dredging | | | | | | |
| 12.0.4.B | Obstruction Removal | 1 | Job | LS | $31,500 | $6,000 | $37,500 |
| 12.0.4.B | Earth | 30,000 | CY | $6.50 | $195,000 | $40,000 | $235,000 |
| 12.0.4.B | Rock | 1,300 | CY | $30.00 | $39,000 | $8,500 | $47,500 |
| | Subtotal, Construction Costs: | | | | $265,500 | | |
| 12.0.Z.- | Contingincies @ average of 20 % | | | | | $54,500 | |
| 12.-.-.- | Dredging Total: | | | | | | $320,000 |

PROJECT: Olcott Harbor, NY
SUBJECT: Reevaluation Study Estimate - Plan 10
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | PROJECT COST |
|---|---|---|---|---|---|---|---|
| 14.-.-.-. | RECREATION FACILITIES | | | | | | |
| 14.0.1.- | Parking Lots and Service Roads | | | | | | |
| 14.0.1.B | Parking Lot | 1 | Job | LS | $216,000 | $42,000 | $258,000 |
| 14.0.3.- | Activity Guides and Controls: | | | | | | |
| 14.0.3.B | Footbridge | 1 | JOB | LS | $150,000 | $30,000 | $180,000 |
| 14.0.3.B | Concrete Walkway | 1,173 | CY | $381.60 | $447,617 | $89,383 | $537,000 |
| | Walkway Guardrail | 1,980 | LF | $14.50 | $28,710 | $6,290 | $35,000 |
| 14.0.P.- | Buildings, Public Use (Sanitary Facilities) | 2 | EA | $62,000 | $124,000 | $26,000 | $150,000 |
| | Subtotal, Construction Costs: | | | | $966,327 | | |
| 14.0.Z.- | Contingincies @ average of | 20.00% | | | | $193,673 | |
| 14.-.-.- | Recreation Facilities | | | | | | $1,160,000 |







PLAN

SCALE: 1" = 600'

600' 0 600' 1200'

OLCOTT HARBOR
OLCOTT, NEW YORK

PLAN #10A MODIFIED

U.S. ARMY ENGINEER DISTRICT BUFFALO
FEBRUARY 1990

PLATE B2

OLCOTT HARBOR, NY
RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
BY: JW CHECKED BY: JP PL: AUG 89

| | | ESTIMATED COST | Contingency (In acct. -.-.Z.-) | TOTAL COST |
|---|---|---|---|---|
| 10.-.-.- | BREAKWATERS AND SEAWALLS | $8,570,750 | $1,723,250 | $10,294,000 |
| 12.-.-.- | NAVIGATION PORTS AND HARBORS | $304,500 | $60,500 | $365,000 |
| 14.-.-.- | RECREATIONAL FEATURES | $972,600 | $192,400 | $1,165,000 |
| | TOTAL CONSTRUCTION COST | $9,847,850 | $1,976,150 | $11,824,000 |
| 01.-.-.- | LANDS AND DAMAGES | $56,000 | $14,000 | $70,000 |
| 30.-.-.- | PLANNING ENGINEER'G & DESIGN | | | $1,400,000 |
| 31.-.-.- | CONSTRUCTION MANAGEMENT | | | $906,000 |
| | TOTAL PROJECT COSTS | | | $14,200,000 |

ECT: OLCOTT HARBOR, NY
ECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
UTED BY: JW CHECKED BY: JP PL: AUG 89

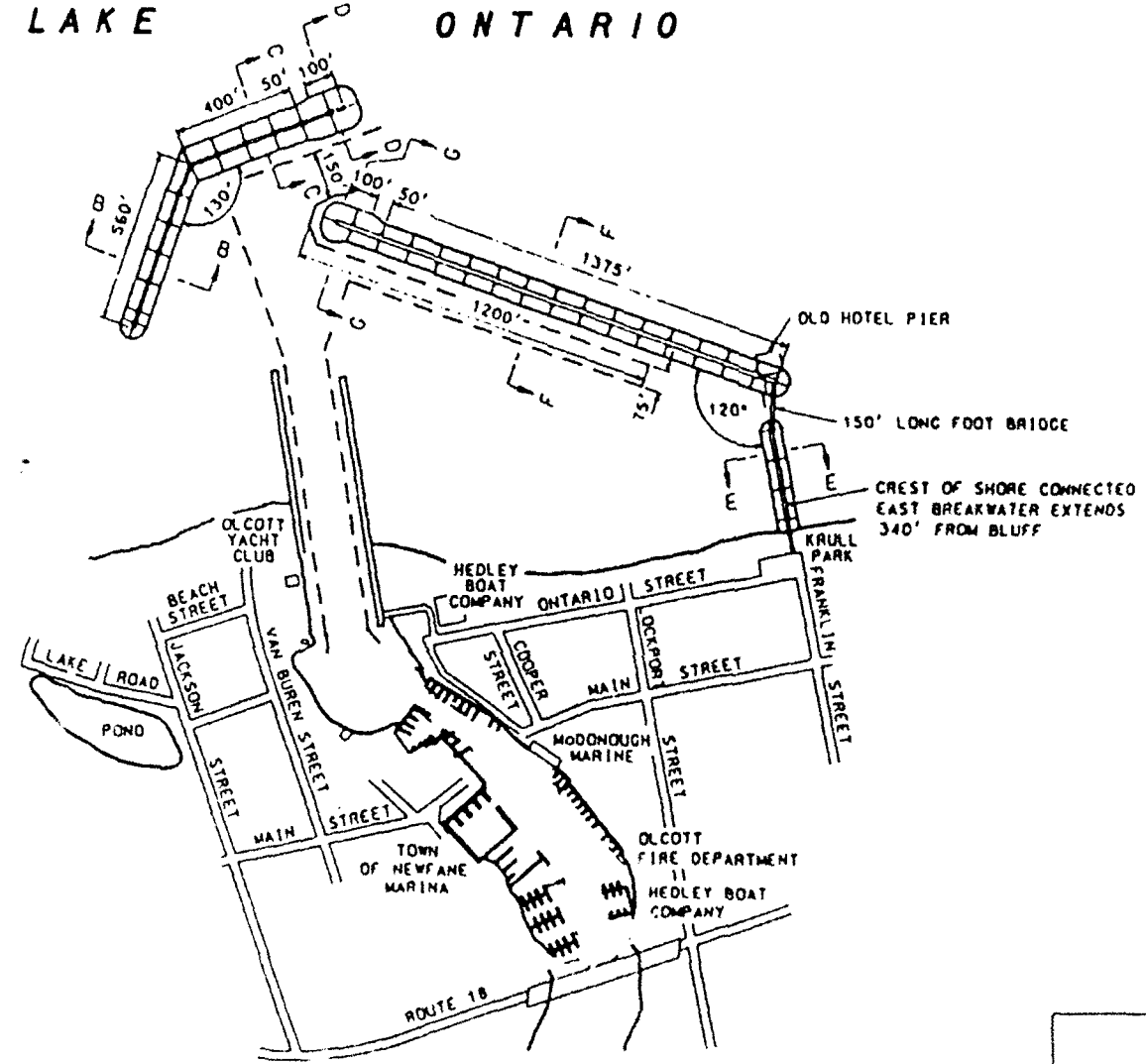
| UNT | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.2.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| .-.-. | BREAKWATERS AND SEAWALLS | | | | | | |
| ).1.- | Breakwaters: | | | | | | |
| ).1.B | West Breakwater | | | | | | |
| ).1.B | Armor Stone | 50,800 | Ton | $43.00 | $2,184,400 | $437,000 | $2,621,400 |
| ).1.B | Underlayer Stone | 18,600 | Ton | $44.50 | $827,700 | $165,300 | $993,000 |
| ).1.B | Bedding Stone | 21,000 | Ton | $33.00 | $693,000 | $138,600 | $831,600 |
| ).1.B | East Breakwater | | | | | | |
| ).1.B | Armor Stone | 69,100 | Ton | $43.00 | $2,971,300 | $600,700 | $3,572,000 |
| ).1.B | Underlayer Stone | 24,500 | Ton | $44.50 | $1,090,250 | $219,750 | $1,310,000 |
| ).1.B | Bedding Stone | 22,700 | Ton | $33.00 | $749,100 | $150,900 | $900,000 |
| ).R.- | Associated General Items: | | | | | | |
| ).R.B | Navigation Lights | 1 | JOB | LS | $55,000 | $11,000 | $66,000 |
| | Subtotal: | | | | $8,570,750 | | |
| ).Z.- | Contingincies @ average of | 20 % | | | | $1,723,250 | |
| .-.- | Breakwaters and Seawall Total: | | | | | | $10,294,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 12.-.-.- | DREDGING | | | | | | |
| 12.0.4.- | Mechanical Dredging | | | | | | |
| 12.0.4.B | Obstruction Removal | 1 | Job | LS | $31,500 | $6,000 | $37,500 |
| 12.0.4.B | Earth | 36,000 | CY | $6.50 | $234,000 | $46,000 | $280,000 |
| 12.0.4.B | Rock | 1,300 | CY | $30.00 | $39,000 | $8,500 | $47,500 |
| | Subtotal: | | | | $304,500 | | |
| 12.0.Z.- | Contingencies @ average of | 20 % | | | | $60,500 | |
| 12.-.-.- | Dredging Total: | | | | | | $365,000 |

T: OLCOTT HARBOR, NY
T: RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
ED BY: JW CHECKED BY: JP PL: AUG 89

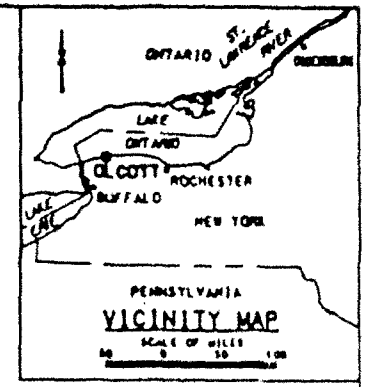
| T | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.2.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| .-. | RECREATION FACILITIES | | | | | | |
| .- | Parking Lots and Service Roads | | | | | | |
| .B | Parking Lots | 1 | JOB | LS | $216,000 | $42,000 | $258,000 |
| .- | Activity Guides and Controls: | | | | | | |
| .B | Footbridge | 1 | JOB | LS | $150,000 | $30,000 | $180,000 |
| .B | Concrete Walkway | 1,250 | SY | $318.00 | $397,500 | $77,500 | $475,000 |
| .B | Walkway Guardrail | 2,000 | LF | $14.50 | $29,000 | $6,000 | $35,000 |
| .B | Precast Walkway Barriers | 3,400 | LF | $16.50 | $56,100 | $10,900 | $67,000 |
| .- | Buildings, Public Use (Sanitary Facilities) | 2 | Ea | $62,000.00 | $124,000 | $26,000 | $150,000 |
| | Subtotal: | | | | $972,600 | | |
| .- | Contingencies @ average of | 20 % | | | | $192,400 | |
| .- | Recreation Facilities Total: | | | | | | $1,165,000 |




PLAN

SCALE: 1" = 600'

600' 0 600' 1200'




OLCOTT HARBOR
OLCOTT, NEW YORK

PLAN #10A MODIFIED
WITHOUT DREDGING

U.S. ARMY ENGINEER DISTRICT BUFFALO
FEBRUARY 1990

PLATE B3

OLCOTT HARBOR, NY
RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED WITHOUT DREDGING
BY: JW CHECKED BY: JP PL: AUG 89

| | | ESTIMATED COST | Contingency (in acct. -.-.Z.-) | TOTAL COST |
|---|---|---|---|---|
| 10.-.-.- | BREAKWATERS AND SEAWALLS | $8,570,750 | $1,723,250 | $10,294,000 |
| 12.-.-.- | NAVIGATION PORTS AND HARBORS | $31,500 | $6,500 | $38,000 |
| 14.-.-.- | RECREATIONAL FEATURES | $972,600 | $192,400 | $1,165,000 |
| | TOTAL CONSTRUCTION COST | $9,574,850 | $1,922,150 | $11,497,000 |
| 01.-.-.- | LANDS AND DAMAGES | $56,000 | $14,000 | $70,000 |
| 30.-.-.- | PLANNING ENGINEER'G & DESIGN | | | $1,400,000 |
| 31.-.-.- | CONSTRUCTION MANAGEMENT | | | $906,000 |
| | TOTAL PROJECT COSTS | | | $13,873,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

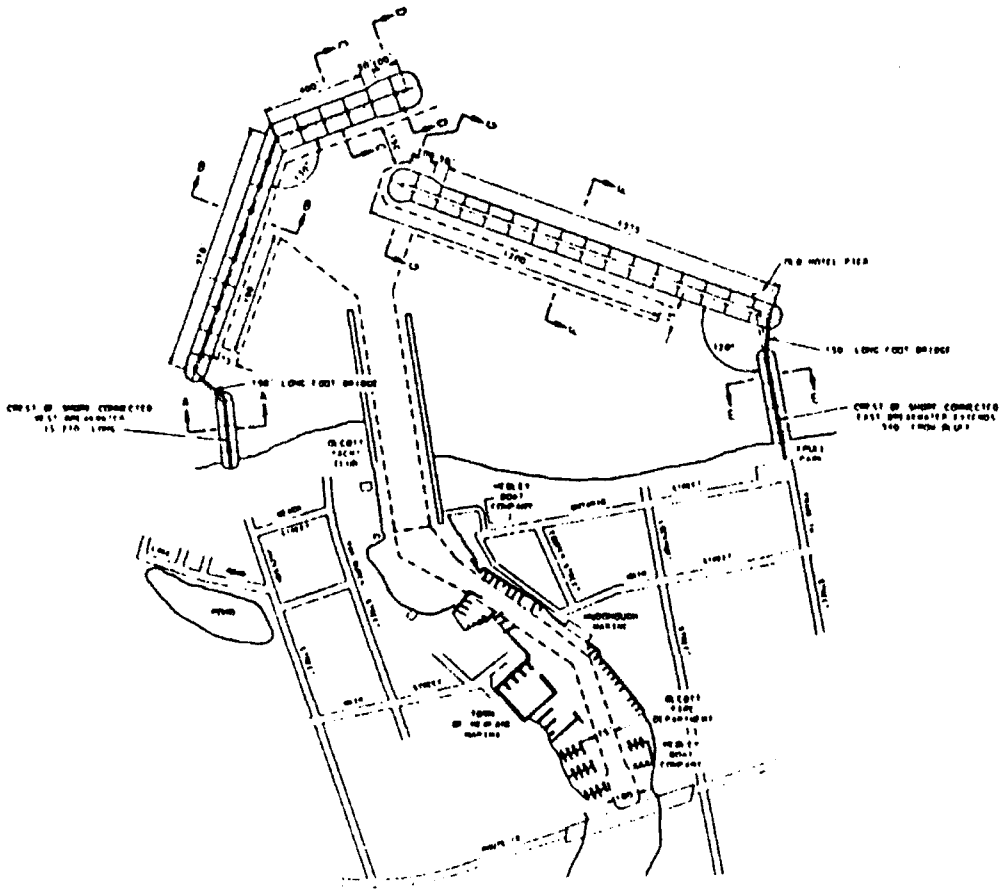
| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. .-.-2.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 10.-.-.-. | BREAKWATERS AND SEAWALLS | | | | | | |
| 10.0.1.- | Breakwaters: | | | | | | |
| 10.0.1.B | West Breakwater | | | | | | |
| 10.0.1.B | Armor Stone | 50,800 | Ton | $43.00 | $2,184,400 | $437,000 | $2,621,400 |
| 10.0.1.B | Underlayer Stone | 18,600 | Ton | $44.50 | $827,700 | $165,300 | $993,000 |
| 10.0.1.B | Bedding Stone | 21,000 | Ton | $33.00 | $693,000 | $138,600 | $831,600 |
| 10.0.1.B | East Breakwater | | | | | | |
| 10.0.1.B | Armor Stone | 69,100 | Ton | $43.00 | $2,971,300 | $600,700 | $3,572,000 |
| 10.0.1.B | Underlayer Stone | 24,500 | Ton | $44.50 | $1,090,250 | $219,750 | $1,310,000 |
| 10.0.1.B | Bedding Stone | 22,700 | Ton | $33.00 | $749,100 | $150,900 | $900,000 |
| 10.0.R.- | Associated General Items: | | | | | | |
| 10.0.R.B | Navigation Lights | 1 | JOB | LS | $55,000 | $11,000 | $66,000 |
| | Subtotal: | | | | $8,570,750 | | |
| 10.0.2.- | Contingincies @ average of | 20 % | | | | $1,723,250 | |
| 10.-.-.- | Breakwaters and Seawall Total: | | | | | | $10,294,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

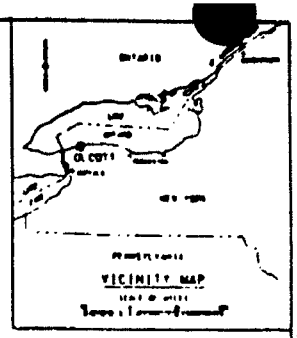
| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 12.-.-.- | DREDGING | | | | | | |
| 12.0.4.- | Mechanical Dredging | | | | | | |
| 12.0.4.8 | Obstruction Removal | 1 | Job | LS | $31,500 | $6,500 | $38,000 |
| | Subtotal: | | | | $31,500 | | |
| 12.0.Z.- | Contingencies @ average of | 20 | % | | | $6,500 | |
| 12.-.-.- | Dredging Total: | | | | | | $38,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10A MODIFIED
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In Acct. -.-.2.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 14.-.-.-. | RECREATION FACILITIES | | | | | | |
| 14.0.1.- | Parking Lots and Service Roads | | | | | | |
| 14.0.1.B | Parking Lots | 1 | JOB | LS | $216,000 | $42,000 | $258,000 |
| 14.0.3.- | Activity Guides and Controls: | | | | | | |
| 14.0.3.B | Footbridge | 1 | JOB | LS | $150,000 | $30,000 | $180,000 |
| 14.0.3.B | Concrete Walkway | 1,250 | SY | $318.00 | $397,500 | $77,500 | $475,000 |
| 14.0.3.B | Walkway Guardrail | 2,000 | LF | $14.50 | $29,000 | $6,000 | $35,000 |
| 14.0.3.B | Precast Walkway Barriers | 3,400 | LF | $16.50 | $56,100 | $10,900 | $67,000 |
| 14.0.P.- | Buildings, Public Use (Sanitary Facilities) | 2 | Ea | $62,000.00 | $124,000 | $26,000 | $150,000 |
| | Subtotal: | | | | $972,600 | | |
| 14.0.2.- | Contingencies @ average of | 20 % | | | | $192,400 | |
| 14.-.-.- | Recreation Facilities Total: | | | | | | $1,165,000 |




PLAN




NOTES:

OLCOTT HARBOR
OLCOTT, NEW YORK

PLAN #108

U.S. ARMY ENGINEER DISTRICT BUFFALO
OCTOBER 1988

PLATE B4

| | | QUANTY UOM | CONTRACT | CONTINGN | TOTAL COST | UNIT |
|---|---|---|---|---|---|---|
| 1 | Federal Contract | | | | | |
| 1 01 | Lands and Damages | | 154,200 | 33,450 | 187,650 | |
| 1 10 | Breakwaters and Seawalls | | 10,860,799 | 1,669,374 | 12,530,173 | |
| 1 12 | Navigation Ports & Harbors | | 21,735 | 5,434 | 27,169 | |
| 1 14 | Recreation Features | | 805,734 | 98,813 | 904,547 | |
| 1 30 | Planning, Engineering and Design | | 2,009,236 | 9,121 | 2,018,357 | |
| 1 31 | Construction Management | | 829,271 | 238,672 | 1,067,943 | |
| | Federal Contract | | 14,680,975 | 2,054,864 | 16,735,839 | |
| 2 | Non-Federal Contract | | | | | |
| 2 14 | Recreation Features | | 312,126 | 46,819 | 358,944 | |
| | Non-Federal Contract | | 312,126 | 46,819 | 358,944 | |
| | Olcott Hbr.- Reevaluation Rprt. | | 14,993,101 | 2,101,683 | 17,094,783 | |

| | | QUANTY UOM | CONTRACT | CONTINGN | TOTAL COST | UNIT |
|---|---|---|---|---|---|---|
| 1 | Federal Contract | | | | | |
| 1 01 | Lands and Damages | | | | | |
| 1 01 A | Pre-Authorization Planning | | 4,000 | 0 | 4,000 | |
| 1 01 B | Post-Authorization Planning | | 11,000 | 1,100 | 12,100 | |
| 1 01 C | Local Cooperation Agreement | | 10,100 | 1,370 | 11,470 | |
| 1 01 D | Acquisistions | | 13,800 | 3,450 | 17,250 | |
| 1 01 F | Appraisals | | 36,400 | 4,280 | 40,680 | |
| 1 01 K | Temporary Permits | | 1,400 | 0 | 1,400 | |
| 1 01 M | Real Estate Receipts/Payments | | 77,500 | 23,250 | 100,750 | |
| | Lands and Damages | | 154,200 | 33,450 | 187,650 | |
| 1 10 | Breakwaters and Seawalls | | | | | |
| 1 10 01 | Breakwaters | | 10,427,976 | 1,594,435 | 12,022,411 | |
| 1 10 0A | Mob. Demob. & Prep. Work | | 376,914 | 69,347 | 446,261 | |
| 1 10 0R | Associated General Items | | 55,909 | 5,591 | 61,500 | |
| | Breakwaters and Seawalls | | 10,860,799 | 1,669,374 | 12,530,173 | |
| 1 12 | Navigation Ports & Harbors | | | | | |
| 1 12 A | Navigation Ports & Harbors | | 21,735 | 5,434 | 27,169 | |
| | Navigation Ports & Harbors | | 21,735 | 5,434 | 27,169 | |
| 1 14 | Recreation Features | | | | | |
| 1 14 03 | Activitiy Guides and Controls | | 792,264 | 96,793 | 889,057 | |
| 1 14 0A | Mob. Demob. and Prep. Work | | 13,469 | 2,020 | 15,490 | |
| | Recreation Features | | 805,734 | 98,813 | 904,547 | |
| 1 30 | Planning, Engineering and Design | | | | | |
| 1 30 A | Planning | | 169,776 | 0 | 169,776 | |
| 1 30 B | Eng. and Design Prior to FY 90 | | 671,050 | 0 | 671,050 | |
| 1 30 C | Local Cooperative Agreements | | 10,587 | 0 | 10,587 | |
| 1 30 D | Env. and Regulatory Activities | | 50,444 | 0 | 50,444 | |
| 1 30 F | General Design Memorandum (GDM) | | 425,551 | 0 | 425,551 | |
| 1 30 H | Plans and Specifications | | 196,532 | 0 | 196,532 | |
| 1 30 J | Engineering During Construction | | 193,017 | 0 | 193,017 | |
| 1 30 M | Cost Engineering | | 54,317 | 0 | 54,317 | |

| | | | QUANTY UOM | CONTRACT | CONTINGN | TOTAL COST | UNIT |
|---|---|---|---|---|---|---|---|
| 1 30 | N | Preparation of Bid Documents | | 12,307 | 0 | 12,307 | |
| 1 30 | T | PED Phase - LCPM | | 183,158 | 9,121 | 192,279 | |
| 1 30 | Z | Miscellaneous Activities | | 42,497 | 0 | 42,497 | |
| | | Planning, Engineering and Design | | 2,009,236 | 9,121 | 2,018,357 | |
| 1 31 | | Construction Management | | | | | |
| 1 31 | B | All Other - Contract Admin. | | 169,126 | 16,050 | 185,176 | |
| 1 31 | C | Benchmarks & Baselines | | 14,852 | 1,500 | 16,35 | |
| 1 31 | D | Review of Shop Drawings | | 4,464 | 440 | 4,904 | |
| 1 31 | E | Inspection ans Quality Assurance | | 427,287 | 198,261 | 625,548 | |
| 1 31 | F | Project Office Operations | | 38,386 | 3,900 | 42,286 | |
| 1 31 | G | Damages Assessed Contractors | | 4,226 | 400 | 4,626 | |
| 1 31 | H | Contr. Initiated claims & Litig. | | 14,261 | 1,400 | 15,661 | |
| 1 31 | T | Const. Phase LCPM | | 120,285 | 16,720 | 137,005 | |
| 1 31 | Z | Misc. Activities | | 36,384 | 0 | 36,384 | |
| | | Construction Management | | 829,271 | 238,672 | 1,067,943 | |
| | | Federal Contract | | 14,680,975 | 2,054,864 | 16,735,839 | |
| 2 | | Non-Federal Contract | | | | | |
| 2 14 | | Recreation Features | | | | | |
| 2 14 01 | | Parking lots and Service Roads | 200.00 SY | 234,999 | 35,250 | 270,249 | 1351.24 |
| 2 14 OP | | Buildings, Public Use | | 77,127 | 11,569 | 88,696 | |
| | | Recreation Features | | 312,126 | 46,819 | 358,944 | |
| 2 30 | | Planning, Engineering & Design | | | | | |
| 2 31 | | Construction Management | | | | | |
| | | Non-Federal Contract | | 312,126 | 46,819 | 358,944 | |
| | | Olcott Hbr.- Reevaluation Rprt. | | 14,993,101 | 2,101,683 | 17,094,783 | |

RE-EVALUATION REPORT PROJECT COST SUMMARY
OLCOTT HARBOR, NY - PLAN 10B
AUGUST 1989 PRICE LEVELS

| ACCOUNT CODE | FEATURE | ESTIMATED COST | CONTINGENCY | TOTAL COST |
|---|---|---|---|---|
| 10.-.-.- | BREAKWATERS AND SEAWALLS | $10,297,950 | $2,082,050 | $12,380,000 |
| 12.-.-.- | NAVIGATION PORTS AND HARBORS | $360,500 | $69,500 | $430,000 |
| 14.-.-.- | RECREATIONAL FEATURES | $1,745,435 | $354,565 | $2,100,000 |
| | TOTAL CONSTRUCTION COST | $12,403,885 | $2,506,115 | $14,910,000 |
| 01.-.-.- | LANDS AND DAMAGES | $56,000 | $14,000 | $70,000 |
| 30.-.-.- | PLANNING ENGINEER'G & DESIGN | | | $1,400,000 |
| 31.-.-.- | CONSTRUCTION MANAGEMENT | | | $1,100,000 |
| | TOTAL PROJECT COSTS | | | $17,480,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10B
COMPUTED BY: JW CHECKED BY: JP PL: AUG 8[illegible]

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 10.-.-.-. | BREAKWATERS AND SEAWALLS | | | | | | |
| 10.0.1.- | Breakwaters: | | | | | | |
| 10.0.1.B | West Breakwater | | | | | | |
| 10.0.1.B | Armor Stone | 80,000 | Ton | $43.00 | $3,440,000 | $697,000 | $4,137,000 |
| 10.0.1.B | Underlayer Stone | 24,600 | Ton | $44.50 | $1,094,700 | $220,300 | $1,315,000 |
| 10.0.1.B | Bedding Stone | 27,200 | Ton | $33.00 | $897,600 | $182,400 | $1,080,000 |
| 10.0.1.B | East Breakwater | | | | | | |
| 10.0.1.B | Armor Stone | 69,100 | Ton | $43.00 | $2,971,300 | $600,700 | $3,572,000 |
| 10.0.1.B | Underlayer Stone | 24,500 | Ton | $44.50 | $1,090,250 | $219,750 | $1,310,000 |
| 10.0.1.B | Bedding Stone | 22,700 | Ton | $33.00 | $749,100 | $150,900 | $900,000 |
| 10.0.R.- | Associated General Items: | | | | | | |
| 10.0.R.B | Navigation Lights | 1 | JOB | LS | $55,000 | $11,000 | $66,000 |
| | Subtotal: | | | | $10,297,950 | | |
| 10.0.Z.- | Contingincies @ average of | 20 % | | | | $2,082,050 | |
| 10.-.-.- | Breakwaters and Seawall Total: | | | | | | $12,380,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 108
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 12.-.-.- | DREDGING | | | | | | |
| 12.0.4.- | Mechanical Dredging | | | | | | |
| 12.0.4.B | Obstruction Removal | 1 | Job | LS | $31,500 | $6,000 | $37,500 |
| 12.0.4.B | Earth | 40,000 | CY | $6.50 | $260,000 | $50,000 | $310,000 |
| 12.0.4.B | Rock | 2,300 | CY | $30.00 | $69,000 | $13,500 | $82,500 |
| | Subtotal: | | | | $360,500 | | |
| 12.0.Z.- | Contingencies @ average of | 19 % | | | | $69,500 | |
| 12.-.-.- | Dredging Total: | | | | | | $430,000 |

PROJECT: OLCOTT HARBOR, NY
SUBJECT: RE-EVALUATION STUDY ESTIMATE - PLAN 10B
COMPUTED BY: JW CHECKED BY: JP PL: AUG 89

| ACCOUNT CODE | ITEM | QUANTITY | UNIT | UNIT PRICE | AMOUNT | Contingency (In acct. -.-.Z.-) | Project Cost |
|---|---|---|---|---|---|---|---|
| 14.-.-.-. | RECREATION FACILITIES | | | | | | |
| 14.0.1.- | Parking Lots and Service Roads | | | | | | |
| 14.0.1.B | Parking Lots | 1 | JOB | LS | $324,000 | $66,000 | $390,000 |
| 14.0.3.- | Activity Guides and Controls: | | | | | | |
| 14.0.3.B | Footbridge | 2 | EA | $150,000.00 | $300,000 | $60,000 | $360,000 |
| 14.0.3.B | Concrete Walkway | 2,600 | SY | $318.00 | $826,800 | $168,200 | $995,000 |
| 14.0.3.B | Walkway Guardrail | 4,030 | LF | $14.50 | $58,435 | $11,565 | $70,000 |
| 14.0.3.B | Precast Walkway Barriers | 6,800 | LF | $16.50 | $112,200 | $22,800 | $135,000 |
| 14.0.P.- | Buildings, Public Use (Sanitary Facilities) | 2 | Ea | $62,000.00 | $124,000 | $26,000 | $150,000 |
| | Subtotal: | | | | $1,745,435 | | |
| 14.0.Z.- | Contingencies @ average of | 20 | % | | | $354,565 | |
| 14.-.-.- | Recreation Facilities Total: | | | | | | $2,100,000 |

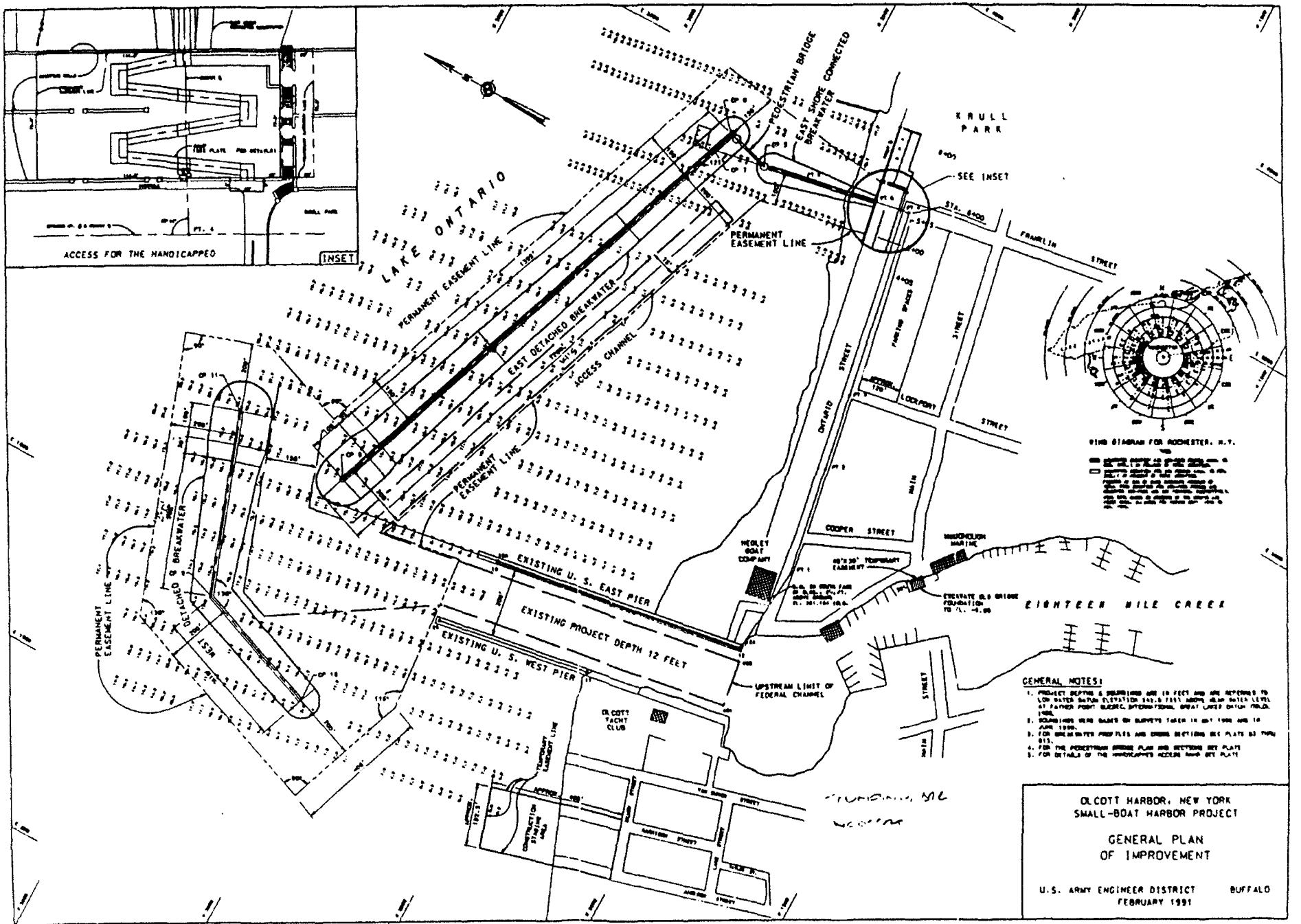

ACCESS FOR THE HANDICAPPED
INSET
LAKE ONTARIO
PERMANENT EASEMENT LINE
EAST DETACHED BREAKWATER
ACCESS CHANNEL
PEDESTRIAN BRIDGE
EAST SHORE CONNECTED
BREAKWATER
KRULL PARK
SEE INSET
PERMANENT EASEMENT LINE
FRANKLIN STREET
ONTARIO STREET
LOCKPORT
COOPER STREET
WEDLEY BOAT COMPANY
EXISTING U. S. EAST PIER
EXISTING PROJECT DEPTH 12 FEET
EXISTING U. S. WEST PIER
DETACHED BREAKWATER
PERMANENT EASEMENT LINE
UPSTREAM LIMIT OF FEDERAL CHANNEL
OLCOTT YACHT CLUB
EIGHTEEN MILE CREEK
WIND DIAGRAM FOR ROCHESTER, N.Y.
GENERAL NOTES:
OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
GENERAL PLAN
OF IMPROVEMENT
U.S. ARMY ENGINEER DISTRICT BUFFALO
FEBRUARY 1991

PLATE B5

# Appendix C

## ECONOMICS ANALYSIS

## OLCOTT BEACH

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## C1. INTRODUCTION

Olcott Beach is a dynamic, rapidly evolving community on the south shore of Lake Ontario. The former turn of the century railroad resort community is experiencing a strong revitalization as the Great Lakes, particularly Lake Ontario, realize dramatic increases in recreational navigation, sportfishery, and tourism.

The community recognized the potential stimulus to the Olcott Beach economy created by the successful NYS salmonid stocking program at Eighteen-Mile Creek on Lake Ontario. A Revitalization Plan was formulated in 1984 and revised in 1986. Many components of the plan were implemented during the past five years. The business district has undergone renewal through a Federal development grant, giving Olcott a new, clean appearance. Emerging businesses such as new restaurants, Bed & Breakfast establishments, and a campground have opened. In addition, funds from Town, County, State, and Federal sources have resulted in: creation of a Tourist Information Center; deteriorating structures being demolished; property purchased for public access and public use; creation of parking areas with sanitary facilities; and Town Marina expansion.

The harbor bristles with hundreds of boating fishermen seeking world record breaking salmon. Marinas are filled beyond capacity with boats from throughout the northeast and mid-west. The piers are filled with hundreds of fishermen and a vibrant charter boat industry serves clientele from the Northeast and Midwest. New residential development and renovation of older housing stock, and a potential expansion of Krull Park are creating an attractive lakeshore community at the doorstep of Buffalo, Niagara Falls, Rochester, Hamilton, and Toronto.

The Toronto skyline, visible directly across Lake Ontario from Olcott Beach, reflects the international nature of the Great Lakes. Over five million people live within approximately a two hour drive of Olcott Beach, including over three million residents of Metro Toronto.

The Town of Newfane is developing a Master Plan at this time. The Master Plan will chart the course for Olcott Beach when the proposed lake breakwater complex is constructed. The Master Plan considers upland developments with picnic areas, amphitheater, golf course, campground, gardens, trails, parking facilities, fish cleaning stations, expanded beach area and a marina complex of over 1,000 slips.

The Town of Newfane recognizes the potential of Olcott Beach as a major international recreation harbor based on the water and fishery resources of Lake Ontario. The Olcott Beach harbor expansion envisioned for the lakefront, has the potential to become the dominant recreational harbor in western Lake Ontario.

C2. WITHOUT PROJECT CONDITION

The Without Project condition describes the pattern of recreation activity expected to persist over the 50 year evaluation period in the absence of a Corps recreation project. The Without Project condition presents existing water and related land recreation resources. It also outlines any recreational resources that are scheduled to be provided over the evaluation period. This section has six main topics: Baseline Data, Lake Ontario Fisheries Program, Lake Ontario Charterboat Activities, Revitalization Of Olcott Beach, Existing Conditions and Lake Ontario Boating And Fishing Demand.

"Baseline Data" presents information on the socio-economic characteristics and infrastructure of Olcott up to the Study year, 1989. The next two sections presents the development of various recreational activities using Lake Ontario and their impact on the types of recreation locating at Olcott Harbor. "Revitalization Of Olcott Beach" presents the changes the Town of Newfane has planned to meet the needs of recreationists. "Existing Conditions" outlines the location and type of recreational activities currently taking place at Olcott Harbor. Finally, "Lake Ontario Boating and Fishing Demand" outlines the historical growth in these two recreational fishing activities.

a. Baseline.

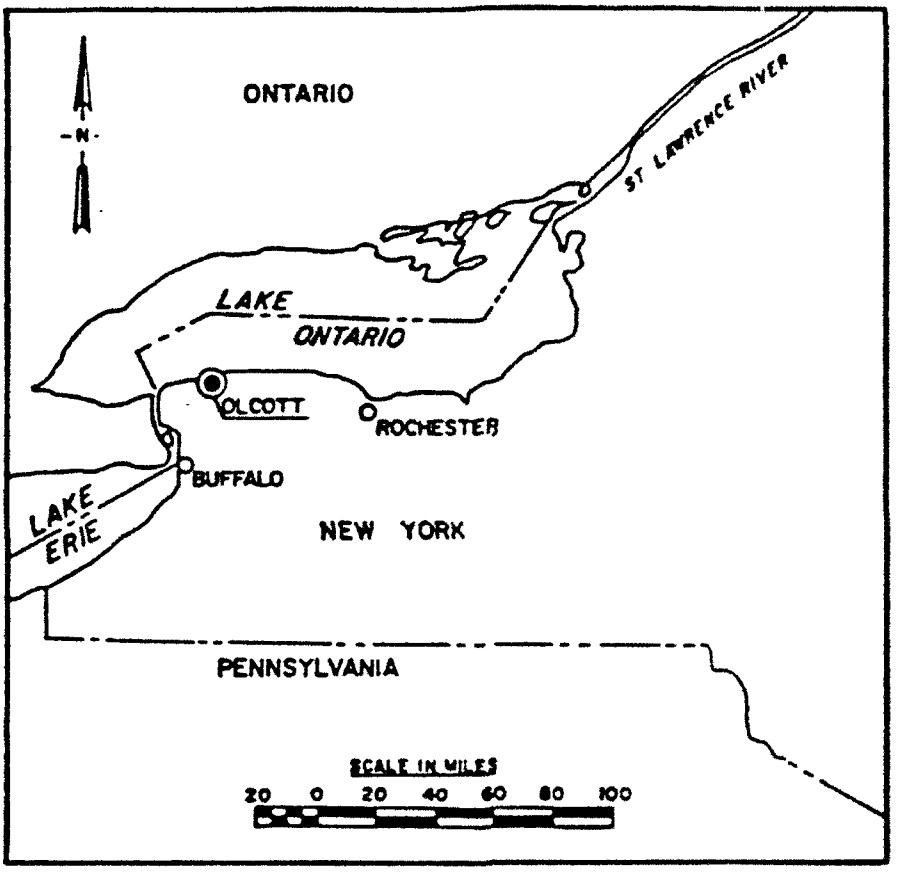
(1) Location - The Hamlet of Olcott Beach is located in the town of Newfane, Niagara County, New York, at the confluence of Eighteen-Mile Creek and Lake Ontario. The mouth of Eighteen-Mile Creek is about eighteen miles east of the Niagara River, six miles east of Wilson, New York, and approximately sixty-three miles west of Rochester, New York. A map of Olcott's location within the region is shown in Figure C1. The harbor at Olcott Beach is located on Eighteen-Mile Creek at the mouth of the creek.

(2) Olcott History - Olcott was the first area in the Town of Newfane to be settled, probably as a consequence of heavy reliance on water transportation in the early eighteen hundreds. The first settlers arrived from Canada in 1807 and built cabins on the east bank of Eighteen-Mile Creek. Lake Road opened in the fall of 1811 and connected Olcott with Fort Niagara and Sommerset. In 1812, an inn, store, and tavern were built on the west bank, perhaps reflecting the improvement of West Creek Road. West Creek Road connected the growing community with Ridge Road, the major east-west route. With the onset of the War of 1812, many settlers fled from the area and in 1813, the British burned all the structures at the mouth of Eighteen-Mile Creek, except for Burgoyne Kemp's log cabin.

The village was quickly rebuilt and called Kempville. Soon after, timber and crops were shipped from the harbor to Canada

and eastern New York. The opening of the Erie Canal in 1825 and the Welland Canal in 1833 diverted commerce from the harbor at Kempville. The harbor was revitalized by constructing a pier and warehouse on the east bank. The village center slowly began to shift to the east side of the creek. The east bank remained

Figure C 1 Location Of Olcott Harbor




undeveloped from the time of the British attack until the revitalization efforts. The village became known as Olcott in 1837. The name can be attributed to Thomas Olcott, a local resident who had bought large chunks of land in the original site now known as Olcott. Development of the east bank was probably influenced by the opening of the Lockport Road between 1850 and 1860.

Between 1867 and 1877, the Corps of Engineers built parallel piers to protect the entrance to Eighteen-Mile Creek. An entrance channel was also dredged for access to Lake Ontario. Olcott was an official customs point of entry with its' own customs officer at this time. By 1878, there was sufficient commerce and tourism to support three hotels.

Tourism increased significantly when the International Railroad Company purchased the Ten Brook Grove, named after Allbert Ten Brook who purchased land north of the original Lake Road. The first picnic on record was in 1847. The picnics continued through the 1890's. In 1900 the International Railway purchased the area north of Main Street now known as Krull Park. The Olcott Beach Resort hotel and amusement park were constructed. The Olcott Beach Resort Hotel was a major tourist destination point in the early 1900's. The famous hotel was located at the foot of Franklin Street, now the public beach area. The same year, on August 29, 1900 a trolley service was started between Olcott and Lockport with connections to Buffalo, New York. The Hotel was destroyed by fire in 1935. It was not rebuilt. However, segments of the old hotel piers remain in existence. Another fire destroyed several additional hotels of the era. In 1937 the trolley service was terminated. The tourism era came to an end. A few of the large Victorian era residences dating from the turn of the century remain in Olcott. However, all of the hotels and most of the other old facilities were demolished.

In December, 1937 Frederick Krull bought the property from the railroads and 2 days later gave the property to Niagara County. The land was to be used as a public park. In the 1960's funds were made available to Niagara County to purchase land for recreational purposes. Two farms were purchased and Krull Park became a 329-acre park. A majority of Krull Park to this day remains undeveloped.

Around the year 1924, a dam and powerhouse were constructed on Eighteen-Mile Creek, approximately two stream miles upstream from Lake Ontario. The 80 feet high dam has a limited storage pool upstream and a spillway 70 feet wide. The Powerhouse was taken out of service in 1961 and sat idle for 26 years. Then, in 1987, the dam and powerhouse were renovated by the Olcott Harbor Board of Trade. The Board leases the facility to Lavalin Hydro. The operating facility currently generates approximately 1.8 million kilowatts per year. Energy is sold to the Niagara Mohawk Power Corporation.

An entire block of buildings burned down in the village center June 11, 1927, with the exception of the Albright Hotel, which was made of brick. The Episcopal Church, Zonta Club, Skating Rink, and several cottages were destroyed as total damages were estimated at $100,000 in 1927 prices. The destruction occurred in the village center from the shores of Lake Ontario south to Main Street, from Cooper Street east to the Lockport-Olcott Road.

A new bridge spanning Eighteen-Mile Creek was installed in 1935, connecting East and West Main Street. This bridge was later replaced by a raised bridge in 1970, located several hundred feet south of the original bridge. The new raised bridge is part of State Route 18, a major east-west roadway.

The Olcott Beach Hotel, which was the social center of Olcott for many years, was torn down in 1937. The famous hotel was destroyed by fire in 1935, as stated earlier in the text, and marked the end of the tourism era. The hotel had 100 rooms for rent, a dance area of 14,000 square feet, a large dining room, and recreational facilities. Two other hotels, Harbor View (later called The Henderson) and The Rockwell, were torn down in 1943 and 1946, respectively.

The Town of Newfane school system was centralized in 1941 after consisting of 17 or 18 independent school districts for several years. Construction of the school did not begin until 1948 because of the shortage of building materials during World War II. The Elementary Wing and Academic Wing were occupied in 1949 and 1950, respectively.

The Inter-Community Memorial Hospital at Newfane, currently one of the leading small hospitals in the area, began providing services September 17, 1958. The Volunteer Fire Company in Newfane and The State Bank of Newfane moved to larger quarters in 1952 and 1955, respectively. The State Bank of Newfane merged with the Liberty National Bank in 1963 and is now part of Norstar Bank N.A.

Several changes occurred in industries located in the Town of Newfane and the hamlet of Olcott from 1946 to 1985. Such changes included reorganizations, closures and relocations. The Noury Chemical Company moved into the Town of Newfane. The Newfane Basket and Manufacturing Company reorganized. The Collins Grist Mill closed, and the Lockport Felt Company relocated.

Noury Chemical, a manufacturer of organic peroxides, moved to the Town of Newfane in 1946 from Buffalo, N.Y. The company was formerly known as Cadet Chemical and, after several corporate reorganizations, it is now known as AKZO Chemie America.

The Newfane Basket and Manufacturing Company, originally involved in farmers' supplies, switched to the building supply business in 1963. Since this time, the company has been known as the Taylor Lumber Supply Company.

The Collins Grist Mill, located on Eighteen-Mile Creek to take advantage of available water power, discontinued operation in 1975. The mill had been owned by a member of the Collins family since 1965, 30 years after it was originally built.

The Lockport Felt Company, also situated along Eighteen-Mile Creek to take advantage of the available water power, moved from the Town of Newfane in 1985 to relocate their office in Quincy, Florida. The company produced felts for the paper-making industry.

The Town of Newfane Marina, located on the west bank of Eighteen-Mile Creek, was opened to the public May 27, 1979. The marina had six launch ramp lanes plus transient and permanent docking facilities. A fish cleaning station and a few hundred parking spaces for recreational vehicles have been added in recent years. Section C2,e,(3) discusses the existing facilities at the Town of Newfane Marina in more detail.

The Town of Newfane received a Community Development Block Grant in the amount of $750,000 in 1982. The purpose of this grant was for the betterment of Olcott including home improvements, business property improvement, and Main Street Olcott improvement.

(3) Socio-Economic Characteristics

(a) Economy - The economy of Western New York (WNY) appears to have a bright future. In 1980, the area was the 31st largest metropolitan area in the United States. The impact of transition to a service based regional economy and the dramatic economic growth in the province of Ontario have improved the economic climate of Western New York.

The U.S.-Canadian free trade agreement effects are expected to make significant contributions to the regional economy, especially in Erie and Niagara Counties. Many Canadian firms, for example, have already established U.S. operations in Western New York. During the ten year phase in of the Free Trade Agreement, foreign companies can benefit from the areas two foreign trade zones. One foreign trade zone is located in Buffalo; another in Lewiston, Niagara County, New York.

During the 1983-1987 period, the Buffalo-Niagara Falls consolidated Metropolitan Statistical Area (CMSA) experienced one of the sharpest expansions on record. The five year expansion has largely occurred in the service sector. The economic expansion has also helped to reverse the continued out-flow of the regions young workers and slow down the area's population decline. The area's smaller labor force is now experiencing selected labor shortages. The CMSA unemployment rate during 1987, for example, dropped below the national rate for the first time since the series began in 1974. As Western New York continues to reflect the national trend of an older population, a large number of employment opportunities will arise from retirements. Over 100,000 job openings are expected annually in Western New York during the short term. Approximately 95% of the openings are attributed to separations from the labor force and occupational mobility.

(b) Employment - Employment declined from 1979-1983 in the Buffalo-Niagara Falls area and then showed a resurgence from 1983-1987, see Table C1. The growth in employment can be

Table C1 - Total Area Employment (Thousands)

| Area | 1978 | 1979 | 1980 | 1982 | 1983 | 1984 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|
| Buffalo-Niagara Falls | 522.8 | 538.7 | 521.2 | 474.7 | 473.2 | 479.0 | 492.8 | 508.0 |
| Erie County | 428.6 | 440.9 | 426.5 | 387.9 | 386.7 | 400.3 | 407.2 | 420.2 |
| Niagara County | 94.2 | 97.8 | 94.6 | 86.8 | 86.6 | 78.7 | 85.6 | 87.7 |

SOURCE: New York State Business Fact Book, 1988, 1985, 1984, 1981, 1979 - New York State Department of Commerce.

credited to the services sector. The services sector increased approximately 27%, from 100,800 in 1980 to 127,900 in 1987.

Employment figures by type of industry for the Buffalo-Niagara Falls CMSA in selected historical years from 1980-1989, and for the town of Newfane in 1980, are shown in Table C2. Aside from the services sector, the Buffalo-Niagara Falls area is experiencing employment growth in the wholesale, retail trade and finance, insurance and real estate sectors.

Table C2 - Employment By Type Of Industry In The Town Of Newfane And Buffalo-Niagara Falls CMSA

| Industry | Town of Newfane | Buffalo - Niagara Falls CMSA | | | |
|---|---|---|---|---|---|
| | (1980) | (1980) | (1986) | (1987) | (1989)1/ |
| TOTAL | 3,722 | 503,400 | 501,600 | 515,800 | 535,500 |
| Contract Construction | 100 | 16,900 | 18,300 | 20,100 | 20,600 |
| Transp., Public Utilities | 133 | 27,300 | 25,000 | 25,200 | 25,300 |
| Wholesale, Retail Trade | 537 | 113,600 | 123,900 | 127,400 | 132,200 |
| Finance, Ins., Real Estate | 87 | 22,400 | 26,400 | 28,200 | 31,000 |
| Services, Mining, Misc. | 1,098 | 100,800 | 122,500 | 127,900 | 136,600 |
| Government | 118 | 88,000 | 84,600 | 86,100 | 88,700 |
| Manufacturing | 1,649 | 134,400 | 100,900 | 100,900 | 101,100 |
| Durable Goods | ( 373) | ( 89,300) | (64,500) | (63,200) | (63,400) |
| Nondurable Goods | (1,276) | ( 45,100) | (36,400) | (37,700) | (37,700) |

SOURCES: 1980 Census of Population, Characteristics of People and Housing prepared by the New York State Data Center and New York State Business Fact Book, 1981, 1988 NYS Dept. of Commerce.

1/ Second Quarter, 1989. State of New York Department of Labor, Labor Area Summary.

(c) Industry/Services - The business activity in Olcott is centered around retail trade and service-type establishments. Marinas, marina-related enterprises, and restaurants are the predominant type of businesses in the area. Many of the restaurants and recreational areas are only open for the duration of the summer season. Larger institutions, such as banks and insurance agencies, are located in larger, surrounding towns.

There are five businesses in Olcott that provide boat services, equipment and repair. These include: Hedley Boat Co., McDonough Marine, Olcott Bait and Tackle, Teal Marine and Brokerage, and the Olcott Yacht Club. Fishing tackle, supplies, and licenses can be purchased at Fishing Rods Tackle Shop, Harbor Sports Center, Olcott Bait and Tackle, and Southshore Bait and Tackle. The former three also freeze fish for customers.

Table C3 presents a complete listing of the sixteen restaurants and taverns in the community. Olcott provides lodging accommodations at twelve inns. See Table C4 for a listing. In addition, at least three private cottages are available for visitors to rent. The community can do their grocery shopping at any of three different stores: The Harbor Inn Store, the Olcott Mini-Mart, and the Sears Bros. Sunoco, which is also a service station.

Table C3 - Olcott Restaurants And Taverns

| | |
|---|---|
| Barnacle | Olcott Mini Mart |
| Cal's Restaurant | Open Air Bar |
| Erma's Olcott Bowl | Park Place |
| Harbor Inn Restaurant | Pat and Maria's Pizzeria |
| Linda's Olcott Inn | Pat's Hot Dogs |
| McDonough's Olcott Boathouse Restaurant | Seafood Bar |
| New Coney Island | Village Tavern |
| Olcott Yacht Club (Private) | Yesterday's at Olcott Beach |

Table C4 - Olcott Lodging Accommodations

| | |
|---|---|
| Apple Tree Guest House | Hedley Boat Co., Fisherman Rooms |
| Bayside Guest House | Inn on the Hill |
| Bit-O-Country | Kenny's Fisherman Cottage |
| Coney Island | Linda's Olcott Inn |
| Harbor Inn Motel | Sheehan's Lodging |
| Harbor View Guest House | Silver Hickory Inn |

Recreational outlets in the Olcott community include boating, canoeing, camping, amusement games, bowling, and roller skating. Southshore Bait and Tackle rents out canoes and boats and boat tours are provided by Olcott Beach Tours, Ltd. Camping can be enjoyed at the Harbor Inn Camp Ground.

(d) Population - The population of the Buffalo - Niagara Falls consolidated metropolitan area (CMSA) decreased 10% from 1,306,957 in 1960 to 1,181,600 in 1986. The Buffalo - Niagara Falls consolidated metropolitan statistical area consists of Erie and Niagara County. Table C5 shows the population of Erie County, city of Buffalo, Niagara County, town of Newfane, and the city of Niagara Falls for selected historical years from 1960-1986.

Buffalo and Niagara Falls experienced the largest population decline from 1960 to 1986, dropping 39% and 37% respectively. The city of Buffalo had a population of 532,759 in 1960 and 324,820 in 1986. The city of Niagara Fall's population declined from 102,394 in 1960 to 64,550 in 1986. The town of Newfane's population remained relatively stable over this same period.

The Buffalo - Niagara Falls CMSA population decreased moderately (5.7%) from 1980-1987, but showed a slight increase from 1987 to 1988, see Table C6. Most of the population loss from the 1980-1987 period was attributed to the 1982-1983 economic recession.

Table C5 - Area Population 1960-1980

| Area 1/ | 1960 | 1970 | 1980 | 1986 |
|---|---|---|---|---|
| Buffalo-Niagara Falls | 1,306,957 | 1,349,211 | 1,242,826 | 1,181,600 |
| Niagara County | 242,269 | 235,720 | 227,354 | 216,900 |
| Niagara Falls (C) | 102,394 | 85,615 | 71,384 | 64,550 |
| Newfane (T) | 8,523 | 9,459 | 9,268 | 8,950 |
| Olcott (CDP) | 1,215 | 1,592 | 1,571 | N/A |
| Erie County | 1,064,688 | 1,113,491 | 1,015,472 | 964,700 |
| Buffalo (C) | 532,759 | 462,768 | 357,870 | 324,820 |

1/ Abbreviations are (C) city, (T) town and (CDP) census designated place.

SOURCES: 1980 Census of Population, U.S. Department of Commerce. County and City Data Book 1988, U.S. Department of Commerce. 1986 population figures from July 1, 1986. Prepared by New York State Department of Economic Development.

Table C6 - Buffalo-Niagara Falls Area CMSA Population

| | Buffalo-Niagara Falls (Erie and Niagara County) | | |
|---|---|---|---|
| 1980 | 1,242,826 | 1985 | 1,185,120 |
| 1981 | 1,231,118 | 1986 | 1,181,600 |
| 1982 | 1,220,493 | 1987 | 1,171,637 |
| 1983 | 1,206,668 | 1988 | 1,175,592 |
| 1984 | 1,204,797 | | |

Source: Annual Labor Area Report, Buffalo Area Fiscal Year 1989, N.Y. Dept. of Labor

Projections of Erie county's population show a slight increase from 1990 to 2000 and then a slight decrease from 2000 to 2010. The population of Niagara county is projected to increase 3.1%, from 1990 to 2010, see Table C7. The town of Newfane's population is forecasted to grow approximately 5% from 1990 to 2010.

Table C7 - Erie, Niagara County, And Town Of Newfane Projected Populations 1985-2010

| | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 |
|---|---|---|---|---|---|---|
| Erie County | 991,748 | 983,773 | 985,769 | 987,749 | 986,626 | 984,665 |
| Niagara County | 217,263 | 217,257 | 219,861 | 221,589 | 222,938 | 223,962 |
| Town of Newfane | 8,850 | 8,850 | 9,050 | 9,200 | 9,250 | 9,300 |

(e) Income - Erie county's per capita income has grown at an average annual growth rate of 7.65% from 1978 to 1986. Niagara county's per capita income grew at a 7.3% average annual growth rate from $7,700 in 1978 to $13,516 in 1986. Table C8 presents the per capita income for Erie and Niagara county for

Table C8 - Per Capita Income For Erie And Niagara County 1978-1986)

| County | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|
| Erie | $8,021 | $8,901 | $9,865 | $10,777 | $11,285 | $11,916 | $12,971 | $13,680 | $14,469 |
| Niagara | $7,700 | $8,629 | $9,450 | $10,277 | $10,812 | $11,259 | $12,301 | $13,003 | $13,516 |

SOURCE: 1987-1988 New York State Statistical Yearbook, Table F-17, pg. 17. Nelson A. Rockefeller Institute of Government

the period 1978-1986. Mean and median income for the town of Newfane in 1979 dollars as compiled in the 1980 Census were $10,479 and $8,093, respectively.

(4) Land Use - The town of Newfane encompasses a total of 53 square miles or 33,920 acres. The hamlets of the town of Newfane are apportioned as shown in Table C9.

Table C9 - Land Use In The Town Of Newfane

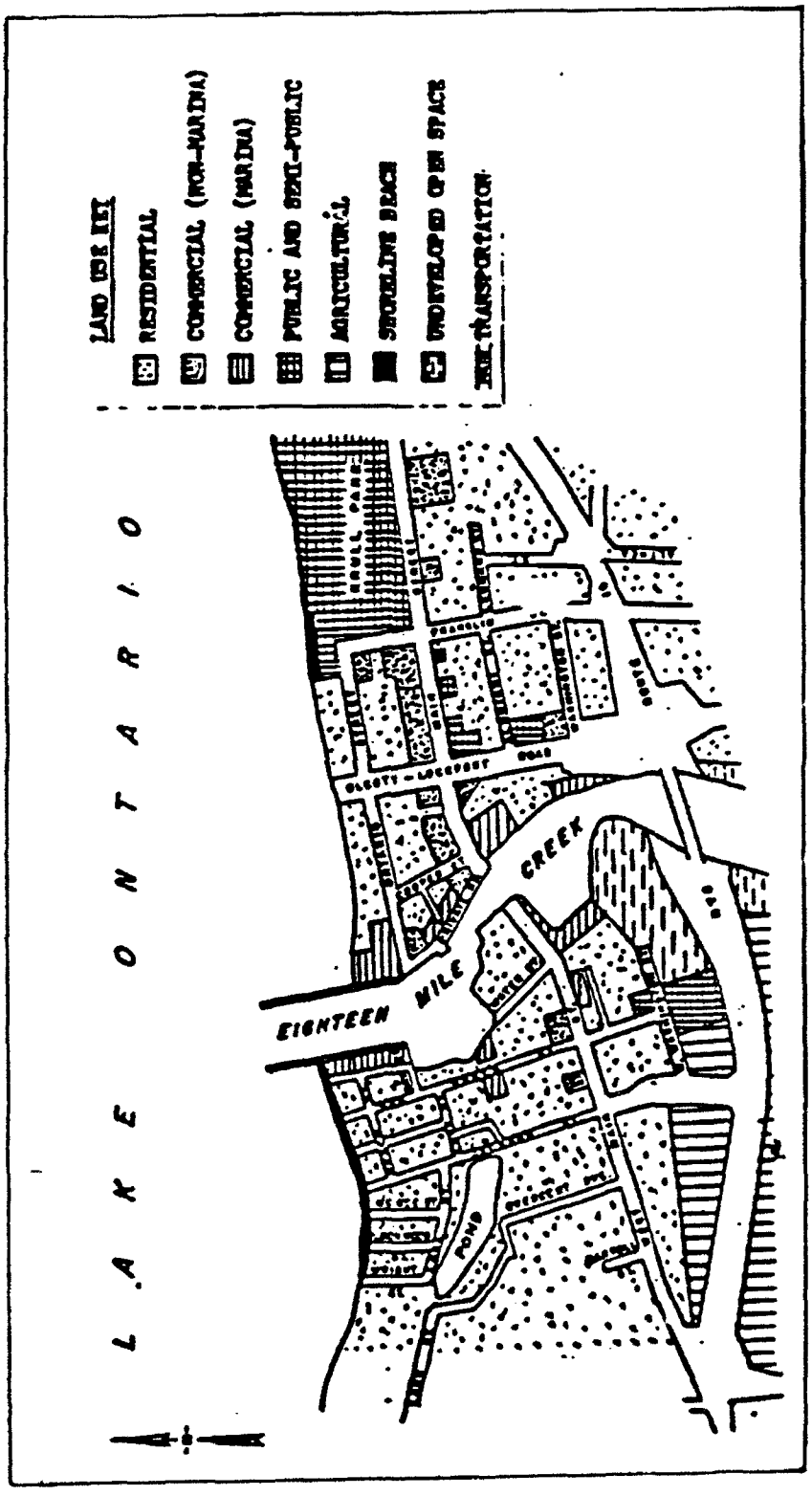
| Area | Acres |
|---|---|
| Olcott-Burt | 1,978 |
| Newfane | 2,031 |
| Wrights Corners | 1,450 |
| Total in hamlets | 5,459 |
| Total outside of hamlets | 28,461 |
| Total no. of acres | 33,920 |

Land use is primarily commercial in the Olcott Harbor area, from the federal piers upstream to the Route 18 bridge. The commercial entities on the east bank of Eighteen-Mile Creek in the Olcott Harbor project area are Hedley's Boat Company and McDonough's Marine. Hedley's Boat Co. encompasses the area east of the east pier, between Ontario and Main Streets, and also the area north of the Route 18 bridge. McDonough's Marine is located south of the foot of East Main Street. The only site of residential development on the east bank is a small area just north of the Route 18 bridge.

The west bank of Eighteen-Mile Creek in the Olcott Harbor area is mixed, commercial, public, and residential. Commercial entities include The Olcott Yacht Club and Teal Marine. The Olcott Yacht Club is located along the lakeshore adjacent to the west pier. Teal Marine is situated near the foot of Water Street along with King Marine. The town of Newfane Marina, a public entity, is located south of West Main Street to north of the Route 18 bridge. The residential area along the west bank, in the Olcott Harbor area, is between Bay Street and West Main Street. Houses in this area include both small, summer-cottage type structures and some larger, two-story units.

The Eighteen-Mile Creek shoreline upstream of the Route 18 bridge is primarily residential. Businesses along East Main Street, east of the Olcott-Lockport Road intersection, form the commercial nucleus of the community. Krull Park, a recreational area owned and maintained by Niagara county, makes up approximately 17% of the 1,978 acres in the Olcott region. The 329-acre park extends about 4,700 feet south from the Lake Ontario shoreline and generally forms the eastern boundary of the hamlet. The entire developed area at Olcott is bordered by agricultural lands located east of the park, south of Route 18, and west of Hopkins Creek. A land use map of the Olcott community is presented in Figure C2.

Figure C 2 Olcott Harbor Land Use Map



(5) Transportation - Olcott is linked with other hamlets, villages and cities in the Niagara region by local and State highways. New York State Route 18 is a primary east-west route, parallel to the Lake Ontario shoreline. State Route 18 provides access to the Robert Moses Parkway (to Niagara Falls, Buffalo and Ontario, Canada) on the west, and Lake Ontario State Parkway (to Rochester) on the east. Olcott is the northern terminus of New York State Route 78, which extends southward through the town of Newfane to Lockport and suburban Buffalo. Route 78 also intersects the New York State Thruway (I-90) about 28 miles south of Olcott.

The street system in Olcott is generally adequate for local traffic flows. Olcott-Lockport Road (Route 78) is the major north-south route through the hamlet. East and West Main Streets are the principal local east-west roads. A Main Street bridge was built over Eighteen-Mile Creek in 1935, but was too low to allow for the passage of sailboats beneath it. The bridge was demolished and replaced by the Route 18 bridge in 1970. The new structure has a vertical clearance of more than 50 feet above low water datum and a horizontal clearance of more than 100 feet. There are public parking facilities in the immediate harbor areas and several limited capacity, privately owned parking areas are also located near the local marina establishments.

Olcott Harbor was initially developed as a port for waterborne commercial traffic. It no longer functions as a commercial port. A small local excursion boat had operated out of the harbor during the summer months.

The hamlet has daily bus service to Lockport, where there are bus line connections to other cities in the region. Two airfields for small, private aircraft are situated southwest of Olcott. A Conrail freight line is located parallel to and about 1-1/2 miles south of the lakeshore. There is a service siding on this line in the community of Burt.

(6) Services - Residential and business facilities in the hamlet are serviced by local electric, gas, and telephone utility service lines. The community's water is supplied by the Niagara County Water District, which draws its water from the west branch of the Niagara River through its pumping station in the town of Wheatfield. Water is distributed throughout Olcott via the town's District No. 2 waterlines. A water storage tower is located on land between Route 18 and West Washington Street. The town of Newfane has recently completed the construction of sewer lines and a sewage treatment plant to service the hamlets of Olcott and Newfane and other developed areas in the vicinity of the Olcott-Lockport Road. The treatment plant is located along the lakeshore east of Olcott. Some of the sewage from sources in the Newfane hamlet is serviced by the Town Sewer District No. 1.

Olcott Elementary School is located on Godfrey Road immediately east of Olcott-Lockport Road. The structure contains classroom facilities and a gymnasium and serves the educational needs of the local grade school population. Other schools in the town include the New Junior and Senior High Schools and three other elementary schools. A town library is located in the hamlet of Newfane.

The Olcott Fire Company provides fire protection by volunteer personnel for the town of Newfane north of the Conrail tracks. The company's seven emergency vehicles are housed in a fire hall on Olcott-Lockport Road near Albright Street. Fire hydrants are located along most of the streets throughout the hamlet. Police services in Olcott are provided by the town, county, and State.

The Olcott Post Office is located on East Main Street near Franklin Street. Other major community facilities, such as the Newfane Town Hall and Inter-Community Memorial Hospital, are located in the Newfane hamlet. The town of Newfane provides solid waste disposal services for the local hamlets.

(7) Recreation - The Olcott area provides numerous recreational opportunities such as swimming, picnicking, sailing, and canoeing among other activities. There are currently fifteen launch ramps at ten sites around the county's Lake Ontario shoreline which can offer access to Lake Ontario and to the lower Niagara River. A survey distributed to 600 registrants of the 1988 Spring ESLO Derby, revealed Olcott Harbor was the sixth most popular site to launch out of a total of 14 sites that were used by the derby entrants. Figure C3 shows the location of each launching site along the Niagara county Lake Ontario shoreline. Table C10 presents a summary of the facilities available at these ten sites. Several of the launching sites have restrictions regarding their use, which are also mentioned in the table.

Olcott Harbor, which is protected by two federally constructed piers, provides a deep natural channel to allow passage of large sailboats. The channel, 12 feet in depth and approximately 140 feet in width, allows small-craft and large sailboats to access and egress the channel safely.

The federal piers provide exceptional shore-fishing in the spring and fall for the seasonal salmon runs. The piers allow shore-fishermen and non-boat owners to participate in the thrill of catching trophy-size fish without having to travel a great distance out into the lake. Excellent catches of coho salmon have been consistently reported by fishermen using the federal piers. Eighteen-Mile Creek was ranked as one of the top ten tributaries in Lake Ontario in 1984 for number of salmonids stocked.

Figure C-3 Existing Lake Ontario Launch Ramps

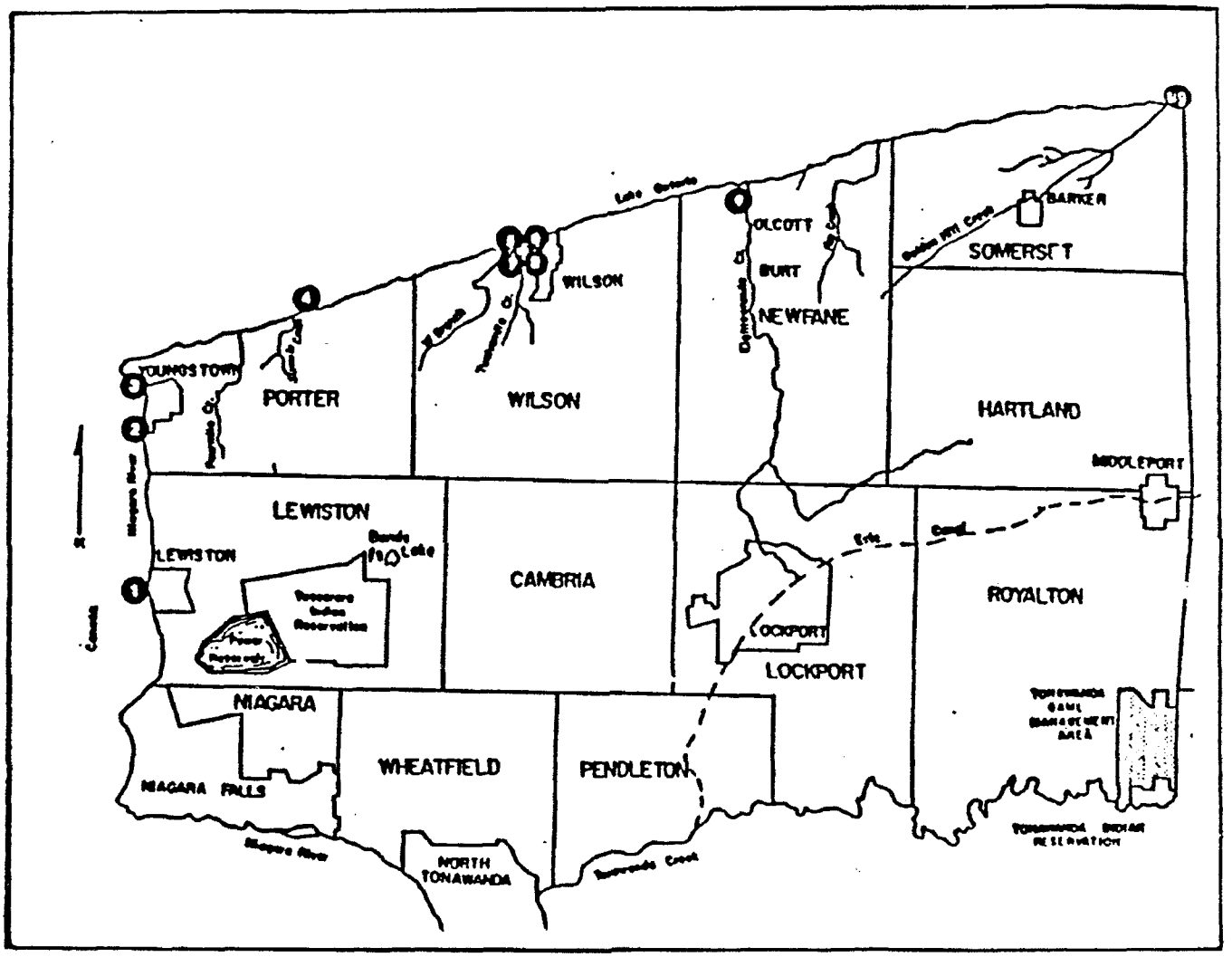


Table C10 - Lake Ontario Launch Ramps

| No. | Location | Facility | Simultaneous Launchings Possible | Restrictions |
|---|---|---|---|---|
| 1 | Lower Niagara River | Village of Lewiston | 1 | Steep, winding, semi-improved ramp. Light craft |
| 2 | Lower Niagara River | Village of Youngstown Ramp | 1 | Use limited to town residents (May-Oct.) No parking in area. |
| 3 | Lower Niagara River | Ft. Niagara State Park | 1 | Semi-improved ramp. |
| 4 | Sixmile Creek | Willow Beach Campground | 1 | Gravel surface. Access to lake limited by gravel bar. Not suitable for general use. |
| 5 | Twelvemile Creek West Branch | Town of Wilson | 1 | Steep approach. Access to lake limited by recurring gravel bar. |
| 6 | Twelvemile Creek | Wilson Tuscarora State Park | 2 | Excellent access. Wilson Harbor |
| 7 | Twelvemile Creek | Beccue Boat Basin | 1 | Access. Wilson Harbor lift launch facility operational |
| 8 | Twelvemile Creek | Wilson Boathouse | 2 | Access. Wilson Harbor boat rental |
| 9 | Eighteen-mile Creek | Newfane Town Marina | 6 | Access. Olcott Harbor |
| 10 | Golden Hill | Golden Hill State Park | 2 | Access to lake limited by recurring gravel bar. |
| TOTALS | | | 18 | |

Krull Park provides the public with a beach, picnicking facilities, baseball fields, and tennis courts. Presently, 44.5 acres of the 329-acre public area are developed for recreational use. The park can accommodate over 3,000 visitors and usually serves over 1,000 visitors on an average weekend day. An estimated 250,000 visitors use Krull Park annually. The Park has extensive baseball and softball programs during the spring and summer.

b. Lake Ontario Sportfishing Program. The development of the Lake Ontario sport fishery is largely due to the New York State Department of Environmental Conservation (NYSDEC) fish stocking program that began in 1968. The salmonid restoration program was modeled after the successful Michigan Department of Natural Resources program for Lake Michigan. The NYSDEC program started to stock coho salmon in 1968. This was followed by the stockings of chinook salmon in 1969; brown trout, lake trout and steelhead in 1973; domestic rainbow in 1974; and atlantic salmon in 1983.

(1) New York State Stocking Program - The goals of the NYSDEC have been threefold: 1) To develop and maintain an intensive sport fishery in Lake Ontario and its tributaries; 2) to re-establish a balanced predator-prey fish community in open waters of the lake; and 3) to re-establish self sustaining fish populations of lake trout and atlantic salmon. The intensity of this commitment is illustrated by the construction of a $10.9 million fish hatchery on the Salmon River at Altmar, New York. The facility was completed in September, 1981 and has annual operational and maintenance costs of $354,000. The hatchery typically produces 3.2 million chinook salmon fingerlings and a total of 1.3 million yearling coho salmon, steelhead, brown trout and rainbow trout. (Salmonids are usually stocked as yearlings: 8" - 10" long; and fingerlings: 4" - 5" long.) The facility can raise fingerlings and yearlings plus tag fish and perform egg collection. Approximately 2,000 salmon return to the Altmar fish hatchery yearly, providing approximately 8 million salmon eggs.

There are thirteen hatcheries located in Canada and New York State that stock Lake Ontario waters. Seven of these hatcheries are located in New York State. One hatchery; located in Allegheny, New York; is a federal hatchery. New York State operated hatcheries are located in Altmar, Rome, Bath, Caledonia, Livingston Manor (Catskill), and Saranac Lake (Adirondack). See Table C11 for the type of fish stocked at each hatchery. There are plans to improve water quality at the Altmar and Saranac Lake operations. At the Altmar hatchery, for example, water quality improvements involve laying a pipeline to a lower reservoir to increase water flows to the hatchery. This will lower summer water temperatures and raise winter water temperatures for more ideal hatchery conditions.

Table C11 - Lake Ontario Fish Hatcheries In New York State And Canada

| LOCATION | FISH STOCKED |
|---|---|
| NEW YORK STATE: | |
| Allegheny (US Fish & Wildlife Soc) | Lake Trout |
| Saranac Lake (Adirondack) | Landlocked Atlantic Salmon |
| Livingston Manor (Catskill) | Brown Trout |
| Caledonia | Brown, Rainbow, Chinook, Coho |
| Bath | Rainbow Trout |
| Rome | Brown Trout |
| Altmar | Brown, Steelhead, Coho, Chinook |
| CANADA: | |
| Normandale, Ont. | Rainbow Trout |
| Ringwood, Ont. | Coho, Chinook |
| Harwood, Ont. | Brown, Lake Trout |
| Codrington, Ont. | Brown Trout |
| Deer Lake, Ont. | Brown Trout |
| White Lake, Ont. | Lake Trout |

There are six provincial fish hatcheries in the Province of Ontario, Canada, that provide fingerlings for Lake Ontario stocking. The six hatcheries are located in Normindale, Ringwood, Harwood, Codrington, Deerlake, and White Lake. See Table C11 for the type of fish raised at each hatchery. There are no plans to increase or reduce the number of hatcheries or fish produced at these hatcheries. The Province of Ontario's Ministry of Natural Resources is monitoring the Lake Ontario stocking program on a steady state basis to determine the current program's effectiveness.

The stocking programs of the New York State Department of Environmental Conservation, Province of Ontario's Ministry of Natural Resources, and the U.S. Department of Fish and Wildlife, were able to exceed their stocking goal of 8.2 million salmonids in Lake Ontario in 1988. An additional 400,000 (1987 class) coho salmon and rainbow trout fingerlings were stocked in Lake Ontario in an attempt to offset the shortages of yearlings of these species. New York State was responsible for over 5.5 million of the salmonids stocked in Lake Ontario in 1988. The Province of Ontario accounted for the other 2.7 million salmon. New York State is expected to continue this level of salmonid stocking in 1989 and the years to follow, as is the Province of Ontario. See Table C12 for the historical stocking trends in New York State from 1985 to the present and in the Province of Ontario from 1984 to 1988.

## Table C12 - New York State And Province Of Ontario Historical Stocking Trends 1985 - Present

New York State

| | 1985 | 1986 | 1987 | 1988 | 1989* |
|---|---|---|---|---|---|
| Coho Salmon | 376,000 | 547,000 | 80,000** | 556,000 | 350,000 |
| Chinook Salmon | 3,022,000 | 2,849,000 | 3,111,000 | 2,848,000 | 2,700,000 |
| Lake Trout | 1,186,000 | 1,382,000 | 1,185,000 | 1,015,000 | 1,200,000 |
| Brown Trout | 440,000 | 442,000 | 418,000 | 404,000 | 500,000 |
| Rainbow Trout | 738,000 | 103,000 | 131,000 | 227,000 | 138,000 |
| Steelhead | 344,000 | 462,000 | 572,000 | 715,000 | 412,000 |
| Atlantic Salmon | 68,000 | 55,000 | 65,000 | 38,000 | 49,000 |
| Salmon Total | 6,174,000 | 5,840,000 | 5,562,000 | 5,849,000 | 5,349,000 |

Province of Ontario

| | 1984 | 1985 | 1986 | 1987 | 1988 |
|---|---|---|---|---|---|
| Coho Salmon | 131,128 | 190,592 | 272,957 | 400,255 | 386,878 |
| Chinook Salmon | 662,400 | 703,383 | 597,542 | 513,931 | 496,207 |
| Lake Trout | 493,113 | 725,390 | 851,876 | 1,128,110 | 1,023,572 |
| Brown Trout | 165,822 | 163,854 | 297,872 | 318,903 | 387,651 |
| Rainbow Trout | 110,000 | 106,231 | 200,000 | 363,156 | 375,104 |
| Steelhead | 0 | 0 | 0 | 0 | 0 |
| Atlantic Salmon | 0 | 0 | 0 | 1,309 | 48,955 |
| Salmon Total | 1,562,463 | 1,889,450 | 2,220,247 | 2,725,364 | 2,718,407 |

* Proposed stocking figures for 1989. Actual 1989 figures will be available February 1, 1990.

** The NYSDEC stocked high numbers of fall fingerlings in 1986 to make up for the shortage of yearlings in 1987. It is more economical for the NYSDEC to stock the coho salmon as fingerlings rather than yearlings. However, this reduced the number of yearlings for the 1987 stocking year.

The highly successful sportfishing program in Lake Ontario produced a world record coho salmon in 1989. This coho broke the old record set 48 years ago in British Columbia, Canada. In September, 1989, a 33 pound 4 ounce coho salmon was caught downstream from the Short Bridge in Pulaski, New York on the Salmon River. The record catch broke the old record by 2 pounds and 4 ounces. The successful Lake Ontario sport fishery can be credited for the world record catch.

The sportfishing program will continue to be successful according to recent reports on the Lake Ontario forage base. The forage base for salmonids consists mainly of alewives and smelt. Alewives constitute up to 90% of trout and salmon diets and smelt can make up to 10-20%. The number of salmonids being caught and their excellent condition and growth reflect a healthy number of alewives and smelt present in the lake. The U.S. Fish and Wildlife Service and the NYSDEC, assess the forage base situation every year. They expect the population of alewives and smelt to remain stable in Lake Ontario for the foreseeable future.

There were 14 major fishing contests planned for Lake Ontario in 1989. The derbies started April 1 and ended September 17th. Two of these derbies were located in Niagara County: The Niagara County Stream Derby (April 1-2) and the Niagara County Derby (September 15-17). The largest derby is the Empire State Lake Ontario Trout and Salmon (ESLO) Derby. It is 78 days long, has a total prize value of over $95,000 distributed over 100 prize categories, with an entrance fee of $13 per person. There is a Spring, Summer and Fall derby period. A list of the 14 major fishing contests planned for Lake Ontario in 1989 is shown below in Table C13.

Table C13 - 1989 Lake Ontario Fishing Derby Calendar

| | |
|---|---|
| April 1-2 | Niagara County Stream Derby |
| April 27-30 | Empire State/Lake Ontario (ESLO) Spring Derby |
| April 27-30 | ESLO Cash Bash |
| April 27-30 | International Lake Ontario Fishing Classic |
| To be announced | Oswego County Spring Derby |
| May 6-July 23 | Empire State/Lake Ontario (ESLO) Summer Derby |
| May 18-21 | Henderson "Rod & Reel" Trout Derby |
| June 16-18 | Lake Ontario Pro Am (LOWRANCE) Salmon Team Tournament (Wilson and Olcott Harbors) |
| July 8-9 | ELSO Tournament of Champions |
| July 27-30 | Wayne County Trophy Waters Tournament |
| August 5-13 | Orleans County Derby |
| August 19-September 4 | ESLO Fall King Salmon Derby |
| September 15-17 | Niagara County Derby |
| September 17-17 (tent) | Salmontario Derby - (Pulaski-Sandy Pond-Oswego) |

A survey was mailed to 600 registrants of the 1988 Spring ESLO derby by the Wayne County Public information Office. Data obtained from the 600 randomly selected entrants were compiled. Official registration for the 1988 spring portion of the ESLO derby (April 28,29, 30 and May 1) came to 13,700 entrants. Almost

25 percent of the participants came from out of state, with more than half of these coming from Pennsylvania. Only 37 percent of total derby participants came from lakeshore counties. The percentage of entrants using boats was 99 percent. An estimated 7,200 craft were involved in the derby. Olcott harbor was the sixth most popular place to launch out of a total 14 sites that were used by entrants. The shoreline of Niagara county was the third most popular place to fish out of 11 geographical areas. Total revenue generated from the four day event was estimated at $5,978,000, of which $4,119,000 was brought into the region by non-resident fishermen. Over 17 percent of these total expenditures ($1,028,000) took place in Niagara County. Almost 30% of total expenditures was for boat services. Thus in Niagara County alone, the Spring ESLO tournament generated over $300,000 in boat services.

(2) Life History Of Lake Ontario Stocked Fish Species - The type of fish stocked each year in Lake Ontario waters include: Coho salmon, chinook salmon, rainbow trout, steelhead, Atlantic salmon, brown trout, and lake trout. A brief explanation of each species unique life history follows.

The coho salmon is a Pacific salmon species that was introduced into Lake Ontario in 1968. Adult coho salmon weigh between 5 and 12 pounds on average, but 20 pounds or more is not uncommon. The species usually spends two to three years in the open lake, then runs up tributary streams to spawn between September and October. There is some evidence of natural reproduction of coho salmon in Lake Ontario. However, the majority of cohos are hatched and raised in hatcheries. Coho salmon are raised in hatcheries for approximately 18 months before being released. In their natural environment, the young fish will spend 16 to 24 months in their nursery stream and then will journey to deeper water depths, or smolt. Smolting is the stage where fish will undergo metabolic and physical changes before they head downstream. These changes include an improved gill efficiency to assist the fish in adapting to the lake environment, and a physical change where the fish lose their darkened parr marks and take on a silvery very sleek appearance. After smolting, the now mature coho will feed heavily on alewives for approximately 16 months and return to their nursery streams in the fall to spawn and soon after die.

The chinook salmon, also known as King salmon, is another Pacific salmon species that was introduced into Lake Ontario in 1969. The chinook salmon is larger on average than the coho salmon. The average size of a mature chinook salmon is 33 to 36 inches in length and weighs an average of 18 pounds. Trophy catches of 40 pounds or more are not uncommon. Chinook salmon have a higher incidence of natural reproduction than coho salmon because they are stocked in larger numbers. The bulk of the chinook salmon population will be hatched and raised in hatcheries for 4 to 6 months and then released. In their natural environment, the

chinook salmon run up tributary streams in the fall and spawn between August and September. Unlike the coho, the chinook salmon will smolt, or journey to the lake, usually after only one year in their nursery stream. Once they enter the lake, they will spend thre to five years feeding before returning to their nursery streams to spawn and eventually die.

Rainbow trout, so called because of a red line running laterally along the fish, were introduced in New York in the 1880's from western North America. The fish will occur mainly in streams, sometimes lakes, and usually where there is a gravel bottom. Their average life span is between 4 to 8 years and they weigh between 6 to 10 pounds on average. Rainbow trout and steelhead have the highest incidence of natural reproduction in Lake Ontario among salmonids. The two species have an approximately 30% occurrence of natural reproduction as compared to 15% and 20% for coho and chinook salmon, respectively. Rainbow trout yearlings will spend 13 months in the hatchery and fingerlings 6 months, before being released. Rainbow trout spawn in the spring (January-May) in their natural environment. The majority will die as a result of spawning although there are small numbers that will spawn more than once.

Steelhead, originally from the Pacific Northwest, are a strain of rainbow trout. The steelhead usually occur in lakes or sea-run populations whereas rainbow trout occur mainly in streams. Their average life span is 5 to 8 years of age and they weigh an average of 16 pounds at maturity. Steelhead are raised in hatcheries for 10 to 12 months and then released into the lake or its tributaries. In their natural environment, the steelhead will run up tributary streams from September to June and will spawn in the spring. Like the rainbow trout, the steelhead will stay in their nursery stream for two years, but will spend an equal length of time in the lake before returning in the spring to spawn, and eventually die.

Atlantic salmon, a native of Lake Ontario and surrounding areas, began to decline in the 1870's and reached near extinction in the 20th century. Environmental changes and overfishing are blamed for the decline of Atlantic salmon. In 1983, the NYSDEC attempted to reintroduce the species to Lake Ontario by stocking approximately 49,000 fish. The NYSDEC hopes to create a naturally reproducing population of Atlantic salmon. Since 1983, an average of 45,600 Atlantic salmon a year were stocked in New York Lake Ontario waters. Atlantic salmon are raised in hatcheries for an average of 15 months. Adult Atlantic salmon spawn in the spring, in their natural environment, and will return to the lake after only a few weeks in their nursery stream. They are able to spawn more than once and can live up to 9 years. After hatching, the young fish will spend two to three years in their nursery stream before smolting.

Brown trout, native to Europe, were first introduced in New York in 1883. The average life span of brown trout is three to five years and they weigh 5 to 10 pounds on average. The fish usually occurs in streams but can also be found in large lakes. Brown trout do not have a very high incidence of natural reproduction in Lake Ontario probably due to its low stocking numbers. Yearlings of this species are released after 15 to 17 months in hatcheries. Brown trout fingerlings are raised for 3 months in hatcheries and then released. In their natural environment, the fish spawns in the fall and is capable of spawning more than once. Brown trout will reach maturity at one to two years of age, and it is known that females generally mature a year later than males.

Lake trout, like Atlantic salmon, were near extinction in Lake Ontario in the mid 1900's. Lake trout prefer cold water temperatures and highly oxygenated lakes. Environmental changes over the years destroyed the highly oxygenated environment in Lake Ontario and thus nearly wiped out the lake trout population. The NYSDEC has attempted to reintroduce the lake trout population in Lake Ontario by stocking high numbers of the species beginning in 1973. Every year since 1973, NYSDEC has stocked lake trout in Lake Ontario in hopes of re-establishing a naturally reproducing population.

It is not certain if the program has become successful because it is difficult to identify which species are natural and which are produced at hatcheries. Lake trout yearlings and fingerlings are raised in hatcheries for 17 and 10 months respectively before being released. In their natural environment, lake trout reach maturity in 5 to 6 years, weigh 8 to 15 pounds, and live longer than any other salmonid, sometimes up to 20 years. Lake trout spawn in October and November, mainly in lakes. Table C14 shows where and when the Lake Ontario stocked fish are most likely to be caught.

(3) Lake Ontario Fish Advisory - There is a significant debate over whether Lake Ontario fish are safe for consumption. In April, 1989 the New York State Department of Health (NYSDOH) reiterated its fish advisory released in 1988. The fish advisory recommended eating no lake trout, chinook, or coho over 21" long, brown trout over 20" long, and rainbow over 25". The advisory recommended no more than one meal per month of smaller coho, browns, and rainbows. In addition, women of childbearing age, infants, and children under 15 should not eat fish with elevated contaminant levels.

Many researchers dispute the NYSDOH testing procedures. One of the methods of testing NYSDOH uses to test fish contaminant levels is to examine the entire fish, the skin, bones, and fatty tissues included. Other researchers test simply a clean fillet, where they found two-thirds less contaminants than the NYSDOH procedure. There are still other University research specialists

Table C14 - Movements Of Lake Ontario Stocked Fish

| TYPE OF FISH | LAKE ONTARIO TRIBUTARY STREAMS | LAKE ONTARIO PIERS | CLOSE IN-SHORE | DEEPWATER TROLLING |
|---|---|---|---|---|
| Brown Trout | Sept-May | Sept-Dec<br>March-May | Sept,Oct<br>March-May | May-Aug |
| Rainbow/Steelhead | Sept-May | Sept-Dec<br>March-May | Sept,Oct<br>March-May | May-Oct |
| Chinook/Coho | Sept-Oct | Sept-Oct | Aug,Sept<br>March-May | May-Aug |
| Lake Trout | - | Oct,Nov<br>April | Jan-Dec | May-Sept |

that argue eating Lake Ontario fish on a regular basis is comparable to breathing the air in a large city.

There is some evidence to believe the NYSDOH fish advisory in Lake Ontario could be relaxed in the future if contaminant levels are reduced. Every mature coho salmon tested by the NYSDOH in 1989 showed a decline in the contaminant level from 1988. This leads many forecasters to believe the water quality is improving since cohos spend a relatively short period of time in the Lake. During 1989 field investigations, it was observed that fishermen cleaning salmonids at fish cleaning stations were very careful to cut out fatty tissue and remove skin from the fillets. Fishermen were generally aware of the NYSDOH advisory but intended to consume the fish. However, the level of contaminants in salmonids continues to be a serious concern to NYSDOH, fishermen, and the general public. The New York State Fishing Regulations Guide provides recommendations regarding consumption to minimize potential adverse health impacts and insure public awareness.

(4) Olcott Harbor, N.Y. Stocking Program - The coastal littoral zone of Olcott Harbor and Eighteen-Mile Creek provide important aquatic habitat for both coldwater and warmwater fish. Although coldwater fish seasonally utilize the creek when water temperatures are cooler, as water temperature increases during summer months, the creek becomes essentially a warmwater stream, until the cooling process begins again in the fall. The creek was among the top ten tributaries to Lake Ontario for numbers of salmonids stocked and it supports substantial reproduction of

warm water species. Warm water species include small-mouth bass, northern pike, rock bass, black crappie, brown bullhead and large-mouth bass. The terrestrial vegetation along the intensively developed creek is sparse between the creek mouth and the Route 18 bridge. However, upstream of the Route 18 bridge, riparian terrestrial vegetation along the high steep banks of the creek is characterized by a variety of woody and herbaceous vegetation. Plants found in the upstream zone include oak, baxelder, ash, beech, red maple, elm, etc. Regarding aquatic plants, emergents such as cattail and burseed; submersibles such as water milfoil and coontail, as well as mats of floating vegetation such as lesser duckweed, dominated the aquatic plant community in the upstream areas.

Olcott Harbor and Eighteen-Mile Creek have played a prominent role in the New York State Fish Stocking program in the western end of Lake Ontario. There were 440,450 salmonids released in the Olcott Harbor, N.Y. area in 1988 (See Table C15.). The following fish were stocked in the mouth area of Olcott harbor in 1988: 111,800 lake trout yearlings, 55,000 lake trout fingerlings, 30,700 brown trout yearlings and 8,400 rainbow trout fingerlings. In addition, 180,000 chinook salmon fingerlings, 32,550 coho salmon yearlings, and 22,000 coho salmon surplus spring fingerlings were stocked in Eighteen-Mile Creek.

Table C15 - *Olcott Harbor 1988 Stocking Figures*

| | |
|---|---|
| Lake Trout Y | 111,800 |
| Lake Trout F | 55,000 |
| Brown Trout Y | 30,700 |
| Rainbow Trout F | 8,400 |
| Chinook Salmon F | 180,000 |
| Coho Salmon Y | 32,550 |
| Coho Salmon surplus spring F | 22,000 |
| Salmon Total | 440,450 |

Y - yearlings F - fingerlings

Nearby harbors, Wilson, Sodus, and Oak Orchard also receive stocking by NYSDEC. Stockings for these three harbors totaled 119,100, 264,250, and 376,000 fish respectively in 1988. The proposed stocking totals for 1989 are similar to the 1988 numbers. New York State Department of Environmental Conservation has established the general rate and species mix stocked annually in the Olcott Harbor area.

Approximately 180,000 chinook and 30,000 coho are scheduled to be released annually at the mouth of Eighteen-Mile Creek. In addition, 40,000 brown trout and 12,500 rainbow trout are

programmed for annual release in the creek. Another 110,000 salmonids are also stocked just off the mouth.

The continual stocking of salmon at Olcott Harbor ensures this area as a future prime fishing location. Annual stocking of salmon alone at Olcott Harbor has averaged 320,000 per season. This stocking schedule is expected to continue, in the future.

(5) New York State Fishing Regulations - New York State fishing regulations prohibits licensed fishermen to have fish in their possession in streams such as Eighteen-Mile Creek at Olcott, New York at night. Night is defined as 1/2 hour after sunset to 1/2 hour before sunrise. For this reason, the piers at Olcott are heavily used by fishermen after sundown. The New York State regulations note that night fishing is prohibited from September 1st through March 15th and snatching is prohibited in Eighteen-Mile Creek from the railroad bridge upstream to Burt Dam. New York State requirements for salmon and trout caught in Lake Ontario in Niagara County are shown in Table C16.

Table C16 - New York State 1989-1990 Fishing Regulations For Niagara County,Lake Ontario Waters*

| SPECIES | OPEN SEASON | MINIMUM LENGTH | DAILY LIMIT |
|---|---|---|---|
| Brown Trout<br>Rainbow Trout<br>Coho Salmon<br>Chinook Salmon | All Year | 9" | 3 in combination in Lake Ontario and all tributaries upstream. |
| Lake Trout | 1/1-9/30 | Possession limited to fish < 25" or > 30"; all others must be released | 3 |

* License year October 1st through September 30th.

New York State (1989-1990) fishing regulations for Lake Ontario say that the following fish can be fished for at any time during the year: Brown trout, rainbow trout, coho salmon, and chinook salmon. The minimum length, for harvest purposes, must be nine inches and the daily limit is three in any combination. It is acceptable to fish for lake trout only from January 1st through September 30th. Possession of lake trout is limited to fish smaller than 25 inches or greater than 30 inches and the daily limit is three.

c. Lake Ontario Charter Boat Activities. The success of the Lake Ontario sport fishery rehabilitation has spurred the development of charterboat operations in the lake. The Lake Ontario charterboat fleet has grown from 33 charter guide boats in 1975 to 150 boats by 1982 to an estimated 500 charterboats today. Approximately 200 are members of The Lake Ontario Charterboat Association. Another 150-200 are members of local "area" associations and the remaining are unaffiliated. There are eight charterboat associations for the Lake Ontario area. The Lake Ontario Charterboat Association estimated the total number of charter craft operating out of nine geographical areas along the shores of Lake Ontario in 1985. Olcott/Wilson Harbor accounted for 10 of these charter captains. A periodic newsletter, entitled "Charterlines," is provided to charterfishing boat operators as an educational activity, by the New York Sea Grant Extension program.

A 1985 survey of New York State Lake Ontario charterfishing captains revealed that most captains will operate from April through September. The average number of trips made per year was 47. The charter operators made twice as many full day trips as half-day excursions. Ninety-one percent of the respondents revealed that charterfishing was not their primary source of income. Most charter captains said they were involved in charterfishing because of the enjoyment, to be outdoors, and the non-monetary benefits.

The presence of charterboats is expected to increase as it has in the past three years. The NYSDEC does not feel current fishing pressure will decimate the fish population in Lake Ontario. Many factors could enter such a forecast (i.e. disease, decline in forage base, unforeseen genetic problems, overfishing or a combination of such factors). There are several challenges facing charterfishing operators today. Two important issues are the growing expectations of charterfishing clients and the concern over the toxicity of Lake Ontario fish. For example, the immensely successful harvest in 1987 heightened the public's expectations for the 1988 season. The 1987 fishing season was one of the best on record for salmonid harvests and catch rates. People began expressing concern about the salmonid population in the spring of 1988 because of the low numbers of salmonids, especially brown trout, caught in Lake Ontario in the spring of 1988.

The decline in the number of fish caught in April 1988 can be explained by three factors. First of all, lower than normal water temperatures and unseasonably high winds prevented many fishermen from fishing during the popular spring season. Secondly, salmonids were exposed to a more preferred forage base in 1987 causing the salmonids to be more elusive to anglers. The abundant forage base was characterized by a record smelt population and a smaller than normal population of alewives. Lastly, it is believed that anglers simply had very high expectations for the 1988 fishing season and because of the

effects of the aforementioned factors these expectations were not met.

The impacts experienced by charterfishing operators as a result of the NYSDOH fish advisories in 1987 and 1988 could be ameliorated if contaminants in waters of Lake Ontario decrease in future fish toxicology tests. The charterfishing industry experienced a small decline in clientele because of the unfavorable fish advisories in 1987 and 1988. The fish advisory could be relaxed in the future, which will mean more business activity for charterfishing operators.

d. Revitalization Of Olcott Beach: 1980 - Present.

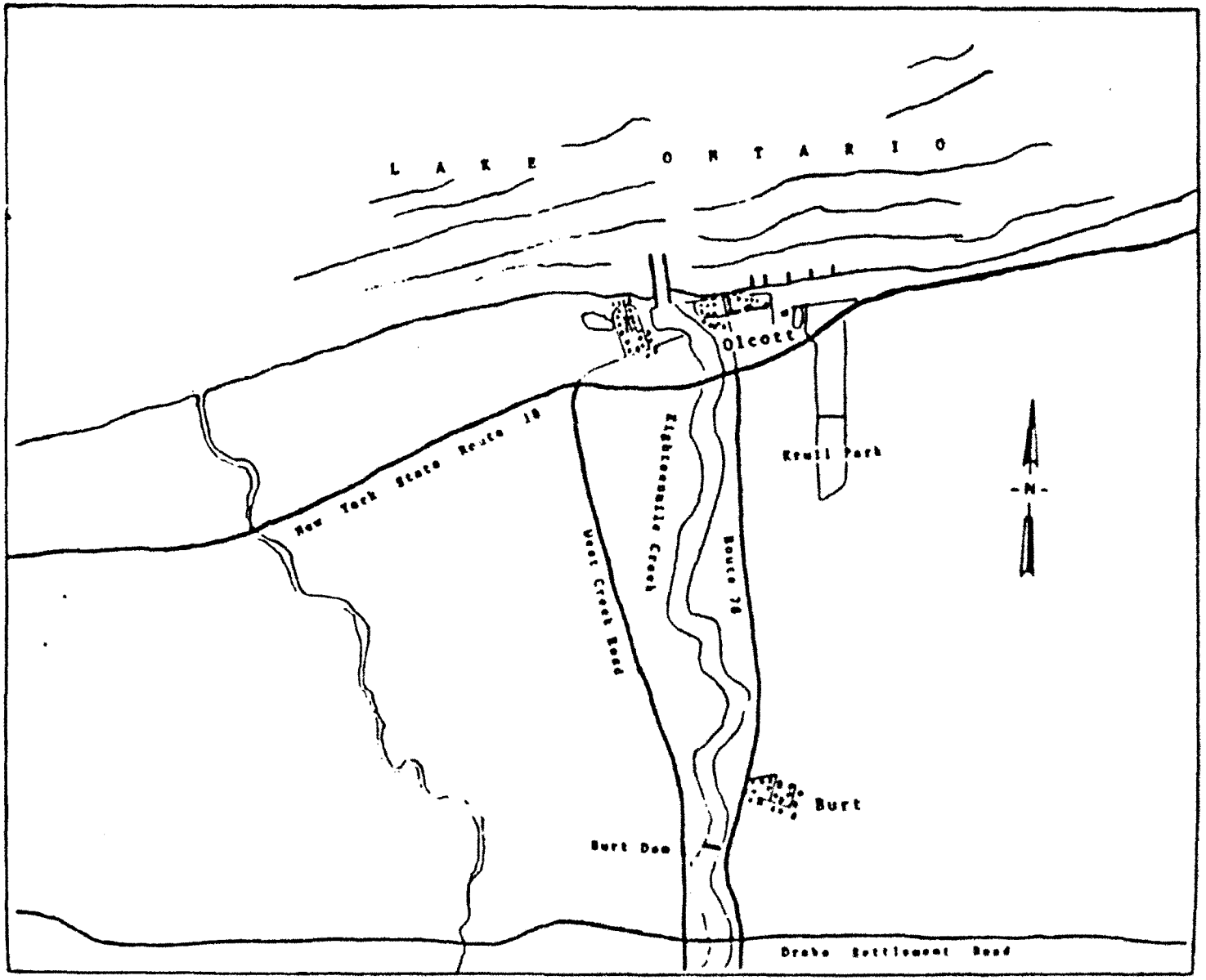
In the early 80's New York State became concerned about the lack of a state policy or goals that would direct development of its lakeshore area. A Coastal Management Program was developed by New York State to meet this need. The State had a preliminary Coastal Management Program in place by 1982. This program outlined 44 policies that the State wanted all lakeshore development to conform with. The Department of State was responsible for the management and enforcement of these goals and objectives.

This responsibility could be transferred to the local community if they developed and adopted a Local Waterfront Revitalization Program (LWRP) that incorporated these 44 policies. These local programs would also reflect local issues, problems, goals, and objectives associated with local shoreline development. Non-adoption of the LWRP would mean New York State Department of State would continue to administer coastal development in the various local communities. Other effects of not adopting a LWRP would be: loss of self determination for the Town in regard to local coastal actions, lack of inclusion of local imperatives and policy interpretations in the State program. It could also jeopardize complimentary funding priorities from state and federal sources.

The Town of Newfane developed a LWRP for inclusion into the State Coastal Management Program between 1984 and 1986. The plan presented the program's boundaries in the town of Newfane, the 44 development policies, proposed land and water uses in the affected areas, proposed public and private projects, and techniques for implementing the program.

The Local Waterfront Revitalization Area (LWRA) in the Town of Newfane included two major areas. The first area was between the south shore of Lake Ontario and the southern right of way of New York State Route 18. The second area included 2.5 miles of 18 Mile Creek. The area stretched east-west between Route 78 and West Creek Road and north-south from New York State Route 18 Bridge to Drake Settlement Road (See Figure C4).

Figure C-4 The Local Waterfront Revitalization Area In The Town Of Newfane



This area was divided into four sites for evaluation. Two of these sites are impacted by the Olcott Harbor report: The Olcott Hamlet area in general and Eighteen-Mile Creek (The area between Route 78 and West Creek Road and from New York State Route 18 bridge south to Drake Settlement Road). This latter area encompasses Eighteen-Mile Creek up to the Burt Dam.

The Waterfront Revitalization Plan stressed development of the Olcott Harbor area for boating and sportfishing opportunities. Local waterfront development policies in the plan gave first priority to water dependent recreational and related commercial development. This approach to development would capitalize on both traditional harbor uses and the availability of existing marine facilities and existing marine related infrastructure. The Town would foster the development of restaurants, marine/fishing supplies, and tourist recreational uses within the Olcott area. The Town would use its zoning powers, authority to issue water/sewer permits, property tax abatements, favored lease arrangements and loan guarantees/rate reductions to induce such growth in the Olcott area.

The Town recognized that the area fish habitats are the primary attraction for sportfishing and boating. The importance of Eighteen-Mile Creek as a focal point of spring and fall migrations for cold water fish species (coho salmon, chinook salmon, brown trout, and steelhead) needed to be preserved. Consequently, development that would destroy or significantly impair the viability of the areas fish habitat would not be undertaken.

The main problem at Olcott was identified as providing the public with access to the water related recreational resources in the area. Recreational opportunities available in Olcott included swimming, boating, fishing, scenic passive recreation, playground activities, as well as restaurants and overnight accommodations. Potential new recreational opportunities included swimming, golfing, hiking, and cross country skiing.

The Town adopted a public access policy to be included in the LWRP. The policy gave priority to providing public access to public beaches, boating facilities, fishing areas, and public parks. The following goals were developed: To protect, maintain, and enhance public access at the Town Marina, Fishermen's Park, and Krull Park; to improve access to the federal piers, especially the east federal pier which was unusable due to legal Creek fishing areas and the downstream side of Burt Dam; to invite marine development around the New York State Route 18 Bridge over Eighteen-Mile Creek; and to protect via local regulations the Eighteen-Mile Creek wetland from further marine development. Any proposals that removed shoreline access barriers would be given priority for development.

The Town outlined a number of capital improvement projects (public and private) that could be taken to achieve these goals. These projects included: Development of a program that would inform the public about the recreational opportunities available at Olcott; expansion of the Town Marina; expansion and renovation of private harbor docks for boating; renovation of Ontario Street; development of Eighteen-Mile Creek south of the Route 18 Bridge; the construction of a fishermen's trail at Burt Dam; improvements to Krull Park (an amphitheater, golf course, beach, etc.); and development of the Outer Harbor.

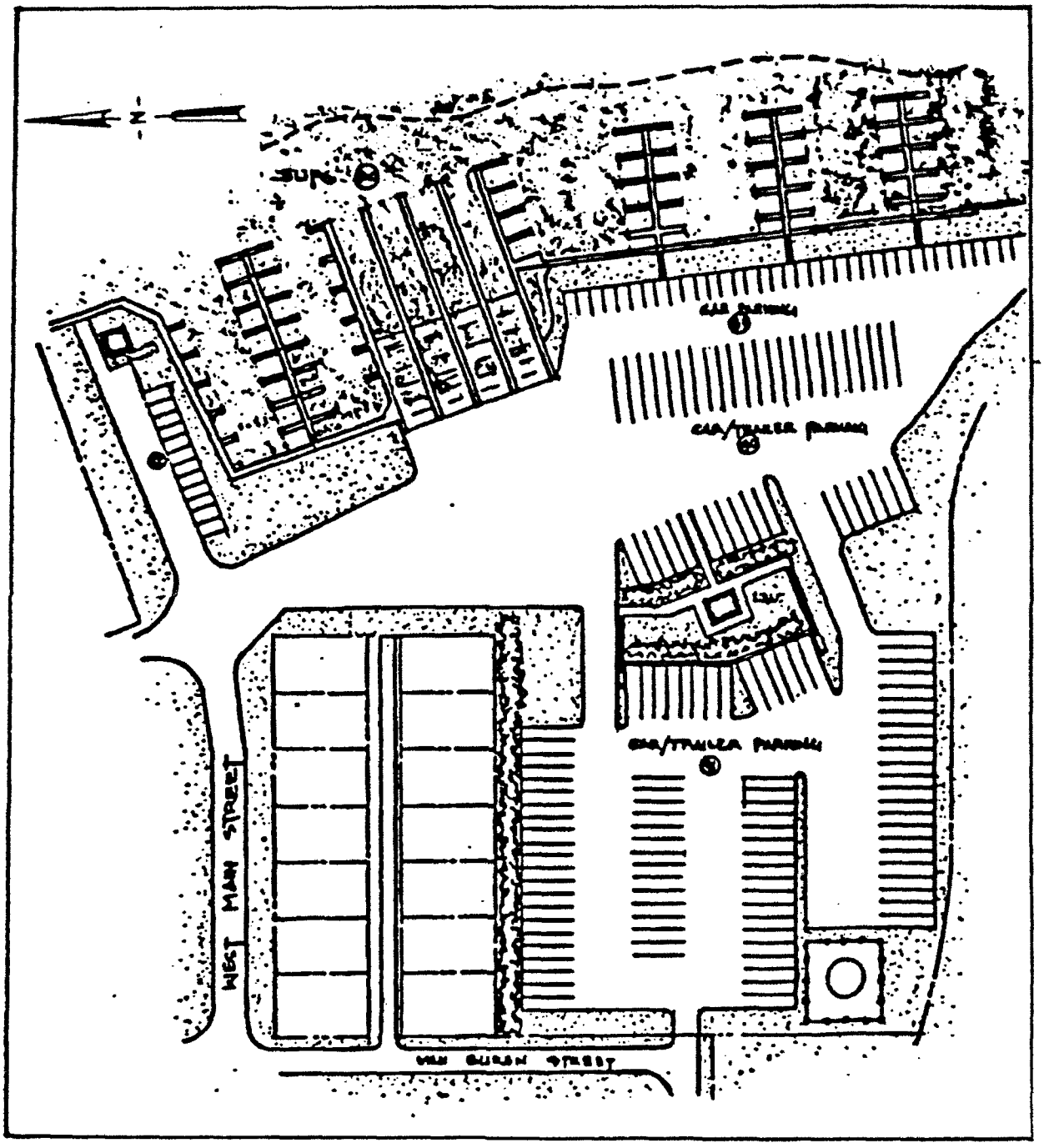
(1) Public Information Program - The Town proposed developing a local Chamber of Commerce that would develop information for public dissemination. Information could be in the form of maps/brochures that would outline area services, facilities and events. This information could also be incorporated into current tourism efforts developed by Niagara county, the Seaway Trail Program and New York State.

A Town of Newfane Tourism Committee was developed in the mid 80's. The committee developed a number of brochures that outline area services, facilities and events. Over 13,000 of these brochures were distributed in 1989 alone. Recreational attractions and services at Olcott have been incorporated into promotional brochures developed by Niagara county and New York State. Olcott is highlighted in the "Niagara County Fishing Map". It is also in a number if "I Love New York" tour guide brochures (The New York State "Seaway Trail" Brochure and "I Love New York" Western Region, etc.).

Also the Town developed an information center in Olcott. The Town bought a railroad caboose for this purpose and placed it at the intersection of Route 78 and Route 18. The center is staffed during the week from April to October. The center offers a number of brochures about area attractions.

(2) Town Marina Expansion - The Town marina provided 30 seasonal slips in 1984, 25 spaces for transient craft, three launching ramps with two lanes each, parking for 50 to 60 autos, a fish cleaning station and public restrooms. The expansion would include renovation and expansion of the existing public launch ramps by installing concrete ramps and extending them to handle larger craft, adding one double wide launch ramp, providing floating docks for 40 additional seasonal renters and 20 additional transient spaces, removal of approximately 13,000 cubic yards of shoal material in the navigation channel, adding an additional 100+ parking spaces west of the current parking area and providing one way egress from this new parking area to Washington Street and New York State Route 18. The estimated cost of this project was set at $997,000. Figure C5 shows a schematic of the proposed expansion.

Figure C-5 Town Marina Expansion



The Town had accomplished the majority of its goals by the fall of 1989. At this time the three launch ramps had been renovated and lengthened, the marina could accommodate 48 seasonal slip renters and had 55 spaces for transient craft. The Town had dredged 12,100 cubic yards of material from the channel in 1989. It had also developed the additional 100 parking spaces but still lacked the one way egress to Route 18. In addition, the Town had leased an additional 250 to 300 parking spaces for launch ramp users on the south side of Route 18.

The Town plans to expand its seasonal slips to 68 and transient spaces to 75 by the 1990 season. It had also made major improvements to its fish cleaning station by sending the stations refuse via pipeline to its sewerage treatment plant. The Town plans to expand the use of its fish cleaning station in the future by doubling the current fish cleaning table work area. It also plans to upgrade the fish stations grinding mechanism to accommodate the increased usage.

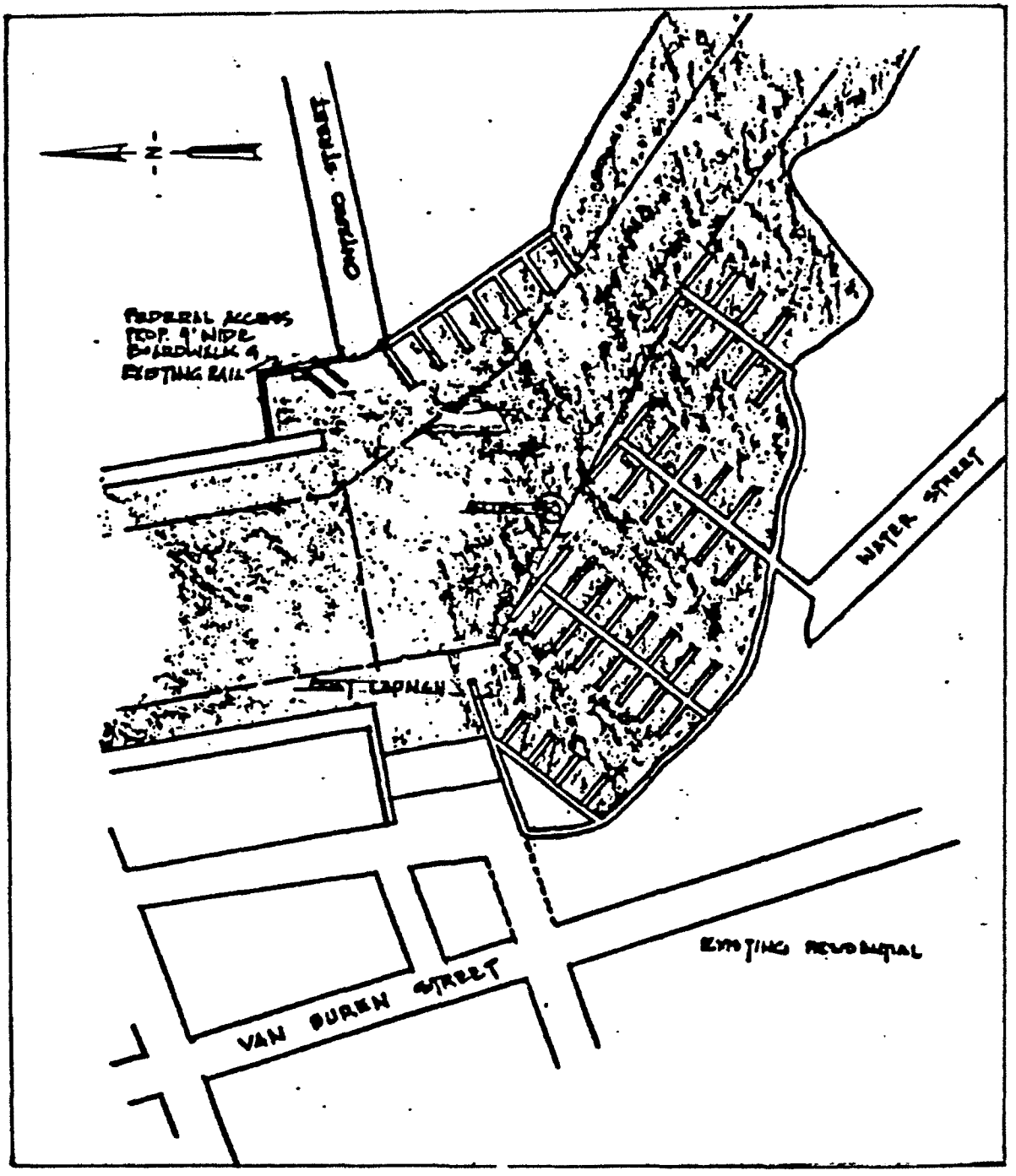
(3) Renovate Harbor Marinas and Dockage - This plan had four major elements: Construct two new double wide launch ramps at the end of Lake Street; develop the basin area between Bay Street and Water Street for 60 new slips for small, shallow draft boats by dredging 5,000 cubic yards and constructing a T-breakwall at the end of the federal piers to reduce wave action in this area; create paved parking lots at Beach and Van Buren streets (56 spaces) and at Lockport and East Main Streets (26 spaces) for tourists and fishing traffic; and promote general facade improvement of shoreline structures for esthetic purposes. Costs for the above were placed at $620,000. This figure did not include the construction cost of the T-breakwall (See Figure C6).

Most of this development was envisioned to be completed by the private sector. However, new parking at Lockport and East Main streets, on the east side of Olcott, was to be completed using money from HUD for renovation of the East Main street commercial area.

The majority of this plan remains to be completed. Construction of the Corps Federal project would alleviate the wave action in the basin between Bay Street and Water Street. However, usage of the basin for commercial purposes would need to be worked out with the local cottage owners who hold the water usage rights. The development of the parking lot at Lockport and East Main Streets has been completed using HUD funds.

Facade improvements have been most noticeable on the east side of the creek. Major improvements have taken place at McDonough's Marina, located at the foot of Ontario Street. Most of the marina's 45 slips have been replaced. In addition, the marina

Figure C-6 Marina Development Between Bay Street And Water Street



has applied for a permit that would double the number of slips to 90. Hotel rooms above the marina facility have been renovated and the structure's exterior has been refurbished.

(4) Renovation Of Ontario Street - The Ontario Street region overlooked the lake but was generally overdeveloped and in poor condition. The area was located between the harbor and Krull Park. The region could link these recreation resources and foster complimentary use of each area by visitors.

The Town proposed removal of all structures on the north and south sides of Ontario Street. The area would then be developed as commercial/retail space. Anticipated uses would include overnight accommodations as well as a restaurant and retail facilities. This general area would be developed to include: A hotel with 60 rooms and conference/seminar capabilities, 10,000 square feet of retail space, and a 2,500 square foot restaurant. All facilities would be linked by a path from Lockport street to Krull Park. Parking for 90 autos would be provided south of the project area. This plan would necessitate the closure and abandonment of Ontario Street between Lockport Road and Franklin Streets. Total project cost was placed at $2.5 M (See Figure C7).

In addition, the Town outlined commercial structures in the east side of the hamlet that needed structural rehabilitation (See Figure C8). These structures were identified for inclusion in a district renovation project funded with HUD Small Cities Block Grant monies.

The Town has spent over $129,000 to date, acquiring seven homes on the north side of Ontario Street. The homes have been demolished and temporarily converted to parking. The Town has also purchased a vacant lot on the south side of the intersection of Franklin and East Main Street. This vacant lot has been paved and converted into parking. The Town projects to spend an additional $50,000 for purchase and demolition of properties in this area within the next year. Numerous negotiations have taken place with prospective builders of the hotel. However, no firm development plans have been negotiated to date.

A HUD grant of $750,000 was received by the Town. These funds were used to renovate all of the buildings targeted for renovation in the LWRP. This was completed by 1989. In addition, the facade of all buildings on East Main Street between Route 78 and Van Buren Street received renovation. A covered wooden canopy stretches the full length of this area giving shelter to pedestrian traffic and providing a visual connection between all of the buildings on the north side of East Main Street. The money was also used to purchase a vacant lot at the corner of East Main Street and Franklin. The lot was paved and converted to a parking area.

Figure C-7 Ontario Street Renovation

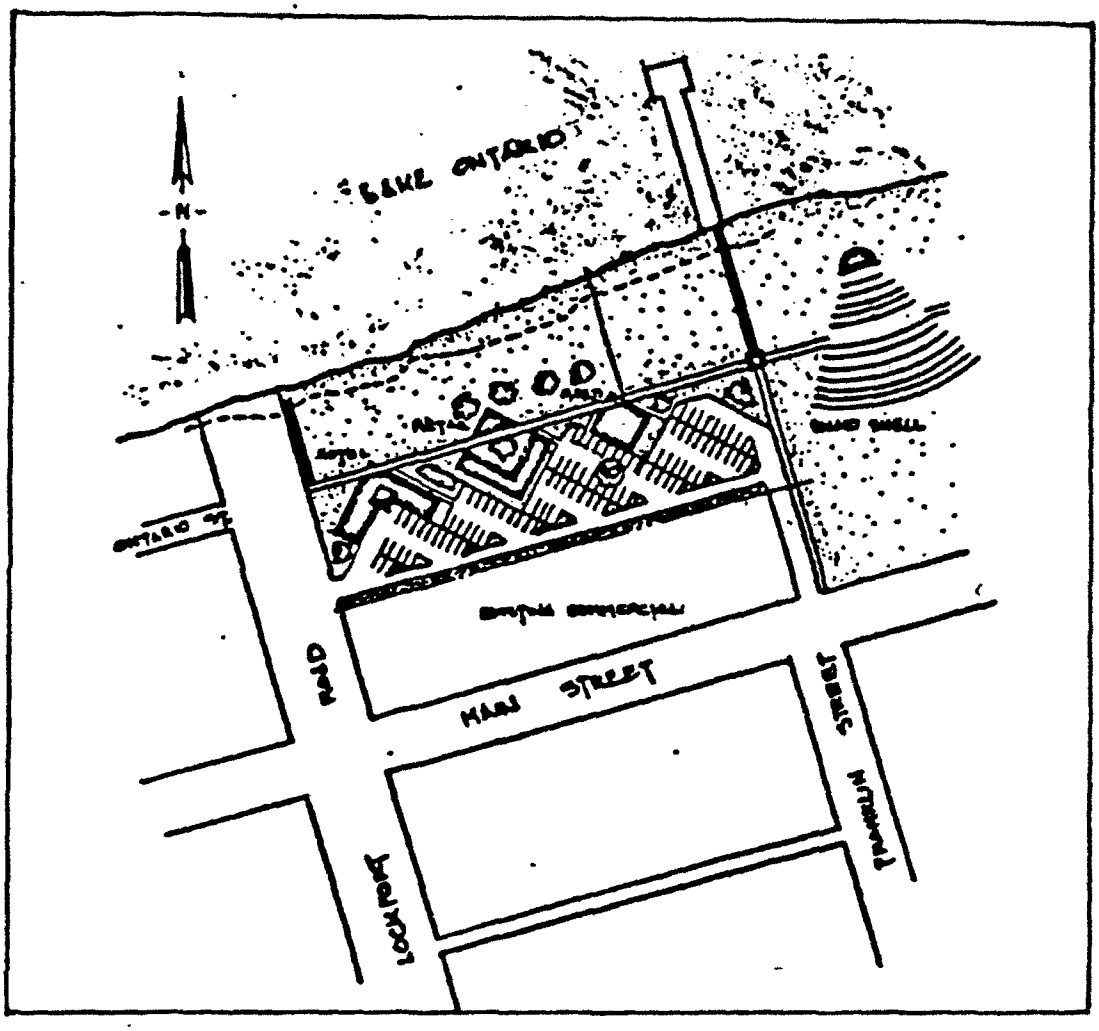
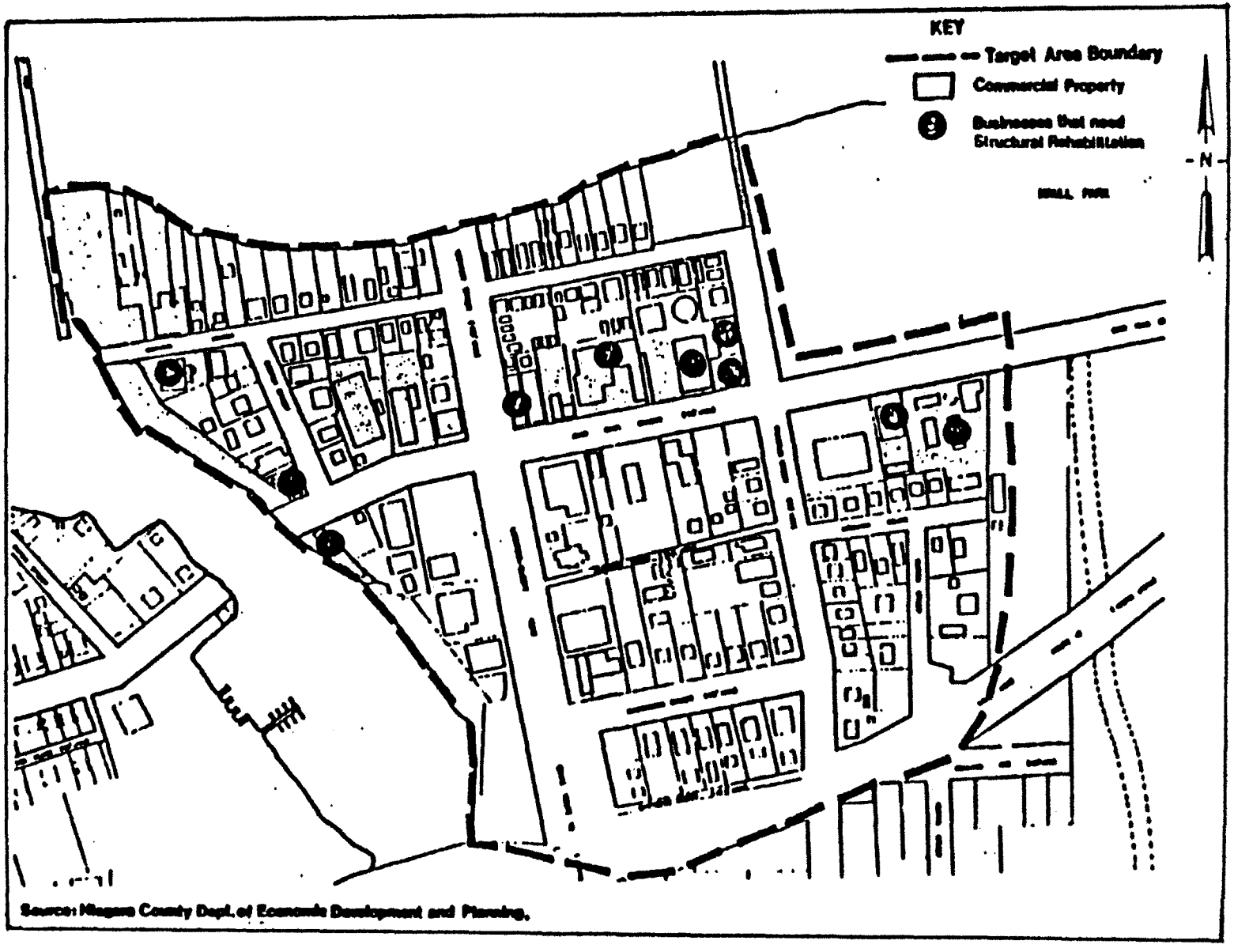


Figure C-8 Commercial Structures Needing Structural Rehabilitation



(5) Eighteen-Mile Creek Development - South Of New York State Route 18 - Increased demand for marine facilities at Olcott Harbor was expected to exceed the growth of slips capable of being developed in the area north of the Route 18 bridge. The only available area for new expansion of slips was on Eighteen-Mile Creek south of the Route 18 Bridge. However, the entire area of Eighteen-Mile Creek is designated a protected wetland under New York State law. Increased demand for new slips in the Olcott Harbor area would put additional pressure to develop this wetland area. There were approximately 60 private docks in the wetland by 1984.

The Town proposed limited marine growth in the first 800 feet of the Creek, south of the New York State Route 18 bridge. This would insure the proper use and protection of the remaining 2.5 miles of Eighteen-Mile Creek as a wetland and provide relief for marina development pressures. No other marine dockage would be allowed in the wetland and existing dockage would be phased out in accordance with municipal zoning provisions and New York State Department of Environmental Conservation permit actions.

This plan called for the development of 110 slips on the first 800 feet of the west bank of Eighteen-Mile Creek, south of the Route 18 bridge. Upland development would include parking for 134 autos, boat sales and storage, lavatory and showers, 8,000 square feet of retail space, shoreline access for marina patrons and 14 condominiums in a well landscaped setting (See Figure C9). Total development costs were estimated at $1.4 M, excluding the residential units. Private developers were envisioned as the major source of the development costs. There has been very little progress to date on this plan.

(6) Fishermen's Trail At Burt Dam - The project area consisted of approximately 1,500 feet of Eighteen-Mile Creek Gorge, between Burt Dam and the Town of Newfane's Fishermens Park (See Figure C10). This area has shown increased usage by sport fishermen, especially during the spring and fall salmon runs. Improvement in the quality of the sport fishery in the area has contributed to this increased usage.

Recommended improvements called for expansion of the parking lot to accommodate 50 autos, establishment of a trail/walkway along the east creek shore for scenic and fishing access between Burt Dam and Fishermens Park, cleanup of the stream bed at the base of the dam, and provision of restrooms and a picnic area. Total cost was estimated at $55,000. The town has accomplished all of the above. In addition, the parking area currently accommodates 75 autos.

Figure C-9 Eighteen-Mile Creek Development-South Of State Route 18

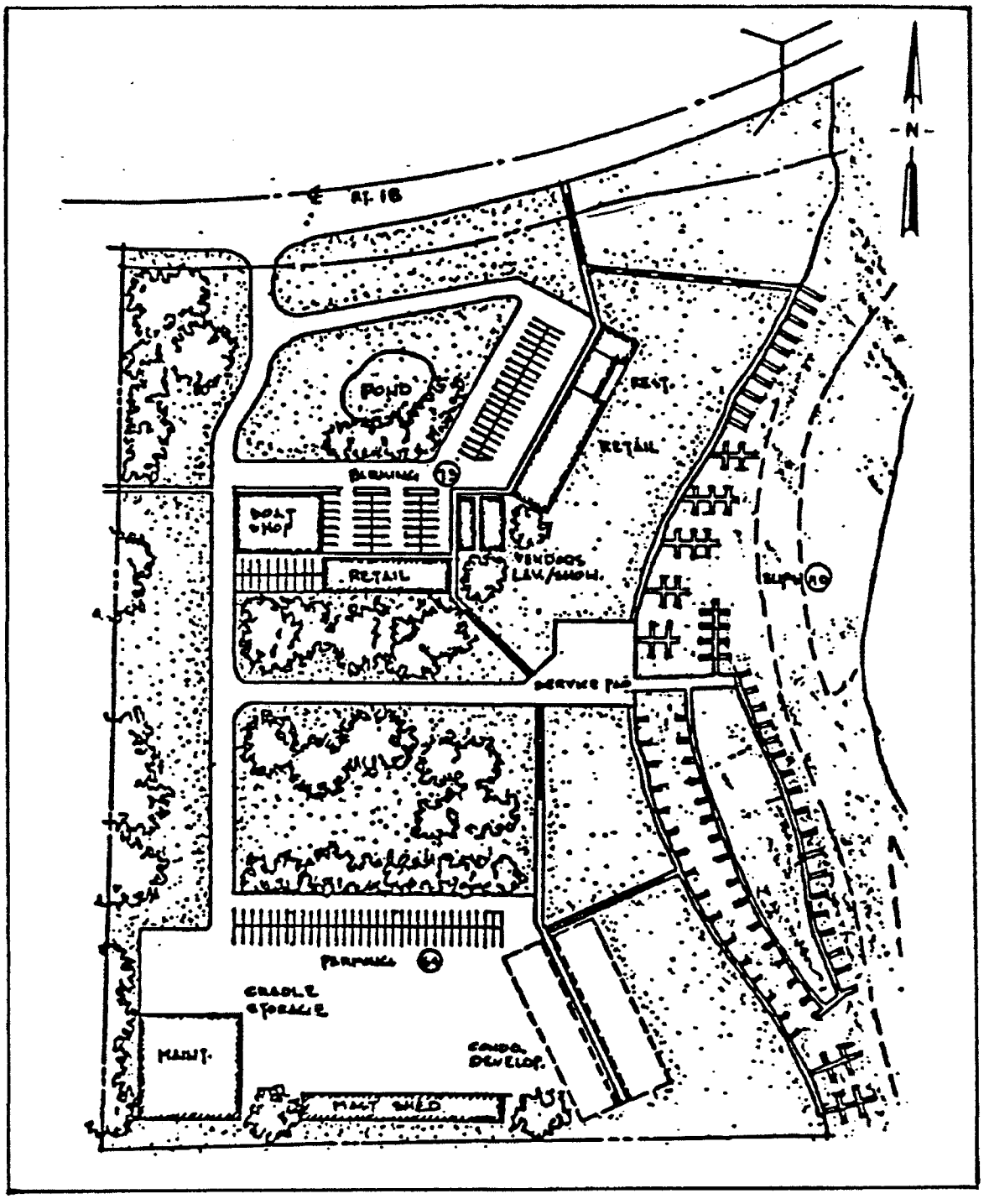
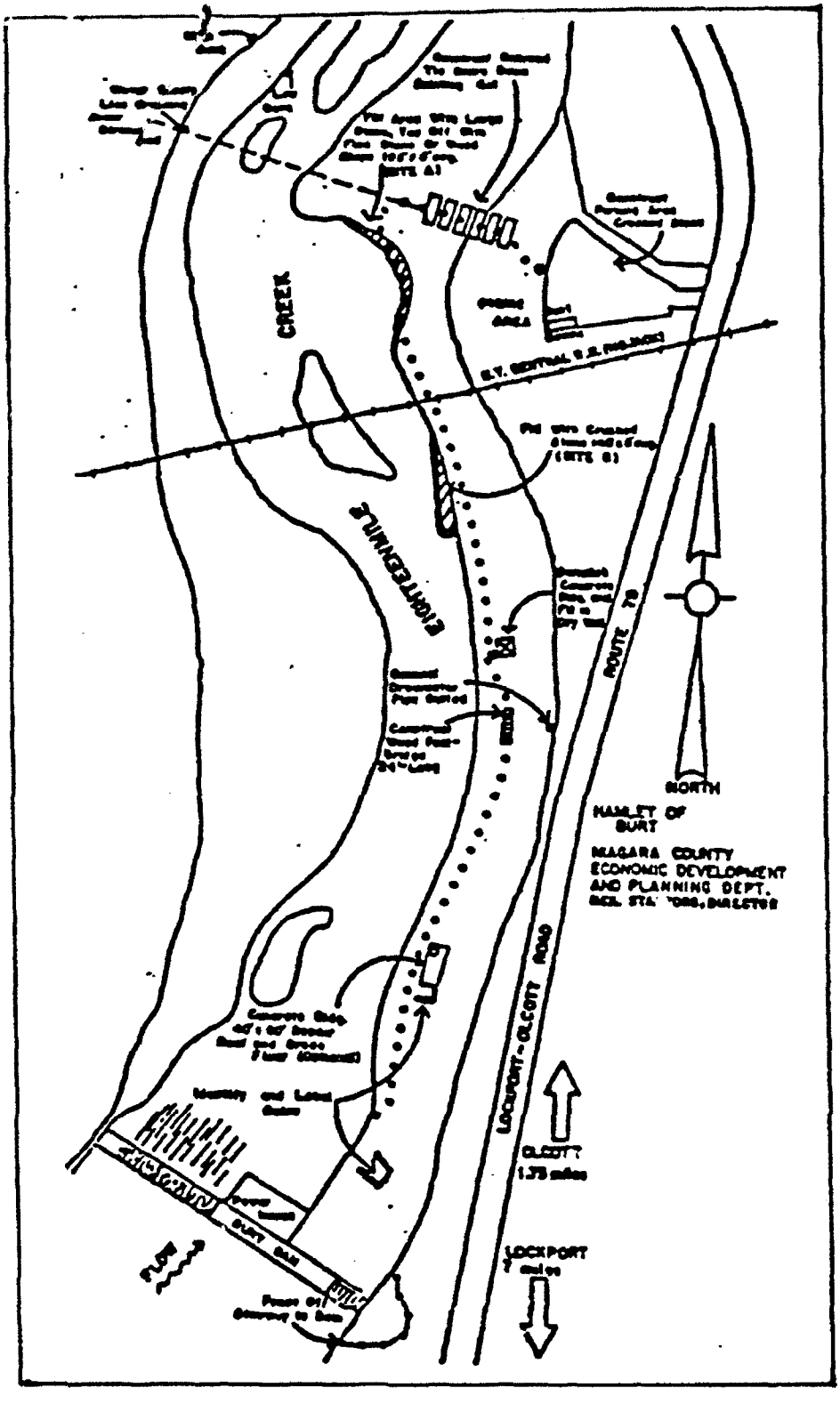


Figure C-10 Development Of Fishermans Trail At Burt Dam



(7) Krull Park Improvements - Krull Park is a 318 acre county park that straddles Route 18 in Olcott. Forty-five of these acres have been developed for recreational uses. The remaining 273 are leased for agricultural uses. The park offers picnic shelters, grills, tables, a beach, swimming, fishing piers, tennis courts, playground equipment, horseshoe pits, baseball diamonds, basketball courts, and public restrooms.

Krull Park was targeted for expansion to satisfy recreational demand for a variety of recreational activities. The park was ideal for expansion since it was largely undeveloped, adjacent to the harbor area, and accessible to the lakefront. Proposed improvements included the following: A 350 seat bandstand/amphitheater on the terraced slope overlooking Lake Ontario, an 18 hole golf course with a small clubhouse and necessary parking south of Route 18, two new softball fields adjacent to the existing hardball field, a recreation complex with outdoor pool and ice skating rink, lavatory/showers and a refreshments/warming building for year round use, and cross country skiing trails of varying length through the golf course, see Figure C11. Total development costs came to $858,000.

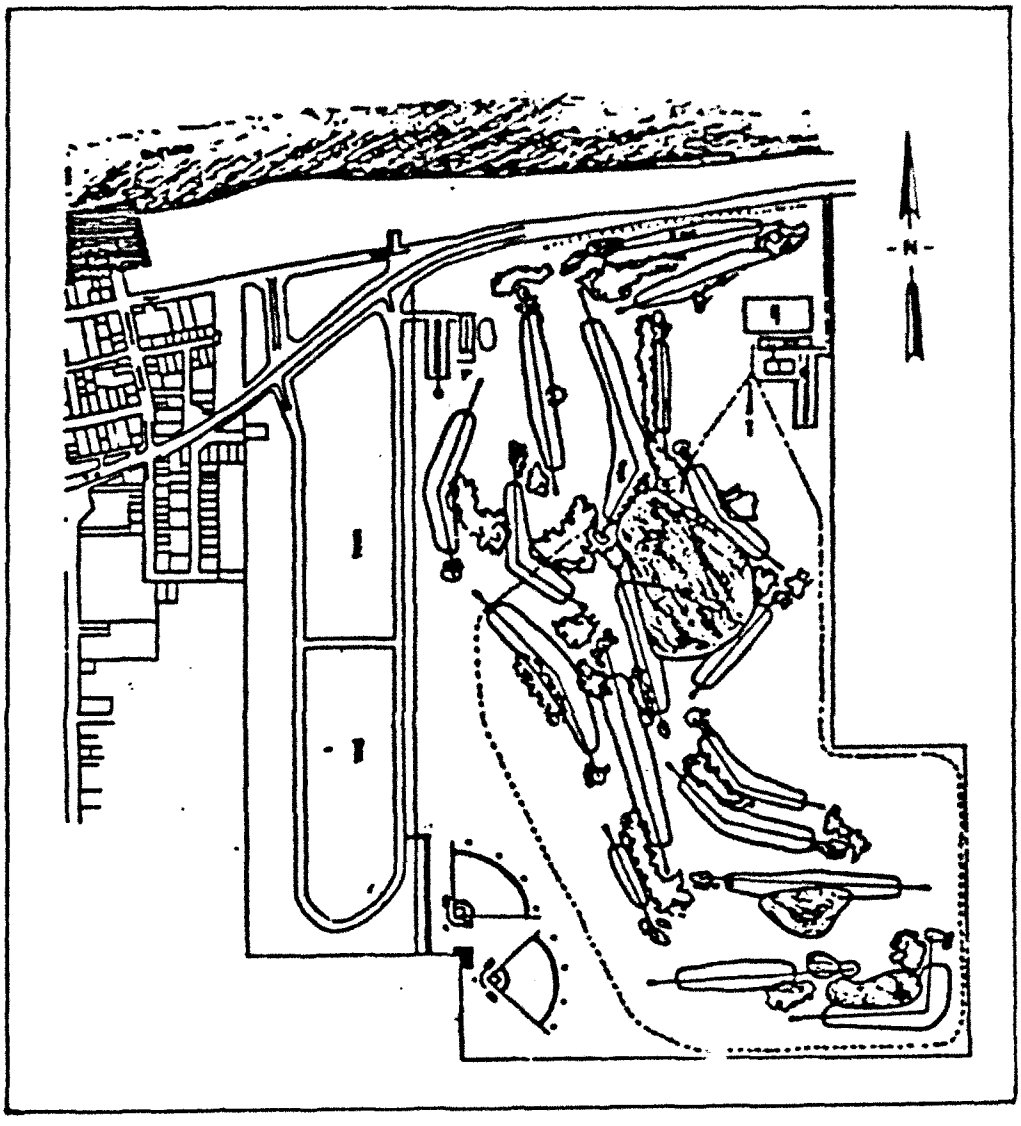
Most of the proposed improvements to Krull Park have been incorporated into a "Town Master Plan". This document is currently being formulated for the Town by the firm of Wendell Engineers.

(8) Outer Harbor Development - Numerous proposals for developing the Outer Harbor have been made. However, the Town endorsed the U.S. Army Corps of Engineers plan of development as being the most reasonable and consistent with plans for and goals of development of the shoreline as outlined in the LWRP. Estimated construction cost was placed at $11,800,000 in 1983 dollars. The plan consisted of constructing a basin area for between 500 and 600 recreational craft to the east of the existing east federal pier. The basin would consist of a 1,650 foot dogleg east breakwater that would be connected to shore. There would also be a detached 1,100 foot L-shaped west breakwater.

This plan is the focus of this Reevaluation report. Optimization of Plan 10 was performed, the results of which are presented in this Reevaluation Report. The Town is one of the local sponsors for the development of this project.

Total costs for all of the plans presented comes to $18,430,000 (See Table C17). The Town remains committed to these projects. It has spent $75,000 for renovation of buildings in the downtown Olcott area. It has spent over $129,000 to purchase and demolish buildings in the Ontario Street area targeted for redevelopment. It has made major improvements to its Fishermen's Park parking facility and has improved the quality of the trails leading to

Figure C-11 Krull Park Improvements



the Burt Dam. These improvements cost $55,000 to complete. The Town spent $53,000 in 1989 to purchase property on the west side of the harbor. This land will be used for access to the Lake Ontario shoreline. The Town has spent over $1 M since 1985 to implement the capital improvement plans outlined in the LWRP.

Table C17 - Local Waterfront Revitalization Plan Project Costs.

| LWRP Project | Estimated Cost $ | Funding Resources |
|---|---|---|
| 1. Town Marina Expansion | 997,000 | Twn, Fed |
| 2. Renovate Harbor Marinas And Dockage | 620,000 | Private |
| 3. Renovation of Ontario Street | 2,500,000 | Twn, Private |
| 4. Eighteen-Mile Creek Development | 1,400,000 | Private |
| 5. Fishermen's Trail At Burt Dam | 55,000 | Twn, Private |
| 6. Krull Park Improvements | 858,000 | Cnty, State |
| 7. Outer Harbor Development | 12,000,000 | Fed, State |
| | $18,430,000 | |

The Town modified its land use zoning ordinances in 1985 to facilitate implementation of these plans (See Figure C12). The Town also identified a number of federal, state and county agencies that would be instrumental in the development of these projects. Any agencies that would be involved in permit issuance, review of proposed development plans, or could serve as funding sources were identified. Representative federal agencies included: The Department of Agriculture; Department of Commerce; Department of Defense, U.S. Army Corps of Engineers; Department of Housing and Urban Development; Department of the Interior; and Department of Transportation. Representative state agencies included: The State Department of Commerce; State Department of Environmental Conservation; Department of State; and the State Office of Parks Recreation and Historic Preservation.

In addition to the state and federal agencies, the Town has been coordinating with the Niagara County Planning and Industrial Development Department as well as the Western New York Economic Development Corporation. The Town obtained $93,000 to develop a "Town Master Plan" in the summer of 1989. Funding came from a combination of sources: State, county and local.

The Town continues to coordinate with all agencies: Federal, state and county; that would be involved in the development of the projects outlined in the LWRP.

e. Existing Conditions. This section covers current land use zoning in the Olcott hamlet area as well as the types of activities that take place there.

(1) Land Use. Figure C 12 shows current land use in the Hamlet of Olcott. About one half of the lands that border the harbor area in Olcott are occupied by marine related commercial enterprises. Service marine facilities also occupy extensive water areas in the harbor.

Most of the land in Olcott beyond the harbor area consists of residential properties. Residential properties bordering the west bank of the harbor between Bay Street and West Main Street include both small summer-cottage type structures and some larger two story units. The communities major residential areas are located east and west of the immediate harbor area.

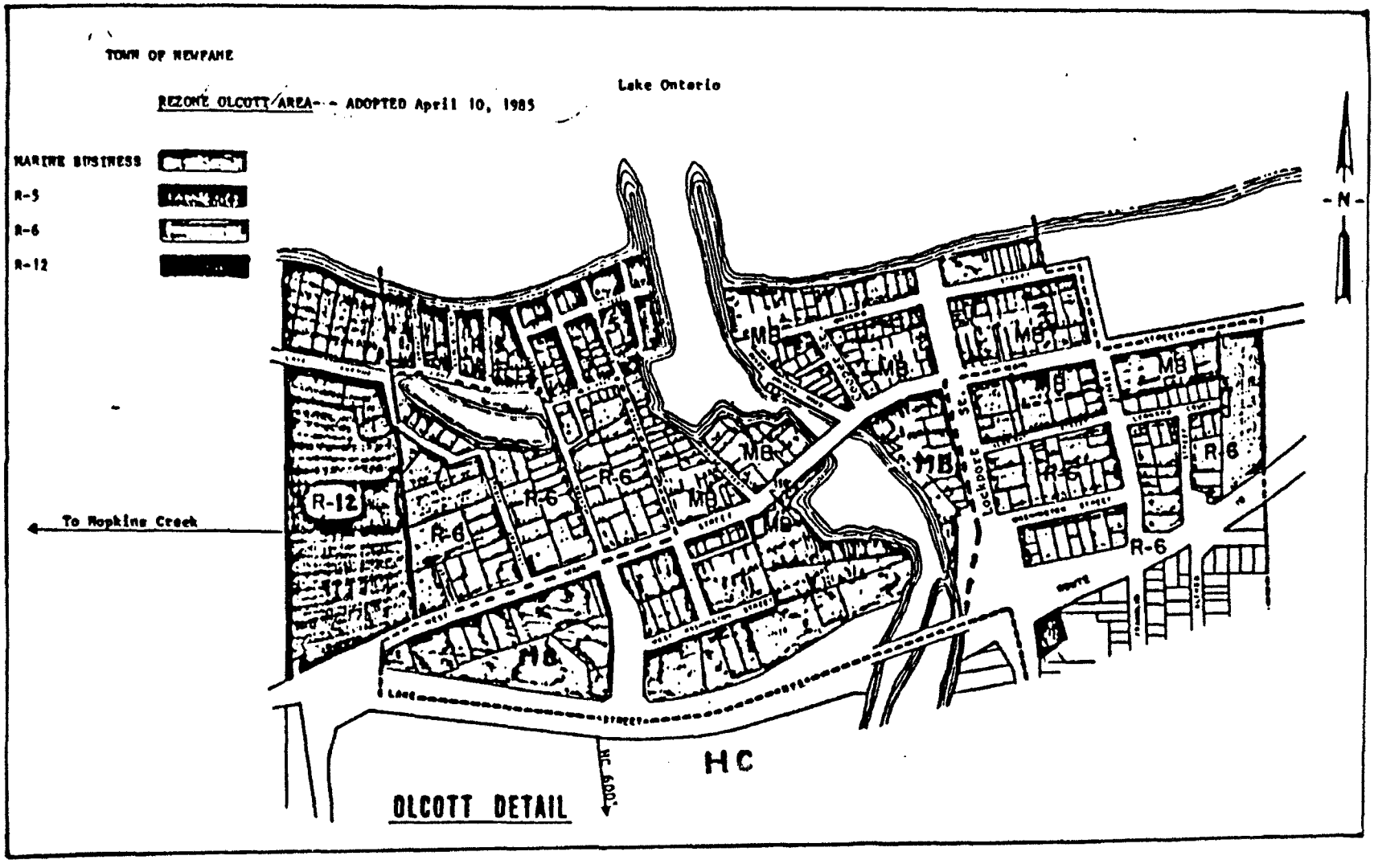
The main downtown area is located on East Main Street between Route 78 and Franklin Street. Commercial establishments are located along east Main street and Route 78. Public and semi-public lands include those areas occupied by churches, the fire hall, and other public facilities.

Krull Park is owned and maintained by Niagara County and is the largest recreational land area in the community. The park extends about 4,700 feet south from the lake Ontario shoreline and generally forms the eastern boundary of the hamlet.

The entire developed area at Olcott is bordered by agricultural lands located east of the park, south of Route 18, and west of Cresent avenue. Some residential strip developments parallel major roads within about one mile of Olcott.

(2) Parking. Vehicular parking areas are limited and confined to small lots adjacent to the marina facilities. Some on street parking is available adjacent to local businesses and on some residential side streets. Major parking for the hamlet is provided [illegible] rull Park. The town has been addressing the parking proble[illegible]ce 1985 by buying and demolishing older homes and converting the sites to parking. The town has improved traffic flow around the east creek bank area by making a number of streets one way. A fifty space public parking area has been developed near Mc Donoughs marine. The town has also converted Lockport Street, between East Main street and Ontario street, into public parking for about 30 automobiles. This was accomplished by purchasing buildings located there and removing them. The town has converted residential parcels on the north and south side of Ontario street at the intersection of Lockport Street into another 30 parking spaces. The town has also bought and demolished buildings on the southwest corner of East Main street and Franklin street for a 40 space paved parking area. This parking lot services businesses located along East Main street.

Figure C-12 Town Of Newfane's Land Use Zoning For Olcott Harbor-1985



(3) Marinas - Olcott Harbor is presently one of the principal recreational boating harbors along the south shore of Lake Ontario west of Rochester, New York. Relatively deep natural channel depths, are available to accommodate the average draft requirements of recreational craft. The harbor area provides both public and private dockage, and marina facilities and services for about 162 vessels. A facility location map is provided on Figure C13.

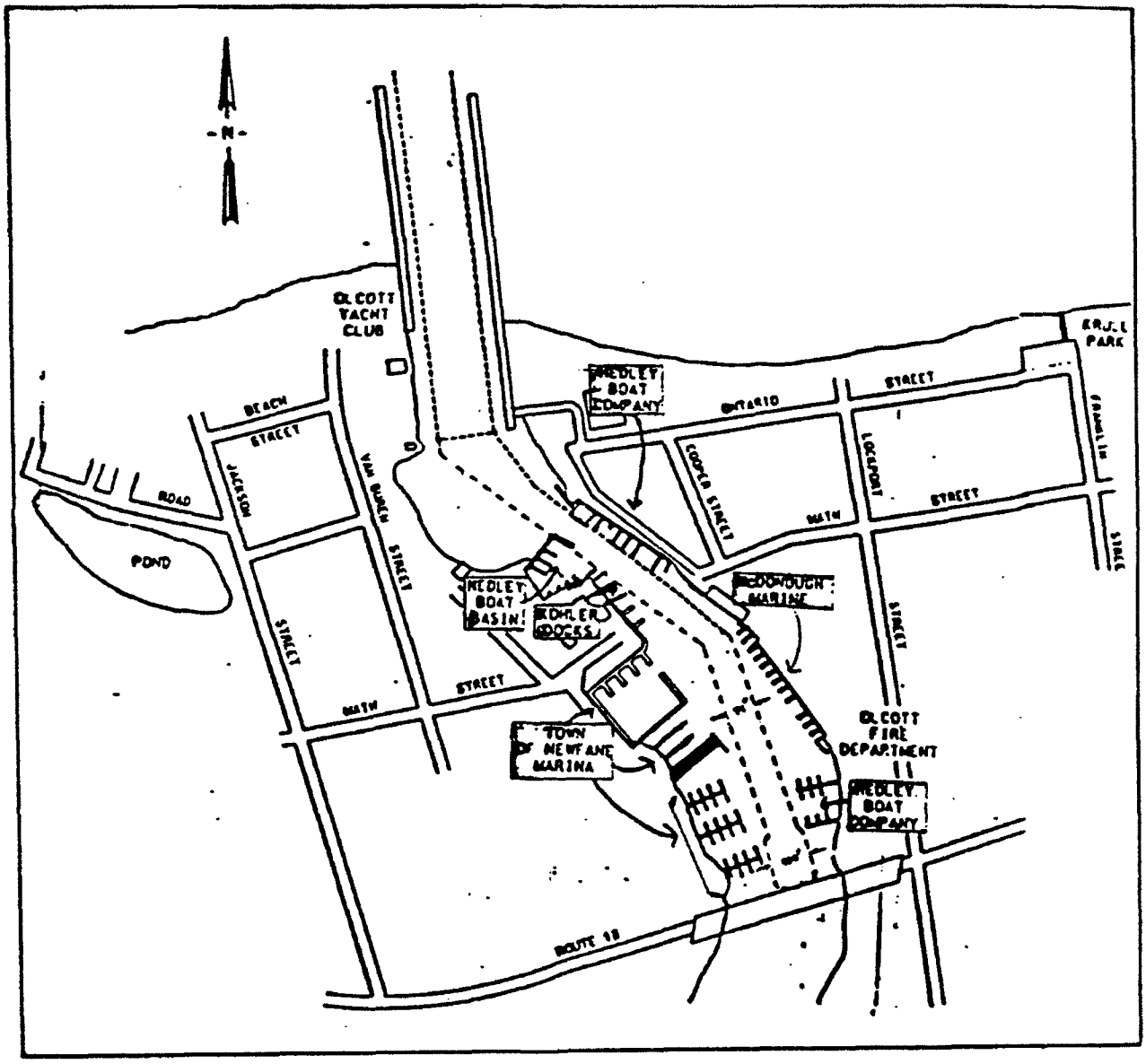
Olcott is a regional harbor that draws small-boat owners from areas throughout western New York and southern Ontario. It is easily accessible by automobile from the Buffalo, Rochester, and Toronto metropolitan areas. It is conveniently located on Lake Ontario for boating along the southwestern and northwestern lakeshore.

Recreational boating activities begin in the late spring and generally continue until mid-October. Sailing and motoring from the harbor is not limited to the immediate lake area. Cruising trips to the Bay of Quinte on the north Canadian shore and the Thousand Islands region of northern New York State are common. Annual regattas and boat races, such as the South Shore Regatta and the Canadian Regatta, are conducted throughout the course of the boating season. The largest boating event, the Block House Regatta, attracts about 130 sailing vessels to the harbor. The permanent based fleet mix for Olcott Harbor is summarized in Table C18.

Table C18 - Olcott Harbor Project Area Summary Of Permanent Fleet

| Type of Craft | Less Than 16 Feet | 16-25 Feet | 26-39 Feet | 40 plus Feet | Total |
|---|---|---|---|---|---|
| Outboards | 16 | 13 | - | - | 29 |
| Sailboards | - | - | - | - | |
| Inboards | 2 | - | - | - | 2 |
| Cruisers | - | 20 | 18 | 2 | 40 |
| Auxiliary Sailbts | 2 | 30 | 48 | 2 | 82 |
| Inboards/Outbrds | 4 | 5 | - | - | 9 |
| House/pontoon | - | - | - | - | |
| Total | 24 | 68 | 66 | 4 | 162 |

Figure C-13 Locations Of Current Marina Facilities



(a) Major Marina Facilities - Four marina facilities are located in the lower portion of Eighteen Mile Creek north of the Route 18 bridge. Three are private and one is public. A survey of the facilities was conducted in the fall of 1989. Facilities available at each marina are outlined in Table C19. Each of these marinas are addressed individually below, starting at the mouth of Eighteen-Mile Creek and proceeding upstream.

Table C19 - Marina Facilities Services

| Marina Facilities | Hedley Boat Co. | King Docks* | McDonough Marina | Newfane Marina | Olcott Yacht | Teal Marina |
|---|---|---|---|---|---|---|
| Owner | Private | Private | Private | Town | Private | Private |
| Slips | 61 | 8 | 45 | 48 | 0 | 0 |
| Transient Slips | 0 (3) | 0 | 0 | 30 | 0 | 0 |
| Moorings | 4 (3) | 0 | 0 | - | 0 | 0 |
| Dry Storage | X | | (50) | - | | |
| Launch Ramps | - | - | - | 6 | X | - |
| Hoist | X | - | - | - | | - |
| Parking | X | X | X | X | X | X |
| Fuel | X | - | X | | - | - |
| Sanitary | X | | | | | |
| Sales/Service | X | - | X | | - | X |
| Restaurant | | | X | | X | |
| Lodging | X | - | - | - | - | - |
| Fish Cleaning Station | - | - | - | X | - | - |

* Formerly known as Kohler Marina; changed ownership in 1988.

The Hedley Boat Company has three berthing areas in the harbor that offer wet slip seasonal rentals. These locations are: (1) At the foot of Ontario Street, on the eastern side of Eighteen-Mile Creek, adjacent to the east federal Pier (23 slips); (2) the

Hedley Boat Basin on the west side of Eighteen-Mile Creek (14 slips); and (3) on the east side of Eighteen-Mile Creek near the Route 18 bridge (24 slips). The steel sheetpiling of the Hedley Boat Basin serves as a harbor breakwater providing shelter to craft in that area.

The Hedley Boat Company provides wet berths for 61 craft. The facilities offer launching and retrieval services for current slip renters as well as other boat owners needing these services. There is a launch hoist situated at location one on the eastern side of the harbor. The launch is a power type with wheels. It is equipped with guides to allow for the cradling of sailing crafts within its frame while it glides them into the water. In addition, there is a stiff-leg derrick to facilitate the launching of the sailboats. The Hedley Boat Company also provides boat fuel, sales of marina related items, marina repairs and winter storage.

A renovation of the Company's sales room was completed in 1989. There are no current plans for dockage expansion north of the Route 18 bridge. However, the Hedley Boat Company does own property south of the Route 18 bridge. Environmental considerations, however, have limited development south of the Route 18 bridge to private residential docks.

McDonough Marina is located adjacent to the Hedley Boat Company on the eastern shore of Eighteen-Mile Creek, at the end of Main Street. This marina has 45 wet slips for rent on a seasonal basis. In addition, there are 50 dry covered and uncovered storage spaces at this facility. McDonough's supplies boat fuel and also operates a boat and motor sales and service facility on the western side of the creek. The repair shop is near the Town of Newfane Marina, on West Main Street.

The first floor of McDonough's Marina contains a restaurant, and floor space for marina sales. The second floor of the marina has recently been converted into hotel rooms to accommodate fishermen. The marina has been upgrading the quality of its docking facilities over the last three to five years. The marina currently has a permit pending with the Corps of Engineers that would essentially double its current number of wet slips from 45 to 90.

The King Marina facility, formerly known as the Kohler Marina, is situated on the western side of Eighteen-Mile Creek. It is located close to the upstream limit of the federal project in the area marked on the project map as "Olcott Yacht Club". The marina provides wet berths for 8 boats.

Room for expansion at this location is limited since the area north and south of the marina has already been developed by other marina operators for recreational craft usage.

The Olcott Harbor Yacht Club is located at the foot of Beach Street. The Yacht club has a club house with parking for 25 autos. The Club no longer uses the basin area adjacent to its facility for wet slip storage due to water right conflicts. However, the Yacht Club is still active and sponsors regattas during the boating season at Olcott Harbor.

The Town of Newfane Marina is the latest addition of wet slip rental space to be developed at the harbor. The Town of Newfane Marina is located on the west bank of Eighteen-Mile Creek at the foot of West Main Street. The facility has evolved over time to its present configuration. The marina has three distinct areas as outlined in Figure C 14: A basin area at the foot of West Main Street devoted to transient craft; three launch ramps with two lanes per ramp located upstream of the transient basin area; and an area for seasonal slip rentals located upstream of the launch ramps. The Town launch ramps are the only publicly owned and operated launch facilities in the Harbor.

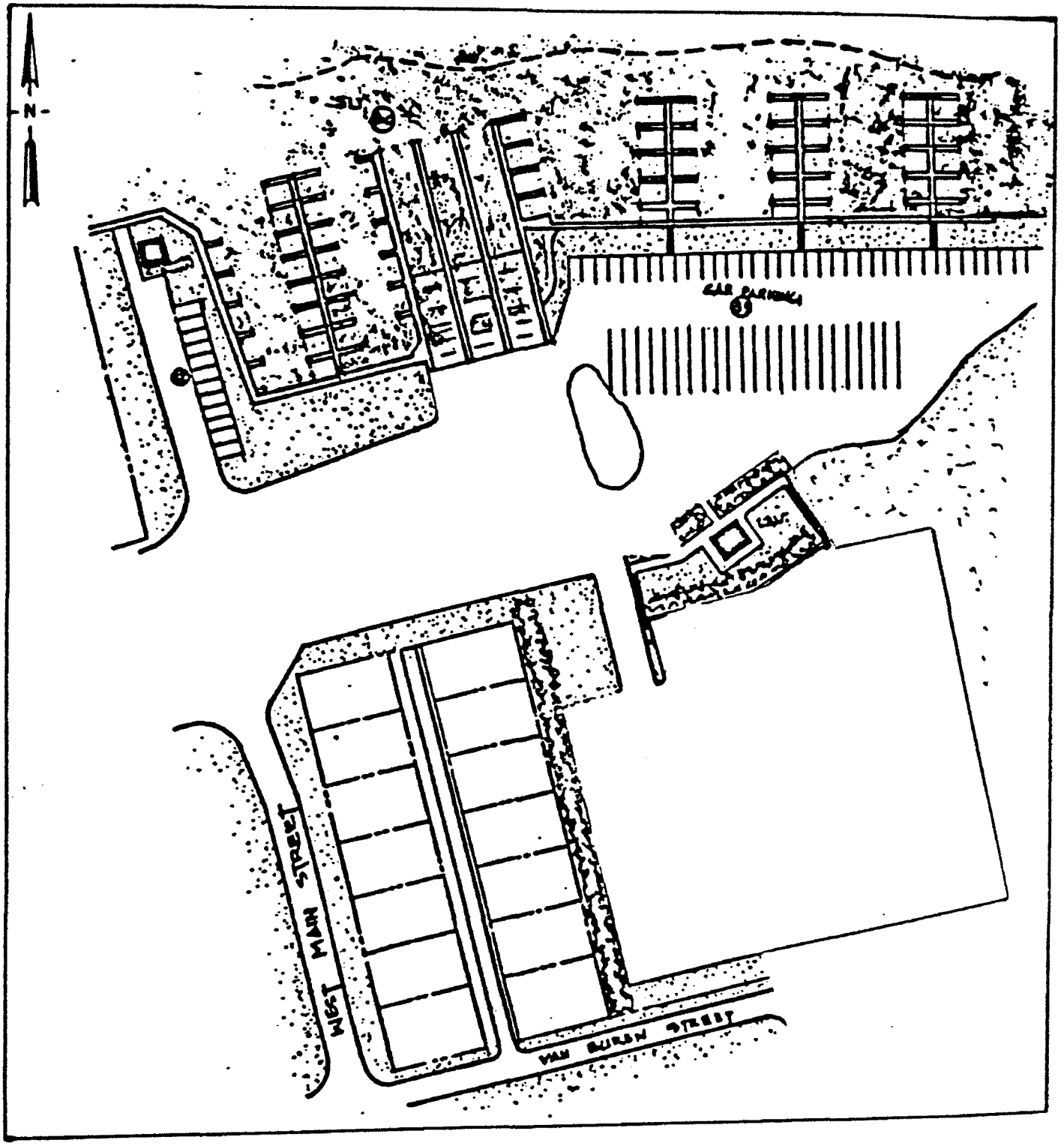
Prior to 1978 the marina had transient docks for 25 boats, 30 seasonal slips, three launch ramps with parking for 50 to 60 autos behind the seasonal slip rental area, a fish cleaning station, and public restrooms.

The development of fishing tournaments put pressure on the Town to upgrade their launch ramp, provide additional parking for launch ramp users, and increase the number of seasonal rental slips as well as transient accommodations.

The use of the Town's transient facilities has increased dramatically. Originally, the slip rental/mooring area for transient craft could accommodate 25 craft per day. The configuration of this area has been changed and through rafting of boats, can now accommodate up to 55 transients per night. There are approximately 15 hookups for electrical service for transient craft. The Town is planning to reconfigure the transient facility area so they can accommodate up to 75 overnight users. Currently, craft wishing to stay overnight have been allowed to tie up to the launch ramp lanes when the transient basin area has been full.

Today, the Town Marina complex has three launch ramps with two lanes each. Each ramp is 23 feet wide. The launch pad surface is a concrete plank and there are walkways that extend over 80 feet into the water. Launching of trailer drawn craft over 30 feet is not unusual at this facility. The majority of trailered craft over 30 feet are owned by charterboat operators.

Figure C-14 Existing Town Of Newfane Marina



Parking for launch ramp users was expanded by developing a 150 space parking area above the original auto parking area located behind the seasonal slip rental area. In addition, the town currently leases space on the south side of Route 18 for launch ramp users. This area provides an additional 250-300 parking spaces. The public launch facilities have handled over 300 launches per day on a fishing derby weekend. Data on the number of annual launches at the Town facility over the last five years is provided in Table C25.

The town of Newfane Marina has a six-lane launching ramp facility. The number of launches are recorded on a daily basis at this facility. However, the records only tally those associated with daily launch fees. Annual or seasonal launch permit holders are reflected in data shown in Table C25 (See Section C2,f,(1)). Lake Ontario Boating and Facility Demand). The marina workers tally the total number of launches by type. Types of launches include the seasonal launch, commercial launch and daily launch. There are four types of seasonal launch permits: Town Resident; Non-Resident; New York State Commercial; and Non-New York State Commercial.

Rates vary for residents and non-residents as well as the type of vessel launched. The totals were derived to assess the origins for the boaters launching vessels at the site.

Launches for 1989 are 9,433 through September. This does not include multiple launches by boaters who purchase season passes. Each seasonal pass user is counted only once in this total. Seasonal launches were estimated to be 3,950, bringing total launches for 1989, through September, to 13,383.

The number of launches by state and Canada for April through September, 1989 is summarized in Table C20. The primary state of origin for launched boats is New York. The next most frequent users are from the states of Pennsylvania and Ohio with 24% and 15% of the total usage, respectively. Olcott provides one of the main access points for launching boats in Niagara County. The percent utilization of the launch ramp by state among non-residents is portrayed in Figure C15. Pennsylvania is the main origin of non-residents launching boats at the town of Newfane marina. Ohio follows with a 35% usage rate for non-residents. The totals on Table C24 (see Section C2,f,(1) Lake Ontario Boating and Facility Demand) show that the eastern states bordering New York State are the most significant users of the launch site at Olcott.

Finally, slips for seasonal rent have increased from 30 in 1978 to 48 in 1989. The Town is also contemplating expanding the number of permanent based slips to a total of 68 by the beginning of the 1990 boating season, see Table C21.

Table C20 - 1989 Launches For The Town Of Newfane Marina

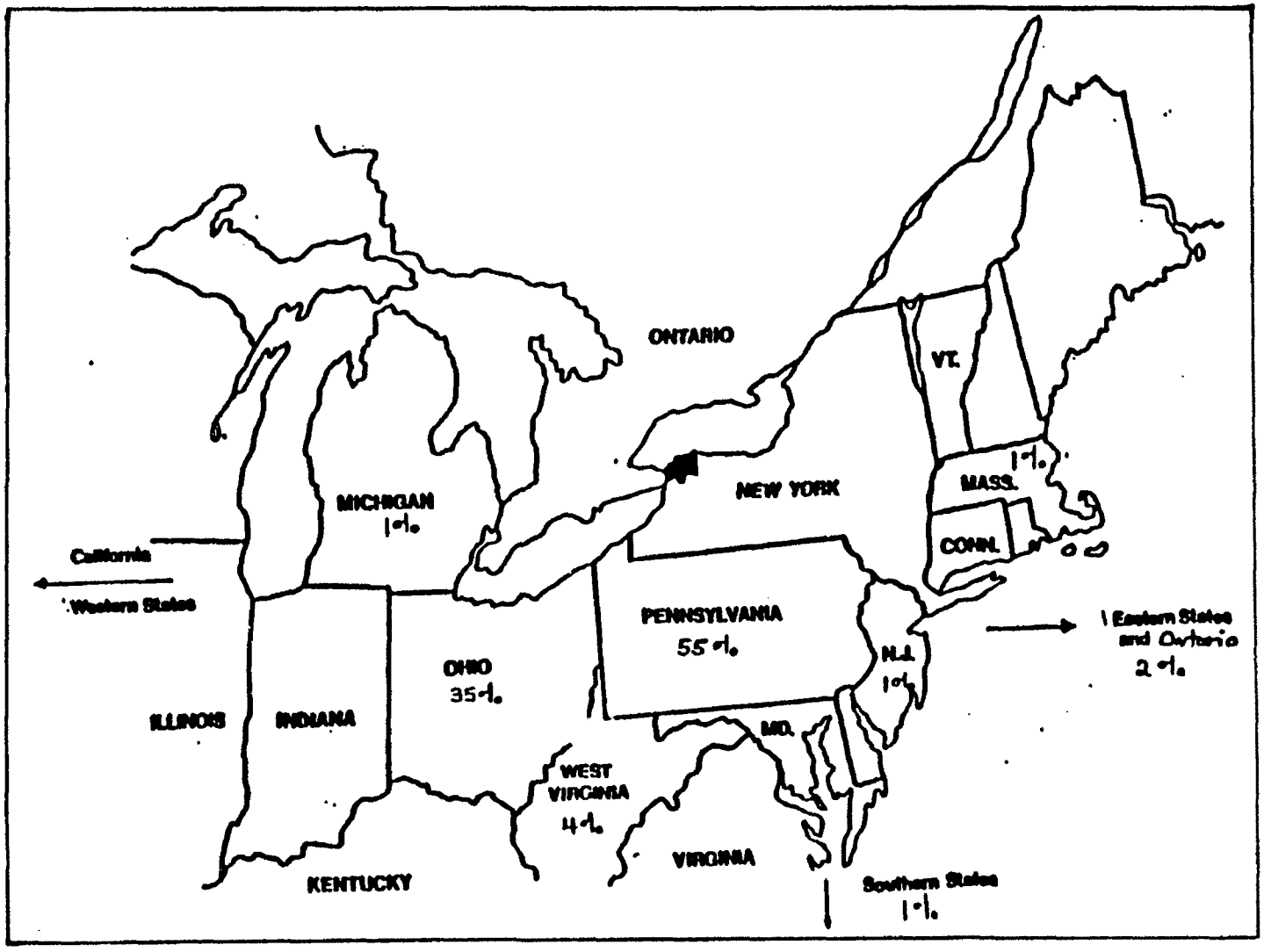
| Area | April | May | June | July | August | September | TOTAL |
|---|---|---|---|---|---|---|---|
| New York | 791 | 579 | 529 | 1,053 | 1,047 | 1,385 | 5,384 |
| Ohio | 141 | 149 | 39 | 66 | 346 | 676 | 1,417 |
| New Jersey | 5 | 20 | | 2 | 5 | 1 | 33 |
| Pennsylvania | 232 | 306 | 145 | 151 | 504 | 867 | 2,205 |
| Connecticut | 1 | | | | 4 | | 5 |
| West Virginia | 26 | 14 | 34 | 13 | 38 | 46 | 171 |
| Maryland | 2 | | 1 | | | 7 | 10 |
| Florida | 1 | 1 | 3 | 5 | 9 | 9 | 28 |
| Delaware | 3 | 4 | 2 | 4 | 3 | 20 | 36 |
| Vermont | 1 | | | | | | 1 |
| Maine | | 2 | | | 2 | | 4 |
| Michigan | | 2 | 2 | 3 | 17 | 23 | 47 |
| Massachusetts | | 2 | 5 | 4 | 24 | 21 | 56 |
| Wisconsin | | | | 1 | | | 1 |
| Nebraska | | | | | 7 | | 7 |
| New Hampshire | | | | 1 | 1 | 1 | 3 |
| Illinois | | | | 1 | | | 1 |
| Indiana | | | | | 1 | 6 | 7 |
| Kentucky | | | | | | 1 | 1 |
| Tennessee | | | | | | 7 | 7 |
| Canada | 2 | | | | 5 | 2 | 9 |
| | | | | | | TOTAL | 9,433 |

Table C21 - Without Project Condition Slips At Olcott Harbor

| Marinas | Wet Slips For Rent 1989 | 1994 |
|---|---|---|
| 1. Hedley Marine | 61 | 61 |
| 2. McDonough Marina | 45 | 90 |
| 3. King Marina | 8 | 8 |
| 4. Town Of Newfane Marina | 48 | 68 |
| | 162 | 227 |

The number of wet slips for rent at Olcott Harbor could increase from 162 in 1989 to 227 in 1994, if McDonough Marine doubles their number of slips from 45 to 90 and the town of Newfane installs 20 additional slips.

Figure C-15 Use Of Town Of Newfane Launch Ramp By State For Non-Resident Users



(4) Public Wharf A public wharf is provided by the town of Newfane at the towns transient dock facilities located at the foot of west Main street. The south side of the transient dock facilities has an L shaped walkway that serves as a public wharf. the wharf extends approximately 140 feet east and 100 feet north. Boats are allowed to tie up to this public walkway to discharge or take on passengers. Ice and public restrooms, as well as the towns fish cleaning station is located within walking distance of the public wharf. This is the only public wharf area in the Olcott Harbor area.

(5) Charter Fishing - Between 100 and 150 charterboat captains used Olcott Harbor over the course of the 1989 season. A 1989 survey of local marinas at Olcott indicated there are between 20 and 30 charterboat captains who rented slip space for the entire 1989 season. These charterboats are "based" out of Olcott Harbor. However, charterboat captains based in Olcott will also go to other harbors along Lake Ontario when there is a major fishing tournament in progress. Most of the 100 to 150 charter captains are from out of State (Pennsylvania, Ohio and Michigan). They have active charter businesses in their home state, and travel to Olcott on weekends for major fishing derbies, and peak salmon run periods during the late summer (Aug/Sept). Many charter captains from Pennsylvania and Ohio focus on Lake Erie walleye when they are not at Olcott. Many of the non-resident charterboat operators launch at Olcott, however, a few launch occasionally at Wilson or the Niagara River.

Over 90 % of the charters at Olcott are specifically for salmon fishing. The peak time periods for Salmon fishing are three weeks in the Spring and four to six weeks in the Fall. During both of these times, salmon can be found one to two miles off shore of Olcott Harbor. In the spring and Summer, salmon are found at selected water temperature zones. Rainbow trout, coho, and chinook prefer water temperatures between 54-56 degrees Fahrenheit. Lake trout can be found at water temperatures between 40-55 degrees Fahrenheit and brown trout at 60 degrees Fahrenheit. Lake Ontario is made up of three thermal layers. The warmest layer, genuinely closest to the surface is called the epilimnion. The middle layer, preferred by salmonids, is called the thermocline. The third layer, or hypolimnion is below the thermocline and is the coldest temperature zone. The depth of each thermal zone is dependent on the particular season and its temperature. For example, from June to the end of August the surface layer, or epilimnion, is very deep. Therefore, the salmonids will be found in deep water because the thermocline is located below the epilimnion. In the spring and fall as water temperatures reach approximately 39 degrees the thermocline is closest to the water surface. This stage lasts for only a short period of time and is the time of year when salmonids run up tributary streams.

Salmonids can be found at water depths of 200 to 300 feet in the summer. This depth of water can be attained by traveling only 2 to 3 miles off Olcott Harbor because of the lake bottom topography in this area. At other harbors located to the east of Olcott, this depth of water is not achieved for at least 4 to 6 miles off shore. Thus Olcott Harbor allows charter captains to access deep water in a relatively short period of time. It also allows them to stay out longer when bad weather is coming since shelter is a shorter distance away. In the Fall, the Salmon are running to spawn. Charters need not go very far out onto the Lake. Given the New York State fish stocking program and the lake bottom topography around Olcott Harbor, this port is developing a nearly year round sportfishing industry. The growth in the charterboat industry has created pressure in the Olcott area for permanent slips for this purpose.

(6) Pleasure Boating There are currently 162 seasonal slips for rent to boat owners at Olcott harbor. This number will increase to 227 by 1994. Twenty five of these slips are currently occupied by charterboat fishermen. In addition to the permanent based slip renters, the town of Newfane has facilities to accommodate launch ramp users and transient boaters.

The town of Newfane launch ramp has 6 lanes and accommodates over 13,000 launches per season. The launch facilities are used to their optimum during the spring and fall salmon runs and during derby weekends. The 150 auto-boattrailer spaces the town has adjacent to its launch ramp facilities are filled during these times. The town has leased an area south of the Route 18 Bridge to accommodate an additional 100 auto-boattrailers. During peak usage periods this area is also filled.

Additional pleasureboating activity is generated by transient boaters. These are boaters who sail their boat to olcott for the day. These boaters can stay overnight in the town of Newfanes transient slip area located north of its launch ramp area. There were 1,142 paid transient rentals at the towns transient facility in 1989.

(7) Stream Fishing - Eighteen-Mile Creek is a tributary of Lake Ontario, entering the lake approximately 18 miles east of the Niagara River. The creek drains a watershed of about ninety-three square miles between the City of Lockport and Lake Ontario.

The Stream can be divided into three major segments:

1) Lake Ontario to Route 18 Bridge
2) Route 18 Bridge to Burt Dam
3) Burt Dam to Drake Settlement Road

The first segment is Olcott Harbor. The Harbor area is between Lake Ontario and the Route 18 Bridge and virtually all of the

commercial development in the creek lies in this area. The Olcott Yacht Club, Hedley's Marine, King Marina, McDonough Marina and the Town of Newfane Marina are in this area.

The second creek segment is from Route 18 Bridge upstream to Burt Dam. Approximately sixty acres of the stream is considered wetland in this area. This segment also receives most of the streambank or shoreline fishing pressure. The primary streambank fishing area lies in this segment between the Town of Newfanes' Fishermen Park and Burt Dam.

Fishermens' Park, 3.8 acres, is the only public access point in this segment. The Park provides a very steep access point to Eighteen-Mile Creek off Route 78. Thousands of fishermen heavily fish this area each year during the spring and early fall runs. During the fall runs, fishermen frequently snatch or snag for Coho and Chinook Salmon.

Snatching basically is foul-hooking fish with hooks, gangs, or similar devices whether or not baited. However, bait or artificial lures are generally not used in snatching. Foul-hooking means not hooking fish in the mouth. Snatching on Eighteen-Mile Creek is permitted from August 15 to November 15 from the old New York Central Railroad Bridge to Burt Dam, an area roughly 1,100 feet long. Snatching is not permitted in any other area of Eighteen-Mile Creek at any time.

Although night fishing is permitted in Lake Ontario, New York State Fishing Regulations prohibit possession, at night, of trout and salmon in all but two tributaries of Lake Ontario. The two tributaries are Oak Orchard Creek and Sodus Bay. Night fishing in Eighteen-Mile Creek is prohibited. In addition, fish snatching on Eighteen-Mile Creek is prohibited at night. Night means one half hour after sunset to one half hour before sunrise. Fishing in Lake Ontario or from the Olcott Piers, however, is legal at night.

There are approximately sixty private docks in the second area of Eighteen-Mile Creek. The docks are generally located below residences and accessed through steep stairs from the top of the bluff.

The wetland area between Route 18 Bridge and Burt Dam is characterized by twenty to sixty feet high bluffs on each bank. The approximately sixty acre wetland is regularly flushed by lake flooding and stream flow. The stream is about eight to twelve feet deep along its narrow channel and lined with alluvial flats two to three feet deep.

Fishermens Park is located just downstream of Burt Dam. The town constructed a pedestrian trail from Fishermens Park to Burt Dam several years ago. This has greatly improved access for fishermen, particularly snaggers in the fall.

The third creek segment is above Burt Dam to Drake Settlement Road. The upper area does not support a coldwater fishery since the eighty feet high dam prevents Lake Ontario fish migration into this area. However, the area does have a warmwater fishery, primarily panfish and forage fish. This area has limited public access available for warmwater fishermen.

(8) Pier Fishing - Olcott Harbor provides excellent pier fishing opportunities for fishermen. The west pier is 873 feet long and 26 feet wide; the east pier is 850 feet long and twenty feet wide. A navigation light is located on the north end of the west pier. The federal channel between the piers is approximately 140 feet wide and 1530 feet long, although the distance between piers is 200 feet. The channel depth is maintained to twelve feet below low water datum (LWD).

The two piers are accessed through private properties. The access to the west pier is through the Olcott Yacht Club property; access to the east pier through the Hedley Boat Company property. Parking and sanitary facilities are provided at a town site on the west bank adjacent to the Olcott Yacht Club and at the Town Marina. Sanitary facilities are also provided on the east bank adjacent to the access path. Several parking areas are also located on the east bank.

The use of the federal piers at Olcott has grown tremendously as a result of the NYSDEC Fish Stocking program. Eighteen-Mile Creek is ranked among the top ten tributaries in Lake Ontario in terms of number of fingerlings and yearlings stocked each year.

The two piers are heavily congested and over utilized in the fall and spring during salmonid runs. Fishermen are attracted to the piers because fish congregate immediately offshore for several weeks prior to running upstream. These fish are frequently caught from the piers. Coho, Chinook, Brown Trout, Rainbow Trout, and Steelhead are among the species typically caught from the piers in the spring and fall. Steelhead also migrate upstream in the spring.

An informal survey of pier fishermen was conducted in October, 1989. Over fifty percent of the fishermen were from outside Niagara. Many were from Ohio and Pennsylvania, on three to five day fishing trips. In addition, many were from Erie County. There were usually about thirty fishermen on the piers during weekdays. However, the numbers swelled to several hundred in the evening and on weekends. Fishing pressure increased significantly at night on the piers.

The congestion on the piers frequently resulted in crossed lines when fish are hooked. In addition, fishing lines are often tangled in boat propellers and lost. The large number of boats using the harbor combined with the heavy pier fishing pressure

has created a frustrating situation for both boaters and pier fishermen.

The increased night fishing pressure was attributed to New York State Fishing Regulations. Fishing Regulations prohibit possession of Lake Ontario trout and salmon on tributaries at night time. Thus, many fishermen who would have fished on the creeks in Niagara County at night are not permitted to. They typically fish on the piers at Olcott at night. Also, many workers from Lockport, Niagara Falls, and Buffalo industrial plants fished after work. Many of the fishermen interviewed indicated they spent the entire night fishing on the piers. Three weeknight fishermen counts during September and October indicated 150 to 200 fishermen each night fished from the piers. On weekends during peak run periods, fishermen were lined up shoulder to shoulder on each pier.

Olcott Harbor is perceived by fishermen to be much more productive than nearby Wilson Harbor. Only the 663 feet long east pier at Wilson is practical for pier fishing. The 666 feet long West pier is over one half mile from the nearest road access point and all the lands on Sunset Island between the road access point and the pier are private property. In addition, the pier is connected to shore by a single steel sheet pile wall approximately three hundred feet long, thus preventing safe access. Wilson piers were virtually empty on the two informal weeknight counts. Heavy use by fishermen was indicated at Wilson East Pier on other occasions.

(9) Fishing License Sales - Fishing license sales in New York State have fluctuated in the years between 1972 and 1986, but over all sales increased thirty-one percent. Most of the increase occurred in the Great Lakes Counties bordering on Lake Erie and Lake Ontario. The fishing license sales increased sixty-five percent in Great Lakes counties form 1972 to 1986. The ten Great Lakes counties contributed 31% to the total state sales in 1972 and 39% in 1986.

Each license year begins on October 1 and ends on September 30. For example, the 1980 license data is for the license year October 1, 1979 through September 30, 1980. Fishing license sales for NYS Great Lake Counties are shown in Table C22.

A decrease in fishing license sales occurred in 1976-1979 when a ban was placed on the consumption and possession of Lake Ontario fish by the New York State Departments of Health and Conservation. The possession of eight different species was banned because of possible health effects. Restrictions for several species were relaxed in the spring of 1977. The decrease in sales was due to fewer New York State resident sales. Non-resident sales increased every year, except 1975, despite the

Table C22- NYS Fishing License Sales:Great Lakes Counties (1986)

| County | Resident | Nonresident | Total | Percent Change 72-86 Resident:Non Res:Total | | |
|---|---|---|---|---|---|---|
| Cayuga | 9,037 | 1,387 | 10,424 | 7.5 | 670.6 | 21.4 |
| Chautauqua | 16,310 | 12,428 | 28,738 | 0.9 | 98.8 | 28.2 |
| Erie | 70,642 | 1,406 | 72.048 | 15.3 | 266.1 | 16.9 |
| Jefferson | 24,677 | 17,615 | 42,292 | 18.6 | 319.8 | 69.2 |
| Monroe | 61,501 | 4,020 | 65,521 | 16.9 | 755.3 | 23.4 |
| Niagara | 25,672 | 13,466 | 39,138 | 42.9 | 11,028.9 | 116.4 |
| Orleans | 5,576 | 7,776 | 13,352 | 12.8 | 22,117.1 | 168.3 |
| Oswego 1/ | 25,426 | 52,004 | 77,430 | 71.8 | 11,482.2 | 407.9 |
| St. Lawrence | 20,468 | 4,371 | 24,839 | 27.9 | 123.0 | 38.3 |
| Wayne | 14,974 | 5,408 | 20,382 | 32.4 | 3,505.3 | 77.9 |

1/ The Altmar Salmonid Hatchery is located on the Salmon River in Oswego County. Although the Hatchery opened in 1981, the first fall run of Salmonids under the stocking program occurred in 1973.

ban. Increased non-resident sales is attributed to their strong commitment to fishing. The number of resident fishing licenses sold outnumbered the nonresident licenses sold by sixteen times in 1972. In 1986, they only outnumbered non-resident sales by two times, marking a substantial increase in non-resident sales.

Fishing Licenses sold in the Town of Newfane reflect a dramatic increase form 1980-1987. The sales of non-resident fishing licenses increased at a compound annual rate of 102.9% while total sales increased 43.3% per year. The breakdown of Newfane fishing license sales, by category, is shown in Table C23.

Most of Niagara County's sales of Non-resident fishing licenses occur in Newfane. A total of 13,446 Non resident fishing licenses were sold in Niagara County in 1986. The Town of Newfane sales were 8,732 for license year 1986 and 11,184 for 1987.

A health advisory is in effect for Lake Ontario Salmonids at this time. The fish advisory recommends no consumption of most larger salmonids and only limited consumption of smaller salmonids. The advisory has generated a significant level of debate and is discussed in further detail in Section C2.b.3. Lake Ontario Fish Advisory. The controversy focuses on the testing procedures, primarily results of independent testing resulted in contaminant

levels allowing consumption., In addition, there is evidence that Lake Ontario salmonid contaminant levels may be decreasing. Although the advisory is in effect, most anglers consume their catch of Lake Ontario fish.

Table C23 - Newfane Fishing License Sales 1980-1987

| Year (1) | Resident Year | Non-Res 3 Day | Non-Res 7 Day | Non-Res Total | Year | Non-Res Total |
|---|---|---|---|---|---|---|
| 1980-81 | 1012 | 12 | 54 | 13 | 1091 | 79 |
| 1981-82 | 1435 | 54 | 183 | 60 | 1732 | 297 |
| 1982-83 | 1891 | 146 | 721 | 121 | 2879 | 988 |
| 1983-84 | 2198 | 443 | 3180 | 226 | 6047 | 3849 |
| 1984-85 | 2850 | 982 | 7480 | 270 | 11582 | 8732 |
| 1985-86 | 2374 | 1471 | 8870 | 843 | 13558 | 11184 |

1/ A license Year begins on October 1 and ends on September 30.

Source: Sea Grant Publication; Fishing License Sales in New York's Great Lakes Counties; January, 1988.

f. Lake Ontario Boating And Fishing Demand.

(1) General - Recreational boating on Lake Ontario has steadily increased over the past two decades. This growth is due in part to the successful fish stocking program during this time which resulted in the rehabilitation of the trout and salmon fishery on Lake Ontario. Other factors include improvements in water quality and the changing national trend of higher per capita boat ownership.

From 1985 to 1988, power boat excursions on the open waters of Lake Ontario have increased from 120,892 to 199,888 (65%) and fishing trips increased from 176,251 to 193,725 (10%). From 1977 to 1986, the number of registered boats in New York State increased from 335,288 to 358,400 (7%) after a slight decline until 1980. The 10 county Great Lakes / St. Lawrence River region comprised one quarter of the total increasing its share of the state total by nearly two percent since 1976. Monroe and Erie counties represent the greatest number of registered boats of the upstate counties, 6.9% and 6.4% respectively.

The number of registered boats located in a five county area surrounding Olcott Harbor is presented in Table C24. The Table provides data on number of registered boats from 1985 to 1990 for the counties of Erie, Genesee, Monroe, Niagara and Orleans. Growth in the number of registered boats for this time period ranged from a low of 15 percent in Monroe County to a high of 23

Table C24- Historical Data On Registered Boats By County (1)

| | Y E A R | | | | | |
|---|---|---|---|---|---|---|
| County | 1990 | 1989 | 1988 | 1987 | 1986 | 1985 |
| Erie | 25,792 | 25,633 | 25,544 | 24,217 | 22,775 | 21,892 |
| Genesee | 1,829 | 1,798 | 1,733 | 1,636 | 1,487 | 1,398 |
| Monroe | 27,278 | 27,139 | 27,181 | 26,202 | 24,714 | 23,603 |
| Niagara | 8,303 | 8,190 | 7,998 | 7,592 | 7,134 | 6,820 |
| Orleans | 1,670 | 1,621 | 1,567 | 1,446 | 1,360 | 1,357 |

(1) County Of Residence

percent in Orleans County. Total number of registered boats increased from 55,070 in 1985 to 64,872 in 1990. This is an increase of 9,802 registered boats over a five year period.

(2) Demand For Access To Lake Ontario - Niagara's shoreline is the nearest access point for salmonid fishing for a major metropolitan area with a population in excess of 1.5 million and with over 6 million licensed fishermen living within the a 300 mile radius of Niagara County. Annual spring and fall salmon derbies on Lake Ontario put peak pressures on existing facilities at Olcott Harbor when thousands of fishermen flood into the hamlet. During the 1989 season, Olcott ramps handled as many as 500 fishing boats on a derby day! Cars and trailers have been backed up to as far as route 78 waiting to launch, a distance of over half a mile. Forty-three percent of 9,433 daily launches Newfane launch facility at Olcott during the 1989 season were from out of New York State. Daily launch records kept by the town indicate that the preponderance of out of state launches originate from Pennsylvania (54.5%) and Ohio (35.0%). Table C25 presents the distribution of the non-resident launch statistics at Olcott for the 1989 season.

Since its construction in the late seventies the number of launches occurring at Olcott has been steadily growing. The total number of daily annual launches has grown at an annual compound growth rate of 13.9 percent during the period 1980 to 1988. Though not experiencing as great a growth as the daily launches, the number of annual launch permits has also increased over the decade at 3.2 percent annually. The total number of existing launches occurring at Olcott can only be estimated in that launch permit holders may launch their craft as often as

Table C25 - Distribution Of Out-of-State Launches At Olcott By Area of Origin, 1989 Season

| Area of Origin | Daily Launches in 1989 | Percent |
|---|---|---|
| Pennsylvania | 2,205 | 54.5 |
| Ohio | 1,417 | 35.0 |
| West Virginia | 171 | 4.3 |
| Eastern States | 58 | 1.5 |
| Massachusetts | 56 | 1.5 |
| Michigan | 47 | 1.2 |
| Southern States | 46 | 1.1 |
| New Jersey | 33 | 0.9 |
| Total | 4,033 | 100.0 |

they wish without an additional charge. Table C26 shows the historical launch growth at the existing facility at Olcott for the period 1980 through 1989. Since its construction in the late seventies the number of launches occurring at Olcott has been steadily growing. The total number of daily annual launches has grown at an annual compound growth rate of 13.9 percent during the period 1980 to 1988. Though not experiencing as great a growth as the daily launches, the number of annual launch permits has also increased over the decade at 3.2 percent annually. The total number of existing launches occurring at Olcott can only be estimated in that launch permit holders may launch their craft as often as they wish without an additional charge.

Table C26 - Olcott Harbor Annual Launches And Seasonal Passes 1980-1989)

| Year | Seasonal Launch Permits | Daily Launches |
|---|---|---|
| 1989 1/ | 170 | 9,271 |
| 1988 | 163 | 9,826 |
| 1987 | 192 | 8,999 |
| 1986 | 175 | 8,024 |
| 1985 | 173 | 7,425 |
| 1984 | 165 | 6,596 |
| 1983 | 138 | 5,086 |
| 1982 | 114 | 4,516 |
| 1981 | 130 | 3,322 |
| 1980 | 128 | 3,482 |

1/ Data is based on records for partial year.

(3) NY State Fishing License Sales - During the decade from 1970 to 1980, resident New York State licensed fisherman increased by 125,729 (16.6%) despite a population loss of 684,103 in the State during the same period (Section C2.e.9 of this report discusses fishing license sales in greater detail). Fishing license sales in New York have increased 31 percent during the period between 1972 and 1986 and 65 percent in the Great Lakes counties for the same period. Nonresident sales comprised about one third of the Great Lakes county's total of 394,164 in 1986. This is a significant increase since 1972 when nonresident licenses comprised only about six percent of total license sales. Niagara County license sales along with Niagara County Fishing Derby records indicate that Ontario (23%), Pennsylvania (28%), and Ohio (11%) are the main sources of non-resident fishermen in Niagara County. In terms of species sought, trout and salmon dominate in New York's open lake fishery, comprising 82 percent in 1985 and jumping to over 90 percent of all fish sought in 1988. Clearly, Lake Ontario has become a nationally renowned sport fishery and will continue to play a major role in support of the Nation's growing demand for specialized recreation.

(4) Demand for Shoreline Access - While boating is the primary means of access for Lake Ontario fishermen, public shore access plays an important role for fishing demand particularly for lower income groups. Shore access is provided through the shoreline and piers. According to a Niagara County Fisheries Development Study, most Lake Ontario pier fishing is done between the piers at Wilson and Olcott. During peak times, primarily the spring and fall salmon runs, 150 fishermen line the Wilson east pier and up to 200 line the west pier at Olcott. Fort Niagara, Four-mile Creek, Golden Hill State Park, and Niagara County's Krull Park and Centennial Park provide shoreline access to fishermen on Lake Ontario. Additional shore access is provided along the banks of county streams flowing into Lake Ontario. Major fishing occurs at the streams having the heaviest outflow. The largest and longest spring and fall salmon runs are at Wilson and Olcott. Most existing access for shore based fishermen is at capacity with parking shortage also being a major problem.

(5) Boating Facility Growth - According to permit records, continued growth in boating facilities along Lake Ontario has been spurred by an attempt to meet this demand with the expansion of Lake Ontario marinas providing wet berths for permanent based boats and growing transient traffic as well. These records also indicate continued growth in the number of launch lanes at launch ramp facilities on Lake Ontario. The problem remains however that adequate locations to facilitate cost effective expansion for this growing demand has become scarce so that only marginal sites remain. In 1982, Niagara County Department of Economic Development and Planning estimated a need for an additional 35 boat ramps for Niagara County to meet 1985 demand.

(a) Slip Demand In Niagara And Erie County. The Buffalo District conducted a telephone survey of marina operators in a number of New York State lake counties in the Fall of 1990. Two of the counties canvassed was Erie and Niagara County. A number of questions relating to marina operations and services provided was collected. Some of the questions asked were: number of docks/slips available, number of rentals in the 1990 season, existence of a waiting list, and number of boat owners on the waiting list. Table C27 presents some summary data from the survey.

There are a total of 1,053 and 4,278 slips/moorings located in Niagara and Erie County respectively. Slip utilization in Erie and Niagara County marinas was found to be over 99 percent. Fifty-six percent of the marinas in Erie County and 50 percent of the marinas in Niagara County keep waiting lists. Waiting lists consist of names of boat owners who wish to rent a slip at the marina in question but cannot because there are no slips available. Boaters currently renting slips at a marina are asked at the end of the season, if they will be renewing for the next season. When a slip becomes available for rent in the upcoming season, the marina operator will call the first name on his "waiting" list. He then continues down this list until he has no more slips available for rent. Characteristically, the turnover rate of slip renters in Erie and Niagara Counties is not that high. A turnover rate of three to five percent per year is the norm for area marinas. A total of 1,635 names were on waiting lists in Niagara and Erie Counties for the 1991 boating season. For some marinas, if every slip renter did not return the following year, it would take three years to totally deplete the waiting list. Forty-four percent of the marina operators in Erie County and 50 percent of the marina owners in Niagara County do not even keep waiting lists. This is because the owners have been able to rent all of their slips every year without having to develop and maintain a "waiting" list.

The marina operators were also asked whether they have any plans for expansion. Although many operators expressed a desire to expand, they also indicated space limitations at their marina preclude developing any expansion plans. Only six out of the thirty-nine marinas indicated they have any plans for expansion.

(b) Facility Demand At Olcott - During the Fall of 1988, The Buffalo District conducted two mail surveys to assess, among other things, the demand for an expanded facility at Olcott Harbor, N.Y. Details regarding the administration and subsequent analysis of the survey are described later in this appendix. The surveys were designed for two populations: 1) registered boaters residing in a five county area surrounding the proposed harbor site and 2) non-boat owning households in the same area. Based on the analysis of respondent's data, demand relationships were derived for seasonally renting a slip at the proposed facility at Olcott, launching a boat at the proposed facility, and simply for the existence of the proposed facility regardless of the

Table C27- SLIP UTILIZATION BY MARINAS IN NIAGARA AND ERIE COUNTY - 1990 BOATING SEASON

| MARINA NAME | LOCATION | COUNTY | BOAT OWNERS RENTING SLIPS | DOCKS/ MOORINGS AVAILABLE | PERCENT UTILIZA OF DOCK | EXPAN PLANS | NUMBER OF BOAT OWNERS ON DOCK WAITING LIST |
|---|---|---|---|---|---|---|---|
| NIAGARA COUNTY | | | | | | | |
| HEDLEY MARINE | OLCOTT | NIAGARA | 70 | 65 | 100.00% | No | N/A |
| MAJORS DOCK | OLCOTT | NIAGARA | 7 | 7 | 100.00% | No | 3 |
| McDONOUGH MARINE | OLCOTT | NIAGARA | 70 | 70 | 100.00% | Yes | 30 |
| TOWN OF NEWFANE | OLCOTT | NIAGARA | 120 | 120 | 100.00% | No | 300 |
| BECUE BOAT BASIN | WILSON | NIAGARA | 350 | 350 | 100.00% | No | 30 |
| TUSCARORA YACHT CLUB | WILSON | NIAGARA | 143 | 155 | 92.26% | No | N/A |
| WILSON BOAT YARD | WILSON | NIAGARA | 50 | 50 | 100.00% | No | N/A |
| WILSON YACHT CLUB | WILSON | NIAGARA | 45 | 45 | 100.00% | NO | N/A |
| WILLIAMS MARINE | YOUNGSTOWN | NIAGARA | 20 | 20 | 100.00% | Yes | 10 |
| YOUNGSTOWN YACHT CLUB | YOUNGSTOWN | NIAGARA | 30 | 30 | 100.00% | No | 5 |
| VILLAGE OF LEWISTON | YOUNGSTOWN | NIAGARA | 16 | 16 | 100.00% | No | 100 |
| PERFORMANCE MARINE | NIAGARA FALLS | NIAGARA | 23 | 23 | 100.00% | No | N/A |
| LASALLE YACHT CLUB | NIAGARA FALLS | NIAGARA | 66 | 66 | 100.00% | No | N/A |
| HIDEAWAY HARBOR | PENDELTON | NIAGARA | 36 | 36 | 100.00% | No | N/A |
| | | | 1,046 | 1,053 | 99.34% | | 478 |
| ERIE COUNTY | | | | | | | |
| ANCHOR MARINE | GRAND ISLAND | ERIE | 150 | 150 | 100.00% | Yes | 0 |
| BIG 6 MILE CREEK | GRAND ISLAND | ERIE | 126 | 126 | 100.00% | No | 100 |
| BLUE WATER MARINA | GRAND ISLAND | ERIE | 55 | 55 | 100.00% | No | N/A |
| BUFFALO LAUNCH CLUB | GRAND ISLAND | ERIE | 49 | 49 | 100.00% | No | 10 |
| EAST RIVER MARINA | GRAND ISLAND | ERIE | 57 | 57 | 100.00% | No | 100 |
| RIVER OAKS MARINA | GRAND ISLAND | ERIE | 304 | 304 | 100.00% | No | N/A |
| ISLAND MARINE | GRAND ISLAND | ERIE | 54 | 54 | 100.00% | No | 15 |
| AQUA LANE MARINE | TONAWANDA | ERIE | 51 | 51 | 100.00% | No | N/A |
| BOW & STERN MARINA | NORTH TONAWANDA | ERIE | 110 | 110 | 100.00% | Yes | N/A |
| HI-SKIPPER MARINE | NORTH TONAWANDA | ERIE | 35 | 35 | 100.00% | No | N/A |
| INNER HARBOR YACHT CLUB | NORTH TONAWANDA | ERIE | 28 | 28 | 100.00% | No | 20 |
| ADMIRALS COVE | NORTH TONAWANDA | ERIE | 244 | 244 | 100.00% | No | 0 |
| NIAGARA RIVER YACHT | NORTH TONAWANDA | ERIE | 108 | 108 | 100.00% | No | N/A |
| PLACID HARBOR MARINA | NORTH TONAWANDA | ERIE | 88 | 88 | 100.00% | No | 0 |
| SMITH BOYS | NORTH TONAWANDA | ERIE | 350 | 350 | 100.00% | Yes | N/A |
| WARDELL BOAT YARD | NORTH TONAWANDA | ERIE | 60 | 60 | 100.00% | No | N/A |
| HANKS BOAT LIVERY | BUFFALO | ERIE | 44 | 44 | 100.00% | No | 8 |
| HARBOUR PLACE MARINA | BUFFALO | ERIE | 130 | 135 | 96.30% | No | N/A |
| BUFFALO YACHT CLUB | BUFFALO | ERIE | 50 | 50 | 100.00% | No | 180 |
| ERIE BASIN MARINE | BUFFALO | ERIE | 280 | 280 | 100.00% | No | 500 |
| RICH MARINE SALES | BUFFALO | ERIE | 475 | 475 | 100.00% | No | N/A |
| BOUGAURD BOAT LIVERY | BUFFALO | ERIE | 42 | 42 | 100.00% | No | N/A |
| NFTA SMALL BOAT HARBOR | BUFFALO | ERIE | 1042 | 1042 | 100.00% | Yes | 0 |
| RCR YACHTS | BUFFALO | ERIE | 130 | 130 | 100.00% | No | 24 |
| STURGEON POINT | DERBY | ERIE | 211 | 211 | 100.00% | No | 200 |
| | | | 4,273 | 4,278 | 99.88% | | 1,157 |

facility, and simply for the existence of the proposed facility regardless of the respondent's intended use. These data show significant demand exists for the proposed new facility which supports the State Comprehensive Outdoor Recreation Plan (SCORP) for New York which indicates excessive needs for new boating facilities in that region.

According to survey results, forty percent of registered boaters residing in Niagara County would rent a slip at the proposed facility at Olcott, with over 700 of these Niagara county boaters willing to pay a seasonal storage fee of $1,000 or more. About one out of six registered boaters from the four county area of Erie, Monroe, Genesee and Orleans indicated that they would rent a slip at the proposed site, with approximately 2,600 of these boaters willing to pay $1,000 or more per season for wet storage. Simulated market demand curves were derived from the survey and are presented in a later section.

Demand for accessing a new launch facility at Olcott was also expressed. The survey showed that three quarters of the boaters residing in Niagara county would want to launch there, and over one half of the registered boaters from the outer four county area would launch there also. This is supported by current use statistics at the launch facility at Olcott. Table C26 presented the number of annual launches at Olcott during the period 1980 through 1989 and the number of seasonal launch passes sold for the same period. The number of annual launches at Olcott has grown significantly this decade with nearly a 14 percent annual compound growth rate from 1980 to 1988.

C3. WITH PROJECT CONDITION

a. General Introduction. Two plans were considered in detail in the Reformulation Study: Plan 10A Modified and Plan 10B. Plans 10A Modified and 10B will provide additional facilities for all water related activities currently taking place at the harbor. Existing water related activities/services consist of launch ramps, slip rentals, charterboat operations, slips for transient use, pier fishing, sightseeing, and swimming. These activities will be enhanced by expanding their current capacity, consolidating their locations, and providing safer access to the open lake. The ambience of the whole harbor area will be enhanced by the addition of two new water related activities: A tour boat and a "Water Taxi".

The current launch ramp facilities will be enhanced with the addition of a new launch ramp located adjacent to the north side of the existing launch ramps. In addition ancillary parking will be provided south of the Route 18 bridge. The number of wet slips for seasonal rent will be increased by 886 under Plan 10A Modified and 1,118 slips for Plan 10B. These slips will be located behind breakwaters that will enclose the current Federal piers. Both plans will provide fifty slips for charterboat usage. All charterboat operations will be consolidated into one area: The current town of Newfane slip rental area. In addition, 50 slips will be set aside for transient use. The slips will be located on both sides of the east Federal pier and on the east side of the west Federal pier. These slips will offer power and water hookups.

Access to the lake will be enhanced for pier fishermen and sightseers. Plans 10A Modified and 10B call for pedestrian access to the 3,230 foot long east breakwater. The pedestrian walkway will provide fishermen a new access to the lake fishery. In addition, sightseers will also be able to use the east breakwater. The pedestrian walkway will have a guardrail along its 3,230 foot length. This walkway will offer excellent opportunities for sightseeing during the day and evening.

Access to the open lake will be enhanced for current launch ramp users, slip renters and charterboat fishermen. Currently, wind generated wave action between the Federal Piers makes navigation to and from the lake hazardous. This hazard is acerbated since the Federal piers forms an 1,800 foot long passageway that must be navigated before open water is reached. The wave action has two impacts on slip renters, launch ramp users and charterboat fishermen in their utilization of open lake water. These boaters may decide to not go boating on days when the channel route is choppy. Alternatively, if they are out on the open lake, they may decide to return early to avoid the unfavorable wave climate between the Federal piers.

Both plans will improve boater access to the lake over existing conditions. Both plans will reduce the wave heights between the existing Federal piers. Model testing of the proposed breakwater configurations indicates all waves currently occurring between the Federal piers will be reduced to wave heights of a little greater than .5 feet. This will allow boaters to access the open lake on days when they currently can not. It also allows current boat users to stay out on the open lake longer.

The plans also offer new water related recreational activities. A new tour boat operation will be located on the south west side of the existing east Federal pier. Tours will be offered on the weekends and during the week. In addition, a "water taxi" service will be established to ferry passengers to and from collection points on either side of Eighteen Mile Creek and the new harbor area. This will in essence provide public transportation throughout the harbor area via the water.

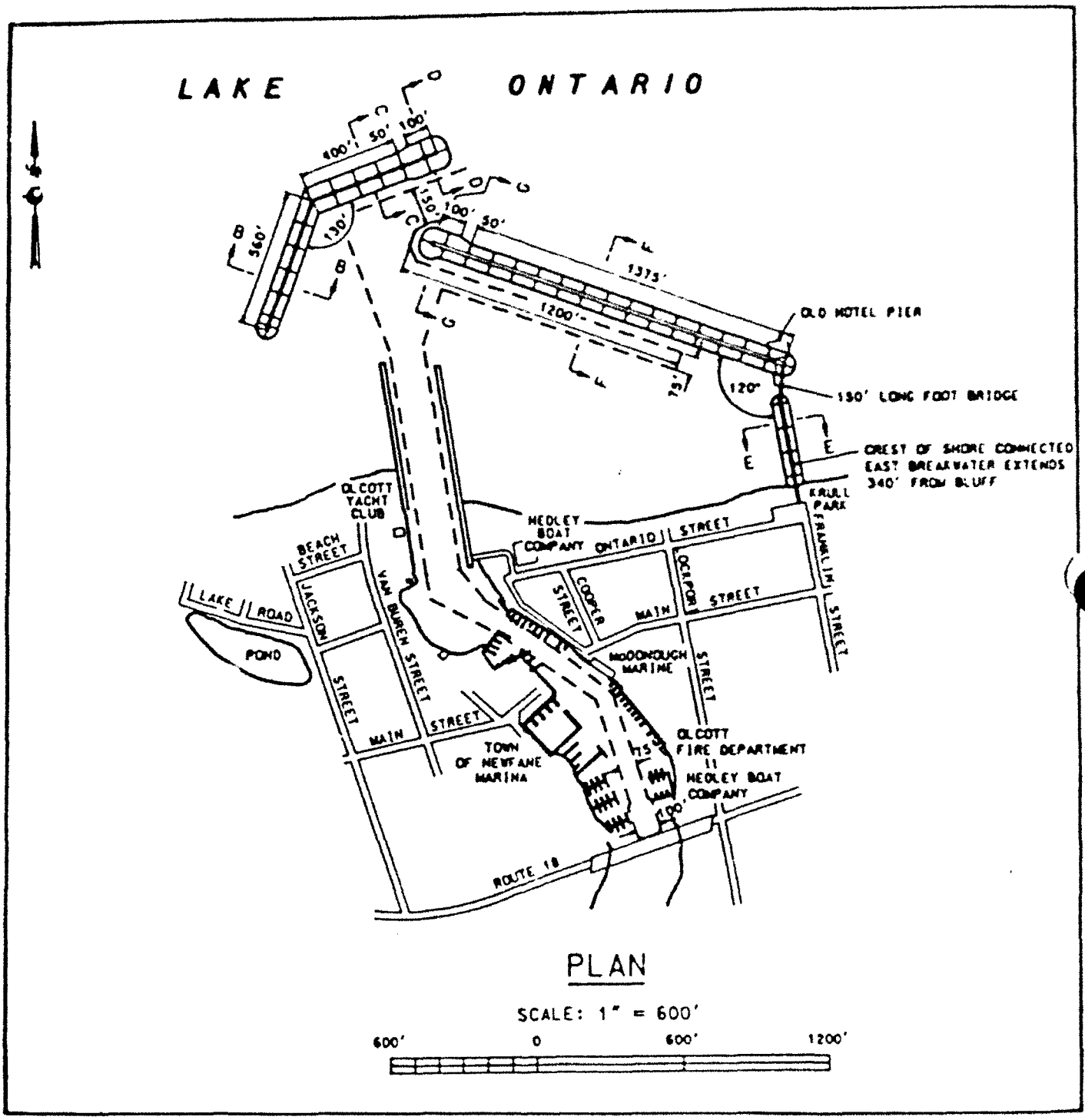
b. Plan Components. The main components of Plans 10A Modified and 10 B are presented below. A more detailed description is located in the Main Report.

(1) Plan 10A Modified - The main components of Plan 10 A Modified (See Figure C 16) consist of:

(a) Rubblemound Breakwaters - The breakwaters are located to the east and west of the current Federal piers. The East Breakwater forms a protected basin area for 886 recreational slips. The East Breakwater has two components: a 340 foot shore connected component linked by a 70 foot pedestrian bridge to a 1,525 foot detached east breakwater. The 70 foot breakwater gap under the pedestrian bridge facilitates passage of water and fish between the harbor and Lake Ontario. A pedestrian walkway with guardrails is provided atop the entire length of the shore connected East Breakwater. The East Breakwater forms an interior angle of 120 degrees. The West Breakwater is detached and consists of a 260 foot long shored leg and a 500 foot long lakeshore leg with an interior angle of 120 degrees. The two breakwaters will reduce wave action in the east basin area to a maximum of 2 feet and between the current Federal piers to a maximum of .6 foot.

(b) Navigation Channels - The entrance channel between the East and West Breakwaters will be 100 feet wide and 12 feet deep. An access channel connecting the entrance channel and the East basin will be 75 feet wide, nine feet deep and 1,200 feet long. Annual maintenance of the channel will be the responsibility of the local cooperator.

Figure C-16 Plan 10 A "Modified"



(c) Launch Ramp - An additional launch ramp consisting of two launch lanes will be located adjacent to the north side of the existing launch ramps. Additional launch ramp parking will be provided South of the Route 18 bridge.

(d) Pedestrian Lake Access - A pedestrian walkway with guardrails is provided atop the entire length of the shore connected East Breakwater. The East breakwater will provide lake access for sport fishermen and sightseers.

(e) Boat Slips - The plan calls for 886 new slips to be located behind the new breakwaters. Fifty slips will be reserved for charterboat operators and another fifty slips for transient craft. This leaves 786 slips for private recreational usage. The slips for transient craft will be located on both sides of the east Federal pier and on the east side of the west Federal pier. These slips will offer power and water hookups. The slips will be installed after mid June and removed after Labor Day. This allows the current federal piers to be used by fishermen during the Spring and Fall salmon runs.

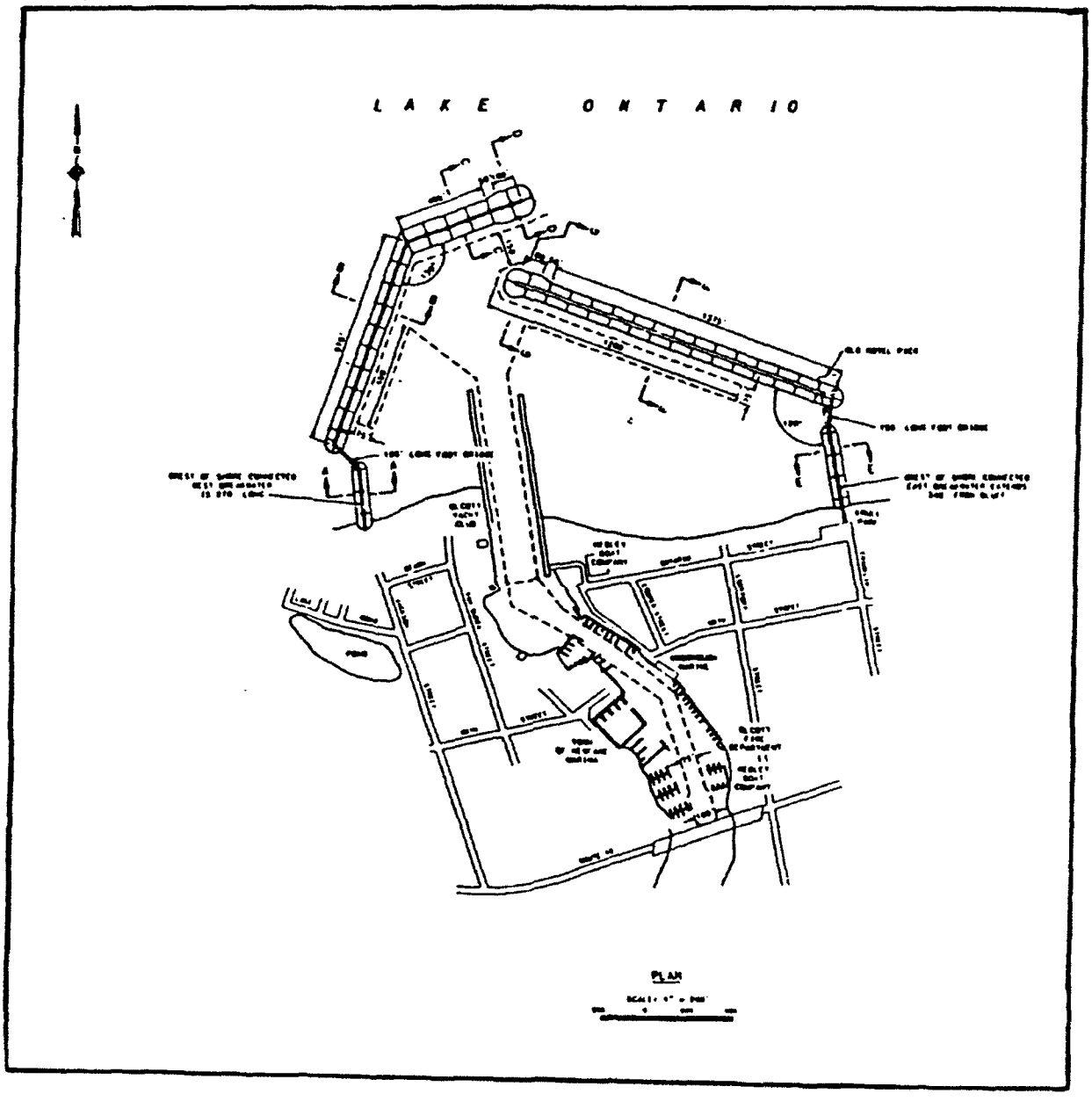
(f) Tour Boat Facilities - Tie-up space for a tour boat operation will be provided on the south end of the west side of the east Federal pier.

(g) Other Ancillary Upland Facilities - In addition to the above facilities, the local cooperator will provide all additional infrastructure improvements and recreational facilities needed to achieve the benefits claimed during the period of analysis. These additional costs include roadways and construction costs of parking areas used by: slip renters, visitors to the slip renters, launch ramp users, charterboat fishermen, tour boat visitors, fishermen fishing off of the breakwaters and sightseers using the breakwaters and the harbor area in general. Also incurred by the local cooperator are all restroom costs, slip access ramp costs and electric and water hookup costs for slip renters, charterboat operators and transient slip users. The local cooperator has also set aside $825,000 for purchase of land and construction materials to provide a marine service building. This building could include all offices needed by the marina staff, public restrooms, and retail floor space for complementary marine retail activities. This money could also be used to provide such marine related services as marine gasoline sales and pump out facilities for boat sanitary holding tanks.

(2) Plan 10B - The main components of Plan 10B (Figure C 17) are as follows:

(a) Rubblemound Breakwaters - The East breakwater is the same as Plan 10A. The East Breakwater forms a protected basin area for 886 slips. The shore connected East Breakwater will

Figure C-17 Plan 10 B



provide lighted pedestrian access and guardrails atop its entire length. The West Breakwater is connected to shore and provides a basin area for an additional 232 boat slips. The West Breakwater has two components: a 270 foot shore connected component linked by a 150 foot pedestrian bridge to a 1,520 foot detached west breakwater. The detached west breakwater has a dogleg right with the shoreward section being 970 feet long and the lakeward section 550 feet long. The 150 foot breakwater gap under the pedestrian bridge facilitates passage of water and fish between the harbor and Lake Ontario. The West Breakwater will provide pedestrian access and guardrails atop its entire length. The two breakwaters will reduce wave action in the east and west basin area to a maximum of 2 feet and between the current Federal piers to a maximum of .6 foot.

(b) Navigation Channels - Same as plan 10 A Modified.

(c) Launch Ramp - Same as Plan 10 A Modified.

(d) Pedestrian Lake Access - A pedestrian walkway with guardrails is provided atop the entire length of the shore connected east breakwater. The west breakwater will also provide a pedestrian walkway with guardrails atop its entire length. These breakwaters will provide lake access for sport fishermen and sightseers.

(e) Boat Slips - Plan 10B calls for 1,118 slips. The East basin will accommodate 836 new slips. The West basin will accommodate an additional 232 slips. Fifty slips for use by transient boaters will be located on both sides of the east Federal pier and on the east side of the west Federal pier. These transient slips will offer power and water hookups. The slips will be installed after mid June and removed after Labor Day. This allows the current federal piers to be used by fishermen during the Spring and Fall salmon runs. In summary, plan 10B calls for: 1,118 new slips, 1,018 will accommodate private recreational boaters, 50 will be used by transient boaters and 50 by charterboat operators.

(f) Tour boat Facilities - Same As Plan 10 A Modified.

(g) Other Ancillary Upland Facilities - Same as Plan 10 A Modified.

The above expansions, consolidations, and new harbor activities will increase the value of the recreation experience to new and existing harbor users. It will also increase the net income of various providers of recreational services. An evaluation of this increase in recreational value and net income is presented in the following section: Benefit Evaluation.

(3) County And Town Development Plans - The development of the Olcott Harbor project is projected to provide an economic stimulus to Niagara County. The Olcott Harbor project was identified as one of the top five economic development projects for the county of Niagara in the recently completed "Comprehensive Economic Development Strategy For Niagara County" (Arthur D. Little Inc., June, 1986.) The construction of the Outer harbor project is foreseen as a catalyst that will induce investment in the local community by various public and private entities. The Outer Harbor project will provide approximately 1,000 additional boat slips for the general public, provide additional launch ramp facilities, provide berthing facilities for a tour boat, provide berthing facilities for 50 charterboat craft and 50 transient slips and provide additional access to the lake for pier fishing and sightseeing.

The $12m to $18m outer harbor project is projected to induce the County to develop the Krull park complex into a major county recreational facility. Projected county investments in the Krull park complex are seen to result in an 400 acre multi use recreational facility offering such recreational opportunities as nature walking trails, camping, base ball and softball diamonds, tennis courts , playgrounds, open lawn areas, an events center, an 18 hole golf course and cross country skiing during the winter. Increased usage is foreseen for the park with respect to all activities. Also the expansion of swimming facilities is a major component of the parks expansion. Total park development costs are placed at over $600,000.

These recreational opportunity expansions are projected to induce private investment in the local area in the form of motels, restaurants, seasonal accommodations as well as retail service facilities. Total private investment costs could approach $22.6M. Private Economic development within the hamlet is predicated upon the development of the Olcott Harbor area as a family oriented tourist area/resort with emphasis on fishing and boating. The main attractor of such usage will be the development of the Outer harbor area into a marine related complex.

The combined perception of development on the part of the county and State at Olcott Harbor, has led to an estimate of combined public and private sector investment in the Olcott Harbor area of $30,305,000.

The proposed development in the town of Newfane has led to the need for the development of an "Olcott Harbor/Upland Development Master Plan." The engineering firm of Wendell Engineers P.C. has been retained to develop the hamlet master plan. The first step in the planning process has been the development of a questionnaire to identify community needs and wants. The findings of the survey have resulted in the derivation of three development schemes that are currently being prepared for

presentation to the public. A recommended development plan will be completed after the public meeting and further meetings with all affected major groups.

Four task force/committees have been devised to insure that all major groups being affected will have a voice in the final Hamlet master Plan. There is an Olcott Harbor Steering Committee which assures day to day coordination between all involved agencies; Town, county, and state officials as well as political representatives. The Olcott Harbor Development Committee coordinates all activities associated with the implementation of the Olcott harbor Project on a local, state and Federal level. This includes New York State Department Of Environmental Conservation, Department Of Transportation, Office Of Parks and Recreation as well as the Western New York Economic Development Corporation , and Niagara County legislatures, commerce and Tourism etc.

The Olcott Harbor Task Force is a chamber of commerce Committee which will lobby on behalf of the business community to obtain Federal State and local funding for the Outer Harbor project.

The Olcott Master Plan Advisory Committee works with engineering and planning consultants to advise the Newfane Town Board, the Niagara County Legislature and Western New York Department Of Environmental Conservation on the development of the Olcott Hamlet Master Plan. This committee has retained the Engineering firm of Wendell Engineers P. C. to develop a hamlet master plan. Preliminary schemes have been developed for the hamlet as a whole.

Implementation of the Olcott Harbor Upland Development Master Plan will result in the following new recreational activities taking place in the Olcott Harbor area: golfing, camping, nature trail hiking, swimming and cross country skiing. In addition there is projected to be an increase in the following recreational activities that currently are offered at Olcott: picnicking and sunbathing. There are also envisioned general play areas that will accommodate tennis, baseball and basketball, as well as general play areas for children( swings, slides, etc.). Finally, there will be an amphitheater for town sponsored activities. Two preliminary artists drawings of the upland Development Master Plan are presented in Figures C18 and C 19. These drawings take into consideration the completion of Plan 10 A Modified and 10 B.

Figure C-18 Artists Rendition Of Upland Development With Plan 10 A Modified

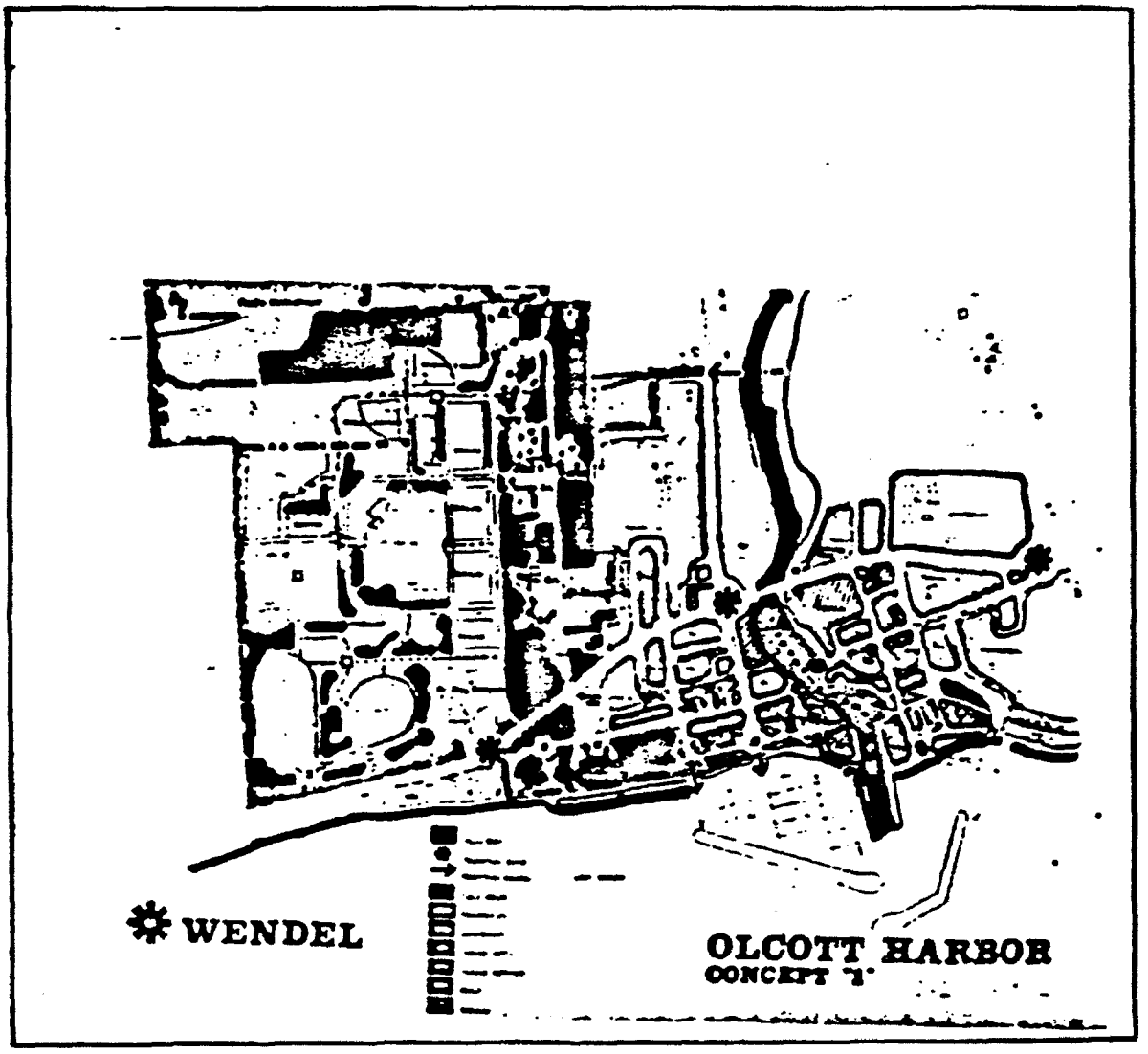
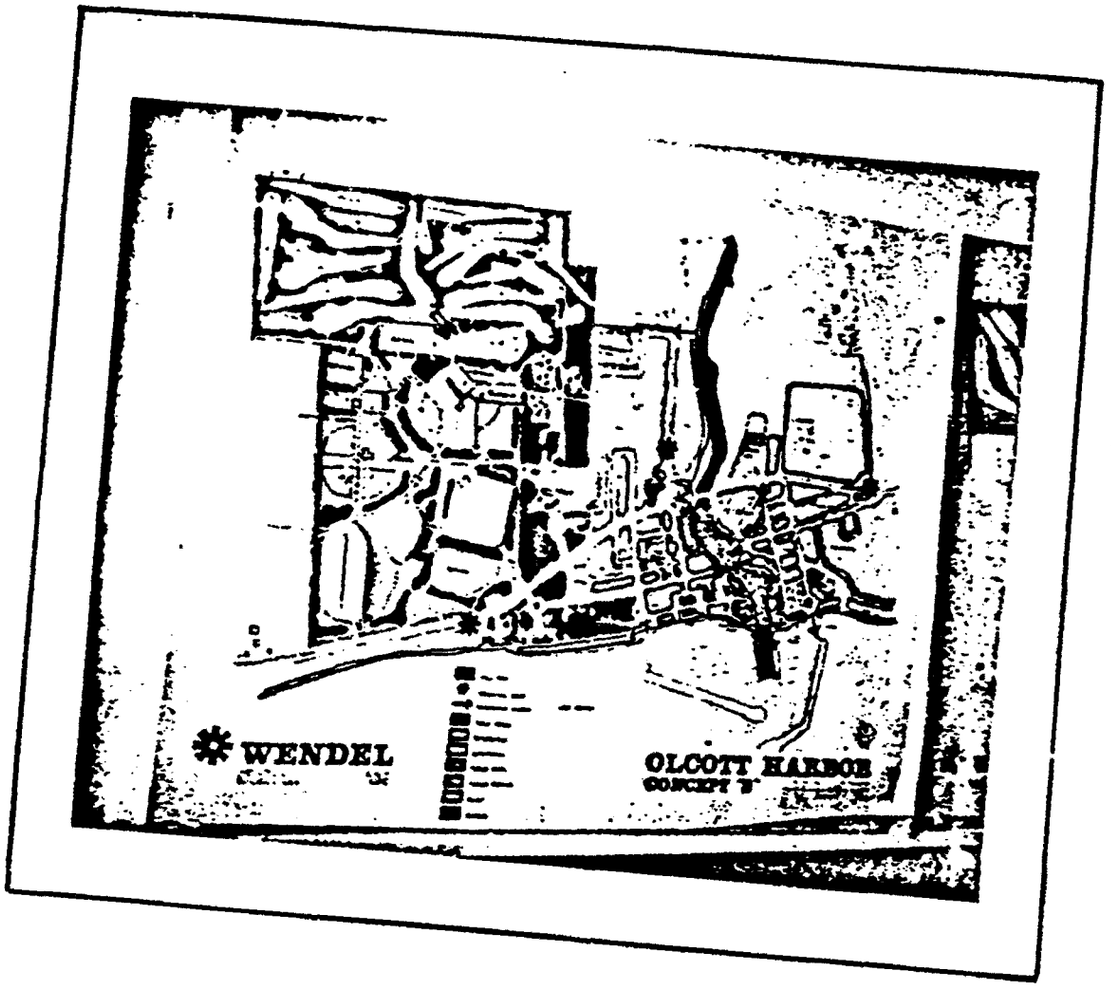


Figure C-19 Artists Rendition Of Upland Development With Plan 10 B



Due to the timing of the development of a "preferred" Olcott Harbor Hamlet Master Plan, a preliminary evaluation of the above mentioned recreational activities has not been attempted prior to the completion of the Reevaluation report. The following new recreational activities will need a preliminary evaluation: golfing, camping, nature trail hiking, picnicking, beach/sun bathing, swimming and cross country skiing. The benefits associated with these recreation activities need to be evaluated by developing estimates of recreation usage under "Without" and "With-Project" conditions. Also addressed should be the question of transfers as well as the phasing in of the recreational activities over time. The Unit Day Value could be used to evaluate the benefits.

The following new recreation activities will also take place due to the project: tennis, baseball, basketball, children's playground activities as well as a summer program of events for the amphitheater. The value of these new recreational activities also need to be developed.

In addition there is projected to be an increase in the following recreational activities that currently are offered at Olcott: picnicking and sunbathing. The recreational value associated with new users participating in existing recreational activities needs to be computed. Also, the recreational value associated with existing recreational users will also rise due to implementation of a outer harbor project. The existing park users will experience a wider range of recreational opportunities at Krull Park (nature walking trails, baseball and softball diamonds, tennis courts, playgrounds, open lawn areas, an events center and an eighteen-hole golf course.) The increase in recreational value associated with recreational activities currently taking place at the park also need to be developed.

C4. BENEFIT ANALYSIS

a. Introduction. Small craft navigational improvements at Olcott Harbor, New York will contribute to National Economic Development (NED) by increasing the usage of the existing site and improving the quality of the existing recreational experience. The NED benefits for Plans 10A and 10B accrue to the following current and new harbor users: Slip renter users, launch ramp users, transient slip users, charterboat slip users, pier fishermen, swimmers and general recreational users. Both plans offer a new tour boat operation.

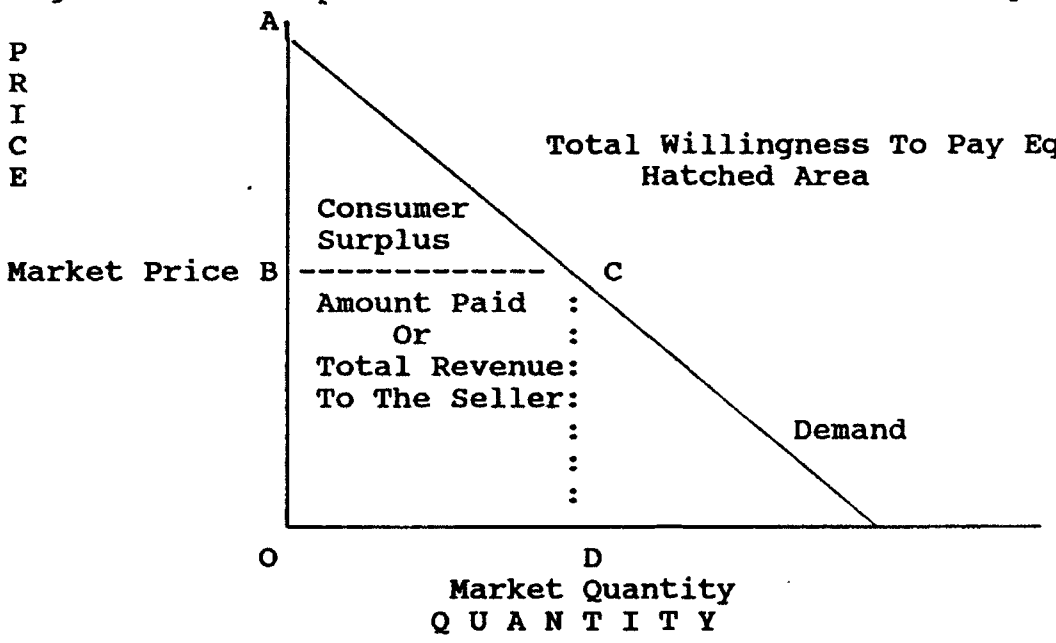
(1) Basis Of Determining All Economic Benefits - The Basic concept used to evaluate economic benefits of water resource investments is the Willingness To Pay principle. Benefits are the maximum amount that individuals are willing to pay rather than go without the goods and services produced by the investment. For marketed goods, this is the amount actually paid to obtain the good plus an additional amount individuals would be willing to pay for the good but do not have to. The difference between the price people are willing to pay and the price actually paid is called Consumer Surplus.

These concepts can be shown graphically, given a demand curve, a goods market price and market supply. Total Willingness To Pay, shown graphically in Figure C 20, is the area under the demand curve and to the left of the quantity supplied. This area has two components: Amount Paid (price times quantity) and Consumer Surplus.

Current methods of evaluating the Consumer Surplus of recreationists include the Unit Day Value, the travel Cost method and the Contingent Value Method. These evaluation methods place a dollar value on the Consumer Surplus area in Figure C20. These methods evaluate the benefit to the buyer or consumer of a recreational activity. Recreational activities provided by the project include recreational boating, pier fishing, charterfishing, Tour boating, and sightseeing.

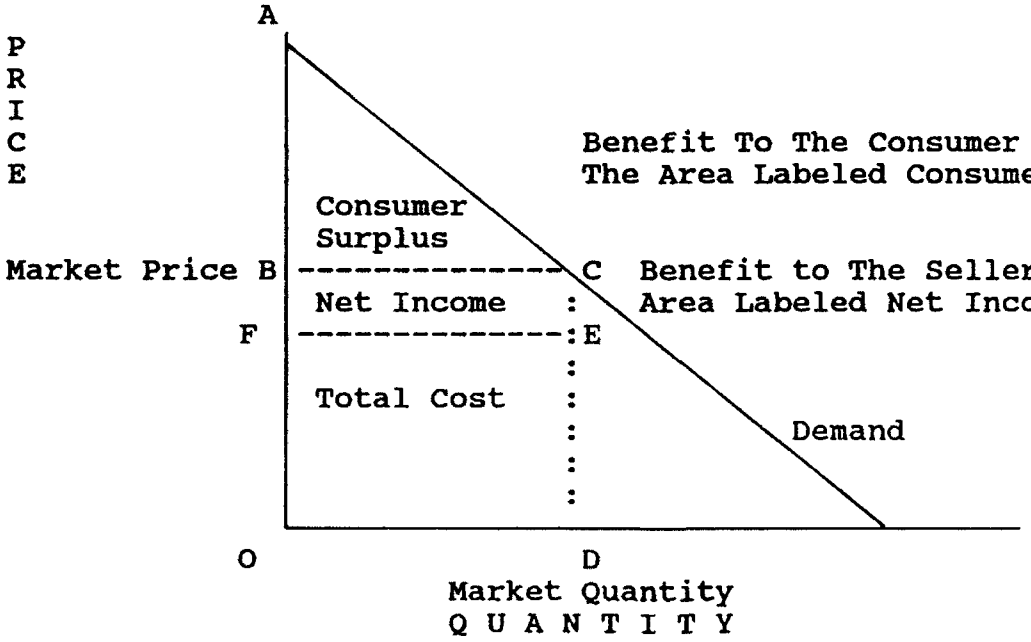
However, evaluating Consumer Surplus only deals with the benefit to the BUYER of the good or service. A transaction would not take place unless the SELLER also benefited. The seller receives the amount paid by the consumer (Area BODC). The amount paid by the buyer is TOTAL REVENUE to the seller. The seller does not retain all of the Total Revenue. He must pay for all of his production costs, both fixed and variable. The seller must pay all of his costs out of the total revenue he obtains. The amount he is left with is the benefit from his sale. This amount is called Net Income. This benefit to the seller is shown graphically in Figure C21. Total Revenue in Figure C21 has been

Figure C20 - Graphical Presentation Of Total Willingness To Pay.




Total Willingness To Pay = area AODC
Consumer Surplus = Benefits To Buyers = area ABC
Amount Paid = Total Revenue To Sellers = area BODC

Figure C21-Graphical Presentation Of Benefit To Buyer And Seller.




Total Benefits = area AODC
Consumer Surplus = Buyer Benefits = area ABC
Net Income = Seller Benefits = area BFEC

divided into Total Cost and Net Income. Net Income is the benefit to the SELLER (BFEC).

A Net Income analysis was envisioned for three distinct providers of services: Charterboat Operators, tour boat operator, and the marina facilities operator. The charterboat operators analysis is presented in the sub-section on "Charter Service Benefits". The marina facilities operator analysis is presented in the sub-section covering Associated Costs, Associated Revenues (See Section C4,i).

As can be seen from Figure C21, benefits to Buyers (Consumers) are completely separate from benefits to Sellers. Consumer Surplus benefits to Buyers (Consumers) is the area under the demand curve above market price (ABC). Consumer surplus benefits to Buyers (Consumers) are measured by the Contingent Value method and the Unit Day Value method. Benefit to Sellers is the additional income generated from total revenues after all costs have been paid (fixed and variable costs). Benefit to sellers is measured by Net Income Analysis (In Figure C21 this is the area BFEC).

(2) Computation Of NED Benefits - All benefits developed reflect 1989 conditions of development, October 1989 price levels, an 8.875 percent annual interest rate and a fifty year project life. Project year 1 was projected to be 1994.

(3) Recreation Market Area - The recreation market area, or study area, was defined by the origination zone of actual and potential user populations. The recreation market area varies by the recreational activity considered. Both plans 10A and 10B increase the supply of facilities for the following recreational activities: Launch ramp users, slip renters, transient boaters, pier fishermen,and sightseeing. Each of these recreational activities could have a different market area. For example, statistics on origins of boater fishermen participating in New York state fishing derbies indicates the Olcott Beach area draws heavily from recreationists in Pennsylvania and Ohio. The market area for recreational boating activity, however, extends west to Michigan and east to Massachusetts. Fishermen trailer boats to Olcott and launch from the town launch ramp. Alternatively, many fishermen using the piers in the Spring and Fall for salmon fishing also come from Pennsylvania and Ohio. Olcott Harbor marina demand studies indicate slip renters will generally originate from locations within a one hour drive by auto. This encompasses a five county area around Niagara County. Sightseers would likely come from this same geographical area.

The ideal method of determining benefits is to sample recreationists in each respective market area. Depending on type of recreational activity being evaluated, the regional recreational market area for Olcott Harbor could vary from a five county area to a six state area. However, time and cost

limitations precluded this approach. Also the survey would have to develop a response rate high enough to have a sample size that would be statistically significant.

Therefore, for this analysis, users of the new facilities (launch ramps, slips, pier fishing) were defined to originate from a five county service area around Olcott Harbor. The regional recreation market ( See Figure C 22) consisted of the following New York State counties: Erie, Genesee, Monroe, Niagara, and Orleans. Substantial existing and future recreational usage of Olcott Harbor will originate from outside the defined regional recreation market. However, per capita use estimates, for recreationists residing outside of the five county recreation market, are not large enough to expect an adequate survey response rate needed to establish a valid demand relationship for these areas.

(4) Benefit Categories - Benefits were computed for the following categories: 1. Willingness to Pay for New Slip Renters and Launch ramp users; 2. boat owners renting new and existing wet slips and transient slips; 3. passengers of slip renters using new and existing wet slips and transient slips; 4. Charterfishing : New and existing charterboat operators; 5. Tour boat ; 6. Pier Fishing : New and existing pier fishermen; 7. Pier Use By General Public; 8. new and existing launch ramp users; 9. Associated Revenues; 10. Harbor of Refuge ; and 11. Flood Inundation Reduction.

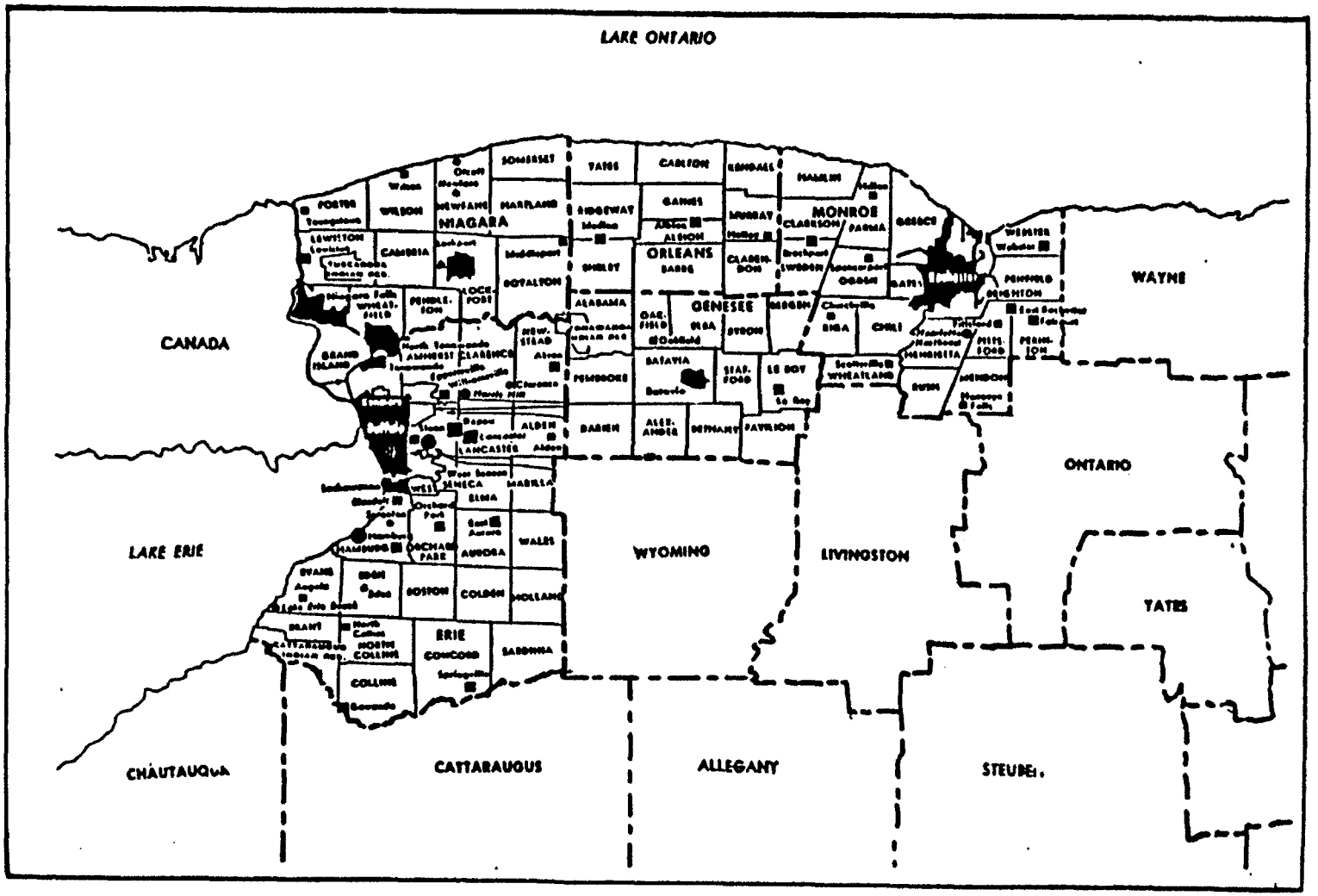
The benefits associated with these activities were developed using a range of evaluation procedures. Willingness To Pay Benefits for users of new slips and new launch ramps were developed from a survey of boat owners in the recreation market area.

A Net Income Analysis was performed for charterboat operators and the local co-operator. The local co-operator will provide the projects slip facilities.

The balance of the benefit analysis either relied on previous benefit analyses or used the Unit Day Value Method. The Unit Day Value Method was used mainly to evaluate benefits to passengers in boats, pier fishing and sightseeing. The categories of General Recreation and Specialized Recreation were used.

With respect to the "Unit Day Value Method", each activity was evaluated with respect to five criteria: Recreational Experience, Availability Of Opportunity, Carrying Capacity, Accessibility and Environmental Quality. The point assessment for each criteria was made as consistent as possible within each recreation category type. For example, all General Recreation activities evaluated were given the same points for Recreation Experience under With Project conditions. This had to do with the number of

Figure C-22 The Regional Recreation Market Area



general and high quality activities present under With project conditions. However, Availability of Opportunity, under General Recreation, varied by recreation type since the location of some alternative recreation facilities were farther away than others. The same consistency was applied when deriving points for Specialized Recreation.

b. Willingness To Pay (WTP) Benefits.

(1) General - Willingness To Pay benefits were evaluated for new slip renters and launch ramp users. These benefits were evaluated based on a user survey. The WTP includes use fees actually paid plus any unpaid value (Consumer Surplus) accrued by slip renters and launch ramp users. If competitive markets existed for the goods and services produced by water resources investments, such as proposed at the Olcott Harbor small boat facility, boat owners would reveal their "Willingness To Pay" through market demand. The market demand curve for improvements at Olcott Harbor could then be used to measure the welfare gain to the nation (i.e. benefits). The market demand curve for this analysis was derived using the "Cortingent Value Method" (CVM).

(2) Willingness To Pay - Conceptually, a small craft harbor facility has a demand curve analogous to that of a marketed good even though many of the "goods and services" are provided without entrance fees. User fees at Public small boat harbors partially recover operation and maintenance costs associated with certain facilities such as docks at the marina, but not Corps project features (i.e. breakwater, entrance channel, etc.). The market demand curve reflects users' "Willingness To Pay" for improvements at Olcott Harbor. Harbor users may be boat owners and non-boat owners.

(a) General - The "Contingent Value Method" (CVM) is a self-estimate approach used to estimate the value of non-market goods (e.g., recreational or other uses). The CVM allows the simulation of a market for non-market goods by creating a hypothetical market and asking a portion of the population of interest (a random sample) how much they would be "willing to pay" so that the goods and services would be provided. The price quantity values reported by the respondents are treated as individual values for the goods. This sample data is used to develop a simulated demand curve for the population of interest. The method is based on collective sampled responses to a questionnaire or a personal interview.

The CVM assumes that individuals know the value to themselves and that the goods and services that would be created can be described in the hypothetical market. It is assumed that respondents react to the survey in the same way as they would to a real market for those goods and services. The CVM for the Olcott Harbor analysis is based on two mail survey questionnaires (See Exhibits C1 and C2).

One mail survey (Boating Facility Survey, For Potential Lake Access Development At Olcott Harbor, New York) was sent to registered boat owners in the Olcott Harbor service area. Use value benefits for boat owners were calculated using data obtained from this survey. Data was also collected on boat owner existence or option values.

The second mail survey (Survey For Potential Lake Access Development At Olcott Harbor, New York) was sent to the Non-Boat owning population. Data on Existence Value for the Non-Boat Owning Population was collected using this survey. Non-boat owners have a "Willingness To Pay" for project improvements based on the concept that they may want to use it at sometime in the future (option value) or because they benefit from simply knowing that the facility exists (existence value).

(b) Survey Design - The survey was conducted on a five county area throughout the Fall of 1988. Two distinct surveys were developed. One survey was sent to a randomly selected sample of New York State registered boat owners. The other survey was sent to a randomly selected sample of general households. The survey consisted of mail questionnaires to four populations of interest: (1) registered boat owners who reside in the county of the project area (Niagara County); (2) registered boat owners residing in a four county service area (Erie, Orleans, Genesee and Monroe Counties); (3) general households in the county of the project area (Niagara County); and 4) general households in a four county service area (Erie, Orleans, Genesee and Monroe).

The total population of boat owners was stratified into two populations of interest, as differences in the variation of WTP and in response rates were believed to exist between boat owners who reside near the Olcott Harbor project site and boat owners from the four county service area. Boat owners residing near the project site (Stratum 1) are therefore defined as those State registered boat owners whose residence is Niagara County. This population of interest comprised a total of 9,931 boat owners. The number of boat owners residing in the four county service area (Stratum 2) was 69,097. Names and mailing addresses of boat owners for the two stratums were obtained from current boat registration rosters (1987) from the State of New York Department of Motor Vehicles Division.

The non-boat owning population of interest was stratified into identical populations of interest as the boating population. Names and mailing addresses for the general household random samples were obtained from RL Polk & Co. Sample sizes for the four populations of interest were determined taking into consideration an assumed target tolerated limits of error (+20%), an assumed tolerated risk of estimate (10%), an estimate of the coefficient of variation of WTP estimates (1.0), finite population correction factor, and an estimate of the response rate.

A total of 6,000 mail survey questionnaires were sent to county residents: 1,000 to Stratum 1 boat owners; 1,000 to Stratum 2 boat owners; 2,000 to stratum 1 non-boaters and 2,000 to stratum 2 non-boaters. Survey recipients were allowed 3 weeks from the mailing date to answer the questionnaire. Otherwise, a second mailing consisting of a POST CARD was sent to non-respondents to allow an additional 3-week response period. Non-boat owners who received boating surveys and boat owners who received non-boating questionnaires were instructed to return the questionnaire uncompleted.

A pretesting of the Olcott Harbor Contingent Value Survey was not performed as the experience gained from CV surveys previously conducted was used in designing the Olcott Harbor questionnaire. Examination of the effectiveness of these previous CV surveys resulted in changes to the protest bid question, payment vehicle and questionnaire format.

The two boat owning samples provided WTP data for wet storage and launch ramp Use Value and Existence Value. The two non-boat owning samples provided WTP data for Existence Value.

(i) Data Analysis - Simulated demand schedules were derived for two populations of interest. The populations of interest were: (1) registered boat owners who reside in the county of the project area (Niagara County) , and (2) registered boat owners residing in a four county service area( Erie, Orleans, Genesee a,d Monroe Counties). Population sizes for Stratum 1 and Stratum 2 boat owners were 9,931 and 69,097 respectively. The derivation of simulated demand schedules are based on applying the sample distribution of WTP bids from the contingent valuation survey questionnaire to the respective population of interest.

(c) Detailed Methodology - Traditionally, water resource alternative plans for improvements are evaluated using a "With-Project" versus "Without-Project" basis. Benefits associated with a particular plan are typically measured as the difference in the value which would be expected if no plan was implemented and the value which is estimated assuming the particular plan is put in place. A unique advantage in using contingent valuation techniques for measuring the economic value associated with proposed water resources alternatives is that the benefits associated with the changes produced with a particular alternative can be elicited directly. In other words, after the conditions of the "Without-Project" and the conditions of the "With-Project" have been fully described, survey respondents can be asked their "Willingness To Pay" for the proposed changes in project conditions. This eliminates the need to determine the "Without-Project" value and "With-Project" value separately.

(i) Willingness to Pay- New Slip Renters - The expected increase in boating activities at Olcott Harbor, as a result of harbor facility improvements, was evaluated using the CVM. Estimates of changes in NED value (benefits) can be ascertained

by sampling the population of interest and asking individuals about their "Willingness To Pay" (WTP) for changes in the quantity of their use of facilities at a particular site. Their answers can then be used to simulate a demand curve from which claimable benefits can be estimated. The CV questionnaire describes the changes that the proposed project would provide. In the Olcott survey this description is as follows:

"The Corps Of Engineers and the State New York, and the Olcott Harbor Task Force are trying to determine the value of new boating facilities at Olcott Harbor. One project under consideration is the construction of a new small boat harbor at basin on either side of Olcott Harbors' current entrance. It is important for us to know how area boaters value the proposed expansion of the harbor.

Presently, all wet storage berths at Olcott Harbor are occupied. Often there are waiting lines at the launch ramp on weekends, holidays and special events. The existing facilities at Olcott Harbor consist of:

- Approximately 200 wet storage spaces (slips,berths,moorings)
- One public boat launch for trailered boats
- All parking areas combined provide approximately 80 spaces for slip renters and 130 auto/boat trailer spaces for launch ramp users
- Easy walking distance to Krull Park and restaurants and shops in downtown Olcott

The "Proposed Project" would provide additional wet storage and launch ramps and a protected outer harbor. The new boat harbor may look similar to the illustration shown on the next page. the new boat harbor is planned to include:

- An additional 600-800 wet slip storage spaces (berths, slips, moorings)
- Electric and water hookup for all slips
- Additional boat ramps and more parking for boat ramp users
- Parking for slip renters
- Breakwaters to protect boats from storms and provide pedestrian access to pier fishermen and sightseers
- A dredged entrance channel to provide safe water access for boats entering or leaving the harbor."

Additionally, the questionnaire included an illustration of how the proposed harbor may look (The Harbor illustration can be seen in Exhibit C1 or C2). The proposed project description and illustration is the basis for survey respondents valuing the

proposed project in the form of wet storage value, launch use value, and existence value.

((a)) Wet Storage Value - Boat owners were asked their annual WTP to rent a wet storage space in the new harbor at Olcott Harbor. The question was stated as follows:

"High construction costs have limited the number of wet storage spaces that are available. Suppose that any new spaces would be auctioned off to boaters who bid the highest dollar amount they would be willing to pay to rent a slip at Olcott Harbor. What is the HIGHEST dollar amount you would pay per season to rent a slip at the new harbor facility if all other harbor facilities remained unchanged? (This seasonal rate would not include winter storage fees.) Circle the value from the list below.

| | | | | |
|---|---|---|---|---|
| $4,000 | $3,000 | $2,500 | $2,000 | $1,500 |
| $1,400 | $1,300 | $1,200 | $1,100 | $1,000 |
| $ 900 | $ 850 | $ 800 | $ 750 | $ 700 |
| $ 650 | $ 600 | $ 550 | $ 500 | $ 450 |
| $ 400 | $ 350 | $ 300 | $ 250 | $ 0 |

If the amount you would pay per season is not shown on the list above, please write in the amount here. $_____"

A protest bid question followed the WTP question to determine the validity of the respondents' answer. The protest bid question used following all WTP questions is as follows:

"Please mark the answer which best describes your reason for answering the previous question the way you did.

(1) That is what it is worth to me.

(2) It's worth more to me, but it's all I can afford to pay.

(3) Not enough information is provided.

(4) I didn't want to place a dollar value.

(5) I object to the wording of the question.

(0) Other _____ "

Valid WTP responses used for analysis of Use Value (Boater Survey) are those which met two criteria. First, the respondent must have answered "Yes" to the following question:

> " 8. Would you ever want to rent a slip at the new harbor facility at Olcott Harbor, if all other boating facilities remain unchanged?
>
> (1) [ ] Yes (2) [ ] No."

The percentage of respondents who answered this question with "no" is used to reduce a like proportion from the number of the total population of interest. Ninety percent confidence intervals were calculated around the proportion of those responding "yes" and "no" and are presented in Table C26. Second, if the respondent's WTP is $0, he must have answered either (1) or (2) on the protest bid question. If these criteria were not met, the WTP response was coded as a missing value, otherwise, the scored WTP is deemed the respondent's WTP per season.

The split of prospective harbor users by use and stratum and the 90 percent confidence limits around this proportion is presented in Table C28. Mean proportions of the cumulative sample distributions were calculated along with 90 percent confidence

intervals around the mean proportion. The 90 percent confidence interval around the cumulative mean proportion is calculated using the equations:

$$\text{upper:} \quad CI = (P + 1.64\,[P\,(1-P) / n])^{1/2},$$

and

$$\text{lower:} \quad CI = (P - 1.64\,[P\,(1-P) / n])^{1/2}$$

where, P = cumulative mean proportion,
n = valid sample size for those who would:

rent slip, Stratum 1, n = 423 and Stratum 2, n = 380
launch, Stratum 1, n = 437 and Stratum 2, n = 410

Sample WTP (for renting a slip) distributions from both strata were used to determine the relationships for the respective populations by first adjusting the population by the proportion in the sample who would use the new proposed facility at Olcott Harbor and by the proportion of those who would store. This adjusted population size is then multiplied by the proportion of the sample who would be willing to pay a given storage fee or greater.

Table C28 - Proportion Of Prospective Olcott Harbor Users By Type Of Use And 90 Percent Confidence Intervals.

| | Sample No Who Would Use Harbor | Sample No Who Would Not Use Harbor | Proportion Who Would Use Harbor 90 % Confidence Lower | Mean | Upper |
|---|---|---|---|---|---|
| STRATUM 1 | | | | | |
| Slips | 169 | 254 | .360 | .400 | .439 |
| Launch | 327 | 110 | .680 | .748 | .816 |
| STRATUM 2 | | | | | |
| Slips | 66 | 314 | .142 | .147 | .206 |
| Launch | 211 | 199 | .474 | .515 | .555 |

The distribution of sample data (annual WTP for storage) was determined and cumulated from high to low. Stratum 2 had an outlier WTP bid of $5,000. This outlier was removed from subsequent data analysis based on the assumption that this bid reflected strategic bias by the survey respondent.

Tables C29 and C30 present the distribution of annual WTP for storage bids for Stratum 1 and Stratum 2, respectively. The storage demand schedules for Stratum 1 and Stratum 2 populations were combined for the mean and lower and upper confidence limits. Combined storage demand for the mean confidence limits is presented in Table C31. Results of the survey indicate that at a $0 storage price, there is demand for 15,969 wet berths at Olcott Harbor by the existing study area boaters.

((b)) Wet Storage Benefit - Based on mooring fees and slip sizes proposed by the Town of Newfane, the weighted annual cost to store a boat at Olcott Harbor would be approximately $1,146. At this average weighted price per slip, demand for storage (Table C31) at Olcott Harbor for the combined five county service area is 2,260. The total area under the demand curve at this price comes to $3,831,506. This was divided by total slips demanded at the average weighted price per slip of $1,146.05. This results in an average Total Willingness To Pay per slip of $1,695.45. This average Total Willingness To Pay per slip can now be multiplied times any marina slip size to obtain the average Total Willingness To Pay associated with various marina slip sizes. Table C32 shows the wet storage benefits at Olcott Harbor for plans 10 A Modified and 10B and for other selected harbor sizes.

## Table C29 - Willingness To Pay For Storage - Stratum 1 Boaters

| Annual Bid Range | Sample Bid Dist. | Sample Cumul. Dist. | Std Err Propor | 90 % Proportion Confidence Interval Lower | Mean | Upper | 90 % Population Confidence Interval Lower | Mean | Upper |
|---|---|---|---|---|---|---|---|---|---|
| 2501 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0 | 0 | 0 |
| 2500 | 1 | 1 | 0.008 | -0.005 | 0.008 | 0.021 | (19)[2/] | 32 | 93 |
| 2000 | 1 | 2 | 0.011 | -0.002 | 0.016 | 0.035 | (9)[2/] | 65 | 153 |
| 1500 | 4 | 6 | 0.019 | 0.017 | 0.049 | 0.081 | 60 | 194 | 352 |
| 1400 | 1 | 7 | 0.021 | 0.023 | 0.057 | 0.091 | 81 | 226 | 398 |
| 1200 | 1 | 8 | 0.022 | 0.028 | 0.065 | 0.102 | 102 | 258 | 443 |
| 1100 | 2 | 10 | 0.025 | 0.041 | 0.081 | 0.122 | 146 | 323 | 531 |
| 1000 | 13 | 23 | 0.035 | 0.129 | 0.187 | 0.245 | 462 | 742 | 1,067 |
| 900 | 3 | 26 | 0.037 | 0.151 | 0.211 | 0.272 | 540 | 839 | 1,185 |
| 850 | 1 | 27 | 0.037 | 0.158 | 0.220 | 0.281 | 566 | 871 | 1,224 |
| 800 | 9 | 36 | 0.041 | 0.225 | 0.293 | 0.360 | 806 | 1,161 | 1,569 |
| 750 | 3 | 39 | 0.042 | 0.248 | 0.317 | 0.386 | 888 | 1,258 | 1,682 |
| 700 | 2 | 41 | 0.043 | 0.263 | 0.333 | 0.403 | 943 | 1,323 | 1,757 |
| 650 | 6 | 47 | 0.044 | 0.310 | 0.382 | 0.454 | 1,110 | 1,516 | 1,979 |
| 600 | 11 | 58 | 0.045 | 0.398 | 0.472 | 0.546 | 1,423 | 1,871 | 2,377 |
| 550 | 9 | 67 | 0.045 | 0.471 | 0.545 | 0.619 | 1,685 | 2,161 | 2,695 |
| 500 | 11 | 78 | 0.043 | 0.563 | 0.634 | 0.706 | 2,014 | 2,516 | 3,074 |
| 450 | 6 | 84 | 0.042 | 0.614 | 0.683 | 0.752 | 2,197 | 2,710 | 3,276 |
| 400 | 8 | 92 | 0.039 | 0.684 | 0.748 | 0.812 | 2,446 | 2,968 | 3,539 |
| 350 | 5 | 97 | 0.037 | 0.728 | 0.789 | 0.849 | 2,605 | 3,129 | 3,700 |
| 300 | 14 | 111 | 0.027 | 0.858 | 0.902 | 0.946 | 3,072 | 3,581 | 4,123 |
| 250 | 8 | 119 | 0.016 | 0.941 | 0.967 | 0.994 | 3,368 | 3,839 | 4,330 |
| 100 | 1 | 120 | 0.014 | 0.953 | 0.976 | 0.998 | 3,409 | 3,871 | 4,350 |
| 50 | 1 | 121 | 0.011 | 0.965 | 0.984 | 1.002 | 3,453 | 3,903 | 4,368 |
| 0 | 2 | 123 | 0.000 | 1.000 | 1.000 | 1.000 | 3,579 | 3,968 | 4,357 |

1/ Population of interest, N = 9,931, valid sample size n = 123, percent who would rent slip: mean = 40.0%, 90% confidence: lower = 36.0%, upper = 43.9%.

2/ Zero value is used for data analysis.

Table C30 - Willingness To Pay For Storage - Stratum 2 Boaters [1/]

| Annual Bid Range[2/] | Sample Bid Dist. | Sample Cumul. Dist. | Std Err Propor | 90 % Proportion Confidence Interval Lower | Mean | Upper | 90 % Population Confidence Interval Lower | Mean | Upper |
|---|---|---|---|---|---|---|---|---|---|
| 2001 | 0 | 0 | 0.000 | 0.000 | 0.000 | 0.000 | 0 | 0 | 0 |
| 2000 | 2 | 2 | 0.030 | -0.006 | 0.043 | 0.093 | (59)[3/] | 522 | 1,321 |
| 1750 | 1 | 3 | 0.036 | 0.005 | 0.065 | 0.125 | 52 | 783 | 1,778 |
| 1500 | 2 | 5 | 0.046 | 0.033 | 0.109 | 0.184 | 325 | 1,304 | 2,617 |
| 1250 | 1 | 6 | 0.050 | 0.049 | 0.130 | 0.212 | 477 | 1,565 | 3,014 |
| 1200 | 1 | 7 | 0.053 | 0.065 | 0.152 | 0.239 | 637 | 1,826 | 3,400 |
| 1100 | 1 | 8 | 0.056 | 0.082 | 0.174 | 0.266 | 803 | 2,087 | 3,778 |
| 1000 | 2 | 10 | 0.061 | 0.117 | 0.217 | 0.317 | 1,149 | 2,609 | 4,511 |
| 900 | 2 | 12 | 0.065 | 0.154 | 0.261 | 0.367 | 1,512 | 3,131 | 5,220 |
| 850 | 2 | 14 | 0.068 | 0.193 | 0.304 | 0.416 | 1,887 | 3,652 | 5,911 |
| 800 | 2 | 16 | 0.070 | 0.232 | 0.348 | 0.463 | 2,275 | 4,174 | 6,584 |
| 750 | 5 | 21 | 0.073 | 0.336 | 0.457 | 0.577 | 3,287 | 5,479 | 8,204 |
| 700 | 2 | 23 | 0.074 | 0.379 | 0.500 | 0.621 | 3,709 | 6,001 | 8,828 |
| 650 | 3 | 26 | 0.073 | 0.445 | 0.565 | 0.685 | 4,357 | 6,783 | 9,740 |
| 630 | 1 | 27 | 0.073 | 0.468 | 0.587 | 0.706 | 4,578 | 7,044 | 10,038 |
| 600 | 4 | 31 | 0.069 | 0.560 | 0.674 | 0.788 | 5,486 | 8,088 | 11,192 |
| 500 | 12 | 43 | 0.036 | 0.875 | 0.935 | 0.995 | 8,567 | 11,218 | 14,134 |
| 250 | 1 | 44 | 0.030 | 0.907 | 0.957 | 1.006 | 8,882 | 11,479 | 14,295 |
| 200 | 1 | 45 | 0.022 | 0.943 | 0.978 | 1.014 | 9,233 | 11,740 | 14,404 |
| 0 | 1 | 46 | 0.000 | 1.000 | 1.000 | 1.000 | 9,792 | 12,001 | 14,210 |

1/ Population of interest, N = 69,097, valid sample size n = 380, percent who would use harbor: mean - 17.4%, lower - 14.2%, upper 20.6% percent.
2/ One $5,000 bid removed from sample as outlier.
3/ Zero value is used for data analysis.

Table C31 - Willingness To Pay For Storage - Combined Strata 1 And 2 Boaters

| STRATUM 1 | | STRATUM 2 | | STRATUM 1 & 2 | |
|---|---|---|---|---|---|
| Annual Slip Price | Slip Storage Demand | Annual Slip Price | Slip Storage Demand | Annual Slip Price | Slip Storage Demand |
| 2501 | 0 | 2001 | 0 | 2501 | 0 |
| 2500 | 32 | 2000 | 522 | 2500 | 32 |
| 2000 | 65 | 1750 | 783 | 2001 | 33 |
| 1500 | 194 | 1500 | 1,304 | 2000 | 587 |
| 1400 | 226 | 1250 | 1,565 | 1750 | 847 |
| 1200 | 258 | 1200 | 1,826 | 1500 | 1498 |
| 1100 | 323 | 1100 | 2,087 | 1400 | 1530 |
| 1000 | 742 | 1000 | 2,609 | 1250 | 1791 |
| 900 | 839 | 900 | 3,131 | 1200 | 2084 |
| 850 | 871 | 850 | 3,652 | 1100 | 2410 |
| 800 | 1,161 | 800 | 4,174 | 1000 | 3351 |
| 750 | 1,258 | 750 | 5,479 | 900 | 3969 |
| 700 | 1,323 | 700 | 6,001 | 850 | 4523 |
| 650 | 1,516 | 650 | 6,783 | 800 | 5336 |
| 600 | 1,871 | 630 | 7,044 | 750 | 6737 |
| 550 | 2,161 | 600 | 8,088 | 700 | 7323 |
| 500 | 2,516 | 500 | 11,218 | 650 | 8299 |
| 450 | 2,710 | 250 | 11,479 | 630 | 8560 |
| 400 | 2,968 | 200 | 11,740 | 600 | 9959 |
| 350 | 3,129 | 0 | 12,001 | 550 | 10249 |
| 300 | 3,581 | | | 500 | 13734 |
| 250 | 3,839 | | | 450 | 13928 |
| 100 | 3,871 | | | 400 | 14186 |
| 50 | 3,903 | | | 350 | 14347 |
| 0 | 3,968 | | | 300 | 14799 |
| | | | | 250 | 15318 |
| | | | | 200 | 15579 |
| | | | | 100 | 15611 |
| | | | | 50 | 15643 |
| | | | | 0 | 15969 |

Table C32 - Wet Storage Benefits At Olcott Harbor And Wet Storage Benefits For Other Selected Harbor Sizes

| Number of Slips Provided | Equilibrium Price $ | Average [3] Area $ |
|---|---|---|
| 15,969 [1] | 0 | - |
| 2,259.87 | [2] 1,146.05 | - |
| 2,200 | 1,164 | 3,730,003 |
| 2,100 | 1,195 | 3,560,457 |
| 2,000 | 1,214 | 3,390,912 |
| 1,750 | 1,274 | 2,967,048 |
| 1,500 | 1,494 | 2,543,184 |
| 1,400 | 1,538 | 2,373,638 |
| 1,250 | 1,595 | 2,119,320 |
| 1,200 | 1,614 | 2,034,547 |
| **1,118** | **1,646** | **1,895,520** |
| 1,068 | 1,665 | 1,810,747 |
| **1,018** | **1,684** | **1,725,974** |
| 1,000 | 1,691 | 1,695,456 |
| 900 | 1,730 | 1,525,910 |
| **886** | **1,735** | **1,502,174** |
| 836 | 1,761 | 1,417,401 |
| 800 | 1,795 | 1,356,365 |
| **786** | **1,809** | **1,332,628** |
| 750 | 1,843 | 1,271,592 |
| 700 | 1,891 | 1,186,819 |
| 600 | 1,987 | 1,017,274 |
| 650 | 1,939 | 1,102,046 |
| 600 | 1,987 | 1,017,274 |
| 550 | 2,033 | 932,501 |
| 500 | 2,078 | 847,728 |
| 450 | 2,123 | 762,955 |

1. Demand for wet berths at P = $0 is (mean) 15,969.
2. Maximum demand at minimum mean storage price ($1,146.05 per year) is 2,260 and maximum area is $3,831,506.
3. Average area is calculated by dividing the total area at the stated average price per slip ($1,146.05) by the total quantity demanded at that price times the number of slips provided. The total area comes to $3,831,506, given an average slip price of $1,146.05. Total slips demanded at that price is 2,259.87. This results in an Average Total Willingness To Pay of $1,695.45. This is then multiplied by the number of slips provided.

Both Plans 10 A Modified and 10B have 100 slips set aside for commercial use. Fifty slips are set aside for charterboat use and 50 slips set aside for transient use. The fifty charterboats will be located at the Town Marina on Eighteen Mile Creek. Boaters currently using these slips at the Town Marina would be relocated to the Outer Harbor. These 50 slips were subtracted from the total number of lakefront slips provided to account for the relocated pleasure boats whose slips would be used by charterboat operators. This adjustment was performed to avoid double counting of slip renters Consumer Surplus benefits with Net Income gain to charterboat operators.

Also 50 Lakefront slips are planned for transient slip renters. The benefits associated with the slips used by transient boaters are presented in a later section. These 50 slips were also subtracted from the total number of Lakefront slips provided by Plans 10A Modified or 10B.

Wet slip benefits for plans 10 A Modified and 10 B are based upon 786 slips and 1,018 slips respectively. Total Willingness To Pay for storage is the sum of estimated annual revenues for storage plus Consumer Surplus. Consumer Surplus is the amount above price that respondents would be willing to pay.

Plan 10 A Modified provides an 886 slip boat harbor. Permanent based boaters (boat owners who rent slips for non commercial use) account for 786 of these slips. The remaining 100 slips are divided evenly between transient use (50 slips) and charter boats (50 slips). Total "Willingness To Pay" for slips used by permanent based boaters is $1,332,600, annually. (This total Willingness to Pay value equals average Total Willingness to Pay per slip of $1,695.45 times 786 slips which equals total willingness To Pay of $1,332,623.)

Plan 10B provides a 1,118 slip boat harbor. There are 1,018 slips for permanent based boaters, 50 slips for transient use and 50 slips for charterboats. Total Willingness To Pay for permanent based (non-commercial boaters) boaters comes to $1,726,000.

Net willingness to pay (Consumer Surplus) is the amount boaters would be willing to pay for storage above the actual cost. Consumer Surplus can be calculated by taking the area under the demand curve above the minimum price being charged seasonally for slip rental (in this case, $1,146.05). Net Willingness To Pay (consumer surplus) also equals Total Willingness To Pay minus slip rental revenue.

Slip rental revenue to non-commercial permanent based boaters for Plan 10 A Modified comes to $900,800. ( 786 slips times an average slip rental fee of $1,146.05 equal slip revenue of $900,795). Slip rental revenue to non-commercial permanent based boaters for Plan 10B comes to $1,166,700. ( 1,018 slips times an average slip rental fee of $1,146.05 equal slip revenue of $1,166,678).

Net Willingness To Pay (Consumer Surplus) for Plan 10A Modified is Total Willingness-To-Pay minus slip revenues. This comes to $431,800, annually. For Plan 10B, Net Willingness To Pay is $559,300. Average consumer surplus per slip for the combined five county service area is $549.40.

c. Existence Values.

(1) General - Existence value is the value that an individual associates with implementation of a project even though he may never use it. The value is attributed only for specific project improvements and not to the resource in general. Therefore, using a contingent valuation survey to elicit existence value, care must be given in the structuring of these questions to ensure that respondents are specifically informed that: 1) the value sought is not for boating projects in general across the region or nation but specifically for one project at one location and 2) the value reflects the incremental portion provided by the project and not the entire project resource after construction. In the case of the proposed project at Olcott Harbor, an individual may never plan to store or launch a boat at the new facility, however they may value other passive uses not elsewhere identified.

(2) Existence Value Measurement - Sampled non-boat owning households and registered boat owners from the two strata were asked their WTP in the form of a one-time contribution for the changes to the boating facility at Olcott Harbor simply to have those changes occur. The question used in the survey for the non-boat owning households is as follows:

> "If Olcott Harbor was expanded, it may be a good thing for the community as well as for boaters. Please circle the highest dollar amount you would contribute ONE TIME to a non-profit group to help pay for the construction and maintenance costs of the harbor expansion. This contribution would ensure that the expansion would be built even if you never plan to use the harbor.

THIS IS NOT A REQUEST FOR CONTRIBUTIONS

(Circle One)

| | | | | |
|---|---|---|---|---|
| $5,000 | $4,000 | $3,000 | $2,000 | $1,500 |
| $1,000 | $ 750 | $ 500 | $ 400 | $ 300 |
| $ 200 | $ 150 | $ 100 | $ 75 | $ 50 |
| $ 30 | $ 25 | $ 20 | $ 15 | $ 10 |
| $ 5 | $ 3 | $ 2 | $ 1 | $ 0 |

If the amount that you would give is not shown on the list above, please write in the amount here.

$_____"

(a) Negative Existence Value - Because there may be proponents in the non-boat owning households whom are against the proposed harbor expansion, an additional question was posed for respondents of the non-boat owning samples who indicated that they were opposed to the project. This question as stated on the survey is as follows:

If the harbor was expanded, it may not be a good thing for the Community. Please circle the value in the list below which is the highest dollar amount you would contribute ONE TIME to a non-profit group to ensure that the harbor would not be built. This contribution would, for example, purchase lands to control land use, provide legal fees to oppose construction, etc.

The number of valid negative WTP existence bids was not sufficient to estimate the population's bid distribution for both strata 1 and 2. Table C33 presents survey data summaries for the negative WTP bid and related questions.

Table C33 - Negative Existence Value WTP Bid Data For Non-Boat Owning Households.

| | Stratum 1 | Stratum 2 |
|---|---|---|
| Total Surveys Returned | 609 | 509 |
| Total Answering For or Against Project Question | 504 | 652 |
| Total In Favor | 327 (64.9%) | 247 (46.9%) |
| Total Indifferent | 149 (29.6%) | 226 (42.9%) |
| Total Opposed | 28 (5.6%) | 54 (10.2%) |
| Total Valid Negative WTP Bids | 14 (8 non zero) | 22 (11 non zero) |

(b) Positive Existence Value - Valid WTP responses to the existence bid question from both surveys (registered boat owners and Non-Boat owners) was collected. Valid WTP responses were ranked from high to low. The sample distribution of respondents willing to pay a stated amount or greater was then cumulated. The sample cumulative mean proportion was calculated as well as the 90 percent confidence intervals around the cumulative mean proportion. In other words, for each WTP bid the percent of the respondents willing to pay the stated bid or greater was calculated along with the 90 percent confidence interval around each percent. This was done for both the non-boat owning and boat owning populations.

((i)) Non-boat Owning Population - The non-boat owning sample was asked "How do you feel about the project at Olcott Harbor?". Responses to this question were the basis for determining the portion of the population to apply the WTP distribution. Approximately 65 percent of non-boaters in Stratum 1 and 47 percent of non-boaters in Stratum 2 indicated that they are in favor of the project.

((ii)) Boat Owning Population - Valid WTP existence responses for the boat owning population were determined based on the following criteria. First, if a non-zero dollar value was selected, this indicated these boat owners were in favor of the project. Second, if the respondent's WTP was $0, he or she must have answered either (1) or (2) on the protest bid question. If these criteria were not met, the WTP response was coded as a missing value. The total valid boat owning population of interest was determined by the proportion of respondents with

valid WTP bids to total returns. Approximately 89 percent of boat-owners in Stratum 1 and 87 percent of boat-owners in Stratum 2 indicated that they are in favor of the project.

(3) Existence Value Benefit For Boat-Owning And Non-boat Owning Households Guidance from Division indicated that Existence Value Benefits were not to be included in the benefits or the benefit to cost ratio analysis for any of the plans being evaluated. The guidance stated: " For a variety of reasons, including survey development, administration and development complexities, lack of flexibility for formulation and scaling purposes, and problematic acceptance of the technique by decision makers, implementation in typical water resource planning is very difficult. Such benefit measurements, therefore, are not appropriate for NED evaluation in feasibility studies".

d. New And Existing Wet Slip and Transient Slip Benefits.

This section provides the benefit analysis for pleasure boaters renting wet slips under Plan 10 A Modified or 10B. There are two types of wet slip renters: permanent based boaters and transient boaters. Permanent based boaters would rent a slip at Olcott and leave their boat at that slip for the entire recreation boating season. Transient boaters are boaters who cruise to Olcott and rent a slip on a daily basis for a limited time period.

These two types of pleasure boaters may use new slips and new transient facilities provided by Plan 10 A Modified or 10B. Alternatively they may use slips and transient facilities that are already present at Olcott under Without Project Conditions.

The benefits accruing to pleasure boaters can be divided into two components: benefits to the boat owner and his immediate family and benefits to his passengers not members of his immediate family.

(1) New Slip Renters. New slip renters consist of permanent based boaters and transient boaters who use new slips provided by the project. Benefits accrue to the boat owner and his immediate family and to passengers not members of his immediate family.

(a) Permanent Wet Slip Renters. Plan 10 A Modified provides 786 slips for use by recreational boaters who would leave their boat at Olcott Harbor throughout the boating season. Plan 10 B provides 1,018 slips for the same purpose.

(i) Benefits For Boat Owners And Their Immediate Household. Benefits to the boat owner and his immediate family was developed by the Contingent Value Survey discussed in section C4b. This benefit was equal to the Consumer Surplus per slip times the number of slips provided. the Consumer Surplus per slip came to $549.40.

Using the above information on Consumer Surplus Per Slip and number of slips provided by plan, Consumer Surplus benefits for Plan 10A and 10B came to $431,800 and $559,300. This is equivalent to $5.45 per person per trip for the operator and each household member.

(ii) Benefits For Non-Household Passengers. Consumer Surplus benefits developed from the survey reflect the value of the recreational boating experience to the new boat owner and his immediate household who rent new slips. However, this does not cover all passengers on the boat. New boat owners renting new slips under plan 10 A Modified and 10B will have passengers on their boats who are not members of their immediate household. The recreational boating experience of these non-household passengers must also be accounted for. This value was calculated using the Unit Day Value Method.

The benefits for these non-household passengers on boats renting slips at the new marina facilities equals the Unit Day Value per non-household passenger under With Project Conditions times the number of passengers not members of the boat owners immediate household times the uses per season times the number of new wet berths provided by each plan.

((a)) Unit Day Value - The new facilities were rated according to five criteria: Recreation Experience, Availability of Opportunity, Carrying Capacity , Accessibility, and Environmental Quality. The Recreation Category used was General Recreation. Table C34 provides a summary of the point values attributed to each criteria for non-household boat slip renter passengers under "With Project" conditions. The point value came to 56. This point value was converted to a Unit Day Value using the point to dollar value table for Fiscal Year 1989. This resulted in a Unit Day Value of $4.33 for the With Project condition.

((b)) Benefits For Non-Household Passengers Of Boat Owners Renting New Slips - The Olcott Harbor contingent value survey revealed that new slip renters would average 40.12 trips per year and carry 3.44 passengers per trip plus the boat operator.

Surveys of current Olcott Harbor slip users indicated over 56 percent of all passengers are not members of the boat owners immediate household. The number of passengers per trip obtained from the contingent value survey (3.44) was multiplied by the percent of passengers not members of the boat owners immediate household (56%). This resulted in 1.93 passengers per trip who were not members of the boat owners immediate household.

Table C34 - Point Values For Non-household Passengers Of Boaters Renting New Slips At Olcott Harbor

| Category: General Recreation | Point Values With Project |
|---|---|
| Criteria | |
| Recreation Experience | 16 |
| Availability of Opportunity | 3 |
| Carrying Capacity | 10 |
| Accessibility | 17 |
| Environmental Quality | 10 |
| TOTAL POINTS | 56 |
| Unit Day Value | $4.33 |

Therefore, the benefits for non-household passengers on boats renting permanent based slips at the new marina facilities equals the With Project condition Unit Day Value per non-household passenger ($ 4.33) times the number of non-household passengers per trip (1.93) times the uses per season (40.12) times the number of permanent based wet slips provided by Plan. Plan 10A and 10B provides 786 and 1,018 new slips for permanent based boaters. Benefits for non-household passengers on boats renting new permanent based slips under Plans 10A and 10B comes to $263,000 and $340,700.

(b) New Transient Slip Renters-Plans 10 A Modified and 10B provides 50 slips for usage by transient craft. Slips for transient craft would be located on the east and west side of the existing east federal pier and on the east side of the existing west federal pier. These slips will be available for rent from early to mid-June to the end of August. This allows the existing federal piers to be used by pier fishermen during the peak spring and fall salmon runs. The rental fee would be $20 per night. A 56 percent occupancy rate during the above time period resulted in 48 rentals per season per slip. This resulted in 2,400 rentals per season.

(i) Net Willingness To Pay For Transient Boat Owners And Their Immediate Household. Annual transient rentals per season were converted to equivalent permanent based boaters. This was accomplished by dividing annual transient rentals (2,400) by the number of times a permanent based boater visits his boat during the season (40.12). This resulted in 60 equivalent permanent based boaters. The contingent value evaluation indicated the Consumer Surplus for each permanent based boater came to $549.40. The benefit to new transient boat owners and their immediate family equals the number of equivalent permanent based boaters (60) times the Consumer surplus per permanent based boater

($549.40). The benefit to new transient boat owners and their immediate family for Plans 10A and 10B equals $32,900.

(ii) Benefits For Non-Household Passengers Of Transient Slip Renters. Consumer Surplus benefits developed for transient boat owners included passengers that are members of their immediate household. However, transient boaters renting new transient slips under plan 10A Modified and 10B will have passengers on their boats who are not members of their immediate household. The number of these non-household passengers will typically be less than the number of non-household passengers on boats that are permanent based. Permanent based slip renters have 1.93 non-household passengers. It was assumed transient boat owners would have one passenger that is a non-household member. The recreational boating experience of these non-household passengers was calculated using the Unit Day Value Method.

((a)) Unit Day Value - The Unit Day Value for these non-household passengers on boats renting transient slips at the new marina facilities was set equal to that derived for non-household passengers of boats renting permanent based slips at the new marina facilities. This Unit Day Value came to $4.33.

((b)) Benefits For Non-Household Passengers Of Boat Owners Renting New Transient Slips - The benefits for these non-household passengers on boats renting transient slips at the new marina facilities equals the Unit Day Value per non-household passenger under With Project Conditions ($4.33) times the number of passengers not members of the transient boat owners immediate household(1.0) times the transient rentals per season (2,400). Benefits for non-household passengers on boats renting transient slips under Plans 10A and 10B came to $10,400.

(2) Existing Slip Renters. People who use existing permanent based slips and existing transient slips would also benefit from Project implementation. The value of their recreational boating experience will increase due to the following harbor improvements: expansion of boat related facilities, the enhancement of access to the open lake provided by either plan, and the additional lake access provided to fishermen and recreationists via the new east breakwater. The evaluation of the increase in their recreational boating experience follows.

(a) Current Permanent Based Wet Slip Users - Table C21 indicated that in 1989 there were 162 wet slips for rent at Olcott Harbor. This number is expected to grow to 227 by project year 1, 1994. The people who use these slips will have an increase in the value of their recreational boating experience due to project implementation (see Section C3). Two specific user groups will benefit: The boat owners immediate household and all passengers not members of the owners immediate household.

(i) Benefits To The Boat Owners Immediate Household - The Contingent Value evaluation indicated Consumer Surplus per slip renter for Plans 10A and 10B came to $549.40. ( The average total willingness to pay value from the contingent evaluation was estimated as $1,695.45 and the average slip fee was $1,146.05. Net Willingness to pay came to $549.40.) This is a value per household AFTER slip fees have been deducted. This value estimates the Consumer Surplus EXISTING slip renters WOULD enjoy under "With Project" conditions. Existing slip renters are currently experiencing a Consumer Surplus value less than the above. This is because there are more harbor amenities/services under "With Project" conditions than there are under "Without Project" conditions.

The benefit of project implementation to slip renters who use existing marina facilities is as follows: The difference between Without Project (WOP) condition and With Project (WP) condition consumer surplus for these slip renters times the number of annual slip rentals under WOP conditions.

((a)) Without Project Condition Consumer Surplus For Slip Renters Using Existing Marina Facilities - The Unit Day Value was used to derive the percent "Without Project Condition Consumer Surplus" is of "With Project Condition Consumer Surplus". Unit Day Values (UDV) have been derived for passengers of slip users under Without and With Project conditions in Table C35. This resulted in Unit Day Values of $3.23 and $4.33, respectively. The "Without" Project" condition UDV as a percent of the "With Project" condition UDV came to 75 percent. This percent was multiplied times the With Project Condition boater Consumer Surplus ($549.40). This resulted in a proxy of Without Project Condition Consumer Surplus for existing slip renters and their immediate household. The WOP condition Consumer Surplus value was $409.83.

Table C35 - Point Values For Passengers Of Boaters Renting Slips At Olcott Harbor
Category: General Recreation

| | Point Values | |
|---|---|---|
| | Without Project | With Project |
| Criteria | | |
| Recreation Experience | 11 | 16 |
| Availability of Opportunity | 3 | 3 |
| Carrying Capacity | 6 | 10 |
| Accessibility | 11 | 17 |
| Environmental Quality | 4 | 10 |
| TOTAL POINTS | 35 | 56 |
| Unit Day Value | $3.23 | $4.33 |

((b)) Increase In Consumer Surplus For Existing Slip Renters - The increase in Slip Renter Consumer Surplus is equal to With Project Condition Slip Renter Consumer Surplus minus "Without Project Condition Consumer Surplus" (See Table C36) This came to $139.57.

Table C36 - Increase In Existing Slip Renter Consumer Surplus

| | Plan 10A And 10B |
|---|---|
| With Project Condition Consumer Surplus | $549.40 |
| Without Project Condition Consumer Surplus | $409.83 |
| Net Increase In Consumer Surplus | $139.57 |

((c)) Benefits To Slip Renters Using Without Project Condition Marina Facilities - The increase in benefits enjoyed by slip renters using existing marina facilities equals the net increase in Consumer Surplus by Plan times the number of Without Project condition slip renters over the 50-year evaluation period.

There are currently 162 wet slips for rent at Olcott Harbor. This number is projected to increase to 227 by project year one and remain at this level over the 50-year evaluation period. The number of charterboat operators currently based at Olcott is 25. The number of WOP condition wet slips available for seasonal rental equals total wet slips minus slips set aside for charters over the evaluation period. This total comes to 202 slips. Multiplying this number of slips (202) times the net increase in Consumer Surplus for WOP condition slip renters ($139.57), equals the increase in Consumer Surplus for WOP condition slip renters. This value came to $28,200. The increase in value to slips rented to charterboat operators under WOP conditions will be evaluated separately.

(ii) Non-Household Passenger Benefits - Boat owners renting slips at the existing harbor facilities will have passengers on their boats who are not members of their immediate household. The recreational boating experience of these non-household passengers will also increase due to project implementation. The increase in this value was calculated using the Unit Day Value Method.

The increase in benefits for passengers on boats renting slips at the existing marina facilities equals the net increase in Unit Day Value per passenger times the number of passengers not members of the boat owners immediate household times the uses per

season times the number of wet berths provided by the existing marina facilities over the Without Project Condition.

((a)) Unit Day Value - The existing and new facilities were rated according to five criteria: Recreation Experience, Availability of Opportunity, Carrying Capacity , Accessibility, and Environmental Quality. The Recreation Category used was General Recreation. Table C35 provides a summary of the point values attributed to each criteria for boat slip renter passengers under "Without" and "With Project" conditions. The point values under "Without Project" and "With Project" conditions, for boat slip renter passengers came to 35 and 56, respectively. These points were converted to a Unit Day Value using the point to dollar value table for Fiscal Year 1989. This resulted in a Unit Day Value of $3.23 and $4.33. The net increase in Unit Day Value came to $1.10.

((b)) Benefits For Non-household Passengers Of Boat Owners Renting Existing Slips - The Olcott Harbor contingent value survey revealed that new slip renters would average 40.12 trips per year and carry 3.44 passengers per trip. These usage patterns were assumed to reflect boaters who currently rent slips at Olcott Harbor.

An adjustment was made to the average number of passengers (3.44) to obtain the number of non-household passengers per trip. A survey of current permanent slip renters at Olcott indicated over 56 percent of all passengers are not members of the boat owners immediate household. Only 56 percent of all passengers (1.93) were assumed to not be members of the boat owners immediate household.

Therefore, the increase in benefits for passengers on boats renting slips at the existing marina facilities equals the net increase in Unit Day Value per passenger ($1.10) times the number of passengers not members of the boat owners immediate household (1.93) times the uses per season (40.12) times the number of wet berths provided by the existing marina facilities over the Without Project Condition for non commercial use (202). These benefits came to $17,200.

(iii) Summary of Benefits For Users Of Existing Harbor Slips - Benefits for users of existing slip facilities consist of two groups: The slip renters immediate household and all passengers not members of the slip renters immediate household. The benefits for these two categories came to $28,200 and $17,200, respectively.

(b) Current Transient Users - There were 1,142 paid transient rentals at the town of Newfanes transient boat facility in 1989. These rentals took place in the rectangular area north of the existing launch ramps. The size of this area is 159 feet by 182 feet. The north side of the basin area is bulkheaded and provides 15 slips for transient use. There are

bulkheads/walkways on the west, south and one-half of the east side of this basin area. The town can accommodate approximately 30 overnight users via direct tieup to existing slips, bulkheads and public walk ramps. The town has accommodated up to 55 overnight visitors. Fifteen of the overnight boaters had slips. The balance tied up to the existing bulkhead/walkways via direct tieup and rafting. Given there are approximately 30 spaces for overnight usage, each space was used 38 times during 1989.

The town of Newfane expects to increase the number of transient slips to 75 by 1990. This will be accomplished by installing new walkways in the mooring area to provide 75 slips for transient use. Given the number of transient rentals per season per transient space in 1989 (38), the 75 transient spaces should generate a minimum of 2,850 transient rentals per season. WOP condition annual transient rentals are expected to be 2,850. The average number of passengers per transient slip rental is assumed to be 3.44, the same as slip renters.

The people who use these "Existing Condition" (WOP condition) transient spaces will have an increase in the value of their recreational boating experience due to project implementation (See Section C3). Two specific user groups will benefit: The boat owners immediate household and all passengers not members of his immediate household.

(i) Benefits To The Boat Owners Immediate Household Who Use Existing Transient Spaces - This analysis parallels that performed for boat owners renting existing slips at Olcott Harbor (See Section C4-d,(2),((a)). Benefits to boat owners using WOP condition transient slip facilities can be computed as follows: 1. Convert annual transient slip rentals to equivalent permanent slip renters, multiply equivalent slip renters times the difference between WOP condition and WP condition consumer surplus per transient space user.

Annual transient slip rentals were converted to equivalent slip renters by dividing annual WOP transient rentals (2,850) by annual visitations per slip renter (40.12). Thus, 2,850 annual transient rentals is equivalent to 71 annual slip renters.

Section C4-d,(2),((a)) indicated the difference between WOP condition and WP condition consumer surplus for each slip renter came to $139.57. Transient boat owners were expected to realize this increase in net consumer surplus also. Benefits to boat owners using WOP condition transient facilities is the difference between WOP condition and WP condition consumer surplus for each slip renter ($139.57) times the equivalent number of annual slip renters (71). Benefits to boat owners using WOP condition transient boater facilities came to $9,900.

(ii) Non-Household Passenger Benefits - Boat owners using the WOP condition transient boater facilities will have passengers on their boats who are not members of their immediate

household. The recreational boating experience of these non household passengers will also increase due to project implementation. The increase in this value was calculated using the Unit Day Value Method.

The increase in benefits for passengers on boats using the WOP condition transient slip facilities equals the net increase in Unit Day Value per passenger times the number of passengers not members of the boat owners immediate household times the number of seasonal rentals.

((a)) Unit Day Value - The Unit Day Value for "Existing Condition" transient boater facilities was developed for WOP and WP conditions. The "Existing Condition" transient boater facilities were rated (Table C37).

Table C37 - Point Values For Non-Household Passengers Of Boaters Using "Existing Condition" Transient Boater Facilities.

| | Category: General Recreation Point Values | |
|---|---|---|
| Criteria | Without Project | With Project |
| Recreation Experience | 11 | 16 |
| Availability of Opportunity | 3 | 3 |
| Carrying Capacity | 6 | 10 |
| Accessibility | 11 | 17 |
| Environmental Quality | 4 | 10 |
| TOTAL POINTS | 35 | 56 |
| Unit Day Value | $3.23 | $4.33 |

according to five criteria: Recreation Experience, Availability of Opportunity, Carrying Capacity, Accessibility, and Environmental Quality. The Recreation Category used was General Recreation. The point values under "Without Project" and "With Project" conditions, for passengers came to 35 and 56, respectively. These points were converted to a Unit Day Value using the point to dollar value table for Fiscal Year, 1989. This resulted in a Unit Day Value of $3.23 and $4.33. The net increase in Unit Day Value came to $1.10.

((b)) Benefits For Non-household Passengers - The Olcott Harbor contingent value survey revealed that new slip renters carry 3.44 passengers per trip. Field interviews indicated that 56 percent of all slip renter passengers are not members of the

boat owners immediate household. Passengers who are not members of the immediate household equal 56 percent of total passengers per trip. This results in 1.93 passengers per new slip who are not members of the new slip renters immediate household. These operating characteristics were assumed to apply to boaters using the "Existing Condition" transient slips over the fifty-year evaluation period.

The increase in benefits for passengers on boats using "Existing Condition" transient facilities equals the net increase in Unit Day Value per passenger ($1.10) times the number of non-household passengers (1.93) times the projected transient rentals per season (2,850). The annual benefits came to $6,000.

(iii) Summary Of Benefits For Users Of "Existing Condition" Transient Facilities - Benefits for users of "Existing Condition" transient facilities consist of two groups: The transient slip user boat owners immediate household and all non-household passengers. The benefits for these two categories came to $9,900 and $6,000, respectively.

e. Charter Service Benefits. Both Plan 10 A Modified and 10B provide 50 slips for the charterboat service industry and one slip for a tour boat. Charter service benefits can be divided into two categories: Sportfishing charterboat benefits and tour boat benefits. The benefits associated with these two usages will be presented in this section.

(1) Charter Boat Fishing Benefits - Over 90 % of the charters at Olcott are specifically for salmon fishing. The peak time periods for Salmon fishing are three weeks in the spring and four to six weeks in the fall. During both of these times, salmon can be found one to two miles off shore of Olcott Harbor. In the spring and summer, salmon are found at the water temperature zone they prefer. The fish naturally migrate toward the shore in the spring. As the shoreline water warms up, the fish begin to migrate out into the lake. In the summer they can be found at 200 to 300 feet. This depth of water can be attained by traveling only 2 to 3 miles off of Olcott Harbor because of the lake bottom topography in this area. Thus, Olcott Harbor allows charter captains to access deep water in a relatively short period of time. It also allows them to stay out longer when bad weather is forecast, since shelter is a shorter distance away. In the fall, the salmon are running to spawn. Charters need not go very far out onto the lake. Given the New York State fish stocking program and the lake bottom topography around Olcott Harbor, this port has the potential to develop a year round sportfishing industry. The growth in the charterboat industry will put pressure on the Olcott area for permanent slips for this purpose.

The continual stocking of salmon at Olcott Harbor ensures this area as a prime fishing location. Table C15 presented salmon fish stocking at Olcott Harbor in 1988. Annual stocking of

salmon alone at Olcott Harbor has averaged 320,000 per season. New York State Department of Environmental Conservation indicates these levels will continue in the future.

The local sponsor has set aside 50 slips for usage by full-time charterboat captains under Plan 10 A Modified or 10B. This allocation of slips to charterboat use is based upon the current usage of Olcott Harbor by charterboat captains, and the future demand for such slips by charterboat operators in the study area. Two individual analyses were performed to capture the benefits associated with these slips. The first analysis was a Net Income approach to capture the rise in net income for the charterboat industry as a whole due to the Olcott Harbor project. The second evaluation analyzed the consumer surplus generated by the fishermen clients who paid for these charters. These two evaluations follow.

(a) Net Income For New Charterfishing Operators - Data on the costs and revenues associated with Charter fishing operations on Lake Ontario, and Olcott Harbor in particular, were obtained from a number of sources. Data on annual costs for Lake Ontario charterboats was obtained from a 1985 survey of charterboat captains performed by Sea Grant. (Lake Ontario's Charterboat Industry: A Profile Of Its Characteristics And Economics, M. P. Voiland Jr., 1985). Annual fixed and variable costs presented in the report were updated to reflect October, 1989 prices. A survey of charter captains operating out of Olcott Harbor in 1989 was performed by the Buffalo District. Data from this survey was used to obtain annual revenues, trips per season, and customers per trip. The above data was used to develop a net income analysis. This net income analysis was used to develop total net income estimates under Without Project Conditions and With Project Conditions. A summary of the net income analysis follows.

(i) Gross Seasonal Revenue Per Charterboat For New Charterboat Operators - Gross revenue was calculated based on a per trip charge and number of charters per season. A survey performed by the Buffalo District of charterboat operators currently using Olcott Harbor indicated a full-time operator would charge $300 per trip. Typically full-time operators on Lake Ontario make between 75 and 100 trips per season. This analysis used 75 trips per season to calculate gross revenue projections for new charterboat operators locating at Olcott Harbor in the "With Project" condition. Gross revenues came to $22,500.

(ii) Annual Charterboat Operating Expenses - The cost of running a charterboat operation for a typical year was developed using 75 trips per season. This reflects the number of trips that would be taken, during each year of the evaluation period, by new charterboat operators locating at Olcott Harbor. Costs were divided into fixed and variable components. Two costs that were not included in the 1985 survey of charterboat captains, was

added to the analysis. The two costs are captains wages, and management costs. Table C38 summarizes these costs.

Table C38 - Annual Charterboat Operating Costs (1)

| Operating Expenses | Fixed Costs ($) | Variable Costs ($) | Total Costs ($) |
|---|---|---|---|
| Fuel | | 1,478 | 1,478 |
| Maintenance & Repair | 1,226 | 613 | 1,839 |
| Crew Labor | | 1,323 | 1,323 |
| Captains Wages | | 1,582 | 1,582 |
| Management Costs(Captain) | | 515 | 515 |
| Miscellaneous | 333 | 166 | 499 |
| Insurance | 690 | | 690 |
| Dockage & Storage | 1,200 | | 1,200 |
| Brochures & Advertisement | 1,702 | | 1,702 |
| Equipment Payment (Owner Equity) | 1,987 | | 1,987 |
| Boat Trailer Payments | 621 | | 621 |
| Boat Payments | 3,625 | | 3,625 |
| Tow Vehicle Payments | 1,192 | | 1,192 |
| | 12,576 | 5,677 | 18,253 |

(1) Annual Operating Costs based upon 75 trips per season

Fixed costs were divided into two categories: Capital costs and "Other" fixed costs. Capital costs were taken for the following equipment: Boat, boat trailer, tow vehicle and fishing equipment.

Certain capital costs were annualized using the Federal Discount rate of 8.875 percent. Capital costs that fell under this category were the cost of a boat, the trailer to tow it on, and the vehicle to trailer it with. The majority of charterboat operators use highly depreciated boats, boat trailers and tow vehicles. However, the capital cost of this equipment was included in the evaluation to account for the "Opportunity Cost Of Capital" over the 50-year evaluation period.

The term of the evaluation for the boat, boat trailer, and tow vehicle were placed at fifteen years, five years, and five years, respectively. The "capital cost" for the boat, boat trailer, and tow vehicle came to $30,000, $2,500, and $12,000, respectively. The annual interest rate equaled the federal discount rate.

Annual payments for these "capital costs" come to $ 7,226. Since the tow vehicle would not be used 100% of the time for chartering operations, only a portion of the tow vehicle monthly payments were used. Recent literature on the charter industry indicates only 40% of the vehicles use is strictly for chartering purposes.

Consequently, only 40 percent of the annual tow vehicle payment costs were used in developing fixed costs associated with the chartering industry. Annual payments on "capital costs" for the boat, boat trailer and tow vehicle came to $5,438.

In addition, it was assumed the boat owner had an equity interest in the charterboat operation equal to the cost of equipment, $8,000. This investment was treated as a loan to the boat owner by himself. The loan had a five year term and an 8.875 percent annual interest rate. The owner would make yearly payments to himself and at the end of five years would realize his original capital expenditure of $8,000 plus yearly interest on this amount at an 8.875 percent annual rate. The annual equipment payments came to $1,987. Annual payments on capital costs (the boat, boat trailer, tow vehicle and equipment return on equity) were $7,425.

"Other" fixed costs included annual maintenance and repair, miscellaneous (charter captain license, association dues, etc) insurance, dockage and storage, and brochures and advertisement. These "Other" fixed costs totaled $5,150 annually.

Total annual fixed costs were composed of annual "capital" payments ($5,438), owner equity payments ($1,987) and "Other" fixed costs ($5,150). Total annual fixed costs came to $12,575.

Annual variable costs covered such categories as gasoline, maintenance and repair, (tackle, rod and reel, boat repair) labor for a first mate, labor costs for the captain, management costs and miscellaneous costs (ice, bait, lures etc). Annual variable costs were based upon 75 trips per season and four clients per trip. Annual variable costs came to $5,677.

Total annual costs, fixed and variable, came to $18,253. These costs were based upon 75 trips per season and an average of 4 customers per trip.

(iii) Annual Net Income Per Year - Annual net income per year is the difference between Gross Annual Revenue ($22,500) minus Total Annual Costs ($18,253). This comes to $ 4,247 a year in net income per charterboat.

(iv) Benefits To New Charterboat Operators Based On Net Income - Plans 10 A Modified and 10B will provide 50 new slips for charterboat operators under With Project conditions. Net income for these charterboat operators equals net income per year per charterboat operator ($4,247) times the number of new charterboat slips provided by the project (50). This results in net income for new charterboat operators of $212,350.

Realization of this amount of net income would necessitate all 50 new charterboat slips to be rented to charterboat operators in project year one, 1994. Although the pressure for slips from the charterboat industry may fill this supply in project year one, there would still be a need to develop a clientele base to

achieve the 75 charters per year fleet average. Consequently, the charterboat fleet was phased in over a five-year period. Ten new charterboat captains were added for each of the projects first five years. The charterboat fleet was assumed to remain constant from project year 5 to project year 50. Annual harbor net income per year was developed by multiplying annual net income per charterboat ($4,247) times the number of charterboats at the project for each of the project study years. This time stream of net income was converted to an average annual equivalent dollar value using an 8.875 percent annual interest rate and a fifty-year project life. Average annual charterboat benefits came to $180,000.

(b) Benefits To Charter Slips Rented To Permanent Based Boaters - There is also a benefit associated with the slips set aside for charters but not used during the first four years of the project. For example, in project year 1, 50 slips are set aside for charters, but only 10 new charters are credited to the project. This leaves forty slips for other temporary uses. This total drops to 30 in project year 2, 20 in project year 3 and 10 in project year 4. Benefits attributable to these slips are twofold: Benefit to the boat owner (Willingness To Pay) and benefit to the passengers (Consumer Surplus).

Benefit to the boat owners who rented these "Charter" slips were assumed to be the same as the Willingness To Pay (WTP) for slip renters. Net WTP for slip renters came to $549.40 per boat owner. This was multiplied by the number of slips rented by these boat owners from project year 1 to project year 4. These willingness to pay values per year were converted to a present worth value using an 8-7/8 percent annual interest rate. This time stream of WTP values was converted to an average annual dollar value given an 8-7/8 percent annual interest rate and a 50-year project life. Average annual benefits for these slips came to $4,200.

There is also a benefit accruing to the passengers of slips set aside for charters but not used during the first four years of the project. For example, in project year 1, 50 slips are set aside for charters, but only 10 new charters are credited to the project. This leaves forty slips for other uses. This total drops to 30 in project year 2, 20 in project year 3 and 10 in project year 4. All of these slips may be rented to boat owners. These boat owners will on an average use their boat 40.12 times per season. On each of these usages, there will be 3.44 passengers. Fifty-six percent of these passengers will not be immediate family members of the boat owner.

Each of these passengers have some consumer surplus associated with the recreational boating experience. Consumer surplus for these passengers was evaluated based upon a Unit Day Value for each passenger for each activity occasion generated. The Unit Day Value was based upon the General Recreation category. This is the same Unit Day Value used in the evaluation of Non-

household passengers of permanent based new slip renters in section C4-d,(1),(a),(ii). This Unit Day Value came to $4.33. (See Table C32).

Consumer surplus for passengers of pleasure craft renting slips set aside for charterboat usage, was generated for each year of the project evaluation period. This was accomplished by multiplying the number of pleasure craft renting slips set aside for charterboats times the trips per pleasure boat per season times the number of non-family related passengers per trip times the Unit Day Value per activity occasion. Average annual benefits for these passengers came to $2,600.

(c) Increase In Net Income For The Existing Charterboat Fleet - Data collected by the Buffalo District indicates there are between 150 and 200 charterboats who use Olcott Harbor for charters per season. The number who rent slips year round at Olcott is placed at 25.

The current charterboat fleet can be divided into a transient fleet of 125 and a permanent based fleet of 25. The transient fleet is characterized by charterboat captains who trailer their boats up to Olcott Harbor for a weekend. Numerous captains, however, bring their boats to Olcott for approximately one month and commute from their home states for weekend charter fishing bookings. The charters of the transient charterboat captains are typically in the spring and fall for salmon sport fishing. It is estimated each transient charterboat captain has an average of 5 charters per season, with four clients per trip.

The existing permanent based fleet of 25 typically averages 60 charters per season also with four clients per trip. Again, these charterboat operators concentrate on fishing for salmonids.

There will be two impacts on the current charterboat fleet from implementation of Plan 10 A Modified or 10B. First of all, there will be an increase in the consumer surplus of charterboat clients using the existing transient and permanent based fleet. Secondly, the permanent based fleet is expected to realize an increase in the number of annual charters per season from 60 to 75. This is due to the improved docking facilities that will be offered, the increased prominence Olcott Harbor will have as a recreational port on Lake Ontario due to the Harbor development, the expected growth in the charterboat industry in general, and the continuation of the excellent sport fishery located around Olcott Harbor. The quantification of these two impacts follows.

The existing permanent based charterboat fleet will realize an increase in total charters per season from 60 to 75 under "With" Project Conditions. This has two impacts. First, the net income of the current permanent based fleet will rise. Secondly, all clients on these additional charters will realize a consumer surplus value equal to the Unit Day Value for clients under With Project Conditions ($17.09, See Table C39).

Table C39 - Derivation Of Points For With Project Condition
Charterboat Clientele

| Criteria | With Project Points |
|---|---|
| 1. Recreation Experience | 15 |
| 2. Availability Of Opportunity | 3 |
| 3. Carrying Capacity | 11 |
| 4. Accessibility | 17 |
| 5. Environmental Quality | 10 |
| Total Points | 56 |
| Unit Day Value | $17.09 |

The increase in net income for the existing permanent based charterboat fleet was calculated by taking the difference between net income for the fleet under the "With Project" condition and the "Without Project Condition. Net income for the existing charterboat fleet, under "without Project" conditions, is presented in Table C40. Net income for the "existing" charterboat fleet, under "without project" conditions, is $22,100.

Given an existing permanent based charterboat fleet of 25, an increase of 15 charters per charterboat is assumed to take place under "With Project" conditions. Again, like the new charterboat fleet, all of these additional charters will not occur at project year one. These additional charters were phased in over a five-year period, starting in project year one. Thus in project year 1, each charterboat in the existing charterboat fleet had 63 bookings. This rose to 66 bookings in project year 2, 69 in project year 3, 72 in project year 4 and 75 in project year 5 through 50. The net income per trip per charterboat operator, associated with these level of bookings was calculated. This was multiplied times the number of charters the fleet had by project year. This resulted in an existing charterboat fleet time stream of net income. Yearly net income for the existing charterboat fleet, for project years 1, 2, 3, 4, and 5 through 50 were $38,900(see Table C41), $55,700, $72,500, $89,400 and $106,200(see Table C42), respectively. This time stream of net income was converted to an average annual dollar value given an 8-7/8% annual interest rate and a 50-year project life. The average annual value of net income for the existing charterboat fleet, under "with project" conditions, came to $93,400.

The increase in net income for the existing permanent based charterboat fleet was calculated by taking the difference between net income for the fleet under the "With Project" condition ($93,400) and the "Without Project Condition ($22,100). The increase in net income for the existing permanent based charterboat fleet is $71,300.

Table C40. Net Income For Existing Permanent Based Charterboats-Without Project Condition, Project Years 1-50.

1. Annual Gross Revenue Per Charterboat

| | |
|---|---|
| Revenue per Charter | $300 |
| Charters Per Season | 60 |
| Gross Revenue Per CharterBoat | $18,000 |

2. Annual Charterboat Operating Costs Per Charterboat (1)

| Operating Expenses | Fixed Costs ($) | Variable Costs ($) | Total Costs ($) |
|---|---|---|---|
| Fuel | | 1,182 | 1,182 |
| Maintenance & Repair | 1,226 | 490 | 1,716 |
| Crew Labor | | 1,058 | 1,058 |
| Captains Wages | | 1,266 | 1,266 |
| Management Costs(Captain) | | 413 | 413 |
| Miscellaneous | 333 | 133 | 466 |
| Insurance | 690 | | 690 |
| Dockage & Storage | 1,200 | | 1,200 |
| Brochures & Advertisement | 1,702 | | 1,702 |
| Equipment Payment (Owner Equity) | 1,987 | | 1,987 |
| Boat Trailer Payments | 621 | | 621 |
| Boat Payments | 3,625 | | 3,625 |
| Tow Vehicle Payments | 1,192 | | 1,192 |
| | $12,576 | $4,542 | $17,118 |

(1) Annual Operating Costs based upon 60 trips per season

3. Net Income Per Charterboat Operator

| | |
|---|---|
| Gross Revenue | $18,000 |
| Total Expenses | $17,118 |
| Net Income Per Charterboat Operator | $ 882 |

4. Net Income For Permanent Based Charterboats Under "Without Project Conditions

| | |
|---|---|
| Net Income Per Charterboat Operator Per Year | $ 882 |
| Number of WOP Condition Permanent Based Charterboats | 25 |
| Average Annual Net Income For Existing Permanent Based Charterboats, Without Project Condition | $22,050 |

Table C41. Net Income For Existing Permanent Based Charterboats-With Project Condition, Project Year 1.

1. Annual Gross Revenue Per Charterboat

| | |
|---|---|
| Revenue per Charter | $300 |
| Charters Per Season | 63 |
| Gross Revenue Per CharterBoat | $18,900 |

2. Annual Charterboat Operating Costs Per Charterboat (1)

| Operating Expenses | Fixed Costs ($) | Variable Costs ($) | Total Costs ($) |
|---|---|---|---|
| Fuel | | 1,241 | 1,241 |
| Maintenance & Repair | 1,226 | 515 | 1,741 |
| Crew Labor | | 1,111 | 1,111 |
| Captains Wages | | 1,329 | 1,329 |
| Management Costs(Captain) | | 433 | 433 |
| Miscellaneous | 333 | 140 | 473 |
| Insurance | 690 | | 690 |
| Dockage & Storage | 1,200 | | 1,200 |
| Brochures & Advertisement | 1,702 | | 1,702 |
| Equipment Payment (Owner Equity) | 1,987 | | 1,987 |
| Boat Trailer Payments | 621 | | 621 |
| Boat Payments | 3,625 | | 3,625 |
| Tow Vehicle Payments | 1,192 | | 1,192 |
| | $12,576 | $4,769 | $17,345 |

(1) Annual Operating Costs based upon 63 trips per season

3. Net Income Per Charterboat Operator

| | |
|---|---|
| Gross Revenue | $18,900 |
| Total Expenses | $17,345 |
| Net Income Per Charterboat Operator | $ 1,555 |

4. Net Income For Permanent Based Charterboats Under "Without Project Conditions-Project Year 1.

| | |
|---|---|
| Net Income Per Charterboat Operator | $1,555 |
| Number of WOP Condition Permanent Based Charterboats | 25 |
| Net Income For Existing Permanent Based Charterboats With Project Condition-Project Year 1. | $38,875 |

Table C42. Net Income For Existing Permanent Based Charterboats-With Project Condition, Project Years 5 Through 50.

1. Annual Gross Revenue Per Charterboat

| | |
|---|---|
| Revenue per Charter | $300 |
| Charters Per Season | 75 |
| Gross Revenue Per CharterBoat | $22,500 |

2. Annual Charterboat Operating Costs Per Charterboat (1)

| Operating Expenses | Fixed Costs ($) | Variable Costs ($) | Total Costs ($) |
|---|---|---|---|
| Fuel | | 1,478 | 1,478 |
| Maintenance & Repair | 1,226 | 613 | 1,839 |
| Crew Labor | | 1,323 | 1,323 |
| Captains Wages | | 1,582 | 1,582 |
| Management Costs(Captain) | | 515 | 515 |
| Miscellaneous | 333 | 166 | 499 |
| Insurance | 690 | | 690 |
| Dockage & Storage | 1,200 | | 1,200 |
| Brochures & Advertisement | 1,702 | | 1,702 |
| Equipment Payment (Owner Equity) | 1,987 | | 1,987 |
| Boat Trailer Payments | 621 | | 621 |
| Boat Payments | 3,625 | | 3,625 |
| Tow Vehicle Payments | 1,192 | | 1,192 |
| | 12,576 | 5,677 | 18,253 |

(1) Annual Operating Costs based upon 75 trips per season

3. Net Income Per Charterboat Operator

| | |
|---|---|
| Gross Revenue | $22,500 |
| Total Expenses | $18,253 |
| Net Income Per Charterboat Operator | $ 4,247 |

4. Net Income For Permanent Based Charterboats Under "Without Project Conditions

| | |
|---|---|
| Net Income Per Charterboat Operator | $ 4,247 |
| Number of WOP Condition Permanent Based Charterboats | 25 |
| Yearly Net Income For Existing Permanent Based Charterboats-With Project Condition-PY 5-50 | $106,175 |

(d) Recreational Value For New Charterfishing Clients - New charterboat clients, under With Project conditions, may use new charterboat captains locating at Olcott Harbor or charterboats currently renting slips at Olcott Harbor. The total benefit to each client who pays for a charter is the area under the demand curve for sportfishing, given a specific price. The area under the demand curve below price was used in the Net Income analysis. However, the area under the demand curve, above price, is equal to the clientele's consumer surplus. A proxy for this value, per client, can be approximated using the Unit Day Value method. Since 90 percent of the charter trips are for salmon, Specialized Recreation Fishing and Hunting was used to determine the Unit Day Value for charterboat fishing clientele. Application of the five criteria resulted in 56 points under "With" project conditions. This converted to a Unit Day Value of $17.09. A summary of the criteria and points allocated to each criteria are presented in Table C39.

(i) Recreational Value For New Charterfishing Clients Using New Charterboat Operators - Charterboat Clientele Consumer Surplus was generated for each year of the project evaluation period. This was accomplished by multiplying the number of new charterboats times the trips per new charterboat per season times the number of clients per trip times the Unit Day Value per activity occasion. A Unit Day Value of $17.09 for "With" Project conditions was used to evaluate the Recreational value for new charterfishing clients. The analysis used 10 new charterboats per year from Project Year one to Project Year 5. This resulted in 50 charterboats in project year five. This level was held constant from project year five to project year fifty. Each charterboat made 75 trips per season with an average of four clients per trip.

This data was used to develop a time stream of consumer surplus values for clients using new charterboat operators over the life of the project. This time stream of values was converted to an average annual value given an 8.875 percent annual interest rate, straight line growth and a 50-year project life. Consumer surplus for charterboat clientele using new charterboat operators was $217,300.

(ii) Recreational Value For New Charterfishing Clients Using Existing Permanent Charterboat Operators - Under with project conditions, the existing permanent based charterboat fleet (25) is expected to have fifteen additional charters, per boat, per season. The charterboat fishing clients who use the existing fleet for these new trips, also have a consumer surplus value associated with these new activity occasions. A proxy for this consumer surplus value was calculated by multiplying the Unit Day Value for charterfishing clients under "With" Project conditions ($17.09) times the number of additional clients occurring during each year of the 50-year project evaluation period. This time stream of consumer surplus was converted to an average annual dollar value.

The additional charters to the existing permanent based fleet were phased in over a five-year period, starting in project year one. Thus, this consumer surplus increase was assumed to develop over a five-year period starting from project year one. This time stream of consumer surplus was converted to an average annual dollar value given a five-year growth period, straight line growth, an 8-7/8% annual interest rate and a 50-year project life. The annual value of the increase in consumer surplus of new clients using the existing permanent based charterboat fleet came to $21,700.

(e) Increase In Recreational Value For Clients Using Existing Charterboat operators - Finally , clients who use the existing charterboat fleet will realize an increase in the value of the recreational sportfishing experience due to the implementation of Plan 10 A Modified or 10B. The increase in consumer surplus for clients of the current charterboat fleet was measured via the Unit Day Value for Specialized Recreation and Fishing. Table C43 shows the derivation of Unit Day Value point values under "Without" and "With" Project conditions. These point values came to 32 and 56 for "Without" and "With" project conditions, respectively. These point values converted to Unit Day Values of $14.62 and $17.09 for "Without" and "With" Project conditions. The net increase in Unit Day Value came to $2.47 per client per trip.

Table C43 - Derivation Of Points For Existing And New Charterboat Clientele

| Criteria | Without Project Points | With Project Points |
|---|---|---|
| 1. Recreation Experience | 8 | 15 |
| 2. Availability Of Opportunity | 3 | 3 |
| 3. Carrying Capacity | 6 | 11 |
| 4. Accessibility | 11 | 17 |
| 5. Environmental Quality | 4 | 10 |
| Total Points | 32 | 56 |
| Unit Day Value | $14.62 | $17.09 |

This value is a proxy for the increase in consumer surplus per client per trip for the existing charterboat fleet. The total increase in consumer surplus for clients of the current charterboat fleet was calculated by multiplying the net increase in Unit Day Value per client($2.47) times the number of client activity occasions generated per season by the current fleet. Table C44 presents the calculations used to generate these benefits.

Table C44 - Benefits To Clients Using The Current Charterboat Fleet

| | TRANSIENT CHARTERBOAT OPERATORS | CHARTERBOATS BASED AT OLCOTT |
|---|---|---|
| Number charterboats | 125 | 25 |
| Charters/season | 5 | 60 |
| Total charters per season | 625 | 1,500 |
| Number clients/charter | 4 | 4 |
| Number annual activity occasions | 2,500 | 6,000 |
| Increase in UDV/activity occasion | $ 2.47 | $ 2.47 |
| Benefits to clients of Existing charterboats | $6,200 | $14,800 |

The activity occasions generated by the current charterboat fleet were based upon 4 clients per trip with each transient charterboat having 5 charters per season and each permanent based charterboat having 60 charters per season. Benefits for clients of existing transient charterboat operators came to $6,200. Benefits for clients of existing permanent charterboat operators were $14,800. The total increase in consumer surplus for clients of the current charterboat fleet came to $21,000.

2. Tour Boat Benefits.

(a) Recreational Value For New Tour boat Clients - Plan 10 A Modified or 10B calls for the construction of a dock facility for a tour boat. The local cooperator has indicated that $500,000 has been targeted for development of the tour boat operation. This $500,000 would be used to purchase a tour boat, and complete dock construction for the tour boat use. Currently, there is no tour boat operating at Olcott Harbor.

There have been up to 10 tour boats operating in the Erie and Niagara County area in the last five to ten years. One tour boat operation, the Maid of The Mist, has been in existence since 1848. This area offers cruises on Lakes Erie and Ontario, the Niagara River and the New York State Barge Canal. The tour boats handle from four passengers to 200 passengers on a typical outing. Season length has been typically from May to September. Some tour boats operate every day of the week. Others operate exclusively on the weekend. Other tour boats operate on a charter basis only.

Benefits for the tour boat operation are twofold: The net income generated by the operation to the respective owners and the consumer surplus enjoyed by the passengers. Lack of specific data on the size of tour boat and related operating expenses,

precluded performing a net income analysis on the tour boat operation. However, the amount of money set aside for the tour boat operation would allow a 100 passenger tour boat to be bought, even if the boat had to be purchased new. Consumer surplus for the passengers was estimated using the Unit Day Value for General Recreation.

(i) Annual Passenger Trips Per Season - Total passenger trips per season were calculated by multiplying trips per day times days per week of operation times weeks in the season times passengers per trip. The tour boat envisioned at Olcott Harbor would have a maximum passenger capacity of 100 people, and be in operation from May through September. Cruises would take place two days during the week and two days on the weekend. There would be two trips offered per day. This is considered reasonable and consistent with other tour vessels operating within the region. On average, each trip was assumed to be at 65 percent of passenger capacity. The cruises would be sightseeing tours as well as dinner cruises. The tour boat would also be available for private tours as well as cruises to Toronto, Canada. Given the above, total passenger trips per season came to 10,920.

(ii) Consumer Surplus Per Tour boat Passenger - A proxy for passenger consumer surplus was developed using the Unit Day Value Method. Points that reflect the value of the recreational tour boat experience at Olcott Harbor, based on the criteria for General Recreation were developed (See Table C45). These point values came to 63. This converted to a Unit Day Value of $4.56, based upon the Fiscal Year 1989 Reference Handbook. This Unit Day

Table C45 - Unit Day Value For Tour Boat Passengers

| Criteria | With Project Points |
|---|---|
| 1. Recreation Experience | 16 |
| 2. Availability Of Opportunity | 10 |
| 3. Carrying Capacity | 10 |
| 4. Accessibility | 17 |
| 5. Environmental Quality | 10 |
| Total Points | 63 |
| Unit Day Value (General Recreation) | $4.56 |

Value of $4.56 per passenger per trip, was used as the proxy for consumer surplus associated with each passenger activity occasion.

(iii) Annual Consumer Surplus For Tourboat Passengers - Annual consumer surplus for tour boat passengers equaled annual passenger trips per season (10,920) times consumer surplus per passenger per activity occasion ($4.56). Annual consumer surplus benefits for tour boat passengers came to $49,800.

(3) Summary Of Charter Service Benefits - A summary of charter service benefits is presented in Table C46. Charter service benefits had two divisions: Sportfishing charterboat benefits and tour boat benefits.

Table C46 - Total Charter Service Benefits

| Benefit Category | Annual Benefit ($) |
|---|---|
| 1. Increase In Net Income To 50 New Charter Operators | 180,000 |
| 2. Increase In Net Income To Existing Harbor Charterboat Operators | 71,300 |
| 3. Recreational Value For Charterfishing Clients Using New Charterboat Operators | 217,300 |
| 4. Recreational Value For New Charterfishing Clients Using Existing Harbor Charterboat Operators | 21,700 |
| 5. Increase In Recreational Value For Charterfishing Clients Using Existing Harbor Charterboat Operators | 21,000 |
| 6. Benefits To Slips Set Aside For Charterboat Usage But Not Used For This Purpose In The First Five Years | |
| a. Slip Renter Benefits | 4,200 |
| b. Benefits Of Passengers Of Slip Renters | 2,600 |
| 7. Benefits To Tourboat Passengers | 49,800 |
| Total Charter Service Benefits | $567,900 |

There were six different sportfishing charterboat benefit categories evaluated: Increase in net income for 50 new charterboat operators, increase in net income for the existing charterboat fleet, recreational value of charterfishing clients using the 50 new charterboats, recreational value of new charterfishing clients using the existing permanent based Olcott Harbor charterboat fleet, increase in recreational value to charterfishing clients using current Olcott Harbor charterboat fleet, benefits to slips set aside for charter use in the first five years of the project, but not used by charterboat operators.

Potential benefit categories associated with the tour boat operation were increase in net income to the tour boat operator, and the recreational value of the tour boat experience to the passenger. The former was not evaluated due to lack of data on operating expenses. The latter was evaluated using the Unit Day Value method.

Total charter service benefits, by benefit category, is presented in Table C46. Total charter service benefits came to $567,900.

f. Pier/Breakwater Fishing Benefits. Benefits have been calculated for pier/breakwater fishing for salmonids for the two plans, 10 A Modified and 10B. Salmonid fishing is a Specialized Recreational Activity. The Unit Day Value (UDV) was used to measure fisherman consumer surplus.

Benefits have not been taken for non-salmonid (warm water) fishing as it does not appear that a project will significantly increase warm water fishing pressure. There is sufficient existing pier capacity for warm water fishing needs. Relatedly, it does not appear that the volume of warm water fishing under the With Project condition will be significantly greater than it would be under the Without Project condition of development.

(1) Ecology Of Salmonid Fishing - The salmonid fishing industry in Lake Ontario is booming. The number of charter boats in the state has grown at an average annual growth rate of 35% per year between 1975 and 1987. The industry initiated its present path of very rapid growth in the eastern end of the lake. Recently it has expanded westward. Currently, Eighteen-Mile Creek, the stream which flows through Olcott Harbor, is a major salmonid environment in the lake. Pier fishing at the existing piers is at capacity on peak days during the peak autumn salmon fishing season.

Salmonids are cold water fish. In the heat of the summer they are only found in the cold waters in the deep portions of the lake. The only way they may be caught at this time is by trolling at considerable depths. The availability of salmonids in deep water during the summer is the basis for a rapidly expanding charter boat fishing industry in the lake and at Olcott Harbor.

Pier/breakwater fishing for salmonids becomes a viable activity (at least a productive activity) when the salmon congregate in the vicinity of the pier/breakwater. Clearly in the summer, when the fish are in the cool and deep portions of the lake, pier/breakwater fishing for salmonids is not productive. The salmon congregate near the shore in the spring and fall, more during the latter time period than the former. As a result, pier/breakwater fishing for salmonids is an autumn and spring activity.

The autumn season, late August until late November, is the more productive of the two seasons because it is in the fall that the salmon run to spawn. In the last week or two of August, the exact date depends upon lake water temperatures, the salmon congregate in the vicinity of the mouth of the stream, waiting for the "right" water temperature which signals the beginning of the spawning run. Thus there is about a four week period, when the fish congregate in and around the mouth of the stream and

within this four week period a two week period when they run upstream. It is during these times that pier/fishing is most productive. This four week period was divided into a two week peak season and a two week non peak season. The analysis assumed there were 8 days during the peak season and 8 days during the non peak season that would be used to determine annual activity occasions. On a peak day in the peak autumn season, pier fishing at the existing piers at Olcott Harbor is near capacity (90%). A turnover rate of two was used for peak days. On non-peak days in the autumn season, use is less but still substantial. It is estimated to be about 50% of instantaneous peak day use. A turnover rate of one was used during non-peak days.

The spring season, April through mid June, is also productive as the salmon congregate along the shoreline. As spring passes and summer approaches, they begin the seasonal migration to the cold waters of the deep portions of the lake. Since the salmon do not "run" at this season, the Spring is not as productive with respect to fish catch. However, the congregation of salmon along the shoreline in the spring makes this time of the year very popular to fishermen. The possibility of catching a salmon at the beginning of a new fishing season attracts many fishermen to Olcott during the spring season.

The spring season runs for approximately two and a half months. During this time it was estimated there were 13 peak days and 13 non peak days. Again on a peak day in the peak spring season, the existing piers at Olcott are used to 90% of its instantaneous capacity. A turnover rate of two was used for peak days. On non-peak days in the spring season, instantaneous pier use was estimated to be thirty percent of peak day use. A turnover rate of one was used during non-peak spring days.

Two groups of fishermen will benefit from Plans 10A and 10B: New fishermen attracted to the new breakwaters and fishermen fishing off of the existing Federal piers.

(2) Benefits To New Pier Fishermen - Benefits to new pier fishermen were evaluated using the Unit Day Value for Specialized Fishing and Hunting. New pier fishermen activity occasions were generated for each plan. Activity occasions were split into peak and non peak days. Peak day breakwater utilization was calculated using such data as length of new breakwater usable and accessible for pier fishing, space standards, and turnover rates.

Peak day utilization was evaluated based upon an unlit east breakwater pedestrian walkway. Non peak utilization was taken as a fraction of peak day utilization.

All of the Pier fishing activity occasions generated from Plans 10 A Modified and 10B will not be realized in project year one. In general, pier fishing activity occasions require some phasing in of use over time. Depending upon the amount of projected additional capacity to be added by a plan, the phase in time

period varies from five years for Plan 10 A Modified to ten years for Plan 10B. The phase in period starts at project year one. No new fishermen activity occasions are projected to happen in Project year one. Growth in fishermen activity in the following years is assumed to be linear. Fishermen activity occasions reach a peak at project year 5 for Plan 10 A Modified and project year ten for Plan 10B. The fishermen activity occasions at these time periods are assumed to remain constant over the rest of the 50 year evaluation period.

The fishermen activity occasions generated during each year of the project evaluation period were then multiplied times the With Project condition Unit Day Value for Specialized fishing and hunting. This time stream of recreational fishing benefits was discounted using the Federal discount rate of 8-7/8 % per year and a fifty-year project life. Various components of this analysis will now be presented.

(a) Unit Day Value - Fundamental to the UDV method of evaluating benefits for a recreational project (in this case, component of a project) is the assessment of recreational points to be awarded the site under the existing (Without Project) and With Project conditions. Table C47 presents the Specialized Recreation UDV Points for salmonid pier/breakwater fishing at Olcott Harbor. The With Plan points are the same for Plan 10A and 10B.

In one category, availability of opportunity, there is no change in the number of points awarded from the Without to the With Project condition. In the remaining four categories, there is a significant change from the Without to the With Project conditions. The recreational experience category, which was awarded 2 points under the Without Project condition (heavy use of the existing facility with frequent overcrowding in the peak season), has been awarded 11 points under the With Project condition (moderate use, evidence of other uses and occasional interference with pier/breakwater fishing). Carrying capacity receives 4 points under Without Project condition (basic facilities to conduct pier fishing) but it has been awarded 12 points (ultimate facility to achieve intent - pier/breakwater fishing) under the With Project condition. Accessibility, which was awarded 4 points under the without Project condition (fair access with poor quality road access and restricted parking which limits access to the site) has been awarded 17 points under the with Project condition (good access with high standard roads and good access, including plentiful parking, providing access within the site). Environmental quality, 5 points under Without Project (average esthetic quality with existing factors that lowers the quality of the fishing experience at the existing site), has been awarded 13 points under the With Project condition (high esthetic quality with no existing factors to lower the quality of the activity at the site).

Table C47 - Specialized Fishing And Hunting Points: Olcott Harbor - Pier Fishing

| Point Category | Without Plan | With Plan | Change |
|---|---|---|---|
| Recreation Experience | 2 | 11 | 9 |
| Availability of Opportunity | 2 | 2 | 0 |
| Carrying Capacity | 4 | 12 | 8 |
| Accessibility | 4 | 17 | 13 |
| Environmental Quality | 5 | 13 | 8 |
| Total | 17 | 55 | 38 |

Total Specialized Recreation Points amount to 17 points under the Without Project condition and 55 points under the With Project condition; an increase of 38 points. These points converted to a Without Project condition UDV of $14.10 and a With Project condition UDV of $16.95. The value of the incremental change in UDV amounts to $2.85.

(b) Projected New Pier Fisherman Activity Occasions - New pier Fishermen activity occasions were generated for each Plan. Activity occasions were split into peak and non peak days. Peak day breakwater utilization was calculated using such data as length of new breakwater usable and accessible for pier fishing, space standards, and turnover rates. Again, peak day usage was evaluated based upon an unlit east breakwater pedestrian walkway. Non-peak utilization was taken as a fraction of peak day utilization.

Peak day activity occasions were calculated using a standard of one fisherman per 10 linear feet of pier/breakwater. The existing East and West Federal piers are wide enough to permit fishing on both sides. The East breakwater in each plan is wide enough to permit fishing on both sides and has a land connection. The West Breakwater is a detached structure under Plan 10 A Modified. No allowance was made for pier fishing off of this structure. Under Plan 10B, The West Breakwater calls for a land connection. Pier fishing from both sides of the West Breakwater

was accounted for under Plan 10B. Fishing activity occasions have been calculated on the basis of two-sided lineage.

It is estimated that salmon only can be caught in water with a depth of 5 or more feet under normal conditions. While it is acknowledged that under turbulent water conditions in the autumn, salmon are caught in water of lesser depths, average conditions require five feet of water. This analysis is based on average analysis and, consequently, the requirement for five or more feet of water adjacent to the pier/breakwater being analyzed.

(i) Usable/Accessible Pier/ Breakwater Length - Using recent soundings of the harbor and a map of the configuration of the proposed breakwaters for each of the two plans, the length of piers and breakwaters with a water depth of 5.0 feet or greater were calculated. All benefits were based upon the resulting "constrained" pier/breakwater lengths. (See Table C48). Plan 10 A Modified provides 3,230 lineal feet of fishable breakwater and Plan 10B, 6,410 lineal feet.

The estimated benefits are dependent upon the length of pier/breakwater frontage available for productive salmon fishing under the With Project condition. The key word is "productive" salmon fishing. Based on discussions of experienced salmon fishermen who fish at Olcott under the Without Project (existing) condition, it is estimated that a minimum of 75 ft. of unobstructed water must be available adjacent to the pier/breakwater. In essence, this means that no boats may be tied to the pier/breakwater or tied to docks which in turn are physically connected to the pier/breakwater, and no boats may be moored within 75 ft. of a pier/breakwater for the latter to be considered as a salmonid fishing site.

Current slip layouts for Plans 10 A Modified and 10B call for the placement of 50 slips along the following areas: The east and west side of the East Federal pier, and the east side of the West federal pier. These slips would be accessed from the existing Federal piers. These slips are to be used exclusively by boaters wishing to have overnight accommodations at Olcott Harbor (Transient slips). These slips would be installed in early to mid-June and removed after Labor Day (The first Monday in September). Thus, the usage of this area during the summer for transient boaters would not interfere with the current usage of the existing federal piers during the Spring and Fall for salmon fishing. Additionally, slip layout for plans 10A Modified and 10B calls for all non-transient slips to be located at least 100 feet from the current federal piers. This allows the current federal piers to be considered a salmonid fishing site once the transient slips have been removed. All fishermen using the existing federal piers under Without Project conditions for salmon fishing, would also be able to use the existing Federal Piers under With project conditions for salmon fishing.

Table C48 - Usable Pier/Breakwater Length

| Existing Federal Piers | Total Accessible Length | Length Not Having 5 Feet of Water Depth | Length Usable For Fishing |
|---|---|---|---|
| East Pier | | | |
| Channel Side | 440 | 0 | 440 |
| Lake Side | 440 | 250 | 190 |
| | 880 | 250 | 630 |
| West Pier | | | |
| Channel Side | 600 | 0 | 600 |
| Lake Side | 420 | 200 | 220 |
| | 1,020 | 200 | 820 |
| Total | 1,900 | 450 | 1,450 |
| **Plan 10 A Modified** | | | |
| East Breakwater | | | |
| Channel Side | 1,865 | 250 | 1,615 |
| Lake Side | 1,865 | 250 | 1,615 |
| | 3,730 | 500 | 3,230 |
| West Breakwater | | | |
| Channel Side | 0 | 0 | 0 |
| Lake Side | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| Total | 3,730 | 500 | 3,230 |
| **Plan 10 B** | | | |
| East Breakwater | | | |
| Channel Side | 1,865 | 250 | 1,615 |
| Lake Side | 1,865 | 250 | 1,615 |
| | 3,730 | 500 | 3,230 |
| West Breakwater | | | |
| Channel Side | 1,790 | 200 | 1,590 |
| Lake Side | 1,790 | 200 | 1,590 |
| | 3,580 | 400 | 3,180 |
| Total | 7,310 | 900 | 6,410 |

(ii) Maximum New Pier Fishing Activity Occasions Per Season - A second variable , besides constrained length of pier/breakwater available for salmon fishing, that affects the magnitude of new pier/breakwater salmonid fishing activity occasions is the turnover rate. This analysis follows the traditional methodology of using a turnover rate of 2.0 for peak days in the autumn season. Since the spring season is less productive with respect to catch per hour fished, a turnover rate of 1.0 (effectively, no replacement of the initial fisherman) has been used.

The new breakwaters at Olcott are used to 70% of its instantaneous capacity on peak days during the spring or autumn. A turnover rate of two was used for peak days. The analysis also follows traditional methodology in that it estimates instantaneous non-peak day use to be a percentage of instantaneous peak day use. Because autumn is the more productive season, a higher factor has been used to estimate non-peak day capacity in the autumn than in the spring. The factor is 30% for the autumn season and 20% for the spring season. This adjustment is based upon estimates of individuals who actively fish for salmon at Olcott Harbor.

The spring season runs from April to mid-June. This two and a half month season was assumed to have 13 peak days and 13 non-peak days. The autumn season runs from late August to late November. The autumn season was assumed to have 8 peak days and 8 non peak days.

Maximum fishing activity occasions for Plans 10 A Modified and 10B came to 11,112 and 22,050, respectively (See Table C49). These activity occasions were phased in over a five year period for Plan 10 A Modified and a ten year period for Plan 10B. No new activity occasions took place in project year one. Growth over the phase in period was assumed to be linear.

(c) Benefits To New Pier Fishermen - Breakwater fishing benefits by plan equals the UDV per new fisherman activity times the number of new recreational fishing activities generated by each plan over the 50 year evaluation period. This time stream of benefits was discounted using a 50 year project life and an 8-7/8% annual discount rate. Again, new pier fishing activity occasions were phased in over a five year time period for plan 10 A Modified and a ten year time period for Plan 10B. New Pier fishermen average annual benefits for Plans 10 A Modified and 10B came to $152,500 and $248,500, respectively.

(3) Increase In Benefits To Existing Pier Fishermen - All fishermen currently fishing from the existing Federal piers will be able to do so under With Project Conditions. However, the value of their recreational fishing experience will increase due to project implementation. This increase was taken as the difference in Unit Day Value between Without and With Project

Table C49 - Maximum Yearly Fishermen Activity Occasions By Plan

| Plan 10 A Modified | Number Of Days | Distance Between Fishermen In Feet | Lineal Feet Available | Peak Number Fishermen | Turnover Rate | Peak Activity Occasions | Percent Of Peak Utilized | Adjusted Activity Occasions |
|---|---|---|---|---|---|---|---|---|
| Spring | | | | | | | | |
| Number of Peak Days | 13 | 10 | 3,230 | 323 | 2 | 8,398 | 70% | 5,879 |
| Number Of Non-peak Days | 13 | 10 | 3,230 | 323 | 1 | 4,199 | 20% | 840 |
| Fall | | | | | | | | |
| Number of Peak Days | 8 | 10 | 3,230 | 323 | 2 | 5,168 | 70% | 3,618 |
| Number Of Non-peak Days | 8 | 10 | 3,230 | 323 | 1 | 2,584 | 30% | 775 |
| | | | | | | | | 11,112 |

| Plan 10B | Number Of Days | Distance Between Fishermen In Feet | Lineal Feet Available | Peak Number Fishermen | Turnover Rate | Peak Activity Occasions | Percent Of Peak Utilized | Adjusted Activity Occasions |
|---|---|---|---|---|---|---|---|---|
| Spring | | | | | | | | |
| Number of Peak Days | 13 | 10 | 6,410 | 641 | 2 | 16,666 | 70% | 11,666 |
| Number Of Non-peak Days | 13 | 10 | 6,410 | 641 | 1 | 8,333 | 20% | 1,667 |
| Fall | | | | | | | | |
| Number of Peak Days | 8 | 10 | 6,410 | 641 | 2 | 10,256 | 70% | 7,179 |
| Number Of Non-peak Days | 8 | 10 | 6,410 | 641 | 1 | 5,128 | 30% | 1,538 |
| | | | | | | | | 22,050 |

Conditions. This value came to $2.85. This was multiplied times the number of annual fishing activity occasions taking place on the existing Federal piers (6,627). This resulted in benefits to existing pier fishermen of $18,900. The derivation of the increase in UDV and annual pier fishing activity occasions taking place on the existing Federal Piers follows.

(a) Increase In The Value Of Recreational Pier Fishing Experience For Existing Pier Fishermen - Table C47 outlines the points attributed to Without And With Project conditions for Specialized Recreation, Fishing and Hunting. These point values came to 17 and 55. These point values converted to Unit Day Values of $14.10 and $16.95. This was a difference of $2.85.

This difference was the increase in the value of the recreational fishing experience enjoyed by pier fishermen currently using the existing Federal Piers.

(b) Existing Annual Pier Fishing Activity Occasions - Existing annual pier fishing activity occasions were generated given the length of the existing piers usable for fishing (See Table C48) and the same space standards, turnover rates and capacity utilization assumptions used for calculating benefits to new fishermen. Total annual activity occasions taking place on the existing federal piers came to 6,627. The derivation of these annual existing activity occasions are outlined in Table C50.

Table C50- Yearly Fishermen Activity Occasions- Existing Conditions

| Existing Federal Piers | Number Of Days | Distance Between Fishermen In Feet | Lineal Feet Available | Peak Number Fishermen | Turnover Rate | Peak Activity Occasions | Percent Of Peak Utilized | Adjusted Activity Occasions |
|---|---|---|---|---|---|---|---|---|
| Spring | | | | | | | | |
| Number of Peak Days | 13 | 10 | 1,450 | 145 | 2 | 3,770 | 90% | 3,393 |
| Number Of Non-peak Days | 13 | 10 | 1,450 | 145 | 1 | 1,885 | 30% | 566 |
| Fall | | | | | | | | |
| Number of Peak Days | 8 | 10 | 1,450 | 145 | 2 | 2,320 | 90% | 2,088 |
| Number Of Non-peak Days | 8 | 10 | 1,450 | 145 | 1 | 1,160 | 50% | 580 |
| | | | | | | | | ------- |
| | | | | | | | | 6,627 |

(4) Summary Of Pier Fishing Benefits - Benefits to pier fishermen have two components: Benefits to new pier fishermen and the increase in benefits to existing Pier fishermen. Average annual Benefits to new pier fishermen came to $152,500 and $248,500 for Plans 10 A Modified and 10B, respectively. The increase in average annual benefits to fishermen using the existing piers came to $18,900 under either plan. Total pier fishermen benefits came to $171,400 and $267,400 for Plans 10 A Modified and 10B, respectively.

g. Sightseeing Benefits. The proposed plan, with the East Breakwater being a component in both plans, will undoubtedly benefit visitors to Krull Park. At present, under the without project condition, visitors to the park will occasionally walk onto the existing piers. However, at present Krull Park is largely undeveloped and access to the existing piers from the park is limited, both in terms of available parking space and physical access from the park to the piers. Consequently, the existing piers are only lightly used by sightseers. Based on field observations at the project site, it is estimated that

under good weather conditions on a peak (weekend) day, about 100 people utilize the existing piers for sightseeing. For this analysis fishermen are not considered sightseers. The latter are defined to be occasional users who use the pier to take advantage of the esthetics and pleasure of being out on the water.

(1) Methodology - The Unit Day Value methodology has been used to estimate the magnitude of sightseeing benefits that will accrue to the proposed plan. The methodology requires development of general recreational points (sightseeing is a "general" as opposed to a "specialized" recreational activity) under the Without and With Project conditions and ascribing the current dollar value to the resulting general recreation points. For existing users (sightseers) the benefit will be their estimated annual usage multiplied by the change (increase) in the UDV from the without to with project condition of development. For new users, the benefit will be the UDV under the with project condition multiplied by their estimated annual usage.

Independently, an estimate of the increase in demand (actually in usage) of the facility has been developed. The increased usage by new users has been projected to be visitors to the developed Krull Park under the with project condition of development. At present, under the without project condition of development, the park is largely undeveloped and underutilized. Niagara County has committed itself to extensive development of the park with implementation of the project.

No increased usage of the new facility is projected for existing users. Existing usage has been projected to remain constant under the without and with project conditions of development. Since the use of the existing piers by existing users is not related to the use of the park, they will not be affected by development of the park.

Sightseeing benefits projected to accrue to the proposed plan are the sum of existing user and new user benefits. While existing users will obtain their benefit immediately upon completion of the project (in Project Year 1), the "new user benefit" only commences in Project Year 1. The full magnitude of "new user benefits" will not be attained until Krull Park is fully developed and attendance has attained projected levels. It has been projected that development of the park will commence before completion of the project such that some development will be in place in Project Year 1. Full development of the park is projected to be complete in Project Year 10. Therefore, "new user" sightseeing benefits have been phased in over a 10-year transition period with straight line growth.

(2) UDV General Recreation Points And Values - Table C51 presents the calculation of the general recreational points ascribed to this benefit category. As sightseeing benefits are only being taken for the East Breakwater, which is a component of both plans, there is no need to separately calculate these

Table C51 - General Recreation Value Points For Sightseeing On The East Breakwaters, Plans 10 A Modified And 10B

| | CONDITION of DEVELOPMENT | | |
|---|---|---|---|
| Point Category | Without Project | With Project | Change |
| Recreational Experience | 11 | 16 | 5 |
| Availability of Opportunity | 2 | 2 | 0 |
| Carrying Capacity | 3 | 11 | 8 |
| Accessibility | 7 | 16 | 9 |
| Environmental Quality | 5 | 13 | 8 |
| Total | 28 | 58 | 30 |

benefits for each plan; the calculation is applicable to both plans. The allocation of points under each of the five categories is discussed below.

Points are awarded under the category of Recreation Experience based upon the number of general activities available at the project site and the quality associated with each recreation activity. The major difference between the Without and With Project condition is the expansion of Krull Park, the creation of a 1,000 boat marina and the addition of the breakwater with a walkway. Thus the 11 points awarded under the Without Project condition have been increased to 16 points under the With Project condition.

For Availability of Opportunity, recreational points are awarded on the basis of the proximity of sites (measured in travel time) which offer the same/similar mix of recreational activities as does the project site. Since the addition of an activity at the project site does not affect the number of competing sites and their proximity to the project site, the points awarded under the two conditions are identical; each has been awarded 2 points - several competing sites within one hour and a few within 30 minutes driving time.

As the length of the proposed East Breakwater (about 2,000 ft.) approximates the combined length of the existing east and west breakwaters, Carrying Capacity under the With Project condition will be about twice that under the Without Project condition. In addition, Carrying Capacity as it is used in P&G (see ER 1105-2-100, p. 6-114) has a quality component. The existing pier provides basic facilities whereas the proposed project will provide the site with optimum (but not ultimate) facilities for sightseeing. Thus this category has been awarded 3 points under the Without Project condition and 11 points under the With Project condition.

Implementation of a project at the site will enhance access for sightseeing purposes. Whereas parking and physical access to the existing piers is limited under the without project condition, both will be greatly enhanced under the with project condition. Thus the recreational point category entitled Accessibility was awarded 7 points under the Without Project condition but 16 points under the With Project condition.

The final recreational point category is Environmental (in past years it was entitled Environmental Quality). The existing piers have been awarded 5 points under the Without Project condition and 13 points under the With Project condition. The latter reflects the fact that the East Breakwater will offer a high (but not quite outstanding) esthetic quality with no factor to limit that quality.

Overall, total general recreation points rise from 28 points under the Without Project condition to 58 points under the With Project condition. The corresponding UDV values are $2.92 under the Without Project condition and $4.39 under the With Project condition. The resulting change in the UDV value from Without to With Project condition of development amounts to $1.47 per day.

(3) Demand (Usage).

(a) Existing Users - Currently, under the Without Project condition, the existing piers are lightly used for sightseeing purposes. While there are no recorded data on the number of sightseeing users, empirical observation suggests that about 100 people use the piers for sightseeing purposes on a peak period summer day. Given a thirteen week peak period with an allowance for inclement weather, it appears that under current (Without Project) conditions sightseeing usage at the existing piers is in the vicinity of 2,500 activity occasions per peak season. Allowing for uncertainty and for non-peak season use, it estimated that annual sightseeing usage at the existing piers (for existing users) amounts to about 5,000 user days per year.

(b) New Users - A reasonable approach for forecasting the number of activity occasions at the East Breakwater is to develop two alternative estimates and to compare the results.

The first method used to estimate sightseeing activity occasions is to relate sightseeing to the volume of activity at Krull Park. Niagara County does not charge for use of the park and it has no hard data on the number of visitations at the park. The Niagara County Parks Department estimates that annual visitations lie somewhere between 100,000 and 250,000 visitations per year. Considering the character and magnitude of development planned for the park upon completion of the federal project, it is reasonable to estimate that under the With Project condition attendance at Krull Park will be somewhere in the range of 250,000 to 500,000 visitor days per year.

Given the attractiveness of Olcott Harbor and the excellent access to be provided to the East Breakwater under the With Project condition of development, it is reasonable to assume that a significant proportion of the park's visitors will use the East Breakwater for sightseeing purposes. Assuming that 15 percent of the users at Krull Park will walk upon the highly accessible, safe and attractive East Breakwater, it is estimated that new user sightseeing use at the East Breakwater will range from 37,500 (250,000 X .15) to 75,000 (500,000 X .15) sightseeing activity occasions per year. Pier sightseers would also emanate from the boater population, tourists visiting Olcott Beach restaurants and shops and people simply driving to Olcott to walk out onto the piers.

The second estimate relies upon an implicit "design criteria". Unfortunately, no such "design criteria" exists for sightseeing on a pier/breakwater. Experience at the Erie Basin Marina in downtown Buffalo, admittedly a very attractive and very accessible site, would tend to indicate that on a peak summertime day the number of people "sightseeing" at an attractive and accessible waterfront site would be quite high and the "design criteria" would be quite small - few linear feet of pier per sightseer.

In preparing this estimate it has been assumed that a reasonable "design criteria" for sightseeing at the breakwater is the pier fishing criterion of 10 linear ft. (single side of the pier) per fisherman. In our analysis, because the breakwater is to be designed with a wide walkway, this amounts to a design criterion of 5 linear feet of breakwater per "sightseer". With 2,000 feet of breakwater, the East Breakwater has an estimated "instantaneous capacity" of 400 sightseers.

Instantaneous capacity is merely the starting point. Sightseers do not stay all day; even fisherman generally stay for no more than five or six hours. The length of stay for sightseers is inevitably less than that for fishermen. We have used a "turn-over rate" of 4.0 per peak day. This would allow for at least four "stays" of up to 1.5 to 2.0 hours per stay. Empirical but informal observation indicate that "stays" of these lengths are probably an overestimate; thus the turnover rate of 4.0 per peak day is probably an underestimate of use. But lacking a rational for any other value, it is the one that has been used in this analysis.

Given an instantaneous capacity of 400 sightseers and a turnover rate of four produces an estimate of 1,600 new user sightseeing activity occasions per peak day. With a 100-day summer tourism season (from Memorial Day to Labor Day) there are 29 peak days (Saturdays, Sundays and national holidays) and 71 non-peak days per season. Allowing a loss of 15 days due to inclement weather produces a tourism season that consists of 25 peak and 60 non-peak usable days.

Given 1,600 activity occasions per day and 25 peak days per season, produces an estimate of 40,000 new user activity occasions on peak days. Assuming that non-peak season use amounts to 30 percent of peak season use, a common assumption used in evaluating water recreation projects, total sightseeing benefits are calculated on a basis of 52,000 sightseeing activity occasions per year. This figure falls within the range of 37,500 to 75,000 sightseeing activity occasions developed in the first estimate discussed above. Therefore, average annual sightseeing benefits for new users have been calculated on a projected total of 52,000 activity occasions per year.

(4) Benefits - Total sightseeing benefits are the sum of sightseeing benefits that accrue to existing users and to new users. The former have been calculated on the basis of 5,000 activity occasions per season and the latter have been calculated on the basis of 52,000 sightseeing activity occasions per season. Table C52 presents the calculation of sightseeing benefits. These benefits apply to either Plan 10 A Modified or 10B.

For existing users (sightseers), the benefit is the increase in the value of their recreational experience under the Without to With Project condition of development. For new users, it is the aggregate value of their recreational experience under the With project condition. By definition, new users do not exist under the Without Project condition.

The increase in the sightseeing recreational value accruing to existing users is $1.47. There are 5,000 current users. The net increase in the recreational value of existing sightseers is $7,300. This benefit will be realized under either plan.

Table C52 - Average Annual Sightseeing Benefits (October, 1989 Price Levels)

| | |
|---|---|
| A. EXISTING USERS | |
| User Activity Days | 5,000 |
| Change in UDV | $1.47 |
| Average Annual Benefit | $7,300 |
| B. NEW USERS | |
| User Activity Days | 52,000 |
| UDV | $4.39 |
| Average Annual Benefit 1/ | $159,400 |
| C. TOTAL AVERAGE ANNUAL BENEFIT | $166,700 |

1/ Includes an allowance for phasing in of benefits over a 10-year period, Project Year 1 to Project Year 10, with amortization at the project interest rate of 8.875 percent.

Potential sightseeing benefits that could accrue to new users amount to $223,300 (52,000 activity occasions times a UDV of $4.39 per activity occasion). However as explained above, full use of the park and thus achievement of 52,000 sightseeing activity occasions at the East Breakwater will not be fully achieved until Project Year 10. Therefore new user sightseeing benefits have been phased in over a 10-year period (PY 1 to PY 10) during which time development of Krull Park is projected to be completed. The resulting annual new user sightseeing benefits amount to $159,400 at October, 1989 price levels.

Total average annual sightseeing benefits, the sum of existing user benefits ($7,300) and new user benefits ($159,400) amount, to $166,700 at October, 1989 price levels.

h. Launch Ramp Benefits.

(1) Willingness To Pay For New Launch Ramp Users - Estimates of changes in NED launch value (benefits) were ascertained by sampling the population of interest and asking individuals about their "Willingness To Pay" (WTP) for changes in the quantity of their use of facilities at a particular site. Their answers were then used to simulate a launch demand curve from which claimable benefits can be estimated. Respondent launch value assignments were based on the description of the changes that the proposed project would provide.

(a) Boat Owner Launch Use Value - Boat owners were asked a series of questions to establish the value of additional launch facilities proposed at Olcott Harbor. The first of these questions establish what portion of the population(s) of interest actually plan to use the new proposed project. The question as stated in the survey is as follows:

> Would you ever want to use the launch ramps at the new harbor facility at Olcott Harbor, if all other boating facilities remain unchanged?
>
> (1) [ ] Yes (2) [ ] No

Following this, respondents were asked the following WTP question which was the basis for the derivation of a simulated demand

curve for launching at the new facility at Olcott:

If it were necessary to charge a seasonal user fee to use the launch ramps, what is the HIGHEST fee you would pay per season to help pay for the construction and maintenance costs of additional boat ramps at Olcott Harbor? Circle the value in the list below.

(CIRCLE ONE)

| | | | |
|---|---|---|---|
| $500 | $400 | $300 | $200 |
| $175 | $150 | $125 | $100 |
| $ 75 | $ 50 | $ 25 | $ 20 |
| $ 15 | $ 10 | $ 5 | $ 0 |

If the amount you would pay per season is not ... on the list above, please write in the amount here.

$_____.

A protest bid question followed the WTP question to determine the validity of the respondents' zero dollar value response. A valid Zero dollar response to the above WTP question was valid only if the respondent answered the protest bid question with choice (1) or (2). The protest bid question was as follows:

Please mark the answer which best describes your reason for answering the previous question the way you did.

(1) That is what it is worth to me.

(2) It's worth more to me, but it's all I can afford to pay.

(3) Not enough information is provided.

(4) I didn't want to place a dollar value.

(5) I object to the wording of the question.

(0) Other _____
(Please specify)

Respondents were then asked a question on their estimate of frequency of use of the new facility. This is needed to determine capacity limitations for peak usage in order to not

over estimate the value that the proposed project would provide. The survey question asked was:

> How many times per season would you typically use the boat ramps at Olcott Harbor at the seasonal cost you indicated in question 15?
>
> _____ Times per season.

Launch benefits are evaluated using a similar methodology as described under the slip value section; a simulated launch demand curve was derived for stratum 1 and stratum 2. The split of prospective harbor users (those who indicated that they would use the new launch facility) by stratum along with the 90 percent confidence limits around this proportion are presented in Table C53. Mean proportions of the cumulative sample distributions were calculated along with 90 percent confidence intervals around the mean proportion.

Table C53 - Proportion Of Prospective Olcott Harbor Launch Ramp Users By Type Of Use And 90 Percent Confidence Intervals

| | Sample No Who Would Launch | Sample No Who Would Not Launch | Proportion Who Would Launch 90 % Confidence Lower | Mean | Upper |
|---|---|---|---|---|---|
| Stratum 1 | 327 | 110 | .680 | .748 | .816 |
| Stratum 2 | 211 | 199 | .474 | .515 | .555 |

A "per launch" demand relationship was derived by the following steps. First, the size of each population of interest was adjusted by the proportion in the sample who indicated that they would launch at the new proposed facility at Olcott Harbor (Table C53). The distribution of valid WTP sample data was cumulated from high to low. The proportion of the sample willing to pay a stated bid value out of the total was calculated and multiplied by the adjusted estimate of the population who would launch at Olcott. This resultant product for each bid value is then multiplied by the corresponding bid's average number of launches. The average number of launches per season for each individual bid amount was calculated by dividing by the seasonal WTP value to derive a WTP per launch for each respective bid value. For example, in Stratum 1 there were four valid $200 seasonal launch bids. The number of respective sample annual launches at that

bid price were 10, 15, 20 and 20. Therefore the number of launches corresponding to $200 WTP bid was 16.3. The converted value per launch was calculated by dividing the estimated total number of annual launches that corresponds with a given seasonal WTP bid into the product of the WTP bid and the estimated number in the population willing to pay that bid. The above procedure was performed for each respective bid to construct the estimated population simulated launch demand curve for stratum 1 and stratum 2 using the mean proportion and the upper and lower 90 percent confidence intervals. The combined launch demand curve for the mean proportion is presented in Table C54.

Table C54 - Combined Launch Demand Curve For The Mean Proportion

| Stratum 1 | | | Stratum 2 | | | Combined Stratum 1 & 2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Seasonal WTP | Boat Owners | Annual Launches | Seasonal WTP | Boat Owners | Annual Launches | Seasonal WTP | Boat Owners | Annual Launches | WTP Per Launch | 1/ |
| $500 | 64 | 3,176 | | | | $500 | 64 | 3,176 | $11.48 | |
| $200 | 191 | 5,240 | $200 | 1,158 | 21,226 | $200 | 1,348 | 26,465 | $10.19 | |
| $175 | 222 | 5,875 | | 1,158 | 21,226 | $175 | 1,380 | 27,101 | $8.91 | |
| $150 | 286 | 6,987 | $150 | 1,489 | 31,149 | $150 | 1,774 | 38,136 | $6.98 | |
| $125 | 318 | 7,368 | $125 | 1,985 | 39,584 | $125 | 2,302 | 46,952 | $6.13 | |
| $100 | 730 | 16,196 | $100 | 5,127 | 95,027 | $100 | 5,858 | 111,223 | $5.27 | |
| $75 | 889 | 20,356 | $75 | 7,277 | 125,558 | $75 | 8,167 | 145,915 | $4.20 | |
| $60 | 921 | 20,992 | | 7,277 | 125,558 | $60 | 8,198 | 146,550 | $3.36 | |
| $50 | 2,350 | 49,109 | $50 | 15,051 | 202,127 | $50 | 17,401 | 251,236 | $3.46 | 2/ |
| $40 | 2,382 | 49,109 | | 15,051 | 202,127 | $40 | 17,433 | 251,236 | $2.78 | |
| $36 | 2,414 | 49,585 | | 15,051 | 202,127 | $36 | 17,464 | 251,712 | $2.50 | |
| $30 | 2,477 | 50,697 | $30 | 15,382 | 203,781 | $30 | 17,859 | 254,478 | $2.10 | 2/ |
| $25 | 4,605 | 73,506 | $25 | 22,328 | 245,461 | $25 | 26,933 | 318,967 | $2.11 | |
| $20 | 5,843 | 86,476 | $20 | 26,132 | 265,930 | $20 | 31,976 | 352,406 | $1.81 | |
| $15 | 6,002 | 87,873 | $15 | 27,290 | 269,866 | $15 | 33,292 | 357,740 | $1.40 | |
| $10 | 6,669 | 91,641 | $10 | 30,267 | 282,650 | $10 | 36,936 | 374,292 | $0.99 | |
| | 6,669 | 91,641 | $8 | 30,432 | 283,312 | $8 | 37,101 | 374,953 | $0.79 | |
| $5 | 7,177 | 93,557 | $5 | 32,913 | 294,228 | $5 | 40,091 | 387,785 | $0.52 | |
| $0 | 7,431 | 95,631 | $0 | 35,560 | 300,655 | $0 | 42,991 | 396,286 | $0.00 | |

1/ WTP per launch is calculated by dividing the number of annual launches into the product of seasonal WTP and number of boat owners willing to pay that seasonal amount.

2/ These points removed to smooth curve.

(b) Boat Owner Launch Use Benefit - Total Willingness To Pay for launching is measured as the sum of estimated annual revenues for launching plus consumer surplus. Consumer surplus is the amount above the launch fee that respondents would be willing to pay. Both of the proposed plans provide an additional

launch ramp with two lanes. Estimated Launch revenues are calculated based on the project providing an additional 5,500 launches annually and a per use launch fee of $3.00 or $16,500. Total Willingness To Pay came to $29,800. Consumer surplus or net Willingness To Pay is Total Willingness To Pay ($29,800) minus launch revenues ($16,500). Net Willingness To Pay or Consumer Surplus, totaled $13,300.

This annual amount was adjusted to reflect demand during peak usage. Demand for launch ramp usage during non-peak times can be handled adequately by the existing launch ramp facilities under Without and With Project conditions. The new launch ramp is only needed to accommodate additional demand during peak times. Analysis of town of Newfane launch ramp statistics indicates that 70% of all launches took place during peak times. It was assumed this trend would continue under the With Project condition. Thus 70% of the consumer surplus derived from the contingent value evaluation was claimed as a benefit for Plan 10 A Modified or 10B. Consumer Surplus for boat owners who use the new launch ramps came to $9,300.

(2) Benefits To Passengers Of New Launch Ramp Users The contingent value evaluation accounted for the benefit to the launch ramp boat owner and his immediate household. However, like permanent based boaters and transient boaters, launch ramp boat owners will have passengers who are not members of their immediate household. The value of these non-household passengers must also be evaluated. This was performed using the Unit Day Value method.

The benefits for passengers on boats using the new launch ramp equals the Unit Day Value per non-household passenger times the number of non-household passengers per launch times the number of launches per season.

(a) Unit Day Value - The Unit Day Value for non-household passengers on boats using the new launch ramp was developed for With Project conditions. The "With Project Condition" launch ramp boater facilities were rated according to five criteria: Recreation Experience, Availability of Opportunity, Carrying Capacity, Accessibility, and Environmental Quality. The Recreation Category used was General Recreation. Table C55 provides a summary of the point values attributed to each criteria for non-household passengers of boat owners using the new launch ramp facilities. The point values under "With Project" conditions came to 53. These points were converted to a Unit Day Value using the point to dollar value table for Fiscal Year, 1989. This resulted in a Unit Day Value of $4.24.

Table C55 - Point Values For Non-Household Passengers Of Boaters Using New Launch Ramp Boater Facilities.

| Category: General Recreation | Point Values With Project |
|---|---|
| Recreation Experience | 16 |
| Availability of Opportunity | 3 |
| Carrying Capacity | 10 |
| Accessibility | 14 |
| Environmental Quality | 10 |
| TOTAL POINTS | 53 |
| Unit Day Value | $4.24 |

(b) Benefits For Non-household Passengers - The Olcott Harbor contingent value survey revealed that new launch ramp users carry 2.78 passengers per trip. Field interviews of current launch ramp users indicated that 63 percent of all launch ramp passengers are not members of the boat owners immediate household. Passengers who are not members of the launch ramp boat owners immediate household equal 63 percent of total passengers per trip. This results in 1.75 passengers per new launch who are not members of the new launch ramp boat owners immediate household. These operating characteristics were assumed to apply to boaters using the "Existing Condition" transient slips over the fifty-year evaluation period.

The benefits for non-household passengers on boats using the new launch ramps is the Unit Day Value per non-household passenger ($4.24) times the number of non-household passengers (1.75) times the projected launches per season (5,500). These benefits came to $40,800.

This annual amount, like the benefit to new launch ramp boat owners and their immediate household, was adjusted to reflect demand during peak usage time. Again, demand for launch ramp usage during non-peak times can be handled adequately by the existing launch ramp facilities under Without and With Project conditions. The new launch ramp is only needed to accommodate additional demand during peak times. Analysis of town of Newfane launch ramp statistics indicates that 70% of all launches took place during peak times. It was assumed this trend would continue under the With Project condition. Thus 70% of benefits for non-household passengers on boats using the new launch ramp was claimed as a benefit for Plan 10 A Modified or 10B. Benefits for non-household passengers on boats using the new launch ramp came to came to $28,600.

(3) Current Launch Ramp Users - Table C25 indicated that in 1989 there were 9,271 launches per season by the three existing launch ramps. This number does not include launches made by people using seasonal launch permits. Total annual launches for 1989, including launches made by seasonal launch permit holders, is 13,034. This results in average launches per ramp of 4,345.

Existing launch ramp usage has grown two hundred and sixty six percent from 1980 to 1989. The annual increase in launches per season has grown by 6 percent from 1985 to 1989. This six percent annual growth is expected to continue up to the base year of the project, 1994. Given the growth in launch ramp usage over the last 5 years, total launches at existing launch ramps are projected to be 16,500 by project year 1, 1994. This level of launches is expected to remain constant over the 50-year evaluation period. The average number of passengers per launch is expected to remain at 2.78 passengers.

The people who use these launch ramps will have an increase in the value of their recreational boating experience due to project implementation (See Section C3). Two specific user groups will benefit: The boat owners immediate household and all passengers not members of his immediate household.

(a) Benefits To The Boat Owners Immediate Household Who Use Existing Launch Ramps - This analysis parallels that performed for boat owners renting existing slips at Olcott Harbor. (See Section C4-d,(2),(a). The benefit of project implementation to launch ramp boat owners using existing marina facilities was calculated as follows: The difference between "Without Project" (WOP) condition and "With Project" (WP) condition consumer surplus per launch times the number of annual launches under Without Project conditions.

The contingent value evaluation indicated Total Willingness To Pay for launch ramp boat owners under Plans 10A and 10B came to $28,600. This assumed a launch ramp fee of $3.00 and 5,500 annual new launches. Total Willingness to Pay per launch came to $5.41. Net willingness to pay per launch is $2.41. This equals total willingness to pay per launch ($5.41) minus the per launch ramp fee ($3.00).

This is a value per household per launch AFTER all launch fees have been deleted. This value estimates the Consumer Surplus EXISTING launch ramp boat owners WOULD enjoy under "With Project" conditions. Existing launch ramp boat owners are currently experiencing a Consumer Surplus value less than the above. This is because the current harbor launch ramp amenities/services are a subset of the "With Project" condition harbor launch ramp amenities/services.

(i) Without Project Condition Consumer Surplus For Launch Ramp Boat Owners Using Existing Launch Ramp Facilities - The Unit Day Value was used to derive the percent "Without Project Condition Consumer Surplus" is of "With Project Condition Consumer Surplus". Unit Day Values (UDV) have been derived for launch ramp boat owners under Without and With Project conditions in Table C56. This resulted in Unit Day Values of $3.23 and $4.24, respectively. The "Without" Project" condition UDV as a percent of the "With Project" condition UDV came to 76 percent. This percent was multiplied times the With Project Condition launch ramp boat owner Consumer Surplus per launch of $2.41. This resulted in a proxy of Without Project Condition Consumer Surplus for existing launch ramp boat owners and their immediate household. The WOP condition Consumer Surplus value was $1.84.

Table C56 - Point Values For Boater Owners Using Launch Ramps At Olcott Harbor

| Category: General Recreation | Point Values | |
|---|---|---|
| | Without Project | With Project |
| Criteria | | |
| Recreation Experience | 11 | 16 |
| Availability of Opportunity | 3 | 3 |
| Carrying Capacity | 6 | 10 |
| Accessibility | 11 | 14 |
| Environmental Quality | 4 | 10 |
| TOTAL POINTS | 35 | 53 |
| Unit Day Value | $3.23 | $4.24 |

(ii) Increase In Consumer Surplus For Without Project Condition Boat Owners Using Existing Launch Ramp Facilities - The increase in launch ramp boat owner Consumer Surplus is equal to With Project Condition launch ramp boat owner Consumer Surplus ($2.41) minus "Without Project Condition launch ramp boat owner Consumer Surplus ($1.84) This came to a net increase of fifty seven cents per launch.

(iii) Benefits To Launch Ramp Boat Owners Using Without Project Condition Launch Ramp Facilities - The increase in benefits enjoyed by launch ramp boat owners using existing launch ramp facilities equals the net increase in Consumer Surplus per launch times the number of Without Project condition launches over the 50-year evaluation period.

There are currently three launch ramps for public use at Olcott Harbor. This number is projected to remain at this level over the 50-year evaluation period under Without Project conditions. Each ramp is projected to handle 5,500 launches annually under

Without Project conditions. This results in 16,500 launches annually from the existing launch ramp facilities. The increase in consumer surplus per launch for boat owners using the existing launch ramps is $ .57. The increase in benefits for WOP boat owners using existing condition launch ramp slips equals the increase in Consumer Surplus per launch for WOP condition launch ramp boat owners ($.57) times the number of Without Project condition launches (16,500). This value came to $9,400.

(b) Passenger Benefits - Launch ramp boat owners using existing launch ramp facilities will have passengers on their boats who are not members of their immediate household. The recreational boating experience of these non-household passengers will also increase due to project implementation. The increase in this value was calculated using the Unit Day Value Method.

The increase in benefits for these non-household passengers equals the net increase in Unit Day Value per non-household passenger times the number non -household passengers per launch times the launches per season under Without Project conditions.

(i) Unit Day Value - The existing and new launch ramp facilities were rated according to five criteria: Recreation Experience, Availability of Opportunity, Carrying Capacity , Accessibility, and Environmental Quality. Table C 57 provides a summary of the point values attributed to each criteria for non-household launch ramp passengers under "Without" and "With Project" conditions. The Recreation Category used was General

Table C57 - Point Values For Non-household Passengers On Boats Using Existing Launch Ramps At Olcott Harbor

| Category: General Recreation | Point Values | |
|---|---|---|
| | Without Project | With Project |
| Criteria | | |
| Recreation Experience | 11 | 16 |
| Availability of Opportunity | 3 | 3 |
| Carrying Capacity | 6 | 10 |
| Accessibility | 11 | 14 |
| Environmental Quality | 4 | 10 |
| TOTAL POINTS | 35 | 53 |
| Unit Day Value | $3.23 | $4.24 |

Recreation. The point values under "Without Project" and "With Project" conditions, for non-household launch ramp passengers came to 35 and 53, respectively. These points were converted to a Unit Day Value using the point to dollar value table for Fiscal

Year 1989. This resulted in a Unit Day Value of $3.23 and $4.24. The net increase in Unit Day Value came to $1.01.

((ii)) Benefits For Non-household Passengers Of Boat Owners Using Existing Launch Ramp Facilities - The Olcott Harbor contingent value survey revealed that new launch ramp users carry 2.78 passengers per trip. An adjustment was made to the average number of passengers per launch (2.78) to obtain the number of non-household passengers per trip. A survey of current launch ramp users at Olcott indicated over 63 percent of all passengers are not members of the boat owners immediate household. therefore 63 percent of all passengers were assumed to non-household members. This came to 1.75 non-household passengers per launch. These operating characteristics were assumed to apply to boaters using the existing launch ramps over the fifty-year evaluation period.

The increase in benefits for non-household passengers on boats using existing launch ramp facilities equals the net increase in Unit Day Value per non-household passenger per launch ($1.01) times the number of non-household passengers per launch (1.75) times the launches per season under Without Project conditions( 16,500). The increase in benefits for non-household passengers on boats using existing launch ramp facilities equals $29,200.

(c) Summary of Benefits For Users Of Existing Launch Ramps - Benefits for users of existing launch ramp facilities consist of two groups: The launch ramp boat owners immediate household and all passengers not members of the slip renters immediate household. The benefits for these two categories came to $9,400 and $29,200, respectively. these benefits apply to Plan 10 A Modified or 10 B.

i. Associated Costs And Revenues. The costs of measures needed over and above breakwater construction costs to achieve the benefits claimed during the period of analysis are associated costs. These costs can be divided into two categories: Facility development costs and infrastructure costs.

Infrastructure costs include costs for new roadways, and parking areas used by: Slip renters, visitors to the slip renters, launch ramp users, tour boat visitors, fishermen fishing off of the breakwater, and general recreationists walking on the new breakwater. Other infrastructure costs include restroom facility costs.

Facility development costs include slip construction costs, launch ramp construction costs, tour boat acquisition and docking facilities, equipment needed to perform winter storage, a main service building and site acquisition costs.

An estimate of these associated construction costs are presented for Plans 10A and 10B in Table C58. These costs came to $6,387,600 and $7,471,900 for Plans 10 A Modified and 10B,

Table C58 - Associated Construction Costs

| | PLAN 10 A MODIFIED ASSOCIATED COSTS | PLAN 10 B ASSOCIATED COSTS |
|---|---|---|
| I. DEVELOPMENT COSTS | | |
| A. MARINA FACILITIES | | |
| 1. SLIPS/WALKWAYS (1) | $3,962,400 | $5,000,000 |
| 2. LAUNCH RAMP (1) | $60,000 | $60,000 |
| 3. TOUR BOAT & DOCK (1) | $500,000 | $500,000 |
| 4. WINTER STORAGE EQUIPMENT (2) | $316,900 | $316,900 |
| 5. BUILDINGS | $825,000 | $825,000 |
| 6. SITE | $350,000 | $350,000 |
| | $6,014,300 | $7,051,900 |
| B. INFRASTRUCTURE | | |
| 1. ROADS | $60,000 | 60,000 |
| 2. WATER/SEWER | $135,000 | $135,000 |
| 3. PARKING | $178,300 | $225,000 |
| | $373,300 | $420,000 |
| C. SUBTOTAL | | |
| 1. MARINA FACILITIES | $6,014,300 | $7,051,900 |
| 2. INFRASTRUCTURE | $373,300 | $420,000 |
| CONSTRUCTION COSTS | $6,387,600 | $7,471,900 |

(1) Includes present value of full replacement of slips/docks or launch ramp in project year 25.

(2) Cost includes periodic replacement of equipment either at project year 25 or every eight years.

respectively. These costs reflect Contingencies, Engineering and Design, and Supervision and Administration costs. In addition, the costs for slips, launch ramps and tour boat dock reflect the present value of full replacement of these features 25 years from project year one, 1994. Winter storage equipment costs also reflect periodic replacement.

Current guidance states that associated costs must be addressed in the cost analysis. However, an offset to these costs must be taken in the benefit analysis if it can be shown that there are user fees that will recoup these costs. User fees generated from the construction of these associated costs fall into six general categories: Slip rental revenues, launch ramp revenues, winter storage revenues, lease revenues, gasoline revenues and waste pumpout revenues.

Associated Costs, associated revenues, and resulting net benefits will be topically addressed.

(1) Associated Construction Costs - Associated construction costs for plans 10A Modified and 10B (Table C58) have been divided into two cost categories: Marina facility related development costs and Infrastructure costs.

(a) Marina Related Facility Development Costs - Marina related facilities consist of slips, one launch ramp with two lanes, a dock for a tour boat as well as the tour boat acquisition cost, winter storage equipment costs, a main "service" building and purchase of the land for the building site. Total marina related facility construction costs were estimated at $6,014,300 for plan 10 A Modified and $7,051,900 for Plan 10B.

Slip construction costs include: slip walkways and electric and water hookup costs. These costs also reflect the present value of full replacement of these features 25 years from project one. Slip construction costs came to $3,962,400 and $5,000,000 for Plans 10 A Modified and 10B, respectively.

Launch ramp construction costs of $60,000 reflect construction of a two lane launch ramp and the present value of full replacement of the launch ramp in project year 25.

Winter storage equipment costs covers all machinery needed to provide winter storage services. This includes one 25 ton retrieval lift ($115,700), two eight ton fork lifts ($92,000), two heavy duty pickup trucks ($32,000) and four boat trailers ($10,000). Winter storage equipment costs reflect replacement of the retrieval lift in project year 25. All other winter storage equipment was replaced every eight years. total winter storage equipment costs came to $316,900.

The building cost of $825,000 would cover the cost of constructing a main "service" building and providing equipment needed for marine gasoline sales and marine pumpout services. The main "service" building would be used as a control center for the entire marina area. The manager's office and common areas (hallways, utilities and restrooms) would be located here. The majority of the "service" building floor space would be leased to businesses offering ancillary marine related retail goods and services.

Building costs of $825,000 would be able to provide a 5,400 square foot main "service" building. Estimates of the square footage that could be provided for $825,000 are based upon construction costs incurred by the Niagara Frontier Transportation Authority in 1985 for construction of a structure providing the same services.

The Niagara Frontier Transportation Authority (NFTA) owns and operates the largest marina complex in Erie and Niagara County in the city of Buffalo. Their current facility offers over 900 wet slips for rent, has 10 launch ramps with 2 lanes each, and offers marine gasoline sales and marine pumpout services.

Their main "service" building has 5,377 square feet. The manager's office and "common areas" (hallways, utilities and restrooms) comprise 1,205 square feet. In addition, there are three leasable spaces within the service building. The first is a 2,396 square foot fast food restaurant with a 100 seat dining area and kitchen. Both the dining area and the kitchen are fully equipped with necessary furniture and equipment. A marine sales store accounts for 1,008 square feet and a bait and tackle shop the remaining 768 square feet. The NFTA main "service" building is opened and closed on a seasonal basis. The season begins May 1st and runs to October 30th.

Main "service" building construction costs for the NFTA came to $400,000 in 1985. Expenditures on the restaurant kitchen facilities and dining room furniture came to $134,000. The cost of facilities needed to provide marine gasoline sales (pipe, storage tank, installation) came to $4,400. Pumpout station construction costs (installation of holding tank, pump and all related connections) came to $2,500.

The exact type of retail activities and corresponding square footage that would locate in the main "service" building at Olcott Harbor have not been determined. However, for this analysis, the retail activities located in the main "service" building were assumed to be the same as those that currently exist in NFTA's main "service" building. This assumption would allow a representative revenue stream to be generated from leasing retail floor space.

(b) Infrastructure Costs - Infrastructure related costs included construction costs for access roads, slip water and sewer lines and hookups thereto, and construction of parking areas for the various users. Infrastructure related costs were estimated at $373,200 for Plan 10 A Modified and $420,000 for Plan 10B.

Total associated development costs for Plans 10 A Modified and 10B came to $6,387,600 and $7,471,900, respectively. These costs reflect contingencies, Engineering and Design, and Supervision and Administration costs. In addition, the costs for slips, launch ramps and the tour boat dock reflect the present value of full replacement of these features 25 years from project year one. Equipment used to provide winter storage was also periodically replaced.

(c) Average Annual Associated Costs - Table C59 summarizes average annual associated costs for plans 10 A Modified and 10B. Average annual associated costs are comprised of construction

costs plus interest during construction on these costs. Also included are various annual expenditures needed to run the marina facility. These include personnel wages and fringe benefits; annual maintenance, repairs and utilities and annual insurance. Average annual associated costs for plans 10A and 10B came to $1,090,700 and $1,254,800, respectively. These costs are computed on an 8-7/8% annual interest rate and a 50-year project life.

Table C59 - Average Annual Associated Costs

| | PLAN 10 A MODIFIED | PLAN 10 B |
|---|---|---|
| A. TOTAL FIRST COSTS | | |
| 1. DEVELOPMENT COSTS | $6,387,600 | $7,471,900 |
| 2. INTEREST DURING CONSTRUCTION | $241,800 | $285,300 |
| TOTAL FIRST COSTS | $6,629,400 | $7,757,200 |
| B. AVERAGE ANNUAL DEVELOPMENT COSTS | | |
| TOTAL FIRST COSTS | $6,629,400 | $7,757,200 |
| PARTIAL PAYMENT FACTOR | 0.09003 | 0.09003 |
| 1. AVG ANNUAL FIRST COSTS | $596,900 | $698,400 |
| 2. ANNUAL WAGES & OVERHEAD | $313,600 | $336,700 |
| 3. ANNUAL MAINTENANCE & REPAIRS | $170,200 | $209,700 |
| 4. ANNUAL INSURANCE | $10,000 | $10,000 |
| TOTAL ANNUAL COSTS | $1,090,700 | $1,254,800 |

(i) Average Annual First Costs - Total First Costs consist of construction costs as presented in Table C59 and Interest During Construction (IDC) on these costs. Interest During Construction was computed over an eleven month period using monthly compounding, at an 8-7/8 percent annual interest rate. Site acquisition costs of $350,000 were subtracted from construction costs before IDC was computed. These total First Costs were converted to an average annual dollar amount based upon the partial payment factor, given a project interest rate of 8-7/8 percent and a fifty-year project life. Average annual first costs came to $596,900 and $698,400 for Plans 10 A Modified and 10B, respectively.

(ii) Other Average Annual Costs - Other average annual costs include annual wages and overhead; annual maintenance, repairs and utilities and annual insurance.

Table C60 summarizes the annual wages associated with the year round operation of the marina facility. This includes one full-

time and two part-time facilities managers with a base pay of $20,000. Two janitorial workers are dedicated to maintenance of the services building during the boating season. Eight part-time laborers provide services ranging from lawn maintenance to minor dock repair; collection of fees (launch ramp fees, gasoline sales, waste pumpout fees, etc); and assistance in the installation and removal of finger catwalks, etc. A security staff enables one security officer to be available 24 hours a day, year round. Lastly, there is one full-time clerical worker.

All labor costs were increased by 33.5 percent to account for all fringe benefits. Annual labor costs for Plans 10A and 10B came to $313,600 and $336,700, respectively.

Table C60 - Annual Marina Wages And Overhead

| TYPE OF EMPLOYEE | NUMBER | $/HOUR | HOURS /WEEK | NUMBER OF WEEKS | 10 A TOTAL | 10 B TOTAL |
|---|---|---|---|---|---|---|
| MANAGER( $20,000 SALARY + 33.5% FOR FRINGE BENEFITS) | | | | | | |
| FULL TIME | 1 | (SALARY) | 40 | 52 | $26,700 | $26,700 |
| PART TIME | 2 | (SALARY) | 40 | 26 | $26,700 | $26,700 |
| JANITORIAL | 2 | $10.00 | 40 | 26 | $27,800 | $27,800 |
| LABORERS (1) | 8 | $10.00 | 40 | 26 | $88,000 | $111,100 |
| SECURITY | 1 | $10.00 | 168 | 52 | $116,600 | $116,600 |
| CLERICAL WORKER | 1 | $10.00 | 40 | 52 | $27,800 | $27,800 |
| | | | | | $313,600 | $336,700 |

(1) There are 8 laborers under Plan 10A and 10 under Plan 10B.

Table C61 summarizes the four basic components of annual maintenance, repairs and utility costs. These four components are: Slip walkways and parking lot maintenance, replacement reserves, utility costs and general office supplies. Annual maintenance, repairs and utility costs came to $170,200 and $209,700 for Plans 10A and 10B, respectively.

A major portion of annual maintenance and repairs is associated with the installation and removal of boat slip walkways. Slip walkways are removed at the end of the season to prevent ice damage from occurring over the winter. Removal would be achieved via a leased floating workboat with crane. Laborers hired by the marina facility would assist in the installation and removal of the slip walkways. These walkways would be stored in a portion of the parking area set aside for slip renters. Maintenance would be performed on them after or prior to the boating season. Any skilled trade repair work (welding) would come from this fund.

Table C61 - Annual Marina Maintenance, Repairs And Utility Costs

| | Plan 10A Modified | Plan 10B |
|---|---|---|
| 1.SLIP WALKWAYS AND PARKING MAINTENANCE | $108,400 | $136,800 |
| 2.REPLACEMENT RESERVES | $14,400 | $14,400 |
| 3.UTILITY COSTS | $42,400 | $53,500 |
| 4.GENERAL OFFICE SUPPLIES (WAG) | $5,000 | $5,000 |
| SUMMARY, MAINTENANCE, REPAIRS, UTILITIES | $170,200 | $209,700 |

Parking lot maintenance would also come from this source. These costs were based upon an average maintenance cost per slip value of $122.85. This value is based on similar annual maintenance costs per slip incurred by a local Western New York public marina facility with over 800 slips. Annual slip, walkway, and parking maintenance and repair costs for Plans 10 A Modified and 10B came to $108,400 and $136,800, respectively.

Money for Replacement Reserves is usually set aside to replace short lived items. The proposed project has very few such items. The existence of annual slip walkway and parking lot maintenance expenditures excludes these items from needing major replacement reserve monies. The size of the replacement reserves also considers that the facility is not a year round facility. The marina service building is closed to the public from November to April. During this time, the marina would have one manager, one clerical worker, and security staff on the premises. No other marina staff would be needed. The restaurant, marina sales and bait shop would be closed.

Consequently, replacement reserves were keyed to the main "service" building construction cost. Replacement reserves were placed at 1.75% of the service building's construction costs. This comes to $14,400 annually. This money would be used primarily to purchase raw materials (paint, cleaning equipment, lawn mowers, lawn mower gasoline, etc.). On site marina facility labor would be used to perform the maintenance/repairs. If needed, these monies could be used to hire skilled labor on a per job basis or contract basis only (Heating, electrical, plumbing, etc.).

Annual Utility Costs were based upon a similar sized local public marina currently in operation in the Buffalo area. These costs include heat, water and electric for all public areas and management space in the main "service" building. It also accounts for water and electric charges associated with slips. However, the three lessees of retail space would pay their own electric and gas consumption. Annual utility costs came to $42,400 and $53,500 for plans 10 A Modified and 10B, respectively.

General Office Supplies of $5,000 per year would cover such items as paper, pens, pencils, calculators, computers, etc.

(2) Associated Revenue Analysis - Revenues generated from Plans 10 A Modified and 10B are developed in this section. There are six revenue sources: Lease income from rental of space in the main "service" building complex (restaurant, marine accessory supplies, and bait shop), slip fees (recreational slip renters, transient slip renters, charterboat slip renters and tour boat slip renters), ramp use revenues, winter storage revenues, gasoline sales revenues, and pumpout service revenues. Table C62 summarizes this revenue analysis. Total annual revenue from the marina complex comes to $1,368,500 and $1,694,900 for Plans 10 A Modified and 10B, respectively. Each revenue generation source will now be discussed.

Table C62 - Associated Revenues From Plans 10 A Modified and 10B

| | Plan 10 A Modified | Plan 10 B |
|---|---|---|
| Main Building Complex | | |
| 1. Lease Revenues | | |
| A. Restaurant Lease Revenues | $52,700 | $52,700 |
| B. Kitchen Equipment Lease Revenues | $24,000 | $24,000 |
| C. Marina Store Lease Revenues | $15,100 | $15,100 |
| D. Bait Shop Lease Revenues | $11,500 | $11,500 |
| Total Lease Revenues | $103,300 | $103,300 |
| Boat Related Revenues | | |
| 2. Slip Revenues | | |
| A. Recreational Slip Revenues | $900,800 | $1,166,600 |
| B. Transient Slip Revenues | $48,000 | $48,000 |
| C. Charterboat Slip Revenues | $60,000 | $60,000 |
| D. Tourboat Slip Revenues | $5,000 | $5,000 |
| | $1,013,800 | $1,279,600 |
| 3. Launch Ramp Revenues | $16,500 | $16,500 |
| 4. Winter Storage Revenues | $219,600 | $277,200 |
| 5. Gasoline Sales Revenues | $7,400 | $9,000 |
| 6. Pumpout Revenues | $7,900 | $9,300 |
| Total Boat Related Revenues | $1,265,200 | $1,265,200 |
| Total Annual Revenues | $1,368,500 | $1,694,900 |

(a) Lease Revenue From The Main Building Complex -The exact size of Olcott Harbors main "service" building and type of retail activities and corresponding square footage that would be

leased has not been determined. However, for this analysis, the building size and the retail activities located in Olcott's main "service" building were assumed to be the same as currently exist in NFTA's main "service" building.

The NFTA main "service" building has 5,377 square feet. There are three leasable spaces: A 2,396 square foot restaurant, a 1,008 square foot marine supply store, and a 768 square foot bait shop. Administrative offices, public restrooms, and building maintenance storage areas comprise the remaining 1,205 square feet. The building is opened and closed on a seasonal basis. The season begins May 1st and runs to October 30th.

Rental revenues from the main "service" building complex would come from the seasonal lease of floor space in the main "service" building complex to the three retail services. All leases were computed on a cost per square foot for the six-month period, May 1st to October 30th. All revenue estimates for the main building complex are based upon lease rental revenues generated by the Niagara Frontier Transportation Authority from lease of retail space in their main "service" building.

(i) Restaurant Complex Lease Revenue - The restaurant complex, dining area, and kitchen facilities, encompasses 2,396 square feet. The dining area (42' x 48') is fully furnished and has a seating capacity of 100 people. The kitchen (19' x 20') is fully equipped with refrigerators, coolers, cooking ranges, and dishwashing facilities.

Estimated rental revenue per square foot, on a seasonal basis, comes to $22.00 per square foot. This is slightly below rental costs per square foot of a similar sized facility currently in operation at the Niagara Frontier Transportation Authority's (NFTA) Small Boat Harbor. Seasonal rental revenue for the restaurant complex comes to $52,700. NFTA currently assesses an annual charge for the usage of the kitchen equipment. This charge comes to $24,000 a year. The use of electric utilities is paid for by the renter.

(ii) Marine Supply Store Lease Revenue - The marine sales shop is 1,008 square feet in size. The shop comprises the back quarter of the building. A promenade, covered porch visually connects the marine sale's shop with the restaurant. The shop has two entrance doors, one on the porch and one inside the main entrance public hall walkway. The facility's hours of operation during the season are not tied to the main-building since it has its own exterior entrance way. Parking is readily accessible behind the main building.

The store is envisioned as providing a complete range of boat equipment accessories ranging from cleats to rope to cleaning waxes. The store would also handle electronic boating equipment as depth finders, ship to shore radios, sonar, etc. The store would also have small boutique items of a nautical nature.

The ideal tenant would be a marine supply store who desires a location or outlet near the water. This would enable the store to have access to a larger inventory than could be stored in the store itself. Items could be ordered from catalogs and picked up at the store.

Estimated rental revenue per square foot, on a seasonal basis, would be $15.00 per square foot. Given the store has 1,008 square feet, this results in annual revenue of $15,100. Electric utilities are paid for by the renter.

(iii) Bait And Tackle Shop Lease Revenue - The bait and tackle shop is 768 square feet in size. The shop faces the slip area and has two entrance doors: One entrance leads to the exterior deck and the other to the main public concourse. Again, shop hours need not be constrained by the hours for the main building.

The shop is envisioned as providing packaged food and bait. The shop would also provide a full range of fishermen gear such as fish line, fish lures, sinkers, rods, reels, downriggers, fish nets, etc.

Estimated rental revenue per square foot, on a seasonal basis, would be $15.00 per square foot. Given the store has 768 square feet, this results in annual rental revenue of $11,500. Electric utilities are paid for by the renter.

(b) Boat Related Revenues - Boat related revenues fall into five categories: Slip rentals, winter storage revenues, launch ramp revenues, gasoline sales to boaters, and pump out services to boaters. These revenues came to $1,265,200 and $1,591,600 for plans 10 A Modified and 10B, respectively (See Table C63). Each category will now be discussed.

(i) Slip Rental Revenues - Plans 10A and 10B accommodate 886 and 1,118 slips, respectively. Fifty of these slips were set aside for charter boats and 50 slips for transient craft. Thus, slip revenues came from three sources: New slip renters, charter boats and transient craft. Slip rental service is based upon a 168 day season from May 1st to the middle of October for new slip renters and charterboat operators. Transient slips will be available from mid June to the end of August. Two factors affect revenues from slip rentals: Fleet mix size and slip rental rates per boat size. Slip rental rates are based upon slip catwalk length.

Slip rental revenues for new slip renters were based upon an average slip rental rate of $1,146 for Plans 10A and 10B, respectively. These average fees are based upon slip fees and slip sizes proposed by the Town of Newfane. Slip fees increased as slip size increased. These fees were similar to slip fees currently being charged at Olcott Harbor and other marinas in the

Table C63 - Boat Related Revenues

| | PLAN 10 A MODIFIED | PLAN 10 B |
|---|---|---|
| 1. SLIPS | | |
| A. New Slip Renters | $900,800 | $1,166,600 |
| B. Transients | $48,000 | $48,000 |
| C. Charterboats | $60,000 | $60,000 |
| D. Tour Boat | $5,000 | $5,000 |
| Subtotal | $1,013,800 | $1,279,600 |
| 2. Launch Ramp Revenues | $16,500 | $16,500 |
| 3. Winter Storage Revenues | $219,600 | $277,200 |
| 4. Gasoline Sales Revenues | $7,400 | $9,000 |
| 5. Pumpout Service Revenues | $7,900 | $9,300 |
| TOTAL REVENUES | $1,265,200 | $1,591,600 |

five county boat slip demand service area. For example, the average summer slip fee for a 33 foot craft at 10 marinas in the boat demand area came to $ 1,431.

Slip rental revenues from new slip renters for Plans 10 A Modified and 10B were based upon 786 and 1,018 slips being available at the average slip rental cost of $1,146. Slip rental revenues for new slip renters came to $900,800 and $1,166,600 for Plans 10A and 10B, respectively.

Plans 10 A Modified and 10B provides 50 slips for usage by transient craft. Slips for transient craft would be located on the east and west side of the existing east federal pier and on the east side of the existing west federal pier. These slips will be available for rent from mid-May to the end of August. This allows the existing federal piers to be used by pier fishermen during the peak spring and fall salmon runs.

Revenues from this source were based upon a daily fee of $20 and a 56 percent occupancy rate during the season. These assumptions resulted in 48 rentals per season per slip. Annual revenues per slip came to $960. Total rental revenue from the 50 slips came to $48,000 for Plans 10 A Modified and 10B.

Plans 10 A Modified and 10B provides fifty slips for charterboat usage. Slip rental revenues for the fifty charterboats were based upon an average slip rental cost of $1,200. Slip rental revenues from charterboats came to $60,000.

Plans 10 A Modified and 10B also provides a 50 foot docking area for the tour boat that will be located in the outer harbor. Annual rental revenues from the dockside facilities comes to $5,000 per season.

(ii) Launch Ramp Revenues - Plans 10 A Modified and 10 B will have one new launch ramp with two lanes. The ramp will be open from May 1st to the middle of October. This is a total of 168 days. Parking spaces for 100 boat trailers and tow vehicles will be provided (50 spaces per ramp). Launch ramp revenues equals total launches during the season times the launch ramp fee of $3.00.

Use of the launch ramp is available 24 hours a day during the boating season. However, the town collects fees and data on launch ramp usage only while staff is present at the site. This is usually a 12 hour period. In addition, a launch fee is not collected from everyone who makes a launch at the town ramp. The town sells season launch ramp passes that entitle the boater to launch an unlimited number of times during the season for a $30 fee. Also the attendants at the launch ramp have other duties to perform at the fish cleaning station. When performing these duties they do not collect launch ramp fees.

An estimate of new annual launches attributable to the project was developed based upon maximum peak day launch ramp usage. Non peak day launch ramp usage was a fraction of maximum peak day usage. Derivation of maximum peak day launch ramp usage was based upon one new launch ramp with two lanes, a 12 hour day, and each lane being used seven times per hour (for either a launch or retrieval). This results in each lane being able to accommodate up to a 84 launches/retrievals in a 12 hour period. This means 42 boats can use each lane during a 12 hour period. However, this peak capacity will not be used each day since launch ramp usage varies according to time of day and day of the week. Boat owners who use launch ramps tend to launch in the morning or after work during the weekdays. On weekends, launch ramp demand may be more evenly spread throughout the day. Weekend demand will be larger than weekday demand.

The 168 day launch ramp season was divided into 46 peak (weekends and holiday days) and 122 non peak days (weekdays). These days were reduced by 10 percent to allow for bad weather. Consequently the 168 day launch ramp season had 41 peak days and 110 non peak days of usage. It was assumed the launch ramp will be used to 80 percent of capacity during peak days. On non-peak days, launch ramp demand is estimated to be 30% of peak capacity usage (25 launches/retrievals per lane or twelve boats per lane per day.)

Total annual launch ramp usage consists of peak day and non peak day use estimates. New launch ramp users attracted to Olcott on non peak days may launch their boat from the existing launch ramps. However these boaters would not have been attracted to

Olcott in the first place if the project had not been in place. Consequently these annual launches were also credited to the project, even though the launch ramp user may not have used the new launch ramp. Table C64 summarizes the derivation of estimated annual boat usages for a two lane launch ramp. Estimated annual boat usages came to 5,500.

Table C64 - Annual Launch Capacity For A Two Lane Launch Ramp

| Type Of Days | Number Of Days | Maximum Daily Launches/ Retrievals Per Lane | Percent Utilization of Daily Lane Capacity | Factor For Converting Launches/ Retrievals To Boats | Number Of Seasonal Boat Uses Per Lane | Number Of Lanes | Number Of Launch Ramps | Total Boat Uses Per Year |
|---|---|---|---|---|---|---|---|---|
| Peak | 41 | 84 | 80% | 0.5 | 1,378 | 2 | 1 | 2,756 |
| Non Peak | 110 | 84 | 30% | 0.5 | 1,386 | 2 | 1 | 2,772 |
| | | | | | | | | 5,528 |

Plan 10 A Modified and 10B each has one new launch ramp with an estimate of 5,500 launches sold annually. Launch ramp fees for the willingness to pay analysis were placed at $3.00 per launch. This results in annual launch ramp revenues of $16,500.

(iii) Winter Storage Revenues - At the end of the season all boats must be removed and placed into winter storage. Current slip renters may wish to store their boats at the marina over the winter instead of taking them home or to other facilities. Many western New York suburbs prohibit storage at residences. Boats 24 feet or longer become increasingly difficult to transport to winter storage facilities, especially as length increases. Therefore, boat slip renters with boat lengths 24 feet or greater generally prefer to store their boat over the winter at the marina. However, many regional marina's contracts with slip renters mandate winter storage at the same facilities.

Table C65 indicates there are 732 and 924 slip renters whose used slips with docks of 24 feet or longer under Plans 10A and Plan 10B, respectively. Generally, boats are at least as long as the slip dock they rent. Usually the boats are longer. Slip dock length was taken as a proxy for boat length. It is assumed all of the slip renters who rent slips with docks of 24 feet or longer, have boats 24 feet or longer. All of these slip renters are assumed to store their boat at the marina complex over the winter.

Table C65 - Winter Storage Revenue

A. SLIPS BY LENGTH

| PIER LENGTH | Plan 10A Modified | Plan 10B |
|---|---|---|
| 20' | 154 | 194 |
| 24' | 292 | 408 |
| 28' | 294 | 340 |
| 32' | 98 | 128 |
| 40' | 48 | 48 |
| Total Slips | 886 | 1,118 |

B. WINTER STORAGE REVENUES

| | PLAN 10A MODIFIED | PLAN 10B |
|---|---|---|
| TOTAL SLIPS | 886 | 1,118 |
| SLIPS 20' | 154 | 194 |
| Boats Wishing Winter Storage | 732 | 924 |
| Winter Storage/Boat | $300 | $300 |
| Winter Storage Revenue | $219,600 | $277,200 |

This may be an underestimation of winter storage demand. Many boats under 24 feet, especially sail boats, would also winter store at Olcott. Also winter storage demand does not account for boat owners in other harbors who may wish to store their boats at Olcott Harbor.

Boat winter storage would take place in the current launch ramp parking lot. Additional storage area could be developed south of the Route 18 bridge. An access road built under the Route 18 bridge could connect the current launch ramp parking lot and the additional storage area south of Route 18. All storage would be outside storage. Watchman services would be provided 24 hours a day.

Outdoor winter storage rates in the Erie-Niagara county area average around $300 per boat. The information on winter storage rates and number of boat owners requesting winter storage was used to generate annual winter storage revenues.

Annual winter storage revenues for Plans 10 A Modified and 10B came to $219,600 and $277,200, respectively. Revenue from this source may grow if boat owners not renting slips at the marina facility decide to store their boat over the winter here. However, this was not modeled into the revenue analysis.

(iv) Gasoline Sales Revenues - A gasoline pump will be located adjacent to the launch ramp area. This will service launch ramp users as well as slip renters. The gas pump would be manned by marina staff. Gasoline purchases typically come from slip renters and launch ramp users. Table C66 summarizes the derivation of annual gallons purchased. Annual gallons purchased under Plans 10 A Modified and 10B came to 148,103 and 180,583, resoectively.

This analysis assumed a typical outing would require 8.75 gallons. This was based upon a five hour outing and average hourly fuel consumption of 1.75 gallons. The analysis assumed slip renters visit their boats 40 times per season, take their boat out on 50% of these visits, and purchase 80% of their fuel requirements at the marina. The new launch ramp accommodates 5,500 boats per season. It is assumed half of the launch ramp users purchase their fuel needs at the gasoline dock.

Table C66 - Gallons Of Fuel Purchased Annually, by Plan

| | Slip Renters | | Launch Ramp Users |
|---|---|---|---|
| | Plan 10 A Modified | Plan 10 B | Plan 10 A Modified Or 10 B |
| Average Fuel Consumption per Hour | 1.75 | 1.75 | 1.75 |
| Number of Hours per Outing | 5.00 | 5.00 | 5.00 |
| Gallons per Outing | 8.75 | 8.75 | 8.75 |
| Outings per Year per Boat (1) | 20.00 | 20.00 | |
| Gallons per Year per Slip Renter | 175.00 | 175.00 | |
| Gallons Per Outing Per Launch Ramp User | | | 8.75 |
| Number of Boats at Marina | 886.00 | 1,118.00 | |
| Number Launches per Year | | | 5,500.00 |
| Total Gallons Needed | 155,050 | 195,650 | 48,125 |
| % of Fuel Purchased at Marina Site | 80% | 80% | 50% |
| Gallons Purchased at Marina | 124,040 | 156,520 | 24,063 |

1/ Given a 168-day season and assuming boaters on the average visit their boat 40 times per season. Out of these 40 visits, assume the boater goes out 50% of the time, (40 x .5 = 20).

A markup of five cents per gallon is assumed. This results in annual revenues from gasoline sales of $7,400 for Plan 10 A Modified and $9,000 for Plan 10B [For example, for Plan 10 A

Modified annual gasoline net income equals (124,040 + 24,063) x $.05 = $7,400]. Gasoline revenues may be greater than this if more than 50% of the launch ramp users purchase gasoline at the docks, or if the average gasoline sale is more than 8.75 gallons. It also does not include revenues generated from the sale of oil or petroleum products.

(v) Pumpout Revenues - A holding tank for placing waste from toilets on board boats will be provided adjacent to the gasoline pump area. This service will be offered based upon a fee of $5.00 for each pumpout. After taking into consideration periodic pumping of the holding tank, net revenue per boat pumpout was placed at $3.00.

Table C65 indicates there are 440 boats under Plan 10 A Modified and 516 boats under Plan 10B that rent slips with dock walks 28 feet or greater. It is assumed each of the boats renting these slips area also 28 feet or greater and have bathroom facilities on board. These boats will need pumpout service once a month from May through October. This results in net annual pumpout service revenue of $7,900, (440 x 6 x $3.00 = $7,920) for Plan 10 A Modified and $9,300 for Plan 10B.

(3) Associated Revenues - Associated Costs Analysis - Table C62 indicates that total annual revenues for Plans 10 A Modified and 10B came to $1,368,500 and $1,694,900, respectively. Table C59 indicates total annual costs came to $1,090,700 and $1,254,800 for Plans 10 A Modified and 10B, respectively. Table C67 indicates annual revenues exceed annual costs by $277,800 for Plan 10 A Modified and by $440,100 for Plan 10B.

Table C67 - Excess Associated Revenues Over Associated Costs

| | PLAN 10 A MODIFIED | PLAN 10 B |
|---|---|---|
| A. TOTAL ANNUAL REVENUES | $1,368,500 | $1,694,900 |
| B. TOTAL ANNUAL COSTS | $1,090,700 | $1,254,800 |
| EXCESS REVENUES OVER COSTS | $277,800 | $440,100 |

The preferred method of handling Associated Costs, Associated Benefits is outlined in the Planning Guidance Notebook, ER 1105-2-100, 15 December ,1989, page 6-141. "NED costs include all costs necessary to achieve the claimed benefits. In addition to costs directly related to the Federal project there may be associated costs. These are costs of measures, over and above Federal project measures, which are required for the benefits to be realized. It is preferred that associated costs be explicitly

treated as NED project related costs, and appear as costs in the benefit-cost ratios."

Consequently, all Associated Investment Costs for Plans 10 A Modified and 10B will be included in the benefit-cost ratio analysis. Likewise, all user fees charged at the site for the use of these associated facilities will be added to the benefits. Excess revenues over costs came to $277,800, and $440,100 for Plans 10 A Modified and 10B, respectively.

The Associated Revenue-Associated Cost analysis is extremely sensitive to slip rental costs and the number of slips provided.

Any changes in final design or reduction in the number of slips provided would change the Associated Revenue - Associated Cost analysis.

Information provided in the Associated Revenue/- Associated Cost analysis is illustrative of revenues and costs generated from Plans 10 A Modified and 10B. The marinas financial feasibility should be based on actual fees and other charges the local cooperator deems appropriate.

j. Harbor of Refuge Benefits. Harbor of refuge benefits are attributable to a boating facility that provides a safe entrance to a protected mooring area in all conditions of weather. The large scale of the Olcott Project will stimulate cruising in western Lake Ontario since boaters will have increased confidence to cope with sudden changes in weather and be assured of safe harbor access and moorage facilities should the need arise.

The existing Olcott piers are not high enough to prevent waves from overtopping during storms. During storms a great amount of water turbulence exists between the existing piers, making harbor access hazardous. Boaters are not able to easily navigate between the existing federal piers under storm conditions to access calmer water in Eighteen-Mile Creek and risk crashing their boats against the steel sheetpiles of the jetties.

Construction of Plan 10 A Modified or Plan 10B would provide a safe east basin and also reduce wave action between the existing federal piers. Boaters would be able to use the east basin to weather out storms. Also, boaters could now navigate between the existing federal piers to gain access to Eighteen-Mile Creek. Eighteen-Mile Creek could also be used for boaters seeking refuge. Four types of boaters would benefit from the Plans: Boaters on cruise, harbor slip renters, harbor launch ramp users, and harbor charterboat users. These boaters would now be able to cruise/use the lake with greater confidence, knowing that an adequately protected harbor is available. Harbor of refuge benefits of $20,000 was credited to the Olcott Project.

k. Flood Inundation Reduction Benefits. Currently, flooding damages are incurred by structures located on the lakefront and within the existing harbor area. Implementation of Plan 10 A Modified or 10B will reduce these damages. An analysis of this reduction in damages was performed by the Buffalo District Engineering Division. The results of their analysis were presented at June, 1989 price levels. All results were updated to October, 1989 prices. A summary of their findings follows. Further information can be found in the Hydraulics Appendix.

(1) Existing Condition Damages - Existing condition damages were determined separately for the lakefront and harbor areas using previously published lakefront and harbor stage-damage curves for Olcott. These curves were used in conjunction with lakefront and harbor ultimate stage-frequency curves for Lake Ontario at "Olcott" to develop damage-frequency curves for the lakefront and harbor areas.

The ultimate stage-frequency curves were determined by adding the maximum (100 year) wave run-up to the instantaneous stage-frequency curve for Lake Ontario. The maximum wave run-up for the lakefront varies from 1 foot to 4 feet. An average run-up value of 1.5 feet was considered the most appropriate for the lakefront area. This 1.5 feet was added to the instantaneous elevation-frequency curve for the Olcott lakefront. The maximum wave run-up for the harbor could not be precisely determined due to the complexity of the wave action within the harbor and the limited funds available for studying the wave phenomena. Wave run-up values of 0.5 feet and 1.0 feet were evaluated by developing elevation-frequency and damage-frequency relationships for each run-up value. The damage frequency curve associated with 0.5 feet was chosen as representative of the harbor because its estimate of damages associated with historic flood events at Olcott appeared more reasonable than those produced using a 1.0 foot run-up.

Integration of the lakefront damage-frequency curve resulted in expected annual damages of $20,400. Integration of the harbor damage-frequency curve yielded expected annual damages of $68,300. Total existing condition expected annual damages came to $88,700.

(2) With Project Condition Damages - Under improved conditions the lakefront and harbor stage-damage curves, and the Lake Ontario instantaneous stage-frequency curve, remains unchanged from existing conditions. The factors or relationships which change under with project conditions are the lakefront and harbor wave run-up, associated Lake Ontario ultimate stage-frequency curves, and the lakefront and harbor damage-frequency curves.

(a) Plan 10 A Modified - Under Plan 10 A Modified, the lakefront maximum run-up is reduced significantly by the project breakwaters. An average value of 0.5 feet was chosen as the wave run-up for the lakefront. Wave run-up within the harbor would be near 0 feet under Plan 10 A Modified.

With project, inundation damages for the lakefront and the harbor area came to $2,900 and $21,800, respectively. Total With Project condition EAD is $24,700.

(b) Plan 10B - Under Plan 10B, the maximum wave run-up at both the lakefront and in the harbor was very small and assumed to be 0.0 feet. With project inundation damages for the lakefront and the harbor area came to $600 and $21,800, respectively. Total with project condition EAD is $22,400.

(3) Plan Benefits - Inundation benefits equals the difference between Without Project inundation damages and With Project inundation damages. This is summarized in Table C68.

| Table C68 - Inundation Benefits By Plan | Plan 10A Modified | Plan 10B |
|---|---|---|
| Without Project Condition Inundation Damages | $ 88,700 | $ 88,700 |
| With Project Condition Inundation Damages | $ 24,700 | $ 22,400 |
| Inundation Benefits | $ 64,000 | $ 66,300 |

Inundation benefits for Plan 10 A Modified and Plan 10B are $64,000 and $66,300, respectively.

1. Benefit Summary. Table C69 presents a summary of benefits associated with Plan 10A Modified and 10B. These benefits reflect October 1989 price levels, a fifty year evaluation period and an 8 7/8 percent annual interest rate. The benefits were accounted for using eleven major headings. These headings were: 1. Net Willingness To Pay, 2- New Passenger Recreational Boating Benefits, 3-Benefits To Current Slip Users, 4-Benefits From Transient Craft, 5-Charter Service Benefits, 6-Pier Fishing Benefits, 7-Sightseeing Benefits, 8-Existing Launch Ramp User Benefits, 9-Associated Benefits, 10-Harbor Of Refuge Benefits and 11-Inundation Reduction Benefits. Total Average Annual Benefits came to $3,231,500 and $3,861,400 for Plans 10A Modified and 10B respectively.

Benefits associated with Plan 10 (Table C69) were also developed, for comparison purposes. Plan 10 was to provide 792 slips. Five hundred and thirty-seven of these slips were located behind

## Table C69 - Benefit Summary-(1)

| | PLAN 10 (597 Slips) | PLAN 10A (886 Slips) | PLAN 10A MODIFIED (886 Slips) | PLAN 10 B (1,118 Slips) |
|---|---|---|---|---|
| 1. NET WILLINGNESS TO PAY-BOAT OWNERS | | | | |
| A. NEW SLIP RENTERS(Less Transients & Charters) | $313,200 | $431,800 | $431,800 | $559,300 |
| B. NEW LAUNCH RAMP USERS | $ 9,300 | $ 9,300 | $ 9,300 | $ 9,300 |
| NET WILLINGNESS TO PAY SUBTOTAL | $322,500 | $441,100 | $441,100 | $568,600 |
| 2. NEW PASSENGER RECREATIONAL BOATING BENEFITS | | | | |
| A. PASSENGERS OF NEW SLIP RENTERS | $190,800 | $263,000 | $263,000 | $340,700 |
| B. PASSENGERS OF NEW LAUNCH RAMP USERS | $ 28,600 | $ 28,600 | $ 28,600 | $28,600 |
| PASSENGER BOATING BENEFITS SUBTOTAL | $219,400 | $291,600 | $291,600 | $369,300 |
| 3. BENEFITS TO CURRENT SLIP USERS | | | | |
| A. INCREASE IN RECREATIONAL VALUE TO CURRENT SLIP RENTER BOAT OWNERS | $28,200 | $28,200 | $28,200 | $28,200 |
| B. INCREASE IN RECREATIONAL VALUE TO PASSENGERS OF CURRENT SLIP RENTERS | $17,200 | $17,200 | $17,200 | $17,200 |
| CURRENT SLIP USER BENEFITS SUBTOTAL | $45,400 | $45,400 | $45,400 | $45,400 |
| 4. BENEFITS FROM TRANSIENT CRAFT | | | | |
| A. NEW TRANSIENT RENTALS | | | | |
| (1) RECREATIONAL VALUE FOR BOAT OWNERS | $17,700 | $32,900 | $32,900 | $32,900 |
| (2) RECREATIONAL VALUE FOR PASSENGERS | $ 5,600 | $10,400 | $10,400 | $10,400 |
| NEW TRANSIENT CRAFT BENEFITS SUBTOTAL | $23,300 | $43,300 | $43,300 | $43,300 |
| B. EXISTING TRANSIENT RENTALS | | | | |
| (1) RECREATIONAL VALUE FOR BOAT OWNERS | $9,900 | $9,900 | $9,900 | $9,900 |
| (2) RECREATIONAL VALUE FOR PASSENGERS | $3,100 | $3,100 | $3,100 | $3,100 |
| NEW TRANSIENT CRAFT BENEFITS SUBTOTAL | $13,000 | $13,000 | $13,000 | $13,000 |
| 5. CHARTER SERVICE BENEFITS( CHARTERFISHING,EXCURSIONS) | | | | |
| A. NET INCOME FOR NEW CHARTER FISHING OPERATORS 50 NEW CHARTERS @ $4,247 NET INCOME PER OPERATOR) | $ 0 | $180,000 | $180,000 | $180,000 |
| B. INCREASE IN NET INCOME FOR EXISTING CHARTER FISHERMEN. | $ 0 | $71,300 | $71,300 | $71,300 |
| C. RECREATIONAL VALUE FOR CLIENTS USING NEW CHARTERBOAT SERVICES | $ 0 | $217,300 | $217,300 | $217,300 |
| D. RECREATIONAL VALUE FOR NEW CLIENTS USING EXISTING CHARTER FISHING OPERATORS | $ 0 | $21,700 | $21,700 | $21,700 |
| E. INCREASE IN RECREATIONAL VALUE FOR EXISTING CHARTER FISHING CLIENTS | $ 0 | $21,000 | $21,000 | $21,000 |

C O N T I N U E D

| | PLAN 10 (597 Slips) | PLAN 10A (886 Slips) | PLAN 10A MODIFIED (886 Slips) | PLAN 10 B (1,118 Slips) |
|---|---|---|---|---|
| F. BENEFITS TO SLIPS SET ASIDE FOR CHARTER USAGE BUT NOT USED IN FIRST 5 YEARS | | | | |
| a. SLIP RENTER BENEFITS | $ 0 | $4,200 | $4,200 | $4,200 |
| b. BENEFITS TO PASSENGERS OF SLIP RENTERS | $ 0 | $2,600 | $2,600 | $2,600 |
| G. SLIP REVENUE FROM NEW CHARTER BOATS | | | | |
| H. NET INCOME FOR NEW TOUR BOAT OPERATOR | TBC | TBC | TBC | TBC |
| I. RECREATIONAL VALUE FOR PASSENGERS USING THE NEW TOUR BOAT | $ 0 | $49,800 | $49,800 | $49,800 |
| CHARTER SERVICE BENEFITS SUBTOTAL | $ 0 | $567,900 | $567,900 | $567,900 |
| 6. PIER FISHING BENEFITS | | | | |
| A. NEW FISHERMEN | $152,500 | $152,500 | $152,500 | $248,500 |
| B. CURRENT FISHERMEN | $18,900 | $18,900 | $18,900 | $18,900 |
| PIER FISHING BENEFITS SUBTOTAL | $171,400 | $171,400 | $171,400 | $267,400 |
| 7. SIGHTSEEING BENEFITS | $166,700 | $166,700 | $166,700 | $166,700 |
| 8. EXISTING LAUNCH RAMP USER BENEFITS | | | | |
| A. INCREASE IN RECREATIONAL VALUE TO CURRENT LAUNCH RAMP BOAT OWNERS | $ 9,400 | $ 9,400 | $ 9,400 | $ 9,400 |
| B. INCREASE IN RECREATIONAL VALUE TO PASSENGERS OF CURRENT LAUNCH RAMP BOAT OWNERS | $29,200 | $29,200 | $29,200 | $29,200 |
| SUBTOTAL | $ 38,600 | $ 38,600 | $ 38,600 | $ 38,600 |
| 9. ASSOCIATED BENEFITS | | | | |
| A. LEASE REVENUES | $103,300 | $103,300 | $103,300 | $103,300 |
| B. SLIP REVENUES | $ 679,100 | $1,013,800 | $1,013,800 | $1,279,600 |
| C. LAUNCH RAMP REVENUES | $16,500 | $16,500 | $16,500 | $16,500 |
| D. WINTER STORAGE REVENUES | $140,400 | $219,600 | $219,600 | $277,200 |
| E. MARINE GASOLINE SALES REVENUES | $5,400 | $7,400 | $7,400 | $9,000 |
| F. PUMPOUT REVENUES | $4,000 | $7,900 | $7,900 | $9,300 |
| | $ 948,700 | $1,368,500 | $1,368,500 | $1,694,900 |
| 10. HARBOR OF REFUGE BENEFITS | $20,000 | $20,000 | $20,000 | $20,000 |
| 11. INUNDATION REDUCTION BENEFITS | $64,000 | $64,000 | $64,000 | $66,300 |
| TOTAL AVERAGE ANNUAL BENEFITS | $2,033,000 | $3,231,500 | $3,231,500 | $3,861,400 |

(1) All benefits reflect October 1989 price levels, an 8 7/8 percent annual interest rate and a 50 year project life.

the east pier. The remaining 255 slips were located in Eighteen-Mile Creek. Since the November 1978 Feasibility Study, all but 60 of the new slips located in 18 Mile Creek have been developed. These newly developed slips now become part of the base case condition. The impact of this slip development is that Plan 10 now provides 597 slips. These 597 slips are divided into permanent based boater slips( 570) and transient boater slips (27). Plan 10 provides one additional launch ramp and access to the East Breakwater for fishing and sightseeing. This plan also has a main marina building and activities located therein (restaurant, bait shop and marina supply shop) comparable to that of Plan 10 A Modified and Plan 10B. This Plan also provides winter storage facilities, gasoline sales and boat pumpout facilities. This plan does not provide slips for charterboat fishermen or facilities for a tourboat.

Benefits for Plan 10 were developed based upon the above level of amenities being provided. The benefits were accounted for using ten major headings. These headings were: 1. Net Willingness To Pay, 2- New Passenger Recreational Boating Benefits, 3-Benefits To Current Slip Users, 4-Benefits From Transient Craft, 5-Pier Fishing Benefits, 6-Sightseeing Benefits, 7-Existing Launch Ramp User Benefits, 8-Associated Benefits, 9-Harbor Of Refuge Benefits and 10-Inundation Reduction Benefits. The benefit evaluation procedures paralleled those used in generating benefits for Plan 10 A Modified. Total Average Annual Benefits for Plan 10 are $2,033,000. Again, these benefits reflect October 1989 prices, a 50 year evaluation period and an 8 7/8 percent annual interest rate.

At this point in the study process, all of the benefit categories used for benefit analysis purposes were re-evaluated with respect to their use in computing each plans benefit to cost ratio. It was determined at this time that two benefit categories would not be used in computing the plans benefit to cost ratios. These two benefit categories are: Net Income for New Charterfishing Operators ($180,000) and Associated Benefits ($1,368,500 for Plan 10A Modified and $1,694,900 for Plan 10B. . A summary of the 10 remaining benefit categories, and their level of benefits, is provided in Table C70 for Plan 10A Modified and Plan 10 B. Total Average Annual Benefits for plan 10A Modified came to $ 1,683,000. Total Average Annual Benefits for Plan 10B came to $ 1,986, 500. These benefits reflect October 1989 price levels, an 8 7/8 percent annual interest rate, and a 50 year project life.

## Table C 70.- Benefits Used In Benefit To Cost Ratio Analysis

| | PLAN 10A MODIFIED (886 Slips) | PLAN 10 B (1,118 Slips) | PLAN 10 (597 Slips |
|---|---|---|---|
| 1. NET WILLINGNESS TO PAY-BOAT OWNERS | | | |
| A. NEW SLIP RENTERS(Less Transients & Charters) | $431,800 | $559,300 | $313,200 |
| B. NEW LAUNCH RAMP USERS | $ 9,300 | $ 9,300 | $ 9,300 |
| NET WILLINGNESS TO PAY SUBTOTAL | $441,100 | $568,600 | $322,500 |
| 2. NEW PASSENGER RECREATIONAL BOATING BENEFITS | | | |
| A. PASSENGERS OF NEW SLIP RENTERS | $263,000 | $340,700 | $190,800 |
| B. PASSENGERS OF NEW LAUNCH RAMP USERS | $ 28,600 | $28,600 | $ 28,600 |
| PASSENGER BOATING BENEFITS SUBTOTAL | $291,600 | $369,300 | $219,400 |
| 3. BENEFITS TO CURRENT SLIP USERS | | | |
| A. INCREASE IN RECREATIONAL VALUE TO CURRENT SLIP RENTER BOAT OWNERS | $28,200 | $28,200 | $28,200 |
| B. INCREASE IN RECREATIONAL VALUE TO PASSENGERS OF CURRENT SLIP RENTERS | $17,200 | $17,200 | $17,200 |
| CURRENT SLIP USER BENEFITS SUBTOTAL | $45,400 | $45,400 | $45,400 |
| 4. BENEFITS FROM TRANSIENT CRAFT | | | |
| A. NEW TRANSIENT RENTALS | | | |
| (1) RECREATIONAL VALUE FOR BOAT OWNERS | $32,900 | $32,900 | $17,700 |
| (2) RECREATIONAL VALUE FOR PASSENGERS | $10,400 | $10,400 | $ 5,600 |
| NEW TRANSIENT CRAFT BENEFITS SUBTOTAL | $43,300 | $43,300 | $23,300 |
| B. EXISTING TRANSIENT RENTALS | | | |
| (1) RECREATIONAL VALUE FOR BOAT OWNERS | $9,900 | $9,900 | $9,900 |
| (2) RECREATIONAL VALUE FOR PASSENGERS | $3,100 | $3,100 | $3,100 |
| NEW TRANSIENT CRAFT BENEFITS SUBTOTAL | $13,000 | $13,000 | $13,000 |
| 5. CHARTER SERVICE BENEFITS( CHARTERFISHING,EXCURSIONS) | | | |
| A. NET INCOME FOR NEW CHARTER FISHING OPERATORS 50 NEW CHARTERS @ $4,247 NET INCOME PER OPERATOR) | $ 0 | $ 0 | $ 0 |
| B. INCREASE IN NET INCOME FOR EXISTING CHARTER FISHERMEN. | $71,300 | $71,300 | $ 0 |
| C. RECREATIONAL VALUE FOR CLIENTS USING NEW CHARTERBOAT SERVICES | $217,300 | $217,300 | $ 0 |
| D. RECREATIONAL VALUE FOR NEW CLIENTS USING EXISTING CHARTER FISHING OPERATORS | $21,700 | $21,700 | $ 0 |
| E. INCREASE IN RECREATIONAL VALUE FOR EXISTING CHARTER FISHING CLIENTS | $21,000 | $21,000 | $ 0 |

C O N T I N U E D

| | PLAN 10A MODIFIED (886 Slips) | PLAN 10 B (1,118 Slips) | PLAN 10 (597 Slips |
|---|---|---|---|
| F. BENEFITS TO SLIPS SET ASIDE FOR CHARTER USAGE BUT NOT USED IN FIRST 5 YEARS | | | |
| a. SLIP RENTER BENEFITS | $4,200 | $4,200 | $ 0 |
| b. BENEFITS TO PASSENGERS OF SLIP RENTERS | $2,600 | $2,600 | $ 0 |
| G. SLIP REVENUE FROM NEW CHARTER BOATS | | | |
| H. NET INCOME FOR NEW TOUR BOAT OPERATOR | TBC | TBC | TBC |
| I. RECREATIONAL VALUE FOR PASSENGERS USING THE NEW TOUR BOAT | $49,800 | $49,800 | $ 0 |
| CHARTER SERVICE BENEFITS SUBTOTAL | $387,900 | $387,900 | $ 0 |
| 6. PIER FISHING BENEFITS | | | |
| A. NEW FISHERMEN | $152,500 | $248,500 | $152,500 |
| B. CURRENT FISHERMEN | $18,900 | $18,900 | $18,900 |
| PIER FISHING BENEFITS SUBTOTAL | $171,400 | $267,400 | $171,400 |
| 7. SIGHTSEEING BENEFITS | $166,700 | $166,700 | $166,700 |
| 8. EXISTING LAUNCH RAMP USER BENEFITS | | | |
| A. INCREASE IN RECREATIONAL VALUE TO CURRENT LAUNCH RAMP BOAT OWNERS | $ 9,400 | $ 9,400 | $ 9,400 |
| B. INCREASE IN RECREATIONAL VALUE TO PASSENGERS OF CURRENT LAUNCH RAMP BOAT OWNERS | $29,200 | $29,200 | $29,200 |
| SUBTOTAL | $ 38,600 | $ 38,600 | $ 38,600 |
| 9. ASSOCIATED BENEFITS | | | |
| A. LEASE REVENUES | $ 0 | $ 0 | $ 0 |
| B. SLIP REVENUES | $ 0 | $ 0 | $ 0 |
| C. LAUNCH RAMP REVENUES | $ 0 | $ 0 | $ 0 |
| D. WINTER STORAGE REVENUES | $ 0 | $ 0 | $ 0 |
| E. MARINE GASOLINE SALES REVENUES | $ 0 | $ 0 | $ 0 |
| F. PUMPOUT REVENUES | $ 0 | $ 0 | $ 0 |
| | $ 0 | $ 0 | $ 0 |
| 10. HARBOR OF REFUGE BENEFITS | $20,000 | $20,000 | $20,000 |
| 11. INUNDATION REDUCTION BENEFITS | $64,000 | $66,300 | $64,000 |
| TOTAL AVERAGE ANNUAL BENEFITS | $1,683,000 | $1,986,500 | $1,084,300 |

(1) All benefits reflect October 1989 price levels, an 8 7/8 percent annual interest rate and a 50 year project life.

## C5. COSTS

Construction costs for Plans 10 A Modified, 10B and Plan 10 were developed (Table C71) using October 1989 price levels. Since all Associated Benefits will not be included in the benefit to cost analysis, all Associated Costs were removed from the Benefit to Cost evaluation.

Average annual costs were developed for the Federal Cost Shared project and the Non- Federal Associated Project (Table C71). These costs include First Costs as well as any annual maintenance costs incurred due to the components of the various plans. All Investment costs include Engineering & Design, Supervision & Administration, and Contingency costs.

Average annual costs Related to the Federal Cost Shared project; for Plans 10 A Modified, 10B and Plan 10; came to $1,650,300, $2,041,600 and $1,490,800, respectively. See Table C 71 below.

Table C71 - Average Annual Costs (October, 1989 Prices)

| I.- Federal Cost Shared Project | Plan 10A Modified (886 Slips) | Plan 10B (1,118 Slips) | Plan 10 (597 Slips) |
|---|---|---|---|
| 1. Investment Costs | | | |
| Breakwater Construction Costs | $14,200,000 | $17,480,000 | $13,486,000 |
| Breakwater IDC 1/ | $ 1,053,800 | $ 1,298,400 | $ 1,000,600 |
| Investment Costs | $15,253,800 | $18,778,400 | $14,486,600 |
| 2. Average Annual Costs | | | |
| Interest 3/ | $ 1,353,800 | $ 1,666,600 | $ 1,285,700 |
| Amortization 3/ | $ 19,500 | $ 24,000 | $ 18,500 |
| Annual Breakwall Maintenance 4/ | $ 277,000 | $ 351,000 | $ 186,600 |
| Average Annual Costs | $ 1,650,300 | $ 2,041,600 | $ 1,490,800 |
| II. Non Federal Associated Project | | | |
| 1. Investment Costs | | | |
| Associated Construction Costs | $ 6,387,600 | $ 7,471,900 | $ 4,536,900 |
| Associated IDC 2/ | $ 241,800 | $ 285,300 | $ 167,700 |
| Investment Costs | $ 6,629,400 | $ 7,757,200 | $ 4,704,600 |
| 2. Average Annual Costs | | | |
| Interest 3/ | $ 588,400 | $ 688,500 | $ 417,500 |
| Amortization 3/ | $ 8,500 | $ 9,900 | $ 6,000 |
| Annual Marina Wages and Overhead | $ 313,600 | $ 336,700 | $ 284,900 |
| Annual Marina Main, Repairs & Utilities | $ 170,200 | $ 209,700 | $ 121,000 |
| Annual Marina Insurance | $ 10,000 | $ 10,000 | $ 10,000 |
| Average Annual Costs | $ 1,090,700 | $ 1,254,800 | $ 839,400 |

1/ Interest-During-Construction was computed using a two year construction season; no construction during January, February and March; monthly compounding and an 8-7/8 percent annual interest rate.

2/ Interest-During-Construction was computed using an 11 month construction season, monthly compounding and an 8 7/8 percent annual interest rate.

3/ Interest and amortization was computed using a 50-year project life and an 8-7/8 percent annual interest rate.

4/ Annual Maintenance for 10 B uses 10A Modified annual maintenance costs, prorated for the additional breakwall length involved.

Interest-During-Construction was computed on breakwater costs and Coast Guard costs. These Interest-During-Construction costs were added to construction costs to arrive at total investment costs. These costs were placed on an average annual basis assuming a 50-year project life and an 8-7/8 percent annual interest rate. Annual maintenance costs were added to the above to arrive at average annual costs.

C6. BENEFIT COST ANALYSIS.

a. Benefit Cost Summary For Plan 10A Modified, Plan 10B And Plan 10.

Table C 72 summarizes average annual benefits, average annual costs, net benefits and benefit to cost ratios for plans 10A Modified, Plan 10B and Plan 10. All benefits and costs reflect an 8 7/8 percent annual interest rate, a 50 year project life and October 1989 Price levels.

Table C 72 Benefit to Cost Summary. (1).

| | Plan 10A Modified | Plan 10B | Plan 10 |
|---|---|---|---|
| AVERAGE ANNUAL BENEFITS | $1,683,000 | $1,986,500 | $1,084,300 |
| AVERAGE ANNUAL COSTS | $1,650,300 | $2,041,600 | $1,490,800 |
| NET BENEFITS | $ 32,700 | $ -55,100 | $- 406,500 |
| BENEFIT COST RATIO | 1.02 | .97 | .73 |

(1) All benefits and costs reflect an 8 7/8 percent annual interest rate, a 50 year project life and October 1989 price levels.

Average annual benefits, average annual costs, net benefits and benefit to cost ratio for Plan 10A Modified came to: $1,683,000, $1,650,300, $32,700 and 1.02 respectively. Average annual benefits, average annual costs, net benefits and benefit to cost ratio for Plan 10 B came to: $1,986,500, $2,041,600, $-55,100 and costs, net benefits and benefit to cost ratio for Plan 10 came to: $1,084,300, $1,490,800, $-406,500 and .73 respectively.

C7. BENEFIT COST SUMMARY FOR THE SELECTED PLAN.

The Selected Plan was identified as Plan 10A Modified (See the Main Report for further details). This plan was then evaluated in detail. This resulted in some structural changes to the plan as well as the number of wet slips that would be provided.

a. Components Of The Selected Plan: Refined Plan 10A Modified)

The main components of Refined Plan 10A Modified are presented below. A more detailed description is presented in the Main Report.

(1) Rubblemound Breakwaters. The breakwaters are located to the east and west of the current federal piers. The east breakwater forms a protected basin area for 800 recreational slips. The east breakwater has two components: a 323 foot shore connected component linked by a 95 foot pedestrian bridge to a 1,545 foct detached east breakwater. The 90 foot breakwater gap under the pedestrian bridge facilitates passage of water and fish between the harbor and lake Ontario. A pedestrian walkway with guardrails is provided atop the entire length of the shore connected east breakwater. The east breakwater forms an interior angle of 121 degrees. The west breakwater is detached and consists of a 410 foot long shore leg and a 550 foot long lakeshore leg with an interior angle of 130 degrees. The two breakwaters will reduce wave action in the east basin area to a maximum of 2 feet and between the federal piers to a maximum of .6 feet. The breakwaters will also reduce wave action in the vicinity of the Olcott Harbor Yacht Club. Sixty new slips will be located in this general area.

(2) Navigation Channels. The entrance channel between the East and West Breakwaters will be 150 feet wide and -10 feet below LWD. An access channel connecting the entrance channel and the east basin will be 75 feet wide, -7 feet below LWD and 1,200 feet long. Annual maintenance of the channel will be the responsibility of the local cooperator.

(3)Launch Ramp. The plan would provide one additional launch ramp (Two lanes) adjacent to the north side of the existing launch ramps owned by the Town of Newfane.

(4) Pedestrian Lake Access- The plan would provide access to the east pier for fishermen and sightseers. A pedestrian walkway with guardrails is provided atop the entire length of the shore connected East Breakwater.

(5) Boat Slips- The plan would provide 860 slips: 760 for wet slip rental, 50 for charterboats and 50 for seasonal transient craft. Eight hundred of the slips would be located in the west basin. The remaining 60 would be located in the area adjacent to the Olcott Harbor Yacht Club. There would be no slips located between the existing federal piers.

(6) Tour Boat Facilities- Tie-up space for a tour boat operation will be provided somewhere in the east basin.

(7) Other Ancillary Upland Facilities- In addition to the above facilities , the local cooperator will provide all

additional infrastructure improvements and recreational facilities needed to achieve the benefits claimed during the period of analysis. These additional costs include roadways and construction costs of parking areas used by: slip renters, visitors to the slip renters, launch ramp users, charterboat fishermen, tourboat visitors, fishermen fishing off of the breakwaters, and sightseers using the breakwaters and the harbor area in general. Also incurred by the local cooperator are restroom costs, slip access ramp costs and electric and water hookup costs for slip renters, charterboat operators and transient slip users. The local cooperator will also provide a marine service building. This building could include all offices needed by the marina staff, public restrooms, and retail floor space for complementary marine retail activities. Other marina services such as marine gasoline sales and pumpout facilities for boat sanitary holding tanks could also be offered.

b. Benefits For The Selected Plan.

All benefit categories were recalculated to reflect 860 total slips( 760 slips for rental to permanent based boaters, 50 slips for rental to charterboat operators and 50 slips for rental to transient boaters), June 1991 price levels and an 8 3/4 percent annual interest rate. Fiscal year 1991 Unit Day Values were used where appropriate.

Total average annual benefits for "Refined Plan 10A Modified" are $1,783,000 (see Table C73.) Again, as mentioned in section C411 on page 167, two benefit categories would not be used in calculating the Benefit to Cost ratio: "Net Income For New Charter Fishing Operators" and all "Associated Benefits". The benefits of $1,783,000 for "Refined Plan 10A Modified" do not include these two benefit categories. A summary of the benefit analysis that brought benefits from an October 1989 price level to a June 1991 price level follows.

(1) Net Willingness To Pay-Boat Owners Net Willingness To Pay for boat owners has two sub categories: new boat owners renting new permanent based slips, and new launch ramp users using the new launch ramp. Benefits for both sub categories are based on net willingness to pay. Benefits for new boat owners renting new permanent based slips will be discussed first.

As presented in Section C4 (pp86-96), net willingness to pay for new boat owners renting new slips was developed via a boat user survey of the identified slip supply area. Data from the boater survey showed total willingness to pay for these slip renters was $3,831,506. This value represented October 1989 price levels. This value was adjusted to reflect June 1991 price levels.

## Table C73 Benefit Summary For "Refined Plan 10A Modified"

| | BENEFITS FOR REFINED PLAN 10A MODIFIED |
|---|---|
| 1. NET WILLINGNESS TO PAY-BOAT OWNERS | |
| A. NEW SLIP RENTERS(Less Transients & Charters) | $480,000 |
| B. NEW LAUNCH RAMP USERS | $ 10,300 |
| NET WILLINGNESS TO PAY SUBTOTAL | $491,000 |
| 2. NEW PASSENGER RECREATIONAL BOATING BENEFITS | |
| A. PASSENGERS OF NEW SLIP RENTERS | $281,900 |
| B. PASSENGERS OF NEW LAUNCH RAMP USERS | $ 31,600 |
| PASSENGER BOATING BENEFITS SUBTOTAL | $313,500 |
| 3. BENEFITS TO CURRENT SLIP USERS | |
| A. INCREASE IN RECREATIONAL VALUE TO CURRENT SLIP RENTER BOAT OWNERS | $ 32,200 |
| B. INCREASE IN RECREATIONAL VALUE TO PASSENGERS OF CURRENT SLIP RENTERS | $ 18,900 |
| CURRENT SLIP USER BENEFITS SUBTOTAL | $ 51,100 |
| 4. BENEFITS FROM TRANSIENT CRAFT | |
| A. NEW TRANSIENT RENTALS | |
| (1) RECREATIONAL VALUE FOR BOAT OWNERS | $ 37,800 |
| (2) RECREATIONAL VALUE FOR PASSENGERS | $ 11,500 |
| NEW TRANSIENT CRAFT BENEFITS SUBTOTAL | $ 49,300 |
| B. EXISTING TRANSIENT RENTALS | |
| (1) RECREATIONAL VALUE FOR BOAT OWNERS | $ 11,300 |
| (2) RECREATIONAL VALUE FOR PASSENGERS | $ 3,400 |
| NEW TRANSIENT CRAFT BENEFITS SUBTOTAL | $ 14,700 |
| 5. CHARTER SERVICE BENEFITS( CHARTERFISHING,EXCURSION | |
| A. NET INCOME FOR NEW CHARTER FISHING OPERATORS 50 NEW CHARTERS @ $4,285 NET INCOME PER OPERATOR) | $ 0 |
| B. INCREASE IN NET INCOME FOR EXISTING CHARTER FISHERMEN. | $ 71,400 |
| C. RECREATIONAL VALUE FOR CLIENTS USING NEW CHARTERBOAT SERVICES | $240,600 |
| D. RECREATIONAL VALUE FOR NEW CLIENTS USING EXISTING CHARTER FISHING OPERATORS | $ 24,100 |
| E. INCREASE IN RECREATIONAL VALUE FOR EXISTING CHARTER FISHING CLIENTS | $ 23,200 |

## Table C73 - CONTINUED

| | |
|---|---|
| F. BENEFITS TO SLIPS SET ASIDE FOR CHARTER USAGE BUT NOT USED IN FIRST 5 YEARS | |
| a. SLIP RENTER BENEFITS | $ 4,800 |
| b. BENEFITS TO PASSENGERS OF SLIP RENTERS | $ 2,800 |
| G. SLIP REVENUE FROM NEW CHARTER BOATS | |
| H. NET INCOME FOR NEW TOUR BOAT OPERATOR | TBC |
| I. RECREATIONAL VALUE FOR PASSENGERS USING THE NEW TOUR BOAT | $ 55,100 |
| CHARTER SERVICE BENEFITS SUBTOTAL | $422,000 |
| 6. PIER FISHING BENEFITS | |
| A. NEW FISHERMEN | $169,000 |
| B. CURRENT FISHERMEN | $ 21,100 |
| PIER FISHING BENEFITS SUBTOTAL | $190,100 |
| 7. SIGHTSEEING BENEFITS | $185,700 |
| 8. EXISTING LAUNCH RAMP USER BENEFITS | |
| A. INCREASE IN RECREATIONAL VALUE TO CURRENT LAUNCH RAMP BOAT OWNERS | $ 10,400 |
| B. INCREASE IN RECREATIONAL VALUE TO PASSENGERS OF CURRENT LAUNCH RAMP BOAT OWNERS | $ 31,800 |
| SUBTOTAL | $ 42,200 |
| 9. ASSOCIATED BENEFITS | |
| A. LEASE REVENUES | $ 0 |
| B. SLIP REVENUES | $ 0 |
| C. LAUNCH RAMP REVENUES | $ 0 |
| D. WINTER STORAGE REVENUES | $ 0 |
| E. MARINE GASOLINE SALES REVENUES | $ 0 |
| F. PUMPOUT REVENUES | $ 0 |
| G. PARKING REVENUES | $ 0 |
| | 0 |
| 10. HARBOR OF REFUGE BENEFITS | $ 20,000 |
| 11. INUNDATION REDUCTION BENEFITS | $ 3,400 |
| TOTAL AVERAGE ANNUAL BENEFITS(1) | $1,783,000 |

(1) All benefits reflect June 1991 price levels, an 8 3/4 percent annual interest rate and a 50 year project life.

Boat owners "Willingness To Pay" is closely associated with levels of income. The level of "average weekly income of non-farm workers in current dollars and seasonally adjusted" was obtained from the Survey Of Current Business, by month, from October 1989, to February 1991. This time stream of income levels was used as data inputs to develop a linear regression equation. This equation was used to forecast average weekly income levels of non farm workers for the Month of June, 1991. Average weekly income rose from $ 338.89 in October of 1989 to $ 355.49 in June of 1991. This is a 4.9 percent increase over a 20 month period. Slip renter Willingness To Pay was assumed to grow at the same rate.

The total area under the boater demand curve( $3,831,506) was allowed to grow by 4.9 percent. Total slip renter Willingness To Pay, in June 1991 price levels, equals $4,019,240. Given 2,260 slips are demanded, the average Total Willingness To Pay per slip is approximately $1,778. Given an average slip price of approximately $1,146, net willingness to pay per slip is $632. This was then multiplied times the number of permanent based wet slips available under the Selected Plan (760). (The Selected Plan has a total of 860 slips, 760 for permanent based boaters, 50 for transient craft use and 50 for charterboat use.) Net Willingness To Pay for permanent based boaters is $480,700 under the Selected Plan.

A similar procedure was used to update net willingness to pay for new launch ramp boat owners. The total area under the launch ramp boater demand curve( $ 29,767) was allowed to grow by 4.9 percent. Total launch ramp boater Willingness To Pay, in June 1991 price levels, equals $ 31,226. Annual launch ramp revenues (5,500 launches times $3.00 per launch) of $16,500 were subtracted from total launch ramp boater willingness to pay. This resulted in net launch ramp boater willingness to pay of $14,700. Benefits were claimed only for the launches that took place during peak times ( 70 percent of the season). Net willingness to pay for boat owners using the new launch ramp at Olcott Harbor is $10,300 under the Selected Plan.

(2) <u>New Passenger Recreational Boating Benefits.</u> Benefits for non-household passengers on boats using the new slips or new launch ramps were computed using Fiscal Year 1991 General Recreation Unit Day Values (UDV). Using the same point values as discussed previously,( 56 points for non-household passengers using new slips and 53 points for non-household passengers using the new launch ramp), Fiscal Year 1991 Unit Day Values came to $4.80 and $4.69 for the two non-household passenger groups.

Benefits for non-household passengers using new slips was based on 760 slips, 40.12 outings per season, 3.44 passengers per trip, 1.93 passengers being non-household members of the boat owner and

a UDV of $4.80. Benefits for non-household passengers on boats renting new permanent based slips under the selected plan comes to $281,900.

The General recreation Unit Day Value for non-household passengers on boats using the new launch ramp, under with project conditions, is $4.69. Benefits for non-household passengers using the new launch ramp was based on one new launch ramp providing 5,500 new launches per season, 70 percent of which take place during peak time periods. The analysis uses 2.78 passengers per trip, 1.75 passengers being non-household members of the boat owner and a UDV of $4.69. Benefits for non-household passengers on boats using the new launch ramp under the selected plan comes to $31,600.

(3) Benefits To Current Slip Users Benefits to current slip users have two components: the increase in recreational value to current slip renter boat owners and the increase in recreational value to passengers of current slip renters.

The benefits to boat owners using existing slips at Olcott Harbor uses the increase in consumer surplus between the without ($473.04 at June 1991 price levels) and with project conditions ($632.48 at June 1991 price levels). This increase in consumer surplus per slip renter( $159.44), is then multiplied times the number of slips available for rent under the without project condition (202) over the project evaluation period. (Note: 227 slips are available for rent under the without project condition, 202 of which are set aside for permanent based boaters, and 25 for charter craft). The benefit to boat owners using existing slips at Olcott Harbor is $32,200 in June 1991 prices.

The benefit to non-household passengers on boats using existing slips at Olcott Harbor uses fiscal Year 1991 Unit Day Values. The benefit to these non-household passengers is the difference in their General Recreation Unit day Value between the without and with project condition. The point values for non-household passengers on boats using existing slips is 35 and 56 for the "without" and "with project" condition respectively. This converted to a Unit Day Value of $3.59 and $4.80 for the "without" and "with project" condition, using Fiscal Year 1991 Unit Day values. The increase in Unit day Value ($1.21 in June 1991 prices) was used in conjunction with the availability of 202 permanent based slips under the without project condition, 40.12 outings per season per slip renter, 3.44 passengers per trip and 1.93 passengers being non-household members of the boat owner to arrive at benefits for these harbor users. Benefits for non-household passengers on boats using existing slips at Olcott Harbor is $18,900 in June 1991 prices.

(4) Benefits From Transient Craft Benefits associated with transient craft fall into two major categories: benefits to new

transient rentals and benefits to existing transient rentals. Both sub-categories have benefits to the boat owner as well as to non-household related passengers.

Boat owner benefits for new transient boaters using new transient slips were based on net willingness to pay of boat owners renting new permanent based slips at Olcott Harbor. This net willingness to pay value, in June 1991 prices, is $632.48. The number of seasonal rentals per new transient slip (48) were converted to equivalent permanent based boaters (1.19). This was multiplied times the number of transient slips (50) to arrive at the number of equivalent permanent based boaters (60). Benefits for new transient boaters using new transient slips equals net willingness to pay per boat renter ($632.48) times the number of equivalent permanent based boaters (60). Boat Owner benefits for new transient boaters using new transient slips are $37,800 in June 1991 prices.

Boat owner benefits for transient boaters using existing transient slips were based on net willingness to pay of boat owners renting existing permanent based slips at Olcott Harbor. The benefits to boat owners using existing transient slips at Olcott Harbor uses the increase in consumer surplus between the without ($473.04 in June 1991 prices) and with project conditions ($632.48 in June 1991 prices) for permanent based boaters. This increase in consumer surplus per slip renter( $159.44), is then multiplied times the number of equivalent permanent based boaters that existing transient slip rentals generate. Given that 75 existing slips are available for transient rental under without and with project conditions, and each slip is rented 38 times per season, these transient slips generate 2,850 rentals per season. Given every 40.12 rentals equals one permanent based boater, these rentals are equivalent to 71 permanent based boaters. The benefit to boat owners using existing transient slips at Olcott Harbor is $11,300 in June 1991 prices (71 times $159.44= $11,320).

Benefits for non-household passengers on boats using new and existing transient slips were computed using Fiscal Year 1991 General Recreation Unit Day Values. The point value for non-household passengers using new and existing transient slips, under with project conditions, was 56. This resulted in a Fiscal Year 1991 General Recreation Unit day Value of $4.80. The point value for non-household passengers using existing transient slips, under without project conditions, was 35. This resulted in a Fiscal Year 1991 General Recreation Unit day Value of $3.59.

Benefits for non-household passengers using new transient slips was based on 2,400 rentals per year, 3.44 passengers per slip usage, 1.0 passengers being non-household members of the boat owner and a UDV of $4.80. Benefits for non-household passengers on boats renting new transient slips under the Selected Plan is $11,500 in June 1991 prices.

Benefits for non-household passengers using existing transient slips was based on the difference in unit day values for these users under the without and with project conditions. These non-household passengers would enjoy an increase in their recreational value of $1.21. This increase in recreational value times the number of non-household passengers affected equals benefits for non-household passengers using existing transient slips. Given 75 existing transient slips, 38 rentals per season per slip, 3.44 passengers per slip usage, 1.0 passengers being non-household members of the boat owner, the number of non-household passengers affected equals 2,850. Benefits for non-household passengers on boats using existing transient slips under the Selected Plan is $3,400 in June 1991 prices.

(5) Charter Service Benefits Charter service benefits have nine sub categories of benefits. Total charter service benefits, reflecting June 1991 prices and an 8 3/4 percent annual interest rate, are $422,000. Again, the benefit category "Net Income For New Charterfishing Operators" ($ 181,900) was not included in the Benefit To Cost Analysis reflecting June 1991 prices. Each sub-category will be briefly discussed.

Net income for new charterfishing operators was recalculated using an 8 3/4 percent annual interest rate. All other assumptions on rental fees and fixed and variable charterboat costs, as previously discussed, remained the same. Net income under the "with" project condition was based upon a fleet of 50 craft, a maximum of 75 trips per season per craft, a $300 fee per charter, total seasonal variable costs of $ 5,678.25 for 75 trips and total seasonal fixed costs of $12,536.84. The "with" project condition net income per season per charterboat operator was $4,284.91 for 75 trips per season. This results in a net income per fleet of $214,246 given 75 trips per season. Again, the 50 new charterboats were phased in over a five year period, with each new charterboat providing 75 charters per year. Net income for new charterfishing operators, using an 8 3/4 percent annual interest rate, is $181,900 in June 1991 prices.

In review of the benefit categories that would be used in the Benefit to cost ratio analysis, some apprehension arose from including benefits derived by new charterboat operators. It was felt that benefits claimed for increases in income to new charter boat owner/operators must be limited only to increases in net income. It was agreed that a net increase in charterboat operator income must not be a transfer of activity from one wage earning occupation to another on the part of the charterboat operator. Net increase in income benefits for new charterboat operators would not be claimable for boat operators who must purchase a vessel to enter the charterboat business.

Project benefits from charterboat fishing would be acceptable if they result from increased use of existing resources, or better use of underutilized resources. It was explained that most, or

much increased charterboat fishing would take place in the "with-project" condition mostly from operators of existing boats located in the Counties surrounding Olcott Harbor. These new charterboat operators would not be a transfer of charterboats from other locations. These new charterboat operators would come from boaters who already owned boats suitable for charterboat fishing, but were not in the industry under the "without Project" condition. These 50 additional charterboat captains would only enter the charterboat industry under "with project" conditions.

Further review indicated that benefits associated with Net Income To New Charterboat Owner/Operators ($181,900) would not be included in the Benefit to Cost ratio for this study. It should be noted that claiming this benefit category in any future reports would involve careful documentation of new charterboat operators coming from existing boat owners in the demand area, using their existing craft, which are currently being used for recreational purposes, and the net increase in charterboat operator income would not be a transfer of activity from one wage earning occupation to another.

The net increase in net income for existing charterboat fishermen, was also evaluated using an 8 3/4 percent annual interest rate. The difference in net income between the with and without project condition, for existing charterboat fishermen was calculated. The existing charterboat fleet has 25 charterboats.

Net income under the "without" project condition was based upon a fleet of 25 craft, 60 trips per season per craft, a $300 fee per charter, total seasonal variable costs of $ 4,542.60 and total seasonal fixed costs of $12,536.84. The "without" project condition net income per season per charterboat operator was $920.56. The "without" project condition net income for the existing fleet was $23,000.

Net income under the "with" project condition was based upon a fleet of 25 craft, a maximum of 75 trips per season per craft, a $300 fee per charter, total seasonal variable costs of $ 5,678.25 for 75 trips and total seasonal fixed costs of $12,536.84. The "with" project condition net income per season per charterboat operator was $4,284.91 for 75 trips per season. This results in a net income per fleet of $107,900, given 75 trips per season.

Trips per season under the "with" project condition were allowed to grow from 63 trips in project year 1, to 75 trips in project year 5. Trips per season stayed at 75 from project year 5 to project year 50. Given 63 trips under with project conditions in project year 1, fleet net income was $39,832. Net income increased to $107,119 in project year five and remained at this level for the remainder of the evaluation period. The average annual value of this time stream of net income, under with project conditions, is $94,400 in June 1991 prices.

Average annual net income for the existing charterboat fleet under "with" project conditions is $94,400. Average annual net income for the existing charterboat fleet under "without" project conditions is $23,000. The difference in average annual net income for the existing charterboat fleet between the "with" and "without" project is the benefit associated with implementing the Selected Plan. The benefit for the existing charterboat fleet operators is $71,400 in June 1991 prices.

Benefits for charterboat clients using new charterboat operators were computed using Fiscal Year 1991 Specialized Fishing Unit Day Values (UDV). The point value of the recreational fishing experience for charterboat clients under "with" project conditions is 56. The corresponding Fiscal Year 1991 Unit Day Value is $18.89.

Benefits for clients using new charterboat operators was based on 50 new charterboats, and four clients per charter. Charters per charterboat per season were 75. The number of new charterboats for project years 1, 2, 3, 4, and 5 through 50 were 10, 20, 30, 40, and 50. This data was used to generate a time stream of benefits for clients using new charterboats. The value of this time stream was $56,670 for project year one. This value increased to $283,350 in project year 5 and remained at this level through project year 50. The average annual value of this time stream is $240,600, in June 1991 prices.

Benefits for new charterboat clients using existing charterboat operators also uses Fiscal Year 1991 Specialized Fishing Unit Day Values (UDV). The point value of the recreational fishing experience for new charterboat clients under "with" project conditions is 56. The corresponding Fiscal Year 1991 Unit Day Value is $18.89.

Benefits for new charterboat clients using existing charterboat operators was based on 25 existing charterboats, and four clients per charter. The number of new charters for project years 1, 2, 3, 4, and 5 through 50 were 75, 150, 225, 300, and 375. This data was used to generate a time stream of benefits for new clients using existing charterboats. The value of this time stream was $5,667 for project year one. This value increased to $28,335 in project year 5 and remained at this level through project year 50. The average annual value of this time stream is $24,100, in June 1991 prices.

Benefits for existing charterboat clients using existing charterboats is based on the net increase in the unit day value of the boating experience between the without and with project condition. The point value of the recreational fishing experience for new charterboat clients under the "without" and "with" project conditions is 32 and 56. The corresponding Fiscal

Year 1991 Unit Day Values are $16.16 and $18.89. The net increase in unit day value is $2.73.

The analysis used 25 permanent based charterboats with 60 charters per season and four clients per charter. This resulted in a charterboat client benefit of $16,400 . There are also 125 transient charterboats that generate 5 charters per boat per season with four clients per charter. These outings generate $6,800 of charterboat client benefits. Total benefits for charterboat clients using the existing charterboat fleet is $23,200 in June 1991 prices.

Benefits also accrue from slips set aside for charterboat use but not used in the first four years of the project by charterboat operators. For example, in project year one , 50 slips are set aside for charterboats, but only 10 new charterboats are credited to the project. this leaves forty slips for other temporary uses. This total drops to 30 in project year two, 20 in project year three and 10 in project year four. Benefits attributable to these slips are twofold: benefit to the boat owner and benefit to the passengers.

The benefit to the boat owners who rented these "charter" slips were assumed to be the same as the willingness to pay for Slip renters. Net willingness to pay for slip renters came to $632.48 per boat owner, per season, in June 1991 prices. This was multiplied by the number of slips rented to these boat owners from project year one to project year four. These willingness to pay values were converted to a present worth value using an 8 3/4 percent annual interest rate and a fifty year project life. Average annual benefits for these slips came to $4,800 in June 1991 prices.

Benefits also accrue to passengers of slips set aside for charters but not used during the first four years of the project. Each slip rented to boat owners used their boats 40.12 times per season,had an average of 3.44 passengers per usage, 56% of which were not members of the boat owners immediate family. The value of the recreational boating experience for these non-household related passengers was computed using Fiscal year 1991 General Recreation Unit Day Values. The point value for this recreational boating experience was 56 which converts to a Unit day Value of $4.80 in June 1991 prices. The time stream of benefits was developed by multiplying the number of pleasure craft renting slips set aside for charterboats in each of the first four project years times the trips per pleasure boat per season (40.12) times the number of non family related passengers per trip( 1.93) times the Unit Day Value per activity occasion ($4.80). This time stream was then converted to an average annual dollar value using an 8 3/4 percent interest rate and a 50 year project life. Average annual benefits for these passengers came to $2,800. this benefit reflects June 1991 prices.

Finally benefits to passengers using the new tour boat are also based on General recreation Unit Day Values. A point value of 63 converts to a Fiscal Year 1991 Unit Day Value of $5.05 per activity occasion. Given 10,920 passengers per season, consumer surplus for tourboat passengers, in June 1991 prices, is $55,100.

(6) Pier Fishing Benefits Pier fishing benefits have two components: benefits enjoyed by new fishermen using the new access to the east pier and increased recreational value of fishing experienced by fishermen using existing facilities at Olcott Harbor. Both benefit categories use unit day values and number of fishing activity occasions generated to determine fishing benefits. The benefits accruing to new fishermen using the new east pier will be discussed first.

The East pier Breakwall length is the same for plan 10A Modified and the Selected Plan. Fishermen salmonid fishing activity occasions associated with the Selected Plan, was made equal to the number of salmonid fishing activity occasions generated by Plan 10A Modified (11,112 , see page 129). This number of salmonid fishing activity occasions (11,112) was multiplied times the Fiscal Year 1991 unit day value associated with this type of fishing ($18.74). This resulted in a maximum salmonid fishing benefit of $208,200. However, these new pier fishing activity occasions were phased in over a five year period. No new salmonid fishing activity occasions took place in project year one. Growth over the phase in period was assumed to be linear. Average annual fishing benefits for new pier fishermen is $169,000. This reflects June 1991 prices, a 50 year evaluation period and an 8 3/4 percent annual interest rate.

All fishermen currently fishing from the existing federal Piers will experience an increase in their recreational fishing experience due to implementation of the selected plan (See pages 125, 126). This increase is the difference in Fiscal Year 1991 Unit Day Value between the Without ($15.56) and "With Project" ($18.74) conditions. This value came to $3.18 using Fiscal Year 1991 Unit Day Values. This net increase in recreational fishing value per fishing activity occasion was then multiplied times the number of annual salmonid fishing activity occasions taking place on the existing piers (6,627). Annual fishing benefits to fishermen using the existing pier at Olcott Harbor is $21,100.

(7) Sightseeing Benefits The Selected Plan, will affect the recreational value of two sightseer groups: existing sightseers who use the harbors current piers and new sightseers who will use the new east pier. Sightseeing benefits use General Recreation Unit Day Values to quantify these benefit categories. Average annual sightseeing benefits are $185,700.

The benefit for existing users will be their estimated annual usage (5,000) multiplied by the change in UDV from the without ($3.25 in June 1991 prices) to the with project ($4.87 in June

1991 prices) condition of development ($1.62). No increased usage of the new facility is projected for existing users. Existing usage is projected to remain constant under the without and with project conditions of development. Existing users will obtain their benefit immediately upon completion of the project. Sightseeing benefits for existing users is $8,100 in June 1991 prices.

The benefit for new users will be the UDV under the with project condition ($4.87 in June 1991 prices) multiplied by their estimated annual usage. Estimated usage grows from 5,200 activity occasions in project year 1 to 52,000 activity occasions in project year 10. Yearly activity occasions remain constant from project year 10 to project year 50 at 52,000 annually. New user sightseeing benefits are $177,600. This benefit reflects a 10 year phase in period, an 8 3/4 percent annual interest rate, fiscal Year 1991 Unit day Values and a 50 year project evaluation period.

(8) Existing Launch Ramp User Benefits Total launches at existing launch ramps are projected to be 16,500 per season over the 50 year evaluation period. Benefits accrue to boat owners and non-household passengers on boats using the launch ramps. Benefits enjoyed by launch ramp boat owners using existing launch ramp facilities equals the net increase in consumer surplus per launch times the number of Without project condition launches over the 50 year evaluation period. The increase in consumer surplus per launch for boat owners using WOP condition launch ramp facilities is $ .63 in June 1991 prices. This times the number of annual launches taking place at these ramps (16,500) provides a time stream of benefits for the 50 year project evaluation period. The value of this time stream is $10,400 using an 8 3/4 percent annual interest rate and a 50 year evaluation period.

Launch ramp boat owners using existing launch ramp facilities will have passengers on their boats who are not members of their immediate household. The recreational boating experience of these non-household passengers will increase due to project implementation. The increase in benefits for these non-household passengers equals the net increase in unit Day Value per non-household passenger times the number of non-household passengers per launch times the launches per season for existing launch ramp facilities.

Fiscal year 1991 unit day values for the without and with project condition for these non-household passengers are $3.59 and $4.69. The net increase in unit day value for these non-household passengers is $1.10. Given 16,500 launches per season, an average of 1.75 non-household passengers per launch, non household passenger benefits are $31,800. This reflects June 1991 prices and an 8 3/4 percent annual interest rate.

(9) Associated Benefits And Costs Current guidance (ER-1105 -2- 100, section 6, page 141) states that:

> "NED costs include all costs necessary to achieve the claimed benefits. In addition to costs directly related to the federal project, there may be associated costs. These are costs of measures over and above Federal project measures which are required for the benefits to be realized. It is preferred that associated costs be explicitly treated as NED project related costs, and appear as costs in the benefit-cost ratios."

An offset to these costs must be taken in the benefit analysis if it can be shown that there are user fees that will recoup these costs. User fees generated from the construction of these associated costs fall into seven general categories: lease revenues, slip rental revenues, launch ramp revenues, winter storage revenues, gasoline revenues, waste pumpout revenues and parking revenues.

However, it was decided that, for the Olcott harbor report, Associated Revenues and Associated costs would not be included in the final Benefit to Cost Ratio analysis. Even though these Associated Revenues and Associated Costs will not be included in the Benefit to Cost Ratio, they were computed for Refined Plan 10A Modified, using June 1991 prices and an 8 3/4 percent annual interest rate. This was to demonstrate the economic viability of such an investment from the local cooperators perspective. Total Average Annual Associated Revenues came to $1,421,300. Total Average Annual Associated Costs came to $1,238,900. Excess "Average Annual Associated Revenues" over "Average Annual Associated Costs" came to $182,400, for Refined Plan 10 A Modified. A description of the updating process for Associated Revenues and Associated Costs follows.

An estimate of construction costs incurred by the local cooperator was obtained from the consulting firm providing technical assistance to the town of Newfane. These construction costs reflected June 1991 price levels and were used in developing all Associated Costs connected with the construction of the project. All revenues and operating costs for the marina were based on a "Fiscal Impact Report" performed for the Town of Newfane in November of 1990 and other local information on marina operating costs in the demand area. Associated Revenues (Benefits), Associated Costs and resulting net benefits will now be topically addressed.

(a) Associated Revenue Analysis - Associated revenues/benefits were recalculated using 860 slips and an 8 3/4 percent annual interest rate. All other assumptions concerning facilities and services provided, previously discussed, remain the same.

Revenues generated from Refined Plan 10 A Modified have seven revenue sources: Lease income from rental of space in the main "service" building complex (restaurant, marine accessory supplies, and bait shop), slip fees (recreational slip renters, transient slip renters, charterboat slip renters and tour boat slip renters), ramp use revenues, winter storage revenues, gasoline sales revenues,pumpout service revenues and parking lot revenues. Table C74 summarizes this revenue analysis. Total annual revenue from the marina complex is $1,421,300.

Table C74 - Associated Revenues From Refined Plan 10 A Modified

| | |
|---|---|
| Main Building Complex | |
| 1. Lease Revenues | |
| A. Restaurant Lease Revenues | $52,700 |
| B. Kitchen Equipment Lease Revenues | $24,000 |
| C. Marina Store Lease Revenues | $15,100 |
| D. Bait Shop Lease Revenues | $11,500 |
| Total Lease Revenues | $103,300 |
| Boat Related Revenues | |
| 2. Slip Revenues | |
| A. Recreational Slip Revenues | $871,000 |
| B. Transient Slip Revenues | $48,000 |
| C. Charterboat Slip Revenues | $60,000 |
| D. Tourboat Slip Revenues | $5,000 |
| | $ 984,000 |
| 3. Launch Ramp Revenues | $ 20,600 |
| 4. Winter Storage Revenues | $ 211,800 |
| 5. Gasoline Sales Revenues | $ 7,200 |
| 6. Pumpout Revenues | $ 7,400 |
| 7. Parking Revenues | $ 87,000 |
| Total Boat Related Revenues | $1,318,000 |
| Total Annual Revenues | $1,421,300 |

(i) Lease Revenue From The Main Building Complex -The exact size of Olcott Harbors main "service" building and type of retail activities and corresponding square footage that would be leased has not been determined. However, for this analysis, the building size and the retail activities located in Olcott's main

"service" building were assumed to be the same as currently exist in NFTA's main "service" building.

The NFTA main "service" building has 5,377 square feet. There are three leasable spaces: A 2,396 square foot restaurant, a 1,008 square foot marine supply store, and a 768 square foot bait shop. Administrative offices, public restrooms, and building maintenance storage areas comprise the remaining 1,205 square feet. The building is opened and closed on a seasonal basis. The season begins May 1st and runs to October 30th.

Rental revenues from the main "service" building complex would come from the seasonal lease of floor space in the main "service" building complex to the three retail services. All leases were computed on a cost per square foot for the six-month period, May 1st to October 30th. All revenue estimates for the main building complex are based upon lease rental revenues generated by the Niagara Frontier Transportation Authority from lease of retail space in their main "service" building.

((a)) Restaurant Complex Lease Revenue - The restaurant complex, dining area, and kitchen facilities, encompasses 2,396 square feet. The dining area (42' x 48') is fully furnished and has a seating capacity of 100 people. The kitchen (19' x 20') is fully equipped with refrigerators, coolers, cooking ranges, and dishwashing facilities.

Estimated rental revenue per square foot, on a seasonal basis, comes to $22.00 per square foot. This is slightly below rental costs per square foot of a similar sized facility currently in operation at the Niagara Frontier Transportation Authority's (NFTA) Small Boat Harbor. Seasonal rental revenue for the restaurant complex comes to $52,700. NFTA currently assesses an annual charge for the usage of the kitchen equipment. This charge comes to $24,000 a year. The use of electric utilities is paid for by the renter.

((b)) Marine Supply Store Lease Revenue - The marine sales shop is 1,008 square feet in size. The shop comprises the back quarter of the building. A promenade, covered porch visually connects the marine sale's shop with the restaurant. The shop has two entrance doors, one on the porch and one inside the main entrance public hall walkway. The facility's hours of operation during the season are not tied to the main-building since it has its own exterior entrance way. Parking is readily accessible behind the main building.

The store is envisioned as providing a complete range of boat equipment accessories ranging from cleats to rope to cleaning waxes. The store would also handle such electronic boating equipment as depth finders, ship to shore radios, sonar, etc. The store would also have small boutique items of a nautical nature.

The ideal tenant would be a marine supply store who desires a location or outlet near the water. This would enable the store to have access to a larger inventory than could be stored in the store itself. Items could be ordered from catalogs and picked up at the store.

Estimated rental revenue per square foot, on a seasonal basis, would be $15.00 per square foot. Given the store has 1,008 square feet, this results in annual revenue of $15,100. Electric utilities are paid for by the renter.

((c)) Bait and Tackle Shop Lease Revenue - The bait and tackle shop is 768 square feet in size. The shop faces the slip area and has two entrance doors: One entrance leads to the exterior deck and the other to the main public concourse. Again, shop hours need not be constrained by the hours for the main building.

The shop is envisioned as providing packaged food and bait. The shop would also provide a full range of fishermen gear such as fish line, fish lures, sinkers, rods, reels, downriggers, fish nets, etc.

Estimated rental revenue per square foot, on a seasonal basis, would be $15.00 per square foot. Given the store has 768 square feet, this results in annual rental revenue of $11,500. Electric utilities are paid for by the renter.

(ii) Boat Related Revenues - Boat related revenues fall into six categories: Slip rentals, winter storage revenues, launch ramp revenues, gasoline sales to boaters, pump out services to boaters and parking revenues. These revenues came to $1,318,000. (See Table C75). Each category will now be discussed.

((a)) Slip Rental Revenues - Refined Plan 10A Modified accommodates 860 slips: fifty of these slips were set aside for charter boats and 50 slips for transient craft. Thus, slip revenues came from three sources: New slip renters, charter boats and transient craft. Slip rental service is based upon a 168 day season from May 1st to the middle of October for new slip renters and charterboat operators. Transient slips will be available from mid June to the end of August. Two factors affect revenues from slip rentals: Fleet mix size and slip rental rates per boat size. Slip rental rates are based upon slip catwalk length.

Slip rental revenues for new slip renters were based upon an average slip rental rate of $1,146. These average fees are based upon slip fees and slip sizes proposed by the Town of Newfane. Slip fees increased as slip size increased. These fees were similar to slip fees currently being charged at Olcott Harbor and other marinas in the five county boat slip demand service area.

Table C75 -Boat Related Revenues-Refined Plan 10A Modified

| | |
|---|---|
| 1. SLIPS | |
| A. New Slip Renters | $ 871,000 |
| B. Transients | $ 48,000 |
| C. Charterboats | $ 60,000 |
| D. Tour Boat | $ 5,000 |
| Subtotal | $ 984,000 |
| 2. Launch Ramp Revenues | $ 20,600 |
| 3. Winter Storage Revenues | $ 211,800 |
| 4. Gasoline Sales Revenues | $ 7,200 |
| 5. Pumpout Service Revenues | $ 7,400 |
| 6. Parking Revenues | $ 87,000 |
| TOTAL REVENUES | $1,318,000 |

For example, the average summer slip fee for a 33 foot craft at 10 marinas in the boat demand area came to $ 1,431.

Slip rental revenues from new slip renters for Refined Plan 10 A Modified were based upon 760 slips being available at the average slip rental cost of $1,146. Slip rental revenues for new slip renters came to $871,000.

Refined Plan 10 A Modified provides 50 slips for usage by transient craft. Slips for transient craft would be located within the east basin. These slips will be available for rent from mid-May to the end of August. Revenues from this source were based upon a daily fee of $20 and a 56 percent occupancy rate during the season. These assumptions resulted in 48 rentals per season per slip. Annual revenues per slip came to $960. Total rental revenue from the 50 slips came to $48,000.

Refined Plan 10 A Modified provides fifty slips for charterboat usage. Slip rental revenues for the fifty charterboats were based upon an average slip rental cost of $1,200. Slip rental revenues from charterboats came to $60,000.

Refined Plan 10 A Modified also provides a 50 foot docking area for the tour boat that will locate in the outer harbor. Annual rental revenues from the dockside facilities comes to $5,000 per season.

((b)) Launch Ramp Revenues - Refined Plan 10 A Modified will have one new launch ramp with two lanes. The ramp will be open from May 1st to the middle of October. This is a total of 168

days. Parking spaces for 100 boat trailers and tow vehicles will be provided (50 spaces per ramp). Launch ramp revenues equals total launches during the season times the launch ramp fee of $3.75.

Use of the launch ramp is available 24 hours a day during the boating season. However, the town collects fees and data on launch ramp usage only while staff is present at the site. This is usually a 12 hour period. In addition, a launch fee is not collected from everyone who makes a launch at the town ramp. The town sells season launch ramp passes that entitle the boater to launch an unlimited number of times during the season for a $30 fee. Also the attendants at the launch ramp have other duties to perform at the fish cleaning station. When performing these duties they do not collect launch ramp fees.

An estimate of new annual launches attributable to the project was developed based upon maximum peak day launch ramp usage. Non peak day launch ramp usage was a fraction of maximum peak day usage. Derivation of maximum peak day launch ramp usage was based upon one new launch ramp with two lanes, a 12 hour day, and each lane being used seven times per hour (for either a launch or retrieval). This results in each lane being able to accommodate up to a 84 launches/retrievals in a 12 hour period. This means 42 boats can use each lane during a 12 hour period. However, this peak capacity will not be used each day since launch ramp usage varies according to time of day and day of the week. Boat owners who use launch ramps tend to launch in the morning or after work during the weekdays. On weekends, launch ramp demand may be more evenly spread throughout the day. Weekend demand will be larger than weekday demand.

The 168 day launch ramp season was divided into 46 peak (weekends and holiday days) and 122 non peak days (weekdays). These days were reduced by 10 percent to allow for bad weather. Consequently the 168 day launch ramp season had 41 peak days and 110 non peak days of usage. It was assumed the launch ramp will be used to 80 percent of capacity during peak days. On non-peak days, launch ramp demand is estimated to be 30% of peak capacity usage (25 launches/retrievals per lane or twelve boats per lane per day.)

Total annual launch ramp usage consists of peak day and non peak day use estimates. New launch ramp users attracted to Olcott on non peak days may launch their boat from the existing launch ramps. However these boaters would not have been attracted to Olcott in the first place if the project had not been in place. Consequently these annual launches were also credited to the project, even though the launch ramp user may not have used the new launch ramp. Table C76 summarizes the derivation of estimated annual boat usages for a two lane launch ramp. Estimated annual boat usages came to 5,500.

Table C76 - Annual Launch Capacity For A Two Lane Launch Ramp

| Type Of Days | Number Of Days | Maximum Daily Launches/ Retrievals Per Lane | Percent Utilization of Daily Lane Capacity | Factor For Converting Launches/ Retrievals To Boats | Number Of Seasonal Boat Uses Per Lane | Number Of Lanes | Number Of Launch Ramps | Total Boat Uses Per Year |
|---|---|---|---|---|---|---|---|---|
| Peak | 41 | 84 | 80% | 0.5 | 1,378 | 2 | 1 | 2,756 |
| Non Peak | 110 | 84 | 30% | 0.5 | 1,386 | 2 | 1 | 2,772 |
| | | | | | | | | 5,528 |

Refined Plan 10 A Modified has one new launch ramp with an estimate of 5,500 launches sold annually. Launch ramp fees were placed at $3.75 per launch. This results in annual launch ramp revenues of $20,600.

((c)) Winter Storage Revenues - At the end of the season all boats must be removed and placed into winter storage. Current slip renters may wish to store their boats at the marina over the winter instead of taking them home or to other facilities. Many western New York suburbs prohibit storage at residences. Boats 24 feet or longer become increasingly difficult to transport to winter storage facilities, especially as length increases. Therefore, boat slip renters with boat lengths 24 feet or greater generally prefer to store their boat over the winter at the marina. However, many regional marina's contracts with slip renters mandate winter storage at the same facilities.

Table C77 indicates there are 706 slip renters who used slips with docks of 24 feet or longer. Generally, boats are at least as long as the slip dock they rent. Usually the boats are longer. Slip dock length was taken as a proxy for boat length. It is assumed all of the slip renters who rent slips with docks of 24 feet or longer, have boats 24 feet or longer. All of these slip renters are assumed to store their boat at the marina complex over the winter.

This may be an underestimation of winter storage demand. Many boats under 24 feet, especially sail boats, would also winter store at Olcott. Also winter storage demand does not account for boat owners in other harbors who may wish to store their boats at Olcott Harbor.

Boat winter storage would take place in the current launch ramp parking lot. Additional storage area could be developed south of the Route 18 bridge. An access road built under the Route 18 bridge could connect the current launch ramp parking lot and the

Table C77 - Winter Storage Revenue: Refined Plan 10A Modified

A. SLIPS BY LENGTH

| PIER LENGTH | Number Of Slips |
|---|---|
| 20' | 154 |
| 24' | 292 |
| 28' | 208 |
| 32' | 98 |
| 40' | 48 |
| Total Slips | 860 |

B. WINTER STORAGE REVENUES

| | |
|---|---|
| TOTAL SLIPS | 860 |
| SLIPS 20'OR LESS IN LENGTH | 154 |
| Boats Wishing Winter Storage | 706 |
| Winter Storage/Boat | $300 |
| Winter Storage Revenue | $211,800 |

additional storage area south of Route 18. All storage would be outside storage. Watchman services would be provided 24 hours a day.

Outdoor winter storage rates in the Erie-Niagara county area average around $300 per boat. The information on winter storage rates and number of boat owners requesting winter storage was used to generate annual winter storage revenues.

Annual winter storage revenues for Refined Plan 10 A Modified came to $211,800. Revenue from this source may grow if boat owners not renting slips at the marina facility decide to store their boat over the winter here. However, this was not modeled into the revenue analysis.

((d)) Gasoline Sales Revenues - A gasoline pump will be located adjacent to the launch ramp area. This will service launch ramp users as well as slip renters. The gas pump would be manned by marina staff. Gasoline purchases typically come from slip renters and launch ramp users. Table C78 summarizes the derivation of annual gallons purchased. Annual gallons purchased under Refined Plan 10 A Modified for slip renters and launch ramp users came to 120,400 and 24,100 respectively.

This analysis assumed a typical outing would require 8.75 gallons. This was based upon a five hour outing and average hourly fuel consumption of 1.75 gallons. The analysis assumed slip renters visit their boats 40 times per season, take their

Table C78 - Annual Gasoline Sales Revenues, Refined Plan 10 A Modified.

| | Renters | Ramp Users |
|---|---|---|
| Average Fuel Consumption per Hour | 1.75 | 1.75 |
| Number of Hours per Outing | 5.00 | 5.00 |
| Gallons per Outing | 8.75 | 8.75 |
| Outings per Year per Boat (1) | 20.00 | |
| Gallons per Year per Slip Renter | 175.00 | |
| Gallons Per Outing Per Launch Ramp User | | 8.75 |
| Number of Boats at Marina | 860.00 | |
| Number Launches per Year | | 5,500.00 |
| Total Gallons Needed | 150,500.00 | 48,125.00 |
| % of Fuel Purchased at Marina Site | 80% | 50% |
| Gallons Purchased at Marina | 120,400.00 | 24,063.00 |
| Markup Per Gallon | $.05 | $.05 |
| Total Sales | $6,000.00 | $1,200.00 |

1/ Given a 168-day season and assuming boaters on the average visit their boat 40 times per season. Out of these 40 visits, assume the boater goes out 50% of the time, (40 x .5= 20).

boat out on 50% of these visits, and purchase 80% of their fuel requirements at the marina. The new launch ramp accommodates 5,500 boats per season. It is assumed half of the launch ramp users purchase their fuel needs at the gasoline dock.

A markup of five cents per gallon is assumed. This results in annual revenues from gasoline sales of $7,200. Gasoline revenues may be greater than this if more than 50% of the launch ramp users purchase gasoline at the docks, or if the average gasoline sale is more than 8.75 gallons. It also does not include revenues generated from the sale of oil or petroleum products.

((e)) Pumpout Revenues - A holding tank for placing waste from toilets on board boats will be provided adjacent to the gasoline pump area. This service will be offered based upon a fee of $5.00 for each pumpout. After taking into consideration periodic pumping of the holding tank, net revenue per boat pumpout was placed at $3.00.

Table C77 indicates there are 414 boats under Refined Plan 10 A Modified that rent slips with dock walks 28 feet or greater. It is assumed each of the boats renting these slips are also 28 feet or greater and have bathroom facilities on board. These boats will need pumpout service once a month from May through October. This results in net annual pumpout service revenue of $7,400. (414 x 6 x $3.00 = $7,452).

((f)) Parking Revenues- The town intends to charge parking fees at lots located close to the marina. These fees will help prevent parking and traffic congestion problems in the town center area of the hamlet. These fees will be collected only during the peak boating season: May through September. The fee structure used assumed $.50 for the first hour, $.75 per hour for the second and third hour, and $1 per hour over three hours. The revenue analysis performed for the Town assumed an average stay of 2 hours and an average fee per vehicle of $1.25. It also assumed 20 percent of potential revenues would be lost due to failure to pay the metered fee. Gross parking revenues in Olcott were estimated to be $87,000 annually.

(b). Associated Costs. The costs of measures needed over and above breakwater construction costs to achieve the benefits claimed during the period of analysis are associated costs. These costs can be divided into two categories: Facility development costs and infrastructure costs. Again, all facility development costs and infrastructure costs were obtained from the consulting firm providing technical assistance to the town of Newfane. These construction costs reflect June 1991 prices.

Infrastructure costs include costs for new roadways, and parking areas used by: Slip renters, visitors to the slip renters, launch ramp users, tour boat visitors, fishermen fishing off of the breakwater, and general recreationists walking on the new breakwater. Other infrastructure costs include restroom facility costs.

Facility development costs include slip construction costs, launch ramp construction costs, tour boat acquisition and docking facilities, equipment needed to perform winter storage, a main service building and site acquisition costs.

An estimate of associated construction costs for Refined Plan 10 A Modified are presented in Table C79. These costs came to $9,805,500. These costs reflect Contingencies, Engineering and Design, and Supervision and Administration costs. In addition, the costs for slips, launch ramps and tour boat dock reflect the present value of full replacement of these features 25 years from project year one, 1994. Winter storage equipment costs also reflect periodic replacement.

(i) Marina Related Facility Development Costs - Marina related facilities consist of slips, one launch ramp with two lanes, a dock for a tour boat as well as the tour boat acquisition cost, winter storage equipment costs, a main "service" building and purchase of the land for the building site. Total marina related facility construction costs were estimated at $8,136,000 for Refined Plan 10 A Modified.

Table C79 - Associated Construction Costs: Refined Plan 10A Modified

| | |
|---|---|
| DEVELOPMENT COSTS | |
| A. MARINA FACILITIES | |
| 1. SLIPS/WALKWAYS (1) | $5,360,000 |
| 2. LAUNCH RAMP (1) | $ 100,000 |
| 3. TOUR BOAT & DOCK (1) | $ 300,000 |
| 4. WINTER STORAGE EQUIPMENT (2) | $ 318,300 |
| 5. BUILDINGS | $ 480,000 |
| 6. ACCESS IMPROVEMENTS | $ 140,000 |
| 7. OTHER AMENITIES | $ 80,000 |
| 8. LAND COSTS(MARINA BOARDWALK & MAIN BUILDING | $ 257,700 |
| 9. MARINA BOARDWALK | $1,100,000 |
| | $8,136,000 |
| B. INFRASTRUCTURE | |
| 1. ROADS | $ 300,000 |
| 2. WATER/SEWER | $ 40,000 |
| 3. PARKING | |
| Ontario & Franklin (102 spaces) | $ 426,000 |
| Ontario & Cooper (50 spaces) | $ 342,000 |
| E. Main & Krull Park (180 spaces) | $ 327,000 |
| Ball Diamond At Krull Park( 318 spaces) | $ 200,000 |
| 4. SHUTTLE SERVICE STARTUP COSTS | $ 34,500 |
| | $1,669,500 |
| C. SUBTOTAL | |
| 1. MARINA FACILITIES | $8,136,000 |
| 2. INFRASTRUCTURE | $1,669,500 |
| CONSTRUCTION COSTS | $9,805,500 |

(1) Includes present value of full replacement of slips/docks or launch ramp in project year 25.
(2) Cost includes periodic replacement of equipment either at project year 25 or every eight years.

Slip construction costs include: slip walkways and electric and water hookup costs. These costs also reflect the present value of full replacement of these features 25 years from project one. Slip construction costs for 860 slips came to $5,360,000.

Launch ramp construction costs of $100,000 reflect construction of a two lane launch ramp and the present value of full replacement of the launch ramp in project year 25.

Tourboat acquisition costs and tourboat dock construction were placed at $300,000.

Winter storage equipment costs covers all machinery needed to provide winter storage services. This includes one 25 ton retrieval lift ($115,700), two eight ton fork lifts ($92,000), two heavy duty pickup trucks ($32,000) and four boat trailers ($10,000). Winter storage equipment costs reflect replacement of the retrieval lift in project year 25. All other winter storage equipment was replaced every eight years. total winter storage equipment costs came to $318,300.

The building cost of $480,000 would cover the cost of constructing a main "service" building and providing equipment needed for marine gasoline sales and marine pumpout services. The main "service" building would be used as a control center for the entire marina area. The manager's office and common areas (hallways, utilities and restrooms) would be located here. The majority of the "service" building floor space would be leased to businesses offering ancillary marine related retail goods and services.

Building costs of $480,000 would be able to provide a 5,400 square foot main "service" building similar to the main service building of the Niagara Frontier Transportation Authorities Small Boat Harbor. The Niagara Frontier Transportation Authority (NFTA) owns and operates the largest marina complex in Erie and Niagara County in the city of Buffalo. Their current facility offers over 900 wet slips for rent, has 10 launch ramps with 2 lanes each, and offers marine gasoline sales and marine pumpout services.

Their main "service" building has 5,377 square feet. The manager's office and "common areas" (hallways, utilities and restrooms) comprise 1,205 square feet. In addition, there are three leasable spaces within the service building. The first is a 2,396 square foot fast food restaurant with a 100 seat dining area and kitchen. Both the dining area and the kitchen are fully equipped with necessary furniture and equipment. A marine sales store accounts for 1,008 square feet and a bait and tackle shop the remaining 768 square feet. The NFTA main "service" building is opened and closed on a seasonal basis. The season begins May 1st and runs to October 30th.

(ii) Infrastructure Costs - Infrastructure related costs included construction costs for access roads, slip water and sewer lines and hookups thereto, and construction of parking areas for the various users. Infrastructure related costs were estimated at $ 1,669,500 for Refined Plan 10 A Modified.

Total associated development costs for Refined Plan 10 A Modified came to $ 9,805,500. These costs reflect contingencies, Engineering and Design, and Supervision and Administration costs. In addition, the costs for slips, launch ramps and the tour boat dock reflect the present value of full replacement of these

features 25 years from project year 1. Equipment used to provide winter storage was also periodically replaced.

(iii) Average Annual Associated Costs - Table C80 summarizes Average Annual Associated Costs for Refined Plan 10 A Modified. Average Annual Associated Costs are comprised of construction costs plus interest during construction on these costs. Also included are various annual expenditures needed to run the marina facility. These include personnel wages and fringe benefits; annual maintenance, repairs and utilities; annual insurance and annual shuttle costs. Average annual associated costs for Refined Plan 10A Modified came to $1,238,900. These costs are computed on an 8-3/4% annual interest rate and a 50-year project life.

Table C80 - Average Annual Associated Costs: Refined Plan 10A Modified

| | |
|---|---|
| A. TOTAL ASSOCIATED FIRST COSTS | |
| 1. ASSOCIATED DEVELOPMENT COSTS | $ 9,805,500 |
| 2. INTEREST DURING CONSTRUCTION | $ 342,000 |
| TOTAL ASSOCIATED FIRST COSTS | $10,147,500 |
| B. AVERAGE ANNUAL ASSOCIATED DEVELOPMENT COSTS | |
| TOTAL ASSOCIATED FIRST COSTS | $10,147,500 |
| PARTIAL PAYMENT FACTOR | 0.08884 |
| 1. AVG ANNUAL ASSOCIATED FIRST COSTS | $ 901,500 |
| 2. ANNUAL WAGES & OVERHEAD | $ 172,200 |
| 3. ANNUAL MAINTENANCE, REPAIRS & UTILITIES | $ 97,200 |
| 4. ANNUAL INSURANCE | $ 35,000 |
| 5. ANNUAL SHUTTLE SERVICE COSTS | $ 33,000 |
| TOTAL AVERAGE ANNUAL ASSOCIATED COSTS | $ 1,238,900 |

((a)) Average Annual Associated First Costs - Total Associated First Costs consist of construction costs as presented in Table C80 and Interest During Construction (IDC) on these costs. Interest During Construction was computed over an eleven month period using monthly compounding, at an 8-3/4 percent annual interest rate. Land acquisition costs of $257,700 were subtracted from construction costs before IDC was computed. These total Associated First Costs were converted to an average annual dollar amount based upon the partial payment factor, given a project interest rate of 8-3/4 percent and a fifty-year project life. Average Annual Associated First Costs came to $901,500.

((b)) Other Average Annual Associated Costs - Other average annual associated costs include annual wages and overhead; annual maintenance, repairs and utilities; annual insurance and annual shuttle costs.

Table C81 summarizes the annual wages associated with the year round operation of the marina facility. This includes one full-time and one part-time facilities managers with a base pay of

Table C81- Annual Marina Wages And Overhead: Refined Plan 10A Modified

| TYPE OF EMPLOYEE | NUMBER | $/HOUR | NUMBER HOURS /WEEK | NUMBER OF WEEKS | TOTAL |
|---|---|---|---|---|---|
| MANAGER | | | | | |
| FULL TIME | 1 | (SALARY) | 40 | 52 | $ 26,700 |
| PART TIME | 1 | (SALARY) | 40 | 26 | $ 13,400 |
| JANITORIAL | 1 | $ 6.00 | 40 | 26 | $ 8,300 |
| LABORERS (1) | 6 | $ 6.00 | 40 | 26 | $ 38,500 |
| SECURITY | 1 | $ 6.00 | 168 | 52 | $ 70,000 |
| CLERICAL WORKER | 1 | $ 5.50 | 40 | 52 | $ 15,300 |
| | | | | | $172,200 |

(1) Managers are salaried at $20,000 per year, base pay. Fringe benefits are computed at 33.5% of base pay.

$20,000. One janitorial worker is dedicated to maintenance of the services building during the boating season. Six part-time laborers provide services ranging from lawn maintenance to minor dock repair; collection of fees (launch ramp fees, gasoline sales, waste pumpout fees, etc); and assistance in the installation and removal of finger catwalks, etc. A security staff enables one security officer to be available 24 hours a day, year round. Lastly, there is one full-time clerical worker.

All labor costs were increased by 33.5 percent to account for all fringe benefits. Annual labor costs for Refined Plan 10A Modified are $ 172,200.

Table C82 summarizes the four basic components of annual maintenance, repairs and utility costs. These four components are: Slip walkways and parking lot maintenance, replacement reserves, utility costs and general office supplies. Annual maintenance, repairs and utility costs came to $97,200.

A major portion of annual maintenance and repairs is associated with the installation and removal of boat slip walkways. Slip walkways are removed at the end of the season to prevent ice damage from occurring over the winter. Removal would be achieved via a leased floating workboat with crane. Laborers hired by the marina facility would assist in the installation and removal of the slip walkways. These walkways would be stored in a portion of the parking area set aside for slip renters. Maintenance would be performed on them after or prior to the boating season. Any skilled trade repair work (welding) would come from this fund.

Table C82 - Annual Marina Maintenance, Repairs And Utility Costs: Refined Plan 10A Modified.

| | Refined Plan 10A Modified |
|---|---|
| 1.SLIP WALKWAYS AND PARKING MAINTENANCE | $ 53,800 |
| 2.REPLACEMENT RESERVES | $ 8,400 |
| 3.UTILITY COSTS( All common areas & management area) | $ 7,800 |
| 4.SLIP WATER & ELECTRIC COSTS | $ 17,200 |
| 5.GENERAL OFFICE SUPPLIES | $ 10,000 |
| SUMMARY, MAINTENANCE, REPAIRS, UTILITIES | $ 97,200 |

Parking lot maintenance would also come from this source. These costs were based upon an average maintenance cost per slip value of $62.50. Annual slip, walkway, and parking maintenance and repair costs for Refined Plan 10 A Modified came to $ 53,800.

Money for Replacement Reserves is usually set aside to replace short lived items. The proposed project has very few such items. The existence of annual slip walkway and parking lot maintenance expenditures excludes these items from needing major replacement reserve monies. The size of the replacement reserves also considers that the facility is not a year round facility. The marina service building is closed to the public from November to April. During this time, the marina would have one manager, one clerical worker, and security staff on the premises. No other marina staff would be needed. The restaurant, marina sales and bait shop would be closed.

Consequently, replacement reserves were keyed to the main "service" building construction cost. Replacement reserves were placed at 1.75% of the service building's construction costs. This comes to $8,400 annually. This money would be used primarily to purchase raw materials (paint, cleaning equipment, lawn mowers, lawn mower gasoline, etc.). On site marina facility labor would be used to perform the maintenance/repairs. If needed, these monies could be used to hire skilled labor on a per job basis or contract basis only (Heating, electrical, plumbing, etc.).

Annual Utility Costs were based upon a similar sized local public marina currently in operation in the Buffalo area. These costs include heat, water and electric for all public areas and management space in the main "service" building. It also accounts for water and electric charges associated with slips. Utility costs for public spaces in the main service building were estimated at $7,800 annually. Utility costs for the slips were based upon a $20 per slip per year cost. Utility costs

associated with the slips came to $17,200 annually. (Note: the three lessees of retail space would pay their own electric and gas consumption.) Total annual utility costs came to $25,000 for Refined Plans 10 A Modified.

General Office Supplies of $10,000 per year would cover such items as paper, pens, pencils, calculators, computers, etc.

The town plans to provide a parking shuttle service between the marina area and the outlying parking lots. The shuttle would run 12 hours a day from April through October. Estimated annual operating costs are $33,000.

(c) Associated Revenues - Associated Costs Analysis - Table C83 summarizes the Associated Revenue Associated Cost analysis. Total annual Associated Revenues for Refined Plan 10 A Modified are $1,421,300 (Refer to Table C74.). Total annual Associated Costs are $1,238,900 (Refer to Table C80). Annual revenues exceed annual costs by $182,400. Again, Associated Revenues and Associated Costs will not be included in the Final Benefit To Cost ratio for this study.

Table C83 - Excess Associated Revenues Over Associated Costs

| | REFINED PLAN 10 A MODIFIED |
|---|---|
| A. TOTAL ANNUAL REVENUES | $ 1,421,300 |
| B. TOTAL ANNUAL COSTS | $ 1,238,900 |
| EXCESS REVENUES OVER COSTS | $ 182,400 |

The Associated Revenue-Associated Cost analysis is extremely sensitive to slip rental costs and the number of slips provided. Any changes in final design or reduction in the number of slips provided would change the Associated Revenue - Associated Cost analysis.

Information provided in the Associated Revenue/- Associated Cost analysis is illustrative of revenues and costs generated by Refined Plan 10 A Modified. The marinas financial feasibility should be based on actual fees and other charges the local cooperator deems appropriate.

(10) Harbor Of Refuge Benefits Harbor of Refuge benefits are attributable to a boating facility that provides a safe entrance to a protected mooring area in all conditions of weather. The Selected Plan will provide a safe east basin and also reduce wave action between the existing federal piers. Boaters will be able to use the east basin to weather out storms.

They will also be able to navigate between the existing federal piers to gain access to Eighteen-Mile Creek. Eighteen-Mile Creek could also be used by boaters seeking refuge from storms. Four types of boaters would benefit from implementation of the Selected Plan: boaters on cruise, harbor slip renters, harbor launch ramp users, and harbor charterboat users. These boats would now be able to cruise/use the lake with greater confidence , knowing that an adequately protected harbor is available. Harbor of Refuge benefits of $20,000 was credited to the Olcott Project.

(11) Inundation Reduction Benefits- A flood damage survey was conducted by Buffalo District personnel in April 1991. Two reaches were chosen: reach 1-the lakefront and reach 2- the harbor. There are a total of 25 residential units in the 500 year floodplain of the two reaches. The total value of these units is $892,000.

The lakefront and harbor stage-damage curves assume that the existing Operation Foresight gabions and dikes, constructed in 1976, are non functional. These structures were not intended to provide permanent protection from lake flooding and have been breached in several places. The lakefront and harbor stage damage curves are presented in Plate 1 of the Hydraulics Appendix.

These curves were used in conjunction with lakefront and harbor ultimate stage-frequency curves for Lake Ontario at Olcott to develop damage-frequency curves for the lakefront and harbor areas. The lakefront and harbor damage-frequency curves were then integrated to compute Expected Annual Damages.

The ultimate stage-frequency curves for the Olcott lakefront and harbor, under existing conditions, were determined by adding the maximum (100 year) wave run-up to the instantaneous stage-frequency curve for Lake Ontario. This instantaneous stage-frequency curve was obtained from the Great Lakes Open Coast Flood Level Report. The maximum wave run-up for the lakefront varies from 1 feet to 4 feet. An average run-up of 1.5 feet was considered the most appropriate for the lakefront area. This run-up of 1.5 feet was added to the instantaneous elevation-frequency curve of Lake Ontario at Olcott. This resulted in the final elevation-frequency curve for the Olcott Harbor lakefront.

The maximum wave run-up for the harbor could not be precisely determined due to the complexity of the wave action within the harbor and the limited funds available for studying the wave phenomena. However harbor wave run-up values of 0.5 feet and 1.0 feet were evaluated by developing elevation-frequency and damage-frequency relationships for each run-up value. The damage frequency curve associated with 0.5 feet run-up was chosen as representative of the harbor because its estimate of damages associated with historic flood events at Olcott appears more

reasonable than the damage-frequency curve based on the 1.0 foot run-up.

Expected annual damages for the lakefront and the harbor, under existing conditions, were then determined by integrating the respective damage-frequency curves. Integration of the lakefront damage-frequency curve resulted in expected annual damages of $3,200. Integration of the harbor damage-frequency curve resulted in expected annual damages of $ 500. Total existing condition expected annual damages are $3,700.

Under the Selected Plan, the lakefront maximum wave run-up is reduced significantly by the project breakwaters. The maximum wave runup under the selected plan ranges from 1.0 feet on the west side of the harbor piers to 0 feet on the east side of the piers. Therefore an average value of 0.5 feet was chosen as the wave runup under the selected plan. Wave runup within the harbor will be nearly 0 feet under "with project" conditions.

Integration of the lakefront and harbor damage-frequency curves yielded lakefront and harbor EAD of $200 and $100 respectively. Total with project condition EAD for the selected plan is $300. Inundation benefits equals the difference between without project inundation damages ($3,700) and "with project" condition inundation damages ($300) or $3,400. These benefits reflect June 1991 price levels and an 8 3/4 percent annual interest rate.

c. Cost Estimate For The Selected Plan.

An Mcases cost estimate was developed for the Federal components of Refined Plan 10A Modified, based on June 1991 price levels. These costs came to $17,061,800. A cost estimate was also developed for Coast Guard related costs. These costs came to $33,000 and reflect June 1991 price levels. Finally, an estimate of construction costs incurred by the local cooperator was obtained from the consulting firm providing technical assistance to the town of Newfane. Total Associated Costs came to $9,805,500. These Associated costs reflect June 1991 price levels and were used in developing all associated costs connected with the construction of the project.

Table C84 summarizes "Total" Project Investment Costs and "Total" Average Annual Costs for Refined Plan 10 A Modified. "Total" Average Annual Costs are presented in June 1991 prices and reflects an annual interest rate of 8 3/4 percent. "Total" Average Annual Costs for Refined Plan 10A Modified are: $ 1,665,100. Again, these average annual costs "Costs" do not include any Associated Costs.

Table C 84- Average Annual Costs For "Refined Plan 10A Modified", June, 1991 Price Levels.

| | Refined Plan 10A Modified |
|---|---|
| 1. Investment Costs | |
| a. Federal Breakwater Construction Costs | $17,061,800 |
| Breakwater IDC 1/ | $ 1,240,600 |
| Federal Investment Costs | **$18,302,400** |
| b. Coast Guard Costs | $ 33,000 |
| Coast Guard IDC 1/ | $ 2,400 |
| Coast Guard Investment Costs | **$ 35,400** |
| c. Associated Construction Costs | $ 0 |
| Associated IDC | $ 0 |
| Associated Investment Costs | **$ 0** |
| Total Investment Costs | **$18,337,800** |
| 2. Average Annual Costs | |
| a. Interest 2/ | |
| Federal | $ 1,601,500 |
| Coast Guard | $ 3,100 |
| Non-Federal | $ 0 |
| Sub Total Interest Costs | **$ 1,604,600** |
| b. Amortization 2/ | |
| Federal | $ 24,500 |
| Coast Guard | $ 0 |
| Non-Federal | $ 0 |
| Sub Total Amortization Costs | **$ 24,500** |
| c. Annual Federal Maintenance 3/ | $ 35,000 |
| d. Annual Coast Guard Maintenance | $ 1,000 |
| e. Annual Marina Dredging Maintenance | $ 0 |
| f. Annual Marina Wages and Overhead | $ 0 |
| g. Annual Marina Main, Repairs & Utilities | $ 0 |
| h. Annual Marina Insurance | $ 0 |
| i. Annual Shuttle Service Costs | $ 0 |
| Sub Total c-i | **$ 36,000** |
| Total Average Annual Costs | **$ 1,665,100** |

1/ Interest-During-Construction was computed using a two year construction season; no construction during January, February and March; monthly compounding and an 8-3/4 percent annual interest rate.

2/ Interest and amortization was computed using a 50-year project life and an 8-3/4 percent annual interest rate.

3/ Annual Maintenance of $35,000 is for breakwall maintenance and periodic dredging of federal channels.

d. Benefit Cost Summary For The "Selected Plan".

Benefits and costs for the Selected Plan were calculated using an 8 3/4 percent annual interest rate, Fiscal Year 1991 Unit Day Values and June 1991 price levels. Average annual benefits, average annual costs, net benefits and benefit to cost ratio for the "Selected Plan" are $1,783,000; $1,665,100; $ 117,900 and 1.07 respectively. These values are summarized in Table C 85.

Table C85-Benefit To Cost Ratio For "Refined Plan 10A Modified", June 1991 Price Levels

| | | |
|---|---|---|
| AVERAGE ANNUAL BENEFITS | (1) | $ 1,783,000 |
| AVERAGE ANNUAL COSTS | (1) | $ 1,665,100 |
| NET BENEFITS | | $ 117,900 |
| BENEFIT COST RATIO | | 1.07 |

(1) These values reflect an 8 3/4 percent annual interest rate, a fifty year evaluation period, and June 1991 Price levels.

Again, the above benefit to cost ratio does not include: Net Income benefits for New Charterfishing Operators, Associated Revenues or Associated Costs. Inclusion of these components into the analysis would result in Average annual benefits of $3,386,200 and average annual costs of $2,919,000.

In addition, as mentioned in Section C3,b,(3), the proposed development of the outer harbor marina complex is projected to induce the County to develop the Krull Park complex into a major county recreational facility. Development of the Krull Park complex will be guided by the "Olcott Harbor Upland Development Plan." Projected County investments in the Krull Park complex are seen to result in a 400 acre multi-use recreational facility offering such recreational opportunities as nature walking trails, camping, baseball and softball diamonds, tennis courts, playgrounds, open lawn areas, an events center, an eighteen hole golf course and cross country skiing during the winter.

Implementation of the "Olcott Harbor Upland Development Master Plan" will result in the following new recreational activities taking place in the Olcott Harbor area: golfing, camping, nature trail hiking, swimming and cross country skiing.

There are also envisioned play areas that will accommodate tennis, baseball and basketball, as well as general play areas for children. Also projected for development is an amphitheater

for town sponsored activities. The benefits and costs associated with these new recreational activities have not been computed.

In addition there is projected to be an increase in the following recreational activities, under the with project condition, that are currently being offered at Olcott: picnicking and sunbathing. Increased usage is foreseen for the Park with respect to all activities.

The increase in current recreational activities offered at Olcott, under with project conditions, has not been calculated. The current Park facilities should be able to absorb these recreational increases with little modification to the Parks current infrastructure. This would indicate a net benefit to the project could be derived from these increased recreational activities. In addition, existing park users would experience an increase in their current recreational values since a wider range of recreational opportunities would be offered at Krull Park ( nature walking trails, baseball and softball diamonds, tennis courts, playgrounds, open lawn areas, an events center, and an eighteen hole golf course). This increase in recreational value for existing park users has also not been calculated. The increase in recreational value to current park users could also potentially increase the benefits.

EXHIBIT C1

BOATING FACILITY SURVEY

27. Here is a list of income categories. Mark the category that best describes the combined annual income before taxes that you and all other members of your household will receive during 1988.

(1) [ ] Under $ 15,000 (5) [ ] $35,000 - $49,999

(2) [ ] $ 15,000 - $ 19,999 (6) [ ] $50,000 - $74,999

(3) [ ] $ 20,000 - $ 24,999 (9) [ ] $75,000 - $99,999

(4) [ ] $ 25,000 - $ 34,999 (10) [ ] $100,000 or more

28. How many years have you lived in Western New York?

_____ Years

29. We are interested in your thoughts about the need for additional recreational facilities and your comments about this questionnaire. Do you have any comments?

_____

_____

_____

_____

_____

_____

_____

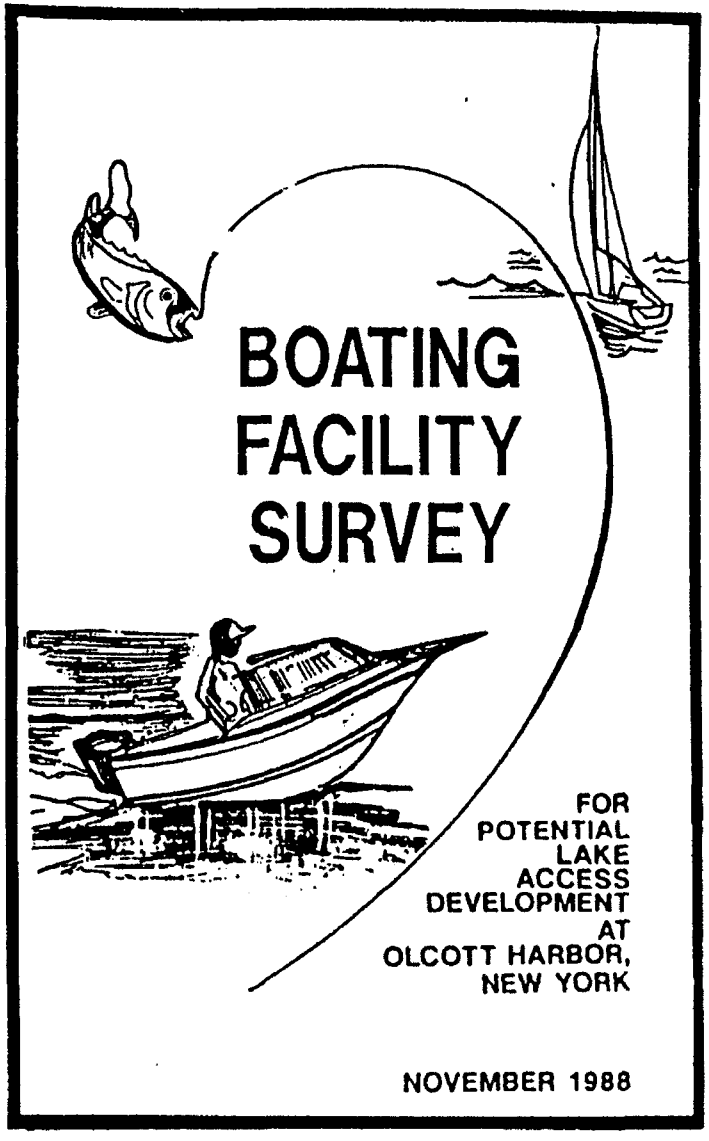
_____

_____

Thank you for your time. Your cooperation in filling out this questionnaire is greatly appreciated. Please put this questionnaire in the postage-paid envelope provided and mail it to us. If you have misplaced the envelope, please send this questionnaire to:

U.S. Army Engineer District,
1776 Niagara Street
Buffalo New York 14207
Attention CENCBPD-EC





## EXISTENCE VALUE

19. If Olcott harbor was expanded, it may be a good thing for the community as well as for boaters. Please circle the highest dollar amount you would contribute **ONE TIME** to a non-profit group to help pay for the construction and maintenance costs of the harbor expansion. This contribution would ensure that the expansion would be built even if you never plan to use the harbor.

**THIS IS NOT A REQUEST FOR CONTRIBUTIONS.**

(CIRCLE ONE)

| | | | | |
|---|---|---|---|---|
| $5000 | $4000 | $3000 | $2000 | $1500 |
| $1000 | $ 750 | $ 500 | $ 400 | $ 300 |
| $ 200 | $ 150 | $ 100 | $ 75 | $ 50 |
| $ 30 | $ 25 | $ 20 | $ 15 | $ 10 |
| $ 5 | $ 3 | $ 2 | $ 1 | $ 0 |

If the amount that you would give is not shown on the list above, please write in the amount here.

$ _____

20. Please mark the answer which best describes your reason for answering the previous question the way you did.

(1) [ ] That's what it's worth to me

(2) [ ] It's worth more to me, but it's all I can afford to pay

(3) [ ] Not enough information is provided

(4) [ ] I didn't want to place a dollar value

(5) [ ] I object to the wording of the question

(6) [ ] Other _____
(Please specify)



DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

Planning Division

Dear Boater:

We are trying to measure the benefits of expanding the small-boat harbor at Olcott, New York.

We need your help in determining the value of the proposed harbor expansion. Because we are only surveying a small random sample of New York State registered boaters, your response is very important as it will represent the opinion of the boating population.

*Please read everything carefully* because your response to questions is based on the information provided. The survey should take less than 5 minutes to complete. This survey is entirely voluntary. Individual responses will be kept completely confidential.

Please return your completed questionnaire as soon as possible. A preaddressed, postage-paid envelope is enclosed for your convenience.

Thank you for your cooperation.

Sincerely,

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

OMB NO702-0016
APPROVAL EXPIRES: 10/31/89

PLEASE READ EACH QUESTION CAREFULLY. CHOOSE ONLY THE MOST APPROPRIATE ANSWER WHERE CHOICES ARE SUPPLIED, UNLESS OTHERWISE SPECIFIED. THEN MARK THE BOX TO THE LEFT OF THE ANSWER WITH AN "X".

For classification purposes, please record the Zip Code of your residence in the space provided here.

1. a. _____

## PART I. BOAT OWNING STATUS

1. b. Do you currently own a boat?

(1) [ ] Yes (2) [ ] No

c. Do you plan to own a boat in the future?

(1) [ ] Yes (2) [ ] No

IF YOU DO NOT CURRENTLY OWN A BOAT AND DO NOT PLAN TO OWN ONE IN THE FUTURE, PLEASE DO NOT COMPLETE THIS SURVEY. RETURN IT UNCOMPLETED IN THE SELF-ADDRESSED, POSTAGE-PAID ENVELOPE. THIS WILL ENSURE THAT WE WILL NOT SEND FOLLOW-UP NOTICES ASKING ABOUT YOUR RESPONSE.

2. Mark the category which best describes the type of boat that you now own or plan to own in the future. (If you presently own more than one boat, answer for the boat that you use most.)

a. Boat type.

(1) [ ] Outboard (4) [ ] Sailboat

(2) [ ] Inboard (5) [ ] Auxiliary Sailboat

(3) [ ] Inboard/Outdrive (0) [ ] Other _____ (Specify)

b. What is the length of your boat (overall)? Ft.____ In.___

c. What is the beam (maximum width) of your boat? Ft.____ In.___

d. What is your boat draft (depth of boat in water)? Ft.____ In ___

3. How many times during the past boating season did you use your boat? (Please Check only one.)

(1) [ ] 0 (7) [ ] 81 - 100

(2) [ ] 1 - 10 (8) [ ] 101 - 150

(3) [ ] 11 - 20 (9) [ ] 151 - 200

(4) [ ] 21 - 40 (10) [ ] 201 - 250

(5) [ ] 41 - 60 (11) [ ] 251 - 300

(6) [ ] 61 - 80 (12) [ ] More than 300



## VALUE OF ADDITIONAL LAUNCH FACILITIES

13. If it were necessary to charge a seasonal user fee to use the launch ramps, what is the BIGGEST fee you would pay per season to help pay for the construction and maintenance costs of additional boat ramps at Olcott Harbor? Circle the value from the list below.

*(CIRCLE ONE)*

| | | | |
|---|---|---|---|
| $500 | $400 | $300 | $200 |
| $175 | $150 | $125 | $100 |
| $ 75 | $ 50 | $ 25 | $ 10 |
| $ 15 | $ 10 | $ 5 | $ 0 |

If the amount you would pay per season is not shown on the list above, please write in the amount here.

$_____

14. Please mark the answer which best describes your reason for answering the previous question the way you did.

(1) [ ] That's what it's worth to me

(2) [ ] It's worth more to me, but it's all I can afford to pay

(3) [ ] Not enough information is provided

(4) [ ] I didn't want to place a dollar value

(5) [ ] I object to the wording of the question

(0) [ ] Other _____ (Please specify)

15. How many times per season would you typically use the boat ramps at Olcott Harbor at the seasonal cost you indicated in question 13 ?

_____ Times per season.

16. Would you ever want to rent winter storage space at the new harbor facility at Olcott Harbor, if all other boating facilities remain unchanged?

(1) [ ] Yes (1) [ ] No

17. Would you be willing to pay $ 10 per foot for outdoor Winter storage at the new harbor facility at Olcott Harbor, if all other boating facilities remained unchanged?

(1) [ ] Yes (1) [ ] No

18. Would you be willing to pay $15 per foot for indoor Winter storage at the new harbor facility at Olcott Harbor, if all other boating facilities remained unchanged?

(1) [ ] Yes (1) [ ] No

9. Would you ever want to use the launch ramps at the new harbor facility at Olcott Harbor, if all other boating facilities remain unchanged?

(1) [ ] Yes (2) [ ] No

10. If both the slip capacity and the number of boat launching ramps were increased at Olcott Harbor, which would you prefer to use?

(1) [ ] Wet storage space (i.e. a berth or a slip)

(2) [ ] launching ramp facility

IF YOUR PREFERENCE WAS " WET STORAGE SPACE", ANSWER QUESTIONS 11 AND 12. THEN CONTINUE WITH QUESTION 16. IF YOUR PREFERENCE WAS "LAUNCH RAMPS" , SKIP QUESTIONS 11 AND 12 AND CONTINUE WITH QUESTION 13.

VALUE OF ADDITIONAL BOAT STORAGE

11. High construction costs have limited the number of wet storage spaces that are available. Suppose that any new spaces would be auctioned off to boaters who bid the highest dollar amount they would be willing to pay to rent a slip at Olcott Harbor. What is the HIGHEST dollar amount you would pay per season to rent a slip at the New harbor facility if all other harbor facilities remained unchanged? (This seasonal rate would not include winter storage fees.) Circle the value from the list below.

(CIRCLE ONE)

| | | | | |
|---|---|---|---|---|
| $4000 | $3000 | $2500 | $2000 | $1500 |
| $1400 | $1300 | $1200 | $1100 | $1000 |
| $ 900 | $ 850 | $ 800 | $ 750 | $ 700 |
| $ 650 | $ 600 | $ 550 | $ 500 | $ 450 |
| $ 400 | $ 350 | $ 300 | $ 250 | $ 0 |

If the amount you would pay per season is not shown on the list above, please write in the amount here. _____$

12. Please mark the answer which best describes your reason for answering the previous question the way you did.

(1) [ ] That's what it's worth to me

(2) [ ] It's worth more to me, but it's all I can afford to pay

(3) [ ] Not enough information is provided

(4) [ ] I didn't want to place a dollar value

(5) [ ] I object to the wording of the question

(6) [ ] Other _____



4. On the average, how many persons go with you when you use your boat?

_____ Persons

5. Please mark the boxes that best describe how your boat is stored (Mark one "X" for Boating Season and one "X" for Winter.)

| | BOATING SEASON | | WINTER | |
|---|---|---|---|---|
| | Private Residence | Commercial/ Public Facility | Private Residence | Commercial/ Public Facility |
| On A Trailer | | | | |
| On a Rack | | | | |
| In Water(Slip, Buoy) | | | | |
| In A Cradle | | | | |
| Hoist | | | | |
| Other(Specify) | | | | |

6. How much do you currently pay to store your boat?

a. Boating Season $ _____

b. Winter $ _____

7. a. Please mark each boating activity in which you participated during the past 12 months.

(1) [ ] Fishing for food for family and friends

(2) [ ] Recreational fishing

(3) [ ] Other recreational boating

(4) [ ] Commercial Charter

(5) [ ] Other commercial use (such as commercial fishing)

(6) [ ] Did not go boating in last 12 months

(0) [ ] Other (Specify) _____

b. Please Circle the one activity from the list above that you did most often.

## PART II. HARBOR EXPANSION AT OLCOTT HARBOR

The Corps of Engineers, the State of New York, and the Olcott Harbor Task force are trying to determine the value of new boating facilities at Olcott Harbor. One project under consideration is the construction of a new small boat harbor basin on either side of Olcott Harbor's current entrance. It is important for us to know how area boaters value the proposed expansion of the harbor.

Presently, all wet storage berths at Olcott Harbor are occupied. Often there are waiting lines at the launch ramp on weekends, holidays and special events. The existing facilities at Olcott New York consist of:

- Approximately 200 wet storage spaces (slips, berths and moorings)
- One Public boat launch facility for trailered boats
- All parking areas combined provide approximately 80 spaces for slip renters and 130 auto/boat-trailer spaces for launch ramp users
- Easy walking distance to Krull Park and restaurants and shops in downtown Olcott.

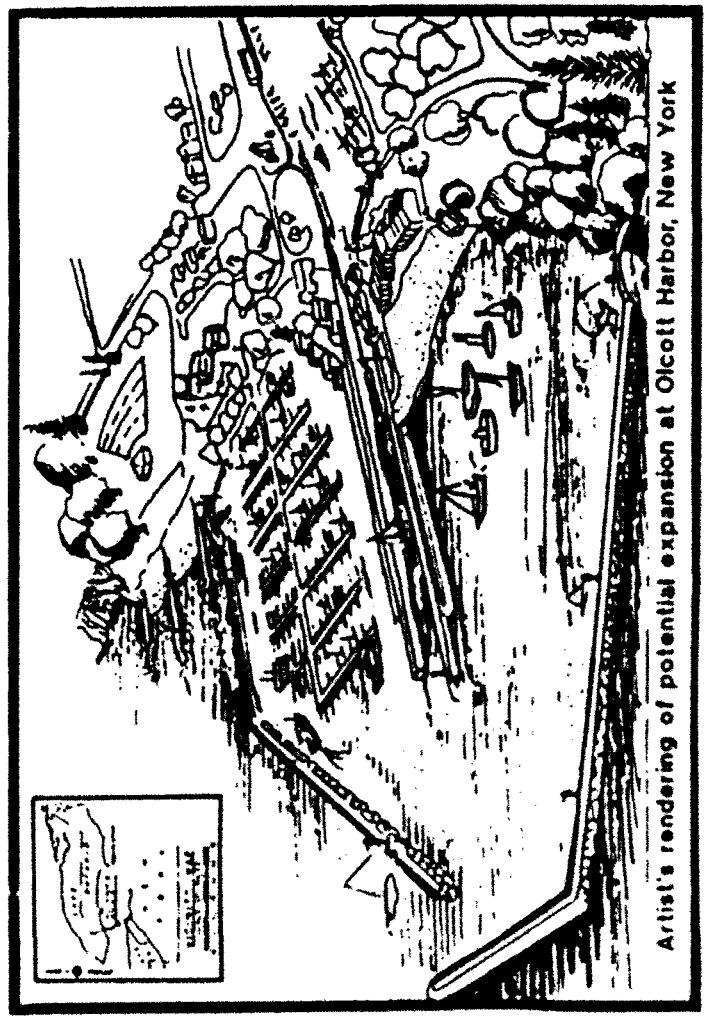
The "Proposed Project" would provide additional wet storage, launch ramps and a protected outer harbor. The new boat harbor may look similar to the illustration shown on the next page. The new harbor is planned to include:

- An additional 600-800 wet storage spaces (berths, slips, moorings).
- Electric and water hookups for all slips
- Additional boat ramps and more parking for boat ramp users
- Parking for slip renters
- Breakwaters to protect boats from storms and provide pedestrian access to pier fishermen and sightseers
- A dredged entrance channel to provide safe water access for boats entering or leaving the harbor.

8. Would you ever want to rent a slip at the new harbor facility at Olcott Harbor, if all other boating facilities remain unchanged?

(1) [ ] Yes (1) [ ] No





Artist's rendering of potential expansion at Olcott Harbor, New York

## PART III. BACKGROUND INFORMATION

The following information will help our research staff analyze the results of the study properly.

21. Which of the following best describes your present status?

(1) [ ] Employed full-time

(2) [ ] Employed part-time

(3) [ ] Retired

(4) [ ] Not employed

(0) [ ] Other _____
(Please specify)

22. What was the highest level of education that you completed?

(1) [ ] No schooling

(2) [ ] Grade school (1-8)

(3) [ ] Some high school (9 - 11)

(4) [ ] High school graduate

(5) [ ] Some college (13-15)

(6) [ ] College graduate (16)

(7) [ ] Post graduate (17+)

(8) [ ] Other school after high school (e.g. art, trade or secretarial school)

23. Are you male or female?

(1) [ ] Male (2) [ ] Female

24. Are you married?

(1) [ ] Yes (2) [ ] No

25. Including yourself, how many persons live in your household?

_____ Persons

26. Please mark the category that contains your age.

(1) [ ] 15- 19
(2) [ ] 20- 24
(3) [ ] 25- 29
(4) [ ] 30- 34
(5) [ ] 35- 39
(6) [ ] 40- 44
(7) [ ] 45- 49
(8) [ ] 50- 54
(9) [ ] 55- 59
(10) [ ] 60- 64
(11) [ ] 65- 74
(12) [ ] 75 & over

EXHIBIT C2

SURVEY FOR POTENTIAL LAKE ACESS DEVELOPMENT

AT OLCOTT HARBOR, NEW YORK

15. Please mark the category that contains your age.

| | | | | | |
|---|---|---|---|---|---|
| (1) | [ ] 15- 19 | | (7) | [ ] 45- 49 | |
| (2) | [ ] 20- 24 | | (8) | [ ] 50- 54 | |
| (3) | [ ] 25- 29 | | (9) | [ ] 55- 59 | |
| (4) | [ ] 30- 34 | | (10) | [ ] 60- 64 | |
| (5) | [ ] 35- 39 | | (11) | [ ] 65- 74 | |
| (6) | [ ] 40- 44 | | (12) | [ ] 75 & Over | |

16. Here is a list of income categories. Mark the category that best describes the combined annual income before taxes that you and all other members of your household will receive during 1988.

| | | | |
|---|---|---|---|
| (1) [ ] Under $ 5,000 | | (7) [ ] $25,000 - $34,999 | |
| (2) [ ] $ 5,000 - $ 7,499 | | (8) [ ] $35,000 - $49,999 | |
| (3) [ ] $ 7,500 - $ 9,999 | | (9) [ ] $50,000 - $74,999 | |
| (4) [ ] $10,000 - $14,999 | | (10) [ ] $75,000 - $99,999 | |
| (5 [ ] $15,000 - $19,999 | | (11) [ ] $100,000 or more | |
| (6) [ ] $20,000 - $24,999 | | | |

17. How many years have you lived in Western New York?

_____ Years

18. We are interested in your thoughts about the need for additional recreational facilities and your comments about this Questionnaire. Do you have any comments?

_____

_____

_____

_____

_____

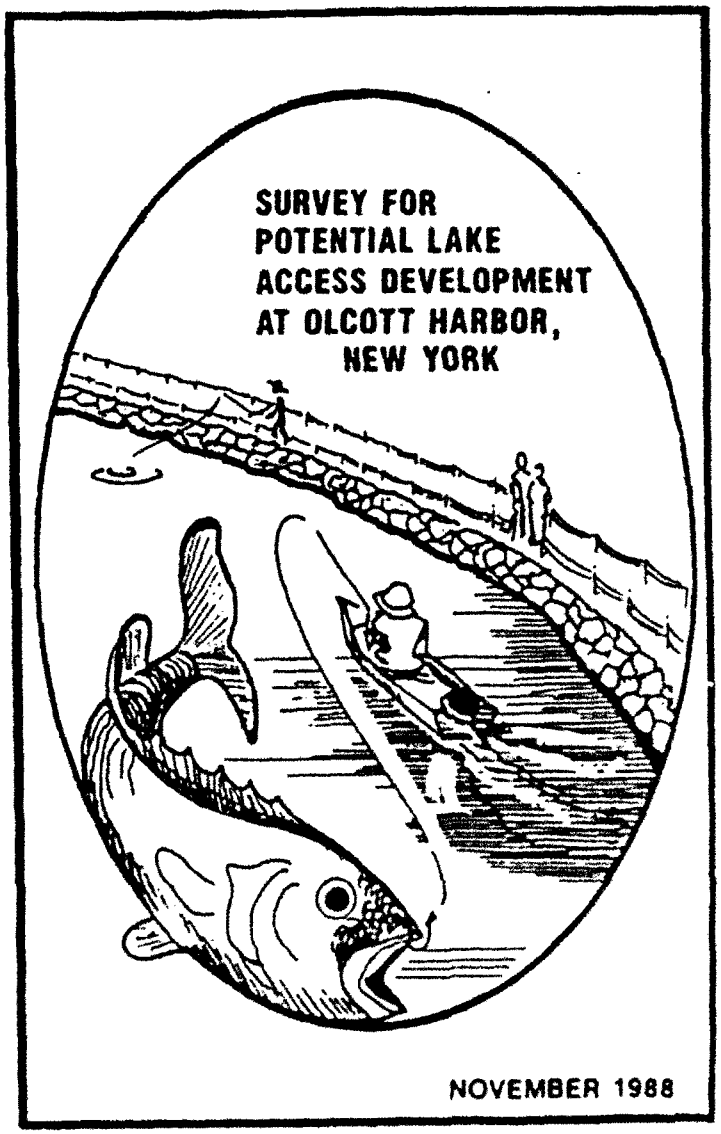
_____

_____

Thank you for your time. Your cooperation in filling out this questionnaire is greatly appreciated. Please put this questionnaire in the postage-paid envelope provided and mail it to us. If you have misplaced the envelope, please send this questionnaire to:

U.S. Army Engineer District,
1776 Niagara Street
Buffalo New York 14207
Attention CENCBPD-EC





DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207-3199

Planning Division

Dear Resident:

We are trying to measure the benefits of expanding the small-boat harbor and increasing public waterfront access at Olcott, New York.

We need your help in determining the value of the proposed harbor expansion. Because we are only surveying a small random sample of New York State residents, your response is very important as it will represent the opinion of the residents of New York State.

Please read everything carefully because your response to questions is based on the information provided. The survey should take less than 5 minutes to complete. This survey is entirely voluntary. Individual responses will be kept completely confidential.

Please return your completed questionnaire as soon as possible. A preaddressed, postage-paid envelope is enclosed for your convenience.

Thank you for your cooperation.

Sincerely,

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

9. Please mark the answer which best describes your reason for answering whichever of the previous questions (i.e. either number 7 or number 8 ) the way you did.

(1) [ ] That's what it's worth to me

(2) [ ] It's worth more to me, but it's all I can afford to pay

(3) [ ] Not enough information is provided

(4) [ ] I didn't want to place a dollar value

(5) [ ] I object to the wording of the question

(0) [ ] Other _____
(Please specify)

## PART C. BACKGROUND INFORMATION

The following information will help our research staff analyse the results of the study properly.

10. Which of the following best describes your present status?

(1) [ ] Employed full-time

(2) [ ] Employed part-time

(3) [ ] Retired

(4) [ ] Not employed

(0) [ ] Other _____
(Please specify)

11. What was the highest level of education that you completed?

(1) [ ] No schooling
(2) [ ] Grade school (1-8)
(3) [ ] Some high school (9-11)
(4) [ ] High school graduate (12)
(5) [ ] Some college (13-15)
(6) [ ] College graduate (16)
(7) [ ] Post graduate (17+)
(8) [ ] Other school after high school (e.g. art, trade or secretarial school)

12. Are you male or female?

(1) [ ] Male (2) [ ] Female

13. Are you married?

(1) [ ] Yes (2) [ ] No

14. Including yourself, how many persons live in your household?

_____ Persons

6. How do you feel about the Project at Olcott?

(1) [ ] I am in favor of the Project.

(2) [ ] I don't care, one way or the other, about the Project.

(3) [ ] I am against the Project.

ANSWER NUMBER 7 ONLY IF YOU ARE IN FAVOR OF THE PROJECT.

7. If Olcott harbor was expanded, it may be a good thing for the Community as well as for boaters. Please circle the highest dollar amount you would contribute ONE TIME to a non-profit group to help pay for the construction and maintenance costs of the harbor expansion. This contribution would ensure that the expansion would be built even if you never plan to use the harbor.

THIS IS NOT A REQUEST FOR CONTRIBUTIONS.

(CIRCLE ONE)

| | | | | |
|---|---|---|---|---|
| $5000 | $4000 | $3000 | $2000 | $1500 |
| $1000 | $ 750 | $ 500 | $ 400 | $ 300 |
| $ 200 | $ 150 | $ 100 | $ 75 | $ 50 |
| $ 30 | $ 25 | $ 20 | $ 15 | $ 10 |
| $ 5 | $ 3 | $ 2 | $ 1 | $ 0 |

If the amount that you would give is not shown on the list above, please write in the amount here.

$ _____

ANSWER NUMBER 8 ONLY IF YOU ARE NOT IN FAVOR OF THE PROJECT.

8. If Olcott harbor was expanded, it may not be a good thing for the Community. Please circle the value in the list below which is the highest dollar amount you would contribute ONE TIME to a non-profit group to ensure that the harbor would not be built. This contribution would, for example, purchase lands to control land use, provide legal fees to oppose construction, etc.

THIS IS NOT A REQUEST FOR CONTRIBUTIONS.

(CIRCLE ONE)

| | | | | |
|---|---|---|---|---|
| $5000 | $4000 | $3000 | $2000 | $1500 |
| $1000 | $ 750 | $ 500 | $ 400 | $ 300 |
| $ 200 | $ 150 | $ 100 | $ 75 | $ 50 |
| $ 30 | $ 25 | $ 20 | $ 15 | $ 10 |
| $ 5 | $ 3 | $ 2 | $ 1 | $ 0 |

If the amount that you would give is not shown on the list above, please write in the amount here.

$ _____



OMB #0702-0016
APPROVAL EXPIRES: 10/31/89

PLEASE READ EACH QUESTION CAREFULLY. CHOOSE ONLY THE MOST APPROPRIATE ANSWER WHERE CHOICES ARE SUPPLIED, UNLESS OTHERWISE SPECIFIED. THEN MARK THE BOX TO THE LEFT OF THE ANSWER WITH AN "X".

For classification purposes, please record the Zip Code of your residence in the space provided here.

1. _____

PART A: BOAT OWNING STATUS

2. Have you ever owned a boat?

[ ] Yes (2) [ ] No

3. Do you currently own a boat?

[ ] Yes (2) [ ] No

4. Do you plan to own a boat in the future?

[ ] Yes (2) [ ] No

5. Do you presently share the use of someone else's boat?

[ ] Yes (2) [ ] No

* ATTENTION BOAT OWNERS * THIS SURVEY IS INTENDED ONLY FOR NON-BOAT OWNERS. PLEASE DO NOT COMPLETE THIS QUESTIONNAIRE IF YOU CURRENTLY OWN A REGISTERED BOAT IN NEW YORK. RETURN THIS QUESTIONNAIRE UNCOMPLETED IN THE SELF-ADDRESSED, POSTAGE PAID ENVELOPE. THIS WILL ENSURE THAT WE WILL NOT SEND FOLLOW-UP NOTICES ASKING ABOUT YOUR RESPONSES.

IT IS IMPORTANT FOR US TO KNOW HOW AREA RESIDENTS VALUE PROPOSED BOAT FACILITIES IN THE AREA. THE FOLLOWING PAGES OF THIS QUESTIONNAIRE ARE CONCERNED WITH THIS ISSUE.

## PART B: HARBOR EXPANSION AT OLCOTT HARBOR

The Corps of Engineers, the State of New York, and the Olcott Harbor Task Force are trying to determine the value of new boating facilities at Olcott Harbor. One project under consideration is the construction of a new small boat harbor basin on either side of Olcott Harbor's current entrance. It is important for us to know how non-boat owning residents value the proposed expansion of the harbor.

Presently, all wet storage berths at Olcott Harbor are occupied. Often there are waiting lines at the launch ramp on weekends, holidays, and special events. The existing facilities at Olcott New York consist of:

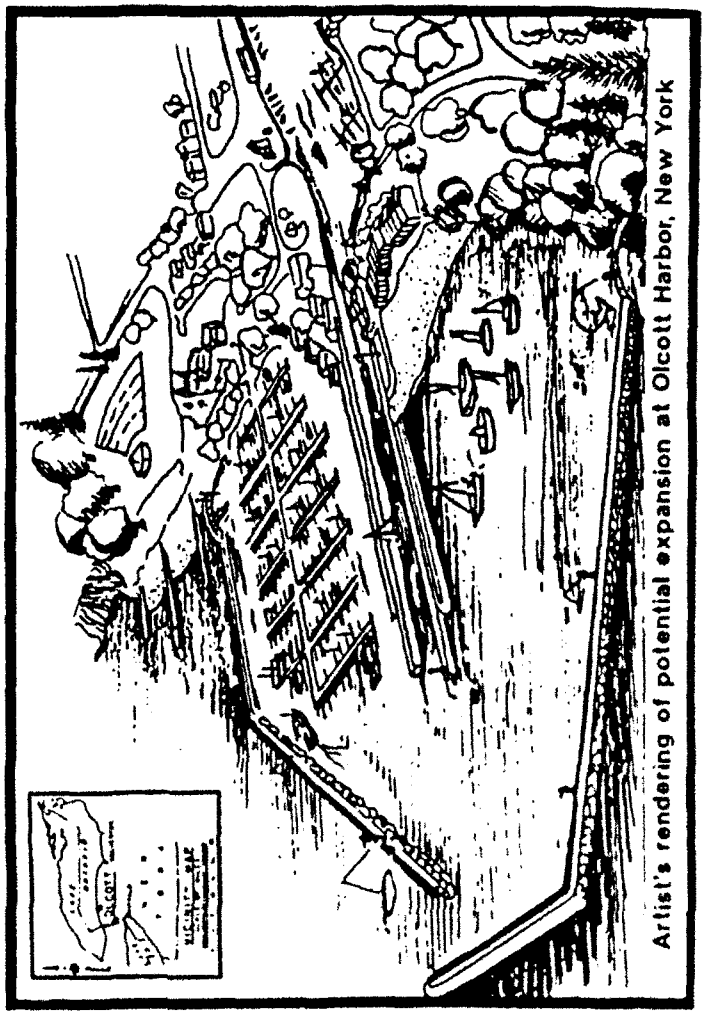
- Approximately 200 wet storage spaces (slips, berths and moorings)
- One public boat launch facility for trailer launching
- All parking areas combined provide approximately 80 spaces for slip renters and 130 auto/boat-trailer spaces for launch ramp users
- Easy walking distance to Krull Park and restaurants and shops in downtown Olcott.

The "Proposed Project" would provide additional wet storage, launch ramps and a protected outer harbor. The new boat harbor may look similar to the illustration shown on the next page. The new harbor is planned to include:

- An additional 600-800 wet storage spaces (berths, slips, moorings).
- Electric and water hookups for all slips
- Additional boat ramps and more parking for boat ramp users
- Parking for slip renters
- Breakwaters to protect boats from storms and provide pedestrian access to pier fishermen and sightseers
- A dredged entrance channel to provide safe water access for boats entering or leaving the harbor.

Once the project is completed, private and public investment in and around Olcott could take place. Some of these investments could include motels and hotels, restaurants, retail service facilities and camp and recreational vehicle sites.





# Appendix D

## HYDRAULICS AND HYDROLOGIC ANALYSES

# OLCOTT, NEW YORK

## EXPECTED ANNUAL DAMAGES


| SECTION | DESCRIPTION | PAGE |
|---|---|---|
| 1. | INTRODUCTION | 1 |
| 2. | EXISTING CONDITIONS | 1 |
| 3. | PLAN 10A | 2 |
| 4. | PLAN 10B | 3 |
| 5. | CONCLUSIONS | 3 |
| 6. | REFERENCES | 3 |


## PLATES


| Number | Title |
|---|---|
| 1 | Stage Damage Curves |
| 2 | Stage Frequency Curves |
| 3 | Damage Frequency Curves |
| 4 | Stage Frequency Curves |
| 5 | Damage Frequency Curves |
| 6 | Stage Frequency Curves |
| 7 | Stage Frequency Curve |
| 8 | Damage Frequency Curve |
| 9 | Stage Frequency Curve |
| 10 | Damage Frequency Curves |

# OLCOTT, NEW YORK

## EXPECTED ANNUAL DAMAGES

### 1. INTRODUCTION

This report presents the calculation of expected annual damages (EAD) due to high lake levels and wave action at Olcott under existing, Plan 10A, and Plan 10B conditions. The following paragraphs explain how the EAD under existing and proposed project conditions were determined.

### 2. EXISTING CONDITIONS

In April 1991, personnel from the Corps of Engineers conducted a flood damage survey in Olcott. Two reaches were chosen. Reach 1 is the lakefront. Reach 2 is the harbor. Most of the structures in the flood area are residential, but there are a few commercial units too. The first floor elevations of many of these structures were established. For the two reaches, there are a total of 25 residential units in the 500-year floodplain. The total value of these units is $892,000.

The lakefront and harbor stage-damage curves assume that the existing Operation Foresight gabions and dikes constructed in 1976 are non-functional since the structures were not intended to provide permanent protection from lake flooding and have been breached in several places. The lakefront and harbor stage-damage curves are shown on Plate 1.

These curves were used in conjunction with lakefront and harbor ultimate stage-frequency curves for Lake Ontario at Olcott to develop damage-frequency curves for the lakefront and harbor areas. The lakefront and harbor damage-frequency curves were then integrated to compute their EAD.

The ultimate stage-frequency curves for the Olcott lakefront and harbor under existing conditions were determined by adding the maximum (100-year) wave runup to the instantaneous stage-frequency curve for Lake Ontario which was obtained from the Great Lakes Open Coast Flood Level report (Reference 1). The maximum wave runup for the lakefront varies from 1 feet to 4 feet as determined by CENCB-ED-DC using the methodology of References 2 and 3. An average runup value of 1.5 feet was considered the most appropriate for the lakefront area and was added to the instantaneous elevation-frequency curve of Lake Ontario at Olcott to yield the ultimate elevation-frequency curve for the Olcott lakefront (Plate 2). Combining the lakefront stage-damage relationship of Plate 1 with the lakefront stage-frequency relationship of Plate 2 provided the lakefront damage-frequency relationship of Plate 3.

The maximum wave runup for the harbor could not be precisely determined due to the complexity of the wave action within the harbor and the limited funds available for studying the wave phenomena. However, harbor wave-runup values of 0.5 feet and 1.0 feet were evaluated by developing elevation-frequency and damage frequency relationships for each runup value. The damage-frequency curve associated with 0.5 feet runup was chosen as representative of the harbor because its estimate of damages associated with historic flood events at Olcott appears more reasonable than the damage-frequency curve based on 1.0 feet runup.

The harbor stage-frequency curve based on 0.5 feet of runup is presented on Plate 4. The combination of the stage-frequency relationship of Plate 4 with the stage-damage relationship of Plate 1 yielded the damage-frequency curve for the harbor shown on Plate 5.

The EAD for the lakefront and harbor under existing conditions were then determined by integrating the damage-frequency curves of Plates 3 and 5. Integrating the lakefront damage-frequency curve of Plate 3 yields lakefront EAD of $3,200. Integrating the harbor damage-frequency relationship of Plate 5 yields harbor EAD of $500. Together the total EAD for the lakefront and harbor under existing conditions is $3,700.

3. **PLAN 10A**

Under the improved conditions of Plan 10A, the lakefront and harbor stage-damage curves and the Lake Ontario instantaneous stage-frequency curve remain unchanged from those for existing conditions. The only factors or relationships which change under project conditions are the lakefront and harbor wave runup associated Lake Ontario ultimate stage-frequency curves and the lakefront and harbor damage-frequency curves.

Under Plan 10A, the lakefront maximum wave runup is reduced significantly by the project breakwaters. The maximum wave runup for the lakefront under plan 10A ranges from 1.0 feet on the west side of the harbor piers to near 0 feet on the east side of the piers. Therefore, an average value of 0.5 feet was chosen as the wave runup for the lakefront under Plan 10A. Adding 0.5 feet of wave runup to the Lake Ontario instantaneous stage-frequency curve yielded the Plan 10A ultimate stage-frequency curve for the lakefront as shown on Plate 6. The ultimate stage-frequency relationship of Plate 6 was then combined with the lakefront stage-damage relationship of Plate 1 to develop the lakefront damage-frequency curve of Plate 3.

Wave runup within the harbor will be nearly 0 feet under Plan 10A conditions. Therefore, the ultimate stage-frequency curve for the harbor is simply the instantaneous stage-frequency curve

for Lake Ontario and is shown on Plate 7. The damage-frequency relationship for the harbor under Plan 10A was based on the stage-frequency relationship of Plate 7 and the stage-damage relationship of Plate 1. This curve is shown on Plate 5.

Integration of the lakefront and harbor damage-frequency curves (Plates 3 and 5) yielded lakefront and harbor EAD of $200 and $100 respectively, which together yield a total EAD for Plan 10A of $300. Subtraction of the Plan 10A EAD ($300) from the existing condition EAD ($3,700) results in $3,400 in EAD prevented by Plan 10A.

## 4. PLAN 10B

Under Plan 10B, the maximum wave runup at both the lakefront and in the harbor is very small and assumed to be 0 feet. Therefore, the instantaneous stage-frequency curve for Lake Ontario is also the ultimate stage-frequency curve for the lakefront and harbor (Plate 9). The data provided by the ultimate stage-frequency curve (Plate 9) and stage-damage curves of Plate 1 yields the lakefront and harbor damage-frequency curves of Plates 8 and 10, respectively. When integrated, the damage-frequency curves yield lakefront and harbor EAD of $0 and $100, respectively, under Plan 10B conditions. The total EAD for Plan 10B is therefore $100. When subtracted from the existing conditions EAD of $3,700, the EAD prevented is $3,600.

## 5. CONCLUSIONS

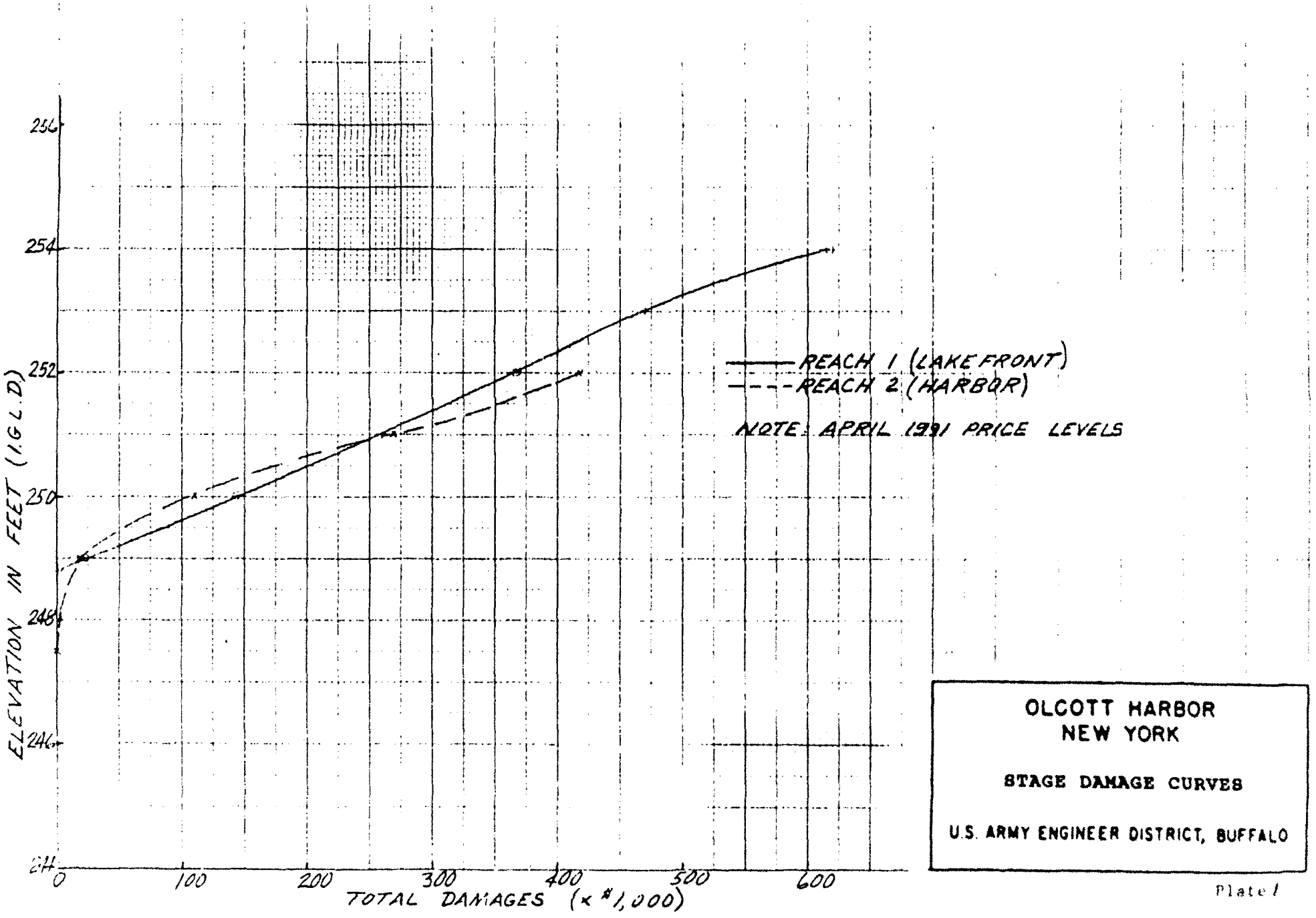
The expected annual damage under existing conditions is $3,700. Under Plan 10A and Plan 10B the EAD are $300 and $100, respectively. The EAD prevented is $3,400 for Plan 10A and $3,600 for Plan 10B.

## 6. REFERENCES

1. U.S. Army Corps of Engineers. 1988. Revised Report on Great Lakes Open-Coast Flood Levels. Detroit, Michigan

2. Ahrens, J.P. and M.F. Titus. 1985. Wave Runup Formulas for Smooth Slopes, ASCE Journal of Waterway, Port, Coastal, and Ocean Engineering, Volume 3, No. 1.

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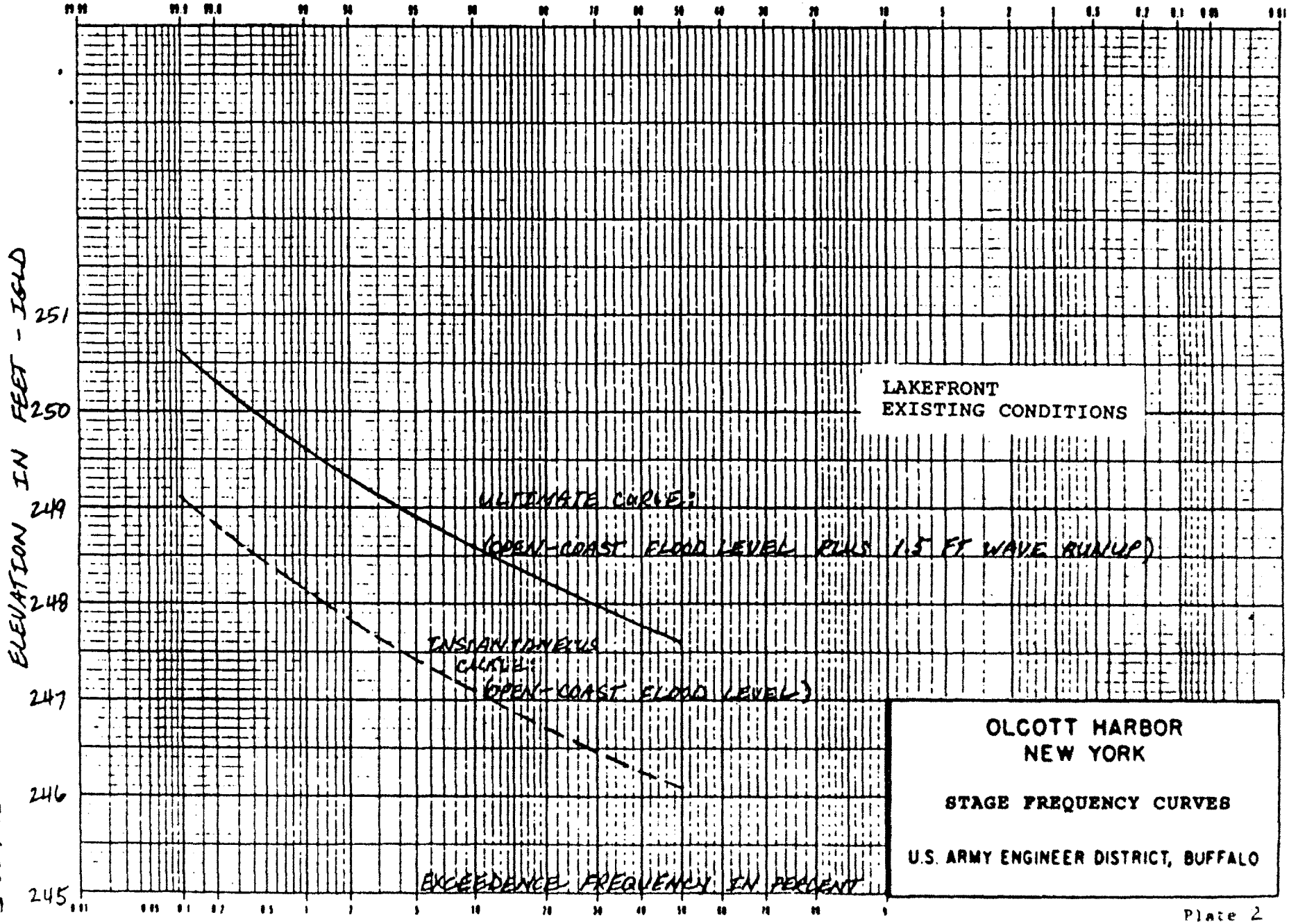

**OLCOTT HARBOR**
**NEW YORK**

**STAGE DAMAGE CURVES**

**U.S. ARMY ENGINEER DISTRICT, BUFFALO**

Plate 1

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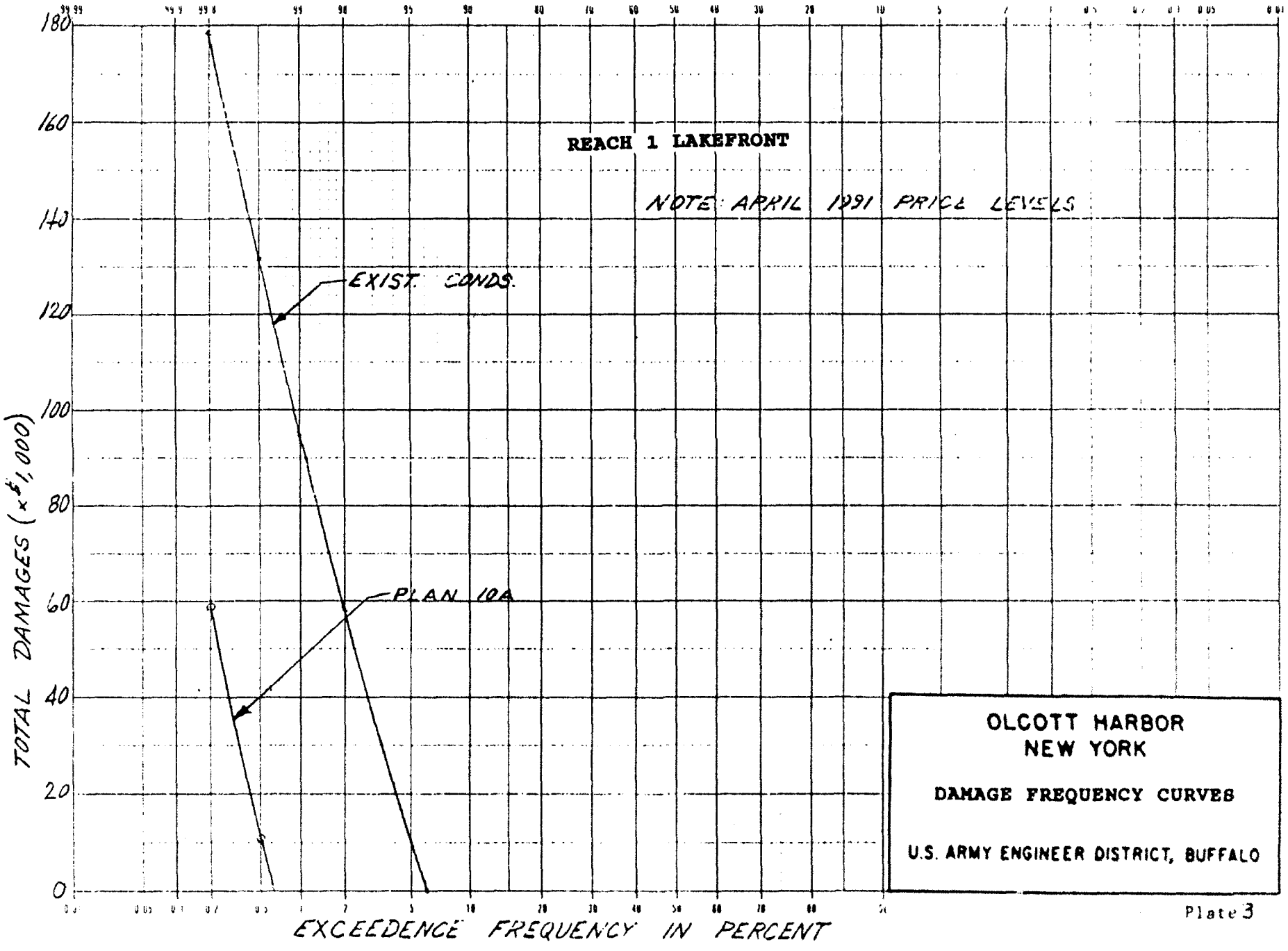



**OLCOTT HARBOR**
**NEW YORK**

**STAGE FREQUENCY CURVES**

**U.S. ARMY ENGINEER DISTRICT, BUFFALO**

PLATE 2




OLCOTT HARBOR
NEW YORK

DAMAGE FREQUENCY CURVES

U.S. ARMY ENGINEER DISTRICT, BUFFALO

Plate 3

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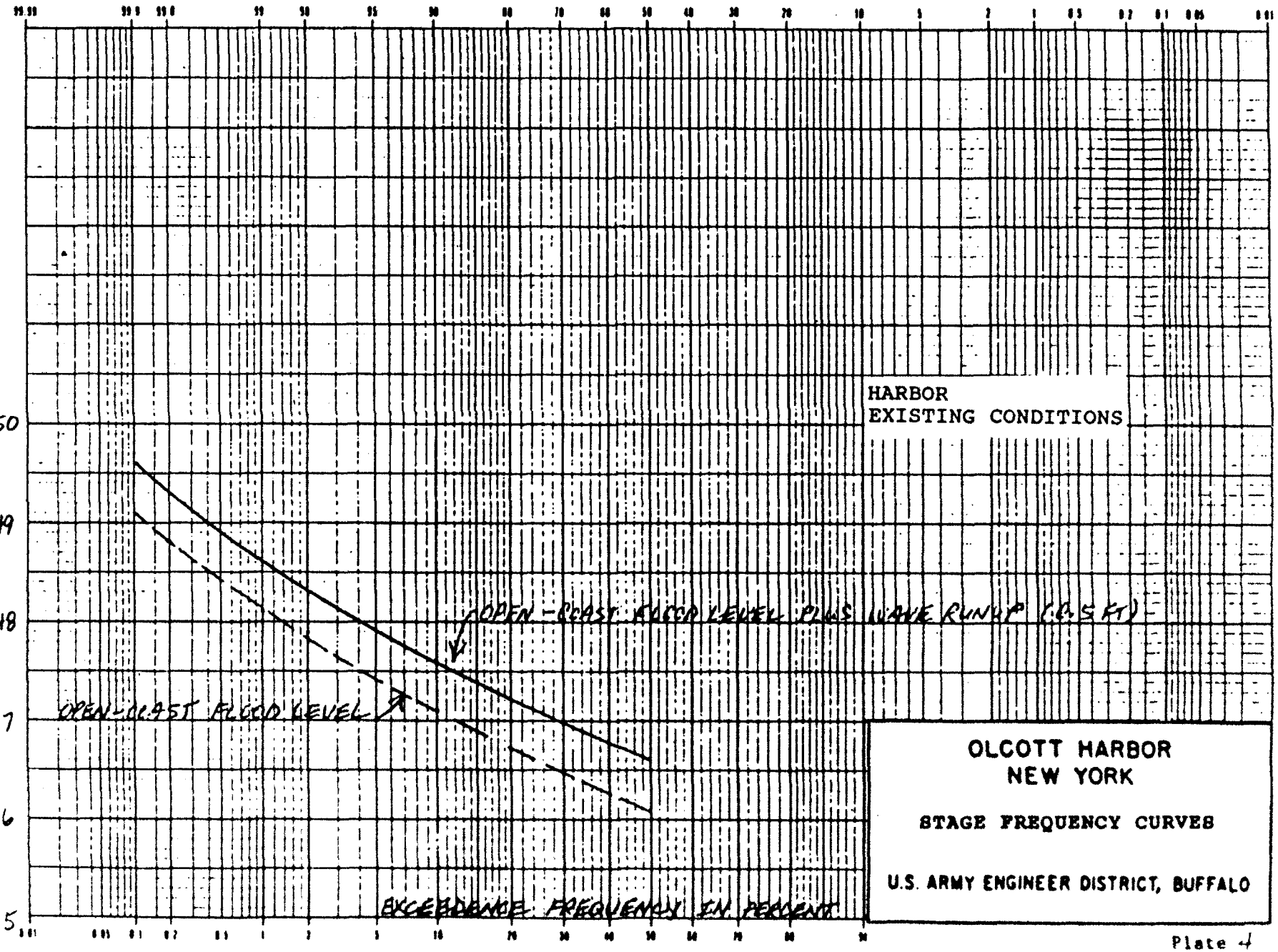
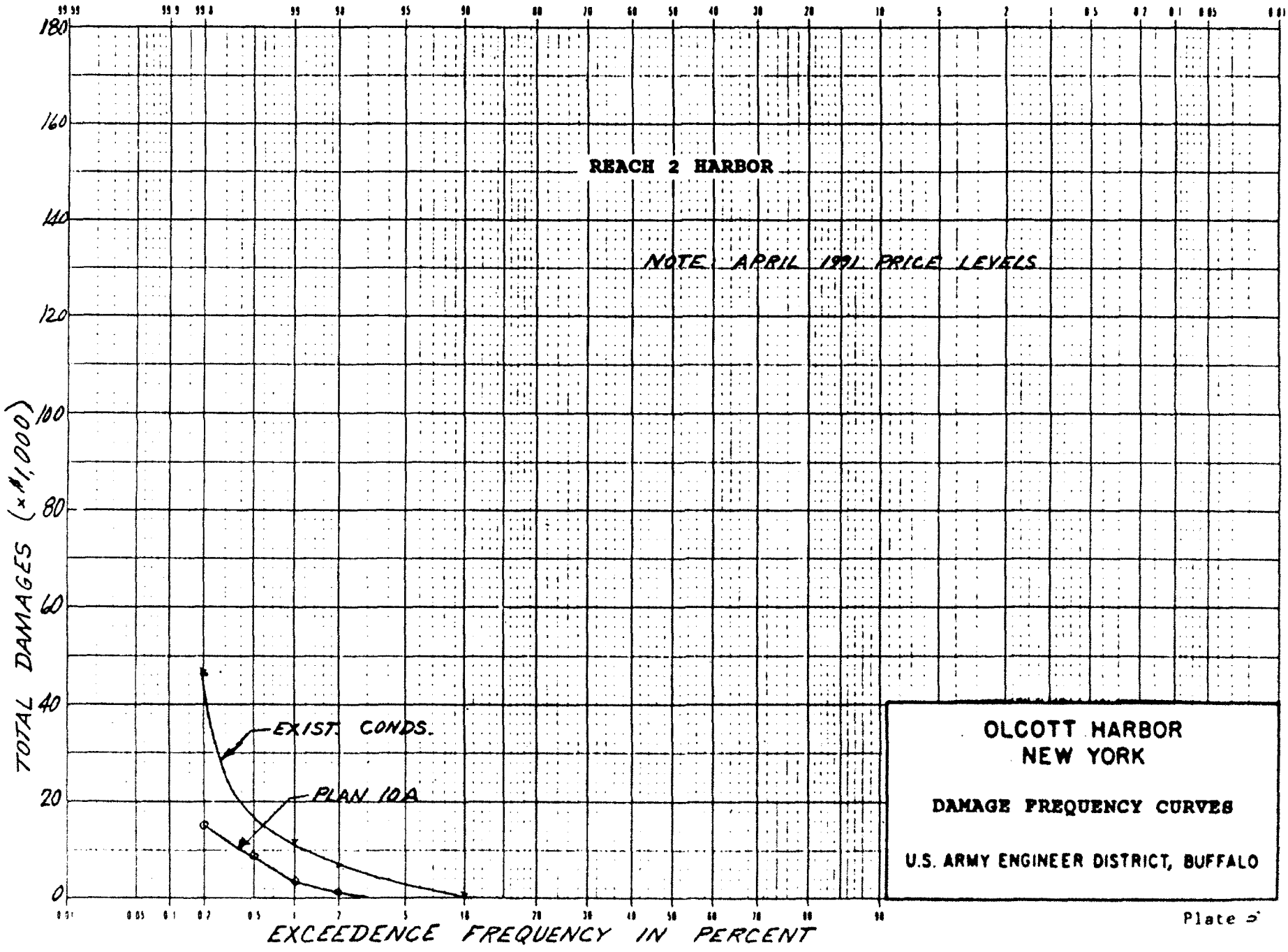



PLATE 4

Plate 4

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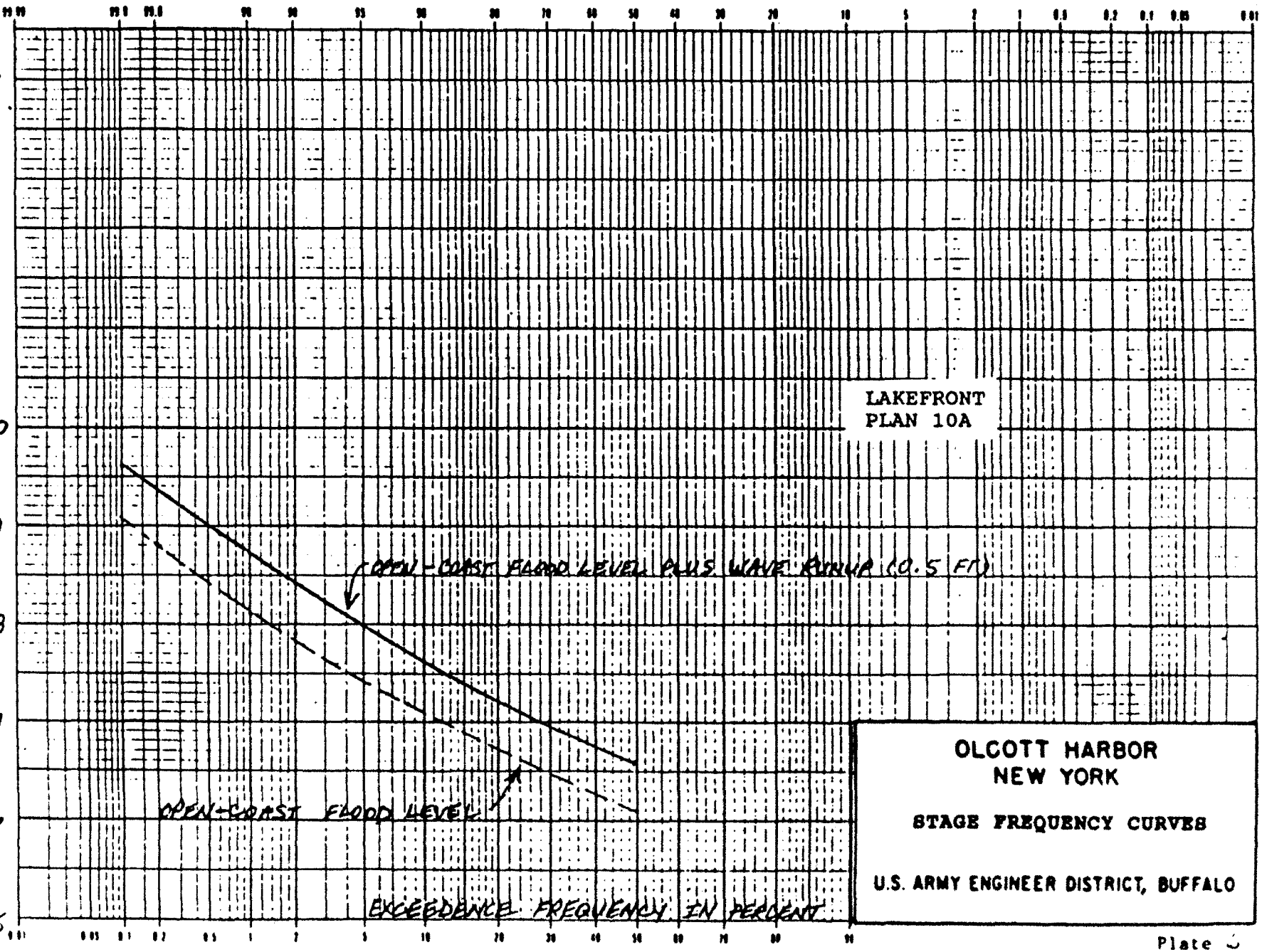

OLCOTT HARBOR
NEW YORK

DAMAGE FREQUENCY CURVES

U.S. ARMY ENGINEER DISTRICT, BUFFALO

Plate 5

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OLCOTT HARBOR
NEW YORK

STAGE FREQUENCY CURVES

U.S. ARMY ENGINEER DISTRICT, BUFFALO

Plate 6

Plate 6

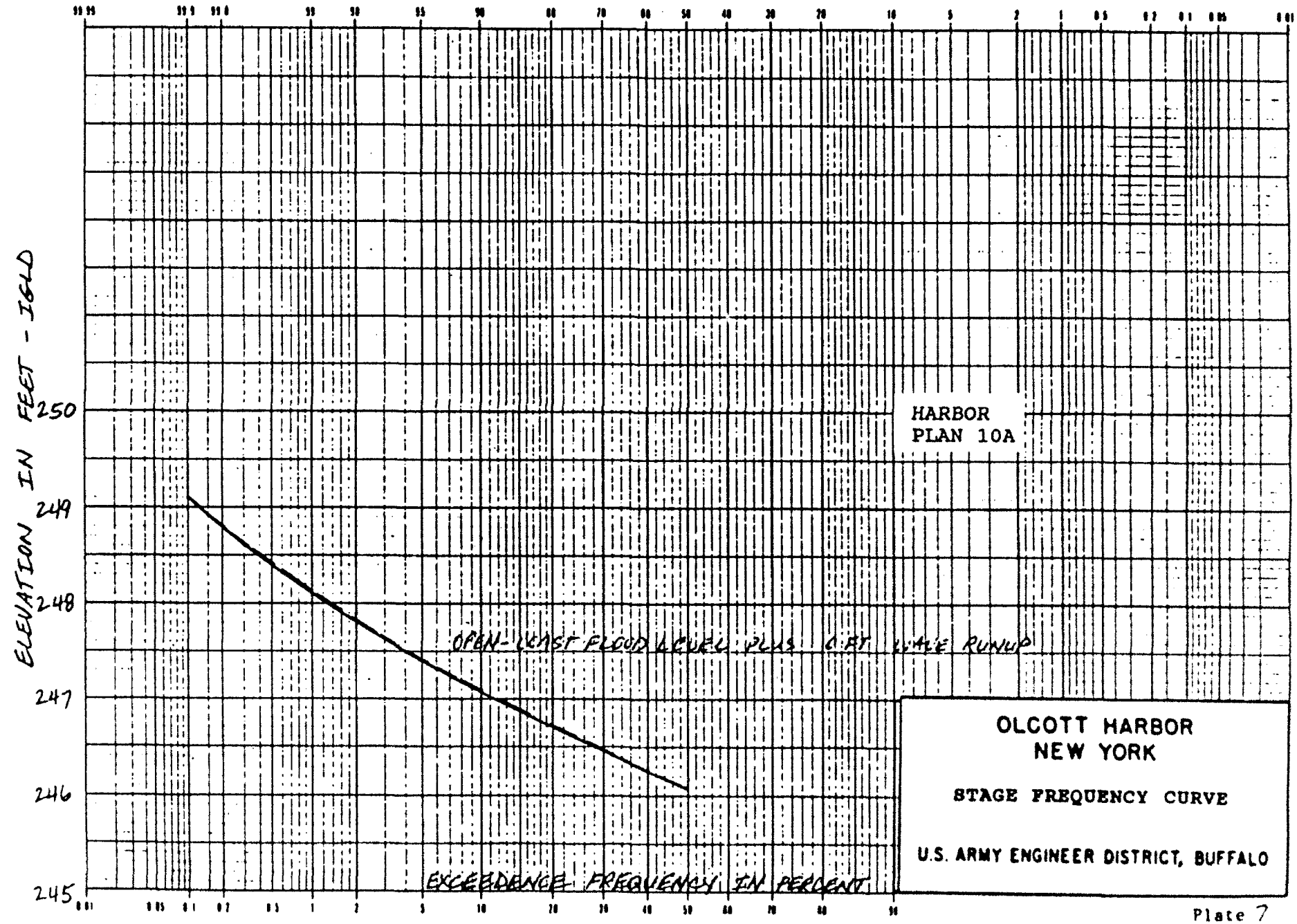
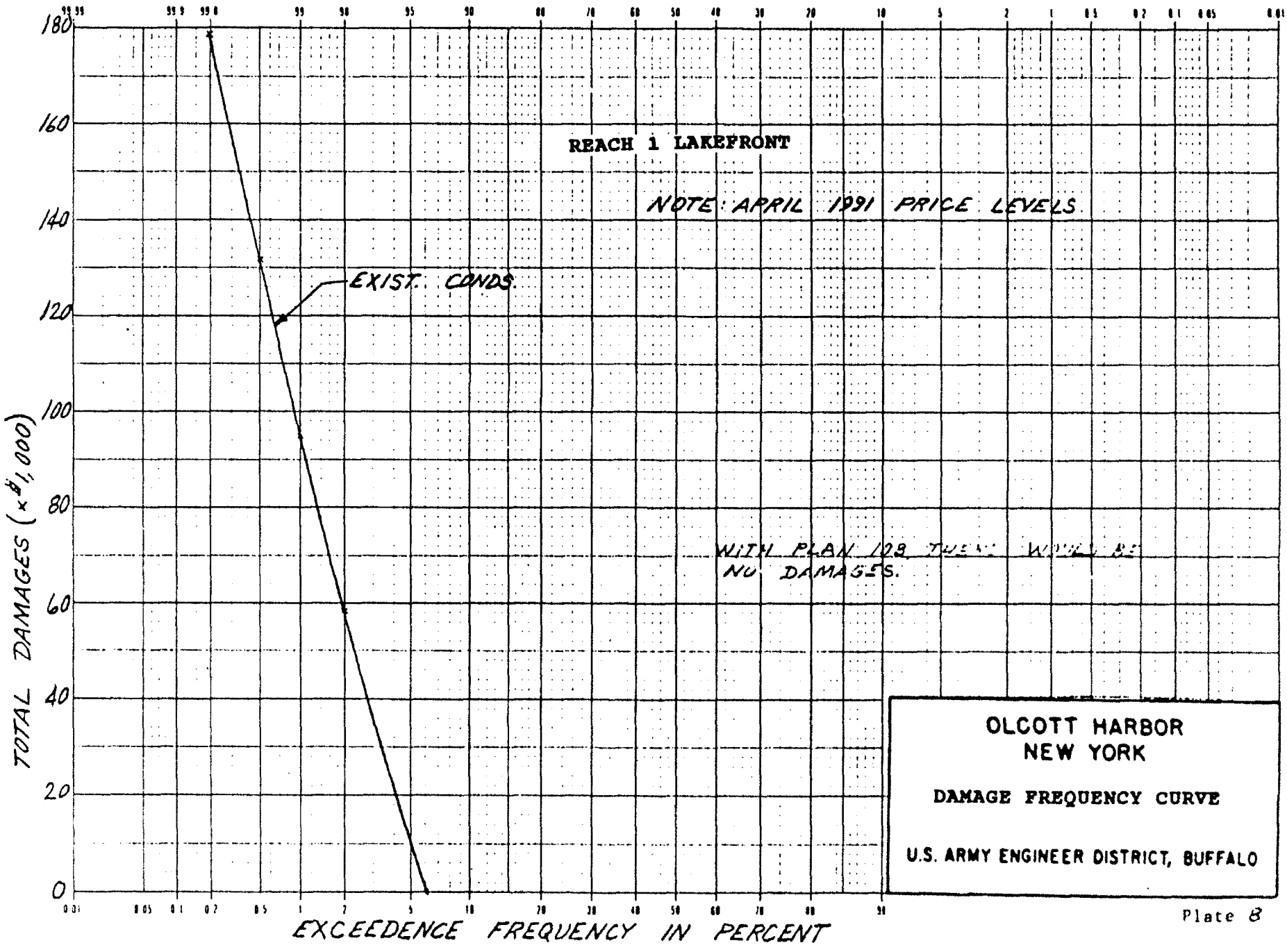



PLATE 7

Plate 7

PROBABILITY BY SB DIVISIONS AP 0756-GB



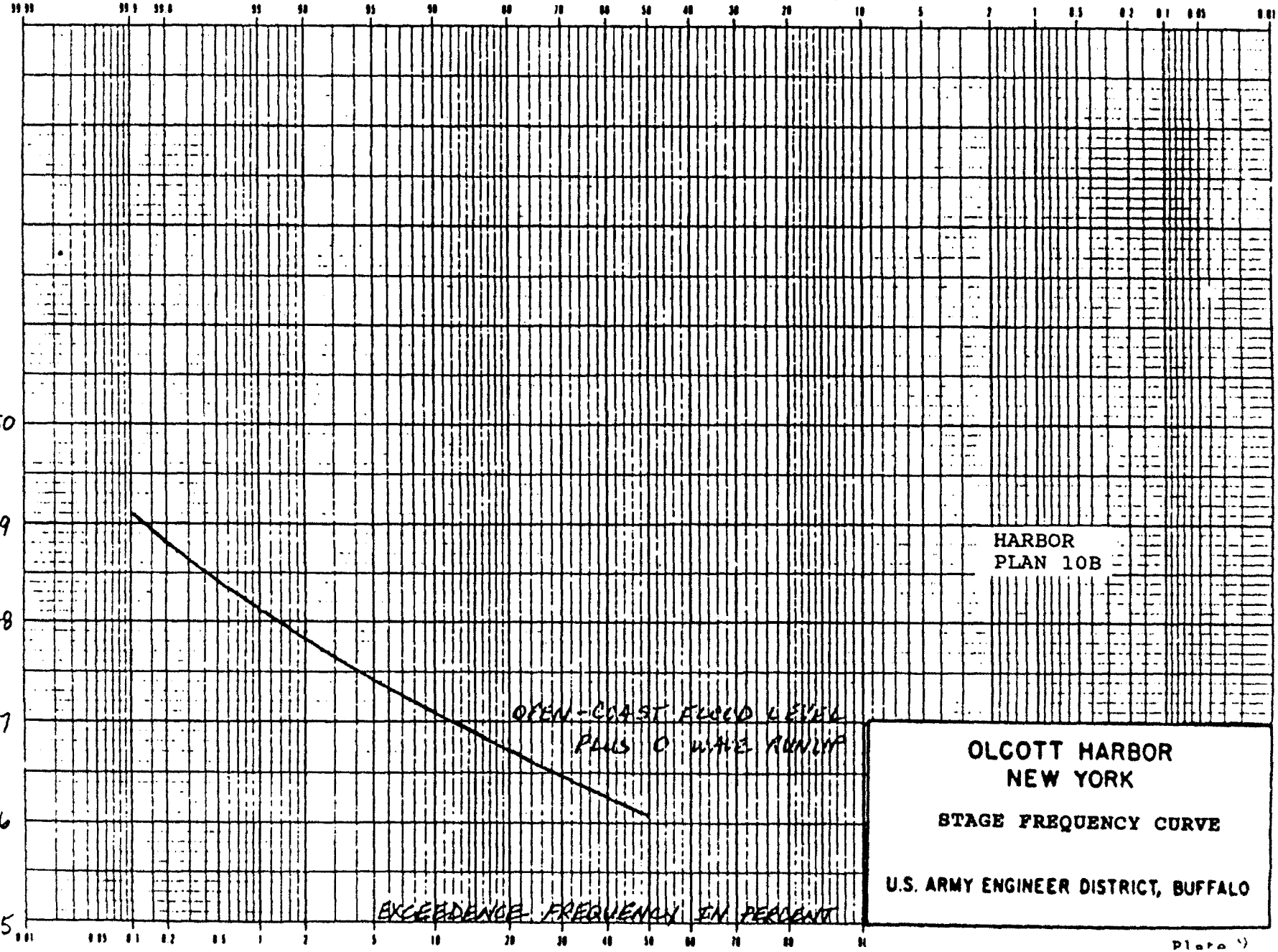

OLCOTT HARBOR
NEW YORK

DAMAGE FREQUENCY CURVE

U.S. ARMY ENGINEER DISTRICT, BUFFALO

Plate 8

GRAPHIC CONTROLS CORPORATION Buffalo New York
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# OLCOTT HARBOR
# NEW YORK

## STAGE FREQUENCY CURVE

U.S. ARMY ENGINEER DISTRICT, BUFFALO

PLATE 9

Plate 9

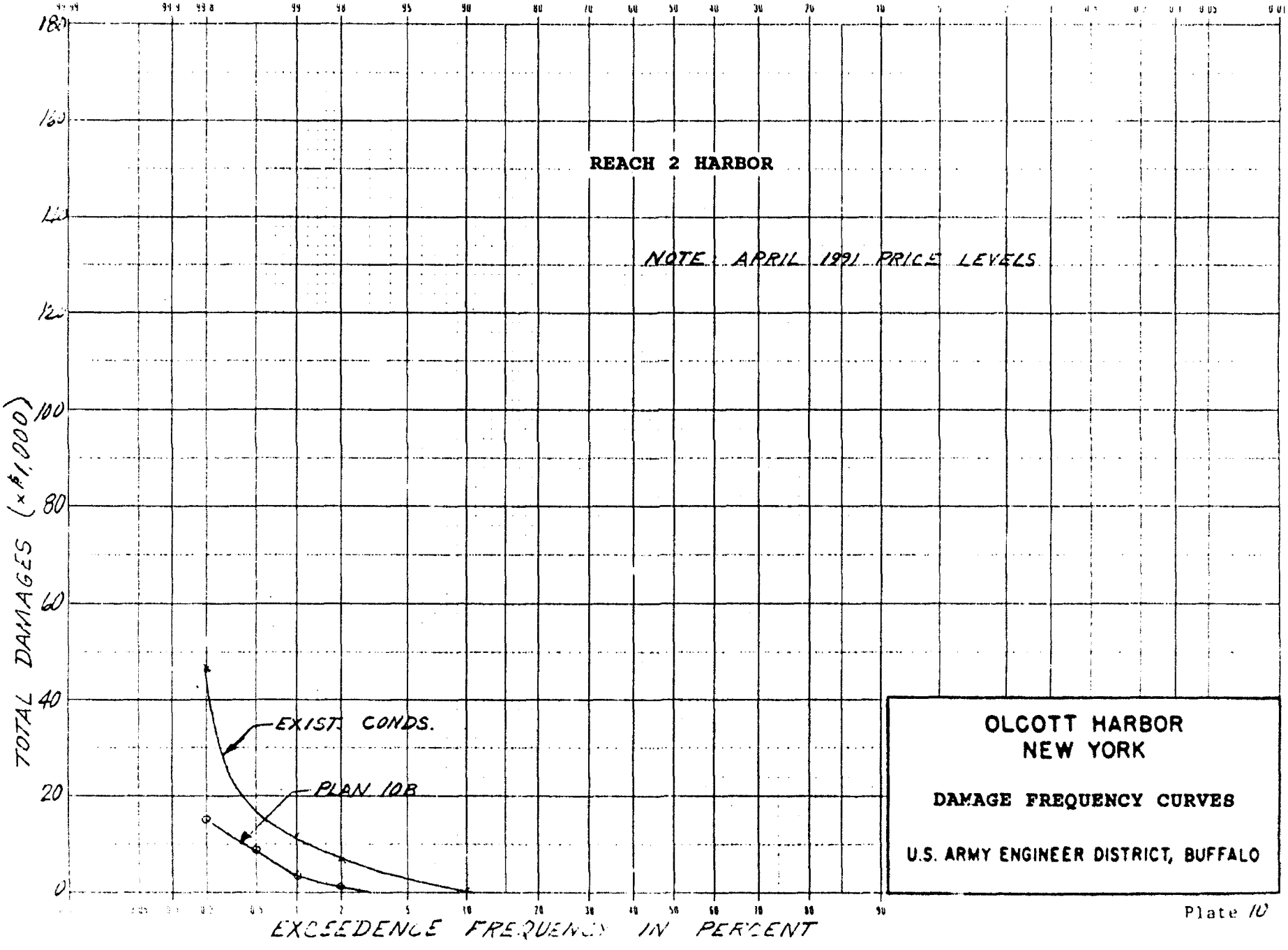

REACH 2 HARBOR
NOTE: APRIL 1991 PRICE LEVELS
TOTAL DAMAGES (x $1,000)
180
160
140
120
100
80
60
40
20
0
EXIST. CONDS.
PLAN 10B
99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90
EXCEEDENCE FREQUENCY IN PERCENT
OLCOTT HARBOR
NEW YORK
DAMAGE FREQUENCY CURVES
U.S. ARMY ENGINEER DISTRICT, BUFFALO

Plate 10

# Appendix E

## GENERAL CORRESPONDENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, New York 13045

December 29, 1992

**Memorandum**

To: Regional Environmental Officer, Boston, MA

From: Acting Field Supervisor, New York Field Office, Cortland, NY, for Regional Director, Hadley, MA

Subject: Review of Draft Reevaluation Report with Draft Supplemental Environmental Impact Statement for the Olcott Harbor Project at Olcott, Niagara County, New York (ER#-92/1035)

In accordance with Mr. Deason's memorandum of November 10, 1992, attached is our suggested compilation to represent the Department of the Interior's comments on the subject document.

We received responses of no comment from the National Park Service, Geological Survey, and Bureau of Mines.

Carl W. Schwartz

Attachment

cc: FWS, BFA (ERT), Washington, DC
COE, Buffalo, NY (Attention: Tod Smith)

Exhibit A

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL AFFAIRS
O'NEILL FEDERAL OFFICE BUILDING - ROOM 1022
10 CAUSEWAY STREET
BOSTON, MASSACHUSETTS 02222-1035

ER#-92/1035

Colonel John W. Morris
District Engineer, Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Colonel Morris:

The Department of the Interior has reviewed the September 1992, Draft Reevaluation Report with Draft Supplemental Environmental Impact Statement for the Olcott Harbor Project at the Hamlet of Olcott, Town of Newfane, Niagara County, New York.

The document is complete in its description of the proposed project and contains all previous U.S. Fish and Wildlife Service (Service) correspondence and recommendations. It is our understanding that, because of current policy constraints, Refined Plan 10A Modified cannot be approved for Federal construction, and that the current recommended plan is No Federal Action.

Pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) the Department of the Interior concurs with the recommendation for No Federal Action.

Thank you for the opportunity to comment on this document. Please inform the Service's New York Field Office of any future revisions of this project and/or your recommendation.

Sincerely,

William Patterson
Regional Environmental Officer

MAILROOM
CENCB-IM-S
4 JAN 93 11 04

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, NEW YORK 10278

DEC 28 1992

Colonel John W. Morris, District Engineer
Buffalo District
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

Class: LO

Dear Colonel Morris:

The Environmental Protection Agency (EPA) has reviewed the draft supplement to the final environmental impact statement (DSEIS), including the associated preconstruction engineering and design phase re-evaluation report, for navigation improvements at Olcott Harbor, Niagara County, New York. This review was conducted in accordance with Section 309 of the Clean Air Act, as amended (42 U.S.C. 7609, PL 91-604 12[a] 84 Stat. 1709), and the National Environmental Policy Act.

The prior EIS, issued in 1978, recommended modifications to the harbor, including construction of offshore breakwaters, pier modification, channel deepening and extension, and recreational pier fishing facilities. Since that time, however, the physical environment of the harbor has changed as have environmental requirements, and economic, engineering, and social considerations. Accordingly, a re-evaluation of the project was deemed necessary.

The DSEIS's preferred alternative (modified plan 10A) involves the construction of: detached and shore-connected breakwaters northeast of the U.S. East Pier; a detached breakwater northwest of the prese[illegible]bor entrance; and an entrance channel between breakwaters [illegible]ced to an access channel leading to a mooring basin east of the U.S. East Pier. The existing navigation channels have been found to be of sufficient dimension so that no initial dredging of the new entrance and access channels and no new dredging in existing channels will be required for the construction of the preferred alternative. Dredging to maintain the authorized and/or minimum depth will be required as necessary.

However, the DSEIS's conclusion with respect to the preferred alternative conflicts with that of the re-evaluation report. Specifically, the re-evaluation report concludes that because this alternative does not meet with Department of the Army policy requirements (to provide for commercial navigation and/or flood damage reduction), the final recommendation for the project is no action.

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Exhibit B

Throughout our involvement with this project, we have expressed concerns about the dredging and open lake disposal of Inner Harbor (Eighteenmile Creek) sediments. Our concerns centered around the testing methodology and the high contaminant levels and high mortalities in the bioassay results from the Inner Harbor sediments. The DSEIS states that for both the preferred alternative, and the recommended no-action, dredging of the Inner Harbor is no longer being considered. Given this, we remove our previous objects to the project. However, if dredging is again considered for the Inner Harbor in the future, we would like to continue to work with you to ensure that appropriate testing protocols and criteria are performed on the sediment.

In a related matter, the DSEIS states that only periodic maintenance dredging of the existing federal channel will be performed. Further, because sedimentation is low in the federal channel, the need for maintenance dredging will be infrequent and minor. The federal channel is located in the outside portion of the Harbor and previous sediment data show that the bottom consists of coarse-grained material with minimal amounts of contaminants and low bioassay mortality levels. Therefore, we do not believe that this routine dredging with open lake disposal will have adverse environmental impacts.

In conclusion, EPA believes that implementation of either the DSEIS preferred alternative (modified plan 10A) or no action will not result in any significant adverse environmental impacts. Therefore, in accordance with EPA policy, we have rated this project as LO, indicating that we do not object to implementation of either of these alternatives. We request, however, that the final supplemental EIS identify the appropriate preferred alternative for the project.

Should you have any questions, please contact Ms. Laura J. Livingston, Assistant Branch Chief, Environmental Impacts Branch, at (212) 264-8428.

Sincerely yours,

Robert W. Hargrove, Chief
Environmental Impacts Branch

STATE OF NEW YORK
DEPARTMENT OF STATE
ALBANY, N.Y. 12231-0001

GAIL S. SHAFFER
SECRETARY OF STATE

December 24, 1992

Mr. Tod Smith
U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, New York 14207-3199

Re: Olcott Harbor Project, Main Report and Supplemental Environmental Impact Statement Volume 1, August, 1991 (Revised, September, 1992).

Dear Mr. Smith:

Thank you for sending the Department of State a copy of the above referenced document for review and comment. The Department has reviewed the Supplement to the Final Environmental Impact Statement and Consistency Determination Report. The following comments, questions and enclosures are provided for your consideration. Please note, although the majority of the policies have been addressed, policies #5, 7, 19, 21, and 30 would be emphasized should a formal consistency determination be performed.

DEVELOPMENTAL POLICIES

POLICY #1. RESTORE, REVITALIZE, AND REDEVELOP DETERIORATED AND UNDERUTILIZED WATERFRONT AREAS FOR COMMERCIAL, INDUSTRIAL, CULTURAL, RECREATIONAL, AND OTHER COMPATIBLE USES.

As noted in (1) (f) of this policy, "waterfront development meant to serve consumer needs would be inappropriate in an area where no increased consumer demands were expected. .. " As boating is a seasonal recreation, would the proposed associated facilities be closed during the winter months? Is the permanent resident population of Newfane large enough to support the associated facilities during the non-tourist season? If this facility were to be operational for only one half of the year, the scale of this project may be considered as inappropriate. What is the geographical area from which customers could be expected to frequent the marina?

Exhibit C

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POLICY #2. FACILITATE THE SITING OF WATER-DEPENDENT USES AND FACILITIES ON OR ADJACENT TO COASTAL WATERS.

Clearly, construction of the proposed rubblemound breakwater would facilitate the siting of water-dependent recreational activities. However, this construction would only enhance water dependent uses related to support of 800 recreational vessels. As stated in Policy #2., Providing for expansion, "A primary objective of the policy is to create a process by which water dependent uses, including commercial uses, can be accommodated well into the future." What land areas remain for future expansion of uses?

POLICY #4. STRENGTHEN THE ECONOMIC BASE OF SMALLER HARBOR AREAS BY ENCOURAGING THE DEVELOPMENT AND ENHANCEMENT OF THOSE TRADITIONAL USES AND ACTIVITIES WHICH HAVE PROVIDED SUCH AREAS WITH THEIR UNIQUE MARITIME IDENTITY.

As stated on page SEIS-18., 2.41 Local Docking and Upland Facilities, "Transient docking along the existing channel entrance piers will be restricted to protect existing fisherman access and fishing areas." However, it appears that water dependent commercial fishing would be deemphasized by the construction of this recreational supportive breakwater. Please consider modifying Plan 1OA in order to enhance the existing commercial fishing industry in Lake Ontario? For example, fish processing activities as well as an open dockside fish market would enhance the existing commercial fishing industry of Lake Ontario. This type of retail/industrial activity would complement the intended recreational development.

POLICY #5. ENCOURAGE THE LOCATION AND DEVELOPMENT IN AREAS WHERE PUBLIC SERVICES AND FACILITIES ESSENTIAL TO SUCH DEVELOPMENT ARE ADEQUATE.

On page SEA-D-1 of the Consistency Determination Report, the Compliance Statement for Policy #5 states that "the Olcott area is sufficiently developed and has sufficient resources to facilitate public services and facilities essential to the proposed development. " Would the existing municipal sewage disposal system be of adequate capacity to treat septage from a potential 800 marine sanitation devices as well as the associated upland development? If not, would the Town of Newfane have the resources to upgrade the plant in order to treat the additional sewage?

FISH AND WILDLIFE POLICIES

POLICY #7. SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS WILL BE PROTECTED, PRESERVED, AND WHERE PRACTICAL, RESTORED SO AS TO MAINTAIN THEIR VIABILITY AS HABITATS.

The compliance statement 6 (b), page SEA-D-2., states that "the final project design would not significantly adversely affect the Lake Ontario salmonid fishery runs up Eighteenmile Creek."

Support for this is cited on page SEIS-33 within a discussion of NYSDEC stocking programs construction scheduling considerations. However, there is no discussion regarding actual disturbance of migratory runs resulting from the existence of a potential 800 vessels and two rubblemound breakwaters. Please elaborate on this important significant habitat issue.

POLICY #8. PROTECT FISH AND WILDLIFE RESOURCES IN THE COASTAL AREA FROM THE INTRODUCTION OF HAZARDOUS WASTES AND OTHER POLLUTANTS WHICH BIO-ACCUMULATE IN THE FOOD CHAIN.

Although the installation of inert rock material and poured concrete would not necessarily introduce hazardous waste into the harbor, the resultant increase in vessel use would present unavoidable contamination events emanating from accidental hydrocarbon spills and bilge discharge. An analysis of bioaccumulation from potential routine and accidental discharges should be performed for the proposed 800 vessels in order to effectively address consistency with Policy #8.

POLICY #9. EXPAND RECREATIONAL USE OF FISH AND WILDLIFE RESOURCES IN COASTAL AREAS BY INCREASING ACCESS TO EXISTING RESOURCES SUPPLEMENTING EXISTING STOCKS, AND DEVELOPING NEW RESOURCES.

As stated in guideline (2) of Policy #9., "Efforts to increase access to recreational fish and wildlife resources should not lead to over-utilization of that resource or cause impairment of the habitat." In addition, "increased human presence can deter animals from using the habitat area. Aside from a general discussion of stocking issues, the effect of 800 vessels on fish resources has not been sufficiently addressed in the Compliance Statement 8(b).

FLOODING AND EROSION HAZARD POLICIES

POLICY #11. ACTIVITIES OR DEVELOPMENT IN THE COASTAL AREA WILL BE UNDERTAKEN SO AS TO MINIMIZE DAMAGE TO PROPERTY AND THE ENDANGERING OF HUMAN LIVES CAUSED BY FLOODING AND EROSION.

As the proposed breakwater has been designed for the purpose of safe harborage for recreational boating activity and associated development, the only area of the entire coast of the Town of Newfane receiving protection would be the area of the proposed marina. Have any other portions of the Town of Newfane coastline been considered for erosion protection concurrent with the proposed construction of Plan 10A, Variation 16? How would future associated water dependent development outside of the immediate area of the proposed harbor be protected from erosion?

POLICY #12. ACTIVITIES OR DEVELOPMENT IN THE COASTAL AREA WILL BE UNDERTAKEN SO AS TO MINIMIZE DAMAGE TO NATURAL RESOURCES AND PROPERTY FROM FLOODING AND EROSION BY PROTECTING NATURAL PROTECTIVE FEATURES INCLUDING BEACHES, DUNES, BARRIER ISLANDS AND BLUFFS.

As noted on page 1-10 of the Main Report, in section (a). Physiography/Topography, "The northerly third is characterized by a narrow beach at the base of a bluff fronting the lake. " Would construction of the breakwater protect all portions of the bluffs or only in the area behind the breakwater? The discussion of accretion in the compliance statement is noted, however, would construction of the breakwater cause increased erosion of the bluffs in areas west and east of the Olcott Harbor?

POLICY #13. THE CONSTRUCTION OR RECONSTRUCTION OF EROSION PROTECTION STRUCTURES SHALL BE UNDERTAKEN ONLY IF THEY HAVE A REASONABLE PROBABILITY OF CONTROLLING EROSION FOR AT LEAST THIRTY YEARS.

As this proposed recreational development in the Town of Newfane is solely dependent on the construction of the breakwater, an estimation of longevity and future maintenance requirements should be included for a period of time in excess of thirty years. Construction of a project of this scale would affect the community for an indefinite period of time. As future maintenance and repairs of the proposed breakwater would likely be required, description of work and estimation of cost should be included.

POLICY #15. MINING, EXCAVATION OR DREDGING IN COASTAL WATERS SHALL NOT SIGNIFICANTLY INTERFERE WITH THE NATURAL COASTAL PROCESSES WHICH SUPPLY BEACH MATERIALS TO LAND ADJACENT TO SUCH WATERS AND SHALL BE UNDERTAKEN IN A MANNER WHICH WILL NOT CAUSE AN INCREASE IN EROSION OF SUCH LAND.

As mentioned on page SEA-B-12, dredging would not be required to construct the proposed project. However, as noted in correspondence from Charles E. Gilbert P.E. to Robert Hargrove on page 7 of SEA-E Environmental Correspondence, it appears that a total of 25, 000 cubic yards of various materials would be dredged from five sites within the project area. Please clarify. Did the original model breakwater studies address the proposed removal of 25,000 cubic yards of material?

PUBLIC ACCESS POLICIES

POLICY #19. PROTECT, MAINTAIN, AND INCREASE THE LEVEL AND TYPES OF ACCESS TO PUBLIC WATER-RELATED RECREATION RESOURCES AND FACILITIES.

Policy #19 discusses elimination of increased public access in the future including, "Construction of private facilities which physically prevent the provision of convenient public access to public water-related recreation resources or facilities from public lands and facilities." Unfortunate, unforseen financial difficulties which would cause an increase in berthing fee may eliminate use of the facility for the moderate income recreational boater. In addition, as the proposed marina will include the majority of the space behind the breakwater, exclusion of access to what is presently accessible to all recreational boaters may be considered to be in conflict with this policy.

POLICY #20. ACCESS TO THE PUBLICLY-OWNED FORESHORE AND TO LANDS IMMEDIATELY ADJACENT OF THE FORESHORE OR THE WATER'S EDGE THAT ARE PUBLICLY-OWNED SHALL BE PROVIDED AND IT SHALL BE PROVIDED IN A MANNER COMPATIBLE WITH ADJOINING USES.

Would facilities such as benches be provided for the immediate docking area of the proposed project? Installation of such facilities along the waterfront to the east and west of the proposed marina tower should be included to insure and enhance public access to the marina for the non-boat owning population.

RECREATIONAL POLICY

POLICY #21. WATER-DEPENDENT AND WATER-ENHANCED RECREATION WILL BE ENCOURAGED AND FACILITATED, AND WILL BE GIVEN PRIORITY OVER NON-WATER-RELATED USE ALONG THE COAST.

As stated in the Explanation of Policy, water-related recreation should occur "Provided the development of water-related recreation is consistent with the preservation and enhancement of such important coastal resources as fish and wildlife habitats. . ." As mentioned in the discussion of Policy #7, the supplemental environmental impact statement does not address potential fish migration interference which would result from the presence of 800 vessels. Until this impact can be determined, consistency with Policy #21 cannot be assured.

POLICY #22. DEVELOPMENT WHEN LOCATED ADJACENT TO THE SHORE WILL PROVIDE FOR WATER-RELATED RECREATION WHENEVER SUCH USE IS COMPATIBLE WITH REASONABLE ANTICIPATED DEMAND FOR SUCH ACTIVITIES AND IS COMPATIBLE WITH REASONABLY ANTICIPATED DEMAND FOR SUCH ACTIVITIES, AND IS COMPATIBLE WITH THE PRIMARY PURPOSE OF THE DEVELOPMENT.

As seen in the Table of Contents and on page 1-7, the discussion of anticipated demand is included in Appendix C which is included in Volume II of this draft report. Please submit

Volume II for review. Until this information is made available, anticipated demand cannot be determined. Please refer to comments address in Policy #1 of this document.

HISTORIC AND SCENIC RESOURCES POLICIES

POLICY #23. PROTECT, ENHANCE AND RESTORE STRUCTURES, DISTRICTS, AREAS OR SITES THAT ARE OF SIGNIFICANT IN THE HISTORY OF THE STATE.

As noted on page SEIS 10, and 12 of the supplemental environmental impact statement, should this project be constructed, the portion of the breakwater to the most eastern side of the proposed project is to be constructed over remains of a hotel pier. In addition, page SEIS-46 states that in 1935, the hotel was destroyed by fire and only part of the old pier remains. Please clarify whether this structure has been considered in the evaluation of historical significance within this proposed project area?

POLICY #25. PROTECT, RESTORE OR ENHANCE NATURAL AND MAN-MADE RESOURCES WHICH ARE NOT IDENTIFIED AS BEING OF STATEWIDE SIGNIFICANCE, BUT WHICH CONTRIBUTE TO THE OVERALL SCENIC QUALITY OF THE COASTAL AREA.

Although not considered to be an area of statewide significance, how would construction of the proposed boardwalk at the base of the bluffs affect overall scenic quality of the shoreline?

AGRICULTURAL LANDS POLICY

POLICY #26. CONSERVE AND PROTECT AGRICULTURAL LANDS IN THE STATE'S COASTAL AREA.

Plate 1.4, Olcott Harbor Land Use Map includes areas designated as Agricultural. Figure 9, page SEIS-19 indicates that this area would be used as parking to support the proposed marina. However, the Compliance Statement states "It is not expected that any important agricultural lands or activities will be affected by the proposed project implementation." Please clarify. It is not clear whether the lands proposed to be used for parking are presently utilized for farming.

WATER AND AIR RESOURCES POLICIES

POLICY #30. MUNICIPAL, INDUSTRIAL, AND COMMERCIAL DISCHARGE OF POLLUTANTS, INCLUDING BUT NOT LIMITED TO, TOXIC AND HAZARDOUS SUBSTANCES, INTO COASTAL WATERS WILL CONFORM TO STATE AND NATIONAL WATER QUALITY STANDARDS.

The Compliance Statement suggests that "although some minor leakage of fluids may occur (i. e., small boat motor oil, grease), no significant introduction of hazardous or pollutant waste, or associated significant adverse impacts, would be expected due to proposed project implementation." It is difficult to imagine that the introduction of bilge water or motor oil leakage from 800 vessels would not have an adverse affect. A calculation as to total potential discharge should be included in this document. In addition, emergency response to an oil spill or related catastrophic event should be addressed. Although probably infrequent, this type of event would have an enormous adverse impact on the harbor.

POLICY #31. STATE COASTAL AREA POLICIES AND MANAGEMENT OBJECTIVES OF APPROVED LOCAL WATERFRONT REVITALIZATION PROGRAMS WILL BE CONSIDERED WHILE REVIEWING COASTAL WATER CLASSIFICATIONS AND WHILE MODIFYING WATER QUALITY STANDARDS; HOWEVER, THOSE WATERS ALREADY OVERBURDENED WITH CONTAMINANTS WILL BE RECOGNIZED AS BEING A DEVELOPMENT CONSTRAINT.

Please see comments regarding policy #30.

POLICY #33. BEST MANAGEMENT PRACTICES WILL BE USED TO ENSURE THE CONTROL OF STORMWATER RUNOFF AND COMBINED SEWER OVERFLOW DRAINING INTO COASTAL WATER.

Although not addressed in the consistency determination report, a discussion of stormwater runoff should be included in the draft main report. Clearly the proposed construction of the associated upland facilities would produce runoff which would have an adverse affect on the surrounding upland and shoreline. This item must be addressed within the supplemental report.

POLICY #34. DISCHARGE OF WASTE MATERIALS INTO COASTAL WATERS FROM VESSELS SUBJECT TO STATE JURISDICTION WILL BE LIMITED SO AS TO PROTECT SIGNIFICANT FISH AND WILDLIFE HABITATS, RECREATIONAL AREAS AND WATER SUPPLY AREAS.

Please see comments regarding policy #30.

POLICY #35. DREDGING AND DREDGE SPOIL DISPOSAL IN COASTAL WATERS WILL BE UNDERTAKEN IN A MANNER THAT MEETS EXISTING STATE DREDGING PERMIT REQUIREMENTS, AND PROTECTS SIGNIFICANT FISH AND WILDLIFE HABITATS, SCENIC RESOURCES, NATURAL PROTECTIVE FEATURES, IMPORTANT AGRICULTURAL LANDS, AND WETLANDS.

Although the consistency statement indicates that no adverse effects from dredging would occur due to the proposed project implementation, page SEIS-21, 2.47 indicates that with regard to maintenance dredging "past dredging and disposal measures, may or may not be the case in the future depending on sediment quality and associated disposal standards and options. " Future sediment sampling and testing results should be discussed in the Supplemental EIS; these concerns should be included in the consistency discussion. Presently, this consistency statement does not adequately address anticipated dredging of contaminated material.

POLICY #36. ACTIVITIES RELATED TO THE SHIPMENT AND STORAGE OF PETROLEUM AND OTHER HAZARDOUS MATERIALS WILL BE CONDUCTED IN A MANNER THAT WILL PREVENT OR AT LEAST MINIMIZE SPILLS INTO COASTAL WATERS; ALL PRACTICABLE EFFORTS WILL BE UNDERTAKEN TO EXPEDITE THE CLEANUP OF SUCH DISCHARGES; AND RESTITUTION FOR DAMAGES WILL BE REQUIRED WHEN THESE SPILLS OCCUR.

A consistency discussion should be included as accidental spills from marina related services such as fueling stations would have enormous adverse impact to the entire marina area.

POLICY #37. BEST MANAGEMENT PRACTICES WILL BE UTILIZED TO MINIMIZE NON-POINT DISCHARGE OF EXCESS NUTRIENTS, ORGANICS AND ERODED SOILS INTO COASTAL WATERS.

The compliance statement has been noted. However, a discussion of stormwater runoff from proposed parking facilities as a non- point source of contamination should be included in the supplement. Until specific shoreline developments and associated in sources are identified, the compliance statement is not complete.

POLICY #39. THE TRANSPORT, STORAGE, TREATMENT AND DISPOSAL OF SOLID WASTES, PARTICULARLY HAZARDOUS WASTES, WITHIN THE COASTAL AREA WILL BE CONDUCTED IN SUCH A MANNER SO AS TO PROTECT GROUNDWATER AND SURFACE WATER SUPPLIES, SIGNIFICANT FISH AND WILDLIFE HABITATS, RECREATION AREAS, IMPORTANT AGRICULTURAL LAND, AND SCENIC RESOURCES.

Although the compliance statement for Policy #35 has been referenced for this policy, emergency response should be addressed in the event of contamination due to accidental catastrophic failure of a hydrocarbon storage facility or hydrocarbon transport system.

POLICY #41. LAND USE OR DEVELOPMENT IN THE COASTAL AREA WILL NOT CAUSE NATIONAL OR STATE AIR QUALITY STANDARDS TO BE VIOLATED.

The compliance statement is noted. However, a discussion regarding air quality standards as a result of increased automobile traffic resulting from the project should be included.

POLICY #44. PRESERVE AND PROTECT TIDAL AND FRESHWATER WETLANDS AND RESERVE THE BENEFITS DERIVED FROM THESE AREAS.

The compliance statement is noted. However, a discussion of impact which would result from expansion into the Eighteenmile Creek Significant Habitat should be included in this supplemental document. In addition, as discussed in Policy #7, a clear determination of the overall impact of 800 vessels on existing upstream habitats has not been included. Such a determination should be made.

Although a compliance statement has been prepared for each of the forty-four policies, a detailed analysis of the actions and related policies which would present the greatest impact should be prepared. For example, the ultimate effect of the proposed project on fish and wildlife has not been fully explored; the compliance statement does not include a discussion of impact of a potential 800 vessels. In addition, an expanded discussion of Policy #5 should be included as public services are essential to development of this proposed project. Also, an expanded compliance statement should be included for Policy #19 as public access may not be available for the non-boat owning population. Please use this document to identify the policies which will be of greatest significance in any future review for consistency by this office.

Please be advised that this review of the Draft Main Report and Supplemental Environmental Impact Statement for the proposed Olcott Harbor Project is not a review for consistency with the State's forty-four policies. Rather, it is a collection of questions and comments drafted with regard to the consistency determination report included on page SEA-D-1 of the supplemental report.

We hope that these comments will be of assistance to the U.S. Army Corps of Engineers, Buffalo District. If you have any questions, do not hesitate to call me at (518) 474-6000.

Sincerely,

Walter F. Meyer
Coastal Resources Specialist

WFM/mm

# COASTAL FISH & WILDLIFE HABITAT RATING FORM

Name of Area: Eighteen Mile Creek - Lake Ontario

Designated: October 15, 1987

County: Niagara

Town(s): Newfane

7½' Quadrangle(s): Newfane, NY

| Score | Criterion |
|---|---|
| 16 | Ecosystem Rarity (ER)<br>One of about 10 major New York tributaries to Lake Ontario, and relatively undisturbed; rare in ecological subzone. |
| 0 | Species Vulnerability (SV)<br>No endangered, threatened or special concern species reside in the area. |
| 9 | Human Use (HU)<br>This is one of the most popular recreational fishing sites on Lake Ontario, of regional significance. |
| 6 | Population Level (PL)<br>One of the major salmonid spawning streams on Lake Ontario (ecological subzone). Geometric mean: $(4 \times 9)^{\frac{1}{2}}$ |
| 1.2 | Replaceability (R)<br>Irreplaceable |

SIGNIFICANCE VALUE = [( ER + SV + HU + PL ) X R]

= 37

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS PROGRAM
A PART OF THE NEW YORK COASTAL MANAGEMENT PROGRAM

## BACKGROUND

New York State's Coastal Management Program (CMP) includes a total of 44 policies which are applicable to development and use proposals within or affecting the State's coastal area. Any activity that is subject to review under Federal or State laws, or under applicable local laws contained in an approved local waterfront revitalization program will be judged for its consistency with these policies.

Once a determination is made that the proposed action is subject to consistency review, a specific policy aimed at the protection of fish and wildlife resources of statewide significance applies. The specific policy statement is as follows: "Significant coastal fish and wildlife habitats will be protected, preserved, and, where practical, restored so as to maintain their viability as habitats." The New York State Department of Environmental Conservation (DEC) evaluates the significance of coastal fish and wildlife habitats, and following a recommendation from the DEC, the Department of State designates and maps specific areas. Although designated habitat areas are delineated on the coastal area map, the applicability of this policy does not depend on the specific location of the habitat, but on the determination that the proposed action is subject to consistency review.

Significant coastal fish and wildlife habitats are evaluated, designated and mapped under the authority of the Coastal Management Program's enabling legislation, the Waterfront Revitalization and Coastal Resources Act (Executive Law of New York, Article 42). These designations are subsequently incorporated in the Coastal Management Program under authority provided by the Federal Coastal Zone Management Act.

This narrative, along with its accompanying map, constitutes a record of the basis for this significant coastal fish and wildlife habitat's designation and provides specific information regarding the fish and wildlife resources that depend on this area. General information is also provided to assist in evaluating impacts of proposed activities on parameters which are essential to the habitat's values. This information is to be used in conjunction with the habitat impairment test found in the impact assessment section to determine whether the proposed activities are consistent with the significant coastal habitats policy.

## DESIGNATED HABITAT: EIGHTEEN MILE CREEK - LAKE ONTARIO

### LOCATION AND DESCRIPTION OF HABITAT:

Eighteen Mile Creek empties into Lake Ontario at the hamlet of Olcott, in the Town of Newfane, Niagara County (7.5' Quadrangle: Newfane, N.Y.). The fish and wildlife habitat extends approximately one and one-half miles from the N.Y.S. Route 18 bridge to the Burt Dam, and includes the entire stream channel and associated wetlands and islands. Eighteen Mile Creek is a relatively large, meandering, warmwater stream, with predominantly silt and gravel substrates. The creek drains approximately 90 square miles of relatively flat agricultural and rural residential lands. Below the Burt Dam, Eighteen Mile Creek flows through a steep sided, undeveloped wooded gorge, where habitat disturbances are minimal. In contrast, the mouth of this Lake Ontario tributary has been extensively developed as a small boat harbor, including marinas, boat launches, and protective breakwalls extending out into the lake. Most of the land area bordering Eighteen Mile Creek is privately owned.

### FISH AND WILDLIFE VALUES:

Eighteen Mile Creek is the largest stream in Niagara County (aside from the lower Niagara River), and is one of about ten major tributaries in the Great Lakes Plain ecological region. Undisturbed tributary streams that provide habitat for major spawning runs by salmonids and other lake-based fish populations are especially important in this region. The extensive beds of emergent and submergent aquatic vegetation in this area account for an estimated 65 acres, comprising one of the largest coastal wetlands in the western portion of Lake Ontario.

Eighteen Mile Creek is particularly significant because large concentrations of coho and chinook salmon and brown trout migrate from Lake Ontario into the creek each fall, from late August through December (September - November, primarily), when salmonids ascend the streams to spawn (although unsuccessfully in most instances). In addition, steelhead (lake-run rainbow trout) migrate into Eighteen Mile Creek during the fall and between late February and April. These fish populations are the result of an ongoing effort by the NYSDEC to establish a major salmonid fishery in the Great Lakes through stocking. In both 1983 and 1984, approximately 200,000 chinook salmon and over 35,000 coho salmon were released in the creek. Eighteen Mile Creek was among the top ten Lake Ontario tributaries for numbers of salmonid stocks in 1984. Eighteen Mile Creek also contains a diverse warmwater fishery. The area supports substantial natural reproduction by smallmouth bass, northern pike, rock bass, black crappie, brown bullhead, and largemouth bass.

The wetlands and undisturbed woodlands bordering Eighteen Mile Creek provide valuable habitats for wildlife that are uncommon in Niagara County's coastal area. A variety of bird species inhabit the area, including great blue heron, green-backed heron, mallard, wood duck, belted kingfisher, marsh wren, common yellowthroat, red-winged blackbird, and swamp sparrow. Other wildlife species occurring along the creek include resident furbearers, such as muskrat, mink, and raccoon.

The fish and wildlife resources associated with Eighteen Mile Creek attract a significant amount of recreational use, although access to the area is limited

by the steep banks and private land ownership. This is one of the most popular recreational fishing streams on western Lake Ontario, due primarily to the large salmonid runs in the area. Fishing pressure is concentrated in the upper one-fourth miles of the area (between Fisherman's Park access sites and Burt Dam) and in the vicinity of Olcott Harbor. The intervening segment of the creek is often fished by small boat or canoe, especially for the abundant warmwater species in the area. Eighteen Mile Creek attracts many fishermen from as far away as Buffalo and Rochester. Local residents also utilize this area to a limited extent for waterfowl hunting and trapping.

**IMPACT ASSESSMENT:**

A habitat impairment test must be met for any activity that is subject to consistency review under federal and State laws, or under applicable local laws contained in an approved local waterfront revitalization program. If the proposed action is subject to consistency review, then the habitat protection policy applies, whether the proposed action is to occur within or outside the designated area.

The specific habitat impairment test that must be met is as follows.

> In order to protect and preserve a significant habitat, land and water uses or development shall not be undertaken if such actions would:
>
> - destroy the habitat; or,
> - significantly impair the viability of a habitat.

Habitat destruction is defined as the loss of fish or wildlife use through direct physical alteration, disturbance, or pollution of a designated area or through the indirect effects of these actions on a designated area. Habitat destruction may be indicated by changes in vegetation, substrate, or hydrology, or increases in runoff, erosion, sedimentation, or pollutants.

Significant impairment is defined as reduction in vital resources (e.g., food, shelter, living space) or change in environmental conditions (e.g., temperature, substrate, salinity) beyond the tolerance range of an organism. Indicators of a significantly impaired habitat focus on ecological alterations and may include but are not limited to reduced carrying capacity, changes in community structure (food chain relationships, species diversity), reduced productivity and/or increased incidence of disease and mortality.

The tolerance range of an organism is not defined as the physiological range of conditions beyond which a species will not survive at all, but as the ecological range of conditions that supports the species population or has the potential to support a restored population, where practical. Either the loss of individuals through an increase in emigration or an increase in death rate indicates that the tolerance range of an organism has been exceeded. An abrupt increase in death rate may occur as an environmental factor falls beyond a tolerance limit (a range has both upper and lower limits). Many environmental factors, however, do not have a sharply defined tolerance limit, but produce increasing emigration or death rates with increasing departure from conditions that are optimal for the species.

The range of parameters which should be considered in appplying the habitat impairment test include but are not limited to the following:

1. physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (including loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates;
2. biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; and,
3. chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, salinity, and pollutants (heavy metals, toxics and hazardous materials).

Although not comprehensive, examples of generic activities and impacts which could destroy or significantly impair the habitat are listed below to assist in applying the habitat impairment test to a proposed activity.

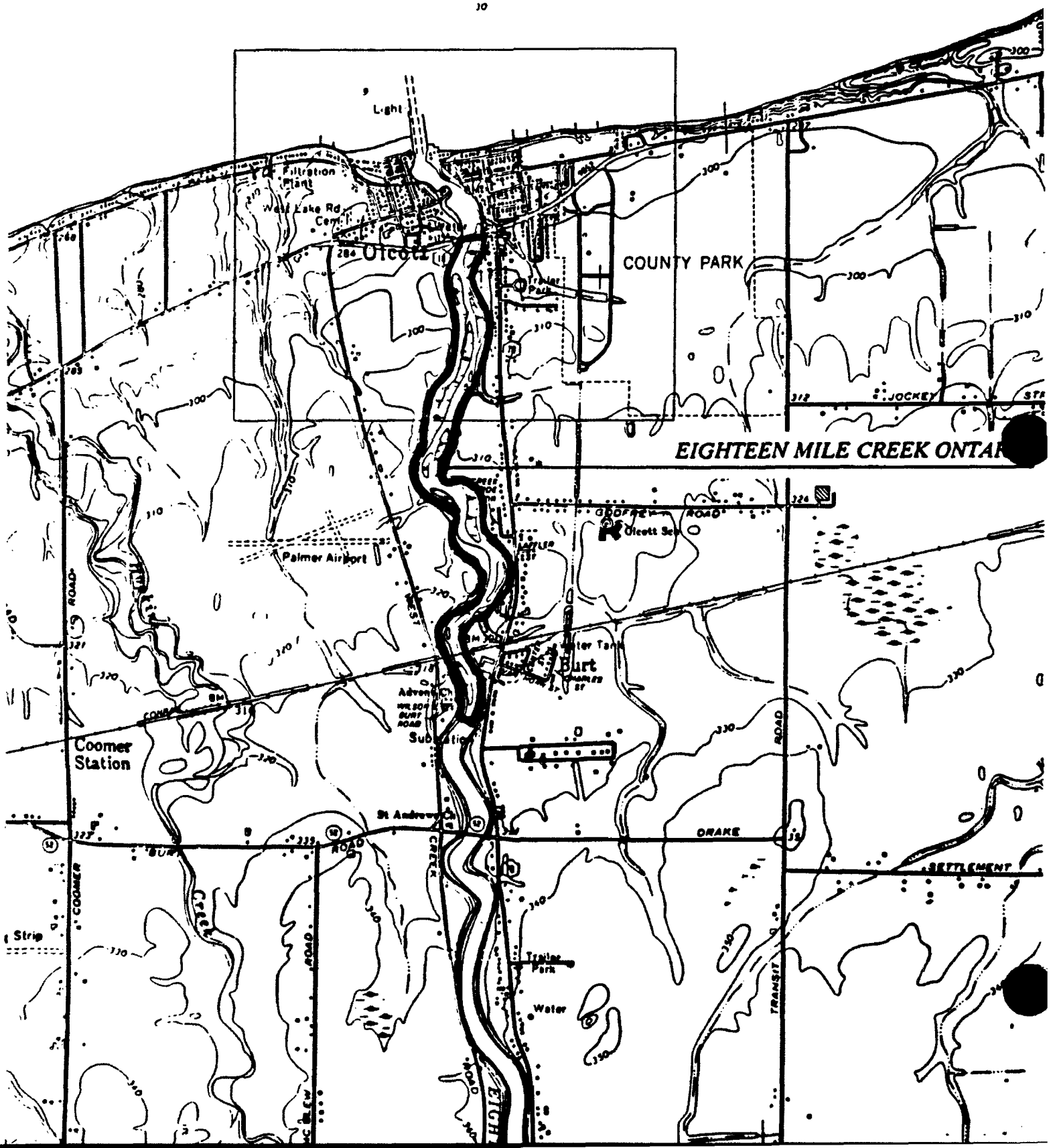
Any activity that substantially degrades water quality, increases temperature or turbidity, reduces flows, or alters water depths in Eighteen Mile Creek would adversely affect the fish and wildlife resources of this area. These impacts would be especially detrimental during fish spawning and nursery periods (late February-July for most warmwater species and steelhead, and September-November for most salmonids), and wildlife breeding seasons (April-July for most species). Discharges of sewage or stormwater runoff containing sediments or chemical pollutants (including fertilizers) could adversely impact on fish or wildlife species. Of particular concern are the potential effects of upstream disturbances, including water withdrawals, stream bed disturbances, and effluent discharges. Hydroelectric facilities on the creek should only be permitted with run-of-river operations. Barriers to fish migration, whether physical or chemical, could have a significant impact on fish populations in the creek. Disturbances of wetland vegetation, including submergent beds, through dredging, filling, or bulkheading, would result in a direct loss of valuable habitat area. Enhancement of motorboat access to the area above Route 18 would significantly increase human disturbance of the habitat, reducing its potential value to many fish and wildlife species. Existing woodlands bordering Eighteen Mile Creek should be maintained to provide bank cover, perching sites, soil stabilization, and buffer areas.

**KNOWLEDGEABLE CONTACTS:**

Tom Hart or Greg Capobianco
Division of Coastal Resources & Waterfront Revitalization
NYS Department of State
162 Washington Avenue
Albany, NY 12231
Phone: (518) 474-6000

Terry Moore, Wildlife Manager
or Steve Mooradian, Fisheries Manger
or Jim Pomeroy, Environmental Protection Biologist
NYSDEC - Region 9
128 South Street
Olean, NY 14760
Phone: (716) 372-8676

NYSDEC - Information Services
700 Troy-Schenectady Road
Latham, NY 12110
Phone: (518) 783-3932


COUNTY PARK
Olcott
Filtration Plant
West Lake Rd
Cem
Trailer Park
Light
JOCKEY
EIGHTEEN MILE CREEK ONTAR
GOODRICH ROAD
Olcott Sch
Palmer Airport
Burt
Water Tank
Coomer Station
Sub Station
St Andrews
DRAKE
ROAD
SETTLEMENT
TRANSIT
COOMER
CREEK
Trailer Park
Water
EIGHT

November 30, 1992

Department of the Army
Buffalo District Corps of Engineers
Attn: Mr. Weiner Cadet
1776 Niagara Street
Buffalo, NY 14207

Dear Weiner,

Thank you for sending me the Olcott Harbor Project Preconstruction Engineering and Design Phase Reevaluation Report of August 1991, Revised: September 1992.

The Corps has done an excellent job studying the Olcott Harbor Project and has put much time and effort into this report. Both my husband and myself agree with the Corps recommendation that No Federal Action Be Taken on this project.

It is a recreational project with a barely viable cost ratio. Should private enterprise undertake such a project it would be one thing, but Federal money should stay out of it.

Thank you again for all the information provided and congratulations on a job well done.

Sincerely,

Lynne B. Seefeldt

Mrs. Lynne B. Seefeldt
3073 Maple Avenue
Wilson, NY 14172

Exhibit D

Mr Wiener Cadet

Department of the Army

U.S. Army Engineer District, Buffalo

1776 Niagara ST.

Buffalo, N.Y. 14207

Nov. 30 1992

Sub Olcott Harbor Project

Dear Sir.

I want to thank you for sending me the Draft Reevaluation report with Draft Supplemental Environmental Impact Statement.

I have read this report and Agree with the Corps Finding.

In my opinion we could not afford this project, The Taxes would be to high.

I would like to thank all members of the Army corps for such a fine report, I feel the Taxpayer Received there moneys worth.

Sincerely

Mr Robert Landry

6070 Exchange ST.

Newfane, N.Y. 14108

Exhibit E

New York State Office of Parks, Recreation and Historic Preservation
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1, Albany, New York 12238
Orin Lehman
Commissioner

518-474-0456

MAILROOM
CENSE-I'-S

3 Dec 92 05 58

November 25, 1992

Mr. John W. Morris
Colonel, U.S. Army
Department of the Army
Corps of Engineers
Buffalo District Office
1776 Niagara Street
Buffalo, New York 14207-3199

Dear Mr. Morris:

Re: CORPS
Olcott Harbor Project
Newfane, Niagara County
89PR1230

Thank you for requesting the comments of the State Historic Preservation Office (SHPO). We have reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966 and the relevant implementing regulations.

Based upon this review, it is the SHPO's opinion that this project will have No Effect upon cultural resources in or eligible for inclusion in the National Register of Historic Places.

If you have any questions, please call Elisabeth A. Johnson in the Project Review Unit at (518) 237-8643 Ext. 284.

Sincerely,

Julia S. Stokes
Deputy Commissioner for
Historic Preservation

JSS/EAJ:gc

DEC -3 PM 2: 16

November 18, 1992

Mr. Timothy Horanburg
Newfane Town Hall
2896 Transit Road
Newfane, NY 14108

Dear Tim,

On behalf of my parents, Robert and Dorothy Hedley, I am sending my comments on the Olcott Hamlet Master Plan Draft EIS.

As this project will be primarily located in a heavily congested area, it is my belief that the area is to small to handle a project of such magnitude.

The Olcott Harbor Task Force was relying heavily on the proposed New York State Bond Act for funding. This was voted down Nov. 3rd by a significant amount of voters. At this point, the Town, County, and State have no money to support this project. For now, the zoning should remain as it is, there is no project.

In a letter dated Nov. 6, 1992 from Colonel John W. Morris of the Buffalo District Corps of Engineers, the breakwalls in Refined Plan 10A Modified can not be approved for Federal construction, and the current recommended plan is No Federal Action. This does not preclude potential project construction by others. Considering the state of our economy, it is highly unlikely that private investors will built this project. For the breakwalls to be economically viable, the cost ratio must be 1 or above. It is currently 1.07, just barely a viable project.

Caution should be made not to "jump the gun" on rezoning the hamlet of Olcott when it appears that this project is a dead issue.

Thank you for taking my comments into consideration.

Sincerely,

Lynne Seefeldt

Mrs. Lynne B. Seefeldt
3073 Maple Avenue
Wilson, NY 14172

cc: Mr. Edward J. Muck/Town of Newfane Planning Board
Mr. Weiner Cadet/Buffalo District Army Corps of Engineers

Exhibit G

United States Department of Agriculture

Soil Conservation Service

James M. Hanley Federal Building
100 S. Clinton Street, Room 771
P.O. Box 7248
Syracuse, New York 13261-7248

November 12, 1992

Mr. Tod Smith
Environmental Analysis Section
Department of the Army
Buffalo District,
Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

Dear Mr. Smith:

We have reviewed the Olcott Harbor Project Draft Reevaluation Report with the Draft Supplemental Environmental Impact Statement, and have no additional comments.

Thank you for the opportunity to review this information. If we can be of any further assistance, please do not hesitate to contact us.

Sincerely,

Paul A. Dodd

PAUL A. DODD
State Conservationist

MAILROOM
GENOE-IM-S
20 Nov 92 09 56

5709 West Bluff
Olcott, New York
14126

November 12, 1992

John W. Morris, Colonel
U.S. Army Corps Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

Dear Colonel Morris,

Thank you for the information packet regarding the Olcott Harbor. We wish to challenge the determination that the project outputs would be primarily recreational. We have to exploit our natural resources, to develop financial stability in this unique community as we have no industry. The economy in this Hamlet of Olcott is tied to its resources, The park, beaches, fishing and boating.

Following the great depression in the early '30s we never regained our prior status, when trains, lake steamers, horse and buggies and later automobiles brought thousands of tourists from Canada and Western New York each year into our Hamlet. The only way we can recapture our former status is through the redevelopment of our natural resources.

In the days when Colonel Hansen was District Engineer for the Corp in this area, we organized a group to help restore our prior status. This was proposed as a joint operation between our Federal and State Governments. Through no fault of the Colonel, the Federal Government showed no interest in sponsoring the development south of a new high level bridge (50 ft. clearance) to be built by the State Government. Later it was shown that development would not be environmentally feasible and gave way to the current proposals off shore.

The bridge when completed, generated enough interest for private investors to build two motels, two restaurants, two tackle and bait ships, enlargement of two marinas, one delicatessen and a lot for seventy camping and recreational vehicles with electric, water, sewer hookups and restrooms with showers. The owners of the motel on Route 18 have since purchased the land between their property and the creek for future development.

Exhibit I

The previously existing business including restaurants, taverns, bowling alley and skating rink have also benefitted from the increased tourism.

The longtime support received from both professional and public agencies, interested groups and most individuals supports the view that the Project is what the community needs and wants. The local negative responses you received are not surprising. There are those who resist change, others who enjoy the attention gained by opposing popular view and those who oppose avidly with the aim of increasing their financial compensation. We had all of them in the late sixties. After the effects of the improvement in Olcott began to show most who formerly opposed it gave it a nod of approval.

The development by private investors, as described above, was stimulated by fishing and less than one hundred boat slips made available by the relocation of the new bridge. Under the proposed plan - - that has the capacity for over 800 slips our goal would be achieved. We understand the results from your questionnaires and future growth support the provisions in this plan.

With the economic development by private investors and with todays unemployment, the present Army Policy should be reviewed. It is difficult to understand why, after twenty years of studies, surveys and designs costing over one and a half million dollars; now due to current policy, the 10A Plan modified cannot be approved for Federal construction.

Sincerely,

Nathaniel L. Cook

Nathaniel L. Cook

Mr Weiner Cadet
Department of the Army
U.S. Army Engineer District, Buffalo
1776 Niagara ST.
Buffalo, N.Y. 14207

Aug. 3 1991

Sub Olcott harbor Project

Dear Sir.

Would you be so kind as to include in your final draft report on the Olcott Harbor project , this petition.

Thank you

Mr Robert Mandry
6070 Exchange ST.
Newfane, N..Y. 14108

Tel 716-778-5212

EXHIBIT I

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

RE: Olcott Harbor Project

Sir:

We the Voters and Taxpayers of the Town of Newfane hear rumor that there will be no Public Hearing and/or Referendum vote to approve the Olcott Harbor Project and related upland development.

We feel that a project with the tremendous cost and impact on the town residents should have a Hearing by your Corp and referendum to follow.

We would appreciate your help in achieving these goals.

Respectfully,

The Undersigned Residents of the
Town of Newfane

Mr Robert Brandy 6070 Exchange St. Newfane N.Y. 14108
Mildred P. Schweigert 2672 Van Horn Ave., Newfane, N.Y. 14108
Howard Ryan 6108 Walnut St Newfane N.Y. 14108
Alyander Brown 2840 S. Main St Newfane NY 14108
Marsha A Brown 2840 S Main St Newfane NY 14108
Thomas Thompson Jr 2836 S Main ST Newfane NY 14108
Donald M. Liddell 6151 Karen Ave Newfane NY 14108
Maryann Liddell 6151 Karen Ave, Newfane, NY 14108
Norman E. Wilby 6070 East Ave., Newfane, N.Y. 14108
Walter T. Gurney Jr. 5967 Ontario St. Olcott N.Y. 14126
Joan A Moore 2330 Fuller Rd. Burt. N.Y. - 14028
Julia A Moore 2330 Fuller Rd. Burt, N.Y. 14028

Commander
U.S.A.C.E. - C.E.C.W.-P
Washirgton, D.C. 20314-1000

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Respectfully,

The Undersigned Residents of the Town of Newfane

Charles R. Dunbar 2555 Fuller Rd Burt, N.Y. 14028
Pamela R. Dunbar 2555 Fuller Rd. Burt NY 14028
Clark A Malarcik 6115 Wilson St Newfane 14108
Leonard R. Enderly 5395 Hoover MT. Rd Lockport 14094
Elmer J Wickley 6067 Exchange Newfane 14108
6072 Exchange Newfane 14108
Wesley E Jackson 6072 E Lavery St Newfane N.Y 14108
Dorothy R Jackson
Kenneth W Klumpp 6087 Corwin ave Newfane NY 14108
Nita K Klumpp 6089 Corwin Ave Newfane, N.Y. 1410
Dore Bonon 6095 Corwin Ave Newfane, NY-14
Michael Maynard 6163 CORWIN AVE, NEWFANE, N.Y. 141
Michael Klem 5[illegible] [illegible]
Cindy L. Hudson 6068 Exchange St. Newfane N.Y. 1
Allan E Barnes 6435 Phillips Rd Burt NY 14
David E. Charles 6999 West Ave. Appleton N.Y. 14
Jeanne M Marchuck 6595 Phillips Rd Appleton N.Y. 14
Jean L Marchuck 2072 Phillips Rd Burt NY
George Marchuck 2072 Phillips Rd Burt, 14022
Eleanor G. Luigert 1670 Hess Rd. Appleton, N.Y. 140
George E Luigert 1670 Hess Rd. Appleton, N.Y. 14008
Kenneth W Layman 5595 Lincoln Ct Newfane N.Y. 14108

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

RE: Olcott Harbor Project

Sir:

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We would appreciate your help in achieving these goals.

Respectfully,

The Undersigned Residents of the Town of Newfane

Richard J. Pascoe - 6044 Wallace Ave. Newfane, N.Y.
Barbara Phillips Shaw 6021 Wallace Ave, Newfane, N.Y.
Thomas H. Shaw 6021 Wallace Ave Newfane N.Y.
Virginia Bowes 6029 Wallace Ave Newfane N.Y.
Francis Bucher 6013 Wallace Ave Newfane N.Y.
Dorothy H. Bucher 6013 Wallace Newfane N.Y.
Albert Verbeke 6026 Wallace Ave Newfane N.Y.
David L. Wall 6[illegible] Chestnut Ridge Rd. Newfane, N.Y.
Helen Nagel 6046 Wallace Newfane, N.Y.
Mary J. Stoltenberg 6851 Wallace Newfane, N.Y.
[illegible] 2584 North Main Newfane N.Y.
Anna E Pascoe 6044 Wallace Ave Newfane N.Y.
Joseph C. Mista 6047 Wallace Ave Newfane N.Y.
Mary E Segnba 6047 Wallace Ave. Newfane N.Y.
Donald W. Wilson 2662 Gail Place Newfane N.Y.
Peter J. Cistella 6054 Wallace Ave. Newfane, N.Y.
Emma W. Cistella 6054 Wallace Ave Newfane, N.Y.
Michael Dieman 6036 Wallace
Nancy R. Taylor 6042 Wallace Ave. Newfane, N.Y.
Duane E. Taylor 6042 Wallace Ave Newfane N.Y.
Bruce Bajenska 6043 Wallace Ave Newfane N.Y.
Terrance & Dale Markandt 6050 Wallace Ave Newfane N.Y.
Emma C. Stoltenberg 6851 Wallace Ave., Newfane, N.Y.
Robert L. Straus 6063 Wallace Ave Newfane N.Y.
William L. Fielding 1700 West Creek Rd. Burt, NY

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

RE: Olcott Harbor Project

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Respectfully,

The Undersigned Residents of the Town of Newfane

| | |
|---|---|
| [illegible] | 6076 East Ave Newfane N.Y. |
| [illegible] | 6082 East Ave Newfane, N.Y. |
| [illegible] | 6098 East Ave Newfane N.Y. |
| [illegible] | 6102 East Ave Newfane N.Y. |
| [illegible] | 6102 East Ave Newfane, N.Y. |
| [illegible] | 6111 East Ave Newfane N.Y. |
| [illegible] | 6111 East Ave. Newfane, N.Y. |
| [illegible] | 2663 Grace Ave Newfane N.Y. |
| [illegible] | 2676 Grace Ave. Newfane, N.Y. |
| [illegible] | 2679 Grace Ave. Newfane |
| [illegible] | 2659 Grace Ave. Newfane, N.Y. |
| Gail Eberhart | 6071 East Ave Newfane, NY |
| Ronald Eberhart | 6071 East Ave Newfane NY. |
| Jim Willard | 5435 WILSON-BURT RD. BURT N.Y. |
| Tom Liddell | 6061 East Ave, Newfane, NY 14108 |
| [illegible] | 6078 East Ave Newfane, NY 14108 |
| Margaret Stark | 6078 East Ave. Newfane, N.Y. 14108 |
| Adrian Mills | 6074 East Ave Newfane, N.Y. 14108 |
| Mark Mills | 6074 East Ave Newfane NY 14108 |
| Joseph [illegible] | 6085 East Ave Newfane NY 14108 |
| Douglas N. Davis | 6066 East Ave Newfane NY. 14108 |
| Judy A. Davis | 6066 East Ave Newfane N.Y. 14108 |
| Matt Udell | 6067 East Ave Newfane NY 14108 |
| Robert A. [illegible] | 6092 Corwin Ave. Newfane N.Y. 14108 |
| [illegible] | 2611 Howard Ave Newfane, N.Y. 14108 |
| [illegible] | 6347 Hatch Rd Newfane, NY 14108 |
| Darlene Rock | 6347 Hartel Rd Newfane, N.Y. 14108 |

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

RE: Olcott Harbor Project

Sir:

We the Voters and Taxpayers of the Town of Newfane hear rumor that there will be no Public Hearing and/or Referendum vote to approve the Olcott Harbor Project and related upland development.

We feel that a project with the tremendous cost and impact on the town residents should have a Hearing by your Corp and referendum to follow.

We would appreciate your help in achieving these goals.

Respectfully,

The Undersigned Residents of the Town of Newfane

Kenneth G Hedley 1534 cooper St Olcott N.Y.
Beatrice Hedley 1538 Cooper St. Olcott Ny.
Rita F. Johnston 1541 cooper St Olcott
Wilhemina N. Dalzell 5758 Ontario St Olcott
Virgil W. Bengler 5858 Ontario St Olcott.
Helen Bengler 5858 Ontario St Olcott.
N. Robert Colantino 5856 Ontario St Olcott
Brenda J. Craft 5856 Ontario St Olcott
Catherine Ilfner 5844 Ontario St, Olcott
Virginia Hedley 6009 Collard ave Olcott
Dick Hedley 6009 Collard ave Olcott
Marion R. Gotts 3426 Lyf. Olcott Rd. Lyf.

Commander
U.S.A.C.E. - C.E.C.W.-P
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Respectfully,

The Undersigned Residents of the Town of Newfane

| | |
|---|---|
| Joan Morgan | 2396 Lkpt-Olcott Rd-Newfane |
| Hugh F. Gardner | 3520 Lockport Olcott Rd |
| James E. Mayer | 2396 Lkpt Olcott Rd Newfane |
| Robert Higgins | 7000 Jockey Rd. East, N.Y. |
| Al Bixby | 3409 Lkpt-Olcott Rd Rochpor |
| James Bizzarelli | 4931 Thrall Rd. Lkpt N.Y. 14 |
| Stanley Budmark | 2650 N. Main Newfane N.Y. |
| Joseph G. Gasper | 6245 Dale Road Newfane, N.Y. 1410 |
| Shirley J. Gasper | 6245 Dale Rd Newfane, N.Y. 14108 |
| Christine M. Budmark | 2650 North Main Street, Newfane, Ny 14 |
| Margaret M. Budmark | 2650 North Main St., Newfane, N.Y. 1410 |
| Betty R. Perry | 7731 N. Lowerwell Rd Appleton 14 |
| Edward W. Wisniewski Jr. | 3974 Corner Rd Newfane N.Y. |
| James H. Knott | 2695 Transit Rd. Newfane 14108 |
| Wayne J. Brubaker | 1692 Hess Rd Appleton 1408 |
| Hilda Fee Brown | 2668 Van Horn Ave Newfane N.Y. 14108 |

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

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Respectfully,

The Undersigned Residents of the Town of Newfane

| | |
|---|---|
| Timothy R. Vecchyn | 1562 Franklin St Olcott 14126 |
| Janet C. Spencer | 1575 Franklin St Olcott 14126 |
| Donald Cass | 6787 W. Washington St, Olcott 14126 |
| Joyce Hillis | 6387 Michelle Dr, Lkpt, NY 14094 |
| Bernard Hilby | 2039 Lkpt-Olcott Rd Burt N.Y. 14028 |
| Scott Kelley | 6009 Collard Avenue Olcott N.Y. 1412[illegible] |
| Josephine M. Kaelin | 5448 W Lake Rd Burt NY 1402[illegible] |
| Kathryn Jaeken | 5448 Lake Rd Burt NY 1402 |

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

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Respectfully,

The Undersigned Residents of the Town of Newfane

Richard Forsyth 2033 Lk Pt Olcott Rd Burt N.Y. 14028
Jacqueline 1313 Lk Rd Olcott 14028
Ann Wnuck 2441 Lk Pt Olcott Rd 14108 Newfane
Hal Jenkins 2567 McClew Rd Burt 14028
John Burnett 6065 Wallace Ave Newfane 14108
Earl M Ridgway 5772 Washington St Olcott N.Y. 14126
Edward Mucek 6045 Condon Rd Newfane NY 14108
Dan Seaver 2747 WEST AVE., NEWFANE, N.Y. 14108
David E Wood 2764 Orchard St, Newfane, N.Y 14108
Kevin Hetch 2753 Main ST Newfane N.Y. 14108
Teresa Yelverton 6468 Hyde Park Lockport NY 14094
John Lutz 6140 Shawnee Newfane NY 14108
Larry Seaver 3904 Lockport-Olcott Rd NY 14094
~~Morris Goldberg Brooklyn~~
Marie Rot 6865 Ridge Rd Lockport NY 14094
Grace Seib 7063 Elliott St. Lockport, N.Y. 14094

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

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The Undersigned Residents of the Town of Newfane

Diane M. Huth 1467 Lockport St. Olcott N.Y. 14126
W.A. Miller 5505 Ward Rds. - " " "
J Stivington Keller Ave Newfane 14108
Paula Ruffalo 3840 Lockport Olcott Rd. Lockport, N.Y.
C H Hatch III 2139 Lockport Olcott RD Burt NY
Jean + Bill Gabriel 1962 Creekside Dr. Burt, NY.
Rod G + Robbie Pollak 3019 Lkpt Olcott Rd, Newfane, N.Y.
[illegible] 1813 Lkpt Olcott Rd Burt NY
Virginia Stenby 6217 Corwin Station Newfane N.Y.
Ellen A Brown 2817 West Creek Rd, Newfane N.
Sandra A Collins 6751 Ross Rd Appleton, N.Y.
[illegible] 2532 McCrew Rd Burt NY
[illegible] 2675 Usher Newfane
Robert G King 3267 Coomer Rd Newfane NY
[illegible] 6452 Charlotte Rd Newfane N.Y.
Betty Gustafson 6453 Hope Lane Lkpt (Newfane)
Kathy Tilley 6465 Hope Lane, Lkpt (Newfane)
Richard Wright 3494 Ewings Rd Newfane NY
Ed Peters 1512 Van Buren St, Olcott NY
Clifford Aber 2810 West Creek Rd. Newfane, N.Y.
Brad Coomer 6652 Swigert Rd Appleton.
Peter Ketch 6736 Swigert Rd Appleton N.Y. 14008

Commander
U.S.A.C.E. - C.E.C.W.-P
Washington, D.C. 20314-1000

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Respectfully,

The Undersigned Residents of the Town of Newfane

George R. Helfrich 6120 Haren Ave Newfane N.Y.
Audrey L. Helfrich 6120 Haren Ave. Newfane, N.Y.
Roger R. Randall 6815 Main St Newfane N.Y. 1410.
Helen E. Judd 7160 Ellicott Rd Lockport N.Y. 14094
Jean B. McSkally 6097 Prospect St. Newfane, N.Y. 14108
Melvin P. Hamlin 6095 Ketchum Newfane NY 14108
Gladys Schultz 6095 Ketchum Cir. Newfane, Ny. 14108
Helen Judd 7160 Ellicott Rd Lockport N.Y. 14094
Dorothy Randall 7815 Main St, Newfane, Ny 14108
Hedwig Clum 6088 Cornwall. Newfane, N.Y. 14108
Jessie Blood 6079 Carman Ave. Newfane, N.Y. 14108.
[illegible] 3169 Poland Dr. Newfane N.Y. 14108
Patricia Zepp 3169 Poland Dr Newfane N.Y. 14108
Glenda Hazel 5776 Beach St Olcott, Ny 14126
James W. Kelly 5776 BEACH ST. OLCOTT, NY. 14126
Joan C. Zunner 2630 Hess Rd Appleton 1400.
[illegible] 5735 McKee Rd Newfane. N.Y. 14108
Jane M. Voelpel 157a Lockport Olcott Rd Olcott Ny 14126
Paula L. Jones 6674 Charlottesville Rd., Newfane N.Y. 14108
[illegible] 6674 Charlottesville Rd; Newfane NY. 14108
Sandra L. Sibley 5735 McKee Road, Newfane, Ny 14108
Steven A. Deshaw #626 S Hatker Rd, Newfane, N.Y. 14108
George S Pettit 3189 coonrod Newfane N.Y. 14108

Olcott, New York
July 19, 1991

John W. Morris, Colonel
Dept of the Army
Buffalo District Corps of Engineers
1776 Niagara St.
Buffalo, N.Y. 14207-3199

Dear Sir:

We are two of the senior Citizens who will have their lives disrupted by the town of Newfane. We have lived here together for fifty years. My husband ten longer. The town didn't let us know we were included in the Olcott Harbor Plan until we found out by accident a couple of weeks before the big meeting at the Olcott Fire Hall. After we started to fight for our existence they told us we could

EXHIBIT 2

stay here, but would be surrounded by parking. Eventually we would be forced out. I feel this is a very traumatic time for us to have to go through, all in our seventies. The emotional stress and illness we've been through the past year has not been good for us.

We are not against the breakwall as our father, Captain Ken Hedley always wanted one to protect the inner harbor. There were many nights and many years our men got up on stormy nights to tie down the boats. The lake is not kind in a good North easter. Boats would not last long out there. The town of Newfane would like this for the fish and tourists at a poor man's expense. We as a nation are being taxed to death and I'm afraid we will

all wake up to bankruptcy some day, when we the people can no longer pay the high taxes.

Thank you for listening.

Sincerely,

Mr. & Mrs. Kenneth Hedley
1538 Cooper St. Bay 284
Olcott, N.Y. 14126

July 13, 1991

John W. Morris, Colonel
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara St.
Buffalo NY 14207-3199

Dear Colonel,

We, property owners fronting on the proposed 1991 Olcott NY Harbor Project, oppose the plan.

The intended condemnation of a part of our property (including the destruction of two structures) for a public lighted passageway would do irreparable damage to our lakefront property.

Admittedly no one welcomes a condemnation process against their property. However, in this

EXHIBIT 5

case the town already owns a right of way to the proposed boardwalk just to the west of our property. It is already in the public domain. It would need only minor expansion to meet the increased needs of the project. This is just one example of a number of questions we have concerning the integrity of the plan.

In the course of the public hearings we found that the citizens committee was unduly influenced by the professional engineers who drew up the plan. The chief consulting engineer, Mr Anthony McKenna, a principal in the Wendel Engineering Co. also holds the office of town of Newfane engineer.

we sensed a "conflict of interest" on the part of Mr McKenna that worked to our disadvantage in presenting our case.

Simply stated - in our judgement the entire process was flawed to the point that the community has little confidence in the plan. And it is our gut feeling that the project will cost a great amount of money & in the long run will not pay its way.

Sincerely,

Joseph B. Rooney
D. Pauline Rooney

5841-43-47
Ontario St
Olcott NY 14126

June 24, 1991

John W. Morris, Colonel
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, N.Y. 14207-3199

Dear Colonel Morris,

We are writing in regard to monies being appropriated for the Olcott Harbor project, Olcott, N.Y.

Rep. John LaFalce has announced a total of $425,000 for the planning, engineering and design for the Olcott Harbor project has been included in the 1992 Energy and Water Appropriation Bill passed by the House of Representatives. This $425,000 is in addition to 1.4 million dollars the Army Corps of Engineers already had alloted to them for studies. This does not include the millions of dollars necessary for construction. Half of the authorized cost of the project would come from the federal government, one quarter for the state and 12.5 percent each from the county and town. The Olcott Harbor project is 99% recreational and is a low priority project as far as the administration is concerned.

The Town of Newfane is responsible for the Upland Developement and the building of dock space for about 800 boats,recreation fishing facilities, sanitary facilities and parking. We feel that the Town of Newfane officials have not been willing to get public input and that there is a need for a Town Referendum before any more money is appropriated.

When the Federal, State, and local governments are on the brink of bankruptcy why do they continue to spend, spend, spend?

Sincerely,

Dorothy Hedley
Robert H. Hedley

Robert and Dorothy Hedley
1540 Cooper St., Box 124
Olcott, New York 14126

EXHIBIT 4

June 12, 1991

John W. Morris, Colonel
Department of the Army
Buffalo Disctrict, Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199

Dear Colonel Morris,

Regarding the Olcott Outer Harbor Project, we have several concerns that we hope you can help us with.

1. Competition between government and private enterprise. The proposed 800 slip marina will be run by the Town of Newfane. They currently operate the Town Marina with 66 seasonal boat slips. They charge $550 for boats 22' or less and an additional $20 per foot for boats over 22', up to 30'. This is half of what private enterprise must charge in local marinas all along the shores of Niagara County. Since town property is off the tax rolls, maintenance and work is done by town employees, and insurance is covered under the township, the taxpayers are actually helping to pay for this marina. Private enterprise must recoup their overhead by charging the customers while still trying to make a living. If this 800 slip marina does become a reality, we fear that neighboring communities such as Wilson will suffer financially with the loss of boaters looking for "lower cost" slips. As members of the Tuscarora Yacht Club in Wilson, we have enclosed a copy of their July 1990 newsletter which clearly states this position and they have approximately 200 slips. This could have a severe negative economic impact on the region.

2. Spending millions of taxdollars on a recreational project. As you are aware, this is a 99% recreational project. 1.4 million dollars has already been spent by the Corps on studies. Rep. John LaFalce is pushing for $425,000 for completion of studies. This does not include construction costs, approximately 13 million dollars. Due to the financial status of the federal and state budgets, we don't understand why this money is being spent on a recreational project.

3. Referendum vote. As the taxpayers in Newfane will be financially supporting this project with their federal, state, county, and local tax dollars, they should have a mandatory referendum to vote yes or no as to whether they want any more money spent on this project before it goes any further.

4. Conflict of interest. It is of our opinion, that a conflict of interest lies in the Town Engineer, Consulting Engineer, and the engineer for the Environmental Impact Study. All of which happen to be Anthony McKenna of Wendel Engineers. How can there be objectivity with one engineering firm doing all of this work? With Wendel Engineers standing to benefit financially, how could anything negative be in their reports?

We thank you for your time and hope that you can help with these matters.

Sincerely,

Mr. and Mrs. David B. Seefeldt

Mr. and Mrs. David B. Seefeldt
3065-7 Maple Avenue
Wilson, NY 14172

cc: Ivan Vamos, NYS Parks, Recreation, and Historic Preservation

EXHIBIT 5

Colonel John W. Morris
Department of the Army
U..S. Army Engineer District, Buffalo
1776 Niagara Street
Buffalo, N.Y. 14207

June 10 1991

Sub Olcott Harbor Project

Dear Sir;

I would like to ask the following questions. How much of the upland development money(copy inclosed)have to be in place and property taken over before the Army corp say it is a go for the breakwalls are to be constructed.

NO 2

The Army corp has not had a public hearing yet.

NO 3

The town of Newfane has not had a mandatory Referendum yet, it seems as though the cart has gotten before the horse.

In my opinion before any more money is spent on this project, we the people in the town of Newfane should have a Mandatory Referendum in November and see if the people want to spend some 14 million or more dollars on such a project.As you well know that there is no Commercial it is just recreational. I feel we should be putting our money more for jobs which we sure need. your help would be greatly appreciated as we have ask for this meany times.

If the voters say yes to spending this kind of money, then put the horse back before the cart , and full steam ahead. But if the voters say NO then lets put the hard earned Tax Dollar to work for Jobs for the men that are coming out of the service with the closing of a lot of the bases.

Thank You

Robert Mandry

encl 2

cc
mr Jimmy F. Bates
Chief, Policy Planning

Mr Robert Mandry
6070 Exchange ST.
Newfane, N.Y. .14108
Tel 716-778-5212

EXHIBIT 6

SUPERVISOR
778-8531
TOWN CLERK
778-8822
HIGHWAY
778-8844
TAX COLLECTOR
778-8822

# TOWN OF NEWFANE

2896 Transit Rd.
Newfane, N.Y. 14108

ASSESSOR
778-8827
WATER/SEWER/REFUSE
778-8587
778-8132
BUILDING INSP.
778-8822
JUSTICE COURT
778-9292

February 15, 1991

Major David P. Plank
Acting District Commander
U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, New York 14207

SUBJECT: OLCOTT OUTER HARBOR PROJECT

Dear Major Plank:

In conjunction with the subject project, the Town of Newfane has undertaken a Master Plan and subsequent Environmental Impact Study. The Master Plan includes 800 ± boat slips to be constructed in the basin created by the Corps breakwall system.

Immediately upland of the project is a bluff which ranges from +6' to 20' above low water datum.

In order to access the boat slips, a pathway or "boardwalk" is required at the base of the bluff. In addition, in order to maximize the number of boat slips in the marina and provide a practical approach to the main head piers, it will be necessary to dredge the near shore area to a minimum depth which would allow for small boat mooring throughout the typical boating season.

Preliminary design estimates show that we can incorporate the dredge material (shale and sand) into the boardwalk, thus saving extraordinary hauling costs. We have estimated that 3,600 cubic yards of material will be placed below mean high water during construction of the boardwalk. A typical section is enclosed for your review.

Since the entire project hinges on the successful construction of the marina, we would like to have a preliminary indication as to whether a permit could be obtained to construct the project as described.

EXHIBIT 7

We stand ready to answer any questions you may have or provide you with additional information at your request. Thank you for your assistance.

Sincerely,

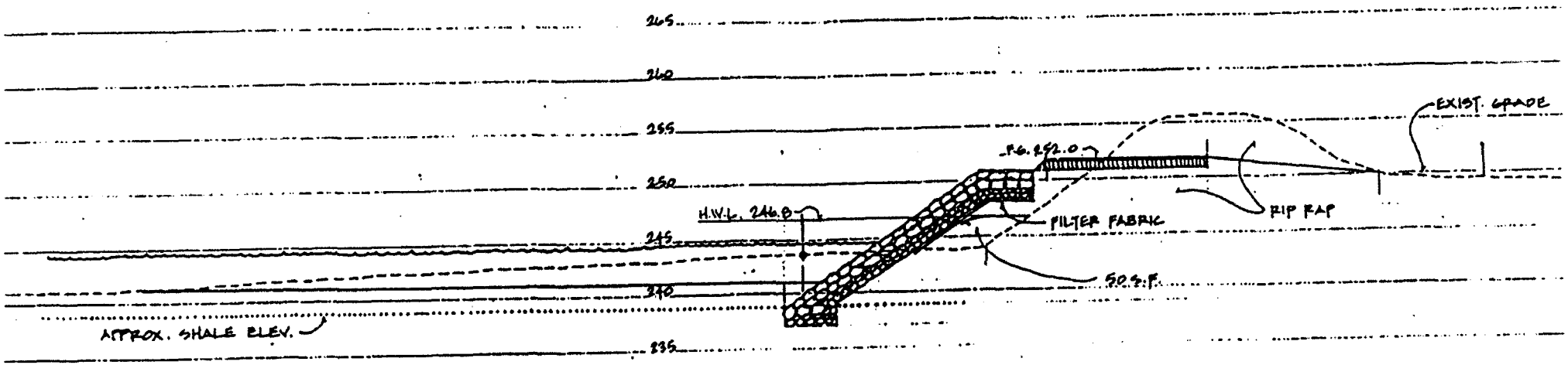
Timothy R. Horanburg
Supervisor

mac

Enclosure

cc: Timothy Byrnes, USCOE
Anthony W. McKenna, Wendel
John Connolly, Chairman Master Plan Advisory Committee
Ivan Vamos, NYS Parks Albany

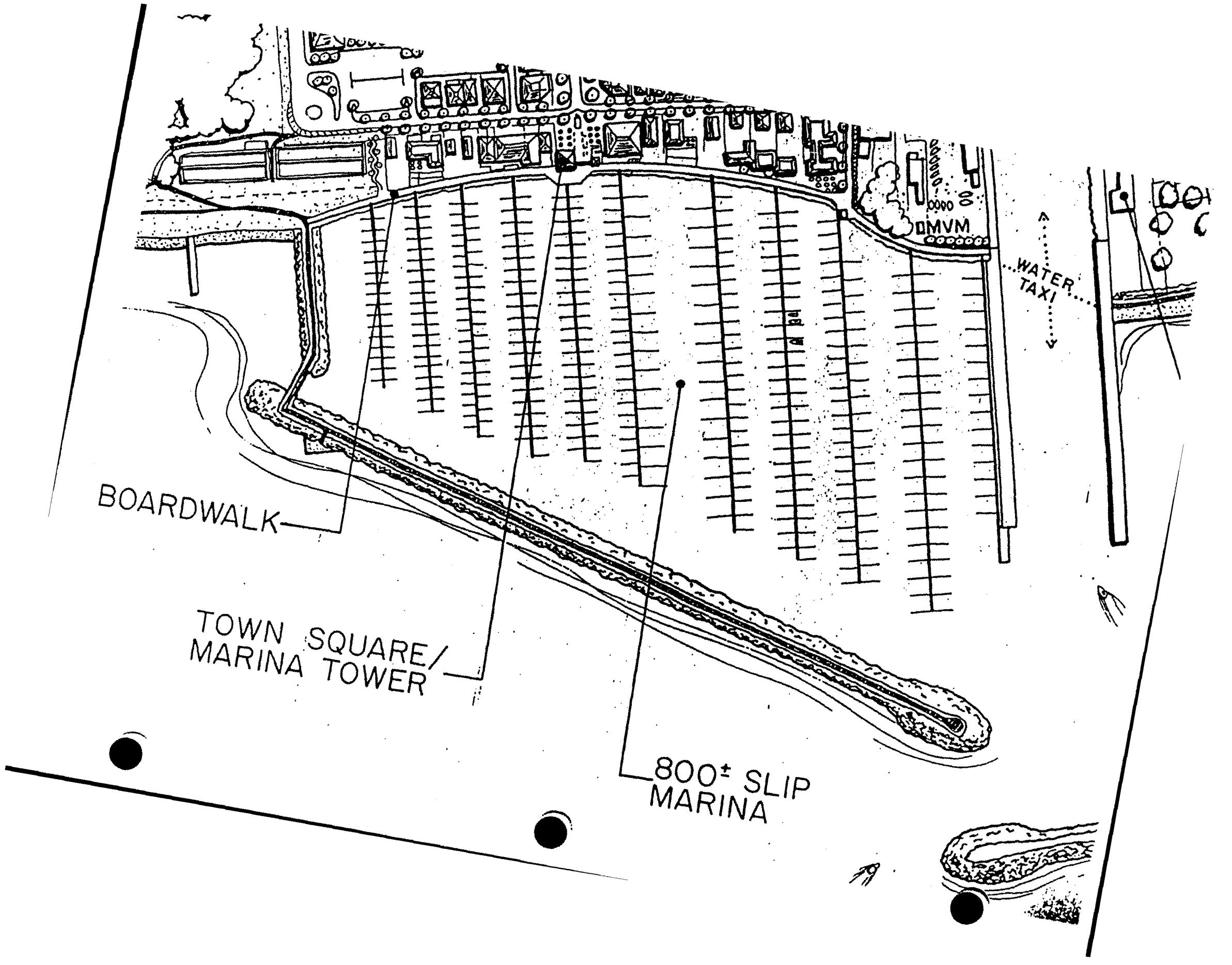
CUT = 110 S.F.
FILL = 24 S.F.
SHALE EX. 10 S.F.




STATION 1+00

SCALE: HORIZ. & VERT. 1"=10'

# OLCOTT HARBOR BOARDWALK - TYPICAL SECTION


MVM
WATER TAXI
BOARDWALK
TOWN SQUARE/
MARINA TOWER
800± SLIP
MARINA

U.S. Department of Transportation
United States Coast Guard

Commander,
Ninth Coast Guard District

1240 E. Ninth St.
Cleveland, Ohio 44199-2060
Staff Symbol: (oan)
Phone: (216) 522-3992

16500
Ser 050-91
28 JAN 1991

From: Commander, Ninth Coast Guard District
To: District Commander, U S Army Corps of Engineers Buffalo, New York

Subj: Aid to Navigation Planning for Corps of Engineers Project at Olcott Harbor, N.Y.

1. The Coast Guard has finalized planning for two fixed aid to navigation structures to be placed on your detached breakwater project at Olcott Harbor, New York. The structures will mark the navigational channel entrance to the harbor through the two new detached breakwaters as shown on your plan 10-A Modified.

2. A Coast Guard Standard Cylindrical Light Tower will mark the northeast end of the West Breakwater Arm and a Coast Guard Standard Aid to Navigation Pole will mark the channel end of the detached Eastern Breakwater Arm, as illustrated on Enclosure (1). Coast Guard drawings for these structures are provided under separate cover.

3. The Coast Guard will place the project on our waterways list for funding for the fourth quarter of 1992 in the amount of 30K. Please adjust your cost estimates to include that amount.

Our point of contact for this project is Mr. William Craig or Senior Chief William Andres at (FTS 942-3366).

L.B. TYO
By direction

Encl. (1) Required Aid to Navigation locations Olcott Harbor, N.Y.

EXHIBIT 8

MAILROOM
CENCB-IT-S
4 JAN 91 08 53

December 31, 1990

United States Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, NY 14207

Attention: Mr. Timothy Byrnes, Project Manager

SUBJECT: OLCOTT OUTER HARBOR PROJECT

Dear Mr. Byrnes:

As a result of our meeting on December 6, 1990, the Steering Committee ordered the enclosed map to be prepared. This map shows in detail the Phase I Uplands Project which coincides with the Federal Breakwall Project.

As we understand it, the federal project will encompass the two breakwaters, aids to navigation, 150 parking spaces, handicap access improvements and restroom facilities. The areas which overlap with the upland project are the 150 parking spaces, the handicap access improvements and the restroom facilities.

The 150 parking spaces will be split up between two lots. The lot on East Main St. in Krull Park contains 300 ± car spaces of which 146 would be assigned to the Federal Project. An additional 4 spaces would be reserved for the handicapped in the Ontario Street at Franklin parking lot. Please note that their are no buildings on either site currently and therefore no relocations will be necessary.

The handicapped spaces are in close proximity to the public restroom building at the foot of Lockport Street. This building will contain an elevator for handicapped access to the boardwalk below and leading to the walkway along the breakwaters.

EXHIBIT 9

At our meeting you also discussed the latest model testing done by the Waterways Experimentation Station (WES). Although we are concerned about wave heights in the new basin as well as the basin directly south of the Olcott-Yacht Club, the Corps has assured us that the waves in these areas will be limited to one foot or less. Given those assurances we would concur with your recommendation to lower the height of the breakwaters approximately 1.5 feet and to shorten the detached breakwall by approximately 300' at a substantial savings to project costs.

We will discuss the contents of this letter with Mr. Vamos of State Parks to gain his concurrence. Additionally we enclose a listing of Steering Committee Members at your request.

Thank you for your assistance.

Very truly yours,

Timothy R. Horanburg
Supervisor, Town of Newfane
Co-Chairman

Ronald L. Perry
Niagara County Legislator
Co-Chairman

/mas
Enclosure
xc: Mr. Ivan Vamos, Deputy Comissioner for Plannning & Development
NYS Parks, Recreation & Historical Preservation
Steering Committee Members

## APPENDIX B

## OLCOTT HARBOR STEERING COMMITTEE

| | |
|---|---|
| Lafalce, John | Congressman, 32nd District |
| Daly, John | State Senator, 61st District |
| Murphy, Matthew | State Assemblyman, 139th District |
| Perry, Ronald | Niagara County Legislator |
| Horanburg, Timothy | Supervisor, Town of Newfane |
| Simonson, Lee | Chairman, Niagara County Legislator |
| Haseley, Lawrence | Niagara County Legislator, Chairman, Parks Committee |
| Kramer, James | Chairman, Olcott Harbor Task Force |
| Kinyon, David | Executive Director, Eastern Niagara Chamber of Commerce |
| Connolly, John | Chairman, Olcott Outer Harbor Citizens Advisory Committee |
| Wendler, James | Former Town Councilman |
| Albond, Harvey | Niagara County Planning and Industrial Development |

DEPARTMENT OF THE ARMY
WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS
3909 HALLS FERRY ROAD
VICKSBURG, MISSISSIPPI 39180-6199

REPLY TO
ATTENTION OF

CEWES-CW-P (1110-2-1403b)

26 DECEMBER 1990

31 DEC 90 11 01

MEMORANDUM FOR Commander, U.S. Army Engineer District, Buffalo,
ATTN: CENCB-PD-PF (Mr. Wiener Cadet),
1776 Niagara Street, Buffalo, NY 14207-3199

SUBJECT: Review of Proposed Improvement Plan at Olcott Harbor, New York

1. A hydraulic model investigation of Olcott Harbor, New York, was conducted at the U.S. Army Engineer Waterways Experiment Station's (WES) Coastal Engineering Research Center (CERC) in 1989 for the U.S. Army Engineer District, Buffalo (NCB). Results were published in Technical Report CERC-90-1, dated February 1990. The model study optimized breakwater lengths and orientations for a mooring area located in Lake Ontario east of the existing jettied entrance to the harbor (NCB plan 10A), and for mooring areas situated to the east and west of the existing entrance (NCB plan 10B).

2. NCB has requested CERC's review of an additional plan (encl) developed subsequent to model testing. The plan (NCB plan 10A modified) involves a mooring area east of the existing entrance (similar to NCB plan 10A), however, the outer offshore breakwater and entrance opening were oriented similar to the NCB plan 10B configuration. This configuration entailed a wider entrance opening (150 ft vs 100 ft) than the original NCB plan 10A and would allow for future expansion of the harbor.

3. A review of the NCB plan 10A modified by CERC personnel indicates the configuration should result in wave conditions in the harbor and mooring area well within the established criteria. The outer breakwater orientation and entrance opening for NCB plan 10A modified were exactly the same as optimized in the model investigation for the NCB plan 10B configuration and should provide similar protection for waves from north through northeast. The inner (shoreward) end of the NCB plan 10A modified breakwater is about 200 ft closer to shore than the NCB plan 10A configuration and should provide greater protection for waves from northwest than the optimized structure in the model study. Based on the angle of wave approach and the orientation of the NCB plan 10A modified structure, the shoreward end of the breakwater may be reduced up to 150 ft in length and conservatively still provide adequate wave protection for waves approaching from northwesterly directions.

4. In summary, based on the model test results previously obtained, the NCB plan 10A modified configuration should provide adequate wave protection in the entrance and in the mooring area east of the existing jettied entrance. The

shoreward leg of the outer offshore breakwater probably could be reduced somewhat in length and still provide wave protection within the established criteria. If questions arise regarding this review, please contact Mr. R. R. Bottin (601-634-3827) or Mr. D. G. Markle (601-634-3680) directly.

FOR THE COMMANDER AND DIRECTOR:

Encl

ROBERT W. WHALIN, PhD, PE
Technical Director

Dept. of Army
Buffalo Dist. Corp of Engineers
Mr Wainer-Cadet

1957 Hess Rd.
Appleton, N.Y.
10-2-90

Dear Sir,

I am a resident of the town of Newfane.

I am opposed to, and resent a few towns people imposing their scheme for the Olcott Harbor Project on me. As I understand it, it will cost the Town $1 Million ca. for the outer harbor part and $10 M ca. for the inner land development part.

If a majority of the People of Newfane want This project I will be silent & pay my taxes.

But I feel a decision of this magnitude should be openly planned, discussed and voted on.

How can this be handled fairly when the

EXHIBIT 11

chairman of the planning group is so closely a part of the consulting engineering firm?

Yours truly,
(Mr) Francis W. Strong

MAILROOM
CENCB-IM-S
11 Oct 90 13 15

9/26 SEP 10 38 HAILROOM CHICO-TH-S

Mr Wiener Cadet
Corps of Engineers
1776 Niagara St
Buffalo NY 14207

Dear Wiener,

No doubt you have seen or heard of the enclosed article which appeared in the Lockport Union Sun on or about 9/19/90.

We are particularly interested in the statement that the Corps will meet with the committee & that the committee will report back by Oct 17.

Apparently this is the citizens advisory committee of some 35 people. However there is another "steering" committee

of 15 or so Newfane business men which is also involved in promoting the project.

We are not sure which committee is to meet with the Corps.

In any event these committee people do not have our interests at heart.

We are in a quandry on how we can put our oar into this discussion of the project.

We are increasingly concerned because the Wendel engineers are surveying & marking posts, etc "all over" our area of the town. Things are getting very defined.

Yet no one has indicated to us whether or not they plan to take our property.

There appears to be almost a conspiracy to bop us into the plan - get the plan OK'd - & then spring the traps on us.

As we see it - we need to take action before the master plan is approved in its present form.

Any advice you can supply will be appreciated.

Sincerely,
Joe & Pauline Rooney

5847 Ontario St
PO Box 302
Olcott NY 14126
1-778-5156

140 Kings Gate S.
Rochester NY 14617
1-467-7133

Olcott, New York
September 20, 1990

Department of Army
Buffalo District Corps of Engineers
Att: Mr. Heiser Cadet
1776 Niagara St.
Buffalo, New York 14207

Dear Mr. Cadet.

Today is our forty-sixth Wedding Anniversary. We've worked hard to establish our home, paid our taxes on time, and we've been very happy here. Good neighbors, etc. Now in our seventies The Town of Newfane and Wendell Engineers want to disrupt our lives. Lee is diabetic, and the emotional stress is too much for him.

They have said we can stay but with an overlay of parking. We have a little cottage we rent to

EXHIBIT 13

fishermen, and the town has rented the lot next to it. We have asked them to put up a small fence to keep the cars from going into our cottage. They have complied with a small plastic one, but the noise and filthy language all night long is terrible. We have nine people stay with us, but were afraid we will lose our little business along with our home. They have other options in this town that would work as well as here. They are disrupting the lives of Louisiana citizen families. Do we as Louisiana citizens have rights? I know we have civil rights. I'm sure the people who are involved in taking or squeezing us out of our homes should fight if it were their aged parents.

We are being physically and

emotionally drained, and we want out of this place.

Mr. Cadet, thank you for listening We are looking to you and Gad to do what is right for us. We've never hurt anyone in our lives, but they sure are hurting us.

Sincerely,

Kenneth and Beatrice Hedley
1538 Cooper St. Bay 7
Olcott, New York 14126

July 29, 1990

Mr. Wiener Cadet
Department of the Army
U.S. Engineer District, Buffalo
Buffalo, New York

Dear Sir:

Before any more money is spent on the Olcott Harbor Project I am requesting that a REFERENDUM be held so that the people of the Town of Newfane are given an opportunity to say YES or NO to this project. It is my understanding that the cost of the Breakwall alone will run into the 15 to 17 MILLION DOLLAR range.

Enclosed is a copy of the proposed UplandDevelopment which projects a cost running into millions of dollars. We, here in Newfane, have had our property reassessed twice in the last four years. Our School taxes went up 40% last year. How much more can we bear?

I am a Senior Citizen living on a fixed income and because and because there is no commercial project planned to help pay for the cost of the Olcott Harbor Project I feel that it will prove to be a financial burden to me and to many other residents of the Town of Newfane.

Please do not deny us the right to a Referendum in this matter. Give us a chance to say YES or NO.

Thank you.

Yours truly,

Robert Mandry
6070 Exchange St.
Newfane, New York 14108

cc:
Congressman John J. LaFalce
Assemblyman Matthew J. Murphy
Commissioner Orin Lehman,
Parks and Recreation.

EXHIBIT 15

copy

Olcott, New York
July 27, 1990

N. Y. State Office of Parks, Recreation and Historic Preservation
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1
Albany, New York 12238

TO: Commissioner of N.Y. State Office of Parks, Recreation and Historic Preservation
Commissioner Lehman

RE: Olcott Outer Harbor Project and Upland Development

Dear Commissioner Lehman:

As sponsor of the Olcott Outer Harbor Project we are contacting you for relief in our problem with the Town of Newfane and the Upland Development plan.

This concerns the homes and property of three Senior Citizen residents; Mrs. Catherine Kress, corner of Ontario & Cooper Sts., Kenneth and Beatri dley, 1538 Cooper St., and Robert and Dorothy Hedley, 1540 Cooper St., Olcott, N.Y. 14126.

We are in the age group 65 to 77 who have lived here most of our lives. Our roots are here and we do not want to move. The Master Plan calls for our property to become a parking lot. The original plan put us in Phase I, which put us in immediate jeopardy but has since been changed to overlay transitional parking/residential, a term used by Wendel Engineers so that we do not have control of our own property. We can stay in our homes but will be completely surrounded by a parking lot and eventually will be taken over by the Town of Newfane for a parking lot.

After a conference with Town Supervisor Timothy Horanburg and Town Attorney Robert S. Roberson on April 27, 1990, we received a letter dated May 4, 1990 with a proposal to enter an option agreement with the Town of Newfane regarding the purchase of our premises. This offer was contingent upon the Outer Harbor Project becoming a reality. We mailed a letter dated May 15, 1990 with a counter-proposal stating that we want to be taken completely out of the Olcott Harbor Master Plan as to a designated parking area and the zoning of overlay transitional parking/ residential. We want to remain zoned as it is zoned at the present time, Marine Commercial, and that we would remain free and clear of any action by the Town of Newfane. We requested a written reply. We have had no response. As sponsor of the Olcott Outer Harbor Project we are appealing to you for satisfaction in this matter.

The Cooper Street parking area is not required by any Agency for the development of the Uplands. There is vacant property available for parking in the vicinity of Cooper Street without taking the permanent homes of senior citizens. This situation is putting a terribe strain on us and is affecting our health and well-being.

EXHIBIT 16

July 21, 1990

Mr. Wiener Cadet
Dept of the Army
U.S. Engineer District, Buffalo
1776 Niagara St
Buffalo, N.Y. 14207

Dear Mr Cadet:

In reference to the Outer Harbor Project at Alcott. Anything that is as costly as this is should definitely be put to a referendum.

I am in favor of an referendum

Sincerely,
Dorothy Randall
Kenmore Taxpayer

EXHIBIT 17

Thomas R Randall
2815 Mona St
Niagara Falls N.Y
14108

July 20, 1990

Mr. Thiem Cadet
Dept. of the Army
U.S Engineer District Buffalo
1776 Niagara St
Buffalo, N.Y. 14207

Sir.

I am writing in regard to the Aloatt outer harbor project Having attended the Public Hearings I feel that the project should be put up to the voters & taxpayers of the Town of Niagara in the form of a referendum

It seems to that the cost of having Public Hearings is

OVER

EXHIBIT 18

a waste of time and money
if there is no referendum
to follow.

Thank you for your
time

Respectfully

Thomas R. Reddick
Resident, Taxpayer
Town of Cheyenne.

PS Spend no more till
You hear from us.

Mr. Wiener Cadet
Department Of The Army
U.S. Engineer District, Buffalo
1776 Niagara Street
Buffalo, NY 14207

Mr. Cadet:

We wish to express our desire for a public referendum vote for the Town Of Newfane outer harbor project. The taxpayers of this community should be given the opportunity to render their approval or disapproval of this costly project by their "vote".

The initial written survey conducted by the town engineering firm on a mass mailing basis, primarily were to individuals who reside out of the township. Repeated verbal inquires addressed to the town board has produced no concrete answers concerning a public referendum, only evasive statements. Thank you for your consideration.

Sincerely,

Charles Manhardt

Charles Manhardt
6105 Walnut St.
Newfane, NY 14108

CC:
Congressman John J Lafalge
House Office Building
Washington, D.C. 20515

EXHIBIT 19

ROBERT B. GITLIN
ATTORNEY AND COUNSELOR AT LAW
200 REYNOLDS ARCADE BUILDING
ROCHESTER, NEW YORK 14614

(716) 325-5143

July 18, 1990

Town Board of Newfane
c/o Timothy Horanburg, Supervisor
Newfane, New York 14108

Planning Board of Town of Newfane
c/o Edward Muck
Newfane, New York 14108

Gentlemen:

I am the attorney for Joseph and Pauline Rooney who are the owners of 5841-43-47 Ontario Street, Olcott, New York. As part of the Olcott Harbor project, the Rooneys have been informed of a proposed condemnation of part of their property, for the purpose of the construction of a pedestrian travelway from Ontario Street, across their property, to the proposed boardwalk. The proposal calls for the demolition of a single family dwelling and garage located on the Rooneys' property.

Those who have visited the site are aware of an already existing pedestrian right-of-way approximately thirty (30) to forty (40) yards to the west of the Rooneys' property which presently runs from Ontario Street to the east pier on Lake Ontario. This pedestrian right-of-way was procurred through great efforts on the part of the municipality. Adjacent to the existing right-of-way is land belonging to the Hedley Boat Company. On the east side of the right-of-way is its boats' storage building, and on the west side is an area which the Hedley Boat Company uses to deposit unsightly (to put it mildly) junk and debris.

The Rooneys are informed that their property is suitable for a pedestrian right-of-way because the site has a lower grade level compared to property east of theirs, and that ingress and egress to and from the lake is desirable at a point at the west end of the project. The desirability of the Rooneys' land, however, flies squarely in the face of reason.

For the municipality to disregard a presently existing public right-of-way clearly deviates from the reasonableness standard established by the courts in condemnation actions.

EXHIBIT 20

Even if it requires a taking of property to widen the present right-of-way, that action would result in the partial removal of the garbage dump owned by the Hedley Boat Company which apparently has been an eyesore for some years. Furthermore, the existing right-of-way is at a lower grade level then the Rooneys' property which would satisfy the engineer's concern for handicap access.

While the engineers have expressed a desire for the pedestrian right-of-way to also allow for service vehicles, including emergency equipment, it is incredulous to believe that the plan will not provide for a more central access route which would allow these vehicles to service the entire length of the boardwalk.

In addition, while it may be argued that the existing right-of-way may divide the Hedley property, it should be pointed out that the existing right-of-way already divides that land, and that widening of the right-of-way cannot have any appreciable effect whatsoever in the operation of the boat company. Furthermore, by widening the right-of-way, it will better allow access for the fire department into its fire lane for the necessary protection of both the west side of the private home owned by the Pawlaks, and the east side of the office building of the Hedley Boat Company.

It is urged at this point, that prior to further public hearing, that the proposed condemnation of the Rooneys' land be immediately rescinded and that the widening and implementation of the existing right-of-way be given primary consideration. A failure to consider this readily available access in advance of condemnation is without reason in basis or fact, and the Rooneys must consider legal recourse if they are to protect not only their interest, but interests of the public. Accordingly, on behalf of Mr. and Mrs. Rooney, it is requested that the issue be addressed immediately, and that I be advised of all action taken in this regard. Further, I would request that your response to remedy this situation be communicated with the appropriate governmental agencies, some of whom have already been advised of this untenable proposal submitted as part of the Master Plan.

Very truly yours,

Robert B. Gitlin

RBG:nm

cc: Mr. Wiener Cadet
c/o US Army Corps of Engineers

cc: Mr. Ivan P. Vamos
Deputy Commissioner for Planning
and Opoerations

Matthew Murphy, NYS Asseemblyman

U.S. Representative John J. LaFalce

N.Y.State Senator John Daly

Mr. Anthony W. McKenna
c/o Wendel Engineers PC

Mr. Alan Bauder
c/o N.Y. State Office of General Services

July 18, 1990

Mr. Wiener Cadet
Dept. of the Army
U.S. Engineer Dist.
Buffalo, N.Y.

Dear Sir:

With reference to the Outer Harbor Project that is in the planning stages for Olcott, N.Y. we wish to express our concern as 45 year residents of the Village of Newfane, N.Y.

Because this Outer Harbor Project is a Multi-Million expenditure we feel that it should be put to a referendum. The people who are going to be asked to finance this very expensive project should definitely have a large voice as to their financial responsibility in this matter.

Yours truly,

cc: Rep. John J LaFalce

Norman E & Denise Milby
6070 East Ave.
Newfane, N.Y. 14108

EXHIBIT 21

6/29/ MAIL ROOM-NCBINO
JUL 29 10 17

Mr Wiener Cadet
U S Corps of Engineers
Buffalo NY

Dear Wiener,

You may have seen this article in yesterday's paper. In any event it pretty well convinces me that the project is a "go".

Mr McKenna - to his credit - has all his ducks in a line. All of the incumbent politicians benefit from the attendant publicity therefore they are all aboard the bandwagon.

He is a master of publicity.

Well we're going to hang in there but the cooking on a believe me the ordinary citizens are hard pressed to buck "city hall" even when their rights are being abused.

Regards,

EXHIBIT 22

OFFICE OF PARKS, RECREATION, HISTORIC PRESERVATION
NEW YORK STATE
Orin Lehman
Commissioner

**New York State Office of Parks, Recreation and Historic Preservation**
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1, Albany, New York 12238

518-474-0445

January 31, 1990

Colonel Hugh F. Boyd, III
Department of the Army
US Army Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199

Dear Colonel Boyd:

Commissioner Lehman asked me to respond to your letter of November 13, 1989, regarding Olcott Harbor.

I wish to thank your staff and that of the Corps' Waterway Experimental Station for their diligent work with local officials and us during the past months. The work has led to the marked improvement of the Olcott Harbor project's feasibility. We appreciate this effort and feel that it will greatly contribute to bring the project to fruition.

Local government and State legislators indicated that the revised project will be fully supported by a local share for funding construction and an agreement to manage the facility. Several State agencies, critical to this project also expressed their support to facilitate findings of consistency, help with upland support services and the provision of lands needed for the project. We recognize that these items constitute most of the elements contained in a local cooperation agreement. We are working toward the timely resolution of the remaining issues.

This letter reaffirms Commissioner Lehman's support of the Olcott Harbor project, including the statements in his letter of November 7, 1988 offering to furnish all necessary items for the non-Federal cooperative share of this project.

As we indicated in previous correspondence however, our agency does not have the funds required to provide the non-Federal share of the cost of construction of this project. Our participation in the next phase is therefore dependent on receiving funds in time to contract for the construction phase of the Olcott project in State fiscal year 1991-1992.

Sincerely,

Ivan P. Vamos
Deputy Commissioner for
Planning and Development

IV:bb

cc: Commissioner Lehman
M. Pirastru



EXHIBIT 23

**New York State Department of Environmental Conservation**
**600 Delaware Avenue, Buffalo, New York 14202**
716/847-4551

**Thomas C. Jorling**
**Commissioner**

January 22, 1990

Colonel Hugh F. Boyd III
U.S. Department of the Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

Attn: Mr. John Zorich, Planning Division
Mr. Charles Gilbert, Engineering Division

Olcott Harbor - Lake Ontario
Reevaluation Study - Plan 10A
Modified
Town of Newfane - Niagara County
DEC No. 9-2928-00023/00001-0

Dear Colonel Boyd:

Regional Director, John Spagnoli, asked me to respond to your District's letters of September 26, 1989, October 18, 1989 and December 28, 1989 concerning the referenced proposal. Our comments are based on the following understandings of the most recent proposal.

1. All new mooring capabilities will be kept to the east of the existing federal piers.

2. The harbor expansion will involve no dredging; existing harbor depths are considered to be adequate.

3. Any future dredging will be the responsibility of a non-federal sponsor, the New York State Office of Parks, Recreation and Historic Preservation, Niagara County or Town of Newfane.

Fortunately, one of our major concerns, disposal of contaminated dredge spoil in Lake Ontario, is no longer an issue (at least with regard to actual construction of this proposal), as stated in your December 28, 1989 transmittal to this office. If our understanding is not correct on this point, advise us and please include a discussion of dredging/disposal impacts in the Federal EIS.

EXHIBIT 24

Although the Department certainly does not favor open lake disposal, it might be approvable depending on:

1. additional sampling (details available upon request) and bioassay results,

2. adequate investigation and documentation of existing conditions at the open lake dump site,

3. effective capping of the heavily polluted sediments with uncontaminated sediments, and

4. an acceptable plan for follow-up monitoring of the dump site.

Also, this is to confirm that if upland disposal were proposed, sediments from areas labeled A and B would have to be disposed at a sanitary landfill, permitted in accordance with 6 NYCRR Part 360 (Solid Waste Management Facilities) in order to meet New York State Environmental Conservation Law requirements. It appears that material from sites C, D & F would be considered uncontaminated and would be exempt from Solid Waste Management Facility Permit requirements in accordance with 6 NYCRR Part 360-7.1 if the disposal is conducted during daylight hours.

We concur with the selection of plan 10A modified over plan 10B, since less disturbance or alteration of the lakebed is involved and water will be better able to move/circulate through the new marina basin from a westerly direction.

We are disappointed that the modeling study did not test the use of underwater culverts to facilitate water circulation through the breakwaters. We understand that the breakwaters are not impervious to the passage of water through them, but it is unclear just how much circulation actually occurs in this manner. While the Corps expressed concern about the cost of culverts and the transmission of waves into the harbor through culverts, the validity of these arguments was not documented by modeling.

The modeling studies suggest that circulation or patterns of movement of water emerging from the mouth of Eighteenmile Creek will not be greatly altered by installation of the proposed breakwaters. We assume that the ability of fish to cue onto water from Eighteenmile Creek will not be impaired (i.e. that salmonid runs will not be reduced by the project).

In conclusion, this Department supports the implementation of plan 10A (modified). Our Bureau of Wildlife's approval is based on its desire to create alternatives to developing marinas in the regulated wetland along Eighteenmile Creek upstream of New York Route 18. Our Bureau of Fisheries approval is contingent upon the idea that present angler access/use of the federal piers will not be diminished by implementation of the project and that anglers will have complete access to the new, proposed east breakwater. In order for anglers to fish off the east side of the existing east federal pier, mooring of boats must not be allowed within 150 feet of the pier.

If you have any questions or wish to schedule a future meeting on this subject, please contact Michael J. McMurray, Senior Environmental Analyst or me at (716)847-4551.

Respectfully,

Steven J. Doleski

Steven J. Doleski
Regional Permit Administrator

cc: Mr. John Spagnoli - Regional Director, Region 9
Mr. Alex Lechich - U.S. Environmental Protection Agency
Mr. Leonard Corin - U.S. Fish and Wildlife Service

MJM/SJD/kah

DEC 28 1989

Environmental Analysis Branch

SUBJECT: Olcott Harbor, New York, Reevaluation Study - Plan 10A (Modified)

Relative to the Olcott Harbor, New York, Reevaluation Study, enclosed for your information is a narrative and plan view pertaining to Plan 10A (Modified). This is the selected plan for Olcott Harbor, as discussed with Mr. Thomas McCartney (U.S. Fish and Wildlife Service) and Messrs. James Pomroy and Steve Mooradian (New York State Department of Environmental Conservation) at a December 19, 1989 meeting held at the Corps of Engineers, Buffalo District office. At the meeting, a Corps Waterways Experiment Station representative provided a detailed explanation of model studies conducted, as well as the rationale that led to selection of this alternative plan. Please review the enclosed material and provide any recommendations and comments on the aforementioned plan to the Study Manager, Mr. Wiener Cadet, by January 19, 1990.

My point of contact pertaining to this matter is Mr. Leonard F. Bryniarski of my Environmental Analysis Branch, who can be contacted by calling 716-879-4173 or by writing to the above address.

Sincerely,

JAMES M. BENNETT

John Zorich, P.E.
Chief, Planning Division

Enclosure

EXHIBIT 25

New York State Office of Parks, Recreation and Historic Preservation
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1, Albany, New York 12238
518-474-0456

NEW YORK STATE
Orin Lehman
Commissioner

# MEMORANDUM

December 26, 1989

TO: Frank Murray

FROM: Ivan Vamos

SUBJECT: Olcott Harbor

Commissioner Lehman suggested that I forward my memo of 12/11 regarding Olcott Harbor for your information and suggestions. As you see in the memo and in our recent monthly report to the Governor, there has been considerable recent change in the Olcott project. The projected NYS cost share for this harbor project has been reduced from $4.5 million to approximately $2,820,000. The project reductions and improved Federal cost sharing that lead to this more favorable cost should not reduce the great value of this harbor to the State and locality during the next few decades.

The other five State agencies that have an interest in the project all stated their support on September 12th at a meeting with legislators, supplemented with more recent phone calls to us. This support largely involves lands, planning and harbor related projects. Unfortunately this support will not appreciably contribute to the need for cost sharing the harbor construction.

I am happy to see this project make such dramatic improvements from NYS's point of view, and I am recommending that we advance the next set of supporting correspondence to the US Army Corps of Engineers which will confirm the State's intent to seek funds in FY 1991-92 for this project. The state legislators who strongly support this project indicate that they may be able to address this funding issue outside of the OPRHP budget.

We realize that the Olcott Harbor project may be the most significant economic development and boating/fishing access project in this area of Niagara County in the next 50 years. Also we recognize the great navigational safety and storm protection improvements offered by the harbor. Our capital construction program is however, already reduced to only the most urgent health and safety problems and the completion of contractually committed projects. We do not see the possibility of adding a $2.82 million project to our 1991-92 capital program within the projected agency expenditure ceiling.



EXHIBIT 26

We have a very limited time to advance the needed correspondence to Colonel Hugh Boyd III before he completes his draft re-evaluation report for the project due in February 1990. We expect to have supporting correspondence assuring us of local governmental funding for their share of this project, and state legislators' letters addressing their support, perhaps through member initiatives. After these letters are in hand, I suggest that we send the required supporting letter to Colonel Boyd.

Though the proposed next letter to Colonel Boyd will not be contractually binding, we request your consensus with this action so as to keep this Federally funded project viable.

Enc'sure

cc: Commissioner Lehman
Al Caccese
J. Goldwater
Joe Grasso
Mario Pirastru

bcc: Wiener Cadet
John Connally/Sen. Daly's Staff
Assemblyman Matthew Murphy

OLCOTT OUTER HARBOR STEERING COMMITTEE

December 19, 1989

Colonel Hugh F. Boyd III
U.S. Army Corps of Engineers
Buffalo District
1776 Niagara Street
Buffalo, New York 14207-3199

Attention: Weiner Cadet

Dear Colonel Boyd:

The Olcott Outer Harbor Steering Committee at their meeting of Friday, December 15, 1989, discussed the various plans being considered for Olcott Harbor.

Following discussion of the model testing in Vicksburg as well as the financial constraints on the authorized project, it was the unanimous consensus of the Committee that Plan 10-A modified was the preferred plan. A copy of the minutes of this meeting is attached.

If you need additional information, please do not hesitate to call.

Very truly yours,

Ronald L. Perry, Co-Chairman

Timothy R. Horanburg, Co-Chairman

RLP:ss
Enclosure

EXHIBIT 27

New York State Office of Parks, Recreation and Historic Preservation
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1, Albany, New York 12238
518-474-0456

Orin Lehman
Commissioner

Weaver, Lyc

# MEMORANDUM

December 11, 1989

TO: Commissioner Lehman
Albert E. Caccese

FROM: Ivan Vamos

RE: Olcott Harbor Proposal Update from 12/5-6 Meeting

On December 5 and 6, meetings were held at the US Army Corps of Engineers' Waterway Experiment Station (WES) at Vicksburg, Mississippi regarding the Olcott Harbor proposal. Analysis done through the application of a 1/60th scale simulation model was reviewed and the impact on the projects performance and finances was analyzed.

The Corps' Buffalo District and WES staff, legislative representatives and Town and County officials attended. Congressman LaFalce's staff was in contact with the meeting participants via telephone. I will review the findings of the meeting and work sessions and provide some comments on the significance of these findings.

The existing (unimproved) harbor was analyzed. The model clearly showed the defects in the harbor as demonstrated by simulated and observed dangers and actual storm damage at Olcott. The harbor is open to storms coming in from the north as well as from wave patterns along a fairly wide arc from the NE to the NW. The smooth entrance channel refracts these waves, perhaps accentuates the damage and sets up conditions for even more dangerous "rogue" waves. The existing conditions are clearly unacceptable and dangerous.

The large harbor proposed for our consideration earlier this fall (plan 10B), performed well. Your response of October 19, 1989 to Colonel Boyd indicated that we had problems funding this project. With project cost estimated at $17.4 million, this project began to broach on the limits of the Federal authorization. We noted that the scale of the project was considerably beyond the harbors of refuge we have supported at other locations. Other considerations had to be addressed by the town; they are doing a plan supported by UDC/WNYEDC (and DOS?)



EXHIBIT 28

funds. A somewhat smaller harbor proposal, eliminating approximately 200 of the proposed slips located in the westerly segment of the harbor, would limit some of the upland impacts of this project.

Consequently, a smaller plan (10A) was considered to be preferable if it was shown to be satisfactory as a harbor. A harbor configuration was tested with a shorter western breakwater. This left the western harbor sections unprotected, however the existing breakwall provided sufficient protection for the inner harbor. The reduced harbor configuration could also be extended at some future date to form a larger project if needed. This reduced option is estimated to cost $13 million.

Other small boat harbors supported by NYS to date cost $4 to $6 million, however, accounting for inflation occurring during the three to ten years since these projects were built, the revised Olcott project is only approximately 30 percent greater than several of these other projects.

There was a concensus that the reduced plan (10A) performed well. Some additional erosion control measures may have to accompany this work along the westside of the harbor. Erosion control measures along the eastside of the harbor at Niagara County's Kroll Park would be needed under all circumstances (the null option, 10A or 10B); these protective measures were discussed and tested with the model. Circulation problems were also discussed and tested. 10A will probably be somewhat better for circulation. Impaction of fish migration following an upstream thermal current was tested, discussed and found to be unaffected. Impacts of ice flows were also discussed and concerns were addressed by WES staff. These findings confirmed the advisability of selecting the smaller 10A option ($13M project).

Cost allocation was discussed at a December 6 meeting. Initial calculations, pursuant to our request (your October 19 letter) and Colonel Boyd's response of November 13, show that the project economics will allow for a cost split of approximately 57 percent Federal - 43 percent local. These costs comprised of a combination of cost allocation associated with a 50 year project life and 2.49 benefit/cost ratio. The cost apportionment is as follows: 50/50 applied to $9.9 million total cost for recreation; 80/20 applied to $2.7 million total cost for commercial navigation; and 65/35 applied to $281,000 total cost for flood protection. Final cost and benefit analysis may differ somewhat from these estimates, however it's clear that the project cost split should be much more favorable to the Local Cooperator(s) than the 50/50 split presented to us on September 11, 1989.

Given the selection of the $13M option and a 57/43 cost split, the proposed funding distribution will be approximately:

| | | |
|---|---|---|
| $ 7,360,000 | Federal | (57%) |
| 2,820,000 | State | (21.5%) |
| 1,410,000 | Niagara County | (10.75%) |
| 1,410,000 | Town of Newfane | (10.75%) |
| $13,000,000 | Total Project | |

Land costs are probably not a problem because of OGS and Town land ownership. Maintenance will be a town responsibility, perhaps under a new harbor authority.

John Connolly from Senator Daly's office stated that Senate Finance was supporting legislative initiatives for the needed State funds. Town and county resolutions are in place supporting their share of the project. If first instance payments are arranged through the authority provided in the State Navigation Law, then these municipalities will advance their payment so as to have a minimal or no effect on the State's cash flow. Town and county resolutions will be sent to us to specify their support. Assemblyman Murphy conveyed his support for this legislative initiative through the local representatives.

If approved, State and local funding for the project will be needed in State FY 1991-1992 (one year away). The contract work is expected to start in the fall of 1991, so the first payment would be needed in September 1991 but sufficient funding authority would be needed to have a Local Cooperator sign an agreement (LCA) in the late spring of 1991.

At the current time no LCA is needed, but if the project is to go into the next phase, a letter of support is required from the prospective cooperator (usually our agency). Comments from the legislators and local governments can be expected to urge us to issue this letter.

I have taken the liberty of forwarding copies of this memo to the other State agencies who participated in meetings convened by Senator Daly and Assemblyman Murphy and Pillittere regarding Olcott Harbor. Some of these agencies offered their support for the project, so perhaps they have also been able to find funding to help with the implementation.

IV:bb

cc: M. Pirastru
S. O'Connor, WNYEDC/UDC
H. Peyrebrune, DOT
H. Doig, DEC
C. McCaffrey, DOS
R. Stapf, OGS

New York State Office of Parks, Recreation and Historic Preservation
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1, Albany, New York 12238-0001

OFFICE OF PARKS, RECREATION, HISTORIC PRESERVATION
NEW YORK STATE
Orin Lehman
Commissioner

November 13, 1989

Mr. John Zorich, P.E.
Chief, Planning Division
Environmental Analysis Branch
Department of the Army
Buffalo District
CORPS of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199

Dear Mr. Zorich:

Re: CORPS
Olcott Harbor Navigation Project
Newfane, Niagara County
89PR1230

The State Historic Preservation Officer (SHPO) has reviewed the above project in accordance with Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's regulations, 36 CFR 800/801.

Based upon this review, it is the opinion of the SHPO that this project will have no effect upon districts, sites, buildings, structures, objects or archeological resources in or eligible for inclusion in the National Register of Historic Places.

If you have any questions, please contact Edward Dudek of the Project Review Unit at (518) 474-0479.

Sincerely yours,

Julia S. Stokes
Deputy Commissioner for
Historic Preservation

JSS/ED:gc



EXHIBIT 29

NOV 13 [redacted]

Plan Formulation Branch

SUBJECT: Olcott Harbor Project, New York

Mr. Orin Lehman
Commissioner
New York State Office of Parks,
Recreation, and Historic Preservation
The Governor Nelson A. Rockefeller
Empire State Plaza
Agency Building 1
Albany, New York 12238

Dear Mr. Lehman:

This is to acknowledge receipt of your October 19, 1989 "Letter of Intent" for the Olcott Harbor project. At this time, as the potential local sponsor, your letter does not indicate that it is the intent of the Office of Parks, Recreation, and Historic Preservation (NYSPR&HP) to furnish all necessary items for the non-Federal share of the subject project. I note with interest the important issues you raised including the formation of a Harbor Authority to share in the cost of the project for which no non-Federal funds are currently budgeted. The timing of a Harbor Authority and availability of non-Federal funds will have a direct impact on when the project can be scheduled for construction.

In view of the above and other concerns, including reaching an agreement on a selected plan with the associated local master plan development, I have delayed completion of my Draft Reevaluation Report until February 1990. To meet this schedule, I anticipate reaching agreement on the selected plan by mid-December 1989. However, if I do not have a definitive letter of project support from a potential non-Federal sponsor by the time I submit my draft report, I regret that I will have to recommend that all further Federal actions on this project be put in the "deferred status."

Regarding commercial and flood control benefits, these benefit categories and their impact on the project cost allocation and apportionment will be considered. Charter fishing, for example, is considered commercial navigation and will be evaluated as such in the report with appropriate cost sharing.

I am providing an information copy of this letter to Mr. Ivan Vamos, Deputy Commissioner, NYSPR&HP; and to each one of the interested Federal, State, and local agencies, and groups and individuals listed on the enclosed sheet.

EXHIBIT 30

Plan Formulation Branch
SUBJECT: Oicott Harbor Project, New York

My point of contact pertaining to this matter is Mr. Wiener Cadet of my Plan Formulation Branch, who can be contacted at 716-879-4247 or by writing to the above address.

Sincerely,

HUGH F. BOYD III
COLONEL U.S. ARMY
COMMANDING

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

Enclosure

CF:
CENCB-PD
CENCB-PD-PF
CENCB-PO
DDE-PM

OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
NEW YORK STATE
Orin Lehman
Commissioner

**New York State Office of Parks, Recreation and Historic Preservation**
The Governor Nelson A. Rockefeller Empire State Plaza
Agency Building 1, Albany, New York 12238

518-474-0456

October 27, 1989

John Zorich, P.E.
Chief, Planning Division
Department of the Army
Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199

Dear Mr. Zorich:

Enclosed is a copy of Commissioner Lehman's letter of October 19, 1989 regarding the Olcott Harbor proposal.

Some of the issues addressed in the letter pertain to your scoping coordination work discussed in your letter of October 18, 1989. The letter notes that economic and funding issues still need to be addressed.

We will be happy to discuss these issues with you as appropriate.

Sincerely,

Ivan P. Vamos

Ivan P. Vamos
Deputy Commissioner for
Planning and Development

IV:bb
cc: M. Pirastru
Planning



EXHIBIT 31

**New York State Department of Environmental Conservation**
Information Services
Wildlife Resources Center
Delmar, New York 12054



Thomas C. Jorling
Commissioner

October 24, 1989

John Zorich
Dept. of the Army
Buffalo District. Corps of Engineers
1776 Niagara Street
Buffalo, New York 14207-3199

Dear Mr. Zorich:

We have reviewed the Significant Habitat Unit and the NY Natural Heritage Program files with respect to the Olcott Harbor Navigation Improvement work at Lake Ontario, Town of Newfane, Niagara County, New York.

The entire Lake Ontario shoreline in Niagara County is a major duck wintering area. Care should be taken not to destroy valuable habitat or unnecessarily disturb these birds.

Our files are continually growing as new habitats and occurrences of rare species and communities are discovered. In most cases, site-specific or comprehensive surveys for plant and animal occurrences have not been conducted. For these reasons, we can only provide data which have been assembled from our files. We cannot provide a definitive statement on the presence or absence of species, habitats or natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

This response applies only to known occurrences of rare animals, plants and natural communities and/or significant wildlife habitats. You should contact our regional office(s), Division of Regulatory Affairs, at the address(es) enclosed for information regarding any regulated areas or permits that may be required (e.g., regulated wetlands) under State law.

If this project is still active one year from now we recommend that you contact us again so that we may update this response.

Sincerely,

B. Buffington

Burrell Buffington
Significant Habitat Unit

Enc.
cc: Region 9, Wildlife Mgr.

New York Heritage Program is supported in part by The Nature Conservancy

EXHIBIT 32

OCT 19 1989

Environmental Analysis Branch

SUBJECT: Olcott Harbor Navigation Improvement Studies at Lake Ontario, Niagara County, Town of Newfane, New York - Continued Scoping Coordination

Dear Participant:

The U.S. Army Corps of Engineers, Buffalo District, is in the process of finalizing navigation improvement studies for the Olcott Harbor Project on Lake Ontario in the town of Newfane, Niagara County, New York. This project was authorized by the Water Resources Development Act of 1986. Olcott Harbor is a significant regional access area to Lake Ontario fishing, boating, bathing, aesthetic, and associated resources. Federal, State, regional, and local interests have sought navigation improvement measures for many years. Please refer to the enclosed description of alternative plans (Enclosure 1) and related drawings (Enclosure 2, Figures 1 through 9) for specifics on the proposed project.

The feasibility study phase including plan formulation, coordination, evaluation, and tentative selection of plan(s) was completed in 1979. Figure 4 of Enclosure 2 depicts the recommended plan (Plan 10) at that time. Other studies that were recommended are currently being completed to optimize engineering and economic features, and to further assess potential environmental and social impacts pertaining to fisheries, water quality, dredged material disposal, access, aesthetics, and community and regional development.

Please review the Enclosures, reference any previous comments you may have provided on the Olcott Harbor project, and/or provide me with any updated information pertaining to your interests that you think we should know about and/or any comments, concerns, or recommendations you may have. Information will be used to prepare the updated planning documentation. Please provide any comments within 30 days of the date of this letter. Your assistance in this matter is greatly appreciated.

EXHIBIT 33

onmental Analysis Branch
CT: Olcott Harbor Navigation Improvement Studies at Lake Ontario, Niagara
y, Town of Newfane, New York - Continued Scoping Coordination

ly point of contact pertaining to this matter is Mr. Tod Smith of my
ronmental Analysis Branch, who can be contacted by calling 716-879-4173 or
riting to the above address.

Sincerely,

LETTER NOT PROCESSED IN MAIL ROOM

John Zorich, P.E.
Chief, Planning Division

osures

B-PD-ER
B-PD
B-PD-PF

STATE OF NEW YORK
PARKS, RECREATION AND HISTORIC PRESERVATION
ALBANY

ORIN LEHMAN
COMMISSIONER

October 19, 1989

Dear Colonel Boyd:

Thank you for your letter of September 21, 1989 regarding Olcott Harbor. We reviewed this proposal with Dan Kelly of your staff, legislators and representatives of local governments and other State agencies on September 12.

Since non-Federal funds are not budgeted for this project, it will be necessary to confirm the availability of funds from the Town and County and also ascertain that the half of the local share proposed for New York State is available for the March 1992 start indicated in your letter. The large scale of the proposed harbor at Olcott increases our concerns that these unresolved fiscal issues be settled before the project is advanced.

At the September 12 meeting, we discussed the possibility of increasing the Federal share for Olcott Harbor because of commercial and flood control benefits associated with the project. We would like to identify any potential for this improvement in the project's economic support.

We also hope that other agencies interested in this harbor can provide for a part of the local participation, perhaps through a newly formed Harbor Authority. By copy of this letter we are asking for comments and suggestions from these agencies.

Considering that there are no State Park properties or maintenance staff at Olcott, we will ask that the Town or perhaps the new Authority also agree to the maintenance of the project. The New York State Office of General Services and the Town will probably be able to address the land needs for the project.

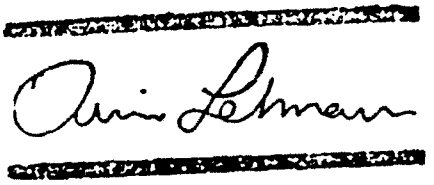
We recognize that all of these issues need to be addressed in a single agreement with a local co-operator. We will try to help

W. Bl

EXHIBIT 34

the involved legislators, other agencies and local governments solve these issues before we can suggest the Olcott Harbor project be advanced.

Sincerely,



Colonel Hugh F. Boyd, III
Department of the Army
Buffalo District, Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199

cc: Congressman LaFalce
NYS Senator Daly
NYS Assemblyman Murphy
Mr. Donohue, WEDC
Commissioner Jorling, NYSDEC
Commissioner Hudacs, NYSOGS
Mr. Stafford, NYSDOS
Mr. Pirastru, NYSOPRHP

SEP 2 1 1989

Plan Formulation Branch

SUBJECT: Olcott Harbor Project, New York

Mr. Orin Lehman
Commissioner
New York State Office of Parks,
Recreation, and Historic Preservation
The Governor Nelson A. Rockefeller
Empire State Plaza
Agency Building 1
Albany, New York 12238

Dear Mr. Lehman:

This is to provide you with an update on the Olcott Small Boat Harbor project and request an updated letter of intent for the non-Federal cooperative share of this project.

Modifications to the existing Corps project at Olcott Harbor were authorized by the 1986 Water Resources Development Act (WRDA). In February 1988, I initiated the Reevaluation Study to update the economic feasibility and cost estimate, and also undertake a model study to fine-tune the project design, as well as address possible environmental concerns. These studies are substantially complete and preliminary indications are that the project will be economically viable and is fully supported by the public. The first costs of the Corps project are presently estimated to be between $12.0 million - $18.0 million. On this basis, with the requirements of the 1986 WRDA, the non-Federal share would be between $6.0 million - $9.0 million. The Draft and Final Reevaluation Reports are scheduled to be completed in November 1989 and May 1990, respectively. Future activities include preparation of a General Design Memorandum and Plans and Specifications scheduled for completion in March 1991 and September 1991, respectively.

As currently scheduled, construction could be initiated in Fiscal Year (FY) 1992. The assumptions required to initiate an FY 1992 construction start include: a fully executed Local Cooperation Agreement; Federal construction funds being made available; and matching non-Federal construction funds available by March 1992. Also, your agency as the official local sponsor, must provide by March 1992, all necessary lands, easements, and rights-of-way for project construction prior to advertising the construction contract.

In keeping with the current schedule, please provide me an updated letter of intent by October 31, 1989, to include in my Draft Reevaluation Report. The letter should indicate that it is the intent of the Office of Parks, Recreation and Historic Preservation (NYSPP&HP) to furnish all necessary items for the non-Federal cooperative share of the subject project.

EXHIBIT 35

Plan Formulation Branch
SUBJECT: Olcott Harbor Project, New York

I am providing an information copy of this letter to Mr. Ivan Vamos, Deputy Commissioner, NYSP&HP.

My point of contact pertaining to this matter is Mr. Wiener Cadet of my Plan Formulation Branch, who can be contacted by calling commercial number (716)879-4247 or by writing to the above address.

Sincerely,

BRUCE W. HAIGH
LTC, U.S. ARMY
DEPUTY COMMANDER

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

CF:
DDE-PM
CENCB-PD (reading file)
CENCB-PD-PF
Ivan Vamos

Plan Formulation Branch

SUBJECT: Olcott Harbor Project, New York SEP - 5 1989

Honorable Matthew J. Murphy
State Assemblyman, 139th District
Room 648
Legislative Office Building
Albany, New York 12248

5 SEP 89 13 00

Dear Mr. Murphy:

This is in response to your letter of August 21, 1989 requesting an update on the past, present, and anticipated future activities of the Corps of Engineers on the Olcott Harbor project; and other pertinent information in preparation for your September 11, 1989 meeting in Albany, New York.

Modifications to the existing Corps project at Olcott Harbor were authorized by the Water Resources Development Act of 1986. In February 1988, I initiated the Reevaluation Study to update the economic feasibility and cost estimate, and also have a model study underway to fine-tune the project design, as well as address possible environmental concerns. These studies are substantially completed and preliminary indications are that the project will be economically viable and is fully supported by the public. The Draft and Final Reevaluation Reports are scheduled to be completed in November 1989 and May 1990, respectively. Future activities include preparation of a General Design Memorandum and Plans and Specifications scheduled for completion in March 1991 and September 1991, respectively.

As currently scheduled, construction could be initiated in Fiscal Year (FY) 1992. The assumptions required to initiate an FY 1992 construction start include: a fully executed Local Cooperation Agreement (sample enclosed): Federal construction funds being made available; and matching non-Federal construction funds available by June 1992. Also, the New York State Department of Parks, Recreation, and Historic Preservation, the official local sponsor, must provide by March 1992, all necessary lands, easements, and rights-of-way for project construction prior to advertising the construction contract.

I trust the above meets your present needs. If I may be of further assistance in this matter, please contact me at (716) 879-4200.

Sincerely,

HUGH F. BOYD III
COLONEL U.S. ARMY
COMMANDING

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

Enclosure

EXHIBIT 36

**WENDEL**
**DESIGN • SURVEY • CONSTRUCTION**
11 PINCHOT CT. • BUFFALO, NY 14228 • 716/688-0766 or 625-6867
FAX 716/625-6825

12 Jun 89 10 28

June 6, 1989

Mr. Wiener Cadet, Study Manager
U.S. Army Corps of Engineers
1776 Niagara Street
Buffalo, New York

SUBJECT: OLCOTT OUTER HARBOR DEVELOPMENT PLAN

Dear Mr. Cadet:

Enclosed is a breakdown of docking slips taken from our preliminary layout plan.

A total of 1058 slips can be accommodated on Plan 10B broken down as follows:

| | | |
|---|---|---|
| a. | East Basin - | 714 |
| b. | West Basin - | 232 |
| c. | Between Federal Piers - | 112 |
| | Total | 1058 |

In addition, one (1) 115' tour boat dock is provided.

The master planning process will explore such issues as location of parking, use of the federal piers, configuration of access/security to docking systems, segregation of boater groups and water levels. These factors will alter the final configuration of docking slips and we ask that you consider the enclosed figures as preliminary and subject to change.

Should you have any questions regarding this information, please contact Terry Gregg or myself at your convenience.

Very truly yours,

WENDEL ENGINEERS, P.C.

Anthony W. McKenna, P.E.

AWM:jeg
xc: Timothy R. Horanburg, Supervisor - Town of Newfane
Ted Belling, Planner - Niagara County Planning Dept.

EXHIBIT 37

7425 CANAL RD. - BOX 501 • LOCKPORT, NY 14094 • 716/433-5993 or 625-8228

## Plan 10B - Olcott Outer Harbor
## Preliminary Boat Dock Breakdown

| Length of Finger Pier | Range of Boat Length | No. of Dockslips East Basin | West Basin | Between Federal Piers |
|---|---|---|---|---|
| 20' | 18' - 24' | 154 | 40 | -- |
| 24' | 24' - 28' | 292 | 116 | -- |
| 28' | 28' - 32' | 122 | 46 | 112 |
| 32' | 32' - 38' | 98 | 30 | -- |
| 40' | 38' - 50' | 48 | -- | -- |
| | Totals | 714 | 232 | 112 |

Add one (1) 115' tour boat dock.

### Suggested Pricing Information

20' Finger Pier - $700/Season
24' " " - $1000/Season
28' " " - $1300/Season
32' " " - $1500/Season
40' " " - $1800/Season

Note: Water/electric utilities assumed provided.

MAY - 1 1989

Plan Formulation Branch

SUBJECT: Olcott Harbor Project, New York - Request for Flow Discharge

Mr. Thomas Callahan
Owner, Burt Dam Power Co.
P.O. Box 392
Lockport, New York 14094

Dear Mr. Callahan:

This is in regard to your April 26, 1989 telephone conversation with Mr. Wiener Cadet of my staff, requesting flow discharge data from the Burt Dam Power Company in the town of Newfane, New York.

Your cooperation is greatly appreciated in providing the daily flow discharge data from the dam on a monthly basis for the period April 1989 through November 1989.

As you may be aware, we are in the process of collecting site-specific field data to assess potential impacts of the proposed small-boat marina project on the immediate environs.

My point of contact pertaining to this matter is Mr. Wiener Cadet of my Plan Formulation Branch, who can be contacted at 716-876-5454, extension 2247 or by writing to the above address.

The Buffalo District -- Leadership in Engineering.

Sincerely,

JOHN ZORICH

John Zorich, P.E.
Chief, Planning Division

EXHIBIT 38

APR 2 8 1989

Plan Formulation Branch

SUBJECT: Olcott Harbor Project, NY - Request for Master Plan

Mr. Timothy Horanburg
Supervisor
Town of Newfane
2896 Transit Road
Newfane, New York 14108

Dear Mr. Horanburg:

This is in regard to the recent discussion you had with Messrs. Wiener Cadet and Tod Smith of my staff on the Olcott Harbor Waterfront master plan as it relates to the proposed small-boat harbor marina project.

I would appreciate your continued participation in formulating the Olcott project by providing me an updated version of the Town's waterfront master plan, which will serve as a current land use reference in assessing the impacts of the proposed project on anticipated land use and vice versa. Further, as you are aware, the procedures used to evaluate this project's economic feasibility depend upon the number of slips created by the project. The master plan, therefore, should identify the number of slips the community desires. In addition, if phased slip installation is anticipated, I need to know the installation schedule, both number of slips and year of installation. Also, parking and other project-related facilities, and planned future developments should be fully consistent with the recreation needs to be fulfilled by the Corps project.

Please provide me a draft copy of your master plan by early July 1989, as my Draft Reevaluation Report is due September 1989.

My point of contact pertaining to this matter is Mr. Wiener Cadet of my Plan Formulation Branch, who can be contacted at 716-876-5454, extension 2247 or by writing to the above address.

The Buffalo District -- Leadership in Engineering.

Sincerely,

JOHN ZORICH

Ruth F. Boyd III
Colonel, U.S. Army
Commanding

CF:
CENCB-PD
CENCB-PD-PF
NYS Parks, Rec. & Hist. Preservation
ATTN: Ivan Vamos, Dpty Commissioner

EXHIBIT 39

MAR 3 1 198

Plan Formulation Branch

SUBJECT: Olcott Harbor Project, New York

Mr. Philip Morris
Chief, Sea & Lake Measurement Section
Physical Oceanography Division
Great Lakes Acquisition Unit
N. OMA 1211
P.O. Box 2170
Rockville, Maryland 20852

Dear Mr. Morris:

I am going to conduct a field data collection program including hourly lake levels at Olcott Harbor, New York during the months of April through November 1989 in connection with the subject project.

I am requesting that the hourly lake level data recorded during these months at the Olcott gage, station 2076 be provided to the Buffalo District, Corps of Engineers, ATTN: CENCB-PD-PF. I also request that the information be provided in early July for April, May and June and in early November for August, September and October for timely input to the ongoing physical model study for the project.

Thank you for your attention to this matter.

My point of contact pertaining to this matter is Mr. Wiener Cadet of my Plan Formulation Branch who can be contacted at telephone number (716) 876-5454, extension 2247, or by writing to the above address.

Sincerely,

KENNETH R. HALLOCK

Hugh F. Boyd III
Colonel, U.S. Army
Commanding

CF:
CENCB-PD (Reading File)
CENCB-PD-PF

EXHIBIT 40

SUPERVISOR
778-8531
TOWN CLERK
778-8822
HIGHWAY
778-8844
TAX COLLECTOR
778-8822

# TOWN OF NEWFANE

2896 Transit Rd.
Newfane, N.Y. 14108

ASSESSOR
778-8827
WATER/SEWER/REFUSE
778-8587
778-8132
BUILDING INSP.
778-8822
JUSTICE COURT
778-9292

January 4, 1989

Colonel Hugh Boyd, III
Commander, Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207

Dear Colonel Boyd:

Your attendance would be appreciated at a meeting of governmental and community leaders on Thursday, January 19 from 8:30 to 10:30 a.m. at the Best Western-Lockport Inn, 515 South Transit Street in Lockport. The purpose of this meeting is to discuss a plan of organization for a cooperative effort among the agencies which will be most involved in the Olcott Harbor Project.

The Olcott Harbor Project, a planned $13 million breakwall and marina project, is currently in the design and planning stages by the U.S. Army Corps of Engineers. During our meeting, we will be providing much more detailed information regarding the nature and scope of the project. Enclosed for your reference is a copy of the brochure entitled "Lakeport for Niagara", which provides some basic information regarding the project.

Please call the Olcott Harbor Task Force (716 433-4762) to confirm your attendance.

Sincerely,

Timothy R. Horanburg
Supervisor, Town of Newfane

TRH:djc

Enc.

EXHIBIT 41

MAILROOM-MCBM-FS

14 Nov 88 11 15

# EASTERN NIAGARA CHAMBER OF COMMERCE

*Progress in Niagara*

November 10, 1988

Dear Friend,

One of the most significant economic development projects to occur in Niagara County for the next 20 years is quickly taking shape, and your input is greatly needed to assure that the greatest possible impact for the area's economy is achieved. The Olcott Harbor Project, a planned $13 million breakwall and marina project, slated for Olcott Beach on the Niagara County shoreline of Lake Ontario is in the design and planning stages of the U.S. Army Corps of Engineers at this time.

I would like to invite you to attend a meeting of governmental and community leaders on Friday, November 18 at 2 PM at the Niagara County Cornell Cooperative Extension Administrative Building, 4487 Lake Avenue (Route 78) in Lockport. The primary purpose of this meeting will be to discuss a plan for organizing a cooperative effort among the agencies which will be involved in the Olcott Harbor Project. The Agenda for the meeting is listed below.

Please call the Chamber of Commerce office (433-3828) to confirm your attendance. Thank you in advance for your interest in the project.

Sincerely,

David R. Kinyon
President

AGENDA

1. Project Overview
2. Organization Proposal/Election of Temporary Chairman
3. Identification of Problems & Issues
4. Formation of Steering Committee
5. Formation of Development Master Plan

EXHIBIT 42

Lockview Plaza • 41 Main Street • Lockport, New York 14094 • (716) 433-3828

# OLCOTT HARBOR TASK FORCE

MAILROOM-NCBIN-S

10 Nov 88 11 05

James W. Kramer, Sr.
Chairman

November 9, 1988

Colonel Hugh Boyd, III
Commander, Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207
ATTN: Wiener Cadet

Dear Mr. Cadet:

On behalf of the Olcott Harbor Task Force, I would like to invite you to attend the first in a series of public presentations dealing with the economic impact of harbor developments in the Great Lakes Region on Wednesday, November 30 at 6 p.m. at the Harbor Inn Restaurant in Olcott Beach.

The purpose of this presentation, which is being made by David White, Program Coordinator for the New York State Cooperative Extension/Sea Grant Program, is to make area residents and officials better aware of the tremendous economic impact and other related benefits which will result from the Olcott Harbor Project.

Please use the convenient reservation form enclosed so that we can make arrangements for your attendance. As always, thank you in advance for your interest in and support of the Olcott Harbor Project.

Sincerely,

James W. Kramer

James W. Kramer, Sr.
Chairman

JWK:djc

Enc.

STATE OF NEW YORK
PARKS, RECREATION AND HISTORIC PRESERVATION
ALBANY

ORIN LEHMAN
COMMISSIONER

November 7, 1988

Dear Colonel Clark:

This concerns the Olcott Harbor Recreation Navigation Project proposed along Lake Ontario. Please be advised that it is the intent of the Office of Parks, Recreation and Historic Preservation to furnish all necessary items for the non-federal cooperative share of this project, which as we understand it, does not constitute a commitment of Agency funds.

Sincerely,

Orin Lehman

Colonel Daniel R. Clark
Department of the Army
Buffalo District Corps of Engineers
1776 Niagara Street
Buffalo, NY 14207-3199

cc: Congressman LaFalce

EXHIBIT 44

SUPERVISOR
778-8531
TOWN CLERK
778-8822
HIGHWAY
778-8844
TAX COLLECTOR
778-8822

# TOWN OF NEWFANE

2896 Transit Rd.
Newfane, N.Y. 14108

ASSESSOR
778-8827
WATER/SEWER/REFUSE
778-8587
778-8132
BUILDING INSP.
778-8822
JUSTICE COURT
778-9292

September 2, 1988

SUBJECT: Olcott Harbor Project, New York-"Passenger Only" Ferry Service

Mr. Ivan P. Vamos
Deputy Commissioner
Planning and Operations
NYS Office of Parks, Recreation
and Historic Preservation
Agency Building 1
Empire State Plaza
Albany, NY 12238

12 SEP 88 11 05
NYS OFFICE OF PARKS

Dear Colonel Boyd:

As a result of two meetings held on July 20 and August 18, 1988 between members of your staff; the town of Newfane; Niagara County; the State of New York Office of Parks, Recreation, and Historic Preservation; and other interested individuals; it was agreed that "Passenger Only" Ferry Service should be considered for inclusion in the Olcott Harbor project.

On behalf of the Town Board of Newfane, I hereby inform you that the Town supports including consideration of this option in your on-going project planning. The Town Board considers this option to be compatible with the desired environment for the Olcott Harbor area and understands that it is within the scope of the existing project authorization.

Sincerely yours,

Timothy R. Hohamburg
Supervisor, Town of Newfane

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO ATTENTION OF:

DAEN-CWP-A

11 June 1980

SUBJECT: Olcott Harbor, New York

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on Olcott Harbor, New York. It is accompanied by the reports of the Board of Engineers for Rivers and Harbors and the District and Division Engineers. These reports are in response to a resolution adopted 19 October 1967 by the United States House of Representatives Committee on Public Works. The Committee requested the Board of Engineers for Rivers and Harbors to review the reports on Olcott Harbor, New York, transmitted to Congress on 15 April 1936, and subsequent reports with a view to determining whether the existing project should be modified at the present time.

2. The District and Division Engineers recommend that modifications of the existing Federal navigation project for Olcott Harbor, New York, in the interest of small boat navigation and recreational fishing, be authorized for construction. Their recommended plan consists of constructing two offset breakwaters near the entrance of the existing navigation channel, an additional jetty adjoining the existing west jetty, and dredging an access channel upstream of the existing project in Eighteenmile Creek. The east breakwater, by virtue of its alinement, would provide a protected mooring basin, which would be accessible via a dredged channel off the entrance channel. Also, the crest of the east breakwater will have a concrete walkway with a guardrail for fishermen who will gain access from shore via a wooden footbridge. Based on April 1978 price levels, the reporting officers estimate the first cost of construction to be $7,894,000, of which $3,952,500 would be Federal and $3,941,500 would be non-Federal. Average annual charges, based on a 50-year period for economic analysis and an interest rate of 6-5/8 percent are estimated at $599,800, including $21,600 for operation and maintenance. Average annual benefits are estimated at $903,500, and the

EXHIBIT 46

benefit-cost ratio is 1.5. Use of the currently prescribed Federal interest rate of 6-7/8 percent would reduce the benefit-cost ratio from 1.5 to 1.4.

3. The Board of Engineers for Rivers and Harbors concurs in general in the views and recommendations of the reporting officers. The Board recommends that modification of the existing Federal navigation project for Olcott Harbor be authorized for construction in accordance with the plan of the District Engineer and the President's proposed cost-sharing policy. In accordance with that policy, the cost to the United States is estimated at $3,557,800 for construction. The non-Federal cost is estimated at $4,336,200, of which $394,700 is the total cash contribution required from the State of New York.

4. I concur in the views and recommendations of the Board.

J. W. MORRIS
Lieutenant General, USA
Chief of Engineers

DEPARTMENT OF THE ARMY
BOARD OF ENGINEERS FOR RIVERS AND HARBORS
KINGMAN BUILDING
FORT BELVOIR, VIRGINIA 22060

REPLY TO
ATTENTION OF:

BERH-PLN

21 August 1979

SUBJECT: Olcott Harbor, New York

Chief of Engineers
Department of the Army
Washington, DC 20314

## Summary of Board Action

The Board believes that modifications to the existing Federal navigation project at Olcott Harbor are needed, are economically justified, and are environmentally acceptable. The Board concurs with the reporting officers' plan consisting of two offset breakwaters near the entrance of the existing navigation channel, a new entrance channel, an additional jetty adjoining the existing west jetty, and an access channel in Eighte nmile Creek upstream of the existing project. The east breakwater, by virtue of its alinement, would provide a protected mooring basin accessible via a dredged channel off the new entrance channel. The project construction cost is estimated at $7,894,000, of which $4,336,000 would be non-Federal. The benefit-cost ratio is 1.5.

## Summary of Report Under Review

1. Authority.--This report is in response to a resolution adopted 19 October 1967 by the United States House of Representatives Committee on Public Works. The Committee requested the Board of Engineers for Rivers and Harbors to review the reports on Olcott Harbor, New York, transmitted to Congress on 15 April 1936; and subsequent reports with a view to determining whether the existing project should be modified at the present time. The resolution is quoted in full in the District Engineer's report.

2. Description of the study area.--Olcott Harbor is located in the Town of Newfane, Niagara County, New York, on the south

EXHIBIT 47

shore of Lake Ontario at the mouth of Eighteenmile Creek. First improved in the early 1870's for commercial navigation by small sailing vessels, the harbor currently serves recreation craft in a region with a combined population in excess of 6,000,000. This region includes the metropolitan areas of Buffalo and Rochester, New York and Toronto and Hamilton, Ontario, Canada.

3. Existing improvements.--The existing Federal project at Olcott was completed in 1918 by the U.S. Army Corps of Engineers, and was modified in 1930, 1950, and 1963. The project consists of a 12-foot deep entrance channel (below low-water datum) 140 feet wide and two parallel jetties set 200 feet apart. The west jetty is 873 feet long and the east jetty is 850 feet long. Both jetties have a concrete cap and are used by fishermen. The entrance channel extends about 1,460 feet into Lake Ontario from the shoreward end of the jetties. The controlling depth of the channel is 11 feet because of a rock shoal at the entrance. Maintenance dredging of the entrance channel is infrequent, as a dam about 2 miles upstream of Olcott at the Hamlet of Burt prevents most creek sediment from reaching the channel. The Town of Newfane Marina and four commercial marinas provide mooring facilities for 134 boats. Eight launching ramps, of which six in the Town of Newfane Marina are public, are available for trailer-launched boats. The town is increasing the capacity of its marina by providing 135 new slips for occupancy in 1980. Although unscheduled, an additional 130 moorings are planned for construction in the near future by the commercial marinas.

4. Problems and needs.--Specific problems identified by local interests at Olcott Harbor include an inadequately protected entrance channel, lack of an adequate channel along the inner harbor frontage used for mooring boats, storm wave damage in the inner harbor, and lack of access and facilities for public fishing. During storms from the northerly quadrants, waves entering between the entrance channel jetties are reflected off the jetties and into the harbor, resulting in rougher conditions than are present in the lake and causing damages to boats and structures. Also, fishing off the existing jetties has always been popular, but interest has intensified as a result of a successful salmonid fishery program started in 1968 by the State of New York. However, there is no public access to the jetties and fishermen must trespass through private lands. Additional public fishing facilities are needed to accommodate the fishing demand. Lastly, a 1978 regional

analysis of boating needs on Lake Ontario and in Niagara County indicates an existing and future need for additional mooring spaces.

5. Improvements desired.--Local interests desire wave protection for the existing entrance channel and dredging upstream in Eighteenmile Creek to provide adequate access to existing moorings and to allow development of additional needed slips and moorings. In recognition of the need for berthing space beyond the capabilities of Eighteenmile Creek, they also desire development of a protected area east of the east jetty. Local interests further expressed a desire for additional fishing and public launching facilities.

6. Alternatives considered.--In addition to a "no action" alternative, the District Engineer considered 10 structural plans comprising breakwaters and jetties, singularly and in combinations, along with dredging. The development of plans was aided by active public participation and was accomplished sequentially until a plan evolved that best met the needs of local interests.

7. Plan of improvement.--The District Engineer, upon examining the economic, environmental, and social considerations of the alternatives studied, selected a plan to modify the Federal project which provides the maximum net benefits, best satisfies the planning objectives, and is the one preferred by local interests. The proposed plan consists of two offset breakwaters near the entrance of the existing channel, an additional jetty adjoining the existing west jetty, and an access channel upstream of the existing project in Eighteenmile Creek. The east breakwater, commencing near the mouth of the existing entrance channel, would follow a east-southeasterly alinement for 1,350 feet, then southerly for 300 feet, and be connected to shore by a 150-foot wooden bridge. A protected mooring basin would be provided in the area inclosed by the east breakwater, shore, and existing east jetty. Access to this mooring area would be provided by a 9-foot deep and 100-foot wide channel parallel to the long arm of the breakwater. The east breakwater would have a smooth walkway and a guardrail to accommodate fishermen. The west breakwater would follow a west-southwesterly alinement for 550 feet, then southwesterly for 560 feet. A new entrance channel would be dredged 12 feet deep between the breakwaters and connect with the existing channel. The additional jetty adjoining the existing west jetty on the lakeside would extend 330 feet from shore. The structures,

ranging from 16 to 11 feet above low-water datum, would be of rubblemound construction. The dredging of Eighteenmile Creek for a distance of 1,500 feet upstream of the existing project would provide a 9-foot deep and generally 100-foot wide access channel into the inner harbor. A 150-foot square turning basin would also be provided at the upstream end of the channel. About 30,000 cubic yards of highly polluted dredged material from Eighteenmile Creek would be placed in an upland diked disposal area. A 2,300 square yard rock ledge and other bottom material to be dredged from the new entrance channel and access channel paralleling the east breakwater is judged to be suitable for open water disposal and will be placed in deep water about 1 mile offshore.

8. Economic evaluation.--Based on April 1978 price levels, the District Engineer estimates the total first cost of the proposed plan of improvement at $7,894,000, of which $3,952,500 would be Federal and $3,941,500 would be non-Federal. Annual charges, based on an interest rate of 6-5/8 percent and a 50-year period for economic analysis, are estimated at $599,800, including $21,600 for operation and maintenance. Average annual benefits are estimated at $903,500, consisting of $748,800 for navigation, $138,100 for recreation, and $16,600 from the utilization of underemployed and unemployed labor in constructing the project. The resultant benefit-cost ratio is 1.5.

9. Project effects.--The proposed project would provide a safe all-weather harbor for a potential 537 boats in the east basin and for 399 boats in the inner harbor in Eighteenmile Creek. It would also provide a harbor of refuge for boats seeking refuge from storms on Lake Ontario. About 20,560 fisherman-days annually will be provided by the project's recreation facilities. The region's underemployment and unemployment problems will be lessened during construction of the project. Dredging will eliminate approximately 5 acres of benthic habitat. However, about 3.1 acres of aquatic habitat would be created on the submerged sides of the breakwaters and jetty, where the rubblemound provides numerous small spaces. While the removal of polluted sediments in Eighteenmile Creek could release some nutrients and heavy metals into suspension and thereby affect water quality and aquatic organisms, such impacts would be short-term. In the long-term, the removal of this material could lessen the opportunity for these toxins to enter the food chain. The disposal of the 30,000 cubic yards in the 8-acre upland site will eliminate agricultural production on the land for several years. The effluent from the diked disposal area would be ditched to Eighteenmile Creek and Lake Ontario and

will cause turbidity at the outfalls. Other effects of the project include: temporary turbidity in the harbor and lake as a result of construction; destruction and displacement of aquatic life, and promotion of commercial and residential development.

10. Recommendations of the reporting officers.--The District Engineer recommends modification of the Federal project at Olcott Harbor, in accordance with the plan described in his report and subject to certain conditions of local cooperation. He further recommends that, if necessary, the improvements for navigation be undertaken independently of providing public recreational fishing facilities whenever the required local cooperation for navigation has been furnished, and that the public fishing development be accomplished if necessary or desirable. The Division Engineer concurs and issued a public notice affording interested parties an opportunity to present additional information to the Board of Engineers for Rivers and Harbors.

## Review by the Board of Engineers for Rivers and Harbors

11. General.--The scope of the Board review encompassed the overall technical, economic, social, environmental, and policy aspects involved in the improvement proposed by the District Engineer. The review considered the report's conformance with the essential elements of the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources. The Board also considered the views of all local interests, as well as Federal and state agencies.

12. Response to the Division Engineer's public notice.--The only response to the Division Engineer's public notice was from the New York State Department of Environmental Conservation which reemphasized that its Bureau of Fisheries regards the creation of recreational fishing facilities as an integral part of the project. The Department also expressed hope that its earlier comments regarding possible project impacts on fish spawning, model studies, and mitigative measures would not be forgotten and would receive proper recognition throughout the planning process. The Board gave careful consideration to the Department's comments and notes that the creation of recreational fishing facilities is an integral part of the project. During postauthorization planning studies, the District Engineer will have the Waterways Experiment Station, Vicksburg, Mississippi, develop and test a physical model of his plan which will address several items, including the Department's concerns. Changes in

water circulation patterns resulting from breakwater construction will be studied in these models for their effect on spawning routes. The Board believes that project design modifications can be made, if necessary, to minimize such possible impacts and to mitigate such project effects.

13. Findings and Conclusions.--The Board of Engineers for Rivers and Harbors concurs in general in the views and recommendations of the reporting officers. The improvements are economically justified and the requirements of local cooperation are generally appropriate. The Board believes that the District Engineer's proposed plan will provide a significant contribution to the regional economy and improvement of social well-being, and that the beneficial effects will outweigh the potential adverse impacts. Use of the currently prescribed interest rate of 6-7/8 percent would reduce the benefit-cost ratio from 1.5 to 1.4.

14. The Board notes that the reporting officers adopted the option to not complete a Section 404 (Public Law 92-500) Evaluation Report on the proposed discharge of dredged material from the entrance channel and access channel along the east breakwater, into the open waters of Lake Ontario. Therefore, as provided by Section 404(r) of Public Law 92-500, as amended, they are not seeking an exemption for the proposed discharge through Congressional authorization at this time. The Board believes that since this material is judged to be suitable for open water disposal at this time, this evaluation can be accomplished later.

15. The President, in his June 1978 water policy message to Congress, proposed several changes in cost sharing for water resources projects to allow states to participate more actively in project implementation decisions. These changes include a cash contribution from benefiting states of 5 percent of first costs of construction assigned to nonvendible project purposes and 10 percent of costs assigned to vendible project purposes. Application of this policy to the Olcott Harbor project requires a contribution from the State of New York of an estimated $394,700 in cash (5 percent of $7,894,000 total estimated project first costs assigned to nonvendible project purposes, based on April 1978 price levels). Other items of local cooperation would not be affected by this additional requirement. The total non-Federal cost would change from $3,941,500 to $4,336,200, and the total Federal cost would change from $3,952,500 to $3,557,800.

16. Recommendations.--Accordingly, the Board recommends that modification of the existing Federal navigation project for

BERH-PLN
SUBJECT: Olcott Harbor, New York

Olcott Harbor, New York, be authorized for construction generally in accordance with the plan of the District Engineer with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, and in accordance with the President's proposed cost-sharing policy. The cost to the United States for construction is presently estimated at $3,557,800. This recommendation is made with the provision that, prior to the commencement of construction, state and local interests will, in addition to the general requirements of law for these types of projects, agree to comply with the following requirements:

a. The State of New York provide a cash contribution equal to 5 percent of the total first cost of the project;

b. Local interests:

(1) Provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction and maintenance of the project and for aids to navigation upon the request of the Chief of Engineers, including suitable areas determined by the Chief of Engineers to be required in the general public interest for initial and subsequent disposal of dredged material, and including necessary retaining dikes, bulkheads, and embankments therefor, or the costs of such retaining works;

(2) Hold and save the United States free from damages due to the construction and maintenance of the project, not including damages due to the fault or negligence of the United States or its contractors;

(3) Provide and maintain without cost to the United States adequate berthing areas and local access channels with depths commensurate with those in the Federal improvements, and necessary mooring facilities, utilities, a public landing with suitable supply and essential sanitary facilities, a launching ramp, parking area, and access roads, open to all on equal terms;

(4) Reserve anchorage spaces and mooring facilities adequate for the accommodation of transient craft and craft seeking refuge;

(5) Accomplish without cost to the United States such relocations or alterations of utilities in upland areas as necessary for project purposes;

(6) Establish a competent and properly constituted public body empowered to regulate the use, growth, and development of the harbor with the understanding that public facilities will be open to all on equal terms;

(7) Bear all separable costs of operation, maintenance, and replacements allocated to sport fishing from harbor structures; and

(8) Contribute in cash 50 percent of that portion of the first cost allocated to recreational navigation and fishing, exclusive of aids to navigation, promptly upon receipt of written notice from the Secretary of the Army or his representative. Such contribution is to be paid in a lump sum prior to construction or by installments during the construction period at a rate proportionate to the proposed or scheduled expenditure of Federal funds as required by the Chief of Engineers, the final apportionment of the cost to be made after actual costs have been determined.

FOR THE BOARD:

JAMES A. JOHNSON
Major General, USA
Chairman

**MEETING MINUTES**

EXHIBIT 48

CENCB-PP-PM

MEMORANDUM FOR RECORD

SUBJECT: Minutes of 7 March 1991 meeting on the Olcott Harbor Project, New York

1. A meeting was held regarding the subject project at Buffalo District Offices on 7 March 1991. A list of meeting attendees is attached.

2. Mr. Timothy Byrnes, Project Manager with the Corps of Engineers opened the meeting expressing the desire that everyone work together in partnership. The agenda for the meeting was distributed and is attached.

3. Mr. Byrnes began by addressing the impacts on the scope of work resulting from the Corps higher headquarters guidance. Mr. Byrnes stated that three plans would have to be evaluated; Plan 10, Plan 10B and Plan 10A modified and that this was additional work. Ms. Susan Lubick and Mr. John Connolly questioned the need to look at other plans and what affect this might have on plan selection. Mr. John Zorich clarified that additional work would be necessary to give Corps higher headquarters adequate information to make a decision. Mr. Byrnes summarized that as it appeared although Plan 10 and Plan 10B would be examined, Plan 10A Modified was likely to be the recommended plan.

4. Mr. Byrnes gave the status of the designs as being subject to internal review before finalization with the intent that they be incorporated into the reevaluation report.

5. Mr. Byrnes indicated that the detailed cost estimate for the project would not be done for sometime. The estimate would be conducted after the detailed designs were complete so that the estimate would reflect some of the cost savings expected from reduction of the crest height of the breakwaters and reduction in the shorearm length of the west breakwater.

6. Mr. Vamos raised an issue relative to real estate. He stated that the real estate required in the LCA will not be acquired by the state until after the LCA is executed. The acquisition time is 18 months. However, he stated that for state owned property, it would not be difficult to meet the LCA requirement but for non-state owned property it would be a problem. Mr. Dunfee stated the Corps could furnish real estate needs. Discussion followed. It was concluded that all real estate needs for the Federal project were within public ownership.

7. Mr. Byrnes stated the reevaluation report would be revised in accordance with guidance received and in addition to the revisions for planning evaluation, designs and cost estimates mentioned earlier, it would address the economic benefits and cost sharing. It was mentioned that benefits would be reduced although leaving a viable project and that cost sharing would be slightly more than 50% Federal based on charter boat fishing. Storm damage reduction could be considered incidental and cost shared as recreation (50-50). It was also mentioned that Plan 10A would no longer consider docks within the existing Federal piers.

8. Questions were raised as to why was the reevaluation and additional work being performed and was this considered extraordinary. Mr. Byrnes and Mr. Zorich responded that this was not unusual and in this particular instance, additional information was needed by higher authority to make a decision.

9. Mr. Byrnes briefly concurred that the Supplemental Environmental Impact statement and associated public meeting and review, Local Cooperation Agreement, Financial Analysis and Financial Plan, and Plan and Specifications would be delayed until after approval of the reevaluation report. Some concern was expressed that without work on an LCA the amount of money the locals needed and timing thereof could not be established. Mr. Byrnes stated he realized the dilemma this created. Mr. Dunfee stated that this should not prevent discussion of the generic content of an LCA.

10. Mr. Byrnes then briefed the attendees on Life Cycle Project Management and the Corps' willingness and expectation that the local sponsor play a more active role in establishment of the Project Management Plan (PMP) which includes the project schedule and cost estimate. Mr. Byrnes emphasized the objective of "we" in partnership and made known to the sponsor that he could attend monthly Project Review Board meetings at the Corps.

11. Mr. Byrnes distributed a project schedule and stated that the schedule and associated project cost was for preliminary discussions on the PMP, being accomplished as a part of this meeting. Mr. Byrnes stated the schedule and estimate had not left the District and would not until it was coordinated with the NYSOPRHP. Again, Mr. Byrnes emphasized the need to a "we" position relative to the schedule and cost.

12. The preliminary project schedule was then discussed with Mr. Byrnes stating that Preconstruction Engineering and Design (PED) could possibly be done in December 1992, with completion of construction in November 1996. Mr. Byrnes reiterated here and throughout the meeting the preliminary nature of the schedule and costs. Mr. Byrnes discussed restraints due to real estate acquisition and the allowable environmental window for inwater construction and its impact on the schedule.

13. Discussion of the schedule followed. Thoughts were provided that with greater examination of this schedule regarding real estate acquisition time, some time could possibly be shaved off the entire project duration. Mr. Byrnes stated again that this was exactly the type of feedback he sought and that greater refinements to the preliminary schedule would probably yield a shorter schedule and thus a less costly project.

14. The project costs were then discussed. Mr. Byrnes indicated that previously unprogrammed efforts were reflected on the schedule and that based on the guidance and all thoughts to date a preliminary estimate of the increased cost of PED would be of the order of $300,000. Mr. Byrnes stated that all the documentation on the schedule and cost increase was not prepared as this schedule and cost had been developed at a preliminary level to determine what was needed to finish the job. Mr. Byrnes identified that the reevaluation report additional requirements, and extension of the reevaluation timeframe were in part the cause of the increase. Mr. Byrnes stated that as the final schedule and cost was developed, this documentation would be detailed.

15. Real estate requirements and the need to get them was discussed. Mr. Dunfee and Mr. Vamos agreed that there were possibilities to reduce the impact of this real estate time on the schedule.

16. A discussion of the environmental windows impact on the schedule followed. It was concluded that additional local input would be fruitful in any further discussions of the environmental window.

17. The locally furnished items were discussed as being the access ramp, sanitary facilities and parking areas. The access ramp was to be included using the Corps design of the ramp in

Kruell Park and the proposed boardwalks was not to be considered a part of the Federal Project. However, it was agreed that later consideration may be given to other access furnished by the locals and that the Corps design and cost would be used to determine cost sharing. The sanitary facility was considered a concrete pad in Kruell Park near the access ramp and parking that of a lot in the master plan just to the southeast of the existing Kruell Park sanitary facilities. Cost for the sanitary facility could be furnished by the Corps and costs for the parking area was that furnished by the town's consultant. Again, these costs could be used to determine cost sharing the facilities equivalent to these furnished by the local sponsor. Mr. Vamos stated a totally self-contained restroom facility is required and should be provided as integral to the navigation/recreation project. Mr. Zorich agreed and stated the District would revisit our plan of a concrete pad only. Mr. Byrnes stated that local master plans will show to a minor extent in the Corps EIS but that would not release locals from obtaining a permit.

18. A discussion of the project's prospects followed. It was stated that the project was still favorable from an economic prospective although not as much as initially anticipated. The project would not exceed the maximum cost limitations but the project would cost more due to the extension of time.

19. There was mention that the time schedule did not noticeably show when money would be needed. Mr. Byrnes stated again that the data was preliminary and that during refinement a cost would be assigned to each task. Mr. Byrnes stated that refinement of the schedule and costs would be made and furnished to Mr. Vamos to obtain his input. Mr. Byrnes stated this was only the beginning of discussions on the PMP and additional coordination would be needed.

Timothy Byrnes

TIMOTHY BYRNES
Project Manager

OLCOTT HARBOR MEETING
Buffalo District Office
March 7, 1991

## Attendees

| Name | Organization | Telephone |
|---|---|---|
| Tom McKenna | Olcott | 625686; |
| Jim Hogan Burg | TN. Newfane | 778-9531 |
| Ron Perry | Niag Cty | 172-2636 |
| Tom Lyons | OPRHP | 518 474 04 |
| Dario Violanti | N.Y.S Parks | 716 278 17 |
| David Kinyon | Eastern Niagara Chamber of Comm | 716-433-382 |
| Jim Bennett | COE - Envir Sect. | 716-879-418 |
| Ted Valerio | COE - Proj. Mgmt. Br. | 716-879-4231 |
| John Zorich | COE - Planning Br. | 716-879-42 |
| Larry Dunfee | COE - Real Estate | 716 879-4117 |
| H. Frank Parson | COE - Counsel | 716-879-418 |
| Susan Lubicic | Rep. John J. LaFalce | 716-852-400 |
| | | 282-335-325 |
| Ivan Vamos | NYS Parks, Rec - HP | 518-474-0479 |
| John Connolly | Sen. J.B. Daly | 716-282-726. |
| Marie J Pirastru | NYS. Parks, Rec. HP | 716-278-1701 |

Olcott Harbor Meeting
Buffalo District Office
March 7, 1991

AGENDA

1. Impacts of Corps Higher Headquarters Guidance
    a. Planing Evaluations and Plan Selection
    b. Designs
    c. Timing of the Selected Plan's refined Cost Estimate
    d. Reevaluation Report
    e. Supplemental Environmental Impact Statement
        Public Meeting
        Public Review
    f. Local Cooperation Agreement
    g. Financial Analysis and Financial Plan
    h. Plans and Specifications
2. Life Cycle Project Management
    a. Project Management Plan
    b. Project Status Reporting
    c. Sponsor Role
3. Project Schedule
4. Project Cost
5. Locally Furnished Items

MINUTES OF MEETING
Olcott Outer Harbor Steering Committee
Monday, November 27, 1989, 10:00 a.m.
Eastern Niagara Chamber Office
Lockport, New York

Present: T. Horanburg, R. Perry, D. Kinyon, M. Murphy, W. Ross, T. McKenna, J. Connolly, A. Beilein, J. Kramer, W. Cadet, R. Guido, R. Hedley, T. Belling

There was considerable discussion as to which plan should be selected by the Town and County (10a or 10b). It was decided to contact Congressman La Falce's office to determine if the funding cap could be raised or whether it would be too difficult.

The Corps explained the cost sharing possibilities. It was noted that the project costs would probably not be a 50/50 split since some parts of the project could receive a higher percentage of federal funds.

The Corps asked the Committee to resolve the following questions:

1. Select a preferred plan (10a or 10b) before December 15, 1989.

2. Provide letters of local support by February 1, 1990.

The Corps also noted that DEC and EPA were objecting to lake dumping of the dredged materials. It may be necessary to truck the materials to an upland dumping site. We will try to get a clarification from DEC.

Respectfully submitted,

Theodore J. Belling

Theodore J. Belling
Acting Secretary

CENCB-PD-PF 16 November 1989

MEMORANDUM FOR RECORD

SUBJECT: Olcott Harbor Project - Polluted Dredged Material Disposal

1. Date: 14 November 1989
2. Place: NYSDEC, 600 Delaware Avenue, Buffalo, NY
3. Purpose: Discuss alternative disposal methods.
4. Participants:

| | | |
|---|---|---|
| Jim Pomeroy | DEC - Fish and Wildlife | 372-0645 |
| Steve Mooradian | DEC - Fisheries | 372-8676 |
| Paul Eisman | DEC - Regulatory Affairs | 847-4551 |
| Wiener Cadet | Corps of Engineers | 879-4247 |
| Len Bryniarski | Corps of Engineers | 879-4173 |
| Steve Doleski | NYSDEC | 847-4551 |
| Dick Leonard | Corps of Engineers | 879-4270 |
| Michael J. McMurray | DEC - Regulatory Affairs | 847-4551 |

5. Mr. Steve Doleski indicated that he has a problem with the Corps' request for open-lake disposal of polluted dredged material. He recalled last year that DEC did not issue a permit to the town of Newfane for disposing of some dredged material in the lake. Mr. Doleski concluded that it would be inconsistent for DEC to concur in the Corps suggestion. Mr. Dick Leonard replied that, the Corps request, although similar to the Town request, is different in that the polluted material will be capped with cleaner material, followed by an as built bathymetry survey, as well as some future monitoring, in order to determine whether or not the deposited dredged material moved or not. Mr. Leonard also indicated to Mr. Doleski that certain precautionary measures could be taken to insure that dredged material was deposited at the specified open-lake disposal site (i.e., marking the open-lake disposal site with a U.S. Coast Guard buoy, providing an inspector on-board the vessel), and that dispersal of material during open-lake deposition would be minimized by restricting dredging deposition to periods with less wind and wave action. Mr. Doleski continued to express strong reservations about open-lake disposal.

6. Mr. Mooradian suggested using the material for fill in constructing other project-related facilities such as parking areas, because the material is neither toxic nor hazardous. Mr. Doleski said he will consult with DEC experts about the degree of pollution and classification of the dredge material before reaching a decision.

7. Mr. Pomeroy suggested trucking or hauling the dredged material by scow to CDF Site #4 in Buffalo. However, trucking the material may not be practical economically or environmentally for a number of reasons: It would take more haul trucks and more trips over public roads, and ellutriate leakage from dredged material in haul trucks may not be preventable completely, if at all. Mr. Cadet however, indicated that it may be a costly solution, but worth looking into.

8. Mr. Leonard requested that DEC provide a response to the Corps letter to DEC regarding disposal of the material.

9. Mr. Cadet gave an overview on project status and informed DEC and FWL that the Corps will meet with them sometime in December or early January to discuss the results of the model testings of the fishery parameters.

10. Meeting adjourned at 12:45 PM.

Wiener Cadet

WIENER CADET
Project Manager

cf:
Len Bryniarski
Dan Kelly
John Zorich
John Kymor
Dick Leonard
Chuck Gilbert
James Bennett

SUMMARY MINUTES ON
OLCOTT HARBOR PROJECT
Sept 27, '89

1. PLACE : CORPS OF ENGRS.
2. TIME : 1:30 PM - 5:30 PM
3. PURPOSE : DISCUSS MASTER PLAN DEVLPMNT AND ALT. PLANS 10A & 10.
4. ATTENDEES See attached sheet.

5. Wiener, C made the introductory remarks and set the agenda for meeting. Ron Guido followed by expressing the need for more time as the existence value benefits may not be accepted by higher authorities. requested that the master plan parking spaces for winter storage. This was discussed at length by the participants.

6. Mark Mistretta of Wendel Engineers presented the three schematic develo around plans 10A and 10B (one based on 10A; 2 based on 10B). These sche are preliminary. A public meeting will be held soon to have more inp from the public before finalizing them and recommending one plan

7. Wiener C asked Ron Guido if he would object to use these schematics for completing his benefit evaluation. Ron indicated he need to know the number of parking spaces and their location. Wiener concluded this first part of the meeting by asking Wendel Engineer to provide copies of the three schematics for use in the Re-evaluation report, and also to address Ron Guido request for parking areas for w storage. Wiener, C also that a write-up be provided the Corps of Engrs on the elements of the plan and their functions.

8. Wiener, C introduced the discussion of plans 10 and 10B. He emphas that the Corps usually recommends the National Economic Development, which may turn out to be plan 10A. However he said, the Corps may recommend plan 10B if it is preferred by the non-Federal sponsors But the non-Federal sponsor pays the excess cost 100 percent. He also suggested that non fed look at the possibility of paying 100 percent for cost of some project related facilities such as parking, sanitary and dredging le Creek.

9. Meeting adjourned at 5:30PM.

CENCB-PD-PF (1110-2-1150a) 7 July 1989

MEMORANDUM FOR: Files

SUBJECT: Summary Minutes of meeting on Olcott Harbor Project, New York, 5 July 1989

1. Date: 5 July 1989

2. Place: Buffalo District Office

3. Purpose: See Agenda (Enclosure 1)

4. Participants: See Enclosure 2

5. The meeting started at 3:30 PM. Mr. Wiener Cadet, Project Manager, in his opening remarks stated that the Olcott Harbor project is a good project. We are certain that the revised plans we are evaluating are economically justified from a Federal view point; and also profitable from a non-Federal perspective. He exhibited a June 2, 1989 newspaper article by the Lockport Union Sun and Journal, of which the title reads: OLCOTT PLAN LOOKS PROFITABLE. Mr. Cadet said "we are optimistic that we won't have to go back to Congress for reauthorization as our design refinement prior to the model testings, and the results of the model testings indicate significant cost savings will be realized." At that point Ms. Lubick interjected and said, "I am glad to hear that." She also recalled her discomfort at the initial March 1988 meeting when there was uncertainty about the economic viability of the project.

6. Mr. Cadet proceeded with a slide presentation. He discussed the worse wave condition for the without-project conditions where wave heights in the entrance channel vary from 3-6 feet; and to a maximum of 10 feet on the east, west, and north sides of the existing Federal piers. He also discussed the revised Plan 10A and the optimum plan resulting from the testing of Plan 10A. Also, a video tape of the test for the existing condition was shown. Based on the test results for Plan 10A, it was indicated to Ms. Lubick that both Plan 10A, and Plan 10B (being tested) will result in construction costs within about $17+ million, which will comply with the Section 902 of the 1986 Water Resources Development Act. The last part of his slide presentation covered information on the benefit analysis for the project. He demonstrated the demand analysis based on the results of the boater survey spanning a larger market area comprising of Niagara, Genesee, Orleans, Monroe, and Erie Counties. The survey results show that about 2,000 people would be willing to pay $1,100 per year to rent a slip in the market area including Olcott. He concluded saying: since the project may provide a maximum of 1,118 slips, the demand and supply theory indicate that those slips will be filled in a relatively short period of time or at the time of installation. *

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* Ms. Lubick requested a copy of the information on the boater survey slide.

7. Mr. Cadet then discussed the current schedule. He stated that a two-month delay in completing the Reevaluation Report - due to WES being late in completing the physical model testings - will not adversely impact on the initiation and/or completion of the General Design Memorandum (GDM) and Plans and Specifications (P&S). Regarding the schedule, Mr. Golyski emphasized that the PED phase must be completed in FY 91 in order to initiate construction in FY 92, because funds can not be appropriated for PED and construction in the same FY. He suggested that we start GDM as soon as the model study is completed in the first quarter of FY 90.

8. Ms. Lubick indicated that she will work with the non-Federal sponsors towards implemention of the project. She mentioned having Congressman LaFalce write to State Senator Daly and Assemblyman Murphy. She will start working on identifying the players that will be involved in the execution of the required LCA prior to initiation of construction. She also would appreciate an early start on the Draft LCA to maintain the schedule and attain the desired results. She suggested, and we agreed to, holding a meeting in October 1989 involving the State of New York Park and Recreation, Niagara County, Town of Newfane, some elected officials (Congressman LaFalce, State Senator Daly and Assemblyman Murphy), and Corps representatives to discuss implementation of the project by identifying and addressing concerns, and establish priorities. She expressed the possibility of preparing a slide presentation for the next District Congressional briefing. As she put it, viewing some of these project slides would help the Congressman.

8. Mr. Cadet thanked everyone in attendance for their time and input and adjourned the meeting at 4:45 PM. Mr. Cadet then took Ms. Lubick to meet with Colonel Boyd.

Wiener Cadet

WIENER CADET
Project Manager

AWP

MINUTES OF MEETING
Olcott Outer Harbor Steering Committee
Tuesday, June 20, 1989 1:00 P.M.
Eastern Niagara Chamber Office, Lockport, N.Y.

Present: Perry, Horanburg, McKenna, Kramer, Albond, Kinyon, Belling

Legislator Perry opened the meeting noting that the Outer Harbor Project was moving ahead and it was; therefore, time to define the roles of State, County and Town officials and determine the purpose and function of the various committees. It was noted that project funding would have to be included in the 1990 State budget and the 1991 County budget.

It was suggested that the Planning and Industrial Development Department be asked to research and identify sources of funding for park development.

Kinyon suggested the County Legislature and state officials be invited to a tour of Olcott and the existing harbor arranged by the Task Force so that they could get a first hand view of the project area.

Five existing committees were identified.

1) Olcott Harbor Task Force
2) Ad Hoc Olcott Outer Harbor Project Advisory Committee
3) Olcott Harbor Development Committee
4) Olcott Master Plan Advisory Committee
5) Olcott Harbor Steering Committee

After lengthy discussion, the consensus concerning the membership and roles of the various committees was as follows:

1) Olcott Harbor Steering Committee - to consist of representatives from the Town, County and State to monitor the progress of the project and assure the day-to-day coordination of all involved agencies. This working committee will meet at least monthly on the third Friday at 3:00 P.M. Membership as follows: Niagara County Legislator from 18th District, Town of Newfane Supervisor, Chairman Commerce & Tourism Committee, Chairman Parks Committee, Senator Daly, Assemblyman Murphy, Town Councilman and one additional member appointed by the town supervisor from Town of Newfane. Perry and Horanburg to be co-chairman of this committee.

2) Olcott Harbor Development Committee - to coordinate all federal, state and local on-shore development activities associated with the implementation of the Olcott Harbor Project. Membership to be as follows: Congressman LaFalce, U. S. Army Corps of Engineers, Senator Daly, Assemblyman Murphy, NYS Department of State, New York State DEC., New York State DOT, New York State

Office of General Services, WNY Economic Development Corp., New York State Office of Parks & Recreation, Chairman of Niagara County Legislature, Niagara County Legislator representing the 18th District, Chairman Niagara County Commerce & Tourism Committee, Town of Newfane Supervisor, Chairman of the Olcott Harbor Task Force. It was noted that this committee met last year and elected Supervisor Horanburg as chairman.

3. Olcott Master Plan Advisory Committee - to work with engineering and planning consultants, to advise the Newfane Town Board, Niagara County Legislature and WNYEDC on the development of the master plan and guide the development and implementation of the Olcott Hamlet Plan so it relates to the Outer Harbor Project. Members of this Committee to be appointed by the Town Supervisor.

4) Olcott Harbor Task Force - to lobby on behalf of the business community to obtain federal, state and local funding for the Outer Harbor Project and develop general public support for the project. J. Kramer, Chairman; D. Kinyon, treasurer.

5) Ad Hoc Olcott Outer Harbor Project Advisory Committee - established for the Corps of Engineers requirements in 1978. It was the consensus that the Steering Committee and Advisory Committee could provide a better forum for a successful project; therefore, it was felt that this committee could be dissolved.

It was decided to hold the next meeting of the Steering Committee on July 21, 1989 at 3:00 P.M. Notices will be sent out by the Town.

Major order of business will be to work out a Memorandum of Agreement which will define the roles of the County and the Town in the Outer Harbor Development. Staff to prepare a draft prior to that meeting.

MAILROOM-NCEIM-S

# OLCOTT HARBOR TASK FORCE

June 1, 1989 - Best Western Inn Lockport

7 JUN 89 10 06

**PRESENT:** David Kinyon, Michael McMurray, Robin Linhart, Anthony McKenna, Kathleen Ganz, Donna Landers, Timothy Horanburg, William L. Ross, James Kramer, Ronald Perry, Mario Piastru, Wiener Cadet, David Kersten, Albert Rottaris, David L. Miller, Patrick Murphy, Ron Guido, and Don Glynn

**PRESENTATION BY WIENER CADET:**

Briefly went over 2 plans that are being tested:

10A Was tested and report is on the way to the Corp.
10B Is being constructed now, report should be available at the end of June. This plan would include the West Basin and contain 1,000 boat slips.

Construction should start in Fiscal Year March 1992 and be completed in Fiscal Year 1994 (Sept. thru Dec. 1993).

**PRESENTATION BY RON GUIDO:**

Gave a slide presentation and overall summary of how the Army Corp. arrives at the cost and benefit factors it uses to justify a project.

The Corp. bases their ideas on a 50 year basis of what it would be like with and without the project.

Two surveys were sent randomly to people in Niagara Co., Erie Co., Genessee Co., Orleans Co., and Monroe Co.

Some interesting stats:

Project Development:

66.7 % Niagara Co. approved
47.1 % Other Counties approved

Willingness to Pay Based on $700 per Slip

1,156 Niagara Co.
4,957 Other surrounding counties

Willingness to Pay $1,000 per Slip

More than 3,000 people

Nearby parking is major problem at the moment. This will be addressed when the Master Plan is developed by the Town of Newfane.

They Army Corp. has done as much as possible now, until the Master Plan is developed

CENCB-PD-PF

4 May 1989
Cadet/ms/2247

SUBJECT: Summary Minutes of Meeting on Olcott Harbor Project, New York, 2 May 1989

MEMORANDUM FOR File

1. DATE: 2 May 1989

2. PLACE: Harbor Inn Restaurant, Olcott

3. PURPOSE: See Agenda (Enclosure 1)

4. Participants: See Enclosure 2.

5. Mr. Wiener Cadet, Project Manager, introduced himself and welcomed everyone in attendance, then asked the participants to introduce themselves. In his opening remarks, Mr. Cadet stated that the main purpose of the meeting was to share the results of the boater and household surveys with the Olcott Harbor Project task force. He also pointed out that the message was one of optimism as to the economic justification of the project.

6. Mr. Ron Guido, project chief economist, seconded by Mr. Jon Brown, gave an overview on the economic principles, methods, and parameters involved in the economic analysis. For instance, he spoke of National Economic Development (NED) benefits as direct benefits that the Corps is interested in. He also spoke of Regional Economic Develop (RED) benefits which do not contribute to B/C ratio. He provided a listing of all the benefit categories the Corps will consider in the final economic analysis, and emphasized that two major categories of benefits are based on willingness to pay as opposed to what user will actually pay to use the recreation facility.

7. Mr. Guido discussed the results of the two surveys the Corps recently completed. The surveys revealed that 67 percent of the Niagara County general population are in favor of the project. A total demand for slips for the six-county market area considered was evaluated at 6,113 slips. Mr. Guido reasoned that, based on the survey results, construction of about 1,000 slips at Olcott at a reasonable rental fee of $700 per year, would result in average annual benefits of approximately $1.1 million. Given this and the other categories of benefits involved, Mr. Guido said he is comfortable that the overall average annual benefits will support a $20 million project.

8. Messrs Guido, Cadet, and Brown satisfactorily answered several questions from the participants.

9. Mr. Cadet's closing remarks emphasized caution through the steps toward construction, and told the task force members that a lot of work needs to be done before a project can be implemented.

10. Meeting adjourned at 12:45 p.m.

Wiener Cadet
WIENER CADET
Project Manager

[redacted]

MAILROOM-NCBIM-S

21 Mar 89 09 47

# TOWN OF NEWFANE

## OLCOTT OUTER HARBOR PROJECT

## FEBRUARY 27, 1989

A Public Information Meeting was held at the Miller Hose Fire Company at 7:12 pm. on February 27, 1989. Supervisor Timothy Horanburg opened the meeting with a short synopsis of what has been accomplished so far in the planning stage with the Corp of Engineers. He introduced some of the project principals that were in attendance.

Dave Kenyon, Chamber of Commerce
Weiner Cadet, Corp of Engineers
Art Beilein, Representing Assemblyman Murphy
Ronald Perry, Niagara Co. Legislature
Warren Rathke, Newfane Town Councilman
James Wendler, Newfane Town Councilman
Richard Loeffert, Newfane Town Councilman
Anthony McKenna, Wendel Engineers
Terry Gregg, Wendel Engineers
James Kramer,Task Force President
Tim Arlington, Wendel Engineers

Supervisor Horanburg turned the meeting over to Anthony McKenna, who gave a slide presentation. The presentation showed the non-resident fishing license sale growth over the last five years, the Town Marina, the Outer Harbor Project area as it is now and with the breakwalls drawn in, and a tour of Olcott as it was in the 1900's compared to as it looks today.

The presentation turned to a question & comment period.

Question: Where are the parking spaces for the boat slips in the area of the breakwalls going to be put? I under stand that there has to be 1½ spaces for each slip..

Answer: (Tim Horanburg) This is one of the problems that has to be addressed. There are many options to consider, stack storage is one that has been mentioned. Of course, the area of the breakwalls would be the most advantageous.

Question: (Al DeChambeau, Wrights Corners) Can't Krull Park be used for parking? It is under utilized. There is probably space for 500 cars as well as a turn-around area.

Answer: (Tim Horanburg) If the park can be used there is space for roughly 500 to 600 cars. In our discussion

with the Army Corp, it became apparent that there was no way we could have a boat launch in the Outer Harbor area.The existing Marina would be used as the launch facility.

Question: (Jim Moore-Fuller Rd.) Can you tell me of the 700 plan for slips how many would be transiant and how many permenant?

Answer: (Terry Gregg - Wendel Engineers) There would probably be about 32 to 35 transiant boat slips. There would also be a tour boat area.

Comment: (Ron Perry-Niag.Co. Leg.) I would like to clarify a comment made earlier. The law only calls for .5 space for parking per slip.

Question: What kind of public access will there be to the break-wall area?

Answer: (Tim Horanburg) This will be open to the public. We are now looking at attaching the breakwalls to both shores. This would provide access to fishermen & people who just want to walk out there.

Question: (Sylvia Krueger) Who will run this facility?

Answer: (Tim Horanburg) The Town of Newfane. In order to get our investment back, we have to have control of the operation.

Question: (Robert Mandry) What about Car Ferry service to Oshawa or Toronto?

Answer: (Tim Horanburg) I am against it and I'll show you why. (Slides were shown of the Michigan area where a ferry service is being run and the negative impact on the area).

Question: (Paul Mayer) Has a tram type of transport from the parking areas to the park and launching area been considered?

Answer: (Tim Horanburg) It will be considered now. This is the type of imput we are looking for from you.

Question: If everything goes along on schedule, what is the projected completion of the project.

Answer: (Tim Horanburg) 1992.

Comment: (Ron Perry) We must keep pressure on Congress. Right now there is 2 years funding for this project. There

are 3 more years to go, and funding could be stopped at any time.

Question: (Nancy Taylor, Newfane Town Clerk) What type of problems will there be if the funding for the control of lampreyeels is cut back?

Answer: (Ron Perry)This is a major concern. If the funding for control of eels is stopped, it will destroy the fishing industry. Letters must be written to voice our concern.

Comment: (Tim Horanburg) I would just like to mention a few of the items of concern that will have to be addressed. Reparian rights (N.Y.S. owns the land under water and it will have to be leased from the State), Slips, Pumpouts, Public Rest Rooms, Showers, and parking, just to name a few. We are also looking for ideas for the use of Krull Park, and Public Access.

Question: (Ed Smith) Will we have to go to public referendum for approval to spend this money?

Answer: (Tim Horanburg) I'm not sure yet, but if we do, at least if we run the project we can show that we will be able to recoup our expenses.

Question: (Larry Lapman) What kind of warranty will there be on the dock slips that are put in?

Answer: (Tim Horanburg) That depends on the quality of dock Usually there is a 5 year warranty, but the ones we have at the Marina are still in excellent shape & they are 13 years old.

Question: (Mark Hamm) What are you planning to do with the cars with trailers when it comes to parking?

Answer: (Tim Horanburg) this is one of the problems that we are looking at and that we need imput from the community and users of the facility

Question: (Francis Danielwicz) How high above the water will the breakwalls be?

Answer: (Weiner Cadet) They will be 12' above the ordinary low water level and 8' to 10' wide. We are testing for the effects of 6' waves.

Question: The docks we have now, preference is given to Town residents. Is the same going to be true of the

Outer Harbor docks?

Answer: (Tim Horanburg) Absolutely Not. This is being built with Federal Funds and the Federal Government defines a resident as anyone who lives in the United States. It will be first come, first serve.

Supervisor Horanburg thanked everyone for coming and closed the meeting. 8:45 pm.

Ann M. Webb
Sec.

HALLROOM MCBIM-S
21 MAR 89 09 47

MEMO FOR RECORD:

OLCOTT HARBOR PROJECT
30 JANUARY 1989
OLCOTT HARBOR INN
TIME: 6:00 PM

1. Meeting was sponsored by the Olcott Harbor Task Force to promote public awareness and support for the project.
Mr. Chuck Pistas, program Coordinator for the Michigan State Sea Grant Program presented several small boat harbor projects constructed along the eastern shores of Grand Haven South Har and Ludington, Michigan. He emphasized the economic impa of these projects on the aforementioned areas and on the State of Michigan as a whole. Mr Chuck drew parallels between these projects and the proposed Olcott Harbor projec as to expected stimulation of local economic development in the area of housing, commerce and recreation.
Turn out was estimated at 150 people including Federal state, local officials and the General public.
The presentation was followed by a questions-and-answer sessi Mr. David Kenyon, Olcott Harbor Task Force and moderator, adjourn the meeting at about 9:00 PM.

[redacted]
Proj. Mgr.

# OLCOTT HARBOR MEETING

January 19, 1989

## INTRODUCTION

Given by Timothy Horanburg. Stressed need for everyone's involvement.

## SLIDE PRESENTATION

Given by Anthony McKenna. Presently have 52 Charter Boats and 17 Transient Housing Facilities.

## ORGANIZATION PROPOSAL / ELECTION OF TEMPORARY CHAIRMAN

Given by John Connolly.

- We must start today organizing and addressing problems
- Asking for help in organizing
- Handed out his Proposal for Harbor Development Committee
- Did not want action today, but to bring back thoughts to the next meeting.
- Should be action at every meeting from here on.

- Motion was made by James Kramer, Seconded by Ron Perry to elect Timothy Horanburg as Temporary Chairman

## PROBLEMS & ISSUES

- Should be stressed that the main objective is to make everything available to the public.
- Problems Are:
  - Public Parking
  - Restrooms
  - Handicapped Access
  - Walkways
  - Public & Private Development of the Uplands
  - Riparian Rights - Eminent Domain
  - Operation & Maintenance (Possible 500 -1,000 boat marina
  - Financing & Sharing of Costs - 50% Federal, 25% State 12.5% County and Town - For Breakwalls only. Possible overall cost of $22 Million
  - Environmental Impacts
  - Licensing & Landuse Regulations
  - Accommodation of Charter Fishermen
  - Boat Storage and Handling (Would like private as much as possible)

## POINTS OF INTEREST

- Master Plan will cost approximately $60 - $80,000
- Approximately 160 people attended the last public meeting held at the Olcott Harbor Inn. Presentation was given by Mr. Dave White. The next meeting will be held January 30, 1989, presentation given by Mr. Chuck Pistas, Program Coordinator, Michigan State Sea Grant Program.
- The County hopes to be able to come up with help for financing
- Possible Timetable--Wiener Cadet
  - Sept. 1989 - Plan to complete re-evaluation report
  - March 1990 - Report will be final
  - Model in Vicksburg, Miss. will be complete with plans and specs
  - 1991 - Designed
  - 1992 - Start bids for construction of breakwalls
  - 1994 - Construction Complete

[redacted]

JAN 2 3 1989

**MEMO FOR RECORD**

OLCOTT HARBOR PROJECT
19 JANUARY 1989
PLACE: BEST WESTERN LOCKPORT INN

DATE : 19 January 1989
TIME : 0830
ATTENDEE : See enclosure 1.
PURPOSE : See Enclosure 2.

Mr Tim Horanburg introduced himself, stated the purpose of the meeting and asked everyone in the audience to identify themself and the agency they represented. Then he turned the meeting over to Mr. Tony McKenna. Mr. Tony McKenna, Town Engineer gave an overview of existing Harbor boating and other activities. His account of number of boats and launches indicated a need for more slips with regard to the demand for slips in Erie and Niagara Counties. Mr. McKenna showed the layout of two alternative plan that the Buff. District is studying for optimization. Mr McKenna was followed by Mr John Connolly of Senator Daly's office. Mr. Connolly emphasized that the local authorities need everyone participation in the form of technical advice, money and manpower to help bring the project to fruition. He asked that a temporary chairman be established for orderly conduct of business. As a result, Mr Tim Horanburg, Supervisor Town of Newfane, was unanimously nominated Temporary Chairman of the Olcott Harbor Development Committee. The Committee was composed of heads of a number of Federal, State and local agencies (See enclosure 3 for complete list). Mr Tim Horanburg indicated that the 1st task for the Committee is to have an Upland master plan developed. To achieve that he said he needs help from everybody. He indicated that more specifics will be discussed at the first Committee meeting which he plans to organize soon. In answer to a question from Mr. Connolly regarding project schedule, Mr. Horanburg asked Mr Wilcox Cadlet project Manager to respond. Mr Cadlet outlined the current schedule from the Reevaluation reports scheduled to be completed in FY 90 to completion of construction scheduled for FY 94.

Mr Horanburg thanked everyone in attendance and adjourned the meeting at 10:30 AM.

Wilcox Cadlet
Proj. Mgr

[redacted]

OLCOTT HARBOR PROJECT

MEMO FOR RECORD

10 Jan. 1989 MEETING

PLACE: WENDEL ENGINEERS, AMHERST N.Y.

TIME : 3:00 O'CLOCK PM.
ATTENDEES : See attached sheet

PURPOSES : a) DISCUSS PERMIT REQUEST BY Mc DONOUGH MARINA
b) DISCUSS UPLAND DEVELOPMENT AND COORDINATION.

1. Meeting started at 3'0'clock PM. Mr Cadet stated purposes of the meeting and stressed the need for more coordination between Wendell Engineers and the Corps, particularly regarding upland development, the proposed marina layout and Corps economists to help in the evaluation of benefits for the proposed projects.

2. Mr. Tony McKenna, Wendel Engineer expressed difficulties that he has been experiencing not knowing the plan that the Corps will implement. Mr Guido, Economist, Corps of Engrs also expressed difficulties in estimating benefits not knowing the number of boats the proposed marina will accomodate. Mr Cadet Corps, Project Manager, indicated that two preliminary plans are being looked at. These plans are not final as they will undergo modifications as the study progresses and as the model results dictate. He indicated that the configuration will not be drastically different than that shown in the preliminary plans. He went on saying Wendell Engineers may assume that either the smaller or the larger plan would be implemented.
Tony McKenna agreed to develop the marina layout using the prelim. plans and adjust channel locations for maximum number of berths. Importance of Parking spaces was also stressed. Town of Newfane noted.
Some info. on breakwater layout and cross sections were provided to Wendel Engineers for their use.

3. Request for Corps Permit by Mc Donough to expand its marina was also discussed as it would impact on proposed Federal Channel in 18-mile Creek. Town of Newfane also plans to expand their marina leaving only 60' ft for Fed. Channel.
Denton Clark Corps Coastal Engrg Chief, indicated he needs at least 80 ft for Fed. Channel as opposed to 100' ft shown on proposed Corps plan. Town of Newfane agreed to cut expansion to 220 ft. M. Grigg of Wendel Engrs. indicated that Mc Donough will agree to modify his plan. Meeting adjourned at 5:30 PM.

# DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

| REFERENCE OR OFFICE SYMBOL | SUBJECT |
|---|---|
| CENCB-PD-PF | Olcott Harbor Project, New York, Summary Minutes of 1 Dec 88 Meeting |

TO Files FROM W. Cadet, Project Manager DATE 13 DEC 88 CMT 1 Cadet/ls/2247

1. Date: 1 December 1988, 10 a.m.
2. Place: Buffalo District Office
3. Purpose: See Agenda (Enclosure 1)
4. Participants: See Enclosure 2

5. Mr. John Zorich, Chief, Planning Division welcomed everyone in attendance, stated the purpose of the meeting and asked the participants to introduce themselves.

6. Mr. Wiener Cadet, Project Manager, gave an overview on the project development going back to 1978 when the U.S. Fish and Wildlife Service (USFWS) and New York State Department of Environmental Conservation (NYSDEC) expressed concerns regarding possible adverse impacts of the project on the local fisheries. Now that the project is authorized, the Corps, as promised, is undertaking actions to satisfactorily address thes concerns which mainly relate to project-induced variations in such parameters as flow patterns, temperature, and velocity. Mr. Cadet turned the session over to USFWS and NYSDEC representatives who restated their concerns for the record. Mr. Tom McCartney (USFWS) and Mike Wilkinson (NYSDEC) expressed concurrence in Mr. Cadet's statements and added that water quality parameter (sedimentation, turbidity) was also their concern. Mr. McCartney discussed the type of fish present in the area. He said he expects some difficulties with the data collection program, but he believes these difficulties can be alleviated with the initial literature search. He hopes the literature search will help identify what might be a useful set of acceptable ranges of the parameters to be considered in the model study.

7. Mr. Lee Butler, Coastal Engineering Research Center (CERC) of the Corps Waterways Experiment Station (WES) recalled his conversation with Mr. Cadet regarding the numerical model study to address these stated concerns. As a result, he said, he discussed it further with his colleagues and found that the numerical model study was not warranted for this particular project. Mr. Butler then discussed the rationale for arriving at this conclusion, and recommended that we take advantage of the physical model which can best evaluate these parameters given the size of the project and the high cost of numerical models. He said a low-cost numerical model without sufficient data collection is not as good an answer as the physical model. The physical model, he said, can be replicated fairly well and the injection of dye will determine water circulation patterns. He added that glass beads can be used to show changes in sediment patterns; and warm water can be introduced in the creek to indicate temperature variations between the creek an the lake. He continued saying the physical model will show changes (positive and/or negative) between the without and with-project conditions. The question is to what extent these deviations will be acceptable. Mr. Butler suggested that we complete the literature search between now and late winter so that we determine the need for site-specific data collection early next year. He also suggested the Corps and USFWS keep in touch to plan for the field data collection if it is needed; and that important points of collection would be in the creek, outside the jetty entrance, and in the lake side of the proposed structures.

[redacted]

MEMO FOR RECORD Olcott Harbor Project, N.Y
10/28/88 meeting

1. Date : 28 october 1988
2. Place : Niagara County Cooperative Extension, Lockport, N.Y.
3. Purpose : Discuss Coordination of Olcott HBr. Proj. upland develop. and roles of local, state and fed agencies.
4. Participants : See attached list (Enclosure 1)
5. Discussion revolved around above stated purpose. It was noted the Town of Newfane designated Tony McKenna, Town Engineer to coordinate work efforts w/ wiener Eckut, project Planner, and also discuss elements and development of a Master Plan. An Olcott Harbor Coordinating Committee was suggested. This committee would comprise of members of several local, state and Federal agencies. A list of possible agencies was handed out (See enclosure 2).
The next meeting was scheduled for 18 November 1988 at 2:0. PM at the Niagara County Cooperative Extension Office in Lock, N.Y.
6. Meeting adjourned at 5:00 PM.

# DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

| REFERENCE OR OFFICE SYMBOL | SUBJECT |
|---|---|
| CENCB-PD-PF (332-2-5c) | Olcott Harbor Project, NY. Summary Minutes of 1 Sep 88 Workshop |

TO Files | FROM W. Cadet, Project Manager | DATE 2 Sep 88, Cadet/ms/2247 | CMT 1

1. Date: 1 September 1988

2. Place: Town of Newfane, New York

3. Purpose: Discuss realignment of project structures and lake access and boating facilities surveys.

4. Participants: (See Enclosure 1).

5. The workshop started at 2:30 p.m. with the discussion of two possible realignments of the proposed breakwaters. These realignments consider connection of the West Breakwater to shore at the previously proposed, or a wider angle. Proposed modification to the West Breakwater would protect the West Basin and provide berths for 200 or more slips, depending on the location of the point of connection of these breakwaters to shore. Mr. Horanburg would prefer this point of connection to shore to be on the west side of the outlet of the small pond west of Lake Street. Messrs. Wiener Cadet, Project Manager; and Tim Horanburg, Town Supervisor, discussed at length the viability of these plans, given the uncertainty of economic feasibility due to increased costs. They agreed, however, that it would be worthwhile considering.

6. Lakefront access property and needed parking facilities were also discussed. Mr. Horanburg was optimistic that all lakefront properties would be acquired by the town prior to project plan implementation. These lands would be converted to parking spaces only. All new boat launch facilities would be in the inner harbor, south of the town's existing launch ramp/marina. This area would be the center of the boat launch ramp plus trailer boat parking. Mr. Horanburg also indicated that as a result of this project and the protection it would provide to the beach to the east, Niagara County is planning to extend the small existing beach further to the east to provide for more lakefront recreation. Mr. Horanburg provided us with a copy of the town of Newfane's local waterfront revitalization program which discusses proposed land and water uses, and proposed public and private projects.

7. Agreement was reached that the considered modified plans as well as the previously authorized plan,would be studied, and model-tested by the Corps to address all environmental, engineering, and other concerns.

8. In answer to a question by Mr. McKenna, Town Engineer, regarding channel size in 18-Mile Creek north of the old Main Street bridge, Mr. Cadet indicated that the ultimate size of the 18-Mile Creek channel is yet to be finalized, and will depend on the current and/or future project conditions. Messrs. McKenna and Horanburg agreed they would prefer a 50-60-foot channel. Mr. Cadet indicated that will be taken into consideration.

9. The next items discussed were the "Boating Facility" and "Lake Access" survey booklets. Regarding future expansion projects by the town and county, Mr. Jon Brown would like to have

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more specifics from the county as these projects will be referred to in the surveys. Mr. Horanburg indicated that the Corps may contact Niagara County Planning and Industrial Development Department (Mr. Ted Belling or Mr. Leo Nowak).

10. A checklist of needed recreation statistics/data/background information, was left wit Mr. Horanburg to complete and return to the Corps, Buffalo District Office.

11. Meeting adjourned at 4:30 p.m.

WIENER CADET
Project Manager

CF:

Dan Kelly
J. Zorich
J. Bennett
Ron. Guido
Len Bryniarski
Den Clark
Col. Boyd.
Ken Hallock
C. Gilbert
G. Brooks
T. Horanburg

original

# DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

| REFERENCE OR OFFICE SYMBOL | SUBJECT |
|---|---|
| CENCB-PD-PF | Olcott Harbor Project, New York, Summary Minutes of Meeting 18 August 1988 |

TO Files | FROM W. Cadet, Project Manager | DATE 24 August 1988 | CMT 1 Cadet/ls/2247

1. Date: 18 August 1988, 12 noon
2. Place: Harbor Inn, Olcott, New York
3. Purpose: See Agenda (Enclosure 1)
4. Participants: (See Enclosure 2)

5. Mr. Cadet welcomed everyone present, stated the purpose of the meeting and then asked everyone present to introduce themselves.

6. Mr. Cadet gave a synopsis of the 20 July 1988 meeting at the Buffalo District Office. Approximately 14 people participated, representing the Corps of Engineers, town of Newfane, Niagara County, State of New York, and interested citizens from Niagara County and the Province of Ontario.

Discussion revolved around incorporating the concept of "Ferry Service" into the current Corps study at Olcott. Two types of Ferry Service were discussed:

a. Commercial vehicle (truck)/private auto/passenger ferry
b. Private auto/passenger ferry service

The consensus reached at the 20 July 1988 meeting was the first type of ferry service was not favored; and the second type needed to be investigated further by the Town.

7. For better understanding of the interaction between the Corps, local officials, and the general public, Mr. Cadet outlined some aspects of the Corps Public Involvement Program. He emphasized that the Corps, in its planning process looks for input from a wide range of sources: be it private citizens, town officials, State officials, concerned citizens groups, etc. He also emphasized that the 20 July meeting was to determine the potential feasibility and support or non-support for the aforementioned types of ferry service. To conclude, Mr. Cadet asked for specifics on the question of "Passenger Only" Ferry Service in order to move from the abstract to something concrete. At that point, Mr. Tim Horanburg, Town of Newfane Supervisor, indicated that the Town Board does not support any form of commercial vehicle (truck)/private auto/passenger ferry service, and has no objection to private auto/passenger ferry service. Mr. Ron Perry, Niagara County Legislator, stated that Niagara County is not interested in the commercial vehicle (truck)/private auto/passenger "Ferry Service", but supports the "Passenger Only" Ferry Service. He indicated that the Town would not be able to provide parking facilities. Further, Mr. Horanburg would like the Corps to consider changing the angle of the proposed west breakwater to increase berthing area and determine the costs of realignment to insure it does not preclude future water based development at the Harbor.

In response to Mr. Cadet's request for a Harbor Development Master Plan to guide the Corps efforts, Mr. Perry indicated that Niagara County and the town of Newfane have met to talk about the development of a "Harbor Master Plan" in general. However, no Master Plan is currently being developed. Major topics of discussion for such a Master Plan will revolve around how Krull Park will fit into the physical layout of the proposed Small Boat Harbor project as well as parking and access needs. He said that upland development will be a major concern of the Town if the Olcott Harbor Project is built. Town of Newfane Officials have talked with neighboring local officials who have recently been involved in harbor development

projects (Dunkirk, Toronto). Town control of lakefront property seems to be a necessity. The Town promised to provide information on "Sports Fishing Promotion" at the Harbor for Corps consideration in the economic analysis.

In answer to Mr. Cadet's specific questions on which aspect of the ferry service should be pursued by the Corps, and what the town of Newfane should do for the Corps to officially consider the Town and County Officials' wishes, the following conclusions were reached:

a. Consensus was reached that "Passenger Only" Ferry Service should be pursued.
b. The town of Newfane will initiate a request to their local Congressional representatives, and County and State Officials that a "Passenger Only" Ferry Service component be investigated for incorporation into the Olcott Harbor Project. The Town will provide information on vessel size, etc.

8. At that point, Mr. Cadet called on Ron Guido to introduce the Survey Questionnaire for discussion. Mr. Guido, Corps of Engineers, pointed out that benefits for the project will be partially based upon the results of a series of questionnaires sent out to various target populations. Four types of surveys are being considered.

a. A General Community Survey. Households in the projects service area will be sent a survey to determine their "option value" (existence value) associated with the construction of a Small Boat Facility at Olcott Harbor. Even though the respondent may never use or even visit the new facilities, the very existence of the facility has some value to the general public. The concept of "availability" and "intrinsic value" was discussed.
b. Existing Harbor Slip User Survey. The survey would be used to develop existing slip users consumer surplus as well as their "existence value" associated with such a facility.
c. Regional Boat Owner Survey. The survey would be used to develop the "consumer surplus" as well as "existence value" associated with a facility at Olcott harbor for area boat owners in general.
d. Fishing Derby Participants Survey. Individuals who have participated in previous Fishing Derbies at Olcott Harbor will be surveyed to develop their "existence value" for a Small Boat Harbor Project at Olcott.

9. Mr. Guido's introduction was followed by Mr. Jonathan Brown who conducted the discussion on the "Regional Boat Owner Survey". A "preliminary mock up" of the "Regional Boat Owner Survey" was distributed to all present. The survey will be used to determine the value of boating at Olcott to boaters in general. Specifically, the "consumer surplus" and "existence value" for the surveyed boat owners will be developed. These values will then be scaled up to the boat owner population in the service area.

The content and wording of the survey was open to general discussion. The "draft survey" questionnaire was extensively discussed. The following areas of the "survey" were discussed: survey cover page, title and graphics; signature on the "Introductory Letter"; description of the new project; counties included in the service area; and breakwall access. It was agreed that these areas would be revised as necessary in the interest of clarity and survey success.

10. The meeting adjourned at 4:30 p.m.

Wiener Cadet
Project Manager

CF:
Ron Guido
Don Kelly
John Zonich
LTC Haugh
Col. Boyd
Den Clark
Ivan Vamos (State Park & Rec.)
Every attendee and others

File Copy

# DISPOSITION FORM

For use of this form, see AR 340 15, the proponent agency is TAGO

| REFERENCE OR OFFICE SYMBOL | SUBJECT |
|---|---|
| CENCB-PD-PF | Olcott Harbor Project, New York - Summary of Minutes of 24 May 88 Meeting |

TO Files FROM W. Cadet DATE 31 May 88 CMT 1
Cadet/ms/2247

1. Date : 24 May 1988
2. Place : Olcott Harbor (morning) and Town Hall, Town of Newfane (afternoon)
3. Purposes : Technical modeling work, coastal processes, and environmental concerns.
4. Participants: (see Enclosure 1)

5. The meeting started at 10:00 a.m. at Olcott Harbor, where representatives from the Corps of Engineers (NCB & WES) met with representatives from the U.S. Fish & Wildlife, the New York State Office of Parks, Recreation and Historic Preservation (OPR&HP), the New York State Department of Environmental Conservation (NYSDEC), and local officials and interested citizens of the town of Newfane. Project Manager, Wiener Cadet, explained the purpose of the meeting and requested key participants from the Corps and the State to discuss technical and environmental concerns vis-a-vis the "with and without project conditions". Some interested citizens brought to our attention the possibility of future shoreline erosion along the Krull Park reach. This condition was documented even though it is not an authorized project purpose. The field reconnaissance covered the total lakefront area at Olcott starting from the easternmost jetty through Krull Park to the westernmost jetty, west of the harbor's West Pier. The field meeting generated productive, on-site, dialogue between technical interests, key officials, and some interested citizens. The field meeting ended at 1:30 p.m.

6. At 2:30 p.m. the participants met at the Town Hall, town of Newfane, New York. Mr. John Zorich, Chief of Planning, Corps of Engineers, presided over the meeting. Mr. Zorich made the introductory remarks and set the tone for the meeting. Mr. Cadet gave a brief overview of planning and engineering efforts involved in the re-evaluation study. He also emphasized the need for the re-evaluation because conditions, concerns, and interests may not be the same as they were since completion of the Final Feasibility Report 10 years ago. Mr. Cadet's overview was followed by remarks by Mr. Denton Clark, Chief of Coastal Engineering. Mr. Clark emphasized that the goal is to provide the least amount of structures with the most protection for the mooring area. There appears to be a very minor amount of littoral material moving along the shoreline. Mr. Clark indicated that a bypass system will be considered and the beach on the west side would be monitored. This was followed by a very interesting discussion between the participants, mainly regarding the coastal processes, environmental concerns, and consideration of those concerns in the physical model. NYSDEC has no data on existing conditions (relative to flow patterns, velocity, and water temperatures for fisheries), that could serve as a basis to evaluate model test results. However, NYSDEC representatives asked that the Corps do its best to not adversely and significantly impact on the current cold and warm water fisheries. Salmonid and smallmouth bass sport fishing in the general vicinity of Olcott Harbor and in 18-Mile Creek up to the impassible barrier at Burt Dam is outstanding, which contributes to the community's economy.

7. Other items of information are as follows:

a. A Buffalo District survey crew gathered check profiles in the Outer Harbor area this spring. The existing sounding information will be supplemented by the use of quad. sheets.

[redacted]

b. Possible sources of information on creek flows are the USGS, State DOT, DEC, FERC, and the Burt Dam operator.

c. There is no known information on the substrata material in the presently proposed breakwater areas.

d. The WES model cannot account for wind effect current. It does model wave conditions. It could also model flood conditions coming down 18-Mile Creek.

e. There are both cold and warm water fisheries on 18-Mile Creek: Coho and chinook salmon and brown trout that migrate from Lake Ontario into the creek from late August through December. There is natural reproduction by large mouth bass, smallmouth bass, northern pike, rock bass, crappie, and brown bullhead. A combination of factors likely contribute to migration of fish into Olcott harbor and 18-Mile Creek for seasonal spawning. These factors probably include temperature, chemical and physical quality of the water, velocity of the water, and factors in the plume area at the mouth of the creek.

f. The Olcott Harbor Task Force and others will prepare a Master Plan for the Olcott Harbor area. This will include designation of areas for parking and marina development.

8. Mr. Zorich made the closing remarks. Meeting adjourned at 4:15 p.m.

Enclosure

CF:
File
Col Daniel R. Clark
Dan Kelly
J. Zorich (COE)
K. Hallock
C Gilbert
C Clark, Jr.
L. Bryniarski
R Guido
D Outlaw (WES)
D. Valenti (Park+ Rec)
S. Mooradian (DEC)
S. Doleski (DEC)
R. Anderson (DEC)
M McMurray (DEC)
T Belling (Niagara County)
T. Horanburg (Town of Newfane)

Project Mgr.

OLCOTT HARBOR TASK FORCE
ANNUAL MEETING

-brief-

1. Meeting took place on 4/25/88 (1600) at the Olcott Harbor Inn in Olcott, New York. Those in attendance (21) included the Olcott Harbor Task Force, Mr. Timothy Horanberg, Supervisor, Town of Newfane; Mr. James Kramer, Chairman of the task force; Mr. Dave Kinyon, Chairman, Chamber of Commerce, and Corps representatives (W. Cadet, J. Brown, and D. Clark). Mr. Kramer chaired the meeting and invited Mr. W. Cadet, Project Manager, to brief the group on progress of the project.

2. Mr. W. Cadet gave a brief overview of what has been accomplished since the 11 March 1988 meeting in Buffalo. Mr. Cadet indicated that Colonel Clark classified the Olcott Harbor Project as one of the top priority projects in the District. Mr. Cadet informed those present that the task force and local officials will be invited to meet with experts from the Corps Waterways Experiment Station in July of this year at the Harbor site for discussions of the project and exchenge of ideas.

3. Wiener turned over the meeting to Jon Brown who made a presentation on the 3 methods available to evaluate the economics of the project. Jon's presentation was followed by an interesting question-and-answer session that identified several categories of benefit other than the standard categories claimed in Corps studies.

4. Denton Clark followed by giving a definition of the physical model and how the testing would actually be done. Denton also emphasized that the model may optimize the structure's design, which could result in construction cost savings and an increase in net benefit.

5. Mr. Kramer thanked us for coming and participating at the meeting. We left at 1745 while the group proceeded with their agenda.

[redacted]

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# DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO

| REFERENCE OR OFFICE SYMBOL | SUBJECT |
|---|---|
| CENCB-PD-PF | Olcott Harbor Project, NY (Summary Minutes of Initiation Meeting) |

TO Files FROM W. Cadet DATE 15 March 1988 CMT 1

Cadet/ls/2247

1. Date: 11 March 1988 at 2:00 p.m.

2. Place: Buffalo District Office, Conference Room A

3. Purpose: See Enclosure 1

4. Participants: See Enclosure 2

5. Colonel Daniel R. Clark chaired the meeting. COL Clark stated that the District received $350,000 to start the pre-construction Planning and Engineering of the project. He turned the meeting over to Ms. Susan Lubick, representing Congressman LaFalce. Ms. Susan Lubick requested the meeting. She indicated that she wanted to discuss the particulars of the dredging of the 18-Mile Creek submerged island, and obtain information on the present and future of the Olcott Harbor authorized project. Mr. Horanburg, Supervisor, Town of Newfane, in discussing the particulars, indicated that materials in areas 1 and 2 (See attached map) appear suitable for open-lake disposal, but there were reservations about area 3 materials. It was agreed that the Corps cannot dredge the submerged island because it is located outside of the existing completed project. The Town will do the work with their own resources with little chance of receiving credit for expenditures under a Section 215 Agreement with the Corps. The Town will apply for a permit through the regular Corps and DEC permit process. The Corps will provide technical assistance to the Town with the dredging contract. The method of disposal will be agreed upon in the process. A Water Quality Permit is needed. Jim Brade of the Corps informed the Town that dredging can only take place between June and August as agreed to between the Corps and DEC.

6. Colonel Clark at that point identified the Corps team members of the Olcott pre-construction studies, and asked Dan Kelly to review the time schedule (bar chart) showing work items and time of initiation and completion. In discussing the schedule, Mr. Kelly asked and found that the town of Newfane official, other local officials, and interested citizens present at the meeting are all very interested in having the authorized project implemented. Mr. Ivan Vamos, Deputy Commissioner of NYS office of Parks and Recreation expressed the willingness of his office to share in the cost of the project, but informed the Town that the State (OP&HR) will only provide about 50 percent of the non-Federal share. Town officials said they are aware of this and will be ready to contribute their share of the project cost. Mr. Vamos also indicated that he would like to see what smaller projects are feasible. At the request of Ms. Susan Lubick, Mr. Guido defined, in detail the three possible methods (travel cost method, contingent valuation method, and unit day value method) that can be used in the economic reevaluation of the project. The sponsors are aware that these methods are likely to yield less average annual benefits than the Small Boat Formula method that was used to evaluate benefits in the Final Feasibility Report for the authorized project. At the end of Mr. Guido's overview on these methods, the floor was open to questions. The question and answer session helped to clarify the Corps way of arriving at the economic viability of a project. Ms. Susan Lubick questioned the practice of disregarding regional benefits as part of National Economic Development. Town officials stated that

DA FORM 2496 PREVIOUS EDITIONS WILL BE USED

people from Ontario, Canada came across the border to use the facilities at Olcott Harbor well as people from Cleveland, Ohio, Pennsylvania, and West Virginia. Mr. Guido indicate that his branch will send out questionnaires to all the project's economic areas. Mr. Horanburg promised to help in the distribution of, and securing information for, the questi naire. Ms. Susan Lubick at the end of the meeting thanked the Corps for its efforts, and stated that this project is a prime project for Congressman LaFalce who wants to see it implemented.

7. Meeting adjourned at 3:45 p.m.

Wiener Cadet
Project Manager

Enclosures

Copy Furnished:

CENCB-DE
CENCB-PD
CENCB-PD-PF
CENCB-PD-EC
CENCB-PD-ER
CENCB-ED
CENCB-ED-D
CENCB-ED-DC
CENCB-ED-DG
CENCB-ED-HQ
CENCB-ED-DF

NEWS ARTICLES

US Army Corps of Engineers
Buffalo District

# Clips

No 1-5 Date 1-9-90
Prepared J. Davis Phone: 879-4104

Union-Sun & Journal Lockport N.Y. Dec. 17, 1989
Breakwalls OK'd For Olcott Harbor

# Breakwalls OK'd For Olcott Harbor

By Bev Chavers

A $15 million plan for breakwalls in Olcott was unanimously approved Wednesday by the Newfane Town Board.

The board, with Supervisor Timothy Horanburg absent, voted to support the Army Corps of Engineer's plan 10 A, which includes a small breakwall in the west basin, unconnected to the shore. This plan would allow for future extension of the breakwall.

Plans for the breakwall to be constructed in the east basin remain unchanged. This area would eventually house 800 boat slips.

Under plan 10 A, both breakwalls will be built. The longer one, 1,650 feet long, would be linked to the shore by a 300-foot pedestrian bridge built over the remains of the old hotel pier. The new breakwall would end across from the east federal pier.

The second, shorter breakwall will be about 1,000 feet long. It will begin about 500-feet off the end of Jackson Street, and turn at a 120-degree angle off the end of the west federal pier.

Eventually, that breakwall can be extended to allow for more boatslips.

Town Engineer Anthony McKenna, one of several officials who went last week to view a working scale model of the breakwalls at the Army Corps facility in Mississippi, explained why plan 10 A was chosen.

He said that based on the original plan and figures from 1978, the federal government placed a $17.4 million limit on the total project.

"Using plan 10 A, the current cost of the project would be $13 million. With inflation, the cost to complete the project would be $15 million. For plan 10 B, current costs would be $17.4 million, with final costs escalating to $20 million, which is over the cap set by the federal goverment," he said.

The $17.4 million would be funded by all levels of government. The federal goverment would finance half the cost, the state 25 percent and the county and town each 12.5 percent.

The town is still concentrating on drawing up a new masterplan, to decide what parts of Olcott will be set aside for commercial businesses, public access to the lake, parks, private housing, parking and recreation.

The 33-member Olcott Harbor Citizens Advisory Group, headed by John Connolly, continues to make progress on drawing up one plan to present to the public.

"We need at least two more meetings, so the plan won't be ready for public presentation before the first of the year," McKenna said.

One of the biggest problems that has to be tackled is parking. The Army Corps insists there be adequate parking space, located close enough to the breakwalls to be convenient to both boaters and tourists.

One of the most likely places for parking will be Krull Park.

The Army Corps plans to have final plans of the breakwalls drawn up in 1991, with construction to begin in 1992. It will probably take about two years to finish building the breakwalls.

Cadet 2

US Army Corps of Engineers
Buffalo District

# Clips

No 11-1 Date November 1, 1989

Prepared: J. Davis Phone: 879-4104

Niagara Gazette Tuesday, Oct. 24, 1989

# Olcott meetings scan new horizons

## Committee seeks public input tonight on developing harbor, marina

By DON GLYNN
Niagara Gazette

OLCOTT — A 35-member Olcott Outer Harbor Citizen Advisory Committee, responsible for developing a master plan for this lakefront community, will hold a second public hearing at 7 p.m. today at the Olcott Fire Hall.

About 90 people attended a similar session Thursday night at the Newfane Fire Hall.

Committee chairman John Connolly noted the centerpiece of the master plan would be the improvement and expansion of the harbor and its related facilities.

"These hearings are aimed at showing the public three preliminary plans for the harbor development and to obtain the public's input for what should also be included in those plans," Connolly said.

Under an agreement already approved, the federal government will pay 50 percent of the project costs and the state 25 percent, with the county and Town of Newfane sharing 25 percent.

Earlier, the overall cost was estimated from $11 million to $17.4 million, depending on how extensively the harbor will be changed.

One plan would provide for a marina to accommodate nearly 800 boat slips while an expanded design would include some 1,000 slips.

Based on final approvals from various government agencies, construction would start in the spring of 1992 and be completed by the fall of 1994.

Connolly said Monday the Buffalo District of the U.S. Army Corps of Engineers has required that a town master plan be approved by the end of this year.

A corps spokesman said the project could not be given final approval unless the town could prove that docks, adequate parking, and other vital services would be provided in connection with the harbor expansion.

Earlier this year, the Buffalo District engineers' office sent questionnaires to boat owners in Erie, Niagara, Orleans, Genesee and Monroe counties, asking the maximum annual price they would pay for a boat slip. More than 6,200 boat owners said they would pay up to $700 a year and nearly 2,000 said they would pay $1,000 to $1,200.

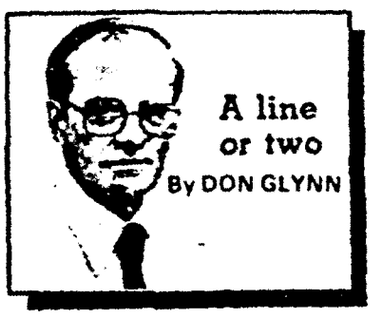
Some residents have raised concerns that homes would be lost to make way for the development.

"It might be difficult to complete such a project without taking some homes," Connolly said. "One of the objectives of the master plan is to determine long-range goals," he said, referring to inevitable changes in the residential and commercial areas to accommodate a large-scale development.

2 Cadet CENCBPD-PF

Niagara Gazette Friday Oct. 27, 1989

# Olcott waters could make big waves in Falls tourism




Too often Niagara's tourist industry is measured simply by the ambitious plans for downtown development.

Yet the proposed Olcott Harbor *Project could have a major sharp* impact on the future of tourism throughout the Niagara Frontier. From all indications, local, state and federal authorities are convinced that it would be a viable investment.

It would mean extensive improvements of the harbor, perhaps as many as 1,000 new boat slips, and a revitalized business district in the lakefront community once considered a great spot to spend the summer.

The estimated $18 million project costs would be shared by the federal government (50 percent), the state (25 percent), and the county and Town of Newfane (each 12.5 percent).

Assemblyman **MATTHEW J. MURPHY**, D-Lockport, who has been directly involved with the project since it was first discussed in 1977, also thinks it may come to fruition.

"I became strongly involved in this project because I believe its implementation will make the area more physically attractive while creating one of the largest economic booms Western New York has ever seen," Murphy said. "It is our goal to complete this project without a major disruption of homes. I would encourage the residents of the county to rally behind it as well because, in the long run, it will be beneficial to everyone."

Longtime county residents fondly recall Olcott Beach as a major destination for summer travelers across the Northeast. In earlier days, train excursions brought hundreds of seasonal visitors who stayed at the sprawling waterfront hotels.

"The economic and social impact this (project) is going to have on Niagara County cannot be underestimated," Murphy says. "Charter boat fishing has put Olcott on the map in recent years, and the new outer harbor project will help further its reputation as one of the country's premier fishing areas."

Nearly 300 residents from Olcott and the township recently attended two public hearings about the harbor development.

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**IN THE SPOTLIGHT: RALPH HUBBELL**, dean of Western New York broadcasters, was honored by a group of local friends Thursday at the Red Coach Inn. "Hub," quietly observing his 80th birthday, was sports director for many years at radio station WBEN.

The luncheon here was coordinated by veteran broadcaster **EDWARD F. JOSEPH**, one of Hubbell's close friends for decades. Among those attending the party was **JIMMY THOMPSON**, who started his radio career as a correspondent for Hubbell before becoming the news and sports director of WJJL.

Full retirement is not part of Hubbell's makeup. He recently joined the staff of radio station CJFT (530) in Fort Erie, Ont.

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**NATIONAL EXPOSURE: Mayor MICHAEL C. O'LAUGHLIN** is the centerfold in the current issue of the Chemical Manufacturers Association Monthly, a trade publication. In a short message next to his photo, the mayor notes: "Without companies like DuPont, Occidental, Olin, Goodyear, and Airco Carbon, we would be a village."

• • •

**DRESS CODE:** The Rainbow Centre Factory Outlet Mall will stage its second annual Halloween Costume Parade and Contest with registration at 5:30 p.m. Monday near the first-level fountain. Prizes will be awarded in three categories up to 12 years of age.

**PARTY TIME: JACK WEBER** is chairman of the German dessert baking contest which the Kiwanis Club of North Niagara Falls is sponsoring at its sixth annual Oktoberfest from 3:30 p.m. to 11:30 p.m. Saturday at the State Armory, Main Street and Spruce Avenue. Weber said a special prize will be awarded for the best apple entry.

Area apple growers have made generous donations to the Kiwanis event, a club spokesman said.

• • •

**QUOTABLE QUOTE:** A friend sent me a note the other day with this reminder from the top of the memo pad: "Middle age occurs when you are too young to take up golf and too old to rush up to the net" — **FRANKLIN P. ADAMS.**

*Don Glynn is a veteran Niagara Gazette reporter, editor and columnist.*

2 Cadet

CENCBPD-PF

US Army Corps of Engineers
Buffalo District

# Clips

No 10-2 Date 3 October 1989
Prepared D. Collins Phone 879-4104

Union Sun & Journal/Lockport, N. Y./15 Sept. 1989

# Olcott Harbor Financing Eyed

**If a port authority is established to handle the proposed $18 million Olcott Harbor renovation, Newfane and Niagara County residents won't have to worry about an increase in their tax bills.**

This and other cost-sharing ideas were discussed at a meeting in Albany Monday, attended by Newfane Supervisor Timothy Horanburg, Assemblyman Matthew Murphy, state Sen. John Daly, County Legislative Chairman William Ross, Legislator Ronald Perry and Newfane Town Engineer Anthony McKenna.

The officials discussed establishing a port authority, which would be able to use marina revenues to pay for the project.

Five state agencies were represented at the meeting, including the state Department of Environmental Conservation, which is involving itself in the project for the first time.

At the meeting, officials first discussed the possibility of Newfane and Niagara County each contributing about $2.5 million toward the renovation. Horanburg said they also discussed seeking contributions of $4.5 million from the state and $9 million from the federal government, but "nothing was committed at the meeting."

Horanburg said if the port authority is established, money to pay for the project would come from marina revenues.

"If you have 1,000 boat slips, you'll get $800 to $900 annually per slip for rentals, plus other marina charges. The port authority could take out a bond and pay for it with these revenues.

"I'll be the last person going to people and saying, 'You have to pay more taxes!' " he said.

Financing of the proposed renovation may be delayed until 1991, when state and local governments must tell the federal government whether they intend to pursue the project. Also, local taxpayers may have to come up with at least $5 million to fund the project if a port authority is not established.

Horanburg said these dollar figures could be altered dramatically, especially if more boat slips were to be installed, which would add another $4.5 million to the total.

The $18 million would cover dredging of the harbor at the mouth of Eighteenmile Creek, construction of breakwalls into Lake Ontario, and the addition of restrooms, additional parking areas and sidewalks.

The amount of federal funding depends upon how much of the project is classified as flood protection, economic development or recreational development, with the percentage of each determined by the U.S. Army Corps of Engineers.

Horanburg said more government funding would be provided if the Corps of Engineers declares all or part of the area a flood plain or navigational waterway.

He also said the Department of Parks and Recreation may not have to be the lead agency for the project.

McKenna presented "Plan 10-B" to the officials at the Albany meeting, and Horanburg said they all "responded warmly" to the proposals.

The Olcott Harbor Task Force has been working on various plans, and it will present the findings at a public forum Horanburg is hoping to schedule the first week of October.

"As soon as task force chairman John Connolly gives me a date, it will be announced in the paper and on the radio," Horanburg said.

Murphy was enthusiastic about Monday's meeting, and he is also enthusiastic about the project itself. He urged state officials to consider the project as a benefit to all of Western New York, not just to those living in the Newfane-Olcott area.

He reminded them that fishing licenses are purchased here by Canadians and out-of-state residents and that public opinion surveys circulated in Western New York were favorable to the area.

Murphy added the entire region would benefit from improvements to the marina and outer harbor area.

2 Kelly

more...



The Olcott marina and harbor at the mouth of 18-Mile Creek.

Buffalo News/Buffalo, N. Y./September 18, 1989

## Meeting set on Olcott Harbor plans

OLCOTT — The Olcott Harbor Development Project "is going to have an incredible economic impact on Niagara County," according to Assemblyman Matthew J. Murphy, D-Lockport.

Murphy said he and Newfane Supervisor Timothy R. Horanburg would discuss the construction project with representatives of the U.S. Army Corps of Engineers at a meeting Tuesday in the Corps of Engineers office in Buffalo.

The assemblyman said information gathered at Tuesday's session would help in preparations for a meeting to be scheduled later in Albany among state, federal and local officials "to find out where we stand as far as planning and funding are concerned."

The $23 million project to improve Olcott Harbor and provide 1,058 boat slips is to be financed jointly by the federal, state, county and town governments. It includes the construction of two breakwaters into Lake Ontario at the mouth of Eighteen Mile Creek and possibly restrooms, fish cleaning stations, a parking lot and other facilities.

(2 CADET) CENCBPD-PF

# D'Amato Staff Briefed On Olcott Harbor Plan

A delegation of Niagara County officials met recently with representatives of U.S. Sen. Alphonse D'Amato to try to strengthen the senator's support for including the Olcott Harbor improvements project in the federal Water Omnibus Bill.

The legislation is under consideration before a congressional House-Senate conference committee in Washington, D.C.

The purpose of the meeting was to better acquaint D'Amato's staff with some recent economic impact data the county has developed on the project, according to David Kinyon, executive director of the Lockport-Eastern Niagara Chamber of Commerce.

The improvements include construction of a $12 million breakwater at the mouth of the harbor and dredging of the area.

The Olcott Harbor improvements project, also referred to as a "super marina," has been identified as a priority project for the county by the consulting firm of Arthur D. Little Inc. of Boston, which recently completed a comprehensive economic development strategy for the county, Kinyon said.

The A.D. Little report projects a combined public and private sector investment of more than $30 million being generated by the breakwater and harbor dredging project, he said.

According to Kinyon, D'Amato's staff responded positively to the scope of the project and the importance to the area's economy, making suggestions as to how local interests could further their cause by developing other economic indicators.

"We documented that the Niagara County Fishery is presently generating more than $10 million annually, compared with $2.6 million spent during 1976-77," Kinyon said. "In the town of Newfane alone, fishing license sales increased from 1,091 licenses in 1980-81 [illegible],043 in 1984-85.

"Of those licenses sold, 6,077 were to out-of-county residents," he said.

Also attending the session from Niagara County were county Legislator Ronald Perry of Newfane; Newfane Councilman James Wendler; Newfane Town Engineer Anthony McKenna of Wendel Engineers, also a member of the Olcott Harbor Improvements Task Force, and Ted Belling, planner with the county Planning and Industrial Development Department.

The group also hopes to meet with representatives of Sen. Daniel Patrick Moynihan.

Kenyon noted that the bill before the House-Senate conference committee is an authorization bill only, and should it be approved and signed into law, the $12.4 million project would have to go through the appropriations process in Congress.

"Niagara County, Newfane and the Chamber of Commerce have made a multi-year commitment to continue pursuing funding for this project because of its substantial economic impact on the area," Kinyon said.

Buffalo News/ Buffalo, N.Y./ June 12, 1989

# Olcott expects its ship to come in with proposed 'supermarina' project

By ED CHRZANOWSKI
*News Niagara Correspondent*

NEWFANE — Today, Olcott Harbor has about 200 slips.

Eventually, it will be able to accommodate 1,058 slips and a 115-foot tour-boat dock.

"When this project is completed in the spring of 1993, we will become one of the favorite recreational spots in the Eastern United States," Newfane Supervisor Timothy R. Horanburg said of the Olcott Outer Harbor Development Plan.

Horanburg estimated that the project immediately would bring $50 million in investments. "The potential to the area is unlimited," he said.

The $23 million project, sometimes referred to as "the supermarina," calls for building two breakwaters that will extend from Olcott Harbor into Lake Ontario.

The 1,650-foot-long east breakwater will be an extension of the old hotel pier in Krull Park on the east side of Olcott.

The 1,450-foot-long west breakwater will begin at the foot of Jackson Street on the west side of the harbor. The gap between the two will allow boats to enter the basin or outer harbor. The breakwaters, which will be about 200 feet wide at the base and at least 20 feet wide at the top, probably will function as piers and walkways, said Town Engineer Anthony W. McKenna of Wendel Engineers.

McKenna said that 714 slips will be in the east basin, 232 in the west basin and 112 between the federal piers in the middle of the harbor.

The estimated $13.5 million cost of the breakwaters will be financed 50 percent by the federal government, 25 percent by the state, and 12.5 percent each by the county and town.

The town alone will be responsible for any additional costs. The estimated cost of building the slips is $4.5 million.

McKenna said estimating additional expenses was difficult because the master plan for upland development has not been done. But the U.S. Army Corps of Engineers has said the economic benefits created by the project would warrant a cost of no more than $23 million.

Horanburg said the town would be responsible for building facilities such as rest rooms, walkways, fish-cleaning stations, gas pump-outs and a 1,000-car parking lot and other upland development that might cost $5 million.

The town probably will sell bonds for the project and pay them off in six to seven years with revenue from the docks.

By Thursday, the town expects to receive a $73,000 grant from the Western New York Economic Development Corp. to help finance a master plan for the upland development, Horanburg said. The town and county will contribute $10,000 each toward the study. The master plan is expected to be done by September, he added.

The county's participation and cooperation in the project is crucial, particularly with the parking problem, Horanburg said.

The Niagara County Planning Department has proposed using the north side of the county's Krull Park as a 700-car parking lot. Horanburg said the county owns 325 acres in the Olcott area, with only 45 acres developed into a park.

"We will go to the public very soon to get their input into this master plan," Horanburg said.

2 Cadet, NCD, OCE

Niagara Gazette/ Niagara Falls, N.Y./ June 6, 1989

# 1993 could bring 'super marina'

## Engineers present update on Olcott Harbor proje

By DON GLYNN
Niagara Gazette

LOCKPORT — The long-awaited "super marina" for Olcott Harbor could be a reality in four years, the chief economist of the U.S. Army Corps of Engineers predicted Monday.

The engineers presented an update on the project — initially estimated at more than $24 million — during a session coordinated by the Lockport-Eastern Niagara County Chamber of Commerce at the Best Western Inn, Transit Road.

"Tests are being conducted on the breakwall (model) at our waterways experimental station in Vicksburg, Miss., and those results will have an impact on the number of slips which could be included at this marina," said Ronald J. Guido, chief of the economic branch for the Buffalo District of the Army engineers.

If funds and required approvals are obtained, construction on the 1,000-slip marina could begin in mid-1992, with the project completed by 1993.

"Actually this plan is on a side burner — not a back burner," Guido said, referring to the unique waterfront facility proposed several years ago. He explained that the tests at the experimental laboratory would determine the configuration of the breakwall.

"We don't want to spend $3,000 fine-tuning (the plans) and then have to redo it," Guido said.

Originally, the planned harbor improvements included 500 boat slips at the marina. "We decided to increase that...we expanded the market area," Guido added.

He said that surveys conducted by a Washington, D.C., consulting firm convinced the engineers that they needed to think in terms of a regional harbor, instead of a local facility.

The surveys included registered boat owners as well as household occupants in two geographical areas: Niagara County and Erie-Orleans-Genesee-Monroe counties.

Guido said the response rate from Niagara County (about one-third) was lower than that of the four-county area. The results showed Niagara County residents favoring the project by 66.7 percent, with the other counties approving it by 47 percent.

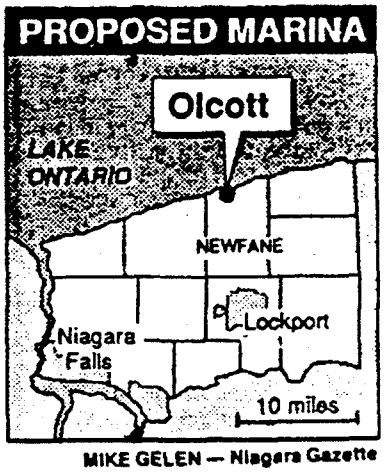
Wiener Cadet, project engineer for the U.S. Army Corps of Engineers said his department needs to move ahead with planning so engineers can get the information by September to keep the marina on schedule.

The engineers said the overall cost of the channel work and breakwall would be about $20 million. Docks, restrooms, and related operational facilities would add $4.6 million.

Guido also noted the engineers' economic branch has attempted to determine how much people would be willing to pay for the marina and its services. Annual rental fees on boat slips run from $500 to $1,000, depending on location, he said. The recent surveys revealed that area residents would accept fees in the $700 range.

A major problem to be resolved is adequate parking for marina users, Guido said. "People expect to find the (parking) lot real close to where they'll keep the boats," he said.

Any plan for a remote parking area would have to include some type of shuttle service, he suggested.



MIKE GELEN — Niagara Gazette

CADET PD-Pf

Union-Sun Journal/ Lockport, N.Y./ June 2, 1989

# Olcott Plan Looks Profitable

By Kathleen Ganz

**The Olcott outer harbor project looks like it's going to be worth the money it costs to build it, according to the chief economist for the Army Corps of Engineers.**

Ronald Guido of the Army Corps gave a slide presentation to a group of people interested in seeing the project become a reality.

Representatives of the state, county, town of Newfane, the Army Corps, the Department of Environmental Conservation, Economic Development Corp. and the local chamber of commerce heard an update on the project, which if all goes well, will begin construction in March 1992.

In order for the project to get the final go-ahead from the federal government, the Army Corps has to prove there would be enough economic advantage to the area to justify the money spent on it.

Guido said before a final recommendation is made by his office, actual cost figures for the project must be released by the Army Corps, which is designing the breakwalls.

"I have a high degree of confidence the project will be economically justifiable," Guido said.

Last year, the Army Corps mailed several thousand questionnaires to both boat owners and non-boat owners in Niagara, Erie, Genesee, Orleans and Monroe counties to determine who wants the breakwalls, and what they would be willing to pay to get them.

Guido said 66.7 percent of non-boater in this county would be in favor of the project, with 47.1 percent of non-boaters in the other counties saying they would like to see the project developed.

The questionnaire sent to boat owners also asked, based on a yearly fee of $700, if they would be interested in renting a slip?

From the results of the survey, Guido estimated Olcott could sign up 1,156 Niagara County boaters and 4,957 from the outlying counties.

If the price of the slips jumped to $1,000 each, more than 3,000 boaters would still be interested in renting one, and there was still interest in renting a slip at $5,000 a year.

"That's pretty substantial," Guido said. "There's a heck of a demand for dock slips in Olcott."

He said if the dock rental was dropped from $700 a year to $500, the demand would jump to 11,466 boaters.

"Based on present numbers, we can justify the project, but we have to get results from Mississippi to see what kind of a configuration we'll have," Guido said.

"When we find out how many slips they're including in the project, and what it's going to cost, then we'll get back to work on the feasibility study."

Under the direction of project engineer Weiner Cadet, the Army Corps is building a scale model replica of the breakwalls at its facilities in Vicksburg, Miss. The configuration of the project has been changed several times, to learn what would work best in Olcott.

Corps engineers have been drawing a series of breakwall patterns on paper, then designing them to scale and putting them in a miniature body of water that exactly matches the conditions in Olcott harbor and Lake Ontario. Using this system, the engineers can see how the walls will affect wave action, erosion, fish-breeding, water temperature and dozens of other factors, then they can easily change the height, length or angle of the walls to correct problems.

Cadet said the corps is now working on plan 10-B, which includes two walls, and allows for 1,000 boat slips.

The first wall, 1,300 feet in length, would connect to the beach at Jackson Street, and turn east at the end of the existing west federal pier.

The second pier, about 1,500 feet in length, would connect at Franklin Street and head out into the water.

This newest plan would allow for a total of 1,000 boat slips — both along the lengths of the piers and inside the "west basin" formed between the shorter wall and the existing west federal pier.

Cadet said he plans to have his recommendation for a final plan ready by the end of the month, with cost projections, to send to Washington, D.C., for final approval and funding.

If the plan is approved by the federal government, construction would start in early 1992, and be completed in December 1993.

Not only must the project be economically feasible, there must also be enough parking available for the people who will use it.

And that parking has to be close enough to the beach for the convenience of the public.

"How far are you willing to walk from your car to your slip every weekend," Guido asked those at the meeting.

"And keep in mind you're carrying a cooler, and a couple of kids. If this isn't user-friendly, it's not going to work."

Parking will be addressed when Newfane draws up its master plan, according to Town Supervisor Timothy Horanburg, designed to help the town figure out what areas will be set aside for businesses, homes, recreational areas, and parking.

Newfane Town Engineer Anthony McKenna said only 45 acres of the 318-acre county-owned Krull Park is now developed, and part of that is being considered for parking.

The town is asking for $93,000 to draw up the master plan, including $73,000 from the state, $10,000 in in-kind services from the county, and $10,000 local contribution from the town.

David Miller of the Western New York Economic Development Corp. said so far, everything looks favorable for the state to kick in its share, and final word will arrive June 19.

Those attending the meeting included David Kinyon and Donna Landers from the Chamber of Commerce; representatives of Assemblyman Matthew Murphy, state Sen. John Daly and Rep. John LaFalce; Legislative Chairman William Ross; Legislator Ronald Perry; Mario Piastru from the state parks department; James Kramer of the Olcott Harbor Task Force; Michael McMurray of the state Department of Environmental Conservation; Robin Linhart from Supervisor Horanburg's office; Miller; Horanburg; McKenna; Cadet and Guido.

# Olcott Harbor Plan Boosted

5/13-3

A major step has been made in the second year of funding for the proposed Olcott Outer Harbor Project.

Rep. John LaFalce announced that the House Appropriation Committee has added $350,000 in the Energy and Water appropriations bill for the second year of the three-year harbor feasibility study for the project.

"This would indicate a clear commitment to the project," LaFalce said.

The measure must now be approved by the full House and the Senate.

The Army Corps of Engineers is doing a feasibility study of the project, which calls for erecting breakwalls at Olcott Harbor and related development at a cost of $12 million.

The corps has begun a scale model of the breakwalls in Vicksburg, Miss. LaFalce said if all goes as planned, construction of the breakwalls could begin in Olcott within five years.

# *Fish May Bite, Rain Or Shine*

4/28/89

Some fishing experts say the fish bite more often when it rains, while others disagree and would prefer to stay dry.

Local weather watcher Bob Clark said, "That's what they tell me, but I can't vouch *for* that *from* experience, because I'm not a fisherman."

Either way, anglers heading toward Wilson and Olcott for the annual Empire State Lake Ontario Trout & Salmon Derby will get a chance to test both sides of this theory this weekend.

According to the National Weather Service the weekend will be a mix of dry and rainy spells.

Tonight will be cloudy with showers likely after midnight and a chilly low of 40 degrees.

Saturday will be mostly cloudy, with a 60 percent chance of showers and a high of 60 degrees.

There is a chance of showers Sunday with a low of 40 to 45 degrees and a high of 55 to 60 degrees.

With $50,000 worth of prizes for the largest salmon caught and a prize package of $17,200 for the largest brown trout, fishermen may just go through the inconvenience of sitting under an umbrella to land the big one.

Clark said the low last night was 31 degrees and the high should be in the upper 50s today.

"Most of this weekend will be relatively similar to what today's weather turns out to be," Clark said.

Clark said Western New York weather is among the most changeable in the country.

"As they say, whatever the weather is, you could wait a few minutes and it will change," he said.

4/28/89

# Lake Fishing Derby Opens Today

4/27/89

By Kathleen Gamz

By daybreak today, fishermen had their boats lined up at the Wilson and Olcott launches ready to catch the big one that will bring in a prize package worth $50,000.

Today marks the first day of the annual four-day spring Empire State Lake Ontario Trout & Salmon derby. More than 13,000 fishermen registered for the 1988 ESLO derby, and even more are expected this year because of bigger prizes and eastern Niagara County's growing reputation for big fish.

The grand prize this year for the biggest salmon is worth $50,000, and includes a 1989 Nissan Pathfinder, donated by Lockport Nissan; a boat and motor and fishing equipment.

The biggest brown trout will bring in a prize package worth $17,200, including an outboard motor and thousands of dollars worth of fishing gear.

Local fishermen say the fish are out there, but it's going to take some skill to bring them in.

"During winter, the fish stay on the Canadian side of the lake where the bait is," said Dick Robinson, the Cooperative Extension's natural resource agent.

"Right now they're heading back, gorging on a smorgasbord of smelt."

Wilson waters harbored the biggest fish caught at the derby a few years ago — a 37-pound beauty.

Nobody really expects to top the all-time record for Lake Ontario, which is a whopping 47.9-pounder

About half the fishermen registered for the ESLO derby come from the seven New York state counties along Lake Ontario. Another 35 percent usually come from other areas of the state, with the remaining 16 percent from Pennsylvania and the New England and Mid-Atlantic states.

Wilson and Olcott are ready for the out-of-towners.

Jane Voelpel, owner of Bayside Bed & Breakfast in Olcott said the nine Ithaca fishermen who rented rooms from her during last year's ESLO derby made reservations then, and are back again. She said her establishment is booked for all this year's derbies, and fairly full every weekend during the fishing season.

Voelpel, who is also a member of the Newfane Tourism Committee, said there is a big lack of entertainment in the area for fishermen's families.

"We need to offer shopping and other things for families to do when the men are out on the lake," she said.

That problem is being addressed in Olcott, where residents are drawing up plans in anticipation of the Olcott Harbor Project, a giant breakwall in the lake that would provide hundreds of boat docks and result in a major tourism boom.

Much of the overflow from the Wilson and Olcott bed and breakfast establishments wound up in Lockport again this year.



**READY TO GO — Capt. Jack Hart checks the fishing equipment early this morning before heading out on the lake on the first day of the spring ESLO derby. Capt. Jack is one of thousands of fishermen hoping to land the biggest biggest fish in this year's derby. He lives at 4240 Willow Road in Wilson. (Photo By James Donner)**

Dawn Sobieraski, front desk manager at the Best Western in Lockport, said she booked nine rooms for a group of Pennsylvania fishermen, and could have housed many more if the motel hadn't already been filled because of an out-of-town convention.

"We've had a lot of phone calls from fishermen, but we haven't been able to accommodate them," she said.

"We've had to send them down to the Lockport Motel."

Olcott's only motel, the Harbor Inn, has been full since last year, and so has the adjacent campground.

Manager Theresa Claire said the ESLO fishermen booked the inn's 16 rooms a year ago, with four men to a room, and all 80 campsites are full — half of them booked a year in advance.

"We're turning them away," she said. "The real die-hards are out there in tents," she said.

Harbor Inn's restaurant opened at 5:00 this morning, ready to feed hundreds of fishermen before they head out on the lake.

Local weigh-in stations are at the Wilson and Olcott bait & tackel stores, and prizes will be awarded at 7 p.m. Sunday at the Rochester Hilton at 175 Jefferson Road.

UNION-SUN & JOURNAL

*Editorially Speaking*

4/7/87

# Changes Begin In Olcott, Wilson

In case you haven't already noticed, some major changes are occurring along the Lake Ontario shore in Niagara County.

Some major housing developments are currently underway in Olcott, and now an exciting $12-million housing plan has been announced in Wilson.

The Wilson proposal, located about two miles west of Tuscarora State Park, would include 112 housing units, tennis courts, recreational areas and a marina for development residents.

★ ★ ★

The plan, proposed by owner Floyd "Red" Clark and his son, David, has passed the initial hurdles in Wilson, and has an excellent chance of reaching fruition.

The Olcott and Wilson projects are indicative of the growing interest in lakefront development, and many more ideas are reported to be on area drawing boards.

With the Olcott Harbor redevelopment plan progressing satisfactorily, this area can expect to see a continuing boom in shoreline development...much the same as happened directly across the lake in Canada in the 1950s and 60s.

★ ★ ★

The county appears to be on the brink of a dramatic change that could really blossom in the next decade and in the early 2000s.

Lake Ontario is one of our most valuable resources and more and more people are becoming aware of it, and want to enjoy it. And that's why places like Olcott and Wilson are beginning to experience some changes already.

THURSDAY, DECEMBER 1, 1988

# Olcott Plans For Harbor

By Kathleen Ganz

**Olcott is on the brink of one of the most exciting developments to ever hit the area, but its success depends on the people taking the time to do the project right.**

That was the message David White, program coordinator for the state Sea Grant Extension gave to about 160 people Wednesday evening at the Harbor Inn Restaurant.

Plans are moving ahead for the Olcott Harbor Project, which should begin in 1990, if all goes well.

White gave a slide presentation on the impact of harbor projects on other municipalities on the Great Lakes. He said no two projects are alike, but Olcott planners can take advantage of the mistakes and successes of other harbor projects.

Noting the large crowd, which included town and county officials, local businessmen and some of the 27 members of the Olcott Harbor Task Force, White said, "nothing ever gets done without grass roots support. I have to commend you for the support you have here. It's the only way things get done."

The Task Force, headed by James Kramer of Newfane, began its work about two years ago by gathering petitions to lobby for money for the required three-year feasibility study for the project.

The Army Corps of Engineers is more than halfway through that study, and is now building a working scale model of the project at its facilities in Vicksburg, Miss.

After the third year of study, if the Corps decides the project is feasible, the federal, state, county and town governments will have to raise the $13 million needed to build the giant breakwalls in Lake Ontario.

White said it's important to think of the project not in terms of lake access, but as a way to vitalize the entire waterfront.

"There are so many opportunities out there for you. You're right on the cutting edge. You have to study and identify all the opportunities that result from a breakwall, and decide which ones you want to go for.

"There are opportunities in addition to boat fishing. Look at building scenic walkways, at providing pier fishing and look at attracting recreational boating," he said.

White showed slides of harbor projects in Michigan, Indiana, Minnesota and, closer to home, in Oswego.

Two Harbors, Minn., is a good example of private and public sector working together, he said, since the railroad donated the property for the harborfront, the state built it and the city maintains it.

At Grand Haven, Mich., a city of about 11,000 people, there are several shops around the harbor, to lure the non-fishermen and non-boaters.

"Figure out your goal. You want everyone to come to Olcott and spend their money, so talk with the user groups and see what they'd go for. Have something for dad and the kids to do while mom goes fishing," he said.

David Kinyon, Chamber of Commerce president, told the group, "Olcott Beach as we know it will be considerably different in a couple of years. We want to see a success in Olcott, and make it the best community we can."

The Olcott Task Force will present a second program on harbor development in January. Kramer

Union-Sun and Journal
Lockport, NY

Jefferson and Journal/ Lewiston, N.Y./ Oct. 21, 1988 Cadet PD P4

# Working Model Of Olcott Harbor Project Being Built

By Kathleen Ganz

A scale model of the proposed Olcott Outer Harbor Project is being built in an Army Corps of Engineers facility in Vicksburg, Miss., a working model designed to iron out all the problems before actual construction begins on Lake Ontario in 1992.

Weiner Cadet, the Army Corps civil engineer in charge of the $13 million project, met Wendesday with local officials to present an update.

At the meeting were Ted Bellings, county planner; Timothy Horanburg, Newfane town supervisor; David Kinyon, president of the Chamber of Commerce; James Kramer, chairman of the Olcott Outer Harbor Task Force; Anthony McKenna, Newfane engineer; Ronald Perry, county legislator, and Legislative Chairman Richard Shanley.

The project calls for building two breakwalls in the lake, one on either side of the existing federal piers in Olcott.

The breakwall to the east of the piers would be about 1,650 feet long, running at an angle between the East Federal Pier to the end of Franklin Street. Access to the pier would be obtained from a 300-foot breakwall built over the remains of the old hotel pier off Krull Park.

On the west side of the federal piers would be the second large breakwall, a 1,200-foot structure running at an angle from a point about 150-feet north of the end of the larger breakwall, tying in to land via a 300-foot breakwall at the west side of Jackson Street.

The plan to tie the piers into land was suggested by Horanburg, who said it would allow space for a second marina. Under the new proposal, called plan 10 B, there would be space for 600 boats west of the existing federal piers and 400 east of the piers.

Cadet said the Army Corps has finished designing the structures on paper, and would begin shortly building a scale model of the piers, to be put in the Corp's Waterways Experimental Station in Vicksburg.

The engineers will simulate every possible condition the piers could face, recording what effect the wind and waves would have on the environment, the land and the structures themselves.

A wind generator will send wind and waves crashing into the miniature walls, much the same conditions the real breakwalls would face from Lake Ontario and Eighteenmile Creek.

"If it looks like there's a problem, we'll change the angle of the breakwall to correct it," Cadet said.

The engineer said the Corps will see what objections the town, the county and the U.S. Fishing and Wildlife Department has, then take steps to correct them.

Among the important considerations are the impact the breakwalls would have on the fishing industry, which provides a major source of revenue in Olcott.

The Corps has designed a brand new method to study temperatures in the waters around the breakwalls, and is seeing what effects temperatures, waves and winds have on fish migration and breeding.

"We're working with the U.S. Fishing and Wildlife Department to see if the breakwalls would have a negative effect on fish. If so, we'll make adjustments until we find the configuration we're looking for.

"The reason for the breakwall is to provide a safe harbor, one that is environmentally safe as well," Cadet said.

Also on the Corp's list of items to be checked out on the scale model in Vicksburg are to see if the water circulation in the harbor is sufficient to provide safe, clean water and to make sure waves in the inner harbor are low enough for boats to handle.

Kramer and Kinyon announced that several informational meetings will be scheduled to let the public know more about the project. The next meeting will be Nov. 30 at the Olcott Harbor Inn.

Within the next few weeks, the Corps will be mailing 6,000 survey brochures to people who use the lake, in an effort to determine the value of the harbor expansion.

A total of 4,000 boaters will receive a boating facility survey, asking questions about what types of boats are owned, how often the owner uses the lake and for what purpose, and

whether or not they would use the facilities at the proposed expansion.

About 6,000 residents in a random sampling will receive questionners asking for their opinion, as non-boaters, of the worth of the project and whether or not they would financially support the expansion plan.

Bellings mentioned that the county Economic Development Strategy plan recommended a supermarina in Olcott as one of the top five economic development projects for the county.

Buffalo News/ Buffalo, N.Y./ Sept. 3, 1988

# Snagging of Salmon Spurs Olcott Debate

By MICHAEL LEVY
*News Staff Reporter*

OLCOTT — Salmon have sparked wars and built trading fortunes on the Pacific Coast for centuries.

Now Pacific salmon are bringing economic fortune and political confrontation to the Great Lakes.

This Niagara County community, for example, has seen lakeside property values soar 100 percent this year; and $13 million was added to the tax base in the last four years by new businesses keyed to fishing.

But controversy heats up every year when the fish begin their spawning run up 18 Mile Creek from the harbor to the Burt dam.

Snagging is the issue, pitting fisherman against fisherman, businessman against businessman.

Snaggers harvest fish by dragging or jerking weighted treble hooks through the water, foul-hooking them.

And thousands of visitors come to this creek hoping to take home a 30-pound trophy.

"At least five new tackle shops and 17 new bed and breakfast places have opened here recently," said Newfane Town Supervisor Tim Horanburg, as he ticked off the economic benefits of all fishing activity. "We know snagging is part of that picture.

"Fishing license sales in Olcott and Newfane have gone from 1,000 in 1980 to more than 13,500 this year.

"It's estimated that visitors spend between $30 and $60 a day when they're fishing; so when you count the 3-day, 7-day and season licenses sold to New Yorkers and out-of-staters and multiply, you come up with more than $4.6 million put into the local economy," Horanburg said.

But that bright picture might change if the state moves to ban salmon snagging, something many anglers feel is long overdue.

"I'm neutral on the snagging issue," said gas station owner David Sears. "But snagging seems to give us an extra month. After Nov. 30, it dies right down, here."

(continued)



RON MOSCATI/Buffalo News

Newfane Supervisor Tim Horanburg stands beside Olcott Harbor.

"How much our businesses would lose if snagging were banned is a real question," Horanburg said. "Nobody knows if we are losing anglers because of snagging, or if there would be enough of them to take up the slack if snagging was abolished."

Last year during the Aug. 15-Nov. 30 snagging season, 9,300 cars — many from Ohio and Pennsylvania — paid $1 to enter Fisherman's Park on 18-Mile Creek.

Twenty years ago, when salmon were first planted in the Great Lakes to replace the vanishing lake trout, biologists in New York, Ohio, Michigan and Wisconsin believed snagging was needed to prevent rafts of dead salmon in the streams from creating health — or at least aesthetic — problems.

Unlike Atlantic salmon, rainbow and brown trout, which also have been planted in the same streams, Pacific salmon die after they run up the tributaries to spawn. They do not feed during their spawning run, either, so it's hard to make salmon take lures or bait.

Snagging, opponents say, has led a generation of fishermen to believe that is the only way to harvest salmon from streams.

"But whenever snaggers were on the stream, no other angling was feasible," said Michael Hansen, Wisconsin's Great Lakes fisheries specialist. "There just was no place for any other fishing."

Last year Wisconsin became the first Great Lakes state to end snagging. Ohio will do so next fall.

New York authorities face the same problems, the same complaints from anglers. Five years ago, the Department of Environmental Conservation banned snagging from many streams where the fish run.

But rotting salmon carcasses continued to be a problem each fall, along with complaints of littering and rowdyism. Worse, many trout — not legal to snag — are killed by snag hooks late in the season.

"Don't get me started on snagging," says charter skipper Dennis Mihalec of Pittsburgh, who brings charter parties to Olcott Harbor from May through October every year.

"Number 1, the snaggers kill a lot of trout; number 2, they butcher these fish for the eggs, which they can sell for 50 cents a pound. Then they either leave them to rot on the bank or jam the town's fish-cleaning station with the carcasses."

"None of my members better leave rotting salmon on the bank," says Tom Meiler of the United Salmon Snaggers of America, a locally based organization that was formed to oppose the first state limits on snagging.

"Not everyone can afford to buy a 25-foot boat or afford to charter one just to catch a few fish," he noted. And, he added, snaggers are even willing to go along to with some of New York's most recent proposals.

In 1989 the DEC wants to shorten the Aug. 15-Nov. 30 snagging season to Sept. 1 through Nov. 1, change some of the tackle rules and ban night fishing.

New York now has a law that makes it illegal to leave any fish parts on stream banks and next fall will regulate the sale of eggs, according to Stephen Mooradian, DEC Region 9 fisheries manager.

"We'd go along with the September opener," Meiler said. "There are no salmon in the streams until then, anyway. But cutting us out of the back part of the season is unfair."

The reason for that move is to prevent damage to trout, which typically enter salmon streams just behind the salmon, according to Robert Lange, New York's Great Lakes fisheries chief.

The snaggers have suggested, instead, that the state stop stocking trout in 18 Mile Creek to minimize the problem.

Moreover, Meiler says, "snaggers are confined to limited areas now."

"It gets very crowded in the few places we are allowed to snag. And Olcott sees a phenomenal drop in tourism once snagging season ends," he added.

"Ontario has the same problems we do, and they don't allow snagging. You'll have those problems whenever you see that many big fish in a stream," he continued.

When Wisconsin banned snagging in 1987 "the feeling was that we would lose revenue," Hansen said. "In fact, our license revenue increased by $15 the first year we outlawed snagging, and I'd bet that the revenue for local businesses has picked up quite a bit, too."

Out-of-state snaggers were "pretty much self-contained," Hansen said. "They'd come in a camper, harvest their fish, preserve them and leave.

"The spin fishermen and fly fishermen who can now use the streams stay in motels, spend more money on the local economy."

"Banning snagging was relatively easy," he added. "Oddly enough, no other Great Lakes state has ever asked us how we did it."

"There is some sentiment for ending snagging here altogether," said the DEC's Lange, "but Michigan tried that last year and lost in court. I think our approach will be to phase it out in stages."

"I do not know how much business we really gain from snagging," said Horanburg, "or how many regular fishermen we lose because snaggers are on the creek.

"Still, I would not mind seeing snagging phased out over the next three years so we'd have time to teach people there are other ways to catch these fish."

Horanburg, who neither fishes nor snags nor goes boating — "I am the kind of guy who likes to sit on the dock and watch the action" — is betting that by 1990 four things will occur that might completely overshadow this "salmon war":

"We will have another 200 dock spaces in 18 Mile Creek — the dredging of the sunken island in the main channel is almost completed, now.

"We should see the first of the twin outer harbor breakwaters under construction, and that will mean at least another 500 boat slips.

"We should see development of more of the county's 300 idle acres at Krull Park. We are supposed to get a golf course there, for one thing.

"And new subdivisions and our first waterfront condominium development will be completed by then — expensive homes for people who want to live here and commute to Rochester and Amherst.

"Olcott has already changed radically, thanks to fishing," Horanburg said. "No longer are the little beachfront cottages used for welfare housing and nobody laughs anymore when you tell them you're from Olcott.

"I think what we'll be seeing here by the 1990s is a whole waterfront-based community, not just for fishing, but for sailing and swimming and just looking at the lake and relaxing, too."

UNION-SUN JOURNAL

ECOND SECTION THURSDAY, AUGUST 25, 1988

# *Horanburg Blasts Idea Of Commercial Ferry*

NEWFANE — Supervisor Tim Horanburg and residents Robert Mandry and James Moore debated the merits of adding a commercial ferry service between Olcott and Canada to the proposed Olcott Outer Harbor Project at the Town Board meeting Wednesday night.

Horanburg told them he would "fight this thing until hell freezes over," saying that a commercial ferry service would "destroy us."

Horanburg said he was speaking for himself, not the board, and said he would support a study for a passenger ferry linking Olcott to Toronto.

Town Engineer Anthony McKenna said he attended a meeting where a commercial ferry service was discussed, and was told the ships would have to be about 500 feet long, and would have to carry about 80 trucks on board to make the project economically feasible for the shipper.

A Canadian man who said he might be interested in the project said he would require another 80 trucks "qued up on shore" to carry the cargo.

McKenna also said the proposed harbors would have to be extended considerably to accommodate the 500-foot ships, which would mean the entire Outer Harbor project would have to be scrapped.

"We'd have to start all over again," he said. "That would be very expensive."

Horanburg said he would support a study for a commercial lakeport "east or west of here, but it would destroy Olcott."

The Outer Harbor project was approved as a recreational project, and a commercial venture such as Mandry and Moore proposed could not be part of the present plans.

"We've worked too hard on this project to have it stopped now," Horanburg said.

Mandry agreed, saying he doesn't want to hold up the project, but thinks a ferry service would have a big ecomonic impact on the area.

"We're going to be missing the boat if we don't have that service," he said.

## Volunteers Sought For Tourism Booth

NEWFANE — Donna Miller, a Tourism Committee member, told the Town Board Wednesday evening that volunteers are being sought to man the tourism booth/caboose in Olcott.

Anyone interested can contact Town Hall, or a member of the Tourism Committee.

Mrs. Miller said the caboose will be ready soon, and thanked Jeff Neureuther of Newfane who did all the carpentry work in the 1942 caboose.

The caboose is on the southeast corner of Routes 18 and 78. Also on the site will be a kiosk containing town maps and information about fishing and upcoming events.

The Tourism Committee received a letter from Gov. Cuomo saying it had been nominated for the Eleanor Roosevelt Community Service Award.

"It is only throught the dedication of organizations such as yours that we are able to meet many of the needs of our citizens that government alone cannot adequately address," the note said.

"The people of the state of New York join me in thanking you for your unselfish contributions toward the betterment of the quality of life for all people in our state."

On the Tourism Committee are Bill Lytle, Grace Banks, Mrs. Miller, Jane Voelpel, Al Benton, Dick Rybolt, Wanda Manhardt and Chairman Judson Heck.

# Olcott Harbor Plan Boosted

A major step has been made in the second year of funding for the proposed Olcott Outer Harbor Project.

Rep. John LaFalce announced that the House Appropriation Committee has added $350,000 in the Energy and Water appropriations bill for the second year of the three-year harbor feasibility study for the project.

"This would indicate a clear commitment to the project," LaFalce said.

The measure must now be approved by the full House and the Senate.

The Army Corps of Engineers is doing a feasibility study of the project, which calls for erecting breakwalls at Olcott Harbor and related development at a cost of $12 million.

The corps has begun a scale model of the breakwalls in Vicksburg, Miss. LaFalce said if all goes as planned, construction of the breakwalls could begin in Olcott within five years.

FRIDAY, MAY 13, 1988

Union-Sun & Journal/Lockport, N.Y./April 26, 1988

# $12-Million Tab Placed On Olcott Harbor Project

By Avis Townsend

NEWFANE — The Army Corps of Engineers is beginning a $350,000 recreational navigational project to study Olcott Harbor.

At Wednesday's Town Board meeting, Supervisor Timothy Horanburg read a letter from the Corps stating that a scale model of the proposed recreational area will be built and the plans tested in Vicksburg, Miss.

The Corps is investigating a complete renovation of the harbor area, turning it into an all-weather recreational area, with footbridges and walkways in the harbor area, and breakwalls out into the lake, at a final cost of $12 million.

In another matter, with all members present, Jane Voepel and town historian Judson Heck reported on the recent action of the Newfane Tourism Committee.

Voepel represented Newfane at the Lockport Chamber of Commerce Tourism Exposition at the Best Western, promoting eastern Niagara County and "telling people there is more to this area than Niagara Falls."

She told the board 18,000 Newfane tourism brochures were printed this year, up 3,000 from last year. The brochures will be given to all town businesses for distribution. Fishing maps have also been distributed.

Two full-page ads were placed in the Empire State Lake Ontario Derby Gazette, printed in Rochester, with 29 Olcott and Newfane businesses placing ads.

Heck reported that he is receiving information requests from many states, but mainly New York, Pennsylvania and Ohio.

The Tourism Committee is producing a videocasette of happenings in the town over the course of a year, beginning with the Polar Bear Days at Olcott. The tape will be shown at trade shows and will be available for sale to the public.

Heck also announced a contest for the position of honorary mayor of Newfane. Voting will begin June 1 and end at the Great Lakes Salmon Team Tournament and Olcott Field Day on June 18.

To qualify, a person must be a town resident 21 years of age by June 18 and be willing to represent the town in an honorary capacity. There will be no salary for the position.

To vote, a person must pay 25 cents per ballot. The winner will be announced at 5 p.m. June 18 at the weigh-in station.

A caboose was purchased to be used for an information center. The inside has been cleaned, sandblasted and painted, and the outside will be painted red with yellow trim as soon as the weather reaches 62 degrees. The caboose will be parked at the southeast corner of Routes 78 and 18 at Olcott, where boats used to be parked.

In other business, the board voted unanimously to present a master plan for Fishermen's Park at the Burt Dam to the Department of Environmental Conservation. Horanburg had approved cleaning up the site and making it less treacherous for fishermen, as many suffered broken bones from trying to get to the site.

However, after the work had begun, DEC officials were highly irate and reprimanded Horanburg for the work, and told him no more could be done until he presented the master plan.

James Moore of Fuller Road asked Horanburg why he acted without DEC consent.

"I made a mistake. I should have had a permit. We have to make an erosion correction. What I did wasn't wise but I thought it was important to get the work done," Horanburg explained.

Robert Mandry of Exchange Street asked who the people were who had broken legs, and Horanburg told him to contact the Olcott and Newfane fire companies, as each company had transported three people from the site with broken bones.

Rod Hedley of Hedley Marina in Olcott suggested the board meet with the Niagara County Fisheries Board before it gives its final master plan to the DEC, since the board had a plan for Fishermen's Park years ago. Horanburg told him he would be glad to meet with them and hear their input, but it would have to be soon because he had to present his plan shortly.

2 Cadet

CENBM-PF

Lockport - Union Sun

# LaFalce Envisions Boom At Olcott



John LaFalce

In three years, Olcott could be the commercial and recreational hot spot that's been dreamed about for the last century, Rep. John LaFalce said.

LaFalce met this morning with 70 local business leaders and elected officials at a Legislative breakfast sponsored by the Chamber of Commerce.

He discussed the proposed Free Trade Agreement with Canada and gave an update on the Olcott Outer Harbor Project.

A total of $350,000 has been appropriated to the Army Corps of Engineers to begin a feasibility study of the project, and LaFalce assured his audience that money for the second year of study "looks good."

"Some day were going to be having a celebration at the Olcott Harbor and we're going to say, 'We did it,'" LaFalce said. "We're going to have an excellent recreational and commercial project, and it's going to be a real spur to eastern Niagara County."

Once the Army Corps does its three-year study of the project, which includes building a miniature replica of the three piers slated for Olcott harbor, the Corps hopefully will recommend the project for final funding, LaFalce said.

If the plan is approved, the federal government would kick in half the cost of $12 million project. The other $6 million must be non-federal funds.

LaFalce said the county and town won't necessarily have to pay a large portion of the non-federal share.

He said that money can come from any source and recommended that town and county officials confer with Assemblyman Matthew Murphy and state Sen. John Daly to find out how much the state will contribute.

David Kinyon, Chamber of Commerce director, said the job now will be to sell the benefits of the project.

LaFalce thanked the chamber, Town Supervisor Timothy Horanburg and members of the Olcott Task Force for keeping him supplied with information about the project, which in turn helped the congressman push appropriations through Congress.

LaFalce also announced that the Department of Environmental Conservation "will no longer stand in the way" of dredging an island in the mouth of Eighteenmile Creek, ending a long-time battle between the town and the DEC.

Horanburg said the announcement means that 75 to 100 more boat docks can be built in the creek. He said the $100,000 cost of the dredging will come from the town's unexpended balance, and will eventually be subtracted from Newfane's share of the outer harbor project.

FRIDAY, MARCH 4, 1988

UNION-SUN & JOURNAL
THURSDAY, FEBRUARY 11, 1988
SECOND SECTION PAGE 15

# Olcott Outer Harbor Plans Moving Ahead, Newfane Board Told

By Kathleen Gamz

NEWFANE — Plans for the proposed Olcott Outer Harbor Project are moving along quickly, and the town, county and state are working hard to get ready for the $12 million project that could be the largest tourism boost Eastern Niagara County has ever seen.

The Town Board announced Wednesday that the Army Corps of Engineers has received the $350,000 appropriated by Congress to build a working model of the three breakwalls proposed for Olcott Harbor, and a project engineer has been hired.

Supervisor Timothy Horanburg said he met with the county last week to discuss financing and figure out which governmental body will control the breakwalls.

"It's a very complicated thing," Horanburg said. "We're trying to figure out who owns the land and who's going to operate the thing."

The county will be involved in developing Krull Park if the breakwall project actually begins.

Local residents asked the board to try to protect their interests and suggested that a private beach be set aside for the people who live in the area, and that they be allowed free parking and other considerations.

Rod Hedley of Hedley Boat Co. in Olcott said that since two-thirds of the costs for the project will come from the county, state and federal government, the project has to be operated on an equal basis for everyone.

"If people want their own, they have to pay for it," he said.

Preliminary figures are for the federal government to pay half the costs of the project, the state to kick in 25 percent and the county and town to share the other 25 percent equally.

Horanburg said the town's figures could change, and said there are several ways of getting money.

"We can scratch up our share any way we can," he said.

Hedley said Newfane Legislator Ronald Perry told him that Niagara County Community College is doing a feasibility study on the economic impact of the breakwalls to update a study done 10 years ago.

"According to Ron, more money could be coming through from the state," Hedley said.

Horanburg said he received word from Rep. John LaFalce that the town now has preliminary approval to remove the island from Olcott Harbor, which would provide room for more boat docks.

"I'm very optimistic about the whole Outer Harbor project at this point in stage," he said.

The town will meet with officials from other municipalities that have similar projects to ask for advice.

In another matter, with all members present, the board asked for a moment of silence in memory of Olcott resident Jeanne Voelpel, who died Feb. 9. Mrs. Voelpel founded the town Historical Society and was active in the community beautification program.

The Newfane Business Association will plant a tree in front of the post office in Mrs. Voelpel's memory, and the board gave the supervisor permission to put a placque on the tree.

In another matter, Dane Huth of Olcott complained about the old concrete slabs that were put along the Olcott parking lot.

"They're too high and you can't see the lake," he said.

Huth had no objections about using the slabs, remarking, "If you have that junk you might as well use it. You can't make Olcott look any worse than it is," he said.

In reponse to a question from James Moore of Fuller Road, Horanburg said the board has interviewed several candidates for water superintendent to replace John Morello, and expects to make a decision soon.

The board named basketball coaches for the town recreation program.

Joseph Grzybowski of 353 Park Lane Circle, Lockport, will be in charge of the girl's program at $6 per hour; C.J. Jeffers of 5722 W. Main St., Olcott will assist for $5 per hour. For the boys

Hired for the boy's program are Douglas Michalski of Olcott Street, $6 per hour; James Capen of 5807 McKee Road, $6, and David Sharp of Coomer Road, $3.70.

*In other business, the board:*

- Donated unused town desks, chairs and other furniture to the Historical Society to use in the VanHorn Mansion.
- Reminded residents of the free cholesterol screening program at Inter-Community Memorial Hosptial at Newfane from 1 to 4 p.m. Thursday, Feb. 18 and Friday, Feb. 19 and from 9 a.m. to 1 p.m. Saturday, Feb. 20. The screening is open to those age 18 and older.
- Announced that anyone who received erroneous parking tickets from New York City should call 212-460-7640 to have it voided.
- Announced that the state Department of Transportation has posted a "no standing" zone infront of Clark's restaurant on Route 78.
- Said that Ellicott Road between Route 104 and the Hartland town line will be repaved.

Union-Sun & Journal/Lockport, N.Y./December 28, 1987 CENCBPD-PF

# Army Engineers Plan Model Of Olcott Harbor Breakwalls

A miniature replica of the three proposed Olcott breakwalls will be built by the Army Corps of Engineers using part of a $350,000 appropriation approved by Congress last week.

If the financing package is signed by President Reagan, the Corps' Buffalo office will use the money to draw up preliminary designs of the project, then build a scale model of the project.

The project calls for building two semi-circular piers in Lake Ontario at the mouth of Olcott Harbor and dredging the upper section of Eighteenmile Creek, which would be a major boost to fishing and tourism in the area.

Anthony McKenna of Wendel Engineers, who is on the Olcott Harbor Project Task Force, said the Corps will use computers for preliminary designs, then build a scale model of the harbor and breakwalls and replicate conditions in Lake Ontario and the Olcott Harbor as closely as possible to make sure the water behind the breakwalls won't stagnate, and that the project won't interfere with fish or wildlife breeding in the area.

James Kramer, who chairs the 27-member Olcott task force, praised Rep. John LaFalce for his "truly outstanding" efforts in securing the $350,000 appropriation.

"The task force and county and town officials have been spearheading a letter-writing campaign since Oct. 1 to make New York congressmen aware of the project's importance.

"This is a significant breakthrough in getting this project implemented," Kramer said.

"Congressman LaFalce's efforts last year resulted in the Olcott Harbor Project being included in the authorization bill. Much more difficult than simply getting a project authorized is appropriating money for it, and because of the efforts of LaFalce and Sens. Moynihan and D'Amato, we now have that initial appropriation which makes us much more confident about the final outcome of the project."

According to a study done for the county by Arthur D. Little consultants in May 1986, a "supermarina" at Olcott would generate about $30 million in private development in the area, including boat docks, motels, restaurants, retail stores, condominiums and recreational facilities.

Kramer praised the teamwork approach that has characterized the success of the project so far.

"We have elected officials at the federal, state, county and local levels working together with one objective in mind: obtain the necessary funding to enable the construction of the Olcott Harbor Project to stimulate the economy of northern Niagara County and support the growing sport fishing and tourism industries which offer great promise for our area," he said.

The Buffalo News/Buffalo, N.Y./August 23, 1987

# Excursion Boat Helping Tourism Make Splash in Niagara County

By PAUL CARROLL
*News Niagara County Bureau*

OLCOTT — The Miss Olcott Beach, a 64-foot excursion boat, has begun plying the waters of Lake Ontario, adding a new service to Niagara County's growing tourism industry.

Raymond A. Helwig of Lockport, who has been guiding boats in and out of Olcott Harbor for 50 years, heads the venture, Olcott Beach Boat Tours Ltd., which has 12 local investors.

Helwig and a crew of four sailed the boat, powered by twin diesel engines, from Reidville, Va., where it had been used for excursions of Chesapeake Bay and the Potomac River estuary.

The boat, based at a dock leased from the Town of Newfane in Olcott Inner Harbor, is offering trips daily at 7 p.m., with additional trips on Saturdays and Sundays at 1, 3 and 5 p.m.

Each trip lasts about two hours, with excursions alternating either eastward to the New York Electric & Gas Corp. generating plant at Somerset, or westerly to Wilson Harbor.

Helwig hopes to add dinner tours and excursions to Toronto, timed for attendance at Toronto Blue Jays baseball games.

"We're going to run until Oct 1, at least, and we could take the boat to the lower Niagara River later in the season," Helwig said. He hopes for a full season next year.

The boat can accommodate 100 passengers, with a cabin and covered lower deck, and a partially covered upper deck. Helwig had planned to buy a new boat but found he could purchase the wooden vessel, built in 1955, more quickly for $75,000.

The Miss Olcott Beach has a crew of three captains and four seamen.



MICHELE du VAIR/Buffalo News

**Raymond A. Helwig at the wheel of the Miss Olcott Beach.**

Helwig, who worked on cruise boats out of Olcott in the '30s, operated a fishing charter service at Olcott after retiring as a home builder four years ago.

Expansion of sports fishing in recent years has revived tourism along the county's lakeshore, and Olcott has been the focal point, with considerable public and private investment in rehabilitation and new construction.

Olcott Beach Boat Tours has applied to the county Industrial Development Agency for a $37,500 loan, which Helwig says would be used for promotion of the new service and some physical improvements.

The loan application received a favorable recommendation from the agency's Revolving Loan Fund Committee, but the full agency split 2-2, with three members absent, Aug. 14. The application is expected to be reconsidered by the agency.

Buffalo News/Buffalo, N.Y./July 4, 1987

# Olcott Harbor Petition Drive

OLCOTT — The Olcott Harbor Task Force, a group supporting construction of a marine-service facility on Lake Ontario, has started a petition drive for the $13 million project.

James W. Kramer, task force chairman, said the campaign follows the announcement by Rep. John J. LaFalce, D-Town of Tonawanda, that a $350,000 Congressional appropriation has been approved for a feasibility study of the project by the U.S. Army Corps of Engineers.

The drive seeks to demonstrate "to local, state and federal officials the widespread support for undertaking the project," Kramer said.

He said the project would include constructing two breakwaters off the federal piers in Olcott Harbor and dredging a portion of the inner harbor formed by Eighteen-Mile Creek.

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Journal-Register/ Medina, N.Y./ Oct. 31, 1986

# Olcott Harbor Renovations Included In Resources Act

Congressman John J. LaFalce (D-32, NY) recently praised passage of the omnibus Water Resources Act which includes a $6.3 million allocation for improvements to Olcott harbor.

"Although dredging of Olcott Harbor, as well as those at Wilson and Oak Orchard, was completed last summer at my urging, much still needs to be done at Olcott to enhance the area's recreational economy," LaFalce said. The renovation work would involve construction of breakwaters, a stone jetty, recreation fishing facilities, sanitary facilities and a parking area. Half of the estimated $12.6 million cost of the project would come from non-federal sources.

The Water Resources Act, which authorizes important public projects for which funding must still be approved, also includes the construction of an artificial reef in Lake Ontario and the reconstruction and rehabilitation of the New York State Barge Canal.

Creation of an artificial reef near Newfane is considered a key element in ensuring a constant supply of fish in the region. "Water pollution and other factors have contributed to the serious decline of fish in Lake Ontario," LaFalce pointed out. "The reef would be an effort to introduce species of fish no longer in the Lake, or which are needed for ecological balance and would trigger the regeneration of trout, cohoe and salmon. It would be a boon to the recreational and commercial fishing industries of Niagara and Orleans counties."

The 524 mile long Barge Canal is the only inland waterway in the nation not under federal control and receiving no federal funds for either operation or maintenance. "New York has had sole responsibility for maintaining the canal, but the time has come for the federal government to contribute to this truly historic national waterway — a waterway in need of substantial repair." LaFalce further pointed out that "the Corps of Engineers has expressed concern that if the deterioration continues at the present pace, the canal may have to be closed for commercial use in this decade." Under the Water Resources Act, the federal government would pick up one half of the cost of maintaining and repairing the 150 year old canal.

# Appendix F

REAL ESTATE

PLAN 10 AND 10A MODIFIED

1. The areas needed for these plans are:

a. Two adjacent lots located in the western section of Olcott, on the north side of Beach Street. The lots, which front on Lake Ontario, include the adjacent paper street sections of Jackson and Harrison Streets making its approximate overall dimensions 182.5' x 175'. This area is to be used as a staging area for the project and then as a beach access. This is to be taken as a permanent easement. This is referred to in the Appraisal as AREA-A.

b. An irregular shaped, two acre lot which is situated just west of Krull Park, between East Main Street and Lake Road. One acre of this lot is to be taken in fee for a parking lot. This is referred to in the Appraisal as AREA-B.

c. An area on the west side of the Park, located between Ontario Street, at the park's junction with Franklin Street, and Lake Ontario, in the vicinity of the proposed breakwater. This area includes a 15,459 square foot section to be taken as a permanent easement, the land to be used to construct a beach access for the handicapped. The take will also include an adjacent temporary easement area of 1,470 square feet (20' x 73.5"). It includes the existing staircase (10" wide) along with an adjacent 10' wide stripe. This 1,470 square foot square area will be taken for a period of three years. This is referred to in the Appraisal as AREA-C.

d. An irregular shaped area located in Krull Park between Main Street and the Lake. This area is 54,886 square feet and would require a three (3)

year temporary ingress and egress easement to construction areas on or near the beach. This is referred to in the Appraisal as AREA-D.

e. An eight (8) acre area to be taken for disposal purposes next to the dump site presently held by the Town of Newfane. The area would be acquired in fee. This is referred to in the Appraisal as AREA-E.

f. An area of approximately 36 acres located in Lake Ontario where the breakwaters are to be constructed. Navigational Servitude applies.

g. An area approximately 100' x 600' next to the existing U.S. west pier which is to be used for staging. Navigational Servitude applies.

h. An area approximately 18 acres in Eighteen Mile Creek located south of the upstream limits of the present Federal Project to the high level bridge. Navigational Servitude applies.

i. The Federal Government holds the areas described in f, g and h above under Navigational Servitude.

j. Area a and b above are held in fee by the Town of Newfane.

k. Area c and d above are held in fee by Niagara County. However, there is a reversion interest held by others in the property.

l. None of the area is owned by the proposed local sponsor, the State of New York.

m. Estates -

| | | | |
|---|---|---|---|
| (a) | above | staging area and beach access | to be taken as a permanent easement |
| (b) | above | Parking lot | to be taken in fee |
| (c) | above | 15,459 square foot area to be used to construct a beach access ramp for the handicapped | to be taken as a permanent easement |
| | above | 1,470 square foot area to be used which includes the present steps and an adjacent vacant strip next to the 15,459 square foot area | to be taken as a three (3) year temporary easement |
| (d) | above | 54,886 square foot area that provides for construction, ingress and egress to the beach | to be taken as a three year temporary easement |
| (e) | above | Eight (8) acre disposal site which will contain polluted material | to be taken in fee |

| | | |
|---|---|---|
| (f)(g)(h) above | Construction of breakwaters | held under Navigational Servitude |

2. None of the area required for this project require reimbursement under Public Law 91-646 because the land is vacant.

3. The Corps of Engineers has been assured by the Local Sponsor, the State of New York, that it will provide the required project land interest within six (6) months of execution of the Local Cooperation Agreement. The fast response is because all the land required is either held by Niagara County or the Town of Newfane and have no structures.

4. The baseline cost estimate for the real estate is:

| | | |
|---|---|---|
| Area a | staging and beach access | $ 72,000 |
| Area b | parking lot | 48,000 |
| Area c | beach and ramp access | 3,525 |
| | stair area | 100 |
| Area d | ingress and egress to beach | 2,800 |
| Area e | Disposal Site | 13,600 |
| | | $140,025 |
| Estimated cost for acquisition of the above | | 12,000 |
| Total | | $152,025 |

Note: All other areas required for the project are held under Navigational Servitude.

5. The Corps of Engineers has identified moderately polluted material in Eighteen Mile Creek at McDonough Marine. The polluted material would have to be deposited in Area e above.

6. Mineral Rights will not have to be acquired for this project.

7. The estates required for the project are:

a. A fee simple title, subject to existing easements for public roads and highways, public utilities, railroads and pipelines.

b. A perpetual and assignable right and easement to construct, maintain, repair, operate, patrol and replace a breakwater and access, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired, subject; however, to existing easements for public roads and highways, public utilities, railroads and pipelines and:

c. A temporary easement and right-of-way in, over and across the property for a period not to exceed three years, beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a work area, including the right to move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush,

obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easements hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines which are basically standard.

8. This project doesn't require the relocation of roads, railroads, pipelines, utilities, bridges and cemeteries, therefore, Section III of 72 Stat 303, as amended does not apply.

9. The community of Olcott on a whole supports the project but its main concern is funding.

10. Plan 10 was not selected for Detailed Design. Plan 10A Modified was selected for Detailed Design.

PLAN 10 B

1. Basically, the real estate required for Plan 10B is very similar to plan 10 and 10A modified. The only difference is that approximately four (4) additional acres of Navigational Servitude land is needed.

2. The estates, baseline cost, and milestones are the same for both plans.

3. Public Law 91-646 and section 111 of 72 stat 303, as amended is not applicable for the land to be acquired under this plan.

4. Plan 10B was not selected for Detailed Design.

## REFINED PLAN 10A MODIFIED

## (SELECTED FOR PLANS AND SPECIFICATIONS)

1. The areas needed for this plan are:

a. Two adjacent lots located in the western section of Olcott, on the north side of Beach Street. The lots, which front on Lake Ontario, include the adjacent paper street section of Jackson and Harrison Streets making its approximate overall dimensions 182.5' x 175'. This area is to be used as a staging area for the project. This is to be taken as a temporary easement. This is referred to in the appraisal as AREA-A.

b. An irregular shaped, two acre lot which is situated just west of Krull Park, between East Main Street and Lake Road. One acre off this lot is to be taken in fee for a parking lot. This is referred to in the Appraisal as AREA-B.

c. An area on the west side of the park, located between Ontario Street, at the latter's junction with Franklin Street, and Lake Ontario, in the vicinity of the present breakwater. This area includes 15,459 square foot section to be taken as a permanent easement, the land to be used to be taken as a permanent easement, the land to be used to construct a beach access for the handicapped. The take will also include an adjacent temporary easement area of 1,470 square feet (20' x 73.5'). It includes the existing staircase (10" wide) along with an adjacent 10' wide stripe. This 1,470 square foot

square area will be taken for a period of three years. This is referred to in the appraisal as AREA-C.

d. An irregular shaped area located in Krull Park, between Main Street and the Lake. This area is 54,886 square feet and would require a three (3) year temporary ingress and egress easement to construction areas on or near the beach. This is referred to in the Appraisal as AREA-D.

e. An area of approximately 34 acres located in lake Ontario where the breakwaters are to be constructed. Navigational Servitude applies.

f. An area of approximately 2 acres in Eighteen Mile Creek located at the foot of Main Street. Navigational Servitude applies.

g. The Federal Government holds the areas described in e and f above under Navigational Servitude.

h. Areas a and b above are held in fee by the Town of Newfane.

i. Area c and d above are held in fee by Niagara County. However, there is a reversion interest held by others on the property.

j. None of the area is owned by the proposed local sponsor.

k. Estates

| | | |
|---|---|---|
| (a) above | staging area | to be taken as a three (3) year temporary easement |

| | | | |
|---|---|---|---|
| (b) | above | Parking lot | to be taken in fee |
| (c) | above | 15,459 square foot area to be used to construct a beach access ramp for the handicapped | to be taken as a permanent easement |
| | above | 1,470 square foot area to be used which includes the present steps and an adjacent vacant strip next to the 15,459 square foot area | to be taken as a three (3) year temporary easement |
| (d) | above | 54,886 square foot area that provides for construction, ingress and egress to the beach | to be taken as a three year temporary easement |
| (e) | above | construction of breakwaters | held under Navigational Servitude |
| (f) | above | remove old bridge footer | held under Navigational Servitude |

2. Reimbursement under Public Law 91-646 is not required because the land is vacant.

3. The Corps of Engineers has been assured by the Local Sponsor, the State of New York, that it will provide the required project land interest within six (6) months of execution of the Local Cooperation Agreement. The fast response is because all the land required is either held by Niagara County or the Town of Newfane.

4. The baseline cost estimate for the real estate is:

| | | |
|---|---|---|
| Area a | staging area | $ 23,000 |
| Area b | parking lot | 48,000 |
| Area c | beach and ramp access | 3,525 |
| | stair area | 100 |
| Area d | ingress and egress to beach | 2,800 |
| | | $ 77,425 |
| Estimated cost of acquisition of the above | | 12,000 |
| Total | | $ 89,425 |

Note: All other areas required for the project are under Navigational Servitude.

5. No HTW area has been identified by the Corps of Engineers on the lands required for Revised Plan 10A modified.

6. Mineral right will not have to be acquired for this project.

7. The estates required for the project are:

a. A fee simple title, subject to existing easements for public roads and highways, public utilities, railroads and pipelines.

b. A perpetual and assignable right and easement to construct, maintain, repair, operate, patrol and replace a breakwater, and access, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired, subject; however, to existing easements for public roads and highways, public utilities, railroads and pipelines and:

c. A temporary easement and right-of-way in, over and across the property for a period not to exceed three years, beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a work area, including the right to move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easements hereby acquired; subject, however,

to existing easements for public roads and highways, public utilities, railroads and pipelines which are basically standard.

8. The Local Sponsor, the State of New York, has indicated they can meet the following milestones, that within six (6) months after the Local Cooperation Agreement is fully executed. The necessary Rights-of-Entry will be provided to the Corps.

9. This project doesn't require the relocation of roads, railroads, pipelines, utilities, bridges and cemeteries, therefore, Section III of 72 Stat 303, as amended does not apply.

10. The State of New York, County of Niagara and Town of Newfane supports the project but have a concern about funding. I am aware of only a few objections from the community.

11. Enclosed as exhibits are:

Appraisal (exhibit A)

M-CACES (exhibit B)

Real Estate Drawing (exhibit C)

12. This is the plan selected for plans and specifications.

OLCOTT NEW YORK M-CASES

| | | | UNIT | QUANITY | UNIT PRICE | TOTAL | CONTINGENCIES PERCENT | CONTINGENCIES PRICE | TOTAL PRICE | CONTINGCN REASON |
|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | Pre Authorization | LS | 1 | | 4000 | 0 | | 4000 | 1 |
| 01B | | Post Authorization | LS | 1 | | 11000 | 10 | 1100 | 12100 | 2 |
| 01C | | Local Cooperation Agreement | | | | | | | | |
| | 1 | Draft LCA | LS | 1 | | 2400 | 20 | 480 | 2880 | |
| | 2 | Final LCA | LS | 1 | | 1200 | 20 | 240 | 1440 | 3 |
| | 3 | Negotiate LCA | LS | 1 | | 6500 | 10 | 650 | 7150 | |
| 01D | | Acquisition | | | | | | | | |
| 06 | | Local Sponsor 4 | TRACT | 1 | | 12000 | 25 | 3000 | 15000 | |
| 07 | | Federal Review 4 | TRACT | 1 | | 1800 | 25 | 450 | 2250 | 4 |
| 01F | | Appraisals | | | | | | | | |
| | 1A | Staff Appraisals | | 5 | 480 | 2400 | 20 | 480 | 2880 | |
| | 1B | Cost Estimate 5 | TRACT | 5 | 1600 | 8000 | 5 | 400 | 8400 | |
| | 1C | Gross Appraisal 5 | TRACT | 5 | 2400 | 12000 | 5 | 600 | 12600 | 5 |
| | 1F | Review of Appraisal | | 5 | 400 | 2000 | 20 | 400 | 2400 | |
| | 2B | Local Sponsor 4 | TRACT | 4 | 2500 | 10000 | 20 | 2000 | 12000 | |
| | 2F | Review of Appraisal | TRACT | 4 | 500 | 2000 | 20 | 400 | 2400 | |
| 01K | | Temporary Permits | TRACT | 2 | 700 | 1400 | 0 | | 1400 | 1 |
| 01M | | Real Estate Payments | | | | | | | | |
| 03 | | Land Payments 4 | TRACT | 4 | | 77500 | 30 | 23250 | 100750 | 6 |
| | | | | | | | | | | 7 |
| | | | | | | 154200 | | 33450 | 187650 | |

① This stage is complete or nearing completion and most of the actual cost has been identified.

② Additional funds may be required if the project extends beyond 1994.

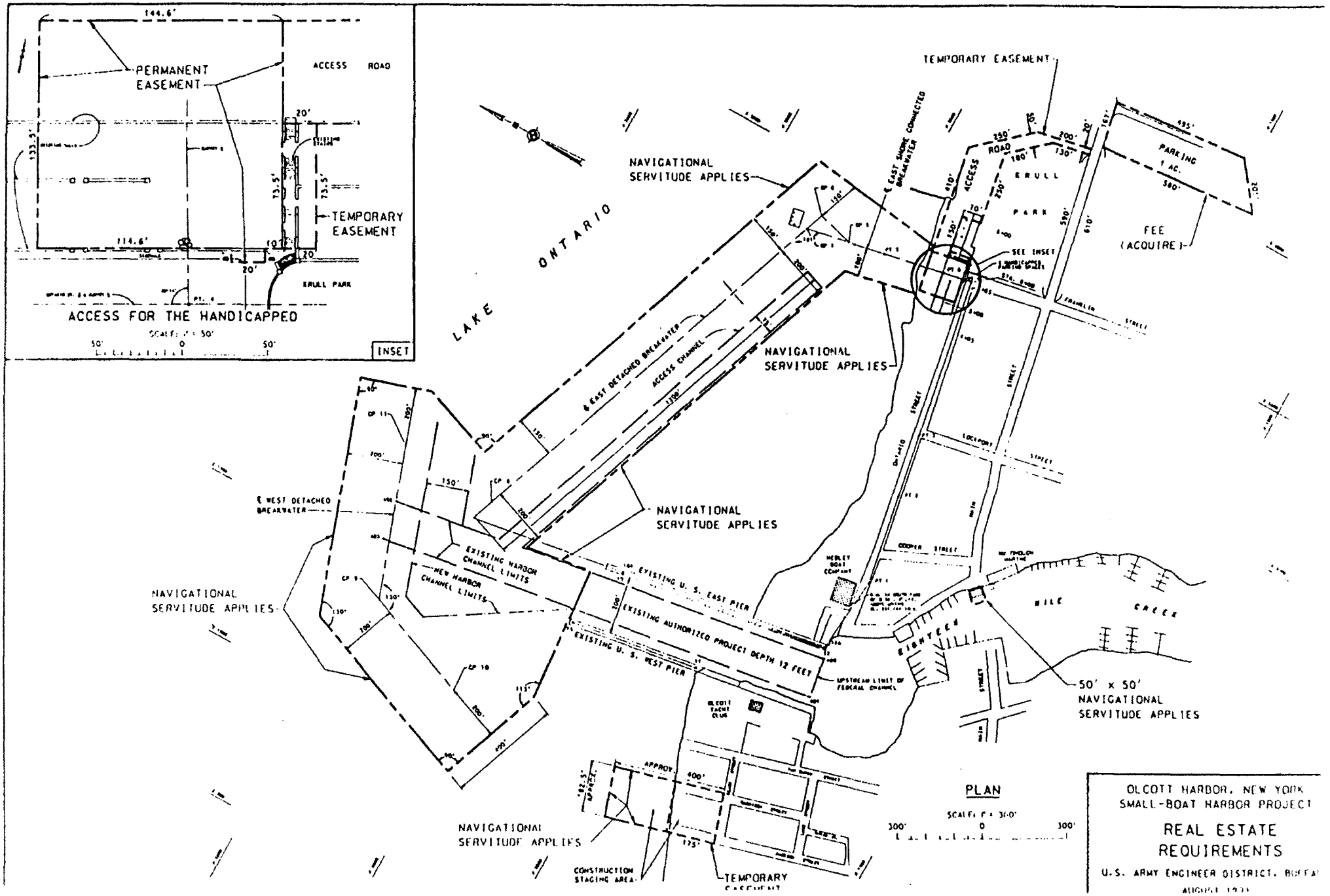
③ Additional funds may be needed depending on the local community involvement with the project.

④ New York State, where engineers are doing most of the work, is having budget problems and may authorize contracts @ may be reduced.

⑤ If material project changes are made additional appraisal cost may be necessary.

⑥ This is to reflect possible land value increases between when the appraisal was made and the LCA executed and final appraisal made.

⑦ The gross appraisal was for 91,025 [illegible] which included 13,400 for a Disposal Site. The Disposal Site is no longer needed and this [illegible]


PERMANENT EASEMENT
ACCESS ROAD
TEMPORARY EASEMENT
ERULL PARK
ACCESS FOR THE HANDICAPPED
INSET
TEMPORARY EASEMENT
NAVIGATIONAL SERVITUDE APPLIES
LAKE ONTARIO
EAST SHORE CONNECTED BREAKWATER
ACCESS ROAD
ERULL PARK
PARKING 1 AC.
FEE (ACQUIRE)
SEE INSET
FRANKLIN STREET
EAST DETACHED BREAKWATER
ACCESS CHANNEL
NAVIGATIONAL SERVITUDE APPLIES
WEST DETACHED BREAKWATER
EXISTING HARBOR CHANNEL LIMITS
NEW HARBOR CHANNEL LIMITS
NAVIGATIONAL SERVITUDE APPLIES
EXISTING U. S. EAST PIER
EXISTING AUTHORIZED PROJECT DEPTH 12 FEET
EXISTING U. S. WEST PIER
UPSTREAM LIMIT OF FEDERAL CHANNEL
HERLEY BOAT COMPANY
COOPER STREET
EIGHTEEN STREET
MILE CREEK
50' x 50' NAVIGATIONAL SERVITUDE APPLIES
OLCOTT YACHT CLUB
APPROX. 600'
NAVIGATIONAL SERVITUDE APPLIES
CONSTRUCTION STAGING AREA
TEMPORARY EASEMENT
PLAN
SCALE: 1" = 300'
300' 0 300'
OLCOTT HARBOR, NEW YORK
SMALL-BOAT HARBOR PROJECT
REAL ESTATE REQUIREMENTS
U.S. ARMY ENGINEER DISTRICT, BUFFALO
AUGUST 1975

U.S. ARMY CORPS OF ENGINEERS
PITTSBURGH DISTRICT
REAL ESTATE DIVISION

APPRAISAL REVIEW

GROSS APPRAISAL REPORT

OLCOTT HARBOR PROJECT
NIAGARA COUNTY, NEWFANE TOWNSHIP
OLCOTT, NEW YORK

OWNERS: Town of Newfane and Niagara County, New York

APPRAISER: Martin Jacobs
Staff Appraiser

DATE OF APPRAISAL: 31 May 1991

EFFECTIVE DATE: 23 May 1991

PURPOSE OF APPRAISAL:

The gross appraisal is to estimate the value of a taking of real property in fee, permanent easement, and temporary easement to be used in a feasibility study.

HIGHEST AND BEST USE:

The appraiser stated that the highest and best use is considered to be, AREA A residential, AREA B municipal function, AREA C and D park, and AREA E recreational.

GROSS VALUE ESTIMATE:

The estimated value of the total project take is considered to be $118,300, based on the appraiser's valuation. The total real estate cost is estimated at $130,300.

SCOPE OF REVIEW:

I visited the site with Mr. Larry Dunfee, Chief, Buffalo District, Real Estate Field Office. We toured the project site and the surrounding area.

REVIEW COMMENTS:

This appraisal is well written and documented. Mr. Jacobs did a commendable job in describing the area and location.

A few typing errors were found but none altered the meaning of the report. The pages should be numbered at the bottom. The write up on Area B refers to zoning as R12 but is referred to as R20 on the charts.

The appraiser emphasized the market approach to value in extracting the fee value of each tract. The appraiser included an adjustment chart for each of the 5 tracts valued. Some sales used in the charts were adjusted by 30 to 75 percent, they should not be considered to be comparable. There were enough comparable sales in each category to not have placed the sales with large adjustments in the charts. These sales could have been placed in the addendum of the report as additional data gathered. The estates taken include temporary easements on lake front property for residential value and park land value, permanent easement on lake front property for park land value, and fee value of two tracts of land for municipal use value. He included the comparable sales he used in the addendum to the report. The easement values were abstracted from the fee values. The appraiser used a rate of 5% to calculate the present value for the three year easements. The rate is considered to be on the lower end of the range.

The appraiser did not find any sales information for park land or municipal land. He used vacant land in the area that was similar in zoning, topography, and location to approximate the lack of these kinds of sales. If more time and fund had been available to look in other locations, more exacting comparable sales may have been found. In my option, the sales information presented is reflective of the detail of this kind of report.

The mixture of sites and varying estates, makes the report difficult to write and difficult for those unfamiliar with the project to understand. The appraiser did a very good job of summarizing the different types of takes in his final estimate of value.

The appraiser in his opinion did not observe any indication of hazardous toxic or radioactive wastes or wetlands on the subject properties.

This value is considered to be contributory to this respective plan only, and is not to be broken down or interpreted in any manner.

The gross appraisal report conforms to Corps of Engineers Regulations and follows the format in the Uniform Appraisal Standards for Federal Land Acquisitions dated 1973, except where noted. The appraisal is approved in the amount of $118,300.

I hereby certify that I have no present interest nor intended future interest in the property appraised and that the estimates furnished are solely those of the appraiser and not necessarily the same if appraised by the undersigned.

Date 14 June 91

JOHN D. CROOKE
Chief Appraiser
Pittsburgh District

# GROSS APPRAISAL REPORT

# FOUR OLCOTT HARBOR SITES & AN 8 ACRE DISPOSAL SITE,

# OLCOTT HARBOR PROJECT,

# OLCOTT, NEWFANE TOWNSHIP,

# NIAGARA COUNTY, NEW YORK

GROSS APPRAISAL REPORT

FOUR OLCOTT HARBOR SITES & AN 8 ACRE DISPOSAL SITE,

OLCOTT HARBOR PROJECT,

OLCOTT, NEWFANE TOWNSHIP,

NIAGARA COUNTY, NEW YORK

## ASSUMPTIONS AND LIMITING CONDITIONS

Pertinent data and information presented in this presented in this report are believed to be accurate. No responsibility is assumed for matters legal in character, nor is any opinion rendered as to the title which is considered to be reliable, but no responsibility is assumed for its accuracy.

The maps, sketches, and/or drawings contained in this report are included to help the reader in visualizing the property. I have made no metes and bounds survey of the property and assume no responsibility for the accuracy of the measurements given.

13 June 1991
DATE

Martin Jacobs
MARTIN JACOBS
Staff Appraiser

1. AUTHORIZATION

This Gross Appraisal report has been authorized by the Buffalo Engineering District, U. S. Army Corps of Engineers.

2. PURPOSE OF THE APPRAISAL AND EFFECTIVE DATE

The purpose of this Gross Appraisal report is to provide the real estate estimates that will be used for the Reevaluation Study of the Olcott Harbor Project in Olcott, New York. The study is to act as a substitute for a General Design Memorandum. The effective date of this report is 15 April 1991.

3. LEGAL DESCRIPTION

No legal description of the subjects is available, however, the Buffalo Engineering District and the local assessor covering the subject area has provided the following information on the five-part subject which will referred to as areas A, B, C, D and E.

AREA A - Town of Newfane, Lots 5.19-2-1 and 5.19-2-2. These two adjacent lots are located in the western section of Olcott, on the north side of Beach Street. The lots, which front on Lake Ontario, include the adjacent paper street sections of Jackson and Harrison Streets making its approximate overall dimensions 182.5' x 175'. Area A is to be used as a temporary staging area which is to be taken for a period of three years.

AREA B - Town of Newfane Lot 5.83-1-1. The subject comprises as irregular shaped, two acre lot which is situated just west of Krull Park, between East Main Street and Lake Road. One acre of this lot is to be taken in fee for a parking lot.

AREA C - Town of Newfane - Part of Lot 14.00-3-1 (Krull Park). This section, which is on the west side of the Park, is located between Ontario Street, at the latter's junction with Franklin Street, and Lake Ontario, in the vicinity of the present breakwater. This area includes a 15,459 square foot section to be taken as a permanent easement, the land to be used to construct a beach access for the handicapped. The take will also include an adjacent temporary easement area of 1,470 square feet (20' x 73.5'). It includes the existing staircase (10" wide) along with an adjacent 10' wide stripe. This 1,470 square foot square area will be taken for a period of three years.

AREA D - An irregular shaped, temporary easement, located in Krull Park, between Main Street and the Lake. The subject would allow for ingress and egress to construction areas on or near the beach such as the future breakwater and the access ramp for the handicapped. The site is to be taken as a temporary easement for a period of three years.

AREA E - An 8 acre section to be taken for disposal purposes from a 47.8 acre dump site presently held by the Town of Newfane(Parcel 15.00-1-9). The site has also been used as a source of road gravel by the Town, but it is not used much at this time.

4. AREA DESCRIPTION

The subject areas are situated in Niagara County, New York which is located in the northwest corner of the state near Canada. The County is situated on the hub of the Great Lakes waterways and it is this proximity which has played a key role in the settling of what was once the continent's Western Frontier. The area still presents many examples of historical significance such as the Erie Barge Canal and Fort Niagara in Youngstown, which served under the British, French and American flags during its three hundred year history.

The County had an estimated population of 220,756 in 1990, down from 227,354 in 1980. The per capita incomes in the county for 1986, 1987 and 1988 were $13,462, $14,168 and $14,989 respectively. Besides Niagara Falls, which are well known and well visited, the County benefits economically by being a major agricultural area. Also adding to its economic strength is the area's attraction for Canadian shoppers who find U.S. prices a great deal more attractive than those in their own country where an 8% Provincial Tax, coupled with a 7% Federal Goods and Services Tax, drive the already high price of all goods even higher. This windfall business has resulted in the building of new malls such as the Walden Galleria in Cheektowatoga, as well as the Niagara Outlet Mall in downtown Niagara Falls, and will result in the building of new giant stores such as the proposed 120,000 square foot Topps' supermarket which is also destined for downtown Niagara Falls. It has also resulted in the

refurbishing of other malls in the area such as the Eastern Hills Mall and the Boulevard Mall.

Niagara County is also well known for recreation especially the fishing along its seventeen miles on the Niagara River and in Lake Ontario. It also has become popular for boating which has led to the development of several new marinas, some replacing areas in what had formerly been the old industrial section of Buffalo. Several more new marinas are being planned for the County. In addition, the area also sponsors several successful yearly festivals and there are a number of local teams which draw many spectators to the locally held games.

The approximate distances from the Buffalo/Niagara area to other major cities are given below:

| City | Miles |
|---|---|
| Albany | 285 |
| Boston | 465 |
| Cleveland | 191 |
| Philadelphia | 288 |
| Pittsburgh | 220 |
| New York | 430 |
| Toronto | 103 |

5. LOCAL AREA DESCRIPTION

The subject areas are located in Olcott, a hamlet in Newfane Township. The Township occupies a north central position in Niagara County. It fronts on Lake Ontario and is surrounded by Wilson and Cambria Townships to the west, Lockport to the south and Hartland and Somerset Townships to the east.

The Township encompasses 68.2 square miles. There are two major roads traversing the Township, State Highway 18 (Lake Road) which crosses in an east/west direction not too far south of Lake Ontario and State Highway 78 (Lockport-Wolcott Road) which runs from Olcott, down through the middle of the Township, to where it joins State Highway 104 (Ridge Road) before crossing over into the City of Lockport. State Highway 104 cuts across the southeast corner of Newfane before entering Hartland Township.

The demographics for both Newfane and Olcott including future projections are given below:

| AREA | 1970 | 1980 | 1990 | 2000 | 2010 |
|---|---|---|---|---|---|
| Newfane | 9459 | 9268 | 8550 | 9200 | 9300 |
| Olcott | 1608 | 1575 | 1504 | 1504 | 1581 |

It can be seen that population growth in the area is expected to be flat, which is what could be expected in an area located more than a comfortable commuting distance from the nearest large city, where the leading industries, tourism and agriculture, do not require a large labor force.

All areas in Olcott have access to the municipal water supply, telephone and electric (New York State Gas & Electric). Several areas, but not all, have access to the municipal sewage system and gas.

Olcott has an elementary school, but no secondary, school which requires that its secondary students be bussed to the school in Newfane.

Olcott itself is divided into an eastern and western section by the north/south running Eighteen Mile Creek.

The Creek is about 80 feet wide at its mouth, both banks of the Creek near the Lake and the area near Lake are dominated by marinas, a yacht club and boat businesses.

6. DESCRIPTION OF THE SUBJECTS

Area A. The site which encompasses Town of Newfane parcels 5-19-2-1 and 5-19-2-2 and the adjacent paper street areas, are located in a low lying, residential area. The homes in the immediate area are older frame dwellings which are in fair to good condition. They are built on concrete slabs due to the high water table in the area. A gated, fenced off area at the junction of Beach and Van Buren streets delineates the local Yacht Club's property. A few empty lots were seen in the vicinity of the subject.

Area B. The subject is located in a flat, high area in the eastern part of Olcott. It is situated just west of a unnamed street which separates it from Krull Park, a County facility comprising 323 acres. The Park offers picnicking and boating, swimming, miniature trails for hiking, tennis courts and areas for fishing. The subject is, flat, unimproved and irregular in shape (163.7' + 495' + 201.8' + 610'). A line of trees is to be found on the side of the subject property (the side adjacent to the unnamed road) while a line of low conifers is to be found at the rear of the lot (the Lake road side of the property). The greater part of the lot is flat, grassy field.

Area C. This property is on the western side of Krull Park. It is vacant, but the site is improved with cemented stone walls

which enclose grassy terraces. The terraces are situated between the level of Ontario Street and the level of the beach some thirty feet below it. Directly across the street from this property are older 2-story frame dwellings. A block away, at the corner of Franklin and Main Streets and along Main Street, is a commercial section.

Area D. Is an irregularly shaped, temporary easement, comprising 1.26 acres, that transverses a section of Krull Park between Main Street and Lake Ontario. The topography varies from a level section, roughly 300 feet wide, which overlooks the lake, to a steep graded area leading down to a relatively narrow, stony beach. Vehicular access to the beach is presently effected by means of a rough cut, unpaved, dirt trail for vehicles, that angles down across the slope, from the flat upper section. The County maintains the area with a lawn-like cover of grass and tree growth has been kept sparse to provide relatively open, but shaded picnic areas.

Area E. Most of the 47.8 acres of this Town of Newfane property is flat and sparsely treed in all but its southern section, where there is to be found moderate to heavy tree and scrub growth. Most of the remaining area is covered with scrub or is clear. The property has no road frontage, and is connected to the local road (Phillips Road) by a narrow, 1,126 foot long easement which allows ingress and egress into the main body of the property along little more than an unpaved truck trail. Just beyond the upper end of the easement is a cleared area where there are found some shallow pits from which road gravel was extracted. There

is an area the Town has dumped junked construction material and metal sections from various types of construction equipment.

In commenting about the local real estate market, Mr. Charles Boyer, the Newfane Township Assessor, commented that things were relatively flat up until about eight months ago when a wave of buying was set off by the anticipated Olcott Harbor Project. This was accompanied by higher prices and increased land banking. This activity has leveled off in the last few months, probably due to the failure of the project to materialize as a short term source of profit.

OCCUPANCY

None of the subject areas are presently occupied.

MINERALS

Not applicable.

TIMBER

Not applicable.

CEMETERIES

None are located on any of the subject areas.

IMPROVEMENTS

The subject areas are unimproved.

OWNERSHIPS & PRIOR TRANSFERS

The areas designated as A, B & E are owned by the Town of Newfane, while those designated as C and D are located within Krull Park which is held by Niagara County. Prior transfers were not researched, however, the names of some of the previous property owners appear on the copies of the assessors cards, see addendum. Even with these names there is no way to relate a

specific owner to any part of a subject, which is now part of a larger assemblage of properties, since all tax map information has been updated to show current conditions.

ESTATES

| | | |
|---|---|---|
| Area A | Temporary staging area | To be taken as a temporary easement for a period of three years. |
| Area B | Parking lot | To be taken in fee. |
| Area C | 15,459 square foot area to be used to construct a beach access ramp for the handicapped. | To be taken as a permanent easement. |
| | 1,470 square foot area which includes the present steps and an adjacent vacant strip. | To be taken a temporary easement for a period of three years. |
| Area D | Provides ingress and egress for construction equipment to get to the beach. | To be taken as a temporary easement for a period of three years. |
| Area E | Eight acre disposal site which will contain hazardous waste. | To be taken in fee. |

For additional material see addendum.

ZONING

| | | | |
|---|---|---|---|
| PARCEL A | R-5 | PARCEL D | County Property (not zoned) |
| PARCEL B | County Property (not zoned) | PARCEL E | ARR |
| PARCEL C | R-6 | | |

Further information about these zones can be found in the addenda.

HAZARDOUS AND TOXIC WASTE

Judging the subjects solely on the basis of their appearance, their location within Olcott and their municipal and county ownership this appraiser would say that they have not been subject to hazardous and toxic waste. This view, however, has not been confirmed by chemical tests.

WETLANDS

None of the subject areas appeared to be a wetland e.g. a swamp, marsh, bog or similar area, or an area which is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances does support a prevalence of vegetation typically adapted for life in saturated soil conditions.

ANALYSIS OF HIGHEST AND BEST USE

This involves the use of the subject property for generating the most profit at the time of the appraisal, or its use and program of future use which will provide the highest

present land values. In the case of a five part subject, the highest and best uses would be as follows:

AREA A - Was formerly improved property which is still located in a residential part of Olcott. Its highest and best use is still seen as being residential, which fits the neighborhood and the area's R.5 zoning.

AREA B - The two acre municipally owned lot, of which one acre is to be taken by the Corps for parking would best serve a municipal function which complies with the existing zoning regulations.

AREA C - The highest and best use of the terraced area by the park would be to remain as a park since any other use would cause the property to revert from the County back to the original owner or his heirs.

AREA D - Involves an access route through Krull Park to the beach. The site's highest and best use would be to remain as a park, the reason being the same as for Area C.

AREA E - Its ARR zoning would permit a variety of residential, community business or accessory uses, however, the site's location, and the land use in the general area would suggest agriculture, including animal husbandry, as its most useful purpose if Town ownership was not considered. Under Town ownership, a recreational use would best serve the public while conforming to zoning ordinances.

MARKET VALUE

The most probable price in terms of money which a property should bring in a competitive and open market, under all conditions requisite to a fair sale, where the buyer and sell each act prudently and knowledgeable, and where the price is not affected by undue stimulus.

APPROACHES TO VALUE

Market Approach - The market approach is utilized estimate the value of the subject property. Based upon recent comparable sales which are considered similar, taking into account such things as the location, size, utilities, access, and time of sale. These sales are investigated and verified to assure that they were arms-length transactions.

Cost Approach - That approach is appraisal analysis which is based on the proposition that the informed purchaser would pay no more than the cost of producing a substitute property with the same utility as the subject property. It is particularly applicable when the property being appraised involves relatively few improvements which represent the highest and best use of the land, or when relatively unique or specialized improvements are located on the site for which there exist no comparable properties on the market.

Income Approach - That procedure in appraisal analysis which converts anticipated benefits (dollar income or amenities) to be derived from the ownership of property into a value estimate. The income approach is widely applied in appraising income-producing properties. Anticipated future income and/or

reversions are discounted to a present worth figure through the capitalization process.

7. MARKET APPROACH

This approach is most suited to valuating the subject since the Cost Approach is a method that is most applicable for new or proposed construction, or for special purpose improved properties where or little or no sales information exists, and the Income Method must rely on income information on similar properties which in this case was not available.

ZONING INFORMATION

| | Subject<br>AREA A | | Comparable 1<br>5.19-2-1 | | Comparable 2<br>5.19-2-2 | | Comparable 3<br>5.20-1-9 | |
|---|---|---|---|---|---|---|---|---|
| Location | Beach Street in Olcott Street Olcott Harbor | 0 | Beach Street in Olcott near Olcott Harbor | 0 | Beach Street Olcott near Olcott Harbor | 0 | E. Lake Road Away from the central harbor area | +5 |
| Topography | Flat | 0 | Flat | 0 | Flat | 0 | Property greatly eroded with 40' drop off to water and no Stairs and no beach | +20 |
| Sales Price | | | $26,500 | | $26,500 | | $30,000 | |
| Sale Date | | | 11/89 | 0 | 8/89 | 0 | 11/89 | 0 |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | 31,937.5 | | 10,310 | -10 | 10,456 | -10 | ±11,880 | -10 |
| Price Per Acre | | | | | | | | |
| Price Per Square | | | $2.57 | | $2.53 | | $2.52 | |
| Zoning | R5 | 0 | R5 | 0 | R5 | 0 | R20 | +5 |
| Utilities Gas | Available | | Available | 0 | Available | 0 | Available | 0 |
| Electric | " | | " | 0 | " | 0 | " | 0 |
| Town Water | " | | " | 0 | " | 0 | " | 0 |
| Town Sewer | " | | " | 0 | " | 0 | " | 0 |
| Telephone | " | | " | 0 | " | 0 | " | 0 |
| Septic System | - | | - | | - | | - | |
| Lake Access | Water front lot | | water front lot | 0 | water front lot | 0 | water front lot | 0 |
| Other Considerations | | | | | | | | |
| Adjustments | | | -10 | | -10 | | +20 | |
| Adjusted Sales Prices | | | $2.31 | | $2.27 | | $3.02 | |

| | Subject<br>AREA A | | Comparable 4<br>6.04-1-18 | | Comparable 5<br>6.04-1-19 | | Comparable 6<br>7.01-1-4 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | Kingfisher Court a few miles away from the harbor area | +20 | Kingfisher Court a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 |
| Topography | | | Flat | 0 | Flat | 0 | Flat | 0 |
| Sales Price | | | $58,950 | | $65,500 | | $80,500 | |
| Sale Date | | | 8/1/89 | 0 | 1/22/90 | 0 | 06/90 | 0 |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | | | ±46,609 | 0 | 52,359 | 0 | ±47,262 | 0 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.26 | | $1.25 | | $1.70 | |
| Zoning | | | ARR | +10 | ARR | +10 | ARR | +10 |
| Utilities<br>Gas | | | Not Available | +5 | Not Available | +5 | Not Available | +5 |
| Electric | | | Available | 0 | Available | 0 | Available | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | | | | | | |
| Telephone | | | Available | 0 | Available | 0 | Available | 0 |
| Septic System | | | Required | +20 | Required | +20 | Required | +20 |
| Lake Access | | | Water front lot | 0 | Water front lot | 0 | Water front lot | 0 |
| Other Considerations | | | Less appealing development | +15 | Less appealing development | +15 | Select development | -15 |
| Adjustments | | | +70 | | +70 | | +40 | |
| Adjusted Sales Prices | | | $2.14 | | $2.13 | | $2.38 | |

| | Subject | | Comparable 7 | | Comparable 8 | | Comparable 9 | |
|---|---|---|---|---|---|---|---|---|
| | AREA A | | 7.01--1-5 | | 7.01-1-6 | | 7.01-1-7 | |
| Location | | | Lake Shore Terrace a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 |
| Topography | | | Flat | 0 | Flat | 0 | Flat | 0 |
| Sales Price | | | $66,930 | | $72,000 | | $67,000 | |
| Sale Date | | | 10/89 | 0 | 08/17/90 | 0 | 3/90 | |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | | | ±52925 | 0 | ±39,040 | 0 | ±43,813 | |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.26 | | $1.84 | | $1.53 | |
| Zoning | | | ARR | +10 | ARR | +10 | ARR | +10 |
| Utilities Gas | | | Not Available | +5 | Not Available | +5 | Not Available | +5 |
| Electric | | | Available | 0 | Available | 0 | Available | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | | | | | | |
| Telephone | | | Available | 0 | Available | 0 | Available | 0 |
| Septic System | | | Required | +20 | Required | +20 | Required | +20 |
| Lake Access | | | Water front lot | 0 | Water front lot | 0 | Water front lo | 0 |
| Other Considerations | | | more select development<br>Narrow irregular shaped lot | -15<br>+20 | Select develop-ment | -15 | Selectdevelop-ment | -15 |
| Adjustments | | | +60 | | +40 | | +40 | |
| Adjusted Sales Prices | | | $2.01 | | $2.57 | | $2.14 | |

| | Subject<br>AREA B | | Comparable 1<br>14.08-1-57.1 | | Comparable 2<br>14.12-1-17 | | Comparable 3<br>14.06-1-28 | |
|---|---|---|---|---|---|---|---|---|
| Location | In Olcott | | Lockport Olcott Rd in Olcott | | Lockport St E S in Olcott | | West Bluff Road | |
| Topography | Flat | | Flat | | Flat | | Flat | |
| Sales Price | | | $19850 | | $45,000 | | $16,000 | |
| Sale Date | | | 03/85 | 0 | 12/90 | 0 | 05/89 | |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | 43,560 | | 17,264 | -5 | 46,880 | 0 | 21,823 | 0 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | 1.15 | | 1.04 | | 0.73 | |
| Zoning | R6 | | R6 | 0 | R6 | 0 | R20 | +5 |
| Utilities<br>Gas | Available | 0 | Available | 0 | Available | 0 | Available | 0 |
| Electric | " | 0 | " | 0 | " | 0 | " | 0 |
| Town Water | " | 0 | " | 0 | " | 0 | " | 0 |
| Town Sewer | " | 0 | " | 0 | " | 0 | " | 0 |
| Telephone | " | 0 | " | 0 | " | 0 | " | 0 |
| Septic System | | | | | | | | |
| River Access | not lakefront property | 0 | not lakefront property | 0 | not lakefront property | 0 | not lakefront property | 0 |
| Other Considerations | | | | | | | | |
| Adjustments | | | -5 | | 0 | | +5 | |
| Adjusted Sales Prices | | | 1.09 | | 1.04 | | .79 | |

| | Subject AREA B | | Comparable 4 14.06-1-34 | | Comparable 5 14.06-1-23.2 | | Comparable 6 5.19-1-31 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | West Bluff Road Olcott | | West Bluff Road Olcott | | West Bluff Road | |
| Topography | | | Flat | | Flat | | Flat | |
| Sales Price | | | $32,000 | | $32,000 | | $15,000 | |
| Sale Date | | | 06/90 | 0 | 03/90 | 0 | 11/89 | 0 |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | | | 25,000 | 0 | 24,942 | 0 | ±12,901 | -5 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.28 | | $1.28 | | $1.16 | |
| Zoning | | | R-20 | +5 | R-20 | +5 | R-20 | +5 |
| Utilities Gas | | | Available | 0 | Available | 0 | Available | 0 |
| Electric | | | " | 0 | " | 0 | " | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | " | 0 | " | 0 | " | 0 |
| Telephone | | | " | 0 | " | 0 | " | 0 |
| Septic System | | | | | | | | |
| River Access | | | Not lakefront property | 0 | Not lakefront property | 0 | Not lakefront property | 0 |
| Other Considerations | | | | | | | | |
| Adjustments | | | +5 | | +5 | | 0 | |
| Adjusted Sales Prices | | | 1.34 | | 1.34 | | 1.16 | |

| | Subject<br>AREA B | | Comparable 7 | | Comparable | | Comparable | |
|---|---|---|---|---|---|---|---|---|
| Location | | | West Bluff Road<br>Olcott | | | | | |
| Topography | | | Flat | | | | | |
| Sales Price | | | $15,000 | | | | | |
| Sale Date | | | 11/89 | 0 | | | | |
| Lot Size<br>Acres | | | | | | | | |
| Lot Size<br>Square Feet | | | 13,568 | -5 | | | | |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.10 | | | | | |
| Zoning | | | R-20 | | | | | |
| Utilities<br>Gas | | | Available | 0 | | | | |
| Electric | | | " | 0 | | | | |
| Town Water | | | " | 0 | | | | |
| Town Sewer | | | " | 0 | | | | |
| Telephone | | | " | 0 | | | | |
| Septic System | | | | | | | | |
| River Access | | | Not Lakefront property | 0 | | | | |
| Other Considerations<br>Access | | | | | | | | |
| Adjustments | | | -5 | | | | | |
| Adjusted Sales Prices | | | $1.05 | | | | | |

| | Subject | | Comparable 1 | | Comparable 2 | | Comparable 3 | |
|---|---|---|---|---|---|---|---|---|
| | AREA C | | 5.19-2-1 | | 5.19-2-2 | | 5.20-1-9 | |
| Location | | | Beach Street in Olcott near Olcott Harbor | 0 | Beach Street Olcott near Olcott Harbor | 0 | E. Lake Road away from the central harbor area | +5 |
| Topography | Property on the side of a steep hill | | Flat | -15 | Flat | -15 | Most of property is flat and useful but with eroded drop off at rear & no beach | -5 |
| Sales Price | | | $26,500 | | $26,500 | | $30,000 | |
| Sale Date | | | 11/89 | 0 | 8/89 | 0 | 11/89 | 0 |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | 16,769 | | 10,310 | 0 | 10,456 | 0 | ±11,880 | 0 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $2.57 | | $2.53 | | $2.52 | |
| Zoning | Marine Business | | R5 | +10 | R5 | +10 | R20 | +15 |
| Utilities Gas | | | Available | 0 | Available | 0 | Available | 0 |
| Electric | | | " | 0 | " | 0 | " | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | " | 0 | " | 0 | " | 0 |
| Telephone | | | " | 0 | " | 0 | " | 0 |
| Septic System | | | - | 0 | - | 0 | - | 0 |
| Access | | | water front lot | 0 | water front lot | 0 | water front lot | 0 |
| Other Considerations | | | | | | | | |
| Adjustments | | | -5 | | -5 | | +15 | |
| Adjusted Sales Prices | | | $2.44 | | $2.40 | | $2.90 | |

| | Subject<br>AREA C | | Comparable 4<br>6.04-1-18 | | Comparable 5<br>6.04-1-19 | | Comparable 6<br>7.01-1-4 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | Kingfisher Court a few miles away from the harbor area | +20 | Kingfisher Court a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 |
| Topography | | | Flat | -15 | Flat | -15 | Flat | -15 |
| Sales Price | | | $58,950 | | $52,359 | | $80,500 | |
| Sale Date | | | 8/1/89 | 0 | 1/22/90 | 0 | 06/90 | 0 |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | | | ±46,609 | +10 | ±52,359 | +10 | ±47,262 | +10 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.26 | | $1.25 | | $1.70 | |
| Zoning | | | ARR | +20 | ARR | +20 | ARR | +20 |
| Utilities<br>Gas | | | Not Available | +5 | Not Available | +5 | Not Available | +5 |
| Electric | | | Available | 0 | Available | 0 | Available | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | | | | | | |
| Telephone | | | Available | 0 | Available | 0 | Available | 0 |
| Septic System | | | Required | +20 | Required | +20 | Required | +20 |
| Lake Access | | | Waterfront lot | 0 | Wateffront lot | 0 | Waterfront lot | 0 |
| Other Considerations | | | Less appealing quality of development and lots | +15 | Less appealing quality of development and lots | +15 | More select development | -15 |
| Adjustments | | | +75 | | +75 | | +45 | |
| Adjusted Sales Prices | | | $2.21 | | $2.19 | | $2.47 | |

| | Subject | Comparable 7 | | Comparable 8 | | Comparable 9 | |
|---|---|---|---|---|---|---|---|
| | AREA C | 7.01-1-5 | | 7.01-1-6 | | 7.01-1-7 | |
| Location | | Lake Shore Terrace a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 |
| Topography | | Flat | -15 | Flat | -15 | Flat | -15 |
| Sales Price | | $66,930 | | $72,000 | | $67,000 | |
| Sale Date | | 10/89 | 0 | 08/17/90 | 0 | 3/90 | 0 |
| Lot Size Acres | | | | | | | |
| Lot Size Square Feet | | ±52,925 | +10 | ±39,040 | +10 | ±43,813 | +10 |
| Price Per Acre | | | | | | | |
| Price Per Square Foot | | $1.26 | | $1.84 | | $1.53 | |
| Zoning | | ARR | +20 | ARR | +20 | ARR | +20 |
| Utilities Gas | | Not Available | +5 | Not Available | +5 | Not Available | +5 |
| Electric | | Available | 0 | Available | 0 | Available | 0 |
| Town Water | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | | | | | |
| Telephone | | Available | 0 | Available | 0 | Available | 0 |
| Septic System | | Required | +20 | Required | +20 | Required | +20 |
| Lake Access | | Waterfront lot | 0 | Waterfront lot | 0 | Waterfront lot | 0 |
| Other Considerations | | more select development<br>narrow irregular shaped lot | -15<br>+20 | more select development | -15 | more select development | -15 |
| Adjustments | | +65 | | +45 | | +45 | |
| Adjusted Sales Prices | | $2.07 | | $2.66 | | $2.22 | |

| AREA D | Subject | | Comparable 1<br>5.19-2-1 | | Comparable 2<br>5.19-2-2 | | Comparable 3<br>5.20-1-9 | |
|---|---|---|---|---|---|---|---|---|
| Location | Section of Krull Park between Main Street and Lake Ontario | | Beach Street in Olcott near Olcott harbor | 0 | Beach Street in Olcott near Olcott harbor | 0 | E. Lake Road away from the central harbor area | +5 |
| Topography | Part of property on a steep grade | | Flat | -15 | Flat | -15 | Property greatly eroded with 40' drop off to water and no stairs and no beach | -5 |
| Sales Price | | | $26,500 | | $26,500 | | $30,000 | |
| Sale Date | | | 11/89 | | 8/89 | | 11/89 | |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | 54,886 | | 10,310 | -15 | 10,456 | -15 | +/- 11,880 | -15 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $2.57 | | $2.53 | | $2.52 | |
| Zoning | | | R5 | N/A | R5 | N/A | R20 | N/A |
| Utilities<br>Gas | Available within the area | | Available | 0 | Available | 0 | Available | 0 |
| Electric | | | " | 0 | " | 0 | " | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | " | 0 | " | 0 | " | 0 |
| Telephone | | | " | 0 | " | 0 | " | 0 |
| Septic System | | | | | | | | |
| Lake Access | Waterfront Lot | | Waterfront Lot | 0 | Waterfront Lot | 0 | Waterfront Lot | 0 |
| Other Considerations | | | | | | | | |
| Adjustments | | | -30 | | -30 | | -15 | |
| Adjusted Sales Prices | | | $1.80 | | $1.77 | | $2.14 | |

| | Subject | | Comparable 4<br>6.04-1-18 | | Comparable 5<br>6.04-1-19 | | Comparable 6<br>7.01-1-4 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | Kingfisher Court a few miles away from the harbor area | +20 | Kingfisher Court a few miles away from the harbor area | +20 | Lakeshore Terrace a few miles away from the harbor, area | +20 |
| Topography | | | Flat | -15 | Flat | -15 | Flat | -15 |
| Sales Price | | | $58,950 | | $65,500 | | $80,500 | |
| Sale Date | | | 8/1/89 | | 1/22/90 | | 06/90 | |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | | | +/- 46,609 | 0 | +/- 52,359 | 0 | +/- 47,262 | 0 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.26 | | $1.25 | | $1.70 | |
| Zoning | | | ARR | N/A | ARR | N/A | ARR | N/A |
| Utilities<br>Gas | | | Not Available | +5 | Not Available | +5 | Not Available | +5 |
| Electric | | | Available | 0 | Available | 0 | Available | 0 |
| Town Water | | | " | 0 | " | 0 | " | 0 |
| Town Sewer | | | Not Available | - | Not Available | - | Not Available | - |
| Telephone | | | Available | 0 | Available | 0 | Available | 0 |
| Septic System | | | Required | +20 | Required | +20 | Required | +20 |
| Lake Access | | | Waterfront Lot | 0 | Waterfront Lot | 0 | Waterfront Lot | 0 |
| Other Considerations | | | Less appealing development | +15 | Less appealing development | +15 | Selected development | -15 |
| Adjustments | | | +45 | | +45 | | +15 | |
| Adjusted Sales Prices | | | $1.82 | | $1.81 | | $1.95 | |

| | Subject | | Comparable 7<br>7.01-1-5 | | Comparable 8<br>7.01-1-6 | | Comparable 9<br>7.01-1-7 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | Lake Shore Terrac a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 | Lake Shore Terrace a few miles away from the harbor area | +20 |
| Topography | | | Flat | -15 | Flat | -15 | Flat | -15 |
| Sales Price | | | $66,930 | | $72,000 | | $67,000 | |
| Sale Date | | | 10/89 | | 08/17/90 | | 3/90 | |
| Lot Size Acres | | | | | | | | |
| Lot Size Square Feet | | | +/-52,925 | 0 | +/-39,040 | -5 | +/-43,813 | 0 |
| Price Per Acre | | | | | | | | |
| Price Per Square Foot | | | $1.26 | | $1.84 | | $1.53 | |
| Zoning | | | ARR | N/A | ARR | N/A | ARR | N/A |
| Utilities<br>Gas | | | Not Available | +5 | Not Available | +5 | Not Available | +5 |
| Electric | | | Available | 0 | Available | 0 | Available | 0 |
| Town Water | | | | 0 | | 0 | | 0 |
| Town Sewer | | | Not Available | - | Not Available | - | Not Available | - |
| Telephone | | | Available | 0 | Available | 0 | Available | 0 |
| Septic System | | | Required | +20 | Required | +20 | Required | +20 |
| Lake Access | | | Waterfront Lot | 0 | Waterfront Lot | 0 | Waterfront Lot | 0 |
| Other Considerations | | | Select development Narrow, irregular shaped lot | -15<br>+20 | Select Development | -15 | Select Development | -15 |
| Adjustments | | | +35 | | +10 | | +15 | |
| Adjusted Sales Prices | | | $1.70 | | $2.02 | | $1.76 | |

| AREA E (Dump Site) | Subject | | 17 Comparable 1 26.00-1-60.2 | | 18 Comparable 2 40.00-1-52.2 | | 19 Comparable 3 14.00-3-3.2 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | property on 3 sides of house of 6299 Drake Settlement Street | | Directly across from 6942 Charlottville Road | | On Transit Rd. | |
| Topography | Nearly all level with one localized area with gravel pits | | Level | 0 | Level | 0 | Level | 0 |
| Sales Price | | | $8,100 | | $8,000 | | $29,500 | |
| Sale Date | | | 10/89 | 0 | 7/20/90 | 0 | 8/16/90 | |
| Lot Size Acres | 8.0 Acres | | 4.0 | -10 | 4.2 | -10 | 31.8 | +25 |
| Lot Size Square Feet | | | | | | | | |
| Price Per Acre | | | $2025 | 0 | $1,905 | 0 | $928 | |
| Price Per Square Foot | | | | | | | | |
| Zoning | Arr | | Arr | 0 | Arr | 0 | Arr | 0 |
| Utilities | | | | | | | | |
| Gas | No | | No | 0 | Yes | -5 | Yes | -5 |
| Electric | Yes | | Yes | 0 | Yes | 0 | Yes | 0 |
| Town Water | Municipal | | Municipal | 0 | Municipal | 0 | Municipal | 0 |
| Town Sewer | None | | None | 0 | None | 0 | None | 0 |
| Telephone | Yes | | Yes | 0 | Yes | 0 | Yes | 0 |
| Septic System | None | | None | 0 | None | 0 | Private | -20 |
| River Access | N/A | | N/A | 0 | N/A | 0 | N/A | 0 |
| Other Considerations | | | | | | | | |
| Adjustments | | | -10 | | -15 | | 0 | |
| Adjusted Sales Prices | | | $1,823 | | $1,619 | | $928 | |

| | Subject | | Comparable 1 | | Comparable 2<br>27.00-1-11 | | Comparable 3 | |
|---|---|---|---|---|---|---|---|---|
| Location | | | near 2440 Transit Road | | S/E corner of Hess Rd and Drake Settlement Road | | | |
| Topography | | | Level | 0 | Level | 0 | | |
| Sales Price | | | $80,000 | | $38,000 | | | |
| Sale Date | | | 04/90 | 0 | 01/22/91 | 0 | | |
| Lot Size Acres | | | 75.0 | +25 | 50.25 | +25 | | |
| Lot Size Square Feet | | | | | | | | |
| Price Per Acre | | | $1,066 | | $756 | | | |
| Price Per Square Foot | | | | | | | | |
| Zoning | | | Arr | 0 | Arr | 0 | | |
| Utilities | | | | | | | | |
| Gas | | | No | 0 | No | 0 | | |
| Electric | | | Yes | 0 | Yes | 0 | | |
| Town Water | | | Municipal | 0 | Municipal | 0 | | |
| Town Sewer | | | None | 0 | None | 0 | | |
| Telephone | | | Yes | 0 | Yes | 0 | | |
| Septic System | | | None | 0 | Private | +5 | | |
| River Access | | | N/A | 0 | N/A | 0 | | |
| Other Considerations | | | | | Property improved with a few frame buildings in very poor condition<br>entire lot is overgrown with trees & scrub | +15<br>+10 | | |
| Adjustments | | | +25 | | +55 | | | |
| Adjusted Sales Prices | | | $1,333 | | $1,172 | | | |

## VALUATION, THE ADJUSTMENT PROCESS

### Explanation of Adjustments

A number of recent vacant land sales were obtained from the Newfane Town assessor. Though many variables that had to be considered in adjusting them to the subject, it was felt that using them would reflect the local real estate market more than if the sales from some other lakeside town or hamlet, even if they might have presented had less variables for consideration.

Nine sales of lake side lots were used to estimate a market value for Area A, the property located between Jackson and Harrison Streets on Beach Street. On the matter of location, the sales involving properties near the harbor were regarded as being most similar to the subject and of a higher value than those which were further away from Olcott's central area e.g. Kingfisher Court and Lakeshore Terrace. An upward adjustment of 20% was made to sales 4, 5, 6, 7, 8 and 9 to account for this locational difference. Sale 3 was adjusted by +5% because it is only a moderate distance away from the center of Olcott.

No time adjustments were made since the sales information gave no indication that time was a relevant factor to value. The sales information did indicate that smaller properties, well under an acre, did have a higher per unit selling price. Sales 1, 2 and 3 were therefore adjusted downward by -10% to account for this.

Further adjustments were made for zoning where the subject's R5 designation was seen as being more valuable than an R20 or ARR. This value difference is not so much in the allowed uses since they are relatively similar, however, the difference would be attributable to the area requirements for each, the R5 requiring a minimum area of 6000 square feet; the R20, 20,000 square feet and the ARR, 40,000 square feet. Upward adjustments of +5% were applied to all R20 zoned sales and +10% to all ARR sales to account for this.

All utilities are available to the subject and the other sites in central Olcott. The sites which are further away usually lacked gas and municipal sewer use. An adjustment of +5%, was used to account for the disadvantage of not having gas. There were no properties requiring an adjustment for a septic system vs. the subject's sewer system, and a +20% adjustment was applied to those properties without the municipal sewer system or a septic system in place.

Other adjustments involved the topography of sale 3 since the property is faulted by the effects of erosion created by the action of the Lake. This has left a steep drop off area at the rear of the property, and has eliminated all of the beach area; a +20% adjustment was made to account for this. The topography of the other sales were like the subject, and required no adjustments. Also considered was an adjustment between the Kingfisher Court and Lake Shore Terrace developments. This was done to remove any intrinsic differences between the two areas so that their sales could more easily be compared to the subject.

The Kingfisher Court locations are considered less desirable and therefore their values were increased by 15%. The Lakeshore Terrace sites are regarded as somewhat more desirable, and they were reduced by 15%. Comparable number 7 was further increased by +20% to account for the fact that its narrow, irregular shape diminished its appeal, which in turn was reflected in its selling price.

Sales of non waterfront property were used to, estimate the value of Area B, the site which is to be taken in part for a parking lot. As with the previous analysis, adjustments for time were not warranted by the sales information. Adjustments for size did seem to be indicated on parcels of less than 1/2 acre since their per unit values were high, and -5% was used for this. The advantage of the smaller minimum area per dwelling unit of the R6 zoning over R12 was also compensated for by adjusting the R12 sales by +5%. Both the subject and the sales all enjoyed access to the same utilities and therefore no adjustments were required.

Determining he value of Area C involved use of the same sales as were used to estimate the market value of Area A. The 1,470 square foot temporary easement was not broken out and dealt with as a separate entity at this point, even though small parcels can, and often do command higher per unit prices. The small size and nature of the site, its being part of a park, coupled with the fact that it would be taken on a temporary basis, indicated that the resulting value would not be significantly effect the final total no matter how the property

was deal with it as a separate entity. All the sales except for Sale 3, were adjusted downward by 15% to account for the subjects' poorer topography, it being located on the side of a steep hill. Sale 3 which is partially eroded by the action of the Lake leaving a drop off, no beach, but having with some area for building, was seen as being only slightly better than the subject, and a partial reduction in value of 5% was applied. As before, the information did not indicate that time was a factor, however, the sales indicated that the larger parcels, of near an acre or more, sold for less premium prices than the smaller ones. All sales of more than 1/2 acre were adjusted upward by 10% to account for this. Marine Business was seen as being a more advantageous zoning designation than R5, R20 and ARR. Adjustments of +10% was applied to the R5s, +15% to the R20s and +20 to ARR zoned properties to compensate for this. The adjustments made for the variables in the "Other Considerations" and the utilities categories in the Area A grid sheets were also applied to those for Area C.

The estimate for the value of Area D used the same basic sales information as those previously used for Areas A & C. Again, size adjustments were suggested by the sales information, the smaller parcels, under an acre, having higher per unit sales values. These were decreased by 15%, while comparable 8, which is only slightly under an acre was decreased by 5%. In addressing the matter of zoning it is felt that the park, which is unzoned County property, and restricted in use to remain a park, cannot be compared with zoned properties, and so this

variable was not dealt with at this point. Of the remaining variables, sites without gas were adjusted upward by 5% Those sites without a municipal sewer hookup, or an in-place septic system were adjusted upward by 20%. No adjustments were made for lake access, since the subject and all the comparable were waterfront properties. The adjustments made in the "Other considerations" category followed those used for Areas A and C.

Area E involves the potential dump site. Sales information, reflecting the sale of similar agricultural land in the subject area again showed that time was not a factor, but size was. A value equivalent to 10% was subtracted from sales where the area was approximately half the size of the subject, while larger parcels, several times the size of the subject, required the addition of the value, +25% being used for this.
Variation between utilities usually involved access to gas, and in two cases already installed septic systems vs. no system at all. Reductions of 5% were made where gas was accessible since the subject did not have it, and a reduction of 20% was applied to Comparable 3 since the property has a septic system, while the subject and the other comparable have no systems of any kind for sewage disposal. In addition to these, a negative adjustment was applied to sale 5 to account for some buildings on the property. They are in a poor state and are seen as a detriment to the property. An additional adjustment of +10% applied to account for the overgrowth of trees and scrub on the property, since this would require an additional expense to clear it before could be regarded as similar to the subject.

VALUATION THE FINAL ESTIMATES OF VALUE

The unadjusted square foot values for the sales used to estimate the value of Area A range from $1.25 - $2.57. When adjusted this range becomes $2.01 - $3.02. The most comparable sales are estimated to be sales 1 and 2 which were originally part of the subject. This appraiser estimates that a value of $2.50 best suites this area, or $79,844, say $80,000 for the entire 31,938 square feet. Since the taking will only involve a three year temporary easement a value based on a 10% return per year to the property owner, or $8,000 per year is considered equitable. The value of this $8,000 per year income stream invested at a conservative 5% for the three years is $22,875.00 say $23,000.

The unadjusted range of square foot prices of the sales used for Area B is $0.73 - $1.28. When adjusted this range becomes $0.79 - $1.34. This appraiser estimates that a value of $1.10 best suites the subject. With a 1 acre parking lot to consider, this translates into $47,916, ($1.10 x 43,560 sq. feet) say $48,000, as its estimated fee value. As before, there are no relocations or damages to consider since the property's use as a parking lot will essentially remain the same as before the taking.

The adjusted range for Area C is $2.07 - $2.90, while the one for Area D is $1.70 - $2.14, the unadjusted range is the same as for Area A. This appraiser estimates that a square foot value $2.40 and $1.80 best suites Areas C and D respectively.

Consideration is given to the fact that both areas are part of Krull Park, and that their use is restricted to remain as a park or else County control would be lost. Comparable sales having similar restrictions were not found, and therefore the loss of

value posed by such a restriction had to be estimated. On other such projects involving park land, a 10% value was usually used to represent the diminished value. In the case of Area C this value would become $0.24 per square foot while Area D would have an estimated value of $0.18 per square foot. The need for relocations and damages was again not seen. The estimated fee values for the two sections of Area C are therefore calculated to be $3,710 and $353. Other considerations relating to Area C concern the fact the 15,459 square feet will be taken as a permanent easement, while 1,470 square feet will be taken as a temporary easement. Because of this, it is estimated that the permanent easement would have a value equivalent to 95% of fee since most, but not all of the bundle of ownership rights would pass to those holding the easement. This would result in an easement value of $3,525. Considering the 1,470 square foot temporary easement, at a return of 10% per year on the $353, the annual rent would be $35, or $105 for the three year period. It is calculated that the value of its income stream at 5%, for a period of 3 years, would be $100.00. In the case of Area D, the value of the entire 54,886 square foot easement area would be $9,876 (54,866 sq. feet x $0.18) say $9,900. Considering the

fact that it is to be taken as 3 year temporary easement for which a 10% return per annum is used, then the annual rent would be $990. The value of this income stream at 5% for 3 years would be $2,831 say $2,800.

The sales used for the disposal area (Area E) had the following per acre range of value before adjustment: $756 - $2,025. When adjusted, this range became $1,172 - $1,823. In deciding which adjusted value best represented the subject, it was felt that sales 1 and 2 best approximated the worth of the property, and a value estimate of $1,700 per acre was used. Considering the fact that contaminated wastes will be deposited at the site, the term of the take becomes lengthy and probably reach a point where it is synonymous with a fee taking. This means that the 8 acre disposal site would have an estimated value of $13,600 (8 x $1,700).

No relocated are considered for any of the subjects since they are unimproved and unoccupied. Severance was not an element because the takings were to be temporary, or did not result in a diminution of the remaining area's value even in the case of the Area B where using one of its two acres might be regarded as creating damages, however, the lot's use has been for a parking, and the future use of the take, as well as the remaining portion, will continue to be as parking lots. A contingencies factor of 30% has been applied to all estimated values to account for possible variations in the market which might result from speculation in the Olcott Harbor Project itself.

FINAL ESTIMATE OF VALUE

| | | |
|---|---|---|
| Area A - | $ 23,000 | Up front amount to be given in lieu of a three year rental for a temporary easement for staging area. |
| Area B - | $ 48,000 | Fee value for 1 acre to be used for a parking lot. |
| Area C1 - | $ 3,525 | For area of permanent easement for handicapped access. |
| Area C2 - | $ 100 | For three year rental for a temporary easement on stair area near Krull Park. |
| Area D - | $ 2,800 | For three year rental of a temporary easement to provide ingress and egress through Krull Park. |
| Area E - | $ 13,600 | Disposal site to be taken in fee. |
| | $ 91,025 | Estimated Total cost without Acquisition Costs |
| | $ 12,000 | Cost of Acquisition @ $3,000 each property as per Buffalo District's estimates the Beach Street property (Area A); the parking lot Area B), the areas in Krull Park (C and D combined) and the disposal area (Area E). |

These values translate into the following:

Lakefront Properties

| | | | |
|---|---|---|---|
| a. | Fee Takings | | 0 |
| b. | Easements | | |
| | Temporary | | |
| | | Residential | $23,000 |
| | | Park | $ 2,900 |
| | Permanent | | |
| | | Municipal Properties | $ 3,525 |
| | | | $29,425 |

Non Lakefront Properties

| | | | |
|---|---|---|---|
| a. | Fee Takings | | |
| | | Municipal Properties | $61,600 |
| b. | Easements | | 0 |
| | | | $61,600 |

| | | |
|---|---|---|
| | | $91,025 |
| Improvements | | -0- |
| Minerals and Timber | | -0- |
| Severance Damages | | -0- |
| | TOTAL | $91,025 |
| Contingencies @30% | | |
| $27,308 say $27,300 | | $27,300 |

| | | |
|---|---|---|
| Relocation | | -0- |
| Acquisition Costs | | $12,000 |
| Total Real Estate Costs | | $130,325 |
| | say | $130,300 |

FINAL ESTIMATE OF VALUE

The final estimate of value for areas A, B, C, D, and E which includes takings that vary from fee to permanent and temporary easements is ONE HUNDRED THIRTY THOUSAND THREE HUNDRED DOLLARS ($130,300); this includes an estimate for acquisition costs. The relationship of all costs to this final total is such that their individual use would not be representative of their particular section of the subject and would probably lead to error.

11. CERTIFICATION

I certify that I have personally inspected and viewed the property herein described and the value estimates developed are my unbiased opinion of the estimated fair market value of the subject property. The facts and data used within the report are true and that I have no interest or future interest in the property and the values established in the report are in no way a determining factor in my compensation for service. I further understand that the facts and data made known to me in making this report are confidential. A statement of my qualifications s an appraiser is included in the Addendum of this report.

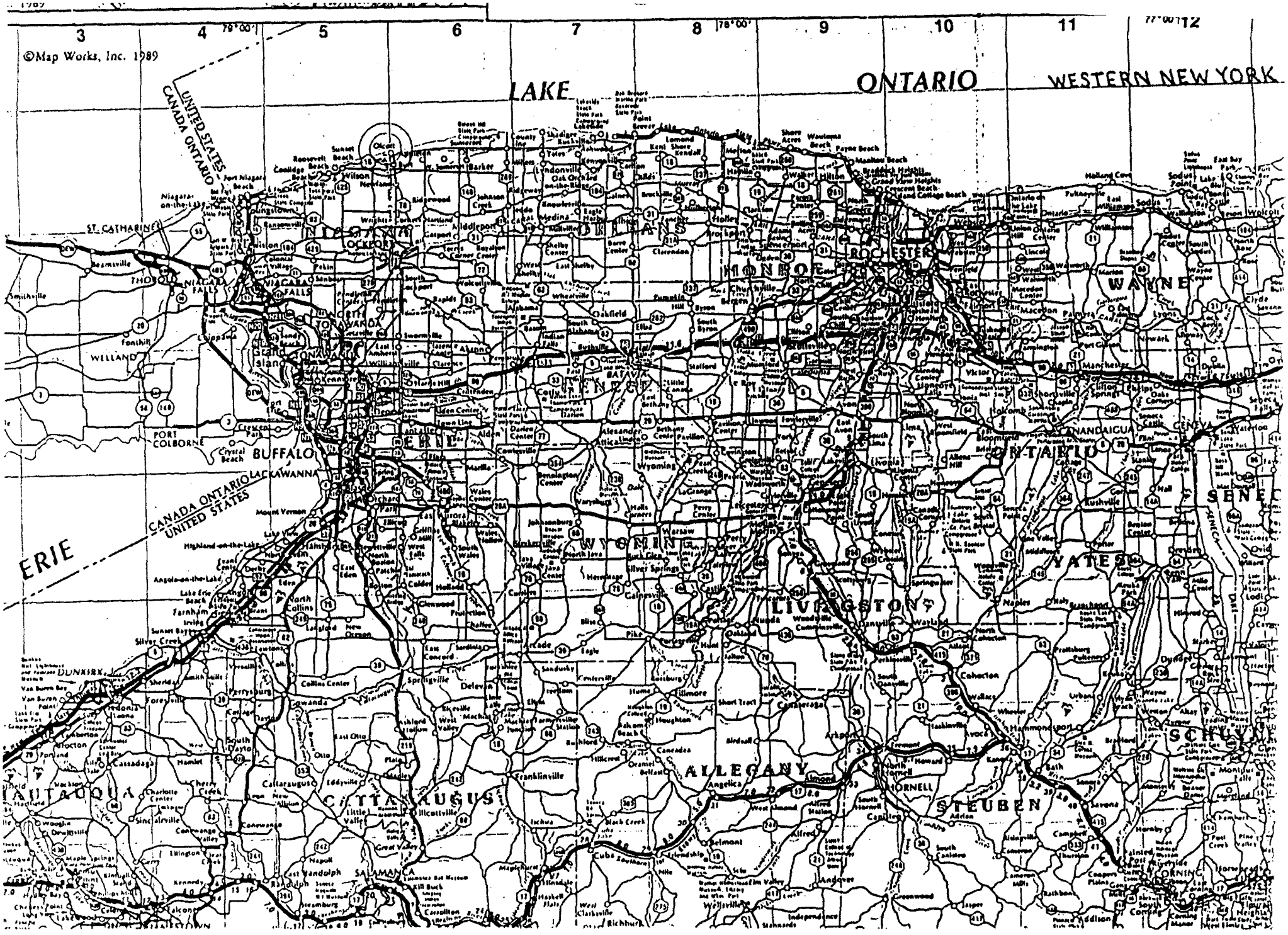
13 June 1991
DATE

Martin Jacobs
MARTIN JACOBS

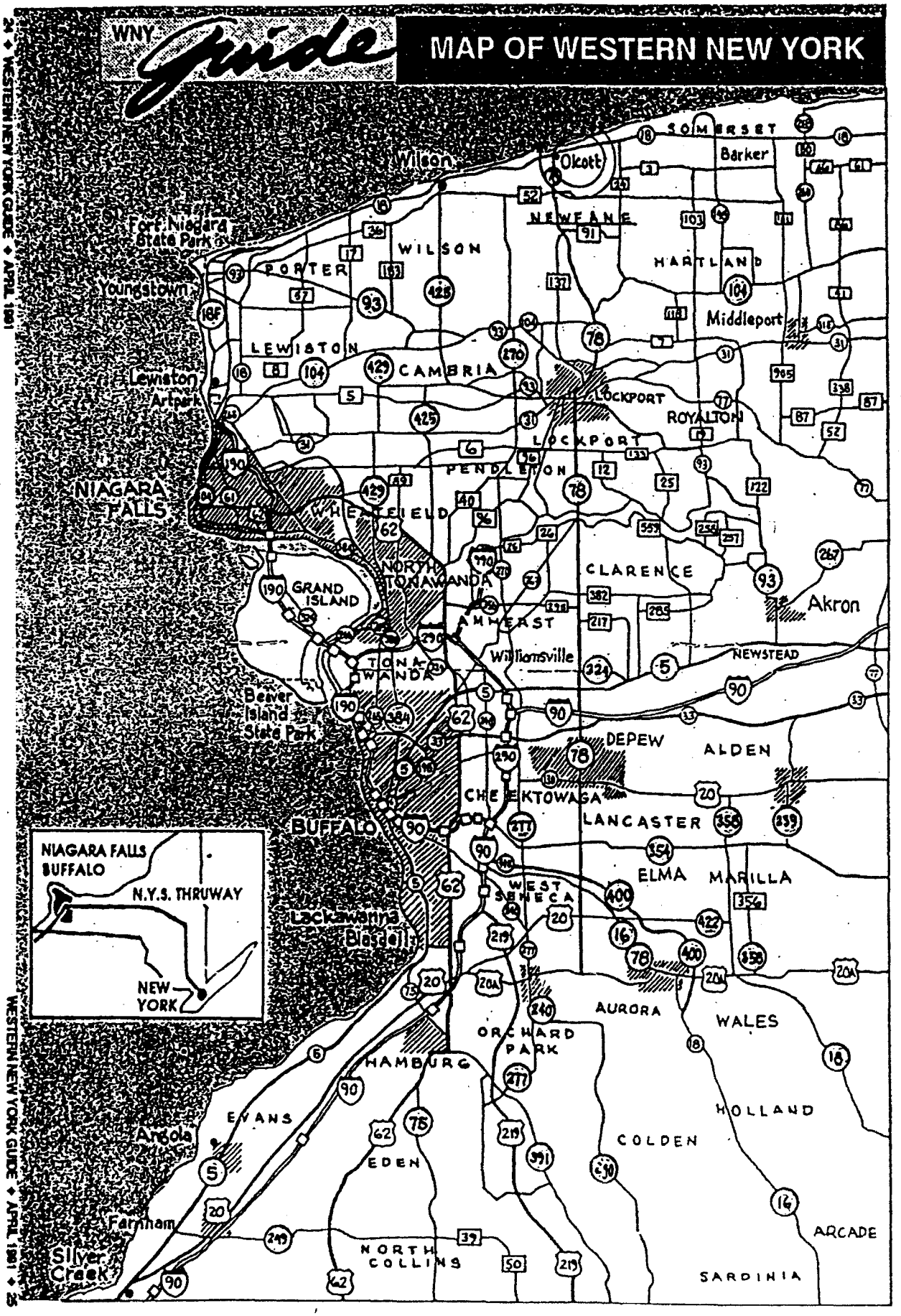
ADDENDUM

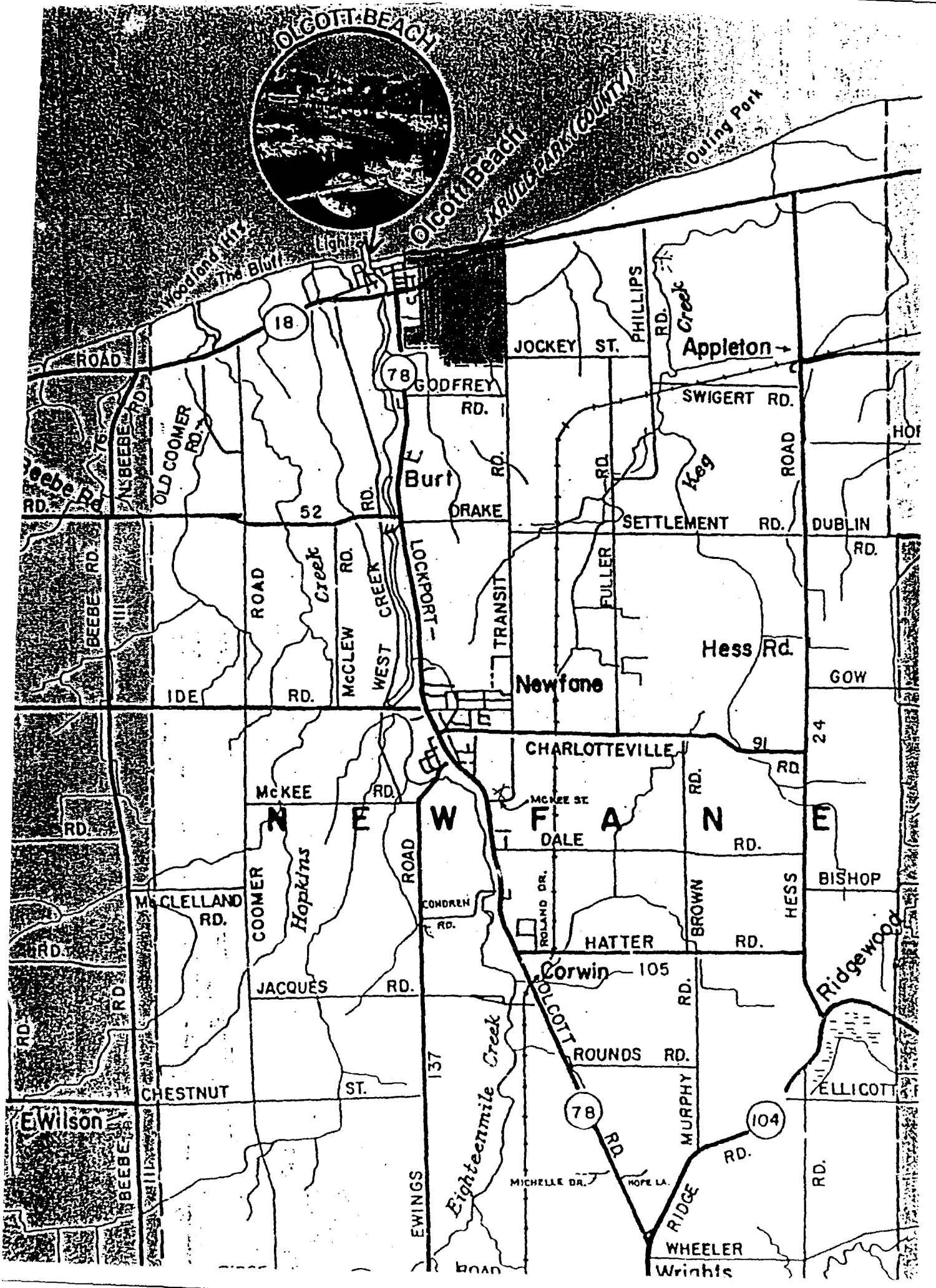

| | |
|---|---|
| SECTION 1 | Area Maps of Western New York and Niagara County |
| SECTION 2 | Town of Newfane Zoning Information. |
| SECTION 3 | Copy of Assessor's Card and Photographs of Area A (Staging Area). |
| SECTION 4 | Copy of Tax Map and Photos of Area B (Parking Lot Area). |
| SECTION 5 | Copy of Assessor's Card & Tax Map of Area C (Steps & Handicapped Access Ramp). |
| SECTION 6 | Map and Photos of Area D (Krull Park Access Easement). |
| SECTION 7 | Copy of Tax Map and Photos of Area E (Town of Newfane Disposal Site). |
| SECTION 8 | Sales Information (Copies of Assessor's and Tax Map Information). |
| SECTION 9 | Photographs the Above Sites. |
| SECTION 10 | The Estates. |
| SECTION 11 | The Qualifications of the Appraiser. |

AREA MAPS


©Map Works, Inc. 1989
LAKE ONTARIO
WESTERN NEW YORK
UNITED STATES
CANADA ONTARIO
CANADA ONTARIO
UNITED STATES
LAKE ERIE
ST. CATHARINES
NIAGARA FALLS
WELLAND
PORT COLBORNE
BUFFALO
LACKAWANNA
ORLEANS
GENESEE
MONROE
ROCHESTER
WAYNE
ONTARIO
YATES
SENECA
LIVINGSTON
WYOMING
ERIE
NIAGARA
CHAUTAUQUA
CATTARAUGUS
ALLEGANY
STEUBEN
SCHUYLER
CHEMUNG
TIOGA
CORNING
SALAMANCA
DUNKIRK
WARSAW
BATAVIA
CANANDAIGUA
GENEVA
HORNELL

# WNY Guide — MAP OF WESTERN NEW YORK




OLCOTT BEACH
Olcott Beach
KRULL PARK (COUNTY)
Outing Park
Woodland Hts.
The Bluff
Light
18
78
52
ROAD
GODFREY RD.
JOCKEY ST.
PHILLIPS RD.
Creek
Appleton
SWIGERT RD.
OLD COOMER RD.
N. BEEBE RD.
Burt
DRAKE RD.
Keg
ROAD
SETTLEMENT RD.
DUBLIN RD.
LOCKPORT
TRANSIT
FULLER RD.
Hess Rd.
GOW
ROAD
Creek
McCLEW
WEST CREEK
RD.
IDE RD.
Newfane
CHARLOTTEVILLE
91
24
RD.
McKEE RD.
McKEE ST.
NEWFANE
DALE RD.
BISHOP
COOMER
Hopkins
ROAD
McCLELLAND RD.
CONDREN RD.
ROLAND DR.
BROWN
HESS
HATTER RD.
Corwin
105
JACQUES RD.
OLCOTT
ROUNDS RD.
Ridgewood
CHESTNUT ST.
137
Eighteenmile Creek
ELLICOTT
E. Wilson
78
104
MURPHY RD.
MICHELLE DR.
HOPE LA.
RIDGE RD.
EWINGS ROAD
WHEELER
Wrights

TOWN OF NEWFANE

Lake Ontario

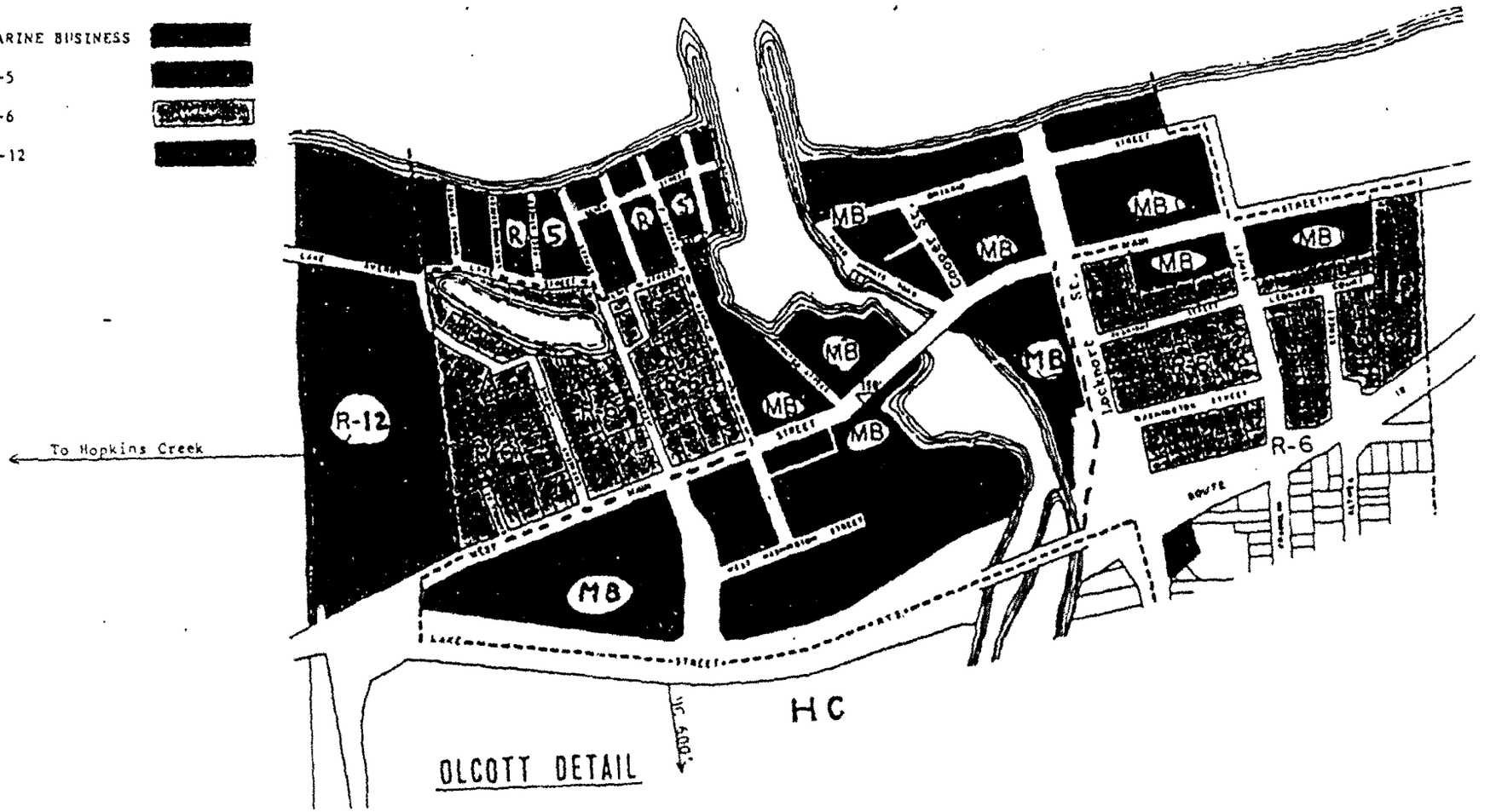
REZONE OLCOTT AREA- - ADOPTED April 10, 1985
and July 23, 1986

MARINE BUSINESS

R-5

R-6

R-12



## 5-2 RESIDENCE DISTRICTS — TABLE OF USE REGULATIONS

P = Permitted Use
SE = Special Exception Use
X = Prohibited Use
All Unlisted Uses are Prohibited in All Districts

| Use Classifications | AAR-40 Agriculture-Recreation Residence | R-20 One Family Residential | R-6 One Family Residence | RT Two Family Residence | RM Garden Apartment Residence |
|---|---|---|---|---|---|
| A. RESIDENTIAL USES | | | | | |
| 1. One-family detached dwelling | P | P | P | P | P |
| 2. Two-family detached dwelling, new | X | X | X | P | X |
| 3. Multiple dwelling | X | X | X | X | P |
| 4. Conversion of existing one-family detached dwelling for two families | SE | X | SE | P | X |
| 5. Planned residential development | SE | SE | SE | SE | SE |
| 6. Mobile home courts, cabin, camping ground | SE | X | X | X | X |
| B. RESIDENTIAL COMMUNITY FACILITIES | | | | | |
| 1. Church or similar place of worship or religious instruction, parish house or rectory, seminary, convent | P | P | P | P | P |
| 2. Nursery school | SE | X | X | X | SE |
| 3. Park, playground or recreational area operated by a governmental agency | P | P | P | P | P |
| 4. Private recreation area, non-profit | SE | X | X | X | X |
| 5. Public library, museum, community center, fire station, government office building | P | P | P | P | P |
| 6. School, elementary or high, public, denomination or private non-profit, accredited by New York Education Department | P | P | P | P | P |
| C. GENERAL COMMUNITY FACILITIES | | | | | |
| 1. Bus passenger shelter | SE | SE | SE | SE | SE |
| 2. Cemetery | SE | SE | SE | X | X |
| 3. College, university | SE | SE | X | X | X |
| 4. Country club | SE | SE | X | X | X |
| 5. Hospital, including auxiliary services and functions | P | P | P | X | X |
| 6. Membership club, non-profit | SE | X | SE | X | X |
| 7. Nursing home, rest home | SE | X | SE | X | SE |
| 8. Philanthropic, fraternal, social or educational organization, office, meeting room | SE | X | X | X | X |
| 9. Airport, general service | SE | X | X | X | X |
| 10. Public utility structure or right-of-way including sewage treatment plant, sanitary landfill or water supply facility, necessary to serve the community, but excluding business office, repair or storage of equipment | SE | SE | SE | SE | SE |
| 11. Private airstrips or airports | SE | X | X | X | X |
| D. BUSINESS USES | | | | | |
| 1. Agriculture, excluding animal husbandry | P | P | X | X | X |
| 2. Animal husbandry | P | SE | X | X | X |
| 3. Funeral home | SE | SE | X | SE | X |
| 4. Greenhouse, plant nursery | SE | X | X | X | X |
| 5. Professional office, medical arts building | SE | X | X | X | SE |
| 6. Veterinarian, veterinary hospital/clinic | SE | X | X | X | X |
| 7. Marine Business | SE | SE | SE | X | X |
| E. INDUSTRIAL USES | | | | | |
| 1. Quarries, clay, sand and gravel pits | SE | X | X | X | X |
| 2. Sa ill | SE | X | X | X | X |
| F. ACCESSORY USES | | | | | |
| 1. Accommodations for not more than two roomers in one or two family detached dwelling, provided that separate kitchen and entrance facilities shall not be provided | P | P | P | P | P |
| 2. Customary accessory structure and/or use | P | P | P | P | P |
| 3. Home occupation in one or two family detached dwelling | P | P | P | P | P |
| 4. Home professional office | P | P | P | P | P |
| 5. Housing for migrant labor | SE | X | X | X | X |
| 6. Private garage, private offstreet parking area pursuant to Article X | P | P | P | P | P |
| 7. Private swimming pool | P | P | P | P | P |
| 8. Roadside stands for sale of farm or home occupation products (See Sec. 9-13) | P | P | P | P | P |
| 9. Signs pursuant to Article XI | P | P | P | P | P |

## 6-2 BUSINESS DISTRICTS — TABLE OF USE REGULATIONS

P = Permitted Use
SE = Special Exception Use
X = Prohibited Use
All Unlisted Uses are Prohibited in All Districts

| Use Classifications | HC Highway Commercial | MB Marine Business |
|---|---|---|
| A. RESIDENTIAL USES | | |
| 1. Dwelling unit over first floor non-residential use | X | P |
| B. RESIDENTIAL COMMUNITY FACILITIES | | |
| 1. Church or similar place of worship or religious instruction, parish house, rectory, seminary or convent | P | P |
| 2. Nursery school | SE | SE |
| 3. Park, playground or recreation area operated by a governmental agency | P | P |
| 4. Public library, museum, community center | P | P |
| 5. Fire station, municipal office or any governmental building of similar character | P | P |
| 6. School, elementary or high, public, denominational or private, non-profit, accredited by the New York Education Department | P | P |
| C. GENERAL COMMUNITY FACILITIES | | |
| 1. Bus passenger shelter | SE | SE |
| 2. Membership club, non-profit | P | SE |
| 3. Philanthropic, fraternal, social or educational institution office or meeting room, non-profit | P | P |
| 4. Public utility structure or right-of-way, including airport, sewage treatment plant or water supply facility, necessary to serve the community | SE | SE |
| 5. Public passenger transportation station or terminal | SE | SE |
| D. BUSINESS USES | | |
| 1. Auditorium, meeting hall | SE | SE |
| 2. Automobile laundry | SE | X |
| 3. Bank | P | P |
| 4. Bowling alley | SE | SE |
| 5. Dance hall, skating rink | SE | SE |
| 6. Eating establishment: drive-in, open-front or curb service | SE | SE |
| 7. Filling station | SE | SE |
| 8. Funeral home | P | X |
| 9. Greenhouse, plant nursery | P | X |
| 10. Hotel | SE | SE |
| 11. Mobile home court, trailer camp | SE | X |
| 12. Motor vehicle, mobile home or boat salesroom or outdoor sales lot for products for sale and/or hire | P | P |
| 13. Office: business, professional or utility | P | P |
| 14. Parking garage, storage garage | P | SE |
| 15. Personal service shop | P | P |
| 16. Radio or TV broadcasting studio | P | P |
| 17. Restaurant | P | P |
| 18. Repair garage | SE | SE |
| 19. Repair shop for household, business or personal appliances | P | SE |
| 20. Recreation facility, commercial | SE | SE |
| 21. Retail store or shop | P | P |
| 22. Shop for custom work and for making articles to be sold at retail premises | P | P |
| 23. Tavern | P | P |
| 24. Theater or motion picture theater, other than an outdoor drive-in theater | SE | SE |
| 25. Veterinarian, veterinary hospital or clinic | SE | SE |
| 26. Vocational school | P | SE |
| 27. Wholesale business | P | SE |
| E. INDUSTRIAL USES | | |
| 1. Non-nuisance industry | X | SE |
| 2. Printing or publishing plant | P | SE |
| 3. Truck terminal, truck transfer station | SE | SE |
| 4. Marina, boat ramp | X | SE |
| 5. Boatyard, boat storage | X | SE |
| 6. Laundry plant, dry cleaning plant | X | SE |
| 7. Storage of fuel or other liquids in tanks | X | SE |
| 8. Outdoor storage area | X | SE |
| 9. Warehouse | SE | SE |
| 10. Research institute or laboratory (using machines not exceeding five (5) HP) | SE | SE |
| 11. Planned Commercial — Industrial Park | X | X |
| F. ACCESSORY USES | | |
| 1. Caretaker's or owner's dwelling unit | SE | SE |
| 2. Customary accessory use, building or structure, except prohibited uses | P | P |
| 3. Private garage or offstreet parking area pursuant to Article X | P | P |
| 4. Private swimming pool | P | P |
| 5. Signs pursuant to Article XI | P | P |

## 5-3 RESIDENCE DISTRICTS — TABLE OF DIMENSIONAL REGULATIONS

| | AAR-40 Agriculture-Recreation Residence | R-20 One Family Residential | R-6 One Family Residence | RT Two Family Residence | RM Garden Apartment Residence |
|---|---|---|---|---|---|
| 1. Lot Area (a)Minimum — sq. ft. | 40,000 | 20,000 | 6,000 | 8,000 | 40,000 |
| 2. Lot Area — Minimum per Dwelling Unit — sq. ft. | 40,000 | 20,000 | 6,000 | 4,000 | 2,500 |
| 3. Lot Coverage — % of Total Lot Area occupied by Main and Accessory Buildings — percent | 10 | 20 | 30 | 35 | 35 |
| 4. Lot Depth — Minimum — feet | 200 | 100 | 100 | 100 | 200 |
| 5. Lot Width — Minimum — feet | 125 | 100 | 60 | 80 | 200 |
| Corner Lot — feet | 165 | 100 | 60 | 80 | 200 |
| 6. Height — Maximum — stories and feet | 2½ — 35 | 2½ — 35 | 2½ — 35 | 2½ — 35 | 2½ — 35 |
| 7. Yards — Minimum — feet | | | | | |
| Front | 60 | 50 | 45 | 45 | 40 |
| Side — minimum for one | 20 | 15 | 10 | 10 | 40 |
| Side — total for both on interior lot | 40 | 40 | 20 | 20 | 80 |
| Side — abutting side street on corner lot | 50 | 50 | 20 | 20 | 40 |
| Rear | 60 | 50 | 25 | 25 | 40 |

(a) Where public sewerage is not available, no lot shall be built upon which has insufficient space for a private sanitary waste disposal system, as determined by the municipality.

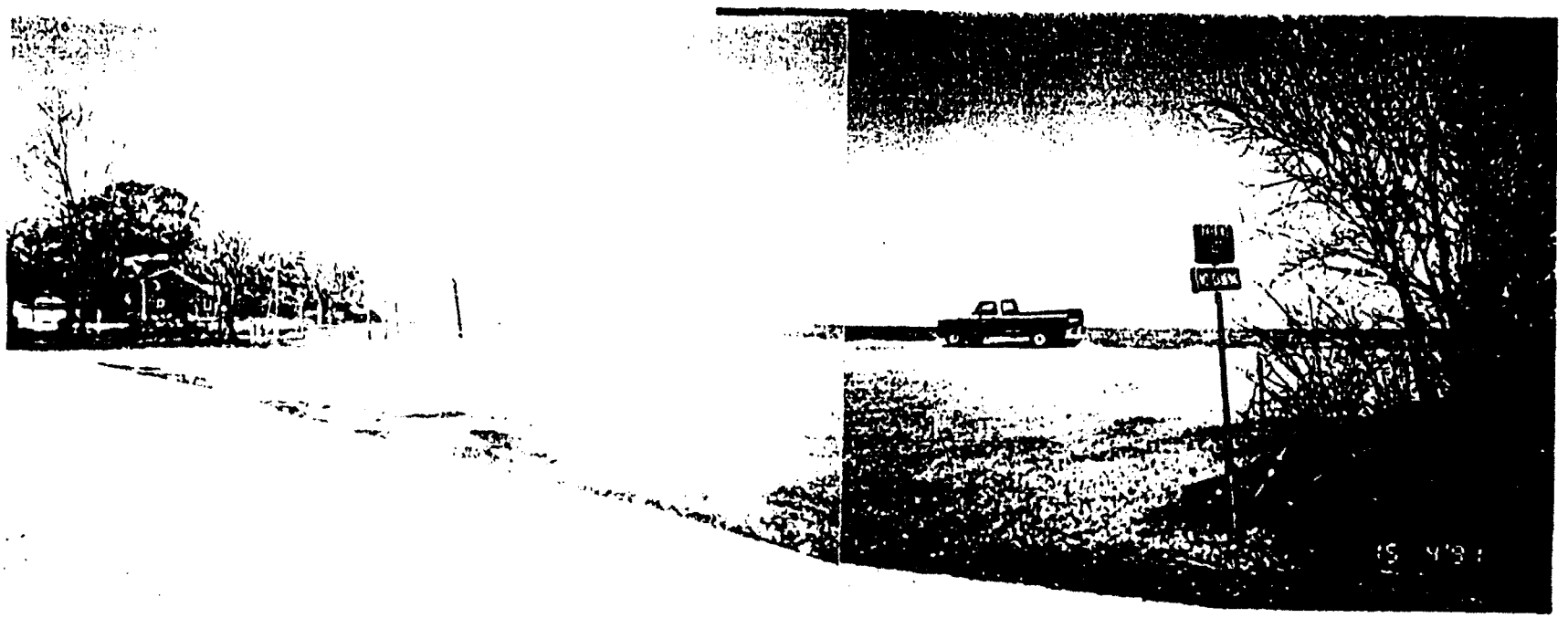
## 6-3 BUSINESS DISTRICTS — TABLE OF DIMENSIONAL REGULATIONS

| | HC Highway Commercial | MB Marine Business |
|---|---|---|
| 1. Lot Area (a) Minimum — square feet | 20,000 | 20,000 |
| 2. Lot Area — Minimum per Dwelling Unit — square feet | None | None |
| 3. Lot Coverage — % of Total Lot Area occupied by Main and Accessory Buildings — percent | 20 | 20 |
| 4. Lot Depth — Minimum — feet | 200 | 100 |
| 5. Lot Width — Minimum — feet | 100 | 100 |
| 6. Height — Maximum — stories and feet | 2-35 | 2-40 |
| 7. Yards — Minimum — feet | | |
| Front | 75 | 75 |
| Side — minimum for one | 20 | 20 |
| Side — total for both on interior lot | 40 | 40 |
| Side — abutting side street on corner lot | 75 | 75 |
| Rear | 50 | 50 |

(a) Where public sewerage is not available no lot shall be built upon which has insufficient space for a private sanitary waste disposal system as determined by the municipality.

STAGING AREA (AREA A)

PROPERTY ON N/S OF BEACH STREET,
BETWEEN JACKSON & VAN BUREN STREETS
(TEMPORARY STAGING AREA)
AREA A



# THE SUBJECTS

VIEW OF TEMPORARY STAGING
AREA AS SEEN FROM BEACH



## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle, Hogs & Prod.
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res. 10 Ac. or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY ____ DATE ____
LISTED BY ____ DATE ____
EDITED BY ____ DATE ____

MEASURING & LISTING COMPLETED ON VISIT
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH

SOURCE
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL

## C SIGNATURE

TOWN OF NEWFANE CODE :252200
5.19-2-2
5.19-2-1 LC
PARCEL--ID CD
AC: 00030370.00
LOC: EEACH ST A S RS 1
TYPE: ~~311~~ LOT: 58.25 X 179.00
OWNR: ~~WAEL, MARGARET L~~
~~20 LINCOLN DRIVE~~
ADDRS: ~~LOCKPORT NY~~ ~~14094~~
SALE: 2655 Liber 2229 PAGE: 11-87 Pg-109

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
F VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A ROTATING
B PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A 6 FT
B 3 TO 6 FT
C UNDER 3
10—WATERFRONT
11—ORCHARD
A
B
C
12—BEAR
13—VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 04

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| F | 10 | 59.00 | | | | |
| D | 10 | 177.00 | | | | |
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## F CARD SEQUENCE

CARD ____
OF ____

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO. ____
ZONING ____

NEIGHBORHOOD TYPE 1-RURAL 2-RURAL
CROSSROADS 3 SURBURBAN 4-URBAN 5-RES
SUBDIVISION 6-MIXED COMMERCIAL ____

ROAD 1-NONE 2-DIRT 3-GRAVEL 4-LOCAL PAVED 5-STATE ____
FRONTING TRAFFIC 1-LANDLOCKED 2-LIGHT 3-MEDIUM 4-HEAVY ____
BUILDING SET BACK 1-LESS THAN 30' 2-30 to 60' 3-MORE THAN 60' ____

VIEW INFLUENCE 1-NONE 2-INFER. 3-SUP ____
WATERFRONT 1-NONE 2-BAY 3-LAKE 4-RIVER CANAL 5-CREEK ____
SITE ELEVATION 1-BELOW STREET 2-EVEN 3-ABOVE STREET ____

SEWER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC ____
WATER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC ____
OTHER UTILITIES 1-NONE 2-GAS 3-ELECTRIC 4-GAS/ELECTRIC ✓

SITE COMPARED TO SURROUNDS 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2
SITE DESIREABILITY 1-POOR 2-TYPICAL 3-SUPERIOR 2
LANDSCAPING 1-INFERIOR 2-TYPICAL 3-SUPERIOR ____
IMPROVEMENTS 1-NO 2-YES ____

## H LABEL CORRECTION

SWIS ____
SECTION ____ BLOCK ____ LOT ____ SUFFIX ____ CD ____
ROUTE NO ____ 10
OWNER INCORRECT ____
PROPERTY ADDRESS INCORRECT ____
PROPERTY CLASSIFICATION 313
SALE PRICE ____ DATE ____

## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT ____
VALID SALE 0-NO 1-YES ____
DATA MATCH 1-NO 2-YES ____
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING ____

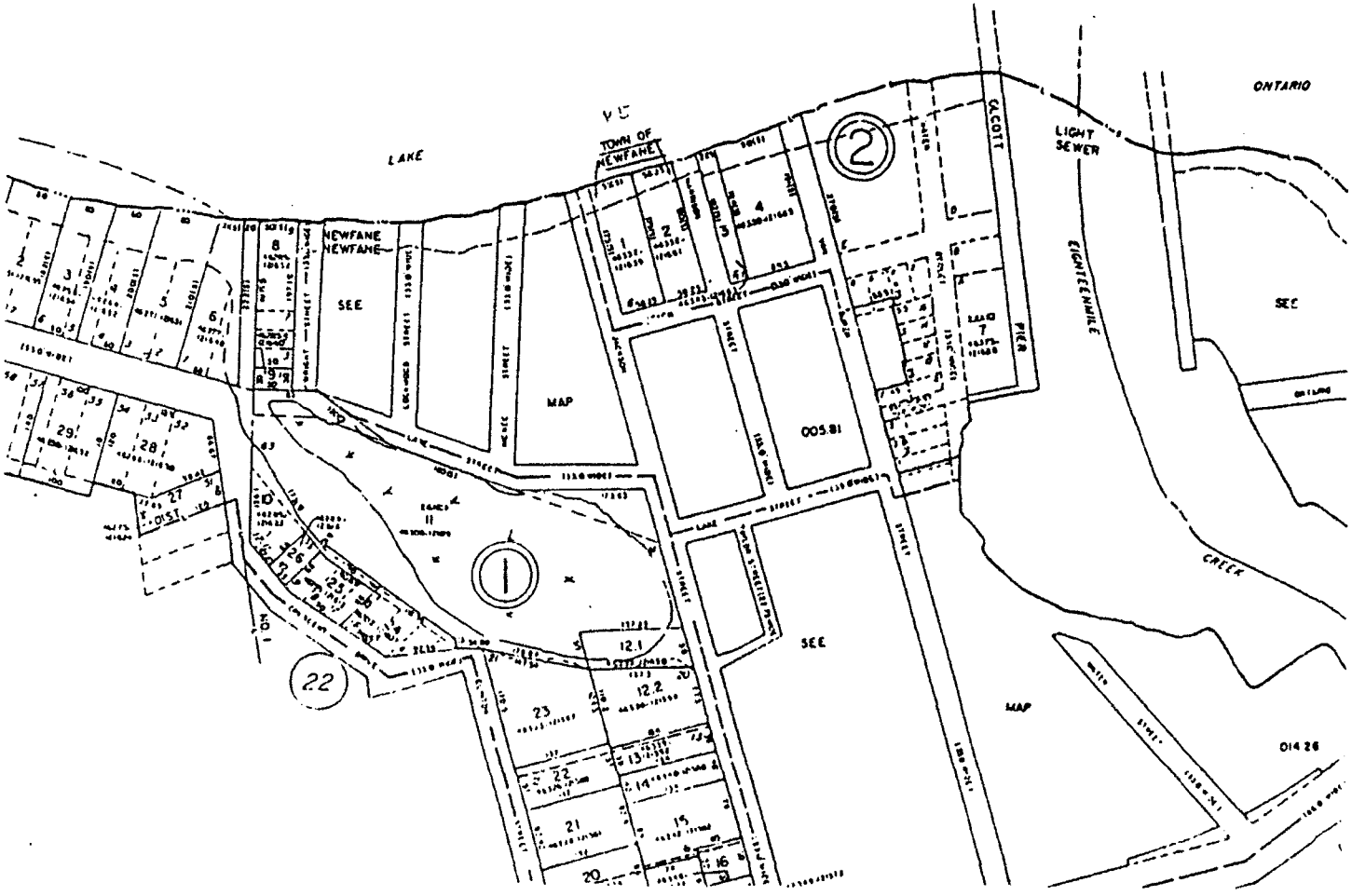
## J SALES NOTES

Both parcels same size
Both lots zoned R5

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM

3.17

TAX MAP

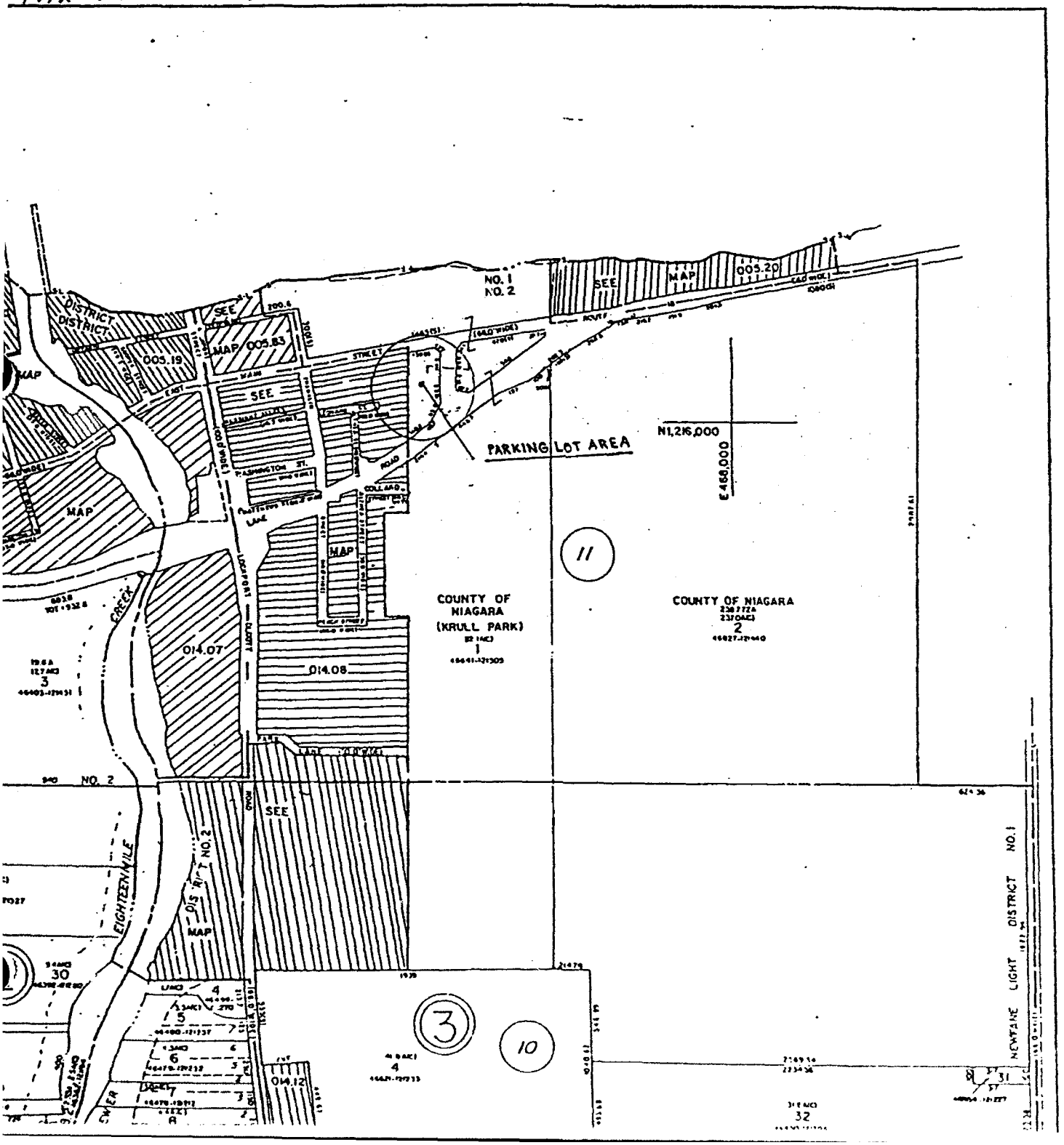

LAKE
TOWN OF NEWFANE
NEWFANE
NEWFANE
SEE
MAP
005.81
SEE
MAP
SEE
ONTARIO
LIGHT SEWER
CALCOTT
PIKE
EIGHTEENMILE
CREEK
014.26
LAKE STREET
MAIN STREET
22
23
12.1
12.2
21
20
15
2
1

PARKING LOT AREA (AREA B)

VIEW OF THE PARKING LOT AREA
AREA B



TAX MAP 14.00


NO. 1
NO. 2
SEE MAP 005.20
DISTRICT
SEE MAP 005.83
005.19
SEE
MAP
PARKING LOT AREA
N1,216,000
E 466,000
11
COUNTY OF NIAGARA (KRULL PARK)
1
COUNTY OF NIAGARA
2
014.07
014.08
CREEK
NO. 2
SEE
EIGHTEEN MILE
DIS RICT NO.2
MAP
30
3
10
014.12
NEWFANE LIGHT DISTRICT NO.1
31
32

ASSESSOR'S CARDS ON THE PROPERTIES

COMPRISING AREA B

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year Round
220—2 Family Year Round
230—3 Family Year Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 9201
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY ____ DA ____
LISTED BY ____ DATE ____
EDITED BY ____ DATE ____

MEASURING & LISTING COMPLETED ON VISIT
1 FIRST 2 SECOND
3 THIRD 4 FOURTH 3

SOURCE
1 OWNER 2 SPOUSE 3 TENANT
4 OTHER 5 ESTIMATE 6 TOTAL REFUSAL
7 INTERIOR REFUSAL 5

## C SIGNATURE

TOWN OF NEWFANE 19 CODE 292800

S.B3-1-1 LF 11-1
PARCEL--ID CD
AC: 000271120.00
LOC: ONTARIO ST A S RS 1

TYPE: 21C LOT: 33.00 X 117.00

OWNR: TOWN OF NEWFANE
~~CHASSE, DARIO P.~~
~~MARVIN GLENDA A~~
5596 TRANSIT RD
~~5953 ONTARIO ST~~

ADDRS: ~~GLENDS ST~~ ~~14126~~
NEWFANE N.Y. 14108

SALE: $26,500 DATE: 10-78

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A ROLLING
B FLAT
07—WOODLAND
08—WASTELAND
09—MUCK
A 6 FT
B 3 TO 6 FT
C UNDER 3
W—WATERFRONT
11—ORCHARD
A
B
C
12—BERR
13—VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14—WETLANDS

987
NOW PARKING LOT

LAND CODES —
F FRONTAGE D DEPTH S SQUARE FEET A ACREAGE V VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| F | 1D | 33.00 | | | | |
| D | 1D | 114.00 | | | | |

## F CARD SEQUENCE

CARD ____
OF ____

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO ____
ZONING ____

NEIGHBORHOOD TYPE 1 RURAL 2 RURAL
CROSSROADS 3 SUBURBAN 4 URBAN 5 RES
SUBDIVISION 6 MIXED COMMERCIAL 2

ROAD 1 NONE 2 DIRT 3 GRAVEL
4 LOCAL PAVED 5 STATE 4

FRONTING TRAFFIC 1 LANDLOCKED
2 LIGHT 3 MEDIUM 4 HEAVY 2

BUILDING SET BACK 1 LESS THAN 30
2 30 to 60 3 MORE THAN 60 3

VIEW INFLUENCE 1 NONE
2 INFER 3 SUP 3

WATERFRONT 1 NONE 2 BAY
3 LAKE 4 RIVER CANAL 5 CREEK 1

SITE ELEVATION 1 BELOW STREET
2 EVEN 3 ABOVE STREET 2

SEWER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC 1

WATER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC 1

OTHER UTILITIES 1 NONE 2 GAS
3 ELECTRIC 4 GAS-ELECTRIC 3

SITE COMPARED TO SURROUNDS 1 INFERIOR
2 TYPICAL 3 SUPERIOR 2

SITE DESIRABILITY
1 POOR 2 TYPICAL 3 SUPERIOR 2

LANDSCAPING
1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

IMPROVEMENTS 1 NO 2 YES 2

## H LABEL CORRECTION

SWIS ____
SECTION BLOCK LOT SUFFIX CD
ROUTE NO 19
OWNER INCORRECT ____
PROPERTY ADDRESS INCORRECT ____
PROPERTY CLASSIFICATION NOT U&V/8 ____
SALE PRICE 37,900 DATE 10.85
Bk 1962 Pg 275

## I SALES VERIFICATION

SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT ____
VALID SALE 0 NO 1 YES ____
DATA MATCH 1 NO 2 YES ____
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING ____



ns, Inc.

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
180—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year Round
220—2 Family Year Round
230—3 Family Year Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL



5 8 3 0 1 0 1 0 0 0

TOWN OF NEWFANE CODE #292800

5.83-1-2 LT 10-W
PARCEL--10 CO
AC: 00031120.00
LOC: CATARIO ST AS RS 1
TYPE: 220 LOT: 33.00 X 117.00
OWNR: ~~KETALIKE/RALPH O~~ TOWN OF NEWFANE--
~~[illegible]~~
~~-090 [illegible]~~
~~5455 ONTARIO ST~~
ADDRS: ~~[illegible]~~ NEWFANE N.Y ~~[illegible]~~ 14108
SALE: $27,500 DATE: 03-78

## C LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A ROTATING
B PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A 6 FT
B 3 TO 6 FT
C UNDER 3
10—WATERFRONT
11—ORCHARD
A
B
C
12—BLAR
13—VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | I | L | W |
|---|---|---|---|---|---|---|
| F | 10 | 33.00 | | | | |
| D | 10 | 117.00 | | | | |
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## G SITE DESCRIPTION

PROPERTY CLASS
SITE NO
ZONING

NEIGHBORHOOD TYPE 1-RURAL 2 RURAL
CROSSROADS 3 SURBURBAN 4 URBAN 5 RES
SUBDIVISION 6 MIXED COMMERCIAL 2

ROAD 1 NONE 2 DIRT 3 GRAVEL
4 LOCAL PAVED 5 STATE 4
FRONTING TRAFFIC 1 LANDLOCKED
2 LIGHT 3 MEDIUM 4 HEAVY 2
BUILDING SET BACK 1 LESS THAN 30
2 30 to 60 3 MORE THAN 60 2

VIEW INFLUENCE 1 NONE
2 INFER 3 SUP 3
WATERFRONT 1 NONE 2 BAY
3 LAKE 4 RIVER CANAL 5 CREEK 1
SITE ELEVATION 1 BELOW STREET
2 EVEN 3 ABOVE STREET 2

SEWER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC
WATER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC
OTHER UTILITIES 1 NONE 2 GAS
3 ELECTRIC 4 GAS/ELECTRIC

SITE COMPARED TO SURROUNDS 1 INFERIOR
2 TYPICAL 3 SUPERIOR 2
SITE DESIREABILITY
1 POOR 2 TYPICAL 3 SUPERIOR
LANDSCAPING
1 INFERIOR 2 TYPICAL 3 SUPERIOR
IMPROVEMENTS 1 NO 2 YES

## H LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CD
ROUTE NO
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION NOT VALID
SALE PRICE 33900 DATE 08.85
BK 1053 PG 261

## I SALES VERIFICATION

SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT 1
VALID SALE 0 NO 1 YES 1
DATA MATCH 1 NO 2 YES 2
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING 3

## J SALES NOTES

CONS. TO 5.83-1-1

KVS Information Systems, Inc.
Buffalo, New York

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agric. Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Mucklands
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year Round
220—2 Family Year Round
230—3 Family Year Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY _____ DATE _____
LISTED BY _____ DATE _____
EDITED BY _____ DATE _____

MEASURING & LISTING COMPLETED ON VISIT
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 1

SOURCE
1 - OWNER 2 SPOUSE 3 TENANT
4 - OTHER 5 ESTIMATE 6 TOTAL REFUSAL
7 - INTERIOR REFUSAL 3

## C SIGNATURE

TOWN OF NEWFANE CODE :292800

5.83-1-3
PARCEL--ID

MR
CO 11
AC: 00030610.00

LOC: ONTARIO ST NS RS 1

TYPE: 220 LOT: 66.00 X 125.00

OWNR: TOWN OF NEWFANE
RAAB, MICHAEL L JR - CULVERNELL
~~5819 Lewis Rd.~~
~~Lockport, N.Y. 14094~~
~~5819~~ 5859-ONTARIO-ST D E
ADDRS: OLCOTT N.Y. 14126
NEWFANE N.Y. 14108

SALE: DATE: -

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A ROTATING
B PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A 6 FT
B 2 TO 6 FT
C UNDER 2
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 2

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | $ | I | M |
|---|---|---|---|---|---|---|
| F | 10 | 22.00 | | | | |
| D | 10 | 120.00 | | | | |
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## F CARD SEQUENCE

CARD 01
OF 03

## G SITE DESCRIPTION

PROPERTY CLASS 210
SITE NO 001
ZONING R1C

NEIGHBORHOOD TYPE 1 RURAL 2 RURAL
CROSSROADS 3 SURBURBAN 4 URBAN 5 RES
SUBDIVISION 6 MIXED COMMERCIAL 2

ROAD 1 NONE 2 DIRT 3 GRAVEL
4 LOCAL PAVED 5 STATE 4

FRONTING TRAFFIC 1 LANDLOCKED
2 LIGHT 3 MEDIUM 4 HEAVY 2

BUILDING SET BACK 1 LESS THAN 30
2 30 to 60 3 MORE THAN 60 2

VIEW INFLUENCE 1 NONE
2 INFER 3 SUP 3

WATERFRONT 1 NONE 2 BAY
3 LAKE 4 RIVER CANAL 5 CREEK 3

SITE ELEVATION 1 BELOW STREET
2 EVEN 3 ABOVE STREET -

SEWER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC 4

WATER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC 4

OTHER UTILITIES 1 NONE 2 GAS
3 ELECTRIC 4 GAS-ELECTRIC 4

SITE COMPARED TO SURROUNDS 1 INFERIOR
2 TYPICAL 3 SUPERIOR 2

SITE DESIRABILITY
1 POOR 2 TYPICAL 3 SUPERIOR 2

LANDSCAPING
1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

IMPROVEMENTS 1 NO 2 YES -

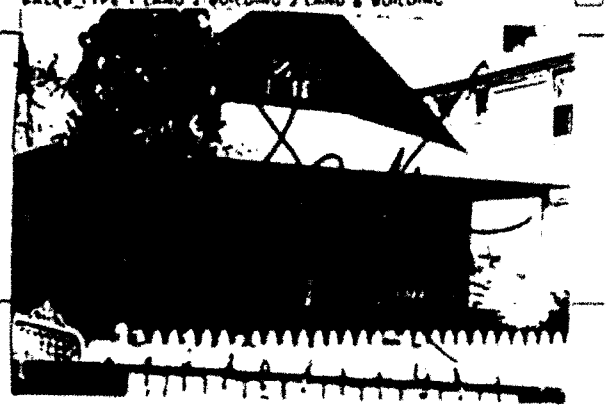
## H LABEL CORRECTION

SWIS _____
5.83 01 -3 _____ _____ _____
SECTION BLOCK LOT SUFFIX CO

ROUTE NO _____
OWNER INCORRECT _____
PROPERTY ADDRESS INCORRECT _____
PROPERTY CLASSIFICATION NOT VALID 330
SALE PRICE 30,000 DATE 10.85
BK 1960 PG 11

## I SALES VERIFICATION Cons. 5.83-1-1

SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT _____
VALID SALE 0 NO 1 YES A/V-7000 - _____
DATA MATCH 1 NO 2 YES _____
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING _____



## A · PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105 · Agricultural Vacant Land
1[illegible]—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestocks
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year Round
220—2 Family Year Round
230—3 Family Year Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY TBK DATE 05-[illegible]-[illegible]
LISTED BY TBK DATE 05-[illegible]-[illegible]
EDITED BY TBK DATE 06-16-88

MEASURING & LISTING COMPLETED ON VISIT
1 · FIRST 2 · SECOND
3 · THIRD 4 · FOURTH [ ]

SOURCE
1 · OWNER 2 SPOUSE 3 · TENANT
4 · OTHER 5 · ESTIMATE 6 · TOTAL REFUSAL
7 · INTERIOR REFUSAL 1

## C SIGNATURE

[signature]



## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E · VEGETABLE
A · GRAIN
B · HAY CORN
C · SILAGE
06—PASTURE
A · ROTATIO[illegible]
B · PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A · 6 /7
B · 3 TO 5 FT
C · UNDER 3
10—WATERFRONT
11—ORCHARD
A
B
C
12—BERR
13—VINEYARDS
A · 5 TONS
B · 4 TONS
C · UNDER 4 TONS
14—WETLANDS

LAND CODES —
F · FRONTAGE D · DEPTH S · SQUARE FEET A · ACREAGE V · VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | I | L | W |
|---|---|---|---|---|---|---|
| F | 10 | 32.00 | | | | |
| D | 10 | 120.00 | | | | |
| | | | | | | |
| | | | | | | |
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## F CARD SEQUENCE

CARD 01 OF 02

## G SITE DESCRIPTION

PROPERTY CLASS 210
SITE NO 0001
ZONING [illegible]

NEIGHBORHOOD TYPE 1 · RURAL 2 RURAL CROSSROADS 3 SUBURBAN 4 URBAN 5 RES SUBDIVISION 6 MIXED COMMERCIAL 3

ROAD 1 NONE 2 DIRT 3 GRAVEL 4 LOCAL PAVED 5 STATE 4

FRONTING TRAFFIC 1 LANDLOCKED 2 LIGHT 3 MEDIUM 4 HEAVY 2

BUILDING SET BACK 1 LESS THAN 30 2 30 to 60 3 MORE THAN 60 1

VIEW INFLUENCE 1 · NONE 2 INFER 3 SUP 2

WATERFRONT 1 NONE 2 BAY 3 LAKE 4 RIVER CANAL 5 CREEK 3

SITE ELEVATION 1 BELOW STREET 2 EVEN 3 ABOVE STREET 2

SEWER 1 NONE 2 PRIVATE 3 COMMERCIAL 4 PUBLIC 4

WATER 1 NONE 2 PRIVATE 3 COMMERCIAL 4 PUBLIC V

OTHER UTILITIES 1 NONE 2 GAS 3 ELECTRIC 4 GAS/ELECTRIC 4

SITE COMPARED TO SURROUNDS 1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

SITE DESIREABILITY 1 POOR 2 TYPICAL 3 SUPERIOR 2

LANDSCAPING 1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

IMPROVEMENTS 1 NO 2 YES 2

## H LABEL CORRECTION

SWIS 210800

SECTION [illegible] BLOCK [illegible] LOT 3.0 SUFFIX [illegible] CO 08

ROUTE NO [illegible]

OWNER INCORRECT [ ]
PROPERTY ADDRESS INCORRECT #5959 Onta[illegible] [ ]
PROPERTY CLASSIFICATION [illegible]
SALE PRICE [illegible] DATE [illegible]

## I SALES VERIFICATION

SOURCE 1 · BUYER 2 SELLER 3 STAMPS 4 AGENT [ ]
VALID SALE 0 NO 1 YES [ ]
DATA MATCH 1 NO 2 YES [ ]
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING [ ]

## J SALES NOTES

KVS Information Systems, Inc.
Buffalo, New York

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agriculture Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY [illegible] DATE [illegible]
LISTED BY [illegible] DATE [illegible]
EDITED BY [illegible] DATE [illegible]

MEASURING & LISTING COMPLETED ON VISIT
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH [illegible]

SOURCE
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL [illegible]

## C SIGNATURE

## D LAND DESCRIPTION

LAND TYPE
01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
1 VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A ROTATING
B PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A 6 FT
B 3 TO 6 FT
C UNDER 3
10—WATERFRONT
11—ORCHARD
A
B
C
12—BEAR
13—VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14—WETLANDS

LAND CODES —
F FRONTAGE D DEPTH S SQUARE FEET A ACREAGE V VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S I W |
|---|---|---|---|---|
| F | 10 | 22.00 | | |
| D | 10 | 120.00 | | |
| | | | | |
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## F CARD SEQUENCE

CARD [illegible]
OF [illegible]

## G SITE DESCRIPTION

PROPERTY CLASS [illegible]
SITE NO [illegible]
ZONING [illegible]

NEIGHBORHOOD TYPE 1 RURAL 2 RURAL CROSSROADS 3 SUBURBAN 4 URBAN 5 RES SUBDIVISION 6 MIXED COMMERCIAL [illegible]

ROAD 1 NONE 2 DIRT 3 GRAVEL 4 LOCAL PAVED 5 STATE [illegible]

FRONTING TRAFFIC 1 LANDLOCKED 2 LIGHT 3 MEDIUM 4 HEAVY [illegible]

BUILDING SET BACK 1 LESS THAN 30 2 30 to 60 3 MORE THAN 60 [illegible]

VIEW INFLUENCE 1 NONE 2 INFER 3 SUP [illegible]

WATERFRONT 1 NONE 2 BAY 3 LAKE 4 RIVER CANAL 5 CREEK [illegible]

SITE ELEVATION 1 BELOW STREET 2 EVEN 3 ABOVE STREET [illegible]

SEWER 1 NONE 2 PRIVATE 3 COMMERCIAL 4 PUBLIC [illegible]

WATER 1 NONE 2 PRIVATE 3 COMMERCIAL 4 PUBLIC [illegible]

OTHER UTILITIES 1 NONE 2 GAS 3 ELECTRIC 4 GAS/ELECTRIC [illegible]

SITE COMPARED TO SURROUNDS 1 INFERIOR 2 TYPICAL 3 SUPERIOR [illegible]

SITE DESIRABILITY 1 POOR 2 TYPICAL 3 SUPERIOR [illegible]

LANDSCAPING 1 INFERIOR 2 TYPICAL 3 SUPERIOR [illegible]

IMPROVEMENTS 1 NO 2 YES [illegible]

## H LABEL CORRECTION

TGWMS [illegible]
SECTION [illegible] BLOCK [illegible] LOT [illegible] SUFFIX [illegible] CD [illegible]
ROUTE NO [illegible]

OWNER INCORRECT [illegible]
PROPERTY ADDRESS INCORRECT [illegible]
PROPERTY CLASSIFICATION [illegible]
SALE PRICE [illegible] DATE [illegible]

## I SALES VERIFICATION

SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT
VALID SALE 0 NO 1 YES
DATA MATCH 1 NO 2 YES
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING



## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
180—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

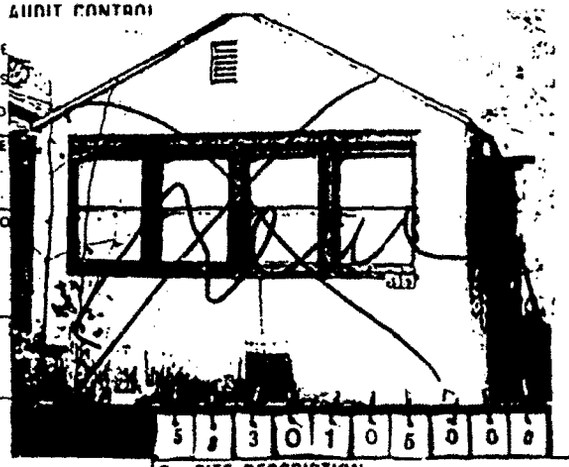
VACANT LAND—300
311—Residential Vacant
312—Residential Vacant Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 AC or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

B AUDIT CONTROL



5 8 3 0 1 0 6 0 0 0

TOWN OF NEWFANE CODE :292800

5.83-1-5 CD
PARCEL--10 CD
AC: 0002937C.CC

LOC: ONTARIO ST NS R5 1

TYPE: ~~210~~ LOT: 16.50 X 38.00

BANK: ~~STENCE/ARTHUR E~~ TOWN OF NEWFANE

~~5865: [illegible]~~

ADDRS: ~~[illegible]~~

SALE: 3500YNNNNNNNNN DATE: 08-78

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A ROTATING
B PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A 6 FT
B 3 TO 5 FT
C UNDER 3
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14—WETLANDS

A/N - 1.00 - 3,000

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| F | 01 | 17.00 | | | | |
| D | 01 | 38.00 | | | | |
| | | . | | | | |
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| | | . | | | | |

## G SITE DESCRIPTION

PROPERTY CLASS
SITE NO
ZONING

NEIGHBORHOOD TYPE 1 RURAL 2 RURAL
CROSSROADS 3 SUBURBAN 4 URBAN 5 RES
SUBDIVISION 6 MIXED COMMERCIAL

ROAD 1 NONE 2 DIRT 3 GRAVEL 4
4 LOCAL PAVED 5 STATE
FRONTING TRAFFIC 1 LANDLOCKED 2
2 LIGHT 3 MEDIUM 4 HEAVY
BUILDING SET BACK 1 LESS THAN 30
2 30 to 60 3 MORE THAN 60

VIEW INFLUENCE 1 NONE 3
2 INFER 3 SUP
WATERFRONT 1 NONE 2 BAY 1
3 LAKE 4 RIVER CANAL 5 CREEK
SITE ELEVATION 1 BELOW STREET 2
2 EVEN 3 ABOVE STREET

SEWER 1 NONE 2 PRIVATE 1
3 COMMERCIAL 4 PUBLIC
WATER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC
OTHER UTILITIES 1 NONE 2 GAS 3
3 ELECTRIC 4 GAS/ELECTRIC

SITE COMPARED TO SURROUNDS 1 INFERIOR 2 TYPICAL 3 SUPERIOR
SITE DESIRABILITY 1 POOR 2 TYPICAL 3 SUPERIOR
LANDSCAPING 1 INFERIOR 2 TYPICAL 3 SUPERIOR
IMPROVEMENTS 1 NO 2 YES

## H LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CD
ROUTE NO 22
OWNER INCORRECT CONS 5.83-1-1
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION 2-FAMILY RES 260
SALE PRICE 11900 DATE 09.05
1.00-19-1966-2

## I SALES VERIFICATION

SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT
VALID SALE 0 NO 1 YES
DATA MATCH 1 NO 2 YES
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING

## J SALES NOTES

ERIC CARR
EXT 381
bme 778-7298

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE —100
105 — Agricultural Vacant Land
110 — Livestock & Products
111 — Poultry & Products
112 — Dairy & Products
113 — Cattle Hogs & Prod
114 — Sheep & Wool
115 — Honey & Beeswax
116 — Other Livestocks
120 — Field Crops
130 — Truck Crops/Muckland
140 — Truck Crops
141 — Orchard Crops
151 — Tree Fruits
152 — Vineyards
160 — Other Fruits
170 — Nursery Greenhouse

RESIDENTIAL —200
210 — 1 Family Year Round
220 — 2 Family Year Round
230 — 3 Family Year Round
240 — Rural Residence with Acreage
250 — Estate
260 — Seasonal Residence
270 — Mobile Home

VACANT LAND —300
311 — Residential Vacant
312 — Residential Vacant Improved
313 — Waterfront Vacant
314 — Rural 10 Acres or Less
321 — Abandon Agricultural
322 — Rural Res 10 Ac or More
323 — Other Rural Vacant
330 — Commercial Vacant
340 — Industrial Vacant
350 — Urban Renewal

COMMERCIAL —400
483 — Partial Residential Use

WILD & FORESTED —900
910 — Private (except 920)
920 — Private Hunting & Fishing
930 — State Owned
940 — County Owned

* Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY ____ DATE __-__-__
LISTED BY ____ DATE __-__-__
EDITED BY KSB DATE 08-06-82

MEASURING & LISTING COMPLETED ON VISIT
1 · FIRST 2 · SECOND
3 · THIRD 4 · FOURTH ____

SOURCE
1 · OWNER 2 · SPOUSE 3 · TENANT
4 · OTHER 5 · ESTIMATE 6 · TOTAL REFUSAL
7 · INTERIOR REFUSAL ____

## C SIGNATURE

TOWN OF NEWFANE - 1.3 CODE :292600

5.83-1-6 OB
PARCEL--1C CD
AC: 00031720.00
LOC: ONTARIO ST NS RS 1
TYPE: 21C LOT: 16.50 X 38.00
OWNR: TOWN OF NEWFANE
~~STANLEY ARTHUR E~~
ADDRS: ~~5965 ONTARIO ST~~ ~~14126~~
SALE: 1500YNNNNNNNNN DATE: 08-78

## D LAND DESCRIPTION

LAND TYPE

01 — PRIMARY
02 — SECONDARY
03 — UNDEVELOPED
04 — RESIDUAL
05 — TILLABLE
1 VEGETABLE
2 GRAIN
3 HAY CORN
4 SILAGE
06 — PASTURE
A ROTATING
B PERM
07 — WOODLAND
08 — WASTELAND
09 — MUCK
A 5 FT
B 3 TO 5 FT
C UNDER 3
10 — WATERFRONT
11 — ORCHARD
A
B
C
12 — BEAR
13 — VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14 — WETLANDS

LAND CODES —
F · FRONTAGE D · DEPTH S · SQUARE FEET A · ACREAGE V · VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S I W |
|---|---|---|---|---|
| F | 01 | 17.00 | | |
| D | 01 | 38.00 | | |

## F CARD SEQUENCE

CARD ____
OF ____

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO ____
ZONING ____

NEIGHBORHOOD TYPE 1 RURAL 2 RURAL CROSSROADS 3 SUBURBAN 4 URBAN 5 RES SUBDIVISION 6 MIXED COMMERCIAL 2

ROAD 1 NONE 2 DIRT 3 GRAVEL 4 LOCAL PAVED 5 STATE 4

FRONTING TRAFFIC 1 LANDLOCKED 2 LIGHT 3 MEDIUM 4 HEAVY 2

BUILDING SET BACK 1 LESS THAN 30 2 30 to 60 3 MORE THAN 60 1

VIEW INFLUENCE 1 NONE 2 INFER 3 SUP 2

WATERFRONT 1 NONE 2 BAY 3 LAKE 4 RIVER CANAL 5 CREEK 1

SITE ELEVATION 1 BELOW STREET 2 EVEN 3 ABOVE STREET 2

SEWER 1 NONE 2 PRIVATE 3 COMMERCIAL 4 PUBLIC 4

WATER 1 NONE 2 PRIVATE 3 COMMERCIAL 4 PUBLIC 4

OTHER UTILITIES 1 NONE 2 GAS 3 ELECTRIC 4 GAS/ELECTRIC 4

SITE COMPARED TO SURROUNDS 1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

SITE DESIREABILITY 1 POOR 2 TYPICAL 3 SUPERIOR 2

LANDSCAPING 1 INFERIOR 2 TYPICAL 3 SUPERIOR ____

IMPROVEMENTS 1 NO 2 YES 2

## H LABEL CORRECTION

SWIS ____
SECTION ____ BLOCK ____ LOT ____ SUFFIX ____ CD ____
ROUTE NO 24
OWNER INCORRECT Cons 5.83-1-1
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION
SALE PRICE 1,100.00 DATE 09-[illegible]-82

## I SALES VERIFICATION

SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT
VALID SALE 0 NO 1 YES
DATA MATCH 1 NO 2 YES A/V - 1111 - 5.83-1-6
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING



## A PROPERTY CLASSIFICATION CODES

**AGRICULTURE — 100**
105 — Agricultural Vacant Land
110 — Livestock & Products
111 — Poultry & Products
112 — Dairy & Products
113 — Cattle Hogs & Prod
114 — Sheep & Wool
115 — Honey & Beeswax
116 — Other Livestock
120 — Field Crops
130 — Truck Crops/Muckland
140 — Truck Crops
150 — Orchard Crops
151 — Tree Fruits
152 — Vineyards
160 — Other Fruits
170 — Nursery/Greenhouse

**RESIDENTIAL — 200**
210 — 1 Family Year Round
220 — 2 Family Year Round
230 — 3 Family Year Round
240 — Rural Residence with Acreage
250 — Estate
260 — Seasonal Residence
270 — Mobile Home

**VACANT LAND — 300**
311 — Residential Vacant
312 — Residential Vacant Improved
313 — Waterfront Vacant
314 — Rural 10 Acres or Less
321 — Abandon Agricultural
322 — Rural Res 10 Ac or More
323 — Other Rural Vacant
330 — Commercial Vacant
340 — Industrial Vacant
350 — Urban Renewal

**COMMERCIAL — 400**
483 — Partial Residential Use

**WILD & FORESTED — 900**
910 — Private (except 9201
920 — Private Hunting & Fishing
930 — State Owned
940 — County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY ____ DATE __-__-__
LISTED BY JMS DATE __-__-__
EDITED BY JMS DATE __-__-__

MEASURING & LISTING COMPLETED ON VISIT
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 4

SOURCE
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL 1

## C SIGNATURE

Mrs Theopolis Pugsley

TOWN OF NEWFANE 5 CODE :292800

S-83-1-7 PP 7-1
PARCEL--10 CD
AC: 00030630.00
LOC: CATARIO ST N S RS 1
TYPE: 2EC LOT: 16.50 X 90.00
TOWN OF NEWFANE ~~SR-MARYANNE~~
OWNR: ~~R ELLIOTT ROBERT - CATHERINE~~
2896 TRANSIT RD
~~627 EAST STATE ST.~~
~~251 BELL ST~~
ADDRS: ~~BARBERTON OHIO~~ ~~44203~~
NEWFANE N.Y. 14108
SALE: PHONE - 216-753-7972 DATE: -

## D LAND DESCRIPTION

627 East State St
Barberton, Ohio
44203
#7500

LAND TYPE
01 — PRIMARY
02 — SECONDARY
03 — UNDEVELOPED
04 — RESIDUAL
05 — TILLABLE
E VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
08 — PASTURE
A ROTATING
B PERM
07 — WOODLAND
08 — WASTELAND
09 — MUCK
A 8 FT
B 3 TO 8 FT
C UNDER 3
10 — WATERFRONT
11 — ORCHARD
A
B
C
12 — REAR
13 — VINEYARDS
A 5 TONS
B 4 TONS
C UNDER 4 TONS
14 — WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 2

| LAND CODE | LAND TYPE | MEASUREMENT | | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|---|
| F | 10 | 16.50 | 0.00 | | | | |
| D | 10 | 89. | 0.00 | | | | |

## F CARD SEQUENCE

CARD __
OF __

## G SITE DESCRIPTION

PROPERTY CLASS
SITE NO
ZONING

NEIGHBORHOOD TYPE 1 RURAL 2 RURAL
CROSSROADS 3 SUBURBAN 4 URBAN 5 RES
SUBDIVISION 6 MIXED COMMERCIAL

ROAD 1 NONE 2 DIRT 3 GRAVEL 1
4 LOCAL PAVED 5 STATE
FRONTING TRAFFIC 1 LANDLOCKED
2 LIGHT 3 MEDIUM 4 HEAVY
BUILDING SET BACK 1 LESS THAN 30
2 30 to 60 3 MORE THAN 60

VIEW INFLUENCE 1 NONE
2 INFER 3 SUP
WATERFRONT 1 NONE 2 BAY
3 LAKE 4 RIVER CANAL 5 CREEK
SITE ELEVATION 1 BELOW STREET
2 EVEN 3 ABOVE STREET

SEWER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC
WATER 1 NONE 2 PRIVATE
3 COMMERCIAL 4 PUBLIC
OTHER UTILITIES 1 NONE 2 GAS
3 ELECTRIC 4 GAS/ELECTRIC

SITE COMPARED TO SURROUNDS 1 INFERIOR 2 TYPICAL 3 SUPERIOR
SITE DESIREABILITY 1 POOR 2 TYPICAL 3 SUPERIOR
LANDSCAPING 1 INFERIOR 2 TYPICAL 3 SUPERIOR
IMPROVEMENTS 1 NO 2 YES

## H LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CD
ROUTE NO 25
OWNER INCORRECT Conv 5.83-1-1
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION NOT VALID
SALE PRICE 7,500 DATE 6 9 85
BK 1961 Pg 335

## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3 STAMPS 4-AGENT
VALID SALE 0-NO 1-YES
DATA MATCH 1-NO 2-YES A/V 2005 - 4 [illegible]
SALES TYPE 1 LAND 2-BUILDING 3 LAND & BUILDING



Inc.

## A — YARD IMPROVEMENTS

| LINE # | STR CODE | MEA. CODE | DIMENSION 1 | DIMENSION 2 | NUMBER UNITS | GRADE | COND | YEAR BUILT/ INSTALLED | INT/EXT | FUNC. UTIL. | DEP. VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | OHI | | 120 | | 5 | C | 3 | 1967 | 1 | 3 | 011 |
| 02 | LP4 | | 35600 | | 1 | C | 3 | 1965 | 0 | 3 | |
| 03 | CP9 | | 600 | | 1 | C | 3 | 1953 | 0 | 3 | |
| 04 | CP5 | | 320 | | 2 | C | 3 | 1960 | 0 | 3 | |
| 05 | L38 | | 2275 | | 1 | C | 3 | 1953 | 0 | 3 | |
| 06 | APL | | 80 | 12 | 1 | C | 3 | 1953 | 0 | 3 | |

MEAS CODE: 1 = Quantity, 2 = Dimensions, 3 = Area, 4 = Dollars
CONDITION: 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good, 5 = Recond
INT/EXT: 0 = External, 1 = Internal
FUNC UTIL: 0 = None, 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good

## C — MEMORANDA

2 BALL DIAMONDS E API
2 HORSESHOE PITS E API

## B

TOWN OF NEWFANE CODE :292800

14.00-3-1
PARCEL--ID

FC
CD

AC: 00029930.00

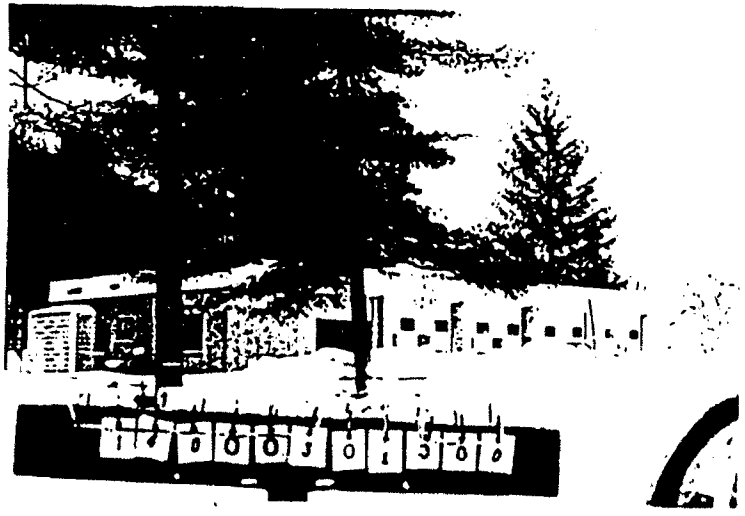
LOC: MAIN ST N&S SIDES RS E

TYPE: 593 LOT: 4587.00 X

OWNR: COUNTY TREASURER

COURTHOUSE
ADDRS: LOCKPORT N Y 14094

SALE: DATE: -



## DESCRIPTION

593
R29

1 = Central Business District
Commercial 4 = Urban
Demand 6 = Suburban
= Rural — 7

1 = Minimal Demand
3 = Normal Demand
5 = High Demand — 1

3 = Gravel
ate — 5

1 = None 2 = Light — 1

1 = Landlocked
4 = Heavy — 3

3 = Good — 3

1 = Inadequate On & Off
On & Off — 2

Conforming — 1

LANDSCAPING
1 = Inferior 2 = Typical 3 = Superior — 3

SEWER 1 = None 2 = Private
3 = Commercial 4 = Public — 2

WATER 1 = None 2 = Private
3 = Commercial 4 = Public — 4

OTHER UTILITIES
1 = None 2 = Gas 3 = Electric 4 = Gas+Elec — 4

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| A | 01 | 30.00 | | | | |
| A | 07 | 51.10 | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

KVS Information Systems Inc

## F — LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CB
ROUTE NO
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION
SITE NO 001
CARD SEQUENCE CARD 01 OF 03

## G — SALES VERIFICATION

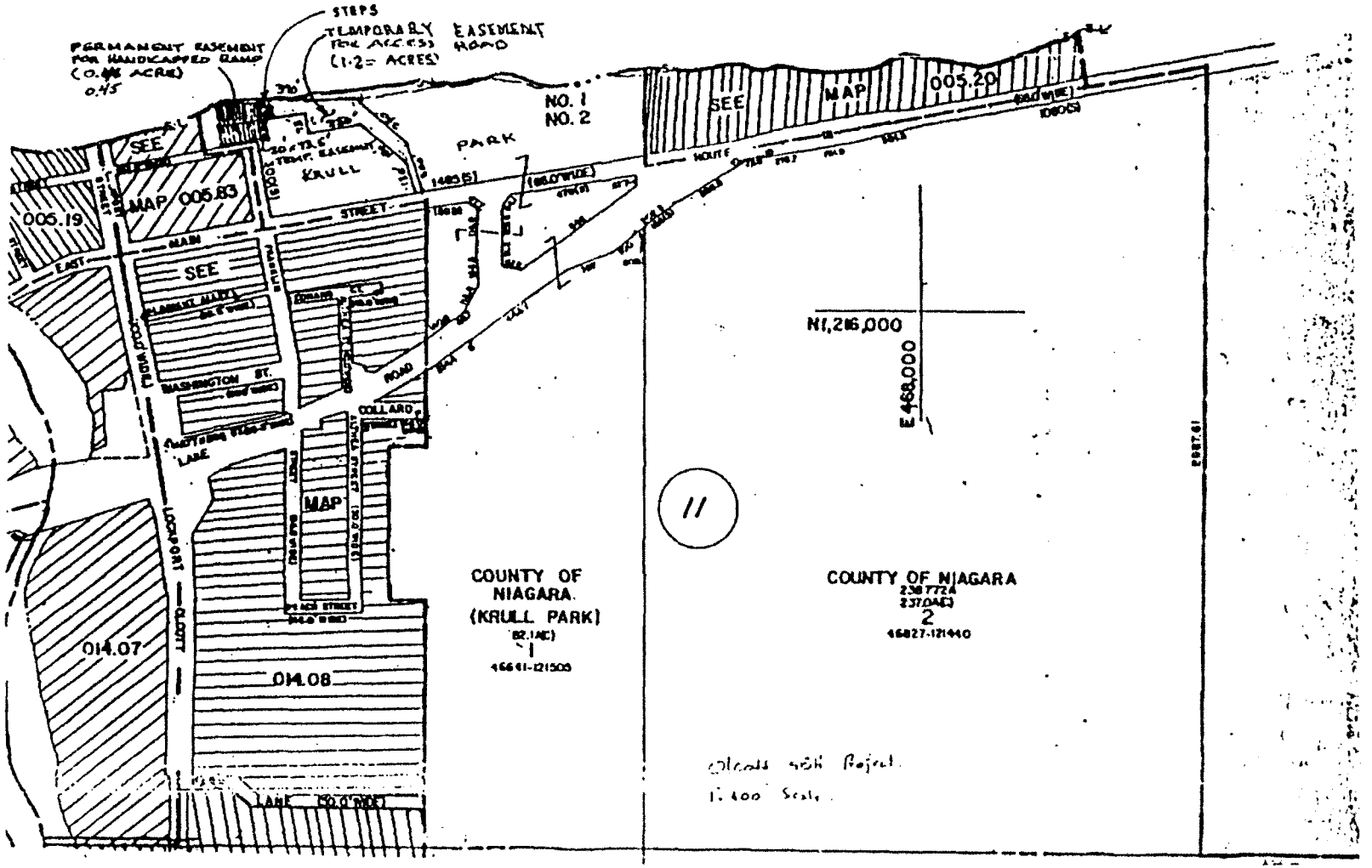
SALE PRICE DATE
SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT
VALID SALE 0 NO 1 YES
DATA MATCH 1 = NO 2 = YES
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING

## H — AUDIT CONTROL

MEASURED BY AWD DATE 12-12-80
LISTED BY AWD DATE 12-12-80
EDITED BY DATE

MEASURING & LISTING COMPLETED ON VISIT
1 FIRST 2 SECOND
3 THIRD 4 FOURTH — 1

SOURCE
1 OWNER 2 SPOUSE 3 TENANT
4 OTHER 5 ESTIMATE 6 TOTAL REFUSAL
7 INTERIOR REFUSAL EMPLOYEE — 4


STEPS
PERMANENT EASEMENT FOR HANDICAPPED RAMP (0.4% ACRE) 0.45
TEMPORARY EASEMENT FOR ACCESS ROAD (1.2± ACRES)
NO. 1
NO. 2
PARK
SEE MAP 005.20
SEE MAP 005.83
005.19
KRULL
STREET
MAIN
EAST
SEE
WASHINGTON ST.
COLLARD
LOCKPORT
LOCK
014.07
014.08
MAP
COUNTY OF NIAGARA (KRULL PARK)
COUNTY OF NIAGARA
N1,216,000
E468,000
Glenn Sill Project
1:400 Scale

## A — YARD IMPROVEMENTS

| LINE # | STR CODE | MEA CODE | DIMENSION 1 | DIMENSION 2 | NUMBER UNITS | GRADE | COND | YEAR BUILT/ INSTALLED | INT/EXT | FUNC. UTIL | DEP VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | OHI | | 120 | | 5 | C | 3 | 1967 | 1 | 3 | 011 |
| 02 | LPH | | 35600 | | 6 | C | 3 | 1965 | 0 | 3 | |
| 03 | CP9 | | 600 | | 2 | C | 3 | 1953 | 0 | 3 | |
| 04 | CP5 | | 320 | | 2 | C | 3 | 1960 | 0 | 3 | |
| 05 | L58 | | 2275 | | 1 | C | 3 | 1953 | 0 | 3 | |
| 06 | API | | 80 | 12 | 6 | C | 3 | 1953 | 0 | 3 | |

MEAS CODE: 1 = Quantity, 2 = Dimensions, 3 = Area, 4 = Dollars
CONDITION: 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good, 5 = Remodel
INT/EXT: 0 = Estimated, 1 = Interior
FUNC UTIL: 0 = None, 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good

## C — MEMORANDA

2 BALL DIAMONDS E API
2 HORSESHOE PITS E API

## B

TOWN OF NEWFANE CODE :292800

14.00-3-1
PARCEL--10

FC
CD

AC: 00029930.00

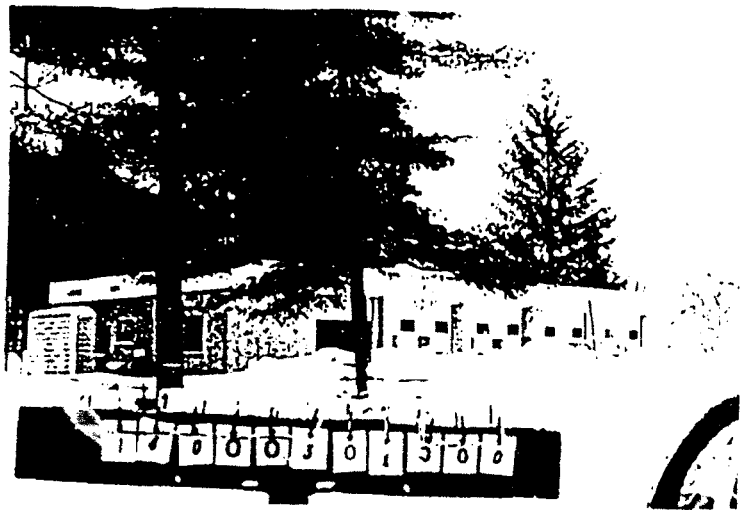
LOC: MAIN ST N&S SIDES

TYPE: 593 LOT: 4587.00 X

OWNR: COUNTY TREASURER

COURTHOUSE
ADDRS: LOCKPORT N Y 14094

SALE: DATE: -



## DESCRIPTION

593
R29

1 = Central Business District
Commercial 4 = Urban
Demand 6 = Suburban
= Rural — 7

1 = Minimal Demand
3 = Normal Demand
5 = High Demand — 1

3 = Gravel — 5

1 = None 2 = Light — 1

= Landlocked
4 = Heavy — 3

3 = Good — 2

1 = Inadequate On & Off
— 2

Condominium — 1

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | I | L | W |
|---|---|---|---|---|---|---|
| A | 01 | 30.00 | | | | |
| A | P7 | 51.10 | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

LANDSCAPING 1 = Inferior 2 = Typical 3 = Superior — 3

SEWER 1 = None 2 = Private 3 = Commercial 4 = Public — 2

WATER 1 = None 2 = Private 3 = Commercial 4 = Public — 4

OTHER UTILITIES 1 = None 2 = Gas 3 = Electric 4 = Gas/Elec — 4

KVS Information Systems, Inc

## F — LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CD
ROUTE NO
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION
SITE NO 001
CARD SEQUENCE CARD 01 OF 03

## G — SALES VERIFICATION

SALE PRICE DATE
SOURCE 1 BUYER 2 SELLER 3 STAMPS 4 AGENT
VALID SALE 0 NO 1 YES
DATA MATCH 1 = NO 2 = YES
SALES TYPE 1 LAND 2 BUILDING 3 LAND & BUILDING

## H — AUDIT CONTROL

MEASURED BY A.L.D. DATE 12-12-80
LISTED BY A.L.D. DATE 12-12-80
EDITED BY DATE

MEASURING & LISTING COMPLETED ON VISIT
1 - FIRST 2 SECOND
3 - THIRD 4 FOURTH — 1

SOURCE
1 OWNER 2 SPOUSE 3 TENANT
4 OTHER 5 ESTIMATE 6 TOTAL REFUSAL
7 INTERIOR REFUSAL EMPLOYEE — 4

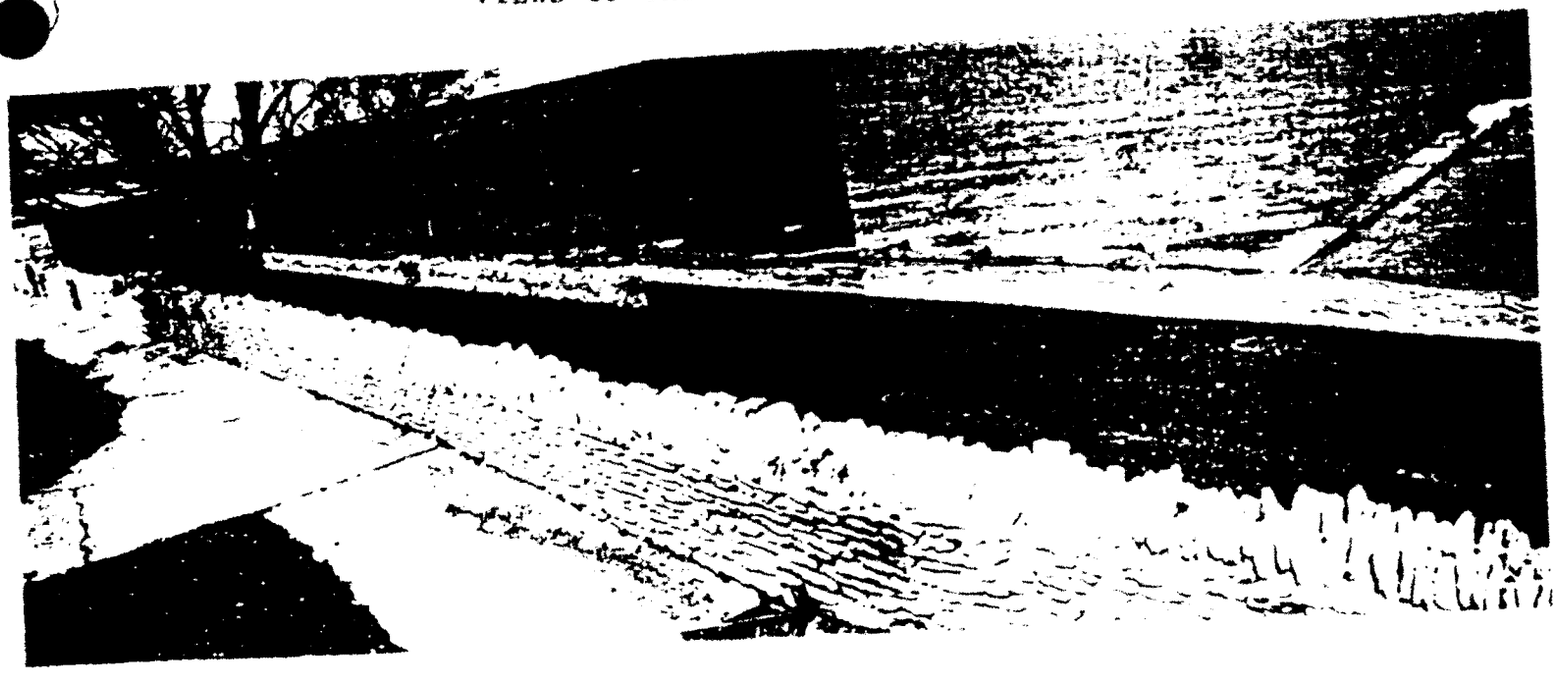
STEPS AND ACCESS AREA (AREA C)

VIEWS OF THE AREA
TO BE USED FOR THE BEACH ACCESS FOR THE HANDICAPPED
THE STAIR AREA (TEMPORARY EASEMENT)
AREA C

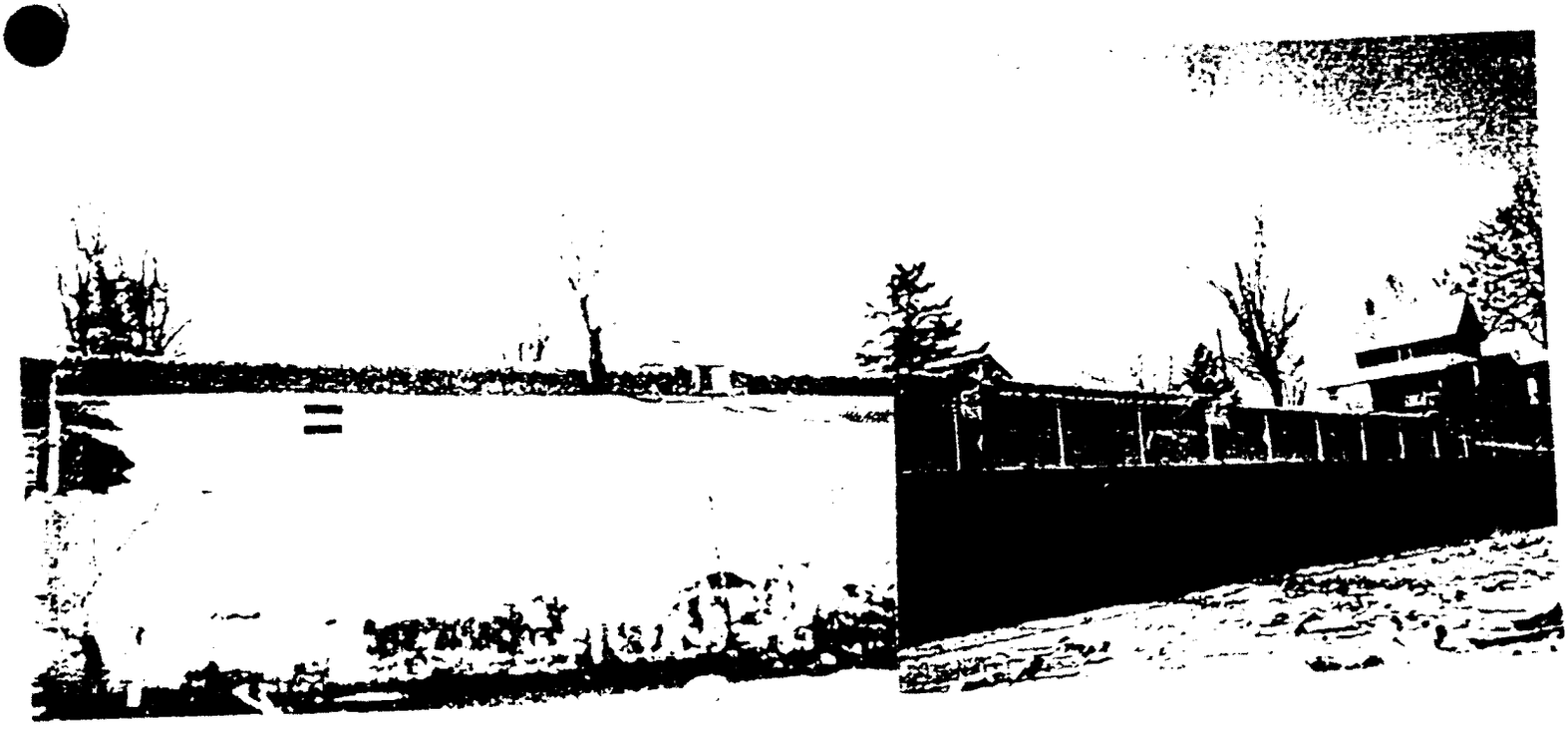




VIEWS OF THE TERRACED AREA CONT.



FROM STREET



FROM BEACH

VIEWS OF THE TERRACE AREA (PERMANENT EASEMENT)





KRULL PARK ACCESS AREA (AREA D)

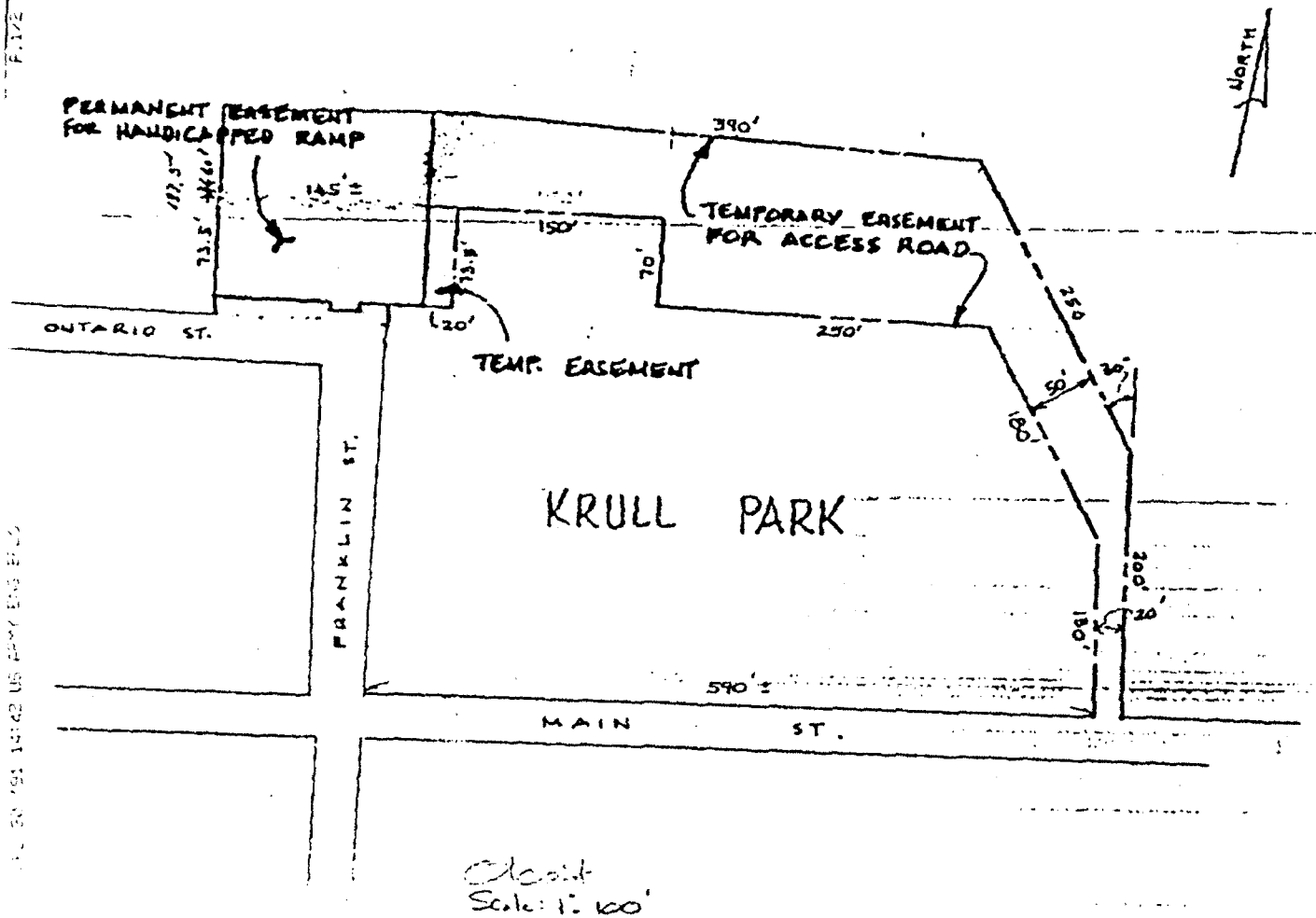
INGRESS AND EGRESS EASEMENT THROUGH KRULL PARK
AREA D



VIEW OF FLAT, GRASSY PICNIC AREA WHICH
WILL INCORPORATED INTO THE EASEMENT



VIEW OF PATH DOWN TO BEACH




Sketch
Scale: 1" = 100'

4.30.91

PACSIMILE HEADER SHEET
(SEE 101-1-3)

| | | | | |
|---|---|---|---|---|
| FROM (NAME) | OFFICE SYMBOL | TELEPHONE NO. 716 | AUTOVON | DTG |
| L. Bridges | CNRC-RE-B | 879 4112 | | 1/30/91 |
| TO (NAME AND ADDRESS) | OFFICE SYMBOL | TELEPHONE NO. | AUTOVON | PRECEDENCE |
| M. Tibbs | CEOAR-RE-F | 644 5037 | | |

SUBJECT

STANDARD FORM 41 (REV. 10-83)
PRESCRIBED BY GSA/ISSM 7010-00-000-5099

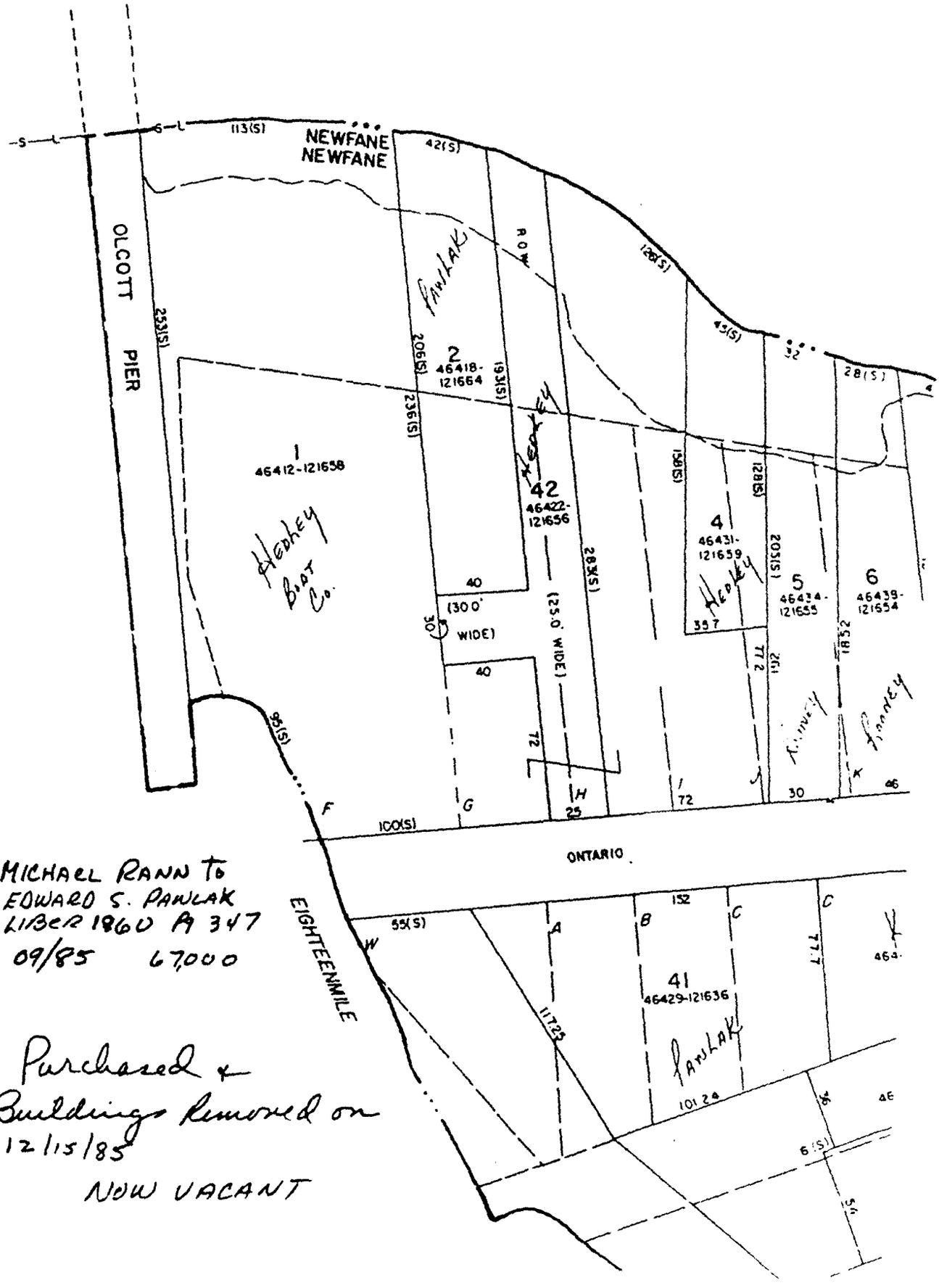
JAN '91 14:42 US ARMY ENG BLD F.1/2

# DISPOSAL AREA (AREA E)

VIEWS OF THE TOWN OF NEWFANE
DISPOSAL AREA
AREA E



VIEW SHOWS GRAVEL PITS




MICHAEL RANN TO
EDWARD S. PANLAK
LIBER 1860 P 347
09/85 67,000

Purchased +
Buildings Removed on
12/15/85
NOW VACANT

SALES INFORMATION

16-3

**A — YARD IMPROVEMENTS**

| LINE | STR CODE | MEA CODE | DIMENSION 1 | DIMENSION 2 | NUMBER UNITS | GRADE | COND | YEAR BUILT/ INSTALLED | INT/EXT | FUNC. UTIL. | DEP. VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
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MEAS CODE: 1 = Quantity; 2 = Dimensions; 3 = Area; 4 = Dollars
CONDITION: 1 = Poor; 2 = Fair; 3 = Normal; 4 = Good; 5 = Remod
INT/EXT: 0 = External; 1 = Internal
FUNC UTIL: 0 = None; 1 = Poor; 2 = Fair; 3 = Normal; 4 = Good

**MEMORANDA**

"BLACK STALLION"
1985 BLDG TORN DOWN.
Removed From Roll.
Land 100% Primary (2 Sites)

SIGNATURE: Sis Rep

**D — LAND DESCRIPTION**

LAND TYPE: 01 PRIMARY; 02 SECONDARY; 03 UNDEVELOPED; 04 RESIDUAL; 05 TILLABLE; A VEGETABLE; B GRAIN; C MAT. CORN; D SILAGE; 06 PASTURE; A ROTATING; B PERM; 07 WOODLAND; 08 WASTELAND; 09 MUCK; A 0 FT; B 3 TO 6 FT; C UNDER 3; 10 WATERFRONT; 11 ORCHARD; A; B; C; 12 NEAR; 13 VINEYARDS; A 5 TONS; B 4 TONS; C UNDER 4 TONS; 14 WETLANDS

LAND CODES: F FRONTAGE; D DEPTH; S SQUARE FEET; A ACREAGE; V VALUE

N NUMBER OF ENTRIES: 01

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| A | 01 | 7687.00 | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

B (1)

TOWN OF NEWFANE 5838 CODE :292000

5.82-1-41 PARCEL--ID — NN CD

AC: 00029750.00

LOC: ONTARIO ST S S — RS 1

TYPE: 425 LOT: 152.00 X 77.79

OWNR: PAWLAK, EDWARD S.

5851 ~~5810~~ ONTARIO ST

ADDRS: OLCOTT NY 14126

SALE: $60,000 DATE: 09-78

**E — SITE DESCRIPTION**

PROPERTY CLASS: 425
ZONING: R6

NEIGHBORHOOD TYPE 1 = Central Business District; 2 = CBD-Fringe; 3 = Urban Commercial; 4 = Urban Industrial; 5 = Suburban Demand; 6 = Suburban; 7 = Rural Crossroads; 8 = Rural — 7

NEIGHBORHOOD TREND 1 = Minimal Demand; 2 = Below Normal Demand; 3 = Normal Demand; 4 = Above Normal Demand; 5 = High Demand — 1

ROAD 1 = None; 2 = Dirt; 3 = Gravel; 4 = Local Paved; 5 = State — 4

PEDESTRIAN TRAFFIC 1 = None; 2 = Light; 3 = Medium; 4 = Heavy — 3

VEHICULAR TRAFFIC 1 = Landlocked; 2 = Light; 3 = Medium; 4 = Heavy — 2

ACCESSIBILITY 1 = Poor; 2 = Average; 3 = Good — 2

PARKING 0 = None; 1 = Inadequate On & Off; 2 = I/On A/Off; 3 = A/On I/Off; 4 = Adequate On & Off — 4

SITE DESIRABILITY 1 = Conforming; 2 = Non-Conforming — 1

LANDSCAPING 1 = Inferior; 2 = Typical; 3 = Superior — 2

SEWER 1 = None; 2 = Private; 3 = Commercial; 4 = Public — 4

WATER 1 = None; 2 = Private; 3 = Commercial; 4 = Public — 4

OTHER UTILITIES 1 = None; 2 = Gas; 3 = Electric; 4 = Gas/Elec — 4

KVS Information Systems, Inc.

**F — LABEL CORRECTION**

SWIS | SECTION | BLOCK | LOT | SUFFIX | CD

ROUTE NO. 1
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION 483
SITE NO. 001
CARD SEQUENCE CARD 1 OF 02

**G — SALES VERIFICATION** Liber & Page 1960 377

SALE PRICE 67000 DATE 85-09
SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT 1
VALID SALE 0-NO 1-YES 1
DATA MATCH 1=NO 2=YES A/V 8600 - 8600
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING 2



16-5

B 1

TOWN OF NEWFANE 5838 CODE :292800

5.82-1-41 NN
PARCEL--10 CO
AC: 0G029750.00
LOC: ONTARIO ST S S RS 1
TYPE: 425 LOT: 152.00 X 77.79
PAWLAK, EDWARD S.
OWNR:
5851
~~5838~~ ONTARIO ST
ADDRS: OLCOTT NY 14126
SALE: $60,000 DATE: 09-78

## A YARD IMPROVEMENTS

| LINE # | STR CODE | MEA CODE | DIMENSION 1 | DIMENSION 2 | NUMBER UNITS | GRADE | COND | YEAR BUILT/ INSTALLED | INT/EXT | FUNC. UTIL. | DEP. VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
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MEAS CODE: 1 = Footage, 2 = Dimensions, 3 = Area, 4 = Dollars
CONDITION: 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good, 5 = Remod.
INT/EXT: 0 = External, 1 = Internal
FUNC UTIL: 0 = None, 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good

## C MEMORANDA

BLACK STALLION
12/85 BLDG TORN DOWN
Removed From Roll.
Land 100% Primary (2 Sites)
SIGNATURE

## D LAND DESCRIPTION

LAND TYPE CODES: 01 PRIMARY, 02 SECONDARY, 03 UNDEVELOPED, 04 RESIDUAL, 05 TILLABLE, 1 VEGETABLE, A GRAIN, B HAY, CORN, C SILAGE, 06 PASTURE, 07 WOODLAND, 08 WASTELAND, 09 MUCK, 10 WATERFRONT, 11 ORCHARD, 12 REAR, 13 VINEYARDS, 14 WETLANDS
LAND CODES: F FRONTAGE, D DEPTH, S SQUARE FEET, A ACREAGE, V VALUE

N NUMBER OF ENTRIES 01

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| 1 | 01 | 7687.00 | | | | |
| | | | | | | |
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| | | | | | | |

## E SITE DESCRIPTION

PROPERTY CLASS 425
ZONING R6

NEIGHBORHOOD TYPE 1 = Central Business District, 2 = CBD-Fringe, 3 = Urban Commercial, 4 = Urban Industrial, 5 = Suburban Demand, 6 = Suburban, 7 = Rural Crossroads, 8 = Rural — 2

NEIGHBORHOOD TREND 1 = Minimal Demand, 2 = Below Normal Demand, 3 = Normal Demand, 4 = Above Normal Demand, 5 = High Demand — 2

ROAD 1 = None, 2 = Dirt, 3 = Gravel, 4 = Local Paved, 5 = State — 4

PEDESTRIAN TRAFFIC 1 = None, 2 = Light, 3 = Medium, 4 = Heavy — 3

VEHICULAR TRAFFIC 1 = Landlocked, 2 = Light, 3 = Medium, 4 = Heavy — 2

ACCESSIBILITY 1 = Poor, 2 = Average, 3 = Good — 2

PARKING 0 = None, 1 = Inadequate On & Off, 2 = I/On A/Off, 3 = A/On I/Off, 4 = Adequate On & Off — 4

SITE DESIRABILITY 1 = Conforming, 2 = Non-Conforming — 1

LANDSCAPING 1 = Inferior, 2 = Typical, 3 = Superior — 3

SEWER 1 = None, 2 = Private, 3 = Commercial, 4 = Public — 4

WATER 1 = None, 2 = Private, 3 = Commercial, 4 = Public — 4

OTHER UTILITIES 1 = None, 2 = Gas, 3 = Electric, 4 = Gas/Elec — 4

KVS Information Systems, Inc.
Buffalo, New York

## F LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CD
ROUTE NO. 1 — 7
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION — 418.3
SITE NO. — 001
CARD SEQUENCE CARD 1 OF 002

## G SALES VERIFICATION Liber 1960 347

SALE PRICE 67000 DATE 85.09
SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT 1
VALID SALE 0-NO 1-YES
DATA MATCH 1 = NO 2 = YES A/V 8600 - 8600
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING



## A YARD IMPROVEMENTS

| LINE # | STR CODE | MEA. CODE | DIMENSION 1 | DIMENSION 2 | NUMBER UNITS | GRADE | COND. | YEAR BUILT/ INSTALLED | INT/EXT | FUNC. UTIL. | DEP. VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (18) | BUILDINGS ALL DEMOLISHED AS OF MAY 10, 1986. RETAIN (1) SEWER UNIT ON PROPERTY & (1) REFUSE. PROPERTY LEASED TO TOWN OF NEWFANE FOR $1.00 BY LEASE DATED 5/14/86. FOR PARKING LOT | | | | | | | | | | |

MEAS CODE: 1 = Quantity, 2 = Dimensions, 3 = Area, 4 = Dollars
CONDITION: 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good, 5 = Remod
INT/EXT: 0 = External, 1 = Internal
FUNC UTIL: 0 = None, 1 = Poor, 2 = Fair, 3 = Normal, 4 = Good

## C MEMORANDA

① COTTAGES-SAME USED YR-ROUND MUST EXAMINED ONLY — INDIVIDUALLY OWNED HSES
② LAND RENT 175 p/yr + TAXES
③ 417A
④ NO COMM. IMPROVEMENTS ALL STRUCTURES LISTED ON RES. CARDS
⑤ LAND ONLY THIS SITE

Robert Grant
Lucille M. Grant

SIGNATURE Daniel J. Cannon

## D LAND DESCRIPTION

LAND TYPE ALL PRIMARY

LAND CODES

| | | | |
|---|---|---|---|
| 01 — PRIMARY | 06 — PASTURE: A - ROTATING, B - PERM | 11 — ORCHARD: A, B, C | F FRONTAGE |
| 02 — SECONDARY | | | D DEPTH |
| 03 — UNDEVELOPED | | | S SQUARE FEET |
| 04 — RESIDUAL | 07 — WOODLAND | | A ACREAGE |
| 05 — TILLABLE: E - VEGETABLE, A - GRAIN, B - HAY CORN, C - SILAGE | 08 — WASTELAND | 12 — REAR | V VALUE |
| | 09 — MUCK: A - 8 FT, B - 3 TO 8 FT, C - UNDER 3' | 13 — VINEYARDS: A - 5 TONS, B - 4 TONS, C - UNDER 4 TONS | |
| | 10 — WATERFRONT | 14 — WETLANDS | |

N NUMBER OF ENTRIES 01

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| A | 01 | 40. | | | | |
| | | . | | | | |
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| | | . | | | | |

## E SITE DESCRIPTION

PROPERTY CLASS
ZONING K6

NEIGHBORHOOD TYPE 1 = Central Business District, 2 = CBD-Fringe, 3 = Urban Commercial, 4 = Urban Industrial, 5 = Suburban Demand, 6 = Suburban, 7 = Rural Crossroads, 8 = Rural — 7

NEIGHBORHOOD TREND 1 = Minimal Demand, 2 = Below Normal Demand, 3 = Normal Demand, 4 = Above Normal Demand, 5 = High Demand — 1

ROAD 1 = None, 2 = Dirt, 3 = Gravel, 4 = Local Paved, 5 = State — 4

PEDESTRIAN TRAFFIC 1 = None, 2 = Light, 3 = Medium, 4 = Heavy — 2

VEHICULAR TRAFFIC 1 = Landlocked, 2 = Light, 3 = Medium, 4 = Heavy — 2

ACCESSIBILITY 1 = Poor, 2 = Average, 3 = Good — 3

PARKING 0 = None, 1 = Inadequate On & Off, 2 = I/On A/Off, 3 = A/On I/Off, 4 = Adequate On & Off — 3

SITE DESIRABILITY 1 = Conforming, 2 = Non-Conforming — 1

LANDSCAPING 1 = Inferior, 2 = Typical, 3 = Superior — 2

SEWER 1 = None, 2 = Private, 3 = Commercial, 4 = Public — 4

WATER 1 = None, 2 = Private, 3 = Commercial, 4 = Public — 4

OTHER UTILITIES 1 = None, 2 = Gas, 3 = Electric, 4 = Gas/Elec. — 4

KVS KVS Information Systems, Inc. Buffalo, New York

(2) TOWN OF NEWFANE 595 CODE :292800
mike 778-8362
S.83-1-28 PARCEL--ID
RS CD 75
AC: 00030460-00
LOC: ONTARIO ST S S RS 1
TYPE: 417 LOT: 132.00 X 132.00
OWNR: KENYON, William G II, KEVIN, Timothy & ROSATI, STACY
1149 LINCOLN AVE
~~5851 ONTARIO ST~~
ADDRS: ~~ELCOTT RT~~ LOCKPORT, N.Y. ~~14126~~ 14094
SALE: 1.00 NOT VALID LIBER-2300 PG-62 DATE: 12-90

## F LABEL CORRECTION

SWIS
SECTION | BLOCK | LOT | SUFFIX | CD
ROUTE NO 18
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
PROPERTY CLASSIFICATION
SITE NO. #2-18 001
CARD SEQUENCE CARD 01 OF 18

## G SALES VERIFICATION

SALE PRICE $60000 DATE 05.86
SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT 1
VALID SALE 0-NO 1-YES 1
DATA MATCH 1 = NO 2 = YES BK 1994 PG 249
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING

## H AUDIT CONTROL

MEASURED BY HES DATE 11-07-80
LISTED BY HES DATE 11-07-80
EDITED BY DATE

MEASURING & LISTING COMPLETED ON VISIT
1 - FIRST 2 - SECOND 3 - THIRD 4 - FOURTH 3

SOURCE:
1 - OWNER 2 - SPOUSE 3 - TENANT 4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL 7 - INTERIOR REFUSAL 3

## I BUILDING-SECTION GENERAL DESCRIPTION

BUILDING NUMBER

SECTION NUMBER

YEAR BUILT

BUILT AS (Property Class)

USED AS (Property Class)

EXTERIOR CONDITION 1 = Poor 2 = Fair
3 = Normal 4 = Good 5 = Excellent

FUNCTIONAL UTILITY 0 = None 1 = Poor
2 = Fair 3 = Normal 4 = Good

ROOF TYPE 00 = No Roof 01 = Flat
02 = Irregular 03 = Gable 04 = Indust.
05 = Shed 06 = Arch. 07 = A-Frame

ROOF MATERIAL 00 = Undetermined 01 = Built-Up
02 = Shingles 03 = Roll Comp. 04 = Metal
05 Fiberglass/Plastic 06 = Slate/Tile

FRAME TYPE 00 = None 01 = Fireproof Steel
02 = Reinfcd. Conc. 03 = Non Fireproof Steel
04 = Masonary 05 = Wood 06 = Light Metal

GRADE A = Expensive B = Good
C = Average D = Economy E = Minimum

GRADE MODIFIER

SECTION PERIMETER

BASEMENT PERIMETER

## J EXTERIOR WALL DESCRIPTION

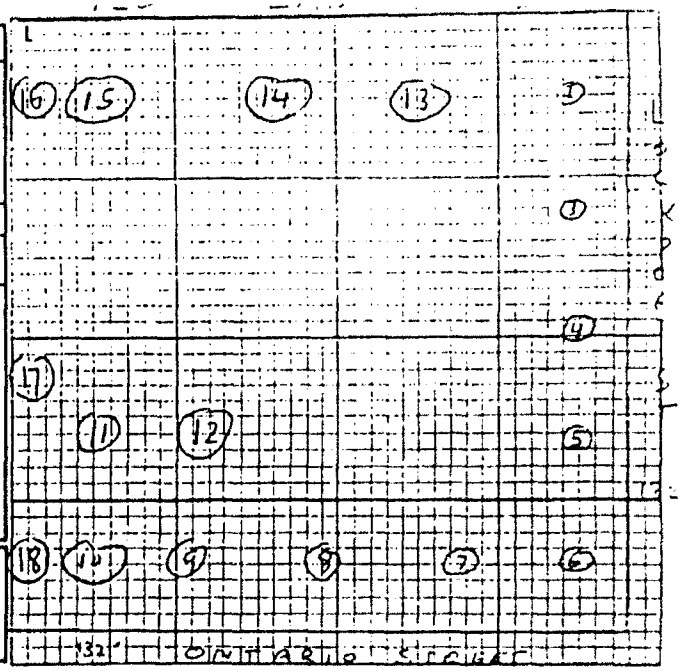
EXT WALL MAT
01 = STONE FRONT
02 = CONC BLK
03 = BRICK/STONE
04 = FRAME
05 = GLASS
06 = CONC WALLS
07 = PRECAST
08 = METAL SANDWICH

EXT FACING MAT
01 = BRICK OR VENEER
02 = WOOD/METL FRAME
03 = CERAMIC TILE
04 = STONE TERRAZZO
05 = GLASS VITRO
06 = MARBLE
07 = GRANITE
08 = STUCCO
09 = ROLLED ASPHALT

| EXTERIOR WALLS | | | FACING (ON WALLS) | | |
|---|---|---|---|---|---|
| MAT. | LINEAL FEET | HT. | MAT. | LINEAL FEET | HT. |
| | | | | | |
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WALL TYPE 00 = None 01 = Prefab Metal
02 = Frame 03 = Conc Block 04 = Brick/Frame
05 = Brk/Masonry or Pre-Cast Concrete
06 = Reinforced Concrete
07 = Panel, Glass or Metal Sandwich
08 = Tilt-Up Panel

L




## K STRUCTURES INDIVIDUALLY OWNED, ALL RES. - VIEW PARCEL INTERIOR DESCRIPTION ○ = SITE # CARD # ①=ALL LAND

| LINE # | LOCATION STORY FROM | TO | HT PER STY | AREA PER STORY | INT COND | FUNC UTILITY | INTERIOR FINISH | FLOOR COVER | CEILING COVER | PART | FLOOR CONSTR | PLUMB WATER | LIGHT | HEAT | HEAT TYPE | AIR COND | A/C TYPE | SPRINK | SPRINK TYPE | USED AS | UNIT TYPE | NO UNITS | USED AS | UNIT TYPE | NO UNITS | USED AS | UNIT TYPE | NO UNITS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | 417A | 02 | 13 | 417A | 03 | 4 | | | |
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INTERIOR CODES

FROM TO
A = ATTIC
B = BASEMENT
C = CRAWL SPACE
M = MEZZANINE
P = PENTHOUSE

PARTITIONS
P = NONE
1 = BELOW NORMAL
2 = NORMAL
3 = ABOVE NORMAL

CONDITION
1 = POOR
2 = FAIR
3 = NORMAL
4 = GOOD
5 = EXCELLENT

FUNCTIONAL UTILITY
0 = NONE
1 = POOR
2 = FAIR
3 = NORMAL
4 = GOOD

INTERIOR FINISH
0 = NONE
1 = 25%
2 = 50%
3 = 75%
4 = 100%
5 = 125%

FLOOR COVER
0 = NONE
1 = WOOD
2 = HOT ASPHYL ASHES
3 = HOT ORG CER
4 = SEAL FLAGSTONE
5 = TERRAZZO

CEILING COVER
0 = NONE
1 = NONE PAINTED
2 = DRYWALL
3 = PLASTER
4 = ACOUS TILE
5 = ACOUS PANEL

FLOOR CONSTR
00 = NONE
01 = CONC REINFORCED
02 = WOOD ON WOOD
03 = STEEL JOISTS
04 = CONC MAS ON GRND
05 = STEEL BEAMS
06 = HEAVY WOOD PLANK
07 = METAL DECKING

PLUMBING PIPING
0 = NONE
1 = MINIMUM
2 = AVERAGE
3 = LARGE

LGT HEAT A/C SPRINKLER
00 = NONE
1 = 25%
2 = 50%
3 = 75%
4 = 100%
5 = 125%

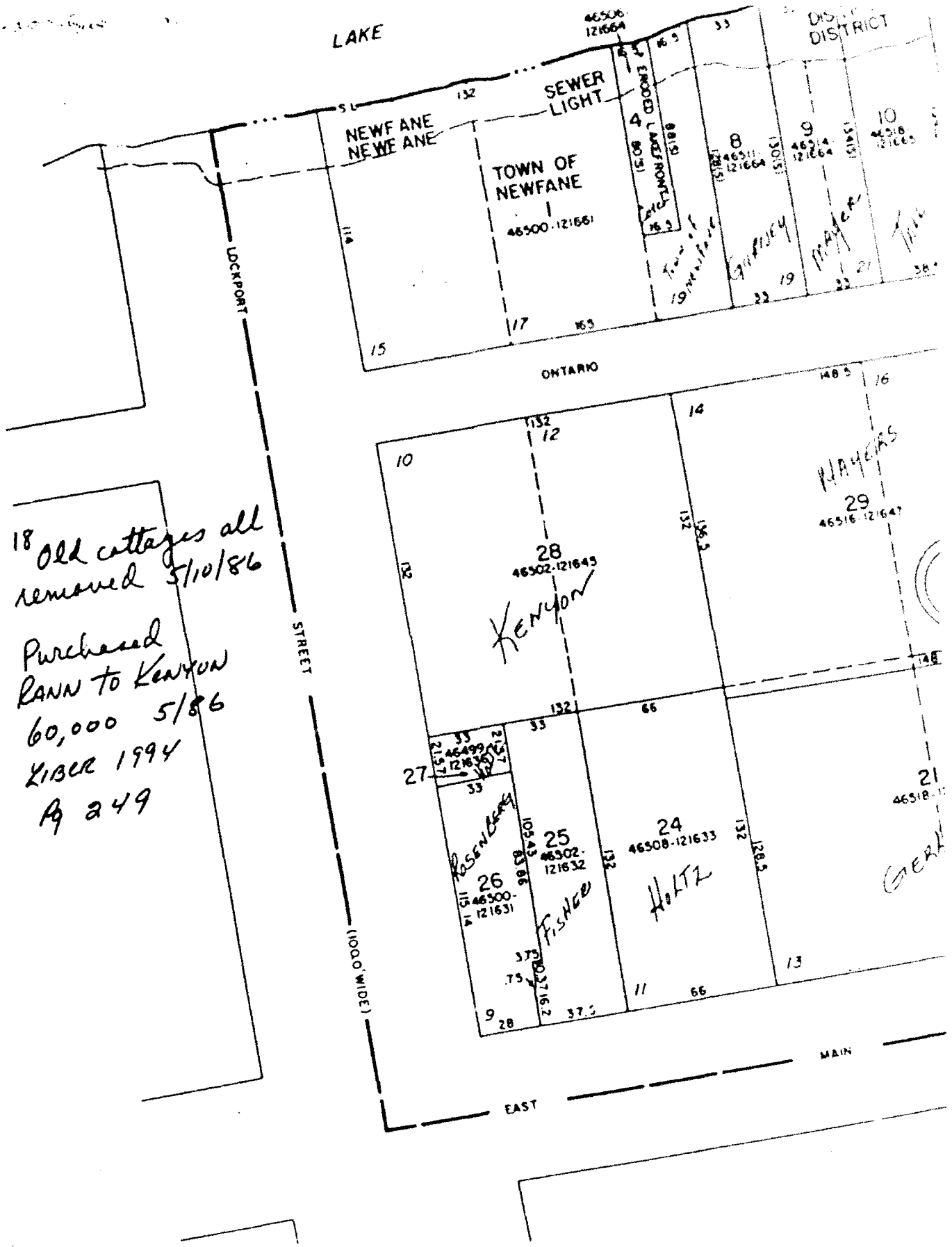
HEATING TYPE
0 = NONE
1 = HOT AIR
2 = HOT WATER/STEAM
3 = UNIT HEATERS
4 = ELECTRIC

AIR COND TYPE
0 = NONE
1 = CENTRAL
2 = UNIT/ROOM
3 = EVAPORATIVE COOLING

SPRINKLER TYPE
0 = NONE
1 = WET
2 = DRY
3 = COMBO

TYPE CODES
01 = A/P
02 = OFFICE
03 = STORE
04 = DEPT STORE
05 = SUPERMKT
06 = SHOPPING CTR
07 = RESTAURANT
08 = FOOD SERV
09 = DRIVE-IN
10 = WAREHOUSE
11 = MINI WHSE
12 = LOFT/WHSE
13 = FACTORY
14 = LAB
15 = HOSPITAL
16 = MED OFFICE
17 = CLINIC
18 = NURSING HOME
19 = CONV HOME
20 = HOTEL
21 = MOTEL
22 = CLUB/LODGE
23 = REST HOME
24 = THEATER
25 = AUDITORIUM
26 = BOWLING
27 = ARENA
28 = RACE TRACK
29 = GOLF COURSE
30 = TOURIST ATTR
31 = CAMP
32 = TRAILER PK
33 = MARINA
34 = RES/REC CLUB
35 = PARK
36 = CEMETERY
37 = SERVICE STA
38 = AIRPORT
39 = BUS TERM
40 = MORTUARY
41 = COMM GARAGE
42 = PARKING LOT
43 = CULTURAL
44 = RELIGIOUS
45 = SCHOOL
46 = PRIVATE SCH
47 = COLLEGE
48 = PRIVATE COL
49 = TRADE SCH
50 = LIBRARY
51 = MUSEUM
52 = HISTORICAL
53 = GOVERNMENT
54 = MISC IMPR
55 = MISC IMPR
56 = MISC IMPR
57 = MISC IMPR
58 = MISC IMPR
59 = MISC IMPR
60 = MISC IMPR
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93 = MISC IMPR
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95 = MISC IMPR
96 = MISC IMPR
97 = MISC IMPR
98 = MISC IMPR
99 = MISC IMPR

**KVS** Information Systems, Inc.
Buffalo, N.Y
Copyright © 1980


LAKE
SEWER LIGHT
NEWFANE
NEWFANE
TOWN OF NEWFANE
46500-121661
LOCKPORT STREET (100' WIDE)
ONTARIO
EAST MAIN
DISTRICT
4
8
9
10
28
46502-121645
KENYON
29
46516-121647
27
46499-121635
26
46500-121631
25
46502-121632
FISHER
24
46508-121633
HALTZ
21
18 old cottages all removed 5/10/86
Purchased RANN TO KENYON 60,000 5/86
LIBER 1994
PG 249

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Horses & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—800
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY ____ DATE __-__-__
LISTED BY LS,M DATE 06-01-81
EDITED BY P.L.S. DATE 06-01-81

MEASURING & LISTING COMPLETED ON VISIT:
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 1

SOURCE:
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL 4

## C SIGNATURE

(3) 14.-1-51.1 8-E

Loc: Fkpl Olcott Rd 1617-LORd
Olcott Post Office --
~~McDonough James~~
~~1568 Lockport St~~
~~Olcott N.Y. 14126~~
United States Postal Service
P.O. Box 8601-
Philadelphia, Pa. 19197-0100

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E VEGETABLE
A GRAIN
B HAY CORN
C SILAGE
06—PASTURE
A - ROTATING
B - PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A - 8 FT
B - 3 TO 8 FT
C - UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A - 5 TONS
B - 4 TONS
C - UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | B | L | W |
|---|---|---|---|---|---|---|
| F | 01 | 100.00 | | | | |
| D | 01 | 208.00 | | | | |
| | | | | | | |
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## F CARD SEQUENCE

CARD ____
OF ____

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO. ____
ZONING R6

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL
CROSSROADS 3-SUBURBAN 4-URBAN 5-RES
SUBDIVISION 6-MIXED COMMERCIAL 2

ROAD 1-NONE 2-DIRT 3-GRAVEL
4-LOCAL PAVED 5-STATE 4

FRONTING T. AFFIC 1-LANDLOCKED
2 LIGHT 3-MEDIUM 4-HEAVY 3

BUILDING SET BACK 1-LESS THAN 30'
2-30 to 60' 3-MORE THAN 60' ____

VIEW INFLUENCE 1-NONE
2-INFER 3-SUP. 1

WATERFRONT 1-NONE 2-BAY
3-LAKE 4-RIVER CANAL 5-CREEK 1

SITE ELEVATION 1-BELOW STREET
2-EVEN 3-ABOVE STREET 2

SEWER 1-NONE 2-PRIVATE
3 COMMERCIAL 4-PUBLIC 4

WATER 1-NONE 2-PRIVATE
3-COMMERCIAL 4-PUBLIC 4

OTHER UTILITIES 1-NONE 2-GAS
3-ELECTRIC 4-GAS/ELECTRIC 4

SITE COMPARED TO SURROUNDS 1-INFERIOR
2-TYPICAL 3 SUPERIOR 2

SITE DESIREABILITY
1 POOR 2 TYPICAL 3 SUPERIOR 2

LANDSCAPING
1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

IMPROVEMENTS 1 NO 2 YES 1

## H LABEL CORRECTION

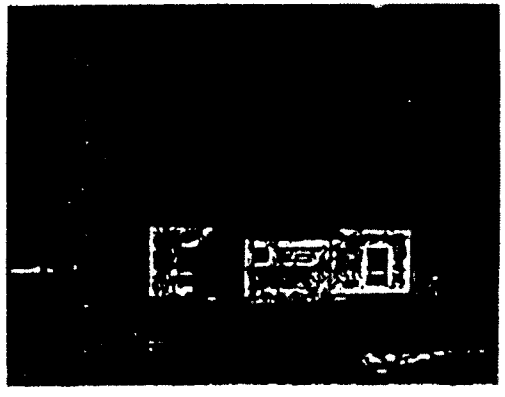
SWIS 292802

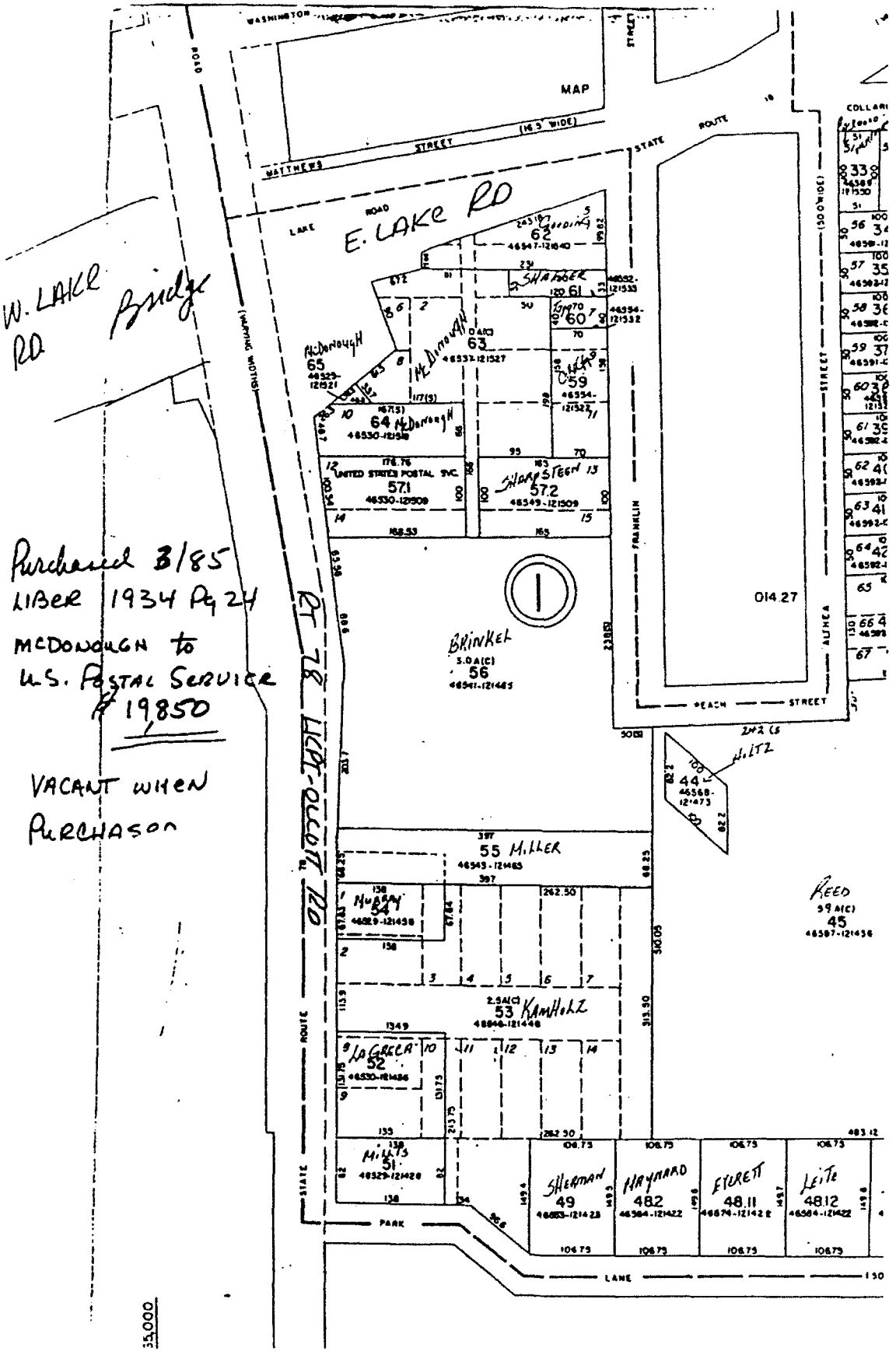
14.08 SECTION | 1. BLOCK | 57.001 LOT | ____ SUFFIX | SU CO

ROUTE NO 5,1,A
OWNER INCORRECT ____
PROPERTY ADDRESS INCORRECT ____
PROPERTY CLASSIFICATION 311
SALE PRICE ____ DATE __.__

## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT ____
VALID SALE 0-NO 1-YES ____
DATA MATCH 1-NO 2-YES ____






Purchased 3/85
LIBER 1934 Pg 24
McDONOUGH to
U.S. POSTAL SERVICE
$19850

VACANT WHEN
PURCHASED

## A PROPERTY CLASSIFICATION CODES

**AGRICULTURE—100**
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

**RESIDENTIAL—200**
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

**VACANT LAND—300**
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural, 10 Acres or Less
321—Abandon Agricultural
322—Rural Res. 10 Ac. or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

**COMMERCIAL—400**
483—Partial Residential Use

**WILD & FORESTED—900**
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

(4)

MEASURED BY ____ DATE __-__-__
LISTED BY CWS DATE 02-16-88
EDITED BY RTK DATE 06-20-88

MEASURING & LISTING COMPLETED ON VISIT:
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 1

SOURCE:
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL 1

## C SIGNATURE

433-6850 6 N
TOWN OF NEWFANE 5MM5 CODE :292800

5.19-2-1 LO
PARCEL--ID CD
AC: 00030370.00
LOC: BEACH ST N S RS I
TYPE: ~~311~~ 313 LOT: 58.25 X 179.00
OWNR: ~~HAEL, MARGARET L~~ Town of Newfane - Town Hall
2896 Transit Rd.
Newfane, N.Y. 14108
~~28 LINCOLN DRIVE~~
ADDRS: ~~LOCKPORT NY~~ ~~14094~~
SALE: 26,500. Liber-2229. Pg-109 DATE: 11-89

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E - VEGETABLE
A - GRAIN
B - HAY CORN
C - SILAGE
06—PASTURE
A - ROLLING
B - FLAT
07—WOODLAND
08—WASTELAND
09—MUCK
A - 8 FT
B - 3 TO 8 FT
C - UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A - 5 TONS
B - 4 TONS
C - UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 04

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| F | 10 | 59.00 | | | | |
| D | 10 | 177.00 | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
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## F CARD SEQUENCE

CARD __
OF __

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO. ____
ZONING R16

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL CROSSROADS 3-SUBURBAN 4-URBAN 5-RES. SUBDIVISION 6-MIXED COMMERCIAL 2

ROAD 1-NONE 2-DIRT 3-GRAVEL 4-LOCAL PAVED 5-STATE 4

FRONTING TRAFFIC 1-LANDLOCKED 2-LIGHT 3-MEDIUM 4-HEAVY 2

BUILDING SET BACK 1-LESS THAN 30' 2-30 to 60' 3-MORE THAN 60' __

VIEW INFLUENCE 1-NONE 2-INFER 3-SUP 3

WATERFRONT 1-NONE 2-BAY 3-LAKE 4-RIVER CANAL 5 CREEK 3

SITE ELEVATION 1-BELOW STREET 2-EVEN 3-ABOVE STREET 2

SEWER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 4

WATER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 4

OTHER UTILITIES 1-NONE 2-GAS 3-ELECTRIC 4-GAS/ELECTRIC 4

SITE COMPARED TO SURROUNDS 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

SITE DESIREABILITY 1-POOR 2-TYPICAL 3-SUPERIOR 3

LANDSCAPING 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

IMPROVEMENTS 1-NO 2-YES 1

## H LABEL CORRECTION

SWIS ____
SECTION __ BLOCK __ LOT __ SUFFIX __ CD __
ROUTE NO. 10
OWNER INCORRECT __
PROPERTY ADDRESS INCORRECT __
PROPERTY CLASSIFICATION 313
SALE PRICE ____ DATE __.__

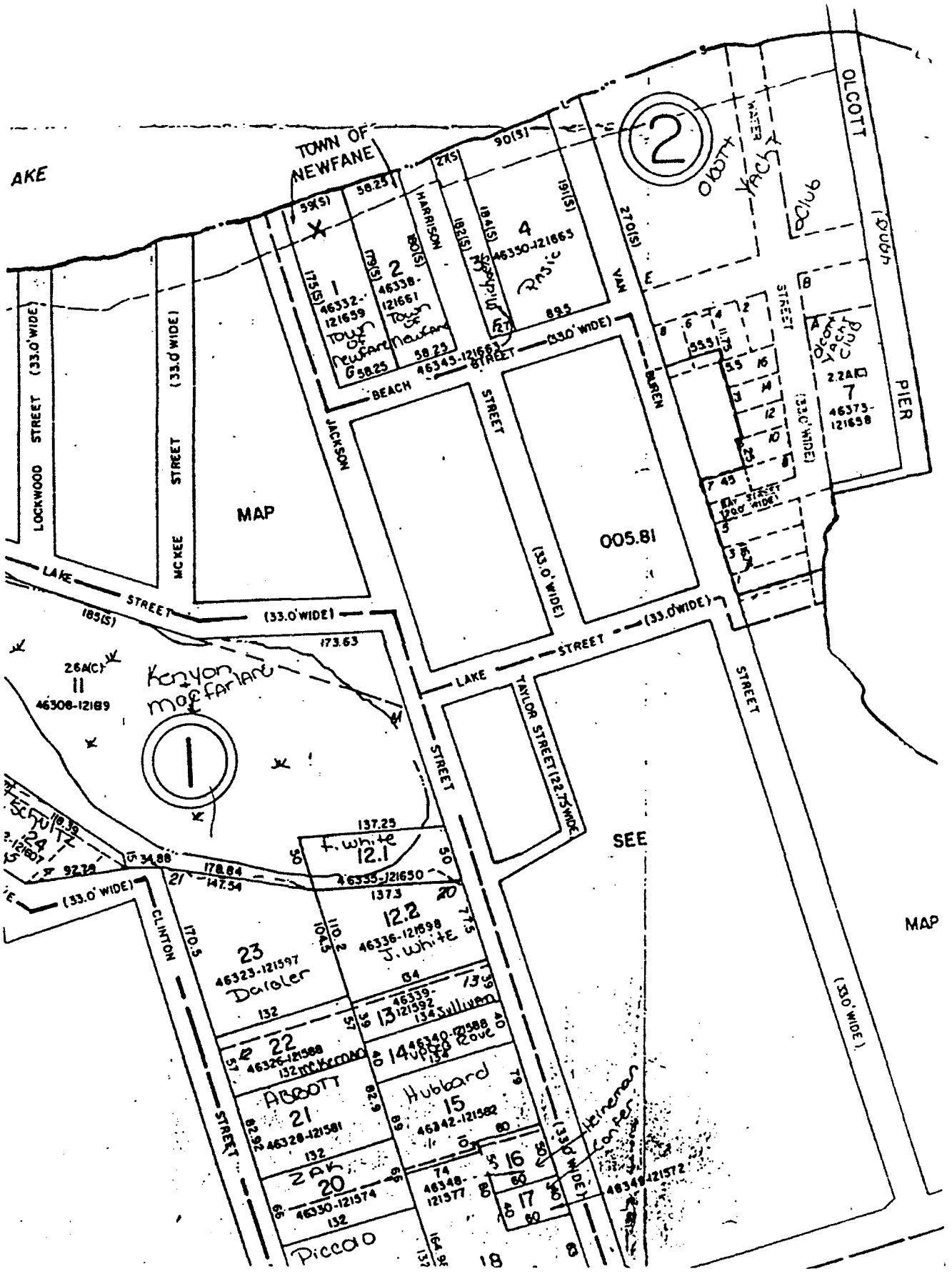
## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT __
VALID SALE 0-NO 1-YES __
DATA MATCH 1-NO 2-YES __
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING __

## J SALES NOTES

—

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM


TOWN OF NEWFANE
LAKE
OLCOTT
PIER
LOCKWOOD STREET (33.0' WIDE)
MCKEE STREET (33.0' WIDE)
JACKSON STREET
VAN BUREN STREET (33.0' WIDE)
BEACH STREET
LAKE STREET (33.0' WIDE)
TAYLOR STREET (22.75' WIDE)
CLINTON STREET
MAP
005.81
SEE MAP
1
2
4
7
11
12.1
12.2
13
14
15
16
17
20
21
22
23
Kenyon McFarland
J. White
Hubbard
Arbott
Piccard
Heineman Center
Water Tank
Pump House

(5) BEACH ST NS 5N

EA3100 (6/82)

NEW YORK STATE
DIVISION OF EQUALIZATION AND ASSESSMENT
BUREAU OF LOCAL ASSESSMENT SERVICES

RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

Swis: | Tax Map Number: 5.19-2-2 | CO: | RSEC: 1

Owner: TOWN OF NEWFANE | Prop Class: 313 | HC:

Location No: 2896 | Location: TRANSIT RD, NEWFANE | Sch Dist:

Sale Price: 26500 | Sale Date: 8/4/89 | Valid: 8/89 | Lot Size: 9211 224

PARCEL IDENTIFICATION CORRECTION AREA

| Swis | Tax Map No | Owner | Prop Class | Lot No | Loc | School Dist | Lot Size |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — Number of Sites (NUMSITE)

| Visit No (VISITS) | Lister Information (LSTINF) Collector | Date (MMDDYY) | Time | Activity | Entry (ENTRY) | Source (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

Quality Control (QCBY): Review Completed | Date

Certified Letter (CTFLET) | Date (MMDDYY)

**SALES INFORMATION SECTION** — Office Use Only

| Date (SALDTE) YYMM | Price (SALPRC) | Type (SALTYP) | Source (VERIFY) | Valid (VALID) | Check | Source 2 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Audit Control Codes

Activity
N = None
M = Measured Entry
L = Listed

Entry (ENTRY)
1 = Interior Inspection
2 = Interior Refusal
3 = Total Refusal
4 = Estimate
5 = Previous

Source (INFSCE)
1 = Owner
2 = Relative
3 = Tenant
4 = Other

Sales Information Codes

Sales Type (SALTYP)
1 = Land Only
2 = Bldg Only
3 = Land & Bldg

Source (VERIFY)
1 = Determination
2 = Buyer
3 = Seller
4 = Stranger
5 = Agent

Valid (VALID)
1 = Valid Sale
2 = Invalid Sale

SWIS/SBL/CD: 292800 5.19-2-2 | Card No ___ of ___

| | | |
|---|---|---|
| Home Number | (HOMENO) | 4,0,0,0 |
| Neighborhood Code | (NBHD) | 24 |
| Zoning Code | (ZONING) | 03 |

Zoning Codes: 01 = None; 04 = Farm; 07 = Multi; 02 = Single Res; 05 = Commercial; 08 = Commercial; 03 = Multi Res; 06 = Industrial; 09 = Governmental

**SITE INFORMATION SECTION** — Site Number: 01 | Property Class (PRCLAS): 313

| | | | | | | |
|---|---|---|---|---|---|---|
| Neighborhood Type | (NBHTYP) | 1 = Rural | 2 = Suburban | 3 = Urban | 4 = Commercial | 1 |
| Road Type | (ROAD) | 1 = None | 2 = Unimproved | 3 = Improved | | 3 |
| Traffic | (TRAF) | 1 = Heavy | 2 = Medium | 3 = Light | 4 = Land locked | 3 |
| Driveway | (DRVWAY) | 1 = None | 2 = Unimproved | 3 = Improved | | 1 |
| Sewer | (SEWER) | 1 = None | 2 = Private | 3 = Comm/Public | | 3 |
| Water | (WATER) | 1 = None | 2 = Private | 3 = Comm/Public | | 3 |
| Other Utilities | (UTIL) | 1 = None | 2 = Gas | 3 = Electric | 4 = Gas and Electric | 4 |
| Site Elevation | (ELEV) | 1 = Below Grade | 2 = Level | 3 = Above Grade | | 2 |
| Site Desirability | (SITDSN) | 1 = Inferior | 2 = Typical | 3 = Superior | | 3 |
| Setback | (SETBCK) | | | | | |
| Physical Change | (PHYCHG) | 1 = Res Const | 2 = Imp Const | 3 = Res Demo | 4 = Imp Demo | |

SALES NOTES

NOTES: LOT 58.25 x 179.

**LAND BREAKDOWN SECTION**

| Land Type (LNDTYP) | Eff. Code (EFFCD) | Front Feet (FRNTFT) | Depth (DEPTH) | Acres (ACRES) | Square Feet (SQFEET) | Soil Rating (RATING) | Waterfrontage (WTRFNT) | Waterfront Type (WTRFNT) | Influence Code (INFLCD) | Influence Percent (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | 58 | 179 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

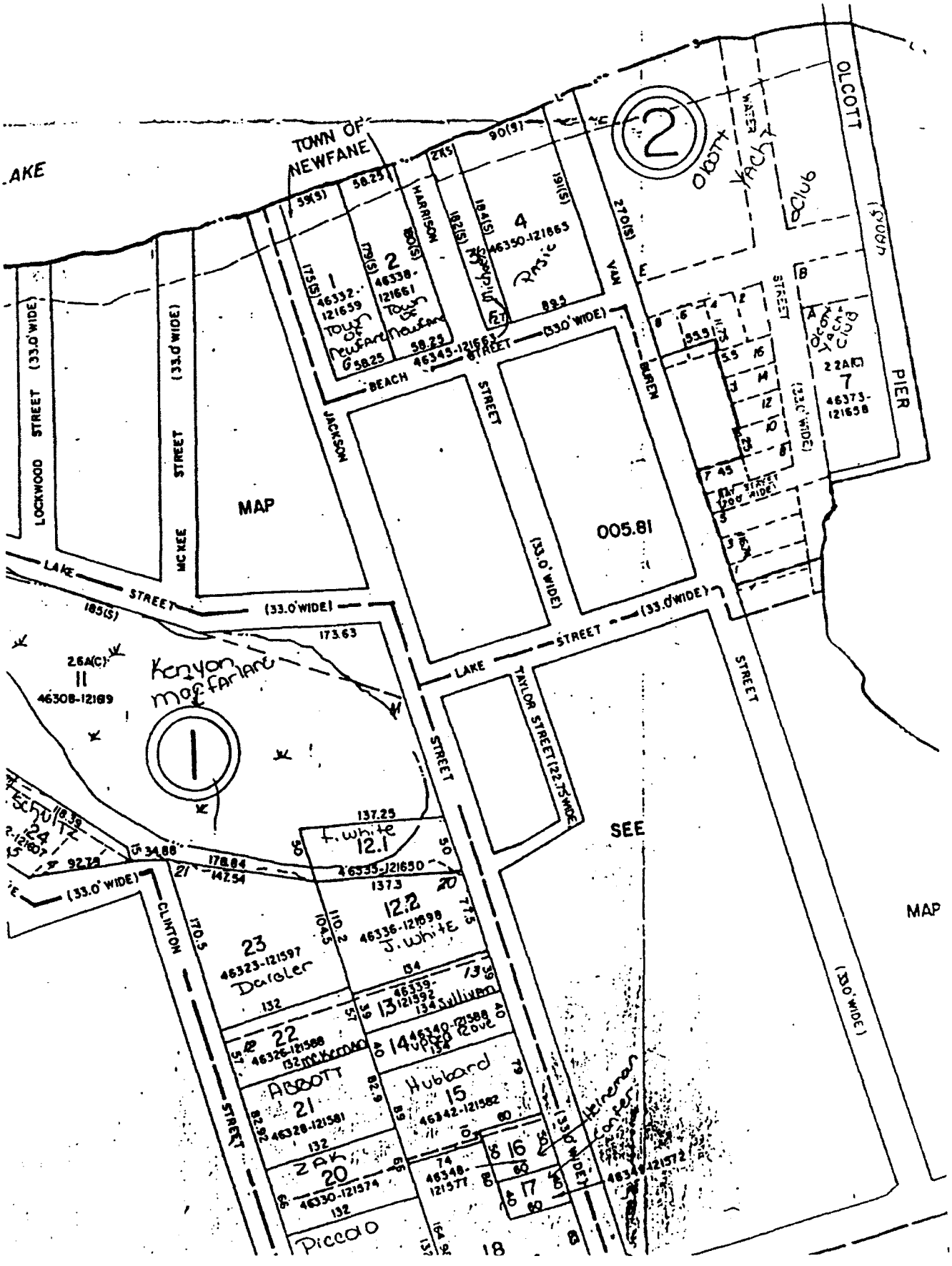
Land Type Codes (LNDTYP)
01 = Primary
02 = Secondary
03 = Undeveloped
04 = Residual
05 = Tillable
06 = Pasture
07 = Woodland
08 = Wasteland
09 = Muck
10 = Waterfront
11 = Orchard
12 = Row
13 = Vineyard
14 = Wetland
15 = Leased Land

Effective Code (EFFCD)
1 = FRNTFT only
2 = DEPTH only
3 = FRNTFT and DEPTH

Soil Rating (RATING)
P = Poor (001 - 10)
N = Normal (002 - 10)
G = Good (003 - 4; 009 - 4; 011 - 10; 013 - 10)

Waterfront Type (WTRFNT)
1 = Pond
2 = River
3 = Lake
4 = Canal
5 = Ocean/Bay

Influence Code (INFLCD)
1 = Topography
2 = Location
3 = Shape
4 = Restricted Use
5 = View
6 = Wetness
7 = Other


TOWN OF NEWFANE
LAKE
OLCOTT
PIER
MAP
LOCKWOOD STREET (33.0' WIDE)
MC KEE STREET (33.0' WIDE)
JACKSON STREET
VAN BUREN STREET
BEACH STREET (33.0' WIDE)
HARRISON STREET
LAKE STREET (33.0' WIDE)
TAYLOR STREET (22.75' WIDE)
CLINTON STREET
005.81
SEE MAP
Kenyon Mac Farlane
J. White
Dercler
Sullivan
Hubbard
ABBOTT
ZAK
Piccolo
Heirens
OLCOTT YACHT CLUB

## A · PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod.
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

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220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
280—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural, 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL (6)

MEASURED BY ____ DATE __-__-__
LISTED BY N.L.D DATE 06-02-80
EDITED BY J.J.K DATE 06-11-80

MEASURING & LISTING COMPLETED ON VISIT:
1 · FIRST 2 · SECOND
3 · THIRD 4 · FOURTH 1

SOURCE:
1 · OWNER 2 · SPOUSE 3 · TENANT
4 · OTHER 5 · ESTIMATE 6 · TOTAL REFUSAL
7 · INTERIOR REFUSAL 4

## C SIGNATURE

1691 LKPT-OLCOTT 22-E

TOWN OF NEWFANE CODE :292800

14.12-1-17 MV
PARCEL--ID CD
AC: 00031450.00
LOC: LOCKPORT ST ES RS 1
TYPE: 311 LOT: 169.24 X 5.1A(C)
OLCOTT FIRE CO INC
OWNR: [redacted]
1573 LKPT-OLCOTT
ADDRS: [redacted] LKPT-OLCOTT RD
OLCOTT N.Y. 14126
SALE: DATE:

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E · VEGETABLE
A · GRAIN
B · HAY, CORN
C · SILAGE
06—PASTURE
A · ROTATING
B · PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A · 6 FT
B · 3 TO 6 FT
C · UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A · 5 TONS
B · 4 TONS
C · UNDER 4 TONS
14—WETLANDS

LAND CODES —
F · FRONTAGE D · DEPTH S · SQUARE FEET A · ACREAGE V · VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S I W |
|---|---|---|---|---|
| A | 01 | 1.00 | | |
| A | 03 | 4.10 | | |
| | | | | |
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| | | | | |
| | | | | |

## F CARD SEQUENCE

CARD __
OF __

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO. ____
ZONING R10

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL CROSSROADS 3-SUBURBAN 4-URBAN 5-RES SUBDIVISION 6-MIXED COMMERCIAL 2

ROAD 1-NONE 2-DIRT 3-GRAVEL 4-LOCAL PAVED 5-STATE 5

FRONTING TRAFFIC 1-LANDLOCKED 2-LIGHT 3-MEDIUM 4-HEAVY 3

BUILDING SET BACK 1-LESS THAN 30' 2-30 to 60' 3-MORE THAN 60' ____

VIEW INFLUENCE 1-NONE 2-INFER 3-SUP. 1

WATERFRONT 1-NONE 2-BAY 3-LAKE 4-RIVER CANAL 5-CREEK 1

SITE ELEVATION 1-BELOW STREET 2-EVEN 3-ABOVE STREET 2

SEWER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 4

WATER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 4

OTHER UTILITIES 1-NONE 2-GAS 3-ELECTRIC 4-GAS/ELECTRIC 4

SITE COMPARED TO SURROUNDS 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

SITE DESIREABILITY 1-POOR 2-TYPICAL 3-SUPERIOR 2

LANDSCAPING 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

IMPROVEMENTS 1-NO 2-YES 1

## H LABEL CORRECTION

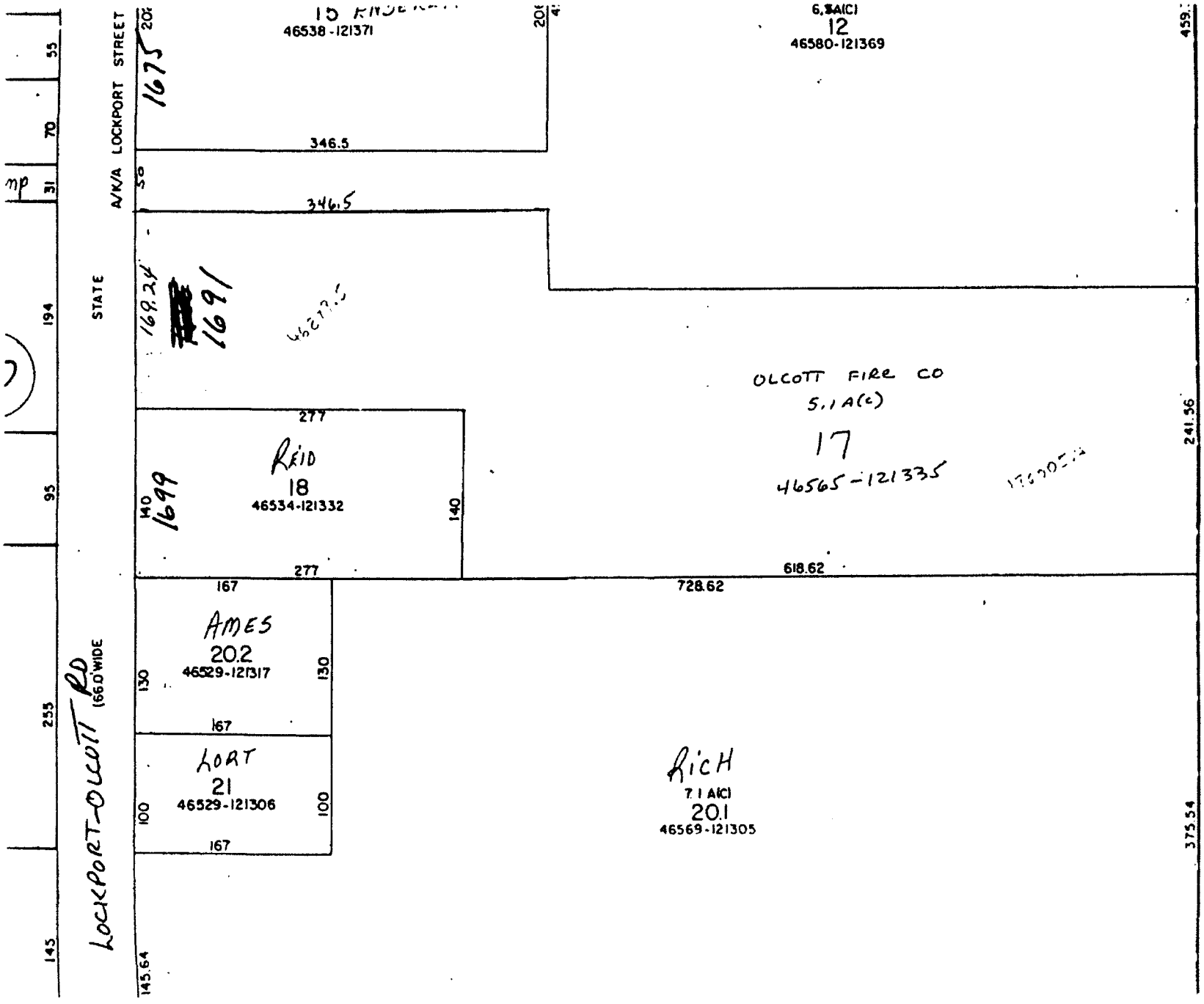
SWIS ____
SECTION ____ BLOCK ____ LOT ____ SUFFIX ____ CD 15
ROUTE NO. ____
OWNER INCORRECT ____
PROPERTY ADDRESS INCORRECT ____
PROPERTY CLASSIFICATION ____
SALE PRICE 45,000 DATE 12.90
BK 2298 PG 133

## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT ____
VALID SALE 0-NO 1-YES ____
DATA MATCH 1-NO 2-YES ____
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING ____

## J SALES NOTES

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM


A/K/A LOCKPORT STREET
STATE
LOCKPORT-OLCOTT RD
(66.0' WIDE)
1675
46538-121371
346.5
346.5
6.3A(C)
12
46580-121369
459.
1691
OLCOTT FIRE CO
5.1A(c)
17
46565-121335
241.56
277
REID
18
46534-121332
140
1699
140
277
618.62
728.62
167
AMES
20.2
46529-121317
130
130
167
LORT
21
46529-121306
100
100
167
RICH
7.1 A(C)
20.1
46569-121305
375.54
145.64
55
70
31
194
95
253
145
201
168.24
20
58

(7) 5576 West Bluff S/S 11-5

EA3100 (6/82)

**NEW YORK STATE**
**DIVISION OF EQUALIZATION AND ASSESSMENT**
**BUREAU OF LOCAL ASSESSMENT SERVICES**

**RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD**

**PARCEL IDENTIFICATION SECTION**

Sum: 292800 | Tax Map Number: 14.06-1-28 | CD | A SEC: 1 | HC

Owner: Douglas, Franklin G. & Jeveue D. | Prop Class: 311

Location No.: 5576 | Location: West Bluff | Sch Dist: NEWFANE

Sale Price: 16000. | Sale Date: 05/89 | Valid: Yes | Lot Size: 87.29x250' .146AC

Liber-2193 Pg-332

| PARCEL IDENTIFICATION CORRECTION AREA | Sum | Tax Map No. | Owner | Prop Class | Loc No. | Lot | School Dist | Lot Size |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — Number of Sites (NUMSIT):

| Visit No (VISITS) | Later Information (LSTINF) Collector | Date (MMDDYY) | Type | Activity | Entry (ENTRY) | Source (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

Quality Control (QCBY) | Certified Letter (CTFLET) | Date (MMDDYY)

**SALES INFORMATION SECTION** — Office Use Only

| Date (SALDTE) YYMM | Price (SALPRC) | Type (SALTYP) | Source (VERIFY) | Valid (VALID) | Check | Source2 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Audit Control Codes**

Activity: N = None; M = Measured Entry; L = Listed

Entry (ENTRY): 1 = Interior Inspection; 2 = Interior Refusal; 3 = Total Refusal; 4 = Estimate; 5 = No Entry

Source (INFSCE): 1 = Owner; 2 = Relative; 3 = Tenant; 4 = Other

**Sales Information Codes**

Sales Type (SALTYP): 1 = Land Only; 2 = Bldg Only; 3 = Land & Bldg

Source (VERIFY): 1 = Disinterested; 2 = Buyer; 3 = Seller; 4 = Stamps; 5 = Agent

Valid (VALID): 1 = Valid Sale; 2 = Invalid Sale

**SWIS/SBL/CD**

292800 14.06-1-28 | Card No. of

House Number (HSENUM)

Neighborhood Code (NBHD)

Zoning Code (ZONING): 01 = None; 02 = Single Res; 03 = Multi Res; 04 = Farm; 05 = Commercial; 06 = Industrial; 07 = Mixed; 08 = Governmental — R12

**SITE INFORMATION SECTION** — Site Number | Property Class (PRCLAS): 311

| | | | | | | |
|---|---|---|---|---|---|---|
| Neighborhood Type | (NBHTYP) | 1 = Rural | 2 = Suburban | 3 = Urban | 4 = Commercial | 1 |
| Road Type | (ROAD) | 1 = None | 2 = Unimproved | 3 = Improved | | 3 |
| Traffic | (TRAF) | 1 = Heavy | 2 = Medium | 3 = Light | 4 = Land locked | 3 |
| Driveway | (DRVWAY) | 1 = None | 2 = Unimproved | 3 = Improved | | 1 |
| Sewer | (SEWER) | 1 = None | 2 = Private | 3 = Comm/Public | | 3 |
| Water | (WATER) | 1 = None | 2 = Private | 3 = Comm/Public | | 3 |
| Other Utilities | (UTIL) | 1 = None | 2 = Gas | 3 = Electric | 4 = Gas and Electric | 4 |
| Site Elevation | (ELEV) | 1 = Below Grade | 2 = Level | 3 = Above Grade | | 2 |
| Site Desirability | (STUSR) | 1 = Inferior | 2 = Typical | 3 = Superior | | 3 |
| Setback | (SETBCK) | | | | | |
| Physical Change | (PHYCHG) | 1 = Res Const | 2 = Imp Const | 3 = Res Demo | 4 = Imp Demo | |

SALES NOTES: Nv-8,000.

NOTES:

**Land Type Codes (LNDTYP)**

01 = Primary; 02 = Secondary; 03 = Undeveloped; 04 = Residual; 05 = Tillable; 06 = Pasture; 07 = Woodland; 08 = Wasteland; 09 = Muck; 10 = Waterfront; 11 = Orchard; 12 = Row; 13 = Vineyard; 14 = Wetland; 15 = Leased Land

**Effective Code (EFFCD)**

1 = FRNTFT only; 2 = DEPTH only; 3 = FRNTFT and DEPTH

**LAND BREAKDOWN SECTION**

| Land Type (LNDTYP) | Eff. Code (EFFCD) | Front Feet (FRNTFT) | Depth (DEPTH) | Acres (ACRES) | Square Feet (SQFT) | Soil Rating (RATING) | Waterfrontage (WTRFNT) | Waterfront Type (WTRFNT) | Influence Code (INFLCD) | Influence Percent (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**Soil Rating (RATING)**

P = Poor; N = Normal; G = Good

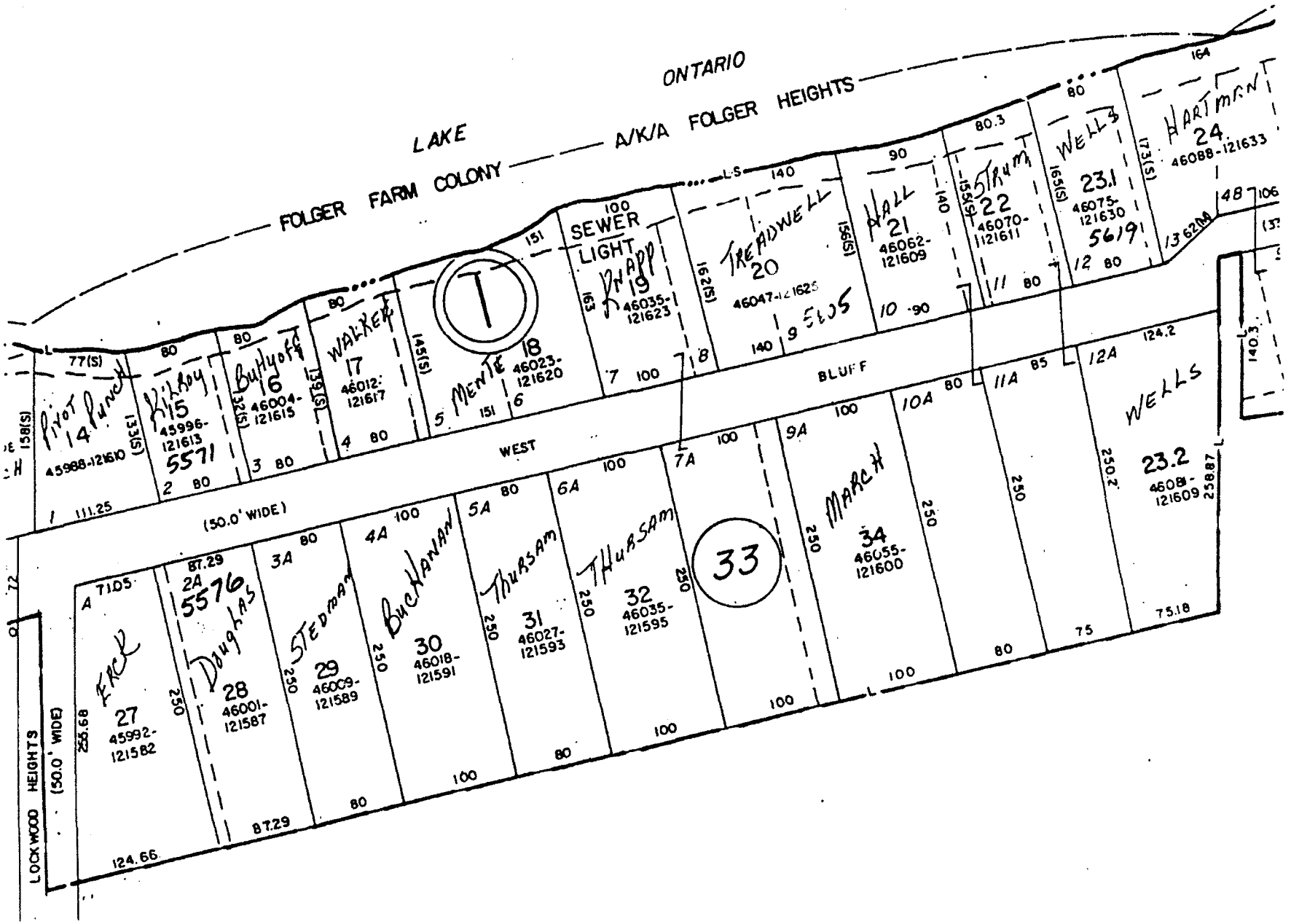
(05) 1 – 10; (06) 1 – 10; (07) 1 – 4; (09) 1 – 4; (11) 1 – 10; (13) 1 – 10

**Waterfront Type (WTRFNT)**

1 = Pond; 2 = River; 3 = Lake; 4 = Canal; 5 = Ocean/Bay

**Influence Code (INFLCD)**

1 = Topography; 2 = Location; 3 = Shape; 4 = Restricted Use; 5 = View; 6 = Wetness; 7 = Other


LAKE ONTARIO
FOLGER FARM COLONY — A/K/A FOLGER HEIGHTS
BLUFF
WEST
(50.0' WIDE)
LOCKWOOD HEIGHTS
(50.0' WIDE)
1 PIVOT 14 45988-121610
2 KILROY 15 45996-121613 5571
3 BUHYOFF 16 46004-121615
4 WALKER 17 46012-121617
5 MENTE 18 46023-121620
6 KNAPP 19 46035-121623
7 TREADWELL 20 46047-121625 5605
8 HALL 21 46062-121609
9 STRUM 22 46070-121611
10 WELLS 23.1 46075-121630 5619
11 HARTMAN 24 46088-121633
12 WELLS 23.2 46081-121609
A ERCK 27 45992-121582
24 5576 DOUGLAS 28 46001-121587
3A STEDMAN 29 46009-121589
4A BUCKANAN 30 46018-121591
5A THURSAM 31 46027-121593
6A THURSAM 32 46035-121595
7A 33
9A MARCH 34 46055-121600
10A
11A
12A
1362.74
87.29
124.66
255.68
250
100
80
75
75.18
258.87
140.3

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(A3100 10/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

SWIS: 292800 | TAX MAP NUMBER: 14.06-1-34 | CO: NL | R-SEC: 1

OWNER: MARCH, NORMAN-WENDY . | PROP CLASS: 311 | NC:

LOCATION NO.: 5604 | LOCATION: West Bluff | SCH DIST: New

SALE PRICE: 32000 | SALE DATE: 6/90 | VALID: Bk 2267 Pg 120 | LOT SIZE: 100 X 250

| PARCEL IDENTIFICATION CORRECTION AREA | SWIS | TAX MAP NO. | OWNER | PROP CLASS | LOC. NO. | LOC. | SCHOOL DIST. | LOT SIZE |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT):

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | __:__ AM/PM | | | |
| 2 | | | __:__ AM/PM | | | |
| 3 | | | __:__ AM/PM | | | |
| | | | __:__ AM/PM | | | |

QUALITY CONTROL (QCBY) | DATE | CERTIFIED LETTER (CTFLET) | DATE (MMDDYY)

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**AUDIT CONTROL CODES**

ACTIVITY: N = NONE; M = MEASURED ONLY; L = LISTED

ENTRY (ENTRY): 1 = INTERIOR INSPECTION; 2 = INTERIOR REFUSAL; 3 = TOTAL REFUSAL; 4 = ESTIMATE; 5 = NO ENTRY

SOURCE (INFSCE): 1 = OWNER; 2 = RELATIVE; 3 = TENANT; 4 = OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 = LAND ONLY; 2 = BLDG. ONLY; 3 = LAND & BLDG.

SOURCE (VERIFY): 1 = UNCONFIRMED; 2 = BUYER; 3 = SELLER; 4 = STAMPS; 5 = AGENT

VALID (VALID): 1 = VALID SALE; 2 = INVALID SALE

SWIS/SBL/CD: 292800 (8) 14.06-1-34 NL | CARD NO. ___ IF ___

ROUTE NUMBER (ROUTE): 311

NEIGHBORHOOD CODE (NBHD): 216

ZONING CODE (ZONING): 01 = NONE; 02 = SINGLE RES; 03 = MULTI RES; 04 = FARM; 05 = COMMERCIAL; 06 = INDUSTRIAL; 07 = MIXED; 08 = GOVERNMENT — R2P

**SITE INFORMATION SECTION** — SITE NUMBER: ___ | PROPERTY CLASS (PRCLAS): 311

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 = RURAL | 2 = SUBURBAN | 3 = URBAN | 4 = COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | | 3 |
| TRAFFIC | (TRAF) | 1 = HEAVY | 2 = MEDIUM | 3 = LIGHT | 4 = LAND LOCKED | 3 |
| DRIVEWAY | (DRVWAY) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | | 1 |
| SEWER | (SEWER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | | 3 |
| WATER | (WATER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | | 3 |
| OTHER UTILITIES | (UTIL) | 1 = NONE | 2 = GAS | 3 = ELECTRIC | 4 = GAS AND ELECTRIC | 3 |
| SITE ELEVATION | (ELEV) | 1 = BELOW GRADE | 2 = LEVEL | 3 = ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 = INFERIOR | 2 = TYPICAL | 3 = SUPERIOR | | 3 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 = RES CONST | 2 = IMP CONST | 3 = RES DEMO | 4 = IMP DEMO | |

SALES NOTES:

NOTES: 2/91 Hd dry wall, Plumbing or electric. Put back in Aug Pmts & review in summer only shell

**LAND TYPE CODE (LNDTYP)**

01 = PRIMARY; 02 = SECONDARY; 03 = UNDEVELOPED; 04 = RESIDUAL; 05 = TILLABLE; 06 = PASTURE; 07 = WOODLAND; 08 = WASTELAND; 09 = MUCK; 10 = WATERFRONT; 11 = ORCHARD; 12 = REAR; 13 = VINEYARD; 14 = WETLAND; 15 = LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 = FRNTFT ONLY; 2 = DEPTH ONLY; 3 = FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE (LNDTYP) | EFF CODE (EFFCD) | FRONT FEET (FRNTFT) | DEPTH (DEPTH) | ACRES (ACRES) | SQUARE FEET (SQFT) | SOIL RATING (RATING) | WATERFRONTAGE (WTRFNT) | WATER FRONT TYPE (WTRFNT) | INFLU ENCE CODE (INFLCD) | INFLUENCE PERCENT (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 120 | 250 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

P = POOR; N = NORMAL; G = GOOD

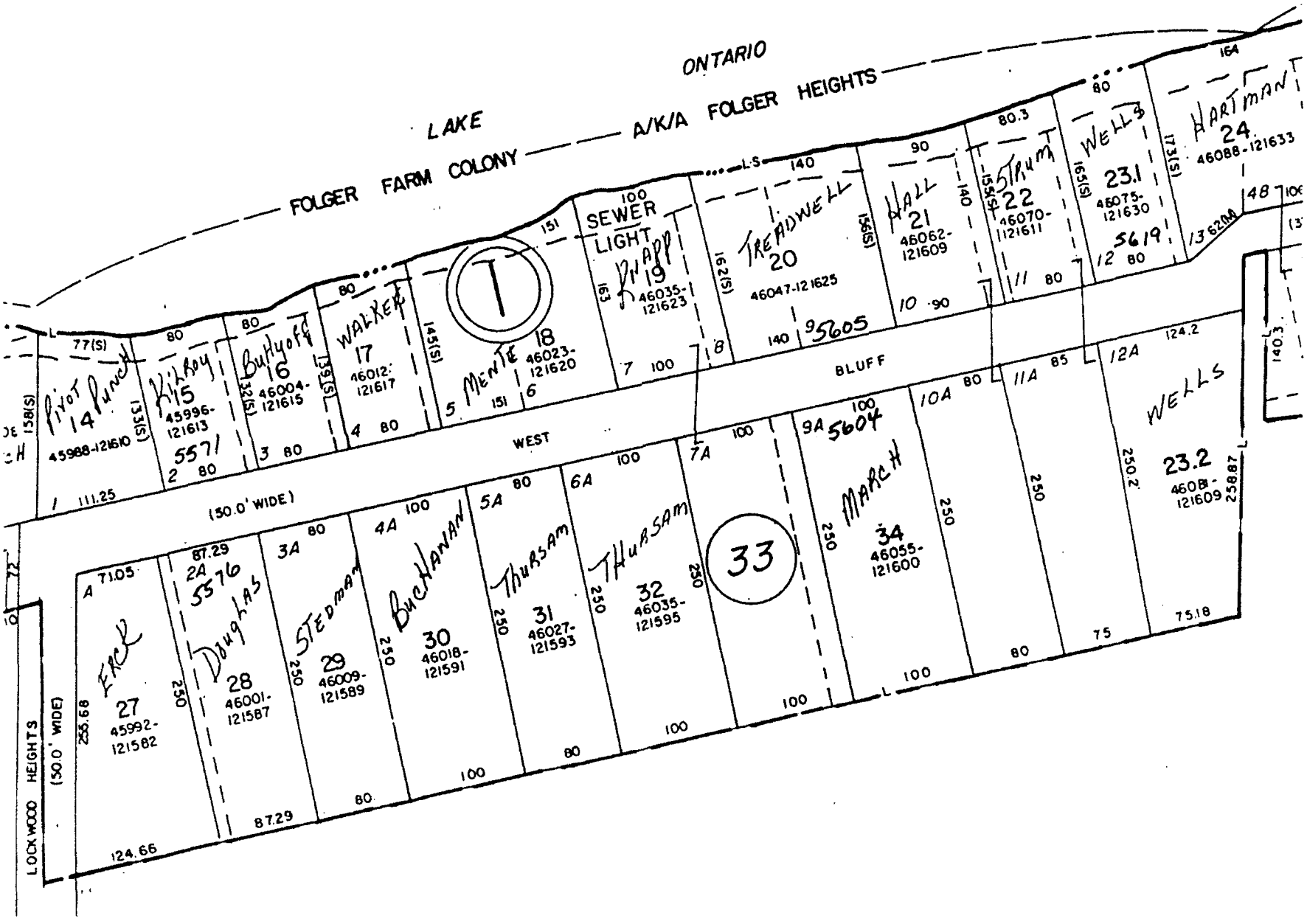
| | |
|---|---|
| 05 | 1 - 10 |
| 06 | 1 - 10 |
| 07 | 1 - 6 |
| 09 | 1 - 6 |
| 11 | 1 - 10 |
| 13 | 1 - 10 |

**WATERFRONT TYPE (WTRFNT)**

1 = POND; 2 = RIVER; 3 = LAKE; 4 = CANAL; 5 = OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 = TOPOGRAPHY; 2 = LOCATION; 3 = SHAPE; 4 = RESTRICTED USE; 5 = VIEW; 6 = WETNESS; 7 = OTHER


LAKE ONTARIO
FOLGER FARM COLONY — A/K/A FOLGER HEIGHTS
BLUFF
WEST
(50.0' WIDE)
LOCKWOOD HEIGHTS
(50.0' WIDE)
SEWER
LIGHT
1
2
3
4
5
6
7
8
9
10
11
12
14 PIVOT PUNCH 45988-121610
15 KILROY 45996-121613
16 BUHYOFF 46004-121615
17 WALKER 46012-121617
18 MENTE 46023-121620
19 KNAPP 46035-121623
20 TREADWELL 46047-121625
21 HALL 46062-121609
22 STRUM 46070-121611
23.1 WELLS 46075-121630
24 HARTMAN 46088-121633
27 ERCK 45992-121582
28 DOUGLAS 46001-121587
29 STEDMAN 46009-121589
30 BUCHANAN 46018-121591
31 THURSAM 46027-121593
32 THURSAM 46035-121595
33
34 MARCH 46055-121600
23.2 WELLS 46081-121609
5571
5576
5604
5605
5619

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EA3100 (8/87)

# NEW YORK STATE
# DIVISION OF EQUALIZATION AND ASSESSMENT
# BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

| SWIS | TAX MAP NUMBER | CO | R-SEC |
|---|---|---|---|
| 292800 | 14.06-1-23.2 | | 1 |

OWNER: Wells, Audrey M.
PROP CLASS: 311
HC:
LOCATION NO.: 5620
LOCATION: W. BLUFF
SCH DIST: NEWFANG
SALE PRICE: $32,000.
SALE DATE: 3/90
VALID: Y
LOT SIZE: 124 X 250.
Lib. - 2248 Pg. 264

| PARCEL IDENTIFICATION CORRECTION AREA | SWIS | TAX MAP NO | OWNER | PROP CLASS | LOC NO | LOC. | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT):

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY): DATE
CERTIFIED LETTER (CTFLET):
DATE (MMDDYY):

**AUDIT CONTROL CODES**

ACTIVITY (ACTIVITY): N = NONE; M = MEASURER ONLY; L = LISTED

ENTRY (ENTRY): 1 = INTERIOR INSPECTION; 2 = INTERIOR REFUSAL; 3 = TOTAL REFUSAL; 4 = ESTIMATE; 5 = NO ENTRY

SOURCE (INFSCE): 1 = OWNER; 2 = RELATIVE; 3 = TENANT; 4 = OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 = LAND ONLY; 2 = BLDG ONLY; 3 = LAND & BLDG

SOURCE (VERIFY): 1 = UNCONFIRMED; 2 = BUYER; 3 = SELLER; 4 = STAMPS; 5 = AGENT

VALID (VALID): 1 = VALID SALE; 2 = INVALID SALE

SWIS/SBL/CD: 292800 14.06-1-23.2
CARD NO. ___ OF ___
ROUTE NUMBER (ROUTE):
NEIGHBORHOOD CODE (NBHD):
ZONING CODE (ZONING):
01 = NONE; 02 = SINGLE RES; 03 = MULTI RES; 04 = FARM; 05 = COMMERCIAL; 06 = INDUSTRIAL; 07 = MIXED; 08 = GOVERNMENT
0,2

**SITE INFORMATION SECTION** — SITE NUMBER: — PROPERTY CLASS (PRCLAS): 311

| | | | | | |
|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 = RURAL | 2 = SUBURBAN | 3 = URBAN | 4 = COMMERCIAL |
| ROAD TYPE | (ROAD) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | |
| TRAFFIC | (TRAF) | 1 = HEAVY | 2 = MEDIUM | 3 = LIGHT | 4 = LAND LOCKED |
| DRIVEWAY | (DRVWAY) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | |
| SEWER | (SEWER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | |
| WATER | (WATER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | |
| OTHER UTILITIES | (UTIL) | 1 = NONE | 2 = GAS | 3 = ELECTRIC | 4 = GAS AND ELECTRIC |
| SITE ELEVATION | (ELEV) | 1 = BELOW GRADE | 2 = LEVEL | 3 = ABOVE GRADE | |
| SITE DESIRABILITY | (SITDSR) | 1 = INFERIOR | 2 = TYPICAL | 3 = SUPERIOR | |
| SETBACK | (SETBCK) | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 = RES CONST | 2 = IMP CONST | 3 = RES DEMO | 4 = IMP DEMO |

SALES NOTES:

NOTES:
Wells, Audrey
43 Coolidge Ave.
Lockport, N.Y. 14094

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**LAND BREAKDOWN SECTION**

| LAND TYPE | EFF CODE | FRONT FEET | DEPTH | ACRES | SQUARE FEET | SOIL RATING | WATERFRONTAGE | WATER FRONT TYPE | INFLU FACT CODE | INFLUENCE PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | 124 | 250 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

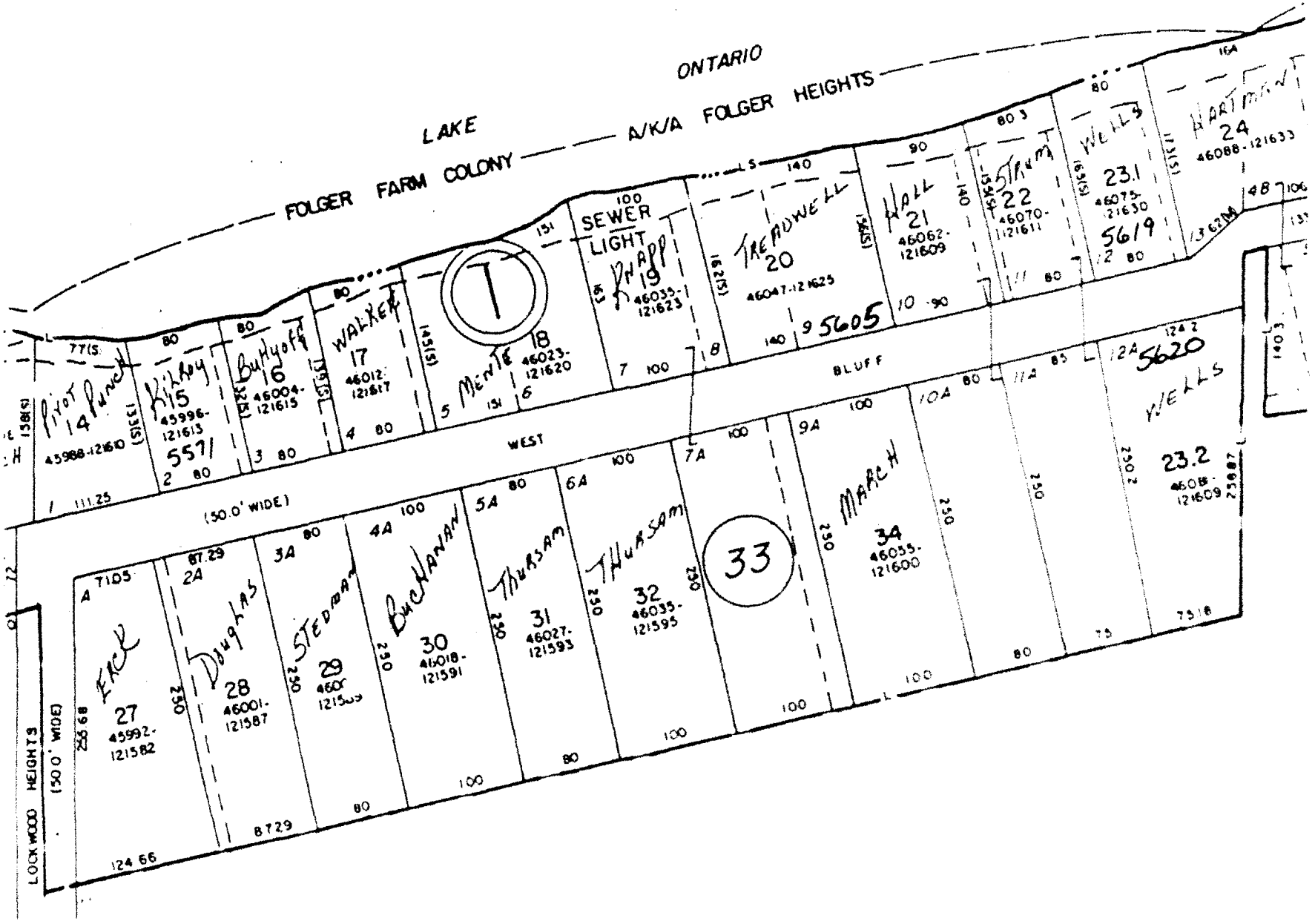
LAND TYPE CODE (LNDTYP):
01 = PRIMARY; 02 = SECONDARY; 03 = UNDEVELOPED; 04 = RESIDUAL; 05 = TILLABLE; 06 = PASTURE; 07 = WOODLAND; 08 = WASTELAND; 09 = MUCK; 10 = WATERFRONT; 11 = ORCHARD; 12 = REAR; 13 = VINEYARD; 14 = WETLAND; 15 = LEASED LAND

EFFECTIVE CODE (EFFCD):
1 = FRNTFT ONLY; 2 = DEPTH ONLY; 3 = FRNTFT AND DEPTH

SOIL RATING (RATING):
P = POOR; N = NORMAL; G = GOOD
05: 1 - 10; 06: 1 - 10; 07: 1 - 4; 09: 1 - 4; 11: 1 - 10; 13: 1 - 10

WATERFRONT TYPE (WTRFNT):
1 = POND; 2 = RIVER; 3 = LAKE; 4 = CANAL; 5 = OCEAN/BAY

INFLUENCE CODE (INFLCD):
1 = TOPOGRAPHY; 2 = LOCATION; 3 = SHAPE; 4 = RESTRICTED USE; 5 = VIEW; 6 = WITNESS; 7 = OTHER


LAKE ONTARIO
FOLGER FARM COLONY — A/K/A FOLGER HEIGHTS
LOCKWOOD HEIGHTS (50.0' WIDE)
(50.0' WIDE)
WEST
BLUFF
SEWER
LIGHT
PIVOT
14
45988-121610
KILROY
15
45996-121613
5571
BUHYOFF
16
46004-121615
WALKER
17
46012-121617
1
MENTE
18
46023-121620
DNAPP
19
46035-121623
TREADWELL
20
46047-121625
9 5605
HALL
21
46062-121609
STAMM
22
46070-121611
WELLS
23.1
46075-121630
5619
HARTMAN
24
46088-121633
5620
WELLS
23.2
46018-121609
ECK
27
45992-121582
DOUGLAS
28
46001-121587
STEDMAN
29
46018-121593
BUCHANAN
30
46018-121591
THURSAM
31
46027-121593
THURSAM
32
46035-121595
33
MARCH
34
46055-121600

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(A3100 (6/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**AUDIT CONTROL CODES**

ACTIVITY
N - NONE
M - MEASURED ONLY
L - LISTED

ENTRY (ENTRY)
1 - INTERIOR INSPECTION
2 - INTERIOR REFUSAL
3 - TOTAL REFUSAL
4 - ESTIMATE
5 - NO ENTRY

SOURCE (INFSCE)
1 - OWNER
2 - RELATIVE
3 - TENANT
4 - OTHER

SALES INFORMATION CODES

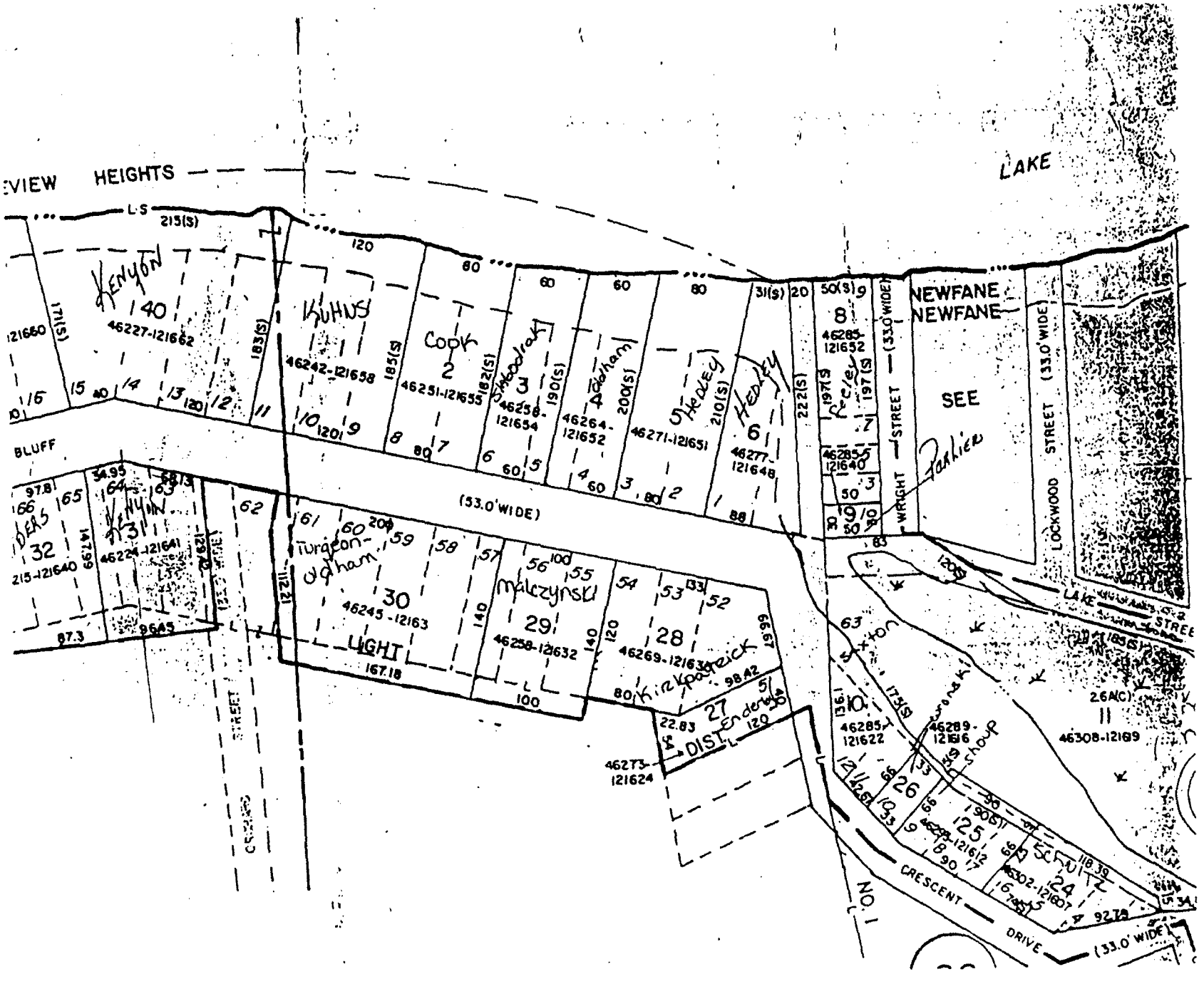
SALES TYPE (SALTYP)
1 - LAND ONLY
2 - BLDG ONLY
3 - LAND & BLDG

SOURCE (VERIFY)
1 - UNCONFIRMED
2 - BUYER
3 - SELLER
4 - STAMPS
5 - AGENT

VALID (VALID)
1 - VALID SALE
2 - INVALID SALE

SWIS/SBL/CO: 292800 5.19-1-31 CARD NO __ OF __

ROUTE NUMBER (ROUTE) 1 1 1


VIEW HEIGHTS
LAKE
BLUFF
(53.0' WIDE)
NEWFANE
NEWFANE
SEE
Parker
WRIGHT STREET (33.0' WIDE)
LOCKWOOD STREET (33.0' WIDE)
LAKE STREET
CRESCENT DRIVE (33.0' WIDE)
KENYON
40
46227-121662
KUHNS
46242-121658
COOK
2
46251-121655
Shadduck
3
46258-121654
Adgham
46264-121652
Hedley
46271-121651
Hedley
6
46277-121648
Rieley
8
46285-121652
9
46285-121640
KENYON
32
215-121640
KENYON
31
46224-121641
Turgeon-Ogham
30
46245-12163
LIGHT
167.18
Malczynski
29
46258-12632
Kirkpatrick
28
46269-121638
Enderson
27
DIST
46273-121624
Sexton
10
46285-121622
Sexton
46289-121616
26
25
24
46302-121607
11
46308-12169
2.6AC.
NO. 1

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(A3180 6/87)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

| SWIS | TAX MAP NUMBER | CO | R-SEC |
|---|---|---|---|
| 292800 | 5.19-1-30 | | 1 |

OWNER: TURGEON, GERALDINE O - MILLY A
OLDHAM, JANICE + KATHERINE E.

PROP CLASS: 311 MC:

LOCATION NO.: LOCATION: WEST BLUFF SCH-DIST: NEW

| SALE PRICE | SALE DATE | VALID | LOT SIZE |
|---|---|---|---|
| 2000 | 3/88 | | 200x140 |

PARCEL IDENTIFICATION CORRECTION AREA

| SWIS | TAX MAP NO | OWNER | PROP CLASS | LOC. NO. | LOC. | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT):

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY) — DATE

CERTIFIED LETTER (CTFLET) — DATE (MMDDYY)

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**AUDIT CONTROL CODES**

ACTIVITY (ACTIVY): N = NONE; M = MEASURED ONLY; L = LISTED

ENTRY (ENTRY): 1 = INTERIOR INSPECTION; 2 = INTERIOR REFUSAL; 3 = TOTAL REFUSAL; 4 = ESTIMATE; 5 = NO ENTRY

SOURCE (INFSCE): 1 = OWNER; 2 = RELATIVE; 3 = TENANT; 4 = OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 = LAND ONLY; 2 = BLDG. ONLY; 3 = LAND & BLDG.

SOURCE (VERIFY): 1 = UNCONFIRMED; 2 = BUYER; 3 = SELLER; 4 = STAMPS; 5 = AGENT

VALID (VALID): 1 = VALID SALE; 2 = INVALID SALE

SWIS/SBL/CD: 292800 5.19-1-30 CARD NO __ OF __

ROUTE NUMBER (ROUTE):

NEIGHBORHOOD CODE (NBHD):

ZONING CODE (ZONING): 01 = NONE; 02 = SINGLE RES; 03 = MULTI RES; 04 = FARM; 05 = COMMERCIAL; 06 = INDUSTRIAL; 07 = MIXED; 08 = GOVERNMENT — 012

**SITE INFORMATION SECTION** — SITE NUMBER: — PROPERTY CLASS (PRCLAS): 311

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 = RURAL | 2 = SUBURBAN | 3 = URBAN | 4 = COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | | 3 |
| TRAFFIC | (TRAF) | 1 = HEAVY | 2 = MEDIUM | 3 = LIGHT | 4 = LAND LOCKED | 3 |
| DRIVEWAY | (DRVWAY) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | | 1 |
| SEWER | (SEWER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | | 3 |
| WATER | (WATER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | | 3 |
| OTHER UTILITIES | (UTIL) | 1 = NONE | 2 = GAS | 3 = ELECTRIC | 4 = GAS AND ELECTRIC | 4 |
| SITE ELEVATION | (ELEV) | 1 = BELOW GRADE | 2 = LEVEL | 3 = ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 = INFERIOR | 2 = TYPICAL | 3 = SUPERIOR | | 2 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 = RES CONST | 2 = IMP CONST | 3 = RES DEMO | 4 = IMP DEMO | |

SALES NOTES:

NOTES:

**LAND TYPE CODE (LNDTYP)**

01 = PRIMARY; 02 = SECONDARY; 03 = UNDEVELOPED; 04 = RESIDUAL; 05 = TILLABLE; 06 = PASTURE; 07 = WOODLAND; 08 = WASTELAND; 09 = MUCK; 10 = WATERFRONT; 11 = ORCHARD; 12 = REAR; 13 = VINEYARD; 14 = WETLAND; 15 = LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 = FRNTFT ONLY; 2 = DEPTH ONLY; 3 = FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE (LNDTYP) | EFF. CODE (EFFCD) | FRONT FEET (FRNTFT) | DEPTH (DEPTH) | ACRES (ACRES) | SQUARE FEET (SQFEET) | SOIL RATING (SOILRG) | WATERFRONTAGE (WTRFNT) | WATER FRONT TYPE (WTRFNT) | INFLUENCE CODE (INFLCD) | INFLUENCE PERCENT (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 200 | 140 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

P = POOR; N = NORMAL; G = GOOD

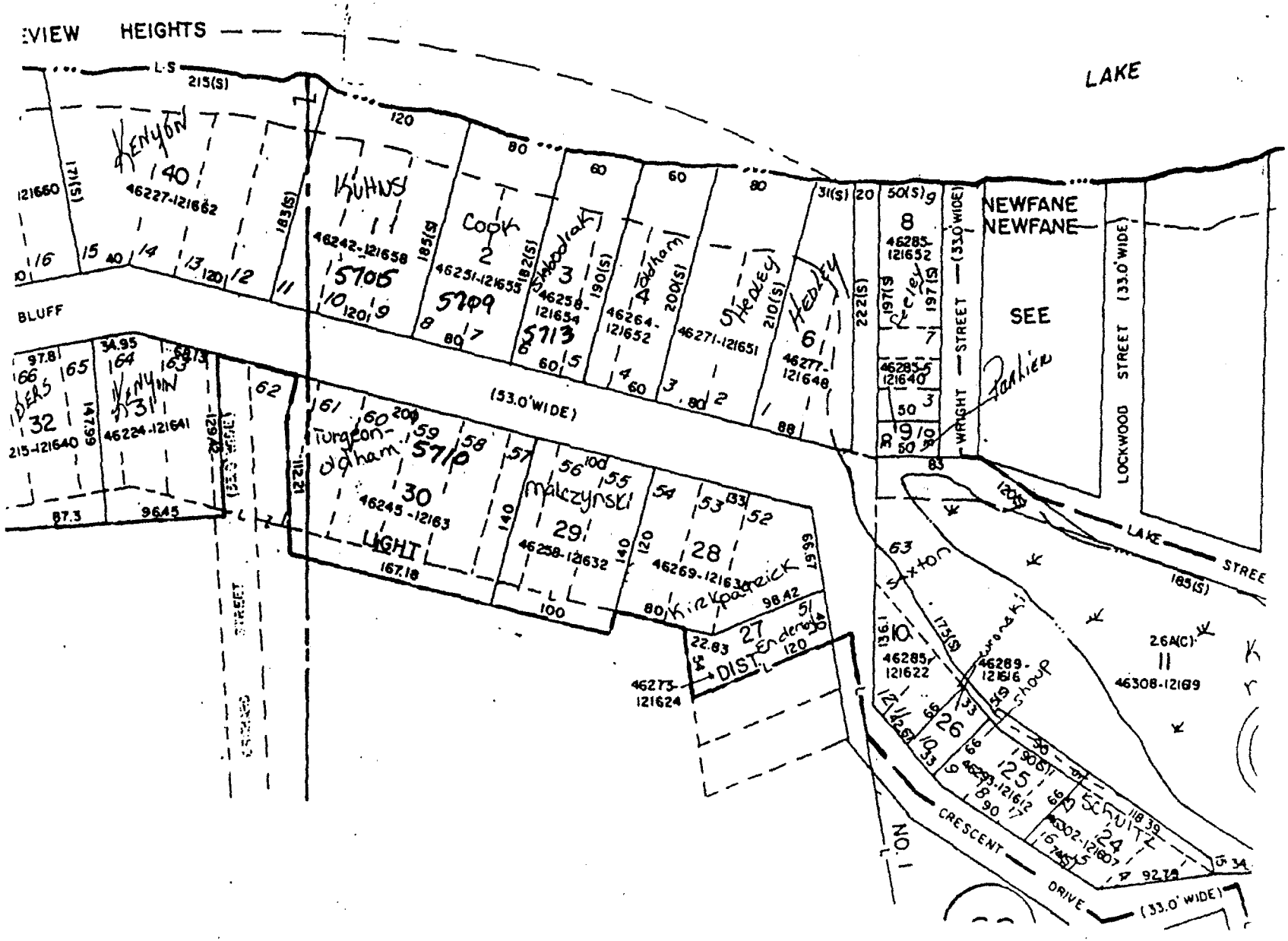
| | | |
|---|---|---|
| 05 | 1 | 10 |
| 06 | 1 | 10 |
| 07 | 1 | 4 |
| 09 | 1 | 4 |
| 11 | 1 | 10 |
| 13 | 1 | 10 |

**WATERFRONT TYPE (WTRFNT)**

1 = POND; 2 = RIVER; 3 = LAKE; 4 = CANAL; 5 = OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 = TOPOGRAPHY; 2 = LOCATION; 3 = SHAPE; 4 = RESTRICTED USE; 5 = VIEW; 6 = WETNESS; 7 = OTHER


VIEW HEIGHTS
LAKE
KENYON
40
46227-121662
KUHNS
46242-121658
5705
Cook
2
46231-121655
5709
Shadbrake
3
46258-121654
5713
Adgham
46264-121652
Hedley
46271-121651
Hedley
6
46277-121648
NEWFANE
NEWFANE
SEE
Tarbell
LOCKWOOD STREET (33.0' WIDE)
WRIGHT STREET (33.0' WIDE)
BLUFF
(33.0' WIDE)
DEARS
32
215-121640
KENYON
31
46224-121641
Turgeon-Adgham
5710
30
46245-12163
LIGHT
Malczynski
29
46258-12632
28
46269-121634
Kozdrick
27
Henderson
DIST
46273-121624
Sexton
10
46285-121622
46289-121616
Shoup
26
25
24
SCHULTZ
46302-121680
CRESCENT
DRIVE
(33.0' WIDE)
NO. 1
LAKE STREET
2.6A(C)
11
46308-12169

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EA3100 (8/87)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**AUDIT CONTROL CODES**

ACTIVITY: N - NONE; M - MEASURED ONLY; L - LISTED

ENTRY (ENTRY): 1 - INTERIOR INSPECTION; 2 - INTERIOR REFUSAL; 3 - TOTAL REFUSAL; 4 - ESTIMATE; 5 - NO ENTRY

SOURCE (INFSCE): 1 - OWNER; 2 - RELATIVE; 3 - TENANT; 4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 - LAND ONLY; 2 - BLDG ONLY; 3 - LAND & BLDG

SOURCE (VERIFY): 1 - UNCONFIRMED; 2 - BUYER; 3 - SELLER; 4 - STAMPS; 5 - AGENT

VALID (VALID): 1 - VALID SALE; 2 - INVALID SALE

SWIS/SBL/CO: 292800 7.01-1-20

CARD NO ___ OF ___

ROUTE NUMBER (ROUTE): 16.100

NEIGHBORHOOD CODE (NBHD): 214

ZONING CODE (ZONING): 01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT — LRR

### PARCEL IDENTIFICATION SECTION

SWIS: 292800 | TAX MAP NUMBER: 7.01-1-20 | CO | R SEC: 1

OWNER: Luthmann, Susan | PROP CLASS: 314 | NC

LOCATION NO: 7120 | LOCATION: LAKE SHORE TERRACE | APPLETON 14008 | SCH-DIST: BARKER 293801

SALE PRICE: 37525. | SALE DATE: 10/22/84 | VALID: Y | LOT SIZE: 166X233.82

Bk 2224 pg 254

| PARCEL IDENTIFICATION CORRECTION AREA | SWIS | TAX MAP NO | OWNER | PROP CLASS | LOC NO | LOC | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

### SITE INFORMATION SECTION

SITE NUMBER: 01 | PROPERTY CLASS (PRCLAS): 314

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 3 |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED | 3 |
| DRIVEWAY | (DRYWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 1 |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 1 |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 3 |
| OTHER UTILITIES | (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC | 3 |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | | 3 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO | |

### AUDIT CONTROL SECTION

NUMBER OF SITES (NUMSIT):

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY): DUPLICATE NUMBERS | DATE

CERTIFIED LETTER (CTFLET) | DATE (MMDDYY)

### SALES INFORMATION SECTION

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | OFFICE USE ONLY CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**SALES NOTES:**

**NOTES:** Mailing Address 3324 Sic Lake Rd Lyndonville, N.Y. 14031

AV $25,800.

### LAND TYPE CODE (LNDTYP)

01 - PRIMARY; 02 - SECONDARY; 03 - UNDEVELOPED; 04 - RESIDUAL; 05 - TILLABLE; 06 - PASTURE; 07 - WOODLAND; 08 - WASTELAND; 09 - MUCK; 10 - WATERFRONT; 11 - ORCHARD; 12 - REAR; 13 - VINEYARD; 14 - WETLAND; 15 - LEASED LAND

### EFFECTIVE CODE (EFFCD)

1 - FRNTFT ONLY; 2 - DEPTH ONLY; 3 - FRNTFT AND DEPTH

### LAND BREAKDOWN SECTION

| LAND TYPE (LNDTYP) | EFF. CODE (EFFCD) | FRONT FEET (FRNTFT) | DEPTH (DEPTH) | ACRES (ACRES) | SQUARE FEET (SQFEET) | SOIL RATING (SOILRTNG) | WATERFRONTAGE (WTRFRNTG) | WATER FRONT TYPE (WTRFRNT) | WATER INFLUENCE CODE (WTRINFLC) | INFLUENCE PERCENT (INFLPCT) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 166 | 233 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

### SOIL RATING (RATING)

P - POOR; N - NORMAL; G - GOOD

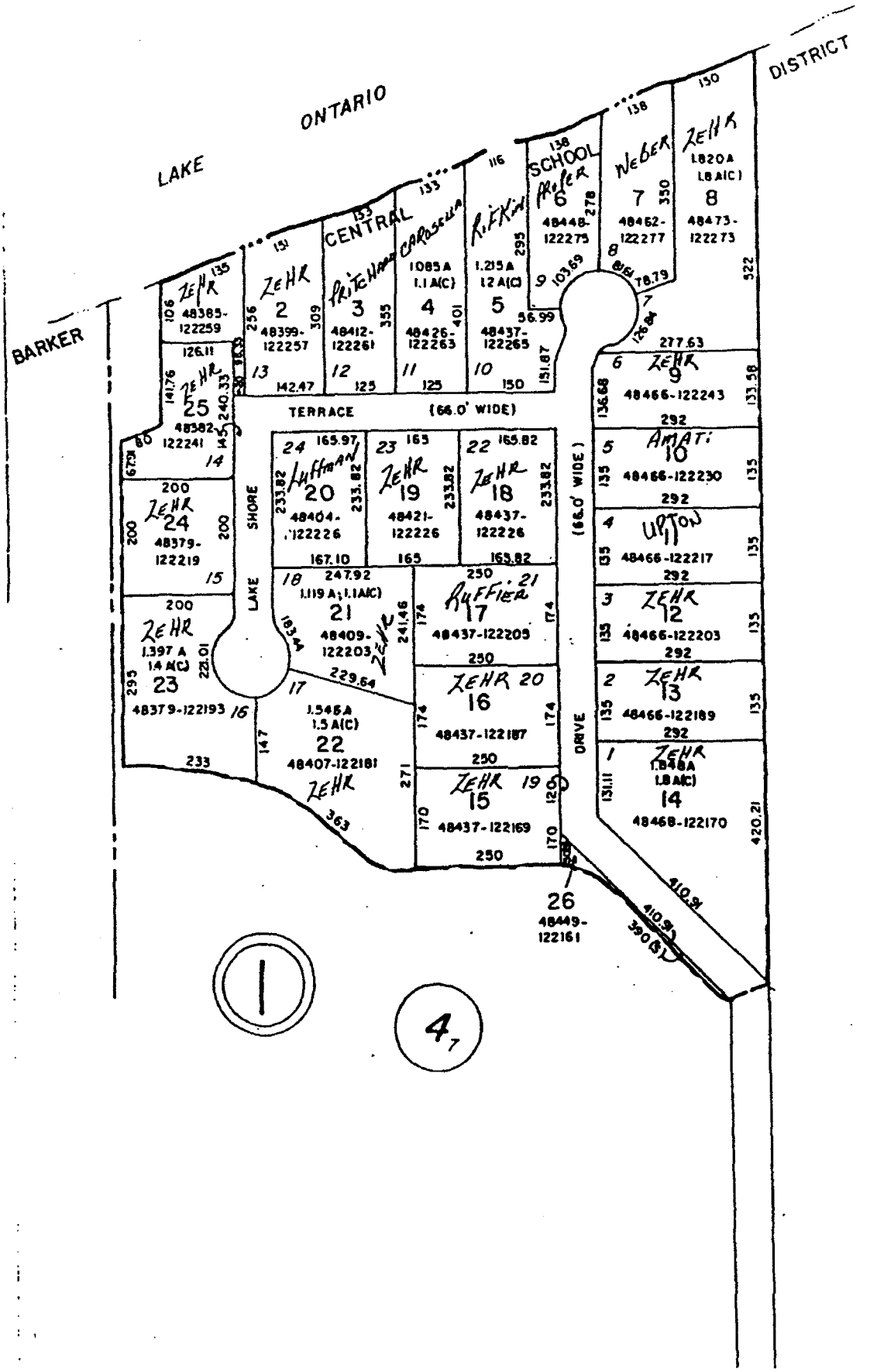
| | | |
|---|---|---|
| 05 | 1 | 10 |
| 06 | 1 | 10 |
| 07 | 1 | 4 |
| 08 | 1 | 4 |
| 11 | 1 | 10 |
| 13 | 1 | 10 |

### WATERFRONT TYPE (WTRFNT)

1 - POND; 2 - RIVER; 3 - LAKE; 4 - CANAL; 5 - OCEAN/BAY

### INFLUENCE CODE (INFLCD)

1 - TOPOGRAPHY; 2 - LOCATION; 3 - SHAPE; 4 - RESTRICTED USE; 5 - VIEW; 6 - WETNESS; 7 - OTHER


LAKE ONTARIO
DISTRICT
BARKER
TERRACE (66.0' WIDE)
LAKE SHORE
DRIVE (66.0' WIDE)
ZEHR 25 48382-122241
ZEHR 24 48379-122219
ZEHR 23 48379-122193
ZEHR 2 48399-122257
CENTRAL 3 48412-122261
PRITCHARD CAROSELLA 4 48426-122263
R.F.KIDD 5 48437-122265
SCHOOL 6 48448-122275
WEBER 7 48462-122277
ZEHR 8 48473-122273
ZEHR 9 48466-122243
AMATI 10 48466-122230
UPTON 11 48466-122217
ZEHR 12 48466-122203
ZEHR 13 48466-122189
ZEHR 14 48468-122170
ZEHR 15 48437-122169
ZEHR 16 48437-122187
RUFFIER 17 48437-122205
ZEHR 18 48437-122226
ZEHR 19 48421-122226
HUFFMAN 20 48404-122226
ZEHR 21 48409-122203
ZEHR 22 48407-122181
26 48449-122161

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7141 Lake Shore Terrace (12) GA

(A3100 10/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

| SWIS | TAX MAP NUMBER | CO | R-SEC |
|---|---|---|---|
| 292800 | 7.01-1-6 | | 1 |

OWNER: PROPER, MALCOLM J DORIS P — PROP CLASS: 313 — NC

| LOCATION NO | LOCATION | SCH DIST |
|---|---|---|
| 7141 | LAKE SHORE TERRACE, APPLETON 14008 | BARKER 293801 |

| SALE PRICE | SALE DATE | VALID | LOT SIZE |
|---|---|---|---|
| 472,000 | 8/17/90 | YES Liber 2278 Pg 37 | 138 x 278 |

PARCEL IDENTIFICATION CORRECTION AREA

| STATE | TAX MAP NO | SUFFIX | PROP CLASS | LOC NO | LOC | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — NUMBER OF SALES (NUMSALE)

| VISIT NO (VISITNO) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY) — DATE — CERTIFIED LETTER (CTFLET) — DATE (MMDDYY)

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE2 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

**AUDIT CONTROL CODES**

ACTIVITY (ACTIVITY): N = NONE; M = MEASURED ONLY; L = LISTED

ENTRY (ENTRY): 1 = INTERIOR INSPECTION; 2 = INTERIOR REFUSAL; 3 = TOTAL REFUSAL; 4 = ESTIMATE; 5 = NO ENTRY

SOURCE (INFSCE): 1 = OWNER; 2 = RELATIVE; 3 = TENANT; 4 = OTHER

**SALES INFORMATION CODES**

SALES TYPE (SALTYP): 1 = LAND ONLY; 2 = BLDG. ONLY; 3 = LAND & BLDG.

SOURCE (VERIFY): 1 = UNCONFIRMED; 2 = BUYER; 3 = SELLER; 4 = STAMPS; 5 = AGENT

VALID (VALID): 1 = VALID SALE; 2 = INVALID SALE

SWIS/SBL/CD: 292800 7.01-1-6 — CARD NO __ OF __

| | | |
|---|---|---|
| ROUTE NUMBER | (ROUTE) | 400010 |
| NEIGHBORHOOD CODE | (NBHD) | 216 |
| ZONING CODE | (ZONING) | ALR |

ZONING CODE: 01 = NONE; 02 = SINGLE RES; 03 = MULTI RES; 04 = FARM; 05 = COMMERCIAL; 06 = INDUSTRIAL; 07 = MIXED; 08 = GOVERNMENT

**SITE INFORMATION SECTION** — SITE NUMBER: 01 — PROPERTY CLASS (PRCLAS): 311

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 = RURAL | 2 = SUBURBAN | 3 = URBAN | 4 = COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | | 1 |
| TRAFFIC | (TRAF) | 1 = HEAVY | 2 = MEDIUM | 3 = LIGHT | 4 = LAND LOCKED | 2 |
| DRIVEWAY | (DRVWAY) | 1 = NONE | 2 = UNIMPROVED | 3 = IMPROVED | | 1 |
| SEWER | (SEWER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | | 1 |
| WATER | (WATER) | 1 = NONE | 2 = PRIVATE | 3 = COMM/PUBLIC | | 3 |
| OTHER UTILITIES | (UTIL) | 1 = NONE | 2 = GAS | 3 = ELECTRIC | 4 = GAS AND ELECTRIC | 2 |
| SITE ELEVATION | (ELEV) | 1 = BELOW GRADE | 2 = LEVEL | 3 = ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 = INFERIOR | 2 = TYPICAL | 3 = SUPERIOR | | 3 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 = RES CONST | 2 = IMP CONST | 3 = RES DEMO | 4 = IMP DEMO | |

SALES NOTES:
Taxes To: Proper, Malcolm J Doris P
3282 Cooper Rd
Newfane, NY 14108

NOTES: DORIS

AIV 17300

**LAND TYPE CODE (LNDTYP)**

01 = PRIMARY; 02 = SECONDARY; 03 = UNDEVELOPED; 04 = RESIDUAL; 05 = TILLABLE; 06 = PASTURE; 07 = WOODLAND; 08 = WASTELAND; 09 = MUCK; 10 = WATERFRONT; 11 = ORCHARD; 12 = REAR; 13 = VINEYARD; 14 = WETLAND; 15 = LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 = FRNTFT ONLY; 2 = DEPTH ONLY; 3 = FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE | EFF CODE | FRONT FEET | DEPTH | ACRES | SQUARE FEET | SOIL RATING | WATERFRONTAGE | WATER FRONT TYPE | INFLU FACE CODE | INFLUENCE PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 138 | 278 | | | | | 3 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

P = POOR; N = NORMAL; G = GOOD

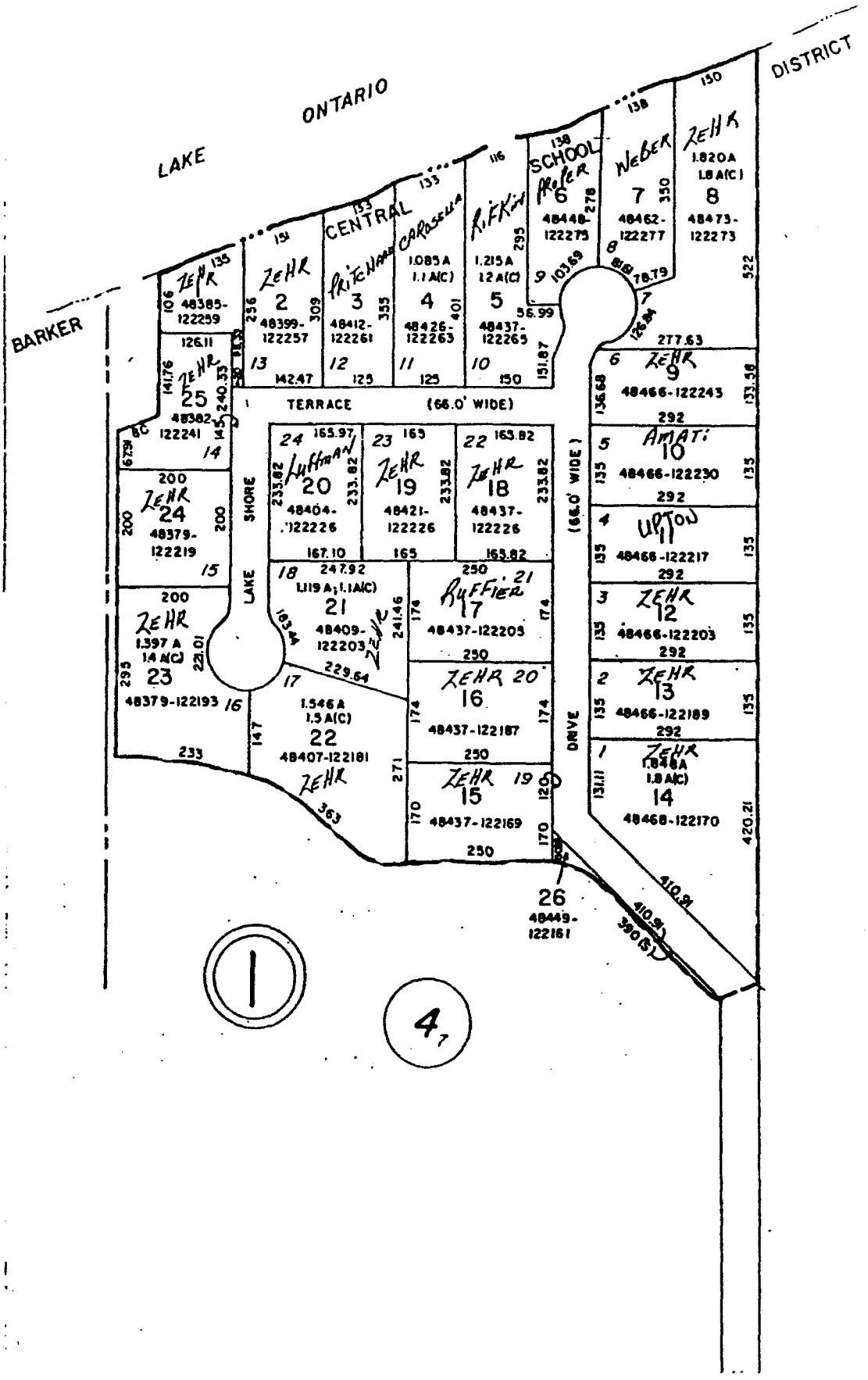
| | | |
|---|---|---|
| 05 | 1 | 10 |
| 06 | 1 | 10 |
| 07 | 1 | 4 |
| 08 | 1 | 4 |
| 11 | 1 | 10 |
| 13 | 1 | 10 |

**WATERFRONT TYPE (WTRFNT)**

1 = POND; 2 = RIVER; 3 = LAKE; 4 = CANAL; 5 = OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 = TOPOGRAPHY; 2 = LOCATION; 3 = SHAPE; 4 = RESTRICTED USE; 5 = VIEW; 6 = WETNESS; 7 = OTHER


LAKE ONTARIO
DISTRICT
BARKER
CENTRAL
SCHOOL
WEBER
ZEHR
TERRACE (66.0' WIDE)
LAKE SHORE
DRIVE (66.0' WIDE)
1
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(A3100 (6/82))

(12)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**AUDIT CONTROL CODES**

ACTIVITY (ACTIVITY)
N - NONE
M - MEASURED ONLY
L - LISTED

ENTRY (ENTRY)
1 - INTERIOR INSPECTION
2 - INTERIOR REFUSAL
3 - TOTAL REFUSAL
4 - ESTIMATE
5 - NO ENTRY

SOURCE (INFSCE)
1 - OWNER
2 - RELATIVE
3 - TENANT
4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP)
1 - LAND ONLY
2 - BLDG ONLY
3 - LAND & BLDG.

SOURCE (VERIFY)
1 - UNCONFIRMED
2 - BUYER
3 - SELLER
4 - STAMPS
5 - AGENT

VALID (VALID)
1 - VALID SALE
2 - INVALID SALE

SWIS/SBL/CD: 292800 7.01-1-10 CARD NO __ OF __

ROUTE NUMBER (ROUTE): 160 010

NEIGHBORHOOD CODE (NBHD): 214

ZONING CODE (ZONING): ARE
01 - NONE 04 - FARM 07 - MIXED
02 - SINGLE RES 05 - COMMERCIAL 08 - GOVERNMENT
03 - MULTI RES 06 - INDUSTRIAL

**PARCEL IDENTIFICATION SECTION**

| SWIS | TAX MAP NUMBER | CD | B-SEC |
|---|---|---|---|
| 292800 | 7.01-1-10 | | 1 |

OWNER: AMATI, THOMAS J. - GIANNA

PROP CLASS: 314 HC:

LOCATION NO: 1247 LOCATION: LAKE POINT DR APPLETON

SCH-DIST: BARKER 293801

| SALE PRICE | SALE DATE | VALID | LOT SIZE |
|---|---|---|---|
| $37,500 | 10/24/90 | YES | LIBER 2290 PG 238 135 x 292 |

PARCEL IDENTIFICATION CORRECTION AREA

| SWIS (1) | TAX MAP NO (2) | OWNER (3) | PROP CLASS (4) | LOC NO (5) | LOC (6) | SCHOOL DIST (7) | LOT SIZE (8) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**SITE INFORMATION SECTION** — SITE NUMBER: 01 — PROPERTY CLASS (PRCLAS): 314

| | | | | | |
|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE (NBRTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL | 1 |
| ROAD TYPE (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 3 |
| TRAFFIC (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED | 3 |
| DRIVEWAY (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 1 |
| SEWER (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 1 |
| WATER (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 3 |
| OTHER UTILITIES (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC | 3 |
| SITE ELEVATION (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | | 2 |
| SITE DESIRABILITY (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | | 3 |
| SETBACK (SETBCK) | | | | | |
| PHYSICAL CHANGE (PHYCHG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO | |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT):

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCDV) DATE

CERTIFIED LETTER (CTFLET) DATE (MMDDYY)

**SALES NOTES:**

**NOTES:**

DIV 3000

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**LAND TYPE CODE (LNDTYP)**

01 - PRIMARY
02 - SECONDARY
03 - UNDEVELOPED
04 - RESIDUAL
05 - TILLABLE
06 - PASTURE
07 - WOODLAND
08 - WASTELAND
09 - MUCK
10 - WATERFRONT
11 - ORCHARD
12 - REAR
13 - VINEYARD
14 - WETLAND
15 - LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 - FRNTFT ONLY
2 - DEPTH ONLY
3 - FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE (LNDTYP) | EFF. CODE (EFFCD) | FRONT FEET (FRNTFT) | DEPTH (DEPTH) | ACRES (ACRES) | SQUARE FEET (SQFEET) | SOIL RATING (SOILRT) | WATERFRONTAGE (WTRFNT) | WATER FRONT TYPE (WTRFNT) | INFLUENCE CODE (INFLCD) | INFLUENCE PERCENT (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 135 | 292 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

P - POOR
N - NORMAL
G - GOOD

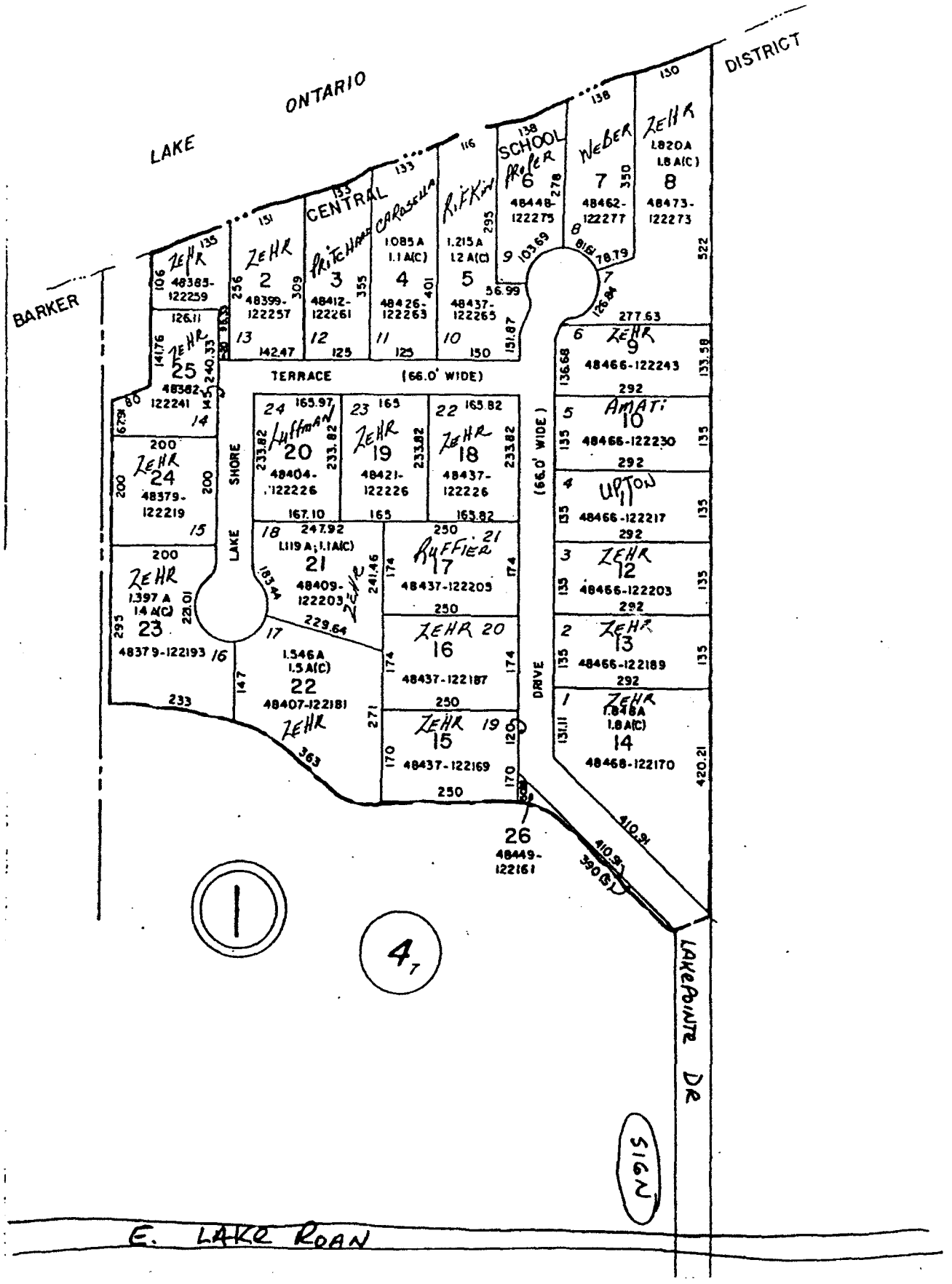
| | | |
|---|---|---|
| 05 | 1 | 10 |
| 06 | 1 | 10 |
| 07 | 1 | 4 |
| 09 | 1 | 4 |
| 11 | 1 | 10 |
| 13 | 1 | 10 |

**WATERFRONT TYPE (WTRFNT)**

1 - POND
2 - RIVER
3 - LAKE
4 - CANAL
5 - OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 - TOPOGRAPHY
2 - LOCATION
3 - SHAPE
4 - RESTRICTED USE
5 - VIEW
6 - WETNESS
7 - OTHER


LAKE ONTARIO
DISTRICT
BARKER
TERRACE (66.0' WIDE)
LAKE SHORE
DRIVE (66.0' WIDE)
LAKEPOINTE DR
E. LAKE ROAD
SIGN
ZEHR 1 48383-122259
ZEHR 2 48399-122257
FRITCHMAN 3 48412-122261
CAROSELLA 4 48426-122263
RIFKIN 5 48437-122265
SCHOOL 6 48448-122275
WEBER 7 48462-122277
ZEHR 8 48473-122273
ZEHR 9 48466-122243
AMATI 10 48466-122230
UPTON 11 48466-122217
ZEHR 12 48466-122203
ZEHR 13 48466-122189
ZEHR 14 48466-122170
ZEHR 15 48437-122169
ZEHR 16 48437-122187
RUFFIER 17 48437-122209
ZEHR 18 48437-122226
ZEHR 19 48421-122226
HUFFMAN 20 48404-122226
ZEHR 21 48409-122203
ZEHR 22 48407-122181
ZEHR 23 48379-122193
ZEHR 24 48379-122219
ZEHR 25 48382-122241
26 48449-122161
1.546A 1.5A(C)
1.397A 1.4A(C)
1.119A; 1.1A(C)
1.085A 1.1A(C)
1.215A 1.2A(C)
1.820A 1.8A(C)
1.848A 1.8A(C)
4T

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(A3100 (6/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

SWIS: 292800 | TAX MAP NUMBER: 7.01-1-7 | CO | B-SEC: 1

OWNER: Weber, Kenneth E. + Nancy | PROP CLASS: 313 | MC

LOCATION NO: 7145 | LOCATION: Lake Shore Terrace, Appleton 14008 | SCH-DIST: 292801 293891

SALE PRICE: $ 67,000. | SALE DATE: 3/90 | VALID: Yes | LOT SIZE: 138 x 278

Liber 2248 - Pg 70

PARCEL IDENTIFICATION CORRECTION AREA

| SWIS 1 | TAX MAP NO 2 | OWNER 3 | PROP CLASS 4 | LOC NO 5 | LOC 6 | SCHOOL DIST 7 | LOT SIZE 8 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**AUDIT CONTROL CODES**

ACTIVITY: B - NONE; M - MEASURED ONLY; L - LISTED

ENTRY (ENTRY): 1 - INTERIOR INSPECTION; 2 - INTERIOR REFUSAL; 3 - TOTAL REFUSAL; 4 - ESTIMATE; 5 - NO ENTRY

SOURCE (INFSCE): 1 - OWNER; 2 - RELATIVE; 3 - TENANT; 4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 - LAND ONLY; 2 - BLDG. ONLY; 3 - LAND & BLDG

SOURCE (VERIFY): 1 - UNCONFIRMED; 2 - BUYER; 3 - SELLER; 4 - STAMPS; 5 - AGENT

VALID (VALID): 1 - VALID SALE; 2 - INVALID SALE

SWIS/SBL/CO: 292800 7.01-1-7 | CARD NO __ OF __

ROUTE NUMBER (ROUTE) | 14.01-1-10

NEIGHBORHOOD CODE (NBHD) | 126

ZONING CODE (ZONING): 01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT | R22

**SITE INFORMATION SECTION** | SITE NUMBER: 01 | PROPERTY CLASS (PRCLAS): 313

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 3 |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED | 3 |
| DRIVEWAY | (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 1 |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 1 |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 3 |
| OTHER UTILITIES | (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC | 3 |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | | 3 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO | |

**AUDIT CONTROL SECTION** | NUMBER OF SITES (NUMSIT)

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY) | DATE | CERTIFIED LETTER (CTFLET) | DATE (MMDDYY)

**SALES NOTES:**

**NOTES:**

AIV 48300

**SALES INFORMATION SECTION** | OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**LAND TYPE CODE (LNDTYP)**

01 - PRIMARY; 02 - SECONDARY; 03 - UNDEVELOPED; 04 - RESIDUAL; 05 - TILLABLE; 06 - PASTURE; 07 - WOODLAND; 08 - WASTELAND; 09 - MUCK; 10 - WATERFRONT; 11 - ORCHARD; 12 - REAR; 13 - VINEYARD; 14 - WETLAND; 15 - LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 - FRNTFT ONLY; 2 - DEPTH ONLY; 3 - FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE (LNDTYP) | EFF. CODE (EFFCD) | FRONT FEET (FRNTFT) | DEPTH (DEPTH) | ACRES (ACRES) | SQUARE FEET (SQFEET) | SOIL RATING (SOILRG) | WATERFRONT (WTRFNT) | WATER INFLU TYPE (WTRINF) | INFLU INFLU CODE (INFLCD) | INFLUENCE PERCENT (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 138 | 278 | | | | | 3 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

P - POOR; N - NORMAL; G - GOOD

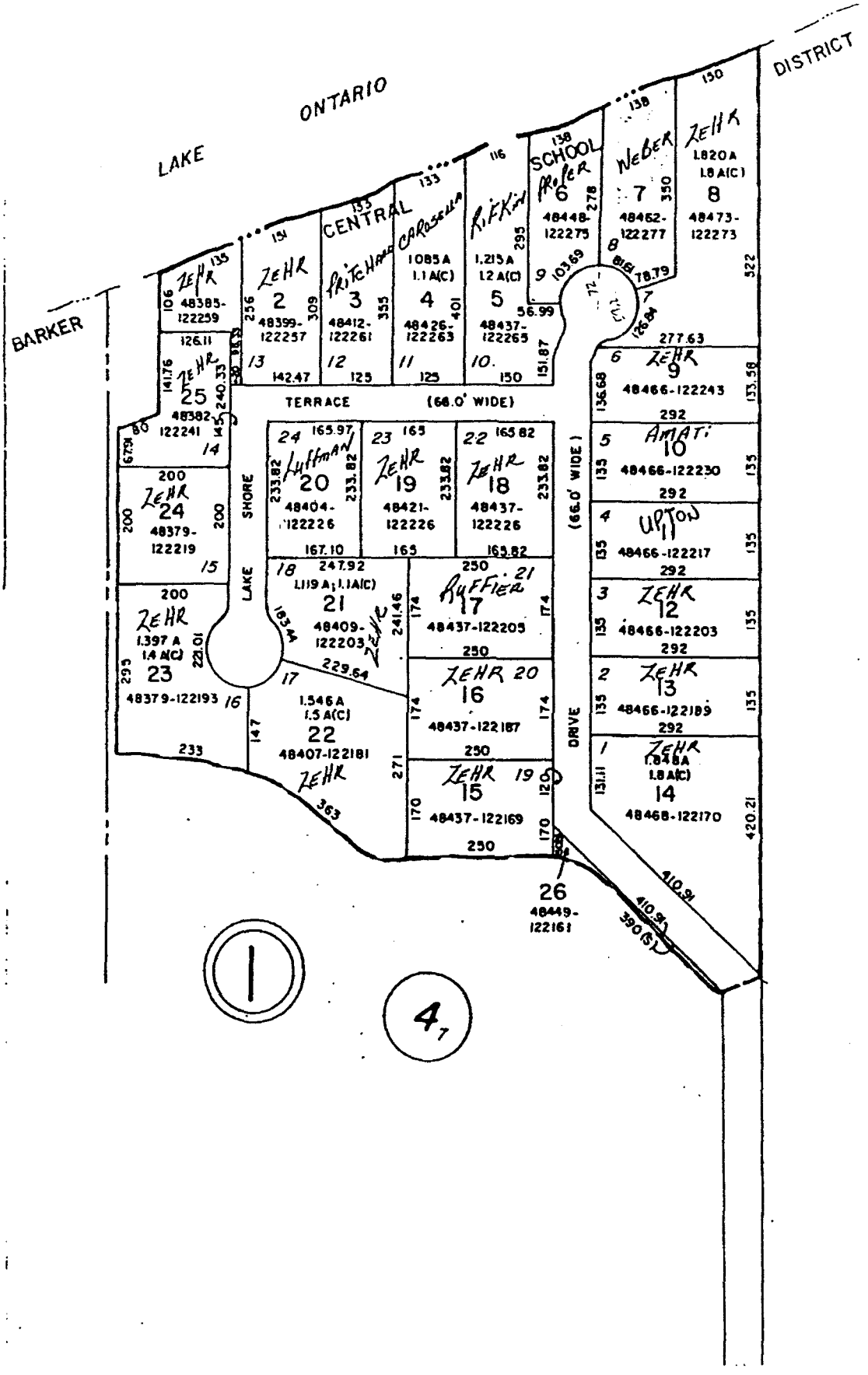
| | |
|---|---|
| 05 | 1 - 10 |
| 06 | 1 - 10 |
| 07 | 1 - 4 |
| 09 | 1 - 4 |
| 11 | 1 - 10 |
| 13 | 1 - 10 |

**WATERFRONT TYPE (WTRFNT)**

1 - POND; 2 - RIVER; 3 - LAKE; 4 - CANAL; 5 - OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 - TOPOGRAPHY; 2 - LOCATION; 3 - SHAPE; 4 - RESTRICTED USE; 5 - VIEW; 6 - WETNESS; 7 - OTHER


LAKE ONTARIO
DISTRICT
BARKER
TERRACE (66.0' WIDE)
LAKE SHORE DRIVE (66.0' WIDE)
ZEHR 25 48382-122241
ZEHR 24 48379-122219
ZEHR 23 48379-122193
ZEHR 2 48399-122257
CENTRAL 3 48412-122261
CARROLL 4 48426-122263
RIFKIN 5 48437-122265
SCHOOL 6 48448-122275
WEBER 7 48462-122277
ZEHR 8 48473-122273
ZEHR 9 48466-122243
AMATI 10 48466-122230
UPTON 11 48466-122217
ZEHR 12 48466-122203
ZEHR 13 48466-122189
ZEHR 14 48468-122170
ZEHR 15 48437-122169
ZEHR 16 48437-122187
ZEHR 17 48437-122205
ZEHR 18 48437-122226
ZEHR 19 48421-122226
LUFFMAN 20 48404-122226
ZEHR 21 48409-122203
ZEHR 22 48407-122181
26 48449-122161
1.397 A 1.4 A(C)
1.119 A; 1.1 A(C)
1.546 A 1.5 A(C)
1.085 A 1.1 A(C)
1.215 A 1.2 A(C)
1.820 A 1.8 A(C)
1.848 A 1.8 A(C)
1
4

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(A3100 (6/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

| SWIS | TAX MAP NUMBER | CD | R-SEC |
|---|---|---|---|
| 292800 | 7.01-1-5 | | 1 |

OWNER: RIFKIN SANDRA B

PROP CLASS: 210 HC:

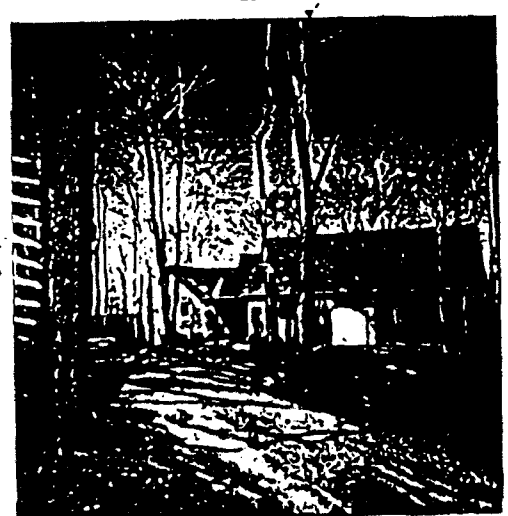
LOCATION NO: 7135 LOCATION: LAKE SHORE TERRACE, APPLETON 14008

SCH DIST: BARKER 293801

| SALE PRICE | SALE DATE | VALID | LOT SIZE |
|---|---|---|---|
| 66930 | 10/89 | Y | 116 x 354 |

BK 2222 Pg 301

| LOC | SCHOOL DIST | LOT SIZE |
|---|---|---|
| B | 7 | B |



**AUDIT CONTROL CODES**

ACTIVITY: N - NONE; M - MEASURED ONLY; L - LISTED

ENTRY (ENTRY): 1 - INTERIOR INSPECTION; 2 - INTERIOR REFUSAL; 3 - TOTAL REFUSAL; 4 - ESTIMATE; 5 - NO ENTRY

SOURCE (INFSCE): 1 - OWNER; 2 - RELATIVE; 3 - TENANT; 4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 - LAND ONLY; 2 - BLDG ONLY; 3 - LAND & BLDG

SOURCE (VERIFY): 1 - UNCONFIRMED; 2 - BUYER; 3 - SELLER; 4 - STAMPS; 5 - AGENT

VALID (VALID): 1 - VALID SALE; 2 - INVALID SALE

| ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|
| | |
| | |
| | |
| | |
| | |

E (MMDDYY)

**OFFICE USE ONLY**

| CHECK | SOURCE2 |
|---|---|
| | |
| | |
| | |
| | |
| | |

SWIS/SBL/CO: 292800 7.01-1-5

CARD NO __ OF __

ROUTE NUMBER (ROUTE):

NEIGHBORHOOD CODE (NBHD): 1216

ZONING CODE (ZONING): 01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT 222

**SITE INFORMATION SECTION** — SITE NUMBER: 01 — PROPERTY CLASS (PRCLAS): 210

| | | | | | |
|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED |
| DRIVEWAY | (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | |
| OTHER UTILITIES | (UTH) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | |
| SETBACK | (SETBCK) | | | | |
| PHYSICAL CHANGE | (PHYCNG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO |

**SALES NOTES:**

**NOTES:** Vets exempt 25% x 1 (Husband)
Vets disability 10%.

12/U 40600/154.00

**LAND BREAKDOWN SECTION**

| LAND TYPE | EFF CODE | FRONT FEET | DEPTH | ACRES | SQUARE FEET | SOIL RATING | WATERFRONTAGE | WATER FRONT TYPE | INFLUENCE CODE | INFLUENCE PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 116 | 354 | | | | | 03 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

01 - PRIMARY; 02 - SECONDARY; 03 - UNDEVELOPED; 04 - RESIDUAL; 05 - TILLABLE; 06 - PASTURE; 07 - WOODLAND; 08 - WASTELAND; 09 - MUCK; 10 - WATERFRONT; 11 - ORCHARD; 12 - REAR; 13 - VINEYARD; 14 - WETLAND; 15 - LEASED LAND

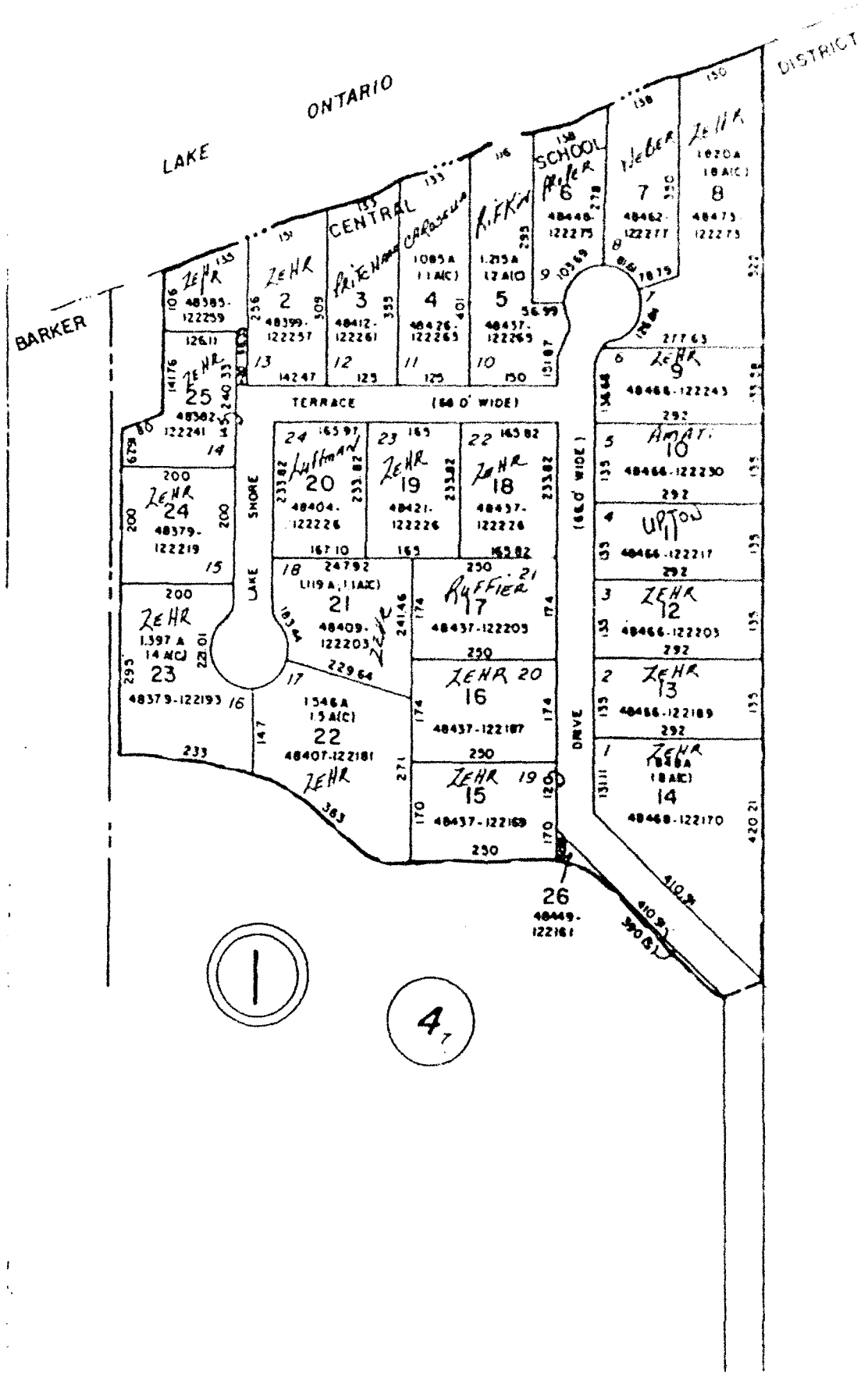
EFFECTIVE CODE (EFFCD): 1 - FRONTEFF ONLY; 2 - DEPTH ONLY; 3 - FRONTEFF AND DEPTH

SOIL RATING (RATING): P - POOR; N - NORMAL; G - GOOD

| | | | |
|---|---|---|---|
| 05 | 1 | 10 | |
| 06 | 1 | 10 | |
| 07 | 1 | 4 | |
| 08 | 1 | 4 | |
| 11 | 1 | 10 | |
| 13 | 1 | 10 | |

WATERFRONT TYPE (WTRFNT): 1 - POND; 2 - RIVER; 3 - LAKE; 4 - CANAL; 5 - OCEAN/BAY

INFLUENCE CODE (INFLCD): 1 - TOPOGRAPHY; 2 - LOCATION; 3 - SWAMP; 4 - RESTRICTED USE; 5 - VIEW; 6 - WITNESS; 7 - OTHER


LAKE ONTARIO
DISTRICT
BARKER
CENTRAL
SCHOOL
TERRACE (66.0' WIDE)
LAKE SHORE
DRIVE (66.0' WIDE)
ZEHR 25 48382-122241
ZEHR 2 48399-122257
3 48412-122261
4 48426-122265
5 48437-122269
6 48448-122275
7 48462-122277
8 48473-122273
ZEHR 9 48466-122243
AMATT 10 48466-122230
UPTON 11 48466-122217
ZEHR 12 48466-122205
ZEHR 13 48466-122189
ZEHR 14 48468-122170
ZEHR 15 48437-122169
ZEHR 16 48437-122187
RUFFIER 17 48437-122205
ZEHR 18 48437-122226
ZEHR 19 48421-122226
LUTTMANN 20 48404-122226
ZEHR 21 48409-122203
ZEHR 22 48407-122181
ZEHR 23 48379-122193
ZEHR 24 48379-122219
26 48449-122161
1
4

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(A3100 (6/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**PARCEL IDENTIFICATION SECTION**

SWIS: 292800 | TAX MAP NUMBER: 7.01-1-7 | CD | B SEC: 1

OWNER: CAROSELLA, NICHOLAS C-MARY E | PROP CLASS: 313 | NC

LOCATION NO: 7131 | LOCATION: LAKE SHORE TERRACE, APPLETON 14008 | SCH DIST: 293801 Barker

SALE PRICE: 80500 | SALE DATE: 6/90 | VALID: Y | BK 2267 PG 122 | LOT SIZE: 133X353

PARCEL IDENTIFICATION CORRECTION AREA

| SWIS | TAX MAP NO | OWNER | PROP CLASS | LOC NO | LOC | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** | NUMBER OF SITES (NUMSIT)

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY) | DATE | CERTIFIED LETTER (CTFLET) | DATE (MMDDYY)

**SALES INFORMATION SECTION** | OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**AUDIT CONTROL CODES**

ACTIVITY: B - NONE; M - MEASURED ONLY; L - LISTED

ENTRY (ENTRY): 1 - INTERIOR INSPECTION; 2 - INTERIOR REFUSAL; 3 - TOTAL REFUSAL; 4 - ESTIMATE; 5 - NO ENTRY

SOURCE (INFSCE): 1 OWNER; 2 RELATIVE; 3 TENANT; 4 OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 - LAND ONLY; 2 - BLDG ONLY; 3 - LAND & BLDG

SOURCE (VERIFY): 1 - UNCONFIRMED; 2 - BUYER; 3 - SELLER; 4 - STAMPS; 5 - AGENT

VALID (VALID): 1 - VALID SALE; 2 - INVALID SALE

SWIS/SBL/CO: 292800 7.01-1-7 | CARD NO __ OF __

ROUTE NUMBER (ROUTE): 40202C

NEIGHBORHOOD CODE (NBHD): 126

ZONING CODE (ZONING): A122

01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT

**SITE INFORMATION SECTION** | SITE NUMBER: 01 | PROPERTY CLASS (PRCLAS): 313

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 3 |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED | 3 |
| DRIVEWAY | (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 1 |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 1 |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 1 |
| OTHER UTILITIES | (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC | 4 |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | | 3 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO | |

SALES NOTES: MRTUNG: 6564 [illegible] LKAT, NY 11561

NOTES: D/V 16700

**LAND TYPE CODE (LNDTYP)**

01 - PRIMARY; 02 - SECONDARY; 03 - UNDEVELOPED; 04 - RESIDUAL; 05 - TILLABLE; 06 - PASTURE; 07 - WOODLAND; 08 - WASTELAND; 09 - MUCK; 10 - WATERFRONT; 11 - ORCHARD; 12 - BEAR; 13 - VINEYARD; 14 - WETLAND; 15 - LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 - FRNTFT ONLY; 2 - DEPTH ONLY; 3 - FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE | EFF CODE | FRONT FEET | DEPTH | ACRES | SQUARE FEET | SOIL RATING | WATERFRONT | WATER FRONT TYPE | WATER INFLU CODE | INFLUENCE PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 133 | 355 | | | | | 3 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

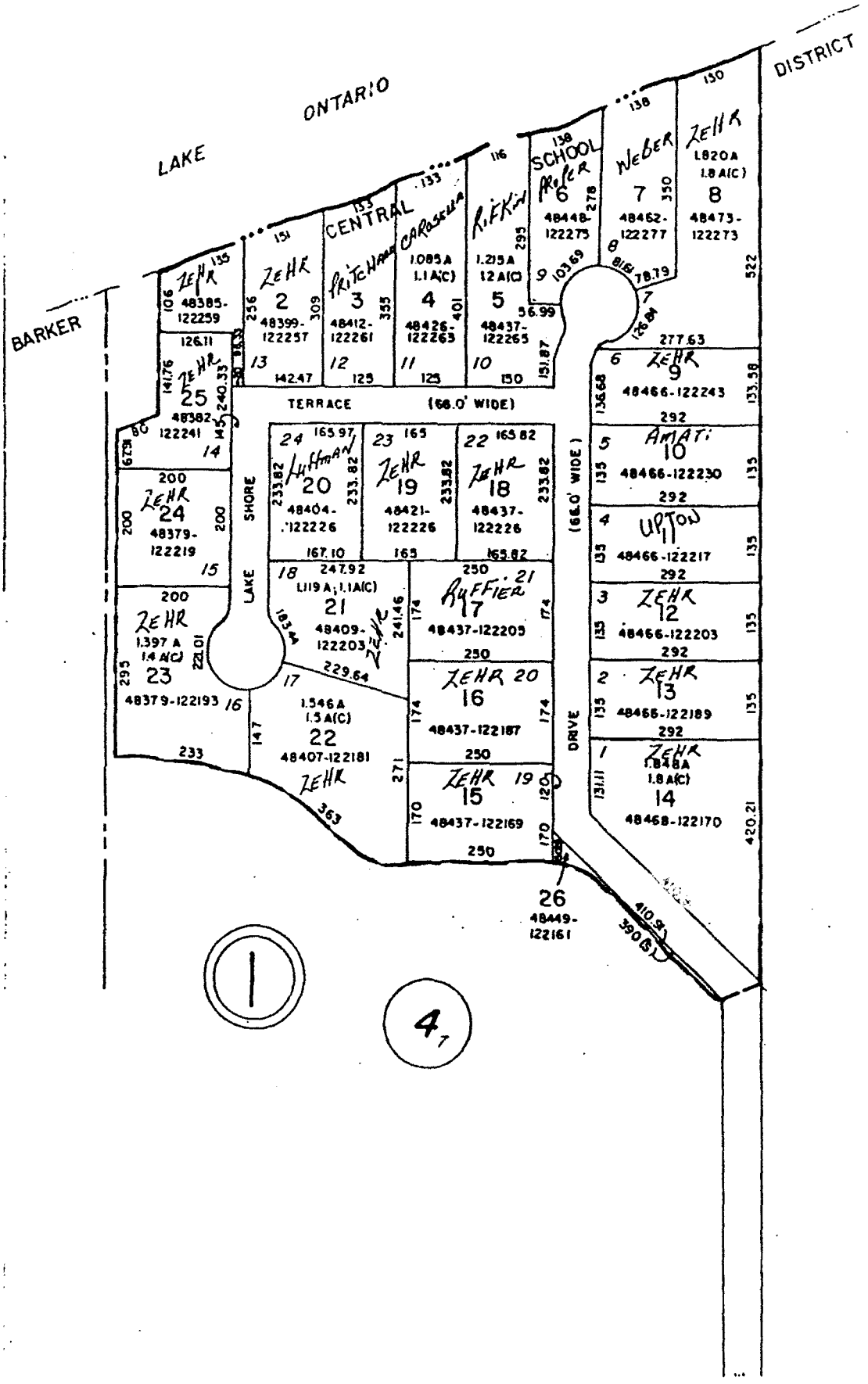
P - POOR; N - NORMAL; G - GOOD

**WATERFRONT TYPE (WTRFNT)**

1 - POND; 2 - RIVER; 3 - LAKE; 4 - CANAL; 5 - OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 - TOPOGRAPHY; 2 - LOCATION; 3 - SHAPE; 4 - RESTRICTED USE; 5 - VIEW; 6 - WETNESS; 7 - OTHER


LAKE ONTARIO
DISTRICT
BARKER
TERRACE (66.0' WIDE)
LAKE SHORE
DRIVE (66.0' WIDE)
ZEHR 25 48382-122241
ZEHR 2 48399-122257
CENTRAL 3 48412-122261
CAROSELLA 4 48426-122265
R.E.KIRK 5 48437-122265
SCHOOL RESERVE 6 48448-122275
WEBER 7 48462-122277
ZEHR 8 48473-122273
ZEHR 9 48466-122243
AMATI 10 48466-122230
UPTON 11 48466-122217
ZEHR 12 48466-122203
ZEHR 13 48466-122189
ZEHR 14 48468-122170
ZEHR 15 48437-122169
ZEHR 16 48437-122187
RUFFIER 17 48437-122205
ZEHR 18 48437-122226
ZEHR 19 48421-122226
HUFFMAN 20 48404-122226
ZEHR 21 48409-122203
ZEHR 22 48407-122181
ZEHR 23 48379-122193
ZEHR 24 48379-122219
26 48449-122161
1.820A 1.8A(C)
1.085A 1.1A(C)
1.215A 1.2A(C)
1.119A; 1.1A(C)
1.397A 1.4A(C)
1.546A 1.5A(C)
4

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(A3100 (6/87)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**AUDIT CONTROL CODES**

ACTIVITY (ACTIVITY)
N - NONE
M - MEASURED ONLY
L - LISTED

ENTRY (ENTRY)
1 - INTERIOR INSPECTION
2 - INTERIOR REFUSAL
3 - TOTAL REFUSAL
4 - ESTIMATE
5 - NO ENTRY

SOURCE (INFSCE)
1 - OWNER
2 - RELATIVE
3 - TENANT
4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP)
1 - LAND ONLY
2 - BLDG. ONLY
3 - LAND & BLDG

SOURCE (VERIFY)
1 - UNCONFIRMED
2 - BUYER
3 - SELLER
4 - STAMPS
5 - AGENT

VALID (VALID)
1 - VALID SALE
2 - INVALID SALE

SWIS/SBL/CD: 292800 7.01-1-17 CARD NO ___ OF ___

| | | |
|---|---|---|
| ROUTE NUMBER | (ROUTE) | 16.090 |
| NEIGHBORHOOD CODE | (NBHD) | 124 |
| ZONING CODE | (ZONING) | AGR |

01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT

**PARCEL IDENTIFICATION SECTION**

SWIS: 292800 | TAX MAP NUMBER: 7.01-1-17 | CD | R SEC: 1

OWNER: Ruffier, Philip A - Teresa J. | PROP CLASS: 314 | NC

LOCATION NO: 1258 | LOCATION: Lake Pointe Dr, Appleton 14008 | SCH DIST: Barker 233801

SALE PRICE: $29,500. | SALE DATE: 9/2/90 | VALID: yes | LIBER-2284 PG-27 | LOT SIZE: 174 x 250

| PARCEL IDENTIFICATION CORRECTION AREA | SWIS | PLAT MAP NO | OWNER | PROP CLASS | LOC NO | LOC | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**SITE INFORMATION SECTION** — SITE NUMBER: 01 — PROPERTY CLASS (PRCLAS): 314

| | | | | | |
|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL: 1 |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | 3 |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED: 3 |
| DRIVEWAY | (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | 1 |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | 1 |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | 3 |
| OTHER UTILITIES | (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC: 3 |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | 3 |
| SETBACK | (SETBCK) | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT)

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY) — DATE — CERTIFIED LETTER (CTFLET) — DATE (MMDDYY)

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) MMDD | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE2 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**SALES NOTES:**

**NOTES:**

A/V 3000

**LAND TYPE CODE (LNDTYP)**

01 - PRIMARY
02 - SECONDARY
03 - UNDEVELOPED
04 - RESIDUAL
05 - TILLABLE
06 - PASTURE
07 - WOODLAND
08 - WASTELAND
09 - MUCK
10 - WATERFRONT
11 - ORCHARD
12 - REAR
13 - VINEYARD
14 - WETLAND
15 - LEASED LAND

**EFFECTIVE CODE (EFFCD)**

1 - FRNTFT ONLY
2 - DEPTH ONLY
3 - FRNTFT AND DEPTH

**LAND BREAKDOWN SECTION**

| LAND TYPE (LNDTYP) | EFF CODE (EFFCD) | FRONT FEET (FRNTFT) | DEPTH (DEPTH) | ACRES (ACRES) | SQUARE FEET (SQFEET) | SOIL RATING (SOIL) | WATERFRONT (WTRFNT) | WATER FRONT TYPE (WTRFNT) | INFLU ENCE CODE (INFLCD) | INFLUENCE PERCENT (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 3 | 174 | 250 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SOIL RATING (RATING)**

P - POOR
N - NORMAL
G - GOOD

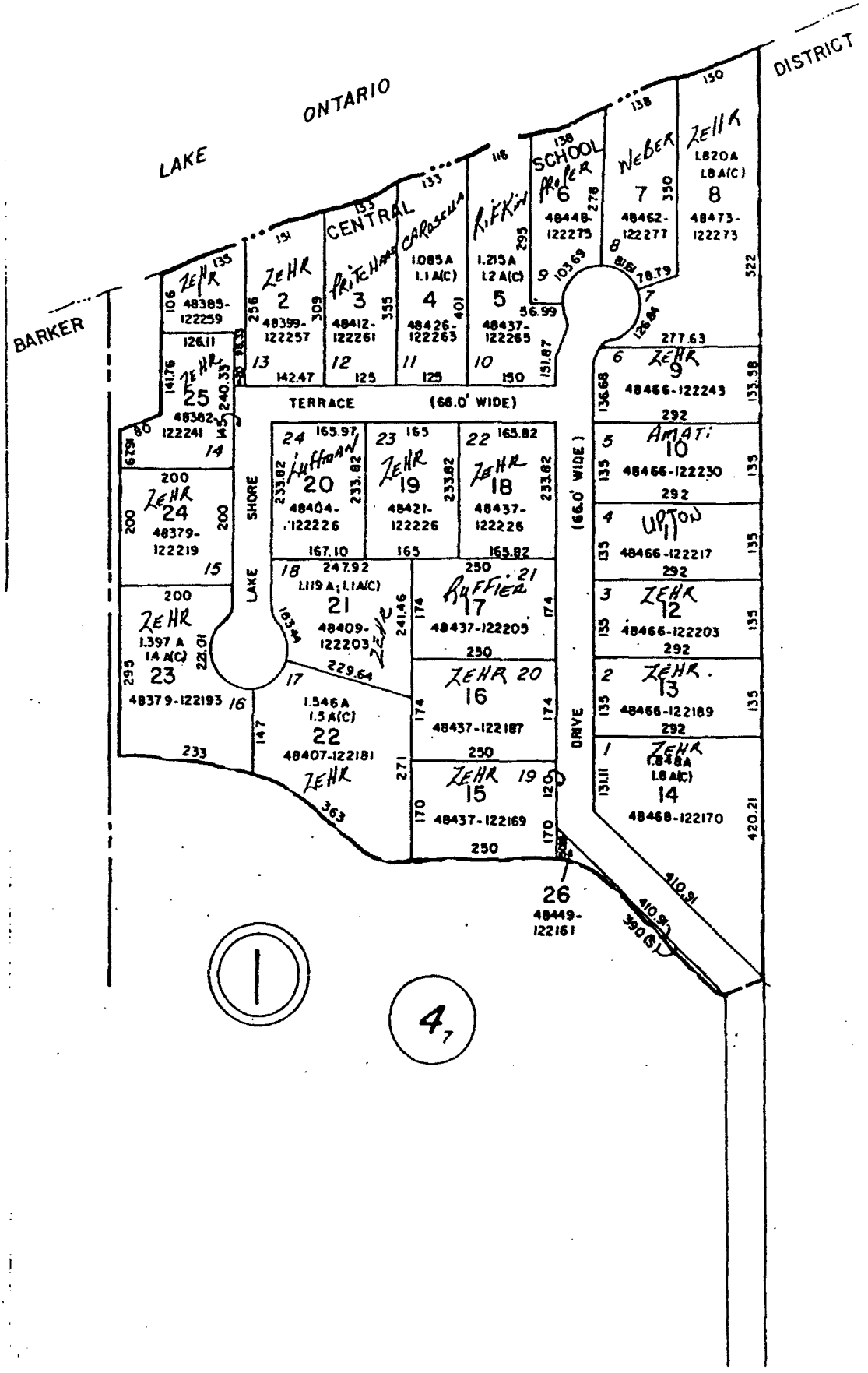
(05) 1 - 10
(06) 1 - 10
(07) 1 - 4
(08) 1 - 4
(11) 1 - 10
(13) 1 - 10

**WATERFRONT TYPE (WTRFNT)**

1 - POND
2 - RIVER
3 - LAKE
4 - CANAL
5 - OCEAN/BAY

**INFLUENCE CODE (INFLCD)**

1 - TOPOGRAPHY
2 - LOCATION
3 - SHAPE
4 - RESTRICTED USE
5 - VIEW
6 - WETNESS
7 - OTHER


LAKE ONTARIO
DISTRICT
BARKER
TERRACE (66.0' WIDE)
LAKE SHORE
DRIVE (66.0' WIDE)
ZEHR 48385-122259
ZEHR 2 48399-122257
CENTRAL 3 48412-122261
CARUSELLA 4 48426-122263
KIFKIN 5 48437-122265
SCHOOL 6 48448-122275
WEBER 7 48462-122277
ZEHR 8 48473-122273
ZEHR 25 48382-122241
ZEHR 24 48379-122219
ZEHR 23 48379-122193
HUFFMAN 20 48404-122226
ZEHR 19 48421-122226
ZEHR 18 48437-122226
ZEHR 21 48409-122203
RUFFIER 17 48437-122205
ZEHR 20 16 48437-122187
ZEHR 22 48407-122181
ZEHR 15 48437-122169
ZEHR 9 48466-122243
AMATI 10 48466-122230
UPTON 11 48466-122217
ZEHR 12 48466-122203
ZEHR 13 48466-122189
ZEHR 14 48468-122170
26 48449-122161
4,7

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6625 - E. Lake Rd - Kingfisher Ct — 3-IV

(A3100 (6/87))

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**AUDIT CONTROL CODES**

ACTIVITY
N - NONE
M - MEASURED ONLY
L - LISTED

(ENTRY (ENTRY)
1 - INTERIOR INSPECTION
2 - INTERIOR REFUSAL
3 - TOTAL REFUSAL
4 - ESTIMATE
5 - NO ENTRY

SOURCE (INFSCE)
1 - OWNER
2 - RELATIVE
3 - TENANT
4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP)
1 - LAND ONLY
2 - BLDG. ONLY
3 - LAND & BLDG

SOURCE (VERIFY)
1 - UNCONFIRMED
2 - BUYER
3 - SELLER
4 - STAMPS
5 - AGENT

VALID (VALID)
1 - VALID SALE
2 - INVALID SALE

SWIS/SBL/CO: 292800 - 6.04-1-18 (13) CARD NO 1 OF 1

ROUTE NUMBER (ROUTE): 26

NEIGHBORHOOD CODE (NBHD):

ZONING CODE (ZONING): 01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT

02

**PARCEL IDENTIFICATION SECTION**

SWIS: 292800 | TAX MAP NUMBER: 6.04-1-18 | CB | R SEC: 1

OWNER: [illegible] A. | PROP CLASS: 210 | HC

LOCATION NO: [illegible] | LOCATION: Kingfisher Ct. | SCH DIST: N.C.

SALE PRICE: 55,900 | SALE DATE: [illegible]/89 | VALID: N | LOT SIZE: 1.077 Ac. 136.15 x 400

Land Only

PARCEL IDENTIFICATION CORRECTION AREA

| SWIS | TAX MAP NO | OWNER | PROP CLASS | LOC NO | LOC | SCHOOL DIST | LOT SIZE |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**SITE INFORMATION SECTION** — SITE NUMBER: 01 — PROPERTY CLASS (PRCLAS): 210

| | | | | | |
|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED |
| DRIVEWAY | (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | |
| OTHER UTILITIES | (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | |
| SETBACK | (SETBCK) | | | | |
| PHYSICAL CHANGE | (PHY) | | | | |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT):

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENERY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | M.+B | 0,2,2,3,9,0 | AM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY): DATE | CERTIFIED LETTER (CTFLET): | DATE (MMDDYY):

**SALES NOTES**

2300
1105



**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALBTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**LAND BREAKDOWN SECTION**

| LAND TYPE | EFF. CODE | FRONT FEET | DEPTH | ACRES | SQUARE FEET | SOIL RATING | WATERFRONTAGE | WATER FRONT TYPE | INFLUENCE CODE | INFLUENCE PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1.0 | | 131 | 2100 | | | | 131 | | | |
| 0.3 | | | | .48 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

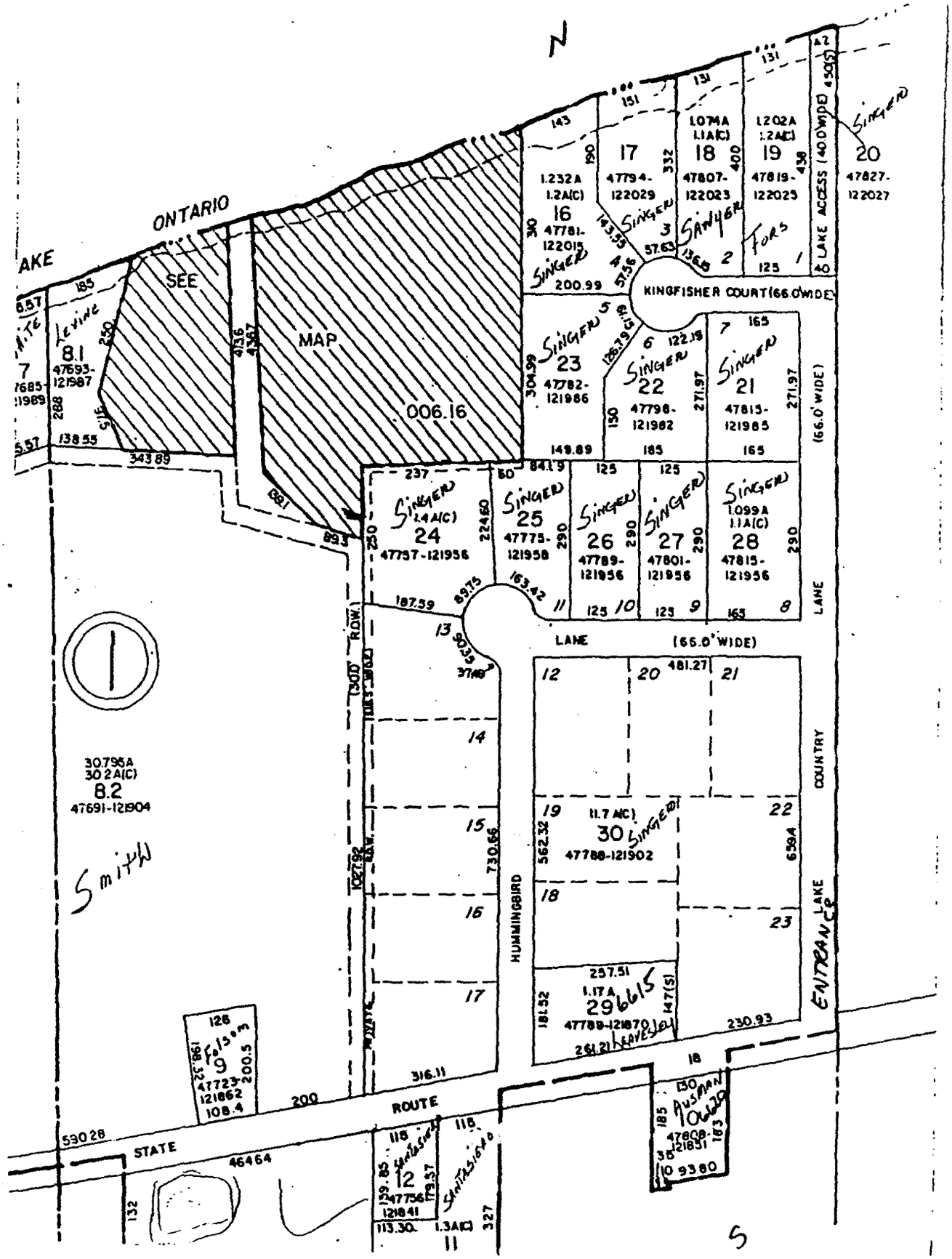
LAND TYPE CODE (LNDTYP)
01 - PRIMARY
02 - SECONDARY
03 - UNDEVELOPED
04 - RESIDUAL
05 - TILLABLE
06 - PASTURE
07 - WOODLAND
08 - WASTELAND
09 - MUCK
10 - WATERFRONT
11 - ORCHARD
12 - BEAR
13 - VINEYARD
14 - WETLAND
15 - LEASED LAND

EFFECTIVE CODE (EFFCD)
1 - FRNTFT ONLY
2 - DEPTH ONLY
3 - FRNTFT AND DEPTH

SOIL RATING
N - NORMAL
G - GOOD
06 1-10
07 1-4
09 1-4
11 1-10
13 1-10

WATERFRONT TYPE (WTRFNT)
1 - POND
2 - RIVER
3 - LAKE
4 - CANAL
5 - OCEAN/BAY

INFLUENCE CODE (INFLCD)
1 - TOPOGRAPHY
2 - LOCATION
3 - SHAPE
4 - RESTRICTED USE
5 - VIEW
6 - WETNESS
7 - OTHER


N
ONTARIO
LAKE
SEE
MAP
006.16
Levine
8.1
47693-121987
30.796A
30.2A(C)
8.2
47691-12904
Smith
KINGFISHER COURT (66.0' WIDE)
LAKE ACCESS (400 WIDE)
17
47794-122029
18
47807-122023
19
47819-122025
20
47827-122027
16
47781-122015
23
47782-121986
22
47798-121982
21
47815-121985
24
47757-121956
25
47775-121958
26
47789-121956
27
47801-121956
28
47815-121956
LANE (66.0' WIDE)
HUMMINGBIRD
COUNTRY LANE
ENTRADA CR
30
47788-121902
29
47789-121870
9
47723-121862
12
47756-121841
ROUTE 200
STATE 46464
Ausman
Orlando
Sandiego
Singer
Fors

6631 KINGFISHER CT (13) 4N

EA3100 (6/82)

**NEW YORK STATE**
**DIVISION OF EQUALIZATION AND ASSESSMENT**
**BUREAU OF LOCAL ASSESSMENT SERVICES**

**RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD**

**Audit Control Codes**

Activity: N = None; M = Measured Only; L = Listed

Entry (ENTRY): 1 = Inspected Interior; 2 = Interior Refused; 3 = Total Refusal; 4 = Estimate; 5 = No Entry

Source (INFSCE): 1 = Owner; 2 = Relative; 3 = Tenant; 4 = Other

Sales Information Codes

Sales Type (SALTYP): 1 = Land Only; 2 = Bldg Only; 3 = Land & Bldg

Source (VERIFY): 1 = Interviewed; 2 = Buyer; 3 = Seller; 4 = Attorney; 5 = Agent

Valid (VALID): 1 = Valid Sale; 2 = Invalid Sale

**SWIS/SBL/CD**

292800 6.04-1-19

Card No. ___ of ___

Roll Number (ROLLYR): 4010310

Neighborhood Code (NBHD): 12.6

Zoning Code (ZONING): 01 = None; 02 = Single Res; 03 = Multi Res; 04 = Farm; 05 = Commercial; 06 = Industrial; 07 = Mixed; 08 = Governmental — ARR

## PARCEL IDENTIFICATION SECTION

Sub: 292800
Tax Map Number: 6.04-1-19
CD:
RSEC: 1
Owner: Foys, Patricia D.
Prop Class: 313
MC:
Location No.: 6631
Location: KINGFISHER Ct
Sch Dist: NEWFANE 292801
Sale Price: $65,500.
Sale Date: 1-22-90
Valid: Yes
Lot Size: 1.2 A. 131 x 400
Liber 2241 Pg 86

PARCEL IDENTIFICATION CORRECTION AREA

| Sub | Tax Map No | Owner | Prop Class | Lot No | Lot | School Dist | Lot Size |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

## SITE INFORMATION SECTION

Site Number: 01
Property Class (PROCLAS): 313

| | | | | | |
|---|---|---|---|---|---|
| Neighborhood Type (NBHTYP) | 1 = Rural | 2 = Suburban | 3 = Urban | 4 = Commercial | 1 |
| Road Type (ROAD) | 1 = None | 2 = Unimproved | 3 = Improved | | W |
| Traffic (TRAF) | 1 = Heavy | 2 = Medium | 3 = Light | 4 = Land locked | 3 |
| Driveway (DRIVWAY) | 1 = None | 2 = Unimproved | 3 = Improved | | 1 |
| Sewer (SEWER) | 1 = None | 2 = Private | 3 = Comm/Public | | 1 |
| Water (WATER) | 1 = None | 2 = Private | 3 = Comm/Public | | W |
| Other Utilities (UTIL) | 1 = None | 2 = Gas | 3 = Electric | 4 = Gas and Electric | W |
| Site Elevation (ELEV) | 1 = Below Grade | 2 = Level | 3 = Above Grade | | N |
| Site Desirability (SITDSR) | 1 = Inferior | 2 = Typical | 3 = Superior | | N |
| Setback (SETBCK) | | | | | |
| Physical Change (PHYCHG) | 1 = Res Const | 2 = Imp Const | 3 = Res Demo | 4 = Imp Demo | |

## AUDIT CONTROL SECTION

Number of Sites (NUMSIT): 1

| Visit No (VISIT) | Later Information (LSTINF) Collector | Date (MMDDYY) | Time | Activity | Entry (ENTRY) | Source (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

Quality Control (QCBY): Quality Control Reviewer; Date
Certified Letter (CTFLETI):
Date (MMDDYY):

## SALES INFORMATION SECTION

Office Use Only

| Date (SALDTE) YYMM | Price (SALPRC) | Type (SALTYP) | Source (VERIFY) | Valid (VALID) | Check | Source |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

SALES NOTES: R/N 45,809.

NOTES: Mailing Address - 40 Reesor Management Corp. Caldwell Bldg. 5820 Main St. Williamsville, N.Y. 14221 -

## LAND BREAKDOWN SECTION

Land Type Codes (LNDTYP): 01 = Primary; 02 = Secondary; 03 = Undeveloped; 04 = Residual; 05 = Tillable; 06 = Pasture; 07 = Woodland; 08 = Wasteland; 09 = Muck; 10 = Waterfront; 11 = Orchard; 12 = Rear; 13 = Vineyard; 14 = Wetland; 15 = Leased Land

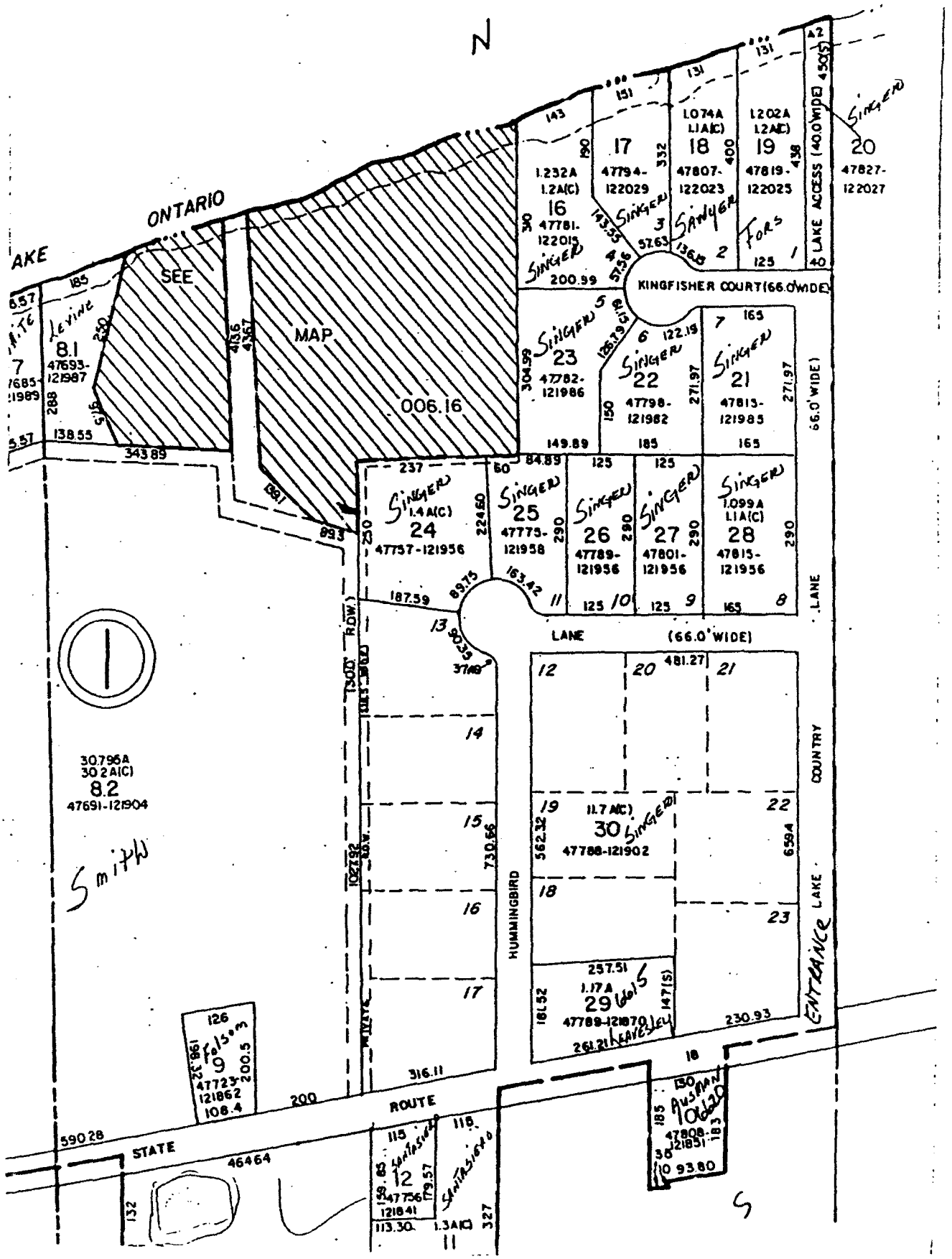
Effective Code (EFFCD): 1 = FRNTFT only; 2 = DEPTH only; 3 = FRNTFT and DEPTH

| Land Type (LNDTYP) | Eff. Code (EFFCD) | Front Feet (FRNTFT) | Depth (DEPTH) | Acres (ACRES) | Square Feet (SQFEET) | Soil Rating (RATING) | Waterfrontage (WTRFNT) | Waterfront Type (WTRFNTT) | Influence Code (INFLCD) | Influence Percent (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 3 | 131 | 400 | | | | 131 | 3 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Soil Rating (RATING): P = Poor; N = Normal; G = Good; (05) 1 - 10; (06) 1 - 10; (07) 1 - 6; (09) 1 - 6; (11) 1 - 10; (13) 1 - 10

Waterfront Type (WTRFNT): 1 = Pond; 2 = River; 3 = Lake; 4 = Canal; 5 = Ocean/Bay

Influence Code (INFLCD): 1 = Topography; 2 = Location; 3 = Shape; 4 = Restricted Use; 5 = View; 6 = Wetness; 7 = Other


N
ONTARIO
LAKE
SEE MAP 006.16
KINGFISHER COURT (66.0' WIDE)
LANE (66.0' WIDE)
LAKE ACCESS (40.0' WIDE)
HUMMINGBIRD LANE
COUNTRY LAKE ENTRANCE
ROUTE 18
STATE
Levine 8.1 47693-121987
17 47794-122029
18 47807-122023
19 47819-122025
20 47827-122027
16 47781-122015
23 47782-121986
22 47798-121982
21 47813-121985
24 47757-121956
25 47773-121958
26 47789-121956
27 47801-121956
28 47815-121956
30.795A 30.2A(C) 8.2 47691-121904
Smith
30 11.7A(C) 47788-121902
29 1.17A 47789-121870
9 47723-121862
12 47756-121841
10 47808-121851
Austman
Fales
Sanitasiewo

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod.
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
180—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural, 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

* Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

(14)

MEASURED BY SAB DATE __-__-__
LISTED BY JBA DATE 10-26-90
EDITED BY TSL DATE 10-28-90

MEASURING & LISTING COMPLETED ON VISIT:
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 1

SOURCE:
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL

## C SIGNATURE

Tim Lee Watson

TOWN OF NEWFANE CODE :292800

6.00-1-5 JS
PARCEL-ID CD
AC: 00018250.00
LOC: E LAKE RD N S RS 1
TYPE: 151 LOT: 17.9A(c) ~~19.70 A(c)~~
OWNR: CIMATO BROS. INC.
MAILS TO: 9220 TRANSIT Rd. E. AMHERST, NY 14051
ADDRS: ~~CLCOTT NY~~ Valid Liber-2282 Pg-263 14126 IVC2 E
SALE: $335,100 DATE: 9-90

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E - VEGETABLE
A - GRAIN
B - HAY, CORN
C - SILAGE
06—PASTURE
A - ROTATING
B - PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A - 8 FT
B - 3 TO 8 FT
C - UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A - 5 TONS
B - 4 TONS
C - UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 04

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| A | 07 | 0.88 | | | | |
| A | 11 | 14.00 | A | 1 | 1 | 1 |
| A | 05 | 1.00 | A | 1 | 1 | 1 |
| F | 10 | 680.00 | | | | |
| D | 10 | 200.00 | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## F CARD SEQUENCE

CARD __ OF __

## G SITE DESCRIPTION

PROPERTY CLASS
SITE NO.
ZONING ARI

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL CROSSROADS 3-SURBURBAN 4-URBAN 5-RES SUBDIVISION 6-MIXED COMMERCIAL 1

ROAD 1-NONE 2-DIRT 3-GRAVEL 4-LOCAL PAVED 5-STATE 5

FRONTING TRAFFIC 1-LANDLOCKED 2-LIGHT 3-MEDIUM 4-HEAVY 3

BUILDING SET BACK 1-LESS THAN 30' 2-30 to 60' 3-MORE THAN 60' 3

VIEW INFLUENCE 1-NONE 2-INFER. 3-SUP. 3

WATERFRONT 1-NONE 2-BAY 3-LAKE 4-RIVER CANAL 5-CREEK 3

SITE ELEVATION 1-BELOW STREET 2-EVEN 3-ABOVE STREET 3

SEWER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 1

WATER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 1

OTHER UTILITIES 1-NONE 2-GAS 3-ELECTRIC 4-GAS/ELECTRIC 3

SITE COMPARED TO SURROUNDS 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

SITE DESIREABILITY 1-POOR 2-TYPICAL 3-SUPERIOR 3

LANDSCAPING 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

IMPROVEMENTS 1-NO 2-YES 2

## H LABEL CORRECTION

SWIS
SECTION BLOCK LOT SUFFIX CD
ROUTE NO. 5
OWNER INCORRECT
PROPERTY ADDRESS INCORRECT
~~PROPERTY CLASSIFICATION~~ OLD SALE 151
SALE PRICE 1,300,000 DATE 03.88
~~Liber 2111 Pg 313~~

## I SALES VERIFICATION

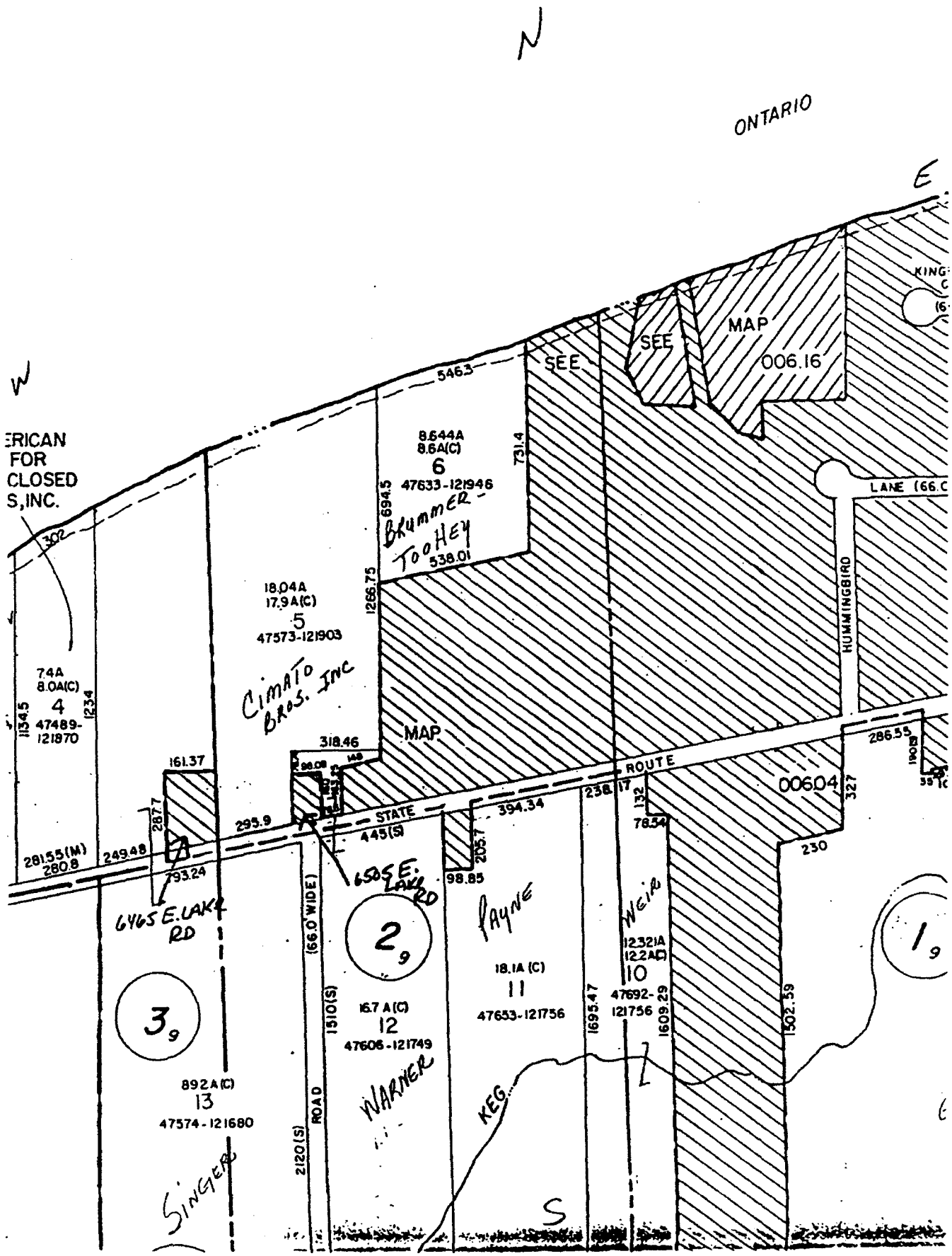
SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT
VALID SALE 0-NO 1-YES
DATA MATCH 1-NO 2-YES
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING

## J SALES NOTES

Exchange - Say = 215.0
All - 12.0 A - Mostly [illegible]
- 3.0 A [illegible] - 30 - [illegible]
- 1.00 - [illegible]
- 5P - [illegible]
10 apart [illegible]

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM

A/V 60900 - 60900


N
ONTARIO
E
W
SEE
MAP
006.16
SEE
5463
731.4
694.5
8.644A
8.6A(C)
6
47633-121946
BRUMMER-TOOHEY
538.01
1266.75
18.04A
17.9A(C)
5
47573-121903
CIMATO BROS. INC
7.4A
8.0A(C)
4
47489-121970
1345
1234
302
ERICAN FOR CLOSED S, INC.
LANE (66.0
HUMMINGBIRD
MAP
318.46
161.37
ROUTE
286.55
006.04
327
238.17
132
78.54
394.34
STATE
445(S)
295.9
287.7
28155(M)
280.8
249.48
793.24
205.7
98.85
230
6465 E. LAKE RD
6505 E. LAKE RD
2
9
3
9
1
9
PAYNE
WEIR
12321A
12.2A(C)
10
47692-121756
18.1A(C)
11
47653-121756
16.7A(C)
12
47606-121749
892A(C)
13
47574-121680
1510(S)
(66.0' WIDE)
ROAD
2120(S)
1695.47
1609.29
1502.59
WARNER
KEG.
SINGER
S

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Horses & Products
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
180—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural, 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY ____ DATE __-__-__
LISTED BY MAW DATE 10-02-00
EDITED BY MAW DATE 10-20-00

MEASURING & LISTING COMPLETED ON VISIT:
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 1

SOURCE:
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL 1

## C SIGNATURE

Signature of RT #6 6.00-1-6

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
I - VEGETABLE
A - GRAIN
B - HAY CORN
C - SILAGE
04—PASTURE
A - ROLLING
B - FLAT
07—WOODLAND
08—WASTELAND
09—MUCK
A - 8 FT
B - 3 TO 8 FT
C - UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A - 5 TONS
B - 4 TONS
C - UNDER 4 TONS
14—WETLANDS

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 02 ~~05~~

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S I W |
|---|---|---|---|---|
| F | 10 | 546.00 | | |
| D | 10 | 700.00 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## F CARD SEQUENCE

CARD ____
OF ____

## G SITE DESCRIPTION

PROPERTY CLASS 313 ~~311~~
SITE NO. ____
ZONING ARR

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL CROSSROADS 3-SUBURBAN 4-URBAN 5-RES. SUBDIVISION 6-MIXED COMMERCIAL 1

ROAD 1-NONE 2-DIRT 3-GRAVEL 4-LOCAL PAVED 5-STATE 2

FRONTING TRAFFIC 1-LANDLOCKED 2-LIGHT 3-MEDIUM 4-HEAVY 2

BUILDING SET BACK 1-LESS THAN 30' 2-30 to 60' 3-MORE THAN 60' 3

VIEW INFLUENCE 1-NONE 2-INFER 3-SUP. 3

WATERFRONT 1-NONE 2-BAY 3-LAKE 4-RIVER CANAL 5-CREEK 3

SITE ELEVATION 1-BELOW STREET 2-EVEN 3-ABOVE STREET 3

SEWER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 2

WATER 1-NONE 2-PRIVATE 3-COMMERCIAL 4-PUBLIC 2 ~~4~~

OTHER UTILITIES 1-NONE 2-GAS 3-ELECTRIC 4-GAS/ELECTRIC 3

SITE COMPARED TO SURROUNDS 1-INFERIOR 2-TYPICAL 3-SUPERIOR 2

SITE DESIREABILITY 1 POOR 2-TYPICAL 3 SUPERIOR 2

LANDSCAPING 1 INFERIOR 2-TYPICAL 3-SUPERIOR 2

IMPROVEMENTS 1 NO 2 YES 1 ~~2~~

CURRENT OWNER (15) E. LAKE RD. 33A N
~~E. 540~~ E L 7C

6.00-1-6
CIMATO BROS, INC
~~BRUMMER, JOZENE M~~ +
~~Timothy J. Toohey~~

~~Legal Notice~~ 1 0

9220 Transit Rd
E. Amherst, NY 14051

## H LABEL CORRECTION

SWIS 292200

6.00 SECTION | 01 BLOCK | 006. LOT | ____ SUFFIX | K4 CD

ROUTE NO. 6
OWNER INCORRECT ____
PROPERTY ADDRESS INCORRECT ____
PROPERTY CLASSIFICATION ~~311~~
SALE PRICE 100000 DATE 12.90
BK 2299 PG 135

## I SALES VERIFICATION

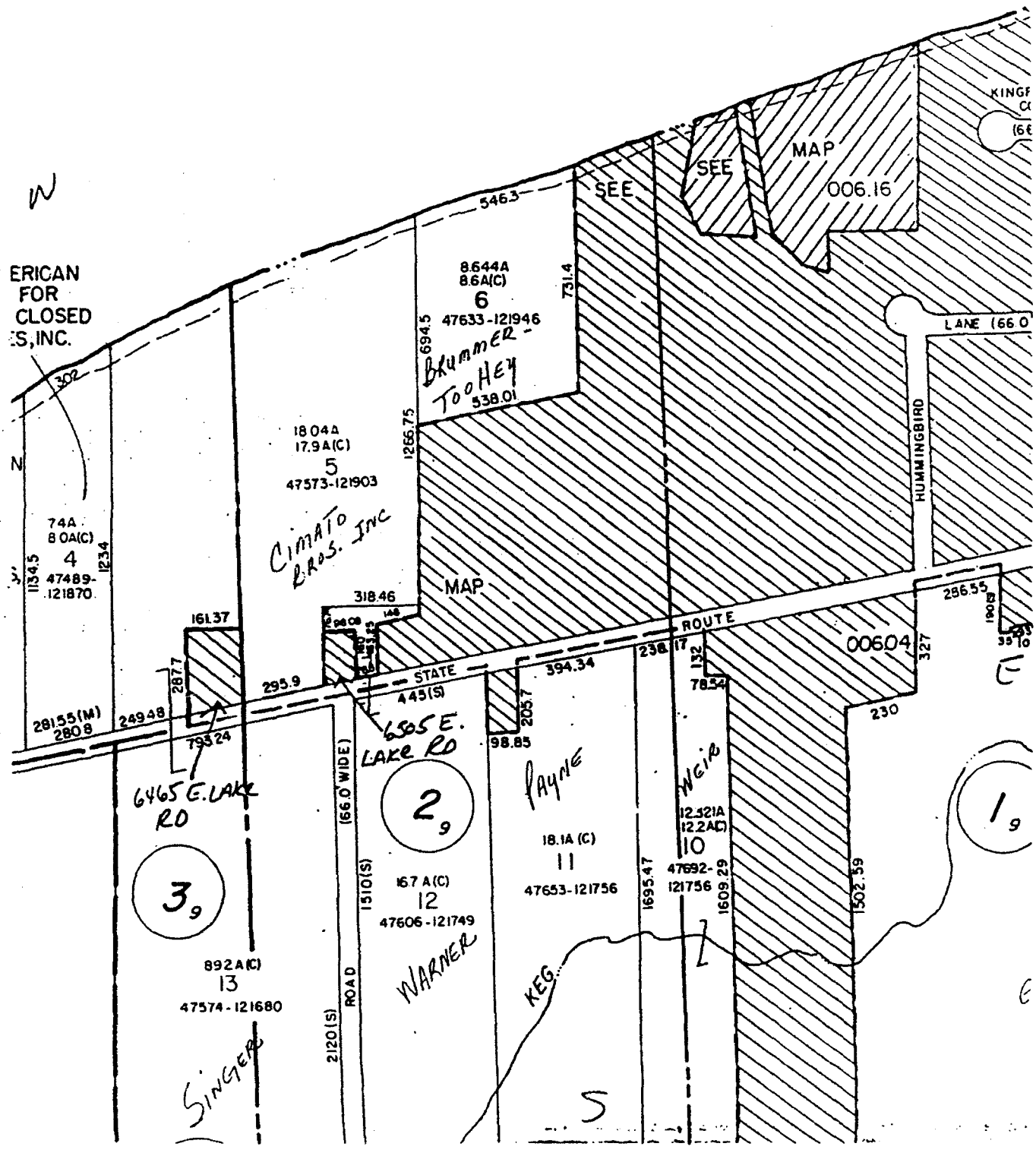
SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT ____
VALID SALE 0-NO 1-YES ____
DATA MATCH 1-NO 2-YES ____
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING ____

## J SALES NOTES

NO TILE'NG
VARIETY OF TREES
2 AC. WOODS NEXT TO LAKE
ORCHARD TREES - APPLES, PEACHES, PEARS
NOT IN YRS 500 - PLUMS, CHERRY

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM

AV 150600


N
ONTARIO
ERICAN
FOR
CLOSED
S, INC.
SEE
MAP
006.16
SEE
5463
731.4
694.5
8.644A
8.6A(C)
6
47633-121946
BRUMMER-
TOOHEY
538.01
LANE (66.0
HUMMINGBIRD
1266.75
18.04A
17.9A(C)
5
47573-121903
CIMATO
BROS. INC
74A
8.0A(C)
4
47489-
121870
1345
1234
302
318.46
MAP
161.37
ROUTE
00604
286.55
327
238.17
132
78.54
230
STATE
445(S)
295.9
394.34
205.7
98.85
2877
28155(M)
2808
249.48
793.24
6465 E. LAKE
RD
6505 E.
LAKE RD
(66.0' WIDE)
2120(S)
ROAD
1510(S)
2g
3g
1g
16.7A(C)
12
47606-121749
WARNER
PAYNE
18.1A(C)
11
47653-121756
WEIR
12.521A
12.2A(C)
10
47692-
121756
1695.47
1609.29
1502.59
892A(C)
13
47574-121680
SINGER
KEG
5

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
103—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle, Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
130—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
160—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural, 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

(16)

MEASURED BY ____ DATE __-__-__
LISTED BY JBA DATE 06-10-80
EDITED BY JFK DATE 06-16-80

MEASURING & LISTING COMPLETED ON VISIT:
1 · FIRST 2 · SECOND
3 · THIRD 4 · FOURTH ____

SOURCE:
1 · OWNER 2 · SPOUSE 3 · TENANT
4 · OTHER 5 · ESTIMATE 6 · TOTAL REFUSAL
7 · INTERIOR REFUSAL 4

## C SIGNATURE

TOWN OF NEWFANE 61 CODE 292800 2a-N

5.20-1-9.1
PARCEL-ID

NC
ED
AC: 00072700.00

LOC: E LAKE RD N RS 1

TYPE: ~~311~~ 313 LOT: ~~352.00 X 153.00~~ 176 105.75

OWNR: ~~LA TORRE CHARLES~~ Montando, Patricia A.
~~C/C N-I TRUST CO~~
~~1 I I PLAZA~~
ADDRS: ~~BUFFALO NY~~ ~~14240~~ 472 Crescent Ave. Buffalo, N.Y. 14214

SALE: #30,000 Liber 2227 Pg 181 DATE: 11-89

## D LAND DESCRIPTION

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
E · VEGETABLE
I · GRAIN
H · HAY CORN
C · SILAGE
06—PASTURE
A · ROTATING
B · PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A · 6 FT
B · 3 TO 6 FT
C · UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A · 5 TONS
B · 4 TONS
C · UNDER 4 TONS
14—WETLANDS

LAND CODES —
F · FRONTAGE D · DEPTH S · SQUARE FEET A · ACREAGE V · VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S L W |
|---|---|---|---|---|
| F | 10 | 340.00 | | |
| D | 10 | 165.00 | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |

## F CARD SEQUENCE

CARD ____
OF ____

## G SITE DESCRIPTION

PROPERTY CLASS ____
SITE NO. ____
ZONING R120

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL
CROSSROADS 3-SURBURBAN 4-URBAN 5-RES
SUBDIVISION 6-MIXED COMMERCIAL 2

ROAD 1-NONE 2-DIRT 3-GRAVEL
4-LOCAL PAVED 5-STATE 5

FRONTING TRAFFIC 1-LANDLOCKED
2-LIGHT 3-MEDIUM 4-HEAVY 3

BUILDING SET BACK 1-LESS THAN 30'
2-30 to 60' 3-MORE THAN 60' ____

VIEW INFLUENCE 1-NONE
2-INFER 3-SUP 3

WATERFRONT 1-NONE 2-DAY
3-LAKE 4-RIVER CANAL 5-CREEK 3

SITE ELEVATION 1-BELOW STREET
2-EVEN 3-ABOVE STREET 3

SEWER 1-NONE 2-PRIVATE
3-COMMERCIAL 4-PUBLIC 4

WATER 1-NONE 2-PRIVATE
3-COMMERCIAL 4-PUBLIC 4

OTHER UTILITIES 1-NONE 2-GAS
3-ELECTRIC 4-GAS/ELECTRIC 4

SITE COMPARED TO SURROUNDS 1-INFERIOR
2-TYPICAL 3-SUPERIOR 2

SITE DESIREABILITY
1-POOR 2-TYPICAL 3-SUPERIOR 3

LANDSCAPING
1-INFERIOR 2-TYPICAL 3-SUPERIOR ____

IMPROVEMENTS 1-NO 2-YES ____

## H LABEL CORRECTION

SWIS ____
SECTION __ BLOCK __ LOT __ SUFFIX __ CD __
ROUTE NO. 8
OWNER INCORRECT ____
PROPERTY ADDRESS INCORRECT ____
PROPERTY CLASSIFICATION 313
SALE PRICE ____ DATE __.__

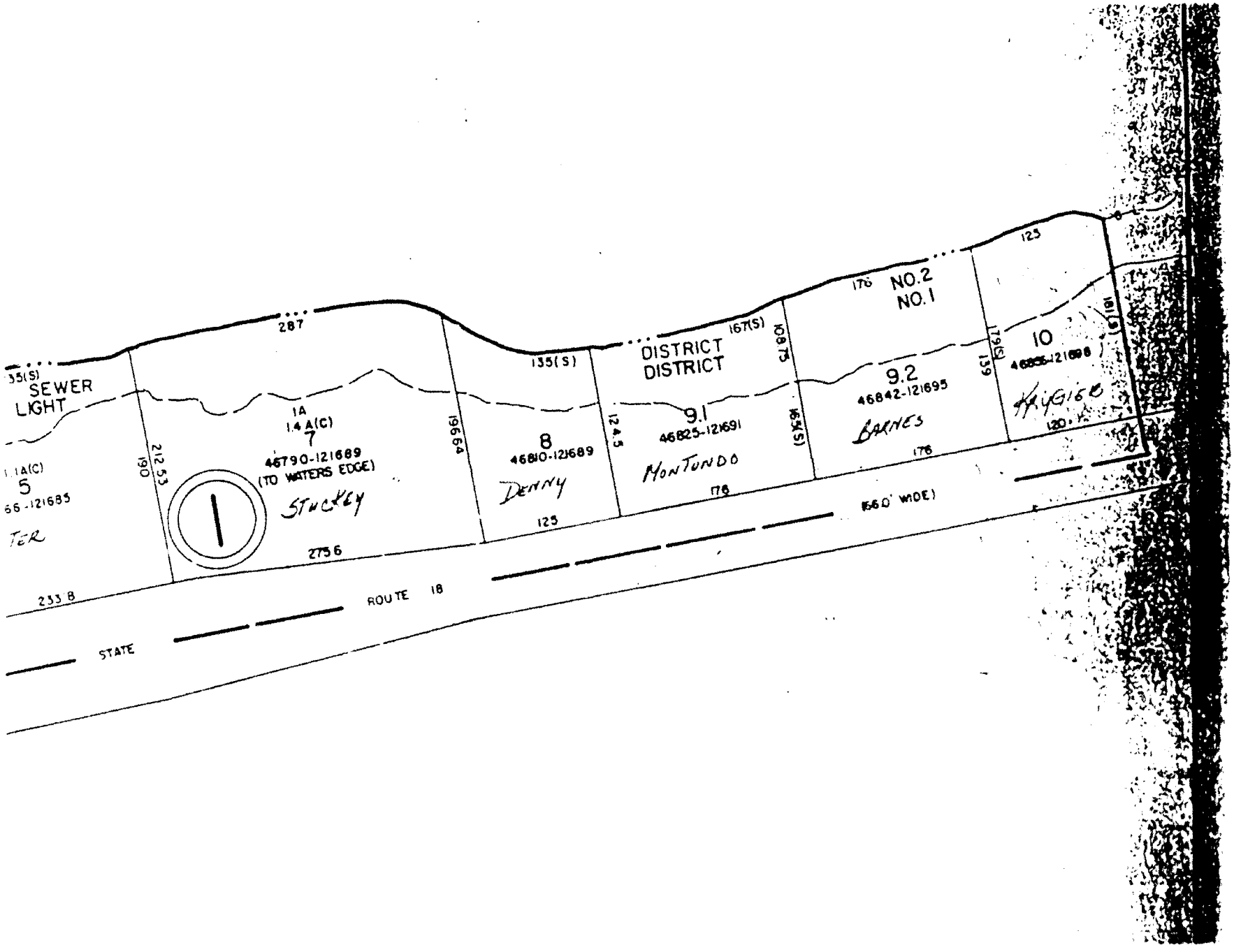
## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT ____
VALID SALE 0-NO 1-YES ____
DATA MATCH 1-NO 2-YES ____
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING ____

## J SALES NOTES

A/V - 12,100.
NO BSMT
NO DOCK
NO BRICK WALL
40' DROP
NO STAIRS

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM


SEWER LIGHT
1.1A(C)
5
66-121685
TER
287
212.53
190
1A
1.4 A(C)
7
46790-121689
(TO WATERS EDGE)
STUCKEY
1
199.64
135(S)
8
46810-121689
DENNY
125
124.5
DISTRICT
DISTRICT
167(S)
9.1
46825-121691
MONTUNDO
178
154(S)
NO.2
NO.1
176
9.2
46842-121695
BARNES
159
125
10
46855-121698
120
161(S)
233.8
STATE
ROUTE 18
2756
(60' WIDE)

COPYRIGHT (C) 1983 N.Y. STATE DIVISION OF EQUALIZATION AND ASSESSMENT

17 Drake Stmt Rd 4/N/A

EA3100 (8/82)

# NEW YORK STATE
## DIVISION OF EQUALIZATION AND ASSESSMENT
## BUREAU OF LOCAL ASSESSMENT SERVICES

## RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD

**AUDIT CONTROL CODES**

ACTIVITY: N - NONE; M - MEASURED ONLY; L - LISTED

ENTRY (ENTRY): 1 - INTERIOR INSPECTION; 2 - INTERIOR REFUSAL; 3 - TOTAL REFUSAL; 4 - ESTIMATE; 5 - NO ENTRY

SOURCE (INFSCE): 1 - OWNER; 2 - RELATIVE; 3 - TENANT; 4 - OTHER

SALES INFORMATION CODES

SALES TYPE (SALTYP): 1 - LAND SALE; 2 - BLDG ONLY; 3 - LAND & BLDG

SOURCE (VERIFY): 1 - UNCONFIRMED; 2 - BUYER; 3 - SELLER; 4 - STAMPS; 5 - AGENT

VALID (VALID): 1 - VALID SALE; 2 - INVALID SALE

SWIS/SBL/CO: 292800 26.00-1-60.21 CARD NO __ OF __

ROUTE NUMBER (ROUTE)

NEIGHBORHOOD CODE (NBHD): 555

ZONING CODE (ZONING): 01 - NONE; 02 - SINGLE RES; 03 - MULTI RES; 04 - FARM; 05 - COMMERCIAL; 06 - INDUSTRIAL; 07 - MIXED; 08 - GOVERNMENT — R2R

**PARCEL IDENTIFICATION SECTION**

SWIS | TAX MAP NUMBER: 26.00-1-60.2 | CD | B SEC: 1

OWNER: Quinn, Robert | PROP CLASS: 314 | NC

LOCATION NO: DRAKE STMT. | LOCATION: N/S | SCH DIST: NEWFANE

SALE PRICE: 8100 | SALE DATE: 10/89 | VALID: 3K 2222 Pg 129 | LOT SIZE: 4.0 Acs

PARCEL IDENTIFICATION CORRECTION AREA

| SWIS (1) | TAX MAP NO (2) | OWNER (3) | PROP CLASS (4) | LOC NO (5) | LOC (6) | SCHOOL DIST (7) | LOT SIZE (8) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**SITE INFORMATION SECTION** — SITE NUMBER: 01 — PROPERTY CLASS (PRCLASS): 314

| | | | | | | |
|---|---|---|---|---|---|---|
| NEIGHBORHOOD TYPE | (NBHTYP) | 1 - RURAL | 2 - SUBURBAN | 3 - URBAN | 4 - COMMERCIAL | 1 |
| ROAD TYPE | (ROAD) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 3 |
| TRAFFIC | (TRAF) | 1 - HEAVY | 2 - MEDIUM | 3 - LIGHT | 4 - LAND LOCKED | 3 |
| DRIVEWAY | (DRVWAY) | 1 - NONE | 2 - UNIMPROVED | 3 - IMPROVED | | 1 |
| SEWER | (SEWER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | |
| WATER | (WATER) | 1 - NONE | 2 - PRIVATE | 3 - COMM/PUBLIC | | 1 |
| OTHER UTILITIES | (UTIL) | 1 - NONE | 2 - GAS | 3 - ELECTRIC | 4 - GAS AND ELECTRIC | 3 |
| SITE ELEVATION | (ELEV) | 1 - BELOW GRADE | 2 - LEVEL | 3 - ABOVE GRADE | | 2 |
| SITE DESIRABILITY | (SITDSR) | 1 - INFERIOR | 2 - TYPICAL | 3 - SUPERIOR | | 2 |
| SETBACK | (SETBCK) | | | | | |
| PHYSICAL CHANGE | (PHYCHG) | 1 - RES CONST | 2 - IMP CONST | 3 - RES DEMO | 4 - IMP DEMO | |

**AUDIT CONTROL SECTION** — NUMBER OF SITES (NUMSIT)

| VISIT NO (VISITS) | LISTER INFORMATION (LSTINF) COLLECTOR | DATE (MMDDYY) | TIME | ACTIVITY | ENTRY (ENTRY) | SOURCE (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

QUALITY CONTROL (QCBY) | DATE | CERTIFIED LETTER (CTFLET) | DATE (MMDDYY)

**SALES NOTES**

**NOTES**

Surrounds new ranch house 6299 Drake Stmt.

**SALES INFORMATION SECTION** — OFFICE USE ONLY

| DATE (SALDTE) YYMM | PRICE (SALPRC) | TYPE (SALTYP) | SOURCE (VERIFY) | VALID (VALID) | CHECK | SOURCE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**LAND BREAKDOWN SECTION**

| LAND TYPE (LNDTYP) | EFF CODE (EFFCD) | FRONT FEET | DEPTH | ACRES | SQUARE FEET | SOIL (SOIL) | WATERFRONT (WTRFNT) | WATER FRONT TYPE (WTRFTY) | WATER FRONT LOCT CODE (WTRFLC) | INFLUENCE PERCENT (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | | | 1.20 | | | | | | |
| 03 | | | | 3.00 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

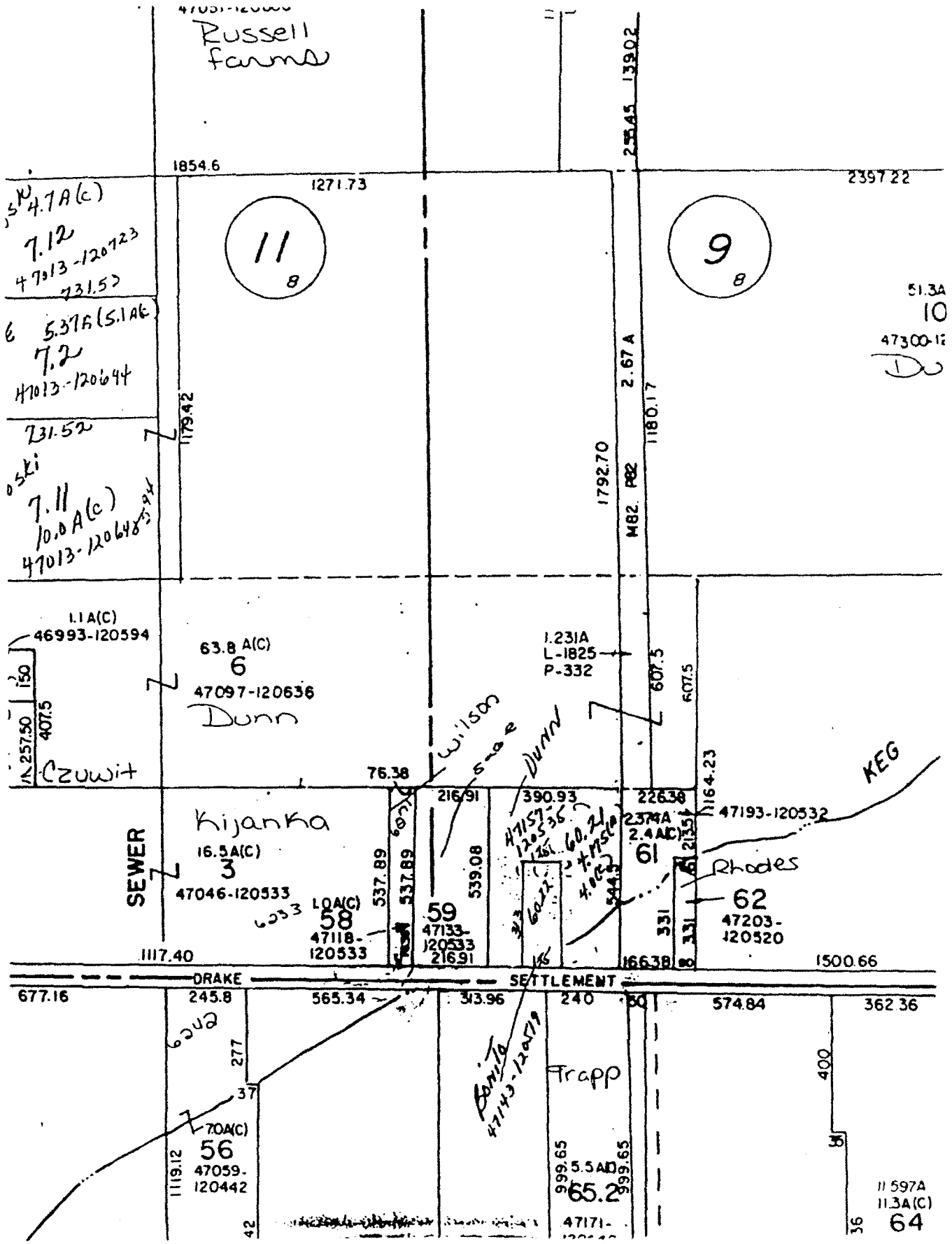
LAND TYPE CODE (LNDTYP): 01 - PRIMARY; 02 - SECONDARY; 03 - UNDEVELOPED; 04 - RESIDUAL; 05 - TILLABLE; 06 - PASTURE; 07 - WOODLAND; 08 - WASTELAND; 09 - MUCK; 10 - WATERFRONT; 11 - ORCHARD; 12 - REAR; 13 - VINEYARD; 14 - WETLAND; 15 - LEASED LAND

EFFECTIVE CODE (EFFCD): 1 - FRNTFT ONLY; 2 - DEPTH ONLY; 3 - FRNTFT AND DEPTH

SOIL RATING (RATING): P - POOR; N - NORMAL; G - GOOD

WATERFRONT TYPE (WTRFNT): 1 - POND; 2 - RIVER; 3 - LAKE; 4 - CANAL; 5 - OCEAN/BAY

INFLUENCE CODE (INFLCD): 1 - TOPOGRAPHY; 2 - LOCATION; 3 - SHAPE; 4 - RESTRICTED USE; 5 - VIEW; 6 - WETNESS; 7 - OTHER


Russell farms
1854.6
1271.73
2397.22
2535.45
1390.2
11
8
9
8
4.7A(c)
7.12
47013-120723
731.52
5.37A(5.1AC)
7.2
47013-120644
731.52
7.11
10.0A(c)
47013-120648
179.42
1792.70
M82. P82
2.67A
1180.17
51.3A
10
47300-12
1.1A(C)
46993-120594
63.8 A(C)
6
47097-120636
Dunn
1.231A
L-1825
P-332
607.5
607.5
257.50
150
407.5
Czuwit
76.38
Wilson
Dunn
216.91
390.93
226.38
1164.23
KEG
47193-120532
Kijanka
16.5A(C)
3
47046-120533
SEWER
537.89
537.89
539.08
47157-120536
60.21
60.22
2.37A
2.4A(C)
61
Rhodes
62
47203-120520
331
331
LOA(C)
58
47118-120533
59
47133-120533
216.91
1117.40
1663.8
1500.66
DRAKE
SETTLEMENT
677.16
245.8
565.34
313.96
240
574.84
362.36
277
37
7.0A(C)
56
47059-120442
1119.12
42
Trapp
47143-120579
999.65
5.5 AC
65.2
999.65
47171-
400
36
11.597A
11.3A(C)
64

(18) 6929 Charlotteville Rd 28AN

EA3100 (6/82)

**NEW YORK STATE**
**DIVISION OF EQUALIZATION AND ASSESSMENT**
**BUREAU OF LOCAL ASSESSMENT SERVICES**

**RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD**

**PARCEL IDENTIFICATION SECTION**

Swis: 292800 | Tax Map Number: 40.00-1-52.2 | CD | R SEC: 1
Owner: HICKMAN, RICHARD W - Joyce E | Prop Class: 314 | HC
Location No: 6929 | Location: Charlotteville Rd., Newkane | Sch Dist: 292801
Sale Price: BK 2272 PG 63 | Sale Date: 8000 7/20/90 | Valid: Yes | Lot Size: 130X790 4.2(A)

| PARCEL IDENTIFICATION CORRECTION AREA | Swis | Tax Map No. | Owner | Prop Class | Loc No | Loc | School Dist | Lot Size |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — Number of Stats (NUMSTT):

| Visit No (VISITS) | Later Information (LSTINF) Collector | Date (MMDDYY) | Time | Activity | Entry (ENTRY) | Source (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

Quality Control (QCBY): Sketch Control Number | Date
Certified Letter (CTFLET) | Date (MMDDYY)

**SALES INFORMATION SECTION** — Office Use Only

| Date (SALDTE) YYMM | Price (SALPRC) | Type (SALTYP) | Source (VERIFY) | Valid (VALID) | Check | Source2 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Audit Control Codes**

Activity (ACTIVY): N = None; M = Measured Only; L = Listed

Entry (ENTRY): 1 = Interior Inspection; 2 = Interior Refusal; 3 = Total Refusal; 4 = Estimate; 5 = No Entry

Source (INFSCE): 1 = Owner; 2 = Relative; 3 = Tenant; 4 = Other

**Sales Information Codes**

Sales Type (SALTYP): 1 = Land Only; 2 = Bldg Only; 3 = Land & Bldg

Source (VERIFY): 1 = Grantor/Grantee; 2 = Buyer; 3 = Seller; 4 = Attorney; 5 = Agent

Valid (VALID): 1 = Valid Sale; 2 = Invalid Sale

SWIS/SBL/CD: 292800 40.00-1-52.2 | Card No. ___ of ___

| | | |
|---|---|---|
| Assmt Number | (ASMTNO) | 5,8,000 |
| Neighborhood Code | (NBHID) | 5.5 |
| Zoning Code | (ZONING) (01 = None; 02 = Single Res; 03 = Multi Res; 04 = Farm; 05 = Commercial; 06 = Industrial; 07 = Mixed; 08 = Governmental) | ARR |

**SITE INFORMATION SECTION** — Site Number: 01 | Property Class (PRCLAS): 314

| | | | | | | |
|---|---|---|---|---|---|---|
| Neighborhood Type | (NBHTYP) | 1 = Rural | 2 = Suburban | 3 = Urban | 4 = Commercial | 1 |
| Road Type | (ROAD) | 1 = None | 2 = Unimproved | 3 = Improved | | 3 |
| Traffic | (TRAF) | 1 = Heavy | 2 = Medium | 3 = Light | 4 = Land locked | 3 |
| Driveway | (DRIVWAY) | 1 = None | 2 = Unimproved | 3 = Improved | | 2 |
| Sewer | (SEWER) | 1 = None | 2 = Private | 3 = Comm/Public | | 1 |
| Water | (WATER) | 1 = None | 2 = Private | 3 = Comm/Public | | 3 |
| Other Utilities | (UTIL) | 1 = None | 2 = Gas | 3 = Electric | 4 = Gas and Electric | 4 |
| Site Elevation | (ELEV) | 1 = Below Grade | 2 = Level | 3 = Above Grade | | 2 |
| Site Desirability | (SITUSR) | 1 = Inferior | 2 = Typical | 3 = Superior | | 2 |
| Setback | (SETBCK) | | | | | |
| Physical Change | (PHYCHG) | 1 = Res Constr | 2 = Imp Constr | 3 = Res Demo | 4 = Imp Demo | |

**SALES NOTES**

MAILING ADDRESS:
7540 RIDGE RD
GASPORT, N.Y. 14067

**NOTES**

DIRECTLY ACCROSS
6942 CHARLOTTEVILLE RD

**Land Type Codes (LNDTYP)**

01 = Primary; 02 = Secondary; 03 = Undeveloped; 04 = Residual; 05 = Tillable; 06 = Pasture; 07 = Woodland; 08 = Wasteland; 09 = Muck; 10 = Waterfront; 11 = Orchard; 12 = Row; 13 = Vineyard; 14 = Wetland; 15 = Leased Land

**Effective Code (EFFCD)**

1 = FRNTFT only; 2 = DEPTH only; 3 = FRNTFT and DEPTH

**LAND BREAKDOWN SECTION**

| Land Type (LNDTYP) | Eff. Code (EFFCD) | Front Feet (FRNTFT) | Depth (DEPTH) | Acres (ACRES) | Square Feet (SQFEET) | Soil Rating (RATING) | Waterfrontage (WATRFT) | Waterfront Type (WTRFNT) | Influence Code (INFLCD) | Influence Percent (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | | | 1.00 | | | | | | |
| 08 | | | | 3.20 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**Soil Rating (RATING)**

P = Poor; N = Normal; G = Good

| | |
|---|---|
| (05) | 1 – 10 |
| (06) | 1 – 10 |
| (07) | 1 – 6 |
| (09) | 1 – 6 |
| (11) | 1 – 10 |
| (13) | 1 – 10 |

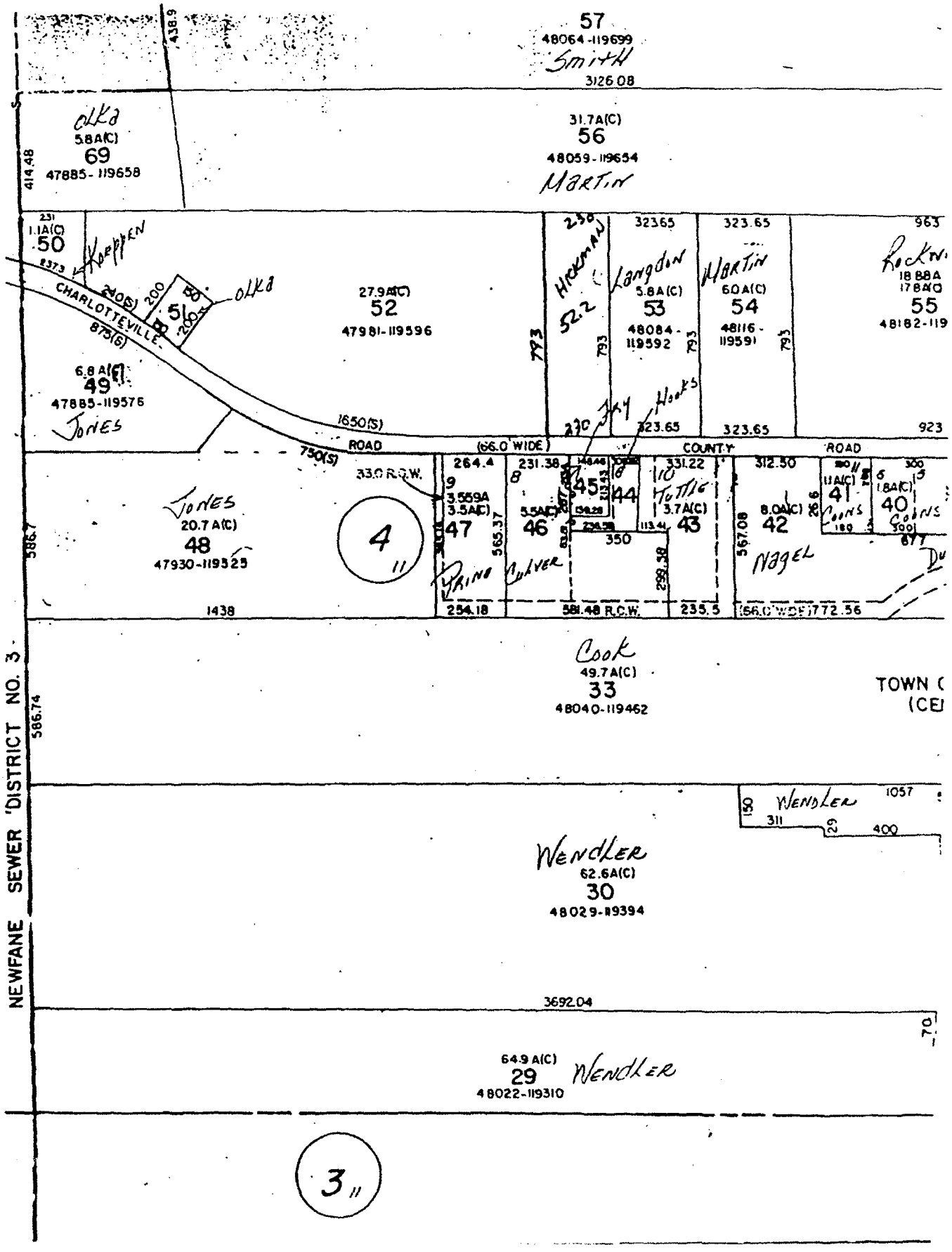
**Waterfront Type (WTRFNT)**

1 = Pond; 2 = River; 3 = Lake; 4 = Canal; 5 = Ocean/Bay

**Influence Code (INFLCD)**

1 = Topography; 2 = Location; 3 = Shape; 4 = Restricted Lot; 5 = View; 6 = Wetness; 7 = Other

A/V 8200


57
48064-119699
Smith
3126.08
31.7A(C)
56
48059-119654
MARTIN
OLKA
5.8A(C)
69
47885-119658
414.48
438.9
231
1.1A(C)
50
KOPPEN
CHARLOTTEVILLE
873(S)
240(S)
200
50
200
51
OLKA
27.9A(C)
52
47981-119596
6.8A(C)
49
47885-119576
JONES
1650(S)
750(S)
ROAD
(66.0' WIDE)
COUNTY
ROAD
793
52.2
HICKMAN
256
323.65
LANGDON
5.8A(C)
53
48084-119592
MARTIN
6.0A(C)
54
48116-119591
323.65
963
ROCKW
18.88A
17.84A(C)
55
48182-119
230
JAY HOOKS
323.65
923
JONES
20.7A(C)
48
47930-119525
586.7
33.0 R.O.W.
4
11
264.4
9
3.559A
3.5A(C)
47
565.37
231.38
8
5.5A(C)
46
45
44
10
331.22
HUTTIG
3.7A(C)
43
350
113.41
299.38
312.50
8.0A(C)
42
367.08
1.1A(C)
41
COONS
180
1.84A(C)
40
COONS
300
877
NAGEL
DU
1438
254.18
581.48 R.O.W.
235.5
(66.0' WIDE) 772.56
Cook
49.7A(C)
33
48040-119462
586.74
TOWN (
(CE
NEWFANE SEWER DISTRICT NO. 3
WENDLER
1057
150
311
29
400
WENDLER
62.6A(C)
30
48029-119394
3692.04
70
64.9A(C)
29
48022-119310
WENDLER
3
11

TRANSIT Rd / W (19) W

EA3100 (6/82)

**NEW YORK STATE**
**DIVISION OF EQUALIZATION AND ASSESSMENT**
**BUREAU OF LOCAL ASSESSMENT SERVICES**

**RESIDENTIAL, FARM AND VACANT LAND PROPERTY RECORD CARD**

**SWIS/SBL/CD** 292800 - 14.00 - 3 - 3.2

Card No. ___ of ___

Hamlet Number (HAMLET) 030 050

Neighborhood Code (NBHD) 56

Zoning Code (ZONING) 01 = None; 02 = Single Res; 03 = Multiple Res; 04 = Farm; 05 = Commercial; 06 = Industrial; 07 = Mixed; 08 = Governmental

**PARCEL IDENTIFICATION SECTION**

Swis 292800 | Tax Map Number 14.00-3-3.2 | CD KK | R SEC 1 | HC

Owner: LAKE ONTARIO FISHING RESORTS | Prop Class 332

Location No. | Location: TRANSIT Rd | Sch Dist 292801

Sale Price $29,500. | Sale Date 8/16/90 | Valid YES | Liber 2277 Pg 214 | Lot Size 31.8 Acres

| PARCEL IDENTIFICATION CORRECTION AREA | Swis | Tax Map No. | Owner | Prop Class | Loc No. | Loc | School Dist | Lot Size |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**AUDIT CONTROL SECTION** — Number of Sites (NUMSIT)

| Visit No (VISITS) | Lister Information (LSTINF) Code | Date (MMDDYY) | Time | Activity | Entry (ENTRY) | Source (INFSCE) |
|---|---|---|---|---|---|---|
| 1 | | | AM PM | | | |
| 2 | | | AM PM | | | |
| 3 | | | AM PM | | | |
| | | | AM PM | | | |

Quality Control (QCBY) | Source | Date | Certified Letter (CTFLET) | Date (MMDDYY)

**SALES INFORMATION SECTION** — Office Use Only

| Date (SALDTE) YYMM | Price (SALPRC) | Type (SALTYP) | Source (VERIFY) | Valid (VALID) | Check | Source 2 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**Audit Control Codes**

Activity: N = None; M = Measured Entry; L = Listed

Entry (ENTRY): 1 = Interior Inspection; 2 = Interior Refusal; 3 = Total Refusal; 4 = Estimate; 5 = Not Entry

Source (INFSCE): 1 = Owner; 2 = Relative; 3 = Tenant; 4 = Other

**Sales Information Codes**

Sales Type (SALTYP): 1 = Land Only; 2 = Bldg Only; 3 = Land & Bldg

Source (VERIFY): 1 = Declaration; 2 = Buyer; 3 = Seller; 4 = Stamps; 5 = Agent

Valid (VALID): 1 = Valid Sale; 2 = Invalid Sale

**SITE INFORMATION SECTION** — Site Number | Property Class (PRCLAS)

| | | | | | | |
|---|---|---|---|---|---|---|
| Neighborhood Type | (NBHTYP) | 1 = Rural | 2 = Suburban | 3 = Urban | 4 = Commercial | 1 |
| Road Type | (ROAD) | 1 = None | 2 = Unimproved | 3 = Improved | | 3 |
| Traffic | (TRAF) | 1 = Heavy | 2 = Medium | 3 = Light | 4 = Land locked | 3 |
| Driveway | (DRVWAY) | 1 = None | 2 = Unimproved | 3 = Improved | | 1 |
| Sewer | (SEWER) | 1 = None | 2 = Private | 3 = Comm/Public | | 2 |
| Water | (WATER) | 1 = None | 2 = Private | 3 = Comm/Public | | 3 |
| Other Utilities | (UTIL) | 1 = None | 2 = Gas | 3 = Electric | 4 = Gas and Electric | 4 |
| Site Elevation | (ELEV) | 1 = Below Grade | 2 = Level | 3 = Above Grade | | 2 |
| Site Desirability | (DESIR) | 1 = Inferior | 2 = Typical | 3 = Superior | | 2 |
| Setback | (SETBCK) | | | | | |
| Physical Change | (PHYCHG) | 1 = Res Const | 2 = Imp Const | 3 = Res Demo | 4 = Imp Demo | |

**SALES NOTES**
Sold 8/90 $29,500

A/V 10,900

**NOTES**

**Land Type Codes (LNDTYP)**

01 = Primary; 02 = Secondary; 03 = Undeveloped; 04 = Residual; 05 = Tillable; 06 = Pasture; 07 = Woodland; 08 = Wasteland; 09 = Muck; 10 = Waterfront; 11 = Orchard; 12 = Row; 13 = Vineyard; 14 = Wetland; 15 = Leased Land

**Effective Code (EFFCD)**

1 = FRNTFT only; 2 = DEPTH only; 3 = FRNTFT and DEPTH

**LAND BREAKDOWN SECTION**

| Land Type (LNDTYP) | Eff. Code (EFFCD) | Front Feet (FRNTFT) | Depth (DEPTH) | Acres (ACRES) | Square Feet (SQFEET) | Soil Rating (SOILRT) | Waterfrontage (WTRFNT) | Water Front Type (WTRFNT) | Influence Code (INFLCD) | Influence Percent (INFLPC) |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | | | | 1.0.0 | | | | | | |
| 03 | | | | 30.80 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**Soil Rating (RATING)**

P = Poor; N = Normal; G = Good

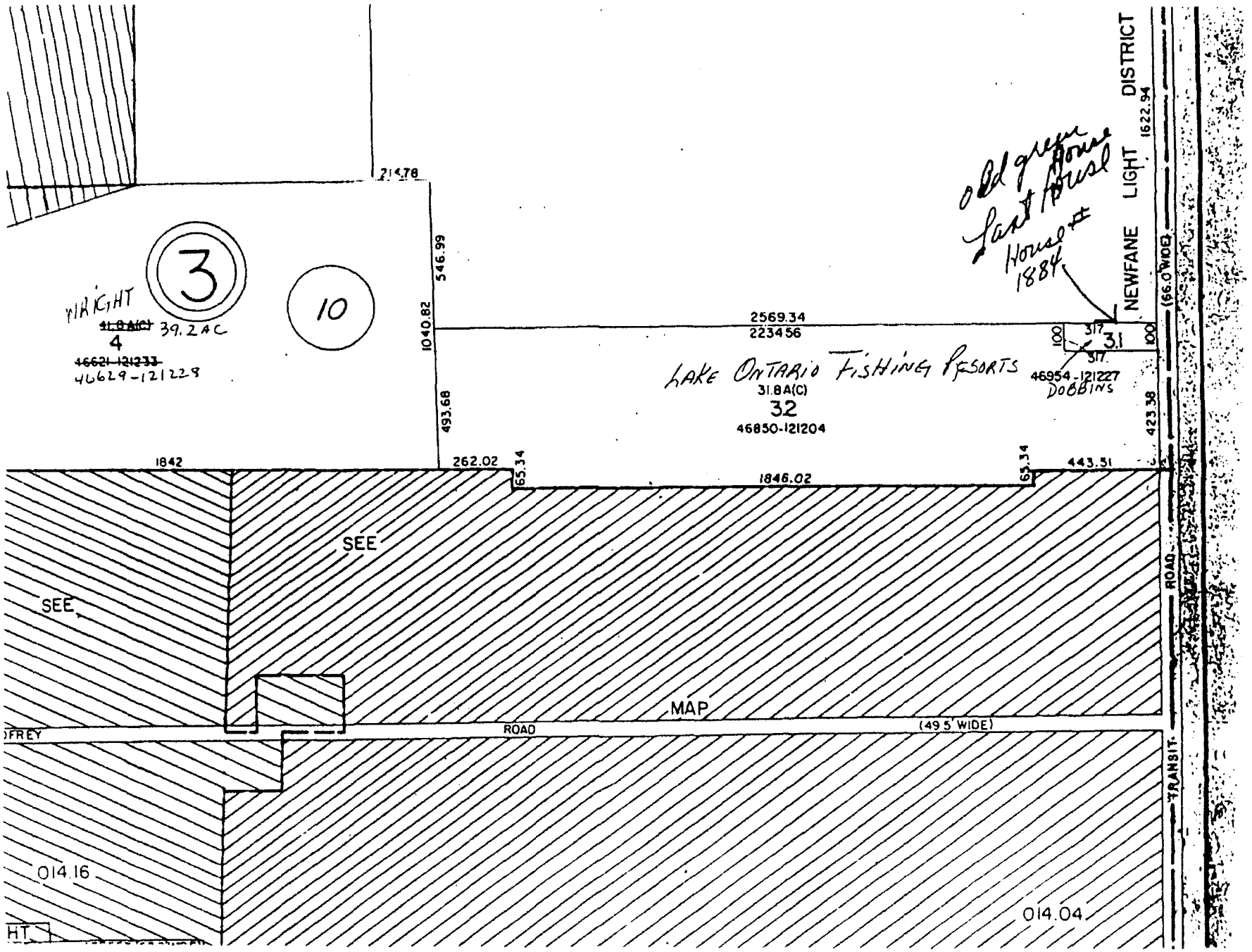
| | |
|---|---|
| 105) | 1 - 10 |
| 106) | 1 - 10 |
| 107) | 1 - 4 |
| 109) | 1 - 4 |
| 111) | 1 - 10 |
| 113) | 1 - 10 |

**Waterfront Type (WTRFNT)**

1 = Pond; 2 = River; 3 = Lake; 4 = Canal; 5 = Ocean/Bay

**Influence Code (INFLCD)**

1 = Topography; 2 = Location; 3 = Shape; 4 = Restricted Use; 5 = View; 6 = Water; 7 = Other


3
10
WRIGHT
~~31.8 A(C)~~ 39.2AC
4
~~46621-121233~~
46629-121229
214.78
546.99
1040.82
493.68
2569.34
223456
LAKE ONTARIO FISHING RESORTS
31.8A(C)
32
46850-121204
Old green House
Last House
House # 1884
NEWFANE LIGHT DISTRICT
1622.94
(66.0' WIDE)
100
317
3.1
317
100
46954-121227
DOBBINS
423.38
1842
262.02
65.34
1846.02
65.34
443.51
SEE
SEE
MAP
ROAD
(49.5' WIDE)
TRANSIT
ROAD
014.16
014.04

2365 19E

TOWN OF NEWFANE CODE :292600

26.00-1-49.1 ~~26.00-1-45.100~~

PARCEL--ID CD

AC: 00010120.00

LOC: CREEK RD E RS 1

TYPE: 321 LOT: ~~325.00~~ 227.28' 75.0 acs ~~75.66AC~~

OWNR: ~~LINDSAY FRANCES L.~~ de LAAT AURIE.

TAXES TO: 5 LAURA SECORD PLACE NIAGARA ON THE LAKE ~~1662 CAPT DECOTT RD.~~

ADDRS: ~~BUFF. N.Y.~~ ONTARIO, CANADA LOS 1J0 ~~14020~~

SALE: DATE: -

## A PROPERTY CLASSIFICATION CODES

AGRICULTURE—100
105—Agricultural Vacant Land
110—Livestock & Products
111—Poultry & Products
112—Dairy & Products
113—Cattle Hogs & Prod
114—Sheep & Wool
115—Honey & Beeswax
116—Other Livestock
120—Field Crops
130—Truck Crops/Muckland
140—Truck Crops
150—Orchard Crops
151—Tree Fruits
152—Vineyards
180—Other Fruits
170—Nursery/Greenhouse

RESIDENTIAL—200
210—1 Family Year-Round
220—2 Family Year-Round
230—3 Family Year-Round
240—Rural Residence with Acreage
250—Estate
260—Seasonal Residence
270—Mobile Home

VACANT LAND—300
311—Residential Vacant
312—Residential Vacant, Improved
313—Waterfront Vacant
314—Rural, 10 Acres or Less
321—Abandon Agricultural
322—Rural Res 10 Ac or More
323—Other Rural Vacant
330—Commercial Vacant
340—Industrial Vacant
350—Urban Renewal

COMMERCIAL—400
483—Partial Residential Use

WILD & FORESTED—900
910—Private (except 920)
920—Private Hunting & Fishing
930—State Owned
940—County Owned

*Consult detailed listing for further divisions as applicable

## B AUDIT CONTROL

MEASURED BY: ___ DATE ___-___-___

LISTED BY KBB DATE 06-21-88

EDITED BY HES DATE 06-30-88

MEASURING & LISTING COMPLETED ON VISIT:
1 - FIRST 2 - SECOND
3 - THIRD 4 - FOURTH 1

SOURCE:
1 - OWNER 2 - SPOUSE 3 - TENANT
4 - OTHER 5 - ESTIMATE 6 - TOTAL REFUSAL
7 - INTERIOR REFUSAL 4

## C SIGNATURE

## D LAND DESCRIPTION A/V 23,200

LAND TYPE

01—PRIMARY
02—SECONDARY
03—UNDEVELOPED
04—RESIDUAL
05—TILLABLE
F - VEGETABLE
A - GRAIN
B - HAY CORN
C - SILAGE
06—PASTURE
A - ROTATING
B - PERM
07—WOODLAND
08—WASTELAND
09—MUCK
A - 8 FT
B - 3 TO 8 FT
C - UNDER 3'
10—WATERFRONT
11—ORCHARD
A
B
C
12—REAR
13—VINEYARDS
A - 5 TONS
B - 4 TONS
C - UNDER 4 TONS
14—WETLANDS

7/85 Sold 2.84 ACRES TO ESTHER GILSON 25.16-1-5.

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| A | 01 | 1.00 | | | | |
| A | 03 | 74.00 | | | | |

## F CARD SEQUENCE

CARD ___
OF ___

## G SITE DESCRIPTION

PROPERTY CLASS ___
SITE NO. ___
ZONING A.R.R.

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL
CROSSROADS 3-SUBURBAN 4-URBAN 5-RES
SUBDIVISION 6-MIXED COMMERCIAL 1

ROAD 1-NONE 2-DIRT 3 GRAVEL
4-LOCAL PAVED 5-STATE 4

FRONTING TRAFFIC 1-LANDLOCKED
2-LIGHT 3-MEDIUM 4-HEAVY 3

BUILDING SET BACK 1-LESS THAN 30'
2-30 to 80' 3-MORE THAN 60' ___

VIEW INFLUENCE 1-NONE
2-INFER. 3-SUP 1

WATERFRONT 1-NONE 2-BAY
3-LAKE 4-RIVER CANAL 5-CREEK 1

SITE ELEVATION 1-BELOW STREET
2-EVEN 3-ABOVE STREET 3

SEWER 1-NONE 2-PRIVATE
3 COMMERCIAL 4-PUBLIC 1

WATER 1-NONE 2-PRIVATE
3-COMMERCIAL 4 PUBLIC 4

OTHER UTILITIES 1 NONE 2-GAS
3-ELECTRIC 4-GAS/ELECTRIC 3

SITE COMPARED TO SURROUNDS 1 INFERIOR
2 TYPICAL 3 SUPERIOR 2

SITE DESIREABILITY
1 POOR 2 TYPICAL 3 SUPERIOR 2

LANDSCAPING
1 INFERIOR 2 TYPICAL 3 SUPERIOR 2

IMPROVEMENTS 1 NO 2 YES 1

## H LABEL CORRECTION

SWIS 292600

026.00 (SECTION) 01 (BLOCK) 049.001 (LOT) ___ (SUFFIX) 00 (CD)

ROUTE NO. 68

OWNER INCORRECT ___
PROPERTY ADDRESS INCORRECT ___
PROPERTY CLASSIFICATION ___

SALE PRICE 80,000 DATE 04.90

Liber-8259 Pg-321 Not Valid (2 PARCELS)

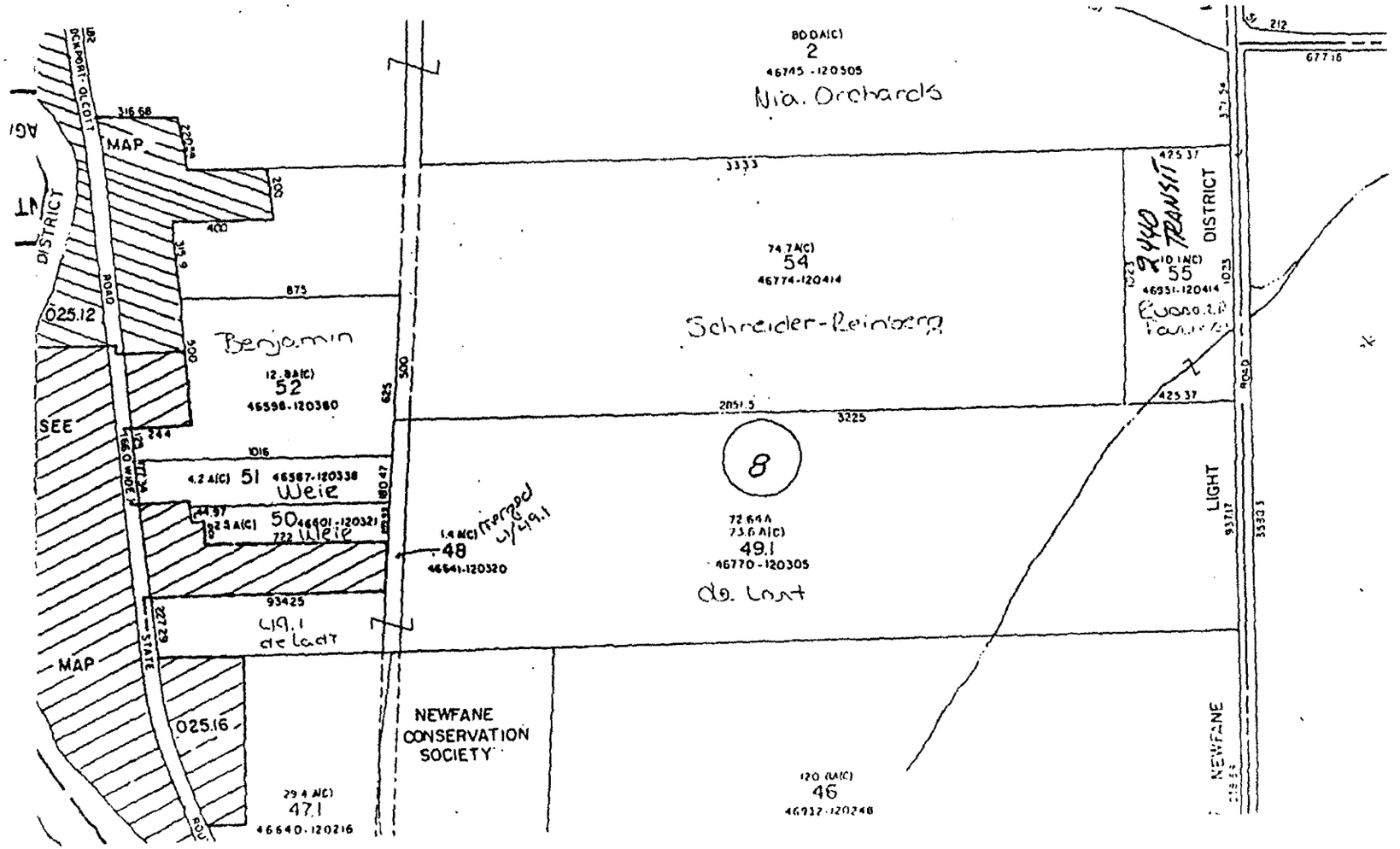
## I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT ___
VALID SALE 0-NO 1-YES ___
DATA MATCH 1-NO 2-YES ___
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING ___

## J SALES NOTES

26.00-1-48 Merged W 26.00-1-49.1 in Sale

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL/FARM/VACANT DATA COLLECTION FORM


MAP
025.12
DISTRICT
SEE
MAP
025.16
STATE
ROUTE
NEWFANE
CONSERVATION
SOCIETY
Benjamin
52
46598-120380
Weie
51
46587-120338
50
46601-120321
48
46641-120320
49.1
de Lost
47.1
46640-120216
Schreider-Reinberg
54
46774-120414
55
46951-120414
Nia. Orchards
2
46745-120505
8
49.1
46770-120305
46
46932-120248
R440
TRANSIT
DISTRICT
LIGHT
NEWFANE
ROAD
212
677.16
3333
3225
875
1016
1023
425.37
316.68
222.58
400
315.9
300
625
500
244
227.29
93425
93717
33303




(21)

TOWN OF NEWFANE 2275 CODE :292800

27.00-1-11 IL 30-E
PARCEL--ID CD

AC: 00011210-00

LOC: HESS RD E RS 1

TYPE: 321 LOT: 46.40 A

CHAR: ~~KEITH-CLEVE & SHIRLEY K~~ SOSKACS, TIBOR-VILMA

ADDRS: ~~MAIN ST~~ 160 MAPLEGROVE AVE 14150
~~NEWFANE NY~~ TONAWANDA, NY 14108

SALE: 38,000 L/Liber 2205 Pg-295 DATE: 12/89

10-15-80

VISIT:

NT
AL REFUSAL

NCE CARD
OF

PTION
ASS

ARR

A - GRAIN A - 8 FT A - 5 TONS
B - HAY, CORN B - 3 TO 8 FT B - 4 TONS
C - SILAGE C - UNDER 3' C - UNDER 4 TONS
16—WATERFRONT 14—WETLANDS

6/89 A/V 13,600 - 16,300

LAND CODES —
F - FRONTAGE D - DEPTH S - SQUARE FEET A - ACREAGE V - VALUE

N NUMBER OF ENTRIES 02

| LAND CODE | LAND TYPE | MEASUREMENT | SOIL RATING | S | L | W |
|---|---|---|---|---|---|---|
| A | 01 | 1.00 | | | | |
| A | 03 | 45.40 | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |
| | | . | | | | |

NEIGHBORHOOD TYPE: 1-RURAL 2-RURAL
CROSSROADS 3-SURBURBAN 4-URBAN 5-RES
SUBDIVISION 6-MIXED COMMERCIAL 1

ROAD 1-NONE 2-DIRT 3 GRAVEL 4
4-LOCAL PAVED 5-STATE

FRONTING TRAFFIC 1-LANDLOCKED 2
2-LIGHT 3-MEDIUM 4-HEAVY

BUILDING SET BACK 1-LESS THAN 30' 2
2-30 to 60' 3-MORE THAN 60'

VIEW INFLUENCE 1-NONE 1
2-INFER. 3-SUP.

WATERFRONT 1-NONE 2-BAY 1
3-LAKE 4-RIVER CANAL 5-CREEK

SITE ELEVATION 1-BELOW STREET 2
2-EVEN 3-ABOVE STREET

SEWER 1-NONE 2-PRIVATE 2
3-COMMERCIAL 4-PUBLIC

WATER 1-NONE 2-PRIVATE 4
3-COMMERCIAL 4-PUBLIC

OTHER UTILITIES 1-NONE 2-GAS 3
3-ELECTRIC 4-GAS/ELECTRIC

SITE COMPARED TO SURROUNDS 1-INFERIOR 2
2-TYPICAL 3-SUPERIOR

SITE DESIREABILITY 2
1-POOR 2-TYPICAL 3-SUPERIOR

LANDSCAPING 2
1-INFERIOR 2-TYPICAL 3-SUPERIOR

IMPROVEMENTS 1-NO 2-YES 2

H LABEL CORRECTION SWIS 292800

| 022.00 | 01 | 011.0000 | | IL |
|---|---|---|---|---|
| SECTION | BLOCK | LOT | SUFFIX | CD |

ROUTE NO. 28

OWNER INCORRECT

PROPERTY ADDRESS INCORRECT

PROPERTY CLASSIFICATION 321

SALE PRICE DATE

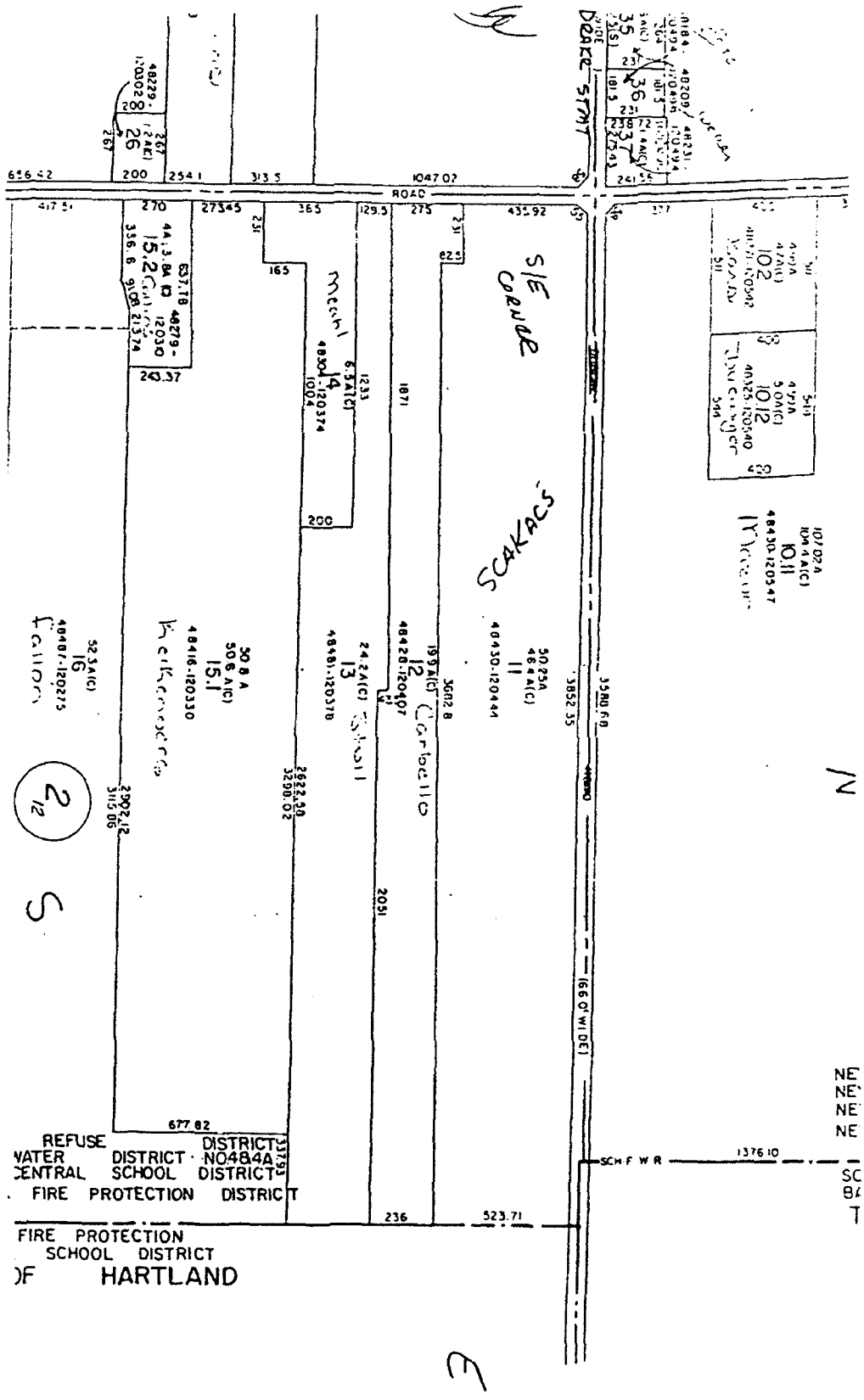
I SALES VERIFICATION

SOURCE 1-BUYER 2-SELLER 3-STAMPS 4-AGENT
VALID SALE 0-NO 1-YES
DATA MATCH 1-NO 2-YES
SALES TYPE 1-LAND 2-BUILDING 3-LAND & BUILDING

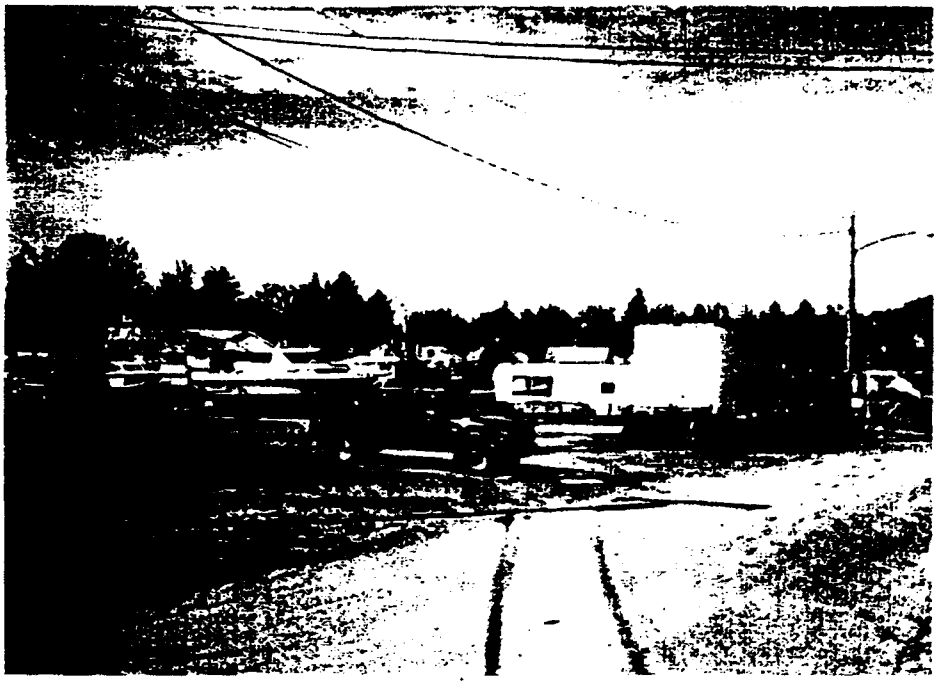
J SALES NOTES

entire Lot is overgrown with trees and weeds

KVS Information Systems, Inc.
Buffalo, New York
RESIDENTIAL FARM VACANT DATA COLLECTION FORM


DRAKE STRT
ROAD
SE CORNER
SCHACS
15.2
15.1
14
13
12
11
10
102
101
2
12
S
N
166.0' WIDE
REFUSE DISTRICT
WATER DISTRICT NO484A
CENTRAL SCHOOL DISTRICT
FIRE PROTECTION DISTRICT
FIRE PROTECTION
SCHOOL DISTRICT
OF HARTLAND

COMPARABLES



NO. 1 5.82-1-41



NO.2 5.83-1-28

COMPARABLES



NO.3 14.08-1-57.1

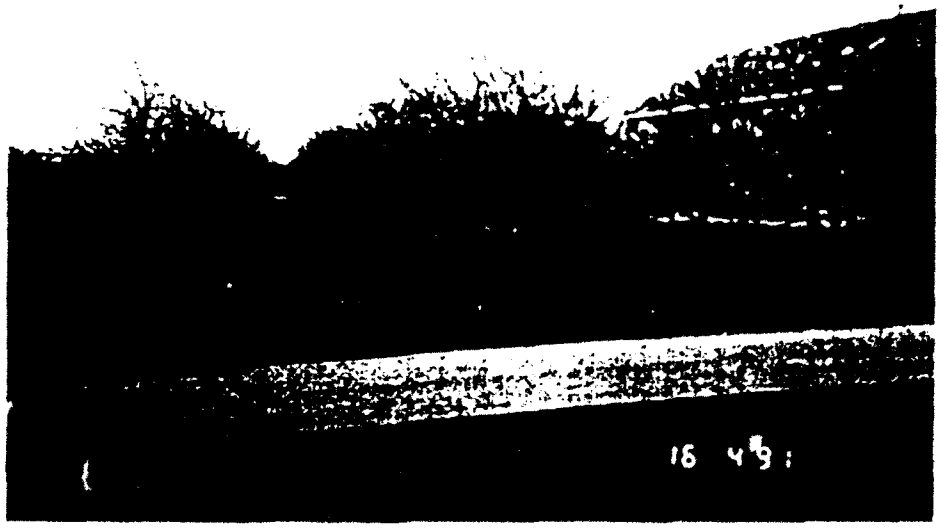


NO.4 & 5 5.19-2-1 & 5.19-2-2

COMPARABLES



NO.6 14.12-1-17



NO.7 14.06-1-28

COMPARABLES



NO.8 14.06-1-34



NO.9 14.06-1-23.2

COMPARABLES



NO.10 5.19-1-31



NO.11 5.19-1-30

COMPARABLES



NO.12 7.01-1-10



NO.12 7.01-1-7

COMPARABLES



NO.12 7.01-1-5



NO.12 7.01-1-4

COMPARABLES



NO.12

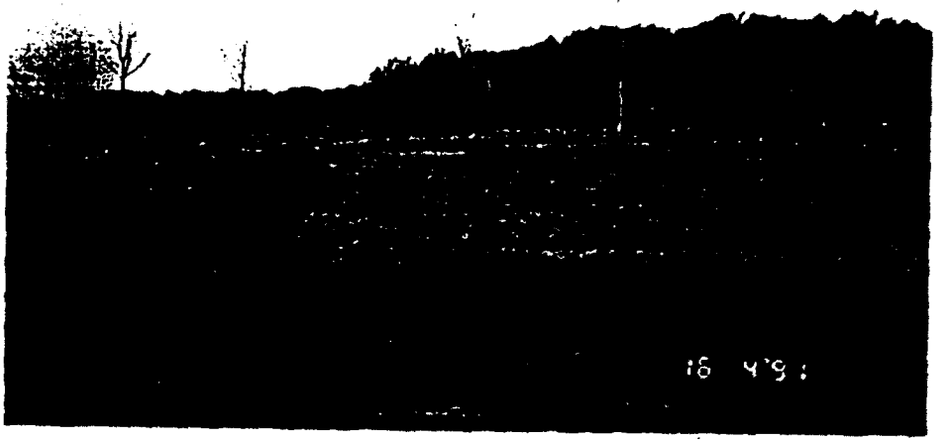
7.01-1-20



NO.12

7.01-1-6

COMPARABLES




NO.12 7.01-1-17



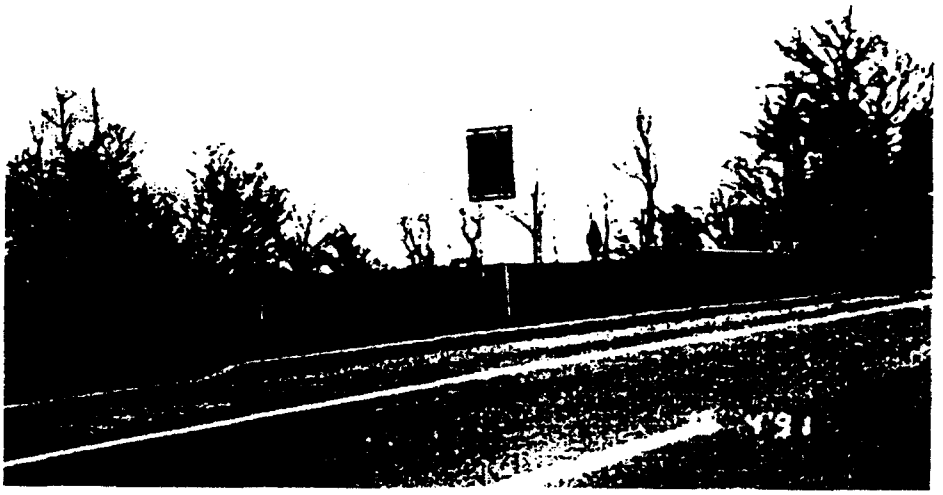

NO.13 SECTION OF 6.04-1-18 & 6.04-1-19

COMPARABLES



NO. 14 6.00-1-5
NO. 15 6.00-1-6

COMPARABLES



NO.16

5.20-1-9

COMPARABLES



NO.17 26.00-1-60.21



NO.18 40.00-1-52.2

COMPARABLES



NO.19 14.00-3-3.2



NO.20 26.00-1-49.1

COMPARABLES

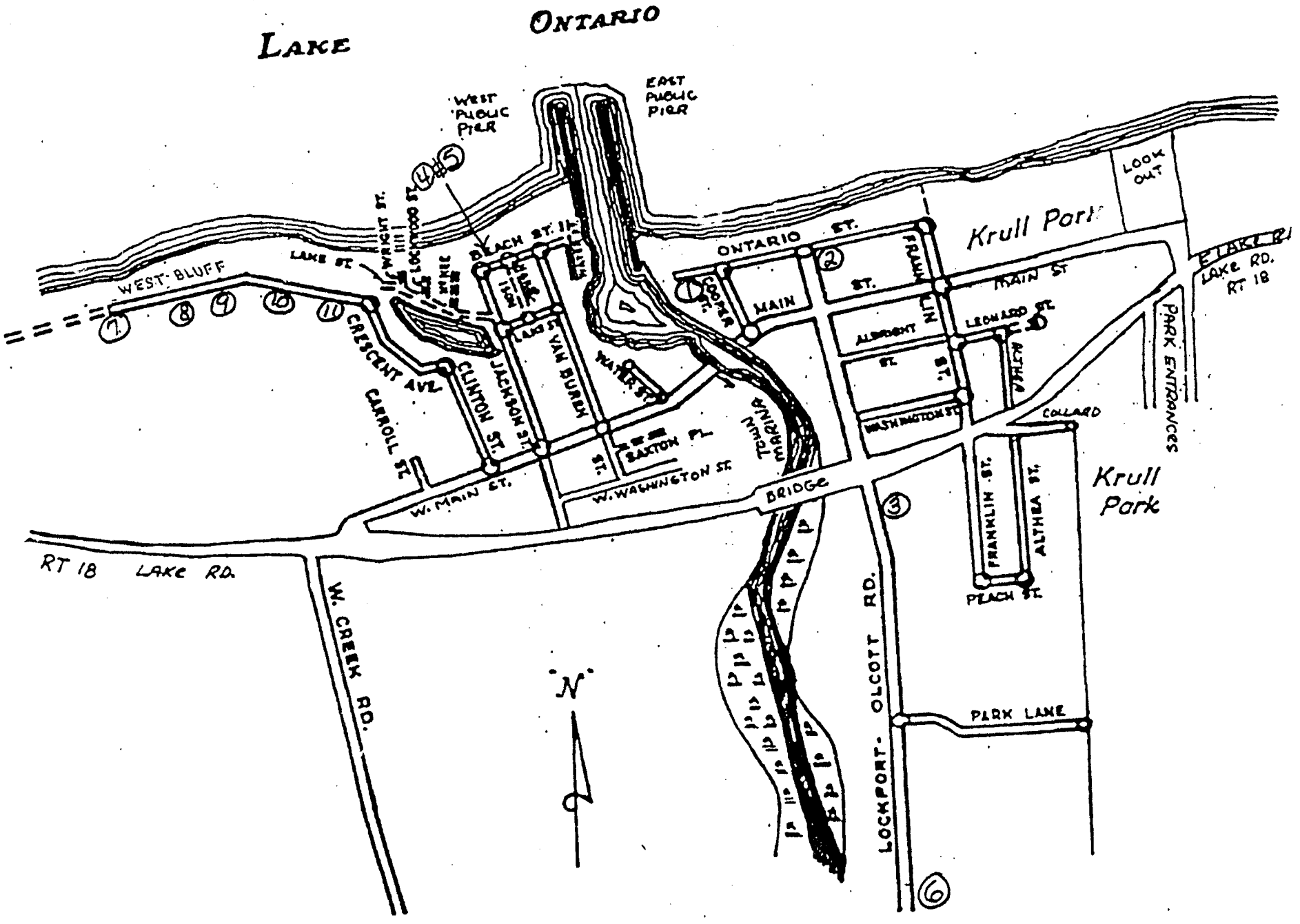





NO.21

27.00-1-11

LOCATION OF SALES


LAKE ONTARIO
WEST PUBLIC PIER
EAST PUBLIC PIER
LOOK OUT
Krull Park
ONTARIO ST.
MAIN ST.
WEST BLUFF
LAKE ST.
BEACH ST.
COOPER ST.
MAIN
FRANKLIN
ALBRIGHT
LEONARD
ALTHEA
PARK ENTRANCES
LAKE RD. RT 18
CRESCENT AVE.
CARROLL ST.
CLINTON ST.
JACKSON ST.
VAN BUREN
WATER ST.
SAXTON PL.
TWIN MARINA
WASHINGTON ST.
COLLARD
W. MAIN ST.
W. WASHINGTON ST.
BRIDGE
RT 18 LAKE RD.
W. CREEK RD.
LOCKPORT-OLCOTT RD.
FRANKLIN ST.
ALTHEA ST.
PEACH ST.
PARK LANE
N
OLCOTT, NEW YORK

THE ESTATES

ESTATES

1. FEE.

The fee simple title to (the land described in Schedule A) 1/ (Tracts Nos. ___, ___ and ___), subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines. 2/

2. FEE EXCEPTING AND SUBORDINATING SUBSURFACE MINERALS.

The fee simple title to (the land described in Schedule A) (Tracts Nos. ___, ___ and ___), subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines; excepting and excluding from the taking all (coal) (oil and gas) in and under said land and all appurtenant rights used in connection with the exploration, development, production and removal of said (coal) (oil and gas), including any existing structures and improvements; provided, however, that the said (coal) (oil and gas) and appurtenant rights so excepted and excluded are hereby subordinated to the prior right of the United States to flood and submerge the land as may be necessary in the construction, operation and maintenance of the project; provided further that any exploration or development of said (coal) (oil and gas) in and under said land shall be subject to Federal and State laws with respect to pollution of waters of the reservoir, and provided that the type and location of any structure, improvement and appurtenance thereto now existing or to be erected or constructed on said land in connection with the exploration and/or development of said (coal) (oil and gas) shall be subject to the prior written approval of the District Engineer, U. S. Army Engineer District, , or his duly authorized representative. 2/

1/ In any estate enumerate the tract numbers only where two or more different estates are acquired in the same complaint or declaration of taking. This applies to all approved estates listed in this figure. The estate recited in an exhibit of a complaint and in paragraph 3 of the declaration of taking will be double spaced.

2/ Where an outstanding interest in the subsurface mineral estate is part of a block ownership which is to be excluded from the taking in accordance with paragraph 5-28g(2), the following clause will be added: "excepting and excluding from the taking all interests in the (coal) (oil and gas) which are outstanding in parties other than the surface owners and all appurtenant rights for the exploration, development and removal of said (coal) (oil and gas) so excluded."

Figure 5-6

# THE QUALIFICATIONS OF THE APPRAISER

QUALIFICATIONS

MARTIN JACOBS

EDUCATION

Graduated from The City College of New York, 1956 with a B.A. degree.

WORK EXPERIENCE

1989: Corps of Engineers, Pittsburgh District

1985-1988: Corps of Engineers, New York District

The appraisal of real estate both for civil and military projects, and the review of appraisals submitted by staff and fee appraisers.

1982-1985: New York City, Department of General Services, Division of Real Property, Appraisal Branch.

The appraisal of City owned industrial or commercial properties which were to be auctioned off by the Division of Real Property or residential properties, housing up to four families, which were to be auctioned by the City's Department of Housing Preservation and Development. Served as a review appraiser for submissions from the in-house staff and from fee appraisers acting under contract from the Public Development Corporation.

ADDITIONAL EDUCATION (APPRAISAL COURSES AND SEMINARS)

S.R.E.A., Course 101, Introduction to Appraising Real Property.

S.R.E.A., Course 102, Applied Residential Property Valuation.

Corps of Engineers, Real Estate Appraisal and Leasing.

locations indicated in Schedule B;) 6/ subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

13. UTILITY AND/OR PIPELINE EASEMENT.

A perpetual and assignable easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. ___, ___ and ___), for the location, construction, operation, maintenance, alteration, repair and patrol of (overhead) (underground) (specifically name type of utility or pipeline); together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

14. BORROW EASEMENT.

A perpetual and assignable right and easement to clear, borrow, excavate and remove soil, dirt, and other materials from (the land described in Schedule A) (Tracts Nos. ___, ___ and ___);7/ subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges in said land as may be used without interfering with or abridging the rights and easement hereby acquired.

15. TEMPORARY WORK AREA EASEMENT.

A temporary easement and right-of-way in, on, over and across (the land described in Schedule A) (Tracts Nos. ___, ___ and ___), for a period not to exceed _____, beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a (borrow area) (work area), including the right to borrow and/or deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies, and erect and remove temporary

6/ The use of this reservation clause may substantially reduce the liability of the Government through reduction of severance damages.

7/ The easement estate may be limited as to time, depending upon project requirements.

Figure 5-6f