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13. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Mill Street Dam did not reveal any conditions which pose an immediate threat to life or property. However, an undermining of the downstream apron should be corrected. Additionally, problems such as surface runoff gullies, riprap failure, concrete deterioration, and some debris accumulation should be remedied.		

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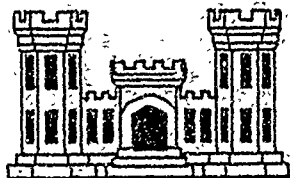
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OSWEGO RIVER BASIN

MILL STREET DAM

CAYUGA COUNTY, NEW YORK
INVENTORY No. NY 775

PHASE 1 INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM



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NEW YORK DISTRICT CORPS OF ENGINEERS

SEPTEMBER 1979

79 10-31 038

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MILL STREET DAM
I.D. No. NY-775
OSWEGO RIVER BASIN
CAYUGA COUNTY, NEW YORK

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Mill Street Dam
I.D. No. N.Y. 775

State Located: New York

County: Cayuga

Watershed: Oswego River Basin

Stream: Owasco Lake Outlet

Date of Inspection: August 2, 1979

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property.

Several deficiencies were noted and these should be corrected within 1 year of the date of final approval of this report. The most serious of these deficiencies was the undermining of the downstream apron. Other problems noted were gullies caused by surface runoff, a section of riprap which had failed on the western bank, deterioration of concrete on the walls of the power canal, and an accumulation of debris on the trash racks in the power canal.

This dam does not have sufficient spillway capacity to adequately discharge the peak outflow from one-half the PMF with the automatic gates open. However, the structural stability analysis indicates that the dam would not be unstable when subjected to the PMF storm event. Prior studies have determined that serious damage can occur along Owasco Outlet when downstream discharges exceed 1,500 cfs. Therefore, the spillway is assessed as being inadequate.

George Koch

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Dam Safety Section
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Approved By:

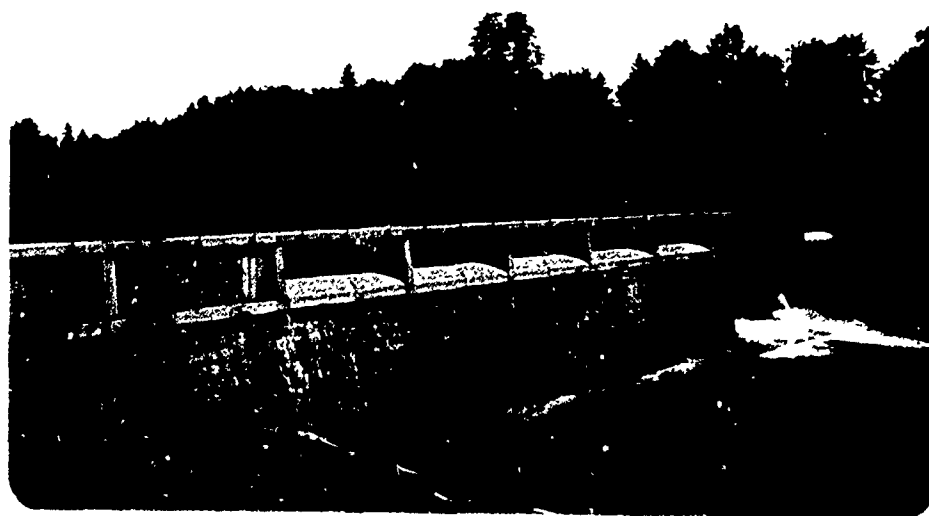
Clark H. Benn
Col. Clark H. Benn
New York District Engineer

Date:

28 Sept 79



Overview - Mill Street Dam I.D. No. N.Y. 775 - Upstream Face



Overview - Downstream Face

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MILL STREET DAM
I.D. NO. N.Y. 775
#64B-4198
OSWEGO RIVER BASIN
CAYUGA COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenant Structures

The Mill Street Dam is a masonry and concrete structure with a gated principal spillway and a crest designed to act as an auxiliary spillway. A foot bridge crosses the top of the dam above the auxiliary spillway crest.

The eastern end of the dam is masonry with a layer of concrete on the upstream face. This segment of the dam is 160 feet long and 25 feet high. The western end of the dam is reinforced concrete with a stone facing on the downstream fascia. This segment of the dam is 76 feet long and 25 feet high.

The principal spillway is located between these two segments. It consists of two trapezoidal channels with automatic flow control gates to regulate outflows. A sluice gate with a square opening 5 feet by 5 feet is located at the base of this section of the structure. This gate can be opened to drawdown the reservoir pool.

A concrete weir on top of a portion of both the masonry and concrete sections forms the auxiliary spillway crest. The auxiliary spillway is divided into 6 sections (5 to the east of the principal spillway section and 1 to the west) by the piers for the foot bridge.

A "Power Canal" on the eastern end of the dam also acts as a spillway at the dam site. Flow in the canal is controlled by a weir located near the downstream end of a 310' channel. The crest elevation of this weir is such that at normal pool elevation there will be flow in the canal, even if the automatic gates

close completely. A highway bridge crosses the canal near the inlet. Downstream of the weir is the inlet to an oval (10 ft. x 12 ft.) penstock which carries water to the non-operational powerhouse. The penstock is about 1500 feet long.

b. Location

The Mill Street Dam is located on Owasco Lake Outlet in the City of Auburn. It is approximately one mile downstream of the Owasco Lake Outlet Dam and about $\frac{1}{2}$ mile upstream of U.S. Route 20. The eastern end of the dam is located adjacent to Miller Street which is off N.Y. Route 38A.

c. Size Classification

This dam is 25 feet high and the reservoir has a storage capacity of 255 acre-feet. Therefore, the dam is in the small size category as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The dam is classified as "high" hazard due to the presence of a large number of homes and commercial establishments in the City of Auburn located downstream of the dam.

e. Ownership

The dam is owned by the City of Auburn. The City Engineer is Mr. Michael O'Neil. Mr. O'Neil's address is 24 South Street, Auburn, New York 13021 and his phone number is 315-252-9531.

f. Purpose of Dam

The dam was originally used to provide a pool to power a mill wheel. In about 1926, the mill wheel was replaced by a hydraulic turbine to generate electricity. The station was operated up until the dam partially failed in 1972. The dam was reconstructed in 1976 to restore the pool for aesthetic and recreational purposes.

g. Design and Construction History

The original dam was built in about 1875. No information concerning the original design or construction was available. The structure partially failed during the flood caused by tropical storm Agnes in June 1972. The dam was reconstructed in 1976. The design for this reconstruction was performed by Konski Engineers of Syracuse, New York.

h. Normal Operating Procedures

The water level in the pool is kept approximately constant for a wide range of flows by the automatic gates (2). If these gates close completely, additional discharge is possible through the operation of the sluice gate.

1.3 PERTINENT DATA

a. Drainage Area

208 square miles

b. Discharge at Dam

		<u>DISCHARGE</u>					
STAGE	WATER SURFACE ELEVATION @:	RESERVOIR DRAIN (FULLY) (OPEN)	(2) AUTOMATIC GATES		AUXILIARY SPILLWAY	POWER CANAL WEIR	TOTAL (CFS)
			(BOTH) (OPEN)	SIDEWALL OVERFLOW			
689.94	Sill of Automatic Gates	403	---				403
695.92	Crest of Power Canal Weir	533	872			---	1405
696.5	Normal Water Surface	544	940			33	1517
696.6	Crest of Auxiliary Spillway	547	948		---	42	1537
697.29	Top of Automatic Gates Structure	560	1002	---	230	119	1911
702	Top-of-Dam	641	1372	872	5964	1115	9964

c. Elevation

Top-of-Dam	702.0
Auxiliary Spillway Crest	696.6
Normal Water Surface	696.5
Power Canal Weir Crest	695.92
Automatic Gates - Sill	689.94
Sluice Gate - Invert	678.5

d. Reservoir Surface Area

(Acres)

Top-of-Dam	24
Auxiliary Spillway Crest	17

e. Storage Capacity

(Acre-Feet)

Top-of-Dam	255
Auxiliary Spillway Crest	137

- f. Dam
 Masonry and Reinforced Concrete Dam
 Dam Length (feet) 277
 Crest Elevation 702.0
 Crest Width (feet) 12
- g. Spillway
 Principal Spillway
 Type: Two trapezoidal channels with automatic flow control "Amil" gates manufactured by Alsthom Atlantic, Inc.
- Auxiliary Spillway
 Type: Concrete ogee-shaped weir above masonry and concrete sections. Divided into 6 sections by piers of the foot bridge. Each section 19.5 ft. wide and 4. feet high.
- h. Reservoir Drain
 Rodney Hunt sluice gate 5 ft. by 5 ft. located at the base of principal spillway section.
- i. Appurtenant Structures
 Power Canal - 24 ft. wide by 370 feet long canal with a concrete weir at downstream end.
 Downstream of weir is 10 ft. x 12 ft. inlet to penstock for powerhouse.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Mill Street Dam is located near the border between the glaciated Alleghany Plateau physiographic province and the Erie-Ontario plains province of New York State. This portion of the Alleghany Plateau is cut by the Finger Lake troughs which are glacially modified valleys of preglacial rivers. The bedrock in the area is predominately limestone overlain by shale, siltstone, and sandstone. These rock forms are from the Devonian period of the Paleozoic Era. The surficial soils are the result of glaciations during the Cenozoic Era, the last of which was the Wisconsin glaciation.

b. Subsurface Investigations

No subsurface information was available concerning the foundation of the original dam. A series of six borings were progressed in 1975 as part of the design of the reconstruction of the dam. These borings indicated that the dam is founded on rock. The rock was soft and highly weathered shale with layers and seams of harder limestone which was more resistant to weathering.

2.2 DESIGN RECORDS

No records were available from the original design of the structure. A design report, prepared by Konski Engineers in 1975, for the reconstruction of the dam was available. This report contained hydrologic computations and preliminary structural stability calculations. A complete set of plans for this reconstruction was also available.

2.3 CONSTRUCTION RECORDS

The only construction records available were from the 1976 reconstruction. A complete set of as built plans, prepared by Konski Engineers, and the specifications for the reconstruction were available.

2.4 OPERATION RECORDS

There were no operating or water level records available for this structure.

2.5 EVALUATION OF DATA

Data concerning the design and construction of the original dam was very limited. However, the entire dam was affected by the reconstruction in 1976. Information regarding this reconstruction was available from the Department of Environmental Conservation files. The information which was available appears to be adequate and reliable for the purpose of the Phase 1 inspection.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Mill Street Dam was conducted on August 2, 1979. The inspection was conducted shortly after the conclusion of a thunderstorm with the temperature around eighty degrees. The water surface at the time of the inspection was several inches below the crest of the auxiliary spillway. The automatic gates of the principal spillway were partially opened and discharging satisfactorily.

b. Masonry and Concrete Sections

The main sections of the dam were in satisfactory condition. There were no signs of distress or movement. The masonry was in good condition with all joints properly pointed. The foot bridge which crosses the dam was also in good condition.

There were two deficiencies noted on these sections. Undermining of the apron beyond the downstream toe was discovered. The undermining was worst on the western end of the apron where a void extended more than 6 feet from the western edge. Near the principal spillway section, the void extended approximately 2 feet under the apron. The problem appeared to be under the apron only. There was no other evidence that the dam had been undermined, because the only location where undermining was noticeable was at the western end of the apron.

The other deficiency was of a minor nature. Surface runoff had created a small erosion gully along the upstream edge of the dam at the western abutment. This gully was about 2 inches deep and extended several inches along the slab.

c. Spillways

Both the principal spillway and the auxiliary spillway sections appeared to be in satisfactory condition.

d. Reservoir Drain

The sluice gate at the base of the principal spillway could not be inspected closely, because of flow from beneath the gate. It was not possible to determine whether the gate was partially opened or if the flow was because of a poor seal.

The gate control mechanism, which was located on the foot bridge, appeared to be operational and in good condition.

e. Downstream Channel

The channel below the dam was in satisfactory condition. There were several areas where the side slopes had been eroded. On the western end of the dam, the riprap had failed in an area which extended from the toe of the dam downstream about 10-15 feet. The failure appeared to have been caused both by scour and surface runoff. On the eastern end of the dam, erosion gullies had formed on the upper portion of the channel bank above the riprap. These gullies were caused by surface runoff occurring over a non-vegetated slope.

f. Reservoir

There were no signs of soil instability in the reservoir area. The slopes in the area immediately upstream of the dam had been armored with riprap to reduce the potential for scour.

g. Appurtenant Structures - Power Canal

The Power Canal near the eastern end of the structure was in satisfactory condition. The concrete on the top of the canal side walls was somewhat deteriorated and spalling. The weir at the downstream end of the canal and the trash rack at the inlet to the penstock were in good condition, but there was an accumulation of debris at each.

3.2 EVALUATION OF OBSERVATIONS

Visual observations revealed several deficiencies. The following items were noted:

1. The undermining of the downstream apron;
2. An erosion gully along the upstream edge of the dam at the western abutment;
3. The failure of the riprap on the western bank downstream of the dam;
4. The erosion gullies on the eastern bank downstream of the dam;
5. The deterioration of the concrete on the walls of the power canal;
6. The accumulation of debris in the power canal both at the weir and at the penstock's trash rack.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The water level in the pool is kept approximately constant for a wide range of flows by the automatic gates. Even when these gates close completely, flow through the power canal will continue until the water level drops below the elevation of the weir crest. Further discharge at lower reservoir levels can be achieved by the operation of the sluice gate.

4.2 MAINTENANCE OF DAM

The dam is maintained by the City of Auburn. While the dam itself is in satisfactory condition, increased maintenance is required to prevent the formation of erosion gullies and to deal with the scour problems (both under the apron and at the toe of the riprap on the western slope). In addition, the trash rack at the inlet to the penstock at the end of the power canal should be cleaned regularly to prevent the accumulation of debris.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system is present.

4.4 EVALUATION

A comprehensive maintenance program for the dam is required. This program should include redirection of surface runoff to prevent the formation of erosion gullies on the channel slopes and regular removal of debris from the power canal. An emergency warning system should also be developed.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The delineation of the contributing watershed to this dam is shown on the map titled "Drainage Area - Mill Street Dam" (Appendix C). The irregular-shaped, north-south oriented watershed of some 208 square miles is about 33 miles long and has a maximum width of 10 miles. The watershed exhibits relatively steep topography with elevations rising from 695 at the dam to the ridges at elevations near 1600. The major tributary within the watershed is named Owasco Inlet which empties into Owasco Lake. The 11 mile long lake has a surface area of 10 square miles and has a watershed of some 205 square miles.

From Owasco Lake northerly to this dam flows a portion of the 21 mile long Owasco Outlet which passes through the City of Auburn and terminates at the Seneca River. An additional 3 square miles of the entire watershed's 208 square miles is drained by this 2.7 mile reach of the outlet. Located 0.9 miles upstream from Mill Street Dam is the Owasco Lake Outlet Dam, a regulating structure which significantly affects flows at this site.

5.2 ANALYSIS CRITERIA

Existing hydrologic/hydraulic information (Ref. 1a,1c) concerning the Owasco Lake Watershed was used to obtain elevation-storage capacity data, elevation-surface area data, and watershed characteristics.

The analysis of the spillway capacity of this dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. A standard project flood (SPF) hydrograph (Ref. 1d) developed for Owasco Lake was input directly into the program, which then flood routed this hydrograph using the "Modified Puls" method over the Owasco Lake Outlet Dam spillway (both no breach and breached conditions) and over this spillway. The spillway design flood selected for analysis was the Probable Maximum Flood (PMF) in accordance with the recommended guidelines of the U.S. Army Corps of Engineers. The PMF storm event is approximately twice the size of the SPF storm event.

5.3 SPILLWAY CAPACITY

The concrete and masonry spillway structure consists of a twin-gated principal spillway and a multiple section ogee-shaped auxiliary spillway topped by a continuous 12 foot wide foot bridge. The two gates of the principal spillway are constant-level upstream control "Amil" gates manufactured by Alsthom-Atlantic, Inc. and were analyzed for orifice flow conditions with a maximum opening area of 75.4 square feet.

The six section ungated auxiliary spillway has a 45° sloping upstream face on an ogee-shaped crest and was analyzed for weir flow conditions.

Additional discharge capacity at the site is obtained from a "power canal" located just east of the dam. This 24 foot wide canal has an ungated weir for flow control and directs discharges into an oval penstock (10 x 12 feet) leading to a non-operational powerhouse. A 5 x 5 foot Rodney Hunt sluice gate acts as a reservoir drain, but was not considered operational during the PMF storm event.

The following table indicates the conditions analyzed:

ANALYSIS CONDITIONS (SPF HYDROGRAPH FOR) (OWASCO LAKE)	ONE-HALF PMF			PMF		
			Depth Above 702.0*			Depth Above 702.0*
	Peak			Peak		
	Inflow	Outflow		Inflow	Outflow	
1) OWLO - no breach; all gates fully open						
MSD - no breach; 2 gates open	70684	10354	0.38	141368	25773	3.98
2) OWLO - same as 1)						
MSD - no breach; 2 gates closed	70684	10354	0.81	141368	25773	4.30
3) OWLO - breached @ W.S. Elev. 724						
MSD - no breach; 2 gates closed	70684	10354	0.81	141368	30543	5.20
4) OWLO - same as 3)						
MSD - same as 1)	70684	10354	0.38	141368	30543	4.89

DISCHARGE CAPACITY @ Mill Street Dam (MSD)

Conditions 1) and 4) 9323 cfs
 2) and 3) 7951 cfs

NOTE: 1)* Top-of-Dam is the Foot Bridge:

Upstream edge of slab @ Elev. 702.00
 Crowned top of slab @ Elev. 702.06

2) OWLO = Owasco Lake Outlet Dam

The spillway does not have sufficient capacity for discharging the peak outflow from one-half the PMF. For this storm event, the peak inflow is 70,684 cfs and the resulting peak outflow is 10,354 cfs. The computed spillway capacity with the "Amil" gates open is 9,323 cfs.

5.4 RESERVOIR CAPACITY

The reservoir impounded by this dam lies primarily within the limits of the existing channel of Owasco Outlet downstream of the Owasco Lake Outlet Dam. The normal water surface is at or near the auxiliary spillway crest elevation of 396.6. The impounded storage capacity for this elevation is 137 acre-feet. Surge storage capacity to the top-of-dam elevation of 702.0 adds 118 acre-feet for a total impounded capacity of 255 acre-feet.

5.5 FLOODS OF RECORD

The maximum known flood in the watershed occurred on June 23, 1972 during tropical storm Agnes when the USGS gaging station, located 3.1 miles downstream, recorded a maximum discharge of 3,250 cfs. However, this structure partially failed during this storm resulting in the need for structural repairs. Hence, the existing "new" dam has not been subjected to a major flood event since its completed 1976 reconstruction.

5.6 OVERTOPPING POTENTIAL

Analysis indicates the spillway does not have sufficient discharge capacity for one-half the PMF. The computed depth of overtopping is 0.38 feet for this storm event. Overtopping would occur for all storm events exceeding 46% of the PMF, under flow conditions having both automatic gates in the open position.

5.7 EVALUATION

This dam does not have sufficient spillway capacity to adequately discharge the peak outflow from one-half the PMF with the automatic gates open. However, the structural stability analysis indicates that the dam would not be unstable when subjected to the PMF storm event. Prior studies (Ref. 1a) have determined that serious damage can occur along Owasco Outlet when downstream discharges exceed 1,500 cfs. Therefore, the spillway is assessed as being inadequate.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observation of the dam did not reveal any signs of major distress. Both the horizontal and vertical alignments were normal. The masonry appeared to be in good condition with no seepage between blocks and all joints properly filled. The exposed concrete showed no signs of deterioration.

b. Data Review and Stability Evaluation

The structural and subsurface information used for the preparation of this report were obtained from the design report and construction plans prepared by Konski Engineers. Cross sections of the dam shown on these plans were used to perform a structural stability analysis. The following conditions were analyzed:

- a. Normal conditions with reservoir at auxiliary spillway crest;
- b. Reservoir at auxiliary spillway crest with an ice load of 7,500 lb./ft.;
- c. One-half PMF, water flowing over the auxiliary spillway crest at a depth of 5.46 feet;
- d. PMF, water flowing over auxiliary spillway crest at a depth of 9.14 feet.

The analyses performed (See Appendix D) indicate that the factors of safety against overturning and sliding are as follows:

<u>CASE</u>	<u>FACTORS OF SAFETY</u>	
	<u>OVERTURNING</u>	<u>SLIDING</u>
a) Reservoir at auxiliary spillway crest;	1.81	22.71
b) Reservoir at auxiliary spillway crest, ice load 7,500 lb./ft.;	1.28	17.04
c) $\frac{1}{2}$ PMF, water flowing over auxiliary spillway to depth of 5.46 feet;	1.46	16.39
d) PMF, water flowing over auxiliary spillway to depth 9.14 feet.	1.29	13.79

The analyses indicate that the factors of safety against sliding under all loading conditions are acceptable. The safety factor against overturning under normal conditions is acceptable, but under extreme loading conditions (ice load, PMF) factors are somewhat lower than desirable. However, in all cases analyzed the resultant falls within the middle two thirds of the base. In addition, the effects of the rock anchors would serve to increase the factors of safety against overturning for all conditions.

d. Seismic Stability

This dam is located in Seismic Zone 2. Due to the location, a seismic stability analysis was performed in accordance with Corps of Engineers' guidelines. The seismic analysis was performed for normal conditions with the water level at the auxiliary spillway crest. The safety factor against overturning with seismic considerations included is 1.65 and against sliding is 1.71. Therefore, the dam appears to have adequate factors of safety for earthquake loading conditions.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase 1 inspection of the Mill Street Dam did not reveal conditions which constitute a hazard to human life or property. The deficiencies noted can be corrected through increased maintenance efforts.

b. Adequacy of Information

The information available for the preparation of this report was adequate.

c. Need for Additional Investigations

No additional investigations are required at this time.

d. Urgency

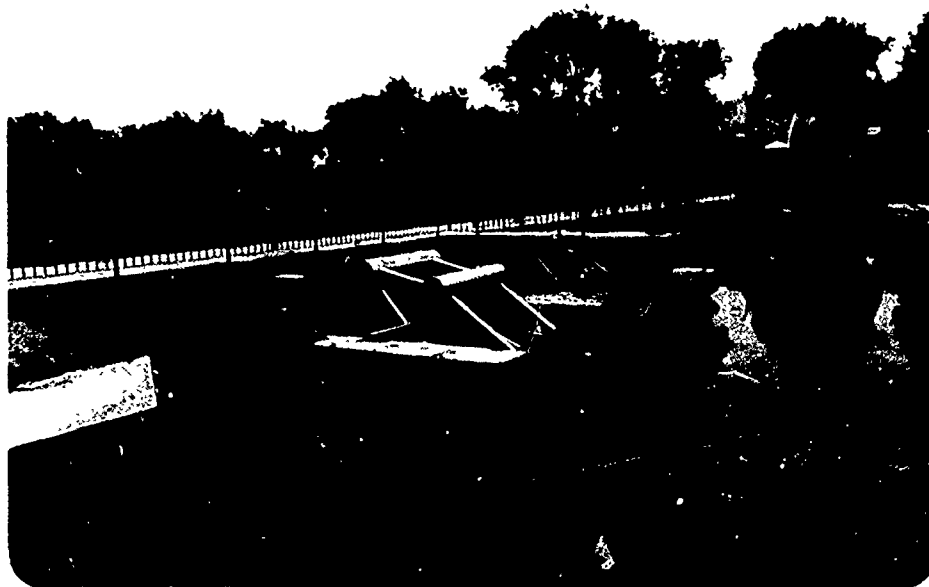
The deficiencies noted on this structure should be corrected within 1 year of the date of approval of this report.

7.2 RECOMMENDED MEASURES

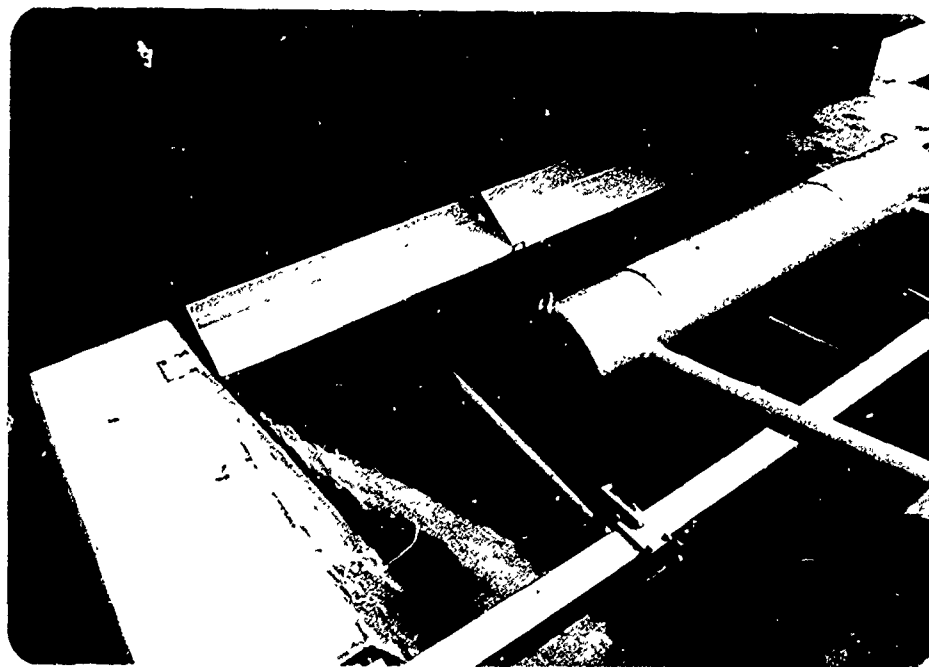
- a. The undermining of the downstream apron should be repaired.
- b. The erosion gully along the upstream edge of the dam at the western abutment should be regraded.
- c. The riprap failure which starts at the downstream toe of the dam on the western bank should be repaired.
- d. The eastern bank downstream of the dam should be regraded and seeded to establish a good vegetative cover on the slope.
- e. The concrete on the walls of the power canal are deteriorating and need to be repaired.
- f. The debris which accumulates in the power canal both at the weir and at the penstock's trash rack should be removed.

APPENDIX A

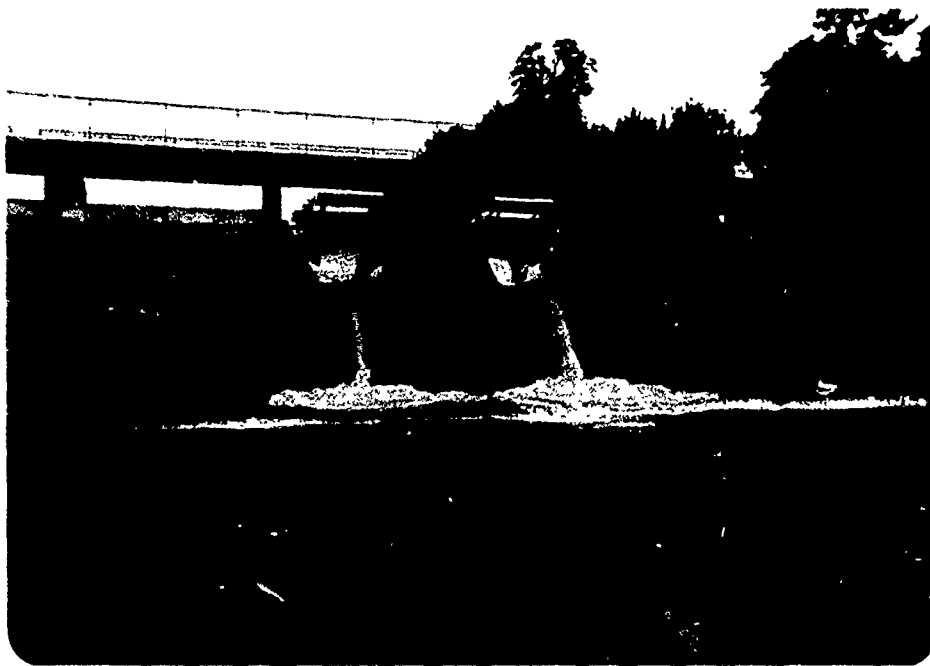
PHOTOGRAPHS



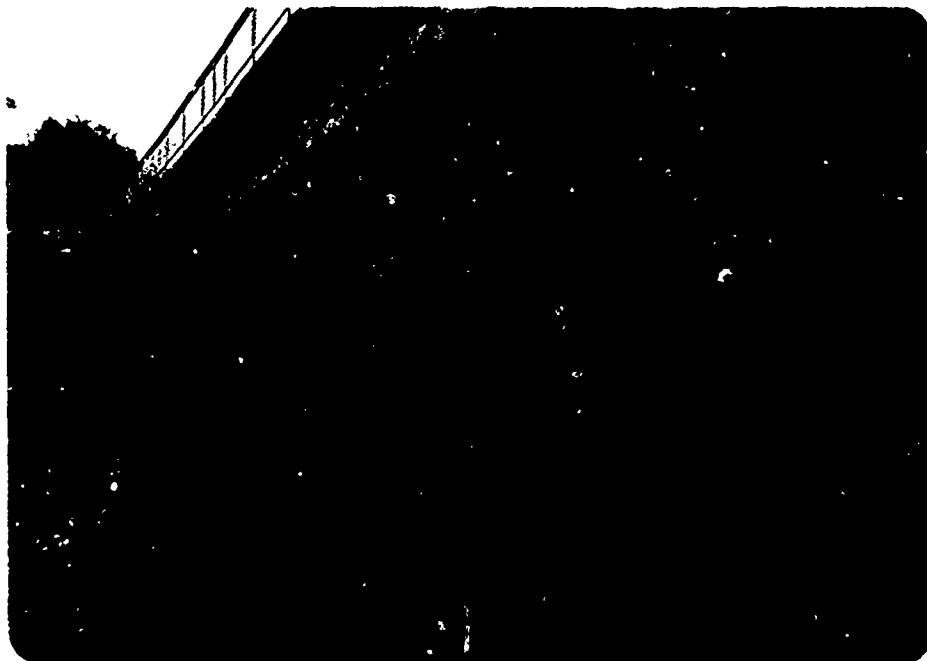
Principal Spillway - Automatic Flow Control Gate



Automatic Flow Control Gate Partially Opened



Principal Spillway Channels with Reservoir Drain Outlet in Center



Downstream Face of Dam - Note Good Condition of Masonry and Joints



Void Under Downstream Apron at Western End of Dam



Undermining of Downstream Apron at Western End of Dam



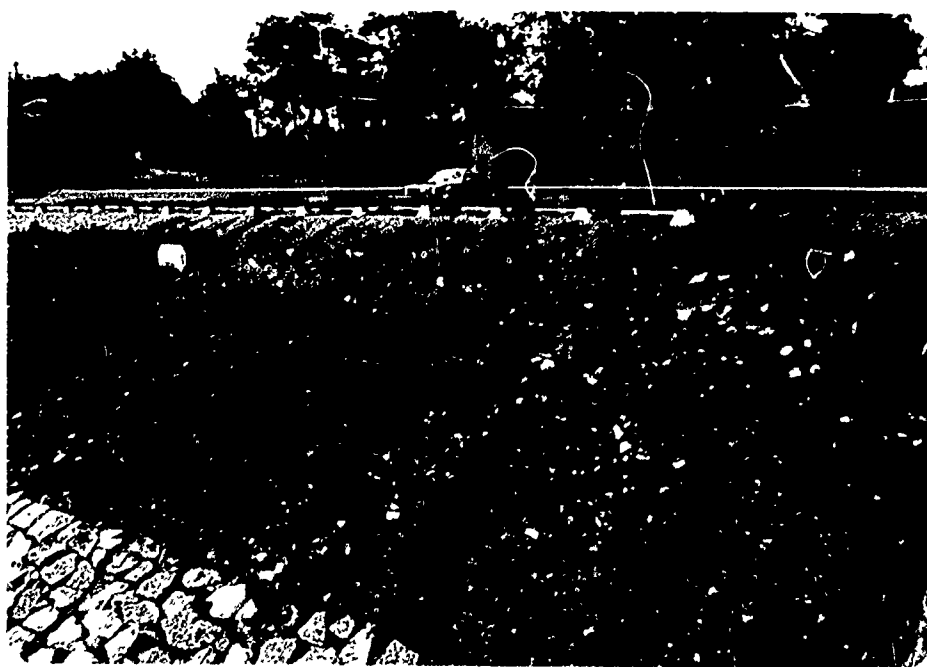
Riprap Failure - Western Abutment



Riprap Failure - Western Side of Channel Downstream of Apron



Erosion Gully Along Upstream Edge of Dam at Western Abutment



Erosion Gullies on Eastern Bank Downstream of the Dam



Weir on Power Canal - Note Debris Accumulation



Downstream Channel - Abandoned Powerhouse in Center of Picture

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST1) Basic Data

a. General

Name of Dam MILL STREET DAMI.D. # N.Y. 775Location: Town AUBURN County CAYUGAStream Name OWASCO LAKE OUTLET

Tributary of _____

Latitude (N) _____ Longitude (W) _____

Hazard Category CDate(s) of Inspection 8/2/79Weather Conditions 80° THUNDERSTORMSb. Inspection Personnel R. WARRENDER W. LYNICKc. Persons Contacted MICHAEL O'NEIL - CITY ENGINEER

d. History:

Reconstructed
Date Constructed 1972Owner CITY OF AUBURNDesigner KONSKI ENGINEERS

Constructed by _____

2) Technical DataType of Dam MASONRY & CONCRETEDrainage Area 208 SQ MILESHeight 25' Length 277

Upstream Slope _____ Downstream Slope _____

c. Abutments

(1) Erosion at Embankment and Abutment Contact SURFACE SOILS EROSION

UPSTREAM AT WEST END OF DAM - SURFACE RUNOFF CREATED

(2) Seepage along Contact of Embankment and Abutment GULLY ALONG BASE OF BRIDGE SLAB

(3) Seepage at toe or along downstream face

d. Downstream Area - below ~~embankment~~ ^{dam}

RIP-RAP SLOPES TRANSITION INTO NATURAL CHANNEL ABOUT
200' DOWNSTREAM OF DAM - UP ABOUT 7' FROM BOTTOM OF CHANNEL

(1) Subsidence, Depressions, etc. EROSION ON SLOPE - BETWEEN
TOP OF RIP RAP & PARKING LOT - SEEDING NOT ESTABLISHED
ON SLOPE

(2) Seepage, unusual growth NONE

(3) Evidence of surface movement beyond embankment toe NONE

(4) Miscellaneous R

e. Drainage System

4) Instrumentation(1) Monumentation/Surveys NONE(2) Observation Wells NONE(3) Weirs NONE(4) Piezometers NONE

(5) Other _____

5) Reservoir

- a. Slopes TREES TO EDGE OF WATERCOURSE - SLOPES IN VICINITY OF DAM ARE LINED WITH RIPRAP
- b. Sedimentation SUBSTANTIAL SILTATION IN RESERVOIR

6) Spillway(s) (including Discharge Conveyance Channel)

a. General PRINCIPAL CHANNEL IN CENTER - AUXILIARY ALL ALONG DAM

b. Principle Spillway (2) ALSTHOM ATLANTIC CONSTANT-LEVEL GATES

c. Emergency or Auxiliary Spillway 5 BOX WEIR STRUCTURES - FLOW BETWEEN CREST & BOTTOM OF BRIDGE

ALSO "POWER CANAL" - VERTICAL WALLS FROM DAM TO CONTROL WEIR - BEYOND WEIR FLOW GOES INTO PENSTOCK TO POWER HOUSE.
TRASH RACK AT INLET TO PENSTOCK IS CLUTTERED WITH DEBRIS

d. Condition of Discharge Conveyance Channel SATISFACTORY

e. Stability of Channel side/slopes CONCRETE SLOPES - OKAY - TOPS OF WALLS
SLOPES OF POWER CANAL ARE IN BAD CONDITION

7) Downstream Channela. Condition (debris, etc.) CHANNEL FREE OF OBSTRUCTIONSb. Slopes RIPRAP FAILURE NEAR DAM ON WEST END-EXTENDS ABOUT 10'
EROSION ON AREAS ABOVE RIPRAP ON WEST SIDEc. Approximate number of homes CITY OF AUBURN - DOWNTOWN
SECTION8) Reservoir Drain/OutletType: Pipe _____ Conduit _____ Other RODNEY HUNT SLUICE GATE

Material: Concrete _____ Metal _____ Other _____

Size: 5' X 5' Length _____Invert Elevations: Entrance 678.5 Exit _____

Physical Condition (describe): _____ Unobservable _____

Material: _____

Joints: _____ Alignment: _____

Structural Integrity: _____

Hydraulic Capability: SATISFACTORYRODNEY HUNT #70998-2 S-5012Means of Control: Gate X Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Other _____

Present Condition (describe): GATE CONTROL - OKAYGATE EITHER NOT SEALING PERFECTLY OR OPENED SLIGHTLY

9) Structural

- a. Concrete Surfaces GOOD
- b. Structural Cracking NONE
- c. Movement - Horizontal & Vertical Alignment (Settlement) NONE APPARENT
- d. Junctions with Abutments or Embankments SATISFACTORY - ON DOWNSTREAM SIDE AT WEST END OF DAM SURFACE RUN OFF HAS CREATED A GULLY
- e. Drains - Foundation, Joint, Face
- f. Water passages, conduits, sluices DRAIN - SATISFACTORY
- g. Seepage or Leakage NONE - MORTAR ON DOWNSTREAM FACE SATISFACTORY MORTAR - POINTING OKAY - NO MORTAR MISSING

h. Joints - Construction, etc. SATISFACTORY

i. Foundation DAM FOUNDATION APPEARS OKAY

j. Abutments OKAY - EXCEPT FOR EROSION ON WEST END

k. Control Gates OKAY

l. Approach & Outlet Channels

m. Energy Dissipators (plunge pool, etc.) APRON AT DOWNSTREAM TOE
UNDERMINED AT WEST END - > 6' AT END - ABOUT
2' UNDER DOWNSTREAM ^{APRON} PORTION DIRECTLY ^{D/S @} EAST AUTOMATIC GATE

n. Intake Structures

o. Stability

p. Miscellaneous WATERLINE downstream of dam on 3 PIERS
OF TRUSS BRIDGE IN CHANNEL.

APPENDIX C

HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>702.0</u>	<u>24</u>	<u>255</u>
2) Design High Water (Max. Design Pool)	<u>NA</u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u>696.6</u>	<u>17</u>	<u>137</u>
4) ~~POWER CANAL WEIR~~ Flashboards	<u>695.92</u> <u>NA</u>	<u>NA</u>	<u> </u>
5) (PRINCIPAL) Service Spillway Crest	<u>689.94</u>	<u>—</u>	<u>55</u>

DISCHARGES - (COMPUTED)

	<u>Volume</u> (cfs)
1) Average Daily	<u> </u>
2) ~~AUXILIARY~~ Spillway @ Maximum High Water (702.0)	<u>5964</u>
3) ~~Spillway @~~ ^{MAXIMUM} High Water (702.0)	<u>2360</u>
4) ^{PRINCIPAL} Spillway @ Auxiliary Spillway Crest Elevation	<u>1266</u>
5) Low Level Outlet @ PRINCIPAL SPILLWAY CREST	<u>403</u>
6) Total (of all facilities) @ Maximum High Water (702.0)	<u>10952</u>
7) Maximum Known Flood	<u>NA</u>
8) At Time of Inspection - WATER SURFACE @ 696.4	<u>GATES - OPERATING</u>

CREST:

ELEVATION: 702.0Type: CONCRETE FOOT BRIDGE OVER MASONRY & CONCRETE GRAVITY STRUCTUREWidth: 12' Length: _____Spillover 2 AUTOMATIC GATES ; 6 OGEE-CRESTED WEIRSLocation ACROSS ENTIRE STRUCTURE

SPILLWAY:

PRINCIPAL

AUXILIARY

689.94Elevation 696.62 CONSTANT-LEVEL UPSTREAM
AUTOMATIC GATES (AMIL)Type WEIRTRAPEZOIDAL (8.2' - 15.58')Width 19.5' EACH 117' TOTAL (NET)

Type of Control

Uncontrolled ✓

Controlled:

MANUF. - ALSTHOM ATLANTIC INC.

Type

OGEE-SHAPED CREST WITH
45° SLOPING UPSTREAM FACE

(gate)

2Number 6MAX. OPENING - 7.35'Size/Length MAX. OPENING - 4.4'Invert Material CONCRETEAnticipated Length
of operating service NANA Chute Length NANA Height Between Spillway Crest& Approach Channel Invert
(Weir Flow)2'

HYDROMETEROLOGICAL GAGES:

USGS
UPSTREAM - #04235396USGS
#04235500 - DOWNSTREAMType : NON-RECORDINGLocation: 2.7 MILES @ CALASCO LAKE3.1 MILES DOWNSTREAM FROM DAM

Records:

Date - 1912 TO PRESENTNOV. 1912 TO PRESENT

DATUM = MSL

Max. Reading - 6/25/726/23/72 Q = 3250 cfs

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE APPARENT

Method of Controlled Releases (mechanisms):

RESERVOIR DRAIN (RODNEY HUNT SLUICE GATE)PRINCIPAL SPILLWAY - 2 GATES (AMIL)

DRAINAGE AREA: 208 SQUARE MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FORESTED - FARMLAND

Terrain - Relief: STEEP

Surface - Soil: RELATIVELY PERMEABLE SCS SOIL GROUP
B - HONEOYE & LANSING
C - LANGFORD

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NA

Potential Sedimentation problem areas (natural or man-made; present or future)

NA

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

HOMES ALONGSIDE EXISTING CHANNEL OF QUASCO OUTLET

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NA

Elevation: _____

Reservoir:

Length @ Maximum Pool _____ 40.9 (Miles)

Length of Shoreline (@ Spillway Crest) _____ NA (Miles)

PROJECT GRID

JOB MILL ST. DAM	SHEET NO. 1/	CHECKED BY	DATE
SUBJECT		COMPUTED BY WCL	DATE 9/11/79

DRAINAGE AREA:

[PORTS ENGRS DESIGNING FOR QUASCO LAKE OUTLET PROJECT 5/19/79]

QUASCO LAKE = 304 SQUARES

DIST. FROM LAKE TO QUASCO LAKE OUTLET DAM = 1.5 MILES

TOTAL " " " TO OUTLET = 117 MILES

TOTAL ADDITIONAL DRAINAGE TO " ARE = 21 SQ MILES

DIST. QUASCO LAKE OUTLET DAM TO MILL ST DAM = 4950' = 0.94 MILES

ADDITIONAL DR AREA (LAKE TO DAM) = 

$\frac{1.8 + 0.94}{17} = \frac{DA}{211} \Rightarrow DA = 3.4 \text{ SQ MILES}$

TOTAL AREA (DAM) = 207.4 SQ MILES

[USGS WATER DATA REPORT 76-1 1977]

GAGE = 0.423539% 2.74 MILES UPSTREAM FROM DAM

DA = 205 SQ MILES

+ 3.4

208.4 SQ MILES

USE 209 SQ MILES ←

TRANSPPOSITION FACTOR: $TF = 1 - \frac{0.3009}{(DA)^{1.1116}}$

TF = 0.853

I.D. # NY-775



NCEED-PH

DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO, NEW YORK 14207

NEW YORK STATE

14 July 1975 16 PM 3 00

CONSTRUCTION DISTRICT

George Koch, Senior Hydraulic Engineer
Bureau of Facilities & Construction Mgmt.
New York State Dept. of Environmental
Conservation
50 Wolf Road
Albany, NY 12233

Dear Mr. Koch:

This is in reply to your letter, dated 25 June 1975, requesting available hydrologic and hydraulic data for Owasco Lake and Outlet.

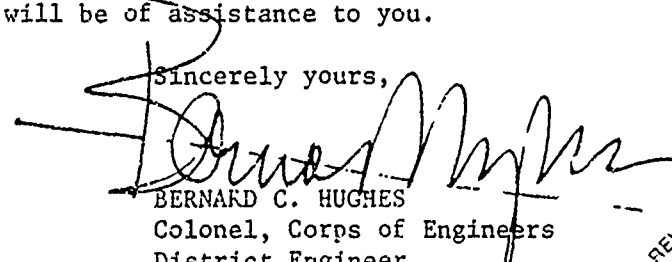
A search of our files revealed that we have not determined an outlet capacity or a spillway design flood for the State Dam. However, rating curves and stage, storage, area, and outflow data have been developed under the direction of Mr. Allan Tedrow, Chief, Program Development Group, New York State Department of Environmental Conservation. I suggest you contact Mr. Tedrow regarding these data.

In June 1962, a local flood protection project was completed on Owasco Lake Outlet. Inclosure 1 is a copy of the Design Memorandum, dated May 1960, for this project. Improvements to the State Dam discussed in this memorandum were to have been made by local interests.

I am also inclosing unit and standard project flood hydrograph data for Owasco Lake developed by the Buffalo District under the Section 214 Program. These data may be of use to you in determining a spillway design flood inflow hydrograph. Flood routings can then be accomplished using Mr. Tedrow's stage-storage data to determine the resultant outflow.

I trust this information will be of assistance to you.

Sincerely yours,


BERNARD C. HUGHES
Colonel, Corps of Engineers
District Engineer

Incl
as stated



OSWEGO BASIN-STANDARD PROJECT STORM CENTERED ON SUB-BASIN C
 DEVELOPMENT OF FLOOD HYD. GRAPH ON AREA C-1 (LOWASCO) (F) D.A.=2015M
 TCR FROM GENERAL STUDY OF OSWEGO BASIN 73-JP-1211

6/

ISIA	NIH	NUHGO	NCLRK	IPNCH	ORCSN	EXIA	RTIMP	
-0	1	56	-0	-0	-0	1.50	.047	
DA	TR	TP	CP	TC	RTIOR	RTIOL	RCVRY	E
201.00	60.00	-0.00	-0.000	-0.00	1.00	-0.00	-0.00	-0.00

STANDARD PROJECT FLOOD HYDROGRAPH ON AREA C-1

UNIFORM LOSS RATE INITIAL LOSSES

NP	BASEL	DELTA	STARTIN	STORM	SPFF	PMS	TUSPC	TRSDA
96	.02	.50	121	-0.00	9.50	-0.00	1.000	606.00

HR	MIN	R-IN	LOSS	EXCESS	UNIT HG	RECSN	FLOW
1	0	0.00	0.00	0.00	21353	121	121
2	0	0.00	0.00	0.00	6351	121	121
3	0	0.00	0.00	0.00	1989	121	121
4	0	0.00	0.00	0.00	2517	121	121
5	0	0.00	0.00	0.00	3250	121	121
6	0	0.00	0.00	0.00	4340	121	121
7	0	.01	.01	0.00	5353	121	121
8	0	.01	.01	0.00	5916	121	121
9	0	.01	.01	0.00	6153	121	121
10	0	.01	.01	0.00	6176	121	121
11	0	.01	.01	0.00	5971	121	121
12	0	.01	.01	0.00	5700	121	121
13	0	.03	.03	0.00	5390	121	121
14	0	.03	.03	0.00	4948	121	121
15	0	.04	.04	0.00	4468	121	121
16	0	.10	.10	0.00	4017	121	121
17	0	.04	.04	0.00	3611	121	121
18	0	.03	.03	0.00	3246	121	121
19	0	0.00	0.00	0.00	2919	121	121
20	0	0.00	0.00	0.00	2624	121	121
21	0	0.00	0.00	0.00	2359	121	121
22	0	0.00	0.00	0.00	2120	121	121
23	0	0.00	0.00	0.00	1906	121	121
24	0	0.00	0.00	0.00	1714	121	121
25	0	.01	.01	0.00	1541	121	121
26	0	.01	.01	0.00	1385	121	121
27	0	.01	.01	0.00	1245	121	121
28	0	.01	.01	0.00	1119	121	121
29	0	.01	.01	0.00	1006	121	121
30	0	.01	.01	0.00	905	121	121
31	0	.03	.03	0.00	813	121	121
32	0	.03	.03	0.00	731	121	121
33	0	.03	.03	0.00	657	121	121
34	0	.03	.03	0.00	591	121	121
35	0	.03	.02	.01	531	121	335
36	0	.03	.02	.01	478	121	398
37	0	.12	.02	.10	429	121	2340
38	0	.14	.02	.12	386	121	3364
39	0	.18	.02	.16	347	121	4566
40	0	.45	.02	.43	312	121	10885
41	0	.17	.02	.15	280	121	7047
42	0	.13	.02	.11	252	121	5617
43	0	.01	.01	0.00	227	121	3897
44	0	.01	.01	0.00	204	121	4166
45	0	.01	.01	0.00	183	121	5055

1-Hr. Unit
Hydrograph

SPF INFLOW
HYDROGRAPH

INCH 2 1000

46	0	.01	.01	0.00	165	121	5851
47	0	.01	.01	0.00	148	121	6309
48	0	.01	.01	0.00	133	121	6701
49	0	.04	.02	.02	120	121	7050
50	0	.04	.02	.02	108	121	6944
1	0	.04	.02	.02	97	121	6720
52	0	.04	.02	.02	87	121	6393
53	0	.04	.02	.02	78	121	6013
54	0	.04	.02	.02	70	121	5629
55	0	.15	.02	.13	63	121	7624
56	0	.15	.02	.13	57	121	8013
57	0	.15	.02	.13		121	7969
58	0	.15	.02	.13		121	8022
59	0	.15	.02	.13		121	8187
60	0	.15	.02	.13		121	8448
61	0	.68	.02	.66		121	20259
62	0	.82	.02	.80		121	27138
63	0	1.02	.02	1.00		121	33914
64	0	2.58	.02	2.56		121	70684
65	0	.95	.02	.93		121	48823
66	0	.75	.02	.73		121	41105
67	0	.08	.02	.06		121	30826
68	0	.08	.02	.06		121	32370
69	0	.08	.02	.06		121	37548
70	0	.08	.02	.06		121	42243
71	0	.08	.02	.06		121	45310
72	0	.08	.02	.06		121	46692
73	0	0.00	0.00	0.00		121	45377
74	0	0.00	0.00	0.00		121	43829
75	0	0.00	0.00	0.00		121	41868
76	0	0.00	0.00	0.00		121	39451
77	0	0.00	0.00	0.00		121	36602
78	0	0.00	0.00	0.00		121	33545
79	0	.01	.01	0.00		121	30479
80	0	.01	.01	0.00		121	27542
81	0	.01	.01	0.00		121	24916
82	0	.01	.01	0.00		121	22481
83	0	.01	.01	0.00		121	20265
84	0	.01	.01	0.00		121	18254
85	0	.05	.02	.03		121	17069
86	0	.06	.02	.04		121	15827
87	0	.07	.02	.05		121	14684
88	0	.18	.02	.16		121	15861
89	0	.06	.02	.04		121	12942
90	0	.05	.02	.03		121	11247
91	0	.01	.01	0.00		121	9808
92	0	.01	.01	0.00		121	9148
93	0	.01	.01	0.00		121	8662
94	0	.01	.01	0.00		121	8219
95	0	.01	.01	0.00		121	7750
96	0	.01	.01	0.00		121	7237
97	0					121	6723
98	0					121	6199
99	0					121	5693
100	0					121	5204
101	0					121	4729
102	0					121	4278
103	0					121	3862
104	0					121	3485
105	0					121	3144
106	0					121	2839

Peak

Incl 2 2053

107	0	121	2564
108	0	121	2340
109	0	121	2117
110	0	121	1893
111	0	121	1707
112	0	121	1541
113	0	121	1392
114	0	121	1256
115	0	121	1134
116	0	121	1025
117	0	121	899
118	0	121	780
119	0	121	663
120	0	121	477
121	0	121	394
122	0	121	329
123	0	121	305
124	0	121	283
125	0	121	264
126	0	121	246
127	0	121	231
128	0	121	216
129	0	121	207
130	0	121	198
131	0	121	190
132	0	121	183
133	0	121	177
134	0	121	171
135	0	121	166
136	0	121	162
137	0	121	158
138	0	121	154
139	0	121	151
140	0	121	148
141	0	121	143
142	0	121	139
143	0	121	135
144	0	121	125
145	0	121	123
146	0	121	121
147	0	121	121
148	0	121	121
149	0	121	121
150	0	121	121
151	0	121	121

TOTAL	10.83	1.45	9.38	129139	18271	1229595
-------	-------	------	------	--------	-------	---------

JAN 2 3053

PROJECT GRID

JOB MILL ST DAM	SHEET NO. 2/	CHECKED BY	DATE
SUBJECT HYDROGRAPH PARAMETERS		COMPUTED BY WCL	DATE 9/11/79

1) USE HYDROGRAPH GENERATED FROM OWAECO LAKE OUTLET DAM ANALYSIS

2) SNYDER UH:

LAG TIME:

$$L_p = \frac{C}{C_u} \left(\frac{L \times L}{C_u} \right)^{0.3}$$

$$L_p = 4 \left(\frac{30.7 \times 16.35}{4} \right)^{0.3}$$

$$L_p = 26.3 \text{ HRS}$$

$$L_u = 30 + 2.7 = 32.7$$

$$L_{CA} = 0.5L_u = 16.35$$

USE $C_u = 4$

UNIT RAINFALL DURATION:

$$t_r = \frac{L_p}{5.5} = \frac{26.3}{5.5} = 4.78 \text{ HRS}$$

DOES NOT RUN:
USE 3 HRS ←

ADJUSTED LAG TIME:

$$T_p = t_r + 0.25 \left(\frac{L}{L_u} - t_r \right)$$

$$= 26.3 + 0.25 (5 - 4.78)$$

$$T_p = 26.3 \text{ HRS}$$

USE $C_p = 0.625$

SOIL LOSS DATA:

INITIAL LOSS = 1.0"/HR CONSTANT LOSS = 0.5"/HR

BASE FLOW: @ 21 cfs / SQ MI @ DA TOTAL = 416 cfs

OWAECO LAKE OUTLET DAM

PMP - PRECIPITATION:

24 HR	48 HR	72 HR	96 HR	120 HR
21	21	21	21	21

OWAECO LAKE OUTLET DAM

OWAECO LAKE OUTLET DAM

PROJECT GRID

JOB MILL ST DAM		SHEET NO. 3/		CHECKED BY	DATE
SUBJECT STAGE - STORAGE DATA				COMPUTED BY WCL	DATE 9/11/79
REF:	PHASE II RECONSTRUCTION PERMIT APPLICATION NO. 706-01-0053 A 9/23/79			DESIGN REPORT PHASE I 5/20/75	
STAGE	SURFACE AREA (ACRES)		VOLUME (AC-FT)		
685			21		
690	---		55		
695	---		113.5		
696.6	17		13.7		
699	21		12.5		
702	24		25.4		
702.06	---		255.4		

$\Delta V = 1.4$
 23 AC-FT/FT

PROJECT GRID

JOB MILL ST DAM				SHEET NO. 4/		CHECKED BY		DATE	
SUBJECT STAGE - DISCHARGE DATA: OUTLET GATE (RESV. DRAIN)						COMPUTED BY WCL		DATE 9/11/79	
SIZE: 5' x 5' = 25 ft² L=5' ELEV. - INVERT 678.5 - CROWN 683.5 $Q = C A \sqrt{2gH}$ C = 0.65 [SUBMERGED CRIFICE - SERIES 3 FIG 309 (RECESSED 1'-6") BUREC - DES. OF SMALL DAMS (2ND ED.) 1977] OR $Q = \frac{2}{3} \sqrt{2g} C L (H_1^{3/2} - H_2^{3/2})$ $Q = 26.75 C (H_1^{3/2} - H_2^{3/2})$ C VARIES WITH H₁ (FIG 1257) H₁ H₂ 5' = d 683.5 678.5									
	STAGE	H	d/H	C	H ₁ ^{3/2}	H ₂	H ₂ ^{3/2}	Q	
CREST OF GATES	689.94	11.44	0.437	.674	38.69	6.44	16.34	403	
	690	11.5	0.435	.674	39.0	6.5	16.57	404	
CREST CANAL WEIR	695.92	17.42	0.287	.689	72.71	12.42	43.77	533	
	696	17.5	0.286	.689	73.21	12.5	44.19	535	
NWS	696.5	18	0.278	.69	76.37	13	46.87	544	
CREST AUX. SPILLWAY	696.6	18.1	0.276	.691	77.0	13.1	47.41	547	
	697	18.5	0.27	.691	79.57	13.5	49.60	554	
	697.29	18.79	0.266	.692	81.45	13.79	51.21	560	
BOTTOM BRIDGE	701	22.5	0.222	.696	126.73	17.5	73.21	624	
TOP	702	23.5	0.213	.693	113.92	18.5	72.57	641	
CROWN	702.66	23.56	0.212	.693	114.36	18.56	72.96	642	

OUTLET GATE - DISCHARGE COEFF.

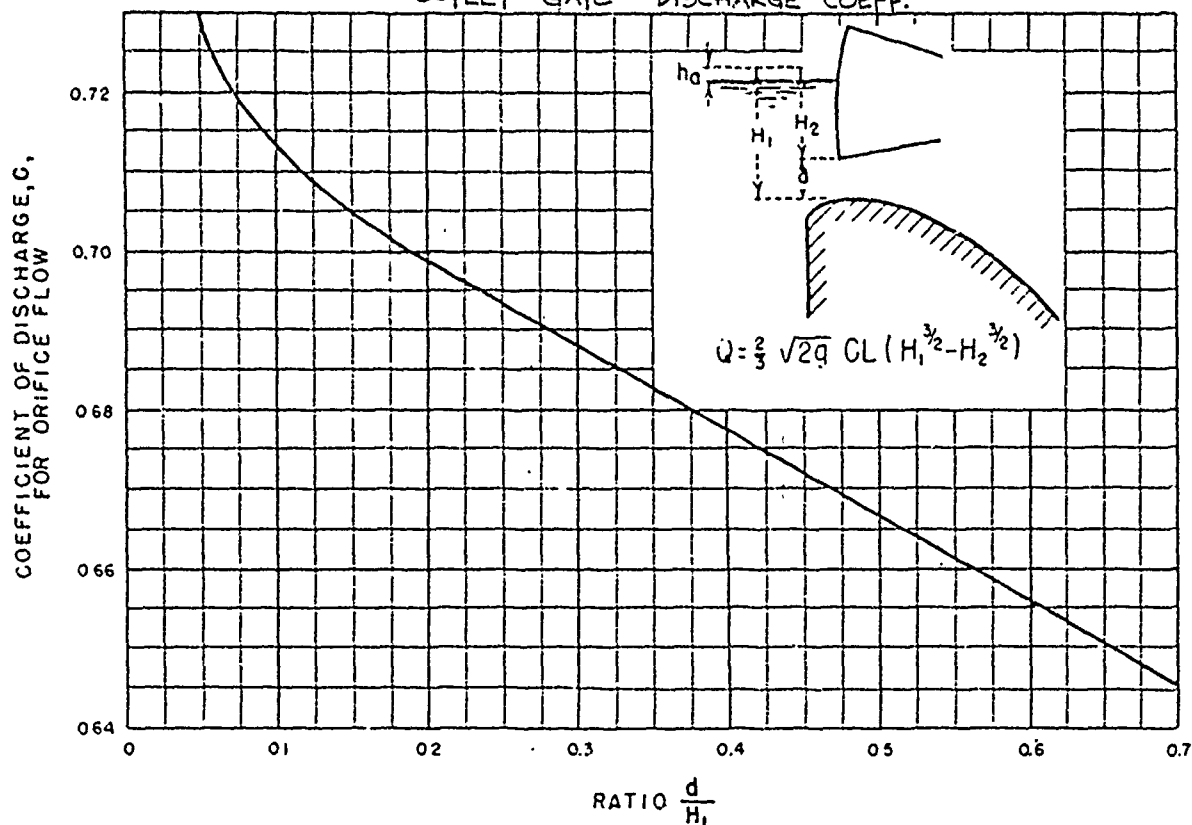


Figure 257. Coefficient of discharge for flow under gates. 288-D-2417.

is the inflow per foot of length of weir crest. The momenta³ at the two sections therefore will be:

$$\text{Upstream, } M_u = \frac{Qv}{g} \quad (8)$$

$$\text{Downstream, } M_d = \frac{[Q + q(\Delta x)]}{g} [v + \Delta v] \quad (9)$$

Subtracting equation (8) from equation (9):

$$\Delta M = \frac{Q(\Delta v)}{g} + \frac{q(\Delta x)}{g} [v + \Delta v] \quad (10)$$

Dividing by Δx :

$$\frac{\Delta M}{\Delta x} = \frac{Q(\Delta v)}{g(\Delta x)} + \frac{q}{g} [v + \Delta v] \quad (11)$$

³The weight of 1 cubic foot of water is taken as a unit force to eliminate the necessity of multiplying all forces and momenta by 62.5 to convert them into pounds.

The rate of change of momentum with respect to time being v times the rate of change with respect to x , and considering the average ve-

locity to be $\left[v + \frac{1}{2}(\Delta v) \right]$, equation (11) can be written:

$$\frac{\Delta M}{\Delta t} = \frac{Q(\Delta v)}{g(\Delta x)} \left[v + \frac{1}{2}(\Delta v) \right] + \frac{q}{g} [v + \Delta v] \left[v + \frac{1}{2}(\Delta v) \right] \quad (12)$$

As $\frac{\Delta M}{\Delta t}$ is the accelerating force, which is equal to the slope of the water surface $\frac{\Delta y}{\Delta x}$ times the average discharge, equation (12) becomes:

$$\frac{\Delta y}{\Delta x} \left[Q + \frac{1}{2}(\Delta Q) \right] = \frac{Q(\Delta v)}{g(\Delta x)} \left[v + \frac{1}{2}(\Delta v) \right] + \frac{q}{g} [v + \Delta v] \left[v + \frac{1}{2}(\Delta v) \right] \quad (13)$$

Spillway



Over

Figure

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elevati

$$\Delta y = \frac{Q}{g} \left[\right]$$

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 Δt

Reservoir



Fig.

PROJECT GRID

JOB MILL ST DAM	SHEET NO. 5/	CHECKED BY	DATE
SUBJECT STAGE - DISCHARGE : CONSTANT-LEVEL GATES (3)		COMPUTED BY WCL	DATE 9/12/79

CONDITION:
NORMAL WATER SURFACE @ ELEV 696.5

ELEV - CREST 689.94 BOTTOM WIDTH = 8'-2 1/2" = 8.21'

TOP 697.29 TOP " = 15'-7" = 15.58'

$Q = C A \sqrt{2 g H} = 4.815 A \sqrt{H}$ ORIFICE FLOW

$C = 0.6$ H MEASURED TO CENTER OF ORIFICE OPENING

A VARIES WITH HEIGHT OF OPENING

WATER SURFACE - CONSTANT LEVEL @ ELEV. 696.5

ELEV.	OPENING TOP WIDTH	H	A	H	Q	(3-GATES)
FOOT-GATE	d	ft	sq ft	ft	cfs	sq ft
689.94	—	8.21	8.21	—	—	—
690	0.06	9.27	9.24	0.49	6	12
695.92	5.98	14.20	11.205	67.01	3.57	1220
696	6.06	14.25	11.245	68.14	3.53	1232
696.5	6.56	14.73	11.495	75.41	3.28	731 1/2 1260

CAVAL WEIR

NU'S

5/ (1260 - 1232) = 28

SHT #

REVISED - SEE SHT 5A

PROJECT GRID

JOB MILL ST. DAM		SHEET NO. 5A		CHECKED BY		DATE	
SUBJECT STAGE-DISCHARGE : CONSTANT-LEVEL GATES (2)				COMPUTED BY WCL		DATE 9/27/79	
DESIGN DATA - ALSTOM ATLANTIC INC.				RECD - 9/24/79			
INSTALLED GATES = 1 AMIL D450 UNITS				[INDEX # D = 450]			
$Q_{MAX} = 470 \text{ cfs}$ FOR HEAD DIFFERENTIAL $> 3'$ WITH DOWNSTREAM WATER SURFACE SURVEYING GATE SILL							
IF INFLOW Q EXCEEDS Q-GATE:							
MAX. WATER SURFACE ELEV. TO AVOID GATE OVERTOPPING = ELEV. OF AXIS OF ROTATION + $0.009D$							
OVERTOPPING ELEV. = $696.5 + 0.009(450) = 700.55$							
$Q_{OT} (\text{ELEV } 700.55) = \frac{4}{3} Q_{MAX} = \frac{4}{3} (470) = 1253.3 \text{ cfs}$							
2 GATES $Q_{OT} = 1253 \text{ cfs}$							
REVISED DISCHARGE CAPACITY: $Q = CAV \sqrt{2gH} = 3.443 AV \sqrt{H}$							
ELEV.	OPENING						(2-GATES)
BOT. GATE	d	WIDTH	L _{AVE}	A	H	Q	2Q
659.94	—	8.21	8.21	—	—	—	—
690	0.0%	8.27	8.24	0.49	6.53	4	18
CAVAL WEIR	695.92	5.95	14.20	11.225	67.01	3.57	436
	696	6.06	14.23	11.245	68.14	3.53	441
NWS	696.5	6.5%	14.78	11.495	75.41	3.28	470
$C = \frac{Q}{A \sqrt{2gH}} = \frac{470}{75.41 \sqrt{29(3.28)}} = 0.429$							

PROJECT GRID

JOB		SHEET NO.		CHECKED BY	DATE
MILL ST. DAM		58/			
SUBJECT				COMPUTED BY	DATE
STAGE - DISCHARGE : CONSTANT-LEVEL GATES (2)				WCL	9/27/79

STAGE	Q	COEFF.	Q	3Q	ORIFICE FLOW
696.5	1.0	470	470 ← (SHT 5A)	940	
696.6	1.008	474		948	
697	1.041	489		978	
697.29	1.065	501		1002	
700.55	1.333	626.7	626.7 ← (SHT 5A)	1253	
$Q = C A \sqrt{2gH} = 231.47 \sqrt{H}$					
GATE - FULLY OPEN $A = 75.41 \text{ ft}^2$ GATE BOTTOM @ 696.5 = NWS CENTER ORIFICE ELEV @ 693.22 GATE SILL @ 689.94					
FOR ELEV. 700.55 $H = 7.33$ $Q = 626.7 \text{ cfs}$					
$C = \frac{Q}{A \sqrt{2gH}} = \frac{626.7}{75.41 \sqrt{2g(7.33)}} = 0.3525$					
(REF = 693.22)					
STAGE	H	Q	12-Q		
700.55	7.33	626.7	1253		
701	7.78	646	1292		
702	8.78	686	1372		
702.06	8.84	688	1376		

PROJECT GRID

JOB MILL ST DAM				SHEET NO. 6/		CHECKED BY		DATE	
SUBJECT STAGE - DISCHARGE : CONSTANT-LEVEL GATES (3)						COMPUTED BY WCL		DATE 9/12/79	
CONDITION: GATES FIXED w/ BOTTOM @ ELEV. 696.5 (NW5) ORIFICE FLOW ← WATER SURFACE RISES: (ELEV. 696.5 - 702.0) OPENING AREA = 75.41 FT² OR L_{AVE} = 11.495' OPENING HT = 6.56' (RUBEN - FIG 257) $Q = \frac{2}{3} \sqrt{2g} C L (H_1^{3/2} - H_2^{3/2}) = 11.495 C (H_1^{3/2} - H_2^{3/2})$ L = 11.495' d = 6.56' C VARIES WITH H REF = 1.897 L									
STAGE	H	$\frac{Q}{H}$	C	$H_1^{3/2}$	H	$H_2^{3/2}$	Q	25	
696.5	---	---	---	---	---	---	---	---	
696.5	1.56	0.93	---	17.19	0.10	0.03	433	1266	
697	7.06	0.93	[0.6 MIN]	19.76	0.50	0.35	479	1358	
697.29	7.35	0.99	---	19.93	0.79	0.70	710	1420	
701	11.26	0.593	0.457	26.72	4.5	9.55	1100	2200	
702	12.06	0.544	0.462	41.99	5.5	12.90	1180	2360	
702.06	12.19	0.541	0.462	42.19	5.56	13.11	1184	2368	
OVERFLOW - GATE SIDEWALLS BETWEEN GATE & BRIDGE PILES: $Q = C L H^{3/2}$ REAR-CRESTED WEIR C = 3.1 $Q = 42.625 H^{3/2}$ ← L = (17.5 - 3.75) = 13.75' (OVER SIDEWALL)									
STAGE	H	Q	25						
697.29	---	---	---						
701	3.71	305	610						
702	4.71	426	872						
702.06	4.77	444	898						

SHT
4A

PROJECT GRID

JOB MILL ST DAM				SHEET NO. 7/		CHECKED BY WCL		DATE 9/18/79	
SUBJECT STAGE - DISCHARGE : AUXILIARY SPILLWAY				COMPUTED BY WCL		DATE 9/18/79			

Ogee shaped with 1:1 sloping upstream face

$Q = C_d L H^{3/2}$ $L = L' - 2(NK_f + K_o)H$ WEIR FLOW

$L' = 117'$ (NET) $N = 5$ (PIERS)
 2 - ABUTMENTS
 $K_f = 0.03$
 $K_o = 0.1$
 $L = 117 - 0.4H$ $L_0 \text{ RAY} = 19.5'$

(FIG. 349) $Q = C_d L H^{3/2}$ $P/H_0 = 1.0$ $C_d = 3.38$ (VELOCITY FACE)

(FIG. 351) $H_0 = 2'$ $C_{incl} = 0.395$ $P/H = 1.0$ $P/H_0 = 1.0$

(FIG. 351) $P/H = 1.0$ $C_{incl} = 0.395$ $P/H = 1.0$ $P/H_0 = 1.0$

FOR 1:1 SLOPING FACE

$H_0 = 2'$ (INCLUDED) $C_d = 3.37$ (BUREAU FIG 250) $L = 117 - 0.4H$

STAGE	H	H_0/H_0	C_d/C_d	C_d	L	Q
626.0	—	—	—	—	117	—
697	0.4	0.2	0.353	3.30	116.8	98
697.39	0.69	0.345	0.345	3.44	116.7	230
701	1.1	0.7	1.07(4.44)	4.14	115.2	440.2
702	5.4	2.7	1.07	4.14	114.8	596.4
702.66	5.46	2.73	1.07	4.14	114.8	617.4

TCP

CROWN

PROJECT GRID

JOB MILL ST DAM		SHEET NO. 8/	CHECKED BY	DATE
SUBJECT STAGE - DISCHARGE : 1) POWER CANAL WEIR 2) WEIR FLOW OVER BRIDGE		COMPUTED BY WCL	DATE 9/12/79	

1) POWER CANAL WEIR :

$Q = CLH^{3/2}$ $L = 24'$ $Q = 174.4 H^{3/2}$ WEIR FLOW

$C = 3.1$

STAGE	H	Q
695.92	—	—
696	2.08	117
696.5	2.58	33
696.6	2.68	42
697	3.08	84
697.28	3.27	119
701	5.08	252
702	6.08	415
702.06	6.14	432

2) WEIR FLOW OVER BRIDGE :

$Q = CLH^{3/2}$ $L = 327$ $C = 3.027$

OVER FLOW ELEV = 702

10' CROWN = " " = 702.06

PROJECT GRID

[illegible]

 FLOW HYDROGRAPH PACKAGE (HLC-1)
 AUGUST 10 1976
 LAST MODIFICATION 26 FEB 79
 MODIFIED BY BURGESS/ELL APR 79

 THIS PROGRAM IS CURRENTLY BEING MODIFIED
 TO RUN ON THE DCS BUREAU/ELL SYSTEM

PLEASE REPORT ANY UNUSUAL OPERATING PROBLEMS
 TO THE TILLSON (423) PH 7-5666

OSYGO RIVER BASIN CAYUGA COUNTY											
IN-775 CITY OF AUBURN INLET - CUMPS ENIGS SPILLWAY FOR DWASCO LAKE OUTLET DAM											
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INLET - CUMPS ENIGS SPILLWAY FOR DWASCO LAKE OUTLET DAM											

K1 ROUTED OUTFLOW - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM

Y	1	1	1	-1	
Y1	3			-1	
Y4	710.72	711	712.82	713	713.27
Y5	715.5	715.87	716	717	717.5
Y6	1287	1350	1777	2388	2584
Y7	5053	5313	5404	6180	6670
Y8	6280	12900	17712	20734	33752
Y9	709	710	710.72	711	712
Y10	717	717	717	717	717
Y11	717	717	717	717	717
Y12	717	717	717	717	717
Y13	717	717	717	717	717
Y14	717	717	717	717	717
Y15	717	717	717	717	717
Y16	717	717	717	717	717
Y17	717	717	717	717	717
Y18	717	717	717	717	717
Y19	717	717	717	717	717
Y20	717	717	717	717	717
Y21	717	717	717	717	717
Y22	717	717	717	717	717
Y23	717	717	717	717	717
Y24	717	717	717	717	717
Y25	717	717	717	717	717
Y26	717	717	717	717	717
Y27	717	717	717	717	717
Y28	717	717	717	717	717
Y29	717	717	717	717	717
Y30	717	717	717	717	717
Y31	717	717	717	717	717
Y32	717	717	717	717	717
Y33	717	717	717	717	717
Y34	717	717	717	717	717
Y35	717	717	717	717	717
Y36	717	717	717	717	717
Y37	717	717	717	717	717
Y38	717	717	717	717	717
Y39	717	717	717	717	717
Y40	717	717	717	717	717
Y41	717	717	717	717	717
Y42	717	717	717	717	717
Y43	717	717	717	717	717
Y44	717	717	717	717	717
Y45	717	717	717	717	717
Y46	717	717	717	717	717
Y47	717	717	717	717	717
Y48	717	717	717	717	717
Y49	717	717	717	717	717
Y50	717	717	717	717	717
Y51	717	717	717	717	717
Y52	717	717	717	717	717
Y53	717	717	717	717	717
Y54	717	717	717	717	717

K1 ROUTED HYDROGRAPH AT MILL ST DAM - NO BREACH OUTLET GATE CLOSED-2 GATES OPEN

Y	1	1	1	-1	
Y1	1			-1	
Y4	690	695.92	696	696.5	697
Y5	8	172	384	973	990
Y6	21	55	112.5	137	185
Y7	605	690	695	696.6	699
Y8	690.6				
Y9	690.6	3.087	1.5	307	
Y10	690.6				
Y11	690.6				
Y12	690.6				
Y13	690.6				
Y14	690.6				
Y15	690.6				
Y16	690.6				
Y17	690.6				
Y18	690.6				
Y19	690.6				
Y20	690.6				
Y21	690.6				
Y22	690.6				
Y23	690.6				
Y24	690.6				
Y25	690.6				
Y26	690.6				
Y27	690.6				
Y28	690.6				
Y29	690.6				
Y30	690.6				
Y31	690.6				
Y32	690.6				
Y33	690.6				
Y34	690.6				
Y35	690.6				
Y36	690.6				
Y37	690.6				
Y38	690.6				
Y39	690.6				
Y40	690.6				
Y41	690.6				
Y42	690.6				
Y43	690.6				
Y44	690.6				
Y45	690.6				
Y46	690.6				
Y47	690.6				
Y48	690.6				
Y49	690.6				
Y50	690.6				
Y51	690.6				
Y52	690.6				
Y53	690.6				
Y54	690.6				

THIS PROGRAM IS COMPLETELY FREE AND MODIFIED
TO RUN ON THE OS/2 HONEYWELL SYSTEM

PLEASE REPORT ANY UNUSUAL OPERATING PROBLEMS
TO THE FILLING (P.O. 423) PH: 7-5566

MILL STREET DAM
 '1Y-775
 CITY OF ALBUQUERQUE
 USWEGO RIVER BASIN
 CAYUGA COUNTY
 PIPE - CORPS ENGRS SPF-UH FOR OWASCO LAKE OUTLET DAM

NW	JNR	P'TH	IDAY	JOB SPECIFICATION						IPRT	NSTAN
				IHR	IMIN	MEIRC	LROPT	TRACE			
160	1	0	0	0	0	0	0	0	0	0	0
			JUPER	NWT	LROPT	TRACE					
			5	0	0	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 4 LRTIO= 1
% 1.00 2.00

一、**政治**
 二、**經濟**
 三、**文化**
 四、**教育**
 五、**社會**
 六、**法律**
 七、**軍事**
 八、**外交**
 九、**宗教**
 十、**藝術**
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 二百六十五、**社會**
 二百六十六、**法律**

SU11-ARFA KINOFF COMPUTATION

INFLOW HYDROGRAPH - OHASCO LAKE OUTLET									
ISTAG	ICIMP	IECON	ITAPE	JPLY	JPRY	INAVE	ISTAGE	IAUTO	
1	0	0	0	0	0	1	0	0	

[illegible]

9112.
14100.
16374.
75196.
60958.
25684.
111380.
4234.
1326.
414.
302.
242.
242.
0.
0.
0.

6726.
13402.
16044.
4740.
7050.
1722.
2396.
4660.
1560.
432.
308.
242.
242.
0.
0.
0.

4680.
12618.
15938.
61652.
73204.
29369.
13446.
5123.
1798.
462.
310.
242.
242.
0.
0.
0.

RTIO 4
796.
11702.
16026.
32218.
78902.
11654.
4474.
5678.
2050.
497.
324.
242.
242.
0.
6.
0.

PLAN
676.
0110.
5248.
7046.
3736.
4130.
5500.
5243.
2265.
520.
332.
246.
242.
0.
0.
0.

1
242.
332.
251.
363.
640.
508.
431.
970.
512.
566.
342.
250.
242.
0.
0.
0.

PH AT
242.
774.
326.
421.
754.
530.
326.
724.
734.
310.
354.
270.
442.
0.
0.
0.

42.
36.
46.
73.
34.
52.
40.
36.
32.
50.
66.
72.
42.
0.
0.
0.

12.
14.
15.
18.
20.
22.
26.
28.
4.
4.
6.
6.
2.
9.
1.
9.

•

Summary

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

— 7 —

HYDROGRAPH ROUTING

ROUTED OUTFLOW - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM														
ISTAG	ICOMP	IFCON	ITAPE	JPLT	JPPT	ISAGE	ISTAGE	IAUTO						
1	1	0	0	0	0	1	0	0						
ROUTING DATA														
CLUSS	AVG	IR5	ISAKE	IOPT	IPNF	LSTR								
0.	0.	1	1	0	0	0								
INSTPS														
3	0	LAG	AR5KK	X	TSK	STGR	ISPRAT							
		0	0.	0.	0.	-711.	-1							

STAGE	711.00	712.00	713.00	713.27	714.00	714.85	715.00	715.12
	715.37	716.59	717.06	717.52	718.00			
1211	1251.00	1777.00	2388.00	2984.00	3175.00	3953.00	4106.00	4221.00
	5313.00	5400.00	6188.00	6670.90	7186.00			
CAPACITY	12900.	17712.	26734.	33752.	40970.	56211.	64233.	
1211	710.	711.	712.	713.	714.	716.	717.	
	709.							

CREF	SF'RID	CDQW	EXPW	ELEV	CDQL	CALEA	EXPL
710.7	0.	0.	0.	0.	0.	0.	0.

DAN DATA		
TYPEL	CDQD	EXPD .DANWID
717.0	3.1	1.5 70.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

WUTFLW

[illegible]

STORAGE			
17510.	17422.	17325.	17228.
17421.	17354.	17264.	17161.
17353.	17281.	17185.	17089.
17287.	17213.	17139.	17059.
17223.	17144.	17061.	16989.
17153.	17073.	16989.	16919.
17083.	17003.	16919.	16849.
17013.	16933.	16849.	16779.
16943.	16863.	16779.	16709.
16873.	16793.	16709.	16639.
16803.	16723.	16639.	16569.
16733.	16653.	16569.	16499.
16663.	16583.	16499.	16429.
16593.	16513.	16429.	16359.
16523.	16443.	16359.	16289.
16453.	16373.	16289.	16219.
16383.	16303.	16219.	16149.
16313.	16233.	16149.	16079.
16243.	16163.	16079.	16009.
16173.	16093.	16009.	15939.
16103.	16023.	15939.	15869.
16033.	15953.	15869.	15799.
15963.	15883.	15799.	15729.
15893.	15813.	15729.	15659.
15823.	15743.	15659.	15589.
15753.	15673.	15589.	15519.
15683.	15603.	15519.	15449.
15613.	15533.	15449.	15379.
15543.	15463.	15379.	15309.
15473.	15393.	15309.	15239.
15403.	15323.	15239.	15169.
15333.	15253.	15169.	15099.
15263.	15183.	15099.	15029.
15193.	15113.	15029.	14959.
15123.	15043.	14959.	14889.
15053.	14973.	14889.	14819.
14983.	14903.	14819.	14749.
14913.	14833.	14749.	14679.
14843.	14763.	14679.	14609.
14773.	14693.	14609.	14539.
14703.	14623.	14539.	14469.
14633.	14553.	14469.	14399.
14563.	14483.	14399.	14329.
14493.	14413.	14329.	14259.
14423.	14343.	14259.	14189.
14353.	14273.	14189.	14119.
14283.	14203.	14119.	14049.
14213.	14133.	14049.	13979.
14143.	14063.	13979.	13909.
14073.	13993.	13909.	13839.
14003.	13923.	13839.	13769.
13933.	13853.	13769.	13699.
13863.	13783.	13699.	13629.
13793.	13713.	13629.	13559.
13723.	13643.	13559.	13489.
13653.	13573.	13489.	13419.
13583.	13503.	13419.	13349.
13513.	13433.	13349.	13279.
13443.	13363.	13279.	13209.
13373.	13303.	13209.	13139.
13303.	13233.	13139.	13069.
13233.	13163.	13069.	12999.
13163.	13093.	12999.	12929.
13093.	13023.	12929.	12859.
13023.	12953.	12859.	12789.
12953.	12883.	12789.	12719.
12883.	12813.	12719.	12649.
12813.	12743.	12649.	12579.
12743.	12673.	12579.	12509.
12673.	12603.	12509.	12439.
12603.	12533.	12439.	12369.
12533.	12463.	12369.	12299.
12463.	12393.	12299.	12229.
12393.	12323.	12229.	12159.
12323.	12253.	12159.	12089.
12253.	12183.	12089.	12019.
12183.	12113.	12019.	11949.
12113.	12043.	11949.	11879.
12043.	11973.	11879.	11809.
11973.	11903.	11809.	11739.
11903.	11833.	11739.	11669.
11833.	11763.	11669.	11599.
11763.	11693.	11599.	11529.
11693.	11623.	11529.	11459.
11623.	11553.	11459.	11389.
11553.	11483.	11389.	11319.
11483.	11413.	11319.	11249.
11413.	11343.	11249.	11179.
11343.	11273.	11179.	11109.
11273.	11203.	11109.	11039.
11203.	11133.	11039.	10969.
11133.	11063.	10969.	10899.
11063.	11003.	10899.	10829.
11003.	10933.	10829.	10759.
10933.	10863.	10759.	10689.
10863.	10793.	10689.	10619.
10793.	10723.	10619.	10549.
10723.	10653.	10549.	10479.
10653.	10583.	10479.	10409.
10583.	10513.	10409.	10339.
10513.	10443.	10339.	10269.
10443.	10373.	10269.	10199.
10373.	10303.	10199.	10129.
10303.	10233.	10129.	10059.
10233.	10163.	10059.	9989.
10163.	10093.	9989.	9919.
10093.	10023.	9919.	9849.
10023.	9953.	9849.	9779.
9953.	9883.	9779.	9709.
9883.	9813.	9709.	9639.
9813.	9743.	9639.	9569.
9743.	9673.	9569.	9499.
9673.	9603.	9499.	9429.
9603.	9533.	9429.	9359.
9533.	9463.	9359.	9289.
9463.	9393.	9289.	9219.
9393.	9323.	9219.	9149.
9323.	9253.	9149.	9079.
9253.	9183.	9079.	9009.
9183.	9113.	9009.	8939.
9113.	9043.	8939.	8869.
9043.	8973.	8869.	8799.
8973.	8903.	8799.	8729.
8903.	8833.	8729.	8659.
8833.	8763.	8659.	8589.
8763.	8693.	8589.	8519.
8693.	8623.	8519.	8449.
8623.	8553.	8449.	8379.
8553.	8483.	8379.	8309.
8483.	8413.	8309.	8239.
8413.	8343.	8239.	8169.
8343.	8273.	8169.	8099.
8273.	8203.	8099.	8029.
8203.	8133.	8029.	7959.
8133.	8063.	7959.	7889.
8063.	7993.	7889.	7819.
7993.	7923.	7819.	7749.
7923.	7853.	7749.	7679.
7853.	7783.	7679.	7609.
7783.	7713.	7609.	7539.
7713.	7643.	7539.	7469.
7643.	7573.	7469.	7399.
7573.	7503.	7399.	7329.
7503.	7433.	7329.	7259.
7433.	7363.	7259.	7189.
7363.	7293.	7189.	7119.
7293.	7223.	7119.	7049.
7223.	7153.	7049.	6979.
7153.	7083.	6979.	6909.
7083.	7013.	6909.	6839.
7013.	6943.	6839.	6769.
6943.	6873.	6769.	6699.
6873.	6803.	6699.	6629.
6803.	6733.	6629.	6559.
6733.	6663.	6559.	6489.
6663.	6593.	6489.	6419.
6593.	6523.	6419.	6349.
6523.	6453.	6349.	6279.
6453.	6383.	6279.	6209.
6383.	6313.	6209.	6139.
6313.	6243.	6139.	6069.
6243.	6173.	6069.	5999.
6173.	6103.	5999.	5929.
6103.	6033.	5929.	5859.
6033.	5963.	5859.	5789.
5963.	5893.	5789.	5719.
5893.	5823.	5719.	5649.
5823.	5753.	5649.	5579.
5753.	5683.	5579.	5509.
5683.	5613.	5509.	5439.
5613.	5543.	5439.	5369.
5543.	5473.	5369.	5299.
5473.	5403.	5299.	5229.
5403.	5333.	5229.	5159.
5333.	5263.	5159.	5089.
5263.	5193.	5089.	5019.
5193.	5123.	5019.	4949.
5123.	5053.	4949.	4879.
5053.	4983.	4879.	4809.
4983.	4913.	4809.	4739.
4913.	4843.	4739.	4669.
4843.	4773.	4669.	4599.
4773.	4703.	4599.	4529.
4703.	4633.	4529.	4459.
4633.	4563.	4459.	4389.
4563.	4493.	4389.	4319.
4493.	4423.	4319.	4249.
4423.	4353.	4249.	4179.
4353.	4283.	4179.	4109.
4283.	4213.	4109.	4039.
4213.	4143.	4039.	3969.
4143.	4073.	3969.	3899.
4073.	4003.	3899.	3829.
4003.	3933.	3829.	3759.
3933.	3863.	3759.	3689.
3863.	3793.	3689.	3619.
3793.	3723.	3619.	3549.
3723.	3653.	3549.	3479.
3653.	3583.	3479.	3409.
3583.	3513.	3409.	3339.
3513.	3443.	3339.	3269.
3443.	3373.	3269.	3199.
3373.	3303.	3199.	3129.
3303.	3233.	3129.	3059.
3233.	3163.	3059.	2989.
3163.	3093.	2989.	2919.
3093.	3023.	2919.	2849.
3023.	2953.	2849.	2779.
2953.	2883.	2779.	2709.
2883.	2813.	2709.	2639.
2813.	2743.	2639.	2569.
2743.	2673.	2569.	2499.
2673.	2603.	2499.	2429.
2603.	2533.	2429.	2359.
2533.	2463.	2359.	2289.
2463.	2393.	2289.	2219.
2393.	2323.	2219.	2149.
2323.	2253.	2149.	2079.
2253.	2183.	2079.	2009.
2183.	2113.	2009.	1939.
2113.	2043.	1939.	1869.
2043.	1973.	1869.	1799.
1973.	1903.	1799.	1729.
1903.	1833.	1729.	1659.
1833.	1763.	1659.	1589.
1763.	1693.	1589.	1519.
1693.	1623.	1519.	1449.
1623.	1553.	1449.	1379.
1553.	1483.	1379.	1309.
1483.	1413.	1309.	1239.
1413.	1343.	1239.	1169.
1343.	1273.	1169.	1099.
1273.	1203.	1099.	1029.
1203.	1133.	1029.	959.
1133.	1063.	959.	889.
1063.	993.	889.	819.
993.	923.	819.	749.
923.	853.	749.	679.
853.	783.	679.	609.
783.	713.	609.	539.
713.	643.	539.	469.
643.	573.	469.	399.
573.	503.	399.	329.
503.	433.	329.	259.
433.	363.	259.	189.
363.	293.	189.	119.
293.	223.	119.	49.

[illegible]

PEAK OUTFLOW IS 9270. AT TIME 62.00 HOURS

THOUS CU FT	INCHES	FEET	AC-FT	THOUS CU FT
1287.	1306.	1319.	1287.	1287.
1342.	1364.	1377.	1342.	1342.
1472.	1497.	1519.	1472.	1472.
1717.	1778.	1821.	1717.	1717.
4911.	5284.	5560.	4911.	4911.
8545.	8754.	8925.	8545.	8545.
9549.	9527.	9511.	9549.	9549.
9199.	9128.	9057.	9199.	9199.
8121.	8131.	8033.	8121.	8121.
7153.	7163.	7076.	7153.	7153.
6417.	6417.	6278.	6417.	6417.
5169.	5169.	5072.	5169.	5169.
5432.	5432.	5350.	5432.	5432.
5377.	5377.	5270.	5377.	5377.
4162.	4054.	4010.	4162.	4162.
3735.	3651.	3625.	3735.	3735.

STATION 1, PLAN 1, RATIO 2
END-OF-PERIOD HYDROGRAPH ORDINATES

THOUS CU FT	INCHES	FEET	AC-FT	THOUS CU FT	INCHES	FEET	AC-FT	THOUS CU FT	INCHES	FEET	AC-FT	THOUS CU FT	INCHES	FEET	AC-FT
1287.	1306.	1319.	1287.	1287.	1342.	1364.	1377.	1287.	1342.	1364.	1377.	1287.	1342.	1364.	1377.
1342.	1364.	1377.	1342.	1342.	1472.	1497.	1519.	1342.	1472.	1497.	1519.	1342.	1472.	1497.	1519.
1717.	1778.	1821.	1717.	1717.	4911.	5284.	5560.	1717.	4911.	5284.	5560.	1717.	4911.	5284.	5560.
4911.	5284.	5560.	4911.	4911.	8545.	8754.	8925.	4911.	8545.	8754.	8925.	4911.	8545.	8754.	8925.
8545.	8754.	8925.	8545.	8545.	9549.	9527.	9511.	8545.	9549.	9527.	9511.	8545.	9549.	9527.	9511.
9549.	9527.	9511.	9549.	9549.	9199.	9128.	9057.	9199.	9199.	9128.	9057.	9199.	9199.	9128.	9057.
9199.	9128.	9057.	9199.	9199.	8121.	8131.	8033.	9199.	8121.	8131.	8033.	9199.	8121.	8131.	8033.
8121.	8131.	8033.	8121.	8121.	7153.	7163.	7076.	8121.	7153.	7163.	7076.	8121.	7153.	7163.	7076.
7153.	7163.	7076.	7153.	7153.	6417.	6417.	6278.	7153.	6417.	6417.	6278.	7153.	6417.	6417.	6278.
6417.	6417.	6278.	6417.	6417.	5169.	5169.	5072.	6417.	5169.	5169.	5072.	6417.	5169.	5169.	5072.
5169.	5169.	5072.	5169.	5169.	5432.	5432.	5350.	5169.	5432.	5432.	5350.	5169.	5432.	5432.	5350.
5432.	5432.	5350.	5432.	5432.	5377.	5377.	5270.	5432.	5377.	5377.	5270.	5432.	5377.	5377.	5270.
5377.	5377.	5270.	5377.	5377.	4162.	4054.	4010.	5377.	4162.	4054.	4010.	5377.	4162.	4054.	4010.
4162.	4054.	4010.	4162.	4162.	3735.	3651.	3625.	4162.	3735.	3651.	3625.	4162.	3735.	3651.	3625.
3735.	3651.	3625.	3735.	3735.	17326.	17422.	17326.	3735.	17326.	17422.	17326.	3735.	17326.	17422.	17326.
17326.	17422.	17326.	17326.	17326.	19403.	19403.	19104.	17326.	19403.	19403.	19104.	17326.	19403.	19403.	19104.
19403.	19403.	19104.	19403.	19403.	21871.	22258.	22615.	19403.	21871.	22258.	22615.	19403.	21871.	22258.	22615.
21871.	22258.	22615.	21871.	21871.	26740.	26740.	26641.	21871.	26740.	26740.	26641.	21871.	26740.	26740.	26641.
26740.	26740.	26641.	26740.	26740.	51329.	56009.	61138.	26740.	51329.	56009.	61138.	26740.	51329.	56009.	61138.
51329.	56009.	61138.	51329.	51329.	77398.	78717.	80063.	51329.	77398.	78717.	80063.	51329.	77398.	78717.	80063.
77398.	78717.	80063.	77398.	77398.	83002.	84010.	83967.	77398.	83002.	84010.	83967.	77398.	83002.	84010.	83967.
83002.	84010.	83967.	83002.	83002.	82267.	81076.	81674.	83002.	82267.	81076.	81674.	83002.	82267.	81076.	81674.
82267.	81076.	81674.	82267.	82267.	71303.	71303.	70325.	82267.	71303.	71303.	70325.	82267.	71303.	71303.	70325.
71303.	71303.	70325.	71303.	71303.	66478.	65760.	65447.	71303.	66478.	65760.	65447.	71303.	66478.	65760.	65447.
66478.	65760.	65447.	66478.	66478.	61907.	61907.	60077.	66478.	61907.	61907.	60077.	66478.	61907.	61907.	60077.
61907.	61907.	60077.	61907.	61907.	56313.	56478.	56040.	61907.	56313.	56478.	56040.	61907.	56313.	56478.	56040.
56313.	56478.	56040.	56313.	56313.	52057.	52241.	51832.	56313.	52057.	52241.	51832.	56313.	52057.	52241.	51832.
52057.	52241.	51832.	52057.	52057.	48539.	48539.	48252.	52057.	48539.	48539.	48252.	52057.	48539.	48539.	48252.
48539.	48539.	48252.	48539.	48539.	45324.	45324.	45020.	48539.	45324.	45324.	45020.	48539.	45324.	45324.	45020.
45324.	45324.	45020.	45324.	45324.	1707.	710.7	710.7	45324.	1707.	710.7	710.7	45324.	1707.	710.7	710.7
1707.	710.7	710.7	1707.	1707.	210.7	710.9	710.9	210.7	210.7	710.9	710.9	210.7	210.7	710.9	710.9
210.7	710.9	710.9	210.7	210.7	710.6	710.6	710.6	210.7	710.6	710.6	710.6	210.7	710.6	710.6	710.6
710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6	710.6

STAGE

STAGE	STAGE	STAGE	STAGE	STAGE
710.7	710.6	710.6	710.6	710.6
710.7	710.6	710.6	710.6	710.6
710.7	710.6	710.6	710.6	710.6
710.7	710.6	710.6	710.6	710.6

PEAK OUTPUT IS 10354, AT TIME 62.00 HOURS										
TIME	STAGE									
	77-HOUR									
	TOTAL VOLUME									
	903059.									
710.7	710.8	710.9	711.0	711.1	711.2	711.3	711.4	711.5	711.6	711.7
710.7	710.8	710.9	711.0	711.1	711.2	711.3	711.4	711.5	711.6	711.7
710.8	710.9	711.0	711.1	711.2	711.3	711.4	711.5	711.6	711.7	711.8
710.9	711.0	711.1	711.2	711.3	711.4	711.5	711.6	711.7	711.8	711.9
711.0	711.1	711.2	711.3	711.4	711.5	711.6	711.7	711.8	711.9	712.0
711.1	711.2	711.3	711.4	711.5	711.6	711.7	711.8	711.9	712.0	712.1
711.2	711.3	711.4	711.5	711.6	711.7	711.8	711.9	712.0	712.1	712.2
711.3	711.4	711.5	711.6	711.7	711.8	711.9	712.0	712.1	712.2	712.3
711.4	711.5	711.6	711.7	711.8	711.9	712.0	712.1	712.2	712.3	712.4
711.5	711.6	711.7	711.8	711.9	712.0	712.1	712.2	712.3	712.4	712.5
711.6	711.7	711.8	711.9	712.0	712.1	712.2	712.3	712.4	712.5	712.6
711.7	711.8	711.9	712.0	712.1	712.2	712.3	712.4	712.5	712.6	712.7
711.8	711.9	712.0	712.1	712.2	712.3	712.4	712.5	712.6	712.7	712.8
711.9	712.0	712.1	712.2	712.3	712.4	712.5	712.6	712.7	712.8	712.9
712.0	712.1	712.2	712.3	712.4	712.5	712.6	712.7	712.8	712.9	713.0
712.1	712.2	712.3	712.4	712.5	712.6	712.7	712.8	712.9	713.0	713.1
712.2	712.3	712.4	712.5	712.6	712.7	712.8	712.9	713.0	713.1	713.2
712.3	712.4	712.5	712.6	712.7	712.8	712.9	713.0	713.1	713.2	713.3
712.4	712.5	712.6	712.7	712.8	712.9	713.0	713.1	713.2	713.3	713.4
712.5	712.6	712.7	712.8	712.9	713.0	713.1	713.2	713.3	713.4	713.5
712.6	712.7	712.8	712.9	713.0	713.1	713.2	713.3	713.4	713.5	713.6
712.7	712.8	712.9	713.0	713.1	713.2	713.3	713.4	713.5	713.6	713.7
712.8	712.9	713.0	713.1	713.2	713.3	713.4	713.5	713.6	713.7	713.8
712.9	713.0	713.1	713.2	713.3	713.4	713.5	713.6	713.7	713.8	713.9
713.0	713.1	713.2	713.3	713.4	713.5	713.6	713.7	713.8	713.9	714.0
713.1	713.2	713.3	713.4	713.5	713.6	713.7	713.8	713.9	714.0	714.1
713.2	713.3	713.4	713.5	713.6	713.7	713.8	713.9	714.0	714.1	714.2
713.3	713.4	713.5	713.6	713.7	713.8	713.9	714.0	714.1	714.2	714.3
713.4	713.5	713.6	713.7	713.8	713.9	714.0	714.1	714.2	714.3	714.4
713.5	713.6	713.7	713.8	713.9	714.0	714.1	714.2	714.3	714.4	714.5
713.6	713.7	713.8	713.9	714.0	714.1	714.2	714.3	714.4	714.5	714.6
713.7	713.8	713.9	714.0	714.1	714.2	714.3	714.4	714.5	714.6	714.7
713.8	713.9	714.0	714.1	714.2	714.3	714.4	714.5	714.6	714.7	714.8
713.9	714.0	714.1	714.2	714.3	714.4	714.5	714.6	714.7	714.8	714.9
714.0	714.1	714.2	714.3	714.4	714.5	714.6	714.7	714.8	714.9	715.0
714.1	714.2	714.3	714.4	714.5	714.6	714.7	714.8	714.9	715.0	715.1
714.2	714.3	714.4	714.5	714.6	714.7	714.8	714.9	715.0	715.1	715.2
714.3	714.4	714.5	714.6	714.7	714.8	714.9	715.0	715.1	715.2	715.3
714.4	714.5	714.6	714.7	714.8	714.9	715.0	715.1	715.2	715.3	715.4
714.5	714.6	714.7	714.8	714.9	715.0	715.1	715.2	715.3	715.4	715.5
714.6	714.7	714.8	714.9	715.0	715.1	715.2	715.3	715.4	715.5	715.6
714.7	714.8	714.9	715.0	715.1	715.2	715.3	715.4	715.5	715.6	715.7
714.8	714.9	715.0	715.1	715.2	715.3	715.4	715.5	715.6	715.7	715.8
714.9	715.0	715.1	715.2	715.3	715.4	715.5	715.6	715.7	715.8	715.9
715.0	715.1	715.2	715.3	715.4	715.5	715.6	715.7	715.8	715.9	716.0
715.1	715.2	715.3	715.4	715.5	715.6	715.7	715.8	715.9	716.0	716.1
715.2	715.3	715.4	715.5	715.6	715.7	715.8	715.9	716.0	716.1	716.2
715.3	715.4	715.5	715.6	715.7	715.8	715.9	716.0	716.1	716.2	716.3
715.4	715.5	715.6	715.7	715.8	715.9	716.0	716.1	716.2	716.3	716.4
715.5	715.6	715.7	715.8	715.9	716.0	716.1	716.2	716.3	716.4	716.5
715.6	715.7	715.8	715.9	716.0	716.1	716.2	716.3	716.4	716.5	716.6
715.7	715.8	715.9	716.0	716.1	716.2	716.3	716.4	716.5	716.6	716.7
715.8	715.9	716.0	716.1	716.2	716.3	716.4	716.5	716.6	716.7	716.8
715.9	716.0	716.1	716.2	716.3	716.4	716.5	716.6	716.7	716.8	716.9
716.0	716.1	716.2	716.3	716.4	716.5	716.6	716.7	716.8	716.9	717.0
716.1	716.2	716.3	716.4	716.5	716.6	716.7	716.8	716.9	717.0	717.1
716.2	716.3	716.4	716.5	716.6	716.7	716.8	716.9	717.0	717.1	717.2
716.3	716.4	716.5	716.6	716.7	716.8	716.9	717.0	717.1	717.2	717.3
716.4	716.5	716.6	716.7	716.8	716.9	717.0	717.1	717.2	717.3	717.4
716.5	716.6	716.7	716.8	716.9	717.0	717.1	717.2	717.3	717.4	717.5
716.6	716.7	716.8	716.9	717.0	717.1	717.2	717.3	717.4	717.5	717.6
716.7	716.8	716.9	717.0	717.1	717.2	717.3	717.4	717.5	717.6	717.7
716.8	716.9	717.0	717.1	717.2	717.3	717.4	717.5	717.6	717.7	717.8
716.9	717.0	717.1	717.2	717.3	717.4	717.5	717.6	717.7	717.8	717.9
717.0	717.1	717.2	717.3	717.4	717.5	717.6	717.7	717.8	717.9	718.0
717.1	717.2	717.3	717.4	717.5	717.6	717.7	717.8	717.9	718.0	718.1
717.2	717.3	717.4	717.5	717.6	717.7	717.8	717.9	718.0	718.1	718.2
717.3	717.4	717.5	717.6	717.7	717.8	717.9	718.0	718.1	718.2	718.3
717.4	717.5	717.6	717.7	717.8	717.9	718.0	718.1	718.2	718.3	718.4
717.5	717.6	717.7	717.8	717.9	718.0	718.1	718.2	718.3	718.4	718.5
717.6	717.7	717.8	717.9	718.0	718.1	718.2	718.3	718.4	718.5	718.6
717.7	717.8	717.9	718.0	718.1	718.2	718.3	718.4	718.5	718.6	718.7
717.8	717.9	718.0	718.1	718.2	718.3	718.4	718.5	718.6	718.7	718.8
717.9	718.0	718.1	718.2	718.3	718.4	718.5	718.6	718.7	718.8	718.9
718.0	718.1	718.2	718.3	718.4	718.5	718.6	718.7	718.8	718.9	719.0
718.1	718.2	718.3	718.4	718.5	718.6	718.7	718.8	718.9	719.0	719.1
718.2	718.3	718.4	718.5	718.6	718.7	718.8	718.9	719.0	719.1	719.2
718.3	718.4	718.5	718.6	718.7	718.8	718.9	719.0	719.1	719.2	719.3
718.4	718.5	718.6	718.7	718.8	718.9	719.0	719.1	719.2	719.3	719.4
718.5	718.6	718.7	718.8	718.9	719.0	719.1	719.2	719.3	719.4	719.5
718.6	718.7	718.8	718.9	719.0	719.1	719.2	719.3	719.4	719.5	719.6
718.7	718.8	718.9	719.0	719.1	719.2	719.3	719.4	719.5	719.6	719.7
718.8	718.9	719.0	719.1	719.2	719.3	719.4	719.5	719.6	719.7	719.8
718.9	719.0	719.1	719.2	719.3	719.4	719.5	719.6	719.7	719.8	719.9
719.0	719.1	719.2	719.3	719.4	719.5	719.6	719.7	719.8	719.9	720.0
719.1	719.2	719.3	719.4	719.5	719.6	719.7	719.8	719.9	720.0	720.1
719.2	719.3	719.4	719.5	719.6	719.7	719.8	719.9	720.0	720.1	720.2
719.3	719.4	719.5	719.6	719.7	719.8	719.9	720.0	720.1	720.2	720.3
719.4	719.5	719.6	719.7	719.8	719.9	720.0	720.1	720.2	720.3	720.4
719.5	719.6	719.7	719.8	719.9	720.0	720.1	720.2	720.3	720.4	720.5
719.6	719.7	719.8	719.9	720.0	720.1	720.2	720.3	720.4	720.5	720.6
719.7	719.8	719.9	720.0	720.1	720.2	720.3	720.4	720.5	720.6	720.7
719.8	719.9	720.0	720.1	720.2	720.3	720.4	720.5	720.6	720.7	720.8
719.9	720.0	720.1	720.2	720.3	720.4	720.5	720.6	720.7	720.8	720.9
720.0	720.1	720.2	720.3	720.4	720.5	720.6	720.7	720.8	720.9	721.0
720.1	720.2	720.3	720.4	720.5	720.6	720.7	720.8	720.9	721.0	721.1
720.2	720.3	720.4	720.5	720.6	720.7	720.8	720.9	721.0	721.1	721.2
720.3	720.4	720.5	720.6	720.7	720.8	720.9	721.0	721.1	721.2	721.3
720.4	720.5	720.6	720.7	720.8	720.9	721.0	721.1	721.2	721.3	721.4
720.5	720.6	720.7	720.8	720.9	721.0	721.1	721.2	721.3	721.4	721.5
720.6	720.7	720.8	720.9	721.0	721.1	721.2	721.3	721.4	721.5	721.6
720.7	720.8	720.9	721.0	721.1	721.2	721.3	721.4	721.5	721.6	721.7
720.8	720.9	721.0	721.1	721.2	721.3	721.4	721.5	721.6	721.7	721.8
720.9	721.0	721.1	721.2	721.3	721.4	721.5	721.6	721.7	721.8	721.9
721.0	721.1	721.2	721.3	721.4	721.5	721.6	721.7	721.8	721.9	722.0
721.1	721.2	721.3	721.4	721.5	721.6	721.7	721.8	721.9	722.0	722.1
721.2	721.3	721.4	721.5	721.6	721.7	721.8	721.9	722.0	722.1	722.2
721.3	721.4	721.5	721.6	721.7	721.8	721.9				

STATION 1, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	1947.	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.	1956.	1957.	1958.	1959.	1960.	1961.	1962.	1963.	1964.	1965.	1966.	1967.	1968.	1969.	1970.	1971.	1972.	1973.	1974.	1975.	1976.	1977.	1978.	1979.	1980.	1981.	1982.	1983.	1984.	1985.	1986.	1987.	1988.	1989.	1990.	1991.	1992.	1993.	1994.	1995.	1996.	1997.	1998.	1999.	2000.	2001.	2002.	2003.	2004.	2005.	2006.	2007.	2008.	2009.	2010.	2011.	2012.	2013.	2014.	2015.	2016.	2017.	2018.	2019.	2020.	2021.	2022.	2023.	2024.	2025.	2026.	2027.	2028.	2029.	2030.	2031.	2032.	2033.	2034.	2035.	2036.	2037.	2038.	2039.	2040.	2041.	2042.	2043.	2044.	2045.	2046.	2047.	2048.	2049.	2050.	2051.	2052.	2053.	2054.	2055.	2056.	2057.	2058.	2059.	2060.	2061.	2062.	2063.	2064.	2065.	2066.	2067.	2068.	2069.	2070.	2071.	2072.	2073.	2074.	2075.	2076.	2077.	2078.	2079.	2080.	2081.	2082.	2083.	2084.	2085.	2086.	2087.	2088.	2089.	2090.	2091.	2092.	2093.	2094.	2095.	2096.	2097.	2098.	2099.	2100.	2101.	2102.	2103.	2104.	2105.	2106.	2107.	2108.	2109.	2110.	2111.	2112.	2113.	2114.	2115.	2116.	2117.	2118.	2119.	2120.	2121.	2122.	2123.	2124.	2125.	2126.	2127.	2128.	2129.	2130.	2131.	2132.	2133.	2134.	2135.	2136.	2137.	2138.	2139.	2140.	2141.	2142.	2143.	2144.	2145.	2146.	2147.	2148.	2149.	2150.	2151.	2152.	2153.	2154.	2155.	2156.	2157.	2158.	2159.	2160.	2161.	2162.	2163.	2164.	2165.	2166.	2167.	2168.	2169.	2170.	2171.	2172.	2173.	2174.	2175.	2176.	2177.	2178.	2179.	2180.	2181.	2182.	2183.	2184.	2185.	2186.	2187.	2188.	2189.	2190.	2191.	2192.	2193.	2194.	2195.	2196.	2197.	2198.	2199.	2200.	2201.	2202.	2203.	2204.	2205.	2206.	2207.	2208.	2209.	2210.	2211.	2212.	2213.	2214.	2215.	2216.	2217.	2218.	2219.	2220.	2221.	2222.	2223.	2224.	2225.	2226.	2227.	2228.	2229.	2230.	2231.	2232.	2233.	2234.	2235.	2236.	2237.	2238.	2239.	2240.	2241.	2242.	2243.	2244.	2245.	2246.	2247.	2248.	2249.	2250.	2251.	2252.	2253.	2254.	2255.	2256.	2257.	2258.	2259.	2260.	2261.	2262.	2263.	2264.	2265.	2266.	2267.	2268.	2269.	2270.	2271.	2272.	2273.	2274.	2275.	2276.	2277.	2278.	2279.	2280.	2281.	2282.	2283.	2284.	2285.	2286.	2287.	2288.	2289.	2290.	2291.	2292.	2293.	2294.	2295.	2296.	2297.	2298.	2299.	2300.	2301.	2302.	2303.	2304.	2305.	2306.	2307.	2308.	2309.	2310.	2311.	2312.	2313.	2314.	2315.	2316.	2317.	2318.	2319.	2320.	2321.	2322.	2323.	2324.	2325.	2326.	2327.	2328.	2329.	2330.	2331.	2332.	2333.	2334.	2335.	2336.	2337.	2338.	2339.	2340.	2341.	2342.	2343.	2344.	2345.	2346.	2347.	2348.	2349.	2350.	2351.	2352.	2353.	2354.	2355.	2356.	2357.	2358.	2359.	2360.	2361.	2362.	2363.	2364.	2365.	2366.	2367.	2368.	2369.	2370.	2371.	2372.	2373.	2374.	2375.	2376.	2377.	2378.	2379.	2380.	2381.	2382.	2383.	2384.	2385.	2386.	2387.	2388.	2389.	2390.	2391.	2392.	2393.	2394.	2395.	2396.	2397.	2398.	2399.	2400.	2401.	2402.	2403.	2404.	2405.	2406.	2407.	2408.	2409.	2410.	2411.	2412.	2413.	2414.	2415.	2416.	2417.	2418.	2419.	2420.	2421.	2422.	2423.	2424.	2425.	2426.	2427.	2428.	2429.	2430.	2431.	2432.	2433.	2434.	2435.	2436.	2437.	2438.	2439.	2440.	2441.	2442.	2443.	2444.	2445.	2446.	2447.	2448.	2449.	2450.	2451.	2452.	2453.	2454.	2455.	2456.	2457.	2458.	2459.	2460.	2461.	2462.	2463.	2464.	2465.	2466.	2467.	2468.	2469.	2470.	2471.	2472.	2473.	2474.	2475.	2476.	2477.	2478.	2479.	2480.	2481.	2482.	2483.	2484.	2485.	2486.	2487.	2488.	2489.	2490.	2491.	2492.	2493.	2494.	2495.	2496.	2497.	2498.	2499.	2500.	2501.	2502.	2503.	2504.	2505.	2506.	2507.	2508.	2509.	2510.	2511.	2512.	2513.	2514.	2515.	2516.	2517.	2518.	2519.	2520.	2521.	2522.	2523.	2524.	2525.	2526.	2527.	2528.	2529.	2530.	2531.	2532.	2533.	2534.	2535.	2536.	2537.	2538.	2539.	2540.	2541.	2542.	2543.	2544.	2545.	2546.	2547.	2548.	2549.	2550.	2551.	2552.	2553.	2554.	2555.	2556.	2557.	2558.	2559.	2560.	2561.	2562.	2563.	2564.	2565.	2566.	2567.	2568.	2569.	2570.	2571.	2572.	2573.	2574.	2575.	2576.	2577.	2578.	2579.	2580.	2581.	2582.	2583.	2584.	2585.	2586.	2587.	2588.	2589.	2590.	2591.	2592.	2593.	2594.	2595.	2596.	2597.	2598.	2599.	2600.	2601.	2602.	2603.	2604.	2605.	2606.	2607.	2608.	2609.	2610.	2611.	2612.	2613.	2614.	2615.	2616.	2617.	2618.	2619.	2620.	2621.	2622.	2623.	2624.	2625.	2626.	2627.	2628.	2629.	2630.	2631.	2632.	2633.	2634.	2635.	2636.	2637.	2638.	2639.	2640.	2641.	2642.	2643.	2644.	2645.	2646.	2647.	2648.	2649.	2650.	2651.	2652.	2653.	2654.	2655.	2656.	2657.	2658.	2659.	2660.	2661.	2662.	2663.	2664.	2665.	2666.	2667.	2668.	2669.	2670.	2671.	2672.	2673.	2674.	2675.	2676.	2677.	2678.	2679.	2680.	2681.	2682.	2683.	2684.	2685.	2686.	2687.	2688.	2689.	2690.	2691.	2692.	2693.	2694.	2695.	2696.	2697.	2698.	2699.	2700.	2701.	2702.	2703.	2704.	2705.	2706.	2707.	2708.	2709.	2710.	2711.	2712.	2713.	2714.	2715.	2716.	2717.	2718.	2719.	2720.	2721.	2722.	2723.	2724.	2725.	2726.	2727.	2728.	2729.	2730.	2731.	2732.	2733.	2734.	2735.	2736.	2737.	2738.	2739.	2740.	2741.	2742.	2743.	2744.	2745.	2746.	2747.	2748.	2749.	2750.	2751.	2752.	2753.	2754.	2755.	2756.	2757.	2758.	2759.	2760.	2761.	2762.	2763.	2764.	2765.	2766.	2767.	2768.	2769.	2770.	2771.	2772.	2773.	2774.	2775.	2776.	2777.	2778.	2779.	2780.	2781.	2782.	2783.	2784.	2785.	2786.	2787.	2788.	2789.	2790.	2791.	2792.	2793.	2794.	2795.	2796.	2797.	2798.	2799.	2800.	2801.	2802.	2803.	2804.	2805.	2806.	2807.	2808.	2809.	2810.	2811.	2812.	2813.	2814.	2815.	2816.	2817.	2818.	2819.	2820.	2821.	2822.	2823.	2824.	2825.	2826.	2827.	2828.	2829.	2830.	2831.	2832.	2833.	2834.	2835.	2836.	2837.	2838.	2839.	2840.	2841.	2842.	2843.	2844.	2845.	2846.	2847.	2848.	2849.	2850.	2851.	2852.	2853.	2854.	2855.	2856.	2857.	2858.	2859.	2860.	2861.	2862.	2863.	2864.	2865.	2866.	2867.	2868.	2869.	2870.	2871.	2872.	2873.	2874.	2875.	2876.	2877.	2878.	2879.	2880.	2881.	2882.	2883.	2884.	2885.	2886.	2887.	2888.	2889.	2890.	2891.	2892.	2893.	2894.	2895.	2896.	2897.	2898.	2899.	2900.	2901.	2902.	2903.	2904.	2905.	2906.	2907.	2908.	2909.	2910.	2911.	2912.	2913.	2914.	2915.	2916.	2917.	2918.	2919.	2920.	2921.	2922.	2923.	2924.	2925.	2926.	2927.	2928.	2929.	2930.	2931.	2932.	2933.	2934.	2935.	2936.	2937.	2938.	2939.	2940.	2941.	2942.	2943.	2944.	2945.	2946.	2947.	2948.	2949.	2950.	2951.	2952.	2953.	2954.	2955.	2956.	2957.	2958.	2959.	2960.	2961.	2962.	2963.	2964.	2965.	2966.	2967.	2968.	2969.	2970.	2971.	2972.	2973.	2974.	2975.	2976.	2977.	2978.	2979.	2980.	2981.	2982.	2983.	2984.	2985.	2986.	2987.	2988.	2989.	2990.	2991.	2992.	2993.	2994.	2995.	2996.	2997.	2998.	2999.	3000.
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711.7	723.3	716.2	713.3	707.3	701.7	69.77	6900	684.2	6788
67.7	66.7	66.2	65.7	65.2	64.8	64.1	63.6	63.1	62.6

710.7	710.7	710.7	710.7	710.6	710.6	710.7	710.8
710.9	711.1	711.4	711.4	711.4	711.4	711.8	712.0
712.2	712.3	712.6	712.7	712.8	713.0	713.3	713.4
713.6	713.9	714.0	714.3	714.3	714.3	714.8	714.9
715.7	716.6	717.0	717.3	717.3	717.3	717.7	717.7
718.2	718.6	719.0	719.3	719.3	719.3	719.6	719.6
719.7	720.3	720.7	721.0	721.0	721.0	721.3	721.3
720.2	720.6	721.0	721.3	721.3	721.3	721.6	721.6
721.1	721.5	721.9	722.2	722.2	722.2	722.5	722.5
722.0	722.4	722.8	723.1	723.1	723.1	723.4	723.4
723.9	724.3	724.7	725.0	725.0	725.0	725.3	725.3
726.0	726.4	726.8	727.1	727.1	727.1	727.4	727.4
728.1	728.5	728.9	729.2	729.2	729.2	729.5	729.5
730.0	730.4	730.8	731.1	731.1	731.1	731.4	731.4
732.0	732.4	732.8	733.1	733.1	733.1	733.4	733.4
734.0	734.4	734.8	735.1	735.1	735.1	735.4	735.4
736.0	736.4	736.8	737.1	737.1	737.1	737.4	737.4
738.0	738.4	738.8	739.1	739.1	739.1	739.4	739.4
740.0	740.4	740.8	741.1	741.1	741.1	741.4	741.4
742.0	742.4	742.8	743.1	743.1	743.1	743.4	743.4
744.0	744.4	744.8	745.1	745.1	745.1	745.4	745.4
746.0	746.4	746.8	747.1	747.1	747.1	747.4	747.4
748.0	748.4	748.8	749.1	749.1	749.1	749.4	749.4
750.0	750.4	750.8	751.1	751.1	751.1	751.4	751.4
752.0	752.4	752.8	753.1	753.1	753.1	753.4	753.4
754.0	754.4	754.8	755.1	755.1	755.1	755.4	755.4
756.0	756.4	756.8	757.1	757.1	757.1	757.4	757.4
758.0	758.4	758.8	759.1	759.1	759.1	759.4	759.4
760.0	760.4	760.8	761.1	761.1	761.1	761.4	761.4
762.0	762.4	762.8	763.1	763.1	763.1	763.4	763.4
764.0	764.4	764.8	765.1	765.1	765.1	765.4	765.4
766.0	766.4	766.8	767.1	767.1	767.1	767.4	767.4
768.0	768.4	768.8	769.1	769.1	769.1	769.4	769.4
770.0	770.4	770.8	771.1	771.1	771.1	771.4	771.4
772.0	772.4	772.8	773.1	773.1	773.1	773.4	773.4
774.0	774.4	774.8	775.1	775.1	775.1	775.4	775.4
776.0	776.4	776.8	777.1	777.1	777.1	777.4	777.4
778.0	778.4	778.8	779.1	779.1	779.1	779.4	779.4
780.0	780.4	780.8	781.1	781.1	781.1	781.4	781.4
782.0	782.4	782.8	783.1	783.1	783.1	783.4	783.4
784.0	784.4	784.8	785.1	785.1	785.1	785.4	785.4
786.0	786.4	786.8	787.1	787.1	787.1	787.4	787.4
788.0	788.4	788.8	789.1	789.1	789.1	789.4	789.4
790.0	790.4	790.8	791.1	791.1	791.1	791.4	791.4
792.0	792.4	792.8	793.1	793.1	793.1	793.4	793.4
794.0	794.4	794.8	795.1	795.1	795.1	795.4	795.4
796.0	796.4	796.8	797.1	797.1	797.1	797.4	797.4
798.0	798.4	798.8	799.1	799.1	799.1	799.4	799.4
800.0	800.4	800.8	801.1	801.1	801.1	801.4	801.4
802.0	802.4	802.8	803.1	803.1	803.1	803.4	803.4
804.0	804.4	804.8	805.1	805.1	805.1	805.4	805.4
806.0	806.4	806.8	807.1	807.1	807.1	807.4	807.4
808.0	808.4	808.8	809.1	809.1	809.1	809.4	809.4
810.0	810.4	810.8	811.1	811.1	811.1	811.4	811.4
812.0	812.4	812.8	813.1	813.1	813.1	813.4	813.4
814.0	814.4	814.8	815.1	815.1	815.1	815.4	815.4
816.0	816.4	816.8	817.1	817.1	817.1	817.4	817.4
818.0	818.4	818.8	819.1	819.1	819.1	819.4	819.4
820.0	820.4	820.8	821.1	821.1	821.1	821.4	821.4
822.0	822.4	822.8	823.1	823.1	823.1	823.4	823.4
824.0	824.4	824.8	825.1	825.1	825.1	825.4	825.4
826.0	826.4	826.8	827.1	827.1	827.1	827.4	827.4
828.0	828.4	828.8	829.1	829.1	829.1	829.4	829.4
830.0	830.4	830.8	831.1	831.1	831.1	831.4	831.4
832.0	832.4	832.8	833.1	833.1	833.1	833.4	833.4
834.0	834.4	834.8	835.1	835.1	835.1	835.4	835.4
836.0	836.4	836.8	837.1	837.1	837.1	837.4	837.4
838.0	838.4	838.8	839.1	839.1	839.1	839.4	839.4
840.0	840.4	840.8	841.1	841.1	841.1	841.4	841.4
842.0	842.4	842.8	843.1	843.1	843.1	843.4	843.4
844.0	844.4	844.8	845.1	845.1	845.1	845.4	845.4
846.0	846.4	846.8	847.1	847.1	847.1	847.4	847.4
848.0	848.4	848.8	849.1	849.1	849.1	849.4	849.4
850.0	850.4	850.8	851.1	851.1	851.1	851.4	851.4
852.0	852.4	852.8	853.1	853.1	853.1	853.4	853.4
854.0	854.4	854.8	855.1	855.1	855.1	855.4	855.4
856.0	856.4	856.8	857.1	857.1	857.1	857.4	857.4
858.0	858.4	858.8	859.1	859.1	859.1	859.4	859.4
860.0	860.4	860.8	861.1	861.1	861.1	861.4	861.4
862.0	862.4	862.8	863.1	863.1	863.1	863.4	863.4
864.0	864.4	864.8	865.1	865.1	865.1	865.4	865.4
866.0	866.4	866.8	867.1	867.1	867.1	867.4	867.4
868.0	868.4	868.8	869.1	869.1	869.1	869.4	869.4
870.0	870.4	870.8	871.1	871.1	871.1	871.4	871.4
872.0	872.4	872.8	873.1	873.1	873.1	873.4	873.4
874.0	874.4	874.8	875.1	875.1	875.1	875.4	875.4
876.0	876.4	876.8	877.1	877.1	877.1	877.4	877.4
878.0	878.4	878.8	879.1	879.1	879.1	879.4	879.4
880.0	880.4	880.8	881.1	881.1	881.1	881.4	881.4
882.0	882.4	882.8	883.1	883.1	883.1	883.4	883.4
884.0	884.4	884.8	885.1	885.1	885.1	885.4	885.4
886.0	886.4	886.8	887.1	887.1	887.1	887.4	887.4
888.0	888.4	888.8	889.1	889.1	889.1	889.4	889.4
890.0	890.4	890.8	891.1	891.1	891.1	891.4	891.4
892.0	892.4	892.8	893.1	893.1	893.1	893.4	893.4
894.0	894.4	894.8	895.1	895.1	895.1	895.4	895.4
896.0	896.4	896.8	897.1	897.1	897.1	897.4	897.4
898.0	898.4	898.8	899.1	899.1	899.1	899.4	899.4
900.0	900.4	900.8	901.1	901.1	901.1	901.4	901.4
902.0	902.4	902.8	903.1	903.1	903.1	903.4	903.4
904.0	904.4	904.8	905.1	905.1	905.1	905.4	905.4
906.0	906.4	906.8	907.1	907.1	907.1	907.4	907.4
908.0	908.4	908.8	909.1	909.1	909.1	909.4	909.4
910.0	910.4	910.8	911.1	911.1	911.1	911.4	911.4
912.0	912.4	912.8	913.1	913.1	913.1	913.4	913.4
914.0	914.4	914.8	915.1	915.1	915.1	915.4	915.4
916.0	916.4	916.8	917.1	917.1	917.1	917.4	917.4
918.0	918.4	918.8	919.1	919.1	919.1	919.4	919.4
920.0	920.4	920.8	921.1	921.1	921.1	921.4	921.4
922.0	922.4	922.8	923.1	923.1	923.1	923.4	923.4
924.0	924.4	924.8	925.1	925.1	925.1	925.4	925.4
926.0	926.4	926.8	927.1	927.1	927.1	927.4	927.4
928.0	928.4	928.8	929.1	929.1	929.1	929.4	929.4
930.0	930.4	930.8	931.1	931.1	931.1	931.4	931.4
932.0	932.4	932.8	933.1	933.1	933.1	933.4	933.4
934.0	934.4	934.8	935.1	935.1	935.1	935.4	935.4
936.0	936.4	936.8	937.1	937.1	937.1	937.4	937.4
938.0	938.4	938.8	939.1	939.1	939.1	939.4	939.4
940.0	940.4	940.8	941.1	941.1	941.1	941.4	941.4
942.0	942.4	942.8	943.1	943.1	943.1	943.4	943.4
944.0	944.4	944.8	945.1	945.1	945.1	945.4	945.4
946.0	946.4	946.8	947.1	947.1	947.1	947.4	947.4
948.0	948.4	948.8	949.1	949.1	949.1	949.4	949.4
950.0	950.4	950.8	951.1	951.1	951.1	951.4	951.4
952.0	952.4	952.8	953.1	953.1	953.1	953.4	953.4
954.0	954.4	954.8	955.1	955.1	955.1	955.4	955.4
956.0	956.4	956.8	957.1	957.1	957.1	957.4	957.4

[illegible][illegible][illegible]

PEAK INTENSITY IS 9271. AT THE 62.60 HOURS

	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CF5	9271.	0992.	7601.	827549.	
CMS	263.	255.	215.	23434.	
INCHES	3.42	1.62	4.10	6.20	
NI	10.56	41.06	104.12	157.43	
AC	4555.	17836.	45231.	68393.	
THRUSS C.I.	9656.	22000.	55792.	94361.	

2013

Year	1927.	1928.	1929.	1930.	1931.	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.	1940.	1941.	1942.	1943.	1944.	1945.	1946.	1947.	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.	1956.	1957.	1958.	1959.	1960.	1961.	1962.	1963.	1964.	1965.	1966.	1967.	1968.	1969.	1970.	1971.	1972.	1973.	1974.	1975.	1976.	1977.	1978.	1979.	1980.	1981.	1982.	1983.	1984.	1985.	1986.	1987.	1988.	1989.	1990.	1991.	1992.	1993.	1994.	1995.	1996.	1997.	1998.	1999.	2000.	2001.	2002.	2003.	2004.	2005.	2006.	2007.	2008.	2009.	2010.	2011.	2012.	2013.	2014.	2015.	2016.	2017.	2018.	2019.	2020.	2021.	2022.	2023.	2024.	2025.	2026.	2027.	2028.	2029.	2030.	2031.	2032.	2033.	2034.	2035.	2036.	2037.	2038.	2039.	2040.	2041.	2042.	2043.	2044.	2045.	2046.	2047.	2048.	2049.	2050.	2051.	2052.	2053.	2054.	2055.	2056.	2057.	2058.	2059.	2060.	2061.	2062.	2063.	2064.	2065.	2066.	2067.	2068.	2069.	2070.	2071.	2072.	2073.	2074.	2075.	2076.	2077.	2078.	2079.	2080.	2081.	2082.	2083.	2084.	2085.	2086.	2087.	2088.	2089.	2090.	2091.	2092.	2093.	2094.	2095.	2096.	2097.	2098.	2099.	2100.	2101.	2102.	2103.	2104.	2105.	2106.	2107.	2108.	2109.	2110.	2111.	2112.	2113.	2114.	2115.	2116.	2117.	2118.	2119.	2120.	2121.	2122.	2123.	2124.	2125.	2126.	2127.	2128.	2129.	2130.	2131.	2132.	2133.	2134.	2135.	2136.	2137.	2138.	2139.	2140.	2141.	2142.	2143.	2144.	2145.	2146.	2147.	2148.	2149.	2150.	2151.	2152.	2153.	2154.	2155.	2156.	2157.	2158.	2159.	2160.	2161.	2162.	2163.	2164.	2165.	2166.	2167.	2168.	2169.	2170.	2171.	2172.	2173.	2174.	2175.	2176.	2177.	2178.	2179.	2180.	2181.	2182.	2183.	2184.	2185.	2186.	2187.	2188.	2189.	2190.	2191.	2192.	2193.	2194.	2195.	2196.	2197.	2198.	2199.	2200.	2201.	2202.	2203.	2204.	2205.	2206.	2207.	2208.	2209.	2210.	2211.	2212.	2213.	2214.	2215.	2216.	2217.	2218.	2219.	2220.	2221.	2222.	2223.	2224.	2225.	2226.	2227.	2228.	2229.	2230.	2231.	2232.	2233.	2234.	2235.	2236.	2237.	2238.	2239.	2240.	2241.	2242.	2243.	2244.	2245.	2246.	2247.	2248.	2249.	2250.	2251.	2252.	2253.	2254.	2255.	2256.	2257.	2258.	2259.	2260.	2261.	2262.	2263.	2264.	2265.	2266.	2267.	2268.	2269.	2270.	2271.	2272.	2273.	2274.	2275.	2276.	2277.	2278.	2279.	2280.	2281.	2282.	2283.	2284.	2285.	2286.	2287.	2288.	2289.	2290.	2291.	2292.	2293.	2294.	2295.	2296.	2297.	2298.	2299.	2300.	2301.	2302.	2303.	2304.	2305.	2306.	2307.	2308.	2309.	2310.	2311.	2312.	2313.	2314.	2315.	2316.	2317.	2318.	2319.	2320.	2321.	2322.	2323.	2324.	2325.	2326.	2327.	2328.	2329.	2330.	2331.	2332.	2333.	2334.	2335.	2336.	2337.	2338.	2339.	2340.	2341.	2342.	2343.	2344.	2345.	2346.	2347.	2348.	2349.	2350.	2351.	2352.	2353.	2354.	2355.	2356.	2357.	2358.	2359.	2360.	2361.	2362.	2363.	2364.	2365.	2366.	2367.	2368.	2369.	2370.	2371.	2372.	2373.	2374.	2375.	2376.	2377.	2378.	2379.	2380.	2381.	2382.	2383.	2384.	2385.	2386.	2387.	2388.	2389.	2390.	2391.	2392.	2393.	2394.	2395.	2396.	2397.	2398.	2399.	2400.	2401.	2402.	2403.	2404.	2405.	2406.	2407.	2408.	2409.	2410.	2411.	2412.	2413.	2414.	2415.	2416.	2417.	2418.	2419.	2420.	2421.	2422.	2423.	2424.	2425.	2426.	2427.	2428.	2429.	2430.	2431.	2432.	2433.	2434.	2435.	2436.	2437.	2438.	2439.	2440.	2441.	2442.	2443.	2444.	2445.	2446.	2447.	2448.	2449.	2450.	2451.	2452.	2453.	2454.	2455.	2456.	2457.	2458.	2459.	2460.	2461.	2462.	2463.	2464.	2465.	2466.	2467.	2468.	2469.	2470.	2471.	2472.	2473.	2474.	2475.	2476.	2477.	2478.	2479.	2480.	2481.	2482.	2483.	2484.	2485.	2486.	2487.	2488.	2489.	2490.	2491.	2492.	2493.	2494.	2495.	2496.	2497.	2498.	2499.	2500.	2501.	2502.	2503.	2504.	2505.	2506.	2507.	2508.	2509.	2510.	2511.	2512.	2513.	2514.	2515.	2516.	2517.	2518.	2519.	2520.	2521.	2522.	2523.	2524.	2525.	2526.	2527.	2528.	2529.	2530.	2531.	2532.	2533.	2534.	2535.	2536.	2537.	2538.	2539.	2540.	2541.	2542.	2543.	2544.	2545.	2546.	2547.	2548.	2549.	2550.	2551.	2552.	2553.	2554.	2555.	2556.	2557.	2558.	2559.	2560.	2561.	2562.	2563.	2564.	2565.	2566.	2567.	2568.	2569.	2570.	2571.	2572.	2573.	2574.	2575.	2576.	2577.	2578.	2579.	2580.	2581.	2582.	2583.	2584.	2585.	2586.	2587.	2588.	2589.	2590.	2591.	2592.	2593.	2594.	2595.	2596.	2597.	2598.	2599.	2600.	2601.	2602.	2603.	2604.	2605.	2606.	2607.	2608.	2609.	2610.	2611.	2612.	2613.	2614.	2615.	2616.	2617.	2618.	2619.	2620.	2621.	2622.	2623.	2624.	2625.	2626.	2627.	2628.	2629.	2630.	2631.	2632.	2633.	2634.	2635.	2636.	2637.	2638.	2639.	2640.	2641.	2642.	2643.	2644.	2645.	2646.	2647.	2648.	2649.	2650.	2651.	2652.	2653.	2654.	2655.	2656.	2657.	2658.	2659.	2660.	2661.	2662.	2663.	2664.	2665.	2666.	2667.	2668.	2669.	2670.	2671.	2672.	2673.	2674.	2675.	2676.	2677.	2678.	2679.	2680.	2681.	2682.	2683.	2684.	2685.	2686.	2687.	2688.	2689.	2690.	2691.	2692.	2693.	2694.	2695.	2696.	2697.	2698.	2699.	2700.	2701.	2702.	2703.	2704.	2705.	2706.	2707.	2708.	2709.	2710.	2711.	2712.	2713.	2714.	2715.	2716.	2717.	2718.	2719.	2720.	2721.	2722.	2723.	2724.	2725.	2726.	2727.	2728.	2729.	2730.	2731.	2732.	2733.	2734.	2735.	2736.	2737.	2738.	2739.	2740.	2741.	2742.	2743.	2744.	2745.	2746.	2747.	2748.	2749.	2750.	2751.	2752.	2753.	2754.	2755.	2756.	2757.	2758.	2759.	2760.	2761.	2762.	2763.	2764.	2765.	2766.	2767.	2768.	2769.	2770.	2771.	2772.	2773.	2774.	2775.	2776.	2777.	2778.	2779.	2780.	2781.	2782.	2783.	2784.	2785.	2786.	2787.	2788.	2789.	2790.	2791.	2792.	2793.	2794.	2795.	2796.	2797.	2798.	2799.	2800.	2801.	2802.	2803.	2804.	2805.	2806.	2807.	2808.	2809.	2810.	2811.	2812.	2813.	2814.	2815.	2816.	2817.	2818.	2819.	2820.	2821.	2822.	2823.	2824.	2825.	2826.	2827.	2828.	2829.	2830.	2831.	2832.	2833.	2834.	2835.	2836.	2837.	2838.	2839.	2840.	2841.	2842.	2843.	2844.	2845.	2846.	2847.	2848.	2849.	2850.	2851.	2852.	2853.	2854.	2855.	2856.	2857.	2858.	2859.	2860.	2861.	2862.	2863.	2864.	2865.	2866.	2867.	2868.	2869.	2870.	2871.	2872.	2873.	2874.	2875.	2876.	2877.	2878.	2879.	2880.	2881.	2882.	2883.	2884.	2885.	2886.	2887.	2888.	2889.	2890.	2891.	2892.	2893.	2894.	2895.	2896.	2897.	2898.	2899.	2900.	2901.	2902.	2903.	2904.	2905.	2906.	2907.	2908.	2909.	2910.	2911.	2912.	2913.	2914.	2915.	2916.	2917.	2918.	2919.	2920.	2921.	2922.	2923.	2924.	2925.	2926.	2927.	2928.	2929.	2930.	2931.	2932.	2933.	2934.	2935.	2936.	2937.	2938.	2939.	2940.	2941.	2942.	2943.	2944.	2945.	2946.	2947.	2948.	2949.	2950.	2951.	2952.	2953.	2954.	2955.	2956.	2957.	2958.	2959.	2960.	2961.	2962.	2963.	2964.	2965.	2966.	2967.	2968.	2969.	2970.	2971.	2972.	2973.	2974.	2975.	2976.	2977.	2978.	2979.	2980.	2981.	2982.	2983.	2984.	2985.	2986.	2987.	2988.	2989.	2990.	2991.	2992.	2993.	2994.	2995.	2996.	2997.	2998.	2999.	3000.
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STORAGE

[illegible]

STAGE

[illegible]

PEACE FULLLY IS 9539. AT TIME 62.60 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9820	9513	9248	7791	646219
CMS	270	269	262	221	23962
CMC-DES		0.43	1.66	4.20	5.34
CMC-FI		10.86	42.23	166.72	160.90
		4717	10344	46355	69935

STATION 2, PLAIN 1, RATION 3
EQU-OF-PERIOD HYDROGRAPH ORIGINATES[illegible][illegible][illegible]

PEAK OUTPUT IS 10354. AT THE 62.60 HOURS

CF5 545
CIS 2230

72-HOUR
8375.
237.

TOTAL VOLUME
902691.
23561.

STATION 2, PLAIN 1, RATIO 4
END-QF-PCKIND HYDROGRAPH ORDINATES

[illegible]

PEAK WITFLU1 IS 25773. AT TIME 60.00 HOURS

CFS	25773.	0-1000K	24-1000K	12-1000K	TOTAL VALUE
GAS	730.	25660.	24682.	19461.	1908419.
THURFS		727.	699.	551.	54043.
RI		1.15	4.44	10.43	14.22
AC-FY		29.29	112.69	266.56	363.06
THURFS CU II		12724.	48956.	115800.	157721.
		15695.	60397.	142837.	194545.

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE FEET (SQUARE METERS)

LOCATION	STATION	AREA	PLAN	RATIO 1	RATIO 2	RATIOS APPLIED TO FLOWS		
						RATIO 3	RATIO 4	
HYD-CATCHMENT AT	1	207.00 (0.23E 13)	1	65029. (1801.42)	66443. (1881.46)	76684. (2001.55)	141368. (4003.10)	
	1	207.00 (0.23E 13)	1	9270. (262.51)	9539. (270.10)	10354. (293.16)	25774. (729.84)	(OWASCO LAKE OUTLET DAM
ROUTED TO	2	207.00 (0.42E 13)	1	9271. (262.51)	9539. (270.11)	10354. (293.20)	25773. (729.81)	(MILL ST. DAM

1/2 PMF PMF

SUMMARY OF DAM SAFETY ANALYSIS

OWASCO LAKE
OUTLET DAM
(NY-776)

PLAN 1

ELEVATION
STORAGE
OUTFLOWINITIAL VALUE
710.72
17712.
1287.SPILLWAY CREST
710.72
17712.
1287.TOP OF DAM
717.00
64233.
6188.RATIO
OF
PMF
0.92
1.24
1.00
2.00MAXIMUM
RESERVOIR
ELEV
710.20
717.47
719.99
728.18MAXIMUM
DEPTH
OVER DAM
2.29
2.47
2.99
11.18MAXIMUM
STORAGE
AC-FT
82626.
84030.
80204.
153935.MAXIMUM
OUTFLOW
CFS
9270.
9539.
10354.
25774.DURATION
OVER TOP
HOURS
51.00
50.00
62.00
121.00TIME OF
MAX OUTFLOW
HOURS
62.00
62.00
62.00
60.00TIME OF
FAILURE
HOURS
0.
0.
0.
0. $\frac{1}{2}$ PMF

PMF

SUMMARY OF DAM SAFETY ANALYSIS

MILL ST. DAM
(NY-775)

FLOOD 1

ELEVATION
STORAGE
OUTFLOWINITIAL VALUE
696.50
136.
973.SPILLWAY CREST
696.60
137.
990.TOP OF DAM
702.06
255.
9460.

RATIO

OF

PMF

0.92

0.96

1.00

2.00

MAXIMUM

RESERVOIR

ELEV

701.92

702.07

702.30

705.94

MAXIMUM

DEPTH

OVER DAM

0.

0.93

0.32

3.92

MAXIMUM

STORAGE

AC-FT

253.

256.

263.

347.

MAXIMUM

OUTFLOW

CFS

9271.

9539.

10354.

25773.

DURATION

OVER TOP

HOURS

0.

7.00

24.00

87.00

TIME OF

MAX OUTFLOW

HOURS

62.00

62.00

62.00

60.00

TIME OF

FAILURE

HOURS

0.

0.

0.

0.

 $\frac{1}{2}$ PMF

PMF

[illegible]

SUMMARY OF DAM SAFETY ANALYSIS

MILL ST. DAM

PLAN 1

ELEVATION
STAGE OF
OUTFLOWINITIAL VALUE
696.50
136.
33.

SPILLWAY CREST

698.00
137.
42.

TOP OF DAM

702.06
255.
9084.RATIO
OF
PMF $\frac{1}{3}$ PMF

1.00

PMF

2.00

MAXIMUM
RESERVOIR
W.S. ELEV
702.61
705.20MAXIMUM
DEPTH
OVER DAM
0.75
4.24MAXIMUM
STORAGE
AC-FT
273.
354.MAXIMUM
OUTFLOW
CFS
10254.
25773.DURATION
OVER TOP
HOURS
41.00
59.00TIME UP
MAX OUTFLOW
HOURS
62.00
60.00TIME OF
FAILURE
HOURS
0.
0.

81 RELATIONSHIP - ALL GATES FULL OPEN - INFLOW HYDROGRAPH TO MILL ST DAM

Y	1	1	1
Y1	3		
Y4	716.72	711	712.82
Y5	715.17	710	716.5
Y5	1287	1450	1777
Y5	5050	5013	5400
Y5	6236	12900	17712
Y5	722	710	710.72
Y5	15710.72		
Y5	117	1007	1.5
Y5	15	0	700
Y5	1	2	

REF. JOINED HYDROGRAPH AT MILL ST DAM - PG BREACH

1

OUTLET + AUTOMATIC GATES CLOSED

Y	1	1	1
Y1	1		
Y1	690.5	690.5	697.29
Y1	0	2	33
Y1	21	55	113.5
Y1	000	091	690.6
Y1	3000		
Y1	3002.00	3.037	1.5
Y1	200		307
Y1	1		
Y1	1		
Y1	1		
Y1	1		
Y1	1		
Y1	1		

Y1	690.5	690.5	697.29	701	702	702.06
Y1	0	2	33	42	162	348
Y1	21	55	113.5	137	185	254
Y1	000	091	690.6	699	702	702.06
Y1	3000					
Y1	3002.00	3.037	1.5	307		
Y1	200					
Y1	1					
Y1	1					
Y1	1					
Y1	1					
Y1	1					
Y1	1					

Y1	690.5	690.5	697.29	701	702	702.06
Y1	0	2	33	42	162	348
Y1	21	55	113.5	137	185	254
Y1	000	091	690.6	699	702	702.06
Y1	3000					
Y1	3002.00	3.037	1.5	307		
Y1	200					
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Y1	1					
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Y1	0	2	33	42	162	348
Y1	21	55	113.5	137	185	254
Y1	000	091	690.6	699	702	702.06
Y1	3000					
Y1	3002.00	3.037	1.5	307		
Y1	200					
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Y1	21	55	113.5	137	185	254
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Y1	3000					
Y1	3002.00	3.037	1.5	307		
Y1	200					
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Y1	1					
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Y1	000	091	690.6	699	702	702.06
Y1	3000					
Y1	3002.00	3.037	1.5	307		
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Y1	0	2	33	42	162	348
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Y1	3000					
Y1	3002.00	3.037	1.5	307		
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Y1	3000					
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Y1	690.5	690.5	697.29	701	702	702.06
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Y1	690.5	690.5	697.29	701	702	702.06
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Y1	690.5	690.5	697.29	701	702	702.06
Y1	0	2	33	42	162	348
Y1	21	55	113.5	137	185	254
Y1	000	091	690.6	699	702	702.06
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Y1	3002.00	3.037	1.5	307		
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Y1	690.5	690.5	697.29	701	702	702.06
Y1	0	2	33	42	162	348
Y1	21	55	113.5	137	185	254
Y1	000	091	690.6	699	702	702.06
Y1	3000					
Y1	3002.00	3.037	1.5	307		
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Y1	690.5	690.5	697.29	701	702	702.06
Y1	0	2	33	42	162	348
Y1	21	55	113.5	137	185	254
Y1	000	091	690.6	699	702	702.06
Y1	3000					
Y1	3002.00	3.037	1.5	307		
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[illegible]

PLEASE REPLY TO: 10357, ARLING 62-60-14955

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CS	1:35.4	13.5	10226	9375	90359
CR	2:03	22	284	237	25572
LINE		0.48	1.80		2.76
FI		11.79	45.78	114.71	171.16
CF		5190	1987	49634	72633
LINE		5315	24550	51470	92053

MAC-116 *** TOP OF VAL. ADJUST. IF EXHAUST, EXHAUST-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
 BOTTOM OF EXHAUSTION ASSUMED TO BE AT 709.00
 STORAGE-ELEVATIONS DATA WILL BE EXTRACTED ABOVE ELEVATION 710.00

STATION: 1, PLUM 1, RATIO 2

REC'D JAN 22 1963

END-OF-PERIOD HYDROGRAPH UPDATES

	OUTFLOW			
2227.	1237.	2237.	1237.	1237.
1301.	1301.	1551.	1551.	1301.
1406.	251.	2123.	2190.	1406.
1406.	3025.	4156.	5465.	2725.
10203.	1155.	12537.	3670.	10203.
28033.	23779.	3587.	3630.	28033.
30448.	2312.	29576.	20201.	30448.
27444.	227.	2732.	25371.	27444.
23182.	2151.	21565.	21053.	23182.
19065.	1721.	21576.	16385.	19065.
15937.	16712.	15930.	10161.	15937.
12914.				12914.

1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4	1702.4
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PLEASE PRINT FULLY IN BLOCK. ALL ITEMS MUST BE PRINTED IN BLOCKS

	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
PTAI:				
30490.	30440.	20125.	21967.	214542.
503.	507.	825.	623.	5577.
				15.84
	1.57	5.24	11.86	
	34.75	137.93	301.16	402.27
	150.34.	57768.	130831.	174756.
	13616.	71257.	161378.	2155558.

CLASCO LAKE
OUTLET DAM

(ASSUMED BREACH)

THE FUL BREACH HYDROGRAPH IS DEVELOPED USING A TIME INTERVAL OF 0.020 HOURS DURING BREACH FORMATION.
COMPARISON CALCULATIONS WERE MADE AT THE INTERVAL OF 1.000 HOURS.
THE TABLE COMPARES THE TWO GRAPHS FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERPOLATED VALUES ARE INDICATED FROM FIVE-MINUTE PERIOD VALUES.

TIME (HOURS)	TIME FROM STARTING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	COMPUTED BREACH HYDROGRAPH (CFS)	PERCENT ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
0.00	0.00	1012.0	1012.0	0.0	0.0	0.0
0.02	0.02	1215.6	1215.6	-26.0	-26.0	-1.0
0.04	0.04	1318.4	1318.4	-7.4	-33.4	-3.0
0.06	0.06	1872.0	1872.0	-7.4	-40.8	-4.0
0.08	0.08	1552.0	1552.0	-7.4	-48.2	-4.0
0.10	0.10	1914.4	1914.4	-6.7	-54.9	-5.0
0.12	0.12	1911.6	1911.6	-6.0	-60.9	-7.0
0.14	0.14	1924.6	1924.6	-5.6	-66.5	-7.0
0.16	0.16	1911.0	1911.0	-5.1	-71.6	-9.0
0.18	0.18	1911.0	1911.0	-5.1	-76.7	-10.0
0.20	0.20	1911.0	1911.0	-5.1	-81.8	-11.0
0.22	0.22	1911.0	1911.0	-5.1	-86.9	-12.0
0.24	0.24	1911.0	1911.0	-5.1	-92.0	-12.0
0.26	0.26	2017.1	2017.1	-4.7	-96.7	-13.0
0.28	0.28	2017.1	2017.1	-4.7	-101.4	-14.0
0.30	0.30	2017.1	2017.1	-4.7	-106.1	-14.0
0.32	0.32	2017.1	2017.1	-4.7	-110.8	-15.0
0.34	0.34	2017.1	2017.1	-4.7	-115.5	-15.0
0.36	0.36	2017.1	2017.1	-4.7	-120.2	-16.0
0.38	0.38	2017.1	2017.1	-4.7	-124.9	-16.0
0.40	0.40	2017.1	2017.1	-4.7	-129.6	-16.0
0.42	0.42	2017.1	2017.1	-4.7	-134.3	-16.0
0.44	0.44	2017.1	2017.1	-4.7	-139.0	-17.0
0.46	0.46	2017.1	2017.1	-4.7	-143.7	-17.0
0.48	0.48	2017.1	2017.1	-4.7	-148.4	-17.0
0.50	0.50	2017.1	2017.1	-4.7	-153.1	-17.0
0.52	0.52	2017.1	2017.1	-4.7	-157.8	-17.0
0.54	0.54	2017.1	2017.1	-4.7	-162.5	-17.0
0.56	0.56	2017.1	2017.1	-4.7	-167.2	-17.0
0.58	0.58	2017.1	2017.1	-4.7	-171.9	-17.0
0.60	0.60	2017.1	2017.1	-4.7	-176.6	-17.0
0.62	0.62	2017.1	2017.1	-4.7	-181.3	-17.0
0.64	0.64	2017.1	2017.1	-4.7	-186.0	-17.0
0.66	0.66	2017.1	2017.1	-4.7	-190.7	-17.0
0.68	0.68	2017.1	2017.1	-4.7	-195.4	-17.0
0.70	0.70	2017.1	2017.1	-4.7	-200.1	-17.0
0.72	0.72	2017.1	2017.1	-4.7	-204.8	-17.0
0.74	0.74	2017.1	2017.1	-4.7	-209.5	-17.0
0.76	0.76	2017.1	2017.1	-4.7	-214.2	-17.0
0.78	0.78	2017.1	2017.1	-4.7	-218.9	-17.0
0.80	0.80	2017.1	2017.1	-4.7	-223.6	-17.0
0.82	0.82	2017.1	2017.1	-4.7	-228.3	-17.0
0.84	0.84	2017.1	2017.1	-4.7	-233.0	-17.0
0.86	0.86	2017.1	2017.1	-4.7	-237.7	-17.0
0.88	0.88	2017.1	2017.1	-4.7	-242.4	-17.0
0.90	0.90	2017.1	2017.1	-4.7	-247.1	-17.0
0.92	0.92	2017.1	2017.1	-4.7	-251.8	-17.0
0.94	0.94	2017.1	2017.1	-4.7	-256.5	-17.0
0.96	0.96	2017.1	2017.1	-4.7	-261.2	-17.0
0.98	0.98	2017.1	2017.1	-4.7	-265.9	-17.0
1.00	1.00	2017.1	2017.1	-4.7	-270.6	-17.0

OWASCO LAKE

OUTLET DAM

(ASSUMED BREACH)

STATION 1

(1) INTERPOLATED BREACH HYDROGRAPH

(2) COMPUTED BREACH HYDROGRAPH

(*) POINTS AT NORMAL TIME INTERVAL

TIME

(HOURS)

46.0

46.1

46.2

46.3

46.4

46.5

46.6

46.7

46.8

46.9

47.0

47.1

47.2

47.3

47.4

47.5

47.6

47.7

47.8

47.9

48.0

48.1

48.2

48.3

48.4

48.5

48.6

48.7

48.8

48.9

49.0

49.1

49.2

49.3

49.4

49.5

49.6

49.7

49.8

49.9

50.0

50.1

50.2

50.3

50.4

50.5

50.6

50.7

50.8

50.9

20000

21000

22000

23000

24000

25000

26000

27000

28000

29000

30000

31000

32000

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40000

1. LAK FLOW AND STAGE (2.0 OF PERIOD) STATION FURNISHING PLAIN-RATIO ECHIDNIC COMPUTATIONS
 2. 1.5 IN. CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA 11 SQUARE MILES (SQUARE KILOMETERS)

DPL. ATION	STATION	WEA.	RUM	RATIOS APPLIED TO FLOWS	
				RATIO 1	RATIO 2
HYD. DUCK. PH. AT	1	207.00	1	70.84	141.60
	(	0.50)	(	2081.50)	4093.10)
ADJUSTED TO	1	207.00	1	10154	30490
	(	0.50)	(	203.10)	863.37)
PROV. EL. TO	2	207.00	1	19354	30543
	(	0.50)	(	203.20)	864.86)

(OWASCO LAKE OUTLET DAM
 (MILL ST. DAM)

$\frac{1}{2}$ PMF PMF

SUMMARY OF DAM SAFETY ANALYSIS

OWASCO LAKE
OUTLET DAM (NY-776)

FLG: 1

ELEVATION		INITIAL VALUE		SPILLWAY CREST		TOP OF DAM		TIME OF FAILURE								
STORAGE	OUTFL.	MAXIMUM	DEPTH	AC-FT	CFS	HOURS	MAX OUTFLOW	HOURS	HOURS							
RESERVOIR		MAXIMUM STORAGE		MAXIMUM OUTFLOW						DURATION OVER TOP		TIME OF FAILURE				
ELEV		AC-FT		CFS						HOURS		HOURS				
719.99		88204.		10354.						60.00		62.00				
727.47		140228.		20450.						95.00		59.00				
RATIO OF PMF		MAXIMUM DEPTH		MAXIMUM STORAGE						MAXIMUM OUTFLOW		DURATION OVER TOP				
1.00		2.99		88204.						10354.		60.00				
2.00		13.47		140228.						20450.		95.00				
PMF		PMF		PMF						PMF		PMF				
1.00		1.00		1.00						1.00		1.00				
2.00		2.00		2.00						2.00		2.00				

SUMMARY OF DAM SAFETY ANALYSIS

MILL ST. DAM

PLAN 1

ELEVATION
SPILLWAY
OUTFLOW

INITIAL VALUE

SPILLWAY CREST

TOP OF DAM

RATIO

OF

P.H.

1/3 PMF

1.00

PMF

2.00

MAXIMUM
DEPTH
OVER DAM

MAXIMUM
STORAGE
AC-IT

MAXIMUM
OUTFLOW
CFS

DURATION
OVER TOP
HOURS

TIME OF
MAX OUTFLOW
HOURS

TIME OF
FAILURE
HOURS

702.06
255.
4084.

696.60
137.
42.

5.14
275.
36543.
102.00

275.
375.

5.14
275.
36543.
102.00

702.31
707.20

1.00
2.00

1/3 PMF
PMF

[illegible]

SUMMARY OF DAM SAFETY ANALYSIS

MILL ST. DAM

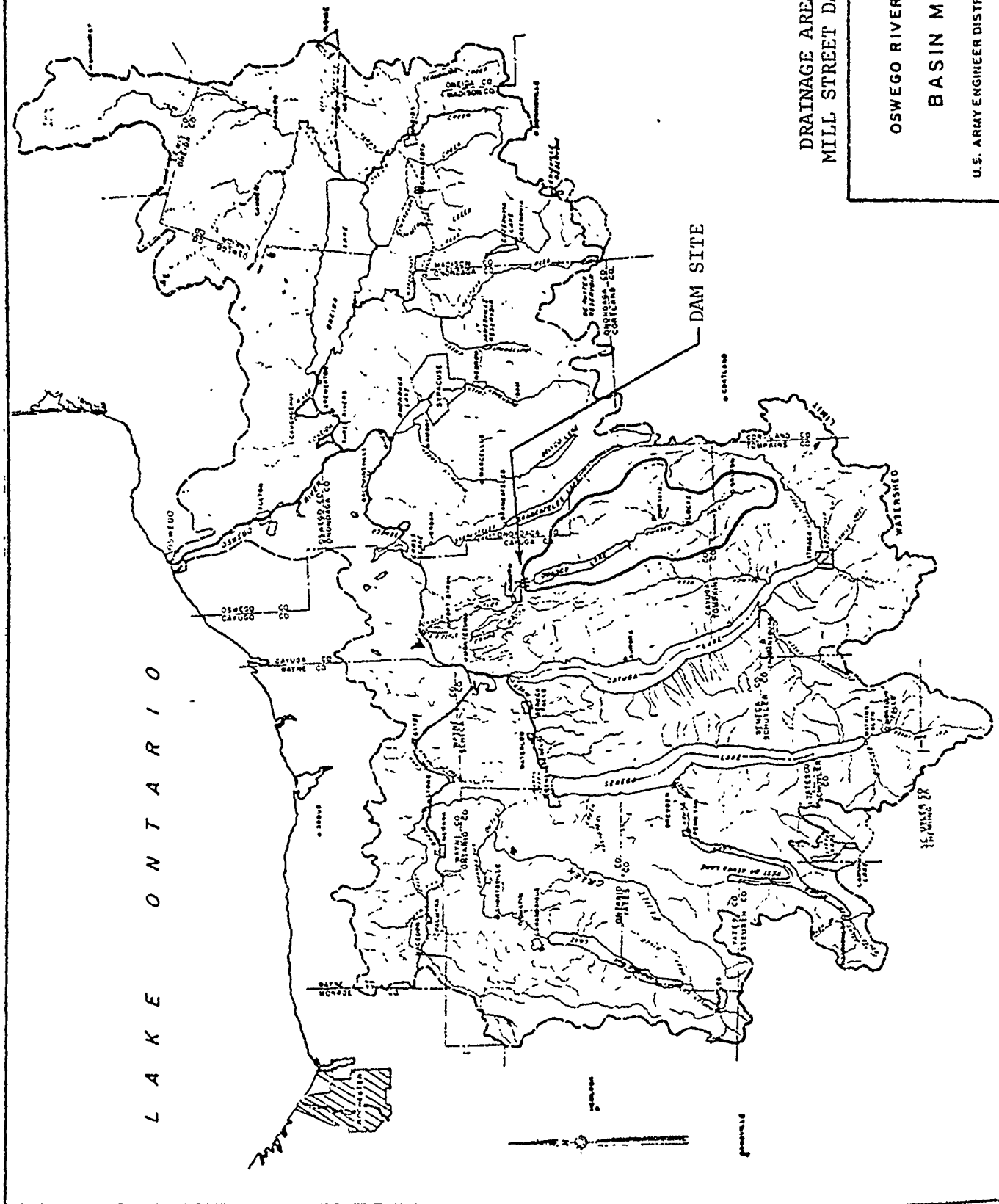
PLAN 1

ELEVATION
STORAGE
OUTFLOWINITIAL VALUE
596.50
136.
973.SPILLWAY CREST
696.60
137.
990.TOP OF DAM
702.06
255.
9460.

RATIO
OF
PMF
1.00
2.00

1/2 PMF ——— PMF

MAXIMUM
RESERVOIR
H.S. ELEV
702.33
706.89MAXIMUM
DEPTH
OVER DAM
0.32
4.83MAXIMUM
STORAGE
AC-FT
263.
368.MAXIMUM
OUTFLOW
CFS
1035+.
30543.DURATION
OVER TOP
HOURS
24.00
90.00TIME OF
MAX OUTFLOW
HOURS
62.00
58.00TIME OF
FAILURE
HOURS
0.
0.



DRAINAGE AREA
MILL STREET DAM

OSWEGO RIVER BASIN
BASIN MAP

U.S. ARMY ENGINEER DISTRICT, BUFFALO

411

LOCATION.--Lat 42°53'56", long 76°32'17", Cayuga County, Hydrologic Unit 04140201, on west side of breakwater at city of Auburn water intake and pumping station, 1 mi (2 km) south of city limits of Auburn, and 1.8 mi (2.9 km) upstream from State dam.

PERIOD OF RECORD.--October 1967 to current year. Records since 1912 collected by, and in files of, city of Auburn.

GAGE.--Nonrecording gage read once daily by employees of city of Auburn Water Division. Datum of gage (revised) is at mean sea level. Reference mark at elevation 715.48 ft (218.074 m) above mean sea level.

REMARKS.--Lake elevation regulated by gates on outlet at State dam. Area of water surface, 10.6 mi² (27.5 km²).

COOPERATION.--Records furnished by city of Auburn.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed elevation, 716.88 ft (218.505 m) June 25, 1972; minimum observed, 709.55 ft (216.271 m) Mar. 10-14, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum observed elevation since 1912, 716.91 ft (218.514 m) Mar. 23, 1936, Apr. 9, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum observed elevation, 713.93 ft (217.606 m) Oct. 1; minimum observed, 710.30 ft (216.499 m) Jan. 12, 13.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	713.93	711.43	711.64	711.18	710.99	712.75	711.03	712.47	713.01	712.72	712.66	712.70
2	713.63	711.28	711.64	711.08	710.97	712.81	711.26	712.48	713.03	712.78	712.71	712.69
3	713.30	711.22	711.61	711.04	710.88	713.11	711.36	712.45	712.98	712.71	712.73	712.71
4	713.07	711.18	711.62	710.92	710.82	713.59	711.42	712.35	712.95	712.52	712.73	712.73
5	712.88	711.16	711.65	710.80	710.73	713.78	711.46	712.33	712.89	712.55	712.70	712.71
6	712.66	711.13	711.61	710.73	710.66	713.73	711.54	712.24	712.83	712.48	712.67	712.70
7	712.50	711.10	711.71	710.61	710.54	713.59	711.38	712.32	712.82	712.50	712.63	712.68
8	712.33	711.07	711.74	710.49	710.50	713.29	711.41	712.45	712.81	712.50	712.78	712.66
9	712.15	711.03	711.73	710.42	710.41	712.98	711.45	712.53	712.86	712.40	712.80	712.68
10	712.01	711.03	711.92	710.38	710.36	712.81	711.49	712.59	712.90	712.66	712.51	712.71
11	711.86	711.02	712.04	710.36	710.37	712.53	711.52	712.65	712.93	712.69	712.59	712.72
12	711.71	711.08	712.10	710.30	710.37	712.38	711.55	712.83	712.86	712.71	712.65	712.69
13	711.60	711.12	712.03	710.30	710.40	712.15	711.58	712.81	712.88	712.86	712.63	712.63
14	711.60	711.20	712.02	710.33	710.46	711.99	711.61	712.74	712.80	712.97	712.72	712.61
15	711.73	711.27	711.93	710.33	710.56	711.78	711.65	713.15	712.86	712.90	712.79	712.63
16	711.78	711.30	711.92	710.35	710.62	711.43	711.63	712.57	712.82	712.70	712.79	712.61
17	711.74	711.33	711.92	710.33	711.06	711.51	712.43	712.50	712.65	712.55	712.71	712.66
18	711.82	711.34	711.83	710.33	711.85	711.38	712.36	712.52	712.82	712.62	712.71	712.68
19	711.95	711.34	711.72	710.32	712.48	711.26	712.24	712.48	712.80	712.64	712.71	712.68
20	711.95	711.37	711.65	710.32	712.83	711.25	712.29	713.03	712.78	712.70	712.73	712.63
21	711.92	711.46	711.60	710.33	712.84	711.18	712.13	713.29	713.04	712.76	712.73	712.56
22	711.78	711.51	711.50	710.34	712.91	711.38	712.00	713.09	712.82	712.78	712.73	712.48
23	711.71	711.56	711.46	710.38	713.20	711.38	711.88	712.90	712.76	712.83	712.72	712.43
24	711.80	711.57	711.41	710.38	713.12	711.34	711.76	712.68	713.29	713.73	712.71	712.31
25	711.85	711.58	711.39	710.39	712.98	711.26	711.70	712.64	712.61	712.68	712.71	712.27
26	711.88	711.58	711.33	710.41	712.86	711.16	712.11	712.65	713.29	712.72	712.70	712.20
27	711.93	711.59	711.33	710.50	712.88	711.18	712.35	712.65	712.55	712.71	712.70	712.18
28	711.43	711.57	711.33	710.97	712.84	711.08	712.47	712.73	712.51	712.7		

STREAMS TRIBUTARY TO LAKE ONTARIO

04235500 OWASCO OUTLET NEAR AUBURN, NY

LOCATION.--Lat 42°56'48", long 76°35'56", Cayuga County, Hydrologic Unit 04140201, on left bank 2.5 mi (4.0 km) downstream from center of Auburn, and 4 mi (6 km) downstream from State dam at outlet of Owasco Lake.

DRAINAGE AREA.--206 mi² (534 km²).

PERIOD OF RECORD.--November 1912 to current year. Prior to October 1966, published as "Owasco Lake Outlet."

REVISED RECORDS.--WSP 324: 1913-14, 1916, 1920(M), 1922(M), 1928(M), 1929, 1932(M). WRD NY 1967: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 533.92 ft (162.739 m) above mean sea level.

REMARKS.--Records fair. Diurnal fluctuation caused by mills in Auburn; seasonal regulation at State dam. Diversion from Owasco Lake (see station 04235396) by city of Auburn for municipal water supply; sewage returns to outlet upstream from station.

AVERAGE DISCHARGE.--63 years (1913-76), 237 ft³/s (8.128 m³/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft³/s (92.0 m³/s) June 23, 1972, gage height, 6.28 ft (1.914 m); minimum, about 2 ft³/s (0.057 m³/s) Dec. 5, 1936; minimum gage height, 1.19 ft (0.363 m) June 26, 1973; minimum daily discharge, 5 ft³/s (0.14 m³/s) Nov. 11, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,720 ft³/s (48.7 m³/s) Mar. 4, gage height, 4.10 ft (1.250 m); minimum, 14 ft³/s (0.40 m³/s) Oct. 24, gage height, 1.32 ft (0.402 m).

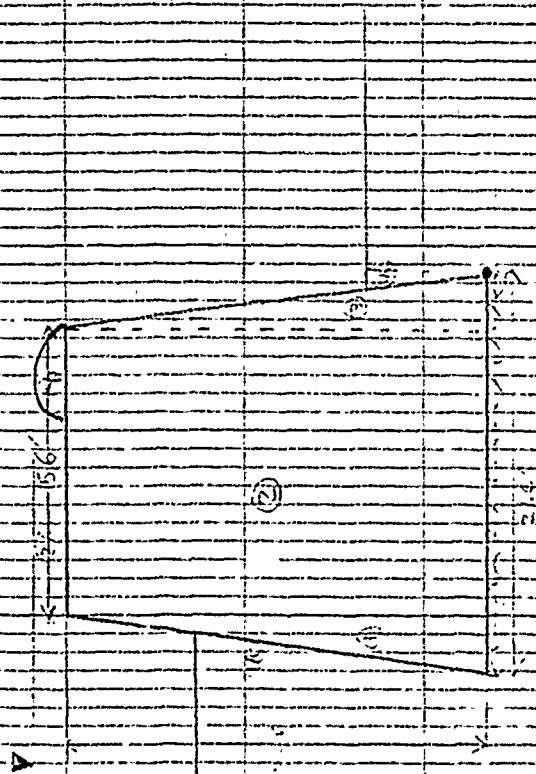
DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1410	446	215	629	653	1250	263	886	320	74	69	45
2	1240	404	287	621	642	1280	140	883	537	277	66	40
3	1130	377	277	596	639	1460	162	864	416	460	107	39
4	1050	351	277	588	631	1540	177	764	355	435	193	36
5	969	314	277	588	627	1650	191	655	346	417	190	35
6	865	297	282	588	621	1600	454	330	342	228	186	34
7	783	287	303	580	615	1520	437	56	343	68	196	36
8	799	267	308	572	611	1450	57	49	236	71	204	36
9	759	257	320	519	607	1340	57	47	46	68	594	37
10	705	262	390	565	605	1240	54	47	50	66	484	101
11	637	248	432	565	323	1140	55	54	148	70	21	198
12	565	267	526	432	116	1100	54	316	265	449	43	195
13	238	277	680	351	123	1010	53	641	257	1030	79	111
14	23	282	654	238	121	950	53	539	208	1190	146	35
15	21	292	637	170	124	890	93	611	206	1130	210	35
16	170	292	621	160	151	847	728	585	354	1070	366	38
17	314	292	604	150	290	820	891	391	342	584	260	42
18	383	292	565	150	831	802	817	401	335	150	66	35
19	397	188	534	140	1150	598	482	411	327	120	66	86
20	654	146	504	54	1210	569	483	904	351	66	65	278
21	759	234	482	50	1230	587	759	1310	850	123	64	262
22	697	248	453	47	1280	588	750	1280	7750	71	63	250
23	303	257	432	46	1340	581	705	1180	796	236	65	240
24	20	184	417	46	1360	570	672	912	434	331	64	221
25	42	262	411	46	1350	624	716	508	320	186	62	210
26	39	262	404	150	1310	582	811	421	307	62	61	213
27	252	262	404	330	1290	489	857	231	300	61	54	208
28	596	262	411	413	1270	468	892	57	179	61	44	198
29	549	267	439	565	1170	465	924	55	72	195	45	193
30	504	282	439	665	---	457	919	54	81	574	42	185
31	475	---	557	660	---	399	---	55	---	299	41	---
TOTAL	17344	8358	13542	11274	22280	28866	13706	15497	10274	10222	4216	3672
MEAN	560	279	437	364	768	931	457	500	342	330	136	122
MAX	1410	446	580	665	1360	1650	924	1310	1150	1190	594	278
MIN	20	146	215	46	116	399	53	47	46	61	21	34
CAL YR 1975 TOTAL	127965			MEAN 351	MAX 1790	MIN 18						
WTR YR 1976 TOTAL	159255			MEAN 435	MAX 1650	MIN 20						

APPENDIX D
STABILITY COMPUTATIONS

46 0700

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KLUPPEL & ESSER CO. MADE IN U.S.A.



Wm. S. ... Dan

PROJECT GRID

JOB	MILL STREET DAM	SHEET NO.	1	CHECKED BY		DATE	
SUBJECT	STABILITY ANALYSIS	COMPUTED BY	RLW	DATE	9/5/79		

SUB AREA CALCULATIONS

1A) SOIL UPSTREAM

$$\frac{1}{2}(16.5)(2.5)(.12) = 2.47K$$

CONVERT TO EQUIVALENT AREA OF CONCRETE

$$\frac{2.47}{.15} = 16.5 \text{ FT}^2$$

2A) WATER ON DAM

$$2(15.6)(.0624) = 1.95$$

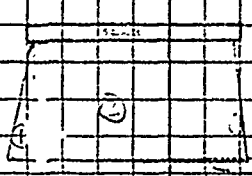
CONVERT TO EQUIVALENT AREA

$$\frac{1.95}{.15} = 12.92 \text{ FT}^2$$

2B) GRAVEL

$$SLAB (12 \text{ FT})(14 \text{ FT})(1 \text{ FT}) = 12 \text{ FT}^2$$

PIERS



$$1 \text{ PIER } (2) \left[\frac{1}{2}(8)(6.5)(3.1)(.15) \right] = 2.42$$

$$1 \left[\frac{1}{2}(11.5)(2.5)(3.1)(.15) \right] = 34.176$$

$$\frac{37.18K}{20 \text{ FT}} = 1.86K/20 \text{ FT} = .093 \text{ in.}$$

CONVERT TO EQUIVALENT AREA

$$\frac{1.86}{.15} = 12.4 \text{ FT}^2$$

TOTAL = 14.37 + 12 = 26.37

PROJECT GRID

JOB MILL STREET DAM.		SHEET NO. 2	CHECKED BY	DATE
SUBJECT STABILITY ANALYSIS		COMPUTED BY RLW		DATE 9/5/79
SUB AREA CALCULATIONS				
(2A) SOIL DOWNSTREAM				
$\frac{1}{2}(7)(10)(.12) = .42$				
CONVERT TO EQUIVALENT AREA				
$\frac{.42}{.15} = 2.8 \text{ ft}^2$				
(5) WEIR				
				
(A) $(5.76) \cdot 5 = 293$				
(B) $\frac{1}{2}(293)(2) = 293$				
(C) $\frac{1}{2}(293)(2) = 293$				
8174 ft ³				
AREA CALCULATIONS				
AREA NO.	VOLUME	DISTANCE FROM CENTER To To		
①	$\frac{1}{2}(23.5)(3) + 6.5 = 51.75 \text{ ft}^3$	19.6 ft		
②	$(156)(27.5) + 12.93 + 27.39 = 403.07 \text{ ft}^3$	10.8 ft		
③	$\frac{1}{2}(23.5)(20) + 2.21 = 321.05 \text{ ft}^3$	20 ft		
④	2.74 ft ³	5.93 ft		

PROJECT GRID

JOB MILL STREET DAM	SHEET NO. 3	CHECKED BY	DATE
SUBJECT STABILITY ANALYSIS		COMPUTED BY RLW	DATE 9/5/79
REVISED ANALYSIS TO ACCOUNT FOR ROUGH SURFACE BETWEEN CONCRETE & ROCK			
$F.S. = \frac{\text{RESISTING FORCE} + S_u A}{\text{DRIVING FORCE}}$ $S_u = \text{SHEAR STRENGTH OF CONCRETE}$ $A = \text{AREA OF BASE}$			
THE SAFETY FACTOR SHOULD BE > 5			
NORMAL CONDITIONS			
$F.S. = \frac{44.29 + .15[(21.6)(1)(144 \frac{1}{2})]}{22.49} = 22.71$			
ICE LOAD OF 10,000#			
$F.S. = \frac{44.39 + .15[(21.6)(1)(144 \frac{1}{2})]}{29.99} = 17.04$			
1/2 PMF			
$F.S. = \frac{44.38 + .15[(21.6)(1)(144 \frac{1}{2})]}{31.18} = 16.39$			
PMF			
$F.S. = \frac{44.38 + .15[(21.6)(1)(144 \frac{1}{2})]}{37.04} = 13.79$			

PROJECT GRID

JOB	MILL STREET DAM	SHEET NO.	4	CHECKED BY		DATE	
SUBJECT	STABILITY ANALYSIS - SEISMIC ANALYSIS			COMPUTED BY	RLW	DATE	9/5/79

NORMAL CONCRETE DAM - WATER AT SPILLWAY CREST - NO ICE

1. CALCULATE HORIZONTAL FORCE ON FACE DUE TO WATER PRESSURE

$$P_h = C \times W h = .7(117.0624)(23.5) = 103$$

2. CALCULATE MOMENT & FORCE OF EARTHQUAKE

$$M_e = .29 P_h y^2 = .29(103)(23.5)^2 = 16.75$$

$$V_e = .725 P_h y = .725(103)(23.5) = 1.76$$

3. REDUCE WEIGHT OF CONCRETE BY 5%

$$(.15)(.95) = .142$$

4. REVISED OVERTURNING F.S. - SEISMIC ANALYSIS

$$F.S. = \frac{\text{RESISTANCE}}{\text{SLIDING FORCE} + M_e} = \frac{728}{466 + 16.75} = 1.65$$

5. REVISED SLIDING F.S. - SEISMIC ANALYSIS

$$F.S. = \frac{\text{RESISTANCE}}{\text{SLIDING FORCE} + V_e} = \frac{411.57}{23.49 + 1.76} = 1.71$$

INPUT TO STABILITY ANALYSIS PROGRAM

<u>INPUT ENTRY</u>	<u>PROGRAM No.</u>
Unit Weight of Dam (K/ft^3)	0
Area of Segment No. 1 (ft^2)	1
Distance from Center of Gravity of Segment No. 1 to Downstream Toe (ft)	2
Area of Segment No. 2 (ft^2)	3
Distance from Center of Gravity of Segment No. 2 to Downstream Toe (ft)	4
Area of Segment No. 3 (ft^2)	5
Distance from Center of Gravity of Segment No. 3 to Downstream Toe (ft)	6
Base Width of Dam (Total) (ft)	7
Height of Dam (ft)	8
Ice Loading (K/L ft.)	9
Coefficient of Sliding	10
Unit Weight of Soil (K/ft^3)	11
Active Soil Coefficient - K_a	12
Passive Soil Coefficient - K_p	13
Height of Water over Top of Dam or Spillway (ft)	14
Height of Soil for Active Pressure (ft)	15
Height of Soil for Passive Pressure (ft)	16
Height of Water in Tailrace Channel (ft)	17
Weight of Water (K/ft^3)	18
Area of Segment No. 4 (ft^2)	19
Distance from Center of Gravity of Segment No. 4 to Downstream Toe (ft)	20
Height of Ice Load or Active Water (ft)	46

NORMAL

ICE LOAD

0.15	RCL	0.15	RCL
51.75	1	51.75	1
51.75	RCL	51.75	RCL
19.6	2	19.6	2
19.6	RCL	19.6	RCL
404.	3	404.	3
404.	RCL	404.	RCL
10.8	4	10.8	4
10.8	RCL	10.8	RCL
38.	5	38.	5
38.	RCL	38.	RCL
2.	6	2.	6
2.	RCL	2.	RCL
21.6	7	21.6	7
21.6	RCL	21.6	RCL
25.5	8	25.5	8
25.5	RCL	25.5	RCL
0.	9	0.	9
0.	RCL	0.	RCL
0.7	10	0.7	10
0.7	RCL	0.7	RCL
0.06	11	0.06	11
0.06	RCL	0.06	RCL
0.27	12	0.27	12
0.27	RCL	0.27	RCL
3.69	13	3.69	13
3.69	RCL	3.69	RCL
0.	14	0.	14
0.	RCL	0.	RCL
16.5	15	16.5	15
16.5	RCL	16.5	RCL
7.	16	7.	16
7.	RCL	7.	RCL
7.	17	7.	17
7.	RCL	7.	RCL
0.0624	18	0.0624	18
0.0624	RCL	0.0624	RCL
8.8	19	8.8	19
8.8	RCL	8.8	RCL
5.9	20	5.9	20
5.9	RCL	5.9	RCL
25.5	46	25.5	46

1.806900513
7.031267154
1.906900513

F.S. OVERTURNING

1.281143762
3.455170624

1/2 PMF

PMF

0.15 RCL
1
51.75
51.75 RCL
2
19.6
19.6 RCL
3
404.
404. RCL
4
10.8
10.8 RCL
5
38.
38. RCL
0
0.15
2. RCL
7
21.6
21.6 RCL
8
25.5
25.5 RCL
9
0.
0. RCL
10
0.7
0.7 RCL
11
0.06
0.06 RCL
12
0.27
0.27 RCL
13
3.69
3.69 RCL
14
5.46
5.46 RCL
14
5.46
5.46 RCL
15
16.5
16.5 RCL
16
7.
7. RCL
17
7.
7. RCL
18
0.0624
0.0624 RCL
19
8.8
8.8 RCL
20
5.9
5.9 RCL
46
25.5

0.15 RCL
1
51.75
51.75 RCL
2
19.6
19.6 RCL
3
404.
404. RCL
4
10.8
10.8 RCL
5
38.
38. RCL
6
2.
2. RCL
7
21.6
21.6 RCL
8
25.5
25.5 RCL
9
0.
0. RCL
10
0.7
0.7 RCL
11
0.06
0.06 RCL
12
0.27
0.27 RCL
13
3.69
3.69 RCL
14
9.14
9.14 RCL
15
16.5
16.5 RCL
16
7.
7. RCL
17
7.
7. RCL
18
0.0624
0.0624 RCL
19
8.8
8.8 RCL
20
5.9
5.9 RCL
46
25.5

1.459904279
4.960003487
17.423544422

F.S. OVERTURNING

1.293588698
3.56308695
17.423544422

SEISMIC ANALYSIS

0.142	RCL
51.75	1
51.75	RCL
	2
19.6	RCL
19.6	3
404.	RCL
404.	4
10.8	RCL
10.8	5
38.	RCL
38.	6
2.	RCL
2.	7
21.6	RCL
21.6	8
25.5	RCL
25.5	9
0.	RCL
0.	10
0.7	RCL
0.7	11
0.06	RCL
0.06	12
0.27	RCL
0.27	13
3.69	RCL
3.69	14
0.	RCL
0.	15
16.5	RCL
16.5	16
7.	RCL
7.	17
7.	RCL
7.	18
0.0624	RCL
0.0624	19
8.8	RCL
8.8	20
5.9	RCL
5.9	46
25.5	

1-71241-582
6.712323579
1-8483-5875

DATE

STARTED 4-21-75

FINISHED 4-21-75

SHEET 1 of 1



EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-1

SURF. ELEV. 692.74

C. W. DEPTH See Note #1

PROJECT Subsurface Emulation
Osborne Street

LOCATION Auburn, New York

DEPTH-FT.	SAMPLE NO.	BLOWS ON SAMPLER					BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
		3	6	9	12	15			
0	1	3	4	9	13			Dark Brown to Black FILL MATERIAL: SILT, SAND, ROCK FRAGMENTS w/ scattered cobbles, boulders & concrete	Note #1 - At completion water @ 7.0', casing raised to 15.0', water @ 7.5', casing out, water @ 7.6'
5	2	6	4	12	16			-Moist	
								(Damp to Moist-Firm)	Note #2 - Coring Time: 21' - 22' 10 minutes 22' - 23' 7 " 23' - 24' 15 " 24' - 25' 17 " 25' - 26' 15 "
10	3	2	2	3	5			Brown & Gray SILT, Some Rock Fragments, little to Some Clay	
15	4	5	7	9	16			-trace organic	
								(Wet-Soft to Stiff)	
20	5	65	100					Black SHALE, highly weathered, soft, fissile, slightly calcareous, iron staining along bedding planes, with a seam of sound, medium hard Dolomitic LIMESTONE from 21.0' to 21.5'	Run #1 21.0' - 26.0'
25								Gray & Dark Gray Dolomitic LIMESTONE, slightly weathered to sound, medium hard, argillaceous slightly fossiliferous	100% Recovery
30								Bottom of Hole @ 26.0'	

N = No. blows to drive 2 "spoon 12" with 140-lb. pin wt. falling 20" per blow.

C = No. blows to drive "casing" with lb. weight falling "per blow.

METHOD OF INVESTIGATION: Cased Boring; drill in place, "B" Core

CLASSIFICATION: Visual by

Laboratory Technician

DATE 4-21-75

NO. 4-21-75

PAGE 1 OF 1



EMPIRE SOILS INVESTIGATIONS, INC.

HOLE NO. B-2

SURF. ELEV. 693.77

G.W. DEPTH See Note #1

SUBSURFACE LOG

Project Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH FEET	BLOW COUNT	BLOWS ON SAMPLER					BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
		0	1	2	3	4			
0	1	5	9	9	18			Dark Gray to Black SAND, SILT & ROCK FRAGMENTS	Note #1 - Encountered water @ 10.0', at completion water @ 6.5', casing raised to 15.0', water @ 8.0' Casing out, hole caved in to 2.0'
5	2	4	2	3	5				
10	3	3	1	1	2			-Wet	
15	4	3	4	6	10			-grades SILT & fine ROCK FRAGMENTS trace to little clay	
20	5	35	100	73				Black SHALE, highly weathered soft, fissile, with a few thin embedded seams of Dolomitic LIMESTONE, recovered in pieces less than 1" to 2"	
25									Run #1 22' to 25' 80% Recovery
30									Run #2 25' to 27' 85% Recovery
35								Bottom of Hole @ 27.0'	
40									
45									

N = No blows to drive 2 "spoon 12" with 140 lb. pin wt. falling 30 "per blow.
C = No. blows to drive "casing" with _____ lb. weight falling _____ "per blow.
METHOD OF INVESTIGATION: Cased Boring; drilled in place; "B" Core

CLASSIFICATION Visual by
Laboratory Technician

DATE

STARTED 4-22-75FINISHED 4-22-75SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-3SURF. ELEV. 694.48G. W. DEPTH NotEncounteredPROJECT Subsurface Exploration
Osborne StreetLOCATION Auburn, New York

DEPTH-FT	SAMPLE NO	BLOWS ON SPLER					BLOWS ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
		0	1	2	3	4			
0								CONCRETE 0.3'	
								Gray LIMESTONE, sound, medium	20 Run #1 0' to 5'
								hard, slightly fractured	15
								(9WALL)	12
									17
5								Partial VOIDS-5.5' - 8.0'	16 85% Recovery
									10 Run #2 5' to 10'
									12
									2
10								Gray LIMESTONE, sound, medium	4
								hard, slightly fractured	15 58% Recovery
								Partial VOIDS-10.0' - 11.0'	2 Run #3 10' to 15'
									3
									7
15								LIMESTONE from 15.0' to 22.0'	5 56% Recovery
								is fractured & recovered in pieces	2
								less than 2" from 15.0' to 22.0'	3 Run #4 15' to 20'
								Gray SANDSTONE-15.7' - 16.1'	4
								VOID 16.3' - 17.5'	5
									6
20								VOID 18.6' - 20.0'	12 54% Recovery
								Dark Gray to Black SHALE, slightly	3 Run #5 20' to 25'
								weathered to weathered, soft to	3
								medium hard, fissile	5
25								Bottom of Hole @ 25.0'	10 77.4% Recovery
									*Coring time in minutes
									Note #1 - Hole began
									caving in at several
									depths after
									completion Run #5
									Note #2 - Limestone
									& Sandstone are the
									materials encountered
									in the wall

N = No. blows to drive 2 "spoon 12" with 140 lb. pin wt. falling 26" per blow.C = No. blows to drive 1 "spoon 12" with 140 lb. pin wt. falling 26" per blow.METHOD OF INVESTIGATION Core Logging; 10' in place, 1' coreCLASSIFICATION Visual by
Laboratory Technician

SHEET 1 OF 1



EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO B-5

SURF ELEV. 679.93

C. W. DEPT. See Note #1

Project Subsurface Exploration
Osborne Street

LOCATION: Auburn, New York

DEPTH - ft.	SAMPLE NO.	ROWS ON SAMPLER					SOIL OR ROCK CLASSIFICATION	NOTES
		0	6	12	18	24		
0								
1	1	3	6	9			Brown fine SAND & SILT, little fibrous organic material, scattered boulders and/or cobbles, becomes wet @ 3.5' , pieces of decomposed wood from 5.0'-5.5' (Wet-Loose)	Note #1 - At completion water @ 3.5'
2	2	10	42	86	122	157	Black SHALE, highly weathered to 6.5', from 6.5' to 7.5' weathered, 7.5' - 8.5' highly weathered, soft, fissile, fractured	Run #1 6.5' to 11.5' Soft 7.5' to 8.5'
3								
4								
5								
6								
7								
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93								
94								
95								
96								
97								
98								
99								
100								

N = No. blows to drive 2 "spoon 1 1/2" with 1 1/2 lb. pin wt. falling 30 "per blow.

C = No. blows to drive _____ "casing" _____ "with _____ lb. weight falling _____ "per blow.

METHOD OF INVESTIGATION: Cased Boring; drilled in place, "J" Core

CLASSIFICATION Visual by

Laboratory Technician

DATE

STARTED 4-23-75

FINISHED 4-24-75

SHEET 1 OF 2



EMPIRE SOILS INVESTIGATIONS, INC.

SUBSURFACE LOG

HOLE NO. B-6

SURF. ELEV. 703.26

C. W. DEPTH. See Note #1

PROJECT Subsurface Exploration
Osborne Street

LOCATION Auburn, New York

DEPTH FOOT	SAMPLE NO.	BLOWS ON SAMPLER					BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
		0-6"	6-12"	12-18"	18-24"	24-30"			
0	1	3	8	10	18			Brown FILL: SILT, SAND, CINDERS, BRICK, scattered boulders and/or cobbles (Moist-Firm)	Note #1 - Encountered water @ 24.0', at completion water @ 24.2'
5	2	2	3	4	7			Brown fine SAND & SILT w/scattered boulders and/or cobbles (Moist to Wet-Loose)	Note #2 - Coring time 37' to 38' 15 min. 38' to 39' 15 min. 39' to 40' 20 min. 40' to 41' 17 min. 41' to 42' 20 min.
10	3	4	8	9	17			Brown & Dark Brown SILT, little organic silt, little fine gravel (Moist-Firm)	
15	4	10	12	18	30			Brown & Gray varved SILT, trace fine sand -grades Gray @ 16.0' (Moist-Firm)	
20	5	20	23	58	87			Gray SILT w/ trace fine sand seams (Damp-Very Compact)	
25	6	0	0	0	0			Driller notes SAND, SILT, GRAVEL and BOULDER from 25.0' to 36.5', the recovered rock ranges in length from 1/4" to 4" pieces (Material appears to be a very boney GLACIAL TILL) (Very Compact)	Run #1 26' to 28' 70% Recovery Run #2 28' to 32' 33% Recovery Run #3 32' to 37' 20% Recovery Run #4 37' to 42' 90% Recovery
30								Dark Gray to Black interbedded SHALE & Dolomitic LIMESTONE, Shale is highly weathered, soft, LIMESTONE is slightly weathered	
35									
40									

N = No. blows to drive 2 "spoon 12" with 140 lb. pin wt. falling 30" per blow.

C = No. blows to drive "casing" with "lb. wt." "per blow"

METHOD OF INVESTIGATION Ground Penetration Test

CLASSIFICATION Visual by

T. H. H. Technician

APPENDIX E

REFERENCES

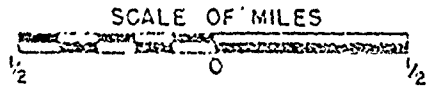
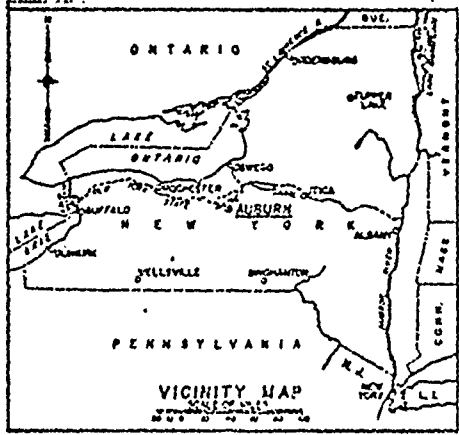
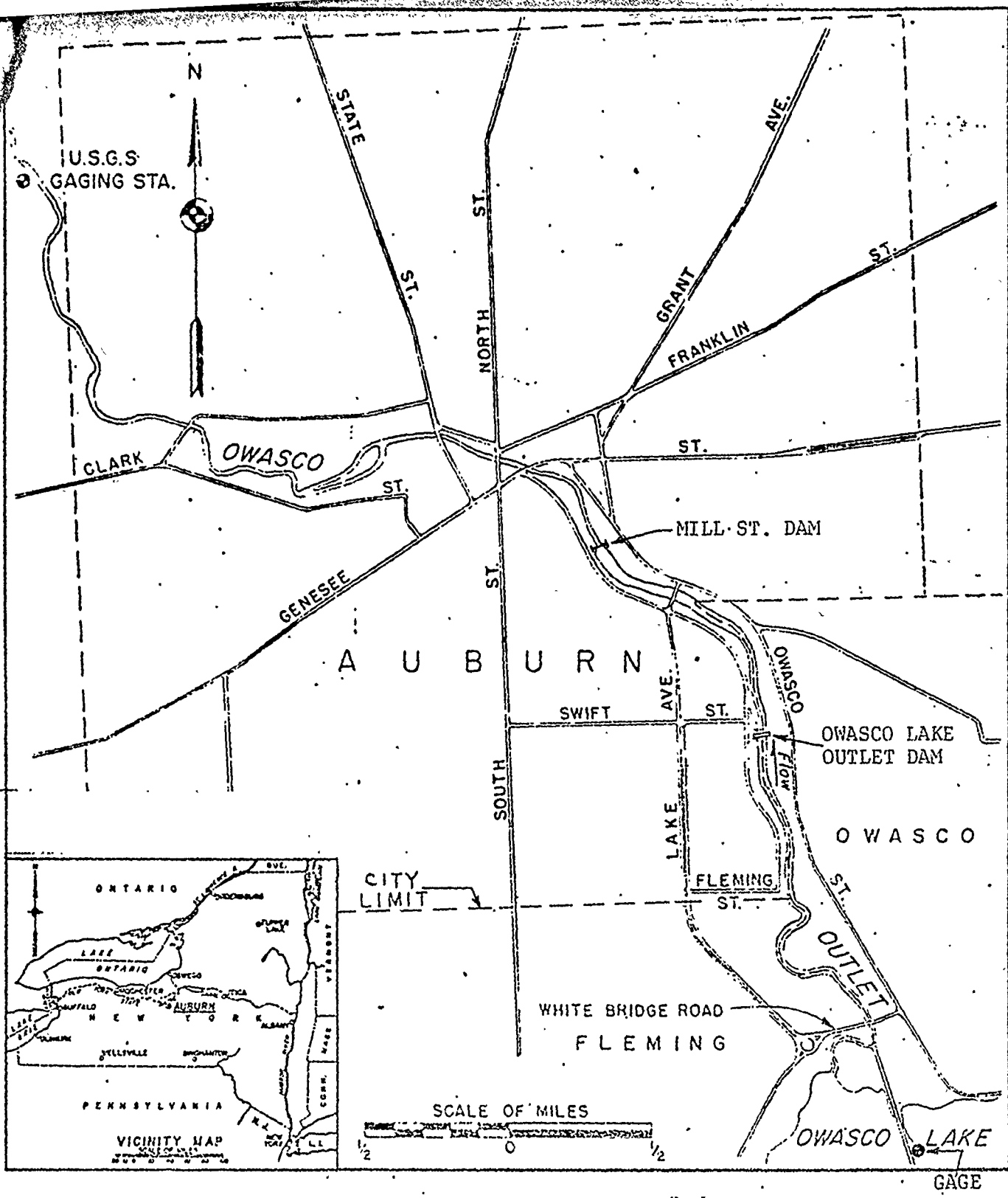
APPENDIX E

REFERENCES

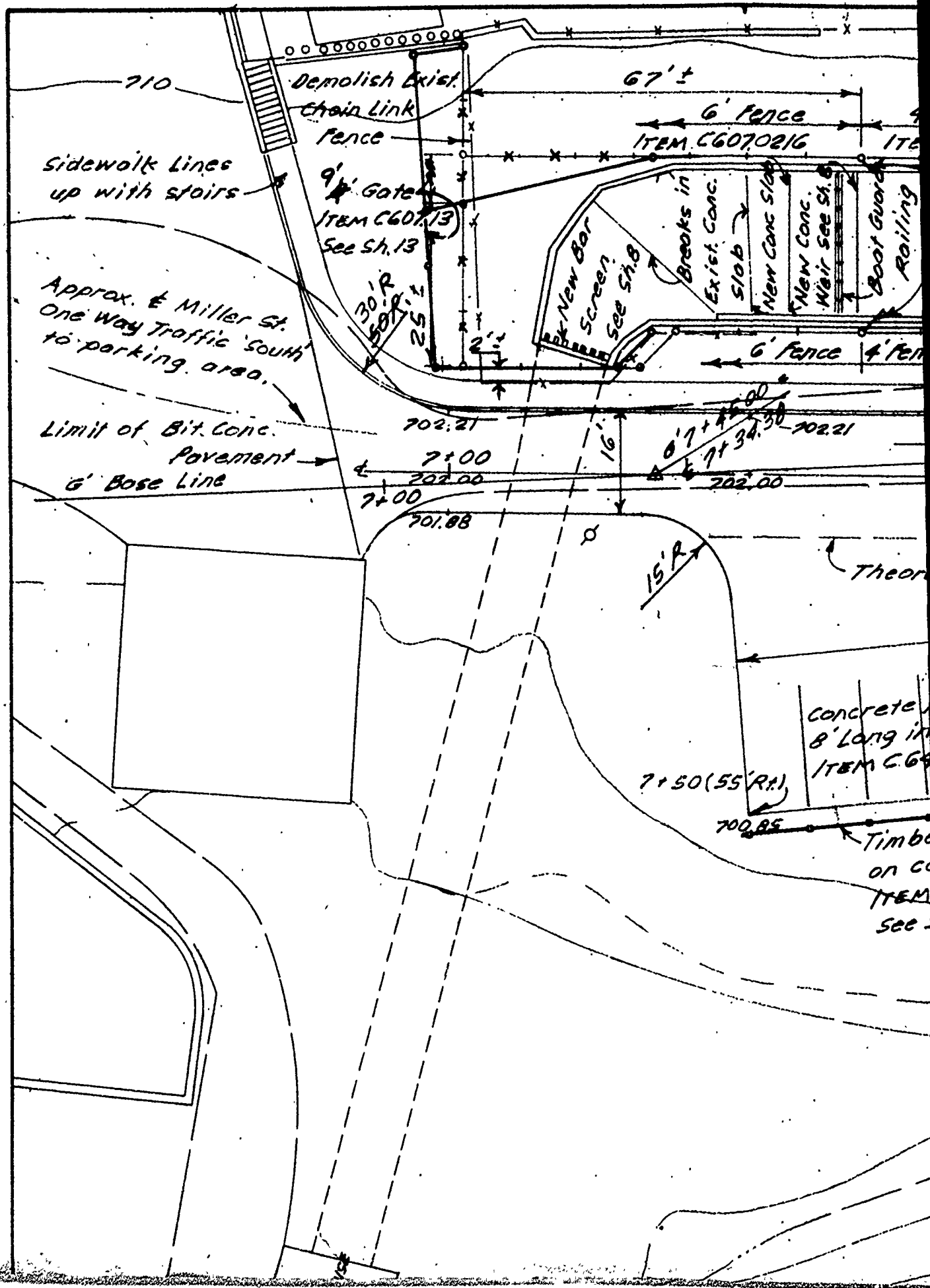
- 1) U.S. Army, Corps of Engineers:
 - a) Design Memorandum on Local Flood Protection - Auburn, New York; Buffalo District, May 1960.
 - b) HEC-1 Flood Hydrograph Package - Dam Safety Version, September 1978.
 - c) Operation and Maintenance Manual for Local Flood Protection Project on Owasco Outlet at Auburn, New York; Buffalo District, September 1961.
 - d) Owasco Lake - Standard Project Flood Hydrograph; Buffalo District; July 14, 1975 letter.
- 2) U.S. Department of Agriculture, Soil Conservation Service; National Engineering Handbook; Section 4 - Hydrology, August 1972.
- 3) U.S. Department of the Interior, Bureau of Reclamation:
 - a) Design of Small Dams, 2nd Edition (Rev. report), 1977.
 - b) Hydraulic and Excavation Table, 11th Edition, (Reprinted) 1974.
- 4) U.S. Department of the Interior, Geological Survey; Water Resources Data for New York - Water Year 1976 - Vol. 1, USGS Report NY-76-1, 1977.
- 5) H. W. King and E. F. Brater; Handbook of Hydraulics, 5th Edition, McGraw-Hill, 1963.
- 6) R. K. Linsley, Jr., M. A. Kohler, and J. L. H. Paulhus; Hydrology for Engineers, 2nd Edition, McGraw-Hill, 1975.
- 7) University of the State of New York; Geology of New York, Education Leaflet 20, (Reprint) 1973.
- 8) C. V. Davis and K. E. Sorenson, Handbook of Applied Hydraulics, 3rd Edition, McGraw-Hill, 1970.
- 9) Engineer's Design Report on Renovation of Mill Street Dam - City of Auburn - Project No. 7240; Konski Engineers, P.C.; Syracuse, N.Y., May 20, 1975.
- 10) Alstom Atlantic, Inc., New York, New York:
 - a) Bulletin No. 16A - Amil Constant Upstream Level Gate, 1973.
 - b) Supplement No. 16-2 - Summary of Important Facts and Supplemental Information for the Amil Constant Upstream Level Gate.

APPENDIX F

DRAWINGS



LOCATION MAP
MILL STREET DAM
NY-775



9' Fence
EM C607.0214

~~New Chain Link Fence~~

710

Chain Link Wings

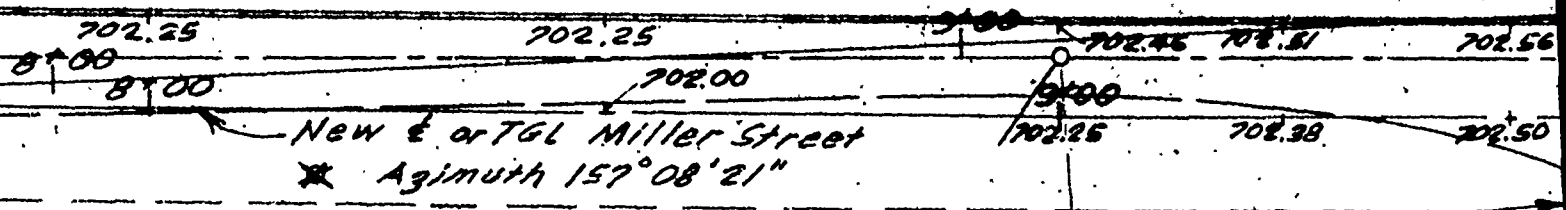
set at 45°
to fence. Old Power Canal - Normal Water Surface Elev. 696.5

Project over canal.

ITEM C607.13 - see Sheet 13.

NYSEG 104 Relocated

Top Soil & Seed between walk and canal wall
ITEMS G13.02 & G14.03



Parking Bumpers
in each stall (Typical)
42.24

Typical Parking Lines - By City
20' Long 10' c/c

Edge of Bituminous Concrete Parking Area

er Guard Rail
concrete post
C642.23
Sheet 10

± 9+50 (35' R.) 90°
701.77

Approx. Top of Embankment

Abutment for sewer
bridge not found.
Adjust grading to

Regrade river bed to

Riprap Area - ITEM
Theo. Top of Embankment

Existing L
Water L

Existing Driveway

4' Fence

Demolish Existing Stone
and Concrete walls to
bottom of canal

702.56 702.61 702.66 702.71
702.50 702.63 702.75 702.88
702.42 702.94 702.97

6' Base Line

Embankment

sewer
und.
ing to SW.

ITEM 620.06 (1.0')

ankment

ing Low
er Line

pt of Exist. Apron

crete Encasement

Theoretical Toe of Slope

Heavy Stone Filling - Item 620.05
and Bedding Material - Item 620.08
to be placed between contours 694
and 700

Approximate Edge of Normal Pool

4' Chain Link Fence

Special
Post - For

Location see Sheet

Grassed Area
4' Chain Link Fence

Normal Pool
40'±
Remove
Conc. S

End Curb

Seed

Sewer

703.38
703.17
703.15
703.25
703.13
703.13
703.13

680

694
700

703.50 ±

END
CURB & Sidewalk

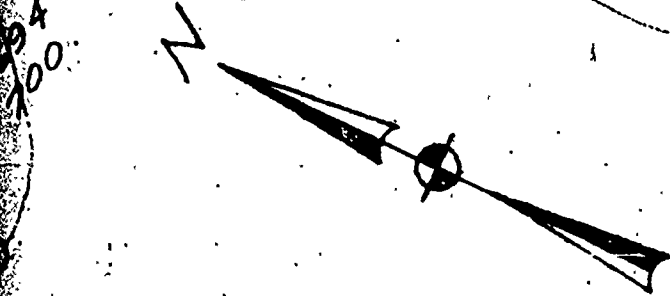
Proposed Shoulderline
2' Stabilized Shoulder
where no curb

NOTES:

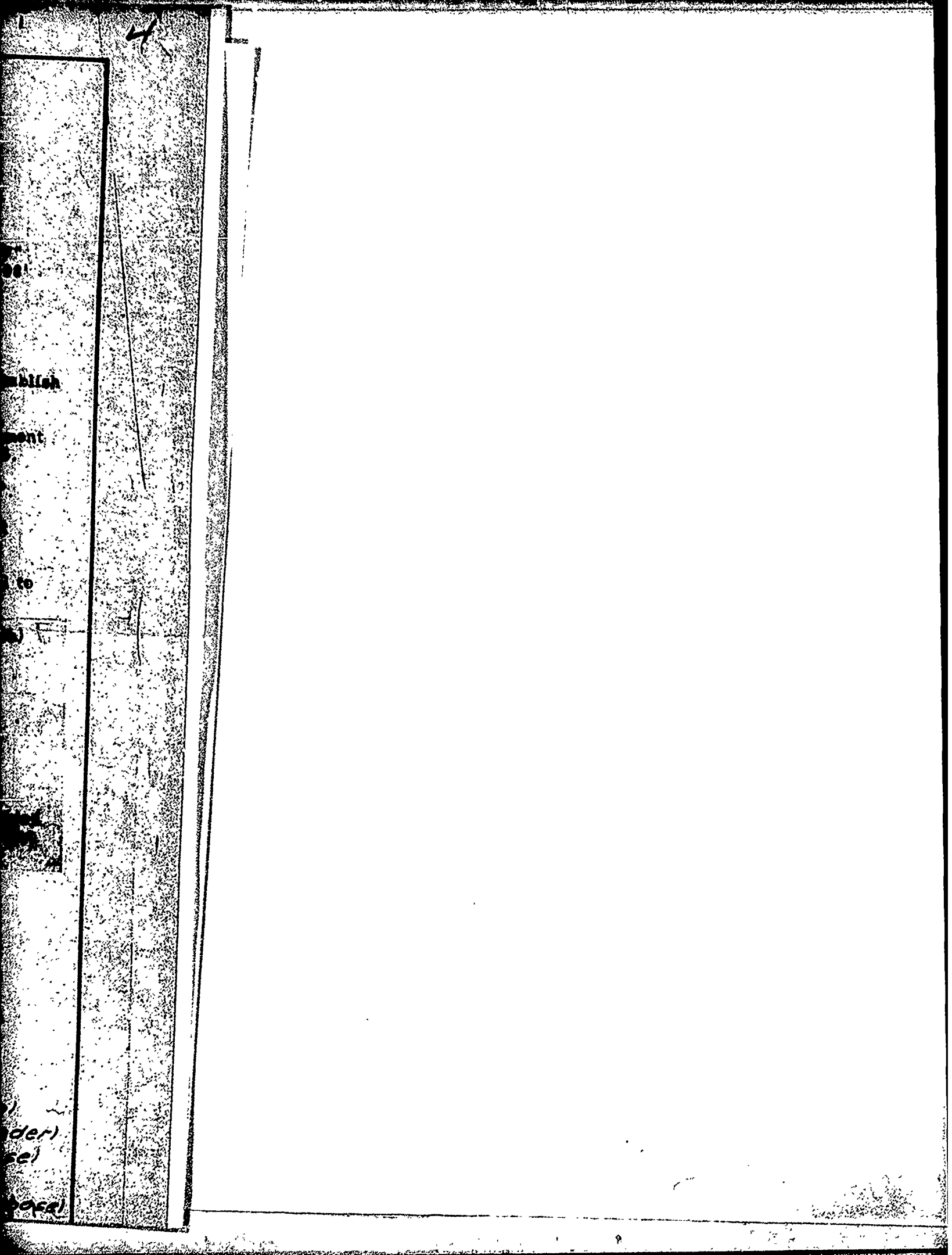
- (1) CURVE DATA FOR $\frac{1}{2}$ BRIDGE AND AXIS OF DAM:
Degree of Curve $4^{\circ}-00'-00''$
Radius 1432.40'
 Δ Angle between intercepts on G-Baseline $4^{\circ}-26'-59''$
Corresponding chord 111.22', corresponding offset 1.11'
Coordinate Point at $\frac{1}{2}$ Dam $G1+80.33$, 0.69' Left
Angle between $\frac{1}{2}$ Dam and G-Baseline $88^{\circ}-39'-32.7''$
Length of $\frac{1}{2}$ Bridge and Dam Axis 280'-0"
Corresponding Δ Angle $11^{\circ}-12'-00''$
- (2) Only sufficient contour lines are given to generally new grading.
- (3) Instead of a profile, spot elevations are given on plan areas. Spot elevations at curb lines are at base of curb.
- (4) All curb ends to be transitioned from 0" to 6" in 12'.
- (5) Seed and mulch all cut or new fill areas on embankment above water line.
- (6) No finished embankment is to be steeper than 1 vertical to 2 horizontal.
- (7) Payment Items for Roadway and Parking Area: (See Sheet 10)
Asphalt Concrete Topping Type 1A-1" - Item 403.01
Asphalt Concrete Binder Type 1A-1 1/2" - Item 403.05
Asphalt Concrete Base Type 1A-3" - Item 403.07
Select Granular Subgrade 8" - Item 304.01
- (8) Cost of regrading channel downstream of dam to be included in prices bid for other items of work. No separate payment will be made for this work.

Remove Exist.
ONE SILL

Sheet 11.



- 1" ITEM 403.01
- 1 1/2" ITEM 403.05
- 3" ITEM 403.07
- 8" ITEM 304.01



ublish

ment

to

der)

se)

pose)

Old Power Ho

676

675

Existing Low Water

Existing Dirt Road - Canal Street (Future B)

SR1 Ac/AN 9/13/77

Existing Sewer Bridge

Regrade and channelize
this portion of downstream
channel to minimum 1% grade.
(Use steeper grade if necessary
to meet existing river bed
of Power House.)

This pier will have
to be underpinned
if not founded on
suitable material
at Elev. 674 or below.
See Sheet 14.

678

680

684

Riprap Area

Item 620.06 (1'-0")

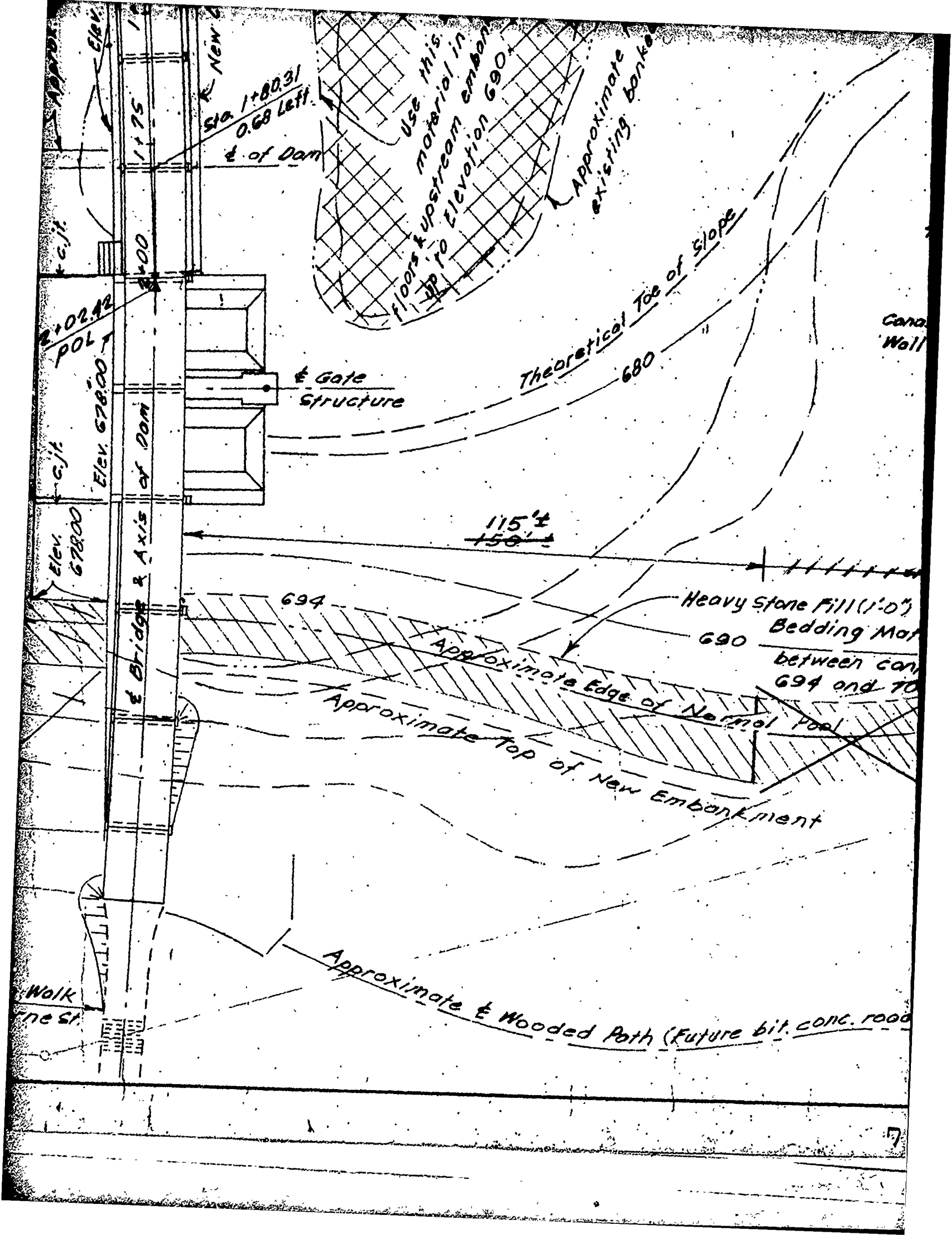
690

700

Luminous Concrete Road or Walk)

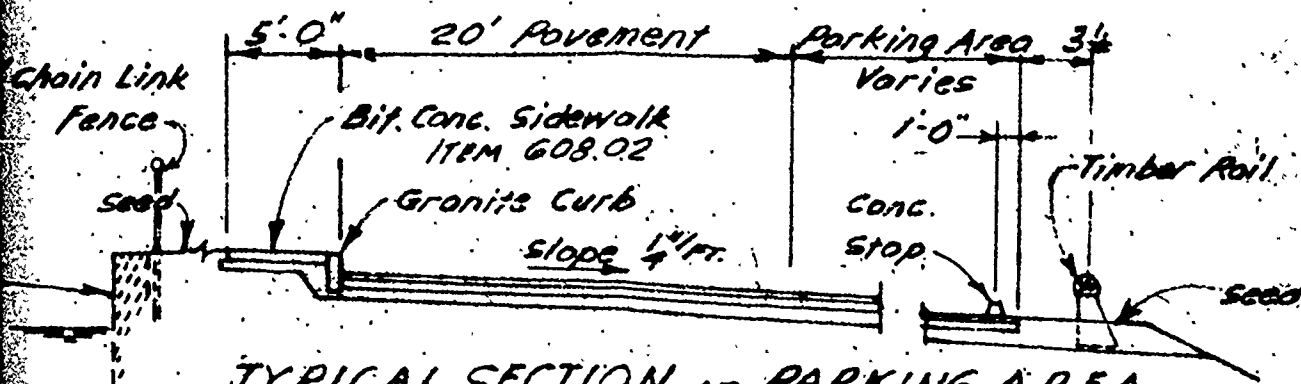
Future Pedestrian
and stairs to Osb

6



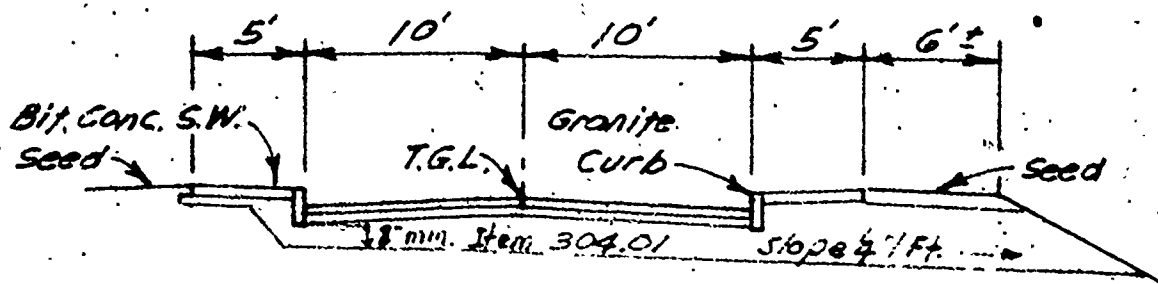
PAVEMENT ITEMS

Scale: 1" = 1'-0"



TYPICAL SECTION AT PARKING AREA

Scale: 1/8" = 1'-0"



TYPICAL SECTION NORTH OF BRIDGE

Scale: 1/8" = 1'-0" (N.T.S.)

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y.				
RENOVATION OF MILL STREET DAM				
CONTRACT NO. 2				
SITE PLAN				
KONSKI ENGINEERS, P.C.				
SYRACUSE			NEW YORK	
MADE BY WFC/AC	CHECKED BY [Signature]	SCALE 1" = 20' And As Noted	DATE 8-16-76	DRAWING NO. 7240F2-S1
				SHEET 3

G1 G Base Line
Sta. 60 + 00

New & of Miller St.

Bituminous Concrete Walk
See Sheet 3

Theoretical
top of
Embankment

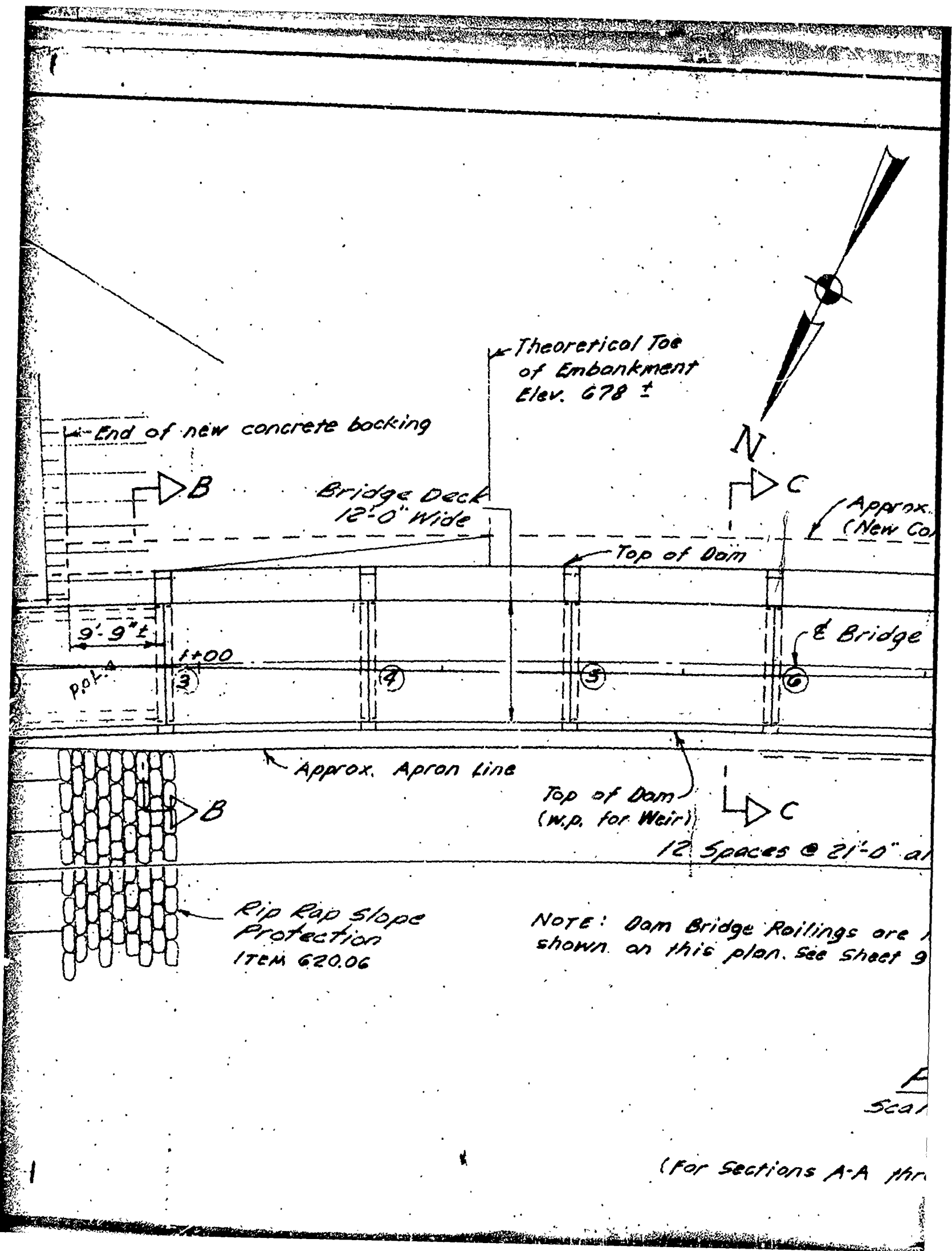
14'-0"

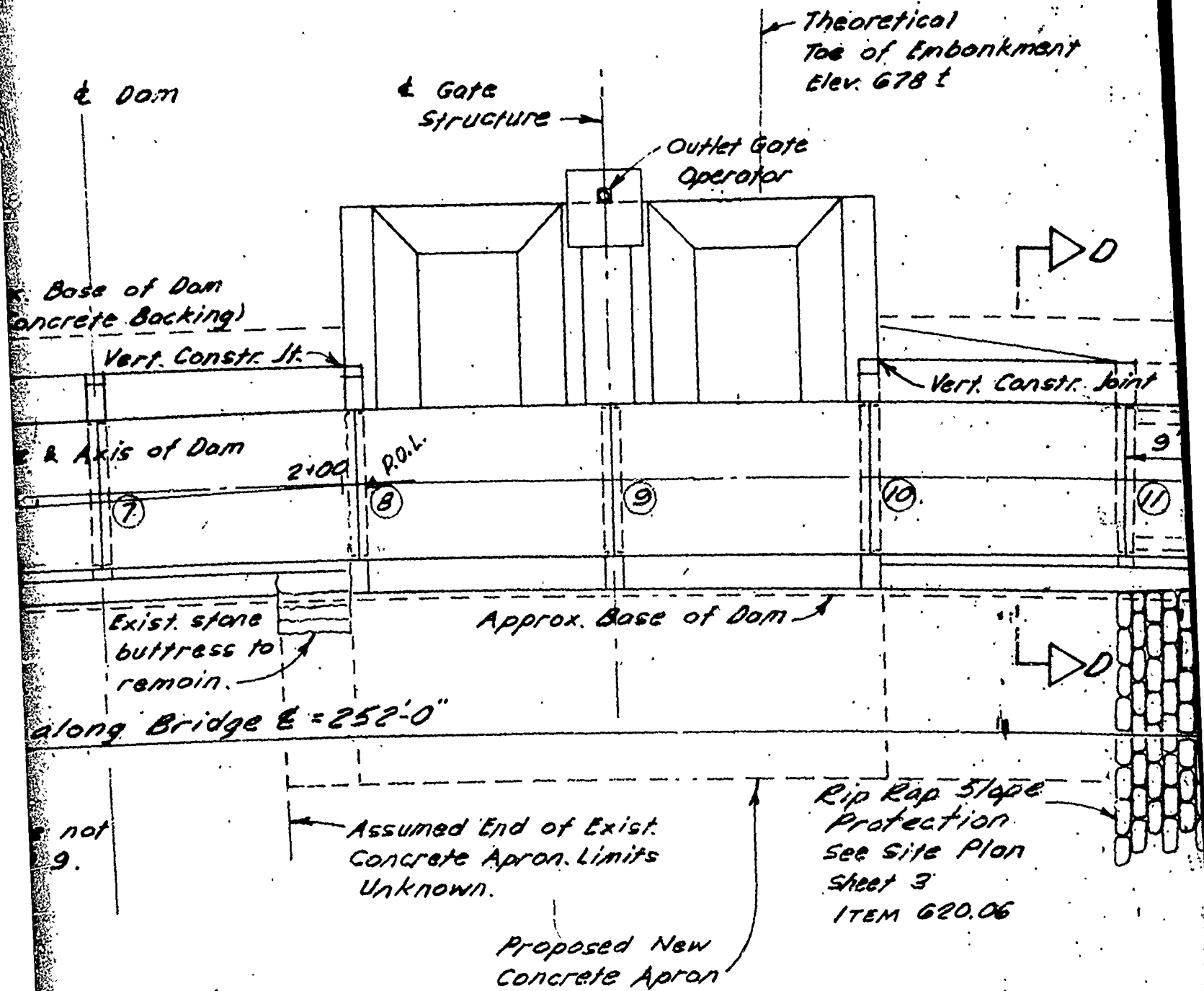
Removable
Traffic Barriers
see Sheet 9

① (Pier Na)

②

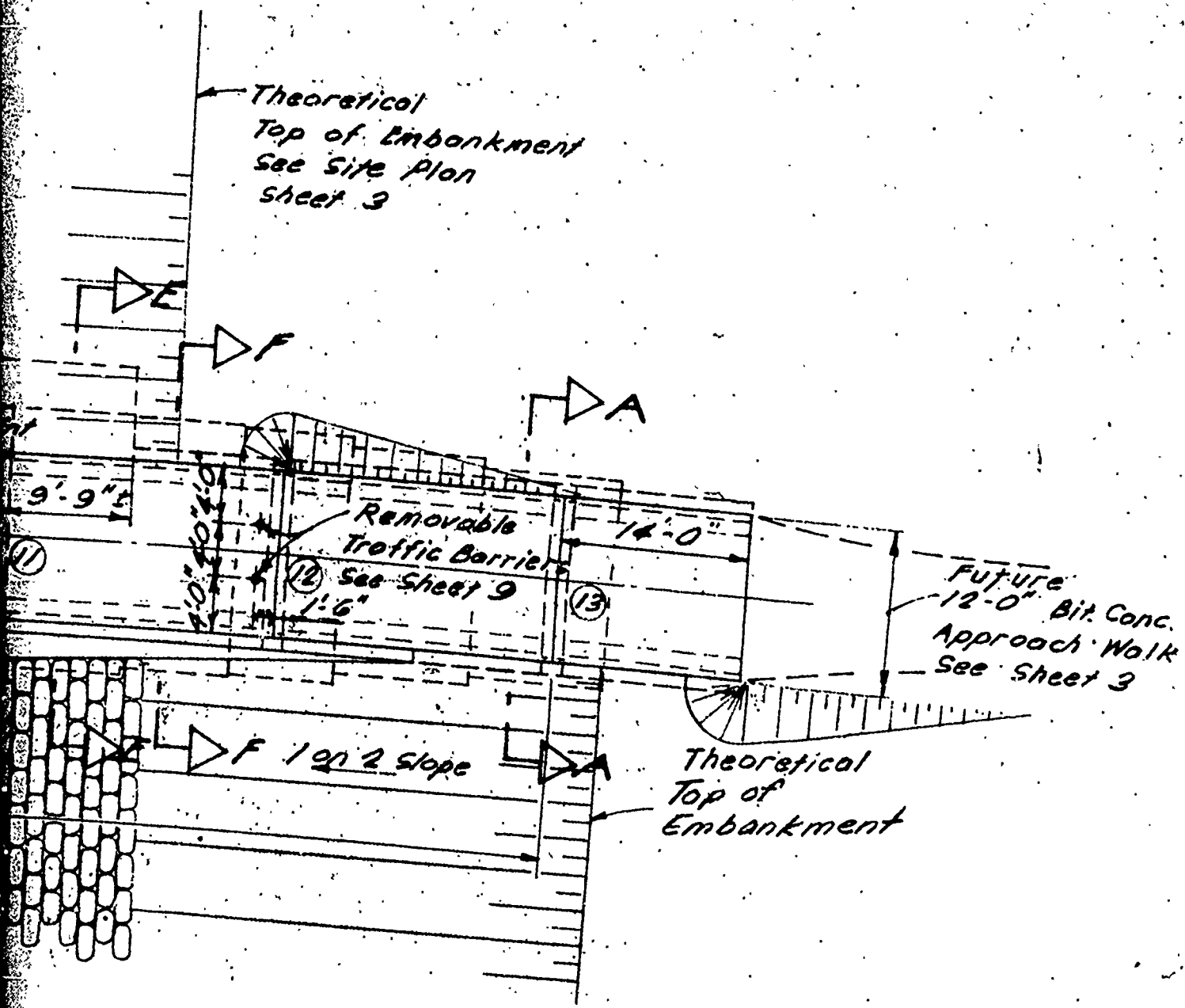
1 on 2 slope





PLAN
Scale: 3/32" = 1'-0"

Wru F-F See Sheet 5)



End of Railing (Far Side)

Concrete Walls
Striated - See Detail
on Sheet 5

Galk
in 2

CRPG

CRPI

Elev. 693.0

Base Slab on Undisturbed Earth
or exist. stone. Limits of
existing stone work unknown.

Elev. 684.0±

Approx. Rock

Top of Riprap (Typ.)

End of concrete encasement
on upstream face

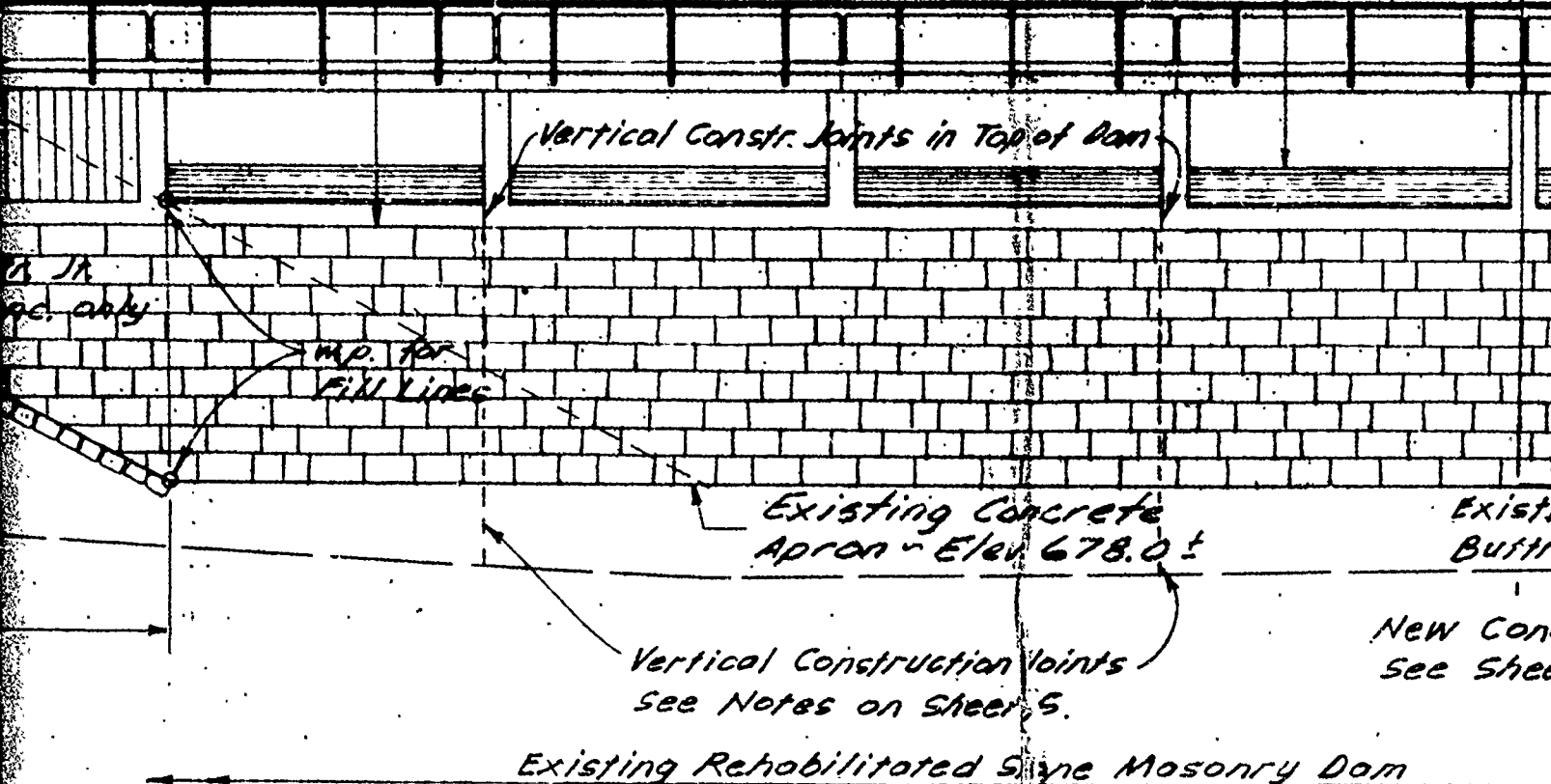
Rip Rap Slope 12'± (Typ. 100'±
Downstream Each Side)

SR2 9/21/77
SR1 9/13/77

Red Steel Railing
0"± panel lengths
Sheet 9
Both Sides

Top of Existing
Dam - Elev. 692.8±
Bottom of Conc. Form - Elev. 693.0
Typical except at Outlet Gate

Ogee Crest
Elev. 696
and dead



DEVELOPED E

Scale: $\frac{3}{32}$ " = 1'

(NOTE: All longitudinal dimensions are

am

(Typical)
(Exact
level)

Deck Elev. 702.0
at Edge of Bridge Slab

Crowned Reinf. Conc. Deck
1'-0" Thick at Edge

Assumed max. HWL 699.

Normal Pool
Elev. 696.5

± Pier

Automatic Gate

Sill Elev.
689.94

Constr. Jt.

Constr. Jt.

Temporary Gate Openings

Stone
to remain

Outlet Gate

Elev. 678.5 (Upstream)
678.0

Conc. Apron

Constr. Jt.
Top of Fm.

Gate Apron
7

New Concrete
Apron - Elev. 678.5
(Downstream, 677.50)

Assumed Rock Line

30'-0" ±

8'-0"

Gate Structure

See Sheet Nos. 6 & 7.

Rock Line at Bottom of
New Reinforced

w/ Stone F
and new stone
dam as close

ELEVATION

referenced to axis of dam)

NOTE 'A' Toe of upstream embankment
to be finished after west temporary
gate openings are closed.

NOTE 'B' Bottoms of all footings to
be founded on rock or undisturbed earth.

NOTE 'C' Provide vertical construction joint
in dam concrete to Elev. 6830 and vertical
control joint in stone masonry. Continue
vertical Construction Joint through concrete
top of Dam.

End of Railing (Far Side)

Concrete Walls
See Sheet 5

RPI RPS

Slope 1 on 4 @ par't. (typ.)

Slope 1/2" per foot and round-off (typ.)

Elev. 693.0 (Constr. It.)

See Note C

1. Top of
2. Sheet Piling

10'-0"
Elev. 688.0 (Constr. It.)

Elev. 684.0
Elev. 683.0 (Constr. It.)

Top of Stone
Elev. 678.0

Bottom Line of
Permanent Steel Sheet Piling
Cut-off Wall - As Driven

See Note B

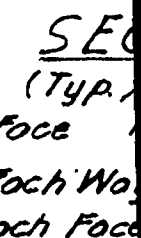
Offset in back face

~~Drive shading into rock
if possible~~

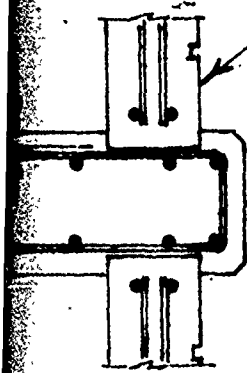
Concrete Dam
Concrete Dam
Facing (Use salvaged
to match existing
as closely as possible.)

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y.				
RENOVATION OF MILL STREET DAM				
CONTRACT NO. 2				
PLAN AND ELEVATION OF DAM				
KONSKI ENGINEERS, P.C.				
SYRACUSE		NEW YORK		
MADE BY WFC/AC	CHECKED BY [Signature]	SCALE As Noted	DATE 8-16-76	DRAWING NO. 7240F2-S2
				SHEET 4



TYPICAL PIER REINFORCEMENT
Scale: $\frac{1}{4}'' = 1'-0''$



Wall - see
Striation Details

Pier

SEC. X
Typ. All Walls
N.T.S.

Way Face Typical

#5 @ 1'-0"
Each Way

Approx.
Fin. Grade

3" cover
Typical

Existing
Masonry Dam

#6 Dowels @ 5'-0" o.c.
Each Way
Drill & Grout
ITEMS CG48.2110
& 602.02

#9 x 8'-0" @ 2'-0" o.c.
Dowels - Drill & Grout
ITEMS CG48.2110
& 602.02

SECTION B-B

Scale: 1/4" = 1'-0"

2'-3" 12'-0"

Bridge

1'-0" slab
@ Edge
(Typ.)

2'-0"

#5 @ 6"

2'-0"

Elev. 702.0
@ Edge (Typ.)

6"

3'-6"

3" cov. (Typ.)

6"

9'-6"

#5 @ 9"

1'-6"

Earth Fill

4'-6"

4'-6"

@ Pier

1'-0"

#5 @ 1'-0" Each Way
Each Face

Elev.

Elev.

Trim off stone if necessary to
see Detail

Exist. Dam

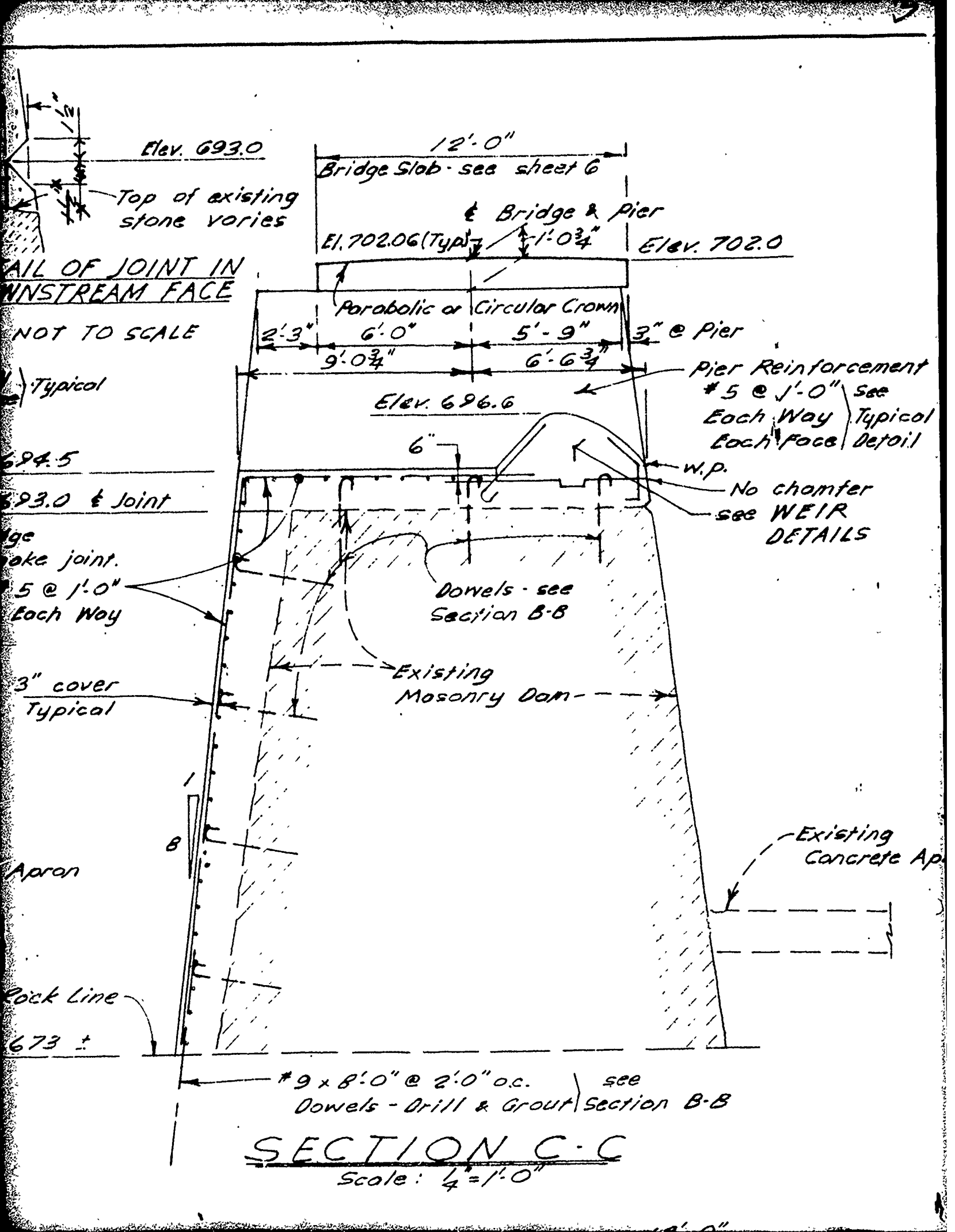
8'-0" min.

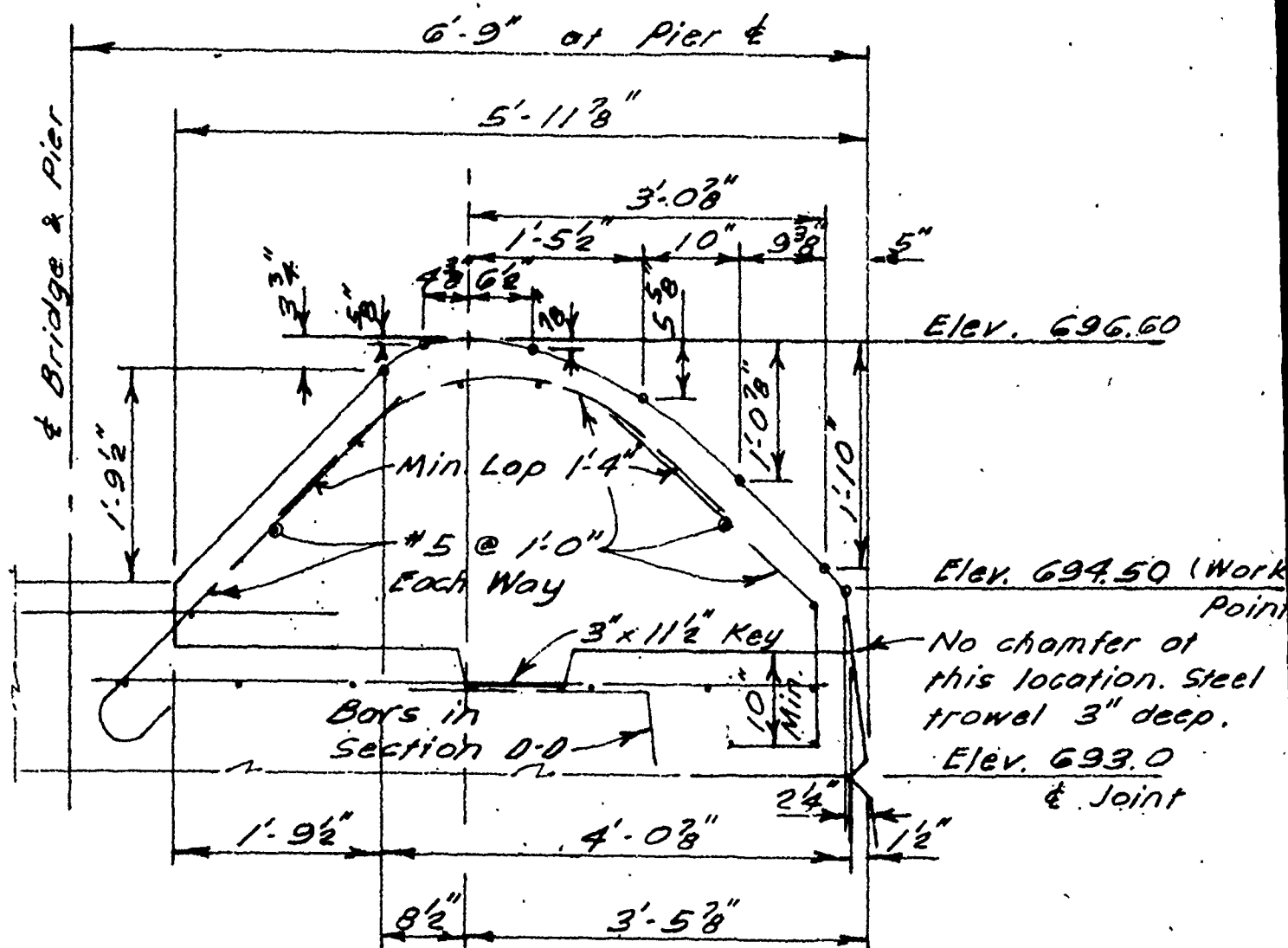
Existing
Concrete

Approx.
Elev.

4'-0"
4'-0"

693.0
Joint





ITEM 601.02

WEIR DETAILS

Scale: 3/4" = 1'-0"

NOTES

The bottom of footing is on approximate bedrock where so indicated. Where sound rock is two (2) feet or less below the given elevation, backfill with Class B concrete. Where sound rock is more than two (2) feet below the given elevation, the Design Engineer shall be so notified and an evaluation of the condition made.

Remove any loose, unsound or fractured material from top of rock and leave surface as rough as possible before pouring concrete.

Drill and grout rock through new concrete footing before pouring

Upstream
Face Only

2" R

SEC. Y

(Typical all Pier
edges in contact
with water)
N.T.S.

Item 601.02

Elev. 694.5

Bridge Slob - see Sheet 9

Bridge & Pier

Elev. 702

8'-3"
9'-0 3/4"
5'-9"
6'-6 3/4"
3"

Elev. 696.6

6"

#5 @ 1'-0"
Each Way

Approx. Fin. Grade

NOTE: These bars
may be lapped as
indicated on down-
stream face of
section.

3" cover
Typical

#5 @ 1'-6" Each Way

2'-6"
Nominal
Typical

Stone Anchors
See Section E-E

Reinforced
Concrete Dam

#5 @ 1'-0"
Each Way

Grout Holes - See Section E-E

15'-0"
#9 x 8-0" x 2'-0" o.c.
Dowels - Drill & Grout

SECTION D-D

Scale: 1/4" = 1'-0"

10'-0"
5'-0"

SRI A-26-9/13/77

Reinforcement
1'-0" S
Detail

Detail

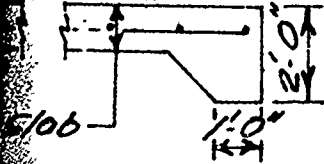
1/2 S

ing

0" Concrete Apron

#5 @ 1'-6" Each Way
Mid Depth

678.0

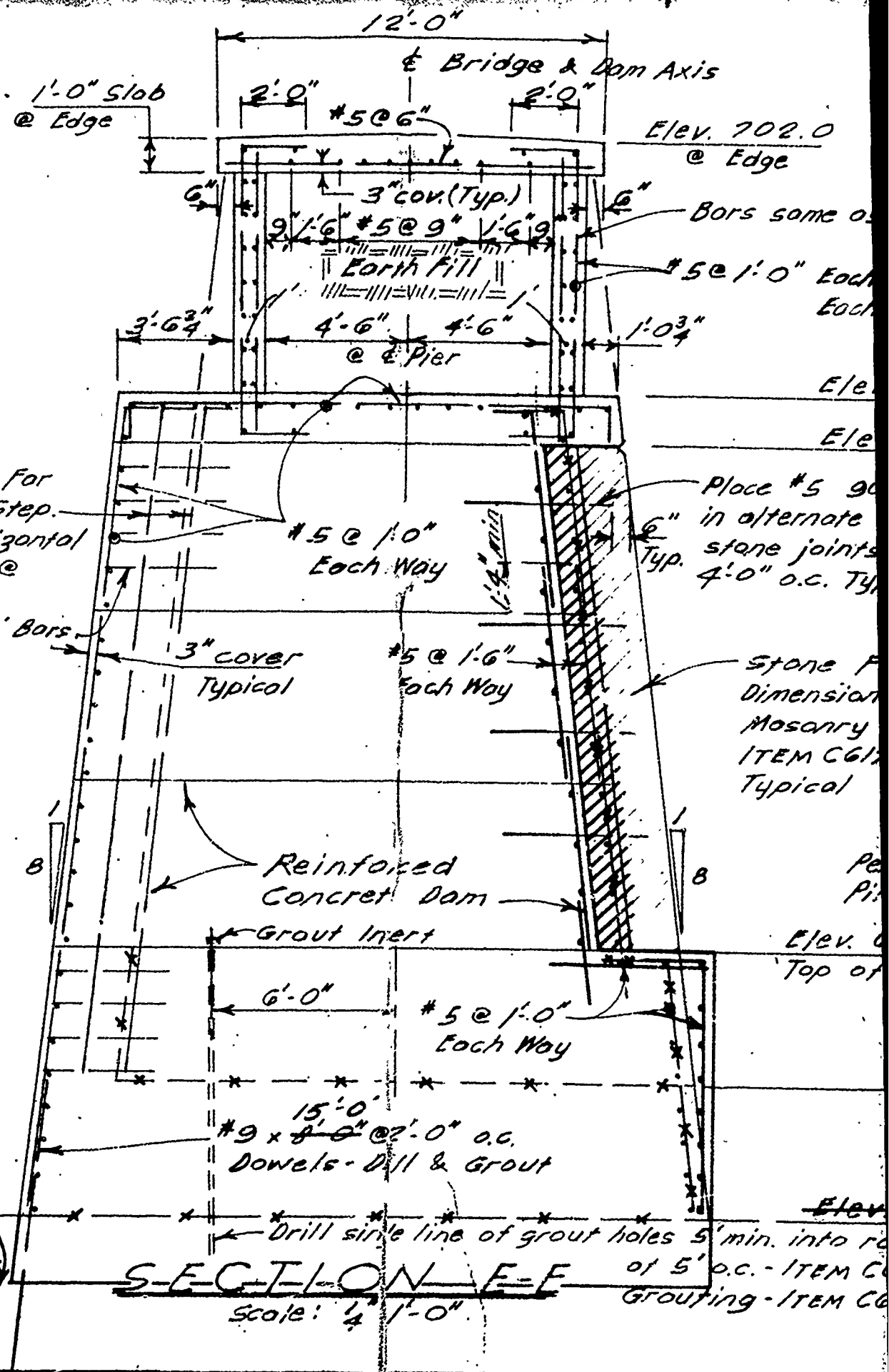


Rock Line

674.5

668.5 Elev. 668.5

666.5 @ Pier (10)



SECTION E-E

Scale: 1/4" = 1'-0"

Section B-B

Typical

94.5

93.0

look bars $\frac{1}{2}$ "

Vertical #5 @ 1'-0" Each Way

ing

ment Steel Sheet see Sheet 4

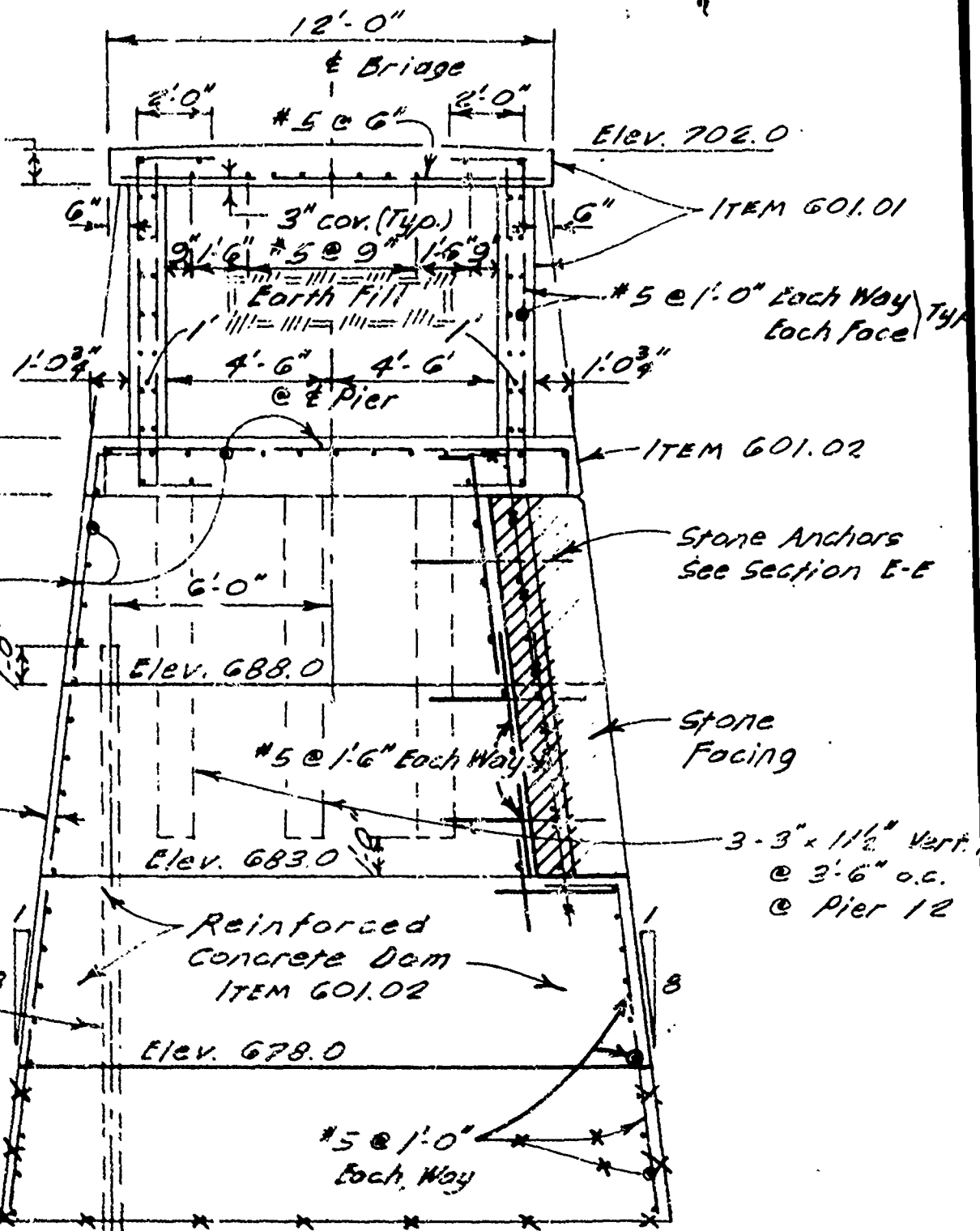
9.0 Footing

Elev. 674.0

2111

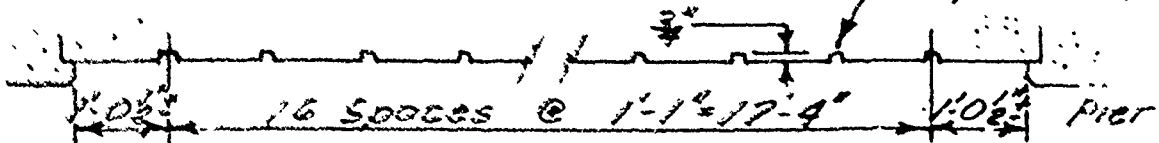
2112

Pier



SECTION F-F

Scale: 1/4" = 1'-0"



STRIATION DETAIL

NOT TO SCALE

Drill and grout rock through new concrete footing before pouring subsequent lifts.

Concrete encasement on back of existing dam, horizontal lifts of new dam and top slabs on both sections shall be placed in alternate pours between vertical construction joints.

Weirs are to be poured after bridge piers are in place and must be poured to exact elevation and finished dead level.

Concrete in bridge slabs, piers and walls to be Class A. All other concrete to be Class B (Class A Optional). Chamfer all exposed edges of concrete 1" x 1" unless otherwise shown or noted.

Leave tops of horizontal lifts rough, and clean and wash thoroughly with high pressure water before placing next lift.

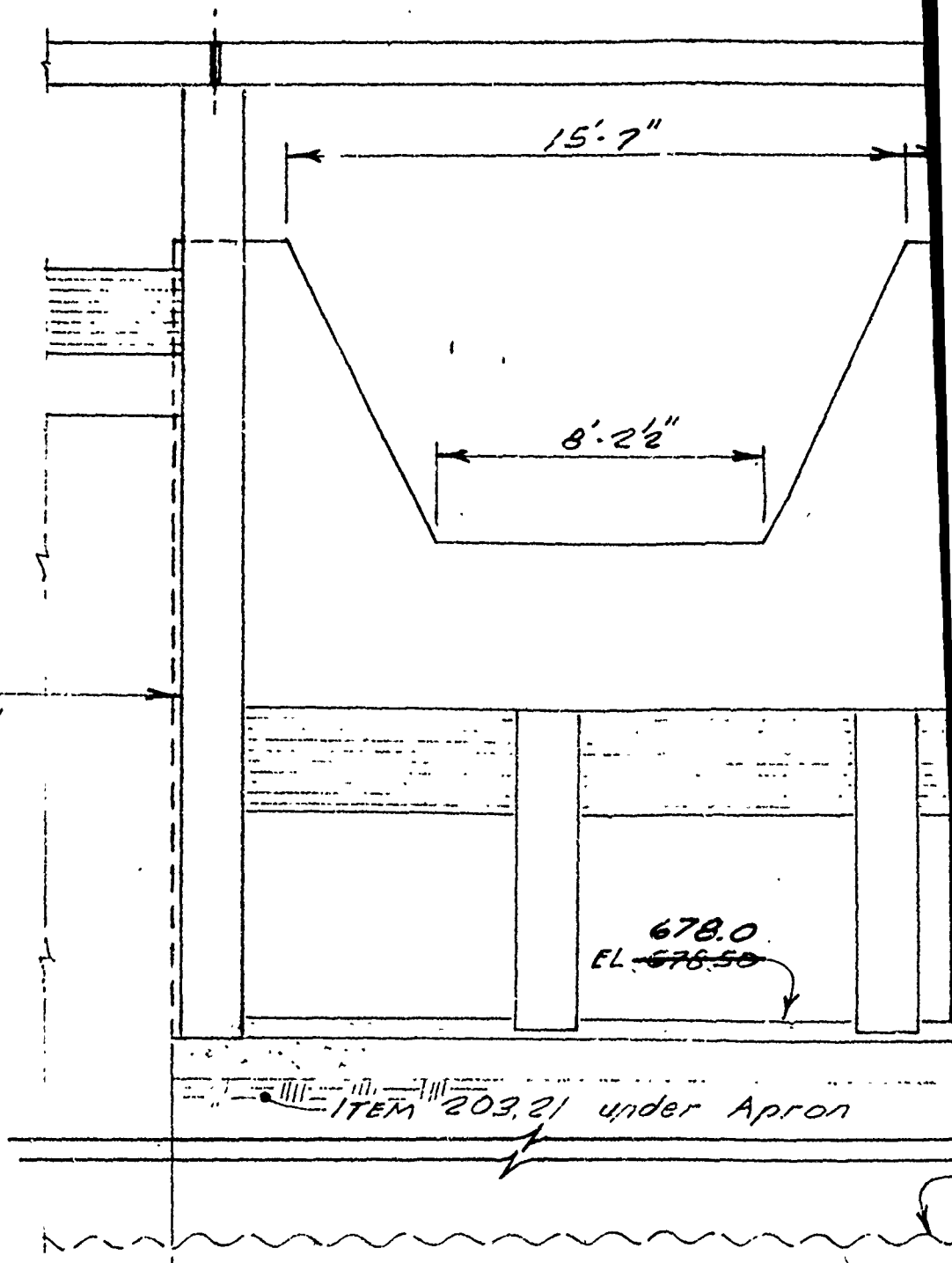
Place stone facing before pouring lift. Horizontal joints in stone and concrete do not have to match. Stone masonry is not capable of supporting a five-foot lift of concrete as a form and must be braced or tied back.

Stone masonry to match that in existing dam as closely as possible.

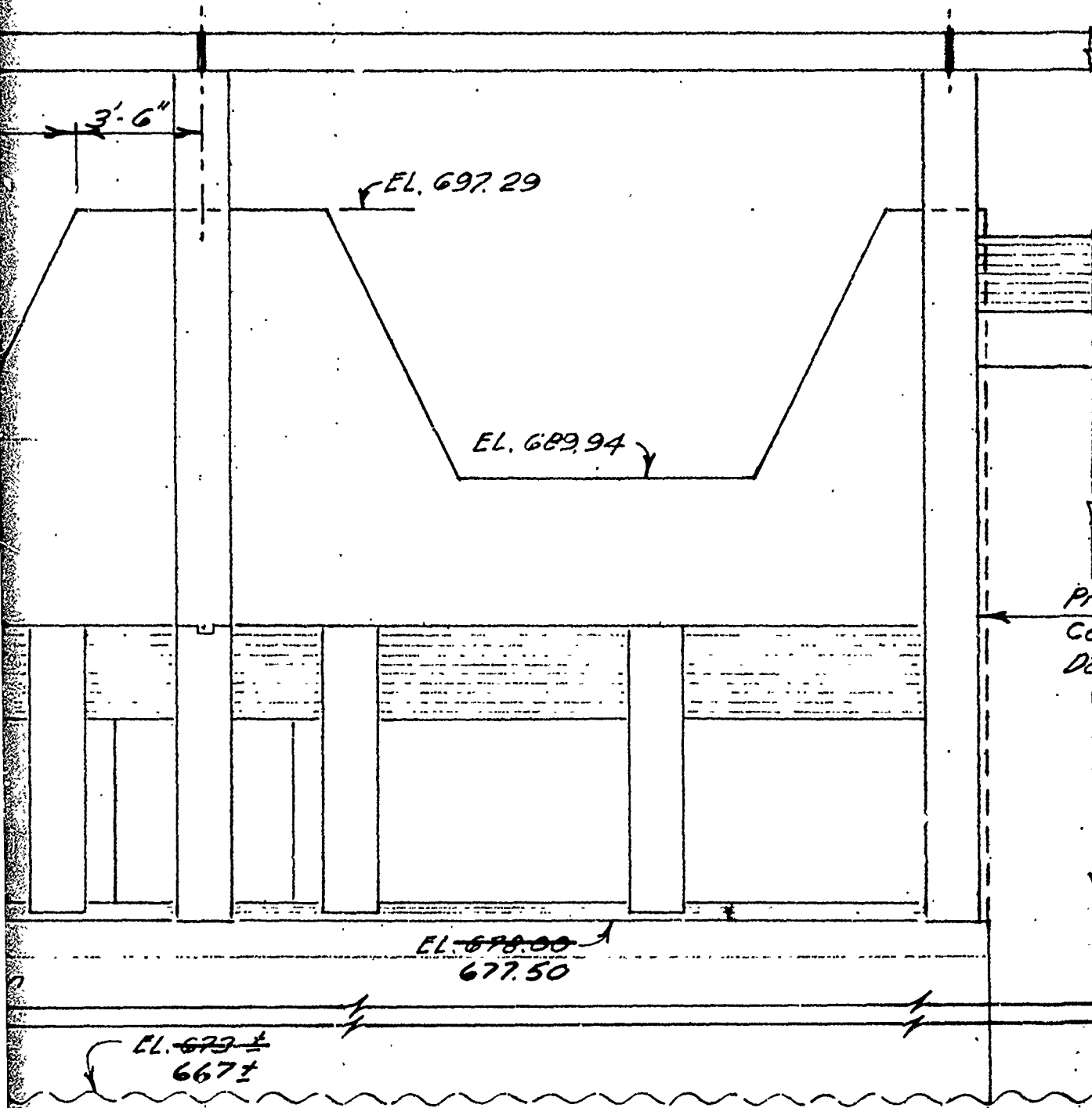
AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y.				
RENOVATION OF MILL STREET DAM				
CONTRACT NO. 2				
TYPICAL SECTIONS - DAM				
KONSKI ENGINEERS, P.C.				
SYRACUSE			NEW YORK	
MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.
WFG/AC	JWG	As Noted	8-16-76	7240F2-S3
SHEET				5

Existing
Masonry
Dam

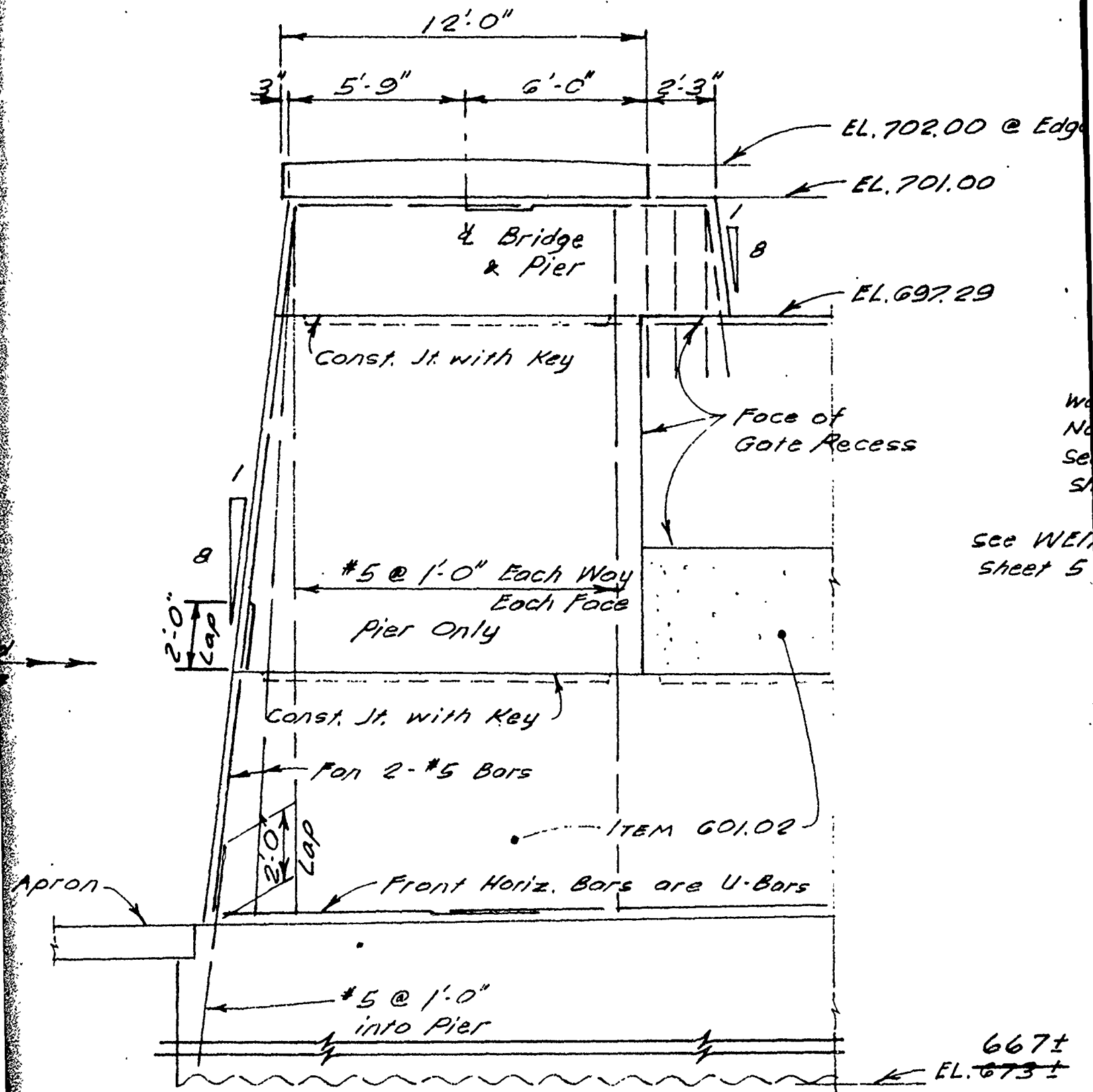


NORTH E.
Scale: 1"



ELEVATION

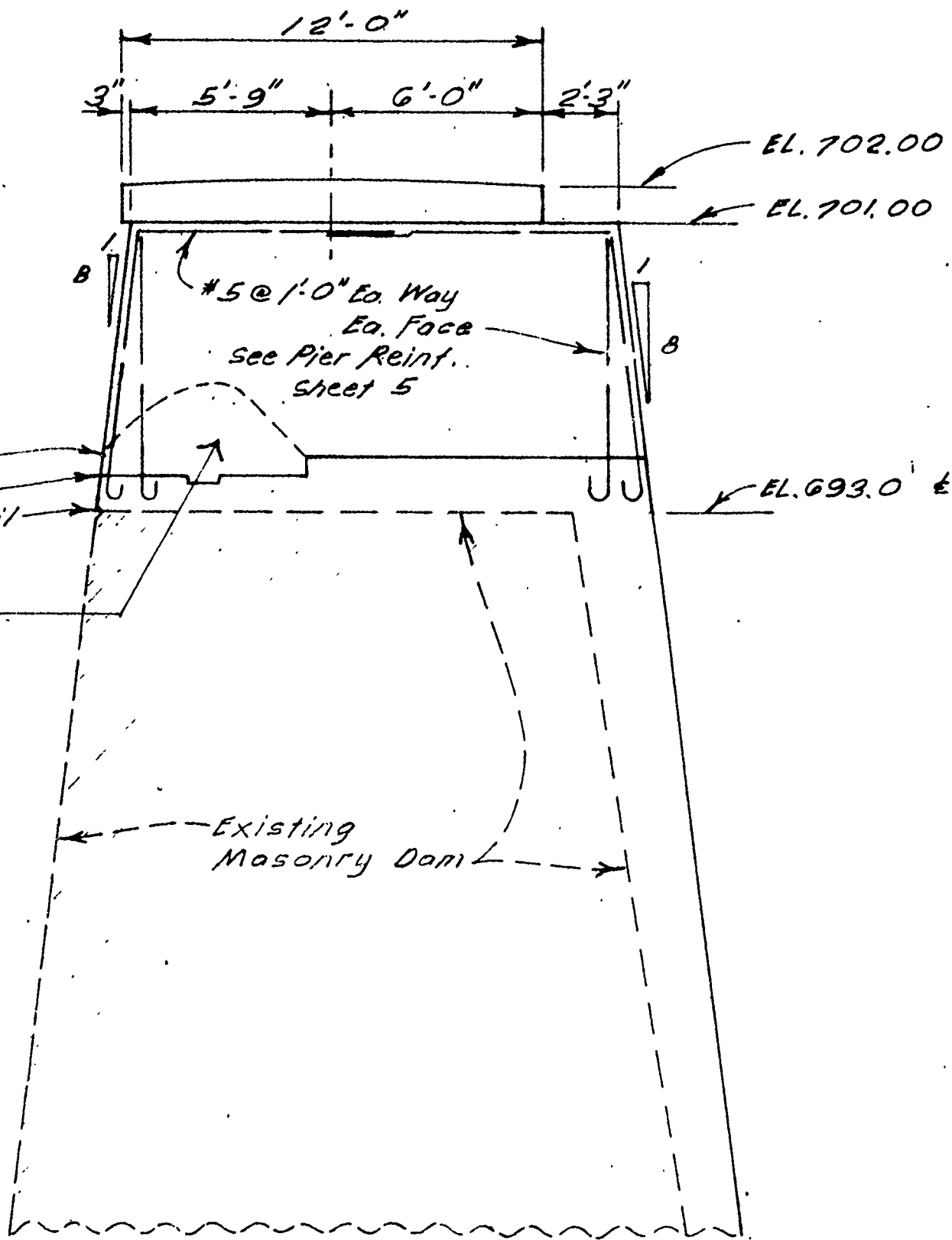
Scale: 1/4" = 1'-0"



@ Edge (Typ.)

WEIR DETAILS
Sheet 5

67±
3±

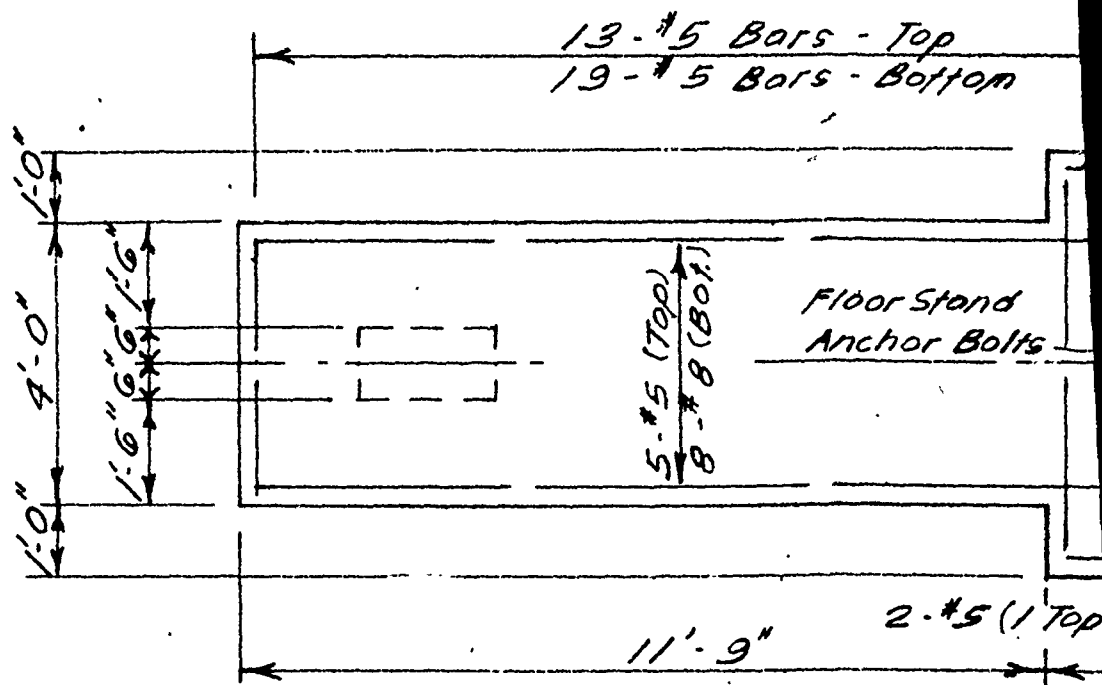


5

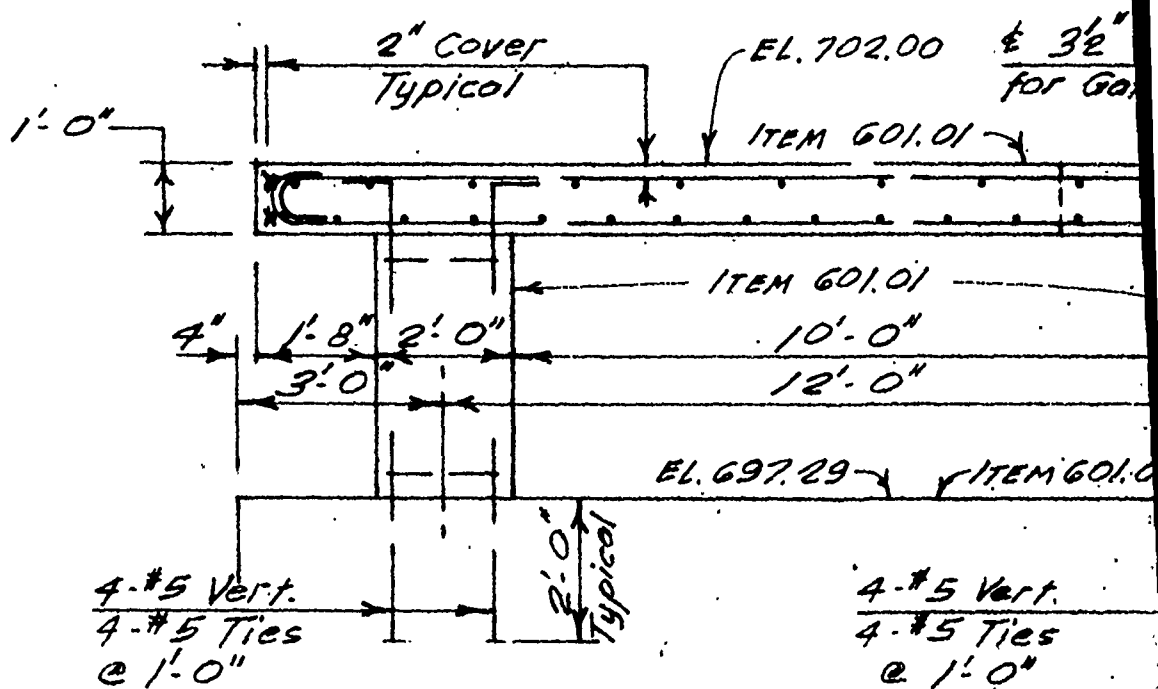
Edge(Typ.)

Joint

Scale



PLAN



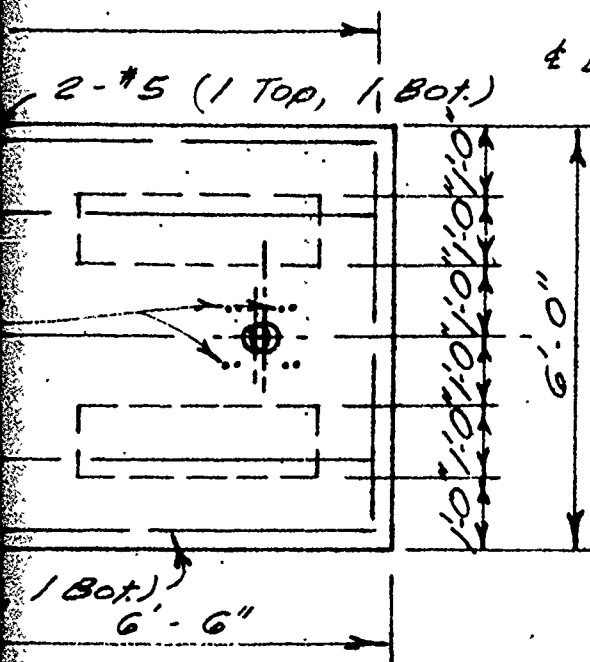
SECTION PLATFORM DETAIL

Scale: 3/8" = 1'-0"

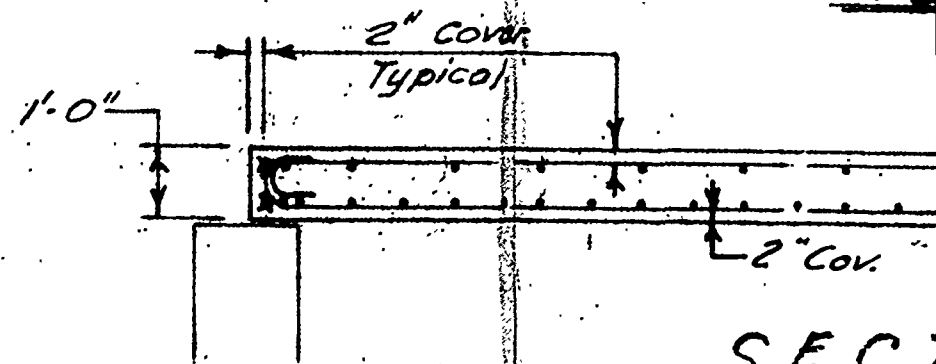
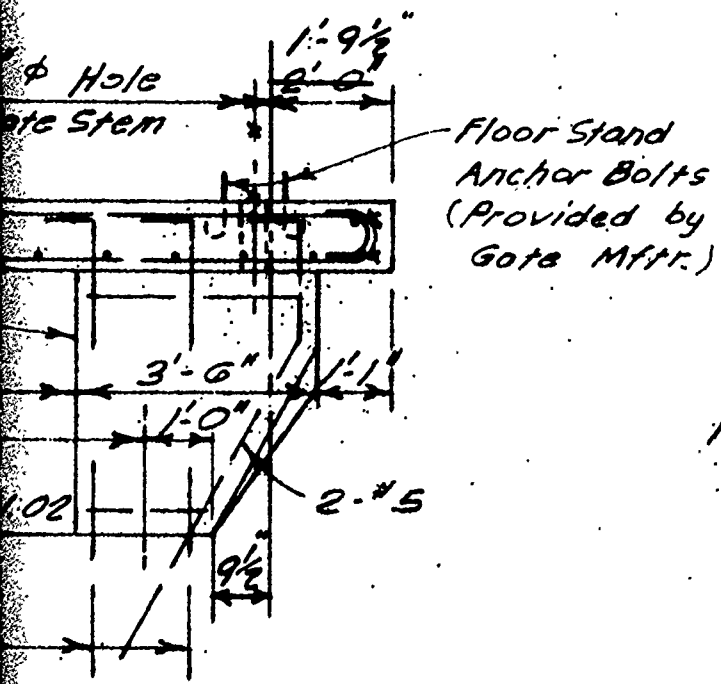
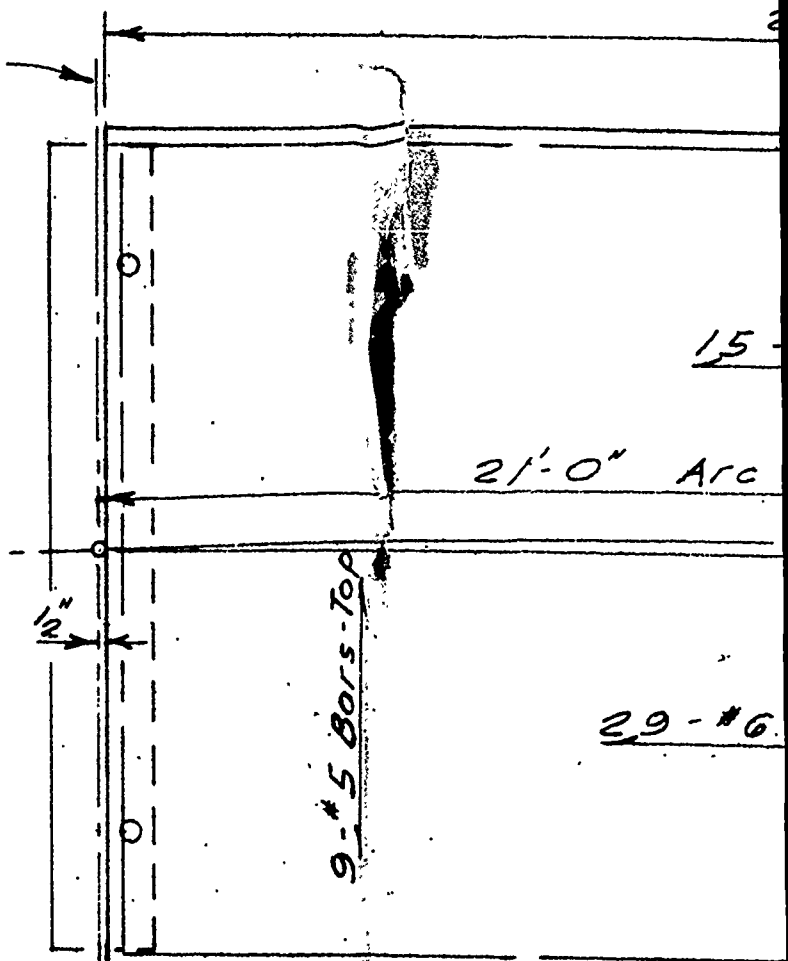
SRI AC/LAS 9/10/77

ELEVATION

1/4" = 1'-0"



Bridge & Pier



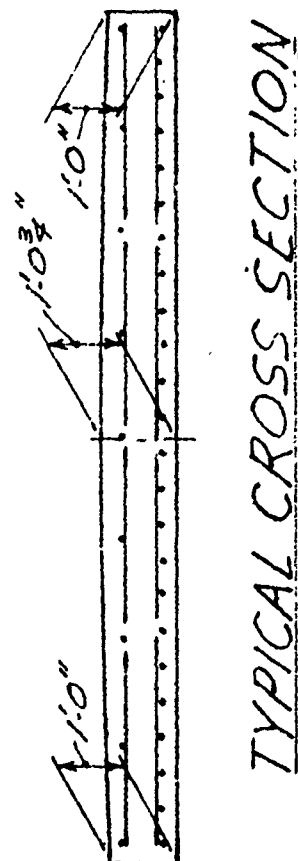
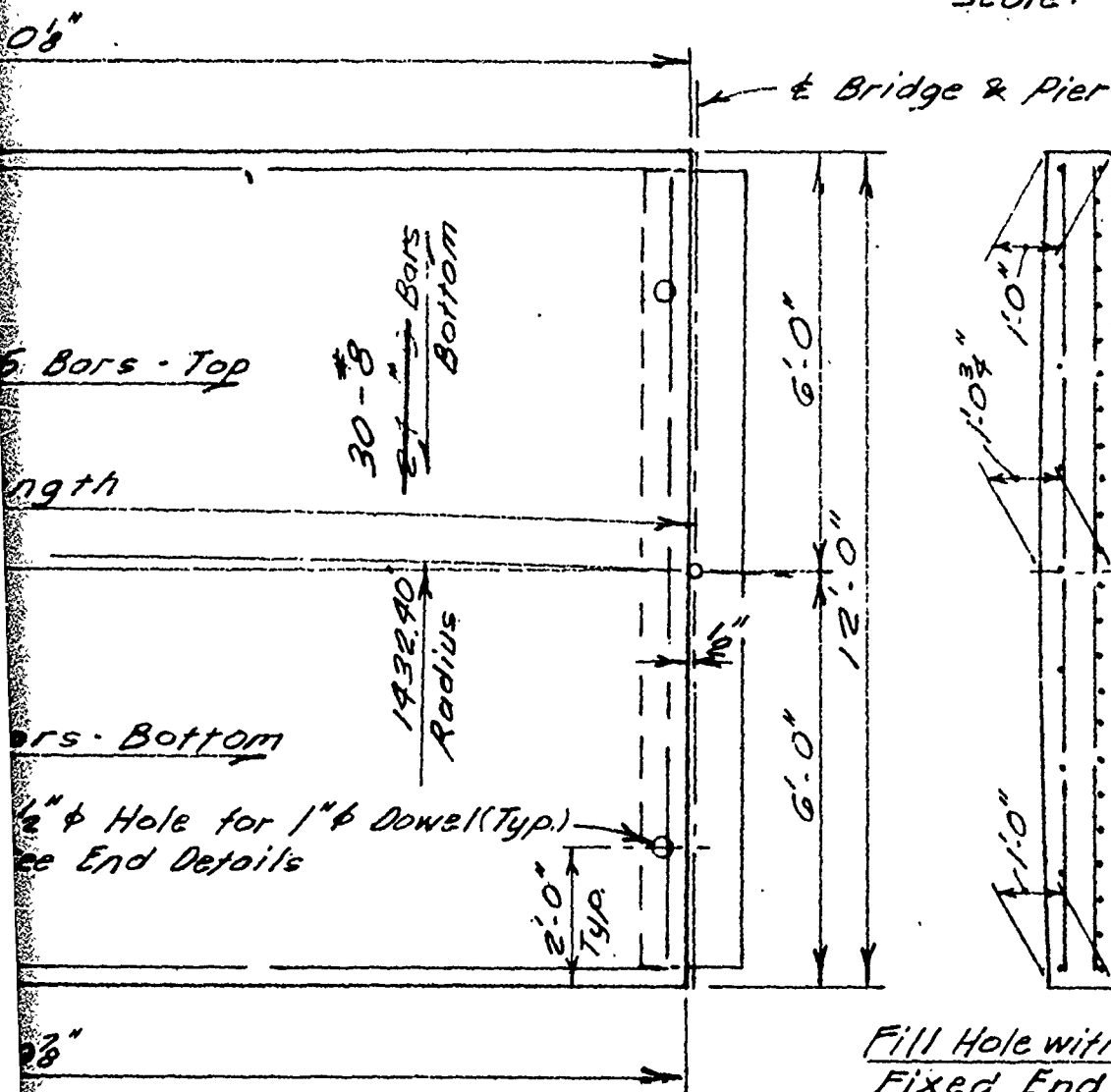
SECTION
BRIDGE
Scale: 3/8"

ILS

7

PIER ELEVATION

Scale: $\frac{1}{4}'' = 1'-0''$



AN

ITEM 601.01

ON

SLAB

1'-0"

END DETAILS

Scale: $1'' = 1'-0''$

AT WEIR

NOTE:

Bridge slabs over Weirs and Gates may be pre-cast or cast-in-place at Contractor's option. Bridge slabs over earth fill, and slob to operating stand shall be cast in place.

Gate erection equipment will be permitted on dam bridge if gross weight does not exceed 36 tons or single axle load 16 tons. When erecting gates, place loaded wheels over a pier. For gate details and erecting procedure see manufacturer's literature. See Specifications.

with Bitumen
on End
plates

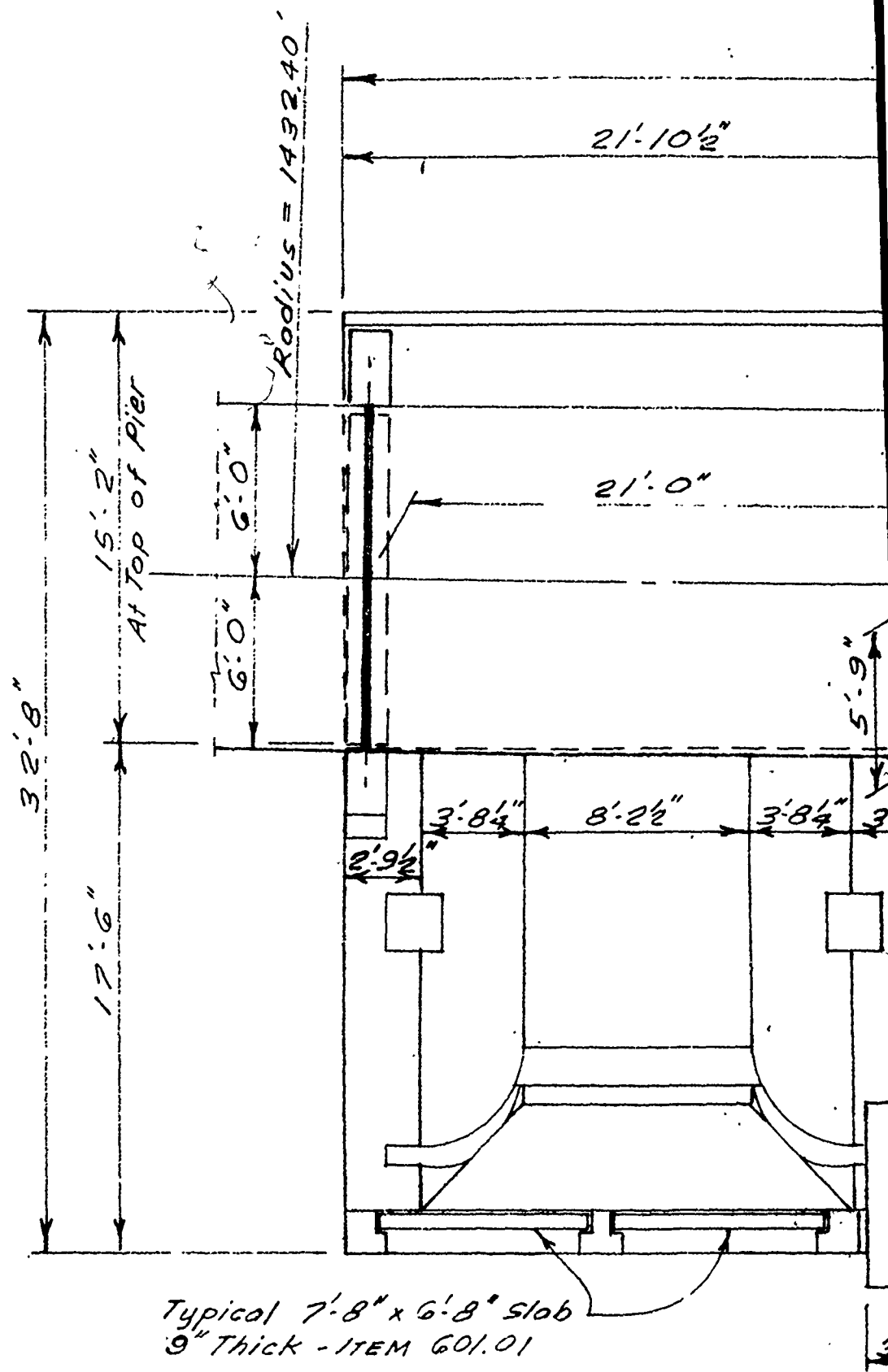
AS BUILT

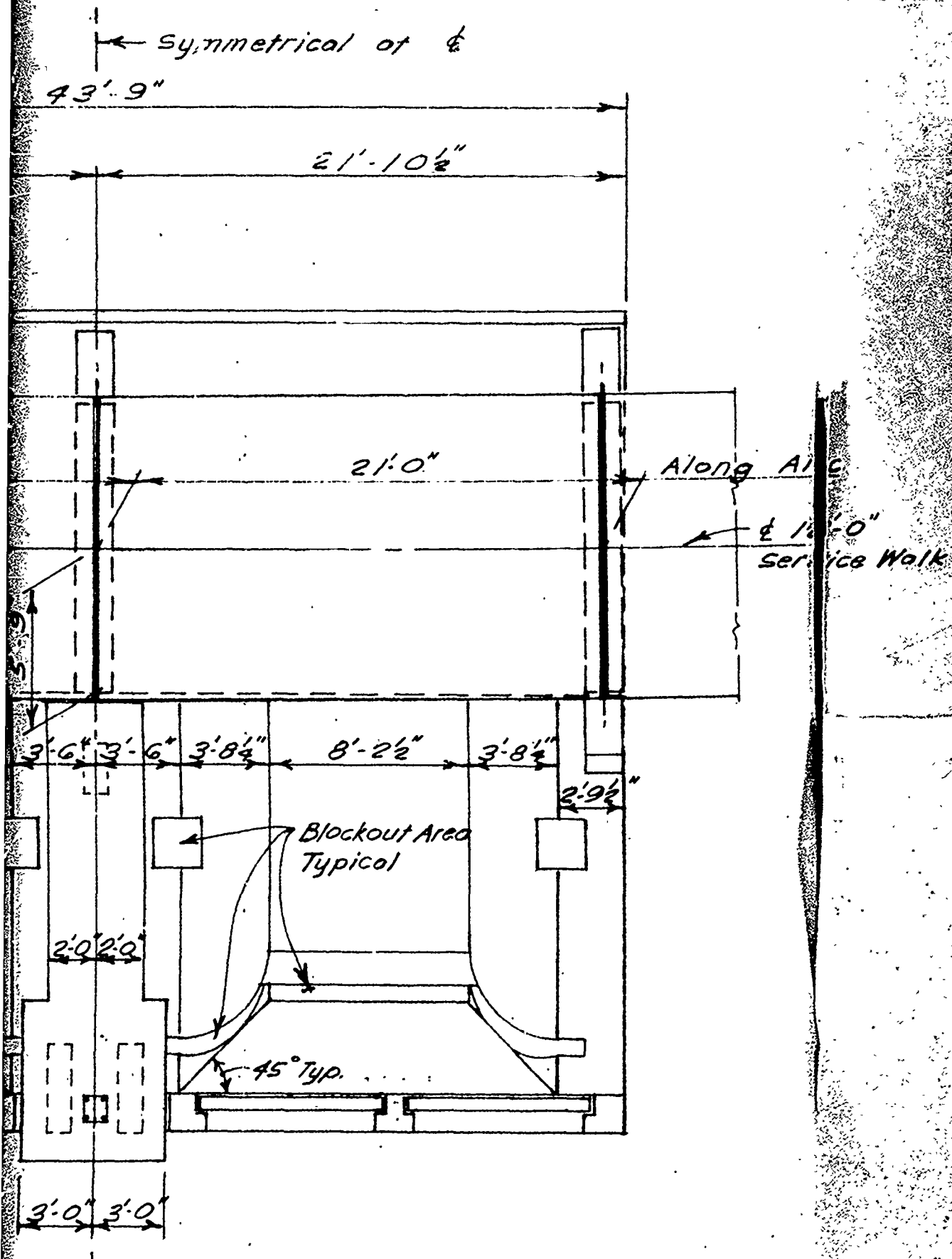
1' x 1'-6"
owels

ring

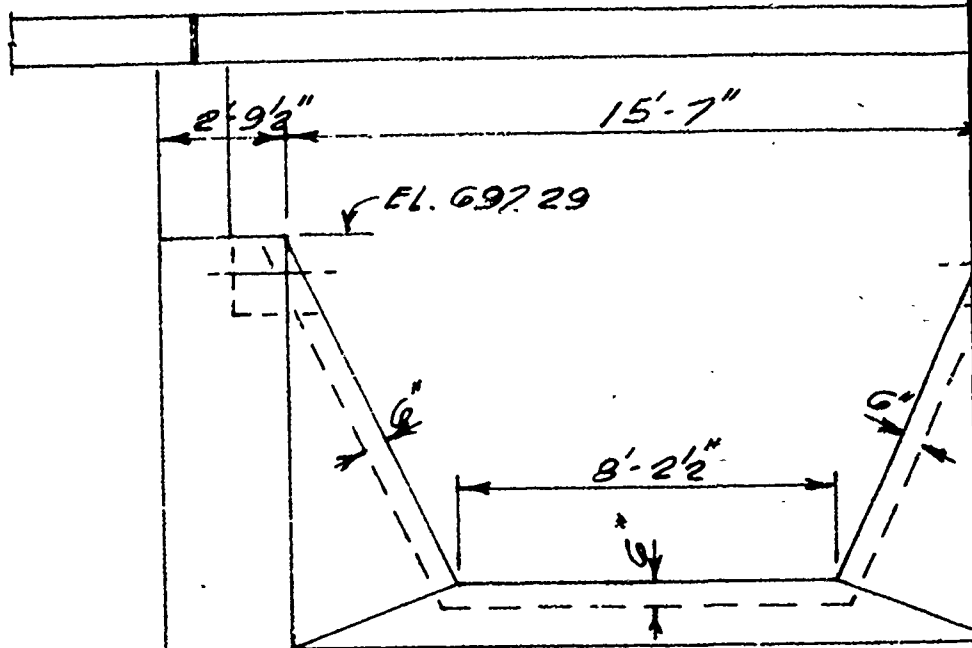
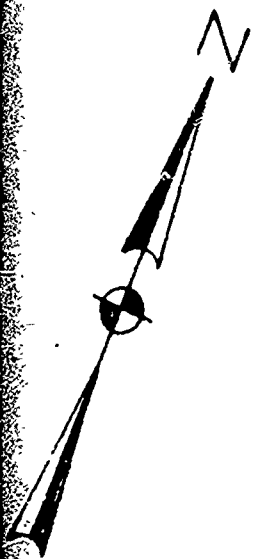
REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y. RENOVATION OF MILL STREET DAM CONTRACT NO.2				
GATE STRUCTURE DETAILS-I				
KONSKI ENGINEERS, P.C.				
SYRACUSE			NEW YORK	
MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.
Ac	JWG	As Noted	8-16-76	7240F2-G1
				SHEET
				6

4

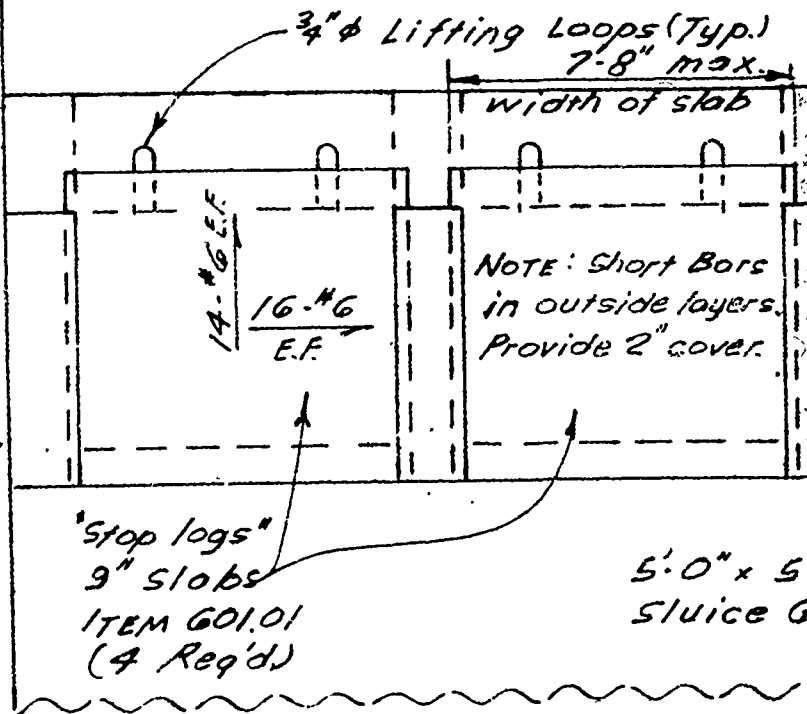




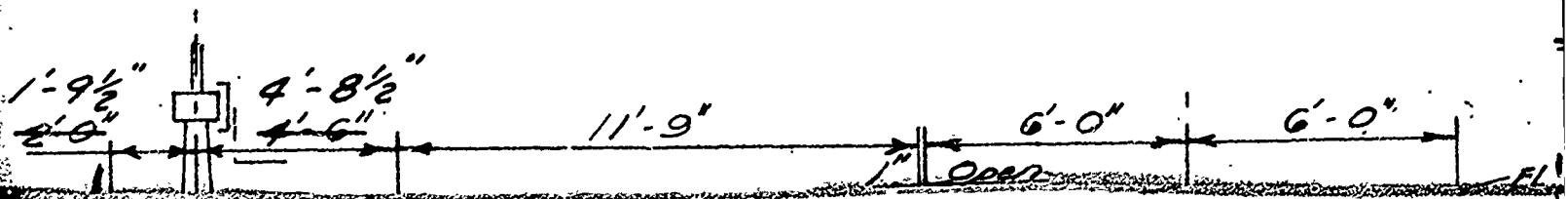
NOTE: Blockout areas are provided in first stage concrete for grouting

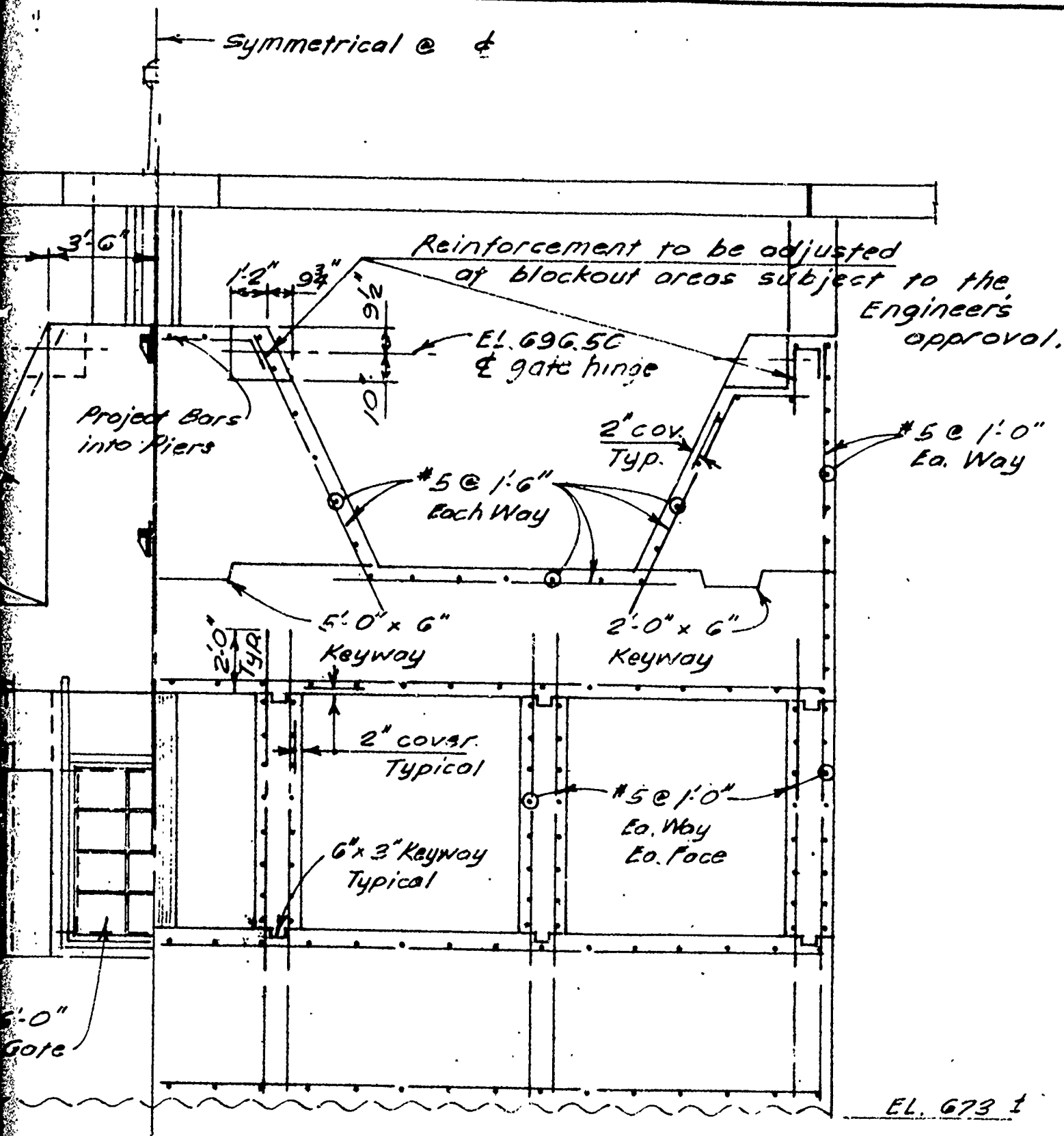


NOTE: Chamfer "Stop Logs" 1/2" x 1/2" max. on all edges. After erection, seal top and exposed sides and bottom edges with Mat'l. Spec. 705.06. Seal grooves with oakum and Nool's pitch.



HALF SOUTH ELEVATION



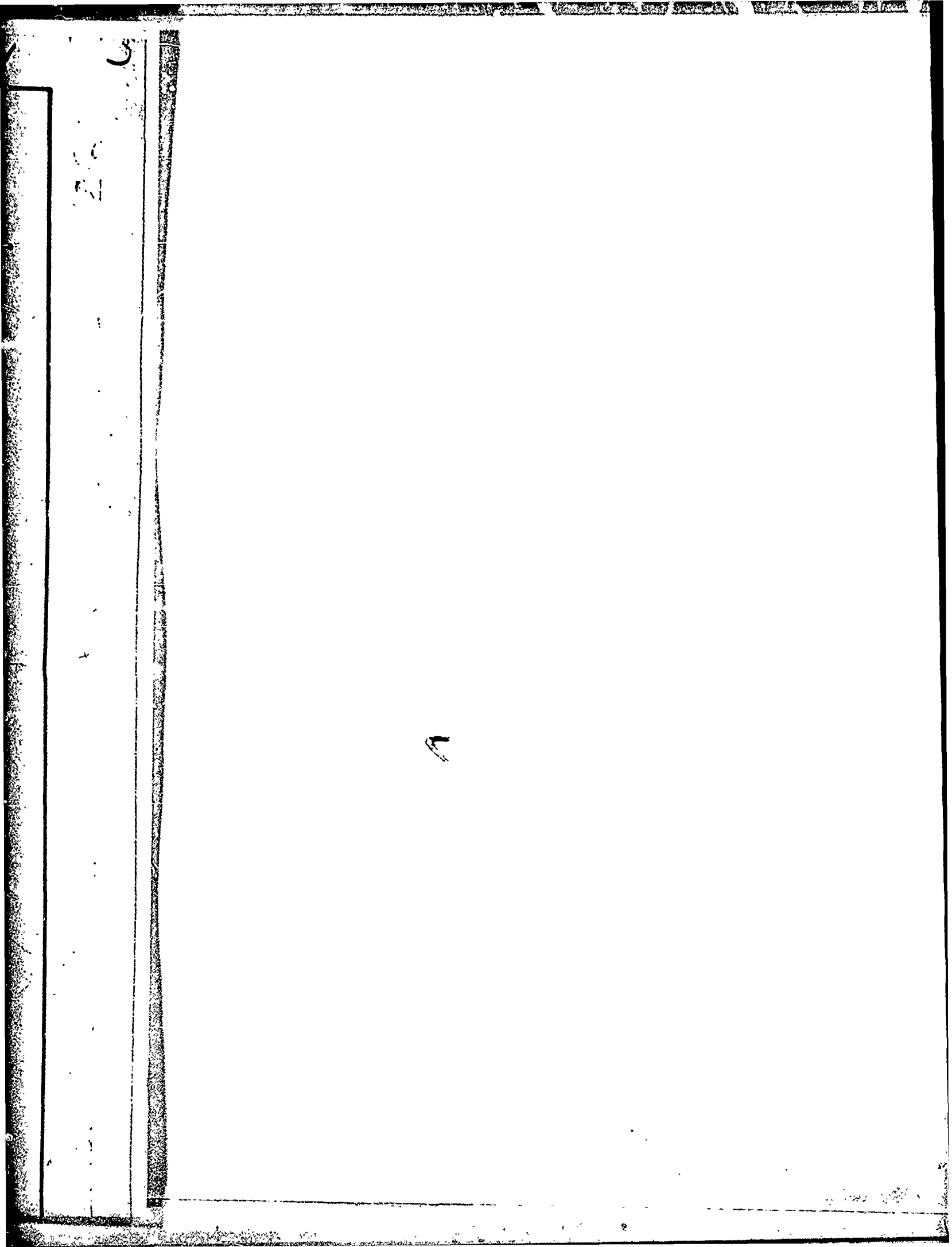


SECTION HALF SECTION

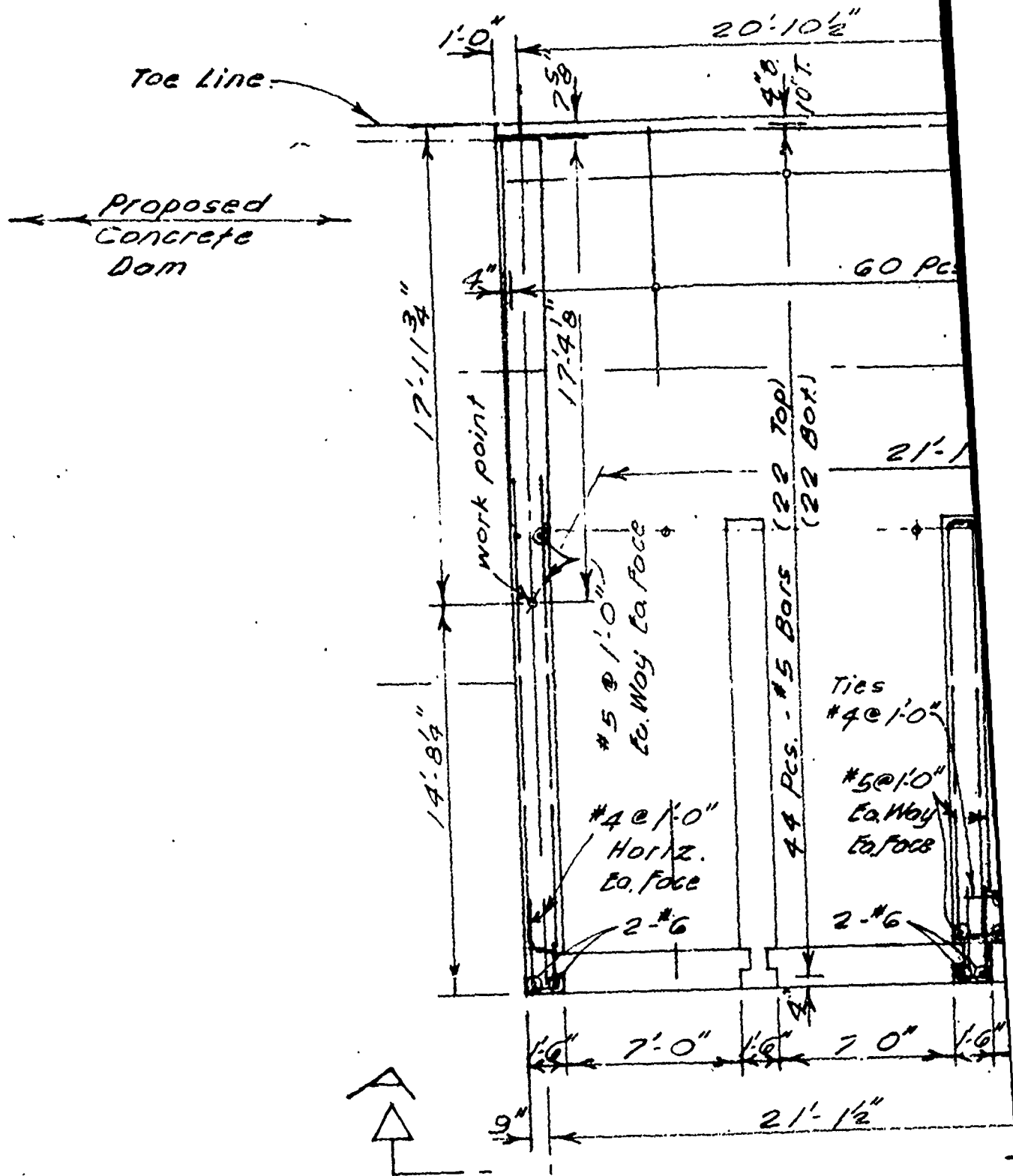
SECTION A-A

Scale: 1/4" = 1'-0"

202.00



SRI A-12A1 9/13/77 SR2 261 9/20/77



FOUNDATI
Scale

smoothed out flush with wall surface.

B 

1:1 

20'-10 1/2"

1'-0"

See Platform
Details
Sheet 6

Notch for Apron

Toe line

Apron

Existing
Masonry
Dam

#5 Bors (30 Top)
(30 Bot.)

Axis of Dam

Pier (Rein)
Typical

21'-1 1/2"

To work point

Grout Holes
See Sht. 5

Work
point

Wall Thimble for
Sluice Gate

#5 @ 1'-0"
Eo. Way to Face

#4 @ 1'-0"
Horiz.
Eo. Face

2'-0" Typ.

2-#6

4 1/2" Typ.

10" Typ.

2'-0" Typ.

21'-1 1/2"

1'-0"

B 

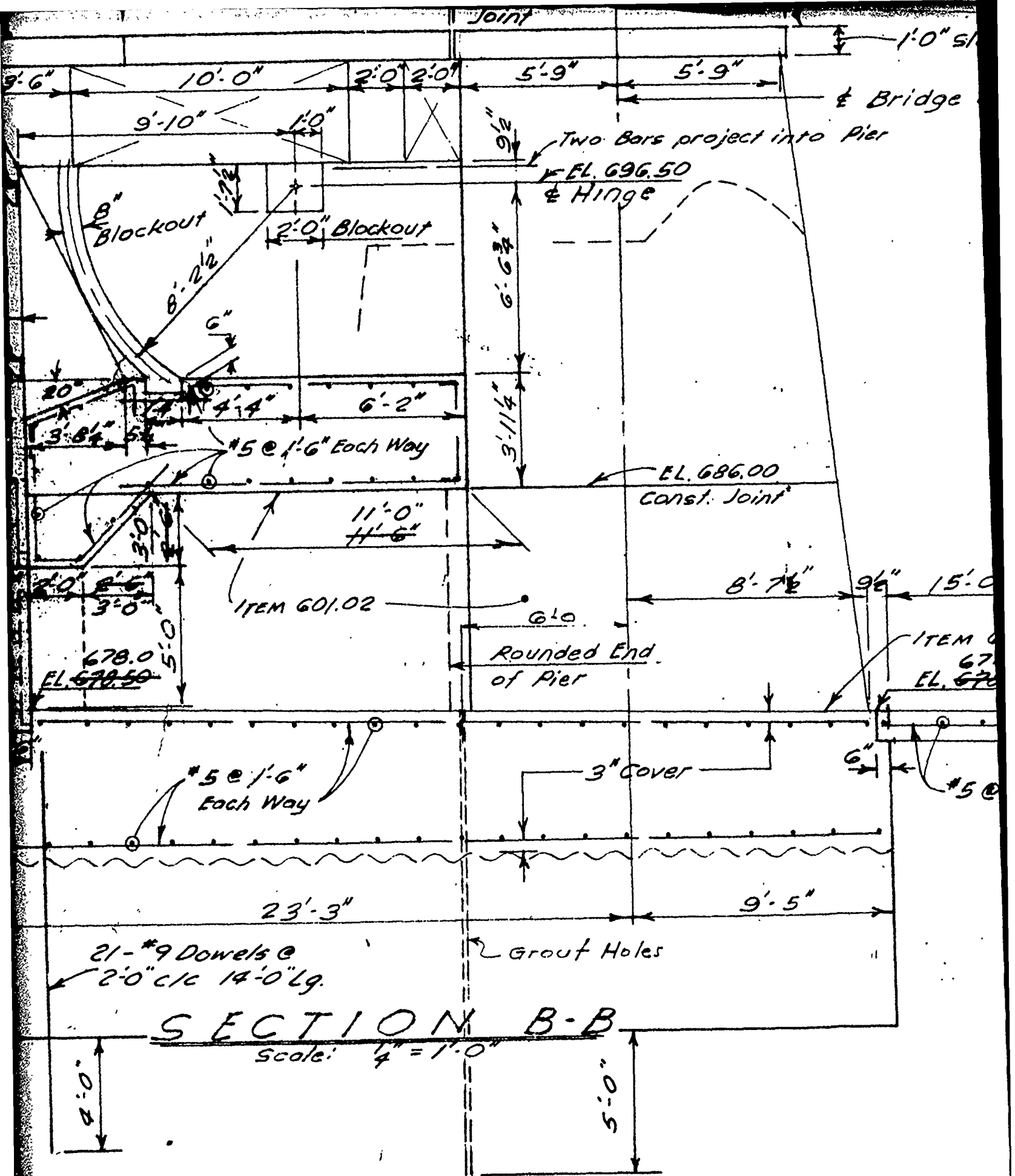
677.25
EL. 677.75

EL. 673 ±

EL. 667 ±

ON PLAN

3/16" = 1'-0"

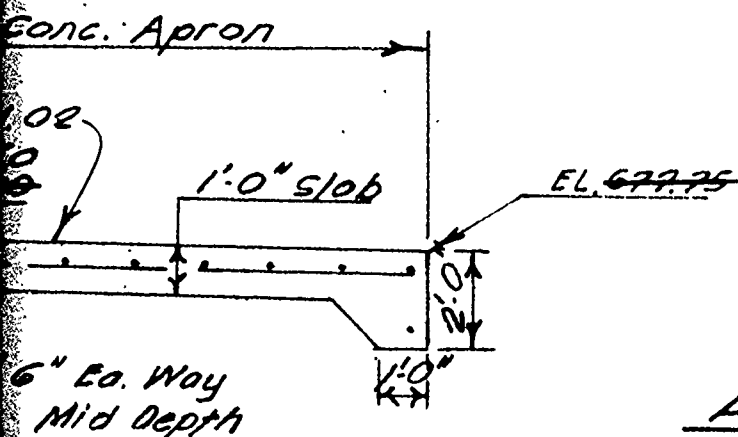


NOTES:

The bottom of footing is on approximate bedrock. Where sound rock is 2' or less below the given elevation, backfill with Class B concrete. Where sound rock is more than 2' below the given elevation, the Design Engineer shall be so notified and an evaluation of the condition made.

For design purposes, the foundation pressure does not exceed 2.5 tons per square foot.

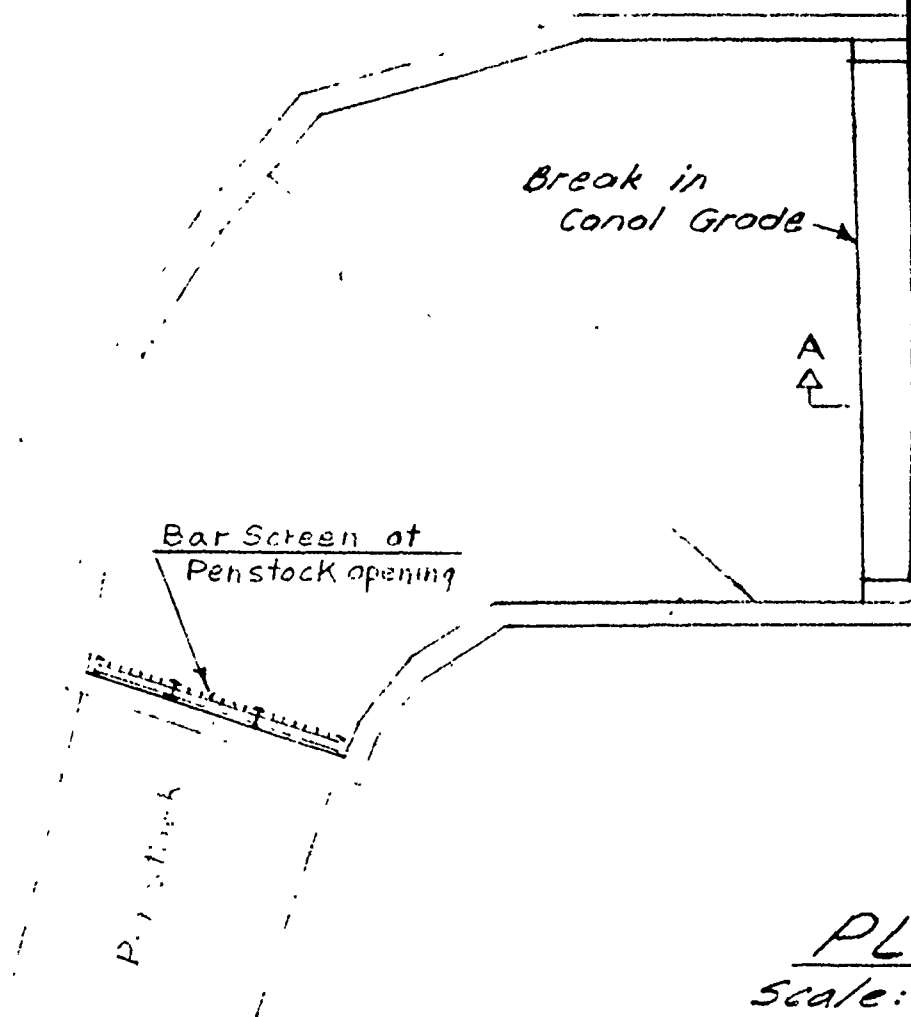
Place #5 bars @ 1'-0" centers each way in all exposed faces of gate structure where not otherwise specified.



AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y.				
RENOVATION OF MILL STREET DAM				
CONTRACT NO. 2				
GATE STRUCTURE DETAILS-II				
KONSKI ENGINEERS, P.C.				
SYRACUSE		NEW YORK		
MADE BY	CHECKED BY	SCALE	DATE	DRAWING NO.
Ac	JWG	As Noted	8-16-76	7240F2-G2
				SHEET
				7

9



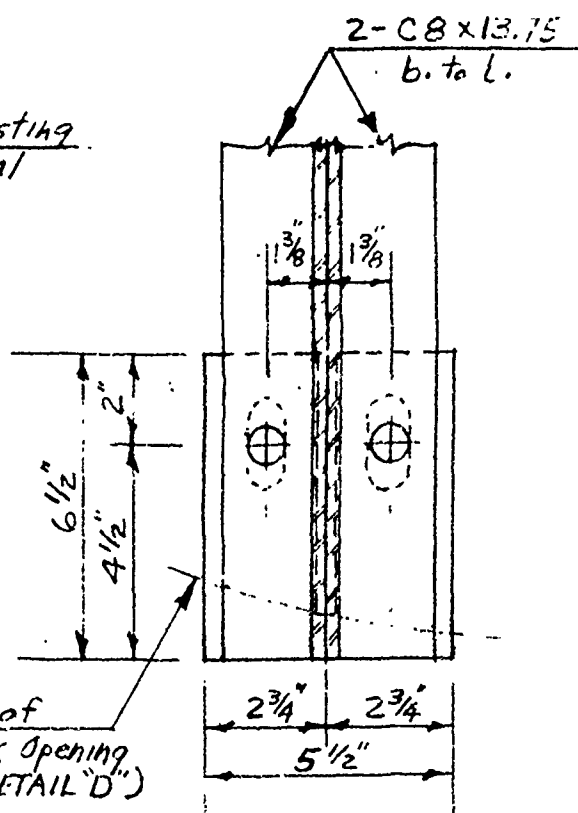
Break in
Canal Grade

A
↑

Bar Screen at
Penstock opening

Penstock

PL
Scale:



FRONT VIEW

DETAIL C

DETAIL "D" (9)

Scale: 3" = 1'-0" (Per

PLAN

$Ve: \frac{1}{8}'' = 1'-0''$

2

3

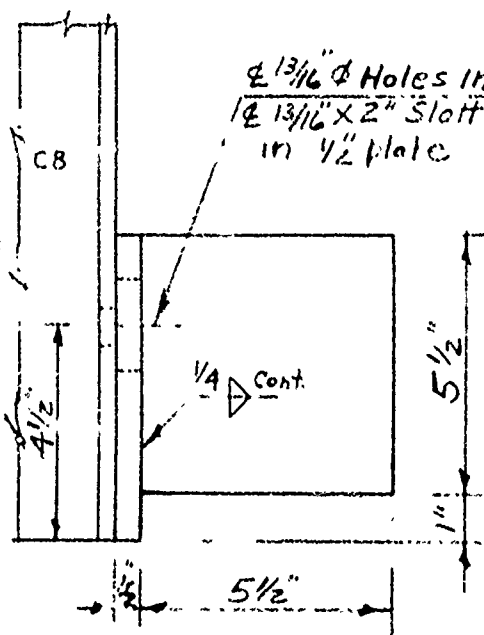
5 1/2" x 5 1/2"

5 1/2" x 5 1/2" x 6 1/2"

Holes & 13/16" & Slotted Holes
H.S. A325 Bolts

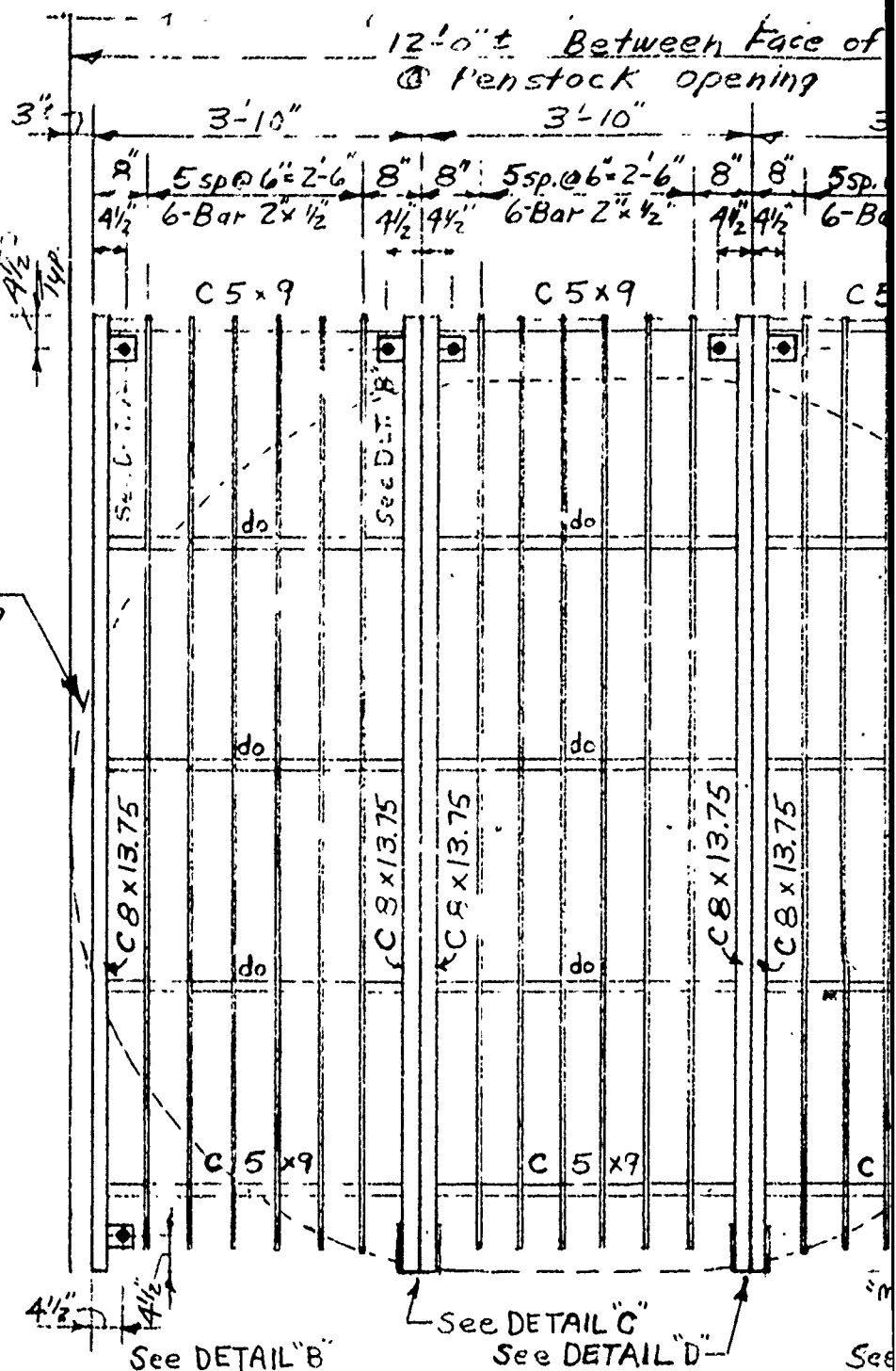
Outline of
Penstock opening

13/16" Holes in C8 Flgs.
13/16" x 2" Slotted holes
in 1/2" plate



SIDE VIEW

(Opp. Hand)
(Penstock Opp.)



ELEVATION

BAR SCREEN A

See

Item C

1'-0" Wall Reinf. #5 @ 1'-0" o.c. both W
each face. Extend Vert Reinf 2'-0"
or bend 7:° and extend 2'-0" into L.

2'-6" E.W.
2'-0" H.W. 6'-1"
6'-0"

El. 691.34±

1'-0" Slob Reinf
#4 @ 12"
Each Way

SR2 9/21/77
SR1 Ac/End 9/13/77

Top of Canal Walls El. 701.0 ±

Three Pilasters:

9" thick at walls poured
against walls - 18" thick
at E - See PLAN.

lab
1'-0" slab

Guard Rail
See Details

Item C642.22

ITEM 601.02

#5 @ 1'-0" in
exposed faces
of pilaster
extend
into
slab

3" cov.
(Typ.)

Const. Jt.

Const. Jt.

5 1/2" x 2 1/2" Keys @ 2'-0" o.c. (Typ.)

#5 @ 12" o.c. Eo. Way

25 - #5 @ 12" o.c.

El. 696.50 Normal

El. 695.92 Top of C

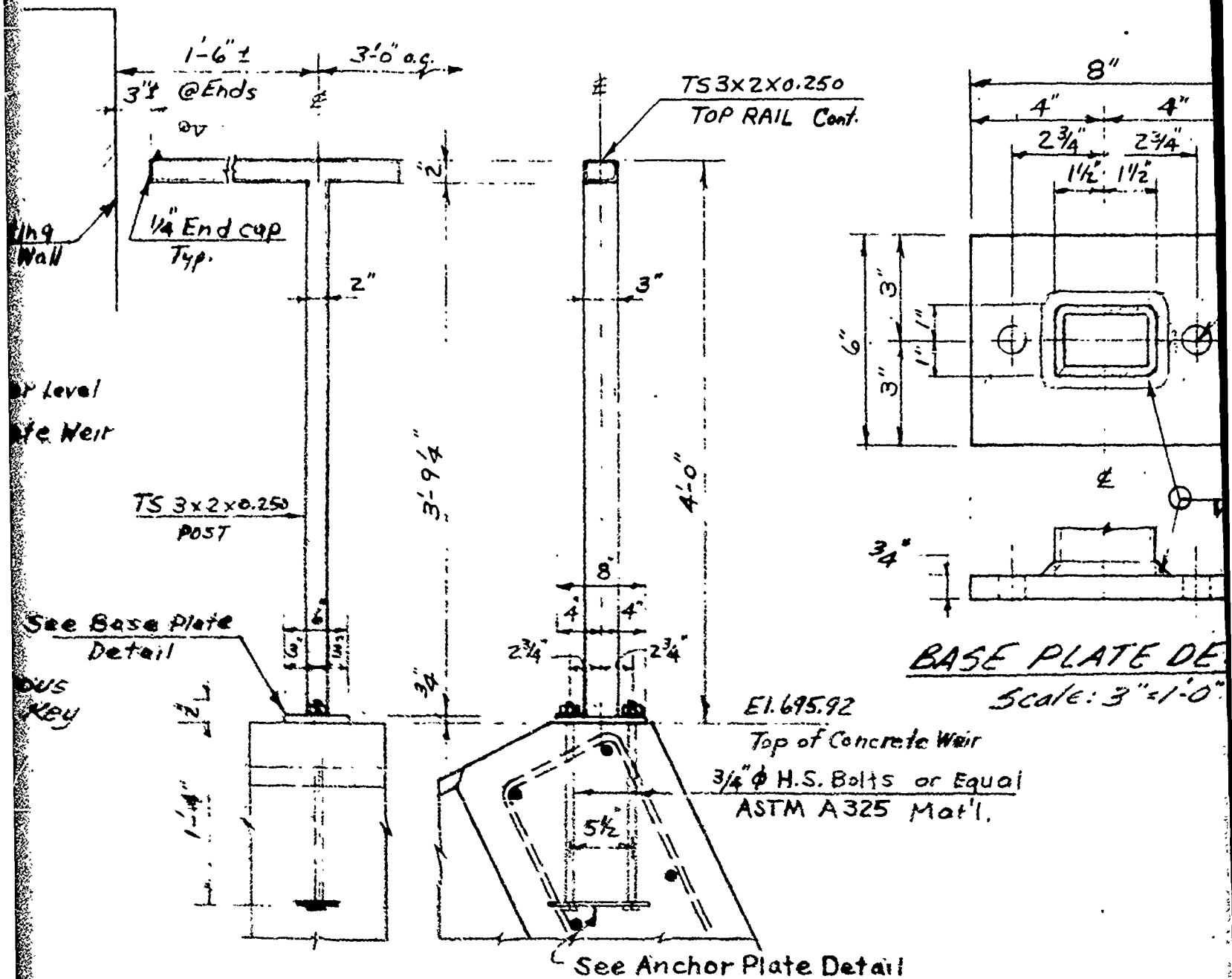
Continuous Slab
Reinforced w/
bars @ 12" o.c.
Eo. Way Eo. Fo

2 1/2" x 5 1/2" Cor

El. 691.4

SECTION

Scale: 1/4" = 1'-0"

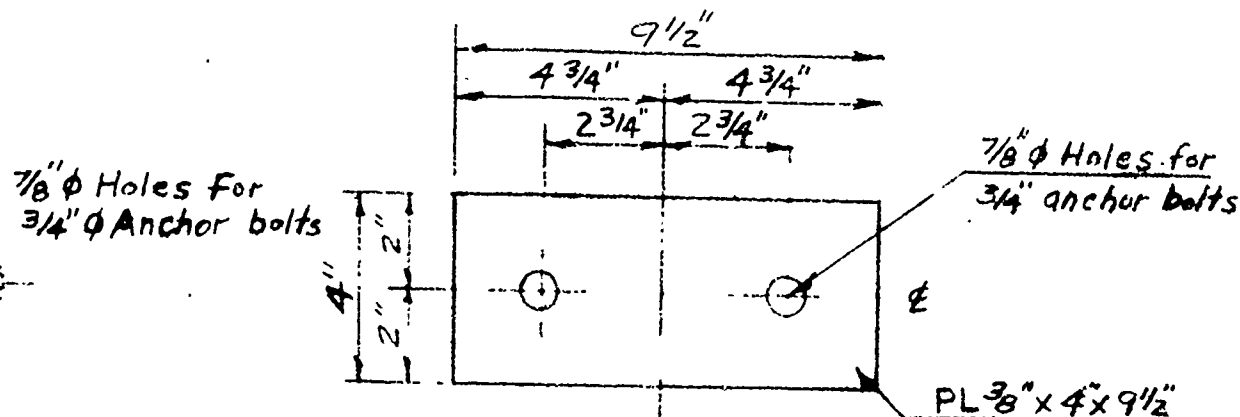


FRONT VIEW SIDE VIEW

GUARD RAIL DETAILS

Scale: 1" = 1'-0"

All Structural Steel and Plate
Material to be ASTM A-36.
For Railing Material see Sheet 9



ANCHOR PLATE DETAIL
Scale: 3"=1'-0"

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y.				
RENOVATION OF MILL STREET DAM				
CONTRACT NO. 2				
CANAL WEIR AND BAR SCREEN				
KONSKI ENGINEERS, P.C.				
SYRACUSE			NEW YORK	
MADE BY 1/27	CHECKED BY A	SCALE As Noted	DATE 8-16-76	DRAWING NO. 7240F2-D1
				SHEET 8

ESTIMATE OF QUANTITIES

ITEM	DESCRIPTION
201.0601	Clearing and Grubbing
203.02	Unclassified Excavation and Disposal
203.03	Embankment in Place
203.09	Proof Rolling
203.21	Select Structure Fill
206.01	Structure Excavation
304.01	Subbase Course
403.01	Asphalt Concrete - Type 1A Top
403.05	Asphalt Concrete - Type 1A Binder
403.07	Asphalt Concrete - Type 1A Base
601.01	Class A Concrete for Structures
601.02	Class B Concrete for Structures
601.0301	Class A Concrete for Structures (Monolithic Slab - Bottom Formwork A)
602.02	Bar Reinforcement for Structures
604.07	Altering Catch Basins, Manholes, Fire Inlets and Drop Inlets
606.10	Box Beam Guide Railing
606.11	Box Beam Guide Railing (Shop Fabricated)
606.14	Box Beam Guide Railing End A
CG07.0214	Galvanized Steel Chain Link Fence with Top Rail (4' High)
CG07.0216	Galvanized Steel Chain Link Fence with Top Rail (6' High)
CG07.13	Galvanized Steel Fence Gates
608.02	Asphalt Concrete Sidewalks, Driveways and Class 1 Bikeways
609.02	Stone Curb - Granite (Type C)
609.03	Stone Curb - Bridge (Type F)

Special Areas

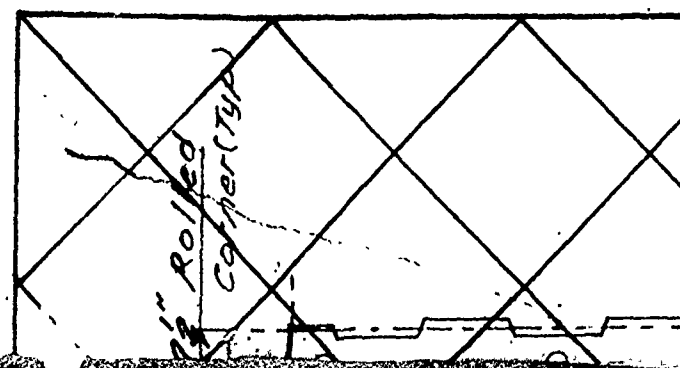
QUANTITIES

	BASIC CONTRACT
	L. S.
Disposal	3,650 C.Y.
	5,600 C.Y.
	2,000 S.Y.
	550 C.Y.
	1,450 C.Y.
	425 C.Y.
Top	110 Ton
Under Binder	165 Ton
se	325 Ton
ures	150 C.Y.
es	1,950 C.Y.
res	
rk (Work Required)	854 S.F.
res	118,700 Lb.
Field	
	1 Eo.
	57 L.F.
(Curved)	34 L.F.
assembly	4 Eo.
Fencing	
	654 L.F.
Fencing	
	250 L.F.
es	3 Eo.
ways	
	80 Ton
	755 L.F.
	54 L.F.
	0.2 Ac.

COMPUTED FLOW CA

Pool	A. Gates	Spillway		Canal
Elev'n.	Flow	Depth	Flow	Depth
696.5*	0/940	0.	0	0.6
697.0	980	0.4	120	1.1
698.0	1060	1.4	770	2.1
699.0	1130	2.4	1720	3.1
700.0	1210	3.4	2890	4.1

*Normal Pool Elevation



2

3

LOW CAPACITIES OF RENOVATED DAM

Canal Weir		Outlet Gate		Total Flow		Free-board
Depth	Flow	Depth	Flow	w/o O.G.	w O.G.	
0.6	30	18.0	540	970	1510	5.5
1.1	80	18.5	550	1180	1730	5.0
2.1	220	19.5	570	2050	2620	4.0
3.1	390	20.5	590	3240	3830	3.0
4.1	670	21.5	610	4770	5380	2.0

O.G. = Outlet Gate

GENERAL NOTES

Design Specifications: Current American A Transportation Officials Standard Specifica

Live Load on Dam Bridge: HS20-44 Truck 1 foot.

Material and Construction Specifications: State Department of Transportation dated Ja addenda except as modified by the Special proposal.

Concrete Items: Description

Mass Concrete in Dam
Piers or Columns over 12" thick
Piers or Columns 12" thick or less
Bridge Deck Slabs (Dam)
Bridge Deck Slab (Roadway Bridge)
Sidewalks (Roadway Bridge)
Bridge Abutments (Roadway Bridge)
Canal Weir
Cap on Sewer Bridge Pier (if needed)

The cost of all joint material will be includ various items of the contract, except as of

The cost of furnishing and placing water us Item 203.03, and Select Structure Fill, Its in the price bid for the item.

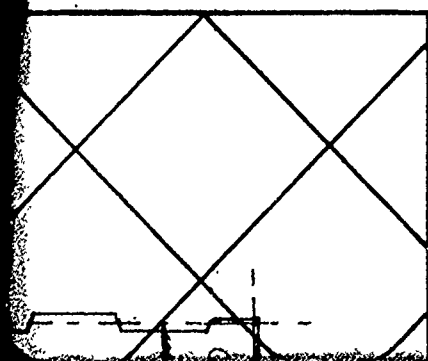
Clearing and Grubbing: Clear and grub on downstream of dam that will be excavated new embankment material. On downstream underbrush, and trees up to 6 inches in dia trees over 6 inches in diameter that will be construction. Variations in final slope su permitted to accommodate large trees that

Elevation Datum: Mean sea level datum of

Utilities: Location of sewer line shown on from positions of manholes indicated. The hydrant (broken underground) not shown on believed to be underground in the area of M canal. The exact location must be determi contractor shall be responsible for the pro or any power or telephone lines in the area bridge. Where necessary the contractor sh or other approved materials, and shall sec utilities.

Subsurface Investigation: The subsurface plans is based upon a limited investigation the sole purpose of preparing an estimate considered as representative of the actual encountered during the construction of this is bound into the Specifications.

FOUNDATION NOTES



an Association of Highway and
ications for Highway Bridges.

ck Load or 100 pounds per square

Specifications of New York
January 2, 1973, with current
ial Specifications in the

- Item No.
- 601.02
- 601.02
- 601.01
- 601.01
- 601.0301
- 601.01
- 601.02
- 601.02
- 601.01

cluded in the price bid for the
is otherwise specified.

used for Embankment in Place,
Item 203.21, shall be included

only those areas upstream and
ed to trim slopes or covered by
dam slopes remove all
diameter. Remove only those
be affected by new slope
surface of 1'-0± will be
at can be left in place.

of 1929.

on the plans was determined
There is also a waterline and
on the plans. The waterline is
of Miller Street just west of the
mined in the field. The
protection of the above utilities
area of the proposed canal
shall provide timber, plank,
securely brace and protect these

Information shown on these
tion made by the Engineer for
of quantities and is not to be
al conditions which may be
his project. Test hole data

FOUNDATION NOTES (Cont'd)

All disintegrated or shattered material shall be removed to the lines and levels ordered by the Engineer. Where unsuitable rock is found and additional rock removal is required the procedure to be used is indicated in other notes on these plans. Payment for additional concrete and bar reinforcement if used will be made at the unit price bid for these items. Rock removed below the levels or outside of the neat lines ordered by the Engineer shall be replaced by Item 601.02 for which no payment will be made.

Foundation Pressures: For design purposes the foundation pressure for the dam does not exceed 2½ tons per square foot. That for the ca bridge and weir does not exceed 1½ tons per square foot.

Sheet Piling: The contractor may use steel sheet-piling sections other than those indicated on the plans provided the section modulus per foot of wall is not less than that for the sections shown. Safe operation sheet piling may be made of any suitable material of adequate strength.

Grouting: The rock foundation beneath the new gate structure and new section of dam shall be pressure grouted after completion of the first concrete lift (footing). Holes for grouting shall be drilled through the new concrete and into the rock to the minimum depth shown. Grouting pressures shall not exceed fifty pounds per square inch. If grout appears at the interface between the concrete and the rock, grouting in that area shall be stopped and the grout allowed to set. At the option of the Engineer, additional holes and grouting may be requested in these areas.

Dewatering: The contractor's attention is directed to the construction and cofferdam notes on Sheet 2, and to the possibility that continuous pumping may be necessary during early stages of construction.

DAM SUPERSTRUCTURE

Stone Masonry: The stone masonry face of the new section of the dam shall match that of the existing portion as closely as possible. Stone for this purpose may be taken from excess stone stored at the site during Phase I construction and from the portions of the existing canal walls that are to be removed for construction of the new canal bridge abutments. If additional stone is needed and a matching type cannot be obtained, the new stones shall be placed at random among the existing stones to minimize the disparity in texture.

Weirs: Concrete weirs must be finished to the exact shape and elevation given on the plans and must be dead level.

Automatic Gates: The gate structure is designed and detailed to accommodate a certain brand of automatic gate. If a different manufacturer's product is selected and approved by the Engineer, the gate structure details will have to be altered. The details for such alterations shall be made by the Contractor and submitted to the Engineer for final approval prior to any construction. The Engineer reserves the right to modify the Contractor's details in any manner consistent with the safety of the structure and the capacity of the gates. Such alterations shall be made by the Contractor at his own expense and without additional cost to the owner.

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Grouting
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grouting
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60 C.Y.
 2,300 lb.
 630 S.F.
 150 C.Y.
 120 C.Y.
 135 C.Y.
 975 S.F.
 1,500 S.F.
 L.S.
 L.S.

1 Eo.

12 Gof.

16 Mo.

64 L.F.

525 L.F.

24 L.F.

212 L.F.

21 Eo.

4 Eo.

725 L.F.

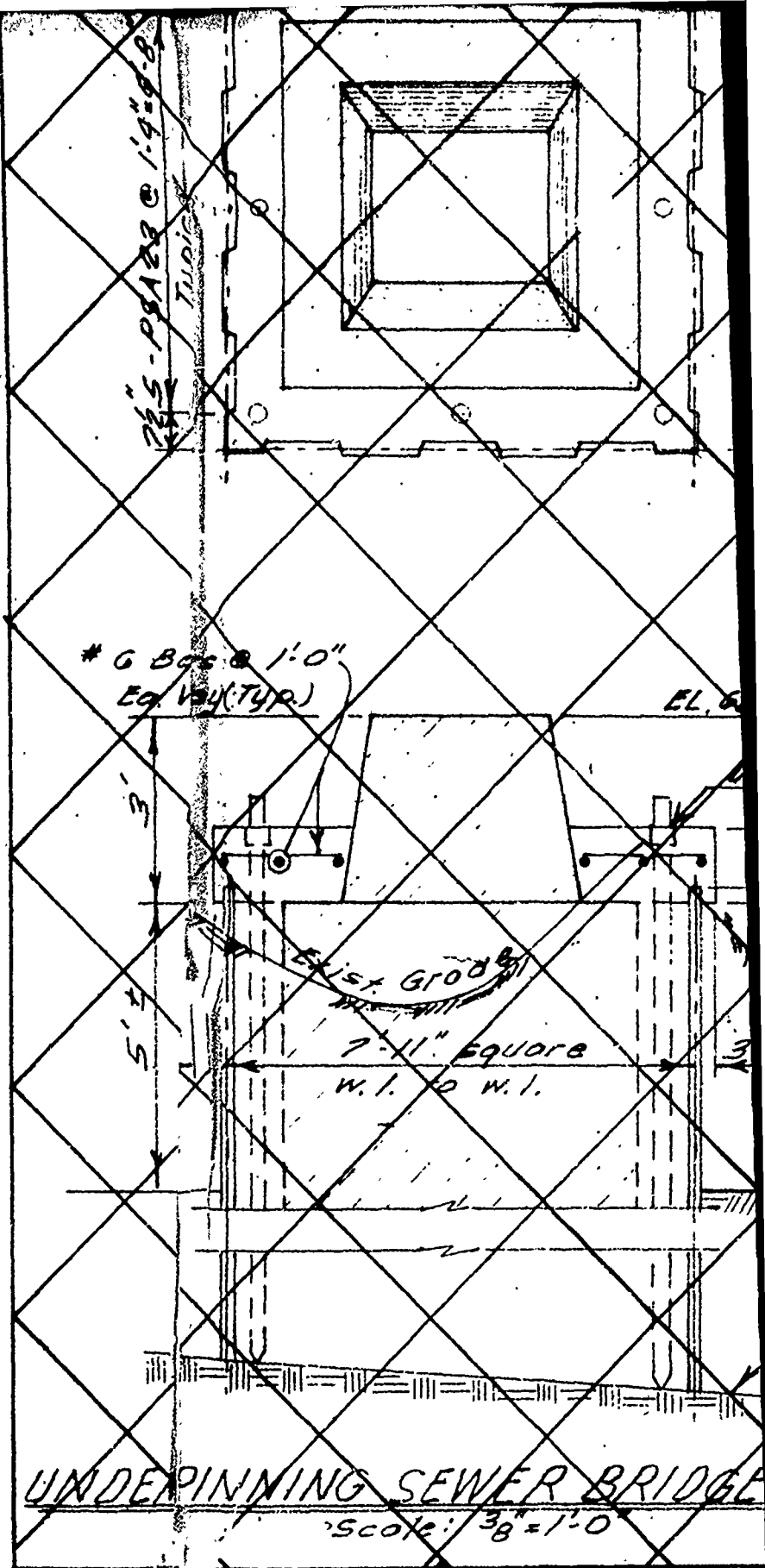
220 L.F.

300 Bag

L.S.

2 Eo.

1 Eo.

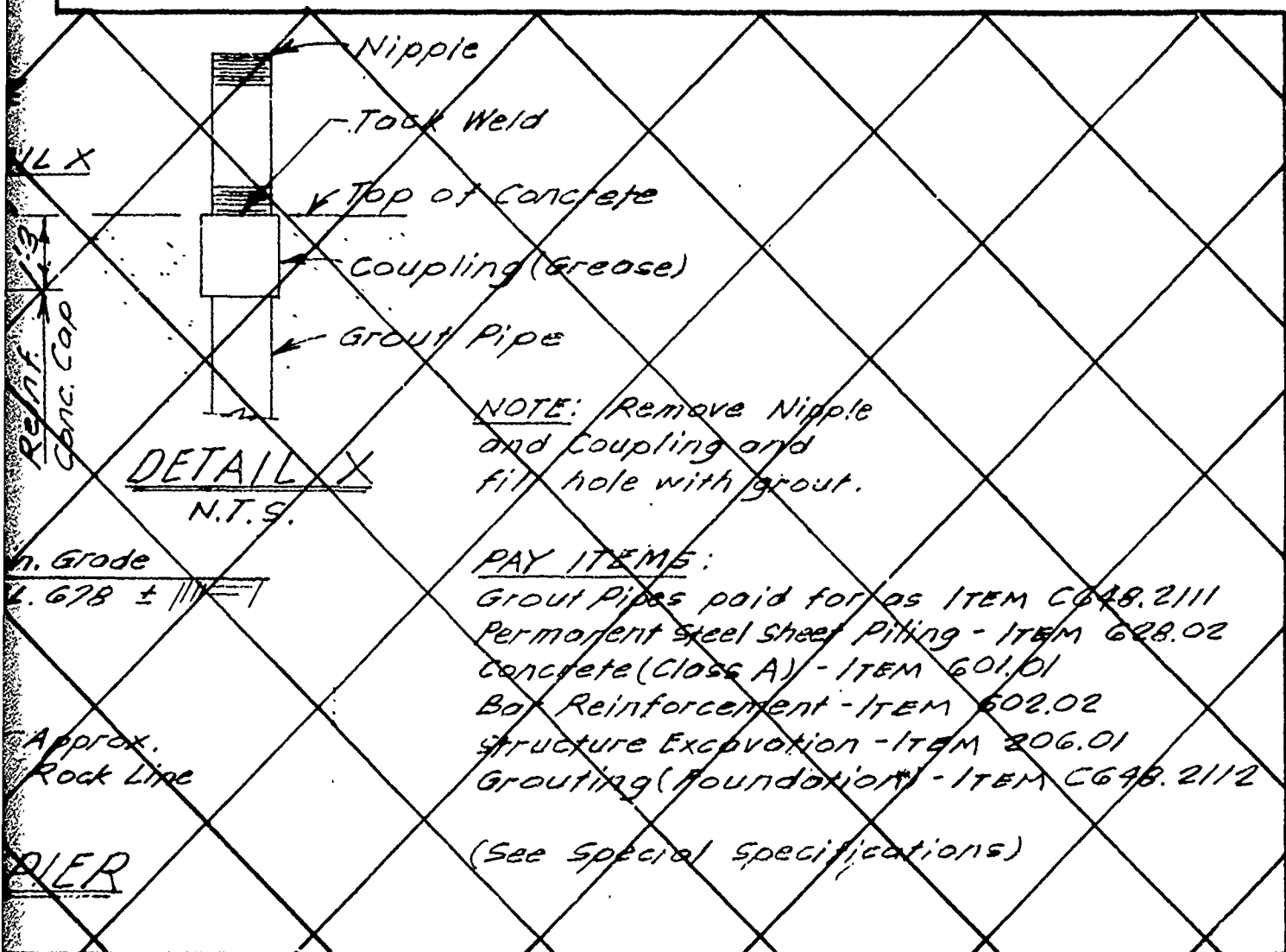


Excavation and Embankment: All sod, topsoil and unsuitable material under the embankments shall be removed as specified under Section Excavation and Embankment, and replaced by the same item as the of embankment adjacent and above as shown on the plans. Existing embankments to be resloped may be benched if necessary to accommodate contractor's equipment. Unsuitable material may be disposed of in floor of the reservoir above the dam.

The installation of Select Structure Fill, Item 203.21, as shown on plans shall be completed to the extent possible immediately upon completion of footings, abutments or walls.

New concrete in the area of the west embankment is to be founded on undisturbed material properly benched as shown on the plans.

New concrete in the back and foundations of the dam is to be founded on rock and shall be poured "in the dry". The Engineer shall inspect the excavations at the time of construction to determine the suitability of the rock for supporting the structure.

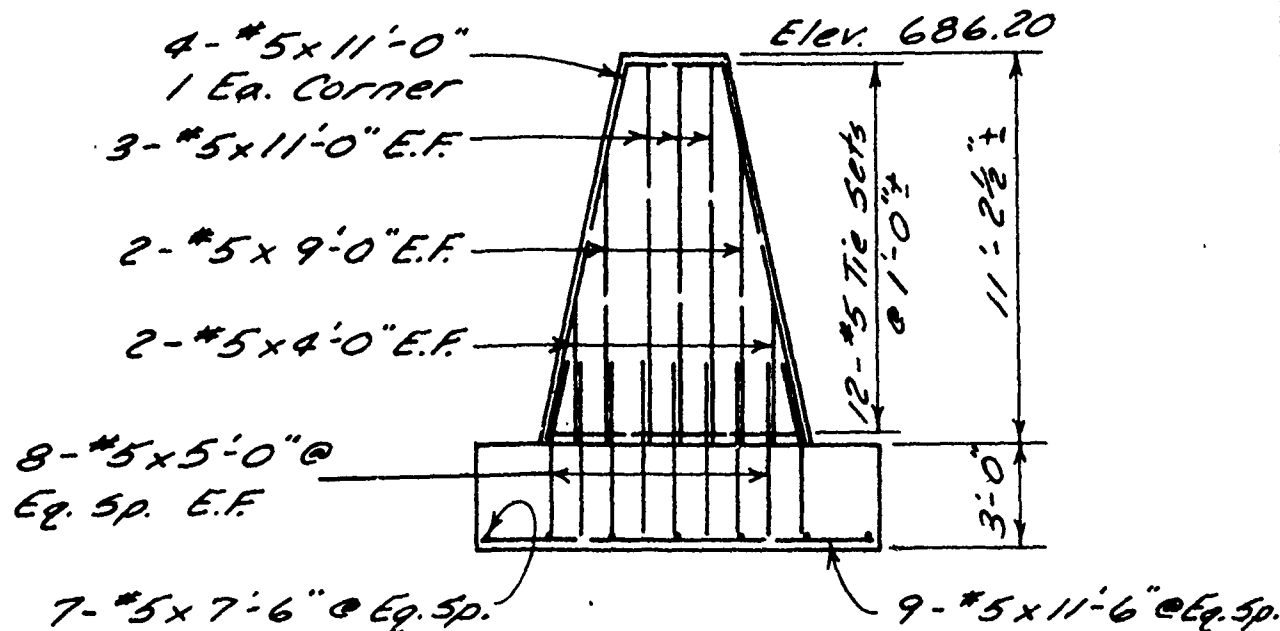
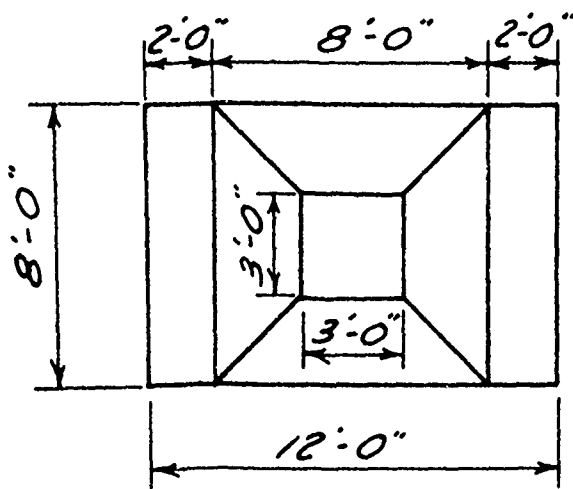


Material
 Section 203,
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SEWER BRIDGE PIER
 Scale: $\frac{3}{16}'' = 1'-0''$

AS BUILT

REV.	DATE	DESCRIPTION	BY	CK.
CITY OF AUBURN, N.Y.				
RENOVATION OF MILL STREET DAM				
CONTRACT NO.2				
ESTIMATE OF QUANTITIES				
AND GENERAL NOTES				
KONSKI ENGINEERS, P.C.				
SYRACUSE			NEW YORK	
MADE BY Ac	CHECKED BY Lat	SCALE As Noted	DATE 8-16-76	DRAWING NO. 7240F2-D7
				SHEET 14

9