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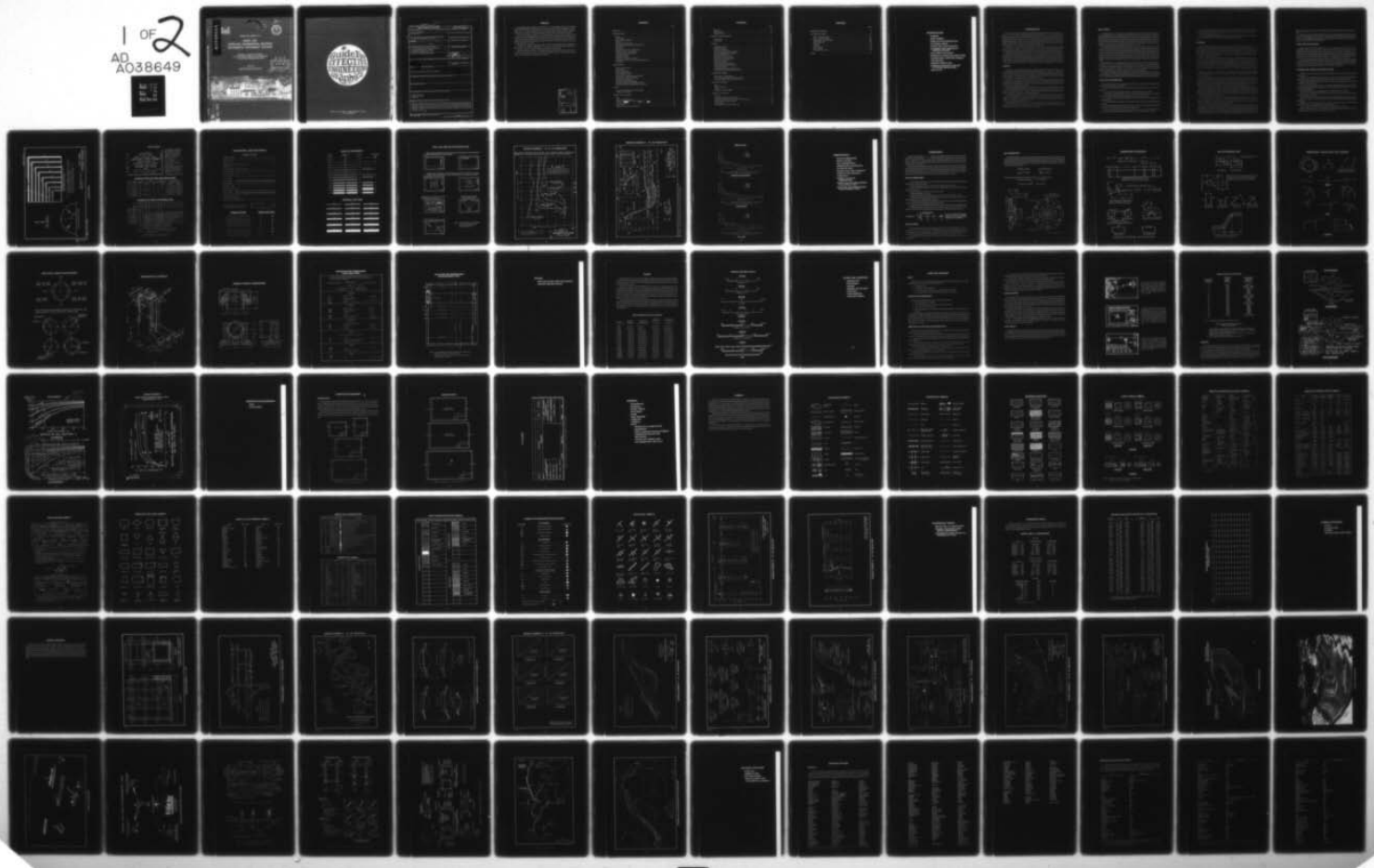

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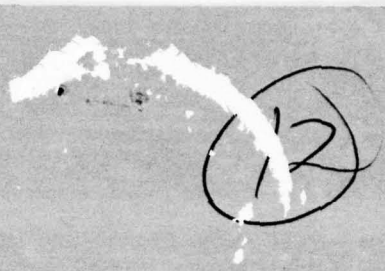

INSTRUCTION REPORT O-77-1

GUIDE FOR EFFECTIVE ENGINEERING GRAPHICS WATERWAYS EXPERIMENT STATION

Publications and Graphic Arts Division
U. S. Army Engineer Waterways Experiment Station
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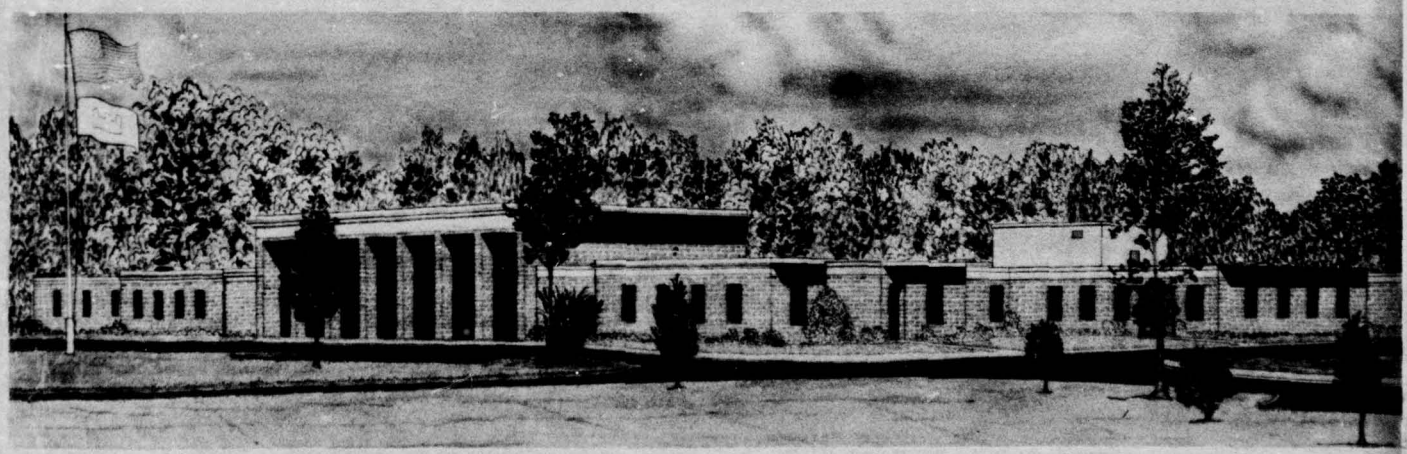

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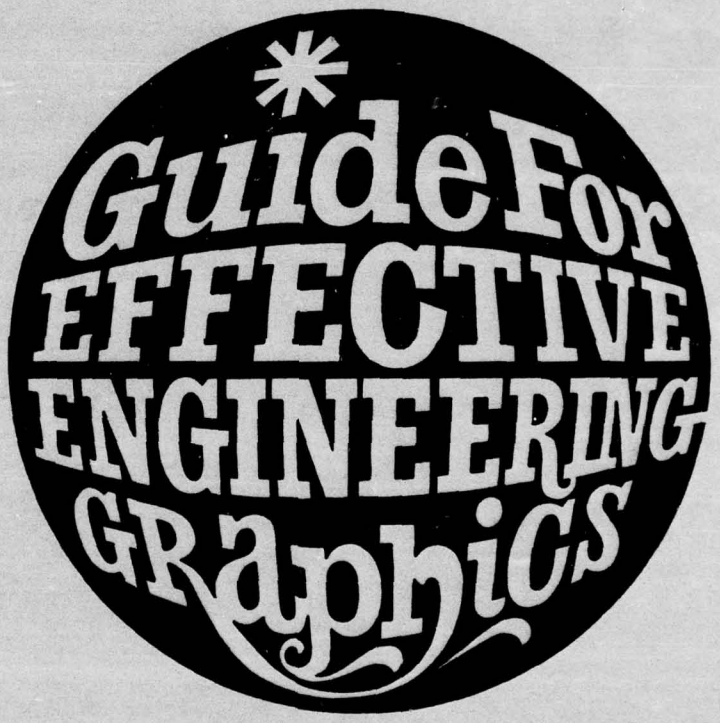

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This Guide describes procedures to be used by Waterways Experiment Station (WES) personnel in the preparation of figures, maps, slides, plates, and other illustrations. Such procedures should simplify the draftsman's or illustrator's task by furnishing him a Guide to follow in planning his illustrations. The Guide establishes procedures for insuring unformity of certain features common to all illustrations, while permitting flexibility in the presentation of the subject. Matters requiring uniform treatment are clearly indicated throughout the Guide.

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PREFACE

This Guide describes procedures to be used by U. S. Army Engineer Waterways Experiment Station (WES) personnel in the preparation of (a) drawings for WES technical publications and (b) visuals for use in oral presentations. Such procedures should simplify the project manager's, draftsman's, or illustrator's task by furnishing him a guide to follow in arranging his material.

The Guide establishes procedures for insuring uniformity of certain features common to all illustrations, while permitting flexibility in the presentation of the technical subject. Matters requiring uniform treatment are indicated clearly throughout the Guide. Suggestions for good practice are included to assist engineers in planning and draftsmen and illustrators in producing clear, concise, well-organized drawings and visuals.

This Guide was compiled by Mr. Nels J. Nyman, Chief, Engineering Graphics Branch, Publications and Graphic Arts Division (P&GAD). The constructive criticism and helpful comments of Mr. Thomas B. Rosser III, Chief of P&GAD, are gratefully acknowledged.

Directors and Technical Director of WES during the preparation of this Guide were COL G. H. Hilt, CE, and COL John L. Cannon, CE, and Mr. F. R. Brown, respectively. The requirements of this Guide are implemented by Station Regulation SR 70-1-3.

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- PLATE AND TITLE LAYOUT
- SCHEDULE OF SIZES AND REDUCTIONS
- CONVENTIONAL LINES AND SYMBOLS
- LINE WEIGHTS
- DRAWING ORIENTATION
- EXAMPLE PLATES WITH LINE AND LETTERING DESIGNATIONS
- GRID STYLES

INTRODUCTION

The primary function of the Engineering Graphics Branch (EGB), Publication and Graphics Arts Division, U. S. Army Engineer Waterways Experiment Station (WES), is to provide cartographic and engineering graphic support to the technical laboratories of WES. In pursuance of this support a variety of maps, plates, figures, illustrations, etc., are prepared in camera-ready condition to ultimately be printed lithographically. Therefore, in order to obtain quality reproduction, the majority of the work produced by the EGB must consist of ink renderings of highly accurate line work and lettering, well balanced, uniform, neat in appearance, and in proper editorial style.

The Branch is also responsible for the preparation of all types of visual aides (slides, Vugraphs, schematics, posters, displays, etc.), technical illustrations for briefings, special cartographic maps involving multicolor and systematic symbolization, and various types of miscellaneous drafting.

Regardless of the volume and nature of the work, all work should conform to accepted standards and format. This Guide should be considered a tool, and is intended for use by WES personnel in presenting the results of their various studies and/or investigations in both a logical manner and one which conforms to generally accepted engineering graphic standards. Every effort was made to present standards that will contribute toward the production of a good-quality and economical report. Samples of plates, figures, illustrations, slides, etc., used therein are typical types prepared for use at WES.

PURPOSE

This Guide is not intended to be a manual on technical drafting or illustrating. Its objective is to present standards for preparing and conveying graphical information in a clear, concise, and uniform manner in WES publications. It can be used to train new, inexperienced personnel in the preparation of plates, diagrams, and illustrations. Project managers can use ths Guide in planning drawings and illustrations prior to submitting them to the EGB for preparation.

The Guide covers certain basic requirements that must be observed in the preparation of illustrations and engineering-type drawings and/or maps to be used in WES publications. Graphical representation in a publication is a means to clarify the text. Quality drafting will upgrade a report whereas inferior drafting will downgrade it.

Items in this Guide include sheet format, general rules, line weights, lettering, inking, dimensioning, conventional lines and symbols, scales, slides and Vugraphs, and excerpts from Instruction Report 0-74-1, dated December 1975, "Guide for Preparation of WES Technical Information Reports," that are pertinent to the functions of engineering graphics.

It is intended that the *must* use of this Guide will accomplish coordination among personnel of varied training and experience. Various individual styles can be interfaced with less difficulty. The purpose of a standard is to establish specific guidelines that will ensure uniformity and consistency within a set of drawings, illustrations, etc.

The instructions contained herein conform, for the most part, to requirements set forth by the Office, Chief of Engineers, in engineer manuals and military standards, and to accepted practices at WES and the engineering and scientific community at large.

SHEET FORMAT

An integral feature of most reports is the presentation of information and data by means of drawings and diagrams. In a continuing effort toward achieving attractive, usable reports, much time and thought has been devoted to the development of techniques for reproducing neat, uniform, and legible drawings as economically as possible. The basic premise developed in pursuance of economy is that a drawing should be prepared in such a way as to enable it to be reduced to a size that will fit on one page 8 in. by 10-1/2 in. in size—the standard size for most Government reports. The border-to-border dimensions adopted by WES for page-size drawings are 6 in. by 9 in.

Thus, properly prepared drawings can be reduced to page size without sacrificing clarity, and because of the resulting economy in printing reports using such drawings, special authority is required to deviate from this practice. It is emphasized that drawings should be prepared with this reduction in mind in order to achieve uniform lettering and line width on all drawings in any one report, and to ensure legibility. Drawings not specifically prepared for reduction and reproduction, such as construction drawings, slides, Vugraphs, etc., if subsequently reduced for reproduction will normally not match other drawings in the report—which distinctly detracts from the appearance of the report and distracts the reader.

Standardizing the size of drawings and the use of letter sizes and line widths thereon results in drawings of convenient size for reduction and printing rather than the large, bulky, unmanageable plates often found in some engineering reports. Thus standardization of drawings for ultimate reduction save many thousands of dollars at WES and at other offices where similar techniques have been adopted. Significant reproduction cost reduction results from the use of this technique.

As shown in the sample drawings in this Guide, it is apparent that each of the 6- by 9-in. reductions is clearly legible. Every feature of the original drawing was drawn with the final reduction in mind and every size lettering on the original was selected so as to produce the desired size on the reduced final size.

STEPS IN PLATE PREPARATION

When work is received from a project manager, EGB supervisors (and employees) normally follow the steps for plate preparation listed below.

1. Review the incoming work and its available source materials. Know the purpose of the drawing.

2. Group similar plates; determine whether a master sheet (base plate) is feasible.

3. Determine the standard WES border sizes to be used; keep the reductions to a minimum. (Figures do not have borders; check their overall image area for lettering sizes.)

4. Check the accuracy and detail arrangement of the rough incoming drawings, pencil sketches, etc., before tracing.

5. Eliminate duplication and unnecessary information. Add or request more detail if drawings are incomplete.

6. All drawings must have a scale or some means to determine size or distance; otherwise state "NO SCALE" or "NOT TO SCALE," whichever is applicable.

7. Maps should be pointed with North at the top of the sheet, or to the left of sheet if top orientation is impracticable, and streamflow should be from left to right wherever possible.

8. Select line weights and types, lettering sizes and styles, and determine order of inking. If lettering is done before lines are ruled in gridded and crowded areas, much erasing can be eliminated.

9. Check drawings for editorial style.

10. Check completed drawing for dimensioning, proper abbreviations, uniformity, etc. If drawings consist of a large amount of data and detail, have them proofread by others.

LETTERING

Lettering used on drawings should be selected with legibility in mind and also be suitable for easy and rapid execution. Both inclined and vertical lettering may be used in a single drawing. Letters in words should be spaced so that the background areas between letters are well balanced and approximately equal; words should be clearly separated. Lettering should not be underlined except where special emphasis is required. Whatever style of lettering is selected it should be of uniform height, proportion, inclination, and spacing.

The size, style, and form of lettering at WES is based on the WRICO TEMPLATE GUIDES, a plain block or gothic-type letter (no serifs). The standard guides consist of vertical and inclined letters in capitals ranging from a 90 guide (0.09-in. height) to a 500 guide (0.5- or 1/2-in. height). The variations in sizes in this range are in proportion with the WES standard plate sizes. Larger standard vertical guides are available with special pens up to 1 in. in height. Special Wrico guides have extended lettering in upper case and condensed lettering in upper and lower case; these guides are available only in limited sizes.

Other types of lettering (in block type) used in WES publications are LEROY and KOH-I-NOOR RAPIDOGUIDE (template type); Varitype, Composer, Headliner, and Phototype (machine-keyboard type); and freehand.

For speed and economy the use of machine-type lettering should be considered in drawings that have lengthy notes, legends, and tables, and in smaller size plates or figures where lettering can be typed directly or pasted on the sheet. Freehand lettering can be used when specified; however, line guides should be used to ensure its uniformity. When a combination of lettering methods is used in a set of report drawings, plate titles should be of the same type of lettering throughout the report.

Upper-case block or gothic lettering should be used in all report-type drawings unless otherwise specified. Main designations should be in vertical lettering except where labeling curves, profiles, or other information within a grid. Titles, headings, notes, legends, tables, and coordinates of a graph should also be in vertical lettering. Inclined lettering is specified for information within a grid, notations in a detail, dimensioning, and elevations.

On plan, location, and vicinity maps, inclined lettering (gothic) should be used to show water features, highways, railroads, elevations, and contours. National land features, cities, towns, civil divisions, map grids, etc., should be shown in vertical lettering. Upper case letters are used for major designations and lower case for minor and smaller features.

For elaborate, complex maps (cartographic), more elements are sometimes required, e.g. combinations of style, form, and size of type. Also meticulous consideration should be given to the positioning of lettering within a map structure, significance of features, and type of reproduction. Maps of this type (complex) are not restricted to block-type lettering and other design characters can be used, provided they meet reduction requirements. Quadrangle maps prepared by U. S. Geological Survey or

Defense Mapping Agency can serve as useful guides in planning lettering styles for the more elaborate maps.

A lettering-size table has been prepared for the various size standard plates. Its use will ensure uniform lettering throughout the report. Selection of proper lettering is considered very important in the production of good graphics. Good lettering will UPGRADE a poor drawing and, conversely, inferior lettering will DOWNGRADE a good drawing.

VICINITY AND LOCATION MAPS

Reports prepared by WES frequently require a vicinity or location map, or both, of the study areas. By definition, "vicinity" is a region near or about, and "location" is a specific position or site of designated limits. For WES purposes a vicinity map is defined as a map that shows a large general area at a small scale with the approximate project site indicated in relation to well known geographic features, such as major cities and water bodies, state boundaries, etc. A map that shows a small area with detail at a large scale, such as an outline or limits of a study site, is designated as a Location Map.

Vicinity and Location Maps can be shown on separate sheets or can be shown together, depending upon the arrangement of the report. When the maps are shown together, the Location Map should occupy the major area of the sheet with the Vicinity Map as an inset. Both maps should have a scale and north point and be oriented with North at the top of the sheet, if practicable.

PLACEMENT AND LABELING OF WORDING ON MAPS

All lettering should be positioned so that the wording reads from left to right or from bottom to top of the drawing.

Lettering should be aligned on the upper side wherever space permits and with the general direction of the feature, such as names of the feature, names of streams, power lines, railroads, etc.

Normally, names of features should be in one line except in extremely large areas, such as large water bodies, terrain features, etc.

Names of mountains, plateaus, valleys, etc., should be extended across the center in a smooth line or curve following the general shape of formation. Label on the upper side if the formation is too narrow to accommodate the name.

Label linear features along a straight segment rather than along a curved portion.

Names of lakes and large rivers should be positioned within the shorelines where space permits so that the entire name can be used.

Do not letter-space or extend names of linear features. Repeat at appropriate intervals to clarify.

Position area names so that the area defined is clearly identified (letter-spacing and extending is permissible).

Lettering size and type for place names and features should be selected to fit predetermined classifications relative to geographical and political importance.

Center contour values on the axes of the contour; repeat values only to clarify.

Route numbers (Interstate, U. S., State) should be oriented with the bottom neatline and symbols should appear to be centered on the road wherever practicable.

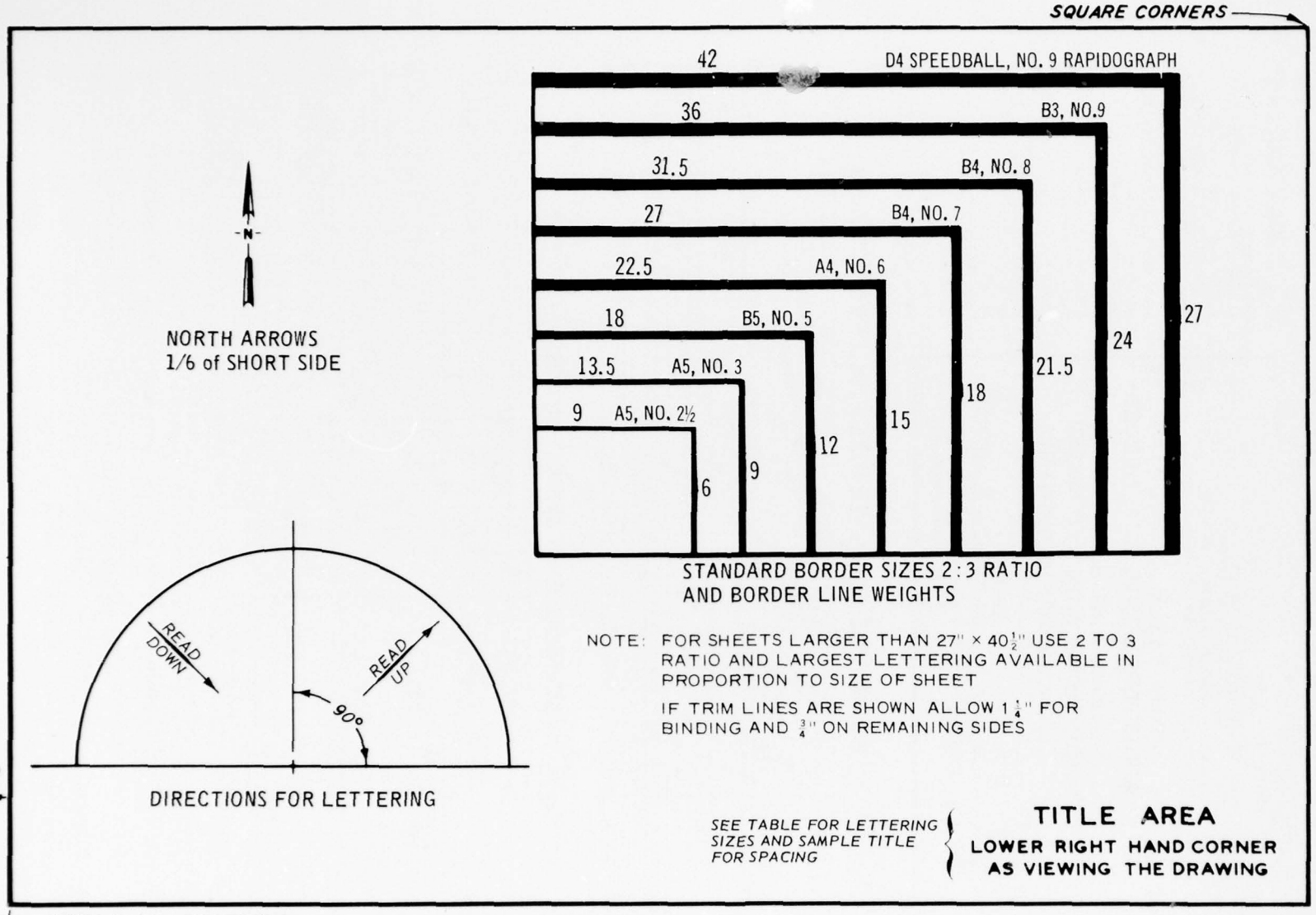
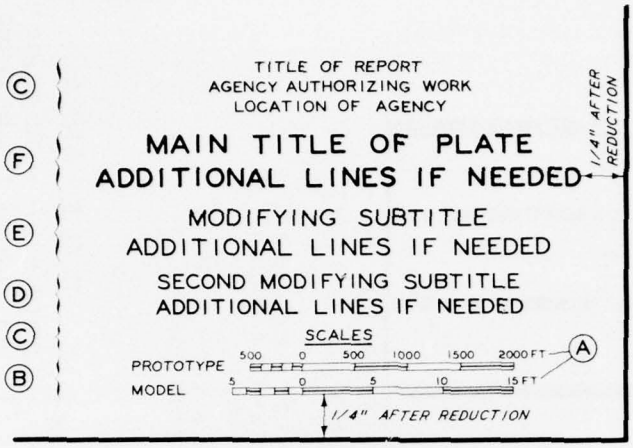


PLATE LAYOUT

TITLE LAYOUT



TITLE OF REPORT, AGENCY AUTHORIZING WORK, AND LOCATION OF AGENCY SHALL BE OMITTED ON ALL PLATES EXCEPT THOSE TO ACCOMPANY LETTERS OR WHEN REQUESTED BY THE PERSON SUBMITTING THE WORK.

OMIT ANY LINES FROM THE TITLE NOT APPLICABLE.

DO NOT USE ABBREVIATIONS IN TITLE OR NOTES.

CIRCLED LETTERS REFER TO THE TABLE OF WRICO LETTERING GUIDE SIZES.

SPACING BETWEEN LINES OF SAME SIZE LETTERING SHALL BE 2/3 OF LETTERING HEIGHT. SPACING BETWEEN LINES USING TWO DIFFERENT GUIDE SIZES SHALL BE EQUAL TO HEIGHT OF LARGER LETTERING.

TITLE SHALL BE SPACED 1/4 INCH FROM BORDERS. (AFTER REDUCTION)

SCHEDULE OF PLATE SIZES AND REDUCTIONS

PLATE SIZE NO.	BORDER SIZE INCHES	REDUCTION PERCENT	BORDER		SMALLEST RAPIDOGRAPH USEABLE	TWO-FOLD PLATES DIMENSIONS-INCHES	
			SPEEDBALL PEN	RAPIDOGRAPH PEN		MINIMUM	MAXIMUM
1	6 X 9	100	A-5	2	3 X 0	9 X 13-1/2	9 X 19-1/2
2	9 X 13-1/2	67		3	00	13-1/2 X 20-1/4	13-1/2 X 29-1/4
3	12 X 18	50	B-5	4	0	18 X 27	18 X 39
4	15X22-1/2	40	A-4, D-5	5	1	22-1/2 X 33-3/4	22-1/2 X 48-3/4
5	18 X 27	33	B-4	6	1	27 X 40-1/2	27 X 58-1/2
6	21X31-1/2	29		7	1	31-1/2 X 47-1/2	31-1/2 X 68-1/4
7	24 X 36	25	B-3	8	2	36 X 54	36 X 78
8	27X40-1/2	22	D-4	9	2		

SCHEDULE OF WRICO LETTERING SIZES

			VERTICAL	A	B	C	D	E	F	G	H	I	J	K	L	M
			SLANT	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
			HEIGHT IN INCHES ON 6" X 9" PLATE	0.045	0.060	0.070	0.087	0.100	0.120	0.145	0.175	0.212	0.250	0.312	0.375	0.500
PLATE SIZE NO.	BORDER SIZE INCHES	REDUCTION PERCENT														
1	6 X 9	100		-	-	-	90	90	120	140	175	200	240	290	350	500
2	9 X 13-1/2	67		-	90	120	120	140	175	200	240	290	350	425	500	750
3	12 X 18	50		90	120	140	175	200	240	290	350	425	500	625	750	1000
4	15X22-1/2	40		120	140	175	200	240	290	350	425	500	625	750	1000	
5	18 X 27	33		140	175	200	240	290	350	425	500	625	750	1000		
6	21X 31-1/2	29		175	200	240	290	350	425	500	625	750	1000			
7	24 X 36	25		175	240	290	350	425	500	625	750	750	1000			
8	27 X 40-1/2	22		200	290	350	425	425	500	625	750	1000				

NOTE: THE GUIDE SIZES MOST FREQUENTLY USED FOR REPORT DRAWINGS MAY BE DETERMINED BY MULTIPLYING:

10 X SHORT SIDE = (B) (WRICO SIZE FOR GRIDS, LEGENDS, AND NOTES). LETTER HEIGHT = 0.06 WHEN REDUCED TO REPORT SIZE (6 X 9).

20 X SHORT SIDE = (F) (WRICO SIZE FOR MAIN TITLE). LETTER HEIGHT = 0.120 WHEN REDUCED.

FOR DRAWING SIZES NOT LISTED ABOVE, USE GUIDE SIZES OF THE NEAREST STANDARD BORDER SIZE.

CONVENTIONAL LINES AND SYMBOLS

ALPHABET OF LINES

VISIBLE OUTLINE

HIDDEN OUTLINE

CENTER LINE

DIMENSION AND EXTENSION LINES

PHANTOM LINE

ADJACENT PARTS, ALTERNATE POSITION

CUTTING PLANE

DITTO OR REPEAT LINE

SHORT BREAK

LONG BREAK

PLATE BORDER

GRID BORDER

MAIN GRID LINES

SECONDARY GRID LINES

DATA CURVES

MODEL LIMITS

PRIMARY INFORMATION

SECONDARY INFORMATION

SECTION LINING, CROSSHATCHING

SECTION OR PROFILE TO BE DRAWN
LOOKING IN DIRECTION OF ARROWS

SYMBOLS FOR LINES

A

B

C

D

E

F

G

H

I

SYMBOLS FOR POINTS

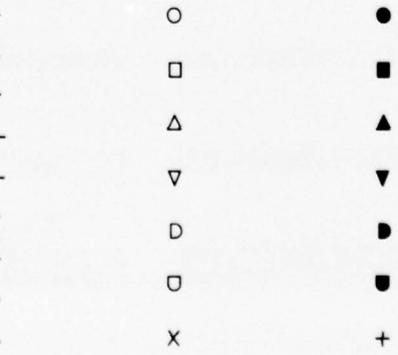
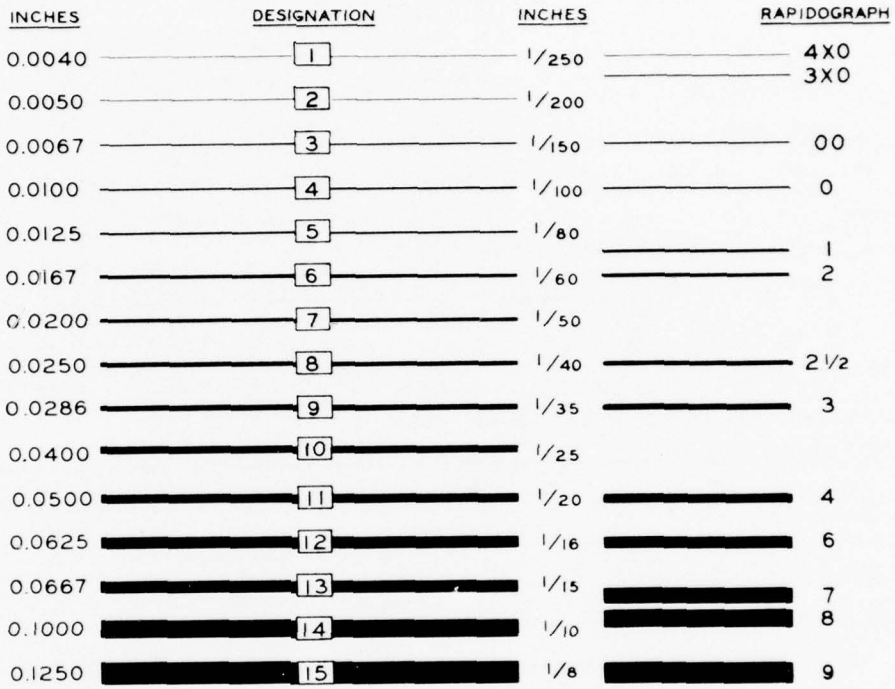
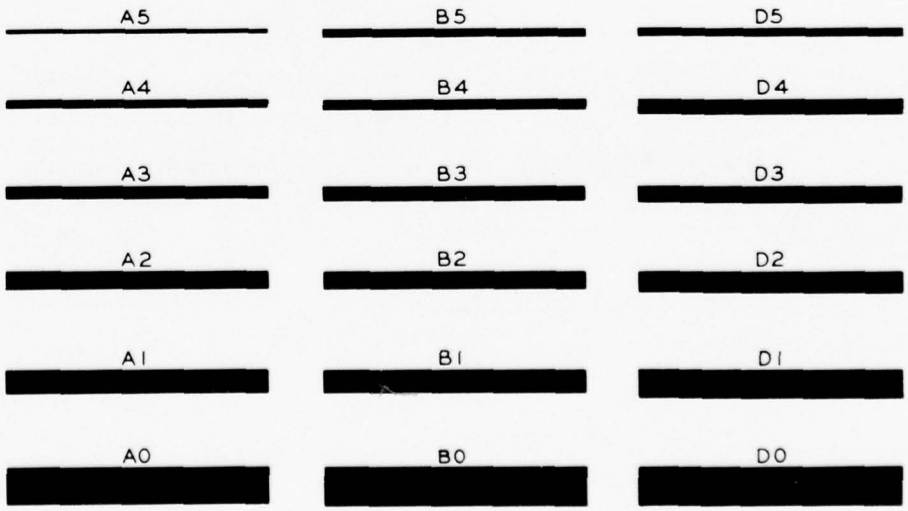


TABLE OF LINE WEIGHTS

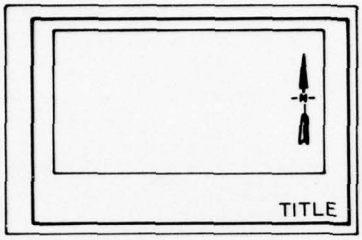


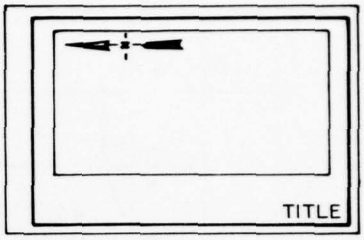
SPEEDBALL PEN SIZES



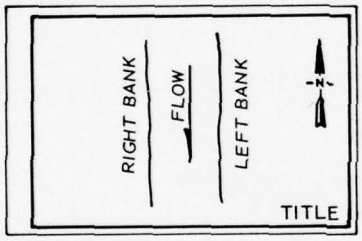
MAP, PLAN, AND SECTION ORIENTATION

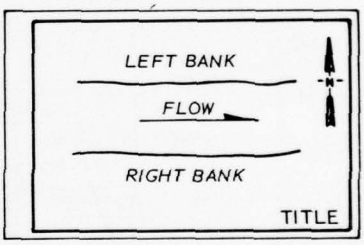
North will point toward the top of the sheet when practicable, or toward the left of the sheet if top orientation is impracticable.



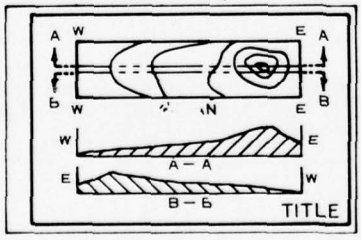


General plans, elevations, and longitudinal sections of channels, locks, dams, etc. oriented with the direction of flow of water from top to bottom of sheet, if practicable, or from left to right.

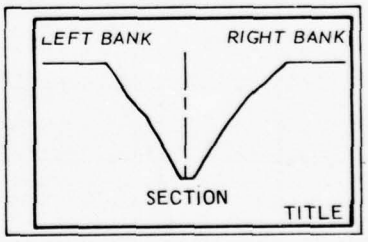




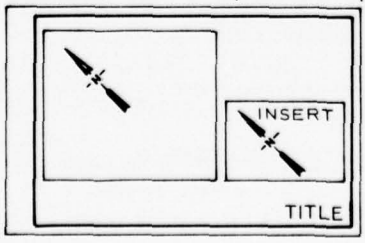
Orientation of sections looking in direction of arrows in plan.



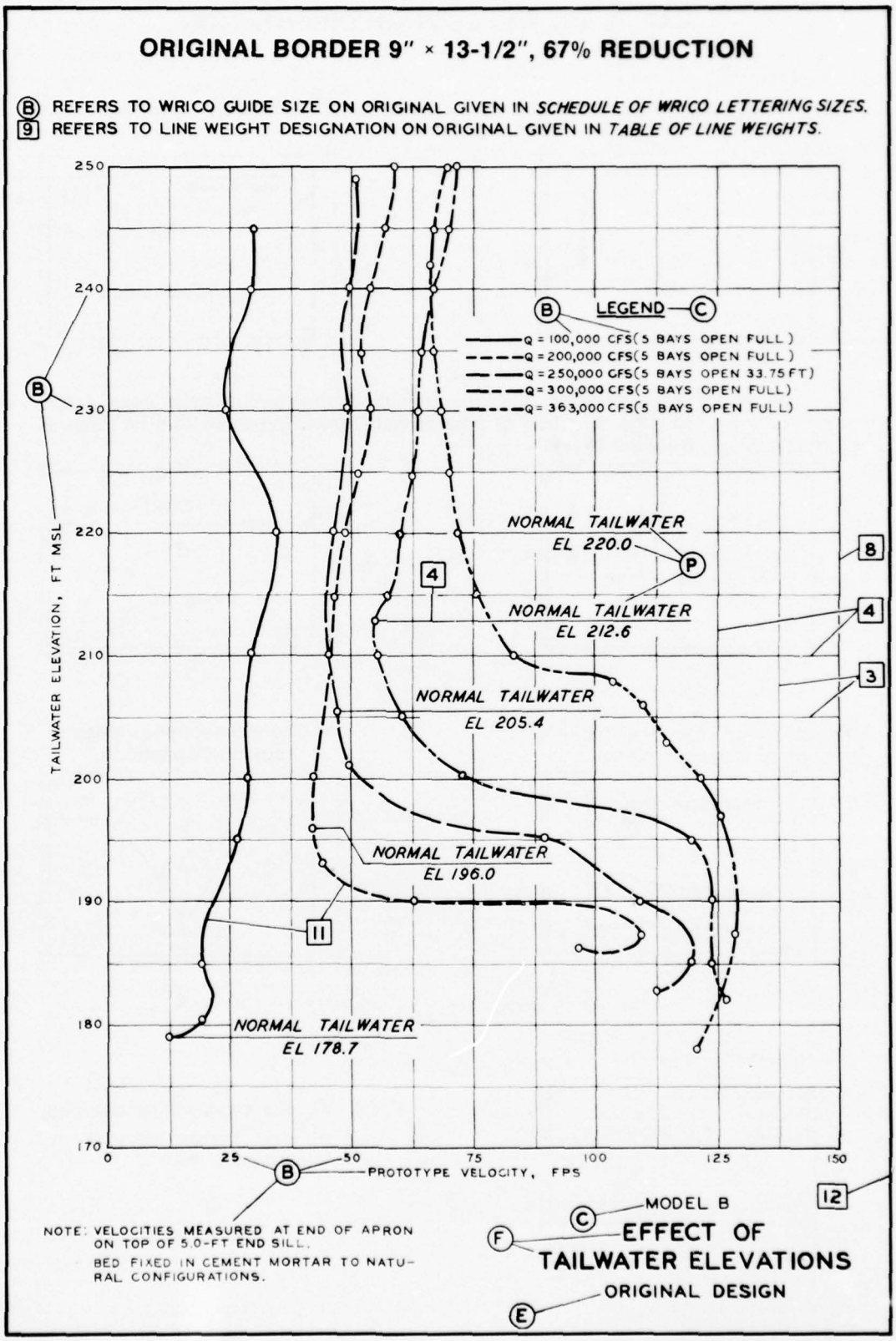
Channel sections viewed looking downstream.

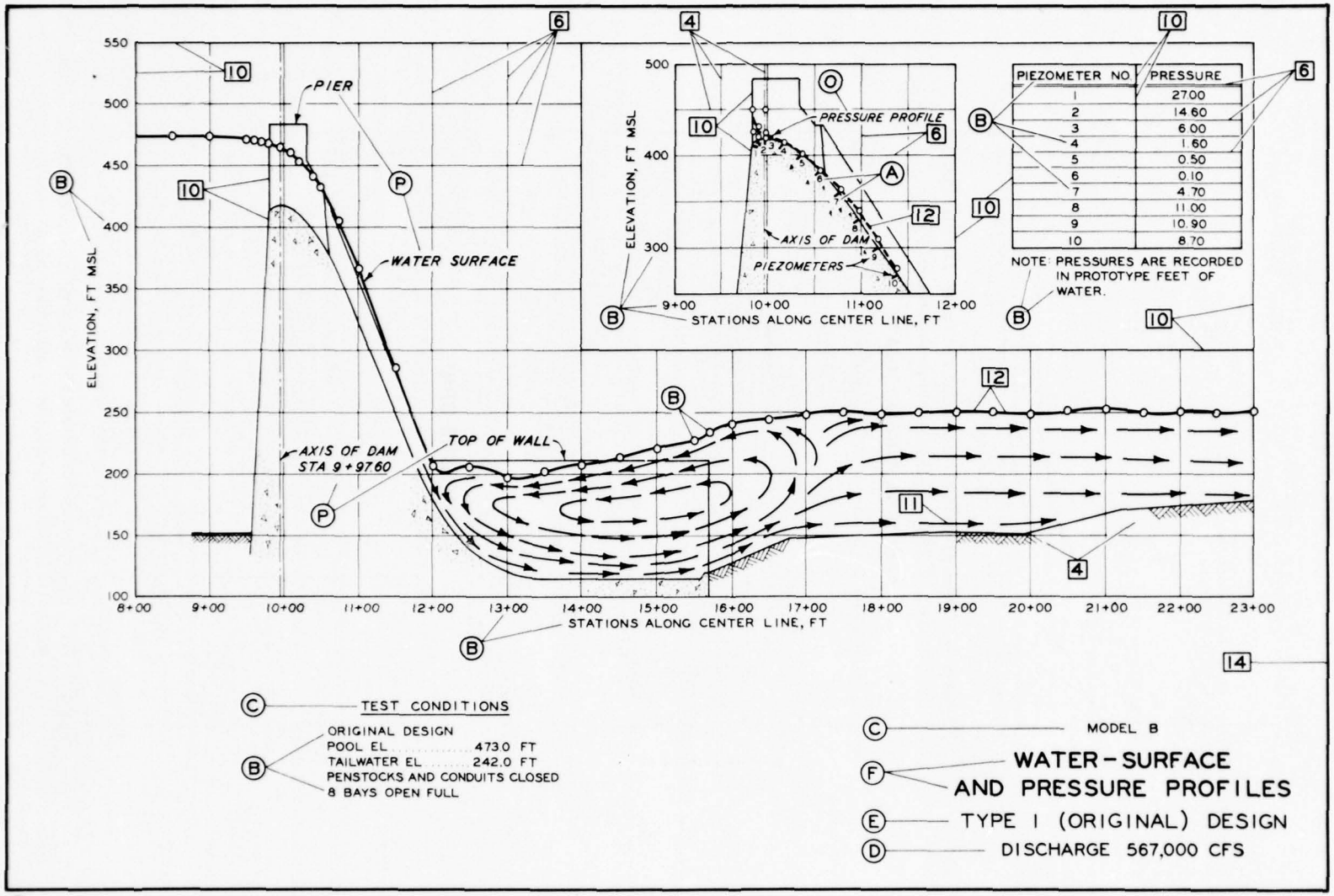


Inserts oriented with plan or map.



Note: Vicinity maps will be oriented with north arrow pointing toward top of sheet.


ORIGINAL BORDER 9" × 13-1/2", 67% REDUCTION
(B) REFERS TO WRICO GUIDE SIZE ON ORIGINAL GIVEN IN SCHEDULE OF WRICO LETTERING SIZES.
9 REFERS TO LINE WEIGHT DESIGNATION ON ORIGINAL GIVEN IN TABLE OF LINE WEIGHTS.
LEGEND
Q = 100,000 CFS(5 BAYS OPEN FULL)
Q = 200,000 CFS(5 BAYS OPEN FULL)
Q = 250,000 CFS(5 BAYS OPEN 33.75 FT)
Q = 300,000 CFS(5 BAYS OPEN FULL)
Q = 363,000 CFS(5 BAYS OPEN FULL)
NORMAL TAILWATER EL 220.0
NORMAL TAILWATER EL 212.6
NORMAL TAILWATER EL 205.4
NORMAL TAILWATER EL 196.0
NORMAL TAILWATER EL 178.7
TAILWATER ELEVATION, FT MSL
PROTOTYPE VELOCITY, FPS
250
240
230
220
210
200
190
180
170
0
25
50
75
100
125
150
NOTE: VELOCITIES MEASURED AT END OF APRON ON TOP OF 5.0-FT END SILL.
BED FIXED IN CEMENT MORTAR TO NATURAL CONFIGURATIONS.
MODEL B
EFFECT OF TAILWATER ELEVATIONS
ORIGINAL DESIGN



(B) REFERS TO WRICO GUIDE SIZE ON ORIGINAL GIVEN IN *SCHEDULE OF WRICO LETTERING SIZES*.

[6] REFERS TO LINE WEIGHT DESIGNATION ON ORIGINAL GIVEN IN *TABLE OF LINE WEIGHTS*.

ORIGINAL BORDER 12" × 18", 50% REDUCTION

GRID STYLES

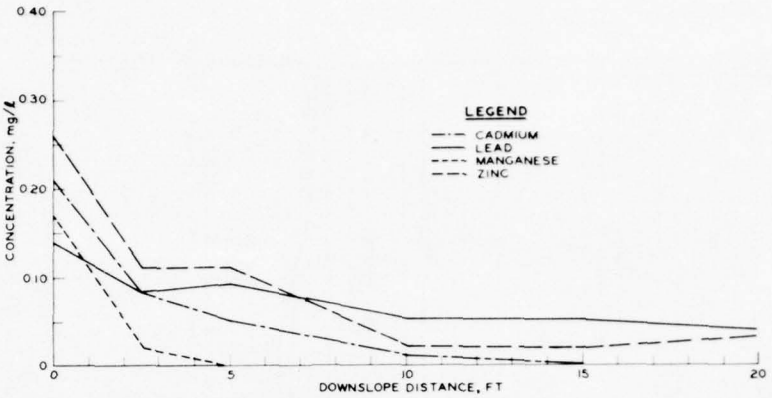


Figure 4. Heavy-metal concentrations in surface water flowing over Susquehanna clay

ABSCISSA AND ORDINATE

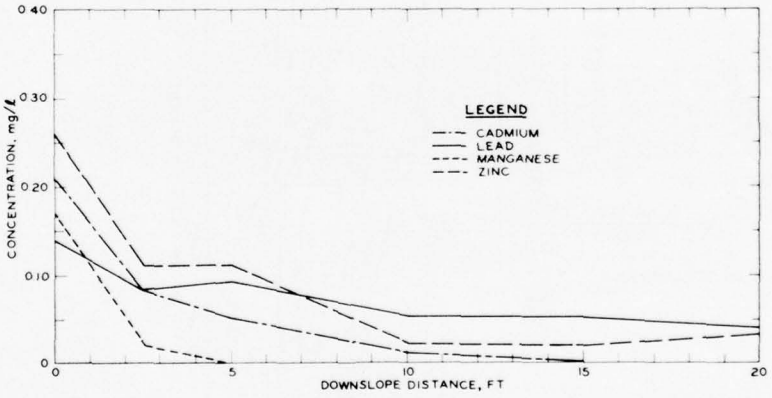


Figure 4. Heavy-metal concentrations in surface water flowing over Susquehanna clay

OUTLINE GRID

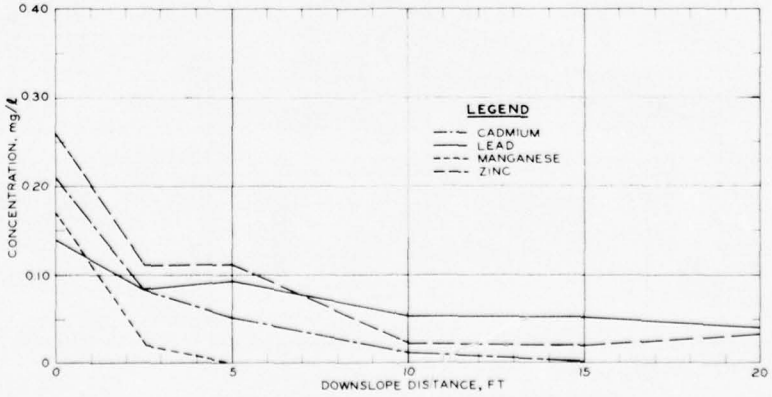


Figure 4. Heavy-metal concentrations in surface water flowing over Susquehanna clay

FULL GRID

DIMENSIONING

- RULES IN DIMENSIONS
- METRIC SYSTEM
- DUAL DIMENSIONING
- DIMENSIONING TECHNIQUES
- EXTENSION LINES
- ANGLES, RADII, AND CHAMFERS
- AZIMUTHS AND BEARINGS
- ISOMETRICS
- EXAMPLE OF METRIC DIMENSIONING
- IDENTIFYING AND DIMENSIONING STRUCTURAL STEEL
- INDICATING AND DIMENSIONING REINFORCEMENT STEEL

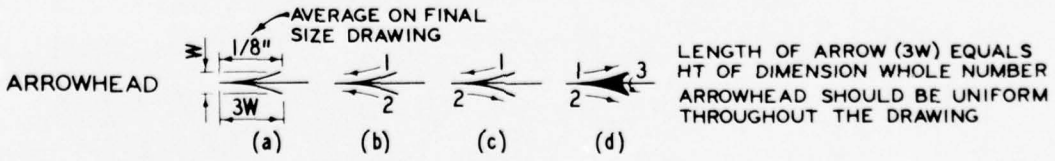
DIMENSIONING

Dimensions on drawings are generally shown in inches and fractional parts of an inch or in feet and inches unless the decimal dimensioning or Systems International (SI) system is used. The symbol for inch is ″, and for foot is ′. The inch symbol can be omitted when all dimensions are in inches; this fact can be stated in a note reading "Dimensions shown are in inches." If metric or SI units are used, this fact should be stated in a note also.

Dimensions (numerals) are placed on top of the line on structural, architectural-type drawings and on project layouts where distances are shown. Dimension lines are broken for values shown in machine and mechanical drawings. The system of dimensioning should be uniform throughout a set of drawings. Unless otherwise specified, elevations are shown to two decimal places as "El 308.52." When an elevation is given to the even foot, only one decimal should be used, as "El 274.0."

RULES IN DIMENSIONING

1. Show enough dimensions so that the intended size and shape can be determined without calculating or assuming any distance.
2. State each dimension clearly, so that it can be interpreted in only one way.
3. Show the dimensions between points, lines, or surfaces that have a necessary and specific relation to each other.
4. Select and arrange dimensions to avoid interpolations.
5. Show each dimension only once.
6. Place the dimension on the feature where its profile shows its true length or shape.
7. Dimensions should be spaced approximately 3/8 in. from the outline of a view and 1/4 in. between parallel lines on a 100 percent size drawing.
8. Values should be uniformly placed midway between points; that is, show all values either above the line or within the line depending on the type of drawing.
9. Stagger numerals when parallel dimension lines are necessary. Avoid crowding of dimensions.
10. Make arrowheads on dimension lines of a size that is in proportion to the reduction of the drawing. The weight of the dimension line should be slightly less than the weight of the letter.



METRIC SYSTEM

Scale drawings in the metric system are based on divisions of 10 as full size and then 1 to 2, 1 to 2-1/2, 1 to 5, 1 to 10, 1 to 20, 1 to 50, and 1 to 100. The unit of measurement is the millimetre (mm) and the dimension values are all understood to be millimetres without any indicating marks. Scale distances on maps are expressed in metres and kilometres and elevations are shown in metres.

An example of metric dimensioning is shown on page 22 and a table of metric equivalents is given on page 54.

DUAL DIMENSIONING

Dual dimensioning is a system in which both the inch and the millimetre values are shown on the same drawing. Identification is provided by enclosing the equivalent converted dimension in brackets [ ]. If the drawing is based on the inch system, the inch dimension should be above or to the left of the metric equivalent, and if the drawing is based on the metric system its dimensions should be above or to the left of the inch equivalent as follows:

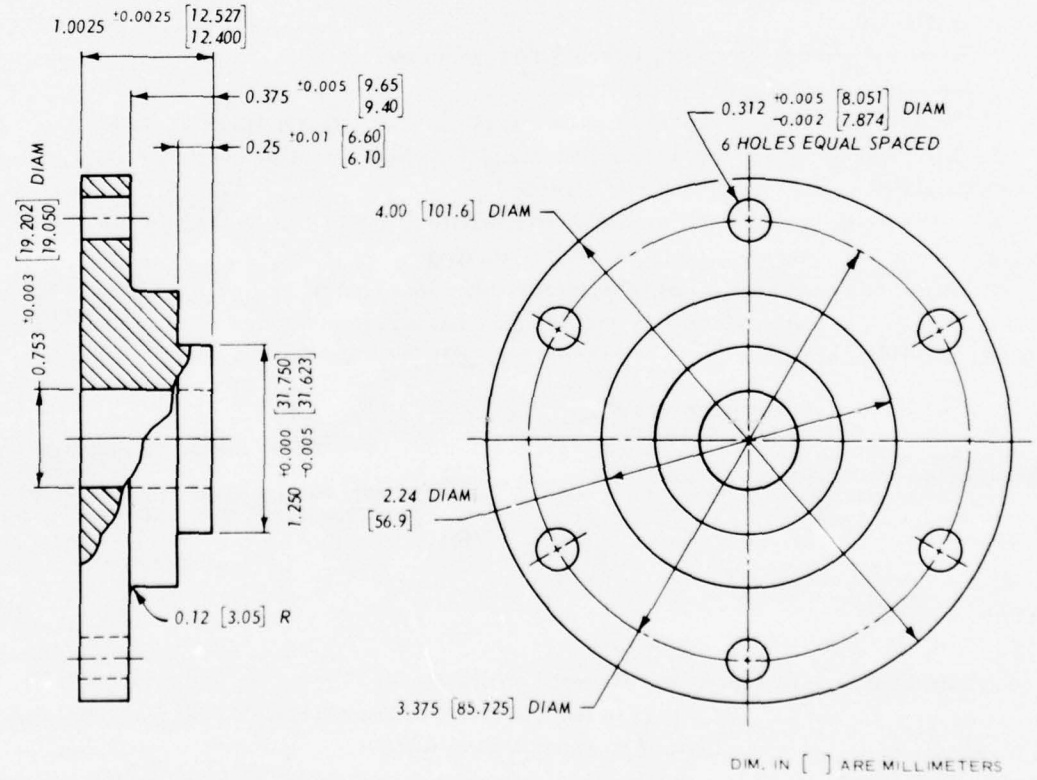
Inch-Based Drawing	Metric-Based Drawing
$\begin{matrix}1.0\\[25.4]\end{matrix}$ or 1.0 [25.4]	$\begin{matrix}25.4\\[1.0]\end{matrix}$ or 25.4 [1.0]

Drawings showing dual dimensioning should show by note or within the title:

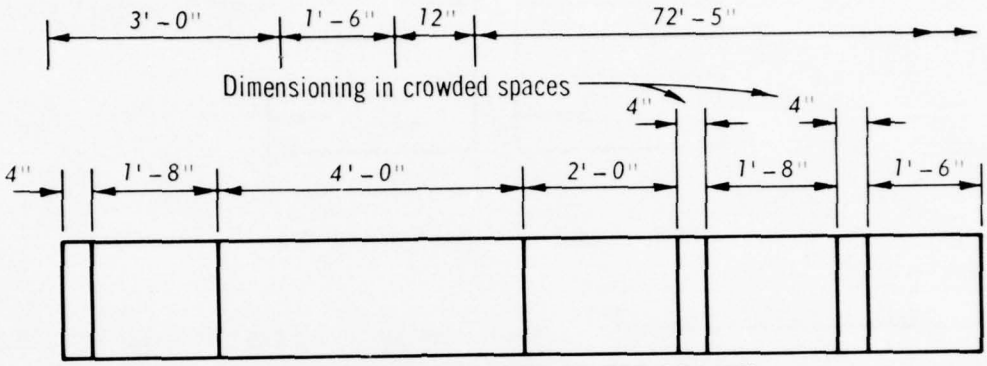
Dimensions in brackets, [ ], are in millimetres

or

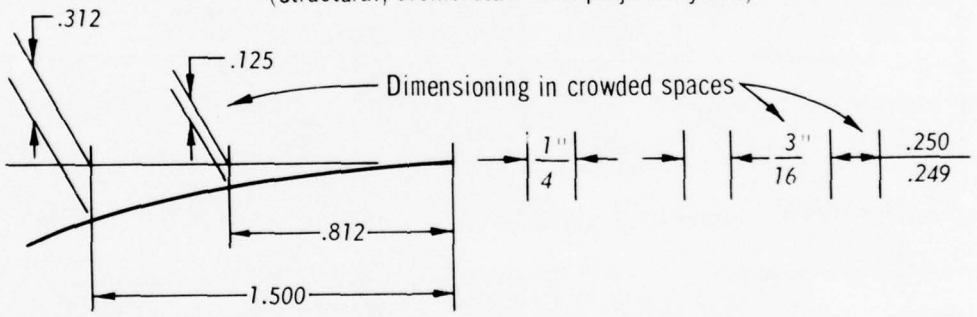
Dimensions in brackets [ ], are in inches



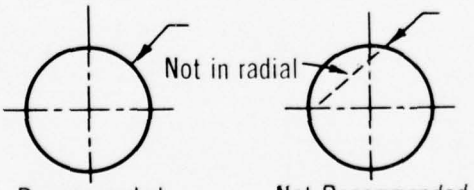
DIMENSIONING TECHNIQUES



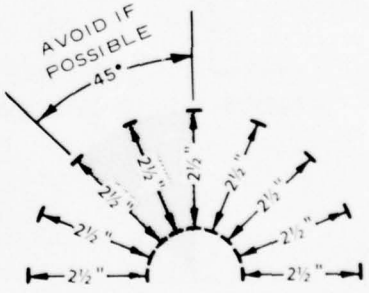
DIMENSIONS PLACED ON TOP OF LINE
(Structural, architectural and project layouts)



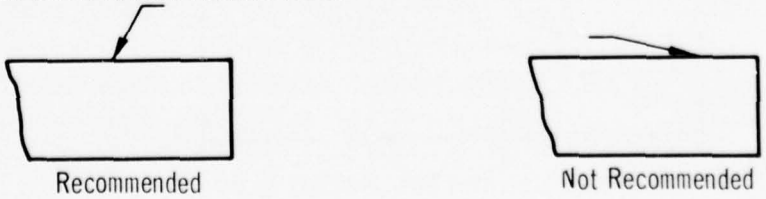
LINES BROKEN FOR DIMENSIONS
(Machine and mechanical drawings)



LEADERS TO CIRCLES
SHOULD BE IN RADIAL DIRECTIONS

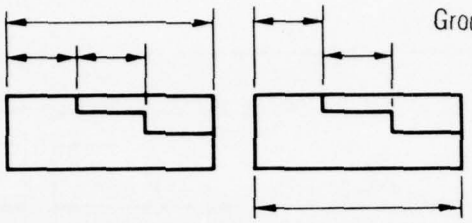


DIRECTIONS OF DIMENSIONS



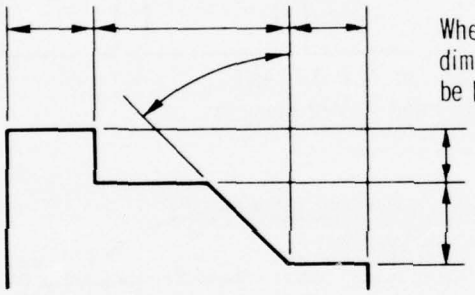
LEADERS SHOULD NOT MAKE SMALL ANGLES WITH OUTLINES

USE OF EXTENSION LINES

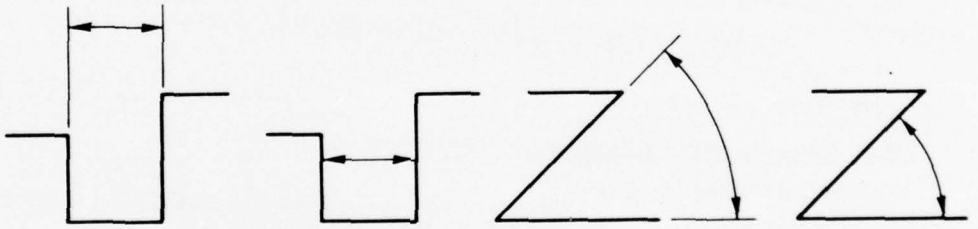


Grouped Dimension Lines

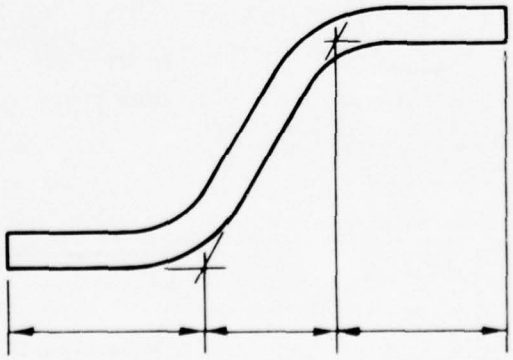
Recommended Not Recommended



Where extension lines cross other extension lines, dimension lines, or object lines they should not be broken. (Keep line crossing to a minimum)

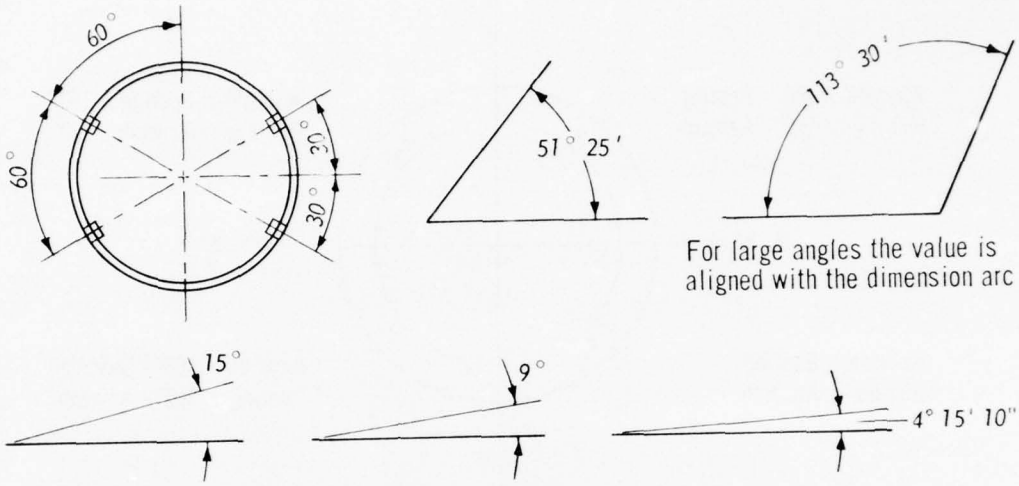


Recommended Not Recommended Recommended Not Recommended

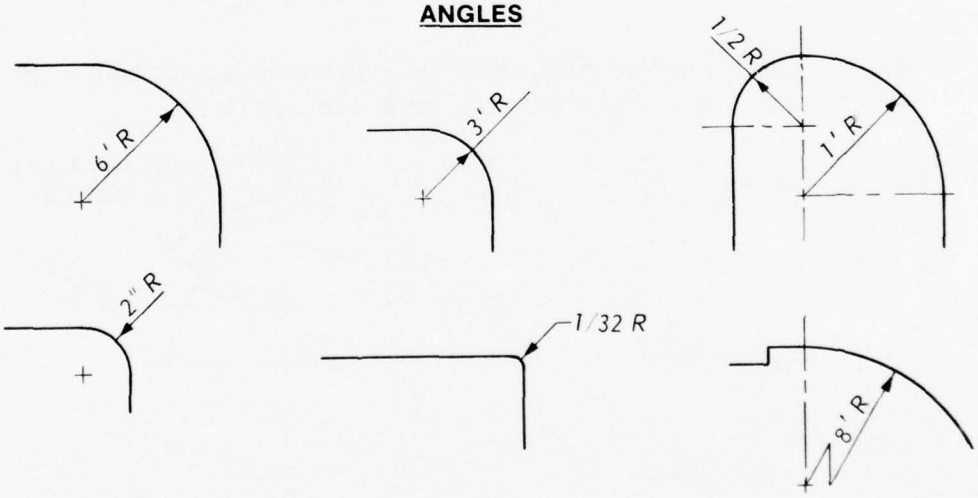


Extension lines pass through points they locate if points are not in outlines

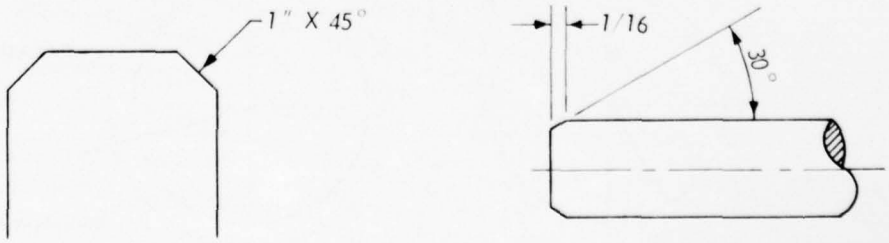
DIMENSIONING—ANGLES, RADII, AND CHAMFERS



ANGLES

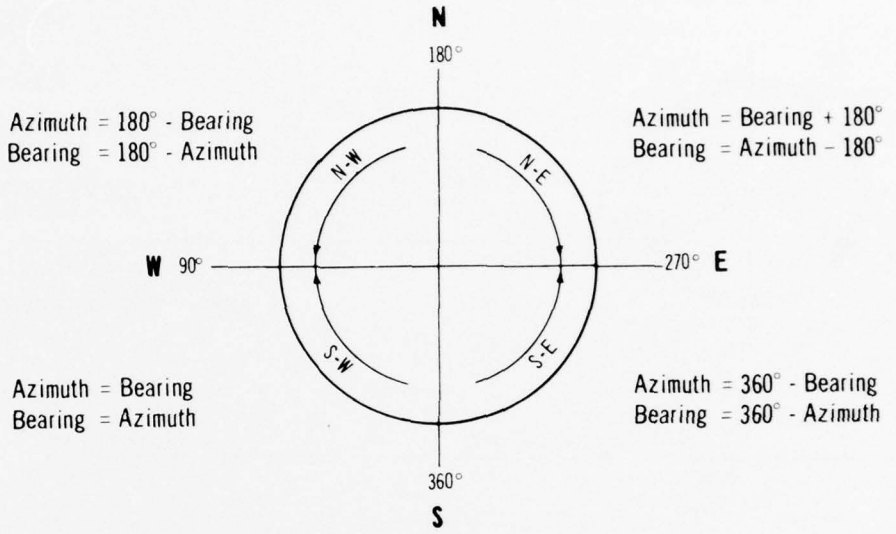


RADII

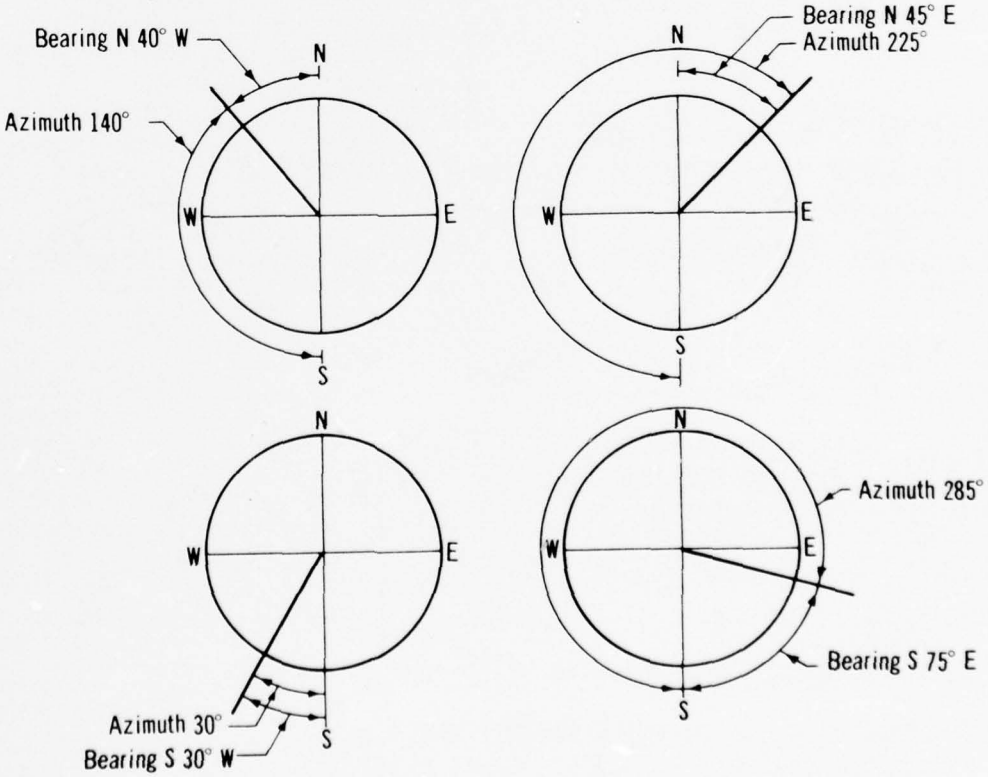


CHAMFERS

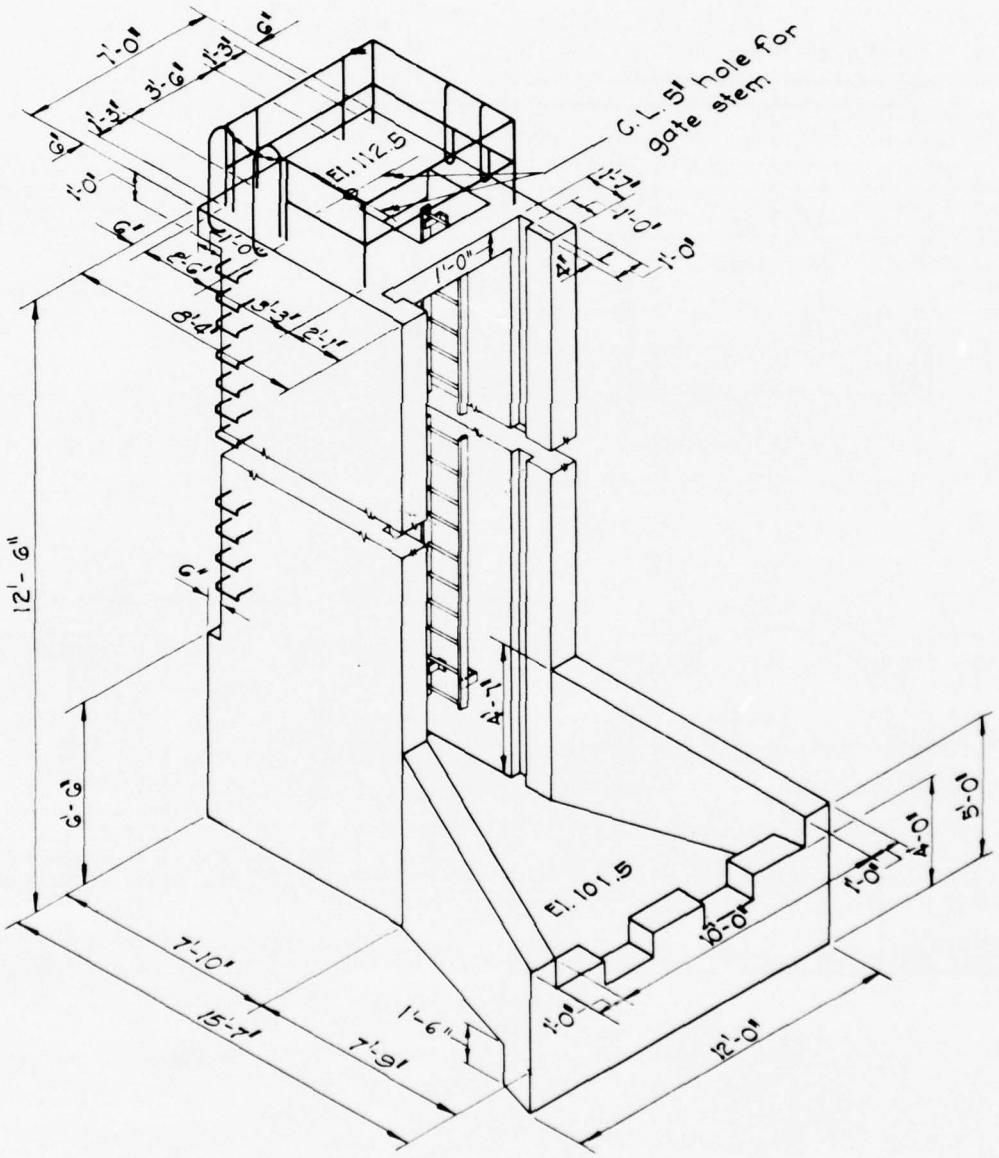
DIRECTIONS—AZIMUTHS AND BEARINGS



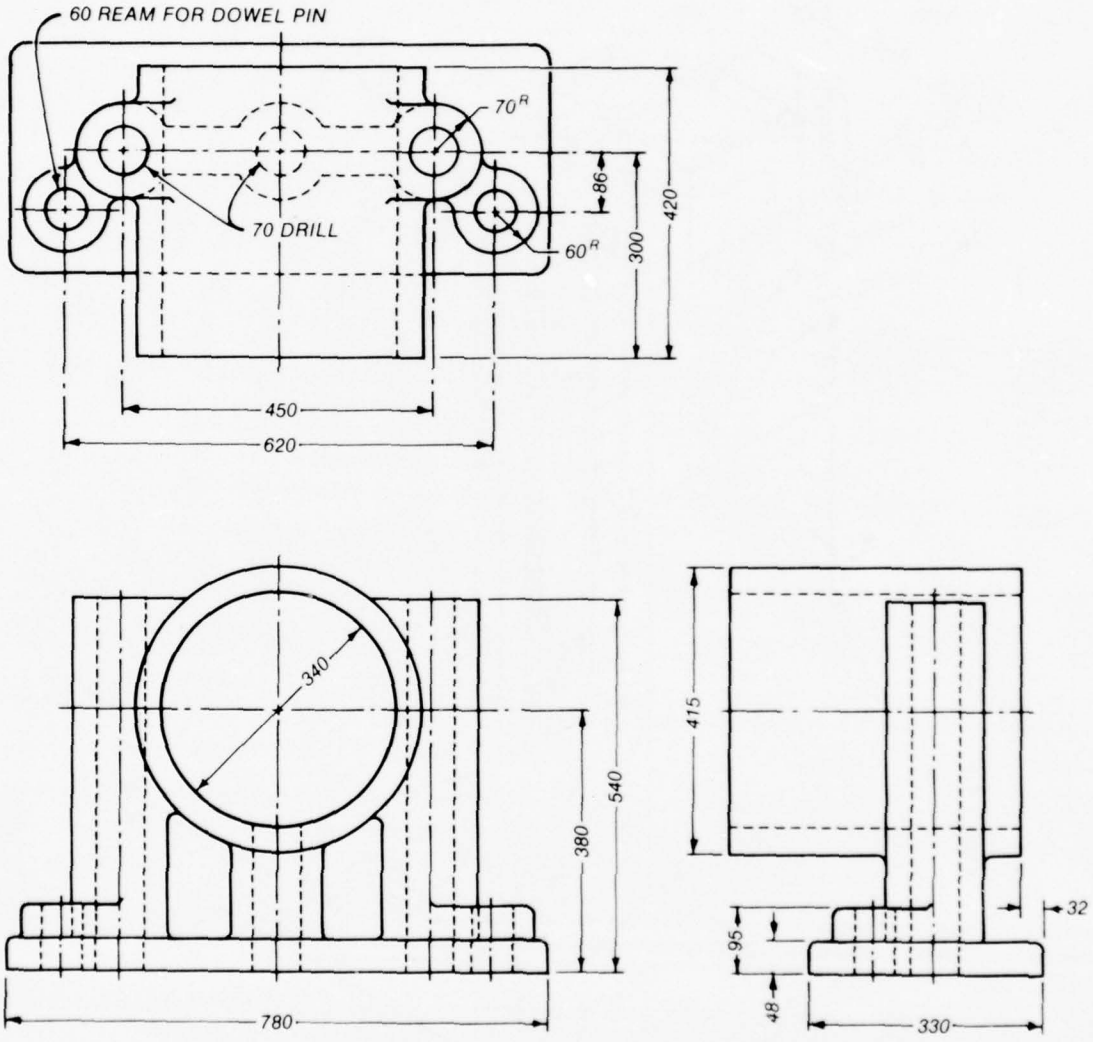
Arrows indicate the direction of measurement of the bearings in each quadrant from 0° or 180°
Azimuths are measured in a clockwise direction from 0° (south point) to 360°



DIMENSIONING AN ISOMETRIC



EXAMPLE OF METRIC DIMENSIONING



IDENTIFYING AND DIMENSIONING STRUCTURAL STEEL

IN DESIGNATING NUMBER REQUIRED AND PROPERTIES OF ROLLED STRUCTURAL MEMBERS THE FOLLOWING SEQUENCE SHOULD BE MAINTAINED

NUMBER REQUIRED — IDENTIFICATION — LENGTH REQUIRED

2 - 20 WF 76 × 9'-10"

SIZE, IN. (OMIT IN. MARKS) — TYPE — WEIGHT, LB (OMIT LB MARK)

ANGLES

EQUAL LEGS	L 3×3×1/2
UNEQUAL LEGS (LONG LEG FIRST)	L 7×3×1/2

BULB (LEGS, IN. × WEIGHT, LB)	BULB L 6×3-1/2×17.4

BEAMS

WIDE FLANGE	20 WF 76
MISCELLANOUS LIGHT	6 B 14
STANDARD MILL	8 M 17
JUNIOR	7 JR. 5.5

AMERICAN STANDARD	15 I 42.9
LIGHT COLUMNS	8×8 M 34.3

CHANNELS

AMERICAN STANDARD	9 [13.4
CAR AND SHIP	12 [44.5
JUNIOR	10 JR. [8.4
SPECIAL	12×4 [75

PLATES

(FLAT STEEL ABOVE 6 IN. IN WIDTH)

PLATE (WIDTH, IN. × THICKNESS, IN. × LENGTH, FEET AND INCHES)	Pl. 33×1/4×3'-0"
CHECKERED PLATE	CK Pl. 1/2

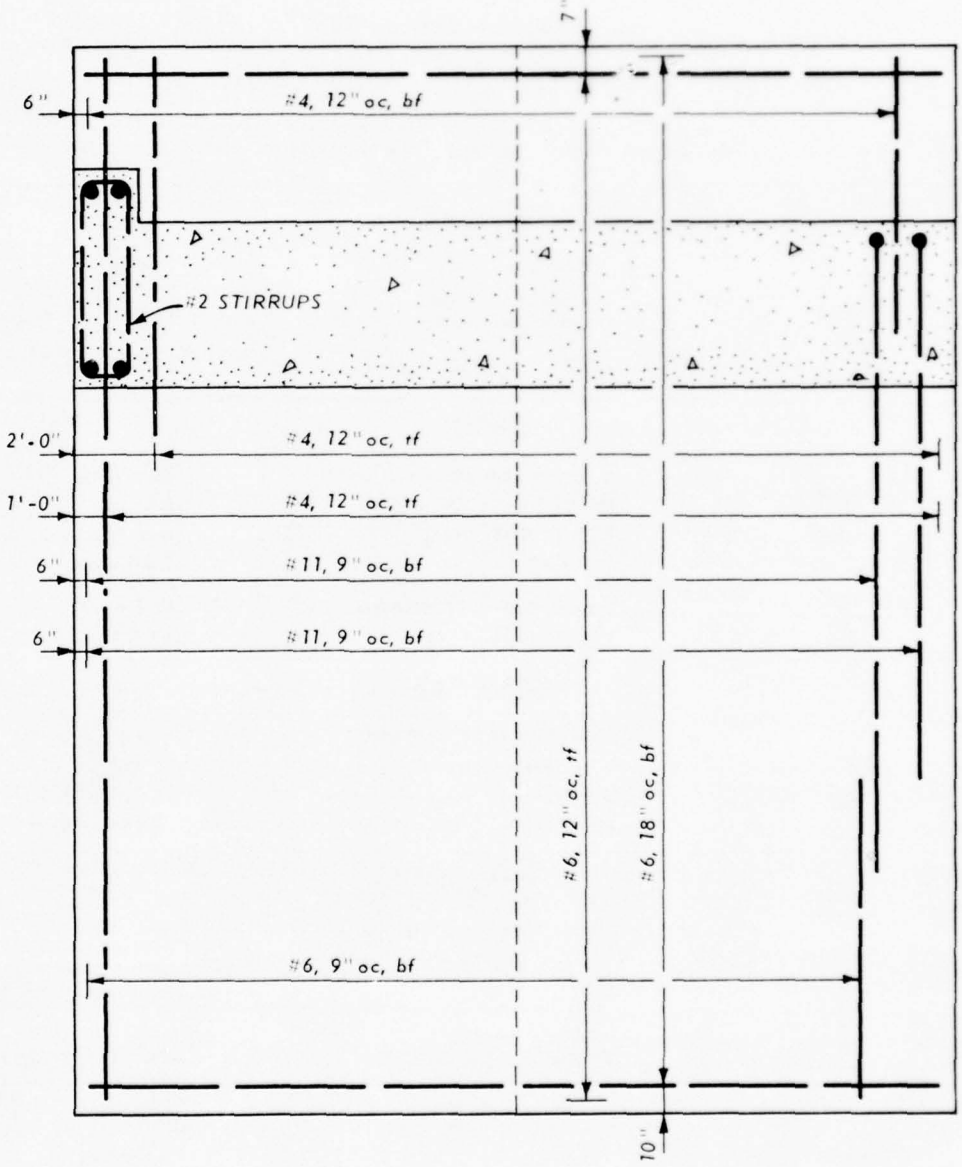
TEES

TEE (FLANGE, IN. × STEM, IN. × WEIGHT, LB)	T 5×3×6.7

ZEES

ZEE	Z 6×3-1/2×15.7

INDICATING AND DIMENSIONING REINFORCEMENT STEEL



NOTES: It is not necessary to show all the reinforcement steel in walls, slabs, beams, and other portions of reinforced structures.

The above sketch shows the maximum in bar indication with bar sizes and spacing as may be required.

SCALES

MAP SCALES AND THEIR EQUIVALENTS

GRAPHIC AND MAP SCALES

SCALES

The function of a scale is twofold: (1) to produce a drawing to a certain size (making a drawing to a scale), and (2) to measure distances accurately. Objects are represented on a drawing in full size, reduced, or in an enlarged size. The scale size of an object depends upon the amount of detail on the drawing or the degree of clarity required.

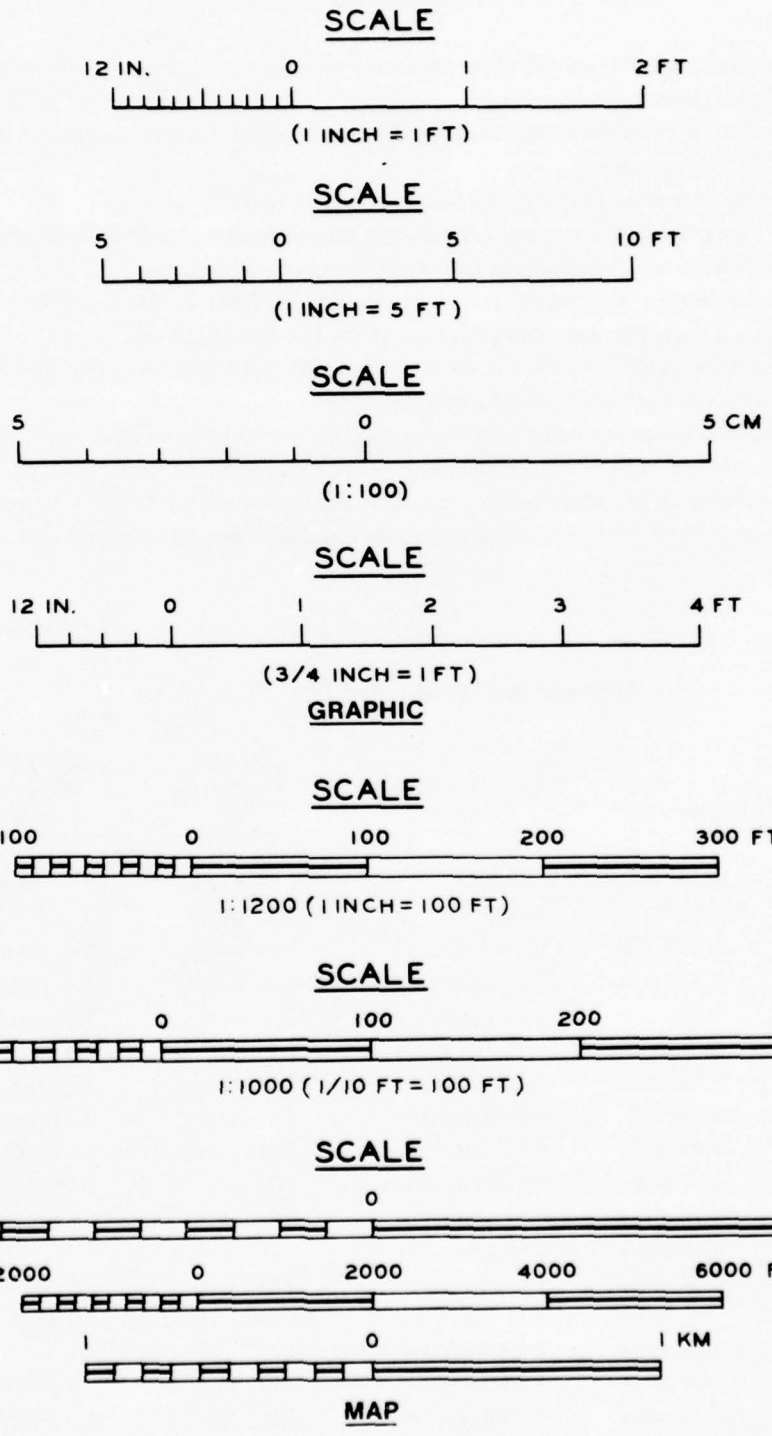
Scales may be expressed in words and figures (1 inch = 10 feet), by a representative fraction, RF, (1/10,000), or by a graphic or bar scale. All drawings and maps prepared at WES should show a scale unless otherwise instructed. A drawing or map without a scale should have a note of this fact in the title or below the drawn object. Note should read "NO SCALE" or "NOT TO SCALE." When a drawing is drawn to one scale only, the scale should appear as the last line of the title wherever space permits; otherwise it should be centered below the object. When comparative scales (model and prototype) are shown, the 0 values of both scales should coincide.

Graphic and bar scales should be used on drawings that are to be enlarged or reduced. If words and figures or a Representative Fraction is shown with a bar or graphic scale their values must be changed to agree with the percentage of enlargement or reduction. All maps must have a bar scale unless otherwise directed. Bar scales shown in a small-scale map such as 1:1,000,000 should indicate the latitude where the scale holds true.

Common Map Scales and Their Equivalents

Map Scale	One Inch Represents	One Centimetre Represents	One Mile Represented by	One Kilometre Represented by
1:2,000	56 yards	20 metres	31.68 inches	50 centimetres
1:5,000	139 yards	50 metres	12.67 inches	20 centimetres
1:10,000	0.158 mile	0.1 kilometre	6.34 inches	10 centimetres
1:20,000	0.316 mile	0.2 kilometre	3.17 inches	5 centimetres
1:24,000	0.379 mile	0.24 kilometre	2.64 inches	4.17 centimetres
1:25,000	0.395 mile	0.25 kilometre	2.53 inches	4.0 centimetres
1:31,680	0.500 mile	0.317 kilometre	2.00 inches	3.16 centimetres
1:50,000	0.789 mile	0.5 kilometre	1.27 inches	2.0 centimetres
1:62,500	0.986 mile	0.625 kilometre	1.014 inches	1.6 centimetres
1:63,360	1.00 mile	0.634 kilometre	1.00 inch	1.58 centimetres
1:75,000	1.18 miles	0.75 kilometre	0.845 inch	1.33 centimetres
1:80,000	1.26 miles	0.80 kilometre	0.792 inch	1.25 centimetres
1:100,000	1.58 miles	1.0 kilometre	0.634 inch	1.0 centimetre
1:125,000	1.97 miles	1.25 kilometres	0.507 inch	8.0 millimetres
1:250,000	3.95 miles	2.5 kilometres	0.253 inch	4.0 millimetres
1:500,000	7.89 miles	5.0 kilometres	0.127 inch	2.0 millimetres
1:1,000,000	15.78 miles	10.0 kilometres	0.063 inch	1.0 millimetre

GRAPHIC AND MAP SCALES



SLIDES AND VUGRAPHS

- PREPARATION
- PROCESSING
- VIEWING
- MINIMUM LETTER SIZES
- VUGRAPHS
- SLIDE EXAMPLES
- VUGRAPH EXAMPLE

SLIDES AND VUGRAPHS

SLIDES

The purpose of a slide is to help people understand quickly information presented to them. A slide should be used for one or more of the following purposes:

a. To clarify an idea.

b. To emphasize an important point.

c. To assist the speaker in following an organized plan of presentation.

d. To arouse the interest and thereby hold the attention of the audience.

FAILURE IN SLIDE PREPARATION

Poor slides are generally caused by one or more of the following:

a. Too much material, too crowded.

b. Letters and symbols are hard to read, too small or too light.

c. Line detail is too fine, can't follow.

d. Color on a slide misused—poor contrast, dark colors blend together, shows black on a group of curves.

The principal factors to consider in producing a good slide are the design of the material to be displayed and the condition in which the slide is presented. The design of the slide consists of the size and shape of letters, symbols, and lines and their arrangement within the area of projection. Information that CANNOT be seen on a slide is of NO value. Limitations for letter sizes can be established mathematically for legibility at a given distance, but factors other than letter size must be considered before legibility is assured.

SIMPLE RULES TO FOLLOW IN SLIDE PREPARATION

Personnel of the EGB and Photography Branch are available to assist the originator in designing an effective slide. The following are recommended rules:

1. Express a minimum of ideas on a slide, preferably one main idea with fewest possible words (15 to 20); use more slides if necessary. Illustrations prepared for publication are NOT suitable for slides.

2. Avoid needless detail; do NOT duplicate information; use standard abbreviations. KEEP THE SLIDE SIMPLE.

3. Arrange legends, notes, etc., in order for easy reading. Avoid lettering vertically; keep it horizontal wherever possible. Include title only to supplement, not to repeat, information.

4. Do not use a border on a slide; the mask serves this purpose.

5. Use a simple block-type letter without serifs, and use all caps wherever possible. Gothic (Wrico & Leroy) is the most acceptable style. Avoid slant lettering.

6. Space lines and words properly, a minimum of 3/4 letter height between lines and the width of letter "W" between words.

7. Lines and symbols should be no narrower than the appropriate line weight for the smallest letter on the slide. In general, use bold lines and keep lines to a minimum.

8. To avoid glare, have slide processed with light-color background on a black and white slide, or use negative slides or film diazo slides on copies with large blank areas.

9. Since all slides at WES are copied on color film, every consideration should be given to the *use* of color to add realism, emphasize important facts, and differentiate specific areas.

10. Be selective in use of color. Color attracts, stimulates, and directs interest. People tend to respond to certain colors—cool colors, blue and its companion colors, blue-green and violet, are retiring; warm colors, yellow and its related colors, orange and red, appear to advance and show strength. For this reason cool colors are most apt to be used in the background and warm colors are used to deliver the dominant message. PLAN YOUR SLIDES.

SLIDE PROCESSING

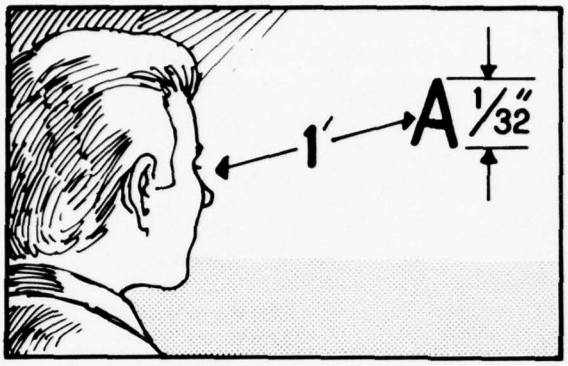
The artwork for slides at WES is prepared for use on 35mm slides (2 × 2). Artwork is photographed and the 35 mm film processed and inserted automatically in a 2- by 2- in. mask with an image opening of 1-11/32 by 29/32 in., an approximate 2:3 ratio. Slides can be copied from black and white drawings with a tinted background added to them photographically, from drawings prepared in color, from negatives, and from film diazos. Quality slides can be produced from all of these, provided the symbols and lettering meet original sheet size requirements.

Slide originals at WES are normally copied on a Polaroid MP-4 Multipurpose Land Camera using Ektachrome color film. This is an exacting, fast, easy method of copying. An area of up to 12 by 18 in. can be copied by this method. For efficient and easier handling, a 6- by 9-in. size range is recommended. Copies larger than 12 by 18 in. must be mounted on a wall and is therefore more expensive and time-consuming because it requires individual adjustments for each camera setup.

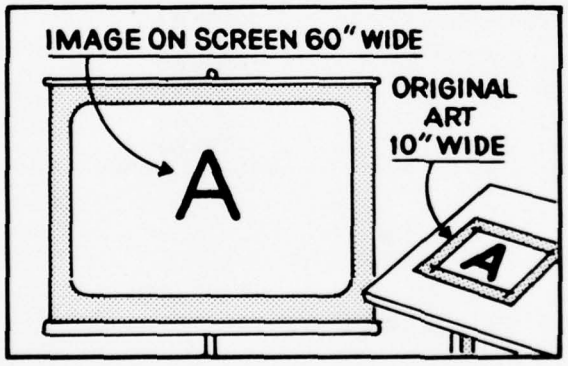
Note: The Photography Branch can handle larger originals on a case by case basis using special equipment and procedures. However, special treatment is obviously more expensive and time consuming and smaller sizes are recommended.

SLIDE VIEWING

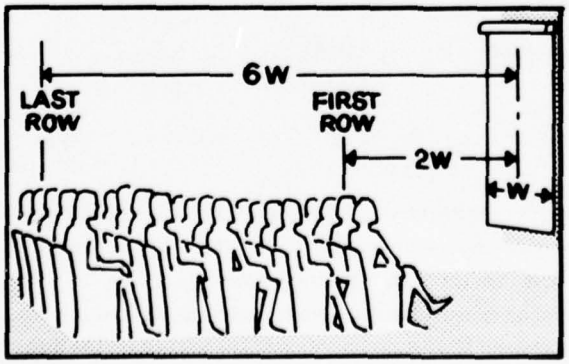
Although horizontal and vertical slides can be mixed since most screens used by WES are square, the HORIZONTAL slide is much preferred to the vertical slide. The horizontal slide can be projected on the screen for better viewing. Often vertical slides extend too close to the floor or up into the ceiling. The horizontal slide can be used also on commonly available screen with a height-to-width ratio of 0.75 to 1 just as effectively without sacrificing a decrease in symbol and lettering sizes.



Letters, symbols, and objects are legible if their height is 1/32" per foot of distance between them and the viewer. At 32 feet, 1-inch lettering is legible, and at 16 feet 1/2-inch lettering is legible. Viewing at a distance of 50 feet requires a letter height of 50/32" or a letter approximately 1-1/2 inches in height.



To establish legibility limits for a slide, the enlargement factor (i.e., the ratio of the projected width to the width of the original drawing) must be known. At a projection distance of 30 feet, the letter height must be 30/32". With an enlargement factor of 6 (for 10-inch originals projected on a 60-inch screen), the required size of lettering on the artwork should be 1/6 of 30/32 = 5/32 = .156 or 175 Wrico guide or 14-pt font.



Screen widths are ordinarily determined by conference room length. For quick viewing, the 6W/2W standard has been generally followed by audiovisual specialists. The last row of viewers should not be more than 6 screen widths away from the screen and the front row no closer than 2 screen widths.

Minimum Letter Sizes for Slide Copy

Long Side of 2:3 Copy, in.	Minimum* Letter Height, in.	Recommended Wrico (W) Varitype (V)
4	0.063	692-8(V)
5	0.078	692-10(V), 90(W)
6	0.094	692-13(V), 90(W)
7	0.110	120(W)
8	0.126	120(W)
9	0.141	140(W)
10	0.157	175(W)
11	0.173	175(W) or 185(W)
12	0.188	185(W) or 200(W)
13	0.204	200(W)
14	0.220	240(W)
15	0.235	240(W)
16	0.251	240(W) or 250(W)
17	0.267	290(W)
18	0.283	290(W)
19	0.298	290(W)
20	0.314	290(W)
21	0.330	350(W)
22	0.345	350(W)
23	0.361	350(W)
24	0.375	350(W) or 375(W)
**		

Note: Values based on projection conditions at a ratio:

$$\frac{\text{Maximum audience distance from screen}}{\text{Width of projected slide}} = 6$$

To determine the minimum height of a letter in an image not in slide ratio (2:3) assume a long side in relation to its short side. Example: For a slide copy with a 6- by 6-in. image, the long side is 9 in.

* Minimum letter sizes for horizontal slide are based on the formula: Letter height = 0.0157 × width of copy (in.).

** For length greater than 24 in. multiply width by 0.0157.

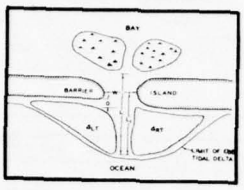
VUGRAPHS

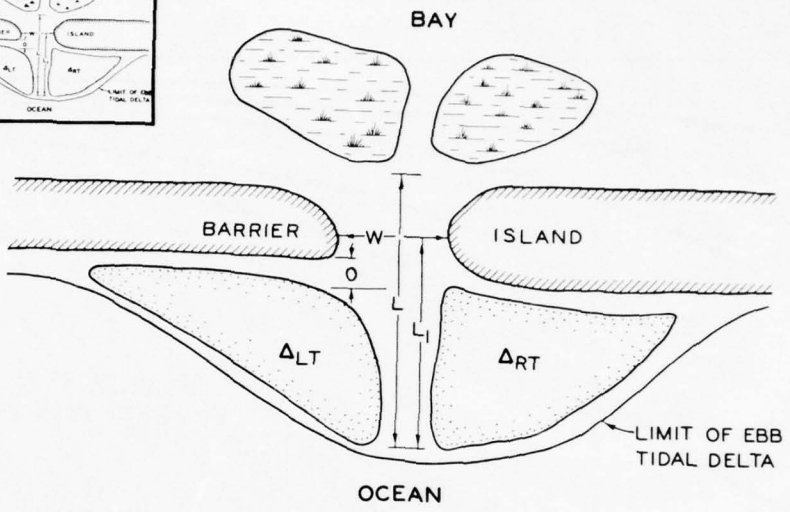
The overhead Vugraph will project up to size 10- × 10-inch mounted transparencies; 8 × 10 Vugraph masks are used at WES. Transparencies are produced photographically, drafted directly on clear film, or by copy images transferred on infrared film and run through a thermal machine.

Quick film copies for classroom purposes and in-house meetings can be made easily and directly from clean Xerox copies of standard page size prints and processed on infrared transfer film. The more elaborate Vugraphs for repeated use and which will be viewed before large audiences must be prepared to meet the same requirements as for a slide. A good slide can be used as a good Vugraph.

SLIDE EXAMPLE

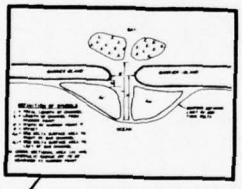
SLIDE IMAGE



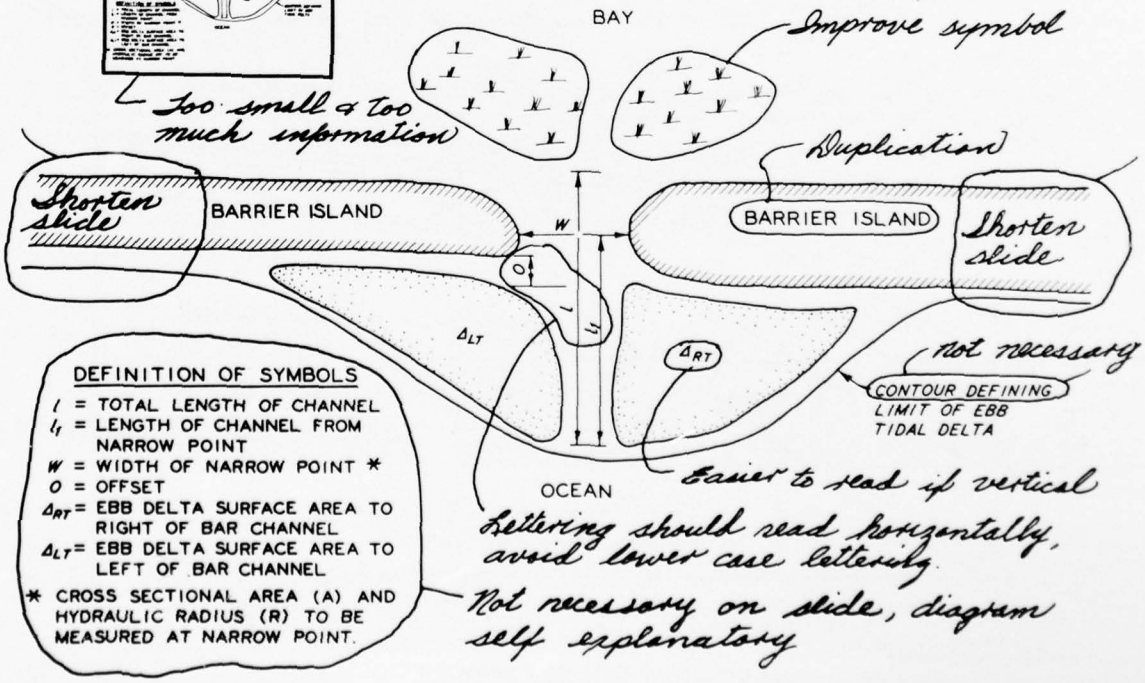


RECOMMENDED

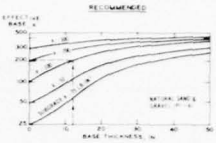
SLIDE IMAGE



Too small & too much information

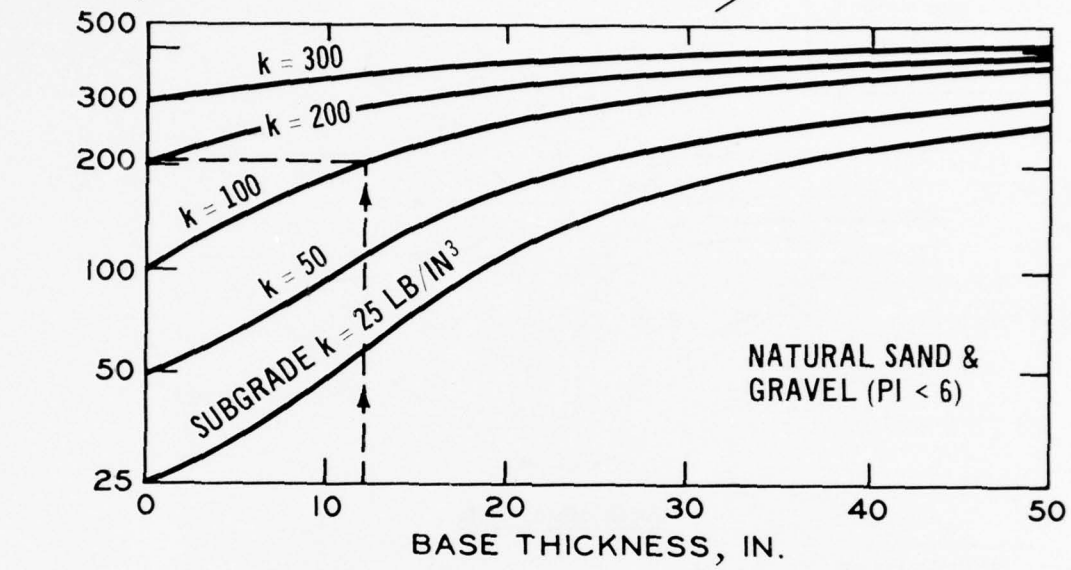


NOT RECOMMENDED



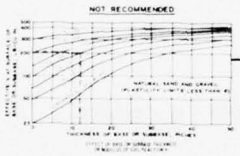
SLIDE EXAMPLE

SLIDE



MODULUS OF SOIL REACTION, k

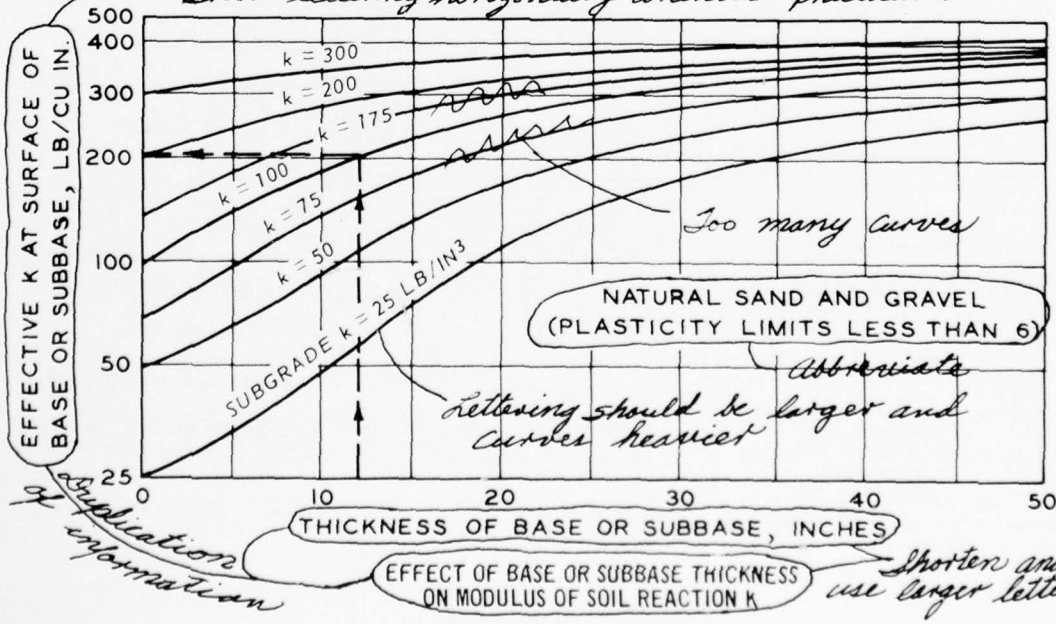
RECOMMENDED



SLIDE

Too much lettering & too many lines on slide

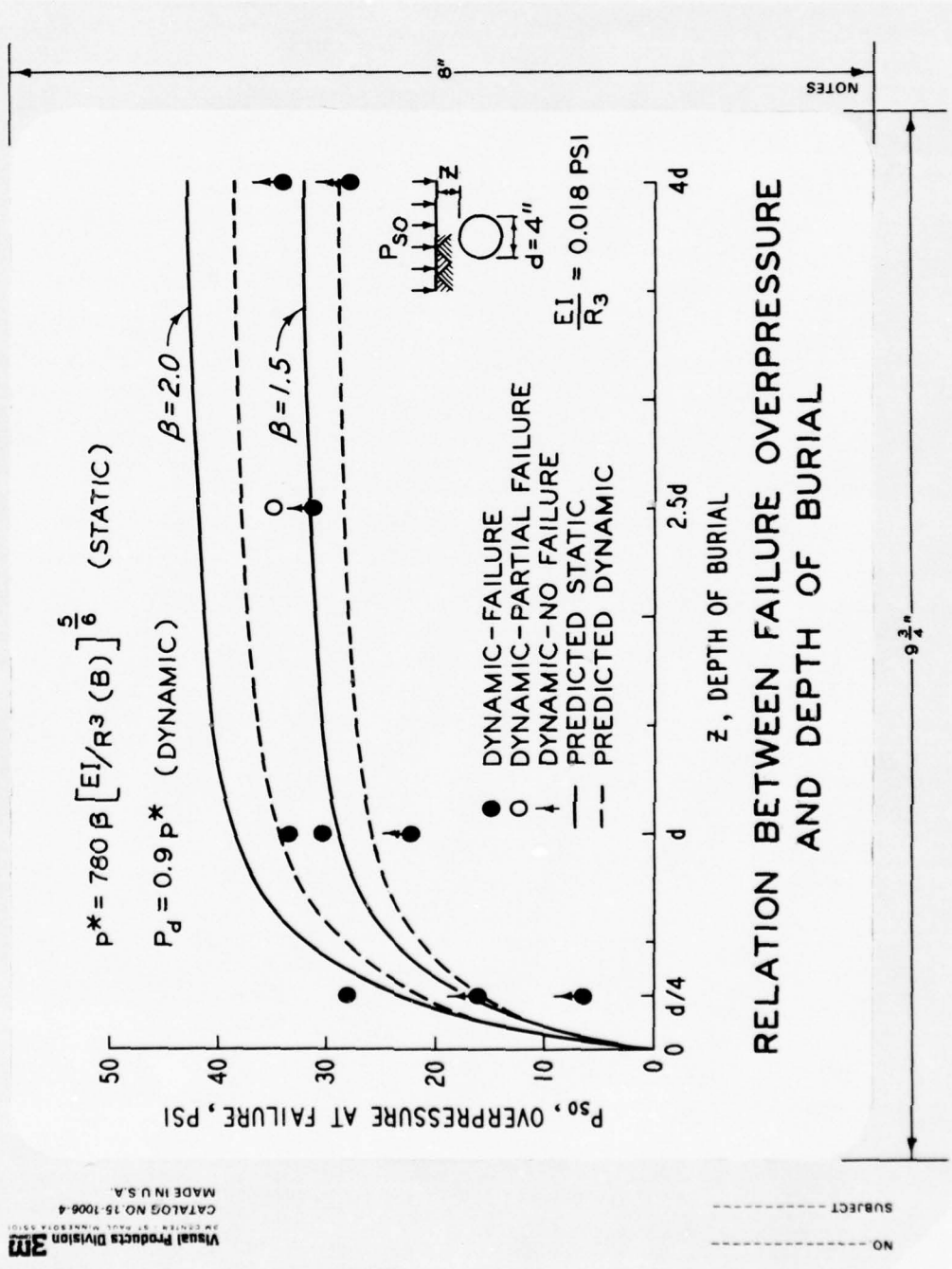
Show lettering horizontally whenever practicable



NOT RECOMMENDED

VUGRAPH EXAMPLE

(Reduced for illustrative purposes, actual image area 9-3/4″ × 8″)



Visual Products Division 3M
CATALOG NO 15-1006-4
MADE IN U.S.A.

CONSTRUCTION DRAWINGS

SIZES

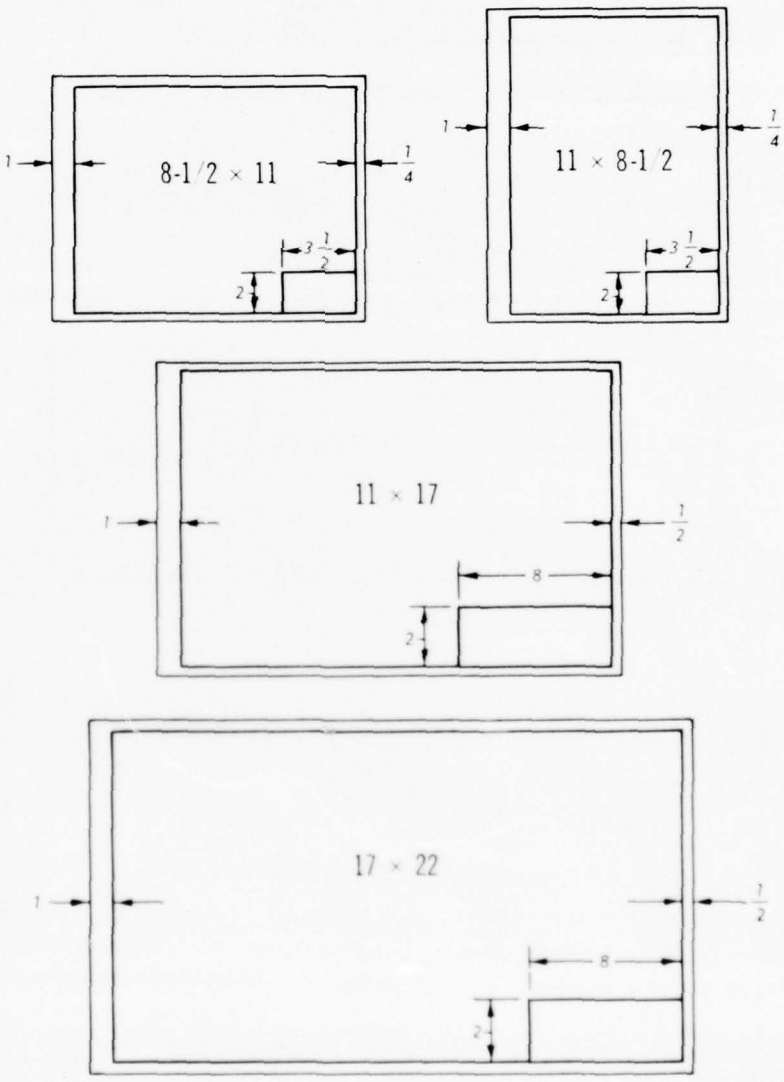
TITLE FORMAT

CONSTRUCTION DRAWINGS

DRAWING SIZES

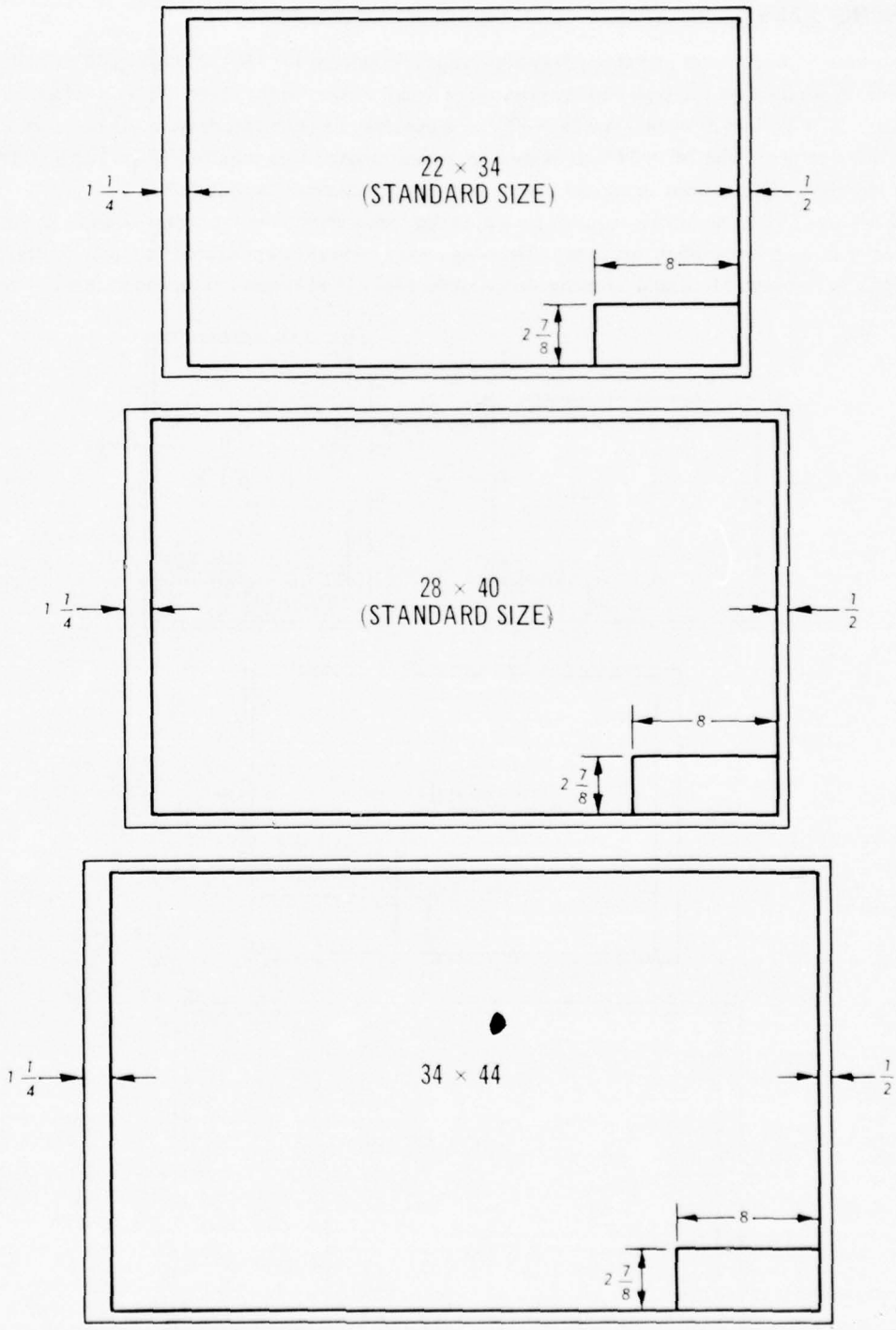
Construction (contract and shop) drawings range in size from 11″ × 8-1/2″ to 28″ × 40″ trim line to trim line, depending on the type and the amount of detail shown on the sheet. The two standard size sheets are 28″ × 40″ and 24″ × 34″. The 28″ × 40″ size is used for most contract drawings since it contains a larger drawing area. The 24″ × 34″ size is used on minor projects that require less spacing and detail. Other size drawings are used in special cases where very little detail is required.

When more than one sheet is required for a drawing, all sheets shall be the same size and will contain suitable matching lines when necessary. Drawings are ordinarily reproduced (contact prints) and submitted at full size. Minimum lettering size must be 1/8-inch in height or equivalent to a 120 Wrico guide.



Note: All sheet sizes are trim line to trim line.

DRAWING SIZES



Note: All sheet sizes are trim line to trim line.

TITLE FORMAT

SYMBOL	DESCRIPTION	DATE	APPROVED
REVISIONS			

APPROVED COLONEL, CE, DIRECTOR		U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION CORPS OF ENGINEERS VICKSBURG, MISS.
RECOMMENDED: LAB CHIEF		
RECOMMENDED: DIV. CHIEF		
REVIEWED: BRANCH CHIEF		
SUBMITTED: PROJECT ENGR.		
DRAWN / TRACED / CHECKED	SCALE: / SPEC. NO.	SHEET OF

Note: For sheet sizes smaller than 11" × 17" select lettering to fit the title block.

SYMBOLS

- TOPOGRAPHIC
- MATERIALS
- SCREW THREAD
- ELECTRONIC
- PIPING
- BASIC WELDING
- COMPUTER
- CHEMICAL
- SOILS
  - UNIFIED SOIL CLASSIFICATION
  - DESCRIPTIVE
  - ROCK CLASSIFICATION AND SYMBOLS
  - SUBSURFACE EXPLORATION
  - GEOLOGICAL
  - TYPICAL SOIL BORING LOGS
  - SOIL BORING WITH TEST DATA

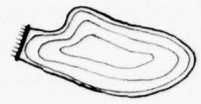
SYMBOLS

Coding and symbolization of elementary parts or features of common and repeated use on drawings, charts, maps, etc., have been developed and standardized through tradition and conventional representation over a long period of time. Symbols listed herein are in general agreement with those employed by organizations within the Corps of Engineers and with those of the American National Standard Engineering Drawing Practices (shown in most technical drawing manuals). Where no symbol is prescribed or has not been standardized, the draftsman or the map maker may use a special symbol providing there is no conflict with an established standard symbol.

Templates and reproduction of symbols on transfer film can be obtained from commercial sources and can be made to order in various sizes. These devices not only reduce and simplify the drafting effort but they accomplish uniform symbolization. Symbols listed in this manual are those used at WES; for other prescribed standard symbols refer to American National Standards Symbols (shown in most drafting textbooks), DMATC TMS-1 (Specifications for Military Maps), FM 21-31 (Topographic Symbols), etc.

Various types of soils and subsurface materials are encountered in field explorations and laboratory testing. Many of the results can be shown by appropriate representation of symbols and abbreviations to locate and delineate soil types on maps and drawings.

TOPOGRAPHIC SYMBOLS

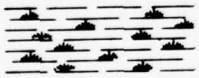

Lake or pond with dam

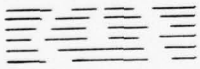
Streams in general

Intermittent stream

Intermittent lake

Salt marsh


Fresh marsh


Tidal flat

Grass

Woodland

Orchard

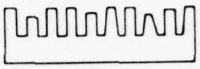
Contours

Depression contours

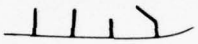
Cuts

Fills

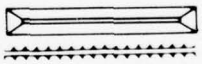
Hachure


Wharves and docks

River gage

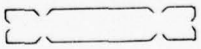

Retards and dikes

Revetment


Levees

Original ground surface

Fill


Riprap in plan

Riprap in section

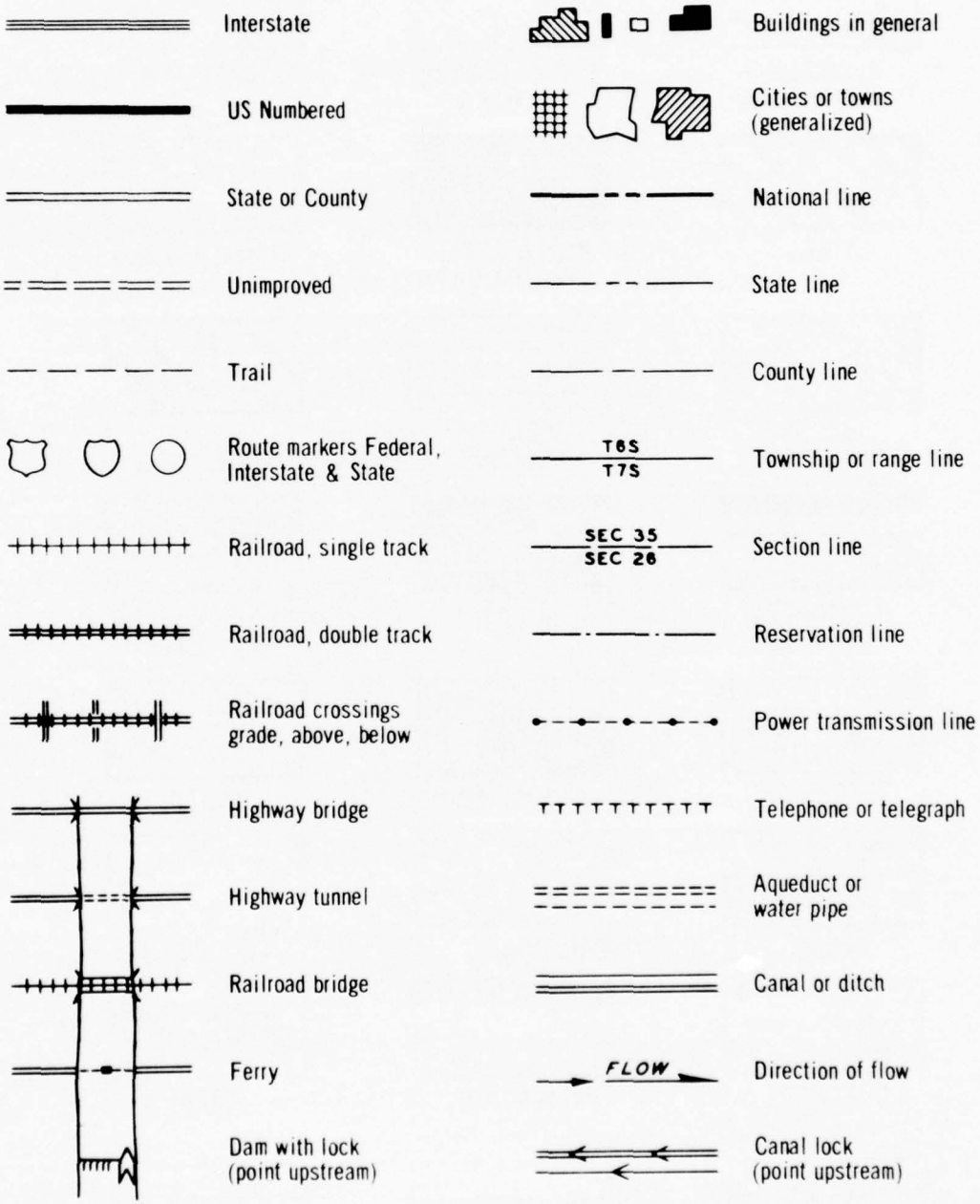
Slope (show designation) e.g. 1V on 4H

River mile

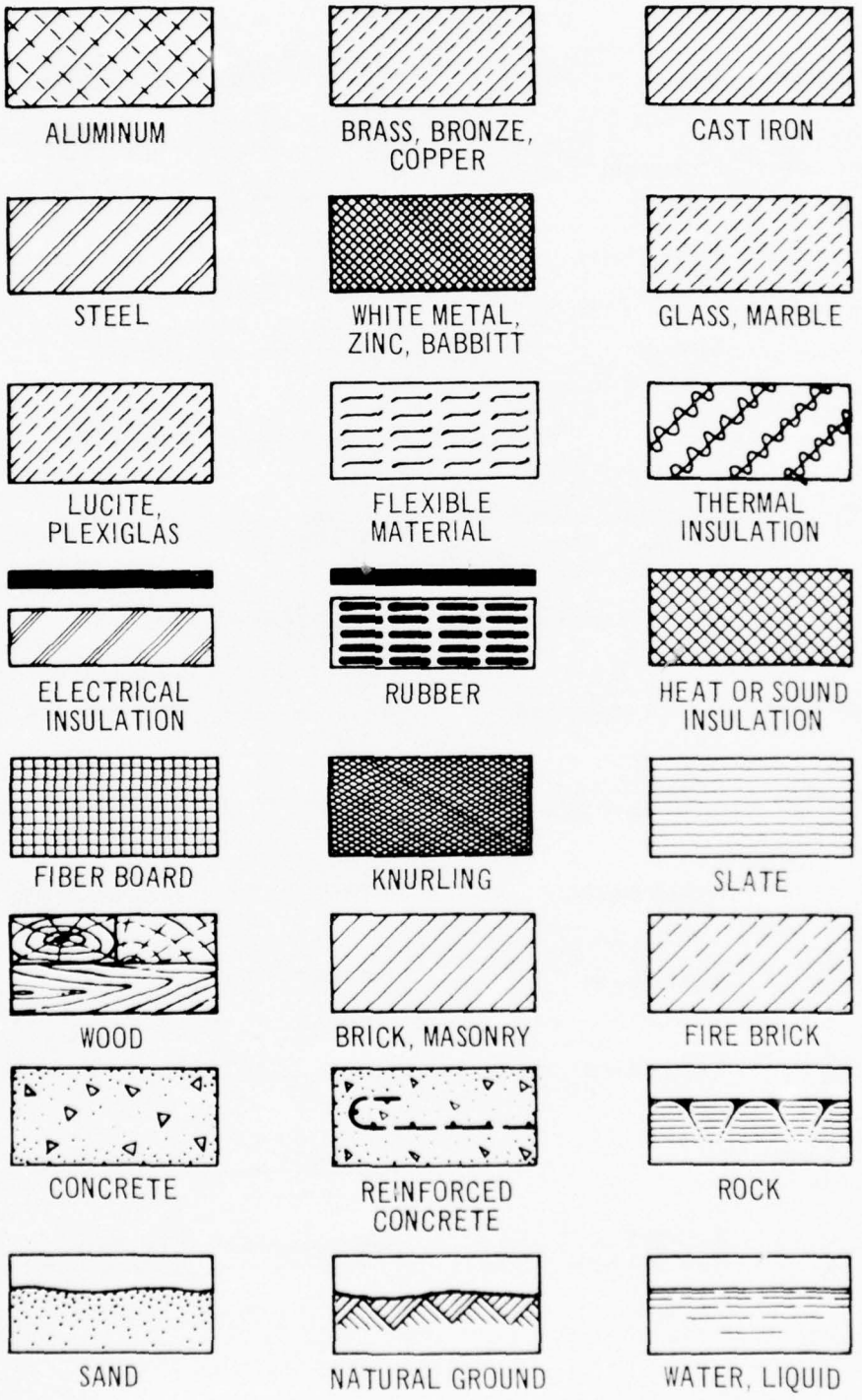
Tanks

Commercial or municipal airfield

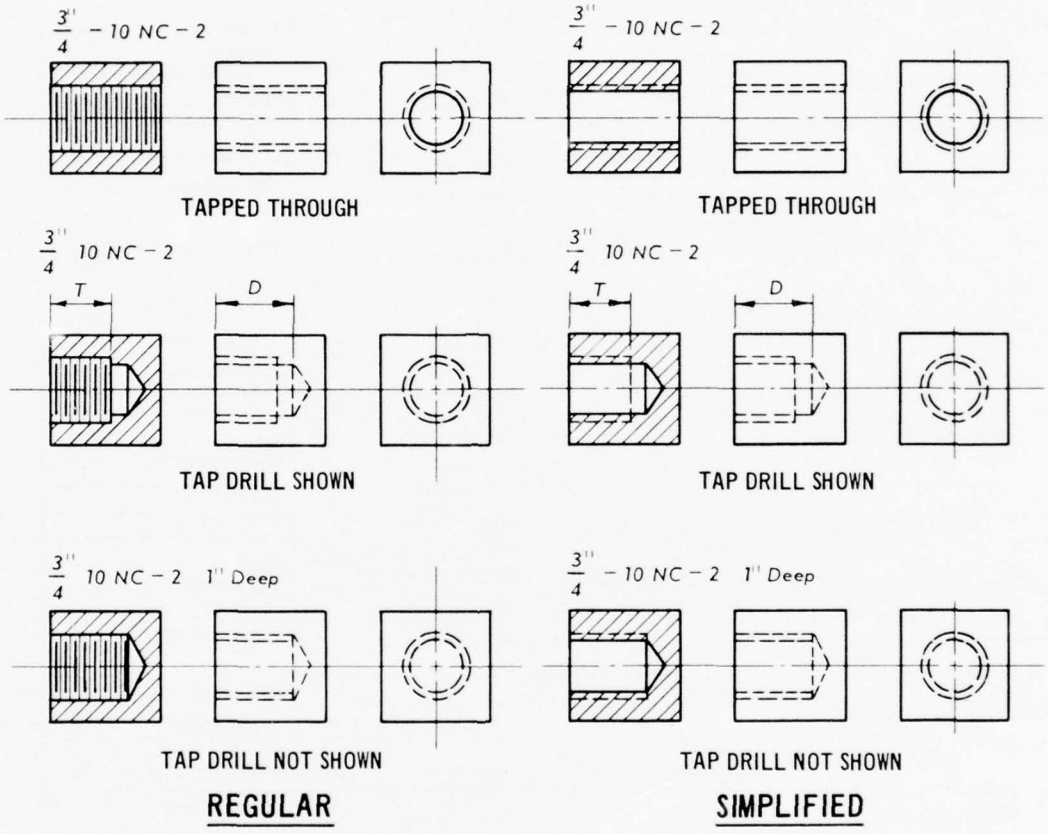
TOPOGRAPHIC SYMBOLS



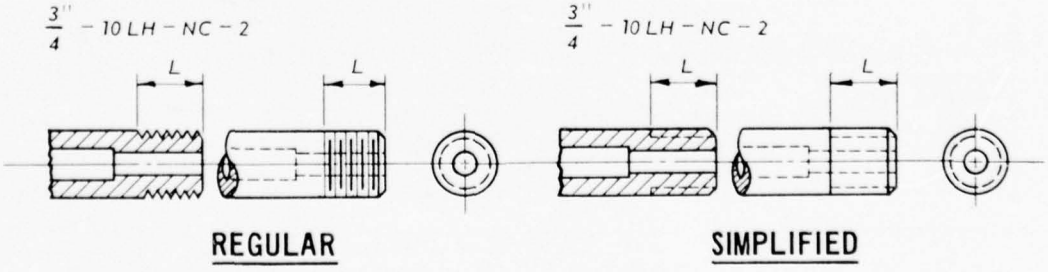
MATERIALS IN SECTION



SCREW THREAD SYMBOLS



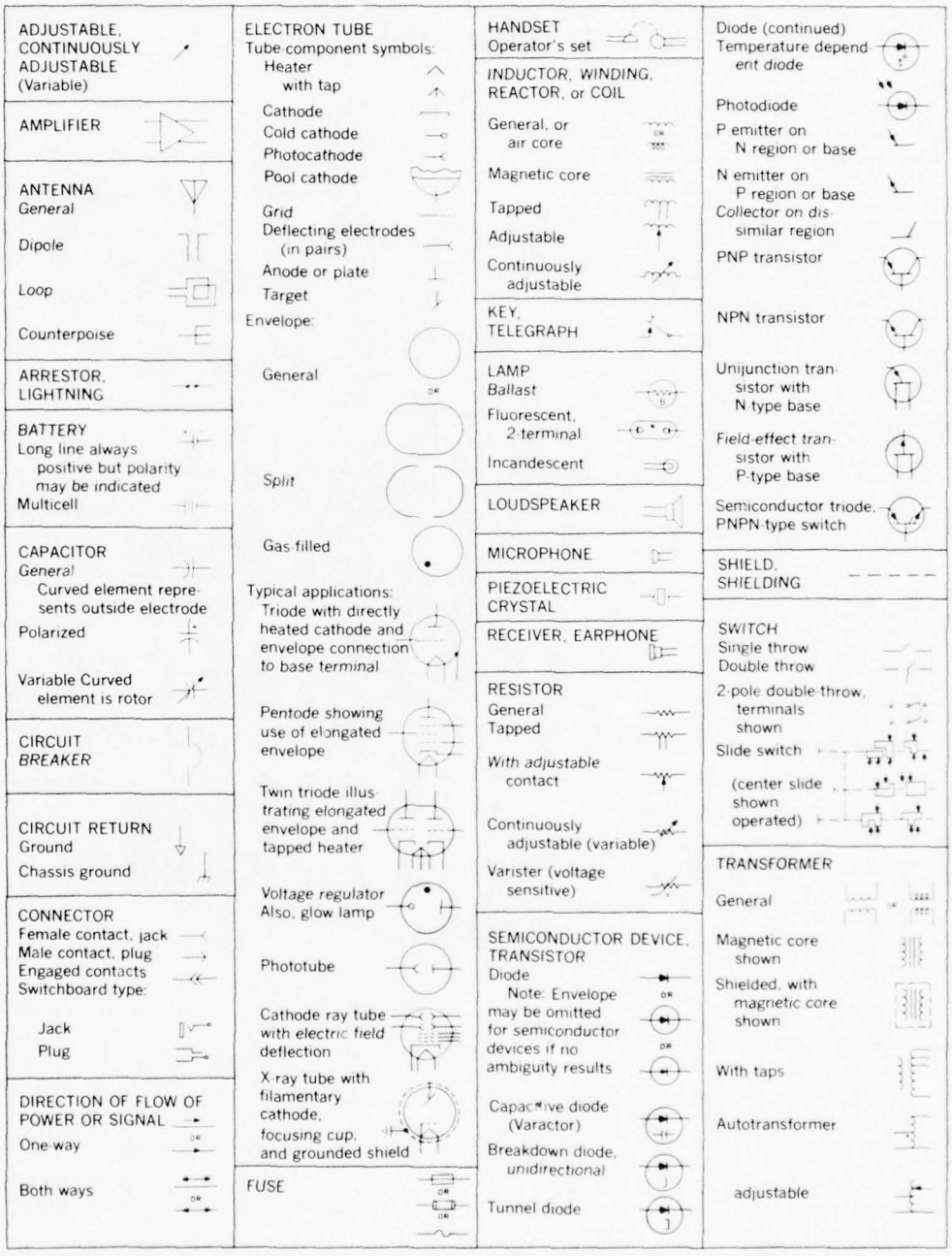
INTERNAL



EXTERNAL

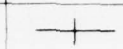
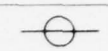
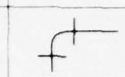
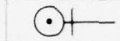
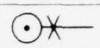
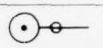
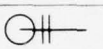
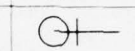
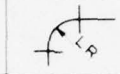
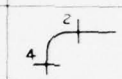
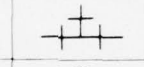
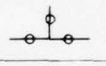
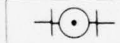
NOTE: Threads are always considered to be "RIGHT HAND." unless specified as "LEFT HAND".

AMERICAN STANDARD ELECTRONIC SYMBOLS[1]



[1]ASA Y32.2-1962.

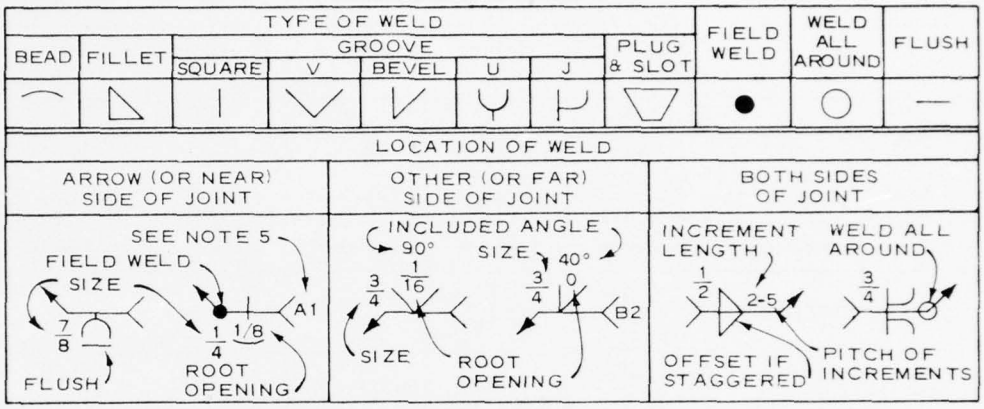
AMERICAN STANDARD PIPING SYMBOLS[1]

ITEM	FLANGED	SCREWED	BELL & SPIGOT	WELDED	SOLDERED
Joint					
Elbow – 90°					
Elbow – 45°					
Elbow – Turned Up					
Elbow – Turned Down					
Elbow – Long Radius					
Reducing Elbow					
Tee					
Tee – Outlet Up					
Tee – Outlet Down					
Side Outlet Tee – Outlet Up					
Cross					
Reducer – Concentric					
Reducer – Eccentric					
Lateral					
Gate Valve – El					
Globe Valve – El					
Check Valve					
Stop Cock					
Safety Valve					
Expansion Joint					
Union					
Sleeve					
Bushing					

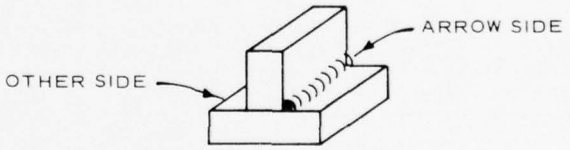
[1]ASA Z32.2.3-1949 (R 1953).

BASIC WELDING SYMBOLS

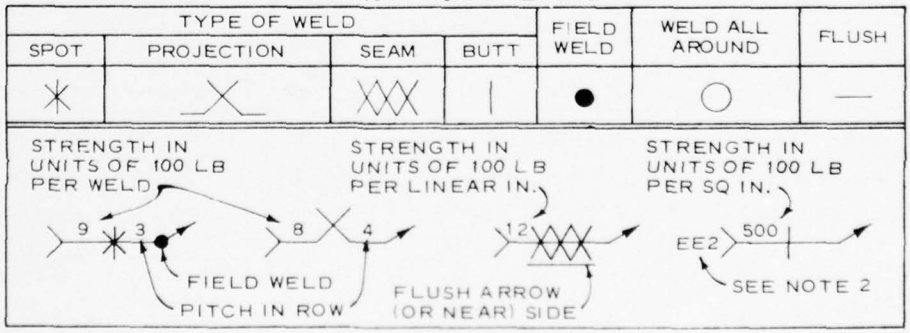
ARC AND GAS WELDING



1. THE SIDE OF THE JOINT TO WHICH THE ARROW POINTS IS THE ARROW (OR NEAR) SIDE.
2. BOTH-SIDE WELDS OF SAME TYPE ARE OF SAME SIZE UNLESS OTHERWISE SHOWN.
3. SYMBOLS APPLY BETWEEN ABRUPT CHANGES IN DIRECTION OF JOINT OR AS DIMENSIONED (EXCEPT WHERE ALL-AROUND SYMBOL IS USED).
4. ALL WELDS ARE CONTINUOUS AND OF USER'S STANDARD PROPORTIONS, UNLESS OTHERWISE SHOWN.
5. TAIL OR ARROW USED FOR SPECIFICATION REFERENCE (TAIL MAY BE OMITTED WHEN REFERENCE IS NOT USED).
6. DIMENSIONS OF WELD SIZES, INCREMENT LENGTHS AND SPACINGS ARE GIVEN IN INCHES.

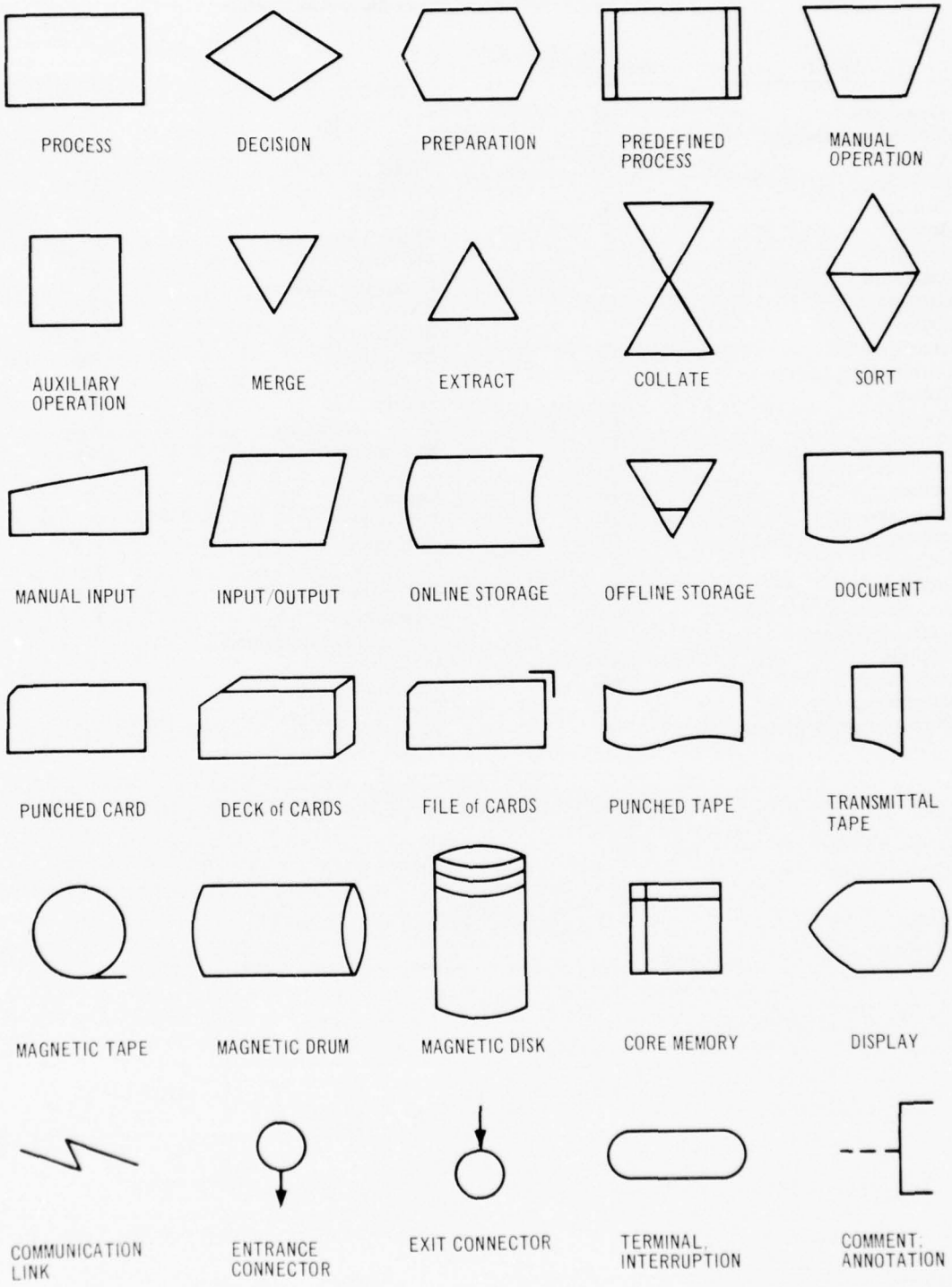


RESISTANCE WELDING



1. SYMBOLS APPLY BETWEEN ABRUPT CHANGES IN DIRECTION OF JOINT, OR AS DIMENSIONED (EXCEPT WHERE ALL-AROUND SYMBOL IS USED).
2. TAIL OF ARROW USED FOR SPECIFICATION REFERENCE (TAIL MAY BE OMITTED WHEN REFERENCE IS NOT USED).
3. ALL SPACINGS ARE GIVEN IN INCHES.

COMPUTER FLOW CHART SYMBOLS



PARTIAL LIST OF CHEMICAL SYMBOLS

Word	Abbreviation	Word	Abbreviation
Aluminum	Al	Molybdenum	Mo
Antimony (stibium)	Sb	Neon	Ne
Barium	Ba	Nickel	Ni
Beryllium	Be	Nitrogen	N
Bismuth	Bi	Oxygen	O
Boron	B	Phosphorus	P
Bromine	Br	Platinum	Pt
Cadmium	Cd	Potassium (kalium)	K
Calcium	Ca	Radium	Ra
Carbon	C	Rhodium	Rh
Chlorine	Cl	Ruthenium	Ru
Chromium	Cr	Selenium	Se
Cobalt	Co	Silicon	Si
Copper	Cu	Silver (argentum)	Ag
Fluorine	F	Sodium (natrium)	Na
Gold (aurium)	Au	Strontium	Sr
Helium	He	Sulfur	S
Hydrogen	H	Tantalum	Ta
Indium	In	Tellurium	Te
Iodine	I	Thallium	Tl
Iridium	Ir	Tin (stannum)	Sn
Iron (ferrum)	Fe	Titanium	Ti
Lead (plumbum)	Pb	Tungsten (wolframium)	W
Lithium	Li	Uranium	U
Magnesium	Mg	Vanadium	V
Manganese	Mn	Zinc	Zn
Mercury (hydrargyrum)	Hg	Zirconium	Zr

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISION		TYPE	LETTER SYMBOL	SYMBOL	TYPICAL NAMES
COARSE – GRAINED SOILS	GRAVELS	CLEAN GRAVEL	GW		GRAVEL, Well Graded, gravel - sand mixtures, little or no fines
			GP		GRAVEL, Poorly Graded, gravel - sand mixtures, little or no fines
		GRAVEL WITH FINES	GM		SILTY GRAVEL, gravel - sand - silt mixtures
			GC		CLAYEY GRAVEL, gravel - sand - clay mixtures
	SANDS	CLEAN SAND	SW		SAND, Well Graded, gravelly sands
			SP		SAND, Poorly Graded, gravelly sands
		SANDS WITH FINES	SM		SILTY SAND, sand - silt mixtures
			SC		CLAY SAND, sand - clay mixtures
FINE – GRAINED SOILS		SILTS AND CLAYS (Liquid Limit <50)	ML		SILT & very fine sand, silty or clayey fine sand or clayey silt with slight plasticity
			CL		LEAN CLAY; Sandy Clay; Silty Clay; of low to medium plasticity
			OL		ORGANIC SILTS and organic silty clays of low plasticity
		SILTS AND CLAYS (Liquid Limit >50)	MH		SILT, fine sandy or silty soil with high plasticity
			CH		FAT CLAY, inorganic clay of high plasticity
			OH		ORGANIC CLAYS of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt		PEAT, and other highly organic soil
WOOD			Wd		WOOD
SHELLS			Sl		SHELLS
NO SAMPLE					

DESCRIPTIVE SYMBOLS

COLOR	
COLOR	SYMBOL
TAN	T
YELLOW	Y
RED	R
BLACK	Bk
GRAY	Gr
LIGHT GRAY	lGr
DARK GRAY	dGr
BROWN	Br
LIGHT BROWN	lBr
DARK BROWN	dBr
BROWNISH - GRAY	br Gr
GRAYISH - BROWN	gy Br
GREENISH - GRAY	gn Gr
GRAYISH - GREEN	gy Gn
GREEN	Gn
BLUE	Bl
BLUE - GREEN	Bl Gn
WHITE	Wh
MOTTLED	Mot

CONSISTENCY	
VERY SOFT	vSo
SOFT	So
MEDIUM	M
STIFF	St
VERY STIFF	vSt
HARD	H

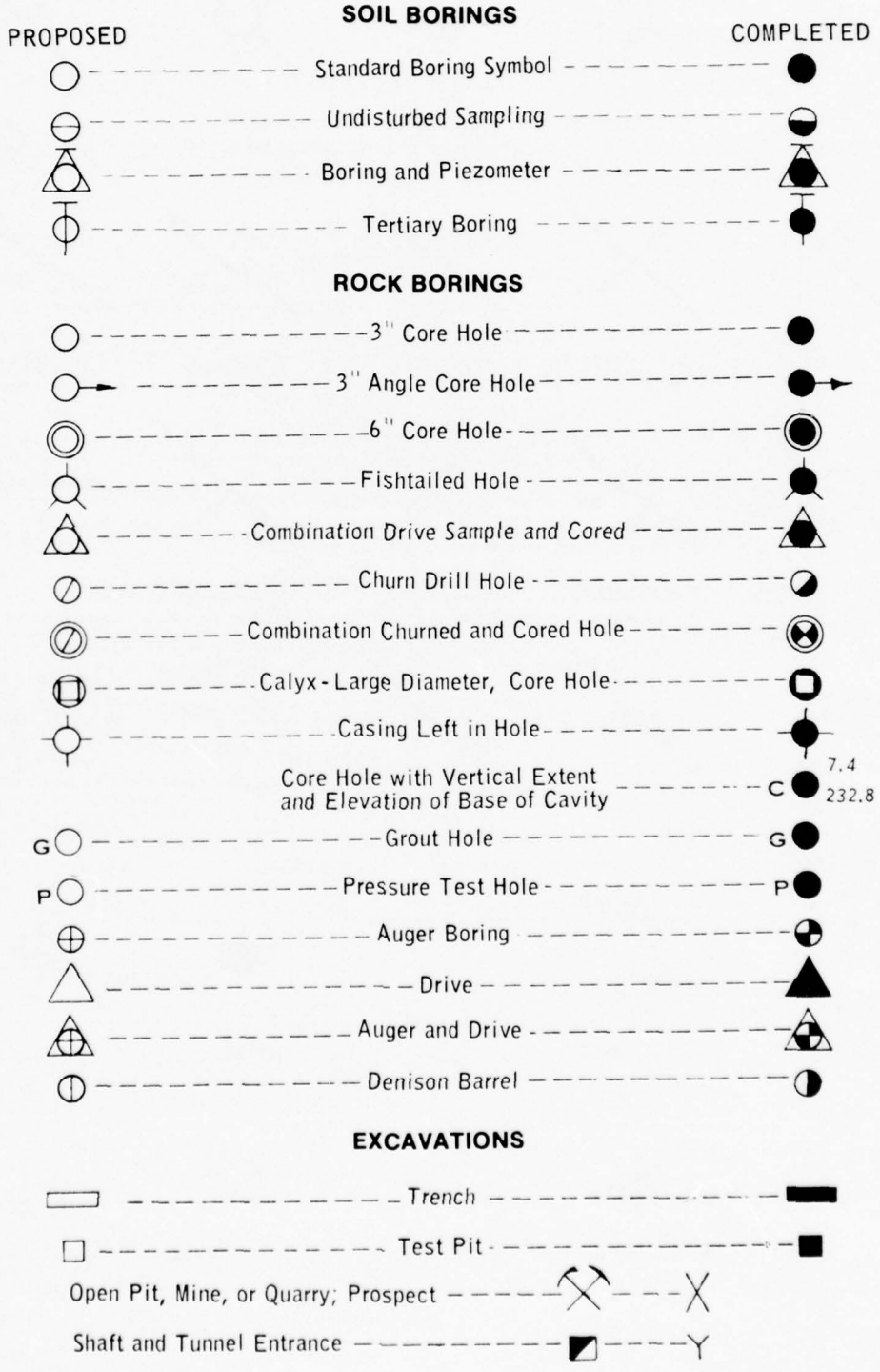
MODIFICATIONS	
MODIFICATION	SYMBOL
TRACES	Tr-
FINE	F
MEDIUM	M
COARSE	C
CONCRETIONS	cc
ROOTLETS	rt
LIGNITE FRAGMENTS	lgf
SHALE FRAGMENTS	shf
SANDSTONE FRAGMENTS	sdsf
SHELL FRAGMENTS	slf
ORGANIC MATTER	O
CLAY STRATA OR LENSES	CS
SILT STRATA OR LENSES	SIS
SAND STRATA OR LENSES	SS
SANDY	S
GRAVELLY	G
BOULDERS	B
SLICKENSIDES	SL
WOOD	Wd
OXIDIZED	Ox
SATURATED	sat
LUMPS OF CLAY	Clp
FREE WATER	FW
CRUMBLY	Cr
GROUND WATER SURFACE	▽

ROCK CLASSIFICATION AND SYMBOLS

GROUP	SYMBOL	ROCK CLASSIFICATION
SEDIMENTARY ROCKS		CONGLOMERATE
		SANDSTONE
		GRAYWACKE
		SILTSTONE
		INDURATED CLAY OR CLAYSTONE
		COMPACTION SHALE
		CEMENTED SHALE
		COAL
		LIMESTONE
		DOLOMITE
		CHALK (OR MARL)

GROUP	SYMBOL	ROCK CLASSIFICATION
METAMORPHIC ROCKS		GNEISS
		SCHIST
		QUARTZITE
		MARBLE
		SOAPSTONE AND SERPENTINE
		SLATE
IGNEOUS ROCKS		GRANITE
		DIORITE
		GABBRO
		RHYOLITE
		ANDESITE
		BASALT (TRAP)
		TUFF OR TUFF BRECCIA
		AGGLOMERATE FLOW BRECCIA

SYMBOLS FOR SUBSURFACE EXPLORATIONS



GEOLOGICAL SYMBOLS

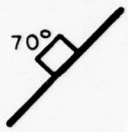
DIP and STRIKE

OVERTURNED BED

HORIZONTAL BED

STRIKE of VERTICAL BED

ATTITUDE of FOLIATION



ATTITUDE of JOINT

ANTICLINAL FOLD

SYNCLINAL FOLD

PLUNGING ANTICLINE

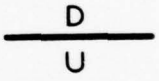
PLUNGING SYNCLINE

OVERTURNED ANTICLINE

OVERTURNED SYNCLINE

STRUCTURAL DOME

STRUCTURAL BASIN



FAULT (Down and Up Sides)

FAULT (Lateral Displacement)

THRUST FAULT

NORMAL FAULT

LANDSLIDE

LAVA FLOW

ALLUVIAL FAN

SAND DUNES

VOLCANO

OIL WELL

GAS WELL

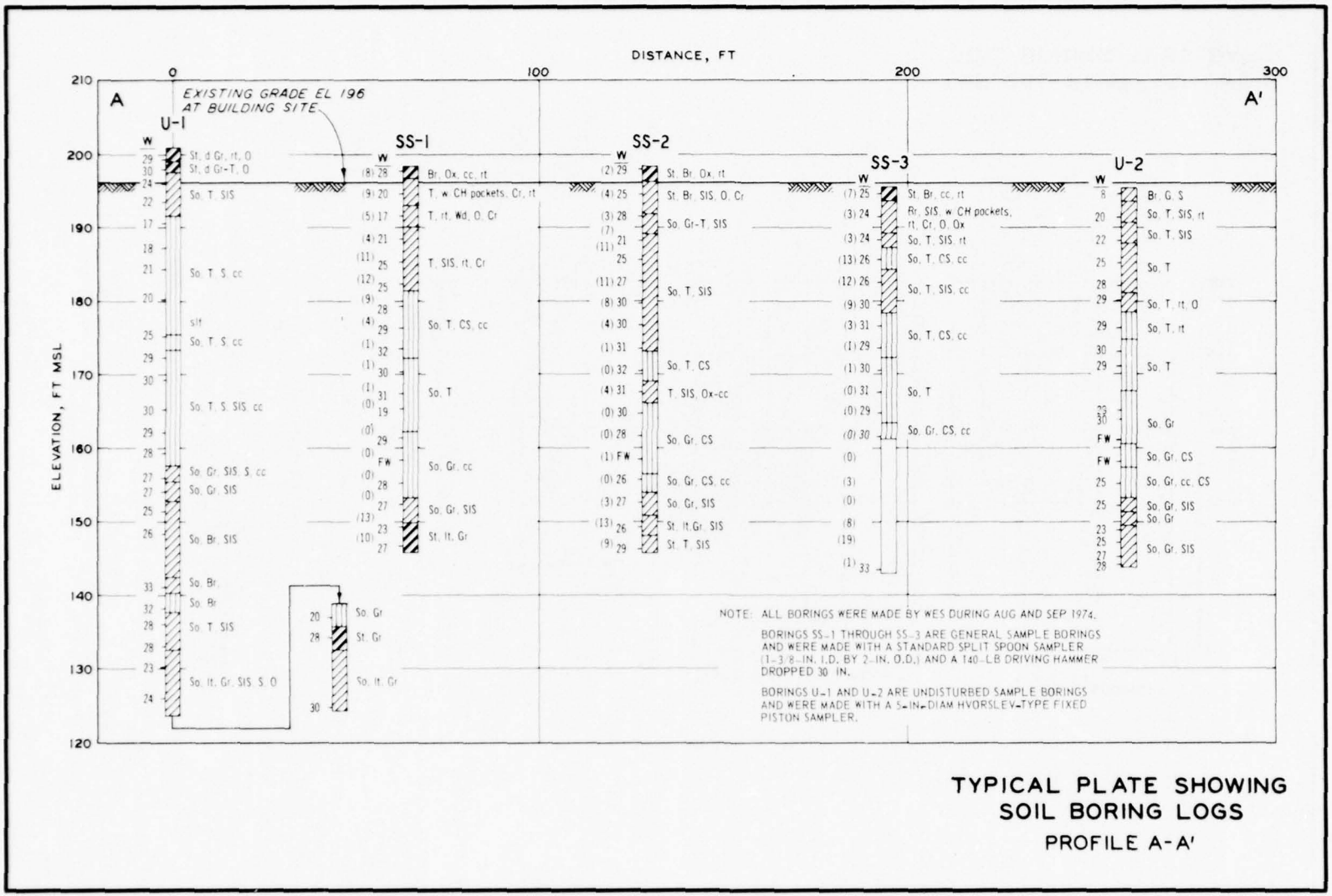
DRY HOLE

OIL and GAS WELL

WATER WELL

MINE; QUARRY

GRAVEL PIT



NOTE: ALL BORINGS WERE MADE BY WES DURING AUG AND SEP 1974.

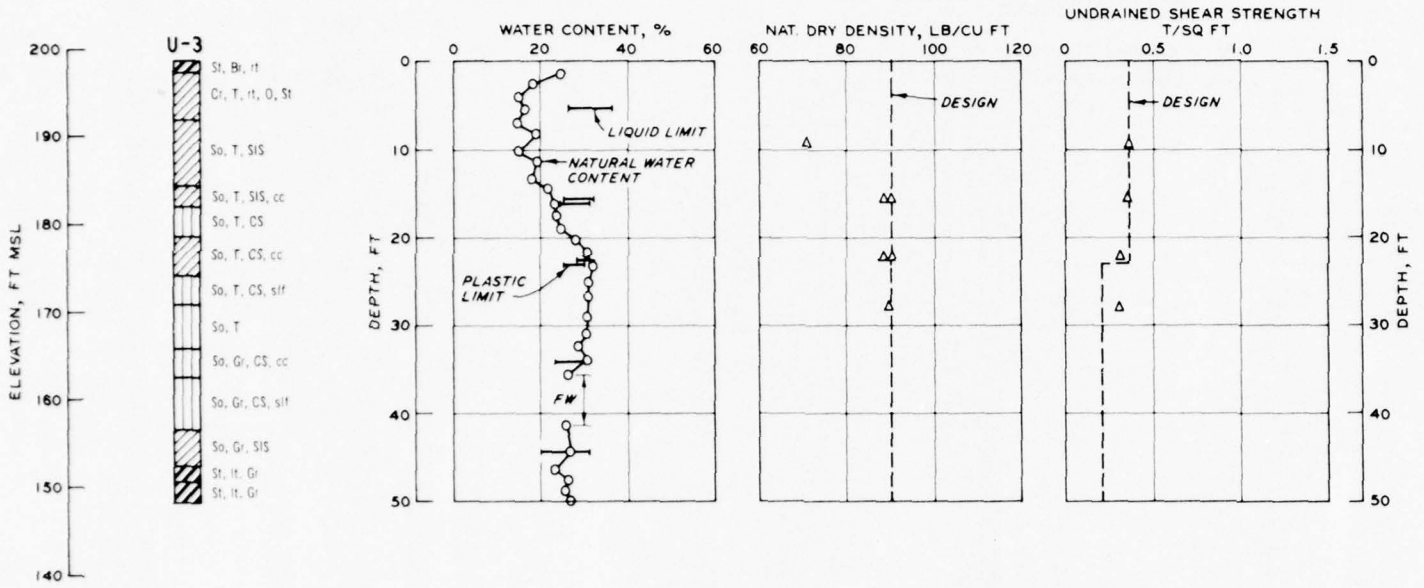
BORINGS SS-1 THROUGH SS-3 ARE GENERAL SAMPLE BORINGS AND WERE MADE WITH A STANDARD SPLIT SPOON SAMPLER (1-3/8-IN. I.D. BY 2-IN. O.D.) AND A 140-LB DRIVING HAMMER DROPPED 30 IN.

BORINGS U-1 AND U-2 ARE UNDISTURBED SAMPLE BORINGS AND WERE MADE WITH A 5-IN-DIAM HVORSLEV-TYPE FIXED PISTON SAMPLER.

TYPICAL PLATE SHOWING SOIL BORING LOGS

PROFILE A-A'

ORIGINAL BORDER 12" × 18", 50% REDUCTION



TYPICAL PLATE SHOWING
SOIL BORING TEST DATA

ORIGINAL BORDER 12" × 18", 50% REDUCTION

CONVERSION TABLES

METRIC AND U. S. EQUIVALENTS

DECIMAL EQUIVALENTS AND METRIC CONVERSIONS

CONVERSION TABLES, INCHES TO DECIMALS OF A FOOT

CONVERSION TABLES

Common metric and U. S. equivalents, decimal equivalents and metric conversions, and conversion tables, inches to decimals of a foot, are shown on the following pages. For additional information for implementing the use of the International System of Units (SI) to U. S. customary units refer to ASTM Standard Practice Guide.

METRIC AND U. S. EQUIVALENTS

LENGTH

Unit		Metric Equivalent		U. S. Equivalent	
Millimetre	(mm)	0.001	Metre	0.03937	Inch
Centimetre	(cm)	0.01	Metre	0.3937	Inch
Decimetre	(dm)	0.1	Metre	3.937	Inches
METRE	(m)	1.0	Metre	39.37	Inches
Dekametre	(dkm)	10.0	Metres	10.93	Yards
Hectometre	(hm)	100.0	Metres	328.08	Feet
Kilometre	(km)	1000.0	Metres	0.6214	Mile

WEIGHT OR MASS

Unit		Metric Equivalent		U. S. Equivalent	
Milligram	(mg)	0.001	Gram	0.0154	Grain
Centigram	(cg)	0.01	Gram	0.1543	Grain
Decigram	(dg)	0.1	Gram	1.543	Grains
GRAM	(g)	1.0	Gram	15.43	Grains
Dekagram	(dkg)	10.0	Grams	0.3527	Ounce
Hectogram	(hg)	100.0	Grams	3.527	Ounces
Kilogram	(kg)	1000.0	Grams	2.2	Pounds

SYMBOLS

Multiplication Factors	Prefix	SI Symbol
$1\,000\,000\,000 = 10^{9}$	giga	G
$1\,000\,000 = 10^{6}$	mega	M
$1\,000 = 10^{3}$	kilo	k
$100 = 10^{2}$	hecto*	h
$10 = 10^{1}$	deka*	da
$0.1 = 10^{-1}$	deci*	d
$0.01 = 10^{-2}$	centi*	c
$0.001 = 10^{-3}$	milli	m
$0.000\,001 = 10^{-6}$	micro	
$0.000\,000\,001 = 10^{-9}$	nano	n

* To be avoided where possible.

DECIMAL EQUIVALENTS AND METRIC CONVERSIONS

DECIMAL	IN.	MM.	DECIMAL	IN.	MM.
.015625	1/64	0.3968	.515625	33/64	13.0966
.03125	1/32	0.7937	.53125	17/32	13.4934
.046875	3/64	1.1906	.546875	35/64	13.8903
.0625	1/16	1.5874	.5625	9/16	14.2872
.078125	5/64	1.9843	.578125	37/64	14.6841
.09375	3/32	2.3812	.59375	19/32	15.0809
.109375	7/64	2.7780	.609375	39/64	15.4778
.125	1/8	3.1749	.625	5/8	15.8747
.140625	9/64	3.5718	.640625	41/64	16.2715
.15625	5/32	3.9686	.65625	21/32	16.6684
.171875	11/64	4.3655	.671875	43/64	17.0653
.1875	3/16	4.7624	.6875	11/16	17.4621
.203125	13/64	5.1592	.703125	45/64	17.8590
.21875	7/32	5.5561	.71875	23/32	18.2559
.234375	15/64	5.9530	.734375	47/64	18.6527
.25	1/4	6.3498	.75	3/4	19.0496
.265625	17/64	6.7467	.765625	49/64	19.4465
.28125	9/32	7.1436	.78125	25/32	19.8433
.296875	19/64	7.5404	.796875	51/64	20.2402
.3125	5/16	7.9373	.8125	13/16	20.6371
.328125	21/64	8.3342	.828125	53/64	21.0339
.34375	11/32	8.7310	.84375	27/32	21.4308
.359375	23/64	9.1279	.859375	55/64	21.8277
.375	3/8	9.5248	.875	7/8	22.2245
.390625	25/64	9.9216	.890625	57/64	22.6214
.40625	13/32	10.3185	.90625	29/32	23.0183
.421875	27/64	10.7154	.921875	59/64	23.4151
.4375	7/16	11.1122	.9375	15/16	23.8120
.453125	29/64	11.5091	.953125	61/64	24.2089
.46875	15/32	11.9060	.96875	31/32	24.6057
.484375	31/64	12.3029	.984375	63/64	25.0026
.5	1/2	12.6997	1.	1.	25.3995

To convert ANY dimension: Multiply inches by 25.3995. Add fractional value from table.
To find CENTIMETERS: Divide Millimeters by 10.

CONVERSION TABLES, INCHES TO DECIMALS OF A FOOT

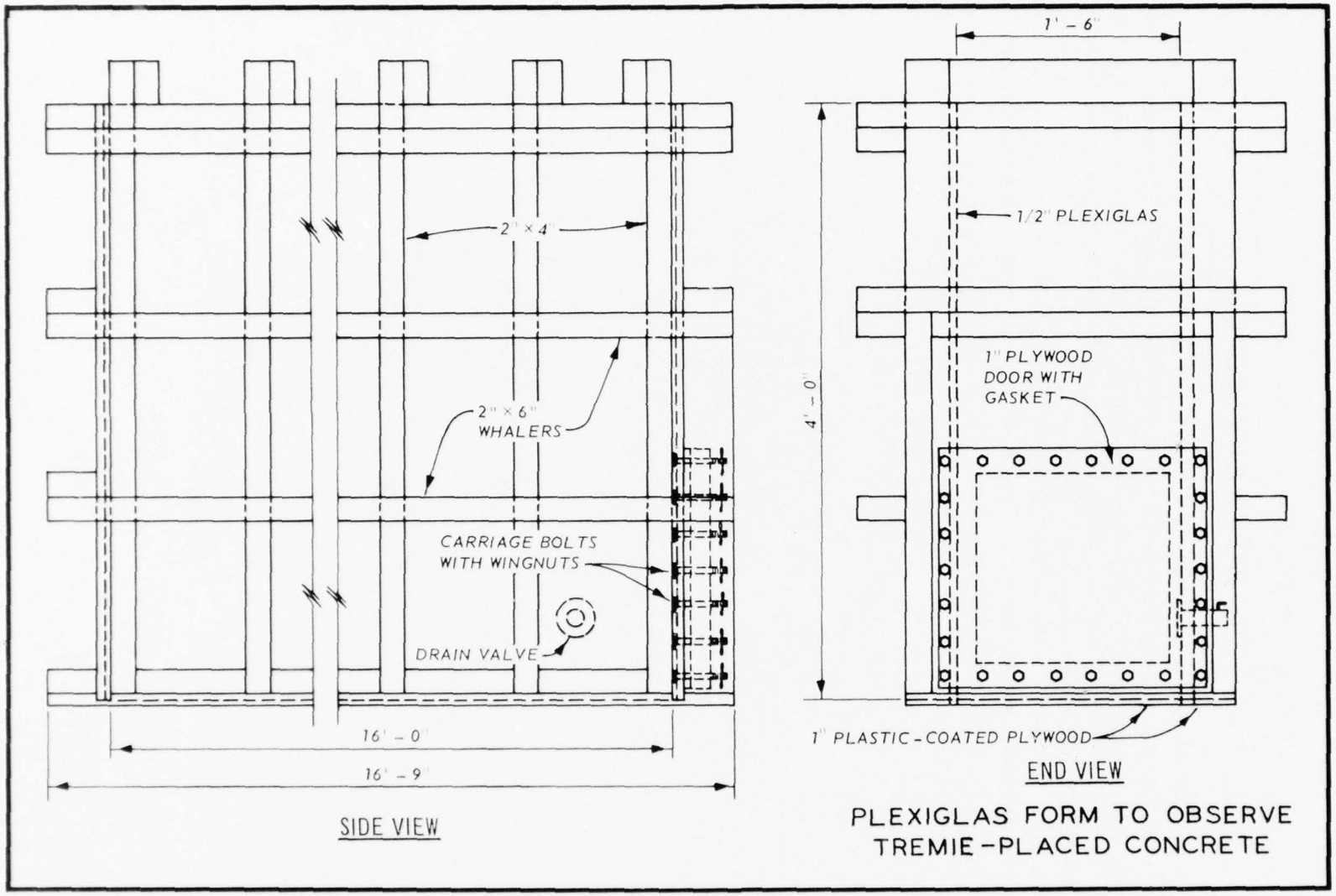
INCHES		1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16
0	.0000	.0052	.0104	.0156	.0208	.0260	.0313	.0365	.0417	.0469	.0521	.0573	.0625	.0677	.0729	.0781
1	.0833	.0885	.0938	.0990	.1042	.1094	.1146	.1198	.1250	.1302	.1354	.1406	.1458	.1510	.1563	.1615
2	.1667	.1719	.1771	.1823	.1875	.1927	.1979	.2031	.2083	.2135	.2188	.2240	.2292	.2344	.2396	.2448
3	.2500	.2552	.2604	.2656	.2708	.2760	.2813	.2865	.2917	.2969	.3021	.3073	.3125	.3177	.3229	.3281
4	.3333	.3385	.3438	.3490	.3542	.3594	.3646	.3698	.3750	.3802	.3854	.3906	.3958	.4010	.4063	.4115
5	.4167	.4219	.4271	.4323	.4375	.4427	.4479	.4531	.4583	.4635	.4688	.4740	.4792	.4844	.4896	.4948
6	.5000	.5052	.5104	.5156	.5208	.5260	.5313	.5365	.5417	.5469	.5521	.5573	.5625	.5677	.5729	.5781
7	.5833	.5885	.5938	.5990	.6042	.6094	.6146	.6198	.6250	.6302	.6354	.6406	.6458	.6510	.6563	.6615
8	.6667	.6719	.6771	.6823	.6875	.6927	.6979	.7031	.7083	.7135	.7188	.7240	.7292	.7344	.7396	.7448
9	.7500	.7552	.7604	.7656	.7708	.7760	.7813	.7865	.7917	.7969	.8021	.8073	.8125	.8177	.8229	.8281
10	.8333	.8385	.8438	.8490	.8542	.8594	.8646	.8698	.8750	.8802	.8854	.8906	.8958	.9010	.9063	.9115
11	.9167	.9219	.9271	.9323	.9395	.9427	.9479	.9531	.9530	.9635	.9688	.9740	.9792	.9844	.9896	.9948

EXAMPLE DRAWINGS

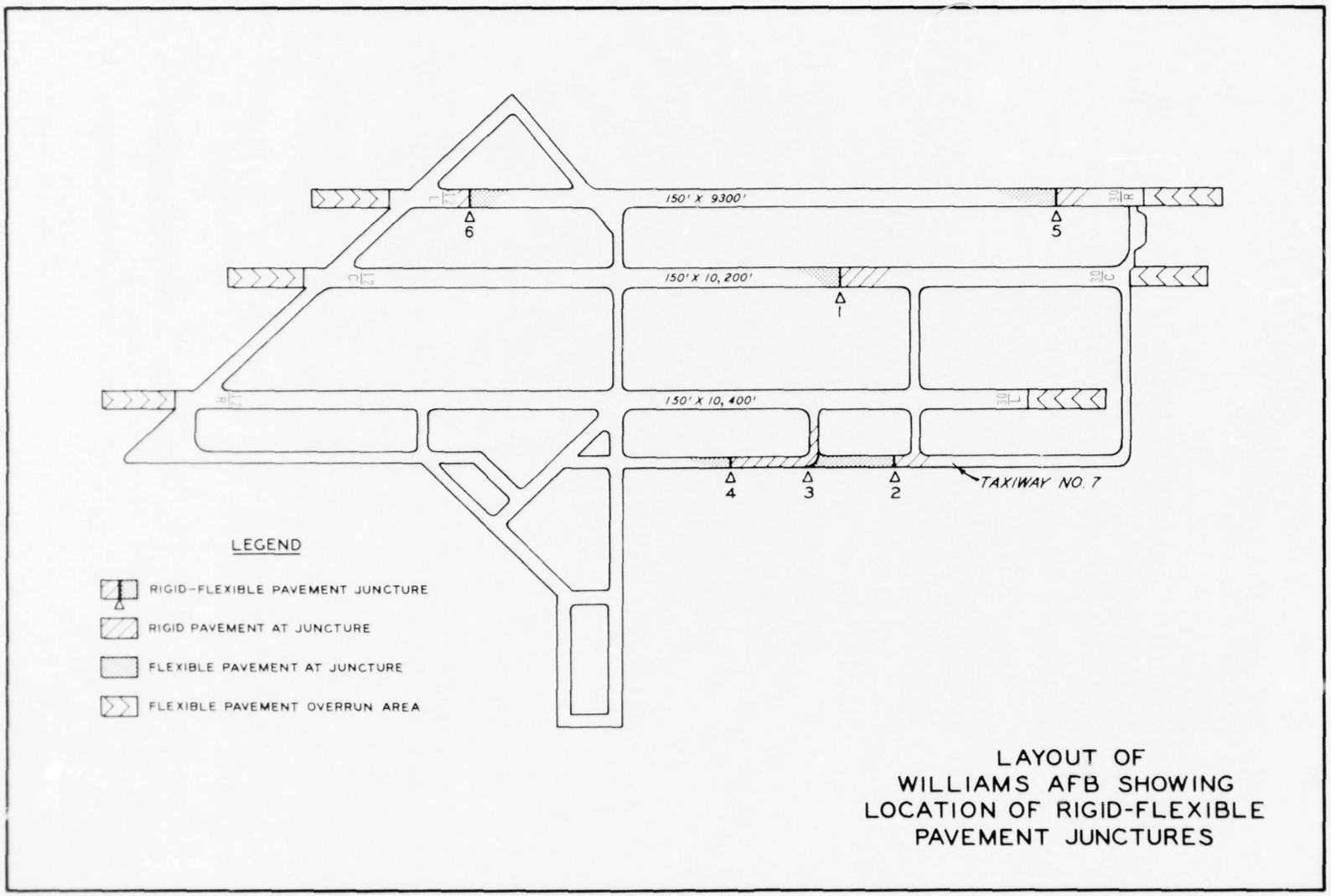
PLATES
ILLUSTRATIONS
FIGURES
LOCATION AND VICINITY MAPS

EXAMPLE DRAWINGS

Included in this section are example plates, illustrations, figures, and project maps—typical drawings incorporated in WES reports. The plates, which are line drawings of project results, are reproductions from originals ranging from border size 6 in. by 9 in. (100 percent) to 27 in. by 40-1/2 in. (22 percent reduction). They are usually grouped at the end of the main text. Illustrations normally intended as special artwork for a technical briefing often are used as a slide and a figure in a report. Figures are prepared by the same standards as plates but borders are omitted and titles are typewritten; figures are usually incorporated in the text of reports. Location and vicinity maps are generally used as figures.



ORIGINAL BORDER 6" × 9", 100%



LAYOUT OF
WILLIAMS AFB SHOWING
LOCATION OF RIGID-FLEXIBLE
PAVEMENT JUNCTURES

ORIGINAL BORDER 9" × 13-1/2", 67% REDUCTION

PLATE 2

ORIGINAL BORDER 12" × 18", 50% REDUCTION

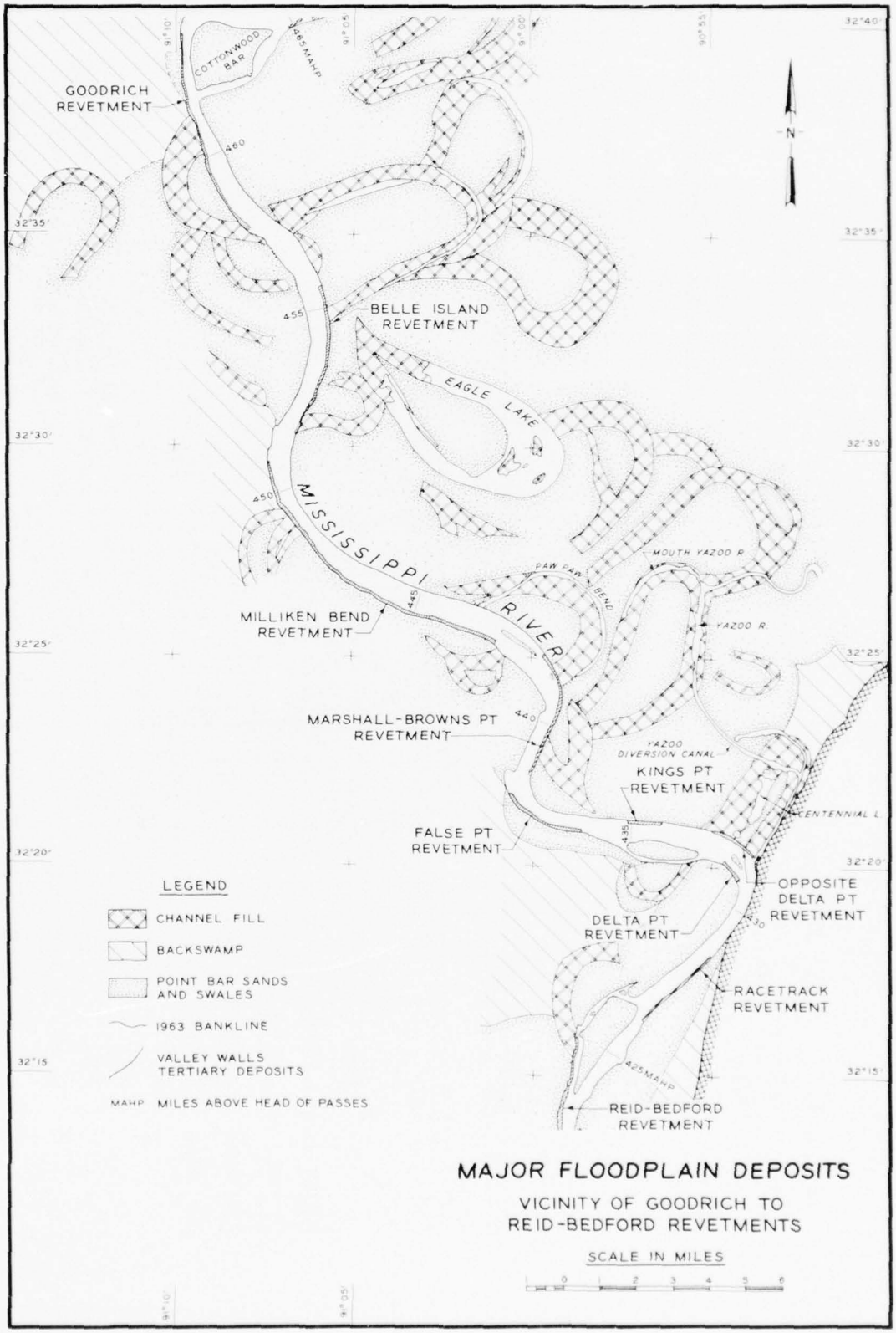
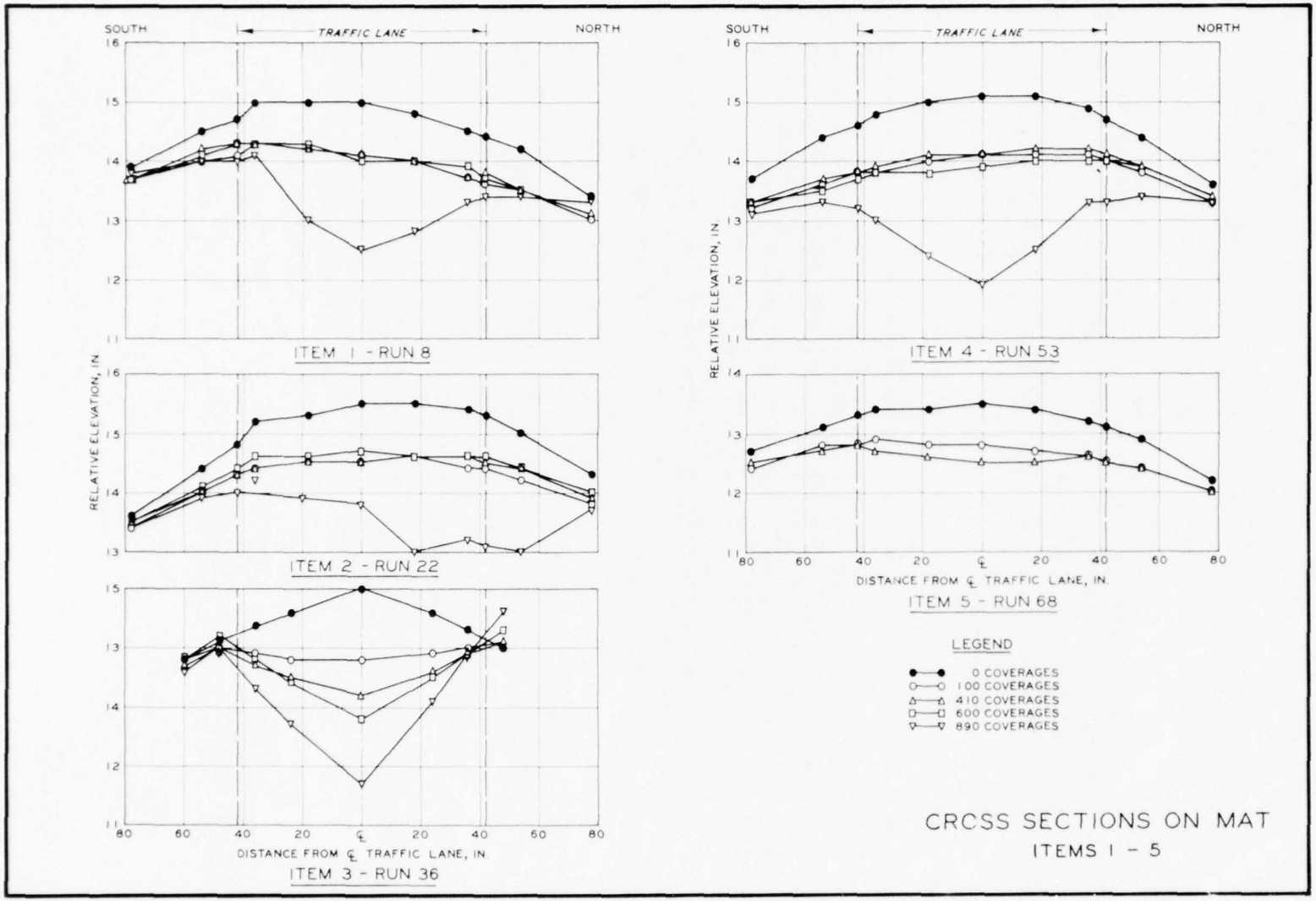


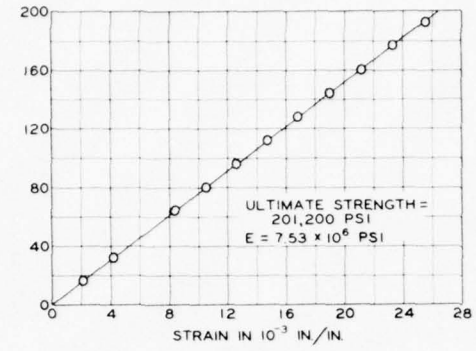
PLATE 3



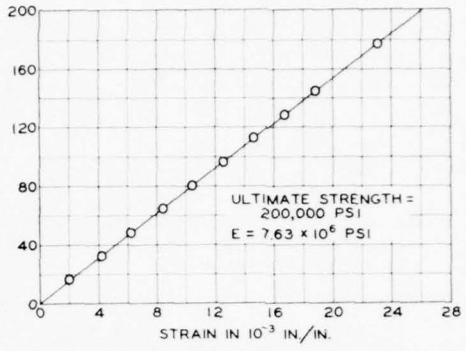
ORIGINAL BORDER 15" × 22-1/2", 40% REDUCTION

PLATE 4

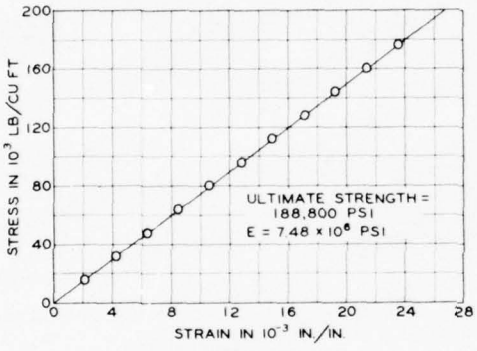
ORIGINAL BORDER 18" × 27", 33% REDUCTION



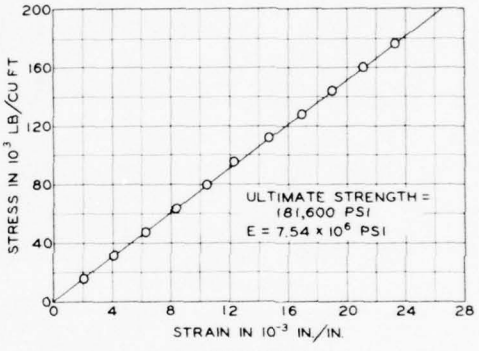
a. SPECIMEN S1



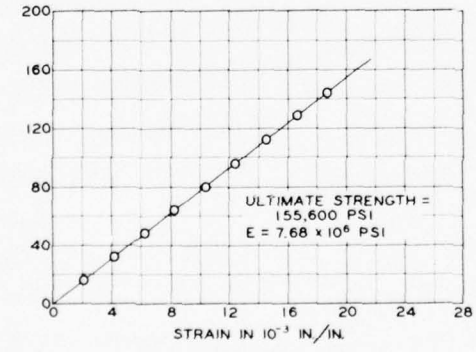
b. SPECIMEN S2



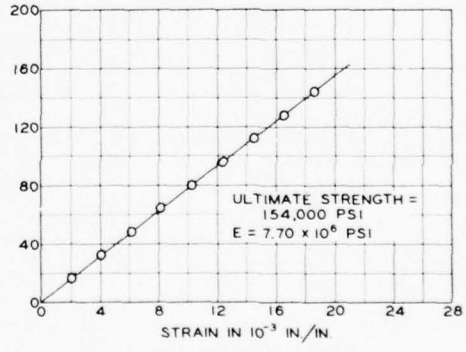
c. SPECIMEN S3



d. SPECIMEN R4



e. SPECIMEN R5



f. SPECIMEN R6

STRESS-STRAIN CURVES
FOR FIBERGLASS RODS

PLATE 5

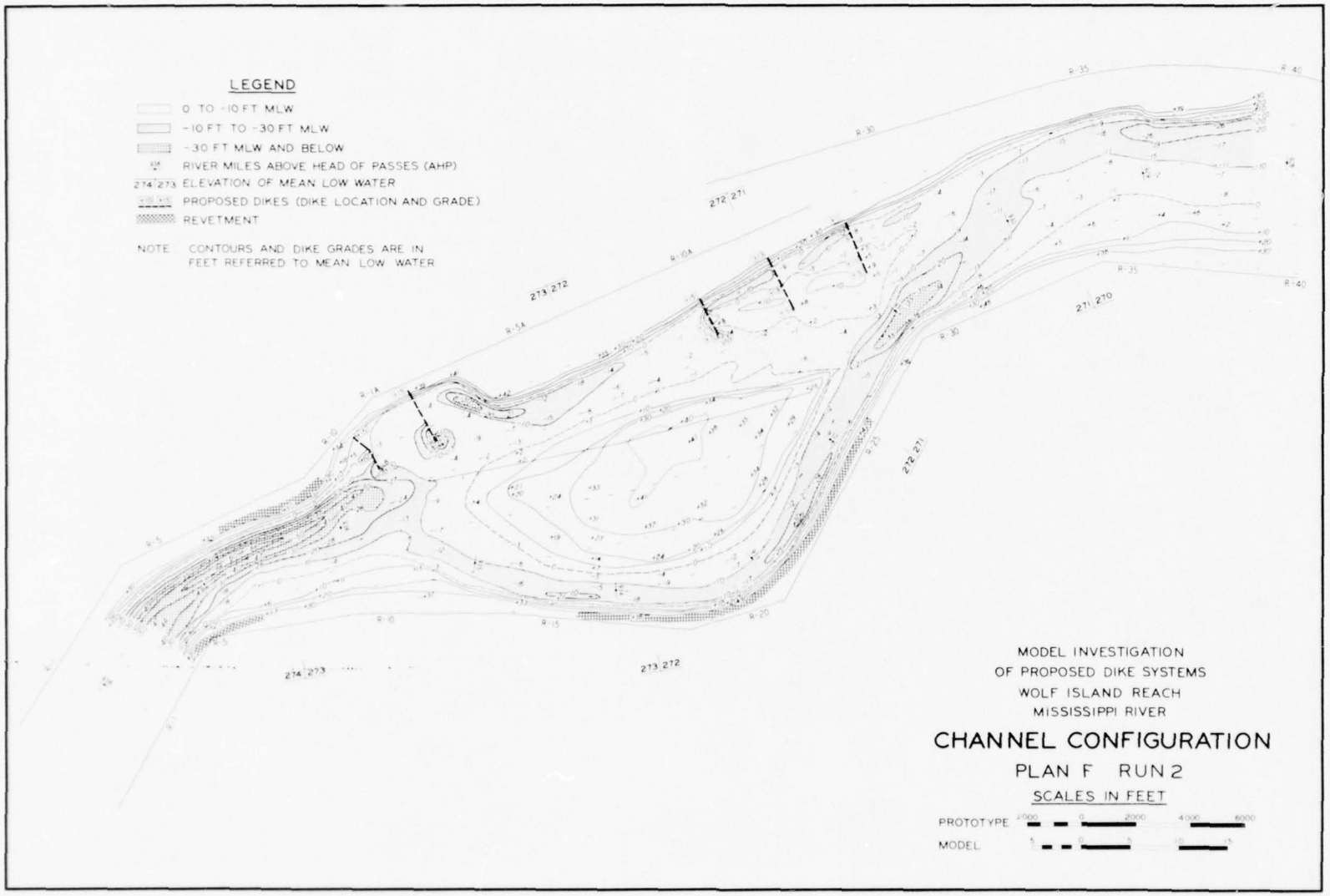
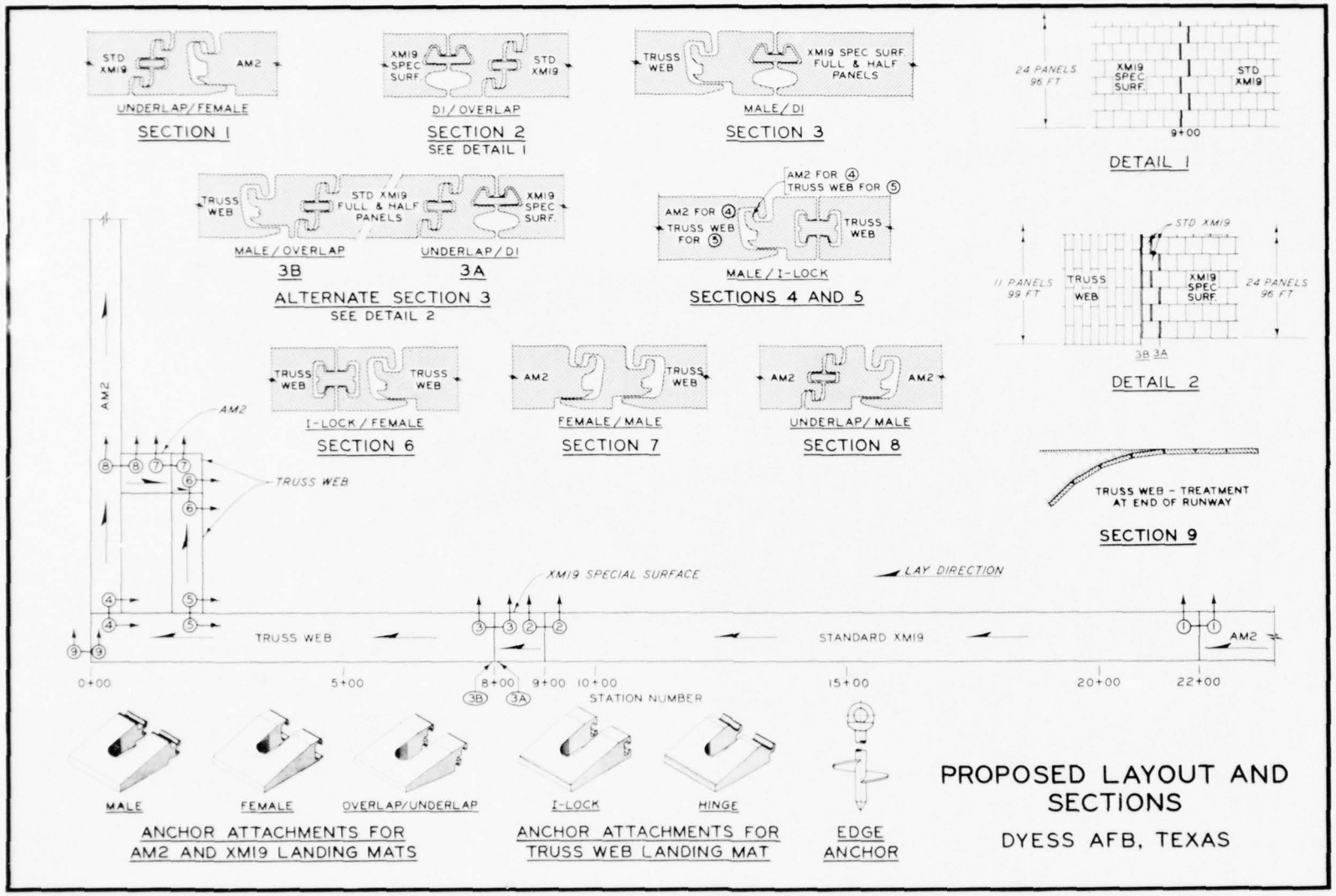
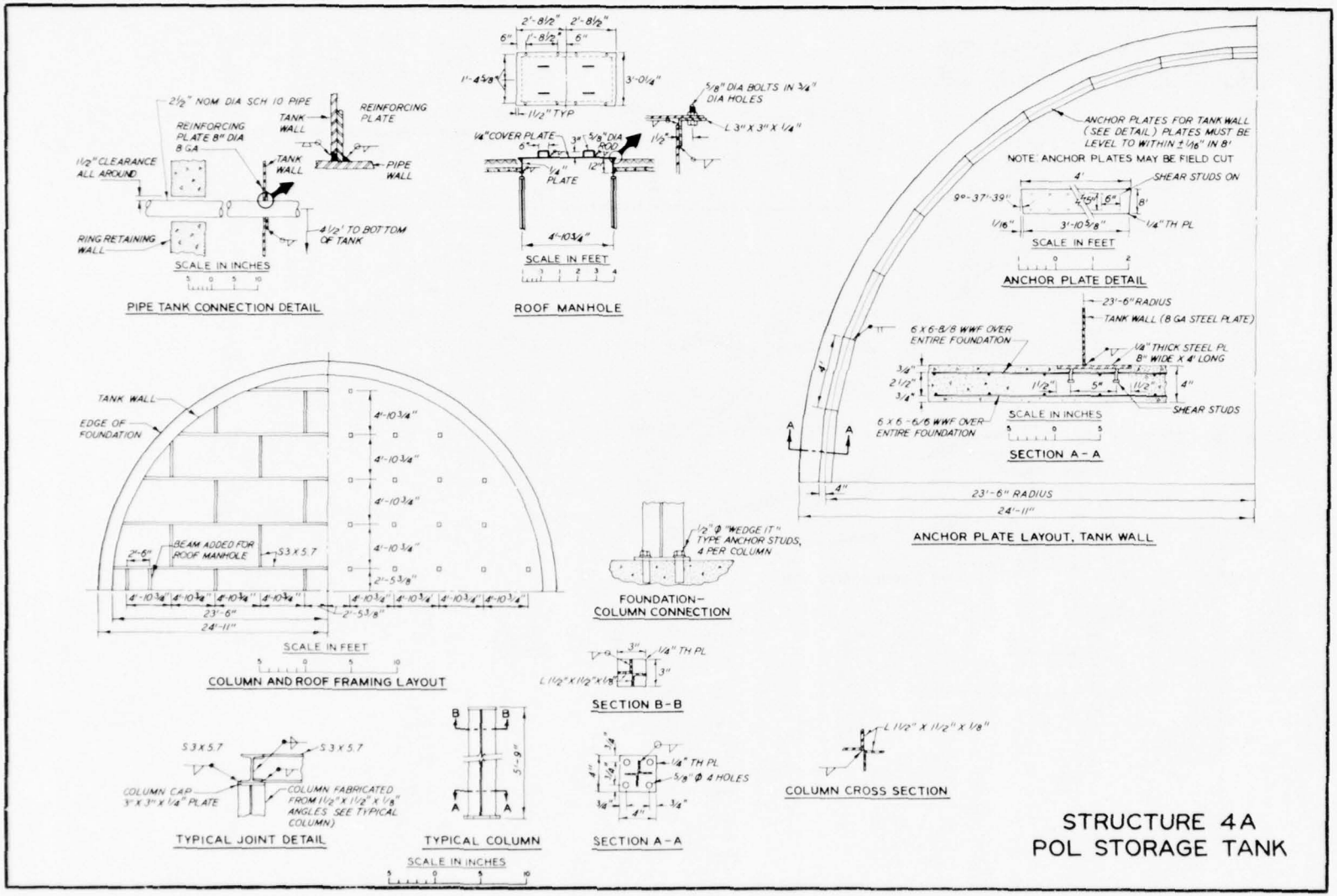


PLATE 6

ORIGINAL BORDER 18" × 27", 33% REDUCTION

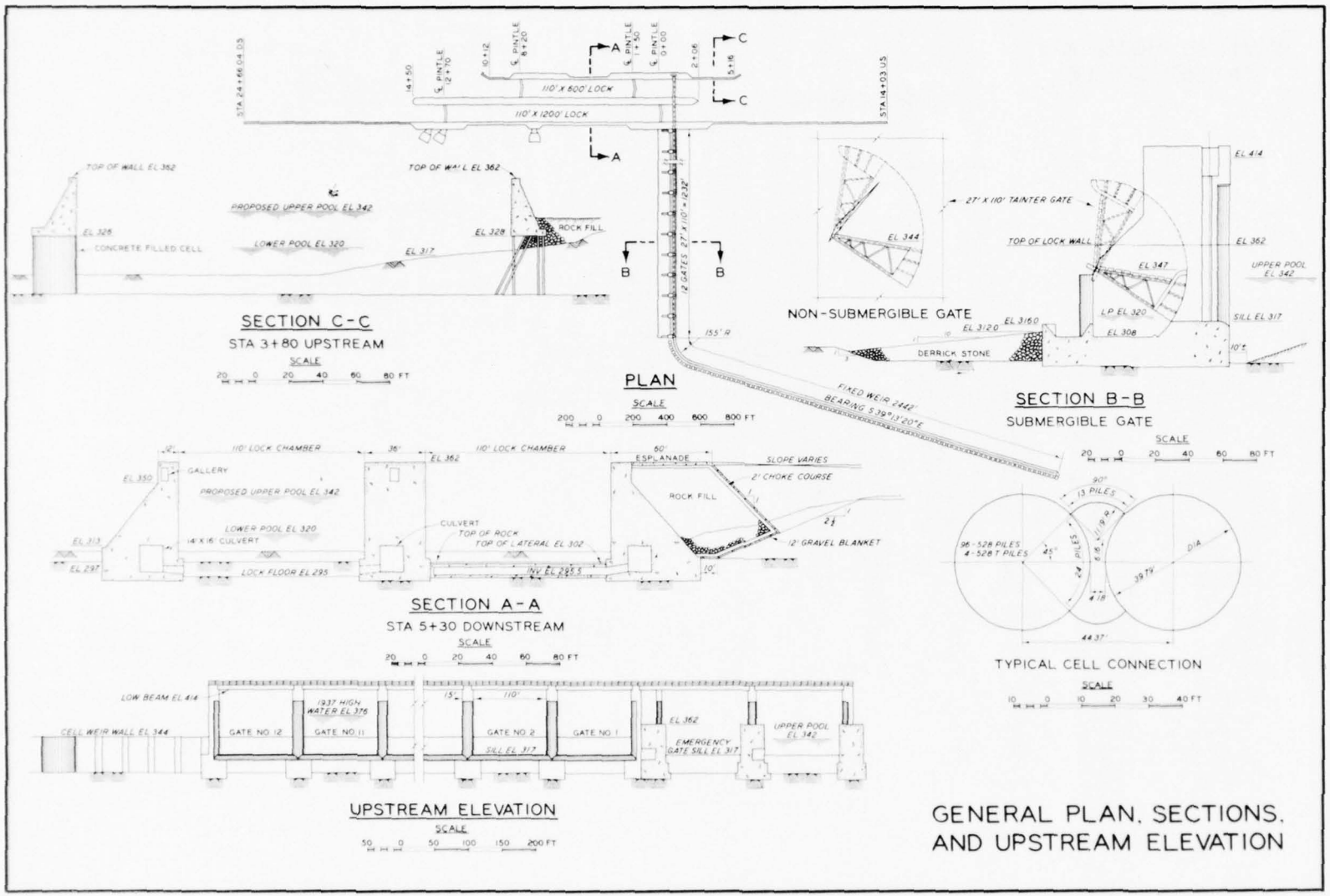


ORIGINAL BORDER 21" × 31-1/2", 29% REDUCTION



ORIGINAL BORDER 24" × 36", 25% REDUCTION

PLATE 8



GENERAL PLAN, SECTIONS, AND UPSTREAM ELEVATION

ORIGINAL BORDER 26" × 39", 23% REDUCTION

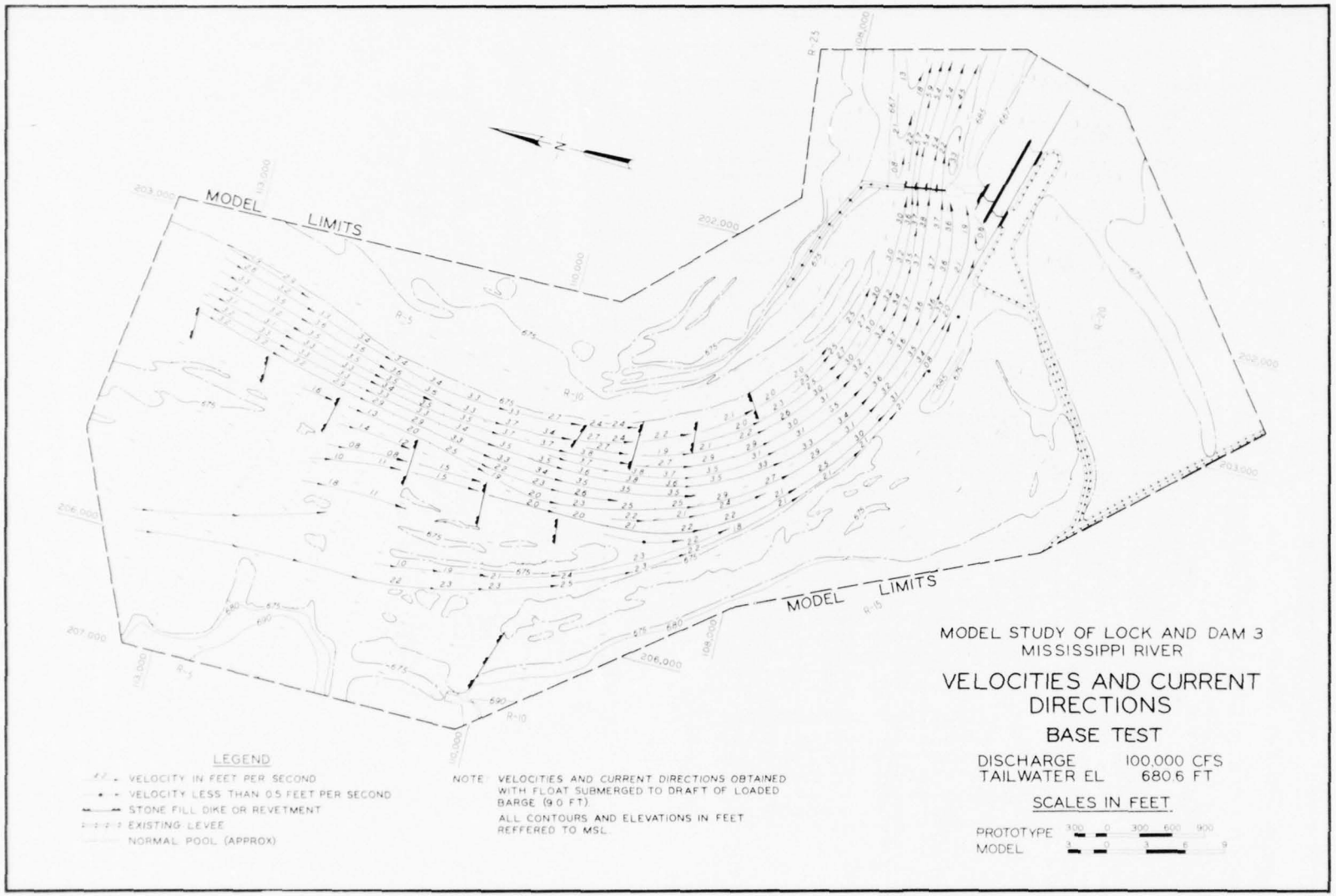
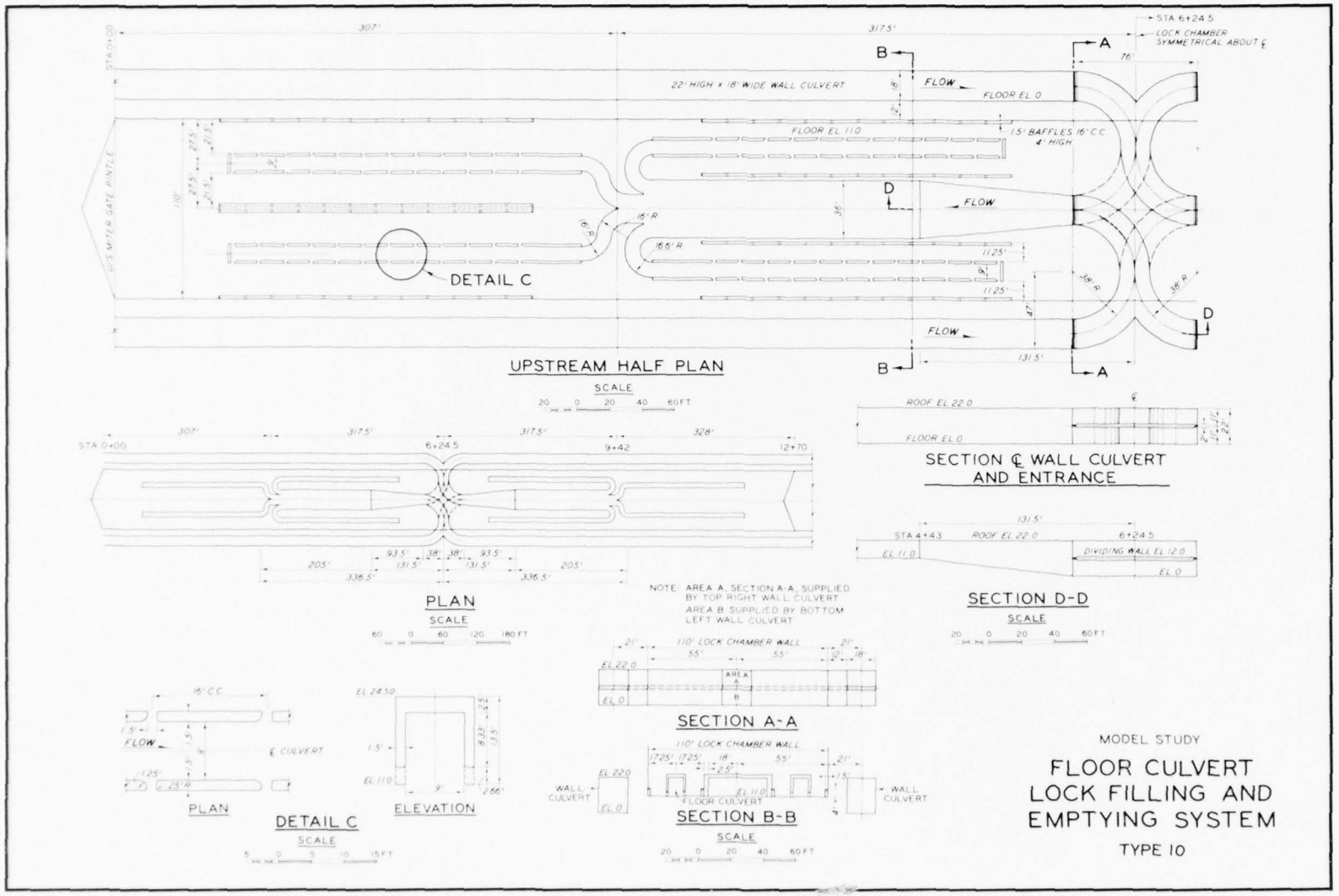
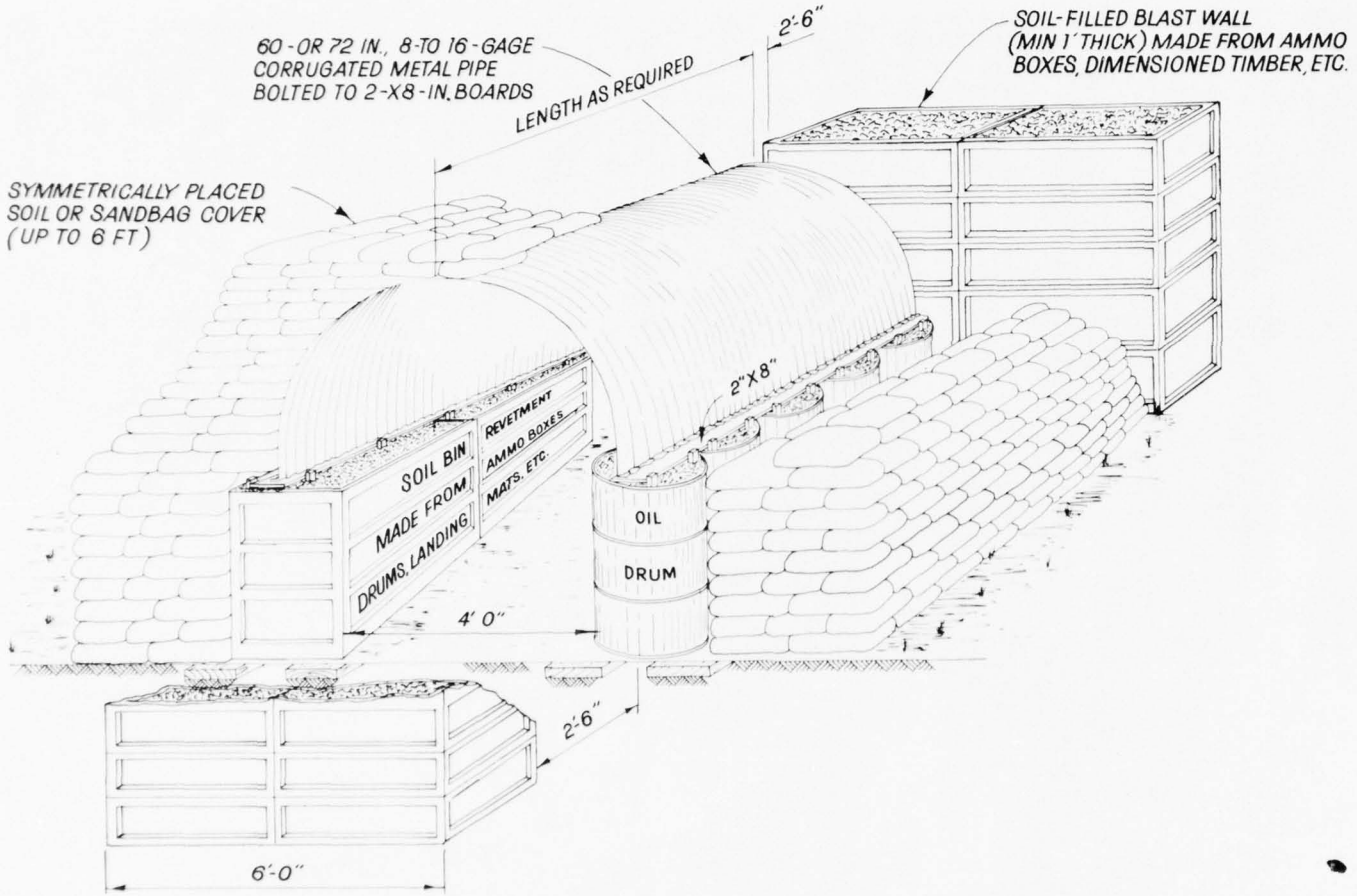


PLATE 10

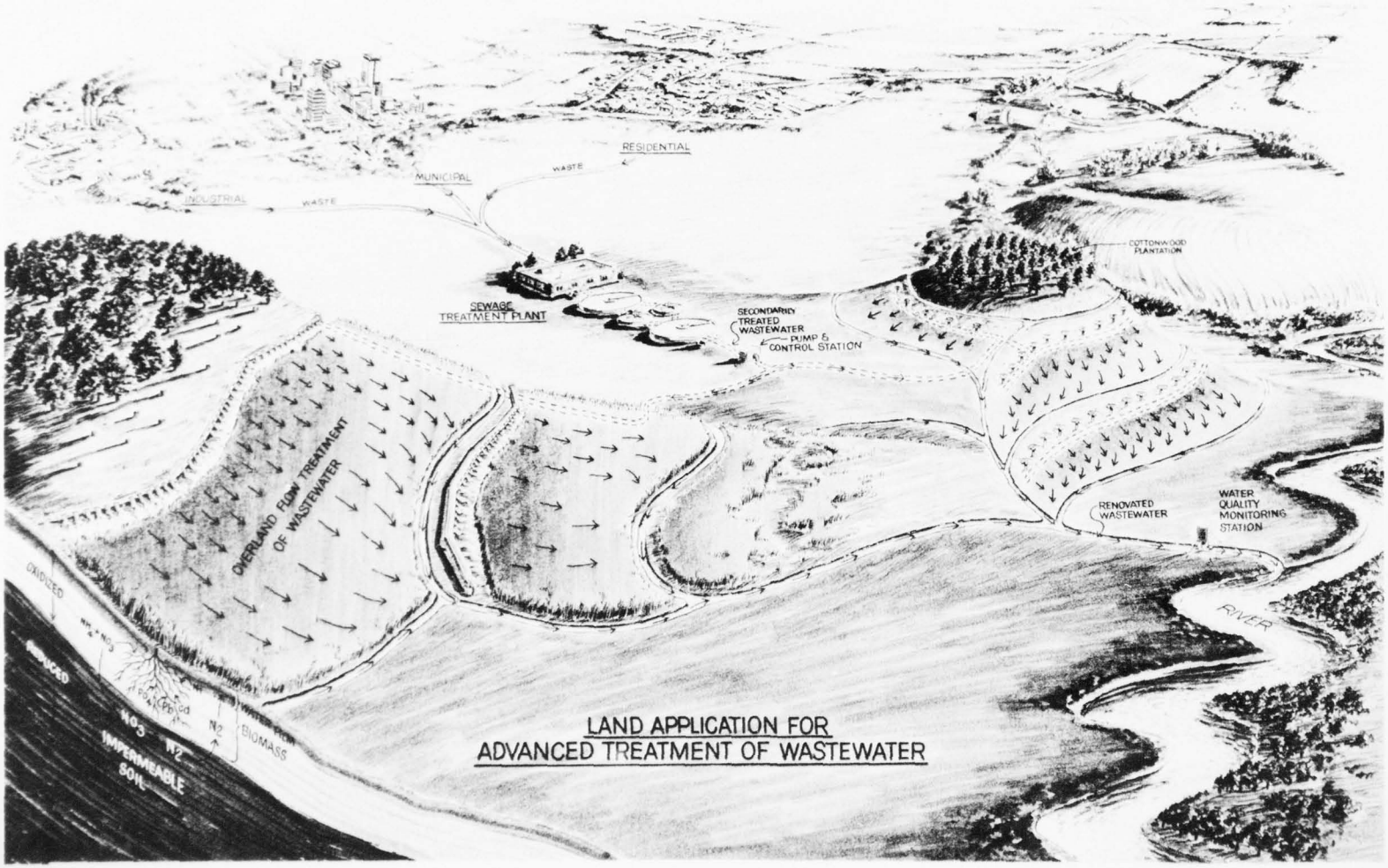
ORIGINAL BORDER 27" × 40-1/2", 22% REDUCTION



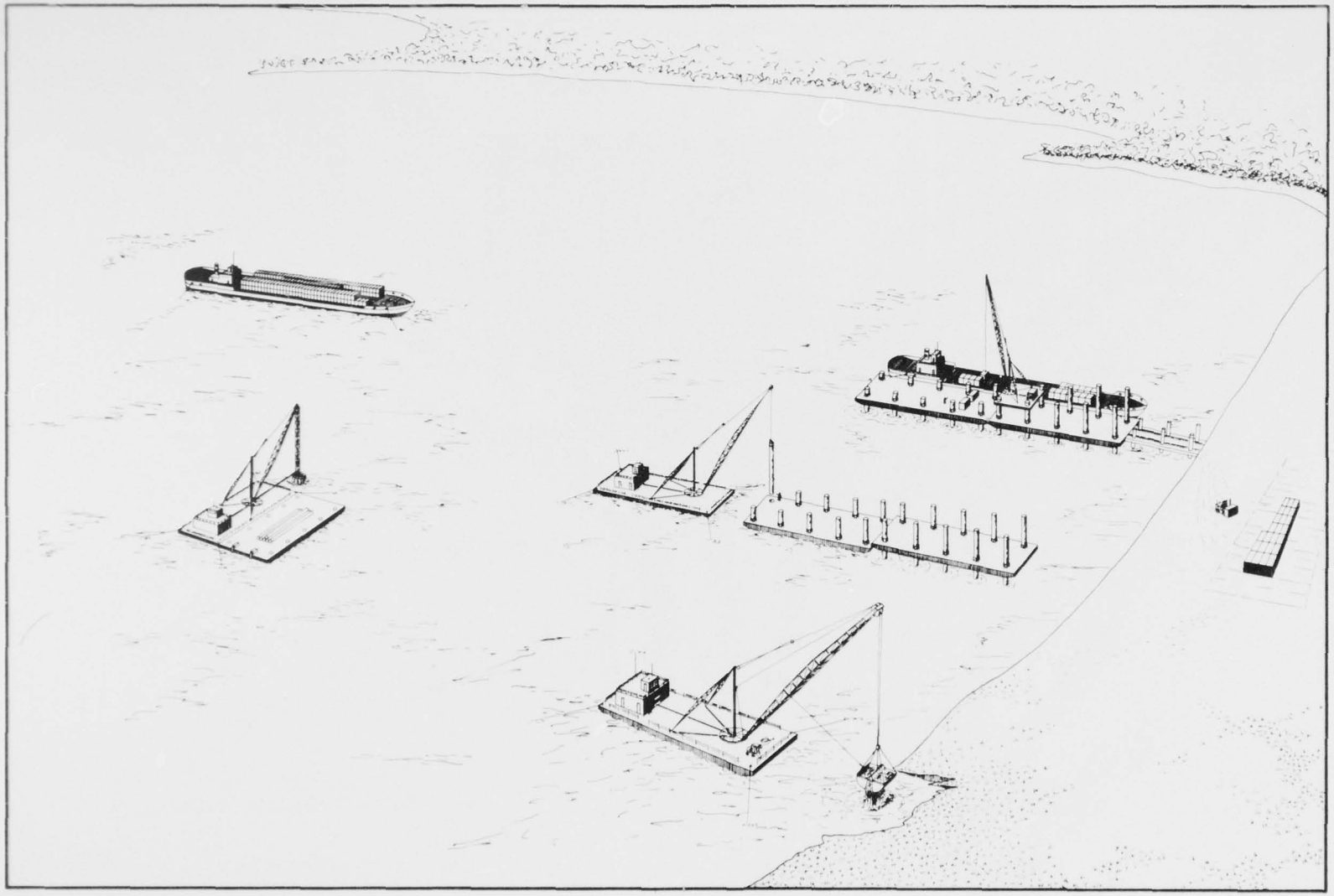
ORIGINAL BORDER 27" × 40-1/2", 22% REDUCTION



TYPICAL ILLUSTRATION

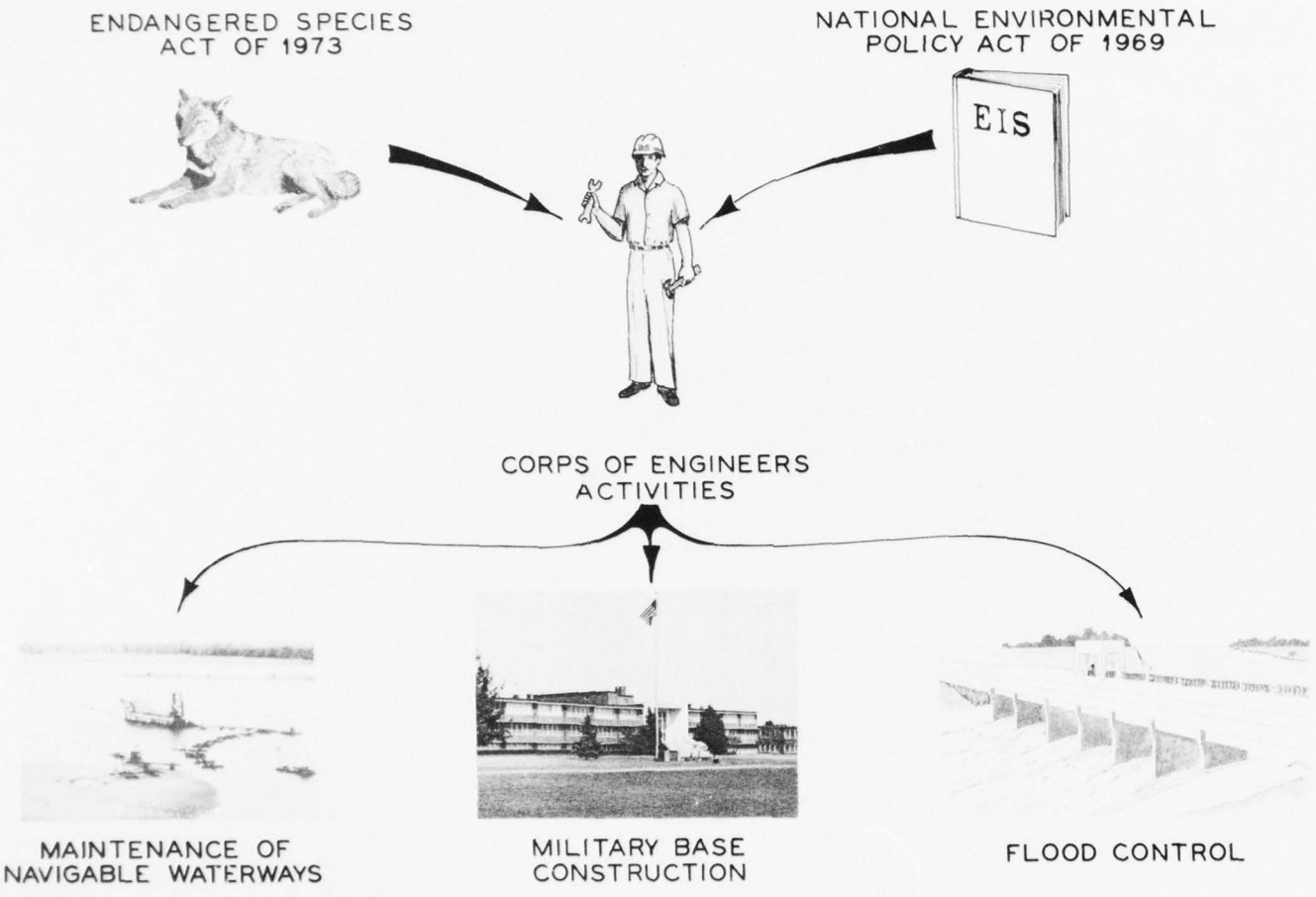


TYPICAL ILLUSTRATION



TYPICAL ILLUSTRATION

FEDERAL AND STATE ENVIRONMENTAL LAWS



TYPICAL ILLUSTRATION WITH HALFTONES

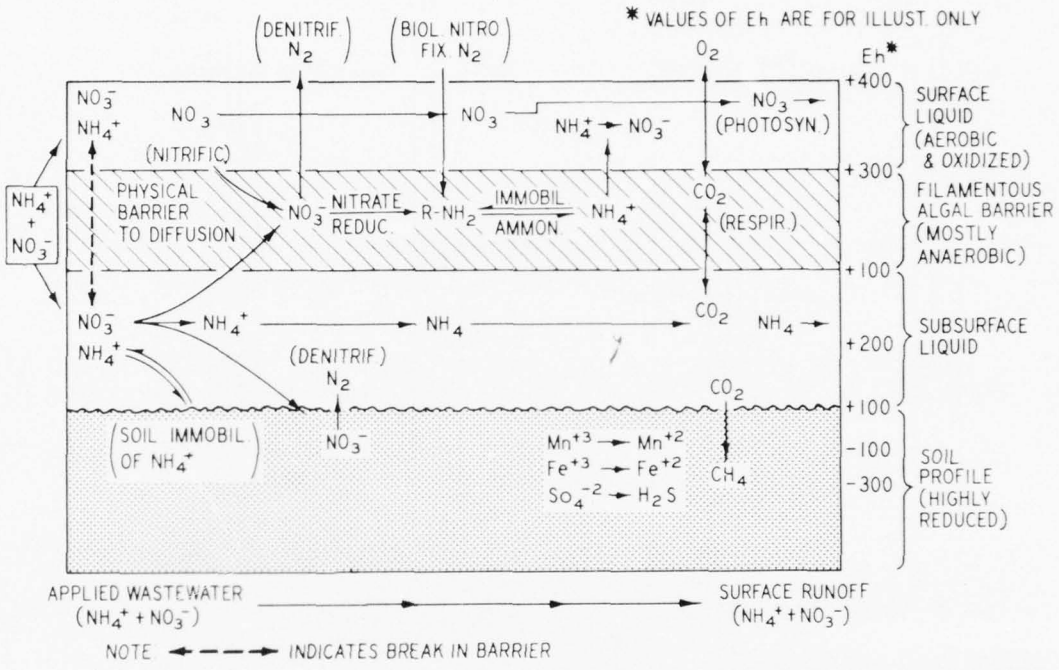


Figure 11. Cross section of a flooded soil.

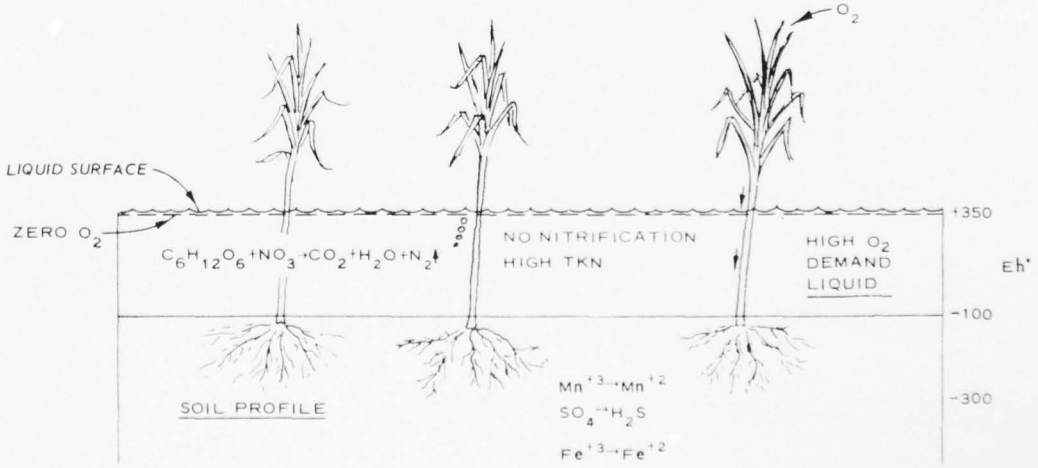


Figure 12. An overland flow surface with the aerobic zone remaining in the liquid flowing over the soil profile

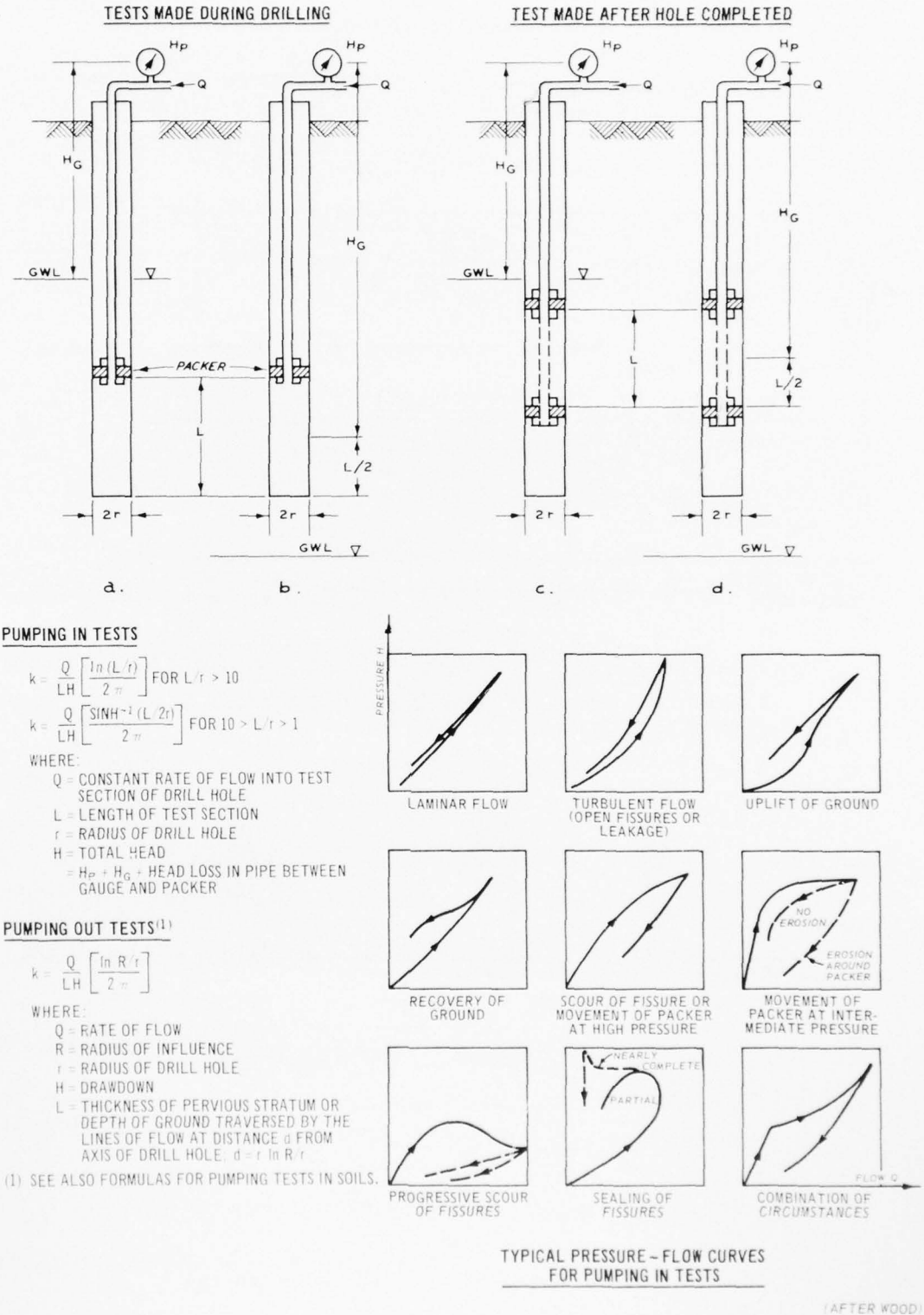
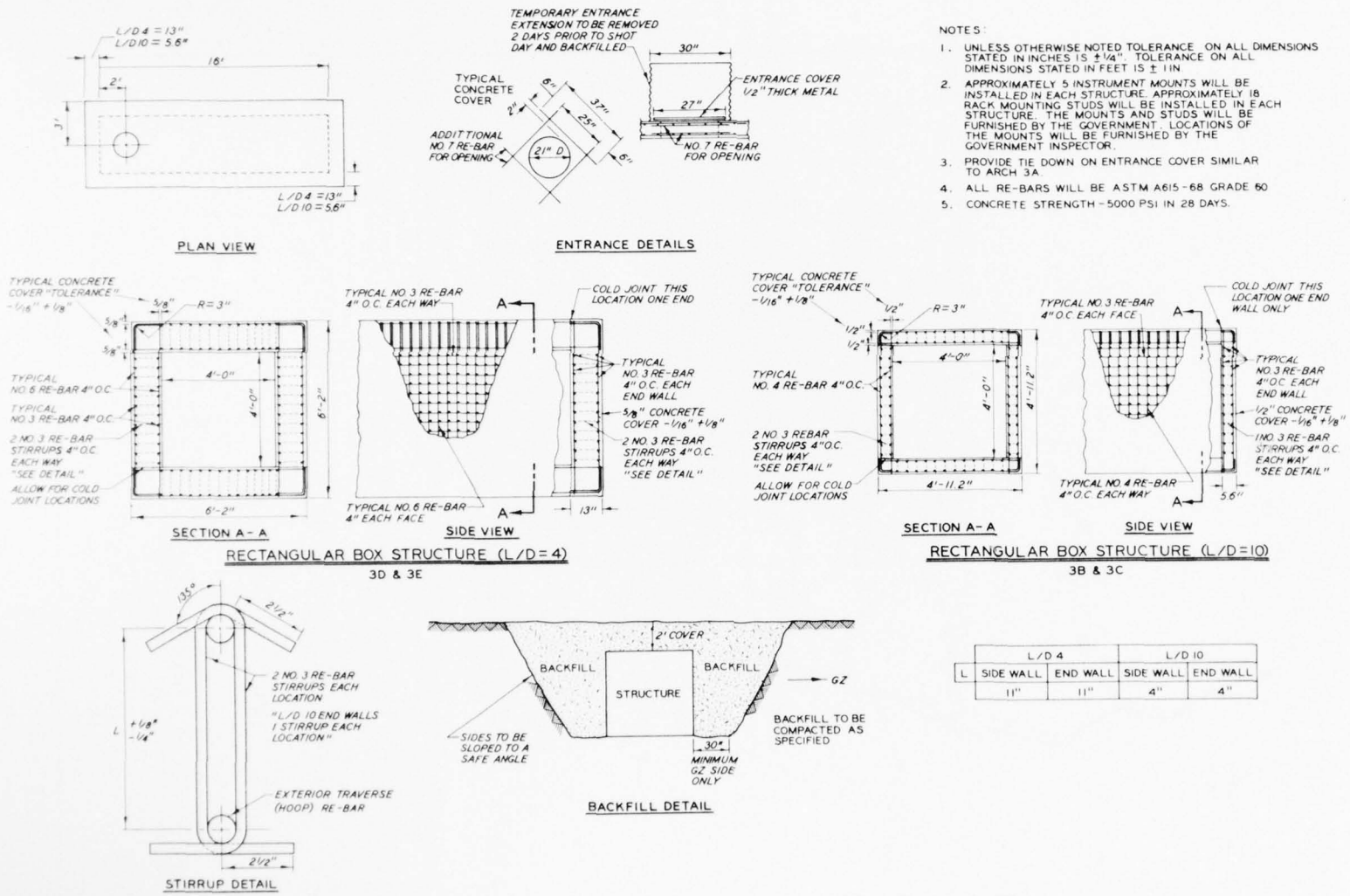


Figure 1. Methods and analyses for water pressure test



L	L/D 4		L/D 10	
	SIDE WALL	END WALL	SIDE WALL	END WALL
	11"	11"	4"	4"

Figure 3. Rectangular structures 3B, 3C, 3D, and 3E

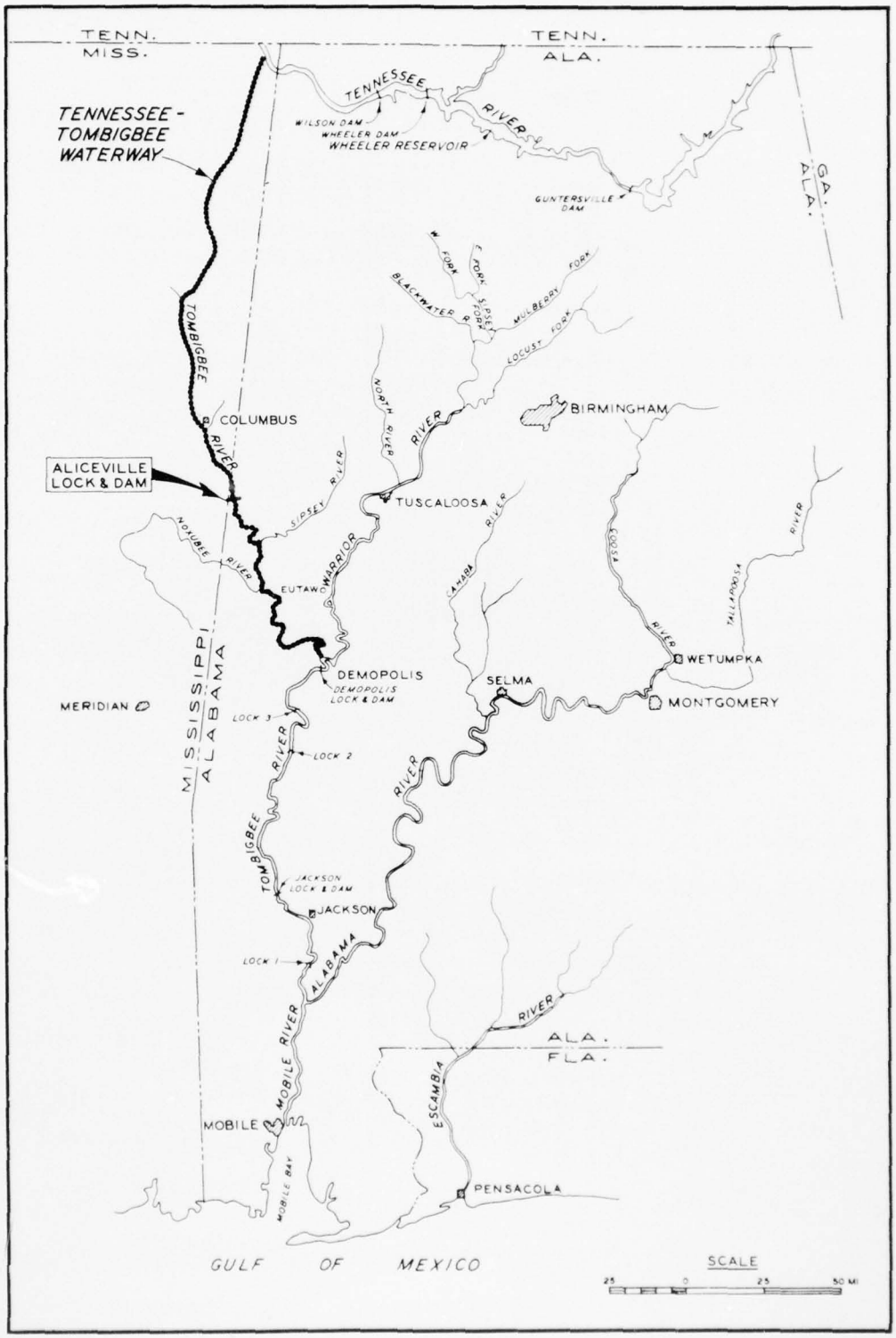
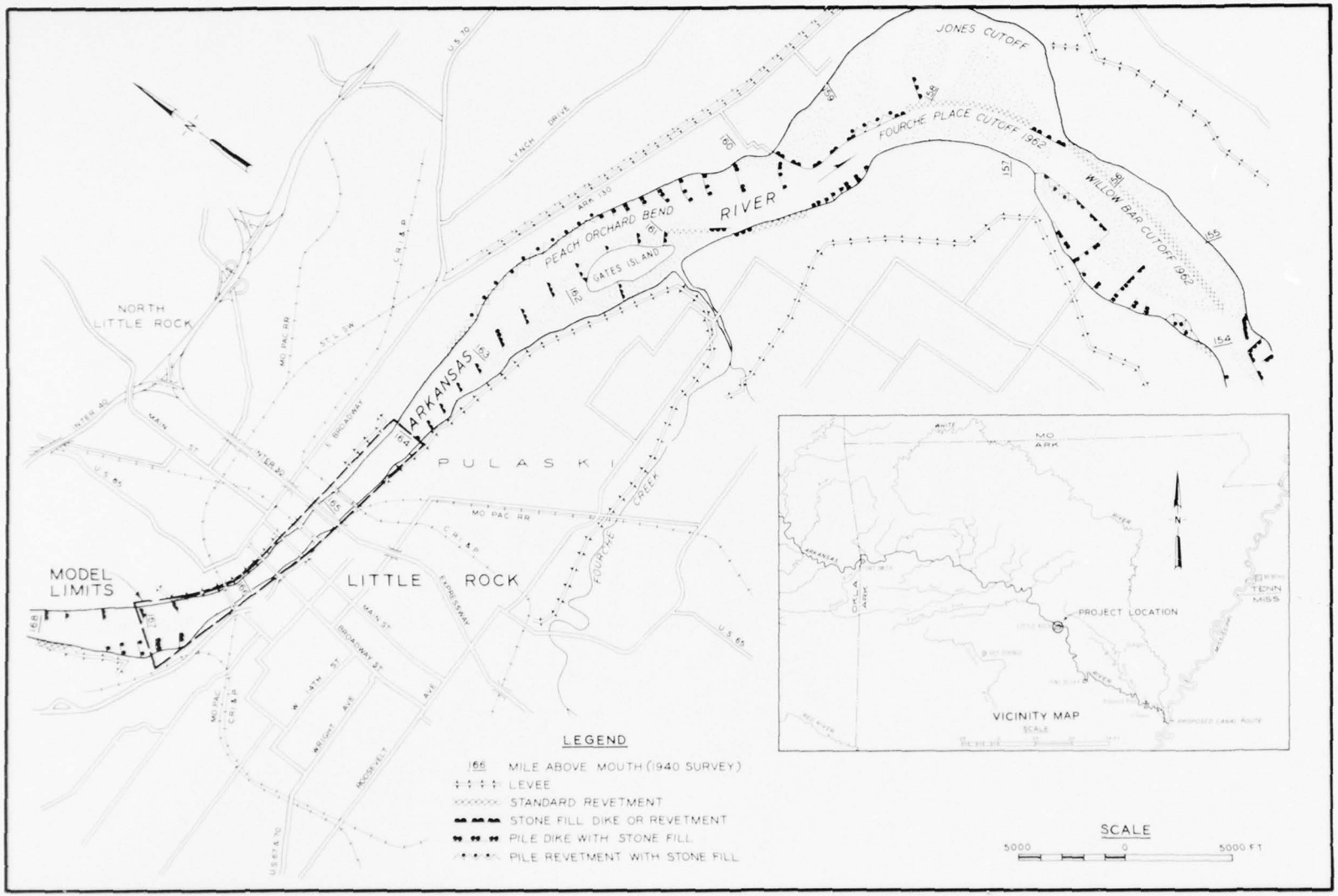


Figure 4. Vicinity Map



EXAMPLE OF A LOCATION MAP WITH VICINITY MAP

EDITORIAL FEATURES

WORD LIST
ABBREVIATIONS
EDITORIAL MARKS
GREEK ALPHABET AND
MATHEMATICAL SYMBOLS

EDITORIAL FEATURES

WORD LIST

1. The word list below comprises difficult or uncommon words often used in WES reports. Experience has shown that these words are often troublesome because of the confusion regarding whether they are one-word or two-word forms, hyphenated or unhyphenated, etc. Much time and money will be saved if WES *authors* and *draftsmen* will refer to this list when *preparing illustrations*.

aboveground (adj)
above ground (adv)
above-mentioned
aforementioned
aforesaid
airblast
airborne
airburst
air-dry (v, adj)
airflow
airmobile (adj)
air photo
alignment (WES)
alinement (DNA)
alongshore
artwork

back draft
backfill
back up (v)
backup (n, adj)
bandwidth
bank-full
bank side (n)
bank-side (adj)
baseline
baseplate
bed form
bed load (n)
bed-load (adj)
bedrock
bell-mouthed
benchmark
birdbath
borderline (adj)
border line (n)
borehole
bottleneck
bottomland
bottom lift (n)
bottom-lift (adj)
Bouyoucos gage
broadleaf

buildup (n)
build up (v)
built-up (adj)
bypass
by-product

cap rock
Cartesian
centerline (n, adj) (DNA)
center line (n) (WES)
center-line (adj) (WES)
channel side (n)
channel-side (adj)
checkpoint
chi-square
cleanup (n, adj)
clean up (v)
close-up (n)
closeup (adj)
close up (v)
coastline
continental shelf
Corps-wide
court-martial (n, v)
cover layer (n)
cover-layer (adj)
cover plate
crossarm
cross-bedded
cross-bedding
crosscurrent
crossflow
cross over (v)
crossover (n, adj)
crossroad
cross section (n)
cross-section (v, adj)
cross-sectional (adj)
cross wave
cutback (n, adj)
cut back (v)
cutoff (n, adj)
cut off (v)

damsite
Darcy's law
daylight
dead load
dead water (n)
dead-water (adj)
deadweight
de-air
decisionmaking
deep water (n)
deepwater (adj)
downdrift
downpull
drawdown (n)
draw down (v)
dump truck
dust-free (adj)

earth fill (n)
earth-fill (adj)
ebb flow
electro-osmosis
enclosure*
endorsement*
end sill

farmland
farther (distance)
fiberglass (n, adj)
fieldwork
flap gate
flatland
flood flow
floodplain
floodwall
floodwater
flow line
flowmeter
fly ash
forklift
FORTRAN
free body (n)
free-body (adj)

* Use "inclosure" and "indorsement" when referring to correspondence.

free-fall
free flow (n)
free-flow (adj)
fresh water (n)
freshwater (adj)
front line (n)
frontline (adj)
frost-free
further (extent)
fuseplug

gage
gradeability
grade line
groundline
groundwater (n, adj)
grumusol
guard wall
guideline
guide wall

half-space (n, adj)
handlaid
handline
harbor side (n)
harbor-side (adj)
headbay
head loss
headroom
headwater
high velocity (n)
high-velocity (adj)
high water (n)
high-water (adj)
hometown (n, adj)
hot plate

ice cap
ice-free

lake bed
lakeshore
landfill (n, adj)
landform
landlocked
land side (n)
land-side (adj)
land use
land wall
lightweight (adj)
lock wall
longtime (adj)
low water (n)
low-water (adj)

main-line (adj)
main stem
mainstream
makeup
man-hour
man-made
Manning's n
Mercator
middepth
midheight
mid-latitude
midpoint
midspan
mudflows
mud-free (adj)

nearshore

oceangoing
ocean side (n)
ocean-side (adj)
off-road
offshore
oven-dry (v)
ovendry (adj)
overall
overbank
overpressure
overrun

payload
percent
Petersen dredge
physicochemical
pipeline
Plexiglas
point bar (n, adj)
Pontacyl Brilliant Pink
powerhouse
power plant
Precambrian
print out (v)
printout (n, adj)
programmed
programmer
programming
pug mill
pulldown (n, adj)
pull down (v)
pumpback
pump house
pushbar
Pyrex

quarry-run stone
quarrystone

rainwater
Ramm
reentrants
reevaluation
reuse
Rzynolds number
ridge crest
ridgetop
riverbank
riverbed
riverflow
river side (n)
river-side (adj)
river wall
roadbed
rockbound (adj)
rockfall (n)
rock fill (n)
rock-fill (adj)
rollout
rundown (n)
run-down (adj)
run down (v)
runoff
run-on
runout
runup (n)
run up (v)

saltwater (adj)
salt water (n)
sandbar
seacoast
sea side (n)
sea-side (adj)
seawall
seawater
setup (n)
set up (v)
shallow water (n)
shallow-water (adj)
sheet metal
shoreline
short-time (adj)
shutoff
sidecast dredge
side slope
sidewall
sinkhole
skin plate
slack water (n)
slack-water (adj)
slip form (n)
slipform (v, adj)
slipformed (v, adj)

slipforming (v, adj)
slowdown
snow cover
snowfall
snowmelt
standby
standoff (n, adj)
state-of-the-art (adj)
state of the art (n)
steerageway
still water (n)
still-water (adj)
stop log
streambank
streambed
streamflow
Styrofoam
Surfa-aero-sealz

tack weld (n)
tack-weld (v)
tailbay
tailgate
tailpipe
tailwater
takeoff (n)
take off (v)
tar-rubber
taxiiane
template
Terra-tire
Thiokol
tidewater
tie-back levee
tie-down
time-consuming
timetable
topdressing
top lift (n)
top-lift (adj)
topside
topsoil
top stratum
trademark
trade name
trade-off (adj)
trapdoor
trashrack
Tri-Cone
turndown (adj)

underlayer
underside
underwater (n, adj, adv)
upriver
Uranine

venturi
von Karman
von Mises

waist-deep
warm water (n)
warmwater (adj)
wastewater (n, adj)
waterborne
watercourse (hydraulics)
water-course (concrete)
waterline
water stop
water table (n, adj)
watertight
wave form
wave front
wavelength
weighhouse
well flow
wellpoint
wing wall
work load
worldwide
worthwhile
wraparound

X-ray (n, adj, v)

ABBREVIATIONS GUIDE FOR WES REPORTS

1. The following is a list of abbreviations commonly used at WES. Though by no means complete, it does include most unit-of-measure abbreviations and other closely related abbreviations acceptable for use in WES reports. For additional abbreviations refer to the American Standard *Abbreviations for Scientific and Engineering Terms,*[17] the GPO *Style Manual,*[15] and Webster's Unabridged.[14]

Term	Abbreviation
acre	spell out
acre-foot	acre-ft
alternating current	a-c (as adj); AC (as noun)
ampere*	amp
ampere-hour	amp-hr
Angstrom unit	A
antilogarithm	antilog
approximate	approx
atmosphere	atm
average	avg
bar	spell out
barrel	bbl
Baumé	Bé
biochemical (or biological) oxygen demand	BOD
brake horsepower	bhp
British thermal unit	Btu
California Bearing Ratio	CBR
calorie	cal
center line	$\mathbb{C}_L$
center to center	c-c, c to c
centigram	cg
centilitre	cl
centimetre	cm
centimetre-gram-second (system)	cgs
centimetres per second	cm/sec
centipoise	cp
chemical oxygen demand	COD
cologarithm	colog
cosecant	csc
cosine	cos
cotangent	cot
cubic	cu
cubic centimetre	cu cm, cc, cm^3
cubic feet	cu ft, ft^3
cubic feet per minute	cfm, cu ft/min, ft^3/min
cubic feet per second	cfs, cu ft/sec, ft^3/sec
cubic inch	cu in., $in.^3$
cubic metre	cu m, m^3

Note: The word "per" can be substituted for the diagonal (/). But in any one report, be consistent.

* For a report written using metric (SI) units, the abbreviations for ampere, volt, and watt are A, V, and W, respectively. (Kilovolts would be abbreviated kV, milliampere, mA, etc.)

Term	Abbreviation
cubic micron	cu μ, μ^3
cubic millimetre	cu mm, mm^3
cubic yard	cu yd, yd^3
cycles per minute	cpm
cycles per second	cps
day	spell out
decibel	db
decibels referred to one milliwatt	dbm
degree*	deg or °
degree Centigrade (or Celsius)	°C
degree Fahrenheit	°F
degree Rankine	°Ra
degree Réaumur	°R
degrees per second	deg/sec
diameter	diam
direct current	d-c (as adj); DC (as noun)
dissolved oxygen	D.O.
downstream	D.S.
dozen	doz
electromotive force	emf
elevation	el
equation	spell out generally (use "Eq" in tables or drawings where space is a factor)
feet per minute	fpm, ft/min
feet per second	fps, ft/sec
feet per second per second	ft/sec^2
foot	ft
foot-pound	ft-lb
foot-pound-second (system)	fps
gallon	gal
gallons per day	gpd, gal/day
gallons per minute	gpm, gal/min
gallons per second	gps, gal/sec
gram	g
gravity (units)	g's
Greenwich time	GW
ground zero	GZ
hectare	ha
hertz	Hz
high explosive	HE
high-water interval	HWI
horsepower	hp
horsepower-hour	hp-hr
hour	hr
hundredweight (112 lb)	cwt
hyperbolic cosecant	csch
hyperbolic cosine	cosh

* Use "degree" symbol in tabulations, where space is an important factor, or in a situation where an abbreviation would be awkward, i.e. 40°14'12".

Term	Abbreviation
hyperbolic cotangent	coth
hyperbolic sine	sinh
hyperbolic tangent	tanh
inch	in.
inches per second	ips, in./sec
inch-pound	in.-lb
inside diameter	ID
joule	J
Kelvin	K
kilobar	kbar
kilocalorie	kcal
kilocycle	kc
kilocycles per second	kcps
kilogram	kg
kilogram-calorie	kg-cal
kilogram-metre	kg-m
kilograms per cubic metre	kg/cu m, kg/m^3
kilograms per second	kgps, kg/sec
kilohertz	kHz
kilolitre	kl
kilometre	km
kilometres per second	kmps
kilonewton	kN
kilopound (1000-lb deadweight load)	kip
kiloton	kt
kilovolt	kv
kilovolt-ampere	kva
kilowatt	kw
kilowatt-hour	kwhr
kips per square inch	ksi
knot	spell out
linear	lin
litre	l (usually a script *l*)
logarithm (common)	log
logarithm (natural)	ln, $\log_e$
magnified 50 times	×50
Manning's roughness	n
maximum	max
mean higher high water	mhhw
mean lower low water	mllw
mean low tide	mlt
mean sea level	msl
megahertz	MHz
megapascal	MPa
megaton	Mt
metre	m
metre-kilogram	m-kg
mho	spell out
microampere	μa
microinch	μin., micron.

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GUIDE FOR EFFECTIVE ENGINEERING GRAPHICS WATERWAYS EXPERIMENT S--ETC(U)
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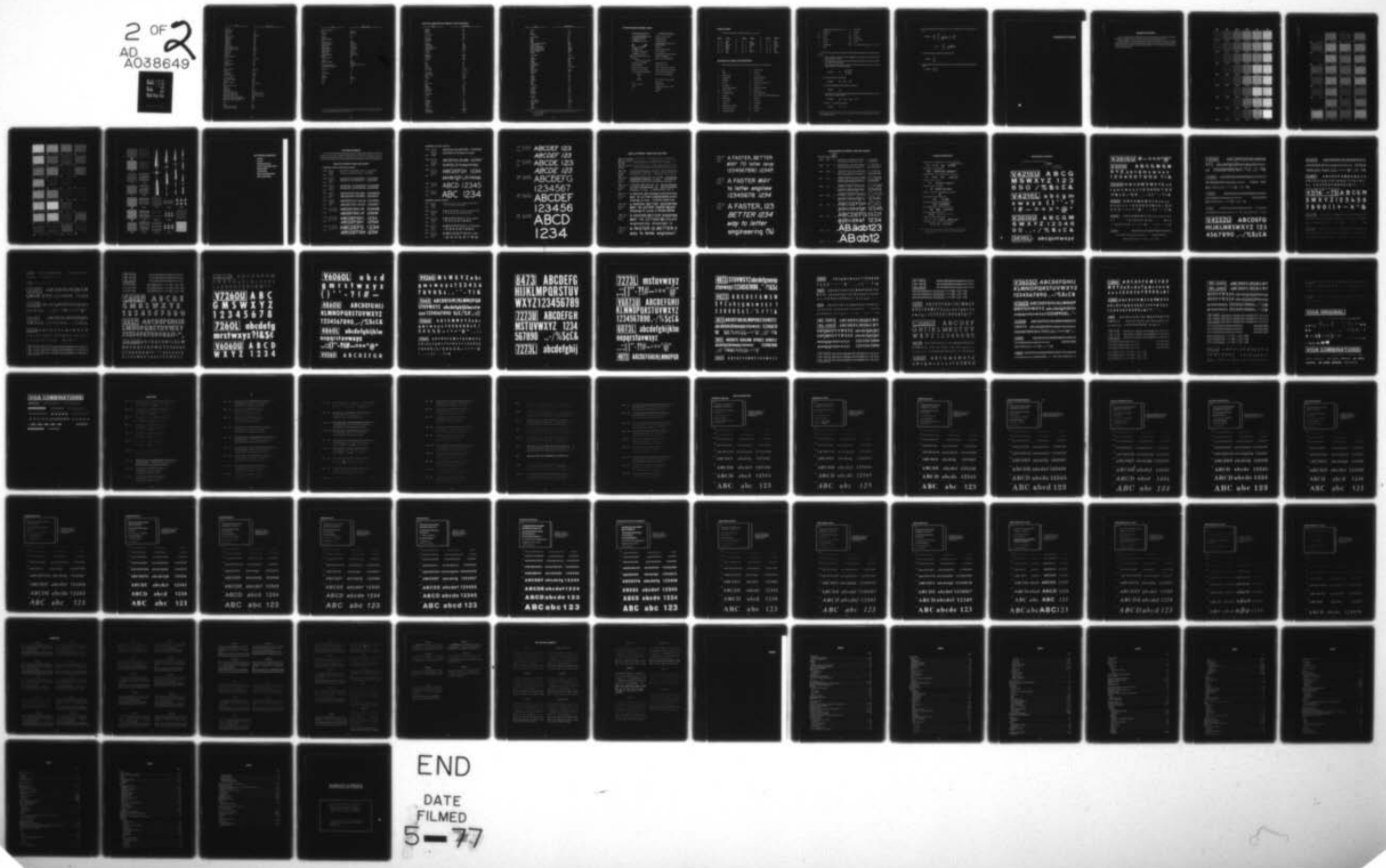

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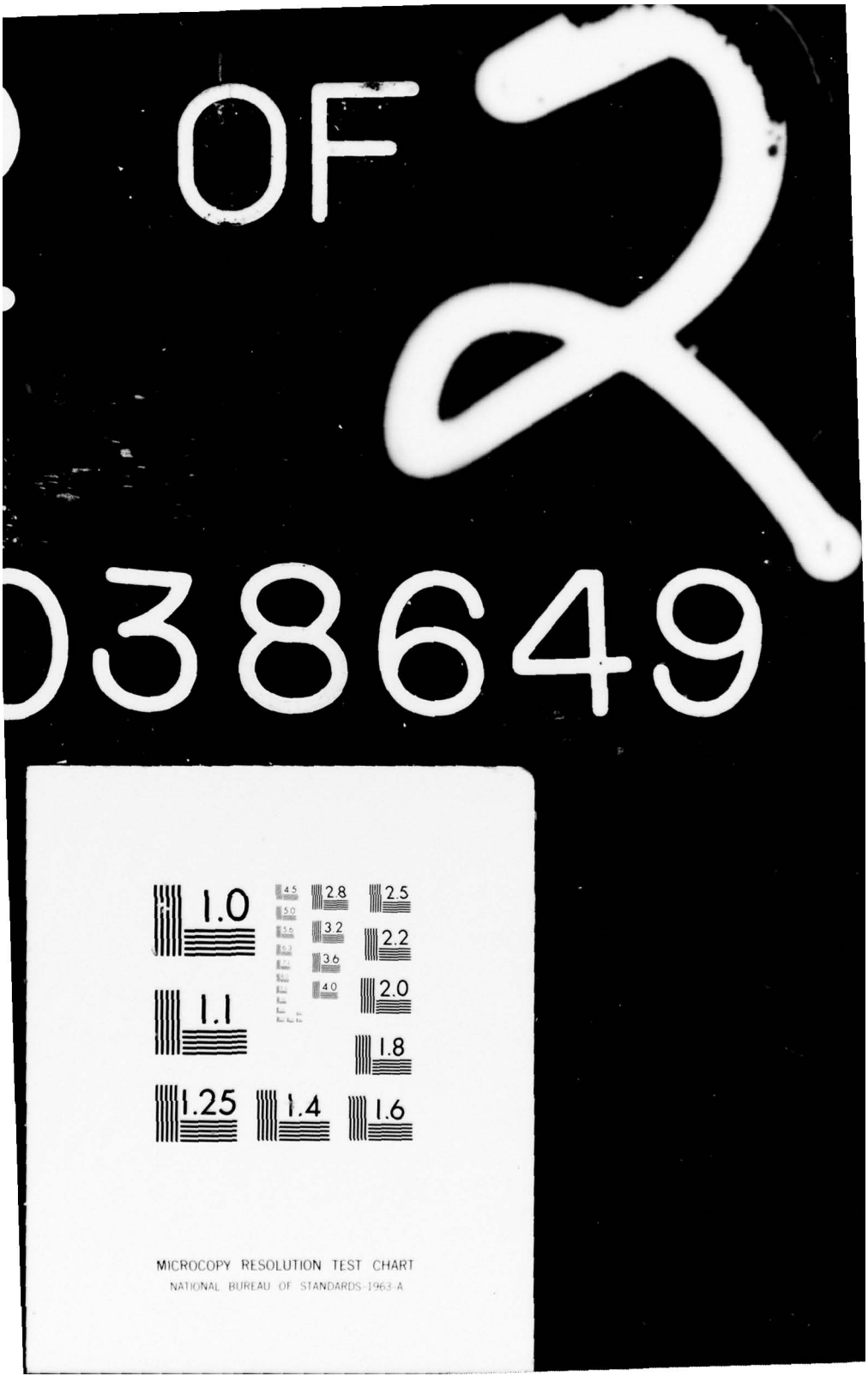
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Term	Abbreviation
micron	μ
microsecond	μsec
microvolt	μv
microwatt	μw
mile	spell out
miles per hour	mph
milliampere	ma
millibar	mb
milligram	mg
millilitre	ml
millimetre	mm
millimicron	mμ
million electron volts	Mev
million gallons per day	mgd
millisecond	msec
millivolt	mv
minimum	min
minute	min
minute (angular)	'
month	spell out
nanosecond	nsec
newton	N
nuclear explosive	NE
number(s)	No.
ohm	Ω
ohm-centimetre	ohm-cm
ounce	oz
ounce-foot	oz-ft
ounce-inch	oz-in.
outside diameter	OD
parts per million	ppm
parts per thousand	ppt
pascal	Pa
percent (tabular)	spell out or %
pint	pt
pores per linear inch	ppi
pound	lb
pound-foot	lb-ft
pound-inch	lb-in.
pounds per cubic foot	pcf, lb/cu ft, lb/ft^3
pounds per square foot	psf, lb/sq ft, lb/ft^2
pounds per square inch	psi, lb/sq in., lb/in.^{2}
pounds per square inch absolute	psia
pounds per square inch differential	psid
pounds per square inch gage	psig
quart	qt
radian	rad
revolutions per minute	rpm
revolutions per second	rps

Term	Abbreviation
Reynolds number	R
rod	spell out
roentgen	spell out
secant	sec
second	sec
second (angular)	"
sine	sin
specific gravity	sp gr
square centimetre	sq cm, cm^2
square foot	sq ft, ft^2
square inch	sq in., $in.^2$
square kilometre	sq km, km^2
square metre	sq m, m^2
square micron	sq μ, μ^2
square mile	spell out
square millimetre	sq mm, mm^2
station	sta
still-water level	swl
tangent	tan
thousand pounds	kip
ton	*spell out*
tons per square foot	tons/sq ft, tons/ft^2, tsf
total Kjeldahl nitrogen	TKN
upstream	U.S.
volt*	v
volt-ampere	va
watt*	w
watt-hour	whr
week	spell out
yard	yd
year	yr

* For a report written using metric (SI) units, the abbreviations for ampere, volt, and watt are A, V, and W, respectively. (Kilovolts would be abbreviated kV, milliampere, mA, etc.)

ADDITIONAL ABBREVIATIONS COMMONLY USED IN DRAWINGS

Term	Abbreviation
altitude	alt
avenue	ave
azimuth	az
bench mark	BM*
cast iron	CI*
cast steel	CS*
centigrade	C*
circular	cir
coefficient	coef
construction	const
construction joint	CJ*
cross section	Xsect
current	cur
cylinder	cyl
diagram	diag
differential	diff
distance	dist
drawing	dwg
each	ea
East	E*
effective	eff
electric	elec
end to end	e-e, e to e
equipment	equip.
face to face	f-f, f to f
Fahrenheit	F*
finish all over	FAO*
flange	flg
flat head	FH*
gage	ga
half round	1/2rd
hard	h
height	hgt
highway	hwy
horizontal	hor
hydraulic	hyd
instrument	inst
interior	int
joint	jt
landside	LS*
latitude	lat
left hand	LH*
length	lg
longitude	long.
Machine	Mach
material list	ML*
miscellaneous	misc

Term	Abbreviation
North	N*
office	off.
on center	OC*
penny (nails)	d**
piece	pc
plate	pl
point	pt
point of compound curve	PPC*
point of curve	PC*
point of intersection	PI*
point of reverse curve	PRC*
point of spiral tangent	PST*
point of tangent	POT*
project	proj
quadrangle	quad
radius	R or rad
railroad	RR*
range	R*
railway	RY*
reference line	ref l
reinforcing	reinf
require	req, req'd
right	r
right hand	RH*
river side	RS*
round	rd
section	sect
South	S*
square	sq
standard	std
steel	stl
street	st
structural	str
technical	tech
tertiary	ter
thread	thd
tolerance	tol
typical	typ
vertical	vert
volume	vol
water edge	WE*
water surface	WS*
weight	wt
West	W*
with	w/
without	w/o

Note: For further abbreviations refer to American Standards Association abbreviations for use on drawings.

* Upper case only.

** Lower case only.

EDITORIAL MARKS IN GENERAL USAGE

Markings in edited draft	Meaning of the mark
Since one notices that the data	Delete "one notices that"
The unclear test series	Transpose letters
had gone not far enough	Transpose words
stet	Restore deleted, crossed-out, or altered material
Director of the WES	Spell out
It was not found that	Insert at indicated point
The fall out contaminated	Close up space
in anisotropic medium	Space properly between characters
¶ The instruments showed that	Make new paragraph
marked. The proof was read by	Run on. No new paragraph
The Holt Lock and dam	Upper case the "d"
The Holt Project	Lower case the "P"
the tests were run	Move to left to point indicated
the tests were run	Move to right to point indicated
Purpose and Scope	Center horizontally on page
15 20 25	Move up to point indicated
15 20 25	Move down to point indicated
l.c.	Lower case
Cap. or "All caps"	Capital letters
c. & l.c.	Capitals and lower-case letters
#	Add space
^	Insert

GREEK ALPHABET

1. Greek letters available on P&GAD typewriters are as follows:

Letters		Names	Letters		Names	Letters		Names
A	α	Alpha	I	ι	Iota	P	ρ	Rho
B	β	Beta	K	κ	Kappa	Σ	σ	Sigma
Γ	γ	Gamma	Λ	λ	Lambda	T	τ	Tau
Δ	δ	Delta	M	μ	Mu	Υ	υ	Upsilon
E	ϵ	Epsilon	N	ν	Nu	Φ	ϕ	Phi
Z	ζ	Zeta	Ξ	ξ	Xi	X	χ	Chi
H	η	Eta	O	o	Omicron	Ψ	ψ	Psi
Θ	θ	Theta	Π	π	Pi	Ω	ω	Omega

MATHEMATICAL SYMBOLS AND EXPRESSIONS

2. The following list provides the most common conventions used in mathematics:

$+$	plus	$\ll$	much less than
$-$	minus	$\propto$	varies as
$\pm$	plus or minus	:	is to, ratio
$\times$	multiplied by	$\rightarrow$	approaches limit of
$\div$	divided by	$\|\|$	absolute value
$=$	equal to	$\sqrt{}$	radical; root; square root
$\neq$	not equal to	$\sqrt[3]{}$	cube root
$\approx$	approximately equal to	Δ	difference; increment
$\equiv$	identical with	d	differential
$\not\equiv$	not identical with	∂	partial differential
$\sim$	similar to	∇	del or nabla; vector differential operator
$\cong$	congruent to	!	factorial
$>$	greater than	$\bar{x}$	mean of x
$<$	less than	Σ	summation
$\geq$	greater than or equal to	$\int$	integral
$\leq$	less than or equal to	$f()$	function of
$\gg$	much greater than	∞	infinity

i	imaginary unit; the square root of -1	$\llcorner$	right angle
$( )$	parentheses	$\triangle$	triangle
$[ ]$	brackets	$\square$	square
$\{ \}$	braces	$\square$	rectangle
$\therefore$	therefore	$\square$	parallelogram
$\parallel$	parallel	$\bigcirc$	circle
$\perp$	perpendicular	$\overset{\frown}{AB}$	arc of circle between points A and B
$\angle$	angle		

3. WES style* for presentation of equations and other mathematical expressions is summarized as follows:

a. Use the sequence $\{ [()] \}$ for signs of aggregation, except where conventional notation specifies brackets or braces.

b. Make aggregation, integral, and summation signs the same height as the expressions which they include, or slightly larger.

c. Place subscripts and superscripts, respectively, half a line below and above the lowest and highest characters in the related material.

Examples: R_1 , $\left(2 \frac{N_{\Delta_1}}{Eh}\right)^{1/2}$

d. Align subscripts with superscripts.

Examples: P_n^2 , $F_\epsilon^{(p,q)}$, P_n^{-2}

e. Place sub-subscripts half a line below the subscripts.

Example: E_{x_o}

f. Use lowercase o's for both subscript and superscript zeros, except in juxtaposition to other superscript or subscript numbers.

Examples: K_o^2 , $f_2(t_0) = f_2(t_1)$, $n^{0.15}$

g. Raise th to a superscript position.

Examples: n^{th} , i^{th}

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* *A Style Manual for Technical Writers and Editors*, by S. J. Reisman, was used extensively in adopting WES style of presentation of mathematical material.

h. Use an integral sign large enough so that it is not overshadowed by the material on either side.

Examples: $\sqrt{\frac{a}{g}} \int_{0}^{h+1} \frac{dx}{\sqrt{hx - x^2}} \left(1 - \frac{x}{2a}\right)^{1/2}$

$$\sin^{-1} x = \int_{o+1}^{x} \frac{dz}{\sqrt{1 - z^2}}$$

i. Center material above and below a summation sign.

Example: $\sum_{\infty - o}^{o}$

j. Make parallel lines long enough to extend to the top and bottom of the material between them.

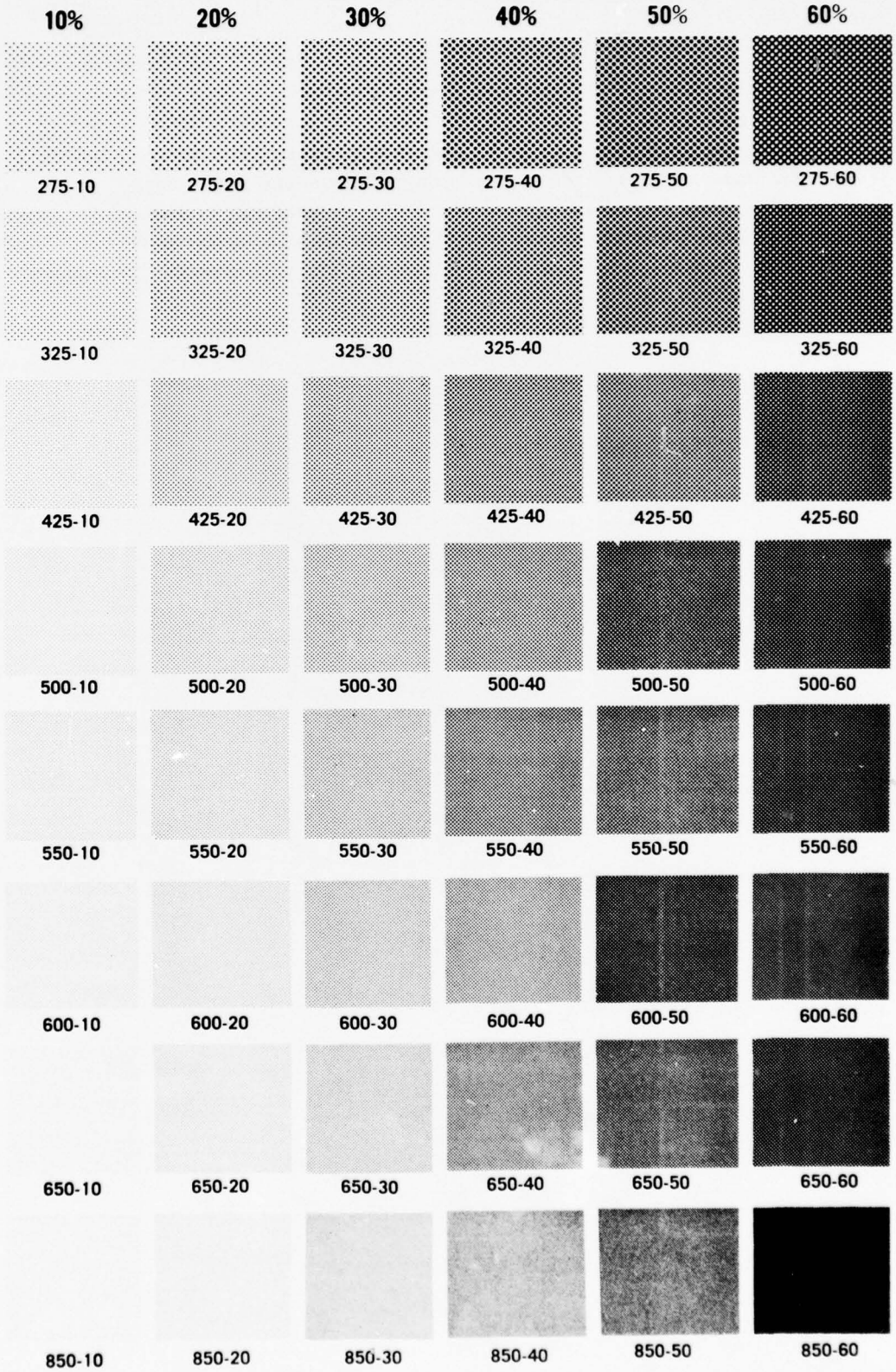
Example: $\left| E^2_{x_o} \right|$

TRANSFER PATTERNS

TRANSFER PATTERNS

The use of transfer patterns eliminates many hours of tedious repetitive handwork and inking of like elements. Application is fast and simple requiring only burnishing and cutting.

Standard symbols, line and dot patterns, are available commercially in heat resistant pressure sensitive acetate sheets. Patterns are printed in black on matte finish transparent acetate sheets. Special patterns for repetitive use such as title blocks, drawing details, etc., can be custom made commercially and in-house from artwork.


10%
20%
30%
40%
50%
60%
275-10
275-20
275-30
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275-50
275-60
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325-30
325-40
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425-10
425-20
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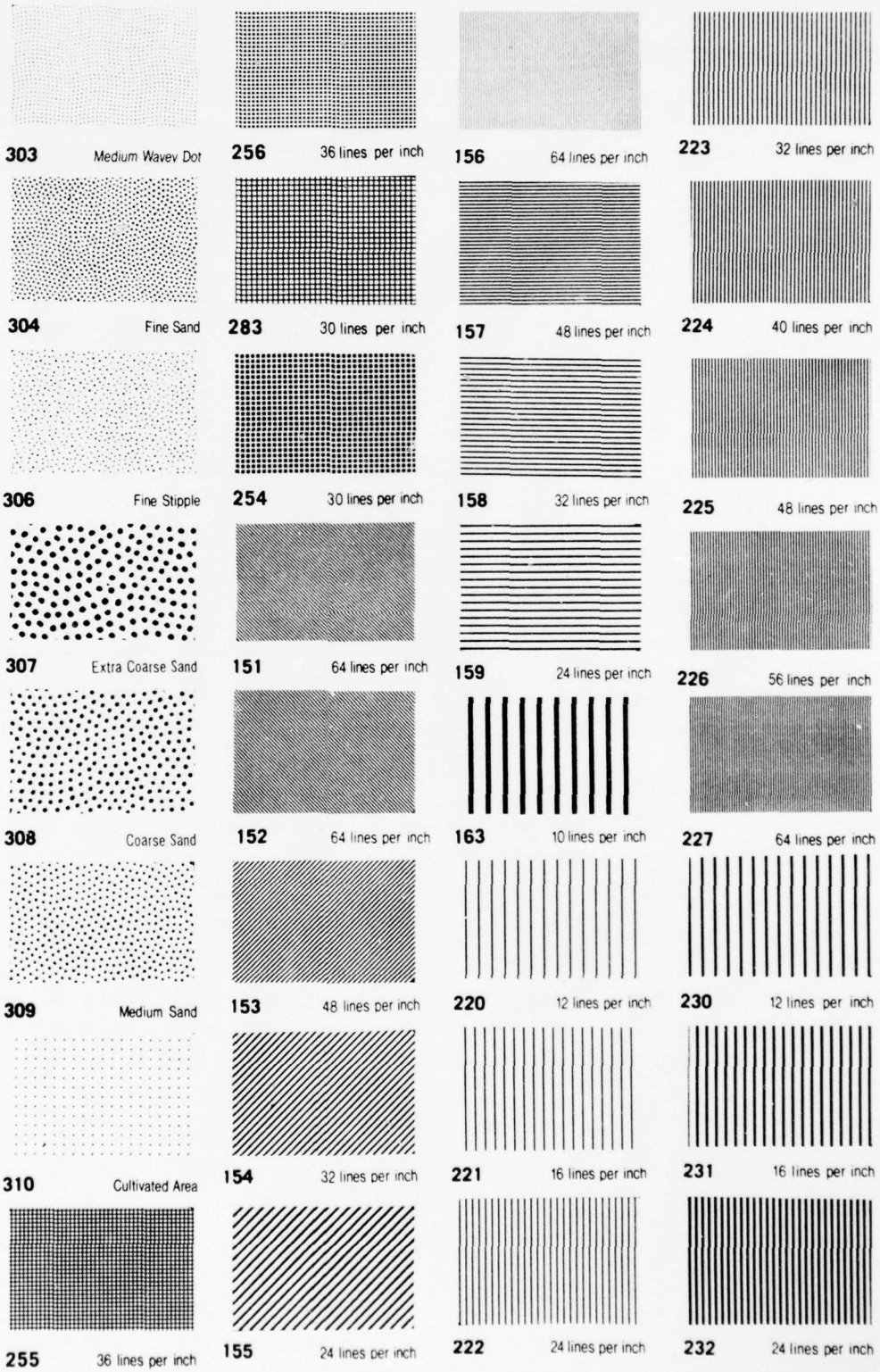
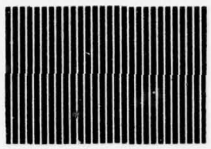
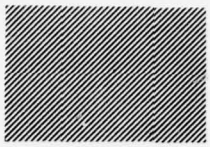
850-60

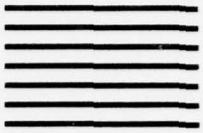

303 Medium Wavey Dot
256 36 lines per inch
156 64 lines per inch
223 32 lines per inch
304 Fine Sand
283 30 lines per inch
157 48 lines per inch
224 40 lines per inch
306 Fine Stipple
254 30 lines per inch
158 32 lines per inch
225 48 lines per inch
307 Extra Coarse Sand
151 64 lines per inch
159 24 lines per inch
226 56 lines per inch
308 Coarse Sand
152 64 lines per inch
163 10 lines per inch
227 64 lines per inch
309 Medium Sand
153 48 lines per inch
220 12 lines per inch
230 12 lines per inch
310 Cultivated Area
154 32 lines per inch
221 16 lines per inch
231 16 lines per inch
255 36 lines per inch
155 24 lines per inch
222 24 lines per inch
232 24 lines per inch



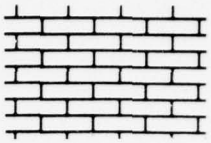
331 24 lines per inch reverse



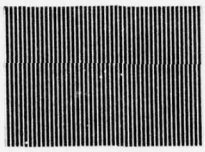
339 42 lines per inch



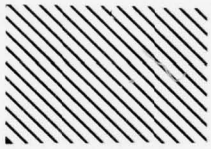
474 10 lines per inch



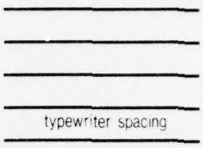
269 Heavy Scale Brick



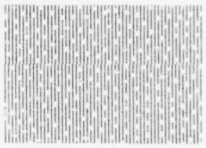
332 48 lines per inch reverse



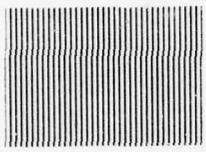
340 16 lines per inch



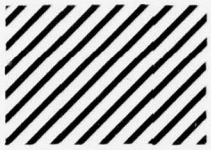
244 5.28 lines per inch



82

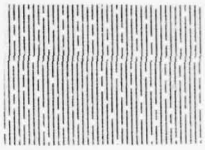


233 32 lines per inch

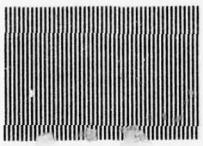


421 10 lines per inch

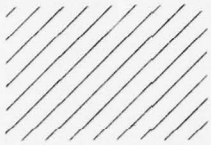
479 9 lines per inch



83



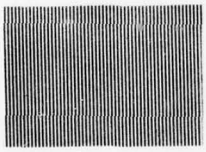
234 40 lines per inch



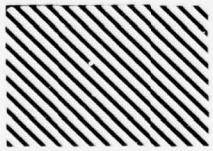
499 11 lines per inch

352 Overflowed Land

267 A.M.S. Tropical Grass



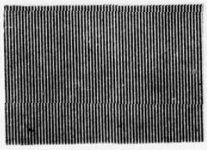
235 48 lines per inch



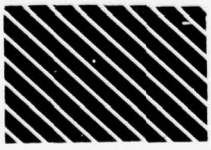
557 15 lines per inch

360 Overflowed Land

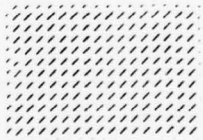
608 A.M.S. Marsh



236 56 lines per inch

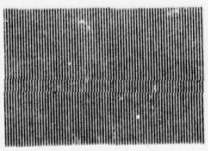


558 10 lines per inch

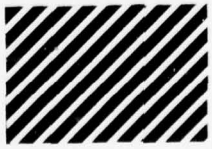


362 European Vineyard

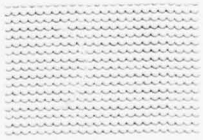
612 A.M.S. Tropical Grass



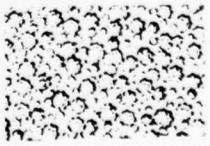
237 64 lines per inch



561 10 lines per inch

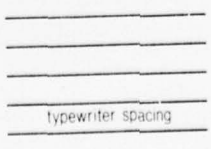


263 Fine Undulating Lines

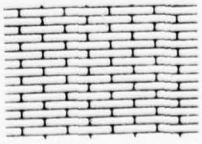


647 Open Woodland

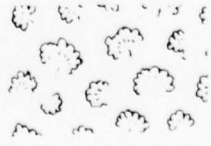
338 48 lines per inch



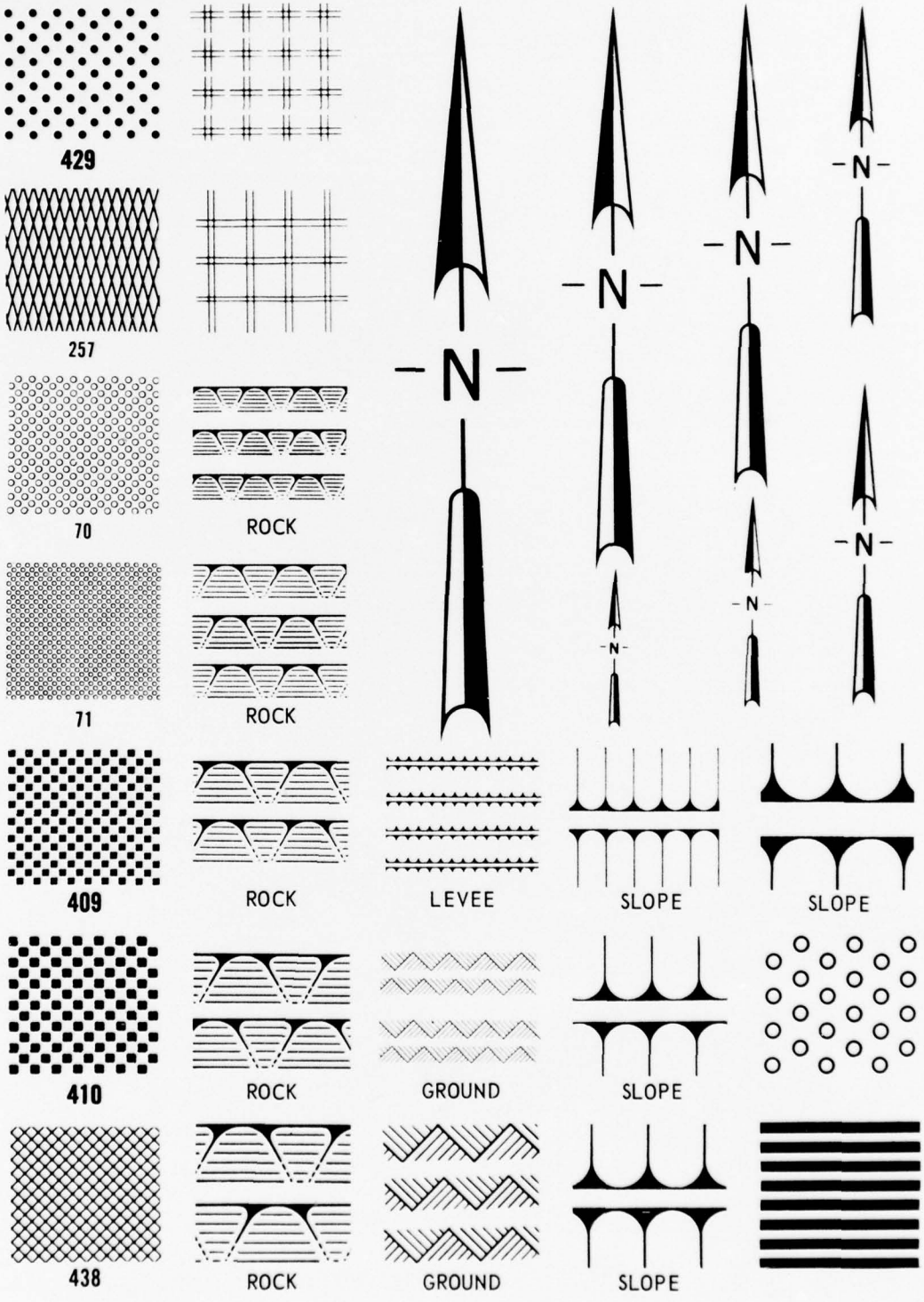
243 6 lines per inch



464 Medium Scale Brick



665 Orchard


429
257
70
ROCK
71
ROCK
409
ROCK
LEVEE
SLOPE
SLOPE
410
ROCK
GROUND
SLOPE
438
ROCK
GROUND
SLOPE
N

LETTERING SAMPLES

WRICO

LEROY

RAPIDOGUIDES

GUIDE SUGGESTIONS

HEADLINER

VARITYPER

PHOTOTYPESETTER

IBM COMPOSER

LETTERING SAMPLES

A variety of lettering, template and machine types, are available at WES ranging in size and style as illustrated in this section. Template lettering includes all standard sizes in Wrico, Leroy, and Rapidoguide. Machine lettering includes the Headliner, Varityper, Composer, and the Phototypesetter which consists of Baskerville, Century Expanded, Chelmsford, Megaron, and Times Roman lettering.

WRICO LETTERING—PENS AND GUIDES

STANDARD—VERTICAL AND SLANT GOTHIC

TEMP. VCN 90
SCN 90
PEN 7 FINE

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890

TEMP. VCN 120
SCN 120
PEN 7 REG

ABCDEFGHIJKLMNOPQRST 1234567890
ABCDEFGHIJKLMNOPQRSTU 1234567890

TEMP. VCN 140
SCN 140
PEN 6 FINE

ABCDEFGHIJKLMNOPQRS 1234567890
ABCDEFGHIJKLMNOPQRS 1234567890

TEMP. VCN 175
SCN 175
PEN 6 REG

ABCDEFGHIJKLMN 12345678
ABCDEFGHIJKLMNO 12345678

TEMP. VCN 200
SCN 200
PEN 6 REG

ABCDEFGHIJKLM 1234567
ABCDEFGHIJKLM 1234567

TEMP. VC & VN 240
SC & SN 240
PEN 4

ABCDEFGHIJK 123456
ABCDEFGHIJK 123456

TEMP. VC & VN 290
SC & SN 290
PEN 4

ABCDEFGHI 1234
ABCDEFGHI 12345

TEMP. VC & VN 350
SC & SN 350
PEN 3

ABCDEFG 1234
ABCDEFGH 1234

CONDENSED—VERTICAL GOTHIC

TEMP. CVC 185
CVL 185
CVN 185
PEN 6 FINE

ABCDEFGHIJKLMNOPQRS 123456789
abcdefghijklmnopqrstuvwxyz

TEMP. CVC 250
CVL 250
CVN 250
PEN 6 REG

ABCDEFGHIJKLMN 1234567
abcdefghijklmnopqrstuvwxyz

TEMP. CVC 375
CVL 375
CVN 375
PEN 4

ABCDEFGH 1234
abcdefghijklmnop

TEMP. CVC 500
CVN 500
PEN 3

ABCD 12345

TEMP. CVC 625
CVN 625
PEN 2

ABC 1234

EXTENDED—VERTICAL GOTHIC

TEMP. EVC 90
EVN 90
PEN 7 FINE

ABCDEFGHIJKLMNOPQRSTU
1234567890&

TEMP. EVC 120
EVN 120
PEN 7 REG

ABCDEFGHIJKLMNOPQ
1234567890&

TEMP. EVC 140
EVN 140
PEN 6 FINE

ABCDEFGHIJKLMN
1234567890

TEMP. EVC 175
EVN 175
PEN 6 REG

ABCDEFGHIJKMN
1234567890

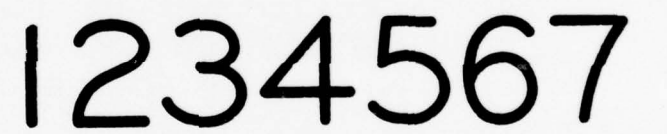
TEMP. EVC 200
EVN 200
PEN 6 REG

ABCDEFGHIJK
123456789

TEMP. VC & VN 425
SC & SN 425
PEN 2

TEMP. VC & VN 500
SC & SN 500
PEN 2

TEMP. VC & VN 625
PEN BRUSH PEN A



TEMP. VC & VN 750
PEN BRUSH PEN B

TEMP. VC & VN 1000
PEN BRUSH PEN C

LEROY LETTERING—TEMPLATES AND PENS

TEMP. 50 C PEN 0000
A FASTER, BETTER WAY TO LETTER ENGINEERING DRAWINGS. (%),"=0123456789 LEROY

TEMP. 60 C & 60 CL
PEN 0000
A FASTER, *BETTER* WAY TO LETTER ENGINEERING DRAWINGS. opqrstuvwxy, (%),"=01234
,ABCDEFGHIJKLMNOPQRSTUVWXYZ& abcdefghijklmnopqrstuvwxyz, (%)"0123456789

TEMP. 80 C & 80 CL
PEN 000
A FASTER, BETTER WAY TO LETTER engineering drawings (%),"=0123
,ABCDEFGHIJKLMNOPQRSTUVWXYZ& abcdefghijklmnopqrstuvwxyz 0123

TEMP. 100 C
& 100 CL
PEN 00
A FASTER, BETTER WAY TO LETTER (%),"=0123456789
ENGINEERING DRAWINGS, IS LEROY (%),"=0123456789
abcdefghijklmnopqrstuvwxyz *abcdefghijklmnopqrstuvwxyz*

TEMP. 120 C
& 120 CL
PEN 0
A FASTER, BETTER WAY TO LETTER 0123456789
ENGINEERING DRAWINGS IS LEROY ="0123456789
a faster, better way to letter *engineering drawings is*

TEMP. 140 C
& 140 CL
PEN 1
A FASTER, BETTER WAY TO (%),"=0123456789
LETTER ENGINEERING DR (%),"=0123456789
drawings is Leroy *a faster, better way to*

TEMP. 175 C
& 175 CL
PEN 2
A FASTER, BETTER (%),"=0123456789
WAY TO LETTER ENGINEERING 2345
drawings is Leroy *a faster, better way*

TEMP. 200 C
& 200 CL
PEN 3
A FASTER, BETTER 123456789
WAY TO LETTER ENGIN (%),012
drawings is Leroy *a faster, better*

TEMP. 240 C
& 240 CL
PEN 3
A FASTER, BETTER 3456789
WAY TO LETTER (%),"=0123
engineering *drawings is*

TEMP. 290 C
& 290 CL
PEN 4
A FASTER 12 *BETTER 3*
way to letter *engineeri*

TEMP. 350 C
& 350 CL
PEN 4

A FASTER, BETTER
WAY TO letter *leroy*
1234567890 *12345*

TEMP. 425 C
& 425 CL
PEN 5

A FASTER *WAY*
to letter *enginee*
12345678 *1234*

TEMP. 500 C
& 500 CL
PEN 6

A FASTER, 123
BETTER 1234
way to letter
engineering (%)

RAPIDOGUIDE LETTERING—PENS AND GUIDES

GUIDE NO.	HEIGHT	RAPIDO-GRAPH PEN NO.	
3030A	5/64"	00	ABCDEFGHIJKLMNÖPQRSTÜVWXYZ (!&?)£$% äabcdeefghijklmnöpqrstüvwxyz 1234567890
3030B	1/8"	00	ABCDEFGHIJKLMNÖPQRST (!&?)£$% äabcdeefghijklmnöpqrstüv 1234567890
3030	5/32"	0	ABCDFFGHIJKLMNÖPQ (!&?)£$ äabcdeefghijklmnöpqrs 123456789
3031	3/16"	1	ABCDEFGHIJKLMN (!&?)£ äabcdeefghijklmnö 1234567
3032	1/4"	2	ABCDEFGHIJK (!&? äabcdeefghijkl 123456
3032A	9/32"	2½	ABCDEFGHIJ (!?) äabcdeefghij 12345
3033	5/16"	3	ABCDEFGH (! äabcdeefgh 12345
3034	3/8"	4	ABCDEFG (!? äabcdeef 1234
3035-8	5/8"	8	ÄB.äab123
3035-9	3/4"	9	ÄBab12

GUIDE SUGGESTIONS

Use top of figure "5" for apostrophe, foot, inch, minute, and second marks:

DEGREE MARK - DROP BOW

$' \; " \; 5 \qquad 4'-3" \qquad 6\frac{1}{4}" \qquad 9°10'20$

Use top of letter "A" for quotation marks:

"A" "DRAFTING FORMAT"

Use diagonal of letter "Z" or first diagonal of figure "4" for virgules.

Z A/B 4 875/35

Use crossbar of letter "H" for dash:

H PLAN A-TEST 4

Use middle bar of letter "E" for hyphen:

E RIGHT-OF-WAY

Use letter "C" and letter "L" to make abbreviation for center line:

℄

Use next smaller size guide to make fractions:

$7\frac{1}{2} \qquad 3'-6\frac{7}{8}"$

Use zero of next larger size guide to make parentheses:

0() (LOCKED)

Use first diagonal of figure "4" to make angle abbreviations:

4 90° $\angle 2 \times 4 \times \frac{1}{3}$

Use letter "X" to make multiplication mark:

5" x 3" X x — DO NOT MAKE FULL "X"

Use letter "H" to make plus and minus signs:

H — + 7+8-4 100' ± H

Use horizontals of figure "4" and letter "B" to make equal sign:

4 = B 9+3=12

NOTE: Pens and guides must be kept clean to function properly and provide good letters. Do not allow ink to dry in pens and collect on letters of the guides; Wash and dry when not in use.

HEADLINER LETTERING

LETTERING HEIGHT, HUNDREDTHS OF INCH

V - 3616 U

STYLE

U - UPPER CASE
L - LOWER CASE

V4216U A B C G
M S W X Y Z 1 2 3
8 9 0 / % $ ¢ £ &

V4216L a b c g m
s w x y z ( ) ' ' - ?
! # — = + × ° @ *

V3616U A B C G M
S W X Y Z 1 2 3 4 8
9 0 . , - / % $ ¢ £ &

3616L abcgsmwxyz

V3616U #—=+×°@*

V3016 A B C G M S W X Y Z a b c g m s w x y z 1 2 3 4 5 6 7 8 9 0 ? ! &

V2416 A B C G M S W X Y Z a b c g m s w x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ £ / % # . , : ; ( ) ‘ ’ - ? ! &

V1816 A B C G M S W X Y Z a b c g m s w x y z 1 2 3 4 8 9 0 $ ¢ £ / % # ½ ¼ ¾ — = + × ° @ * . , : ; ( ) ‘ ’ - ? ! &

V1416 A B C G M S W X Y Z a b c g m s w x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ £ / % # ½ ¼ ¾ — = + × ° @ * . , : ; ( ) ‘ ’ - ? ! &

V1216 ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890 $¢£/%#½¼¾—=+×°@*.,:;()‘’-?!&

V3050 ABCDEFGHIJKLMRSW
XYZ abcdefghijklmnopqrstuvwx
yz 1234567890 $¢£/%#.,:;()''-?!&

V2450 ABCDEFGKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890
$¢£/%#½¼¾—=+×°@*.,:;()''-?!&

V1850 ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890
$¢£/%#½¼¾—=+×°@*.,:;()''-?!&

V1450 ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890
abcdefghijklmnopqrstuvwxyz :;()''-?!& $¢£/%#½¼¾—=+×°@*

V4252U ABCDEFG
HIJKLMRSWXYZ 123
4567890 .,-/%$¢£&

V2452 ABCDEFGHIJKLMQRSWXYZ

abcdefghijklmnopqrstuvwxyz 123456

7890 $¢£/%#½¼¾—=+×°@*.,:;()''-?!&

C1867 A B C D E F G M R S W X Y Z

a b c d e f g h i j k l m p q r s t u v w x

y z 1 2 3 4 5 6 7 8 9 0 $ ¢ & ! ? - ‘ ’ , .

V7/16" −75 A B C G M

S W X Y Z 1 2 3 4 5 6

7 8 9 0 ( ) + − × ° &

V14-121 A B C D E F G M N O P Q R S V W X Y Z

a b c d e f g m n o p q r s w x y z 1 2 3 4 7 8 9 0

$ ¢ £ / % # ½ ¼ ¾ — = + × ° @ * . , : ; ( ) ' ' - ? ! &

V12-121 A B C D E F G H I J K L M Q R S T U V W X Y Z

a b c d e f g h i j k l m p q r s t u v w x y z 1 2 3 4 5 6 7

8 9 0 $ ¢ £ / % # ½ ¼ ¾ — = + × ° @ * . , : ; ( ) ' ' - ? ! &

V10-121 ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz

1234567890 .,:;()''-?!&$¢£/%#½¼¾—=+×°@*

V8-121 ABCDEFGHIJKLMNOPQRRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890 .,:;()''-?!$¢£/%#½¼¾—=+×°@*

3618U ABCDEFGHIJKLM
QRSWXYZ 12345890 /%$¢£

3618L abcdefghijklmnopqrs
tuvwxyz .,:;()''-?!#—=+×°@*

3018U ABCDEFGMNOPQRS
VWXYZ 1234567890 .,-/%$¢£&

C2418 A B C D E F G M S W X Y Z
a b c d e f g h i j k l m n o s w x y z
1 2 3 4 5 6 7 8 9 0 $ ¢ & ! ? - ' ' , .

ML-1820 ABCDEFGHIJKLMNOPQRSTUVWXYZ
ML-1820 ABCDEFGHIJKLMNOPQRSTUVWXYZ
ML-1820 ABCDEFGHIJKLMNOPQRSTUVWXYZ

ML-1820
ML-1820
ML-1820

abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz

1234567890
1234567890
1234567890

$¢£/%#½¼¾—=+×°@*.,:;()''-?!&
$¢£/%#½¼¾—=+×°@*.,:;()''-?!&
$¢£/%#½¼¾—=+×°@*.,:;()''-?!&

C4827 A B C D E
G M R S W X Y Z
1 2 3 4 5 6 7 8 9 0

3627 ABCDEFGHIJK
LMNOPQRSTUVWXY
Z1234567890$&!?-'',

C18-2427 A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z 1 2 3 4 5
6 7 8 9 0 $ ¢ & ! ? - ' ' A B C D E F G
H I J K L M N O P Q R S T U V W X Y Z

C30-112 A B C D E F G M
S W X Y Z a b c m s w x y z
1 2 3 4 5 6 7 8 9 0 $ & ! ? -
V7260U A B C
G M S W X Y Z
1 2 3 4 5 6 7 8
7260L abcdefg
mrstwxyz?!&$¢
V6060U A B C D
W X Y Z 1 2 3 4

V6060L a b c d
g m r s t w x y z
( ) ‘ ’ - ? ! # —

4860U ABCDEFGHIJ
KLMNOPQRSTUVWXYZ
1234567890.,-/%$¢£&

4860L abcdefghijklm
nopqrstuvwxyz
.,:;()‘’-?!#—=+×°@*

V4260 A B C D E F G H

V4260 M S W X Y Z a b c
g m s w x y z 1 2 3 4 5 6
7 8 9 0 $ ¢ . , ' ' - ? ! &

3660 ABCDEFGHIJKLMNOPQR
STUVWXYZ abcdefghijklmrstw
xyz 1234567890 $¢£/%#.,:;()

V3060 A B C G M W X Y Z a b c
g m s w x y z 1 2 3 8 9 0 $ ¢ £ /
% # ½ ¼ ¾ — = + × ° @ * . , : ;

V2460 A B C D E F G M S T U V W X Y Z
a b c d e f g m s t u v w x y z 1 2 3 4 5 6
7 8 9 0 $ ¢ £ / % # ½ ¼ ¾ — = + × ° @
* . , : ; ( ) ' ' - ? ! &

8473 ABCDEFG
HIJKLMPQRSTUV
WXYZ123456789

7273U ABCDEFGH
MSTUVWXYZ 1234
567890 .,-/%$¢£&

7273L abcdefghij

7273L mstuvwxyz

:;()''-?!#—=+×°@*

,:,()''-?!#—=+×°@*

V6073U ABCDEFGHIJ

KLMNOPQRSTUVWXYZ

1234567890,-/%$¢£&

6073L abcdefghijklm

nopqrstuvwxyz

:;()''-?!#—=+×°@*

.,:,()''-?!#—=+×°@*

4873 ABCDEFGHIJKLMNOPQR

4873 STUVWXYZabcdefgmnop
stuvwxyz1234567890.,"-?!&$¢

V4273 A B C D E F G M S W
X Y Z a b c g m s w x y z 1
2 3 8 9 0 $ ¢ £ / % # ? ! &

3673 ABCDEFGHIJKLMOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 12345678
90 $¢£/%#½¼¾–=+×°@*.,:;()"-?!&

3073 ABCDEFG HIJKLMN OPQRST UVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890
.,:;()"-?!&$¢£/%#½¼¾–=+×°@*

V2473 A B C D E F G M R S T U V W X Y Z

V2473 a b c g m s w x y z 1 2 3 4 8 9 0

½ ¼ ¾ – = + × ° @ * . , : ; ( ) ' ' - ? ! &

V1873 A B C D E F G H I J K L M N O P Q R S T U V

W X Y Z a b c d e f g h i j k l m n o p q r s t u v w

x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ £ / % # ½ ¼ ¾ – = + ×

V1473 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5

6 7 8 9 0 $ ¢ £ / % # ½ ¼ ¾ – = + × ° @ * . , : ; ( ) ' ' - ? ! &

ML-3081 ABCDEFGHIJKLMN

ML-3081 ABCDEFGHIJKLMN

OPQRSTUVWXYZ abcdefghijkl

OPQRSTUVWXYZ abcdefghijkl

mnopqrstuvwxyz 1234567890

mnopqrstuvwxyz 1234567890

ML-1881 ABCDEFGHIJKLMNOPQRSTUVWXYZ

ML-1881 ABCDEFGHIJKLMNOPQRSTUVWXYZ

ML-1881 ABCDEFGHIJKLMNOPQRSTUVWXYZ

ML-1881 abcdefghijklmnopqrstuvwxyz
ML-1881 abcdefghijklmnopqrstuvwxyz
ML-1881 abcdefghijklmnopqrstuvwxyz

1234567890$¢£/%#½¼¾—=+×°@*.,:;()“”-?!&
1234567890$¢£/%#½¼¾—=+×°@*.,:;()“”-?!&
1234567890$¢£/%#½¼¾—=+×°@*.,:;()“”-?!&

C2425 A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z a b c d e f g m s t u
v w x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ & ! ? -

C3686U A B C D E F
G H I J K L M R S T U V
W X Y Z 1 2 3 4 5 6 9 0

V18-118 A B C D E F G H I J K L M N O P Q R S T
U V W X Y Z a b c d e f g h i j k l m n o p q r s t
u v w x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ £ / % # ½ ¼

V3051 A B C G M S W X Y Z
a b c g m s w x y z 1 2 3 8 9 0

V3653U ABCDEFGHIJ
KLMNOPQRSTUVWXYZ
1234567890.,-/%$¢£&

V3053 ABCDEFGHIJKLMNOP
QRSTUVWXYZ abcdefghijklm
nopqrstuvwxyz1234890$¢.,''-

V2453 ABCDEFGHIJKLMNOPQRSTU
VWXYZ abcdefghijklmnopqrstuvwxyz
1234567890 $¢£/%#½¼¾–=+×°@*.,:;

V1853 ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 1234567890
$¢£/%#½¼¾–=+×°@*.,:;()''-?!&

V1653 ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijkl
mnopqrstuvwxyz 1234567890.,:;()''-?!& $¢£/%#½¼¾–=+

C3061 A B C D E F G M S T U V
W X Y Z a b c d e f g m s t u v w
x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ & !

C2461 A B C D E F G M S T U V W X Y Z
a b c d e f g m n o p q r s t u v w x y z
1 2 3 4 5 6 7 8 9 0 $ ¢ & ! ? - ' ' , .

C1861 A B C D E F G H I J K L M N O P Q R S T U
V W X Y Z a b c d e f g h i j k l m n o p q r s t
u v w x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ & ! ? - ' ' , .

ML-1821 ABCDEFG HIJKLMNOPQRST UVWXYZ
ML-1821 ABCDEFG HIJKLMNOPQRST UVWXYZ
ML-1821 ABCDEFG HIJKLMNOPQRST UVWXYZ

abcdefghijklmnopqrstuvwxyz 1234567890
abcdefghijklmnopqrstuvwxyz 1234567890
abcdefghijklmnopqrstuvwxyz 1234567890

$c£/%# ½ ¼ ¾ — = + × ° @ * . . : : ( ) " ' - ? ! &
$c£/%# ½ ¼ ¾ — = + × ° @ * . . : : ( ) " ' - ? ! &
$c£/%# ½ ¼ ¾ — = + × ° @ * . . : : ( ) " ' - ? ! &

ML-3082 ABCDEFG HIJKLMN
ML-3082 ABCDEFG HIJKLMN
RSTUVWXYZ abcdefghijklmnop
RSTUVWXYZ abcdefghijklmnop
qrstuvwxyz 1234567890$c.,‘’-?!&
qrstuvwxyz 1234567890$c.,‘’-?!&

ML-1882 ABCDEFG HIJKLMN OPQRSTUVWXYZ
ML-1882 ABCDEFG HIJKLMN OPQRSTUVWXYZ
ML-1882 ABCDEFG HIJKLMN OPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz 1234567890
abcdefghijklmnopqrstuvwxyz 1234567890
abcdefghijklmnopqrstuvwxyz 1234567890

$c£/ %# ½ ¼ ¾ — =+×°@*.,:;()‘’-?!&
$c£/ %# ½ ¼ ¾ — =+×°@*.,:;()‘’-?!&
$c£/ %# ½ ¼ ¾ — =+×°@*.,:;()‘’-?!&

V24-107 A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z a b c d e f g m n o
p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 0

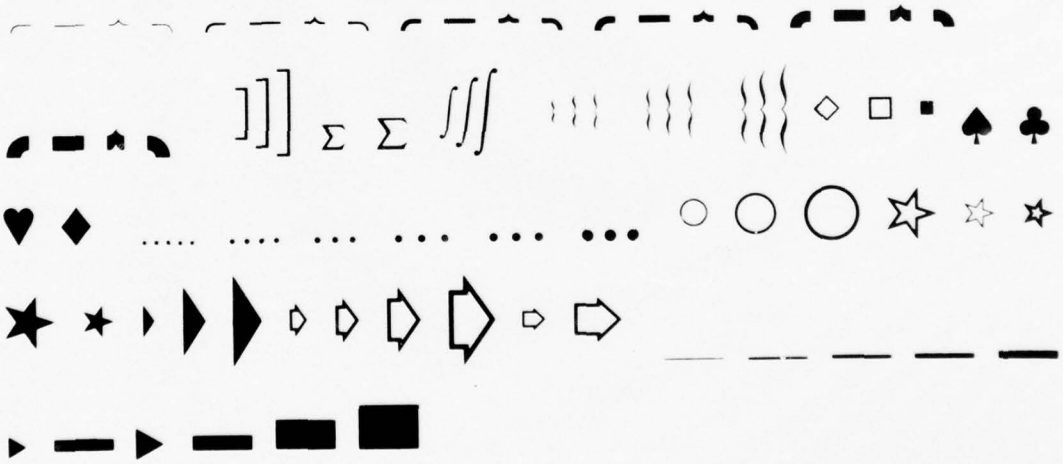
V 18 203

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z a b c d e f g h i j k l m
n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ . , : ; ? !

V 12 203

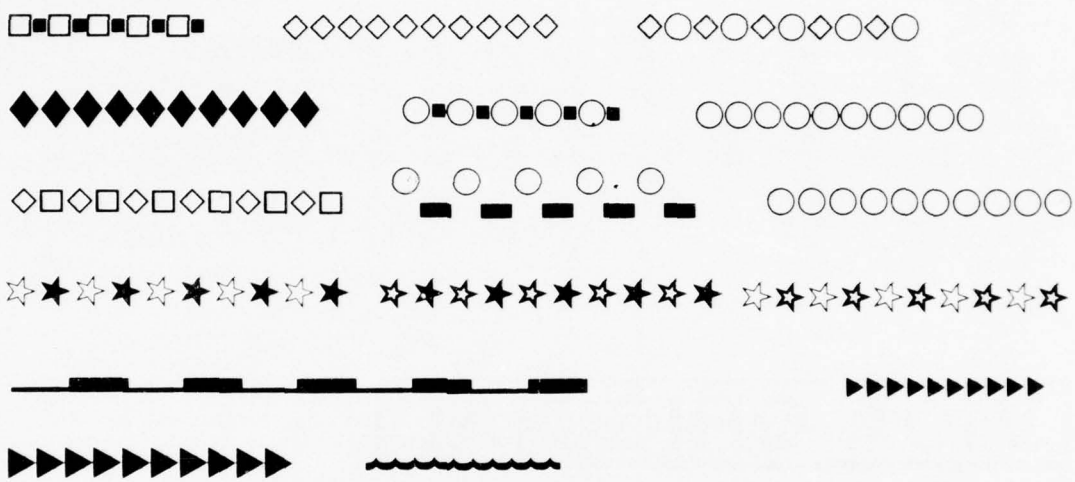
A B C D E F G H I J K L M N O P Q R S
T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w
x y z 1 2 3 4 5 6 7 8 9 0 $ ¢ . , : ; ? !

V10A ORIGINAL



V10A COMBINATIONS

V10A COMBINATIONS



VARITYPER

800 – 13A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

800 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

800 – 8 B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

800 – 6C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

800 – 4D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

800 – 2 D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

2000 – 2D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z , . -

692 – 13A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' ◈ $ % – & ' ( ) ½ † ¼ ¾ ◈ ◆ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

692 – 10D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' ◈ $ % – & ' ( ) ½ † ¼ ¾ ◈ ◆ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

692 – 8D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' ◈ $ % – & ' ( ) ½ † ¼ ¾ ◈ ◆ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

690 – 12B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ ◈ $ % – & ’ ( ) ½ † ¼ ¾ ◈ ◆ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

690 – 10D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ ◈ $ % – & ’ ( ) ½ † ¼ ¾ ◈ ◆ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

690 – 8D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ ◈ $ % – & ’ ( ) ½ † ¼ ¾ ◈ ◆ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

730 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

670 – 12A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

660 – 12A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

660 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

740 – 10C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

740 – 8D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

710 – 10B

Ξ Λ ℘ P Π A Θ | K Σ T < Δ Φ B Ω > E ∞ . Z Ψ X Γ H N M ( ) ,
ξ λ ∝ ρ π α θ ∂ κ σ τ ⊂ δ φ β ω ∫ ϵ [√ ζ ψ χ γ η ν μ ι] ⊃
1 ℑ / ° { – × * ≡ → 2 4 6 } 9 = · ≈ ' ' 3 5 7 8 0 + ℜ ¨ ´ ~

925 – 10B

A B Ψ Δ E Φ Γ H I Ξ K Λ M N O Π = P Σ T Θ Ω § X Y Z ˝ ¨ ¯ ˚
1 2 3 4 5 6 7 8 9 0 " / $ % – & £ ( ) ″ x ! - ; : . , * ¯ ,
α β ψ δ ε φ γ η ι ξ κ λ μ ν ο π + ρ σ τ θ ω ς χ υ ζ ´ ` ~ ˚

1040 – 12A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

1040 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

810 – 12A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

810 – 8B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
▲ ( ) ° ' □ ■] † ‡ ÷ § ★ " ♦ ● ⊕ ♦ ^ ; ± + – = × ¨ [` ´ -

910 – 10B

𝔄 𝔅 ℭ 𝔇 𝔈 𝔉 𝔊 ℌ ℑ 𝔍 𝔎 𝔏 𝔐 𝔑 𝔒 𝔓 𝔔 ℜ 𝔖 𝔗 𝔘 𝔙 𝔚 𝔛 𝔜 ℨ : , . !
1 2 3 4 5 6 7 8 9 0 ' ~ $ % – & ' ( ) % ‹ ‹ › £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

840 – 12B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ❁ † £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

760 – 8C

¼ ¾ ½ ⅓ ⅔ ⅛ ⅜ ⅞ 0 8 9 ¼ ½ ⅓ ¾ ⅕ ⅙ ⅚ ⅐ ⅛ 9 = + – 4 6 ± × ÷ " ' 1 3 5 ' 1 3 5 2 4 6 0 7 8 9

665 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' fl $ % – & ' ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

665 – 8C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' fl $ % – & ' ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

665 – 7D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

605 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' fl $ % – & ' ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

605 – 7D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

1015 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

1005 – 8C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

685 – 8C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

775 – 6C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

635 – 6D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

264

° Ω > < ∴ \ ⌋ ¯ _ Π ′ Σ Δ ∂ ~ { } [ ] | " ∇ Γ ∠ ⌋ ⌉ ⌊ ⌈ √ √

± ω ϵ ρ τ + − = θ π α σ δ ϕ ∞ η → ( ) ‴ ζ ξ γ ψ β ν μ ⌈ ≡ /

± ω ϵ ρ τ + − = θ π α σ δ ϕ ∞ η → κ λ : ζ ξ γ ψ β ν μ ∫ · /

135 E

1 2 3 4 5 6 7 8 9 0 " Σ Δ ∝ Γ ÷ ' ( ) = _ × + [ ] ν μ < > /

1 2 3 4 5 6 7 8 9 0 α σ δ ψ γ η ε κ λ π ζ ξ ρ θ β τ φ ω π −

Q W E R T Y U I O P A S D F G H J K L : Z X C V B N M ? ∂ ∫

434

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 " # $ % _ & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . −

316

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 " # $ % _ & ' ( ) = @ ÷ + £ ¢ ° ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . −

350 – 5

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z ; , . -

229

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z ½ , . /

1 2 3 4 5 6 7 8 9 0 " # $ % _ & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

295

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z . . -

122 A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 " # $ ¤ § & ' { } ℞ ¶ ℔ ● £ ¢ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . ~

361 – 9

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !

1 2 3 4 5 6 7 8 9 0 ' # $ % – & ' ( ) ½ @ ¼ ¾ £ ¢ * ? , . /

a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

1020 – 12A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

1020 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

600 – 12A

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ # $ % – & ’ ( ) ½ @ ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

600 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

600 – 8C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

600 – 7D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

630 – 10B

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

630 – 8C

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ ff ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

630 – 6D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z : , . !
1 2 3 4 5 6 7 8 9 0 ‘ fl $ % – & ’ ( ) ½ fi ¼ ¾ £ ¢ * ? , . /
a b c d e f g h i j k l m n o p q r s t u v w x y z ; , . -

PHOTOTYPESETTER

BASKERVILLE MEDIUM

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!¹²³*£¢%—&?(/[]'

$1234567890)-,.'

ABCDEFGHIJKLMNOPQ
RSTUVWXYZ

BASKERVILLE MEDIUM 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEDIUM DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-,.'

8 PT ABCDEFGHIJKLMNOPQ abcdefghijklmnopqr 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnopq 1234567890

14 PT ABCDEFGHIJ abcdefghijklm 1234567890

18 PT ABCDEFGH abcdefghijk 1234567890

24 PT ABCDEF abcdefg 1234567

30 PT ABCDE abcdef 123456

36 PT ABCD abcd 12345

48 PT ABC abc 123

BASKERVILLE ITALICS

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!456_£¢%—&?(/[]'
$1234567890)-,.'

fi⅛⅜⅝⅞⅛½¼ ff′⁰fl¾ffl
™®Ç©+°=●§ffi†‡″

BASKERVILLE ITALICS 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON ITALICS DISC.

6 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ *abcdefghijklmnopqrstuvwxyz* *$1234567890)-,.'*

8 PT

ABCDEFGHIJKLMNOPQ *abcdefghijklmnopqrs* *1234567890*

10 PT

ABCDEFGHIJKLMN *abcdefghijklmnopq* *1234567890*

14 PT

ABCDEFGHIJ *abcdefghijklm* *1234567890*

18 PT

ABCDEFGH *abcdefghijk* *12345678*

24 PT

ABCDEF *abcdefg* *1234567*

30 PT

ABCDE *abcdef* *123456*

36 PT

ABCD *abcde* *12345*

48 PT

ABC *abc* *123*

BASKERVILLE BOLD

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopq
rstuvwxyz

!789*£¢%—&?(/[]'

$1234567890)-.,.'

ABCDEFGHIJKLMNOPQ
RSTUVWXYZ

BASKERVILLE BOLD 12 POINT
IS COMPLETE LISTING OF
AVAILABLE CHARACTERS
ON BOLD DISC.

6 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-.,'

8 PT

ABCDEFGHIJKLMNOPQ abcdefghijklmnopqr 1234567890

10 PT

ABCDEFGHIJKLMN abcdefghijklmnopq 1234567890

14 PT

ABCDEFGHI abcdefghijklm 1234567890

18 PT

ABCDEFGH abcdefghijk 1234567890

24 PT

ABCDEF abcdefg 1234567

30 PT

ABCDE abcdef 123456

36 PT

ABCD abcde 12345

48 PT

ABC abc 123

CENTURY EXPANDED MEDIUM

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!⅛¼⅜½⅝¾⅞—&?(|£.‘

$1234567890)-,.’

%®□·†[’]° ″#*‡

$1234567890/_

CENTURY EXPANDED MEDIUM 12 PT
IS COMPLETE LISTING OF AVAILABLE
CHARACTERS ON MEDIUM DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-,.’

8 PT ABCDEFGHIJKLMNOPQ abcdefghijklmno 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmn 1234567890

14 PT ABCDEFGHIJ abcdefghijklm 1234567890

18 PT ABCDEFGH abcdefghijk 123456789

24 PT ABCDEF abcdefg 1234567

30 PT ABCDE abcdef 123456

36 PT ABCD abcde 12345

48 PT ABC abcd 123

CENTURY EXPANDED ITALICS

12 PT

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!⅛¼⅜½⅝¾⅞—&?(|£_'
$1234567890)-,.'
% ©□¢ §[´]× ″#+*
$1234567890/_

CENTURY EXPANDED ITALICS 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON ITALICS DISC.

6 PT *ABCDEFGHIJKLMNOPQRSTUVWXYZ* *abcdefghijklmnopqrstuvwxyz* *'$1234567890)-,.'*

8 PT *ABCDEFGHIJKLMNOPQ* *abcdefghijklmnopq* *1234567890*

10 PT *ABCDEFGHIJKLMN* *abcdefghijklmnopq* *1234567890*

14 PT *ABCDEFGHIJ* *abcdefghijklmn* *1234567890*

18 PT *ABCDEFGH* *abcdefghijkl* *12345678*

24 PT *ABCDEF* *abcdefgh* *1234567*

30 PT *ABCDE* *abcdef* *12345*

36 PT *ABCD* *abcd* *1234*

48 PT *ABC* *abc* *123*

CENTURY EXPANDED BOLD

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnop
qrstuvwxyz

!⅛¼⅜½⅝¾⅞—&?(|£_'

$1234567890)-,.'

%™□¢ †[']• "#*=

$1234567890/_

CENTURY EXPANDED BOLD 12 PT
IS COMPLETE LISTING OF AVAILABLE
CHARACTERS ON BOLD DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-,.'

8 PT ABCDEFGHIJKLMNOPQ abcdefghijklmnopqr 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnopq 1234567890

14 PT ABCDEFGHIJ abcdefghijklm 1234567890

18 PT ABCDEFGH abcdefghijk 1234567

24 PT ABCDEF abcdefg 123456

30 PT ABCD abcde 12345

36 PT ABCD abcde 1234

48 PT ABC abc 123

CHELMSFORD MEDIUM

12 PT

ABCDEFGHIJKLMNOP
QRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!⅛¼⅜½⅝¾⅞—&?(|£.‘

$1234567890)-,.’

%®□¢†[’]°”#*‡

$1234567890/_

CHELMSFORD MEDIUM 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEDIUM DISC.

6 PT
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-,.’

8 PT
ABCDEFGHIJKLMNOPQ abcdefghijklmnopqrstuv 1234567890

10 PT
ABCDEFGHIJKLMN abcdefghijklmnop 1234567890

14 PT
ABCDEFGHIJKL abcdefghijklmn 1234567890

18 PT
ABCDEFGHIJ abcdefghijkl 12345678

24 PT
ABCDEFG abcdefgh 123456

30 PT
ABCDEF abcdef 123456

36 PT
ABCD abcd 1234

48 PT
ABC abc 123

CHELMSFORD SLANT

12 PT

ABCDEFGHIJKLMNOPQ
RSTUVWXYZ

abcdefghijklmnopqrst
uvwxyz

!⅛¼⅜½⅝¾⅞—&?(|£_'

$1234567890)-,.'

%©□¢§[´]× ″#*+

$1234567890/_

CHELMSFORD SLANT 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON SLANT DISC.

6 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-,.'

8 PT

ABCDEFGHIJKLMNOPQ abcdefghijklmnopq 1234567890

10 PT

ABCDEFGHIJKLMNO abcdefghijklmno 1234567890

14 PT

ABCDEFGHIJKL abcdefghijklmno 1234567890

18 PT

ABCDEFG abcdefgh 1234567890

24 PT

ABCDEFGH abcdefg 1234567

30 PT

ABCDEF abcdef 123456

36 PT

ABCDE abcde 12345

48 PT

ABC abc 123

CHELMSFORD BOLD

12 PT

ABCDEFGHIJKLMNOP
QRSTUVWXYZ

abcdefghijklmnopqrs
tuvwxyz

! ⅛ ¼ ⅜ ½ ⅝ ¾ ⅞ — & ? (| £ _ ‘

$1234567890)-,.’

% ™ □ ¢ † [’] • ” # * =

$1234567890/_

CHELMSFORD BOLD 12 POINT
IS COMPLETE LISTING OF
AVAILABLE CHARACTERS
ON BOLD DISC.

6 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-,.’

8 PT

ABCDEFGHIJKLMNOPQ abcdefghijklmnopqrs 1234567890

10 PT

ABCDEFGHIJKLMNO abcdefghijklmnopqr 1234567890

14 PT

ABCDEFGHIJKL abcdefghijklmn 1234567890

18 PT

ABCDEFGHIJ abcdefghijk 12345678

24 PT

ABCDEFG abcdefgh 123456

30 PT

ABCDE abcdef 12345

36 PT

ABCD abcd 1234

48 PT

ABC abc 123

MEGARON MEDIUM

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnop
qrstuvwxyz

$1234567890)-,.'

!⅛¼⅜½⅝¾⅞—&?(|£.‘

%®□·†[']°″#*‡

$1234567890/_

MEGARON 12 POINT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEGARON DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz $1234567890)-.'

8 PT ABCDEFGHIJKLMNOPQR abcdefghijklmnopq 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnop 1234567890

14 PT ABCDEFGHIJKL abcdefghijkl 12345678

18 PT ABCDEFG abcdefgh 12345678

24 PT ABCDEF abcdefg 123456

30 PT ABCDE abcdef 12345

36 PT ABCD abcd 1234

48 PT ABC abc 123

MEGARON SLANT

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnop
qrstuvwxyz

$1234567890)-,.'

!1/8 1/4 3/8 1/2 5/8 3/4 7/8 — & ?(| £ _ '

*% © □ ¢ § ['] × " # * +*

$1234567890 / _

MEGARON 12 POINT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEGARON DISC.

6 PT *ABCDEFGHIJKLMNOPQRSTUVWXYZ* *abcdefghijklmnopqrstuvwxyz* *$1234567890)-,.*

8 PT *ABCDEFGHIJKLMNOPQR* *abcdefghijklmnopq* *1234567890*

10 PT *ABCDEFGHIJKLMN* *abcdefghijklmnop* *1234567890*

14 PT *ABCDEFGHIJKL* *abcdefghijkl* *1234567890*

18 PT *ABCDEFG* *abcdefgh* *12345678*

24 PT *ABCDEF* *abcdefg* *123456*

30 PT *ABCDE* *abcdef* *12345*

36 PT *ABCD* *abcde* *1234*

48 PT *ABC* *abc* *123*

MEGARON BOLD

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!123*£¢%—&?(/[]'

$1234567890)-,.'

#⅛⅜⅝⅞½¼_

'$9¾4||70.|=●86†5"

MEGARON 12 POINT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEGARON DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890)-,.'

8 PT ABCDEFGHIJKLMNOPQ abcdefghijklmnopqrstuvwxyz 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnopq 1234567890

14 PT ABCDEFGHIJ abcdefghijklm 1234567890

18 PT ABCDEFGH abcdefghijk 1234567890

24 PT ABCDEF abcdefg 1234567

30 PT ABCDE abcdef 123456

36 PT ABCD abcde 12345

48 PT ABC abcd 123

MEGARON EXTRA BOLD

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmnop
qrstuvwxyz
$1234567890)-,.'
!⅛¼⅜½⅝¾⅞—&?(★£@‘
%■□¢ †[’]+ ”#*‡
$1234567890/-

MEGARON 12 POINT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEGARON DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890)-,.'

8 PT ABCDEFGHIJKLMNOPQR abcdefghijklmnopq 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnop 1234567890

14 PT ABCDEFGHIJ abcdefghijkl 12345678

18 PT ABCDEFG abcdefghi 123456

24 PT ABCDEF abcdefg 12345

30 PT ABCDE abcdef 1234

36 PT ABCD abcde 123

48 PT ABC abc 123

MEGARON EXTRA BOLD CONDENSED

12 PT

ABCDEFGHIJKLMNOP
QRSTUVWXYZ

abcdefghijklmnopq
rstuvwxyz

$1234567890)-,.'

!⅛¼⅜½⅝¾⅞—&?(★£@'

%■□¢ †[']+ "#*‡

$1234567890/-

MEGARON 12 POINT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEGARON DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

8 PT ABCDEFGHIJKLMNOPQR abcdefghijklmnopqrst 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnop 1234567890

14 PT ABCDEFGHIJKL abcdefghijkl 1234567890

18 PT ABCDEFGH abcdefgh 12345678

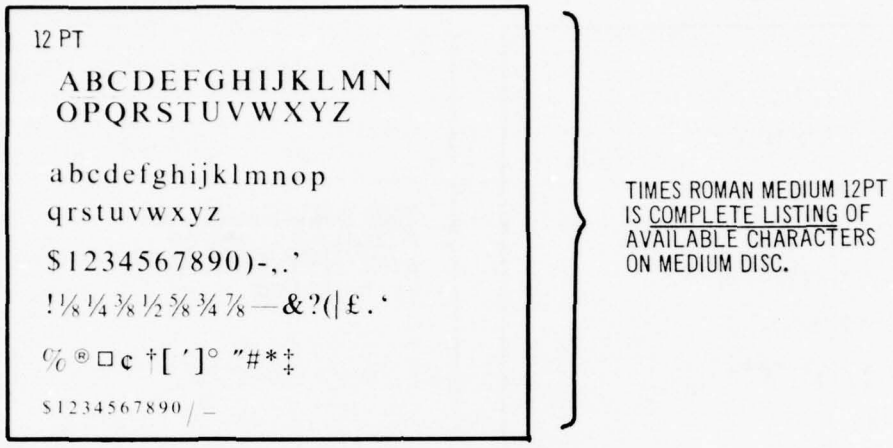
24 PT ABCDEFG abcdefg 123456

30 PT ABCDE abcdef 12345

36 PT ABCD abcde 1234

48 PT ABC abc 123

TIMES ROMAN MEDIUM



TIMES ROMAN MEDIUM 12PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON MEDIUM DISC.

6 PT	ABCDEFGHIJKLMNOPQRSTUVWXYZ	abcdefghijklmnopqrstuvwxyz	$1234567890)-,.'
8 PT	ABCDEFGHIJKLMNOPQR	abcdefghijklmnopq	1234567890
10 PT	ABCDEFGHIJKLMN	abcdefghijklmnop	1234567890
14 PT	ABCDEFGHIJKL	abcdefghijkl	1234567890
18 PT	ABCDEFGH	abcdefgh	123456789
24 PT	ABCDEF	abcdef	123456
30 PT	ABCDE	abcde	12345
36 PT	ABCD	abcd	1234
48 PT	ABC	abc	123

TIMES ROMAN ITALICS

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!1/8 1/4 3/8 1/2 5/8 3/4 7/8 — &?(|£_'

$1234567890)-,.'

% © □ ¢ §1 '1 × "#+*

$1234567890/_

TIMES ROMAN ITALICS 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON ITALICS DISC.

6 PT *ABCDEFGHIJKLMNOPQRSTUVWXYZ* *abcdefghijklmnopqrstuvwxyz* *$1234567890)-,.'*

8 PT *ABCDEFGHIJKLMNOPQ* *abcdefghijklmnopqr* *1234567890*

10 PT *ABCDEFGHIJKLMN* *abcdefghijklmnopq* *1234567890*

14 PT *ABCDEFGHIJ* *abcdefghijklmn* *1234567890*

18 PT *ABCDEFGH* *abcdefghijkl* *1234567890*

24 PT *ABCDEF abcdefgh 12345678*

30 PT *ABCDE abcdef 1234567*

36 PT *ABCD abcdef 12345*

48 PT *ABC abc 123*

TIMES ROMAN BOLD

12 PT

ABCDEFGHIJKLMN
OPQRSTUVWXYZ

abcdefghijklmnopqr
stuvwxyz

!⅛¼⅜½⅝¾⅞—&?(¦£_'

$1234567890)-,.'

%™□¢ †[′]• ″#*=

$1234567890/-

TIMES ROMAN BOLD 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON BOLD DISC.

6 PT ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

8 PT ABCDEFGHIJKLMNOPQ abcdefghijklmnopqrstuvwxyz 1234567890

10 PT ABCDEFGHIJKLMN abcdefghijklmnopqr 1234567890

14 PT ABCDEFGHIJ abcdefghijklmn 1234567890

18 PT ABCDEFGH abcdefghijkl 1234567890

24 PT ABCDEF abcdefgh 12345678

30 PT ABCDE abcdef 1234567

36 PT ABCD abcdef 12345

48 PT ABC abcde 123

TIMES ROMAN MATH—FONT 1

12 PT

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

abcdefghijklmno
pqrstuvwxyz

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

¢=÷×*±∓%!&?(/+−‘
$1234567890)-,.’

TIMES ROMAN MATH 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON FONT 1 DISC.

6 PT
ABCDEFGHIJKLMNOPQRSTUV abcdefghijklmnopqrstuv **ABCDEFGHIJKLMNOPQRSTUV** 1234567890

8 PT
ABCDEFGHIJKLMN abcdefghijklmn **ABCDEFGHIJKLMN** 1234567890

10 PT
ABCDEFGHIJKL abcdefghijkl **ABCDEFGHIJKL** 1234567890

14 PT
ABCDEFG abcdefg **ABCDEFG** 12345678

18 PT
ABCDEF abcdef **ABCDEF** 123456

24 PT
ABCDE abcde **ABCDE** 12345

30 PT
ABCD abcd **ABCD** 1234

36 PT
ABC abc **ABC** 123

48 PT
ABCabc**ABC**123

TIMES ROMAN MATH—FONT 2

12 PT

ABCDEFGHIJKLMNO
PQRSTUVWXYZ

abcdefghijklmno
pqrstuvwxyz

ΑΒ□ΔΕΦΓΗΙΞΚΛΜΝΟ
ΠΘΡΣΤΥΨΩΧ∟Ζ

¢≐≠≈∼≡≅%!&?(/'"‘

$1234567890)[.]'

TIMES ROMAN MATH 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON FONT 2 DISC.

6 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ *abcdefghijklmnopqrstuvwxyz* *1234567890*

8 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ *abcdefghijklmnopqrstuvwxyz* *1234567890*

10 PT

ABCDEFGHIJKLMNOP *abcdefghijklmnop* *1234567890*

14 PT

ABCDEFGHIJK *abcdefghijk* *1234567890*

18 PT

ABCDEFGHIJK abcdefghijk 1234567

24 PT

ABCDEFG abcdefg 1234567

30 PT

ABCDEF abcdef 12345

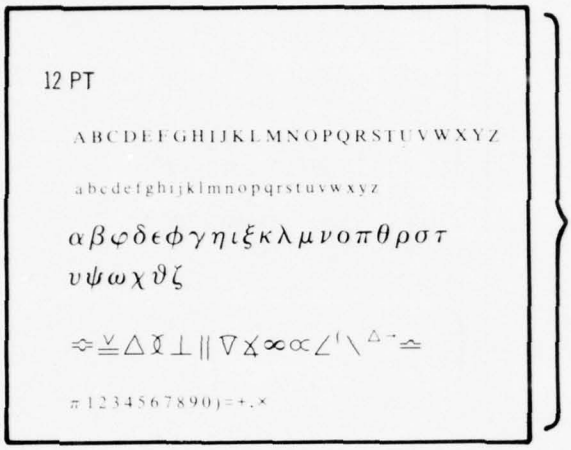
36 PT

ABCDE abcdef 1234

48 PT

ABCD abcd 123

TIMES ROMAN MATH—FONT 3



TIMES ROMAN MATH 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON FONT 3 DISC.

6 PT

8 PT

10 PT

ABCDEFGHIJKLMNO abcdefghijklmno αβφδεφγηιξκλμνοπ 1234567890

14 PT

ABCDEFGHIJK abcdefghijk αβφδεφγηιξ 1234567890

18 PT

ABCDEFGHI abcdefghi αβφδεφγηι 1234567890

24 PT

ABCDEFG abcdefg αβφδεφ 12345678

30 PT

ABCDEF abcdef αβφδε 123456

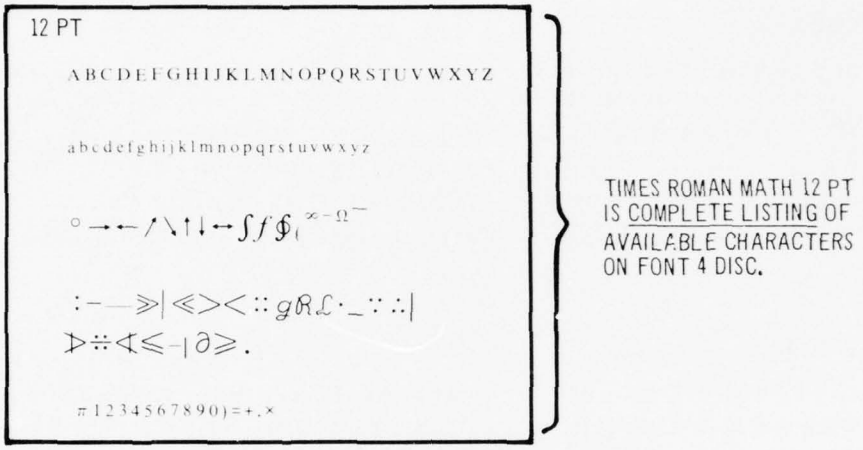
36 PT

ABCD abcde αβφδ 12345

48 PT

ABC abcd αβφ 1234

TIMES ROMAN MATH—FONT 4



TIMES ROMAN MATH 12 PT IS COMPLETE LISTING OF AVAILABLE CHARACTERS ON FONT 4 DISC.

6 PT

8 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

10 PT

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 1234567890

14 PT

ABCDEFGHIJKLMNOP abcdefghijklmnopqrstuvwxyz 1234567890

18 PT

ABCDEFGHIJ abcdefghijklmnopqrst 1234567890

24PT

ABCDEFGHIJ abcdefghijkl 1234567890

30 PT

ABCDEFG abcdefgh 12345678

36 PT

ABCDE abcde 12345

48 PT

ABCD abcde 123456

COMPOSER

AR-12-B

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H J
K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & * ( )
– @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come to the aid

AR-12-I

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H
*J K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & **
( ) – @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL GOOD MEN TO
Now is the time for all good men to come to

B-12-B

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H
J K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & * (
) – @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come to the aid

B-10-I

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ;
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C
*V B N M ‘ ’ : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9*
0 - =
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

B-12-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H J
K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & * (
) – @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL MEN TO
Now is the time for all men to come to the

B-12-I

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H J
*K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & * ( )*
– @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL GOOD MEN
Now is the time for all good men to come to

CN-6-M-PW

q w e r t y u i o p⁵ a s d f g h j k l¹ ? z x c v b n m , . ; Q W E
R T Y U I O P⁷ A S D F G H J K L³ + Z X C V B N M ‘ ’ :
! % & $ /₂ / ₄ * ( ) — /₈ 1 2 3 4 5 6 7 8 9 0 - @
NOW IS THE TIME FOR ALL MEN TO COME TO THE
Now is the time for all men to come to the aid of their

C-9-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ;
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C
V B N M ‘ ’ : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0
- =
NOW IS THE TIME FOR ALL MEN TO COME TO
Now is the time for all men to come to the aid of their

CN-10-B

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H
J K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & * ( )
— 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come to the aid

CG-12-M

† ® ◆ ⌖ ⌖ ◯ ° ⌈ ⌋ £ ✓ □ ■ ● ★ + [=] ? ¢ * ‡ | | |
‖ □ ‘ . ; Q W E R T Y U I O P § A S D F G H
J K L ¶ # Z X C V B N M , . : ! _ _ _ % / & =
( ) _ @ 1 2 3 4 5 6 7 8 9 0 - $
NOW IS THE TIME FOR ALL GOOD MEN TO
‖ ⌈ ® ° □ ⌖ ◆ ⌖ ° □ ◆ ● ⌈ ⌖ ✓]] ★ ⌈ ⌈ ■ □ ◆ ‖ ⌖ ⌈ | ⌈ □ ◆ ⌖ ⌈ ⌖ ◆

UN-7-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; - =
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N
M ' ' : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

UN-8-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; - =
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N
M ' ' : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

UN-10-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , .
; - = Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½
Z X C V B N M ' ' : ! † + $ % / & * ( ) – @ 1 2 3 4 5
6 7 8 9 0
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid

UN-10-MC

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; Q W E
R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N M ' ' :
! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL MEN TO COME TO THE
Now is the time for all men to come to the aid of their

UN-11-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; - = Q W E R T Y U I O P ¼ A S D F G
H J K L ¾ ½ Z X C V B N M ' ' : ! † + $ % / &
* ( ) – @ 1 2 3 4 5 6 7 8 9 0
NOW IS THE TIME FOR ALL GOOD MEN TO
Now is the time for all good men to come to

UN-8-MI

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; Q W E
R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N M ' ' :
*! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0 - =*
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

UN-10-MI

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ;
Q W E R T Y U I O P ± A S D F G H J K L ¢ # Z X C
*V B N M ° ' : ! " + $ % / & * ( ) _ @ 1 2 3 4 5 6 7 8 9*
0 - =
NOW IS THE TIME FOR ALL MEN TO COME TO
Now is the time for allmen to come to the aid of

UN-10-MIC

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; Q W E
R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N M ' ' :
*! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0 - =*
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

UN-11-MI

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H
*J K L ¾ ½ Z X C V B N M ' ' : ! † + $ % / & **
( ) – @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL GOOD MEN
Now is the time for all good men to come to

UN-11-MIC

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ;
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C
*V B N M ' ' : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9*
0 - =
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

UN-10-B

qwertyuiop]asdfghjkl?[zxcvbnm,.
;QWERTYUIOP¼ASDFGHJKL¾½Z
XCVBNM'':!†+$%/&*()–@123456
7890-=
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

UN-10-BC

qwertyuiop]asdfghjkl?[zxcvbnm,.;QWE
RTYUIOP¼ASDFGHJKL¾½ZXCVBNM'':
!†+$%/&*()–@1234567890-=
NOW IS THE TIME FOR ALL MEN TO COME TO THE
Now is the time for all good men to come to the aid of their

UN-11-B

qwertyuiop]asdfghjkl?[zxcvb
nm,.;QWERTYUIOP¼ASDFGHJ
KL¾½ZXCVBNM'':!†+$%/&*()
–@123456/890-=
NOW IS THE TIME FOR ALL GOOD MEN
Now is the time for all good men to come to

UN-11-BC

qwertyuiop]asdfghjkl?[zxcvbnm,.
;QWERTYUIOP¼ASDFGHJKL¾½ZX
CVBNM'':!†+$%/&*()–@12345678
90-=
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

P-8-M

qwertyuiop]asdfghjkl?[zxcvbnm,.;-=
QWERTYUIOP¼ASDFGHJKL¾½ZXCVBN
M'':!†+$%/&*()–@ 1234567890
NOW IS THE TIME FOR ALL MEN TO COME TO THE
Now is the time for all men to come to the aid of their

P-8-I

qwertyuiop]asdfghjkl?[zxcvbnm,.;QWE
RTYUIOP¼ASDFGHJKL¾½ZXCVBNM'':
!†+$%/&*()–@1234567890-=
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

P-10-M

qwertyuiop]asdfghjkl?[zxcvbnm,.
;-= QWERTYUIOP¼ASDFGHJKL¾½
ZXCVBNM'':!†+$%/&*()–@ 12345
67890
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid

P-10-I

qwertyuiop]asdfghjkl?[zxcvbnm,.;
QWERTYUIOP¼ASDFGHJKL¾½ZXC
VBNM'':!†+$%/&*()–@1234567890
0-=
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

P-12-M

qwertyuiop]asdfghjkl?[zxcvb
nm,.;-= QWERTYUIOP¼ASDFG
HJKL¾½ZXCVBNM'':!†+$%/&*
()–@ 1234567890
NOW IS THE TIME FOR ALL GOOD MEN
Now is the time for all good men to come to

PR-7-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; - =
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B
N M ‘ ’ : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

PR-8-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; - =
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N
M ‘ ’ : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

PR-10-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , .
; - = Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½
Z X C V B N M ‘ ’ : ! † + $ % / & * ( ) – @ 1 2 3 4 5
6 7 8 9 0
NOW IS THE TIME FOR ALL MEN TO COME TO
Now is the time for all men to come to the aid of their

PR-11-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b
n m , . ; Q W E R T Y U I O P ¼ A S D F G H
J K L ¾ ½ Z X C V B N M ‘ ’ : ! † + $ % / & *
( ) – @ 1 2 3 4 5 6 7 8 9 0 - =
NOW IS THE TIME FOR ALL GOOD MEN
Now is the time for all good men to come to

PR-10-B

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ;
Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C
V B N M ‘ ’ : ! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0 -
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid of

PR-7-I

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; Q W E
R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N M ‘ ’ :
*! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0 - =*
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of their

PR-8-I

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , . ; Q W E
R T Y U I O P ¼ A S D F G H J K L ¾ ½ Z X C V B N M ‘ ’ :
*! † + $ % / & * ( ) – @ 1 2 3 4 5 6 7 8 9 0 - =*
NOW IS THE TIME FOR ALL GOOD MEN TO COME TO
Now is the time for all good men to come to the aid of

PR-10-I

q w e r t y u i o p] a s d f g h j j k l ? [z x c v b n m ,
. ; Q W E R T Y U I O P ± A S D F G H J K L ¢ ≠ Z X
*C V B N M ° ’ ; ! " + $ % / & * ( ) _ @ 1 2 3 4 5 6 7 8*
9 0 - =
NOW IS THE TIME FOR ALL GOOD MEN TO COME
Now is the time for all good men to come to the aid

PR-11-I

q w e r t y u i o p] a
s d f g h j k l ? [z x
c v b n m , . ; 1 2 3 4
5 6 7 8 9 0 - = Q W E
R T Y U I O P ¼ A S D
F G H J K L ¾ ½ Z X C
V B N M ‘ ’ : ! † + $
*% / & * ( ) – @*
Now is the time for all good men to
NOW IS THE TIME FOR ALL GOOD

PR-11-B

q w e r t y u i o p] a
s d f g h j k l ? [z x
c v b n m , . ; 1 2 3 4
5 6 7 8 9 0 - = Q W E
R T Y U I O P ¼ A S D
F G H J K L ¾ ½ Z X C
V B N M ‘ ’ : ! † + $ %
/ & * ( ) – @
Now is the time for all good men to
NOW IS THE TIME FOR ALL GOOD

PRX-10-G

○⊕□☆■●▲★♁◆ ˜μαψξ[ ]δηιθρφϵ ˚λ ˚νκ ¸π
˜τυζσβογχω ' · ' ◦△†£@ · ¶ ◇( ) ... MAΨΞ§‡
ΔHIΘPΦEφΛϑNKςΠ#TϒZΣBOΓXΩ ' ' ¨

PRX-10-M

1 2 3 4 5 6 7 8 9 0 / ↘ :: Σ ° ƒ sπ ÷ ′ ∴ g ∵ → ! ℵ / ϕ ⁝⁝ = ↗ +
π ‖ ∞ ∠ ∫ ⊥ ± ∓ √ . ¯ [− ≚ ≒ ⋘] ≅ ¯ ( ) − ~ ≲ □ ↛ ≠ ∇ ⊱
∢ + = ∂ + ≳ £ ≈ ≡ ⋙ < · > ∝ ℜ ∞ ⇳ ⩽ Δ ⩾ ≙ X ○ : | \

PRX-10-T

1 2 3 4 5 6 7 8 9 0 ¯ ɓ α ∪ ℓ ᵃ ⁺ ⟦ ⟧ ⟨ p ǂ π ⩰ \ ↑ / β λ ƒ
↓ ⟩ ° ″ // = ‖ \\ γ − ∼ ′ · : [♀ ∂ ϕ &] ⊃ ♂ ( ) ↔ ⩩ ∩ ℋ ⌊
ℵ ¬ ⇐ ⇒ ˅ ⇔ ǂ ⊂ ← ↕ → ∈ ↦ ⇋ ℏ ⇌ ¤ © ® ⌜ + ⌟ ℟ ∈ Å
∫ ˙ | ¨

J-10-M

q w e r t y u i o p] a s d f g h j k l ? [z x c v b n m , .
; - = Q W E R T Y U I O P ¼ A S D F G H J K L ¾ ½
Z X C V B N M ' ' : ! † + $ % / & * ( ) − @ 1 2 3 4 5
6 7 8 9 0 - =
NOW IS THE TIME FOR ALL GOOD MEN TO
Now is the time for all good men to come to the

PRX-11-G

○⊕□☆■●▲★♁◆ ˜μαψξ[ ]δηιθρφϵ ˚λ ˚νκ ¸π
˜τυζσβογχω ' · ' ◦△†£@ · ¶ ◇( ) ... MAΨΞ§‡
ΔHIΘPΦEφΛϑNKςΠ#TϒZΣBOΓXΩ ' ' ¨

PRX-11-M

1 2 3 4 5 6 7 8 9 0 / ↘ :: Σ ° ƒ sπ ÷ ′ ∴ g ∵ → ! ℵ /
ϕ ⁝⁝ = ↗ + π ‖ ∞ ∠ ∫ ⊥ ± ∓ √ . ¯ [− ≚ ≒ ⋘] ≅ ¯ ( )
− ~ ≲ □ ↛ ≠ ∇ ⊱ ∢ + = ∂ + ≳ £ ≈ ≡ ⋙ < · > ∝ ℜ ∞
⇳ ⩽ Δ ⩾ ≙ X ○ : | \

PRX-11-T

1 2 3 4 5 6 7 8 9 0 ¯ ɓ α ∪ ℓ ᵃ ⁺ ⟦ ⟧ ⟨ p ǂ π ⩰ \ ↑ /
β λ ƒ ↓ ⟩ ° ″ // = ‖ \\ γ − ∼ ′ · : [♀ ∂ ϕ &] ⊃ ♂ ( )
↔ ⩩ ∩ ℋ ⌊ ℵ ¬ ⇐ ⇒ ˅ ⇔ ǂ ⊂ ← ↕ → ∈ ↦ ⇋ ℏ ⇌
⇌ ¤ © ® ⌜ + ⌟ ℟ ∈ Å ∫ ˙ | ¨

MT AND MC ELEMENTS

Elite 72

] 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ! a s d f g h j k l ; ' z x
c v b n m , . / [@ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ° A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come

Prestige Elite 72

1 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ½ a s d f g h j k l ; ' z x
c v b n m , . / ! @ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ¼ A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come

Adjutant

] 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ! a s d f g h j k l ; ' z x
c v b n m , . / [@ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ° A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come

Delegate

1 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ½ a s d f g h j k l ; ' z x
c v b n m , . / ! @ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ¼ A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to

Script

1 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ½ a s d f g h j k l ; ' z x
*c v b n m , . / ! @ # $ % ¢ & * ( )*
_ + Q W E R T Y U I O P ¼ A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come to the aid of their country.

Letter Gothic

] 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ! a s d f g h j k l ; ' z x
c v b n m , . / [@ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ° A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come to the aid of their country.

Courier 12

```
1 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ½ a s d f g h j k l ; ' z x
c v b n m , . / ± @ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ¼ A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come
```

Courier 72

```
1 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ½ a s d f g h j k l ; ' z x
c v b n m , . / ± @ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ¼ A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men
```

ORATOR

```
1234567890-=QWERTY
UIOP!ASDFGHJKL;'ZX
CVBNM,./±@#$%¢&*()
_+QWERTYUIOP°ASDFG
HJKL:"ZXCVBNM,.?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men
to come to the aid of their
country.
```

Symbol 12

```
1 2 3 4 5 6 7 8 9 0 = ∠ ϒ δ ε θ τ υ
ξ ι ο ρ π α σ φ ζ λ η ϳ κ ω ¨ ÷ ζ χ
ψ × β ν μ ´ ~ ı √ | { } ± ϒ ′ ′ ) ∫
_ ϳ Γ Δ ← Θ → Τ Ξ ↑ ↓ ℓ Π ∇ Σ Φ < Λ
¶ > § Ω ^ • ≃ Ξ Ψ ∝ ∞ ∿ ∂ ` + ∫
```

Pica 72

```
]2345678 90-=qwerty
uiop!asdfghjkl;'zx
cvbnm,./[@#$%¢&*()
_+QWERTYUIOP°ASDFG
HJKL:"ZXCVBNM,.?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men to come
to the aid of their country
```

Advocate

```
1 2 3 4 5 6 7 8 9 0 - = q w e r t y
u i o p ½ a s d f g h j k l ; ' z x
c v b n m , . / ± @ # $ % ¢ & * ( )
_ + Q W E R T Y U I O P ¼ A S D F G
H J K L : " Z X C V B N M , . ?
NOW IS THE TIME FOR ALL MEN TO COME
Now is the time for all men
```

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