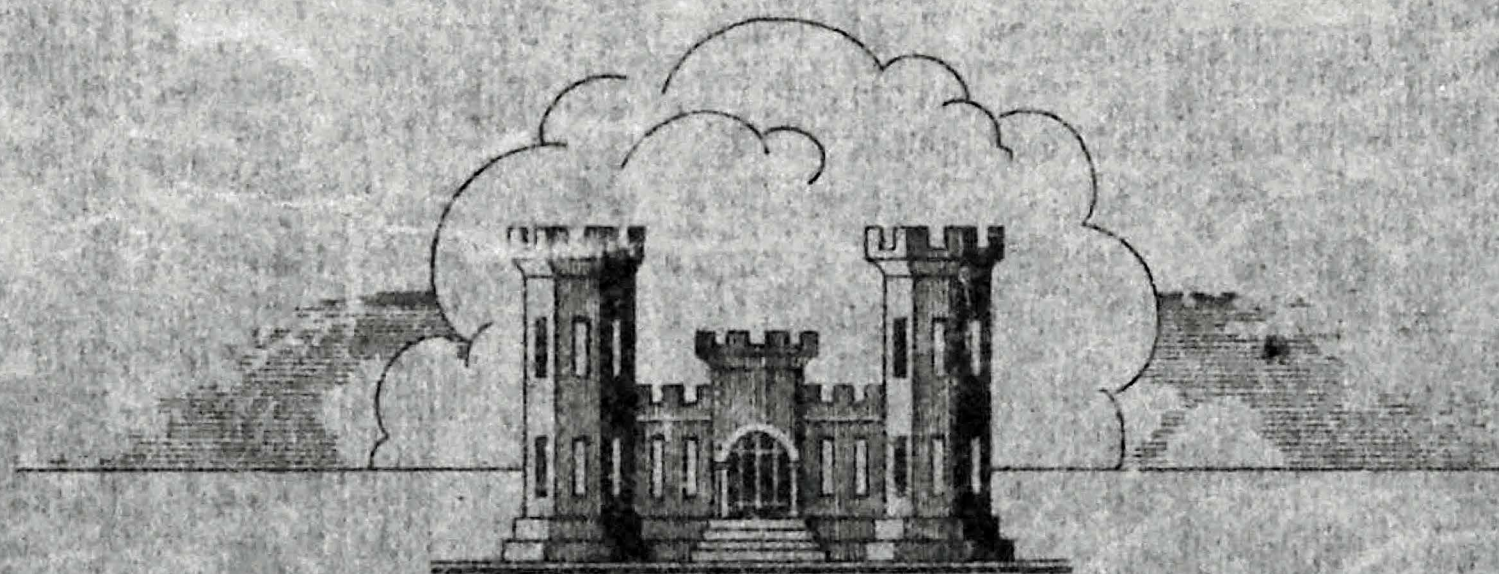


STANDARDS FOR DRAFTING

U. S. Engineer Office
Los Angeles, California



1942

UNITED STATES ENGINEER OFFICE
751 South Figueroa Street
Los Angeles, Calif.

March 1, 1941

SUBJECT: Standards for Drafting

TO: Area Engineers, Chiefs of Divisions, and others concerned.

1. These standards for drafting have been prepared for use in this district and follow departmental policy insofar as it is possible to do so.

2. The quantity production of drawings in this district makes it mandatory that uniformity be practiced in delineating the many types of work in progress. Particularly is this true of construction details, for the majority of employees here are actively engaged with the construction forces. It is obvious that the work will suffer when each of these employees is compelled to memorize more than one set of drafting symbols.

3. The Survey and Drafting Section painstakingly prepares each drawing in accordance with instructions from the originating sections of the district office and standard engineering practice; therefore, they should be followed in all particulars by the field forces except where construction difficulties dictate minor changes. Such difficulties should be anticipated in advance of actual construction and the proper authority consulted relative to revision of plans. When the revision of plans in advance of construction is not feasible, details of the changes made to show the work "as built," will be furnished the Engineering Division at the earliest practicable time.

Edwin C. Felton

Edwin C. Felton,
Lt. Col., Corps of Engineers,
District Engineer.

CONTENTS

<u>Paragraph</u>	<u>Title</u>	<u>Page No.</u>
1.	General	1
2.	Care of Instruments	1
3.	Character of the Work	1
4.	Size of Drawings	2
5.	Title, Scale and Marginal Data	2
6.	(a) Engineering Drawings	3
	(6b) The Plan-Profile	3
	(6c) Details of Channel Structures	4
	(6d) Sectional Views	4
7.	Drafting Survey Data	4
	(7a) Cross Sections	4
	(7b) Profiles	5
	(7c) Maps	5
8.	Datum Planes	5

LIST OF PLATES

<u>Plate No.</u>	<u>Description</u>
TITLES, SCALES, MARGINS	
1(1), 1(2)	Standard sheet sizes
1(3)	Title (for signatures)
1(4)	Title (without signatures)
1(5)	Title (letter size drawings)
1(6)	Revision Block
1(7)	Scales and Marginal Data
LETTERING	
2(1)	Single Stroke Lettering
2(2), 2(3), 2(4)	Samples of Mechanical Lettering
2(5)	Lettering for Maps
ABBREVIATIONS	
3(1)	Abbreviations, Civil and Structural
3(2)	Abbreviations, Geologic
3(3)	Abbreviations, Topographic
ENGINEERING DRAWING	
4(1)	Weights of Lines; Dimensional Expressions
4(2)	Material Symbols
4(3)	Sectional View, Reinforced Concrete
4(4)	Welding Symbols
4(5)	Piping Diagrams
4(6), 4(7), 4(8)	Electric Wiring Symbols
4(9)	Screw Thread Symbols
4(10)	U. S. Standard Bolts and Nuts
4(11)	Metal Fits, Allowances and Tolerances
4(12)	Decimals of Inches and Feet

LIST OF PLATES
(Continued)

<u>Plate No.</u>	<u>Description</u>
GEOLOGY	
5(1)	Symbols for Geologic Maps
5(2), 5(3), 5(4)	Symbols for Soil Borings
DATUM PLANES	
6(1)	Datum Planes, Los Angeles and Vicinity
6(2)	Datum Planes, San Diego and Vicinity
TOPOGRAPHY	
7(1), 7(2), 7(3) 7(4), 7(5)	Standard Topographic Symbols
7(6)	Special Symbols for Large Scale Maps
7(7)	Symbols for Large Area Maps (Preliminary Examinations & Survey Reports)
7(8)	Symbols for Large Area Maps (Improvements Desired, Recommended or Considered)
7(9)	Line Patterns; to Distinguish between Areas on Black and White Maps
MISCELLANEOUS	
8(1)	North Arrows
8(2)	Vicinity Map
8(3)	Erasing
HYDROGRAPHY	
9(1)	Wind Rose
USE OF SPECIAL EQUIPMENT	
10(1)	Pantograph Settings
10(2)	3-Arm Protractor
REINFORCING STEEL	
11(1), 11(2), 11(3) 11(4), 11(5), 11(6) 11(7), 11(8) 11(9), 11(10)	Bar Marking System
11(11)	Bar Bending Data

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE

S T A N D A R D S F O R D R A F T I N G

in the

UNITED STATES ENGINEER OFFICE
LOS ANGELES, CALIFORNIA

1. The standards for drafting contained herein are issued for the purpose of maintaining uniformity in preparation of drawings consistent with Departmental policy. Unnecessary duplication of effort shall be avoided and to this end the Survey & Drafting Section shall be contacted when any program of map drafting or other drawings is contemplated. Survey data obtained by the field forces which may be of value in posting and correcting existing maps shall be forwarded to the District Office as soon as possible after the surveys have been completed.

2. CARE OF INSTRUMENTS. All necessary drawing instruments and supplies shall be furnished by the Government and each person shall be held personally responsible for the care of all equipment issued him. The cost of property lost or damaged through carelessness or neglect shall be charged against the individual. The equipment shall be kept clean and in good repair at all times. No instrument will be put away at night without having been properly cleaned. Replacement of worn or broken parts may be made through the property clerk. The practice of economy is requested in the use of expendable material.

3. CHARACTER OF THE WORK. It is commonly known that a neatly executed drawing is not only pleasing to the eye, but it lends a

certain confidence in exactness of design. A design may be completely ruined by careless drafting or poor lettering as illegible figures or symbols will frequently cause mistakes in the field. It is therefore imperative that all lines and letters be clear, sharp and distinct. Designs shall be distributed uniformly in consecutive order throughout the sheet. Details shall be drawn to such scales that numerous qualifying notations will be unnecessary. All drawings shall be prepared in jet black India ink. Colors will not be used except when clearness of representation absolutely demands their use. Insofar as is practicable, uniformity in size of figures or letters shall be maintained in presenting a particular class of information.

4. SIZE OF DRAWINGS. Orders and Regulations of the Corps of Engineers restrict the size of drawings to the following dimensions: 8 x 10-1/2, 8 x 21, 10-1/2 x 16, 16 x 21, 21 x 32, and 27 x 40, all dimensions in inches at the trim line. For reasons of uniformity, drawings in this office shall be restricted, insofar as is practicable, to the 27 x 40 inch sheet.

5. TITLE, SCALE AND MARGINAL DATA. Each drawing shall bear an appropriate title and scale and bear such marginal data as will definitely establish identification. The title block for a 27 x 40 inch sheet shall be 4 x 7 inches and placed in the lower right corner of the sheet. Other sized sheets shall bear proportionately smaller titles. The marginal data illustrated shall appear on all drawings and maps. Both the representative fraction and the graphic scale shall appear in the title when the same is uniform throughout the sheet. When the designs within a sheet are drawn to different scales the R/F shall appear beneath the subtitle for each

design but the graphic scale shall appear only once for each scale used.

6. ENGINEERING DRAWINGS. (a) In addition to the standard title and marginal data, engineering drawings shall carry a revision block at the immediate left of the title. Delineation of line work shall conform to weights and symbols illustrated. Dimension lines shall not be broken. Dimensions of 12 inches or less shall be expressed in inches; those greater than 12 inches (except for diameters of pipe) shall be in feet and inches. Thus, 12-1/4 inches shall be expressed as 1'-0 1/4". Geology and materials in section shall be illustrated in accordance with the enclosed plates. The abbreviations illustrated shall be rigidly followed. The 1/4", 1/2", 3/4", and 1" = 1 foot scales will meet the ordinary work requirements and shall be given preference to such scales as 3/32", 3/16", etc.

(6b) THE PLAN-PROFILE. The Plan and Profile of the Plan-Profile sheets shall be drawn to the same horizontal scale and shall be so oriented that the drawing progresses from left to right downgrade regardless of the direction of stationing or the polar direction. The plan shall not be broken (i.e. drawn in two parts within the sheet) unless exigency of the work absolutely requires such a break. Scales may be varied to meet requirements of the work but should be uniform throughout one job and of such consistency that complete intelligence will be imparted by the drawing. Horizontal scales best adaptable to the Plan-Profile are 1" = 40 ft., 1" = 100 ft., 1" = 200 ft., 1" = 400 ft. Such scales as 1" = 30 ft., 1" = 60 ft., 1" = 150 ft. should not be used. Profiles shall be plotted on the Plate B grid at scales of 1" = 6 ft., 1" = 12 ft., 1" = 24 ft., etc. Symbols used shall be as illustrated. The vertical datum shall be Mean Sea Level unless otherwise directed. The revision block shall appear on the Plan-Profile.

(6c) DETAILS OF CHANNEL STRUCTURES. A detailed plan of the channel, when prepared, shall be of such scale that "layout" details and controlling dimensions can be shown legibly. Sectional views, public utilities and obstructions shall be indicated on this plan and adequately referenced to the sheets showing the details for construction. As on the plan-profile, stream flow shall be towards the right margin.

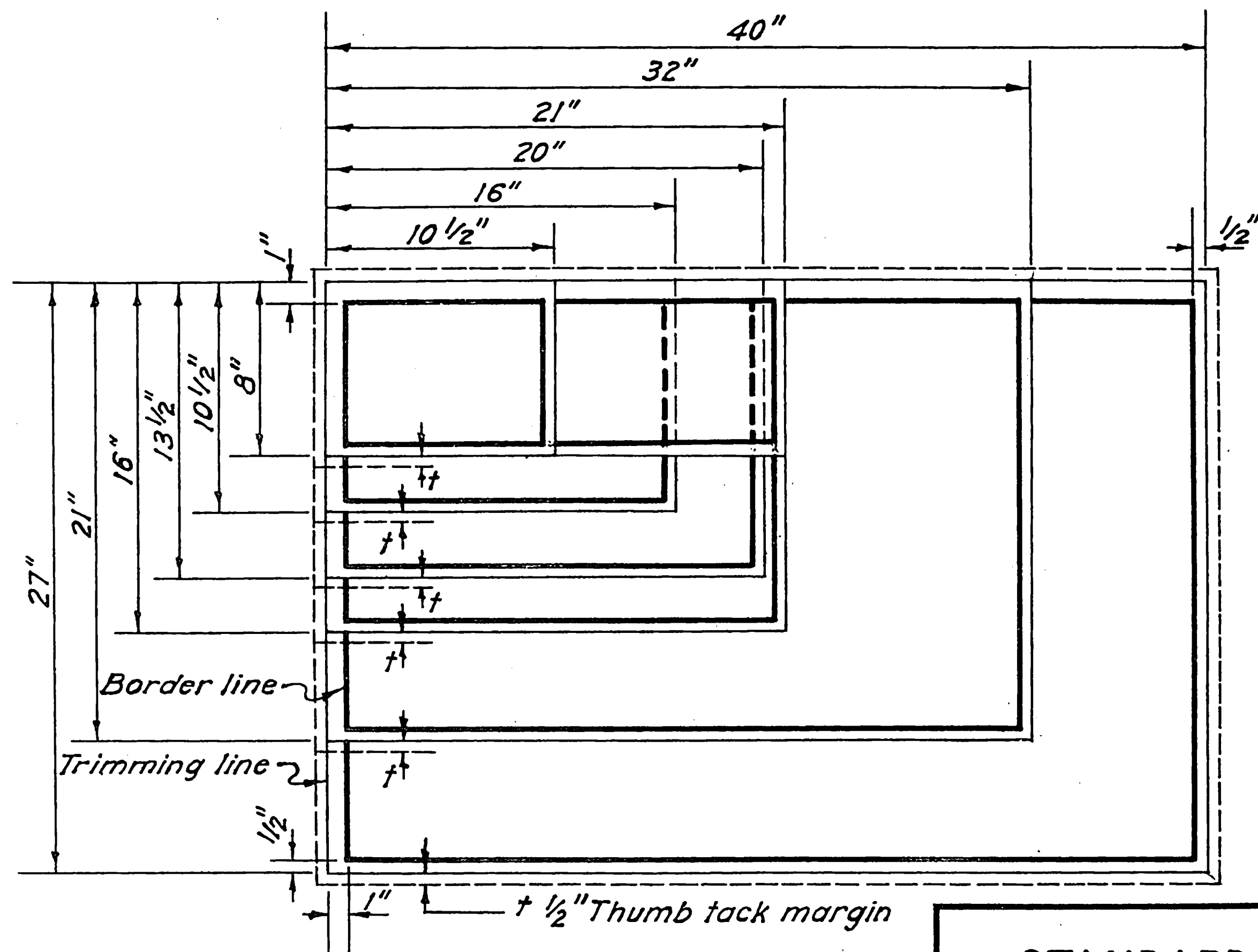
(6d) SECTIONAL VIEWS. Sectional views shall be drawn to show complete composition of the structure for the reach where the section is taken. As general practice these sections should be drawn as though the observer were looking upstream. Longitudinal sections should be drawn as though the observer were in the center of the channel facing the bank. However, this practice shall be varied to avoid complex detailing. The bar marking system illustrated shall be followed in all particulars. Insofar as is practicable the bar bending details shall be drawn in the upper right corner of the sheet which illustrates their placement in the structure.

7. DRAFTING SURVEY DATA. (a) CROSS SECTIONS. Cross sections shall be plotted on standard size sheets at scales best suited to illustrate the work at hand. In all cases the plotting will be so oriented that the observer will be looking upstream when viewing the cross section. When consecutive cross sections are plotted they should ordinarily be kept in line with the center line at zero and transverse distances given to the left and right of zero in terms of feet. The cross section located farthest upstream shall be plotted at the top of the sheet; the remainder shall be plotted below in sequence.

(7b) PROFILES. Profiles shall be plotted on Plate B profile paper or cloth in standard size sheets at scales best suited to illustrate the work at hand, and be so oriented that the grade shall drop from left to right across the sheet. Horizontal distances shall be expressed in terms of 100-foot station. Vertical distances shall be expressed in terms of feet. Roll profiles may be prepared for working drawings, but they must be broken down into standard sheets for record drawings.

(7c) MAPS. Maps for engineering purposes shall be prepared in accordance with Orders and Regulations and Standards of the Board of Surveys and Maps. Conventional signs given in Army Training Regulations 190-10 shall be used insofar as they can be expanded to meet requirements of the work. Plate Series 7 illustrates additional symbols to be used on large scale maps. Symbols required in addition to those illustrated must have the prior approval of the Chief, Engineering Division and when adopted shall be incorporated in these instructions. The title and marginal data shall be the same as for other drawings, except that no revision block shall appear on maps. River profiles shall conform to paragraph (7b) except that horizontal distances may be expressed in terms of River Miles. More detailed instructions will be issued by the Survey & Drafting Section for topographic and aerial mapping when occasion requires.

8. DATUM PLANES. The datum planes existing in this district are illustrated herein for general information. Only Mean Sea Level datum and Mean Lower Low Water shall be used as planes of reference unless specific instructions to the contrary are issued.



SIZES

8" X 10 1/2"
 8" X 21"
 10 1/2" X 16"
 13 1/2" X 20"
 16" X 21"
 21" X 32"
 27" X 40"

MARGINS: ALL SHEETS
 Top and left-----1 inch
 Bottom and right----1/2 inch

NOTE:
 1/2" Thumb tack margin shall
 be left on tracing outside of
 trim line and shall be kept
 free from ink or pencil marks.

STANDARD SIZES
MAPS AND DRAWINGS
 (AS SPECIFIED IN O.&R.)

IN 1 SHEET

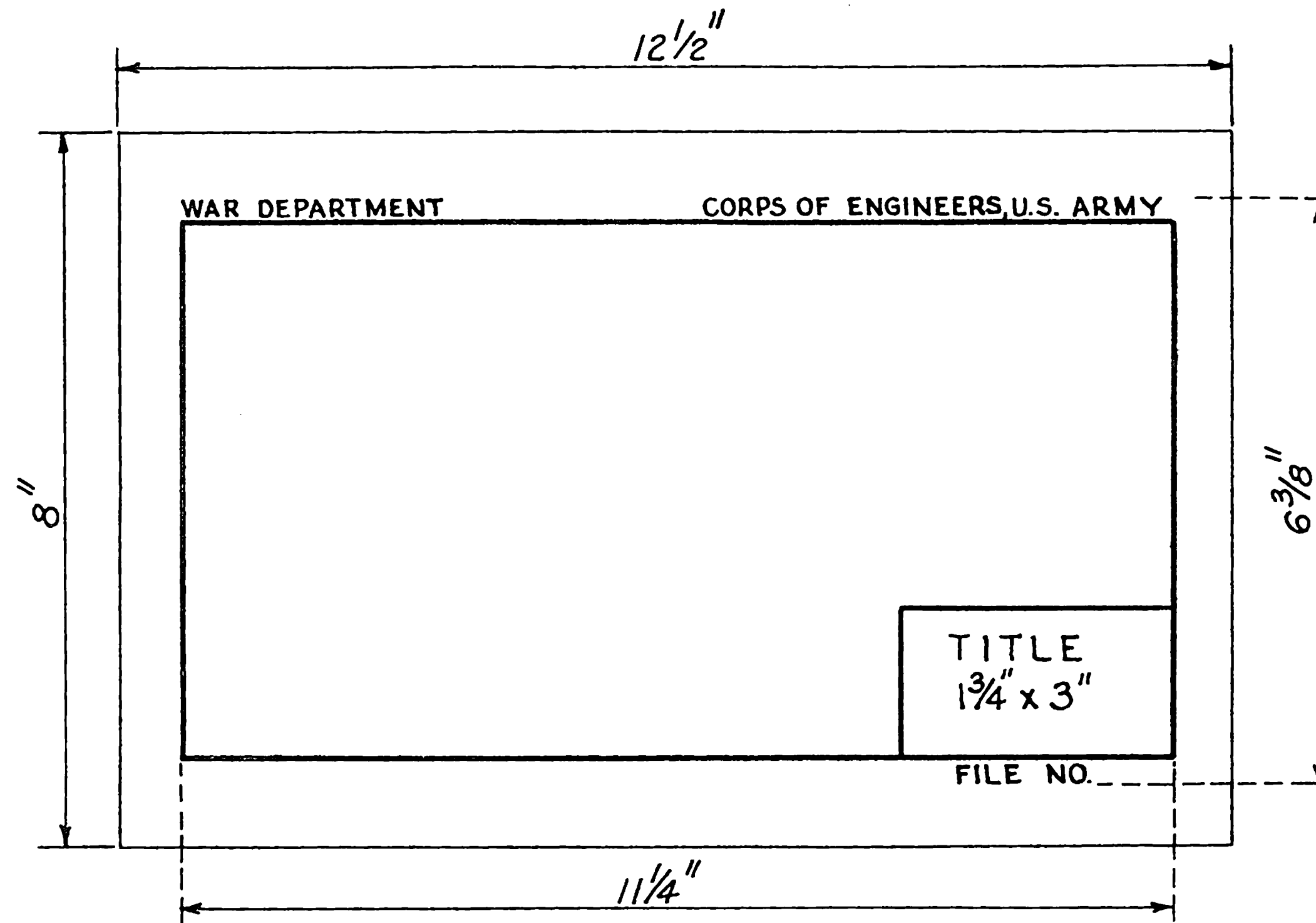
SEPT. 1940

U. S. ENGINEER OFFICE
 LOS ANGELES, CALIFORNIA

REPORT DRAWINGS FOR PUBLICATION

(PAR. 508(C)1. ORDERS AND REGULATIONS)

OCTAVO PAGE CUTS



Limiting dimensions $6\frac{3}{8}" \times 11\frac{1}{4}"$ shall include all marginal lettering whether or not orientation is as shown.

LOS ANGELES COUNTY DRAINAGE AREA, CALIFORNIA.					GUIDE	PEN												
ADD DATUM EXPRESSION ON ALL SHEETS WHERE ELEVATIONS ARE SHOWN. GUIDE AND PEN INDICATED ARE WRICO LETTERING INSTRUMENTS.					120	7												
					290	4												
					240	5												
					240	4												
SCALE: IN 99 SHEETS SHEET NO. 37 GRAPHIC SCALE  FEET DATUM IS MEAN SEA LEVEL U. S. ENGINEER OFFICE. LOS ANGELES, CALIF., JUNE 18, 1937					140	6												
SUBMITTED BY: CAPTAIN, CORPS OF ENGINEERS, U.S. ARMY CHIEF, ENGINEERING DIVISION APPROVED BY: MAJOR, CORPS OF ENGINEERS, U.S. ARMY DISTRICT ENGINEER					120	7												
FILE NO. LAS 383/47	DRAWN R.H.F.	TRACED R.H.F.	CHECKED C.B.H. R.A.	TO ACCOMPANY SPECIFICATIONS DATED:		90	7											
SHEET SIZE TITLE BLOCK SIZE <table style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%;">8 X 10-1/2.....</td><td style="width: 50%;">1-3/4 X 3</td></tr><tr><td>8 X 21.....</td><td>1-3/4 X 3</td></tr><tr><td>10-1/2 X 16.....</td><td>1-3/4 X 3</td></tr><tr><td>16 X 21.....</td><td>2-3/4 X 4-3/4</td></tr><tr><td>21 X 32.....</td><td>3-1/2 X 6</td></tr><tr><td>27 X 40.....</td><td>4 X 7</td></tr></table>					8 X 10-1/2.....	1-3/4 X 3	8 X 21.....	1-3/4 X 3	10-1/2 X 16.....	1-3/4 X 3	16 X 21.....	2-3/4 X 4-3/4	21 X 32.....	3-1/2 X 6	27 X 40.....	4 X 7	LOS ANGELES COUNTY FLOOD CONTROL STANDARD TITLE BLOCK TO BE USED IN THE LOS ANGELES ENGR. DISTRICT IN 1 SHEET JULY 1937 U. S. ENGINEER OFFICE LOS ANGELES, CALIFORNIA.	
8 X 10-1/2.....	1-3/4 X 3																	
8 X 21.....	1-3/4 X 3																	
10-1/2 X 16.....	1-3/4 X 3																	
16 X 21.....	2-3/4 X 4-3/4																	
21 X 32.....	3-1/2 X 6																	
27 X 40.....	4 X 7																	

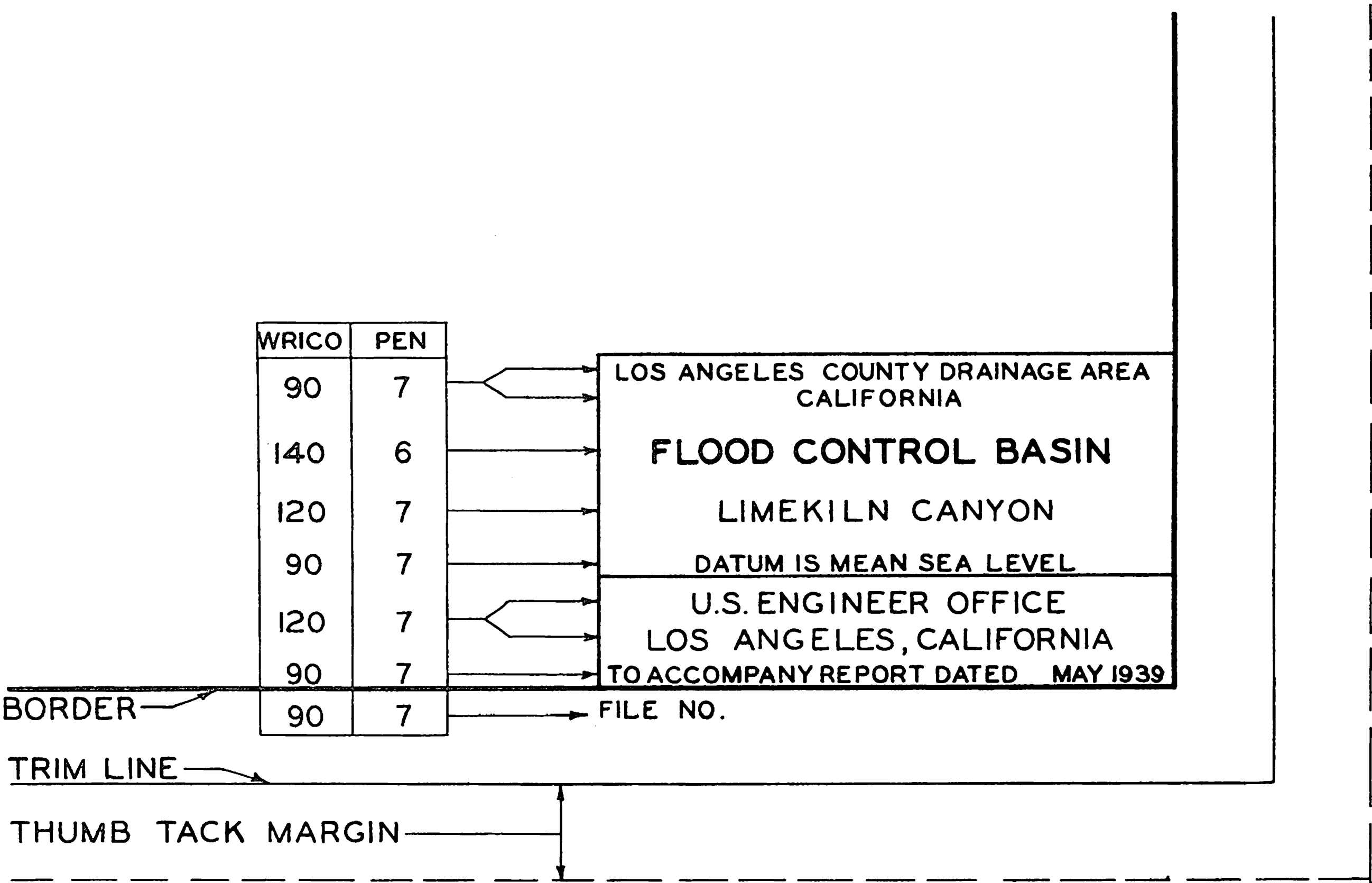
					GUIDE	PEN
LOS ANGELES COUNTY DRAINAGE AREA, CALIFORNIA.					120	7
					290	4
This title is to be used for topographic maps, miscellaneous mechanical dwgs., and others not requiring signatures.					240	5
					240	4
SCALE IN SHEETS SHEET NO.					140	6
					120	7
GRAPHIC SCALE					90	7
					140	6
U.S. ENGINEER OFFICE, LOS ANGELES, CALIF. DEC. 6, 1939					120	7
PREPARED UNDER THE DIRECTION OF LT. COL. EDWIN C. KELTON DISTRICT ENGINEER.					90	7
FILE NO.	DRAWN	TRACED	CHECKED	TO ACCOMPANY SPECIFICATIONS		
DATED						

ADD DATUM EXPRESSION ON ALL SHEETS
WHERE ELEVATIONS ARE SHOWN.

GUIDE AND PEN INDICATED ARE WRICO
LETTERING INSTRUMENTS.

LOS ANGELES COUNTY FLOOD CONTROL
STANDARD TITLE BLOCK
TO BE USED IN THE
LOS ANGELES ENGR. DISTRICT
IN 1 SHEET FEB. 1938

U.S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA



TITLE BLOCK
FOR 8 X 10-1/2 SHEET

5.0"		0.5"	0.5"	0.5"	TITLE BLOCK 4" X 7"
0.75"	DATE	REVISION	REV.	CHK.	
0.4" 18 spaces @ 0.2" = 3.6"					
	0.5"	Border			
Trim line					

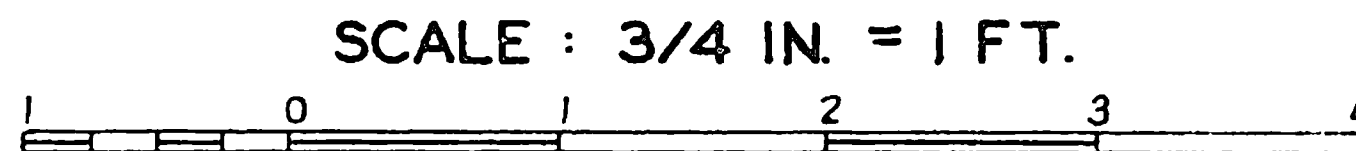
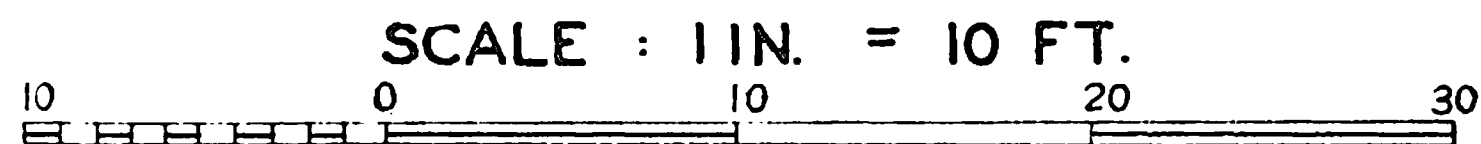
LOS ANGELES COUNTY FLOOD CONTROL
STANDARD REVISION BLOCK
TO BE USED IN THE
LOS ANGELES ENGR. DISTRICT
IN 1 SHEET
OCT. 1936
U.S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA.

WAR DEPARTMENT

CORPS OF ENGINEERS, U.S. ARMY

MARGINAL DATA

WRICO 175-8 FOR 27x40 SHEET
WRICO 140-8 FOR ALL OTHERS



SCALES ILLUSTRATED ONLY TO SHOW PATTERN OR DESIGN TO BE USED.

LENGTHS OF SUBDIVISIONS WILL VARY ACCORDING TO THE SCALE REQUIRED.

MAXIMUM LENGTH SHALL NOT EXCEED 4 INCHES.

WEIGHT OF LINES SHALL BE AS ILLUSTRATED.

SHOW AT LEAST ONE GRAPHIC SCALE FOR EACH CHANGE OF SCALE ON THE DRAWING.

GRAPHIC SCALE

LOS ANGELES COUNTY FLOOD CONTROL
SCALE & MARGINAL DATA

TO BE USED IN THE
LOS ANGELES ENGR. DISTRICT

IN 1 SHEET

SEPT. 1936

U.S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA

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 &

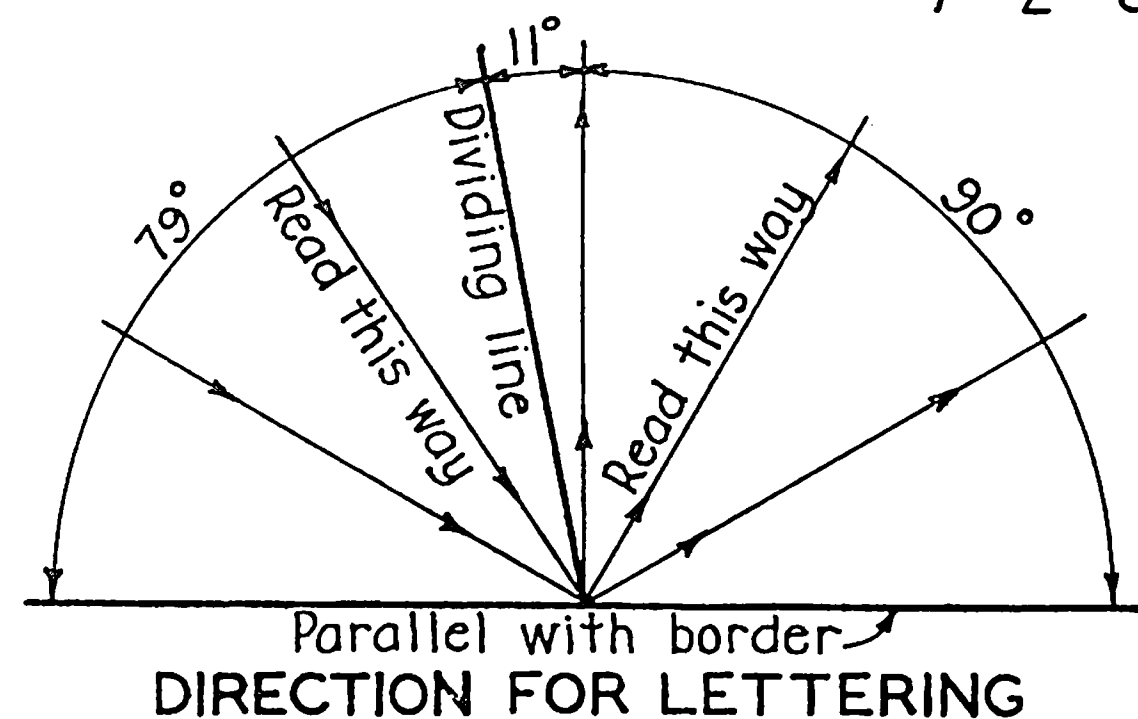
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Due to the lack of uniformity in lettering used by the different draftsmen in this office it is desired that this sheet be used as a sample for single stroke lettering.

Each draftsman should practice this style and make every attempt to duplicate it in his work.

1 2 3 4 5 6 7 8 9 0 &

4-1/2, 2/3 AMES GUIDE



LOS ANGELES COUNTY FLOOD CONTROL

SINGLE STROKE LETTERING

TO BE USED IN THE

LOS ANGELES ENGR. DISTRICT

IN 1 SHEET

SEPT. 1936

U.S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA.

SAMPLES OF WRICO LETTERING

PEN NO.	GUIDE NO. 500	GUIDE NO. 350	GUIDE NO. 290	GUIDE NO. 250	GUIDE NO. 240	GUIDE NO. 185	GUIDE NO. 185	GUIDE NO. 175	GUIDE NO. 140	GUIDE NO. 120	GUIDE NO. 90
2	U	N	O								
3	S	K	V		M						
4	G	P	T		J						
5	O	X	Y		F						
6		Q	Z	0		b	B	E	C		
7				R		f	L	R	A	H	D

NOTE :-WHEREVER A BLANK SPACE APPEARS THE GUIDE AND PEN INDICATED SHOULD NOT BE USED TOGETHER.

EXAMPLE :-THE FIRST SPACE BELOW GUIDE NO. 240 IS BLANK INDICATING THAT THIS SIZE OF GUIDE IS NOT DESIGNED FOR USE WITH PEN NO.-2.

WRICO SIZES AND REDUCTIONS

GUIDE	PEN	LETTERING SAMPLE	ONE-THIRD REDUCTION	ONE-HALF REDUCTION
290 V.	3	12345670	12345670	12345670
290 V.	4	12345679	12345679	12345679
290 V.	5	12345678	12345678	12345678
240 V.	3	ABMSWD38	ABMSWD38	ABMSWD38
240 S.	3	<i>ABMSWD38</i>	<i>ABMSWD38</i>	<i>ABMSWD38</i>
240 V.	4	ABMSWD38	ABMSWD38	ABMSWD38
240 S.	4	<i>ABMSWD38</i>	<i>ABMSWD38</i>	<i>ABMSWD38</i>
240 V.	5	ABMSWD38	ABMSWD38	ABMSWD38
240 S.	5	<i>ABMSWD38</i>	<i>ABMSWD38</i>	<i>ABMSWD38</i>
200 V.	6	ABMSWDJ38	ABMSWDJ38	ABMSWDJ38
200 S.	6	<i>ABMSWDJ38</i>	<i>ABMSWDJ38</i>	<i>ABMSWDJ38</i>
175 V.	6	ABMSWDJN38	ABMSWDJN38	ABMSWDJN38
175 S.	6	<i>ABMSWDJN38</i>	<i>ABMSWDJN38</i>	<i>ABMSWDJN38</i>
140 V.	6	ABMSWDJNZ5427	ABMSWDJNZ5427	ABMSWDJNZ5427
140 S.	6	<i>ABMSWDJNZ5427</i>	<i>ABMSWDJNZ5427</i>	<i>ABMSWDJNZ5427</i>

WAR DEPARTMENT

CORPS OF ENGINEERS, U.S. ARMY

WRICO SIZES AND REDUCTIONS				
GUIDE	PEN	LETTERING SAMPLE	ONE-THIRD REDUCTION	ONE-HALF REDUCTION
120 V.	7	ABMSWDJNOE75246	ABMSWDJNOE75246	ABMSWDJNOE75246
120 S.	7	<i>ABMSWDJNOE752480</i>	<i>ABMSWDJNOE752480</i>	<i>ABMSWDJNOE752480</i>
90 V.	7	ABMSWDJNOECHILUV7528	ABMSWDJNOECHILUV7528	ABMSWDJNOECHILUV7528
90 S.	7	<i>ABMSWDJNOECHILUV75240</i>	<i>ABMSWDJNOECHILUV75240</i>	<i>ABMSWDJNOECHILUV75240</i>
250 V.	6	ABMSWDJN752I	ABMSWDJN752I	ABMSWDJN752I
250 V.	6	<i>abmswjnoechilprgy</i>	<i>abmswjnoechilprgy</i>	<i>abmswjnoechilprgy</i>
185 V.	6	ABMSWDJNEG7528	ABMSWDJNEG7528	ABMSWDJNEG7528
185 V.	6	<i>abmswjnoechilprgyf</i>	<i>abmswjnoechilprgyf</i>	<i>abmswjnoechilprgyf</i>
FREEHAND LETTERING SIZES AND REDUCTIONS				
AMES #5		ABLO85I MEK3267	ABLO85I MEK3267	ABLO85I MEK3267
AMES #5		<i>ahilgrnps areytzfm</i>	<i>ahilgrnps areytzfm</i>	<i>ahilgrnps areytzfm</i>
AMES #4		AHOZL576 JEKTP43I	AHOZL576 JEKTP43I	AHOZL576 JEKTP43I
AMES #4		<i>ruvtgiqdh asykgnohi</i>	<i>ruvtgiqdh asykgnohi</i>	<i>ruvtgiqdh asykgnohi</i>
AMES #3		IHLEFCD375 ABGMOTJ264I	IHLEFCD375 ABGMOTJ264I	IHLEFCD375 ABGMOTJ264I
AMES #3		<i>hiptagzruvnj mskvgaeiuopt</i>	<i>hiptagzruvnj mskvgaeiuopt</i>	<i>hiptagzruvnj mskvgaeiuopt</i>

LETTERING

ROMAN LETTERING TO BE USED ON ALL MAPS INTENDED FOR PUBLICATION.

SAMPLE SHEETS ARE ON FILE IN THE DRAFTING ROOM.

NOTE.—In all slant lettering make slope 2 parts base to 5 parts height. Thickness of shading of shaded letters one-seventh of height.

a. *Civil divisions.*—States, counties, townships, capitals, and principal cities. (All capital letters.)

ABCDEFGHIJ
KLMNOPQRST
UVWXYZ

Towns and villages. (With capital initials.)

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

b. *Hydrography.* (Names of all natural water features.)

Lakes, rivers, and bays. (All capital letters.)

*ABCDEFGHIJ
KLMNOPQRST
UVWXYZ*

Creeks, brooks, springs, small lakes, ponds, marshes, and glaciers. (With capital initials.)

ABCDEFGHIJKLMNOPQRSTUVWXYZ-

abcdefghijklmnopqrstuvwxyz

c. *Hypsography.* (Names of all natural land features.)

Mountains, plateaus, lines of cliffs, and canyons. (All capital letters.)

ABCDEFGHIJKLMNOPQRSTU
VWXYZ

Peaks, small valleys, canyons, islands, and points. (With capital initials.)

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

d. *Public works.*—Railroads, tunnels, bridges, ferries, wagon roads, trails, fords, and dams. (All capital letters.)

ABCDEFGHIJKLMNOPQRSTUVWXYZ

Flood control.—Levees, bank protection, and contraction works. (with all necessary notes and explanations), station numbers, bench marks and borrow pits. (All capitals, using wrico when possible.)

ABCDEFGHIJKLMNOPQRSTUVWXYZ

ABBREVIATIONS

Alternate	A	alt.	Finish	F (cont'd.)	Q
And		&	Foot, feet	f.	
Angles		ls		ft.	
Approximate		approx.			R
Average		av.			Radius
			Gage	G	Reinforced concrete pipe
				ga.	Reinforcement
					Required
					Round bars
Back to back	B	b. b.	Highway	H	
Bars, round		φ	Hoop	Hy.	
Bars, square		□	Horizontal	hor.	S
Beams		bms.			Section
Both faces		B. F.			Serial Number
Both sides		B. S.			Slope, grade
Bottom		bot.			Slope, dimension
			Inch, inches	I	Spreader
			Inclusive	in.	Standard
				incl.	Station
Cast iron	C	C. I.			Stirrup
Cast steel		C. S.		J	Structure
Center line		¢			Strut
Center to center		c. c.		K	Symmetrical
Channel		∟			Square bars
Column		col.			
Concrete		conc.		L	
Concrete pipe		conc. pipe	Longitudinal	longit.	T
Construction		const.			Thread
Construction joint		const. jt.			Top and bottom
Counterfort		cft.		M	Transmission
Cubic feet per second		c. f. s.			Transverse
Countersink		csk.	Mark	Mk	
			Maximum	max.	
			Minimum	min.	U
			Miscellaneous	misc.	
Diameter	D	dia.	Monolith	mono.	V
Dimension		D.			Vertical
Drawing		dwg.			Vitrified
			Near face	N	Vitrified clay pipe
			Near side	N. F.	
				N. S.	
Each	E	ea.			
Elevation		El.			W
Elevation (Titles)		Elev.			Water surface
Existing		Do not abbr.	Outside to outside	O	Wide flange (beams)
Existing ground		Do not abbr.		o. o.	Wrought iron
				P	
			Pavement	pvmnt.	
Far face	F	F. F.	Plate	R	
Far side		F. S.			

ABBREVIATE ONLY WHEN SPACE WILL NOT PERMIT THE
COMPLETE SPELLING

GEOLOGIC ABBREVIATIONS

alternating	alt.	light	lt.
angular	ang.	limestone	ls., or lm.
argillaceous (clayey)	arg.	massive	mass.
auger hole	A.H.	medium	M., or med.
basalt	bas.	metamorphosed	met.
bedded	bdd.	mixture	mix.
bedding	bdg.	moderately	mod.
bottom	bot.	mottled	motld.
boulders	bldrs.	non-slaking	non-slkg.
brown	br.	occasional	occ.
calcareous (limy)	calc.	outcrop	otc.
carbonaceous	carb.	overburden	O.B.
cavity	cav.	pervious	perv.
chocolate	choc.	plastic	plas.
clay	cl.	porous	por.
coarse	crse.	quartz	qtz.
compact	comp.	quartzite	qzt.
combination hole (core and fishtailed)	C.F.H.	reddish	red.
conglomerate	cgl.	rocks	rks., or rx.
consolidated	consol.	rounded	rdd.
contact	cont.	sand	sd.
core hole	C.H.	sandstone	ss.
cross bedding	x-bdg.	sandy	sdv.
crystalline	x-line	serpentine	serp.
dark	dk.	shaft	S.
diorite	di.	shale	sh.
ferruginous (rusty)	ferrug.	shaly	shy.
fine	F.	siliceous	silic.
fishtailed hole	F.H.	silt	st.
fissile	fis.	silty	sty.
formation	fm.	slaking	slkg.
fracture	frac.	slate	sl.
fragment	frag.	specimen	spec.
friable	fri.	speckled	speed.
granite	gr.	sticky	stky.
granules)		subangular	subang.
granular)	gran.	subrounded	subrdd.
gravel	grav.	test pit	T.P.
		trap	tr.
		trench	T.
		tunnel	Tun.
gypsum	gyp.	unconformity	unconf.
gypsiferous	gypsif.	unconsolidated	uncons.
hard	hd.	vertical	vert.
horizontal	horiz.	very coarse	v.c.
impervious	imp.	very fine	v.f.
indurated	ind.	water table	W.T.
interbedded	interb.	yellow	yel.
joint	jt.		
laminated	lam.		

STANDARD ABBREVIATIONS

Aux Mer.....	Auxiliary meridian.	Mdw.....	Meadow.
Ave.....	Avenue.	Mer.....	Meridian.
BM.....	Bench mark.	Mid.....	Middle.
Bdy.....	Boundary.	Mi.....	Mile.
Br.....	Branch, bridge.	MP.....	Milepost.
Bk.....	Brook.	Mil.....	Military.
Bu.....	Butte.	MM.....	Mineral monument.
Can.....	Canyon.	Mon.....	Monument.
C.....	Cape.	Mt.....	Mount.
Cem.....	Cemetery.	Mtn.....	Mountain.
Ch.....	Church.	Mts.....	Mountains.
CGS.....	Coast Guard station.	N, Nat, Natl....	National.
Cor.....	Corner.	N.....	North.
Co.....	County.	No.....	Number.
Cr.....	Creek.	Par.....	Parallel.
Dist.....	District.	Pk.....	Peak.
Div.....	Division.	Pen.....	Peninsula.
E.....	East.	Pt.....	Point.
El.....	Electric, elevated.	Pd.....	Pond.
Elev.....	Elevation.	PO.....	Post office.
Fy.....	Ferry.	PH.....	Power house.
Fd.....	Ford.	Prin Mer.....	Principal meridian.
F, For.....	Forest.	RR.....	Railroad.
Ft.....	Fort.	R.....	Range, river, run.
G Mer.....	Guide meridian.	Res.....	Reservoir, reserva tion.
Gl.....	Glacier.	Rd.....	Road.
Gl.....	Gulch.	Rk.....	Rock.
Gh.....	Gulch (in Alaska).	Sch.....	School.
Hbr.....	Harbor.	Sec, Secs.....	Section, sections.
Hdqrs.....	Headquarters.	Sd.....	Sound.
HW.....	High water.	S.....	South.
Hy.....	Highway.	Spr.....	Spring.
Hol.....	Hollow.	Std Par.....	Standard parallel.
H.....	House.	Sta.....	Station.
I, Ind.....	Indian.	Str.....	Stream, strait.
I.....	Island.	St.....	Street.
Is.....	Islands.	T.....	Township.
Junc.....	Junction.	Val.....	Valley.
L.....	Lake, or little.	VA.....	Vertical angle.
Ldg.....	Landing.	WT.....	Water tank.
Lt.....	Light.	WW.....	Waterworks.
LH.....	Lighthouse.	W.....	West, water.
LM.....	Location monument.		
LW.....	Low water.		

Periods are to be consistently
omitted on all lettering within
the margin of the map.

TERMINOLOGY FOR ENGINEERING DRAWINGS

<u>USE</u>	<u>DO NOT USE</u>	<u>USE</u>	<u>DO NOT USE</u>
Acid proof sewer joint compound	A Sulphur silica joint compound, sulphur silica cement		H
Acre-feet	Acre feet		I
	B		J
Black steel pipe	Black iron pipe		
Both faces (Steel reinforcement)	Bothfaces		
Both sides (Structural steel)	Bothsides		
Both ways	Bothways	Keyway	K Key-way, key way
Bypass	By-pass		
	C		L
Caliber	Calibre	Linear	Lineal
Center	Centre	Longitudinal bars	Longitudinals
Center line	Centerline, center-line	Louver	Louvre
Center to center	On centers, at center		
Chamfer	Champher		M
Corrugated Metal	Corrugated Iron	Manhole steps (for manhole use)	Ladder rungs
Cross section	Cross-section, X-section	Metalwork	Metal work
Cut-off	Cutoff, cut off	Meter	Metre
	D	Midlength	Mid-length, mid length
		Midpoint	Mid-point, mid point
		Miter	Mitre
		Mold	Mould
Dam site	Damsite		
Deposit	Deposite		
Dike	Dyke		
Downstream	Lower	Not to scale	N No scale
	E		
Existing ground surface	Original ground surface		
Expansion Joint Filler	Expansion joint material	Open joint drain	O Open-joint drain
Eyebolt	Eye-bolt		
	F		P
Fibre	Fiber	Pipe line	Pipe-line
Fractions thus: $\frac{1}{2}$, $\frac{1}{4}$	Fractions: 1/2, 1/4	Plane table	Planetable, plane-table
	G	Plant-mixed surfacing	Plantmix, rock and oil
			Q
Gage	Gauge		
Galvanized Steel Pipe	Galvanized Iron Pipe		
			R
		Rain gage	Raingage
		Riprap	Rip-rap, rip rap

TERMINOLOGY FOR ENGINEERING DRAWINGS

<u>USE</u>	<u>DO NOT USE</u>	<u>STEEL REINFORCEMENT</u>	<u>STRUCTURAL STEEL</u>
Service gates	S Regulating gates, slide gates	Both faces	B. F.
Sheet Metal	Sheet Iron	Far face	F. F.
Special bituminous cement	Mastic, plastic asphaltum	Near face	N. F.
Slope dimension, S.D.	Dimension measured along slope	Top and bottom	T. & B.
Steel reinforcement	Reinforcing steel	For spacing only: 12 spaces @ 3'-0" = 36'-0"	Both sides
Steel sheet piling	Sheet steel piling	For bars of specified length and spacing: $\frac{1}{2}" \times 4'-6" - 12" \text{ c.c.}$ 96 - W 6A2002 - 12" c.c.	Far side
Stream gage	Streamgage, stream-gage		Near side
Stream-gaging station	Stream gaging station		Wide flange section: 24" W - 74# x 16'-0" American standard beam: 15" I - 42.9# x 16'-0" Miscellaneous column: 6 x 6 H - 15.5# x 16'-0" Miscellaneous beam: 6" I - 12# x 16'-0" American standard channel: 9" C - 13.4# x 16'-0" Equal leg angles: L - 3 x 3 x $\frac{1}{4}"$ x 16'-0" Unequal leg angles: L - 7 x 4 x $\frac{1}{2}"$ x 16'-0" Special channel: 12 x 4 C - 44.5# x 16'-0" Subway column: 6 x 10 I - 40# x 16'-0"
Template	T Templet	Round bars: 1" ϕ - 12" c.c.	B. S.
24-hour	24 hour	Square bars: 1" $\square$ - 1'-6" c.c.	F. S.
Upstream	U Upper		N. S.
Vapor	V Vapour		
Waterproof	W Water-proof		Tee: 3 x 3 T - 6.7# x 16'-0"
Weep hole	Weephole. weep-hole, weeps		Zee: 6 x 4 Z - 15.7# x 16'-0"
	X		Plate: R - 18 x $\frac{1}{2}"$ x 16'-0"
	Y		Flat bar: R - 2 $\frac{1}{2}"$ x $\frac{1}{4}"$ x 16'-0"
	Z		Two angles, back to back: 2 L - 3 x 3 x $\frac{1}{4}"$ x 16'-0"

DO NOT USE SIMPLIFIED SPELLING
EXCEPT WHEN THE WORD IS STANDARD
TRADE PRACTICE

WAR DEPARTMENT

CORPS OF ENGINEERS U.S. ARMY

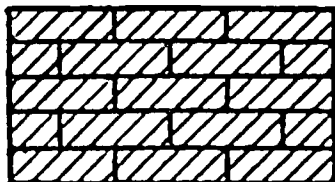
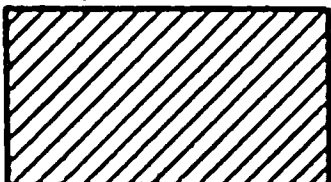
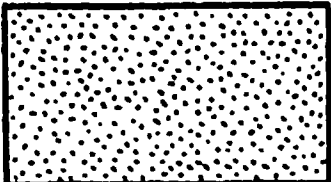
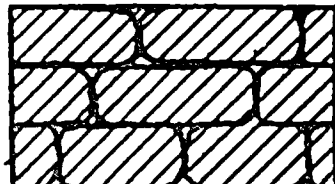
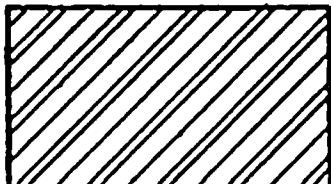
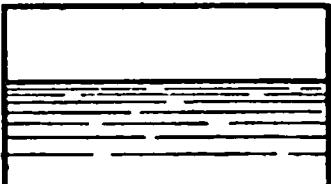
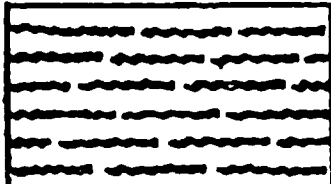
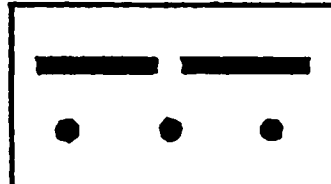
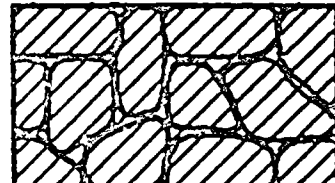
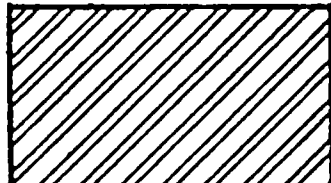
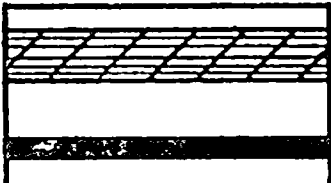
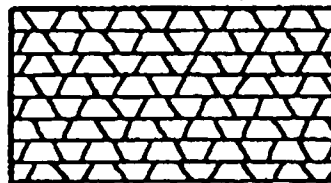
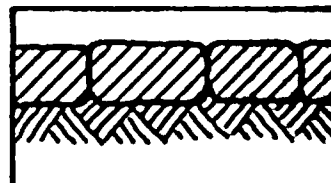
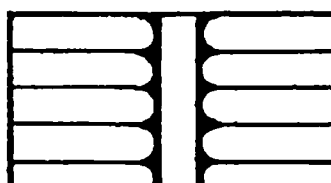
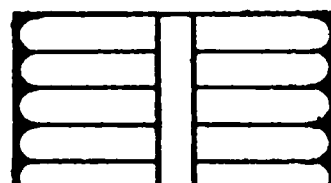
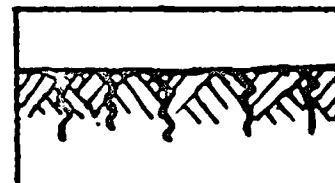
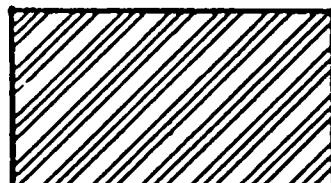
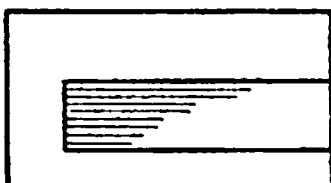
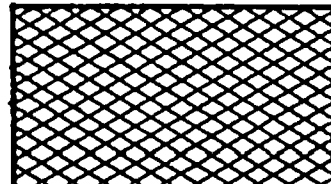
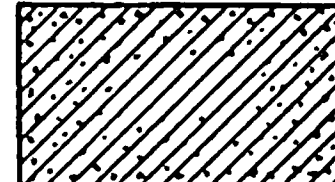
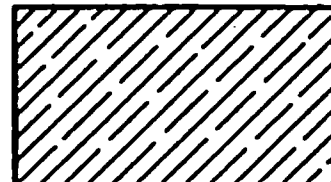
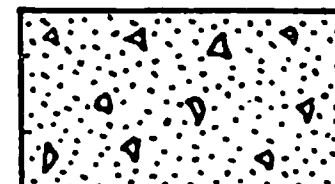
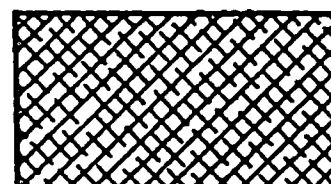
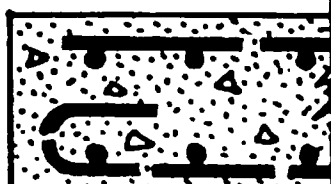
3 point		Border lines.
1 "		Title block lines.
$\frac{1}{2}$ "		Trim lines (for prints)
$\frac{1}{4}$ "		Lines in revision block.
$1\frac{1}{4}$ pt.		Sub-title underlining
$1\frac{1}{4}$ pt.		Principal lines and outlines of details, structures, objects, etc., in view
$\frac{1}{2}$ "		Lines not in view, or hidden, both principal and secondary.
1 "		Existing work within Contract Area.
$\frac{1}{2}$ "		Proposed future construction. Also existing work outside of Contract Area.
$\frac{1}{4}$ "		Center Lines.
$\frac{1}{2}$ "		Right of way limits.
1 "		Reinforcement steel in concrete section, elevation, and plan.
3 "		Reinforcement steel in end view.
$\frac{3}{4}$ "		Secondary lines in view (fillets, panel lines, etc.)
		Phantom line

2 point		Reinforcing steel bending details.
2 "		Sectional view lines
$\frac{1}{4}$ "		Dimension lines limits and arrows.
$\frac{1}{4}$ "		Reference arrows use broken line only in cases where detail is congested or where a grid exists, thereby making more distinctive.
$\frac{1}{4}$ "		Area references such as: Fill-6

Dimensional Expressions

	11"
	12"
	Not 1'-0"
	1'-0 $\frac{1}{4}$ "
	Not 12 $\frac{1}{4}$ "
	1'-6"
	Not 18"

LOS ANGELES COUNTY DRAINAGE AREA
LINE STANDARDS
 TO BE USED IN THE
 LOS ANGELES ENGR. DISTRICT
 IN 1 SHEET JULY 1937
 U.S. ENGINEER OFFICE
 LOS ANGELES, CALIFORNIA

MATERIALS IN SECTION							
							
BRICK	CAST IRON	ASHLER	SAND	SQUARE BARS	LUMBER		
							
COURSED RUBBLE	WROUGHT IRON	WATER	PUDDLE	ROUND BARS			
				ROCK  PLAN & ELEV. PAVING  IN SECTION  FILL  CUT CUT & FILL IN PLAN & ELEVATION			
UNCOURSED RUBBLE	CAST STEEL	INSULATION	EARTH				
							
ROCK	WROUGHT STEEL	GLASS					
							
CINDER	WHITE METAL, BABBIT, ETC.	OTHER MATERIAL					
							
CUT STONE	COPPER, BRASS OR COMPOSITION						
							
CONCRETE	ALUMINUM						
							
			REINFORCED CONCRETE				

REFERENCE: U.S.ARMY T.R. 190-24 AND
CONVENTIONAL SIGNS A. S. M. E.

LOS ANGELES COUNTY FLOOD CONTROL

MATERIAL SYMBOLS

TO BE USED IN THE

LOS ANGELES ENGR. DISTRICT

IN 1 SHEET

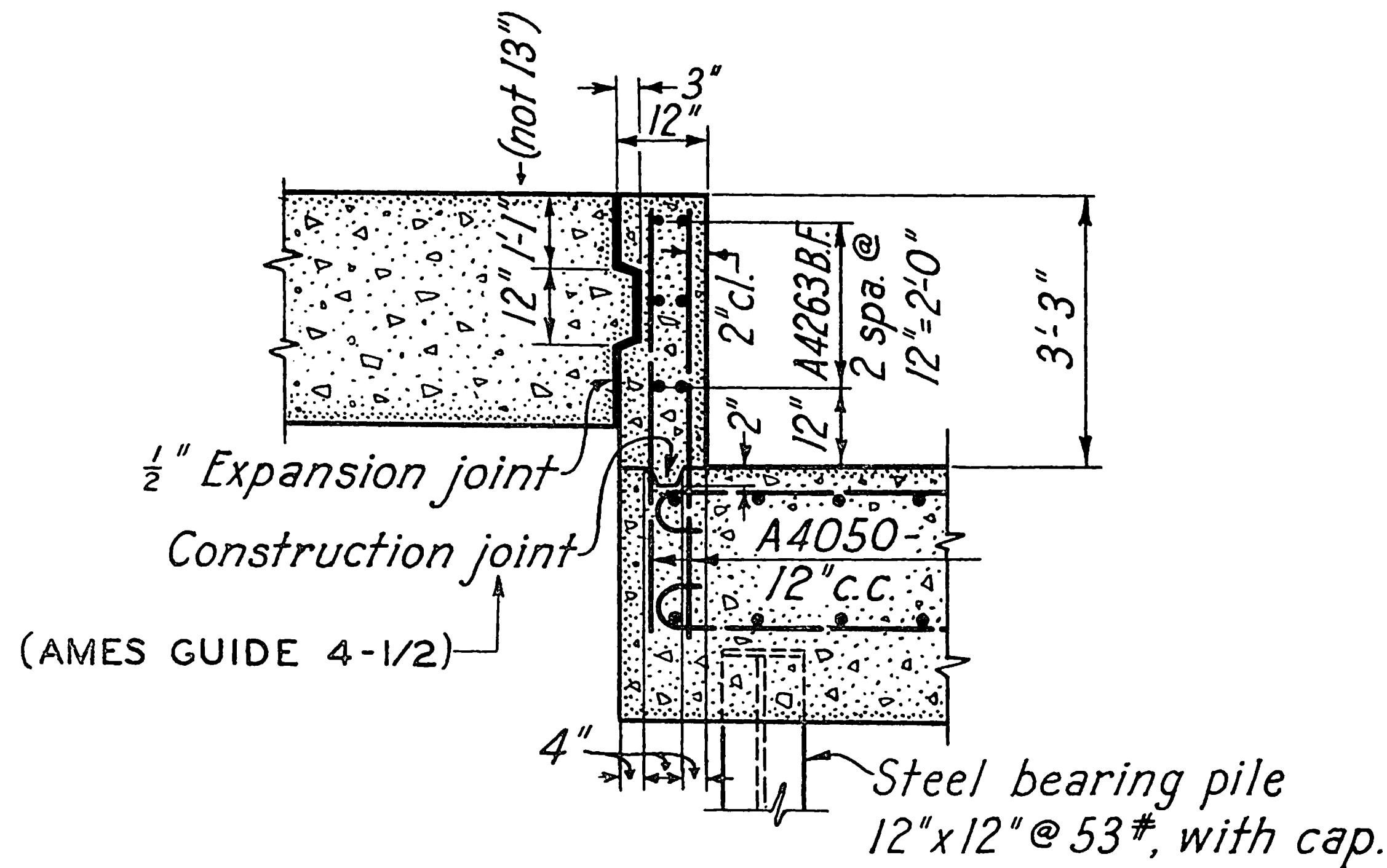
JUNE 1937

U.S. ENGINEER OFFICE

LOS ANGELES, CALIFORNIA.

REFERENCE: U.S.ARMY T.R. 190-24 AND
CONVENTIONAL SIGNS A. S. M. E.

LOS ANGELES COUNTY FLOOD CONTROL
MATERIAL SYMBOLS
TO BE USED IN THE
LOS ANGELES ENGR. DISTRICT
IN 1 SHEET JUNE 1937
U.S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA.



(175-6)-----> **SECTION E-E**
 (140-6)→ **FOR UPSTREAM END OF MONOLITHS 8 & 9**
 (120-7)-----> **SCALE: 3/8 IN. = 1 FT.**
 (90-7)----->

LOS ANGELES COUNTY FLOOD CONTROL
REINFORCED CONCRETE DETAIL
SECTIONAL VIEW

TO BE USED IN THE

LOS ANGELES ENGR. DISTRICT

IN 1 SHEET

APRIL 1939

U. S. ENGINEER OFFICE,
 LOS ANGELES, CALIFORNIA

WELDING SYMBOLS

SYMBOL	SYMBOLS AS USED IN PLAN AND ELEVATION ALTERNATE METHODS		SECTION
FILLET WELDS			
 NEAR SIDE	 NOTE I	 NOTE I	
 FAR SIDE	 NOTE I	 NOTE I	
 BOTH SIDES	 NOTE I	 NOTE I	
 ALL AROUND	 NOTE I	 NOTE I	
 FIELD WELD	 NOTE I	 NOTE I	
EXAMPLE	DESCRIPTION		INTERPRETATION
 $\frac{1}{4}$	Continuous $\frac{1}{4}$ " fillet weld on near side of joint.		
 $\frac{3}{8}$ -12	$\frac{3}{8}$ " Fillet weld 12" long on far side of joint.		
 $\frac{1}{4}$ -3-6	$\frac{1}{4}$ " Intermittent fillet welds 3" long at 6" centers on both sides (welds opposite).		
 $\frac{3}{8}$ -2 $\frac{1}{2}$ -6 S	$\frac{3}{8}$ " Intermittent fillet welds $2\frac{1}{2}$ " long at 6" centers on each side. (welds staggered "S").		
 $\frac{1}{4}$	Continuous $\frac{1}{4}$ " fillet weld all around on both sides		
 $\frac{3}{8}$	Continuous $\frac{3}{8}$ " fillet weld made in field.		
SYMBOL	BUTT WELDS		SECTION
 NEAR SIDE			
 FAR SIDE			
 BOTH SIDES			
 ALL AROUND			
 FIELD WELD			
NOTE I.			
Give size of weld, length of weld (if not continuous), and spacing of welds, if intermittent. Butt welds should very seldom be used as intermittent welds. Typical and special preparation for butt welds should always be detailed and shown in section. Size of every weld must be shown or noted. All welds are continuous unless otherwise shown or noted.			

STANDARD PIPING DIAGRAMS

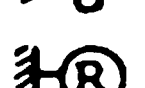
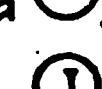
EQUIPMENT	SINGLE LINE DRAWINGS		DOUBLE LINE DRAWINGS		FLOW DIAG'MS
	DRAW TO SCALE		DRAW TO SCALE		NO SCALE
	FLANGED	SCREWED	FLANGED	SCREWED	FL'G'D OR SCR'D.
GATE VALVE					
GLOBE VALVE					
CHECK VALVE					
ANGLE VALVE					
COCK					
3-WAY COCK					
PRESSURE REDUCING VALVE					
QUICK OPENING GATE VALVE					
DIAPHRAGM OPERATED VALVE					
RELIEF VALVE			AS IS	AS IS	
FLOW ARROWS					
ELBOWS					
TEES					
TEE & ELBOW DROPS					
TEE & ELBOW RISERS					

NOTES: VALVE SYMBOLS ARE SHOWN IN ELEVATION. OMIT HANDWHEELS AND STEM FOR PLAN

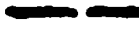
VALVES NORMALLY OPEN
 VALVES NORMALLY CLOSED

STANDARD WIRING SYMBOLS

As recommended and adopted by the Association of Electricians, International, The American Institute of Architects and the American Institute of Electrical Engineers, and approved by the American Engineering Standards Committee.

-  Ceiling outlet.
-  Ceiling outlet (gas and electric).
-  Ceiling lamp receptacle. Specifications to describe type such as key, keyless or pull chain.
-  Ceiling outlet for extensions.
-  Ceiling fan outlet.
-  Pull Switch.
-  Drop cord.
-  Wall bracket.
-  Wall bracket (gas and electric).
-  Wall outlet for extensions.
-  Wall fan outlet.
-  Wall lamp receptacle. Specifications to describe type such as key, keyless or pull chain.
-  Single convenience outlet.
-  Double convenience outlet.
-  Junction box.
-  Special purpose outlet. Lighting, heating and power as described in specifications.
-  Special purpose outlet. Lighting, heating and power as described in specifications.
-  Special purpose outlet. Lighting, heating and power as described in specifications.
-  Exit light.
-  Floor outlet.
-  Floor elbow.
-  Floor tee.
- s^1 Local switch—single pole.
- s^2 Local switch—double pole.
- s^3 Local switch—3 way.
- s^4 Local switch—4 way.
- s^D Automatic door switch.

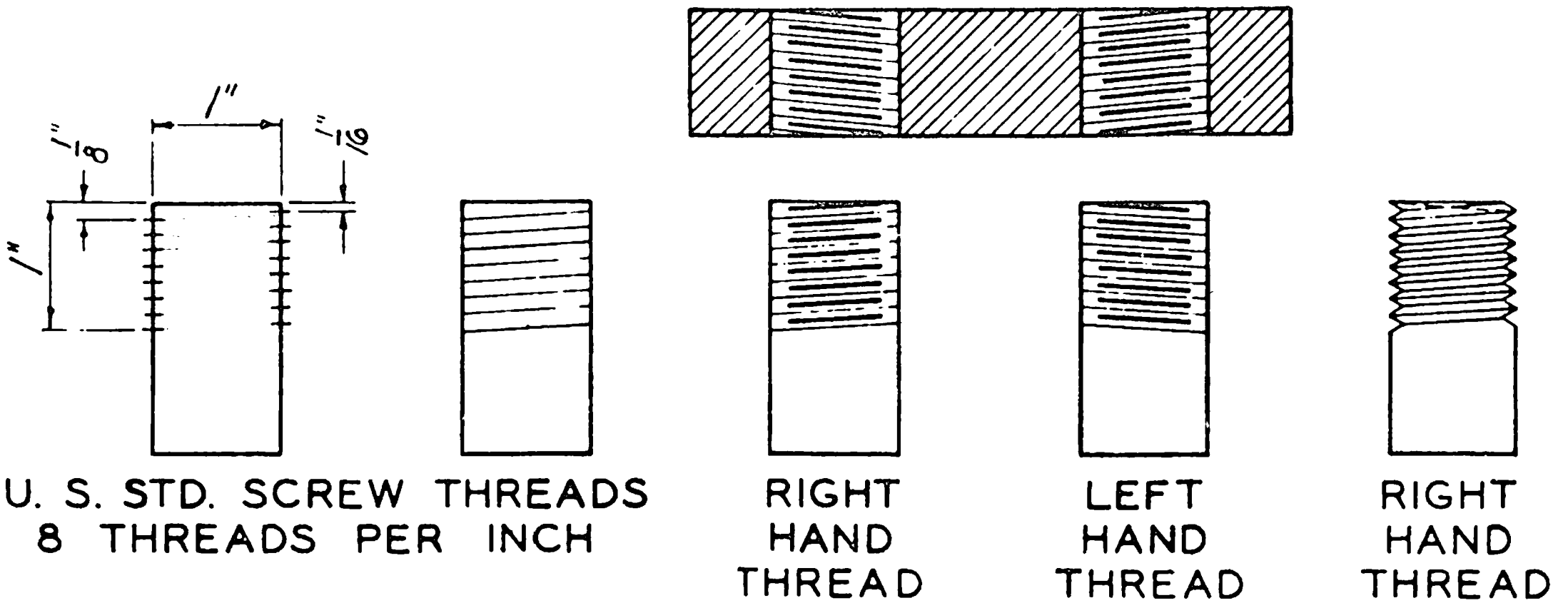
STANDARD WIRING SYMBOLS

S^K	Key push button switch.
S^E	Electrolier switch.
S^P	Push button switch and pilot.
S^R	Remote control push button switch.
	Tank switch.
	Motor.
	Motor Controller.
	Lighting panel.
	Power panel.
	Heating panel.
	Pull box.
	Cable supporting box.
	Meter.
	Transformer.
	Branch circuit, run concealed under floor above.
	Branch circuit, run exposed.
	Branch circuit, run concealed under floor.
"	This character marked on top circuits indicates 2 No. 14 conductors in 1/2-inch conduit.
""	Indicates 3 No. 14 conductors in 1/2-inch conduit.
""	Indicates 4 No. 14 conductors in 3/4-inch conduit unless marked 1/2-inch.
""	Indicates 5 No. 14 conductors in 3/4-inch conduit.
""	Indicates 6 No. 14 conductors in 1-inch conduit unless marked 3/4 inch.
""	Indicates 7 No. 14 conductors in 1-inch conduit.
""	Indicates 8 No. 14 conductors in 1-inch conduit.
Note.—If larger conductors than number 14 are used, use the same symbols and mark the conductor and conduit size on the run.	
	Feeder run concealed under floor above.
	Feeder run exposed.
	Feeder run concealed under floor.
	Pole line.
	Push Button.

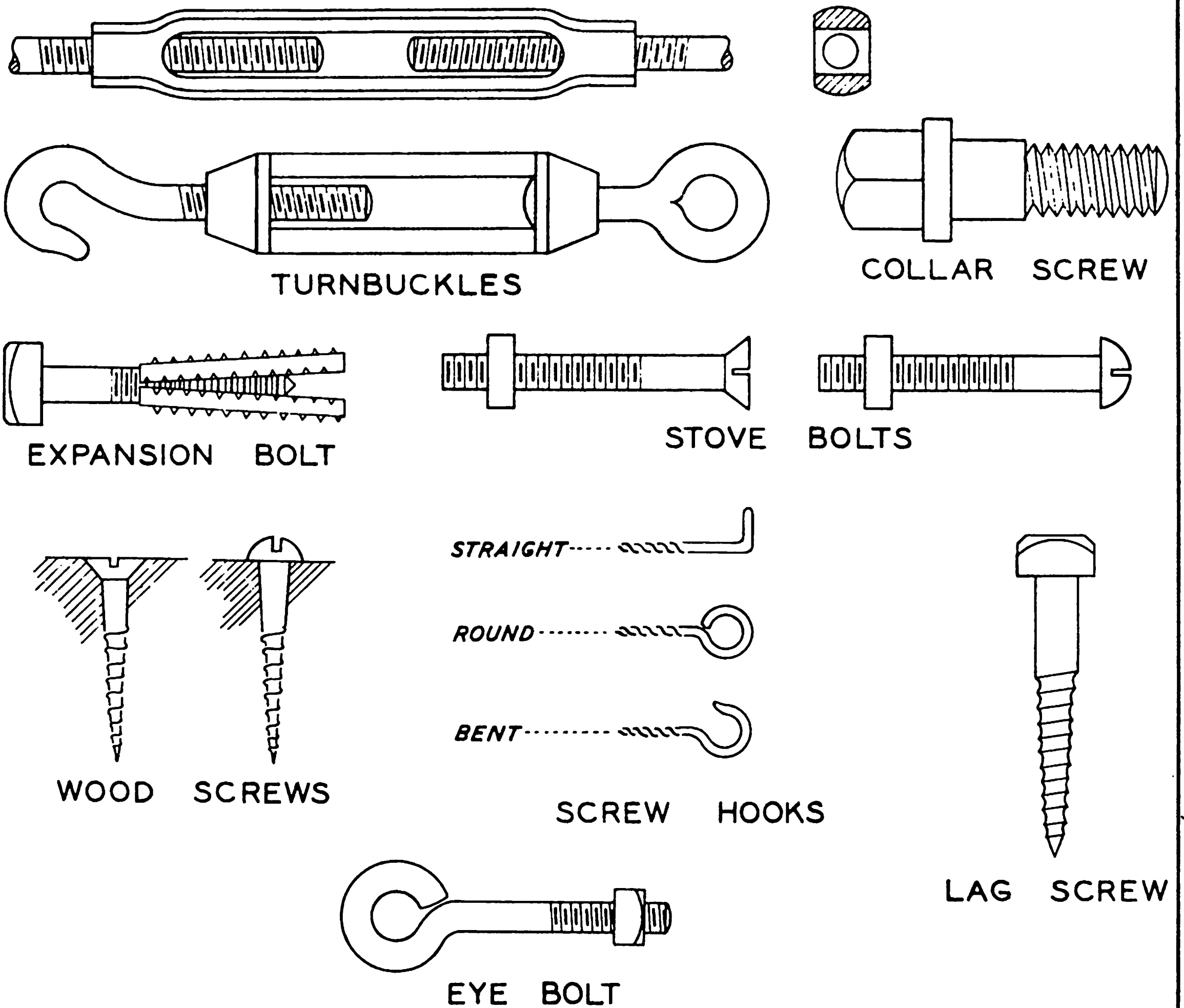
STANDARD WIRING SYMBOLS

	Buzzer.
	Bell.
	Annunciator.
	Interior telephone.
	Public telephone.
	Clock (secondary).
	Clock (master).
	Time stamp.
	Electric door opener.
	Local fire alarm gong.
	City fire alarm station.
	Local fire alarm station.
	Fire alarm central station.
	Speaking tube.
	Nurse's signal plug.
	Maid's plug.
	Horn outlet.
	District messenger call.
	Watchman station.
	Watchman central station detector.
	Public telephone—PBX switchboard.
	Interconnection telephone central switchboard.
	Interconnection cabinet.
	Telephone cabinet.
	Telegraph cabinet.
	Special outlet for signal system. As described in specifications.
	Battery.
	Signal wires in conduit. Concealed under floor.
	Signal wires in conduit. Concealed under floor above.

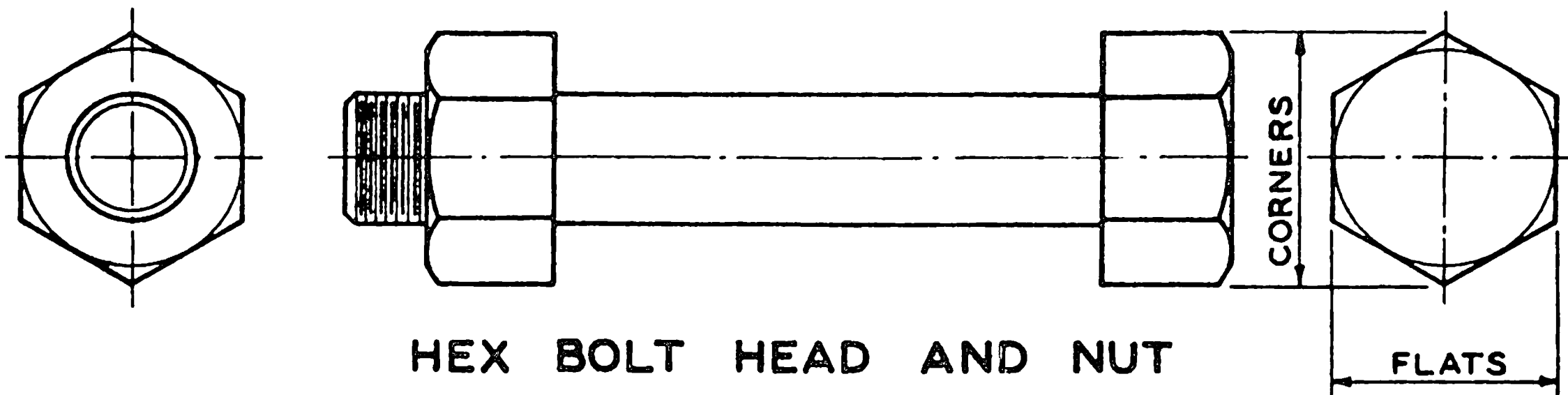
SCREW THREAD SYMBOLS



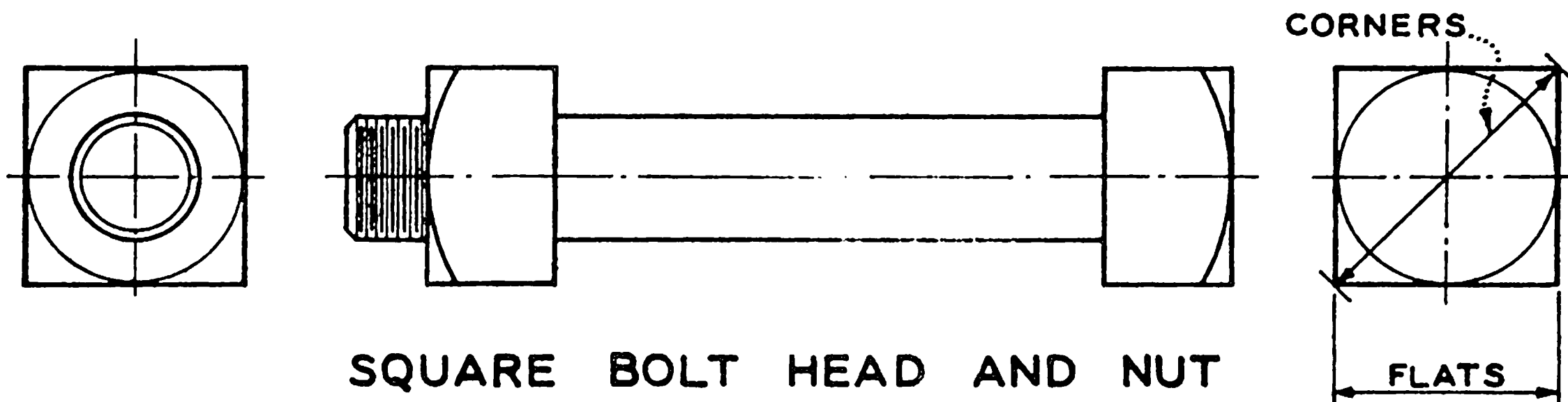
STANDARD BOLTS AND SCREWS



U. S. STANDARD BOLTS AND NUTS



HEX BOLT HEAD AND NUT



SQUARE BOLT HEAD AND NUT

	HEXAGON				SQUARE			
Dia. of bolt, inches	Distance across flats, inches	Distance across corners, inches	Thickness		Distance across flats, inches	Distance across corners, inches	Thickness	
			Head, inches	Nut, inches			Head, inches	Nut, inches
1/4	1/2	37/64	1/4	1/4	1/2	23/32	1/4	1/4
5/16	19/32	11/16	19/64	5/16	19/32	27/32	19/64	5/16
3/8	11/16	51/64	11/32	3/8	11/16	31/32	11/32	3/8
7/16	25/32	29/32	25/64	7/16	25/32	1-7/64	25/64	7/16
1/2	7/8	1-1/64	7/16	1/2	7/8	1-1/4	7/16	1/2
9/16	31/32	1-1/8	31/64	9/16	31/32	1-3/8	31/64	9/16
5/8	1-1/16	1-15/64	17/32	5/8	1-1/16	1-1/2	17/32	5/8
3/4	1-1/4	1-29/64	5/8	3/4	1-1/4	1-25/32	5/8	3/4
7/8	1-7/16	1-43/64	23/32	7/8	1-7/16	2-1/32	23/32	7/8
1	1-5/8	1-7/8	13/16	1	1-5/8	2-19/64	13/16	1
1-1/8	1-13/16	2-3/32	29/32	1-1/8	1-13/16	2-9/16	29/32	1-1/8
1-1/4	2	2-5/16	1	1-1/4	2	2-53/64	1	1-1/4
1-3/8	2-3/16	2-17/32	1-3/32	1-3/8	2-3/16	3-3/32	1-3/32	1-3/8
1-1/2	2-3/8	2-3/4	1-3/16	1-1/2	2-3/8	3-23/64	1-3/16	1-1/2
1-3/4	2-3/4	3-3/16	1-3/8	1-3/4	2-3/4	3-57/64	1-3/8	1-3/4
2	3-1/8	3-39/64	1-9/16	2	3-1/8	4-27/64	1-9/16	2

NOTE: SEE FEDERAL SPECIFICATIONS FF-B-571/a AND FF-S-91 FOR FURTHER DETAILS.

TENTATIVE AMERICAN STANDARD ALLOWANCES AND TOLERANCES FOR METAL FITS

CLASS OF FIT		1 LOOSE	2 FREE	3 MEDIUM	4 SNUG	5 WRINGING	6 TIGHT	7 MEDIUM FORCE	8 HEAVY FORCE
FORMULAE	METHOD OF ASSEMBLY	STRICTLY INTERCHANGEABLE				SELECTIVE ASSEMBLY			
	ALLOWANCE	$0.0025 \sqrt{d}$	$0.0014 \sqrt{d}$	$0.0009 \sqrt{d}$	0.0000				
	INTERFERENCE *					0.0000	$0.00025 d$	$0.0005 d$	$0.001 d$
	HOLE TOLERANCE	$0.0025 \sqrt{d}$	$0.0013 \sqrt{d}$	$0.0008 \sqrt{d}$	$0.0006 \sqrt{d}$	$0.0006 \sqrt{d}$	$0.0006 \sqrt{d}$	$0.0006 \sqrt{d}$	$0.0006 \sqrt{d}$
	SHAFT TOLERANCE	$0.0025 \sqrt{d}$	$0.0013 \sqrt{d}$	$0.0008 \sqrt{d}$	$0.0004 \sqrt{d}$	$0.0004 \sqrt{d}$	$0.0006 \sqrt{d}$	$0.0006 \sqrt{d}$	$0.0006 \sqrt{d}$
TYPICAL FITS	1" HOLE	0.500 +0.002 -0.000	0.5000 +0.0010 -0.0000	0.5000 +0.0006 -0.0000	0.5000 +0.0005 -0.0000	0.5000 +0.0005 -0.0000	0.5000 +0.0005 -0.0000	0.5000 +0.0005 -0.0000	0.5000 +0.0005 -0.0000
	1" SHAFT	0.498 -0.002	0.4991 -0.0010	0.4994 -0.0006	0.5000 -0.0003	0.5000 -0.0003	0.5000 -0.0003	0.5003 -0.0003	0.5005 -0.0003
	2" HOLE	1.000 +0.003 -0.000	1.0000 +0.0013 -0.0000	1.0000 +0.0008 -0.0000	1.0000 +0.0006 -0.0000	1.0000 +0.0006 -0.0000	1.0000 +0.0006 -0.0000	1.0000 +0.0006 -0.0000	1.0000 +0.0006 -0.0000
	2" SHAFT	0.997 -0.003	0.9986 -0.0013	0.9991 -0.0008	1.0000 -0.0004	1.0000 -0.0004	1.0003 -0.0004	1.0005 -0.0004	1.0010 -0.0004
	3" HOLE	2.000 +0.003 -0.000	2.0000 +0.0016 -0.0000	2.0000 +0.0010 -0.0000	2.0000 +0.0008 -0.0000	2.0000 +0.0008 -0.0000	2.0000 +0.0008 -0.0000	2.0000 +0.0008 -0.0000	2.0000 +0.0008 -0.0000
	3" SHAFT	1.996 -0.004	1.9976 -0.0016	1.9986 -0.0010	2.0000 -0.0005	2.0000 -0.0005	2.0005 -0.0005	2.0010 -0.0005	2.0020 -0.0005
	4" HOLE	3.000 +0.004 -0.000	3.0000 +0.0019 -0.0000	3.0000 +0.0012 -0.0000	3.0000 +0.0009 -0.0000	3.0000 +0.0009 -0.0000	3.0000 +0.0009 -0.0000	3.0000 +0.0009 -0.0000	3.0000 +0.0009 -0.0000
	4" SHAFT	2.995 -0.004	2.9971 -0.0019	2.9981 -0.0012	3.0000 -0.0006	3.0000 -0.0006	3.0008 -0.0006	3.0015 -0.0006	3.0030 -0.0006
	5" HOLE	4.000 +0.004 -0.000	4.0000 +0.0021 -0.0000	4.0000 +0.0013 -0.0000	4.0000 +0.0010 -0.0000	4.0000 +0.0010 -0.0000	4.0000 +0.0010 -0.0000	4.0000 +0.0010 -0.0000	4.0000 +0.0010 -0.0000
	5" SHAFT	3.994 -0.004	3.9965 -0.0021	3.9977 -0.0013	4.0000 -0.0006	4.0000 -0.0006	4.0010 -0.0006	4.0020 -0.0006	4.0040 -0.0006
	6" HOLE	5.000 +0.004 -0.000	5.0000 +0.0022 -0.0000	5.0000 +0.0014 -0.0000	5.0000 +0.0010 -0.0000	5.0000 +0.0010 -0.0000	5.0000 +0.0010 -0.0000	5.0000 +0.0010 -0.0000	5.0000 +0.0010 -0.0000
	6" SHAFT	4.993 -0.004	4.9959 -0.0022	4.9974 -0.0014	5.0000 -0.0007	5.0000 -0.0007	5.0013 -0.0007	5.0025 -0.0007	5.0050 -0.0007
	7" HOLE	6.000 +0.005 -0.000	6.0000 +0.0024 -0.0000	6.0000 +0.0015 -0.0000	6.0000 +0.0011 -0.0000	6.0000 +0.0011 -0.0000	6.0000 +0.0011 -0.0000	6.0000 +0.0011 -0.0000	6.0000 +0.0011 -0.0000
	7" SHAFT	5.991 -0.005	5.9939 -0.0024	5.9970 -0.0015	6.0000 -0.0007	6.0000 -0.0007	6.0015 -0.0007	6.0030 -0.0007	6.0060 -0.0007
	8" HOLE	7.000 +0.005 -0.000	7.0000 +0.0025 -0.0000	7.0000 +0.0015 -0.0000	7.0000 +0.0011 -0.0000	7.0000 +0.0011 -0.0000	7.0000 +0.0011 -0.0000	7.0000 +0.0011 -0.0000	7.0000 +0.0011 -0.0000
	8" SHAFT	6.991 -0.005	6.9949 -0.0025	6.9967 -0.0015	7.0000 -0.0008	7.0000 -0.0008	7.0018 -0.0008	7.0035 -0.0008	7.0070 -0.0008
	9" HOLE	8.000 +0.005 -0.000	8.0000 +0.0026 -0.0000	8.0000 +0.0016 -0.0000	8.0000 +0.0012 -0.0000	8.0000 +0.0012 -0.0000	8.0000 +0.0012 -0.0000	8.0000 +0.0012 -0.0000	8.0000 +0.0012 -0.0000
	9" SHAFT	7.990 -0.005	7.9944 -0.0026	7.9964 -0.0016	8.0000 -0.0008	8.0000 -0.0008	8.0020 -0.0008	8.0040 -0.0008	8.0080 -0.0008
	10" HOLE	9.000 +0.005 -0.000	9.0000 +0.0027 -0.0000	9.0000 +0.0017 -0.0000	9.0000 +0.0012 -0.0000	9.0000 +0.0012 -0.0000	9.0000 +0.0012 -0.0000	9.0000 +0.0012 -0.0000	9.0000 +0.0012 -0.0000
	10" SHAFT	8.985 -0.005	8.9935 -0.0027	8.9961 -0.0017	9.0000 -0.0008	9.0000 -0.0008	9.0023 -0.0008	9.0045 -0.0008	9.0090 -0.0008
	12" HOLE	12.000 +0.006 -0.000	12.0000 +0.0030 -0.0000	12.0000 +0.0018 -0.0000	12.0000 +0.0014 -0.0000	12.0000 +0.0014 -0.0000	12.0000 +0.0014 -0.0000	12.0000 +0.0014 -0.0000	12.0000 +0.0014 -0.0000
	12" SHAFT	11.987 -0.006	11.9927 -0.0030	11.9953 -0.0018	12.0000 -0.0009	12.0000 -0.0009	12.0030 -0.0009	12.0060 -0.0009	12.0120 -0.0009
	14" HOLE	14.000 +0.006 -0.000	14.0000 +0.0031 -0.0000	14.0000 +0.0019 -0.0000	14.0000 +0.0014 -0.0000	14.0000 +0.0014 -0.0000	14.0000 +0.0014 -0.0000	14.0000 +0.0014 -0.0000	14.0000 +0.0014 -0.0000
	14" SHAFT	13.986 -0.006	13.9919 -0.0031	13.9948 -0.0019	14.0000 -0.0010	14.0000 -0.0010	14.0035 -0.0010	14.0070 -0.0010	14.0140 -0.0010
	16" HOLE	16.000 +0.006 -0.000	16.0000 +0.0033 -0.0000	16.0000 +0.0020 -0.0000	16.0000 +0.0015 -0.0000	16.0000 +0.0015 -0.0000	16.0000 +0.0015 -0.0000	16.0000 +0.0015 -0.0000	16.0000 +0.0015 -0.0000
	16" SHAFT	15.984 -0.006	15.9911 -0.0033	15.9943 -0.0020	16.0000 -0.0010	16.0000 -0.0010	16.0040 -0.0010	16.0080 -0.0010	16.0160 -0.0010
	18" HOLE	18.000 +0.007 -0.000	18.0000 +0.0034 -0.0000	18.0000 +0.0021 -0.0000	18.0000 +0.0016 -0.0000	18.0000 +0.0016 -0.0000	18.0000 +0.0016 -0.0000	18.0000 +0.0016 -0.0000	18.0000 +0.0016 -0.0000
	18" SHAFT	17.983 -0.007	17.9904 -0.0034	17.9938 -0.0021	18.0000 -0.0010	18.0000 -0.0010	18.0045 -0.0010	18.0090 -0.0010	18.0180 -0.0010
	20" HOLE	20.000 +0.007 -0.000	20.0000 +0.0035 -0.0000	20.0000 +0.0022 -0.0000	20.0000 +0.0016 -0.0000	20.0000 +0.0016 -0.0000	20.0000 +0.0016 -0.0000	20.0000 +0.0016 -0.0000	20.0000 +0.0016 -0.0000
	20" SHAFT	19.982 -0.007	19.9897 -0.0035	19.9934 -0.0022	20.0000 -0.0011	20.0000 -0.0011	20.0050 -0.0011	20.0100 -0.0011	20.0200 -0.0011
	24" HOLE	24.000 +0.007 -0.000	24.0000 +0.0037 -0.0000	24.0000 +0.0023 -0.0000	24.0000 +0.0017 -0.0000	24.0000 +0.0017 -0.0000	24.0000 +0.0017 -0.0000	24.0000 +0.0017 -0.0000	24.0000 +0.0017 -0.0000
	24" SHAFT	23.979 -0.007	23.9884 -0.0037	23.9925 -0.0023	24.0000 -0.0012	24.0000 -0.0012	24.0060 -0.0012	24.0120 -0.0012	24.0240 -0.0012

* Selected average interference of metal.

- 1 Loose Fit - Provides considerable freedom and embraces certain fits where accuracy is not essential.
- 2 Free Fit - Liberal allowance. For running fits with speeds of 600 R.P.M. and journal pressures of 600 $\frac{1}{2}$ lbs.
- 3 Medium Fit - Medium allowance. For running fits under 600 R.P.M. and pressures under 600 $\frac{1}{2}$ lbs., also sliding fits.
- 4 Snug Fit - Zero allowance closest fit which can be assembled by hand. Work of considerable precision.
- 5 Wringing Fit - Zero to negative allowance. Also known as "tunking fit".

6 Tight Fit - Light pressure required for assembly.

7 Medium Force Fit - Considerable pressure required. Max. fit for C.I. holes.

8 Heavy Force Fit or Shrink Fit - For metal that can be highly stressed without exceeding the elastic limit. Not safe for C.I. holes.

Allowance = Greatest tightness or least looseness.

Tolerance = Difference between largest and smallest permissible size of either member.

Form B4a-1925-American Standards Association.

WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY

DECIMALS OF AN INCH FOR EACH 64TH WITH MILLIMETER EQUIVALENTS						DECIMALS OF A FOOT FOR EACH 32ND OF AN INCH													
64THS	DECIMAL	MM.	64THS	DECIMAL	MM.	32NDS	0"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	
1	.0156	0.397	33	.5156	13.097	0	0	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	
2	.0312	0.794	34	.5312	13.494	1	.0026	.0859	.1693	.2526	.3359	.4193	.5026	.5859	.6693	.7526	.8359	.9193	
3	.0468	1.191	35	.5468	13.891	2	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	
4	.0625	1.588	36	.5625	14.288	3	.0078	.0911	.1745	.2578	.3411	.4245	.5078	.5911	.6745	.7578	.8411	.9245	
5	.0781	1.984	37	.5781	14.684	4	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	
6	.0937	2.381	38	.5937	15.081	5	.0130	.0964	.1797	.2630	.3464	.4297	.5130	.5964	.6797	.7630	.8464	.9297	
7	.1093	2.778	39	.6093	15.478	6	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	
8	.1250	3.175	40	.6250	15.875	7	.0182	.1016	.1849	.2682	.3516	.4349	.5182	.6016	.6849	.7682	.8516	.9349	
9	.1406	3.572	41	.6406	16.272	8	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	
10	.1562	3.969	42	.6562	16.669	9	.0234	.1068	.1901	.2734	.3568	.4401	.5234	.6068	.6901	.7734	.8568	.9401	
11	.1718	4.366	43	.6718	17.066	10	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	
12	.1875	4.763	44	.6875	17.463	11	.0286	.1120	.1953	.2786	.3620	.4453	.5286	.6120	.6953	.7786	.8620	.9453	
13	.2031	5.159	45	.7031	17.859	12	.0313	.1146	.1979	.2812	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	
14	.2187	5.556	46	.7187	18.256	13	.0339	.1172	.2005	.2839	.3672	.4505	.5339	.6172	.7005	.7839	.8672	.9505	
15	.2343	5.953	47	.7343	18.653	14	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	
16	.2500	6.350	48	.7500	19.050	15	.0391	.1224	.2057	.2891	.3724	.4557	.5391	.6224	.7057	.7891	.8724	.9557	
17	.2656	6.747	49	.7656	19.447	16	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	
18	.2812	7.144	50	.7812	19.844	17	.0443	.1276	.2109	.2943	.3776	.4609	.5443	.6276	.7109	.7943	.8776	.9609	
19	.2968	7.541	51	.7968	20.241	18	.0469	.1302	.2135	.2969	.3802	.4635	.5469	.6302	.7135	.7969	.8802	.9635	
20	.3125	7.938	52	.8125	20.638	19	.0495	.1328	.2161	.2995	.3828	.4661	.5495	.6328	.7161	.7995	.8828	.9661	
21	.3281	8.334	53	.8281	21.034	20	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	
22	.3437	8.731	54	.8437	21.431	21	.0547	.1380	.2214	.3047	.3880	.4714	.5547	.6380	.7214	.8047	.8880	.9714	
23	.3593	9.128	55	.8593	21.828	22	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	
24	.3750	9.525	56	.8750	22.225	23	.0599	.1432	.2266	.3099	.3932	.4766	.5599	.6432	.7266	.8099	.8932	.9766	
25	.3906	9.922	57	.8906	22.622	24	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	
26	.4062	10.319	58	.9062	23.019	25	.0651	.1484	.2318	.3151	.3984	.4818	.5651	.6484	.7318	.8151	.8984	.9818	
27	.4218	10.716	59	.9218	23.416	26	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	
28	.4375	11.113	60	.9375	23.813	27	.0703	.1536	.2370	.3203	.4036	.4870	.5703	.6536	.7370	.8203	.9036	.9870	
29	.4531	11.509	61	.9531	24.209	28	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	
30	.4687	11.906	62	.9687	24.606	29	.0755	.1589	.2422	.3255	.4089	.4922	.5755	.6589	.7422	.8255	.9089	.9922	
31	.4843	12.303	63	.9843	25.003	30	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	
32	.5000	12.700	64	1.0000	25.400	31	.0807	.1641	.2474	.3307	.4141	.4974	.5807	.6641	.7474	.8307	.9141	.9974	

SYMBOLS FOR GEOLOGIC MAPS SECTIONS AND BORING LAY-OUTS

Formation contacts:

1=Youngest formation; 2, 3, etc.,= Older formations in sequence; Inferred contacts shown with ?

Formation contacts

ascertained with shot number (Shown in red slanted figures) and location of shot (Shown as a red dot) - Elevation in brown, slanted

Known fault

Probable or inferred fault

Concealed fault

(Covered by later deposits)

Fault zone, shear zone

Dip of fault plane

Vertical fault

Overthrust side of thrust fault

Upheaved side of normal fault

Downdropped side of normal fault

Strike and dip of bedding

Component of dip

Strike of vertical strata

Horizontal beds

Strike and dip of overturned beds

Prevailing dip of beds

Strike and dip of schistosity

Strike of vertical schistosity

Strike and dip of joint planes

Strike of vertical joint planes

Joints-Showing bearing and dips

Axis of anticlinal fold

Axis of synclinal fold

Axis of overturned anticline

Axis of plunging anticline showing direction of pitch

Axis of plunging syncline showing direction of pitch

Key horizons

Topographic and structure contours (Shown with various colors of ink)

Location of geologic structure sections

Slide scar

Slide

Caved-in area

Contorted strata

Spring

Mineral spring

Thermal spring

Cavities or vugs

* Cavity in bore hole

Water out of formation. (Water bearing formation.)

Water taken by formation during drilling, leakage and pressure tests.

Dip (Bedding or formation)

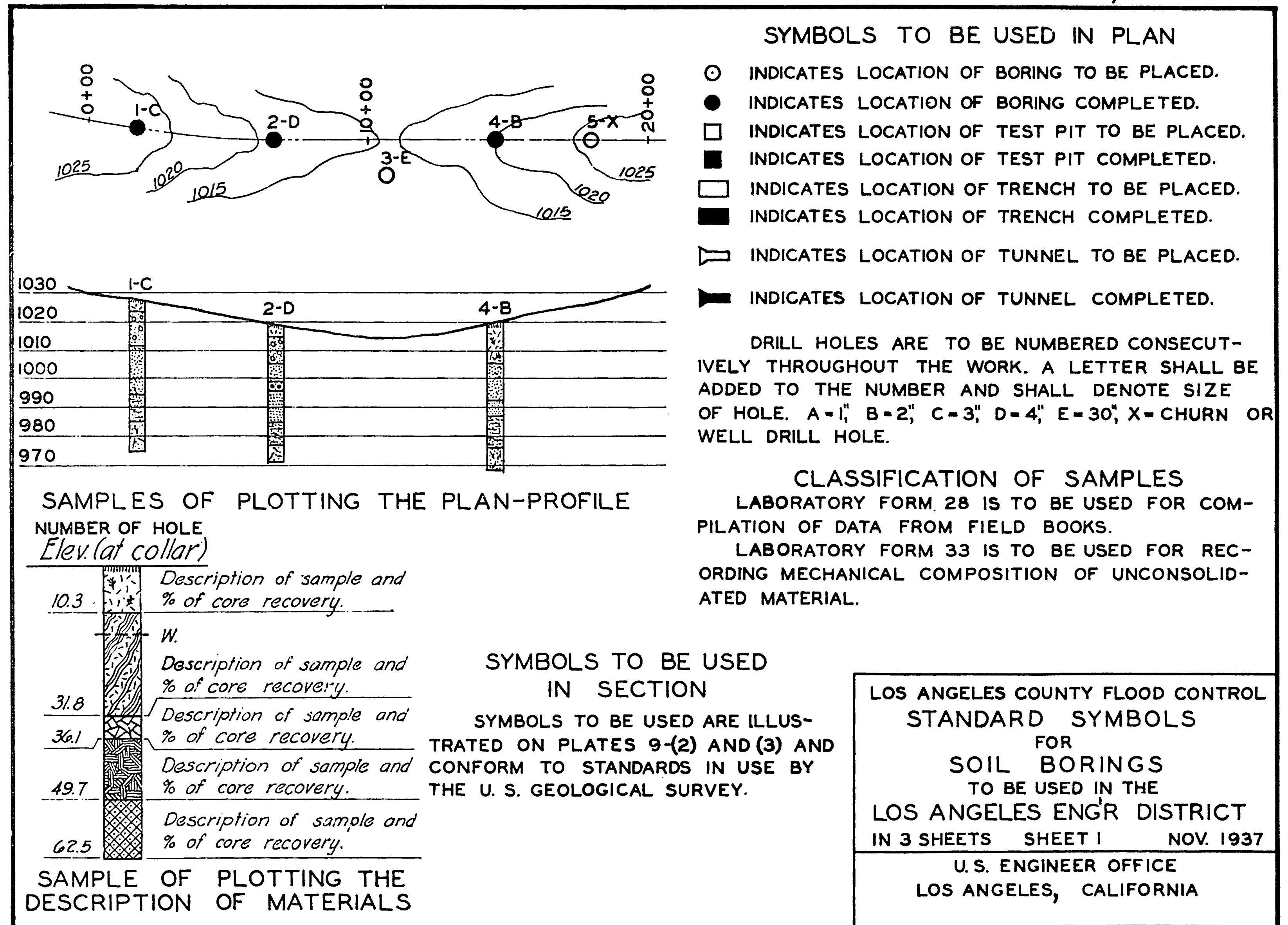
Fault

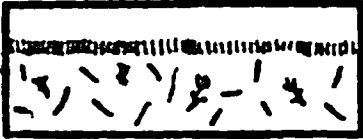
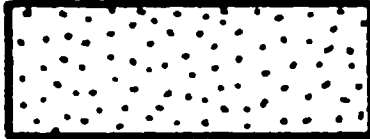
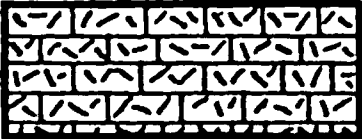
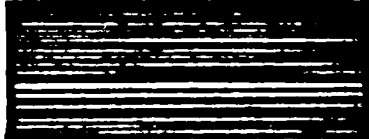
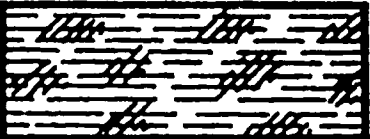
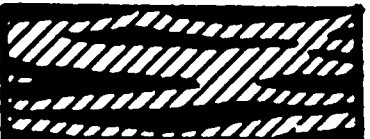
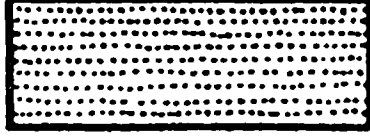
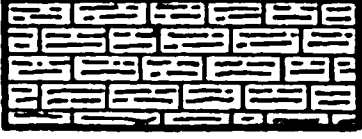
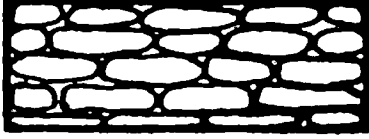
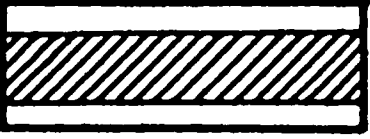
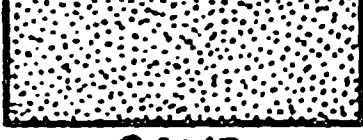
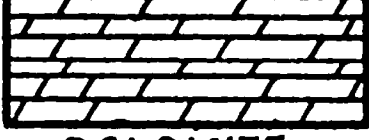
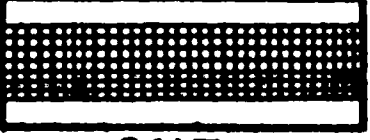
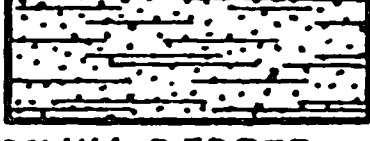
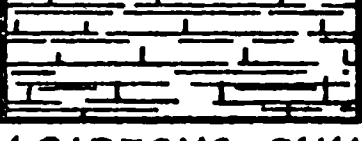
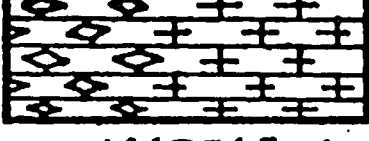
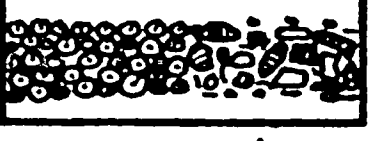
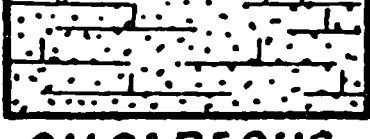
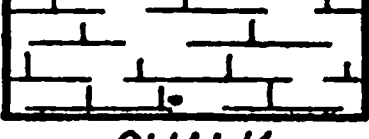
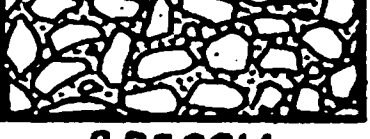
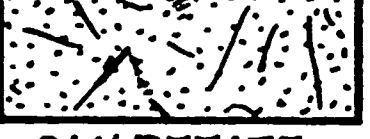
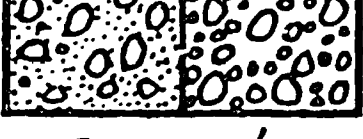
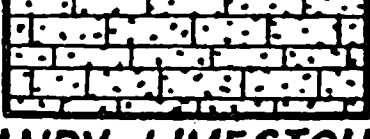
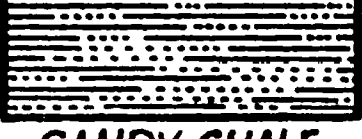
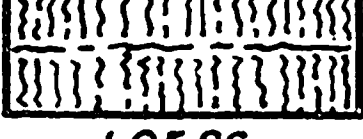
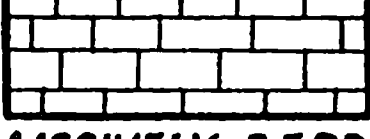
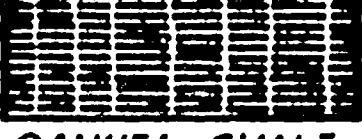
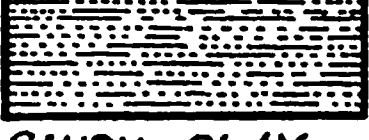
Shear plane

CORE LOG BORING

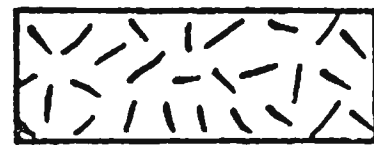
D - 14°
F - 40°
S - 29°

* Symbols to be used in geologic sections, boring lay-outs, etc., for Foundation Exploration are detailed on Plates 5-(2)(3)(4).

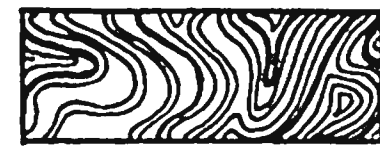


					
SOIL or LOAM	MASSIVE SANDSTONE	CRYSTALLINE LIMESTONE	OIL SHALE	FIRE CLAY or FLINT CLAY	BONE
					
SILT or ALLUVIUM	BEDDED SANDSTONE	CLAYEY or ARGILLACEOUS LIMESTONE	BEDDED CHERT	GYPSUM	BONY COAL or IMPURE COAL
					
SAND	CROSS-BEDDED SANDSTONE	LIMESTONE CONTAINING NODULES of CHERT or FLINT	DOLOMITE	SALT	CANNEL COAL
					
GRAVEL & STRATIFIED DRIFT	THIN-BEDDED or SHALY SANDSTONE	CALCAREOUS SHALE or SHALY LIMESTONE	a. MARBLE b.	a. b. PHOSPHATE ROCK	COAL
					
a. b. GLACIAL TILL & MORAINES	CALCAREOUS SANDSTONE	a. b. SHALE	CHALK	BRECCIA	QUARTZITE
					
a. b. GLACIAL TILL & MORAINES	SANDY LIMESTONE	SANDY SHALE	SLATE	PEAT	
					
LOESS	MASSIVELY BEDDED LIMESTONE	CANNEL SHALE	a. b. CLAY		
					
CONGLOMERATE	THIN-BEDDED LIMESTONE	CARBONACEOUS SHALE	SANDY CLAY		

LOS ANGELES COUNTY FLOOD CONTROL
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FOR
SOIL BORINGS
TO BE USED IN THE
LOS ANGELES ENGR. DISTRICT
IN 3 SHEETS SHEET 2 NOV. 1937
U.S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA



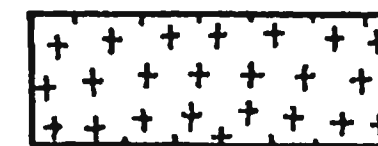
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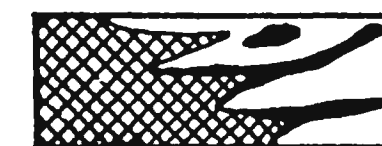
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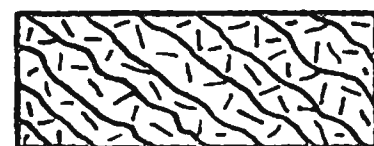
SOAPSTONE, TALC
& SERPENTINE



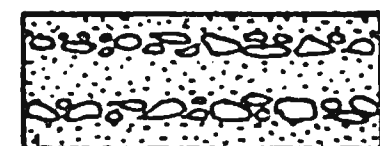
MASSIVE IGNEOUS
ROCK



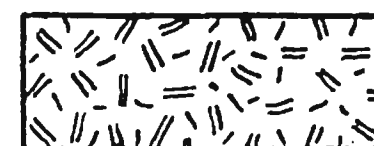
ORE
(SOLID BLACK IN THIN AREAS)



SCHISTOSE or
GNEISSOID GRANITE



VOLCANIC BRECCIA
& TUFF



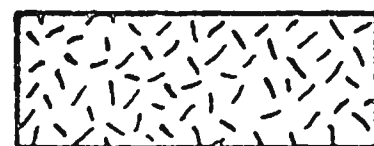
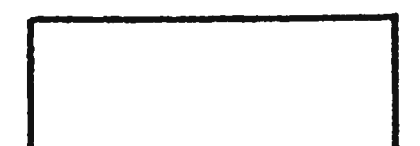
MASSIVE IGNEOUS
ROCK



MASSIVE IGNEOUS
ROCK



ORE



GRANITE



VOLCANIC BRECCIA
or AGGLOMERATE



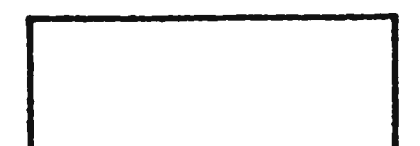
MASSIVE IGNEOUS
ROCK



MASSIVE IGNEOUS
ROCK



LEAN ORE



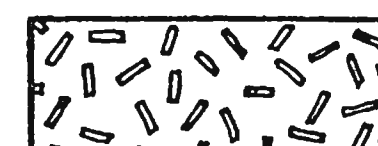
GNEISS



BRECCIATED ROCK
(SEDIMENTARY & IGNEOUS)



MASSIVE IGNEOUS
ROCK



PORPHYRITIC ROCK



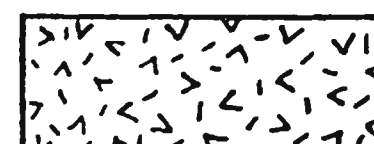
BEDROCK
(KIND NOT INDICATED)



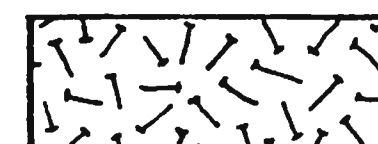
CONTORTED GNEISS



BASALTIC FLOWS



MASSIVE IGNEOUS
ROCK



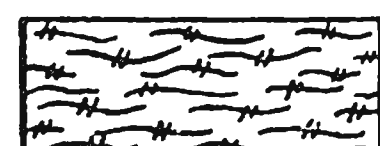
PORPHYRITIC ROCK



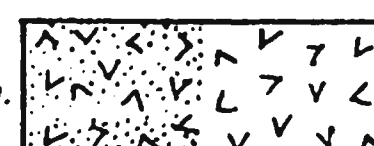
WATER TABLE



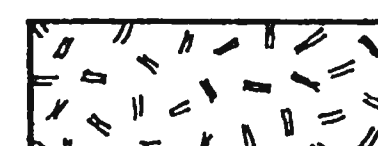
GNEISS & SCHIST



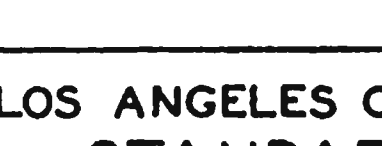
BEDDED LAVA
(ANDESITIC)



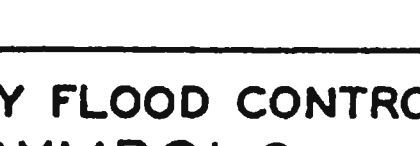
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ROCK



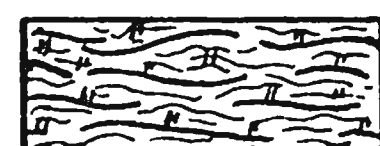
PORPHYRITIC ROCK



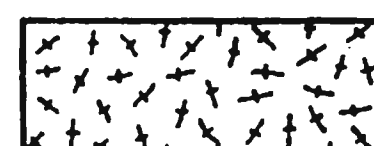
QUARTZ



SCHIST



BEDDED LAVA
& TUFF



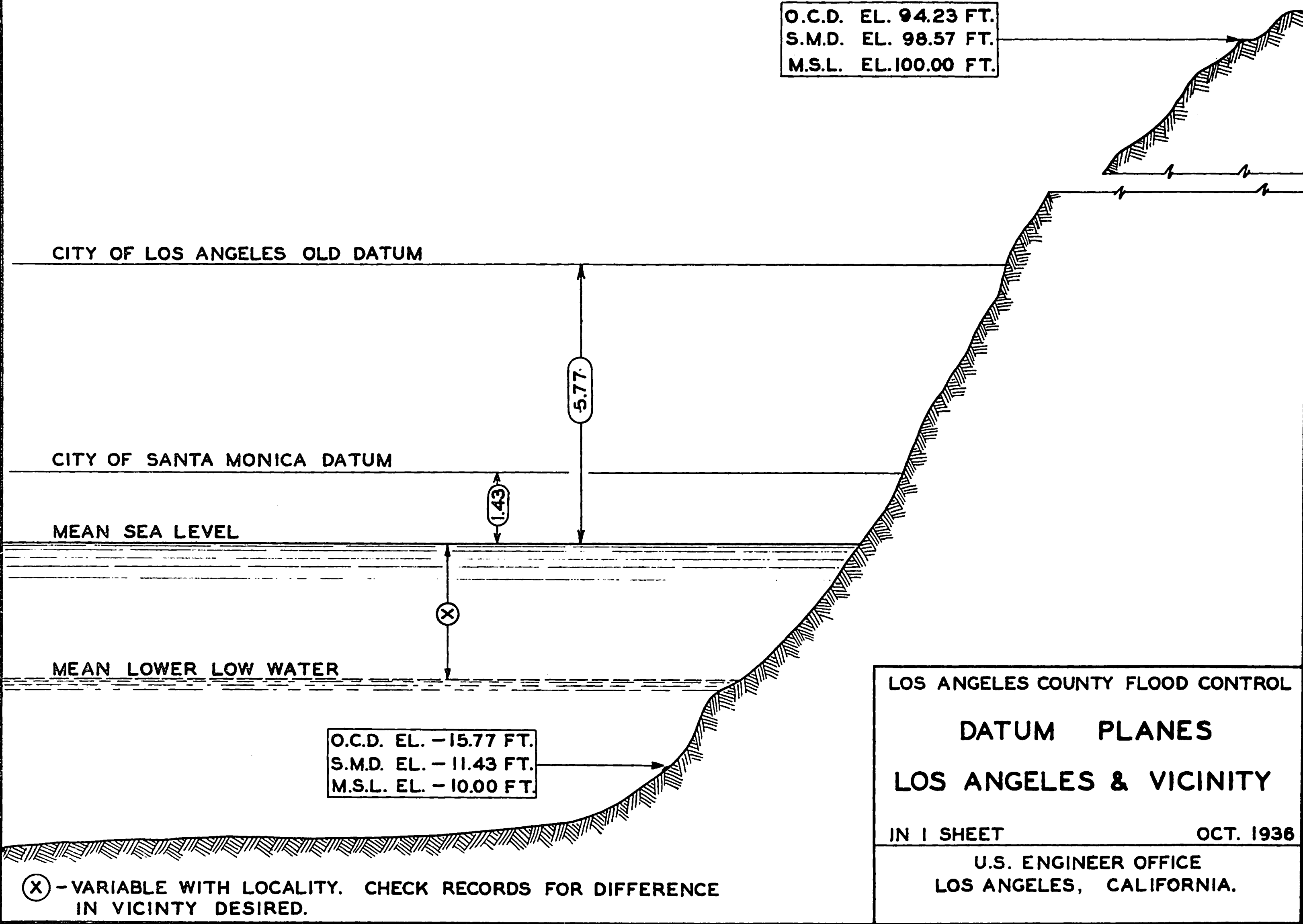
MASSIVE IGNEOUS
ROCK



LOS ANGELES COUNTY FLOOD CONTROL
STANDARD SYMBOLS

FOR
SOIL BORINGS
TO BE USED IN THE
LOS ANGELES ENGR DISTRICT
IN 3 SHEETS SHEET 3 NOV. 1937

U. S. ENGINEER OFFICE
LOS ANGELES, CALIFORNIA



93.881 C.S.D.D.
97.26 M.H.H.W.
102.89 U.S.C.&G.-M.L.L.W.
106.51 L.P.T.S.

100 M.S.L.

NOTE:-

AUTHORITY FOR ALL TIDE DATA SEE COPY OF
LETTER TO LIEUT. E.A. SWANSON, PORT COMMANDER
U.S.N., FROM R.L. FARIS, ACTING SUPT. U.S.C.&G.S.,
DATED NOV. 15, 1916 ON FILE IN OFFICE OF CITY
ENGINEER, SAN DIEGO, CALIF.

CITY OF SAN DIEGO DATUM

MEAN HIGHER HIGH WATER

U.S.G.S. - MEAN SEA LEVEL

U.S.C.&G.S.-M.L.L.W.
(HYDROGRAPHIC DATUM)

LA PLAYA TIDE STAFF

LEGEND

U.S.G.S.= UNITED STATES GEOLOGICAL SURVEY ZERO = MEAN SEA LEVEL =
DATUM FOR ALL TOPOGRAPHICAL SHEETS

U.S.C.&G.= UNITED STATES COAST & GEODETIC ZERO = MEAN OF ALL LOWER
LOW WATER = DATUM FOR COAST & HARBOR CHARTS

CITY = CITY OF SAN DIEGO (ZERO ARBITRARY) DATUM FOR ALL
ESTABLISHMENTS OF STREET GRADES

M.L.L.W. = MEAN OF ALL LOWER LOW WATERS IN BAY OF SAN DIEGO, CALIF.

M.H.W. = " " " HIGH " " " " " " " "

M.H.H.W. = " " " HIGHER HIGH " " " " " " " "

LA PLAYA TIDE STAFF ZERO ARBITRARILY ESTABLISHED FOR
PURPOSE OF TAKING TIDAL OBSERVATIONS

NOTE:

LOWEST TIDE OBSERVED = -5.05 M.S.L.

MEAN HIGH WATER = +2.02 M.S.L.

HIGHEST TIDE OBSERVED = +4.92 M.S.L.

SAN DIEGO COUNTY FLOOD CONTROL

DATUM PLANES

SAN DIEGO & VICINITY

IN 1 SHEET

MAR. 22, 1937

U.S. ENGINEER OFFICE
LOS ANGELES CALIFORNIA

STANDARD TOPOGRAPHIC SYMBOLS

WORKS AND STRUCTURES

Roads	Hard imperviously surfaced roads.....	
	Other main traveled roads, gravel.....	
	Unimproved roads	
Trail		
Railroads	Single track	
	Double track	
	Juxtaposition	
	Narrow gage	
	Abandoned	
Crossings	Grade	
	Railroad above	
	Railroad beneath	
Tunnels	Road	
	Railroad	
Bridges	General symbol	
	Draw	
	Truss	
Ferries		
Fords	General symbol (for vehicles)	
	Trail	
Dam		
Dam with lock		
Wharves and docks		
Retards and dikes		
Revetment (bank protection)		

STANDARD TOPOGRAPHIC SYMBOLS

Church	
Schoolhouse	
Fort	
City, town or village	
Cemetery	
Trench	
Mine or quarry	
Shaft	
Oil or gas wells	
Tanks (oil or gasoline)	
Ditch	
Canal	
Canal lock (point upstream)	
Flood Gate	
Levee	
Buildings in general	
Ruins	
Electric power transmission line	
Gas pipe line	
Oil pipe line	
Race track, stadium	

MARGINAL DATA

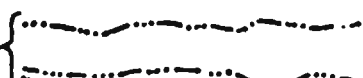
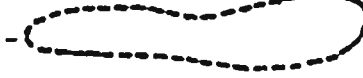
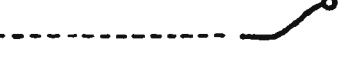
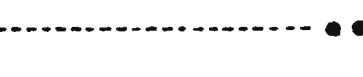
Harriman index number 2621:1150:/99;

Name of adjoining quadrangle (Deer Park)

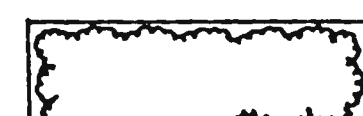
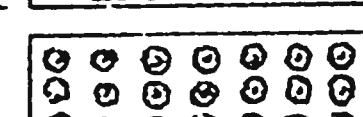
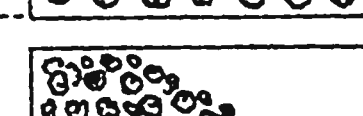
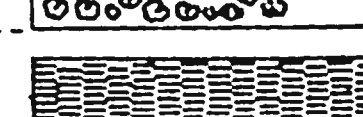
Latitude and longitude numerals 36° 10' 15"

STANDARD TOPOGRAPHIC SYMBOLS

DRAINAGE

Streams in general.....	
Intermittent streams.....	
Probable drainage, unsurveyed.....	
Lake or pond in general.....	
Intermittent lake or pond.....	
Spring.....	
Wells and watertanks.....	
Shoreline.....	Surveyed..... Unsurveyed.....  

LAND CLASSIFICATION

Salt (marsh or swamp).....	
Fresh (marsh or swamp).....	
Woodland.....	
Orchard.....	
Woods in water.....	
Mud.....	
Tidal flats.....	
Sand.....	
Shell fringe.....	
Shell reef.....	

STANDARD TOPOGRAPHIC SYMBOLS

RELIEF

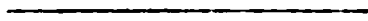
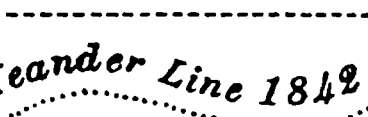
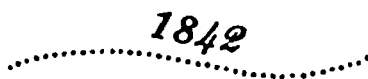
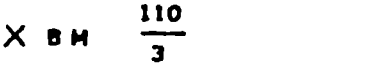
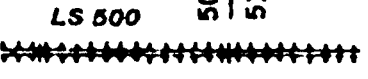
Contours	
Contours (approximate only)	
Form lines (no definite interval)	
Depression contours	
Steep bank or bluff	
Elevation numeral	47.2
Cuts	
Fills	
Washes or sand waste	
Indian mounds	

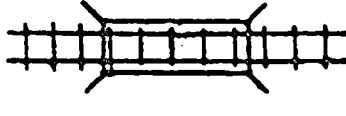
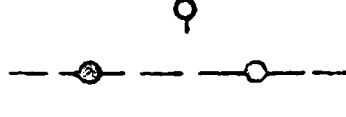
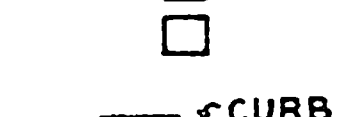
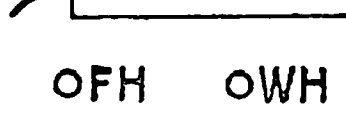
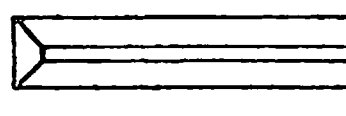
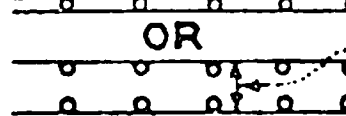
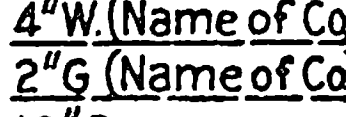
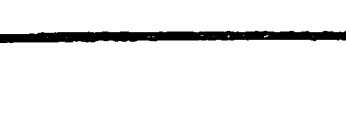
WATER NAVIGATION

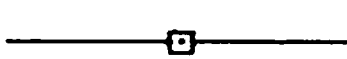
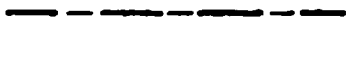
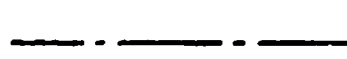
Beacons	Lighted Not Lighted	
Lighthouse		
Stream mileage		550
Direction of flow arrow		
Dredged channel		
Pile		
River gage		

STANDARD TOPOGRAPHIC SYMBOLS

BOUNDARIES, LINES AND MARKS

Latitude and longitude lines	
Meridian line .. (Appropriately Designated)	
State line	
County line	
Reservation line	
Conflicting boundary	
Township and range lines	
Section or survey line	
Projected section line	
Land-grant line	
Engineer District or Division line	
Cemetery, small park, etc.	
Meander line	
Old bank line	
Precise bench mark: (Elevation .. only)	
Bench mark. .. (Elevation .. only)	
Triangulation point or traverse station	
Same as above with elevation	
Any located station or object (with explanatory note)	
Boundary monument	
Section numbers	
Survey numbers	
Levee station and mile post markers	

	Curb-Sidewalk and Street Lines, Lot-lines and No's. in combination.
	Buildings, to scale. Classify, if possible.
	Bridge, Overpass, Underpass (all scales) Classify if possible.
	Steam & Electric Railways (Single track) Gage to scale.
	Retaining Wall - to scale.
	Rip Rap - (Rock paving)
	Poles { Light & Power } Show Teleph. - Teleg. { Poles only }
	Underground.
	Transmission Towers - to scale
	Manholes { Sanitary Sewer } { Other Types }
	Catch Basins.
	Hydrants, Fire or Water
	Levees - Plan View (Crown & Toes to scale)
	Flood control fences. Plot width to scale.
	Dams & Conc. Structures. Actual Plan View - to scale.
	4" W. (Name of Co) Water Main
	2" G. (Name of Co) Gas Main
	10" S. Storm Sewer
	10" SS Sanitary Sewer
	6" O. (Name of Co) Oil Pipe Line

	R/W Line & Post
	City Boundary
	Section Line
	Interior - Section Line
	Located Section Corner
	Triangulation Station
	B.M. (Name or No) Bench Mark
	(ELEV.)
	Traverse Line
	Traverse Line Point
	Center Line (Where needed)
	Trees (all kinds)
	Brush & Small Shrubs

ABBREVIATIONS

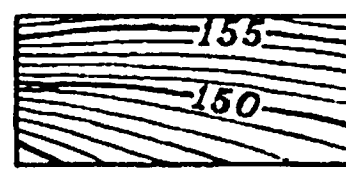
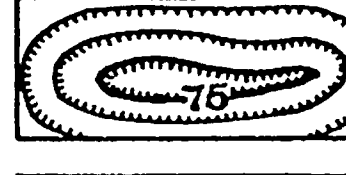
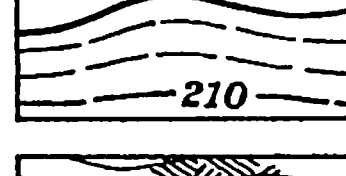
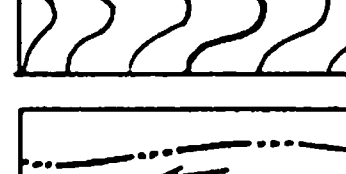
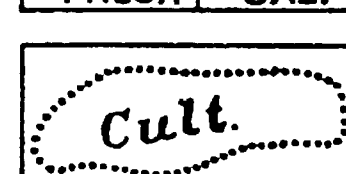
Fd.	Found
N.&T.	Nail & Tin
I.P.	Iron Pipe
F.C.	Flood Control
1-Fr.	1-Story Frame
1-Br.	1-Story Brick
1-St.	1-Story Stone
1-So.	1-Story Stucco
T.L.P.	Traverse Line Point
L.&T.	Lead & Tack

Match Line

MATCH LINE FOR SHEET 20.



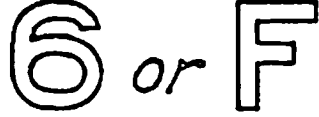
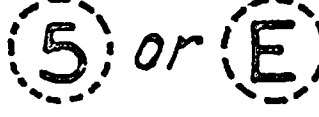
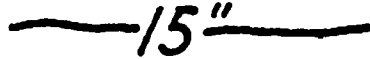
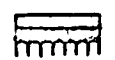
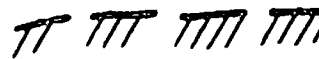
Direction Arrow for Drainage.

	Contours in general. Every 5 TH heavy, regardless of interval.
	Depression Contours.
	Water Surface & Sub-surface contours. Water Surface dashed when intermittent pond.
	Rock Outcrop
	Dry Wash (Indicated by contours)
	Dry Wash not contoured.
	Intermittent Pond, not sounded.
	Marsh
	Cultivated Area. (Not fenced)

LOS ANGELES COUNTY FLOOD CONTROL
**SPECIAL SYMBOLS FOR
 LARGE - SCALE MAPS**
 TO BE USED IN THE
 LOS ANGELES ENGR. DISTRICT
 IN 1 SHEET JULY 1937

U.S. ENGINEER OFFICE
 LOS ANGELES, CALIFORNIA.

LEGEND FOR PRELIMINARY EXAMINATIONS AND SURVEY REPORTS. (LARGE AREA MAPS)

	Boundary of.....drainage basin.		Average.....precipitation in inches at location shown.
	Boundary of basin subdivision.		
	Basin subdivision.	19.3"	Maximum.....precipitation in inches at location shown.
	Adjacent basin subdivision.		
	Existing channel improvement.		isohyetal lines (Precipitation in inches).
	Existing storm drain.		
(†) 	Existing reservoir.		Stream gaging station and number (Non-recording).
	Existing dam (Not classified).		
	Existing flood control, irrigation or water supply dam.		Stream gaging station and number (Recording).
	Existing hydro-electric dam.		Stream gaging stations (Discontinued).
	Existing weir.		Mile above mouth of river.
	Existing diversion dam.		Cultivated land.
	Existing debris basin.		Arable land.
	Existing spreading grounds.		Irrigated area.
	Boundary of area subject to overflow.		Irrigable area.
	Boundary of overflow area.		State highway.
	Precipitation station and number (Non-recording).		U.S. highway.
	Precipitation station and number (Recording)		
	Precipitation stations (Discontinued)		

(†) Use applicable dam symbol when known.

LEGEND FOR IMPROVEMENTS DESIRED, RECOMMENDED OR CONSIDERED.
(LARGE AREA MAPS)

 or  or  *Project number of improvement
desired by.....county.*

 or  *Channel improvement.*

 *Storm drain.*

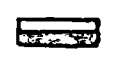
(†)  *Reservoir*

 *Dam site. (Not classified).*

 *Flood control, irrigation, or water
supply dam site.*

 *Hydro-electric dam site.*

 *Weir.*

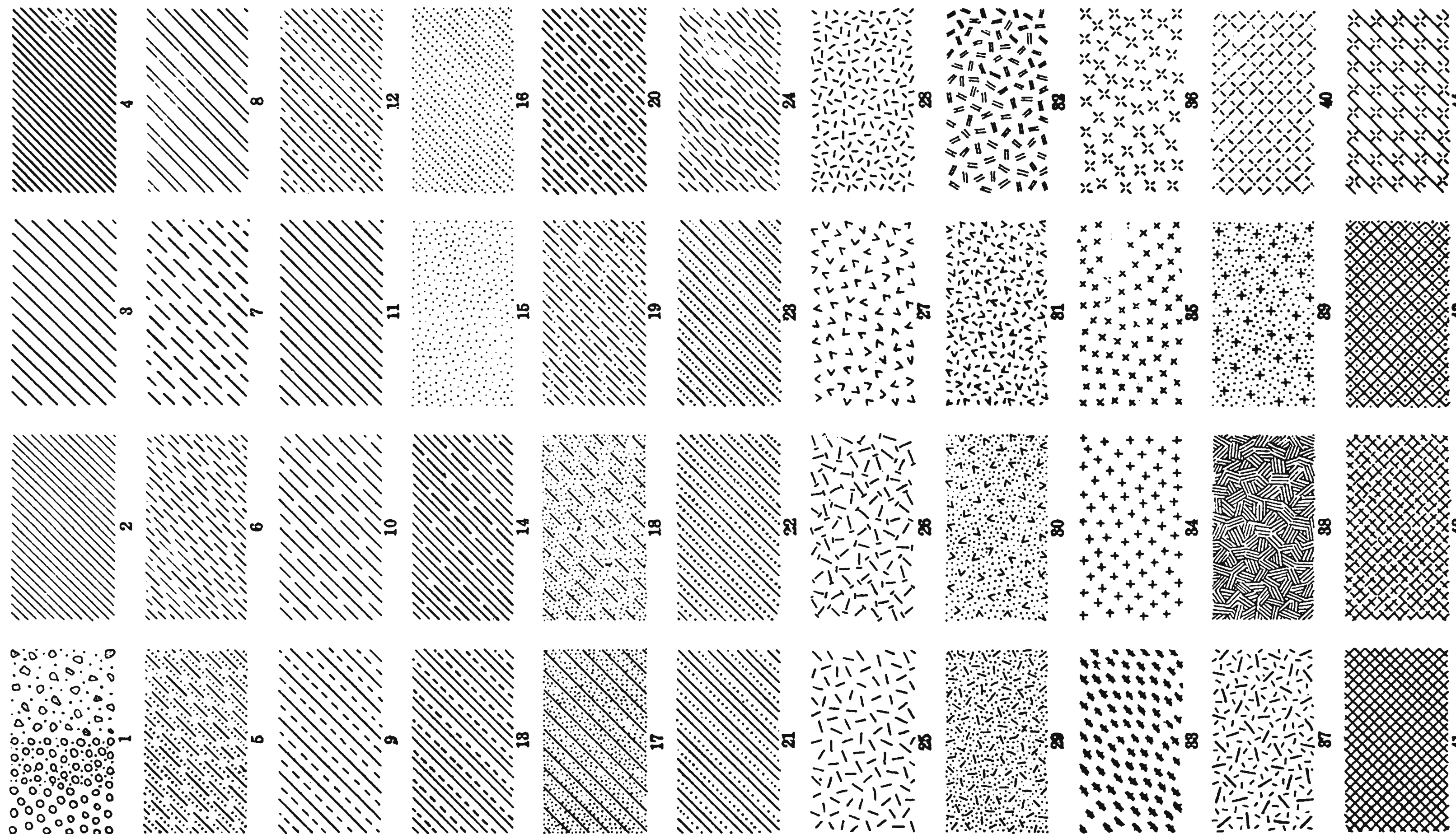
 *Diversion dam.*

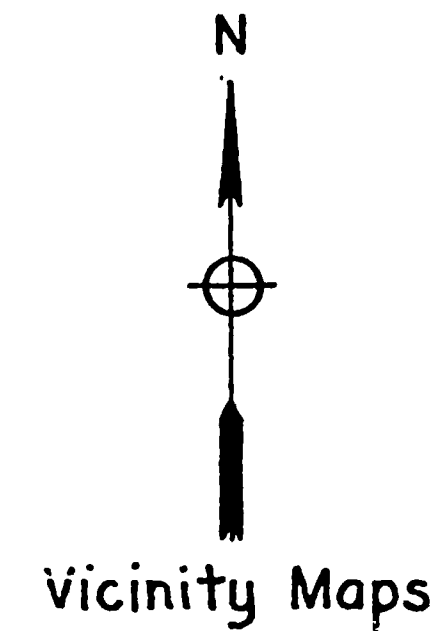
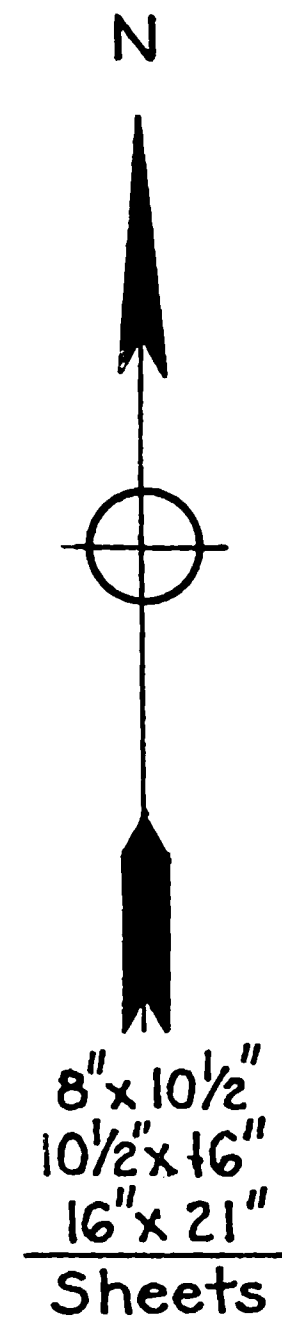
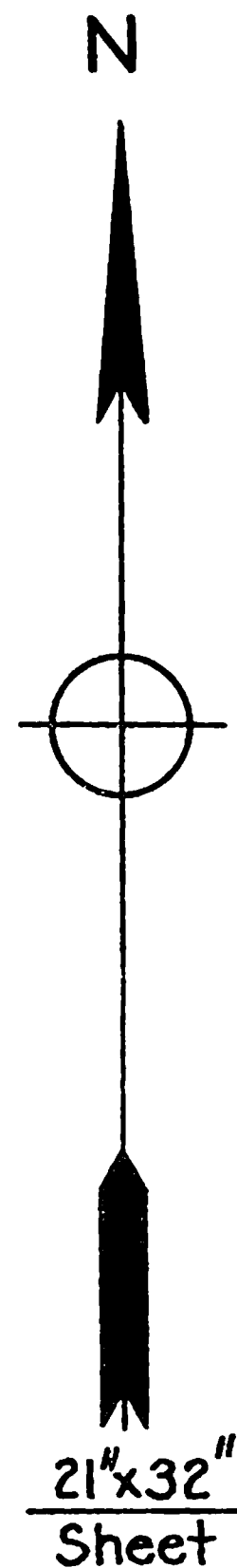
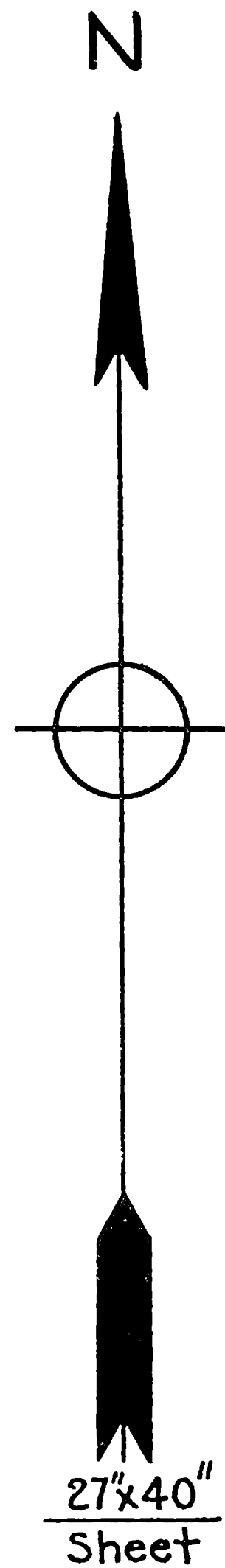
 or  *Debris basin.*

 *Spreading grounds.*

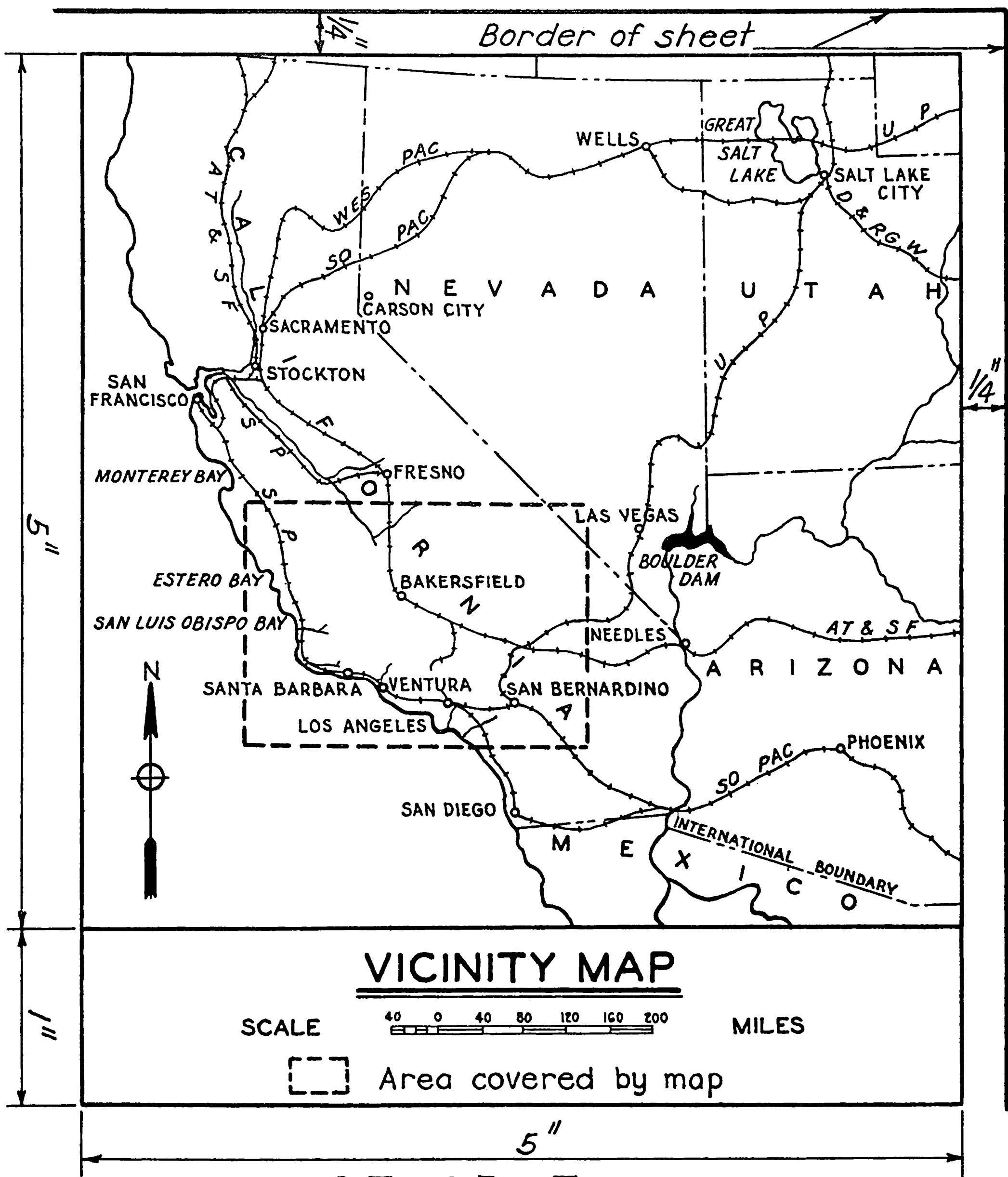
(†) *Use applicable dam symbol when known.*

PATTERNS USED TO SHOW DISTINCTIONS BETWEEN
AREAS ON BLACK AND WHITE MAPS
CONTRASTS MAY BE INCREASED BY VARYING THE DIRECTION
AND SPACING OF LINES





LOS ANGELES COUNTY FLOOD CONTROL
STANDARD NORTH ARROW
 TO BE USED IN THE
 LOS ANGELES ENGR. DISTRICT
 IN 1 SHEET SEPT. 1936
 U.S. ENGINEER OFFICE
 LOS ANGELES, CALIFORNIA.



Note:
Orientation of vicinity
map to be identical to
drawing.
Size illustrated shall
be used for all types
of drawing.

ERASING

Draftsmen should erase in such a manner whereby the least possible evidence of erasure remains, even when several erasures are made, one over the other.

The object of erasing is not merely to remove part of a drawing, but to remove it in such a manner that other lines and figures may be placed in the same spot without having the change apparent on the reproduced print.

Erase willingly. It is seldom possible to obtain the most feasible design without first drafting the work to scale. It is only after the work has been drafted that the designer is able to correct the weak points. Often the only indication of friction between the draftsman and his superior arises because he objects to erasing. To argue over erasing is usually futile and a waste of time. Therefore, objectives will generally be accomplished earlier and with fewer hurt feelings if the draftsman will erase willingly.

The secret of erasing on cloth is to rub lightly and slowly, with such frequent rests that the cloth will not become heated. If the cloth is heated the erasure removes the transparent preparation, making the cloth opaque. The surface cannot be restored for further inking, and the opaque spot shows black on the reproduced black and white print.

Either an "ink eraser" or a "pencil eraser" may be used. The former is more effective but should be used carefully to prevent injury to the tracing. Where the ink is heavy, it may be removed with an ink eraser (Ruby or India) and the remainder with a pencil eraser (Pink Pearl). When the eraser becomes soiled or clogged it should be cleaned by rubbing on clean rough paper. To protect the surrounding parts of a tracing an erasing shield should be used. Artgum should be used in place of gasoline or carbon tetrachloride to clean pencil markings and smudges from tracings.

To resurface the cloth where an erasure has been made use a clean piece of soap-stone or a smooth rounded piece of celluloid and rub the erased area until the cloth shines.

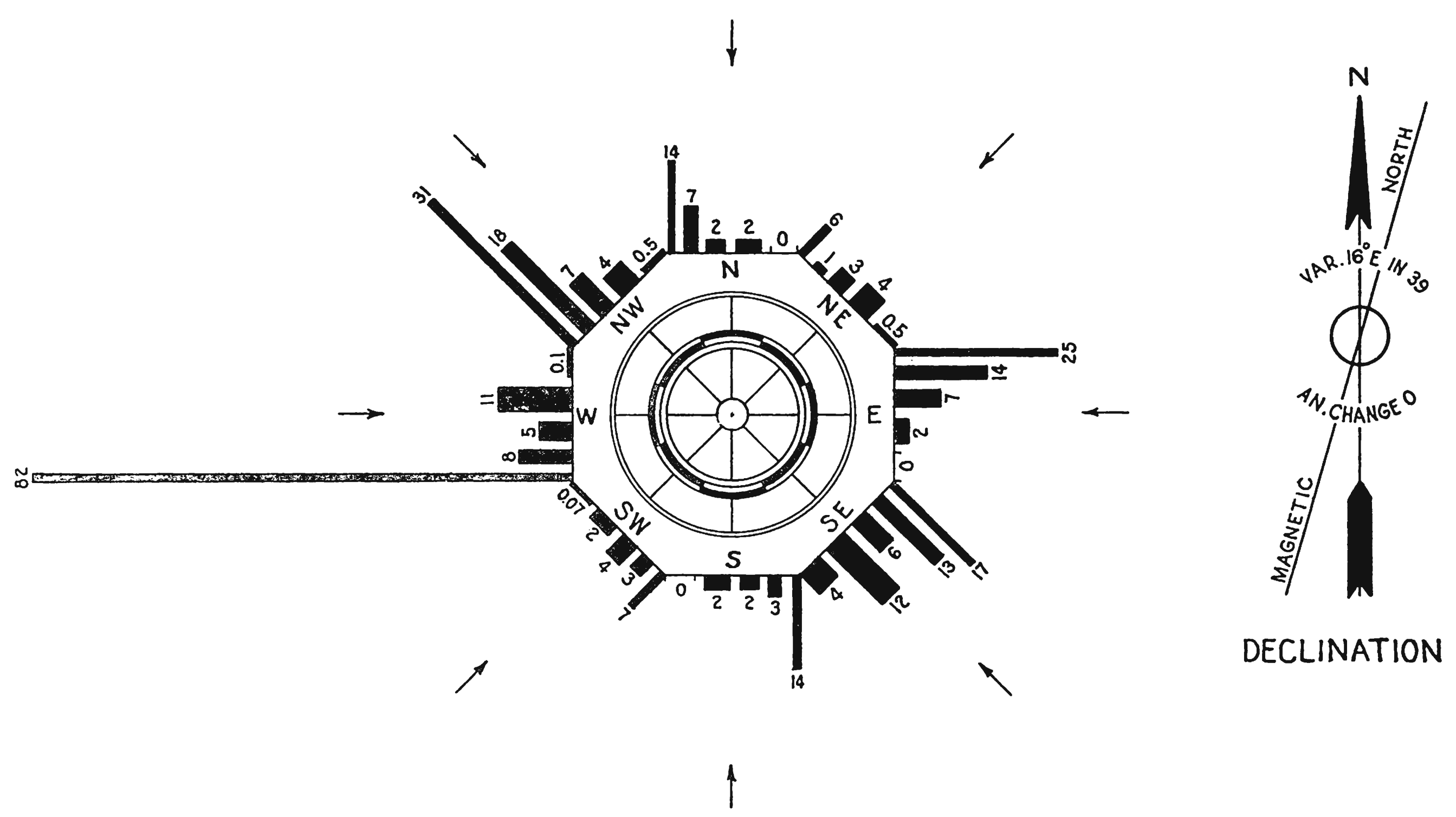
A special ink eradicator for tracing cloth is on the market but is not recommended.

Do not use a steel eraser or metal scratcher to remove ink from tracing cloth. The use of such erasers invariably removes the starch and raises linen fibers sufficiently to catch and spread the ink when writing over such an erased surface. The use of soap-stone will not restore transparency or smoothness once the starch has been removed.

After erasures have been made and the cloth has been polished, all lines and figures which have been erased by mistake should be replaced whether there is anything to be added or not. This point is frequently overlooked, especially if only a small portion of a line is erased, but it requires only a few such omissions to mar the appearance of a drawing. In order to prevent blurring or blotting, especially if the erased surface is not very smooth, the heavier lines should each be built up by making several fine lines until the desired width is obtained, no line being drawn until the preceding one is dry.

The electric erasing machine is the most efficient method of erasing, IF USED CORRECTLY. The tremendous speed at which the eraser revolves permits the cloth to be very easily burned when pressure is used. To overcome this hazard no physical effort should be applied. Speed, not pressure, makes the erasure. The eraser should barely contact the cloth and should be kept constantly moving. Do not attempt to remove all the ink at one time, go over it several times in order to keep the cloth from becoming heated. An erasing shield should be used in making all erasures as this keeps the eraser clean and protects other parts of the drawing. Do not permit the machine to become heated.

In removing ink from process tracings, do not use the electric erasing machine, metal scratcher or pen knife as these methods remove the process coating from the cloth, making it impossible to erase the second time. Use a pencil eraser (Pink Pearl) dipped in water and rub lightly until smeared, then wipe off with a clean piece of cloth while still moist. If necessary repeat this process until the tracing is completely clean.



WIND CHART

LEGEND		DURATION	VELOCITY
Light	0 to 10 M.P.H.		
Mod.	10 to 18 M.P.H.		
Fresh	18 to 24 M.P.H.		
Strong	24 to 38 M.P.H.		
Gale	38 to 55 M.P.H.		

DIRECTION & VELOCITY OF WINDS

Direction is indicated by arrows, velocity by width and accumulated duration by length of lines. Figures at end of lines indicate days of an average year.

SUSPENDED PRECISION PANTOGRAPH METHODS

Method of setting pantograph for ratios indicated on arms requires no explanation.

EXTRAORDINARY RATIOS

S and s = identical lines of original and reproduction.

L = Fo=do=ba = invariable length of bars, expressed in millimeters and measured between centers of joints. Note: Bar lengths for various pantographs = 600 mm, 720 mm, 840 mm, 960 mm.

Numeral directly above the 1/2 graduation = 1/2 L expressed in centimeters.

M = Denominator of smaller ratio.*

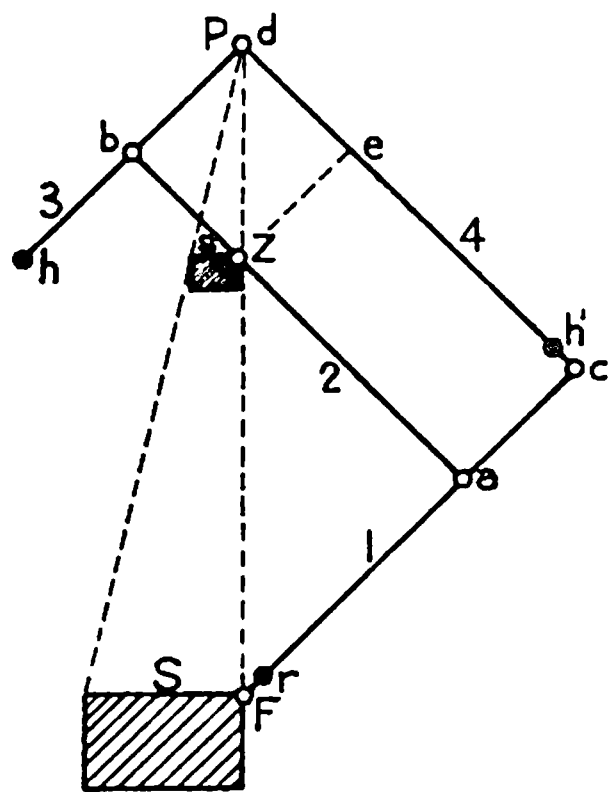
m = Denominator of larger ratio.*

* Note that: Larger figure for denominator = smaller ratio;
Smaller figure for denominator = larger ratio.

Thus $\frac{m}{M}$ is always a genuine fraction.

X = required setting = eZ = Pb = bZ = ca

POLE AT END



$$X:L = \frac{1}{M} : \frac{1}{m}$$

or, $X = \frac{m}{M} \times L$ for reduction and enlargements (pencil and tracing pin interchangeable).

Example:

1" = 3 chains (1:2376) to be reproduced to 12" = 1 mile (1:5280).

L = 840; m = 2376; M = 5280

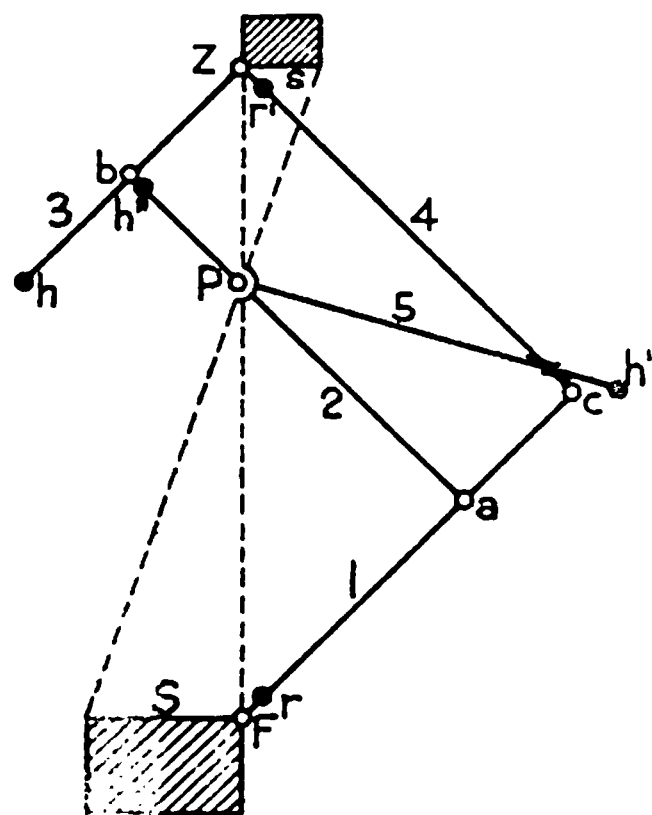
2376

$X = \frac{2376}{5280} \times 840 = 378$

Original under bar 1 at F

Copy under bar 2 at Z

POLE IN CENTER



$$X:(L-X) = \frac{1}{M} : \frac{1}{m} \text{ or,}$$

$X = \frac{m}{M+m} \times L$ for reduction, and

$X = \frac{M}{M+m} \times L$ for enlargements.

Note: With pole in center, pencil is always at Z and tracing pin at F (reductions and enlargements).

Example:

Enlarge 1:2500 to 1" = 2-1/2 chains (1:1980).

L = 840; m = 1980; M = 2500.

2500

$X = \frac{2500}{2500+1980} \times 840 = 468.75$

Reduce 1:1980 to 1:2500.

1980

$X = \frac{1980}{2500+1980} \times 840 = 371.25$

SHRINKAGE CORRECTION

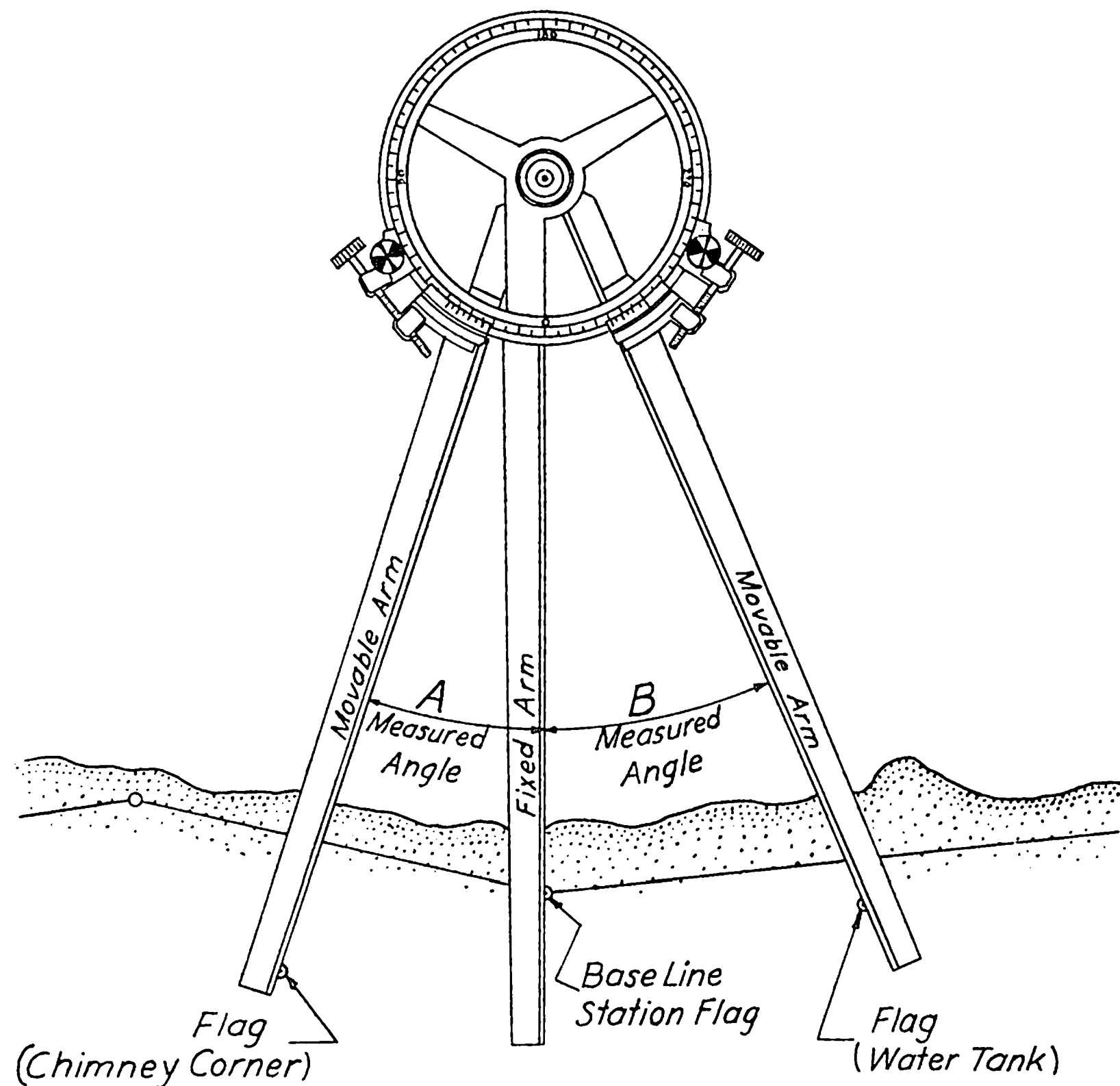
Frequently the accuracy of a reproduction will require consideration of shrinkage in the original.

In measuring a 600 ft. line on the original (1:1200), the length scales 5.95 in. instead of 6 in.

The correct scale of the shrunken drawing therefore is 1:(1200 x $\frac{6}{5.95}$) or, 1:1210.

If a reproduction at 1:2400 is desired, using 960 mm. pantograph arm, pole at end, the correct setting will be $1210 \times 960 = 484$.

2400



USE OF PROTRACTOR FOR PLOTTING
RANDOM SOUNDINGS

OPERATIONS

- (1) *Plot flags and baseline.*
- (2) *Set measured angle A and B from notes.*
- (3) *Move Protractor back and forth until all three arms coincide exactly by flags. Prick center of protractor head.*
- (4) *Pricker point is location of desired point.*

LOS ANGELES COUNTY FLOOD CONTROL
THE
THREE ARM PROTRACTOR

IN 1 SHEET

MAY 1939

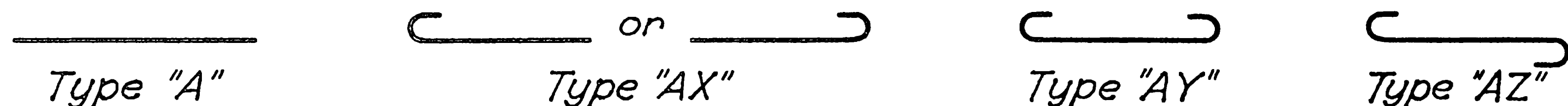
U.S. ENGINEER OFFICE
LOS ANGELES , CALIFORNIA

MARKING SYSTEM:

All bar marks shall be made up of a number which designates the diameter of the bar, one or two letters which indicate the type of bar, and a third set of numbers which complete the designation as explained below. Considering these factors in their natural sequence, we have:

1st - The Diameter Number: The diameter will be designated by a figure which is equal to the number of eighths across the section of the bar, i. e., a $\frac{5}{8}$ " diameter bar will carry the prefix number "5", while a $1\frac{1}{4}$ " diameter bar will have the prefix number "10".

2nd - The Type Letter: All bars having no bends (hooks are not considered as bends) shall be "A" bars. As a sub-division of this classification we have:



Bars having one bend shall be "B" bars, two bends "C" bars, etc., except closed hoops which will carry the letter "H". Curved and all special bars may be marked with any letter not ordinarily used. Examples of this marking are given in Table No. 1. A second letter may be used for sub-types if desired as shown.

3rd - Length or Sequence Number: The final portion of the bar mark is determined as follows:

(a) For Type "A" bars, the final part of the bar mark indicates the length of the bar in feet and inches, the last two numbers giving the inches. For example:

A $\frac{5}{8}$ " ϕ x 1'-11" bar is marked 5A111

A $\frac{3}{4}$ " ϕ x 11'-1" bar is marked 6A1101

(b) For sub-types "AX," "AY," and "AZ," the final portion of the bar mark indicates the out to out dimension of the bar. For example:



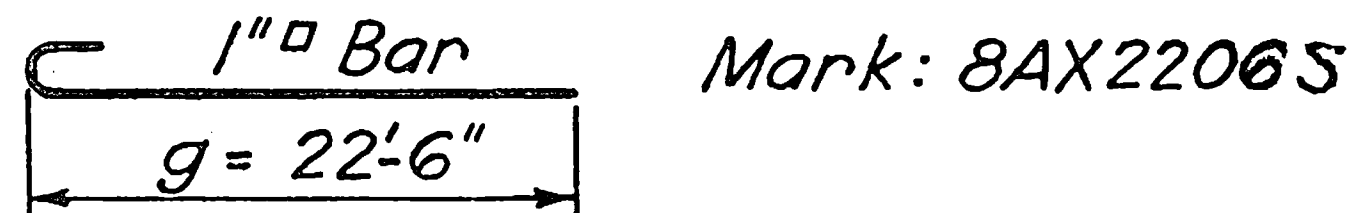
Mark: 7AX1009

(c) For all other types of bars, the final portion of the bar mark is a sequence number, i.e., each different bar of a given type is given a new number, as, for example:

4B107, 4B108, 4B109, 5BC13, etc.

SQUARE BARS

The preceding marking system is for round bars. Square bars shall be marked in the same manner, except that a capital "S" shall follow the mark. For example:



Mark: 8AX2206S

HOOKS & BENDS

Details of hooks and bends are given in Tables No. 2, 3 and 4.

TYPICAL EXAMPLES

The following examples will illustrate the bar marking system, and also indicate the dimensions to be given:

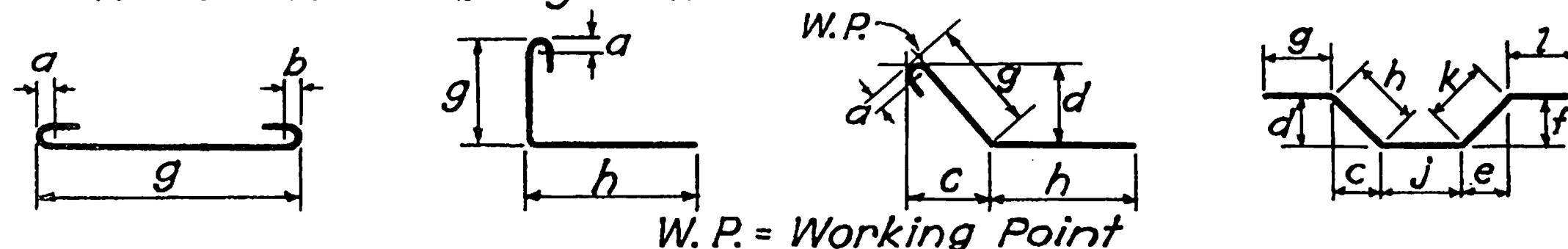
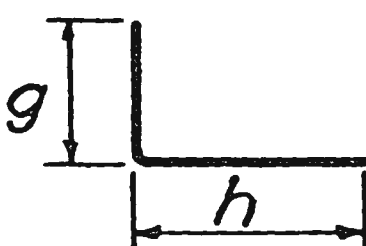
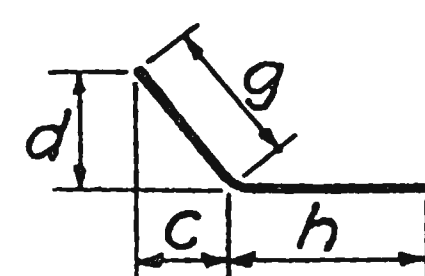
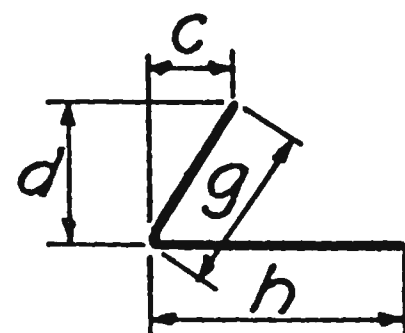
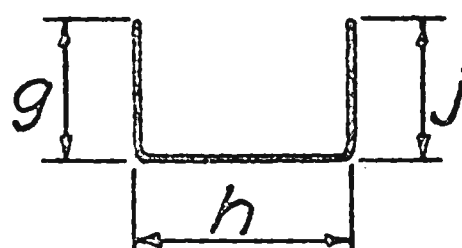
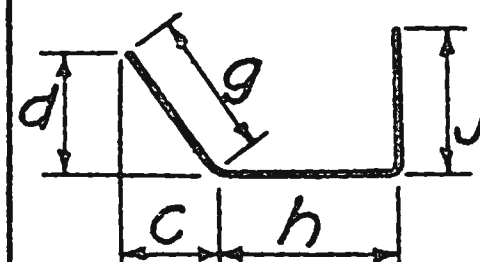
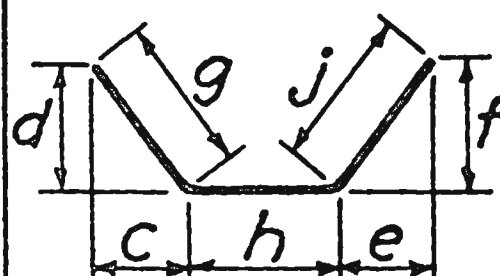
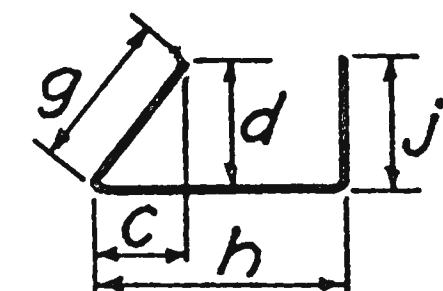
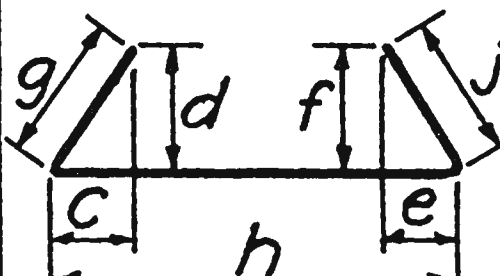
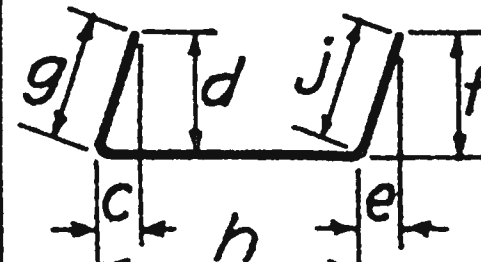
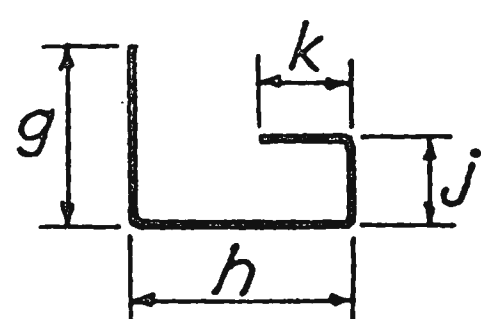
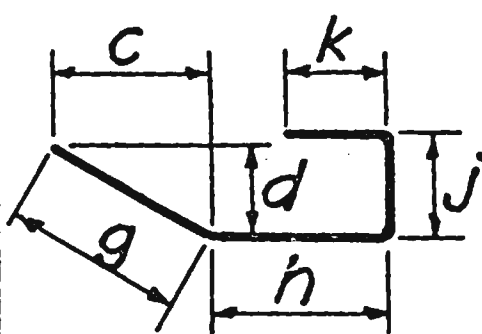
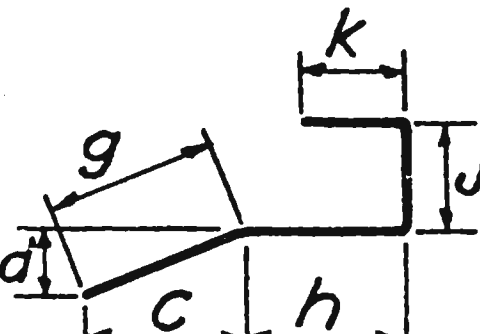
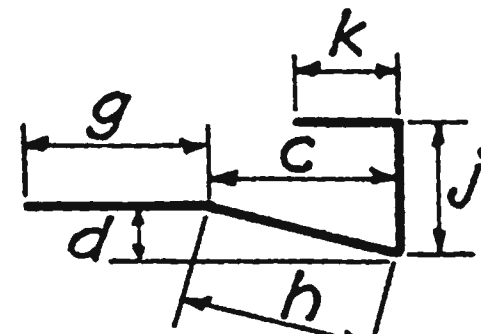
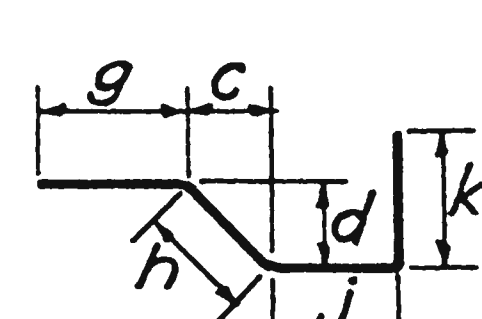
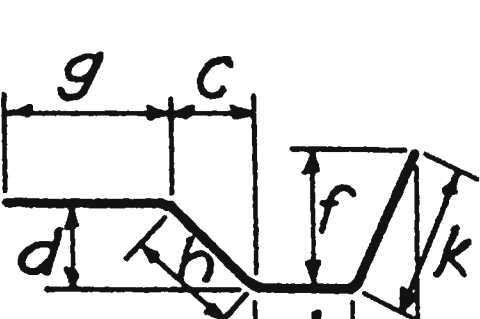


TABLE NO. 1

TYPE	PERMISSIBLE SUB-TYPES FOR SHAPE. HOOKS MAY BE ADDED WITHOUT AFFECTING TYPE OF BAR. LETTERS BELOW FIGURES DESIGNATE SUB-TYPES					
B						
	BA	BB	BC			
C						
	CA	CB	CC	CD	CE	CF
D						
	DA	DB	DC	DD	DE	DF

Other sub-types
may be added
as needed.

TABLE NO. 1 (CONTINUED)

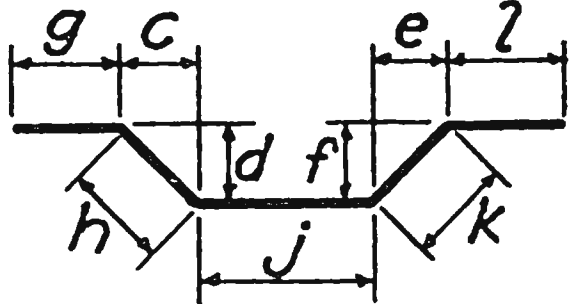
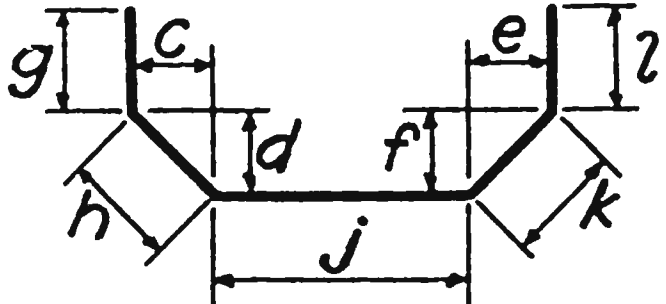
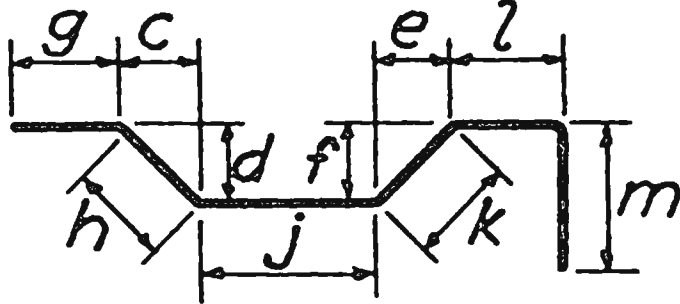
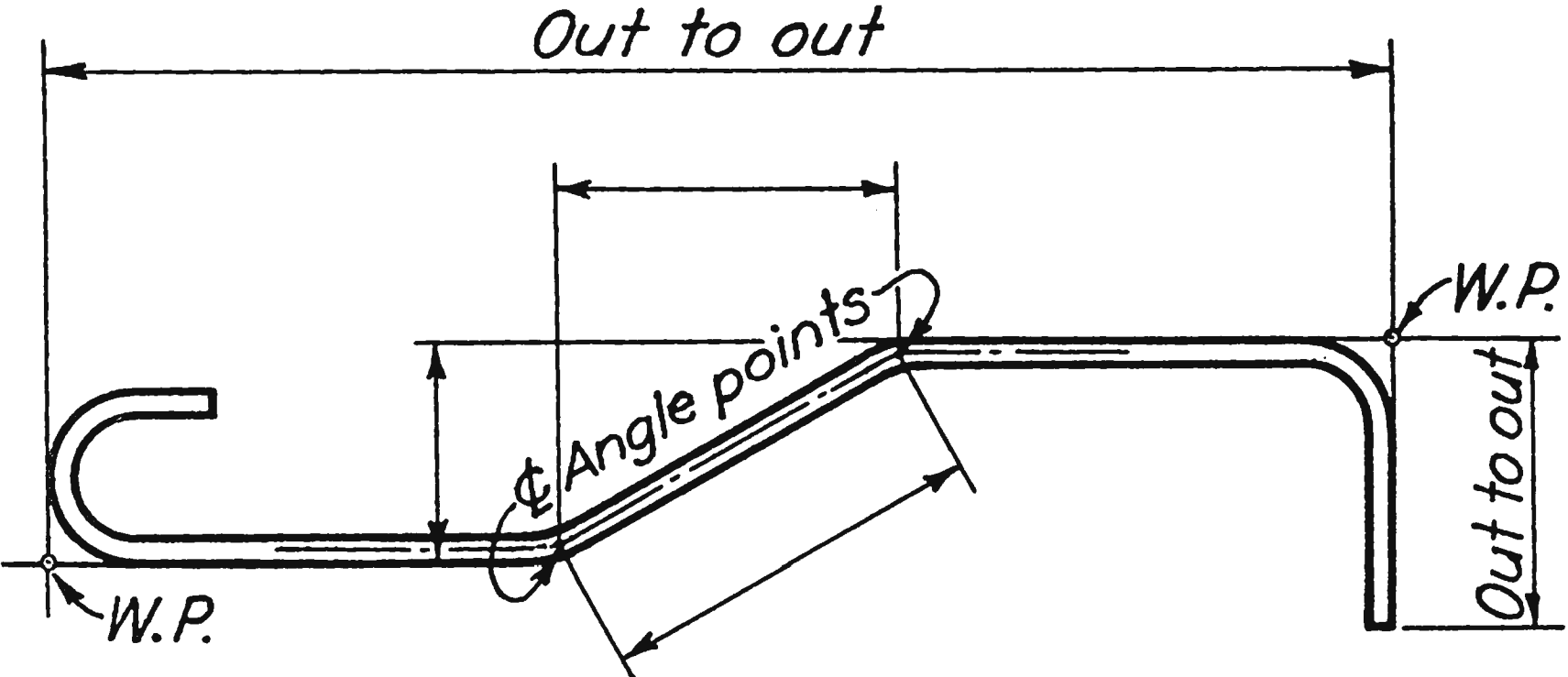
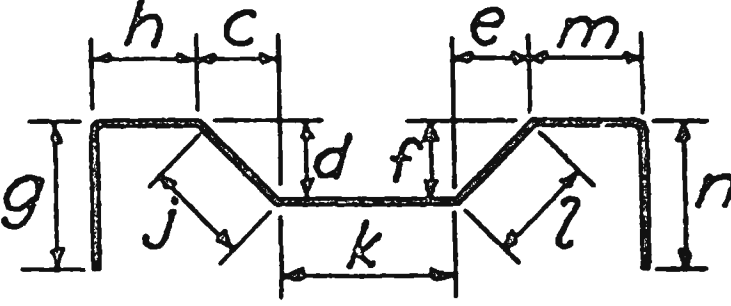
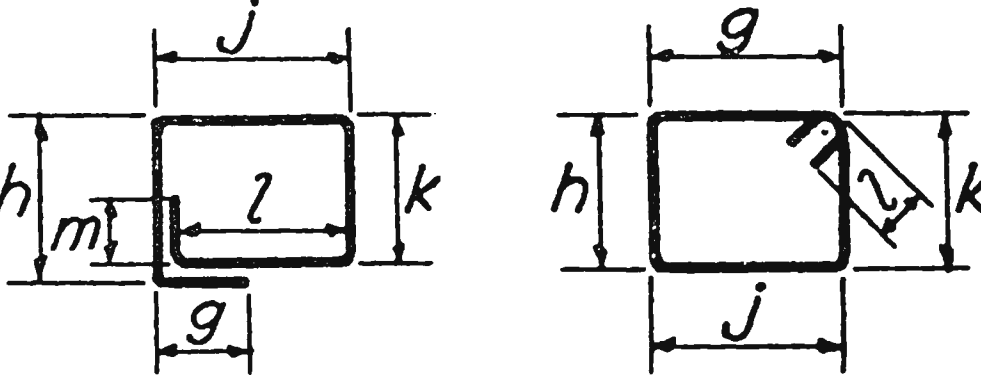
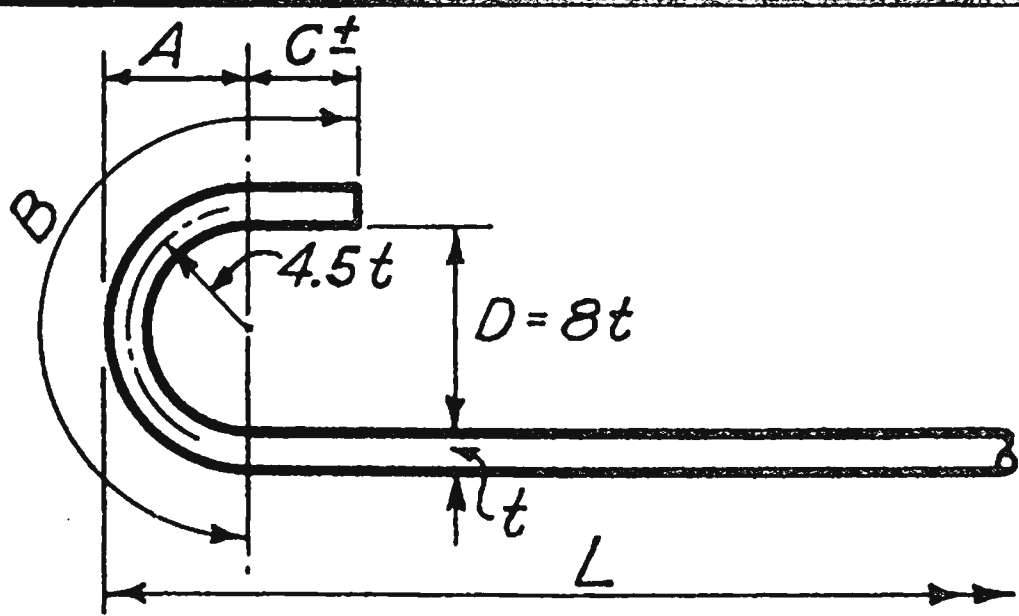
TYPE	PERMISSIBLE SUB-TYPES FOR SHAPE. HOOKS MAY BE ADDED WITHOUT AFFECTING TYPE OF BAR. LETTERS BELOW FIGURES DESIGNATE SUB-TYPES.		
E	 EA	 EB	
F	 FA	 <u>TYPICAL EXAMPLE OF DIMENSIONS</u> <i>All right angle bends and hooks as shown to be dimensioned to working point. All other bends to be dimensioned to center line angle points as indicated above.</i> W.P. = Working Point	
G	 GA		
H	 No Sub-Types		

TABLE NO. 2

DIMENSIONS FOR 180° HOOKS

Bar Size	A	B	C	D	B-A
3/8"	1 7/8"	8"	2 3/4"	3"	6"
1/2"	2 1/2"	10"	3"	4"	7 1/2"
5/8"	3 1/8"	1'-0"	3 1/4"	5"	9"
3/4"	3 3/4"	1'-2"	3 1/2"	6"	10 1/2"
7/8"	4 3/8"	1'-4"	3 3/4"	7"	11 1/2"
1"	5"	1'-6"	4"	8"	1'-1"
1 1/8"	5 5/8"	1'-8"	4 1/4"	9"	1'-2 1/2"
1 1/4"	6 1/4"	1'-10"	4 1/2"	10"	1'-4"



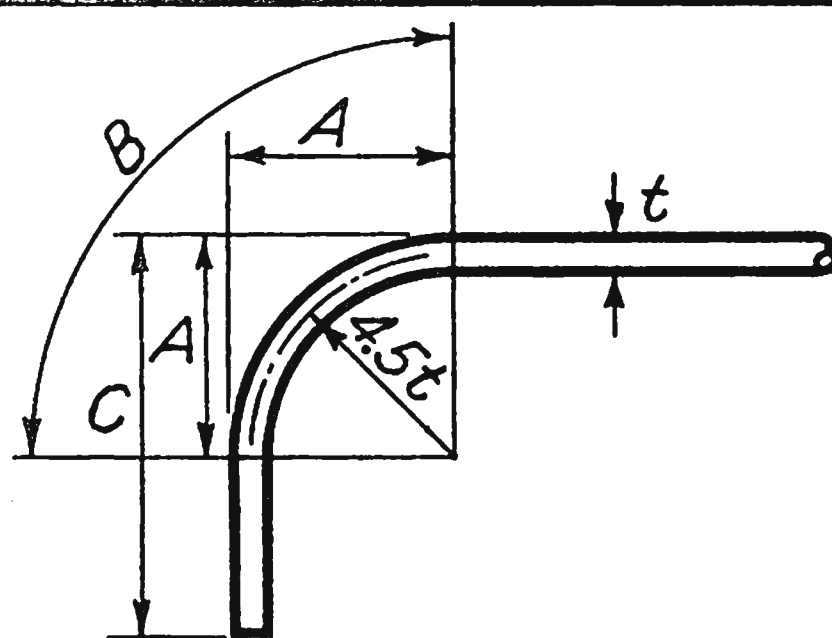
Note:

Add length B-A to L in figuring total length of bar.

TABLE NO. 3

DIMENSIONS FOR 90° BENDS

Bar Size	A	B	C	2A-B
3/8"	1 7/8"	3"	5 5/8"	1"
1/2"	2 1/2"	4"	5 1/2"	1"
5/8"	3 1/8"	4"	6 3/8"	2 1/2"
3/4"	3 3/4"	5"	7 1/4"	2 1/2"
7/8"	4 3/8"	6"	8 1/8"	3"
1"	5"	7"	9"	3"
1 1/8"	5 5/8"	8"	9 1/8"	3 1/2"
1 1/4"	6 1/4"	9"	10 3/4"	3 1/2"



Total length of bar to be given to nearest 3 inches. Take up odd inches in hook detail.

No deduction for stretch for these bends.

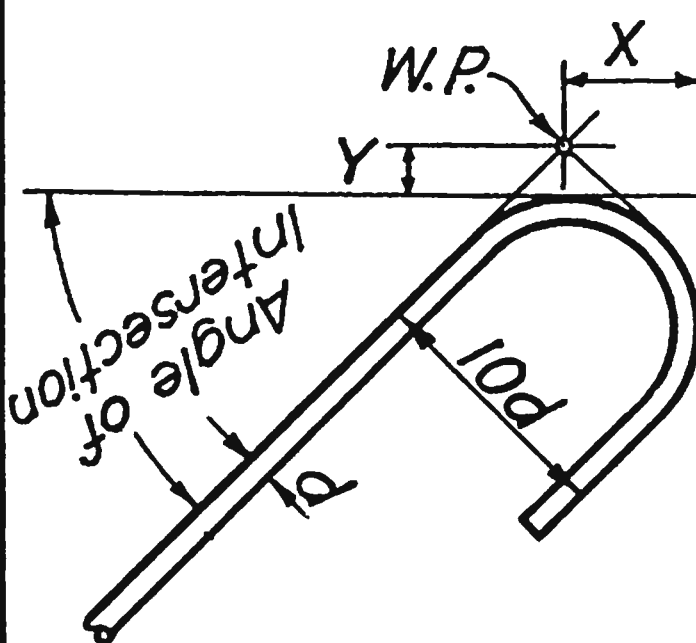
Dimensions B-A and 2A-B are to the nearest half inch.

TABLE NO. 4

OFFSET DIMENSIONS AT ENDS OF HOOKED BARS

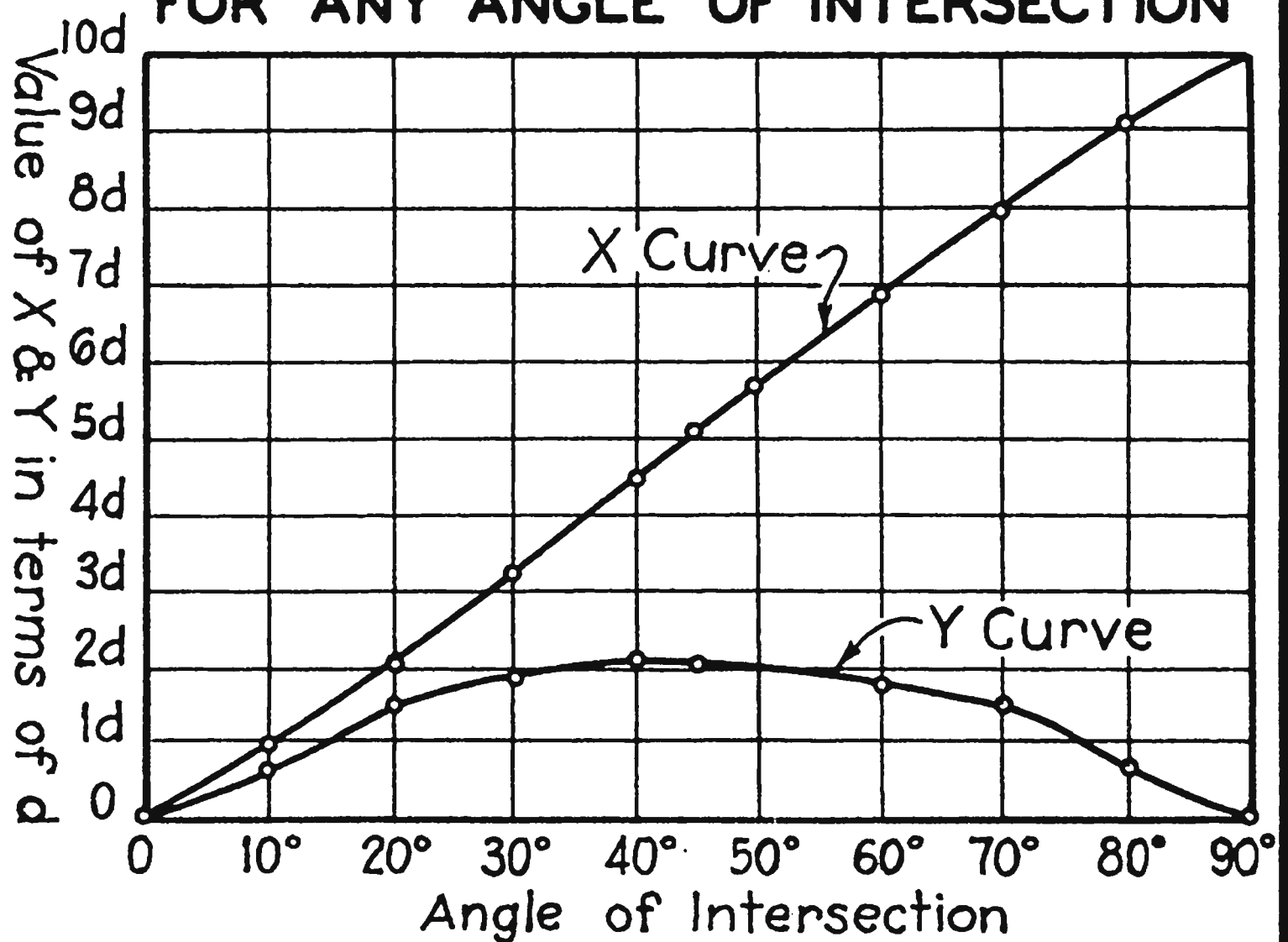
Size of Bar (d)	30° Angle of Intersection		45° Angle of Intersection		60° Angle of Intersection	
	X	Y	X	Y	X	Y
3/8"	1 1/4"	3/4"	2"	3/4"	2 1/2"	3/4"
1/2"	1 1/2"	1"	2 1/2"	1"	3 1/2"	1"
5/8"	2"	1 1/4"	3 1/4"	1 1/4"	4 1/4"	1 1/4"
3/4"	2 1/2"	1 1/2"	3 3/4"	1 1/2"	5 1/4"	1 1/2"
7/8"	2 3/4"	1 1/2"	4 1/2"	1 3/4"	6"	1 1/2"
1"	3 1/4"	1 3/4"	5"	2"	6 3/4"	1 3/4"
1 1/8"	3 1/2"	2"	5 3/4"	2 1/4"	7 3/4"	2"
1 1/4"	4"	2 1/4"	6 1/4"	2 1/2"	8 1/2"	2 1/4"
1 1/2"	4 3/4"	2 3/4"	7 1/2"	3"	10 1/4"	2 3/4"
2"	6 1/4"	3 3/4"	10"	4 1/4"	11 1/4"	3 3/4"

Dimension to this line, -
not to working point.

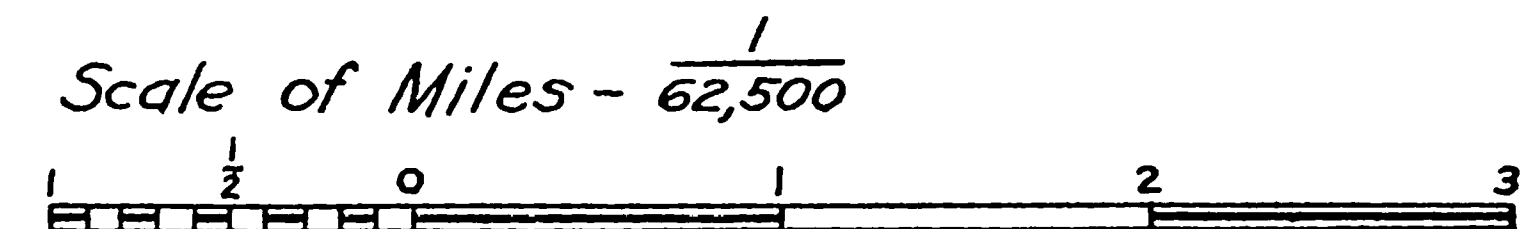
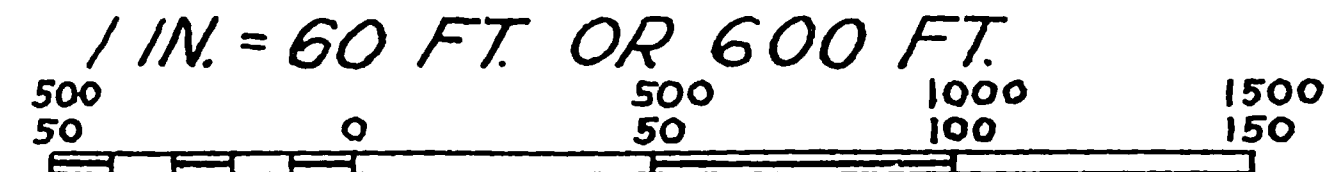
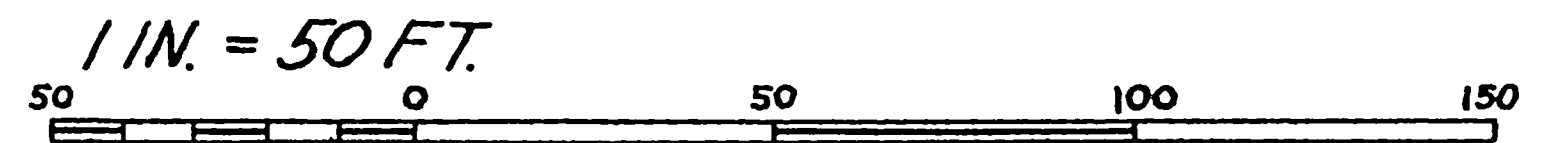
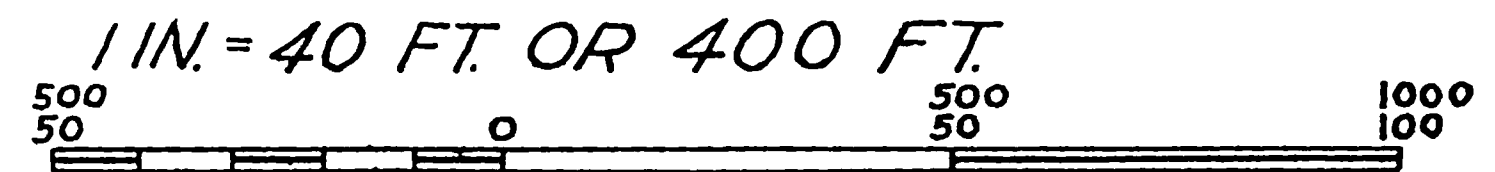
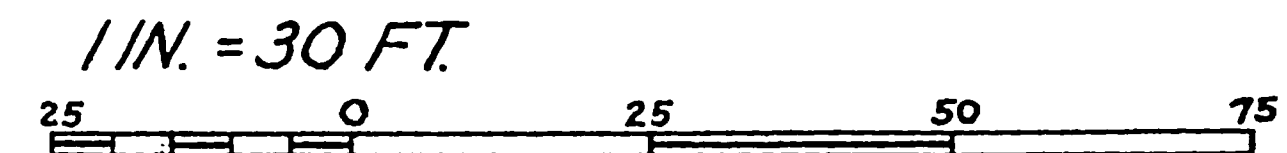
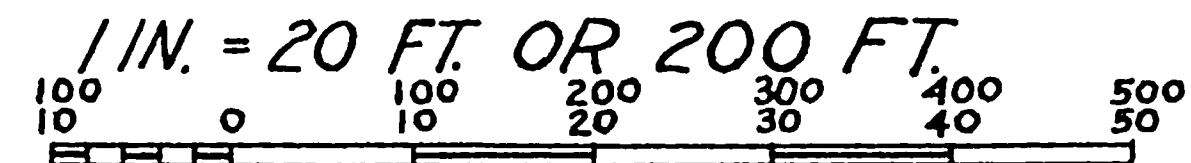
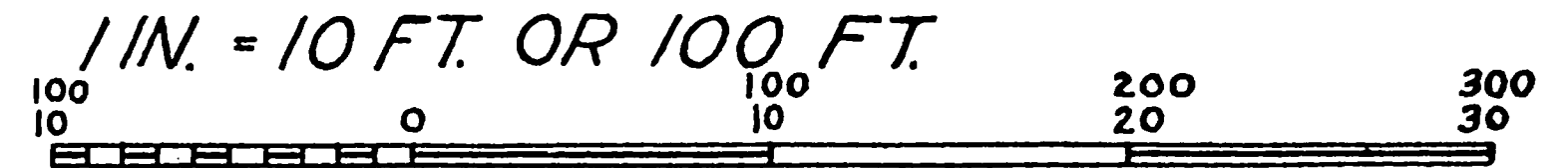
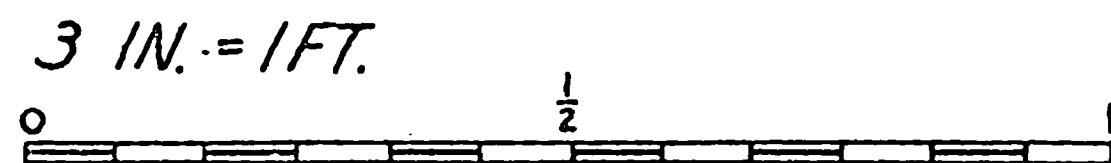
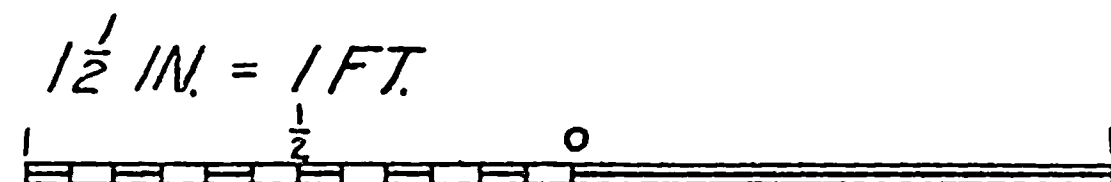
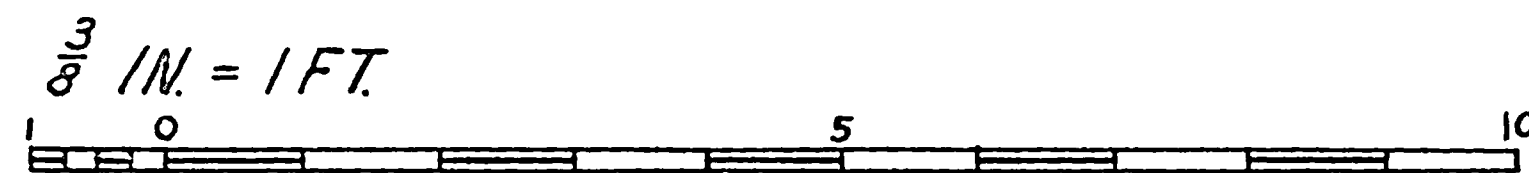
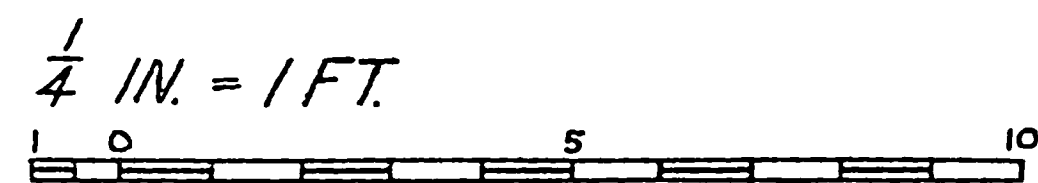
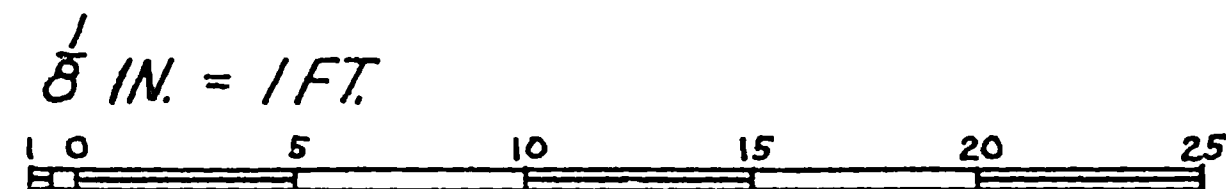
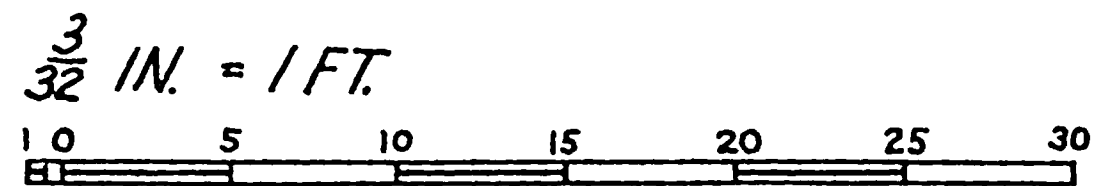


Dimension to this line,
not to working point.

FOR ANY ANGLE OF INTERSECTION



W.P. = Working Point



L.A. COUNTY FLOOD CONTROL

GRAPHIC SCALES

TO BE USED IN THE

LOS ANGELES ENGR. DISTRICT

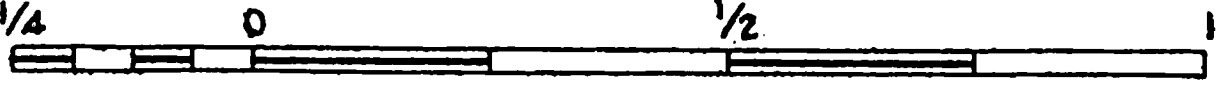
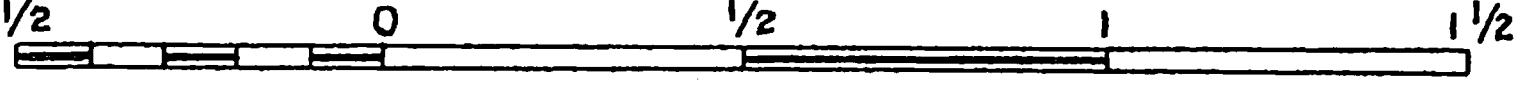
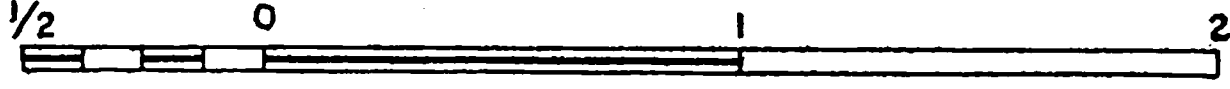
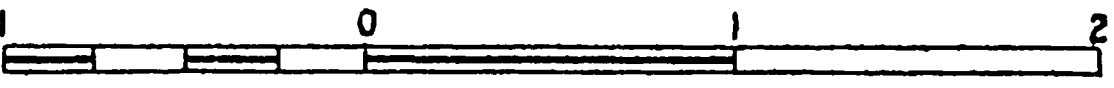
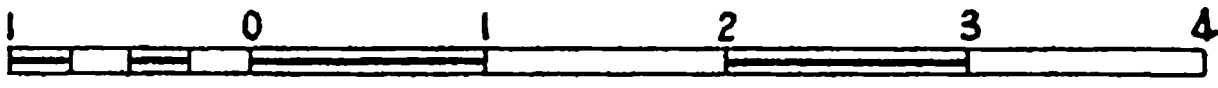
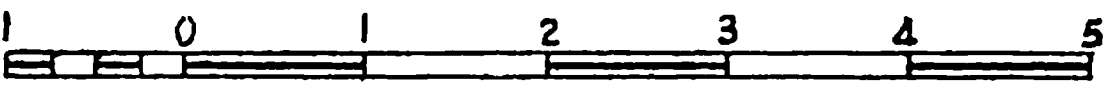
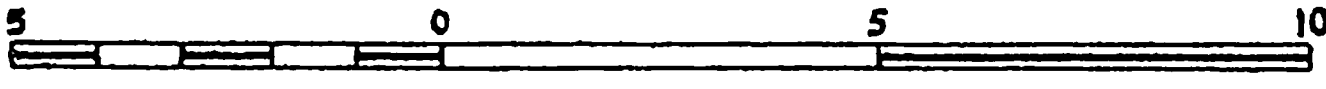
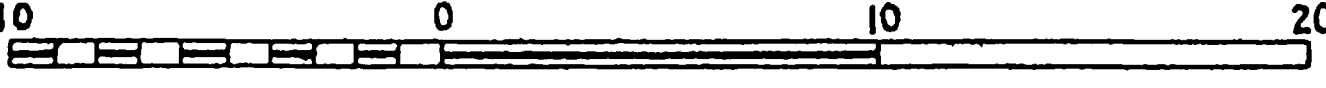
IN 1 SHEET NOVEMBER, 1939

U.S. ENGINEER OFFICE

LOS ANGELES, CALIFORNIA

WAR DEPARTMENT

CORPS OF ENGINEERS, U.S. ARMY

1:12 000	GRAPHIC SCALE		MILES	5 IN.= APPROX. 1 MI.
1:24 000	GRAPHIC SCALE		MILES	2 IN.= APPROX. 3/4 MI.
1:31 680	GRAPHIC SCALE		MILES	1 IN. = 1/2 MI.
1:48 000	GRAPHIC SCALE		MILES	1 IN.= APPROX. 3/4 MI.
1:62 500	GRAPHIC SCALE		MILES	1 IN.= APPROX. 1 MI.
1:96 000	GRAPHIC SCALE		MILES	2 IN.= APPROX. 3 MI.
1:125 000	GRAPHIC SCALE		MILES	1 IN.= APPROX. 2 MI.
1:250 000	GRAPHIC SCALE		MILES	1 IN.= APPROX. 4 MI.
1:500 000	GRAPHIC SCALE		MILES	1 IN.= APPROX. 8 MI.

WAR DEPARTMENT

CORPS OF ENGINEERS, U.S. ARMY

1:1 000	GRAPHIC SCALE		FEET	1 IN.= 83.33 FT.
1:2 000	GRAPHIC SCALE		FEET	1 IN.= 166.66 FT.
1:3 000	GRAPHIC SCALE		FEET	1 IN.= 250 FT.
1:5 000	GRAPHIC SCALE		FEET	1 IN.= 416.66 FT.
1:6 000	GRAPHIC SCALE		FEET	1 IN.= 500 FT.
1:8 000	GRAPHIC SCALE		FEET	1 IN.= 666.66 FT.
1:10 000	GRAPHIC SCALE		FEET	1 IN.= 833.33 FT.
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