COMPARISON BETWEEN REG. DWGS. & COUNTY DWGS.

COUNTY OF SAN DIEGO
CALIFORNIA
COUNTY ENGINEER DEPARTMENT

Rev. 2/11/74

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Drainage

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✓ 102-1	Cleanout, Storm Drain, Types A, B, C, D, & E – CONCENTRIC RINGS DWG. DELETED
D-8 107-2	Catch Basin, Type D
? D-3 108-1	Curb Inlet, Type H
D-13, D-14, D-15 111-4T	Frame and Grates for Drainage Structures
D-34 118-1	Headwalls & Endwalls Types U & Wing
? D-16, D-17 122	Drop Inlet, Type C
D-22, D-23 124-1	Tapered Inlet and Down Drain Flume - Asphalt Concrete Spillway
D-24 125-1	Entrance Taper and Down Drain Pipe
D-30, D-31 126-1	Straight Headwall, Single & Double
D-36, D-37 127-1	L Type Headwall
D-40 128-1	Channel or Pipe Outlet Rock Slope Protection - Protection and Flow Interruption
D-39 129-2	Inlet Apron, Type A for Culverts up to 42" Diameter
✓ 130-1	Inlet, Culvert - Flared OBSOLETE ✓
✓ 140-1	Standard Single Box Culverts
✓ 141-1	Standard Double Box Culverts
✓ 142-1	Standard Triple Box Culverts
✓ 143-1	Standard Box Culvert Miscellaneous Details
✓ 144-1	Standard Culvert Headwalls & Endwalls, Types A, B. & C
✓ 145-1	Standard Culvert Headwalls & Endwalls, Types D & E
✓ 146-1	Standard Reinforced Concrete Warped Wing - Headwalls & Endwalls
✓ 147-1	Standard Construction Loads on Culverts DESIGN AID ✓

Add from State
D80-2
D81-2
D82-2
D83-4
D84-3
D86-A.1
D86-B.1

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✓	180-1	Safe Overfills for R.C.P. or C.M.P. DESIGN AID
✓	181-1	Safe Overfills for Field Assembled Plate Pipe DESIGN AID
D-32, D-33	D-1	Headwall, Gravity Type
D-11	D-4	Notes & Details, Inlet & Cleanouts
D-1	D-5	Curb Inlet - Type A
D-2	D-6	Curb Inlet - Type B
D-3	D-7	Curb Inlet - Type C
D-61	D-9	Rounded Pipe Ends
D-9, D-10	D-11	Storm Drain Cleanout - Type A
D-63	D-12	Concrete Lug
D-62	D-14	Pipe Collar
D-7	D-15	Inlets, Type I & J
M-2	D-18	Inlet Frame & Cover
D-26	D-20	Standard Drainage Outlet (For Sidewalk Area)
D-35	D-24	Headwall, Wing & U-Type (For 42" to 84" Pipes)
D-16, D-17	D-25	Spillway Inlets & Underdrain, Type A, B, & C
D-38	D-28	Curtain Wall
✓	D-34	Curb Inlet - Type G ✓ Dropped?
D-25	D-35	Curb Outlet
D-70, D-71	D-40	Drainage Channel
✓	D-61	Trash Fence ✓ Dropped Not necessary
M-1	M-23	Manhole Frame & Cover (22")
M-3	M-54	Manhole Frame and Two Concentric Covers (36")
S-9	S-27	Concrete Anchor

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Number		Description
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G-14	207-4T	Concrete Driveways
PARTIALLY D-75 ✓	208-1T	Grading of Slopes } CONTROVERSIAL
✓	209	Required Setbacks — Design Aid.
G-7	212-3T	P.C.C. Sidewalks
M-10	218-1	Street Survey Monuments
M-13	219-1	Survey Monuments Locations
✓	220-1	Excavation & Backfill - Culverts, Retaining Walls & Headwalls ✓
✓	221-1	Excavation & Backfill - Roadway, Wingwalls & Slope Protection ✓

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✓	222-1	Excavation & Backfill - Bridge Piers, Abutment & Adjoining Wingwalls
D-20	223-1	Standard Gutter Depressions for Type K, & K-1 Curb Inlets
D-20	224-1	Standard Gutter Depressions for Curb Inlets with Grate
G-8	225	Ramp for Curb, Gutter, & Sidewalk
G-4	226	Special Mountable Curb — Design Aid
✓	227	Asphalt Concrete Driveways — CONTROVERSIAL
✓	231 T	Lot Grading — Design Aid ck w/ LEWR
✓	232 T	Fencing Cut Banks — ck city's Design Aid?
G-21	G-11	Concrete Pavement-Alley Section (20' width, or less)
G-21	G-12	Concrete Pavement-Alley Section (20' to 40')
G-22	G-27	Cutoff Wall at End of Pavement
G-23	G-28	Cutoff Wall at End of Alley Pavement
G-13	G-32	Cross Gutter Type A
G-11	G-33	P.C.C. Curb, Gutter, Sidewalk & Pavement Removal & Replacement
G-12	G-35	Concrete Cross Gutter & Return Segment
G-17	G-39	Alley Apron
G-10	G-42	P.C.C. Joints for Pavement, Sidewalk, Curb, & Cross Gutter
G-9	G-43	Curbs & Gutters Typical Plans
G-1	G-44	6" & 8" Curb Sections & Gutter Section
G-2	G-45	Curb Sections - Types G & H
G-6	G-46	Curb Sections - Type B
G-4	G-57	Curb Section - Type "D" Roll Curb
M-9	T-9	Guard Post and Fence Assembly for Terminating Streets
M-7	T-15	Metal Beam Guard Rail Installation
M-8	T-16	Metal Beam Guard Rail Detail

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Location & Geometrics for Pavement, Sidewalks, Curbs, Driveways, Utilities, etc.

Number		Description
✓	300	Subdivision Improvement Plan Title Block DESIGN AID
✓	301-2	Street Sign CONTROVERSIAL ck w LEWR Non regional
G-9	302-1	Sidewalk Returns
✓	303-1	Median Islands — DESIGN AID ✓
✓	304-3	Turnaround & calculations — DESIGN AID ✓
G-16	305-3T	Driveway Location and Width Requirements

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G-15	306-1	Driveway Location Adjacent to Curb Returns
W-11	307	Fire Hydrant Location
✓	309 T	Trench Utilities Location – Add in Reg. Stds. ✓
✓	310-3	Typical Roadway Sections
✓	311-1	Hillside Residential Street Alternate 1
✓	312-1	Hillside Residential Street Alternate 2
✓	313-1	Hillside Residential Street Alternate 3
✓	314-1	Hillside Residential One-Way Street Alternate 4
✓	315-1	Temporary Hammerhead Turnaround at Dead-End Street
✓	316-1	Temporary Turnaround at Dead-End Street
✓	317-1	Temporary Hammerhead Turnaround at Dead-End Street Hillside Standard
✓	318	Construction Plan Symbols
✓	P-24	Utility Line Locations – CONTROVERSIAL ?

DESIGN AID ✓

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E-1	410 T;p. 1,2,3	Ornamental Street Light
✓	C-42	Cantilever Retaining Wall - Type 1A Elevation
✓	C-43	Cantilever Retaining Wall - Type 1A Sections
✓	C-44	Cantilever Retaining Wall - Type 2 Elevation & Section
✓	C-45	Cantilever Retaining Wall - Type 2 Construction Details
✓	C-46	Cantilever Retaining Wall - Type 3 Elevation & Section
✓	C-47	Cantilever Retaining Wall - Type 3 Construction Details
✓	C-48	Wing Wall Details for Cantilever Walls-Elevation
✓	C-49	Wing Wall Details for Cantilever Walls-Sections
✓	C-50	Counterfort Retaining Wall
✓	C-51	Counterfort Retaining Wall
✓	C-52	General Notes for Retaining Walls
C-8	C-53	Cantilevered Masonry Retaining Wall-Misc. Details
C-5	C-54	Cantilevered Masonry Retaining Wall-Type CM-5
C-6	C-55	Cantilevered Masonry Retaining Wall-Type CM-6 (sloping backfill)
C-9	C-56	Gravity Retaining Wall

Retaining Wall type 1

B3-1 ✓ type 1A B3-3

type 5 ?

B3-8 B3-9

Gen notes ? 4

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C-7	C-57	General Notes for Masonry Retaining Walls
C-1	C-58	Cantilevered Masonry Retaining Wall - Type LM-1
C-2	C-59	Cantilevered Masonry Retaining Wall - Type LM-2
C-3	C-60	Cantilevered Masonry Retaining Wall - Type LM-3
C-4	C-61	Cantilevered Masonry Retaining Wall - Type LM-4
✓	C-63	Cantilevered Retaining Wall - Type L-1
✓	C-64	Cantilevered Retaining Wall - Type L-2
✓	C-67	Cantilevered Retaining Wall - Type L-5
M-6	M-4	Chain Link Fence
M-5	M-5	Chain Link Fence

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Water Systems

Number		Description
I-1	700-T2	Shrubbery Sprinkler Heads Fixed Spray Type
I-2	701-T1	Lawn Sprinkler Heads Pop-up Rotary & Pop-up Spray Types
I-19	702-T2	Impact Sprinkler Head
I-5	703-T	Quick Coupling Valves
I-6	704-T	Garden Valves
I-13	705-T	Manual Valves
I-16	706-1T	Direct Burial Control Wire & Trench Detail
I-15	707-2T	Electrical Pull Box for Direct Burial Control Wires & Splice Detail
I-14	708-T1	Automatic Control Valve - Electric (angle valve)
✓	709-T1	Automatic Control Valve - Electric (globe valve) ✓comment
I-17	710-T	Electric Controller Clock Pedestal Mounting
I-18	711-T	Electric Controller Clock Wall Mounting
I-7	712-T	Atmospheric Vacuum Breaker (Type 1 Backflow Protection)
I-8	713-T	Continuous Pressure Vacuum Breaker Assembly (Type 11 Backflow Protection)
I-9	714-T1	Continuous Pressure Vacuum Breaker Assembly with Check Valves (Type 111 Backflow Protection)
I-10	715-T	Double Check Valve Assembly (Type IV Backflow Protection)
I-11	716-T1	Double Check Valve Assembly A.C. Pipe Service (Type IV, Backflow Protection)
✓	717-T	Pressure Relief Valve Installed with Quick Coupling Valve

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I-28	718-T	Connection Detail for New Asbestos Cement Water Mains
I-29	719-T	Connection Detail for Existing Water Mains
W-17	720-T	Concrete Thrust Blocks for Cast Iron Fittings
W-18	721-T	Concrete Thrust Blocks Bearing Areas

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Traffic Signals and Safety Lighting

For general information on traffic standards used by the County Engineer, refer to the following Department of Transportation (State of California) "Division of Highways" Standard Plans:

MAJORITY COVERED IN REGL. STDS.

ES-1A	Traffic	Signal	&	Highway	Lighting	Installations
ES-1B	"	"	"	"	"	"
ES-2A-10	"	"	"	"	"	"
ES-2B-6	"	"	"	"	"	"
ES-3A-6	"	"	"	"	"	"
ES-3B-18	"	"	"	"	"	"
ES-3C	"	"	"	"	"	"
ES-6B-2	"	"	"	Lighting	Standards	"
ES-6C-2	"	"	"	"	"	"

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AUG. 1972

COUNTY OF SAN DIEGO

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COUNTY ENGINEER DEPARTMENT

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103-1	Cleanout, Storm Drain, Types F, G, & H
104-2 R	Curb Inlet, Type K
105-2 R	Curb Inlet, Type K-1
106-1 R	Inlet, Type I & Type J
107-2	Catch Basin, Type D
108-1 R	Curb Inlet, Type H
109-1 R	Curb Inlet, Type G
110-	Lug, Concrete
111-3	Frame and Grates for Drainage Structures
112-1	Headwall, Gravity Type (for 18" culverts) and Curtain Walls
113-2	Headwall, Wing & U Types, for 42" and 84"
115-1 R	Curb Outlets
116	Drainage Channel
117-1 R	Frame & Cover, Cast Iron Manhole, 22"
118-1	Headwalls, Types U & Wing
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121	Spillway Inlet & Underdrain, Types A, B, & C
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129-2	Inlet Apron, Type A for Culverts up to 42" Diameter
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181-1	Safe Overfills for Field Assembled Plate Pipe

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203-1	Cutoff Wall at End of Pavement
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209	Required Setbacks
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211-1	Concrete Commercial Driveway
212-2	P.C.C. Sidewalks
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407-1	Traffic Signal & Safety Lighting Foundations - Types I & II
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602	Plant List for Cut and Fill Slopes, Coastal Inland Zone, 2 sheets
603	Plant List for Cut and Fill Slopes, Mountain Zone, 2 sheets
604	Plant List for Cut and Fill Slopes, Desert Zone 2 sheets
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Oct. 1971

COUNTY OF SAN DIEGO

CALIFORNIA

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J.E.B
2/74

THE FOLLOWING IS A LIST OF CHANGES TO THE INDEX

STANDARD DRAWINGS (REV. 8/6/74) AND

SUPPLEMENTAL STANDARD DRAWINGS (DRAWINGS ADOPTED FROM CITY OF S.D.):

No. of Old Std. Dwg	Change & Comments
111-1	Replaced By M-23; Removes Redundancy
208	Revised By 208-1T; Updates Notes, Provide Alternate Drains, & Removes Lot Grading
212-2	Revised By 212-3T; Updates Notes & Changes Dimensions
218	Revised By 218-1; Updates Notes
219	Revised By 219-1; Updates Notes
G-22, 23, 24	Replaced By 207-4T; Updates & Unifies Into one Standard Driveway Design.
303	Revised By 303-1; Replaces Circular Curbs By Parabolic Curbs
400 to 409-2	Deleted; Removes Outdated Dwgs & Replaced By Reference to State's Standard Plans.
600 to 608	Deleted; To Be Incorporated Into A Planting Manual

[redacted]

4 of old

Std. Dwg	Change		
700-T	Revised to	700-T2	?
701-T	"	701-T1	
702-T	"	702-T2	
707-T	"	707-T1	
708-T	"	708-T1	
709-T	"	709-T1	
714-T	"	714-T1	
715-T	"	715-T1	

New Standard Drawings that were added are:

Dwg. No.	Description
225	Ramp for Curb, Gutter & Sidewalk
231T	Lot Grading
232T	Fencing Cut Banks
309T	Joint Trench Utilities Location
410T; p. 1, 2, 3	Ornamental Street Lights

Adopted City Dwgs Revise Due to Errors or Inconsistencies with Co. Spec.

C-52, 57	Remove Sect. Refer.
D-4	Revised Note #11
D-7, 34	Add Note on Special Side Frame & Grate
D-20, 26, 32, 39, 43, 44, 45, 46, 67	Remove Refer. to Class "A" P.C.C.

COUNTY OF SAN DIEGO
CALIFORNIA

COUNTY ENGINEER DEPARTMENT

INDEX OF SUPPLEMENTAL STANDARD DRAWINGS

The standard drawings listed in this supplemental index, approved and adopted by the Board of Supervisors, are added to the San Diego County Engineer Department Standard Drawings. These drawings are reproductions of the City of San Diego Standard Drawings and will be used for items of construction on County roads and in County subdivision construction on streets and roads being constructed to County standards.

New County of San Diego Drawing Number (City of San Diego Drawing No.)		County of San Diego Drawing No. to be Deleted
	CONCRETE STRUCTURES	
C-42	Cantilever Retaining Wall - Type 1A Elevation	---
C-43	Cantilever Retaining Wall - Type 1A Sections	---
C-44	Cantilever Retaining Wall - Type 2 Elevation & Section	---
C-45	Cantilever Retaining Wall - Type 2 Construction Details	---
C-46	Cantilever Retaining Wall - Type 3 Elevation & Section	---
C-47	Cantilever Retaining Wall - Type 3 Construction Details	---
C-48	Wing Wall Details for Cantilever Walls-Elevation	---
C-49	Wing Wall Details for Cantilever Walls-Sections	---
C-50	Counterfort Retaining Wall	---
C-51	Counterfort Retaining Wall	---

New County of San Diego Drawing Number (City of San Diego Drawing No.)		County of San Diego Drawing No. to be deleted
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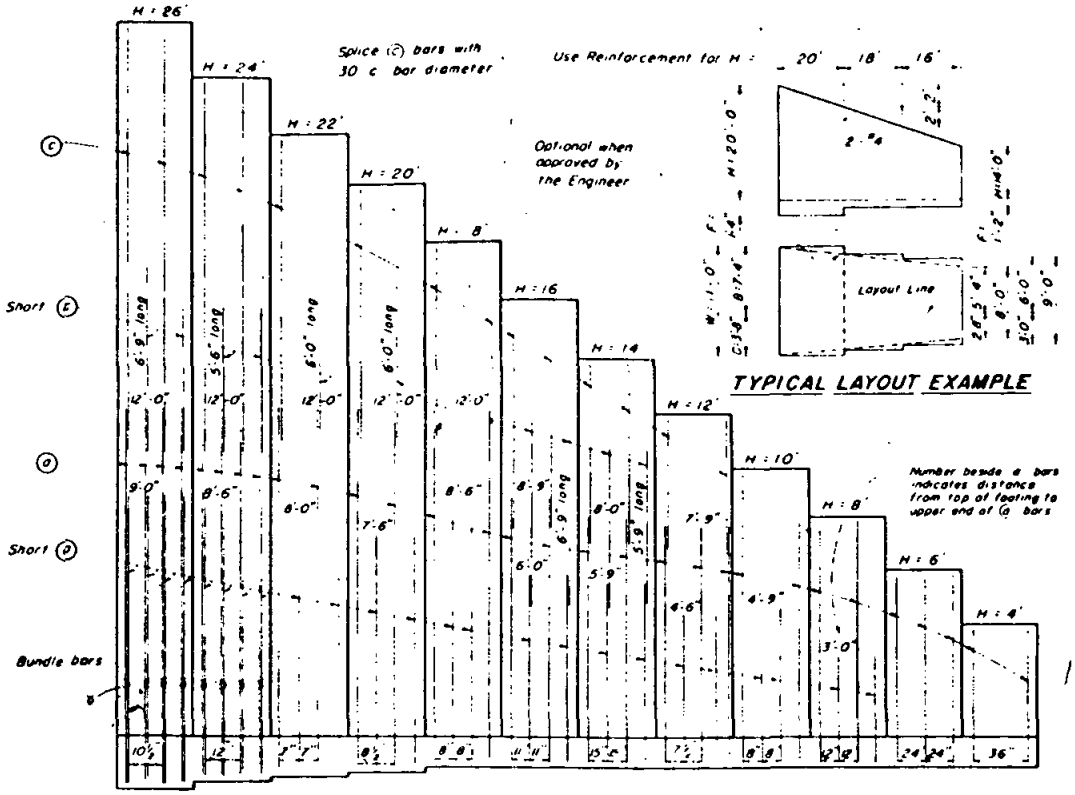
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/16/72

Note Bar cut-offs may be varied in increments of 6"

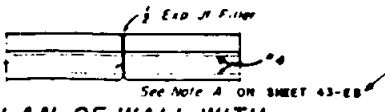


TYPICAL LAYOUT EXAMPLE

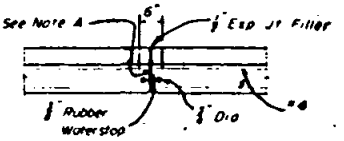
ELEVATION

TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

H	26'	24'	22'	20'	18'	16'	14'	12'	10'	8'	6'	4'
W	14'-3"	13'-3"	12'-0"	11'-0"	10'-0"	9'-0"	8'-0"	7'-2"	6'-2"	5'-2"	4'-2"	3'-2"
C	4'-9"	4'-5"	4'-0"	3'-8"	3'-4"	3'-0"	2'-8"	2'-4"	2'-0"	1'-8"	1'-4"	1'-0"
B	9'-6"	8'-10"	8'-0"	7'-4"	6'-8"	6'-0"	5'-4"	4'-10"	4'-2"	3'-6"	2'-10"	2'-2"
F Spread Ftg	1'-10"	1'-8"	1'-6"	1'-4"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"
E Concrete Pile	2'-1"	1'-11"	1'-9"	1'-7"	1'-5"	1'-5"	1'-5"	1'-5"	1'-5"	1'-5"	1'-5"	1'-5"
G Steel or Timber Pile	2'-4"	2'-2"	2'-0"	1'-10"	1'-8"	1'-8"	1'-8"	1'-8"	1'-8"	1'-8"	1'-8"	1'-8"
S	2'-4½"	2'-3"	2'-11"	1'-10"	1'-9"	1'-8"	1'-7"	1'-6"	1'-5"	1'-4"	1'-3"	1'-2"
© bars	#8 @ 10½	#8 @ 12	#7 @ 14	#7 @ 17	#6 @ 24	#5 @ 11	#5 @ 15	#5 @ 30				
(A) bars	#11 @ 10½	#11 @ 12	#11 @ 7	#11 @ 8½	#10 @ 8	#10 @ 11	#10 @ 15	#6 @ 7½	#5 @ 8	#5 @ 12	#5 @ 24	#5 @ 36
(D) bars	#10 @ 10½	#10 @ 12	#10 @ 7	#10 @ 8½	#9 @ 8	#9 @ 11	#9 @ 15	#5 @ 7½	#4 @ 8	#4 @ 12	#5 @ 24	#5 @ 36
(D) bars, number - size	2 - #7	2 - #7	4 - #7	4 - #7	4 - #7	6 - #7	6 - #7	6 - #7	6 - #7			
(E) bars, number - size	4 - #7	4 - #7	8 - #7	8 - #7	8 - #7	10 - #7	10 - #7	10 - #7	10 - #7	6 - #6	6 - #6	6 - #6
Toe Pressure PSF	5040	4640	4480	4000	3590	3290	2980	2640	2270	1930	1570	1240
Spread Conc CY/ft	7.18	6.31	5.21	4.50	3.85	3.38	2.95	2.43	2.02	1.63	1.26	0.89
Footing Steel lb/ft	393	328	309	233	177	123	90	56	47	28	20	14
Conc Conc CY/ft	7.34	6.44	5.31	4.58	3.90	3.41	2.95	2.52	2.08	1.67	1.28	0.88
pile ftg Steel lb/ft	413	348	339	262	205	160	126	92	82	39	31	24



PLAN OF WALL WITH EXPANSION JOINT ONLY

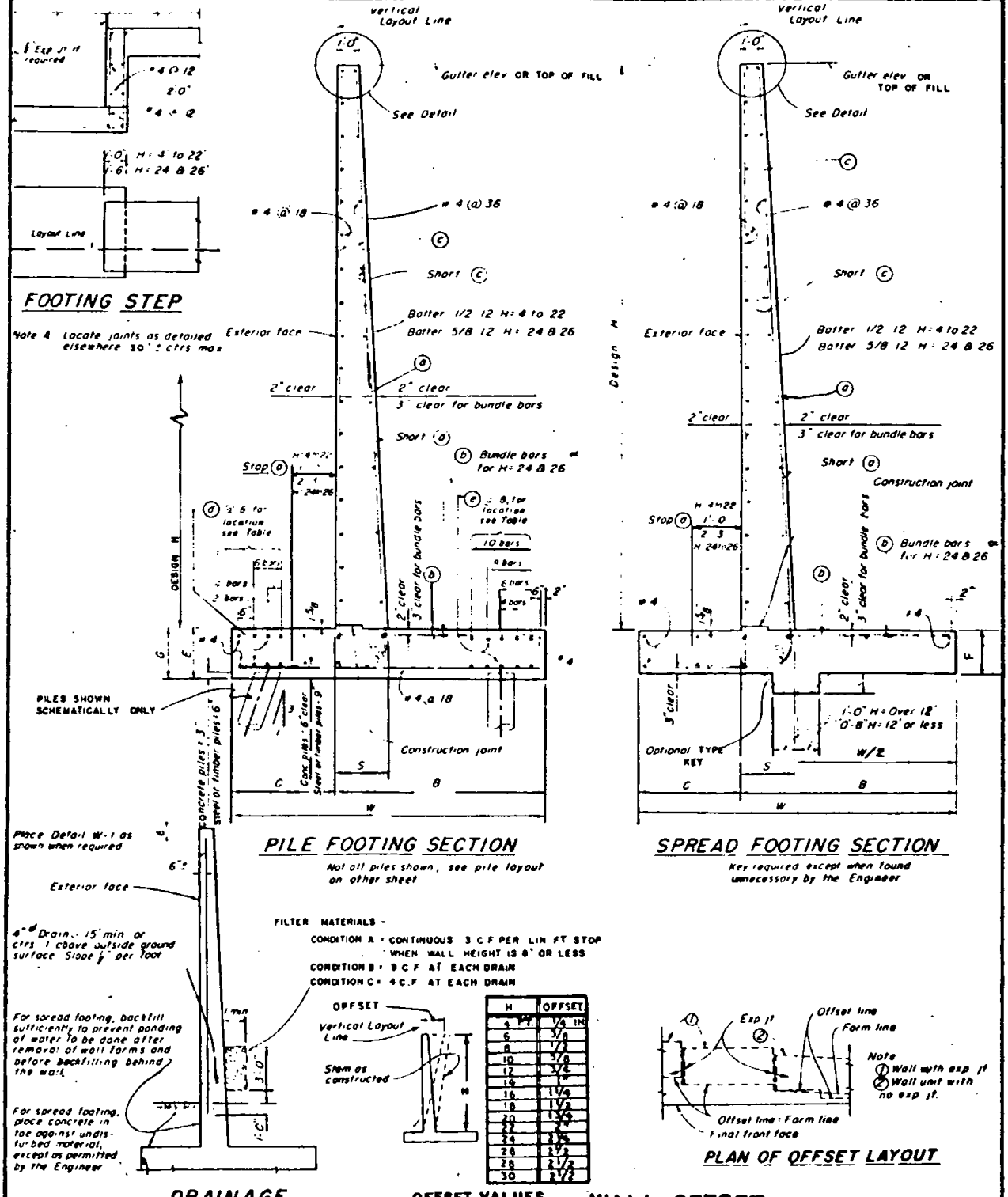


PLAN OF WALL WITH DETAIL W-1

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE NONE
	CANTILEVER RETAINING WALL	
	TYPE 1A ELEVATION	DRAWING NO.
	SEE SHEET C-52 FOR GENERAL NOTES	C-42
	SEE DWG. NO. C-43 FOR SECTIONS	

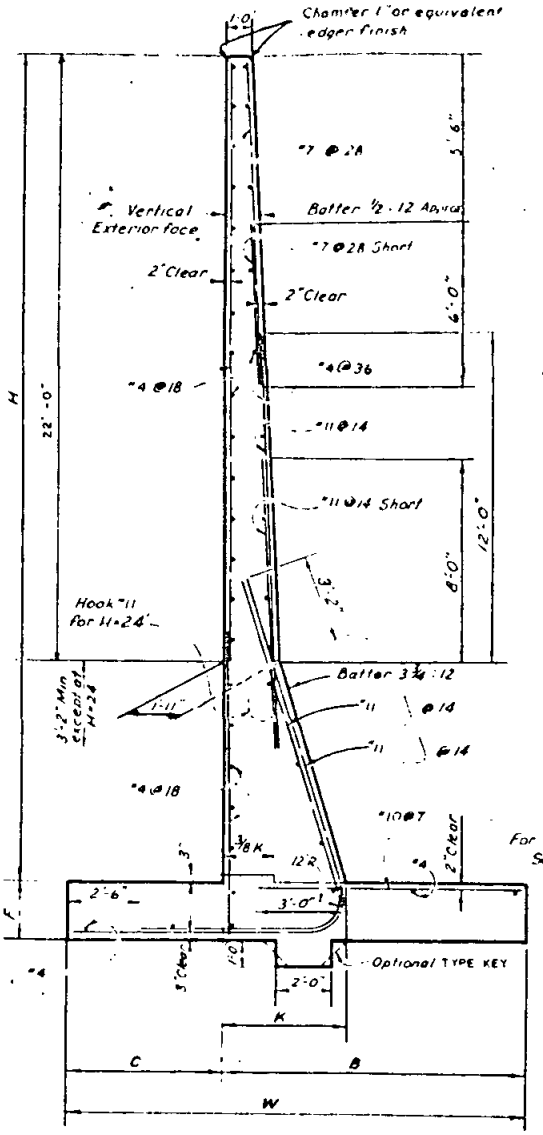
11-21-72

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	W. M. Taylor	6/1/82

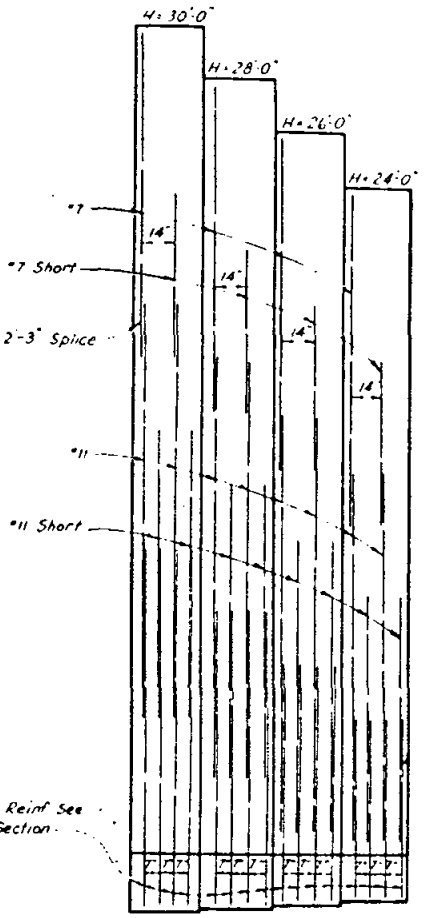


SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CANTILEVER RETAINING WALL	SCALE NONE
	TYPE IA SECTIONS	DRAWING NO.
	SEE DWG. NO. C-42 FOR ELEVATION	C-43
	SEE DWG. C-52 FOR GENERAL NOTES	

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11/10/72



SECTION

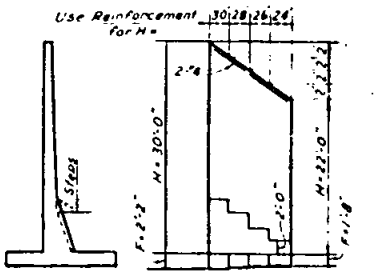


ELEVATION

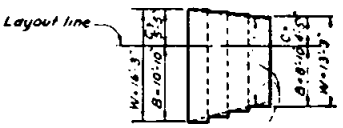
TABLE OF DATA AND REINFORCEMENT				
H	30'	28'	26'	24'
W	16'-3"	15'-3"	14'-3"	13'-3"
C	5'-5"	5'-1"	4'-9"	4'-5"
B	10'-10"	10'-2"	9'-6"	8'-10"
F	2'-2"	2'-0"	1'-10"	1'-8"
K	4'-5"	3'-9½"	3'-2"	2'-6½"
Conc Cf/Ft	947	817	704	607
Reinf Lbs/Ft	444	408	379	348
Toe Pres (1) lbs	5790	5440	5040	4650
H Comp lbs	20700	18360	15950	13730
V Comp lbs	48330	42440	36870	31750
e ft	2.56	2.43	2.25	2.08

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE NONE
	CANTILEVER RETAINING WALL	DRAWING NO.
	TYPE 2 ELEVATION & SECTION	C-44
	SEE DWG. NO. C-45 FOR CONSTRUCTION DETAILS	
	SEE SHEET C-52 FOR GENERAL NOTES	

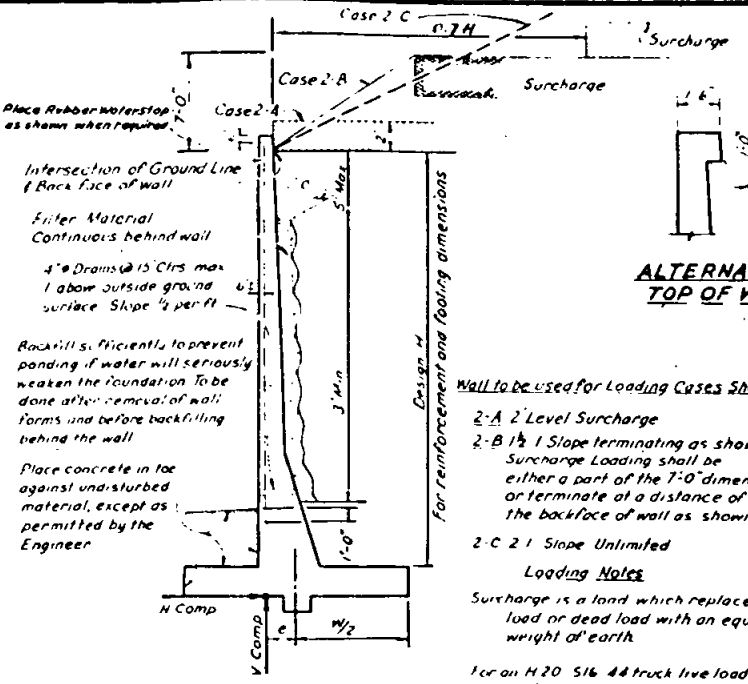
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11/10/72



Bar cut-offs may be varied in increments of 6".



Optional as determined by the Engineer



DESIGN AND DRAINAGE

ALTERNATIVE TOP OF WALL

Wall to be used for Loading Cases Shown

2-A 2' Level Surcharge

2-B 1½ : 1 Slope terminating as shown Surcharge Loading shall be either a part of the 7'-0" dimension or terminate at a distance of 0.7H from the backface of wall as shown

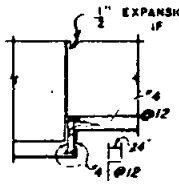
2-C 2 : 1 Slope Unlimited

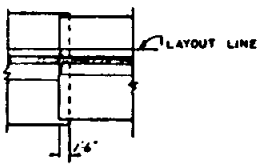
Loading Notes

Surcharge is a load which replaces a live load or dead load with an equivalent weight of earth

For an H 20 S16 44 truck live load use a 2' Level Surcharge

TYPICAL LAYOUT EXAMPLE



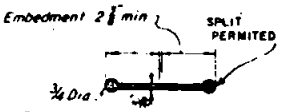


FOOTING STEP

½" Chamfer on exposed face

½" Expansion joint filler with expansion joint filler Joint to extend from top of footing to top of wall Locate joints AT 30'-0" Ctrs MAX OR AS SHOWN ON APPROVED PLANS.

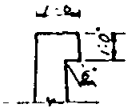
PLAN OF EXPANSION JOINT



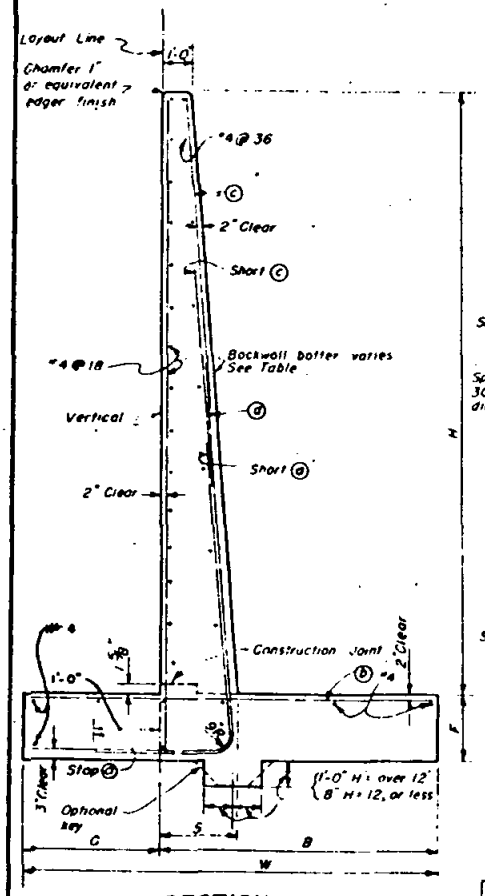
RUBBER WATERSTOP
Use only when watertight joint is required

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CANTILEVER RETAINING WALL	SCALE NONE
	TYPE 2 CONSTRUCTION DETAILS	DRAWING NO.
	SEE DWG. NO. C-44 FOR ELEVATION & SECTION	C-45
	SEE SHEET C-52 FOR GENERAL NOTES	

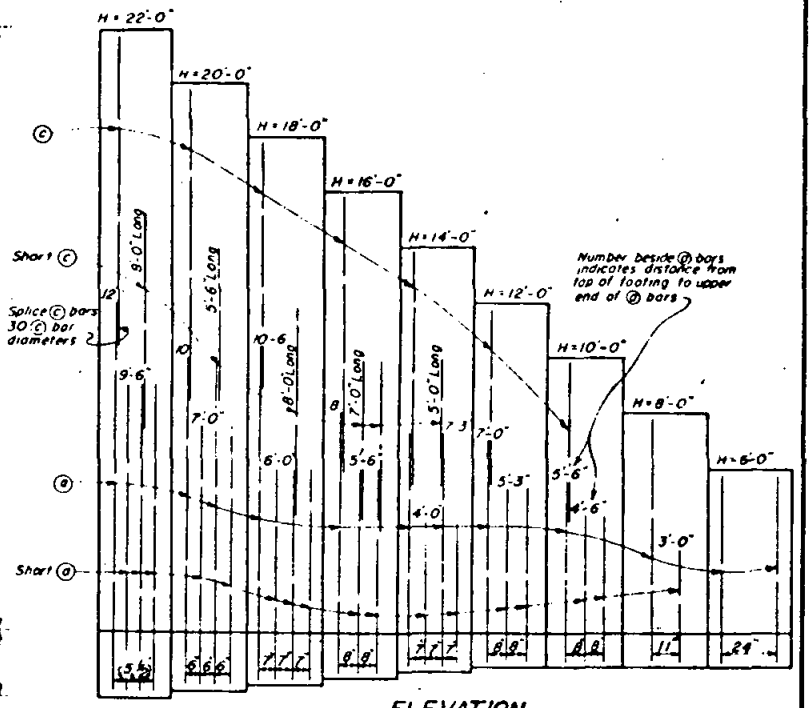
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/8/72



ALTERNATIVE TOP OF WALL



SECTION



ELEVATION

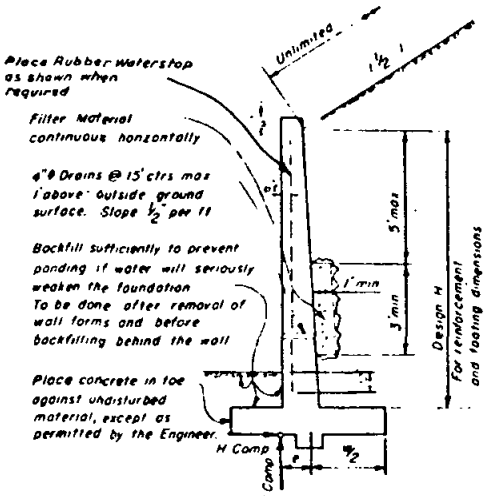
TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

H	22'	20'	18'	16'	14'	12'	10'	8'	6'
W	14'-10"	13'-0"	11'-4"	10'-1"	8'-10"	7'-7"	6'-4"	5'-1"	3'-10"
C	5'-9"	4'-8"	3'-10"	3'-5"	3'-0"	2'-7"	2'-2"	1'-9"	1'-4"
B	9'-2"	8'-4"	7'-6"	6'-8"	5'-10"	5'-0"	4'-2"	3'-4"	2'-6"
F	2'-4"	2'-1"	1'-10"	1'-7"	1'-4"	1'-2"	1'-2"	1'-2"	1'-2"
S	2'-7 1/4"	2'-3"	1'-11 1/4"	1'-8"	1'-7"	1'-6"	1'-5"	1'-4"	1'-3"
BW Batter	7/8:12	3/4:12	5/8:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12
'c' Bars	#8@11	#8@12	#8@14	#6@8	#6@14	#5@24	#5@24		
'a' Bars	#11@5 1/2	#11@6	#11@7	#11@8	#9@7	#8@8	#6@8	#5@11	#5@24
'b' Bars	#11@5 1/2	#11@6	#11@7	#11@8	#9@7	#8@8	#6@8	#5@11	#5@24
Conc CY/FT	76.3	61.6	49.2	39.3	31.9	24.8	20.9	16.2	12.2
Steel lbs/Ft	454	349	273	211	139	94	54	32	21
Toe Press.	6980	6970	6590	5660	4970	4150	3570	2960	2350
H Comp lbs	37400	30600	24250	18900	14450	10470	7360	4900	2780
V Comp lbs	58780	48450	38390	29910	23030	16790	11900	7870	4670
e	1.84'	1.87'	1.79'	1.55'	1.33'	1.10'	.94'	.77'	.59'

Coefficient of friction = 0.63

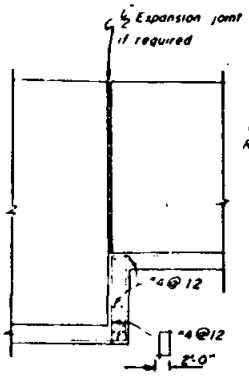
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING CANTILEVER RETAINING WALL TYPE 3 ELEVATION & SECTION SEE DWG. NO. C-47 FOR CONSTRUCTION DETAILS SEE SHEET C-52 FOR GENERAL NOTES	SCALE NONE DRAWING NO. C-46

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	10/16/72

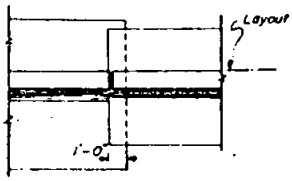


DESIGN AND DRAINAGE

Wall to be used for 1½ : 1 Unlimited Sloping Surcharge



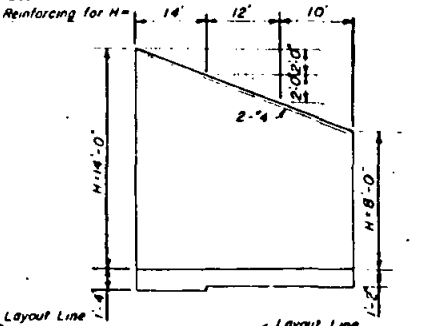
ELEVATION

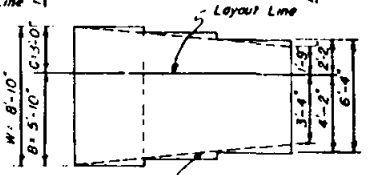


PLAN

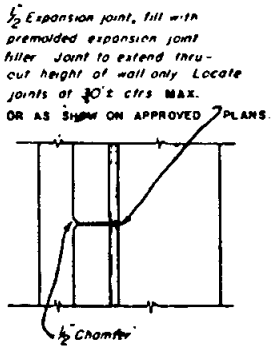
FOOTING STEPS

Note Bar cut-offs may be varied in increments of 6" Use Reinforcing for H= 14' 12' 10'

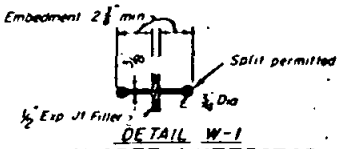




TYPICAL LAYOUT EXAMPLE



PLAN OF EXPANSION JOINT



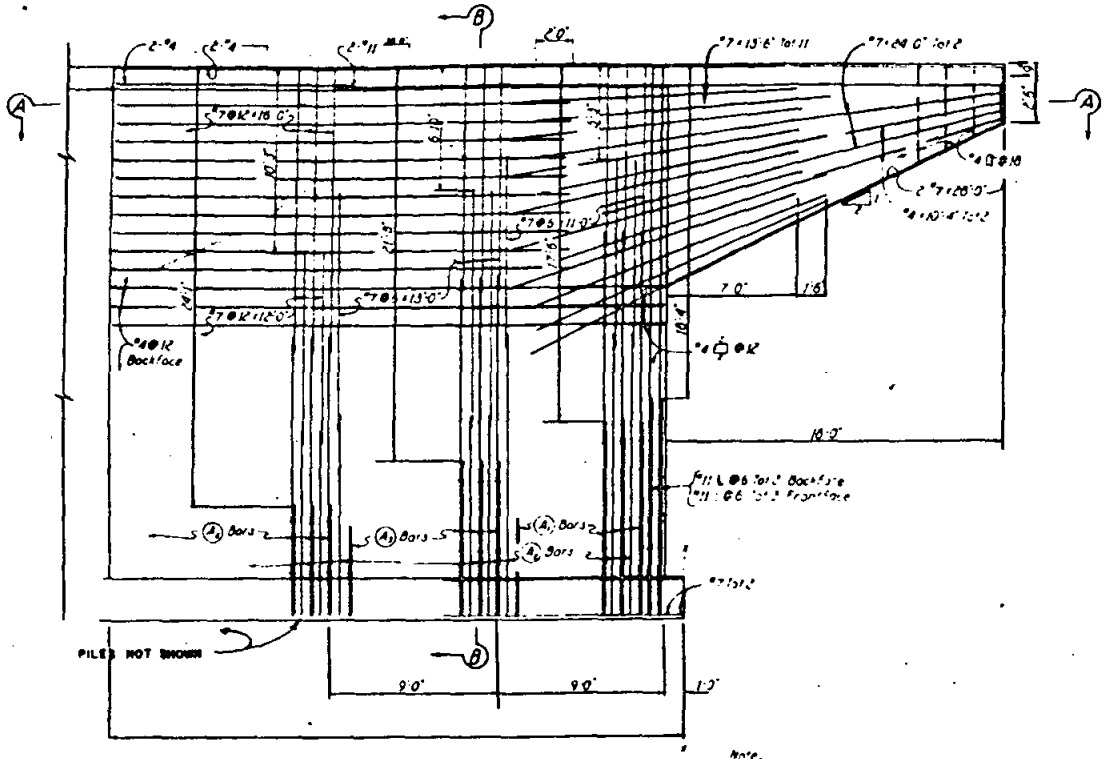
DETAIL W-1

RUBBER WATERSTOP

Use only when watertight joint is required

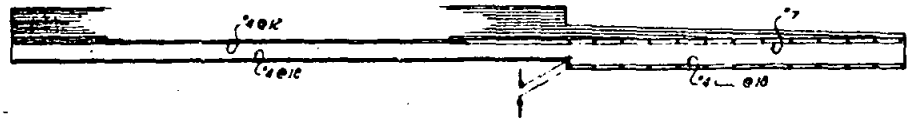
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING CANTILEVER RETAINING WALL TYPE 3 CONSTRUCTION DETAILS SEE DWG. NO. C-46 FOR ELEVATION & SECTIONS SEE SHEET C-52 FOR GENERAL NOTES	SCALE NONE DRAWING NO. C-47

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11/6/70



ELEVATION

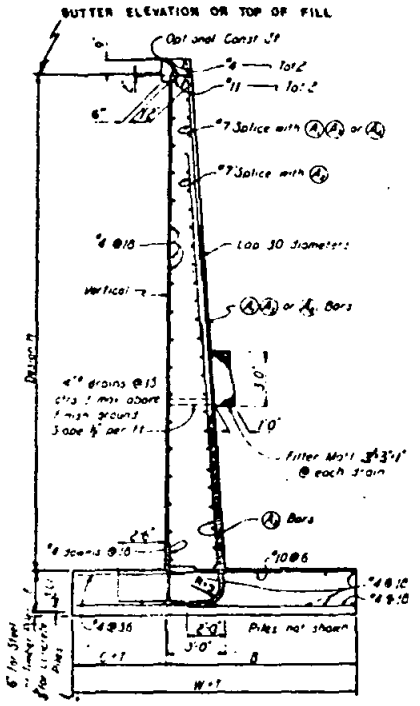
Note:
All bars to be lapped 20 diameters except as noted

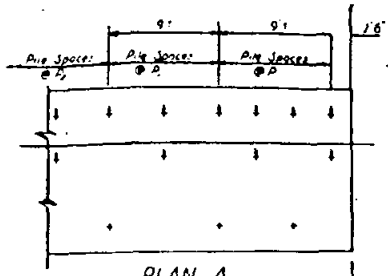


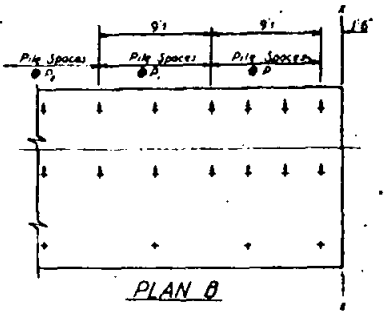
SECTION A-A

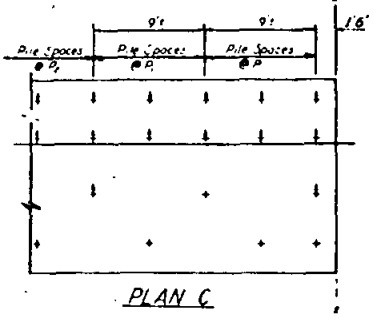
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING WING WALL DETAILS FOR CANTILEVER WALLS – ELEVATION SEE DWG. NO. C-49 FOR SECTIONS SEE SHEET C-52 FOR GENERAL NOTES	SCALE NONE DRAWING NO. C-48

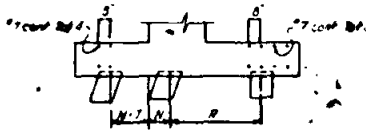
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/6/72

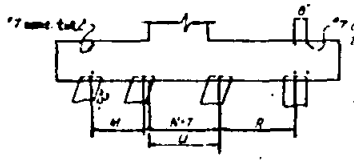










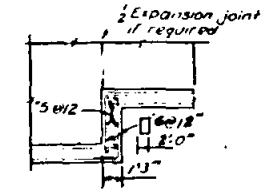


H	20		22		24		26		28	
W	10'-6"		12'-0"		13'-5"		14'-5"		15'-5"	
B	7'-0"		8'-0"		8'-10"		9'-6"		10'-2"	
C	3'-6"		4'-0"		4'-5"		4'-9"		5'-1"	
F	1'-10"		2'-0"		2'-1"		2'-3"		2'-5"	
M	2'-0"		2'-6"		3'-0"		3'-6"		4'-0"	
U					3'-6"		4'-2"		4'-7"	
N	1'-0"		1'-0"		3'-6"		3'-9"		3'-8"	
R	4'-6"		4'-11"		3'-6"		3'-7"		3'-9"	
Wall Batter	¾ 12		¾ 12		¾ 12		¾ 12		¾ 12	
A_1 Bars	1-#11@12		2-#11@12 bundle		2-#11@12 bundle		2-#11@12 bundle		2-#11@12 bundle	
A_2 Bars	1-#11@12		1-#11@12		1-#11@12		1-#11@12		1-#11@12	
A_3 Bars	1-#11@12		1-#11@12		1-#11@12		2-#11@12 bundle		2-#11@12 bundle	
A_4 Bars	1-#11@12		1-#11@12		1-#11@12		1-#11@12		2-#11@12 bundle	
Pile Load Kips	64	90	64	90	64	90	64	90	64	90
P max	3'0"	4'-9"	3'0"	3'3"	3'0"	4'3"	3'0"	3'7"	3'0"	3'10"
P_1 max	3'-9"	5'-3"	3'-8"	4'-1"	4'-3"	6'-0"	4'-0"	4'-8"	3'-6"	4'-7"
P_2 max	4'-3"	6'-0"	4'-2"	5'-7"	4'-10"	6'-8"	4'-3"	5'-8"	3'-9"	5'-5"
F	0	0	6"	0	6"	0	6"	0	8"	0
Plan	A	A	B	A	C	C	C	C	C	C

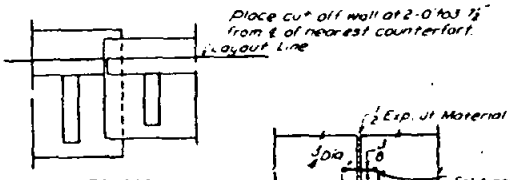
SHEETS C-48 AND C-49 ARE FOR DESIGN REFERENCE ONLY. ALL WING WALL DETAILS AND INTERPRETATIONS THEREOF SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	WING WALL DETAILS FOR CANTILEVER WALLS – SECTIONS	SCALE NONE
	SEE DWG. NO. C-48 FOR ELEVATION	DRAWING NO.
	SEE SHEET C-52 FOR GENERAL NOTES	C-49

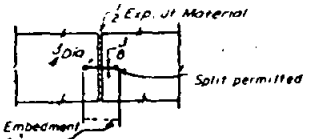
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/6/70



SIDE ELEVATION

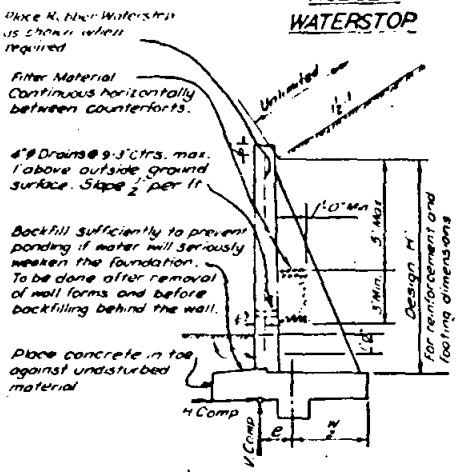


PLAN



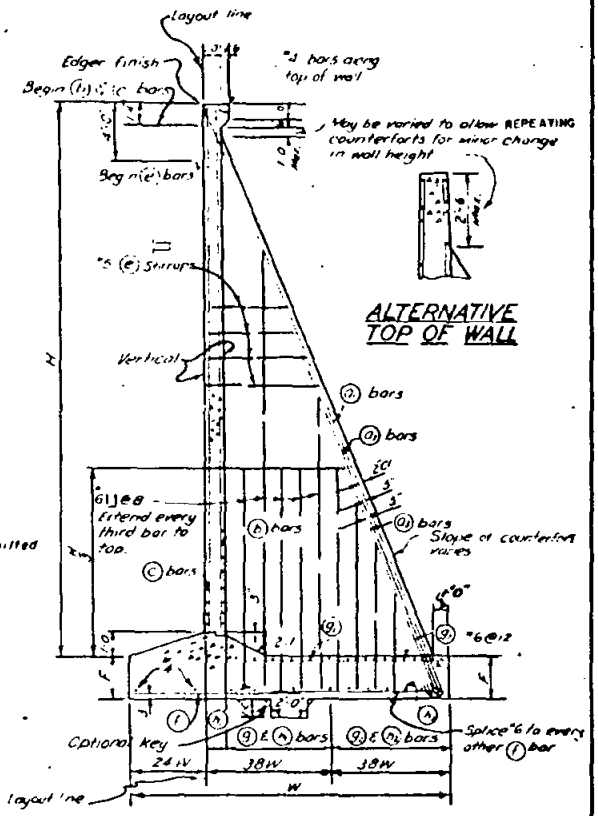
FOOTING STEP

RUBBER WATERSTOP



DESIGN AND DRAINAGE

Wall to be used for ½ : 1 Unlimited Slope Surcharge



SECTION

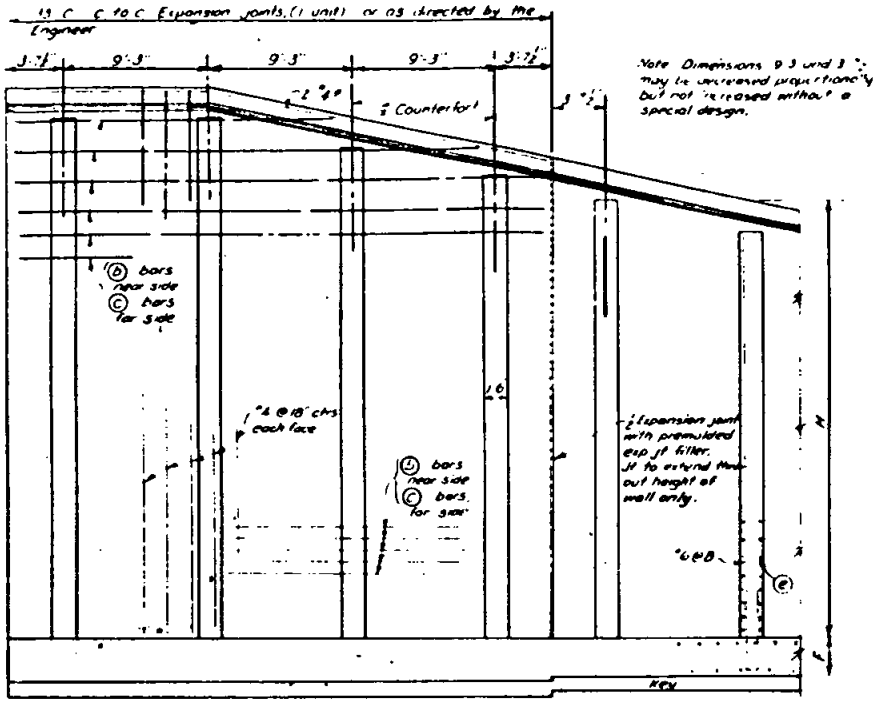
TABLE OF REINFORCING STEEL DIMENSIONS & DATA

H	30'	28'	26'	24'	22'	20'	18'
W	21'-0	19'-6	18'-3	16'-10	15'-6	14'-1	12'-10
F	2'-6	2'-3	2'-3	2'-0	2'-0	2'-0	1'-9
(1) bars, edge counterfort	3'-11	3'-11	3'-11	3'-11	3'-11	3'-11	2'-11
" length	36'-4	33'-10	31'-9	29'-0	26'-10	24'-3	22'-2
(2a) bars, edge counterfort	3'-11	3'-11	2'-11	3'-11	3'-11	2'-11	2'-11
" length	24'-6	24'-0	23'-0	18'-0	16'-0	14'-0	12'-0
(2b) bars, edge counterfort	3'-11	2'-11	2'-11				
" length	18'-3	17'-6	16'-6				
(f) bars, back face, wall	#6						
(c) bars, front face, wall	#6	See table for spacing					
(e) Stirrups counterfort	#5						
(f) bars, toe	11 @ 8	11 @ 8	11 @ 8	11 @ 8	11 @ 8	11 @ 9½	11 @ 9½
" length	9'-3	9'-0	8'-9	8'-0	7'-8	6'-9	6'-2
(g) bars, top of heel	#6@12	#6@12	#6@12	#6@12	#6@12	#5@12	#5@12
(g) bars, top of heel	#6@6	#6@6	#6@6	#6@6	#6@6	#5@6	#5@6
(h) bars, bottom of heel	#6@24	#6@24	#6@24	#6@24	#6@24	#5@24	#5@24
(h) bars, bottom of heel	#6@12	#6@12	#6@12	#6@12	#6@12	#5@12	#5@12
Concrete, cubic ft per lin ft	1232	1064	973	836	751	668	567
Steel, pounds per lin foot	532	493	433	369	331	263	216
Toe Pressure, pounds/sq ft	11,200	10,100	9500	8700	8000	7200	6300
Horizontal Comp. Lbs	71,000	65,200	57,800	48,500	41,100	33,700	27,700
Vertical Comp. Lbs	118,000	101,000	93,000	81,000	68,000	56,000	45,000
Eccentricity of resultant	3.00	2.60	2.40	2.20	2.00	1.85	1.70

QUANTITIES BASED ON 38'-0" WALL UNIT INCLUDING 4 COUNTERFORTS

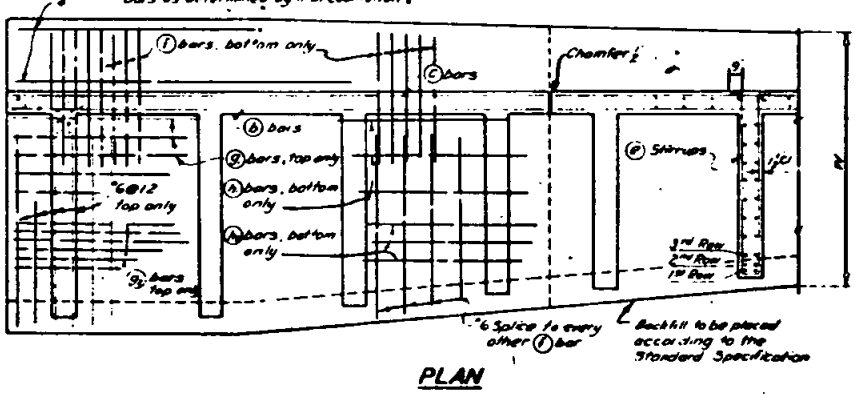
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING COUNTERFORT RETAINING WALL SEE DWG. NO. C-51 FOR SECTIONS & ELEVATION SEE SHEET C-52 FOR GENERAL NOTES	SCALE NONE DRAWING NO. C-50

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	R. M. Taylor	11/1/72



ELEVATION

Note: Use reinforcing in any unit as determined by maximum 'H' in that unit. Use ⓒ, ⓔ, and ⓖ bars as determined by H at counterfort ⓓ



PLAN

TABLE OF SPACING FOR ⓑ ⓒ & ⓔ BARS

Top of wall, Distance below top of wall	ⓑ	ⓒ	ⓔ
2'	24	24	#6
4'	24	24	#6
6'	24	24	24
8'	18	24	24
10'	18	24	24
12'	15	18	18
14'	15	18	18
16'	12	18	18
18'	12	15	15
20'	12	15	15
22'	9	15	12
24'	9	12	12
26'	7	12	9
28'	7	12	9
30'	7	12	9

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING COUNTERFORT RETAINING WALL SEE DWG. NO. C-50 FOR SECTIONS & ELEVATION SEE SHEET C-52 FOR GENERAL NOTES	SCALE NONE DRAWING NO. C-51

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	10/6/72

GENERAL NOTES

DESIGN

A.A.S.H.C. LATEST REVISED EDITION, FILED IN THE GOVERNMENT REFERENCE LIBRARY NO. 625.7.

CONSTRUCTION

COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

DESIGN CONDITIONS

WALLS ARE TO BE USED FOR THE LOADING CONDITIONS SHOWN FOR EACH TYPE WALL.

DESIGN H MAY BE EXCEEDED BY SIX INCHES BEFORE GOING TO NEXT SIZE.

PASSIVE BEARING PRESSURE OF FOOTING KEY SHALL NOT EXCEED ACTUAL TOE PRESSURE.

SPECIAL FOOTING DESIGN IS REQUIRED WHERE FOUNDATION MATERIAL IS INCAPABLE OF SUPPORTING TOE PRESSURE LISTED IN TABLE.

DESIGN DATA

Fc = 1200 psi F'c = 3000 psi

Fs = 20,000 psi n = 10

Earth = 120 pcf and equivalent fluid pressure = 36 psf per foot of height

WALLS SHOWN FOR $1\frac{1}{2}$:1 UNLIMITED SLOPING SURCHARGE ARE DESIGNED IN ACCORDANCE WITH RANKINE'S FORMULA FOR UNLIMITED SLOPING SURCHARGE WITH $\phi = 33^{\circ}42'$.

REINFORCEMENT

COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

INTERMEDIATE GRADE, HARD GRADE, OR RAIL STEEL DEFORMATION SHALL CONFORM TO ASTM 305.

BARS SHALL LAP 20 DIAMETERS, WHERE SPLICED, UNLESS OTHERWISE SHOWN ON THE PLANS.

BENDS SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE, A.C.I.

BACKING FOR HOOKS IS FOUR DIAMETERS.

REINFORCEMENT (Continued)

ALL BAR EMBEDMENTS ARE CLEAR DISTANCES TO OUTSIDE OF BAR.

SPACING FOR PARALLEL BARS IS CENTER TO CENTER OF BARS.

RUBBER WATERSTOP

RUBBER WATERSTOP, WHEN REQUIRED, SHALL BE FURNISHED AND PLACED AS SPECIFIED UNDER SECTION 27, PAR. (L) OF THE STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS LATEST EDITION ON FILE IN THE OFFICE OF THE CITY CLERK.

CONCRETE

ALL CONCRETE SHALL BE CLASS A P.C.C. CONFORMING TO SECTIONS 6 AND 32 OF THE COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

EXCAVATION AND BACKFILL

EXCAVATION AND BACKFILL SHALL CONFORM TO SECTION 6 OF THE COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

COMPACTION OF BACKFILL MATERIAL BY JETTING OR PONDING WITH WATER WILL NOT BE PERMITTED.

EACH LAYER OF BACKFILL SHALL BE MOISTENED AS DIRECTED BY THE ENGINEER AND THOROUGHLY TAMPED, ROLLED OR OTHERWISE COMPACTED UNTIL THE RELATIVE COMPACTION IS NOT LESS THAN 90 PERCENT.

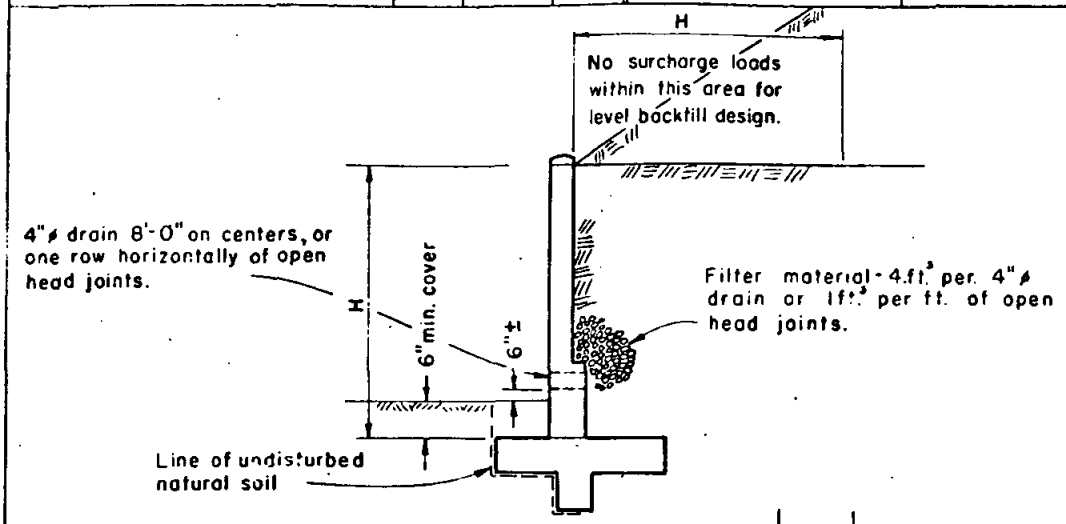
NO BACKFILL MATERIAL SHALL BE DEPOSITED AGAINST CONCRETE RETAINING WALLS UNTIL THE CONCRETE HAS DEVELOPED A STRENGTH OF 2,500 POUNDS PER SQUARE INCH IN COMPRESSION AS DETERMINED BY TEST CYLINDERS, OR UNTIL 28 DAYS AFTER WALL HAS BEEN PLACED. FILTER MATERIAL SHALL CONFORM TO COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.

SPECIAL COVERAGE

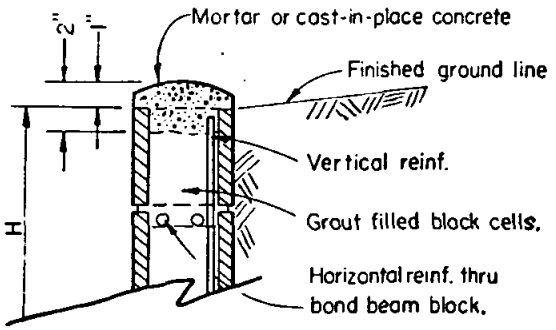
WHERE WALLS ARE CONSTRUCTED ADJACENT TO SALT WATER, THICKNESS OF CONCRETE SHALL BE INCREASED TO PROVIDE THREE-INCH COVERAGE BETWEEN STEEL AND EXPOSED SURFACES.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	GENERAL NOTES FOR RETAINING WALLS	SCALE
	SEE DWG. C-42 thru. C-51	DRAWING NO. C-52

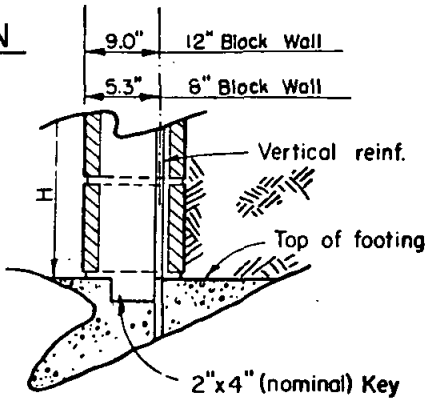
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	Walter



TYPICAL SECTION
no scale



CAP DETAIL
no scale

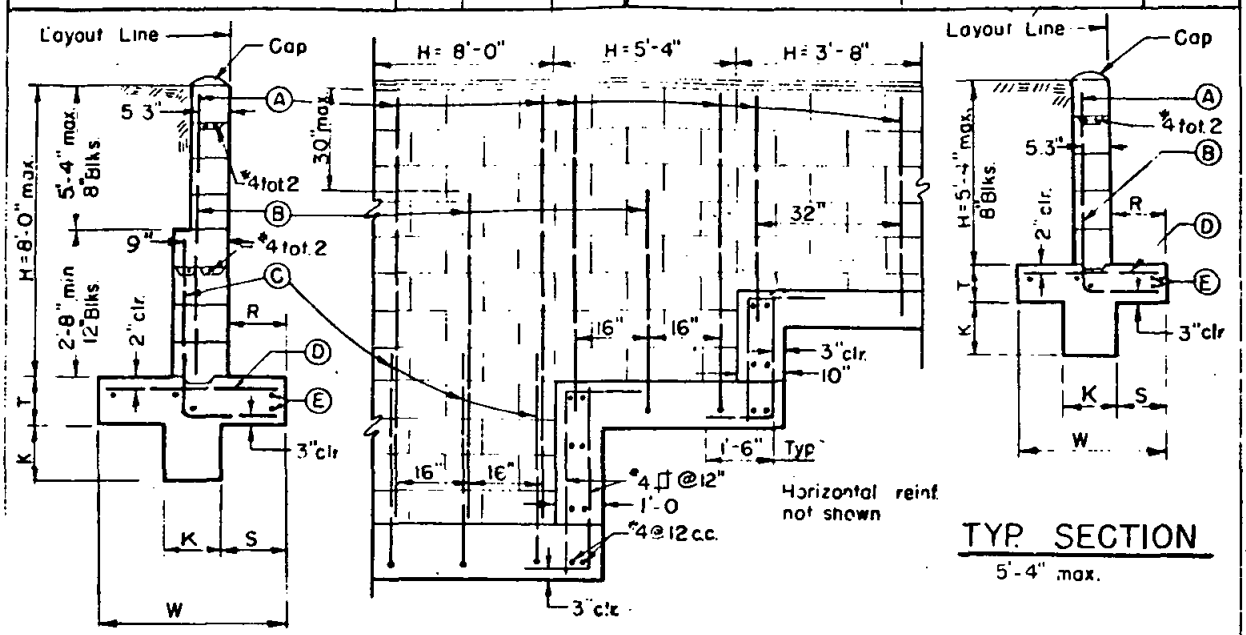


KEY DETAIL
no scale

NOTE: All masonry retaining walls shall be constructed with cap, key and drainage details as shown hereon.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING CANTILEVERED MASONRY RETAINING WALL MISCELLANEOUS DETAILS	SCALE NO SCALE DRAWING NO. C-53

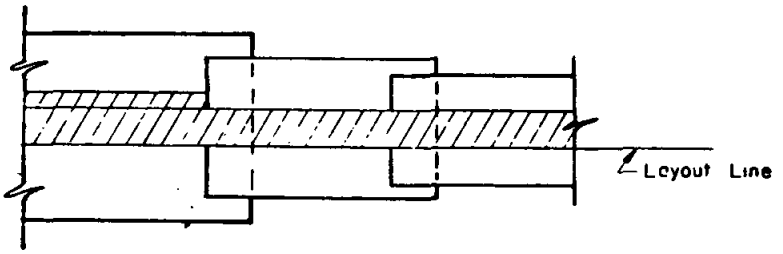
REVISIONS				APPROVALS		
DESCRIPTION	BY	CHKD	DATE	COUNTY ENGINEER	H.M. Taylor	11/10/72



ELEVATION

TYP SECTION
OVER 5'-4"

TYP SECTION
5'-4" max.



PLAN

NOTES

1. Refer to Standard Drawing C-53 and C-57 for additional notes and details
2. Fill all block cells with grout

DIMENSIONS AND REINFORCING STEEL			
H (max)	3'-8"	5'-4"	8'-0"
T (min)	8"	10"	1'-0"
W (min)	2'-1"	3'-1"	4'-3"
R	9"	1'-2"	1'-5"
S	8 1/2"	1'-01/2"	1'-7 1/2"
K	8"	8"	12"
(A)	*4@32 cc	*4@32 cc	*4@32 cc
(B)		*4@32 cc	*4@32 cc
(C)			*7@16 cc
(D)	*4@32cc	*4@16cc	*4@16cc
(E)	*4 tot. 5	*4 tot. 5	*4 tot 6
max. soil press.	774 psf.	1030 psf.	1660 psf.

SPECIFICATION REFERENCE

COUNTY OF SAN DIEGO STANDARD DRAWING

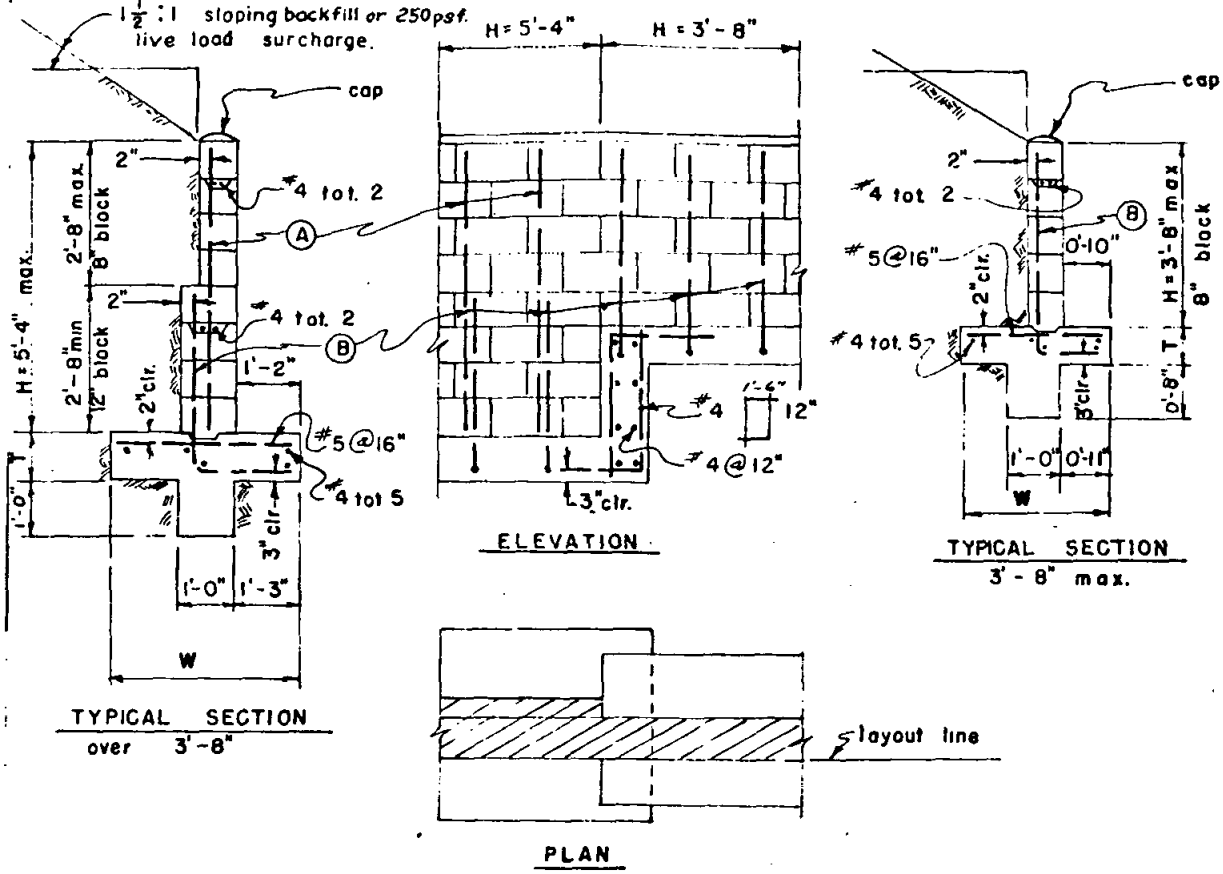
CANTILEVERED MASONRY RETAINING WALL TYPE CM-5

(LEVEL BACKFILL)

SCALE NONE

DRAWING NO C-54

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/16/77



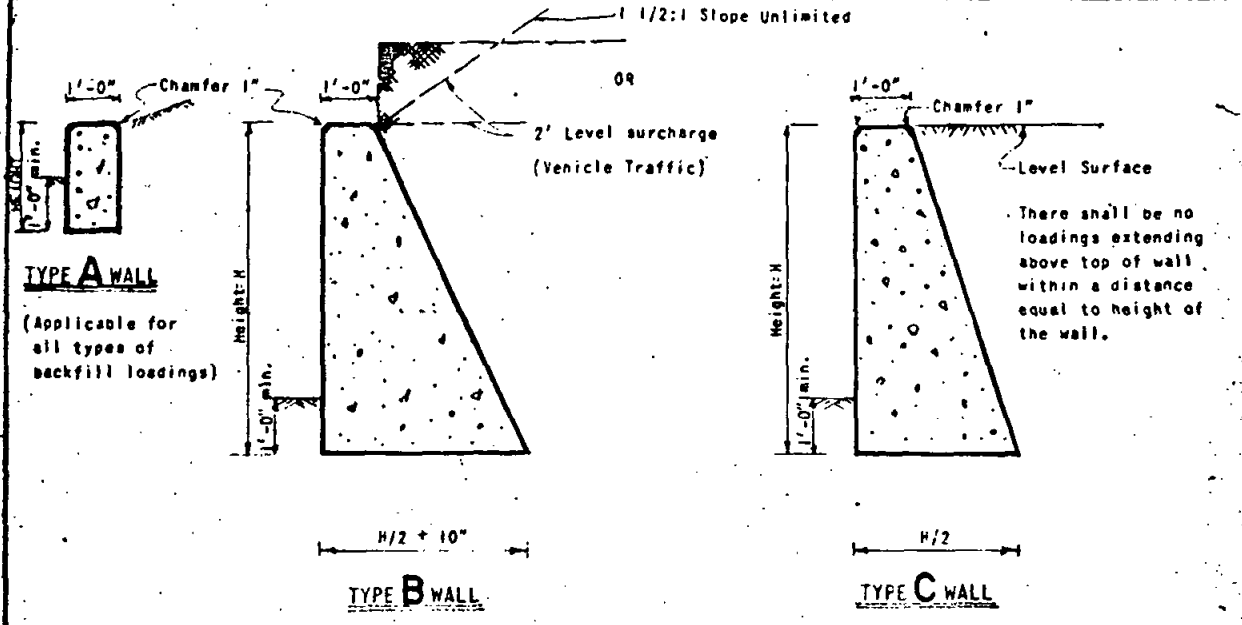
NOTE:

1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all cells with grout.

DIMENSIONS AND REINFORCING STEEL		
H max	5'-4"	3'-8"
T min	0'-10"	0'-8"
W min	3'-10"	2'-9"
(A) bars	#4 @16"	—
(B) bars	#6 @16"	#4 @16"
MAX. TOE PRESS. P.S.F.	2000	1400

	COUNTY OF SAN DIEGO STANDARD DRAWING CANTILEVERED MASONRY RETAINING WALL TYPE CM-6 (Liveload surcharge or sloping backfill)	NONE SCALE DRAWING NO. C-55

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER		

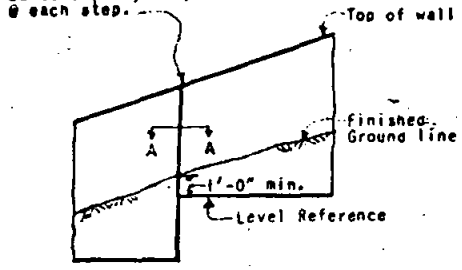


TYPE A WALL

(Applicable for all types of backfill loadings)

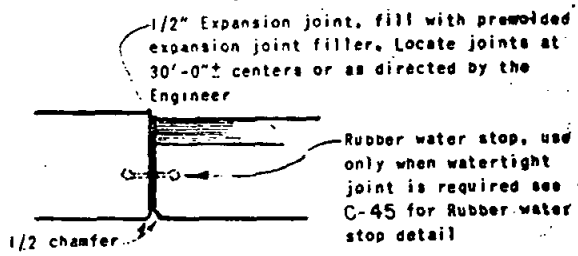
TYPE B WALL

TYPE C WALL



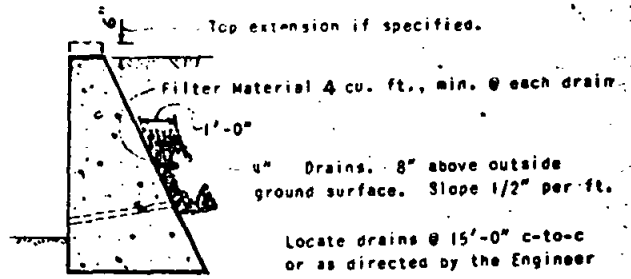
TYPICAL ELEVATION

NOTE: Maximum toe pressure underwall footing = 1 1/2 tons. Special design required where footing material is incapable of supporting this pressure.



SECTION A A.

WALL TYPE	HEIGHT	BASE	CONC. CF/FT
A	1'-6"	1'-0"	1.50
	2'-0"	1'-0"	2.00
B	3'-0"	2'-4"	4.99
	4'-0"	2'-10"	7.66
	5'-0"	3'-4"	10.42
	6'-0"	3'-10"	14.49
C	3'-0"	1'-6"	3.75
	4'-0"	2'-0"	6.00
	5'-0"	2'-6"	8.75
	6'-0"	3'-0"	12.00



TYPICAL DRAINAGE WHEN H > 4'-0"

NOTE: Type A wall height may be exceeded by 3 inches before changing to Type B or Type C.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING GRAVITY RETAINING WALL For General Notes see Drawing C-52 (Articles entitled "Design Conditions", "Reinforcement" and "Special Coverage" shall be voided.)	SCALE NO SCALE DRAWING NO. C-56

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	W.W. Taylor	11/6/72
NOTE CHANGES	J.F.B.	R. Kiesel	12/1/72			

GENERAL NOTES

DESIGN

A.A.S.H.O. Latest Revised Edition Filed in the government reference library No. 625.7, and Uniform Building Code.

CONSTRUCTION

County of San Diego Standard Specifications

DESIGN CONDITIONS

Walls are to be used for the loading conditions shown for each type wall.

Design H shall not be exceeded.

Footing key is required except as shown otherwise or when found unnecessary by the engineer.

Special footing design is required where foundation material is incapable of supporting toe pressure listed in table.

DESIGN DATA

REINFORCED CONCRETE:
Fc=1200 psi Fc=3000 psi
Fs=20,000 psi n=10

REINFORCED MASONRY:
Fm=600 psi Fm=200 psi
Fs=20,000 psi n=50
Earth=120 pcf and equivalent fluid pressure=36 psf per foot of height

Walls shown for 1½:1 unlimited sloping surcharge are designed in accordance with Rankine's formula for unlimited sloping surcharge with $\phi = 33°42'$

REINFORCEMENT

County of San Diego Standard Specificacions

Intermediate grade, hard grade, or rail steel deformation shall conform to ASTM 305.

Bars shall lap 40 diameters, where spliced, unless otherwise shown on the plans.

Bends shall conform to the Manual of Standard practice, A.C.I.

Backing for hooks is four diameters.

All bar embedments are clear distances to outside of bar.

Spacing for parallel bars is center to center of bars.

CONCRETE

All concrete shall be class "A" P.C.C. conforming to the County of San Diego Standard Specifications.

MASONRY

All reinforced masonry retaining wall shall be constructed of regular or light weight standard grade "A" units conforming to ASTM designation C-90-52 and manufactured in accordance with requirements of the Concrete Masonry Association Specifications. All masonry shall conform to the regulations of the Uniform Building Code.

MASONRY MORTAR

The mortar shall consist of one (1) part portland cement to three (3) parts graded mortar sand. Mortar shall be tempered with lime putty in an amount not exceeding twenty-five (25) per cent of the volume of the cement.

MASONRY MORTAR (con't.)

Mortar in horizontal joints shall fully cover all face shell and web members. Vertical joints shall be buttered to a depth greater than the thickness of the face shells of the block. Furrowing of mortar will not be permitted.

GROUT

The grout shall consist of one (1) part portland cement to three (3) parts clean sand for voids less than four inches. If desired, Grout to be used in voids of 4" or greater dimensions, may be mixed of one (1) part portland cement to two (2) parts clean sand to two (2) parts pea gravel. Pea gravel shall be graded such that 100 per cent passes 3/8" sieve and not more than 5 per cent passes the No. 8 sieve. All cells shall be poured solid with grout.

EXCAVATION AND BACKFILL

Excavation and backfill shall conform to the County of San Diego Standard Specifications.

Compaction of backfill material by jetting or ponding with water will not be permitted.

Each layer of backfill shall be moistened as directed by the engineer and thoroughly tamped, rolled or otherwise compacted until the relative compaction is not less than 90 per cent.

No backfill material shall be deposited against masonry retaining walls until the grout has developed a strength of 2,000 pounds per square inch in compression.

OPTIONAL DESIGNS

The wall shown here is not necessarily the most economical solution. It is an acceptable solution for the conditions shown on the drawings. The individual may consult a licensed engineer for more economical solutions for a particular condition.

OPTIONAL MORTAR KEY

Embedment of the first course of block in a poured footing may be omitted by providing a mortar key. The key is formed by embedding a flat 2" X 4" flush with the top of the freshly poured footing. Remove the 2" X 4" after the concrete has started to harden.

OPTIONAL WALL DRAINS

Where the steel spacing is greater than 24" center to center, wall drains may be formed by placing a block on its side. However, all cells below and above the said block shall be grouted solid.

FILTER MATERIAL

See County of San Diego Standard Specifications.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE
	GENERAL NOTES FOR MASONRY RETAINING WALLS	DRAWING NO. C-57
	SEE DWG. C-58 thru C-59	

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. E. Taylor	Director

GENERAL NOTES

DESIGN

A.A.S.H.O. Latest Revised Edition, Filed in the government reference library No. 625.7, and Uniform Building Code.

CONSTRUCTION

County of San Diego Standard Specifications

DESIGN CONDITIONS

Walls are to be used for the loading conditions shown for each type wall.

Design H shall not be exceeded.

Footing key is required except as shown otherwise or when found unnecessary by the engineer.

Special footing design is required where foundation material is incapable of supporting toe pressure listed in table.

DESIGN DATA

REINFORCED CONCRETE:
Fc=1200 psi Fc=3000 psi
Fs=20,000 psi n=10

REINFORCED MASONRY:
Fh=600 psi Fm=200 psi
Fs=20,000 psi n=50
Earth=120 pcf and equivalent fluid pressure=36 psf per foot of height

Walls shown for 1½:1 unlimited sloping surcharge are designed in accordance with Rankine's formula for unlimited sloping surcharge with $\phi = 33°42'$

REINFORCEMENT

County of San Diego Standard Specificacions

Intermediate grade, hard grade, or rail steel deformation shall conform to ASTM 305.

Bars shall lap 40 diameters, where spliced, unless otherwise shown on the plans.

Bends shall conform to the Manual of Standard practice, A.C.I.

Backing for hooks is four diameters.

All bar embedments are clear distances to outside of bar.

Spacing for parallel bars is center to center of bars.

CONCRETE

All concrete shall be class "A" P.C.C. conforming to sections 6 and 32 of the County of San Diego Standard Specifications

MASONRY

All reinforced masonry retaining wall shall be constructed of regular or light weight standard grade "A" units conforming to ASTM designation C-90-52 and manufactured in accordance with requirements of the Concrete Masonry Association Specifications. All masonry shall conform to the regulations of the Uniform Building Code.

MASONRY MORTAR

The mortar shall consist of one (1) part portland cement to three (3) parts graded mortar sand. Mortar shall be tempered with lime putty in an amount not exceeding twenty-five (25) per cent of the volume of the cement.

MASONRY MORTAR (con't.)

Mortar in horizontal joints shall fully cover all face shell and web members. Vertical joints shall be buttered to a depth greater than the thickness of the face shells of the block. Furrowing of mortar will not be permitted.

GROUT

The grout shall consist of one (1) part portland cement to three (3) parts clean sand for voids less than four inches. If desired, Grout to be used in voids of 4" or greater dimensions, may be mixed of one (1) part portland cement to two (2) parts clean sand to two (2) parts pea gravel. Pea gravel shall be graded such that 100 per cent passes 3/8" sieve and not more than 5 per cent passes the No. 8 sieve. All cells shall be poured solid with grout.

EXCAVATION AND BACKFILL

Excavation and backfill shall conform to section 6 of the County of San Diego Standard Specifications

Compaction of backfill material by jetting or ponding with water will not be permitted.

Each layer of backfill shall be moistened as directed by the engineer and thoroughly tamped, rolled or otherwise compacted until the relative compaction is not less than 90 per cent.

No backfill material shall be deposited against masonry retaining walls until the grout has developed a strength of 2,000 pounds per square inch in compression as determined by test 2" cubes, or until the masonry retaining wall has cured for a minimum of 14 days.

OPTIONAL DESIGNS

The wall shown here is not necessarily the most economical solution. It is an acceptable solution for the conditions shown on the drawings. The individual may consult a licensed engineer for more economical solutions for a particular condition.

OPTIONAL MORTAR KEY

Embedment of the first course of block in a poured footing may be omitted by providing a mortar key. The key is formed by embedding a flat 2" X 4" flush with the top of the freshly poured footing. Remove the 2" X 4" after the concrete has started to harden.

OPTIONAL WALL DRAINS

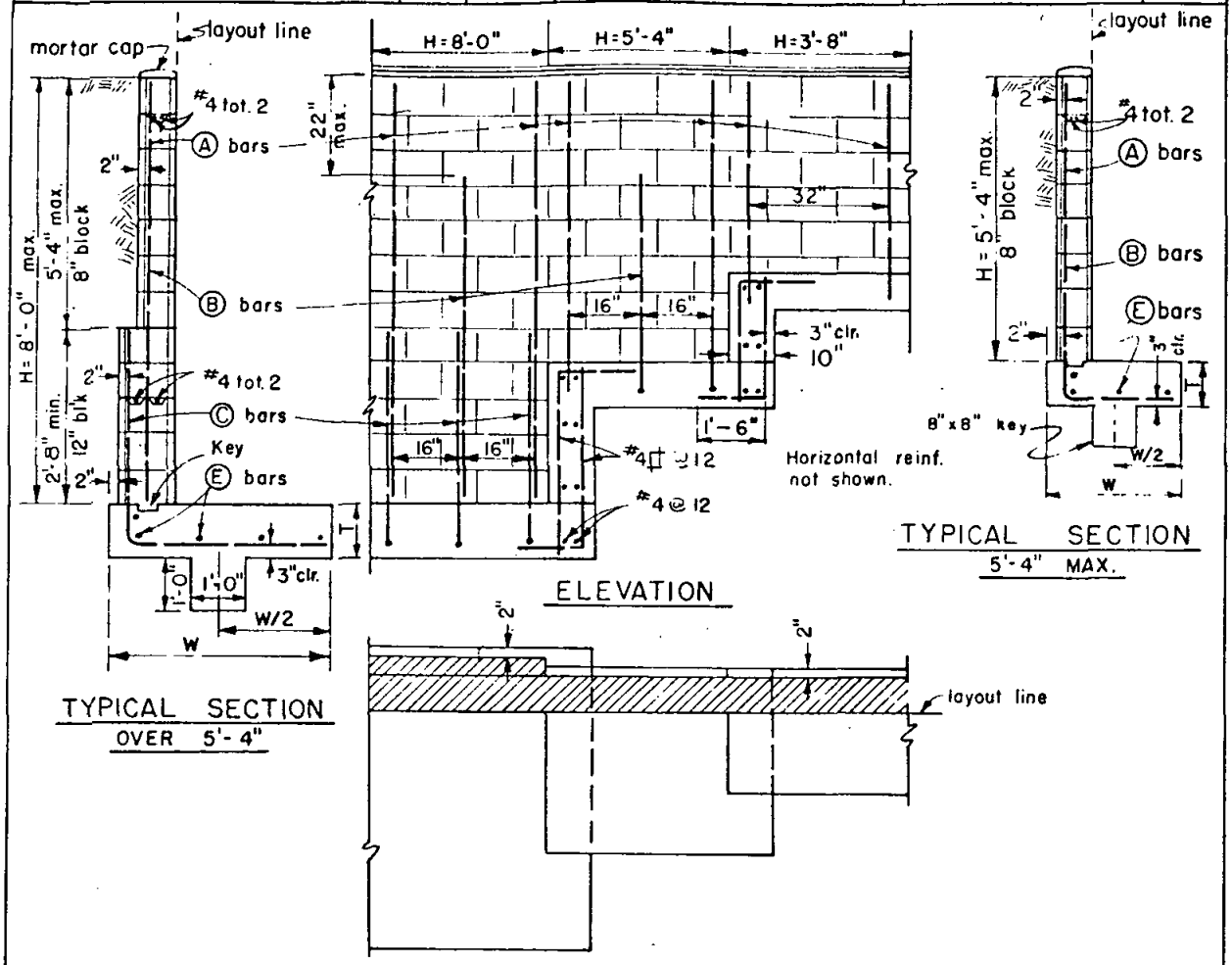
Where the steel spacing is greater than 24" center to center, wall drains may be formed by placing a block on its side. However, all cells below and above the said block shall be grouted solid.

FILTER MATERIAL

See County of San Diego Standard Specifications.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	GENERAL NOTES FOR MASONRY RETAINING WALLS	SCALE
	SEE DWG. C-58 thru C-59	DRAWING NO. C-57

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	Walker



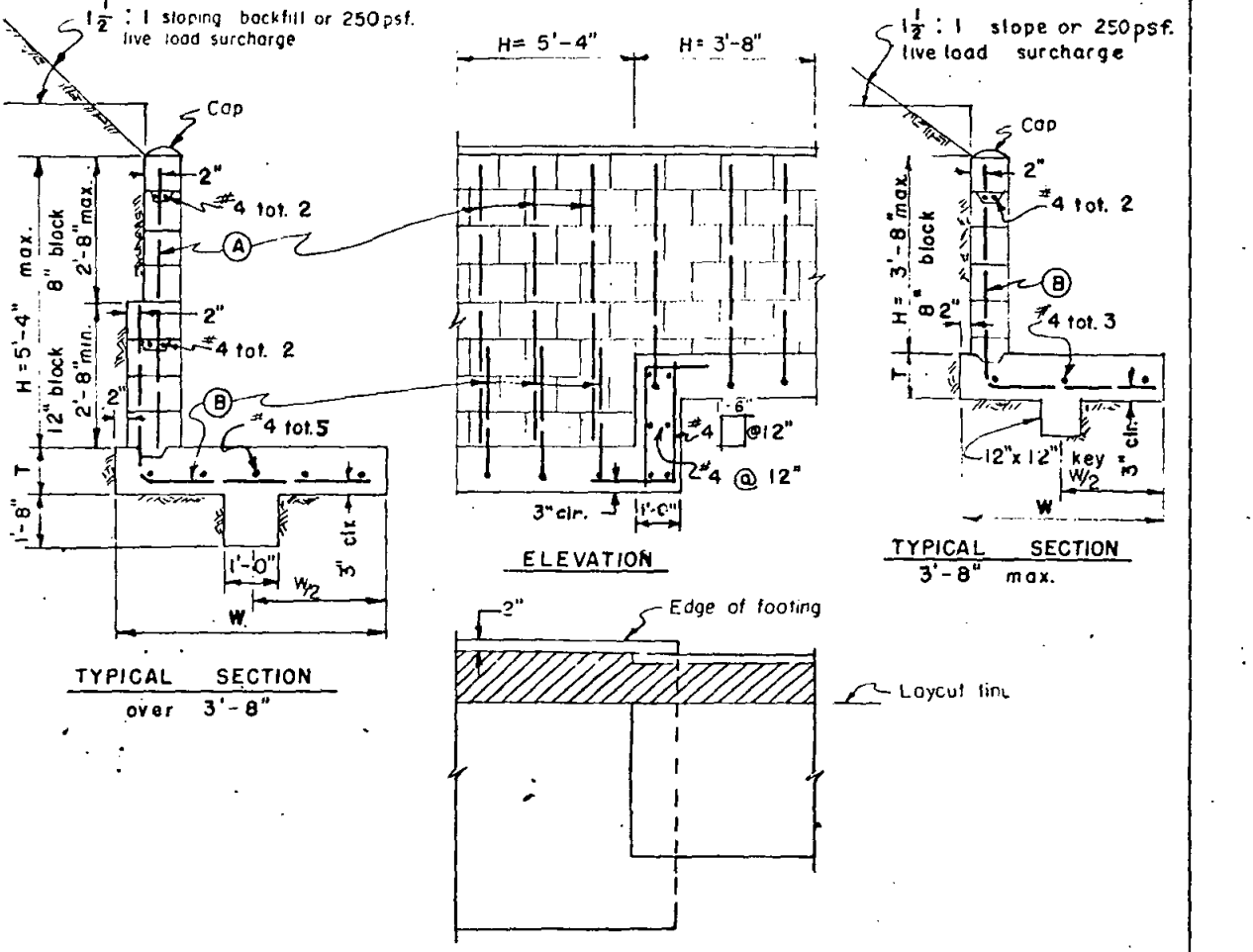
NOTES:

1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all block cells with grout.

DIMENSIONS AND REINFORCING STEEL			
H (max.)	3'-8"	5'-4"	8'-0"
T (min.)	0'-8"	0'-10"	1'-0"
W (min.)	2'-4"	3'-6"	5'-4"
Ⓐ bars	#4 @ 32	#4 @ 32	#4 @ 32
Ⓑ bars	——	#4 @ 32	#4 @ 32
Ⓒ bars	——	——	#6 @ 16
Ⓔ bars	#4 tot. 4	#4 tot. 5	#4 tot. 6
max. soil press. (psf)	500	600	800

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
——	CANTILEVERED MASONRY RETAINING WALL TYPE LM-I (LEVEL BACKFILL)	SCALE NONE
		DRAWING NO. C-58

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	Ideltz



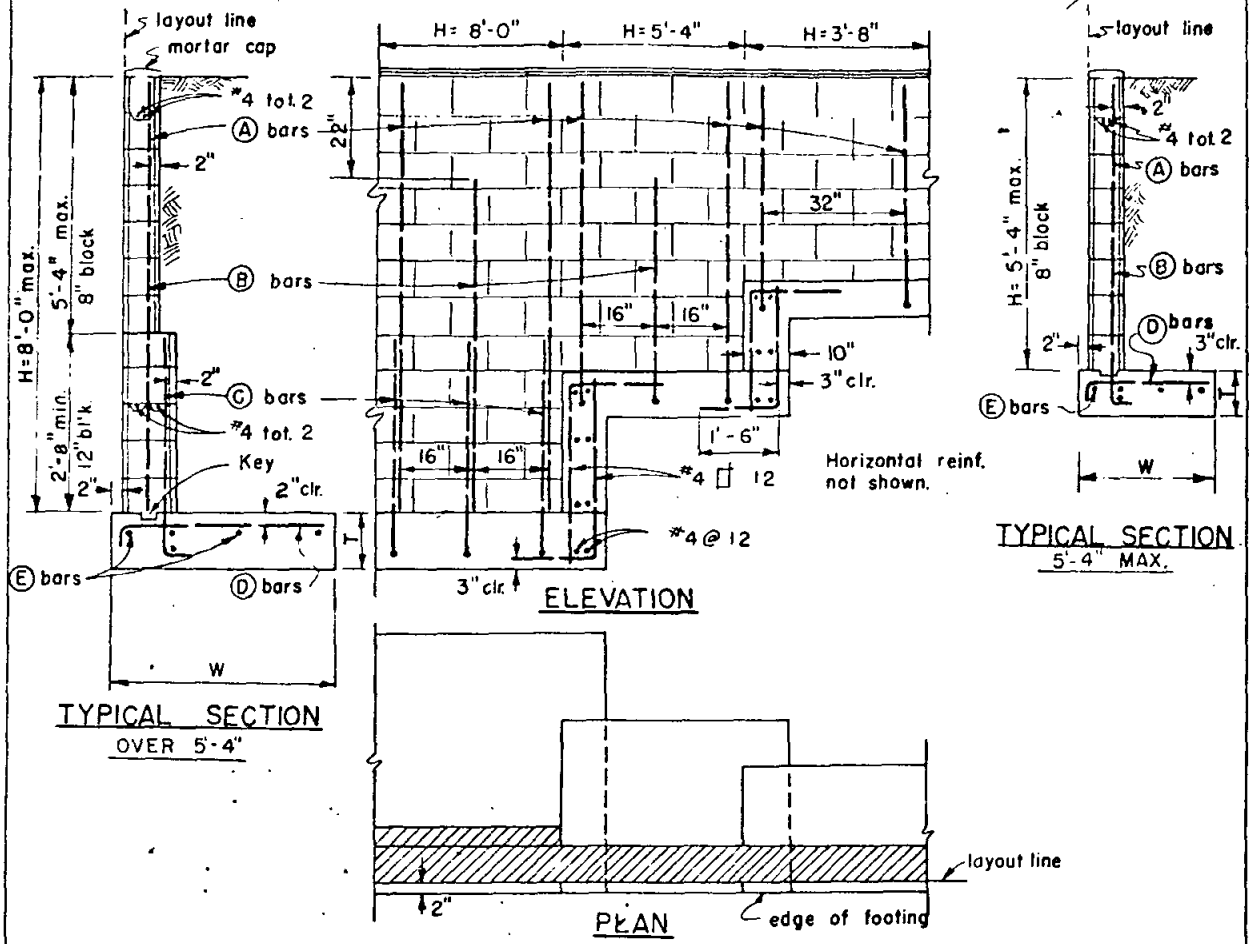
NOTE:

1. Refer to standard drawings C-53 and C-57 for additional notes and detail.
2. Fill all cells with grout.

DIMENSIONS and REINFORCING STEEL		
H max.	5'-4"	3'-8"
T min.	0'-10"	0'-10"
W min.	5'-0"	3'-9"
(A) bars	#4 @ 16"	———
(B) bars	#6 @ 16"	#4 @ 16"
MAX. TOE PRESS. P.S.F.	700	550

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	NONE
	CANTILEVERED MASONRY RETAINING WALL	SCALE
	TYPE LM-2	DRAWING NO.
	(Liveload surcharge or sloping backfill)	C-59

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	



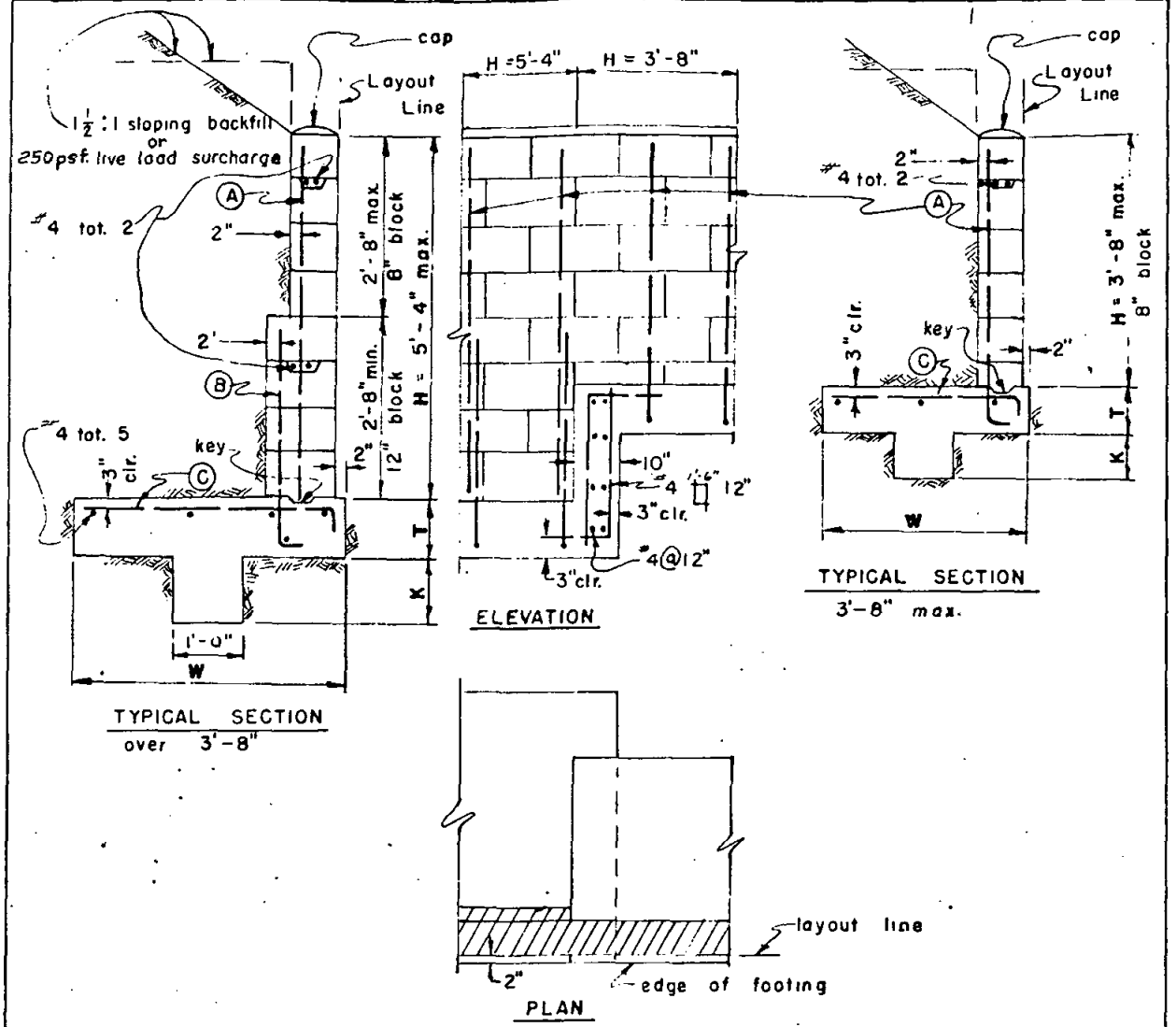
NOTES:

1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all blockcells with grout.

DIMENSIONS AND REINFORCING STEEL			
H max.	3'-8"	5'-4"	8'-0
T min.	0'-8"	0'-10"	1'-0"
W min.	2'-4"	3'-2"	4'-9"
Ⓐ bars	#4@32	#4@32	#4@32
Ⓑ bars	—	#4@32	#4@32
Ⓒ bars	—	—	#6@16
Ⓓ bars	#4@32	#4@16	#6@16
Ⓔ bars	#4 tot. 4	#4 tot. 5	#4 tot. 6
max. soil press. (psf)	1100	1600	2200

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CANTILEVERED MASONRY RETAINING WALL TYPE LM-3 (LEVEL BACKFILL)	SCALE NONE DRAWING NO. C-60

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	ullatt



TYPICAL SECTION over 3'-8"

ELEVATION

TYPICAL SECTION 3'-8" max.

PLAN

NOTE:

1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all cells with grout.

DIMENSIONS and REINFORCING STEEL				
H max	5' - 4"		3' - 8"	
T min	0' - 10"		0' - 8"	
W min	4' - 0"		3' - 0"	
(A) bars	#4 @ 16"		#4 @ 16"	
(B) bars	#6 @ 16"		—	
Surcharge	sloping	live load	sloping	live load
(C) bars	#6 @ 8"	#6 @ 16"	#6 @ 16"	#6 @ 16"
K min	1' - 0"	0' - 8"	1' - 0"	0' - 8"
Toe press.	2700 psf	1900 psf	1700 psf	1430 psf

COUNTY OF SAN DIEGO STANDARD DRAWING

CANTILEVERED MASONRY RETAINING WALL

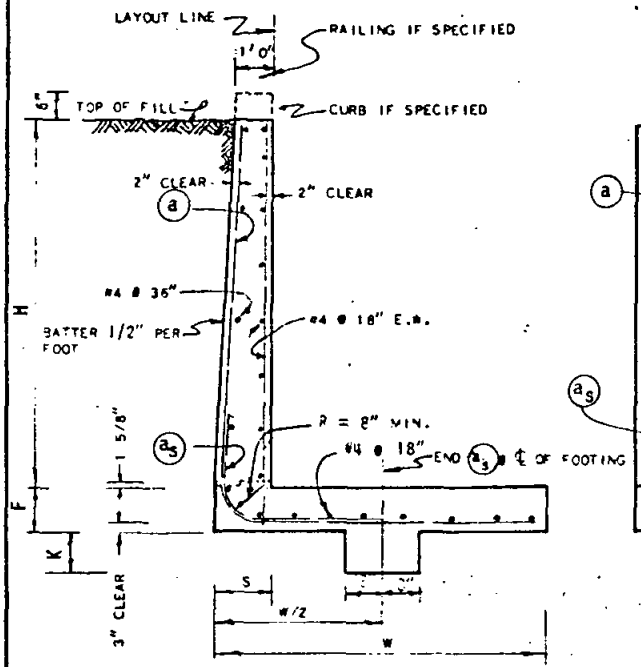
TYPE LM-4

(Liveload surcharge or sloping backfill)

SCALE NONE

DRAWING NO. C-61

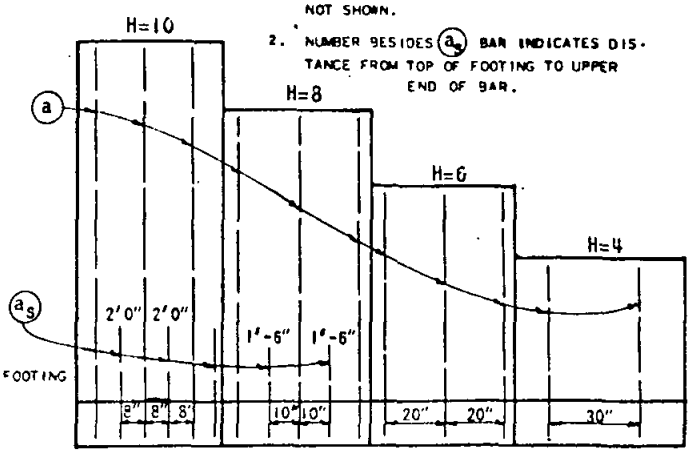
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	[illegible]



TYPICAL SECTION

NOTES:

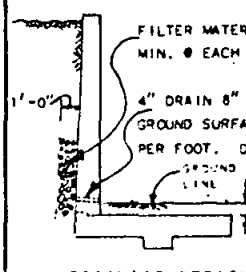
1. FRONT FACE AND HORIZONTAL REINFORCEMENT NOT SHOWN.
2. NUMBER BESIDES (as) BAR INDICATES DISTANCE FROM TOP OF FOOTING TO UPPER END OF BAR.



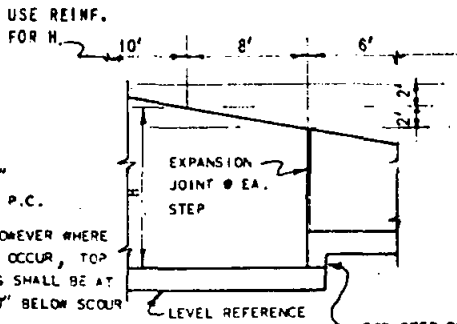
NOTES:

1. There shall be no earth, foundation or other loading extending above design H, within a distance equal to height of the wall.
2. Backfill on top of footing must be placed before backfilling against stem.

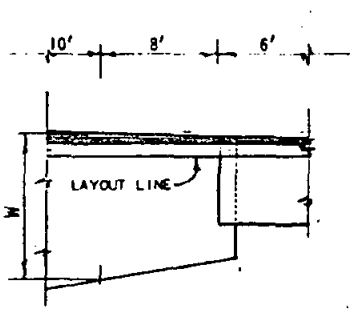
ELEVATION



DRAINAGE DESIGN



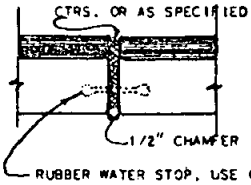
ELEVATION



PLAN

TABLE OF REINF. STEEL, DIMENSION AND DATA				
H	4'-0"	6'-0"	8'-0"	10'-0"
W	3'-6"	3'-10"	4'-10"	6'-6"
F	1'-2"	1'-3"	1'-4"	1'-5"
S	1'-2"	1'-3"	1'-4"	1'-5"
K		0'-6"	0'-8"	1'-0"
(a) bars	#4 @ 30"	#4 @ 20"	#4 @ 20"	#5 @ 16"
(as) bars (short)			#4 @ 20"	#5 @ 16"
Toe pressure P.S.F.	660	1070	1200	1225
Conc. CF/Ft.	7.8	12.4	16.7	23.3
Steel lbs/ft.	10.3	14.9	21.71	36.5

1/2" EXP. JT. MATERIAL. LOCATE JOINTS AT 30'-0" CTRS. OR AS SPECIFIED.



RUBBER WATER STOP, USE ONLY WHEN WATERTIGHT JOINT IS SPECIFIED. SEE C-45

EXPANSION JOINT

SPECIFICATION REFERENCE

COUNTY OF SAN DIEGO STANDARD DRAWING

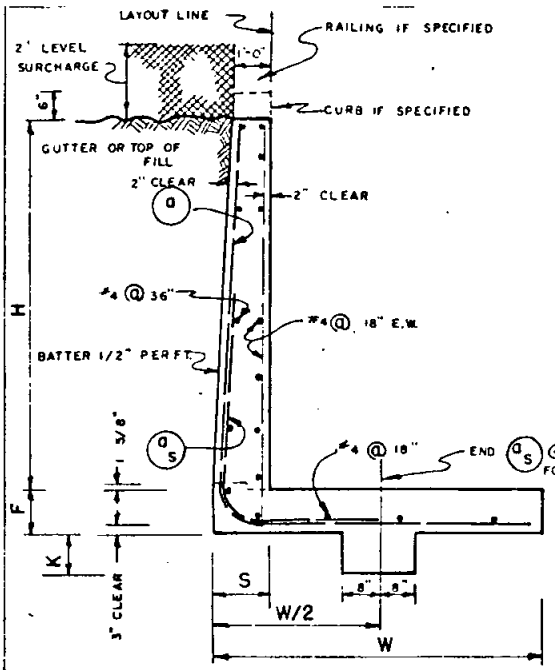
CANTILEVER RETAINING WALL TYPE "L-1"

FOR GENERAL NOTES SEE DRAWING C-52

SCALE no scale

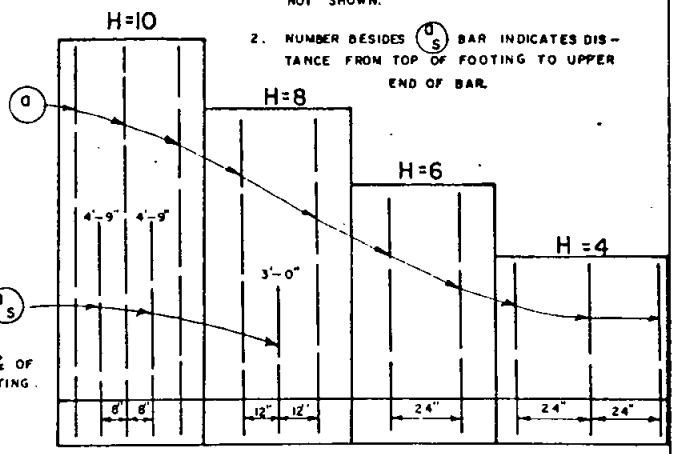
DRAWING NO. C-63

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/64



NOTES:

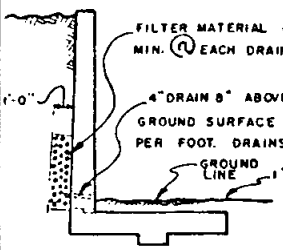
1. FRONT FACE AND HORIZONTAL REINFORCEMENT NOT SHOWN.
2. NUMBER BESIDES (as) BAR INDICATES DISTANCE FROM TOP OF FOOTING TO UPPER END OF BAR.



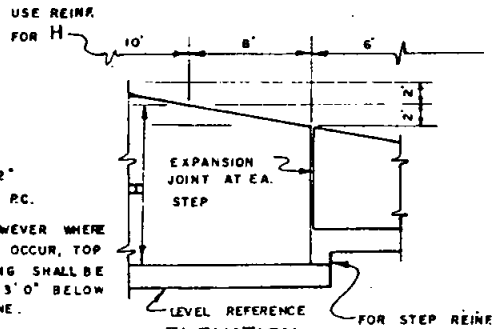
NOTE:
BACKFILL ON TOP OF FOOTING MUST BE PLACED BEFORE BACKFILLING AGAINST STEM.

TYPICAL SECTION

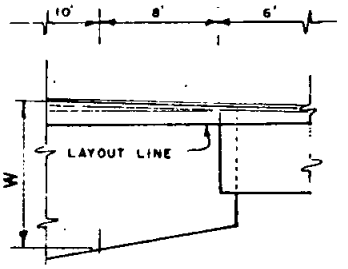
ELEVATION



DRAINAGE DESIGN



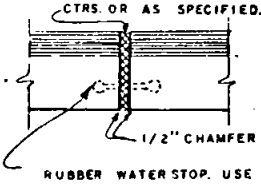
ELEVATION



PLAN

TABLE OF REINF. STEEL, DIMENSION AND DATA				
H	4'-0"	6'-0"	8'-0"	10'-0"
W	3'-9"	5'-3"	6'-9"	9'-0"
F	1'-2"	1'-3"	1'-4"	1'-5"
S	1'-2"	1'-3"	1'-4"	1'-3"
K	0'-8"	0'-8"	1'-0"	1'-3"
(a) bars	#4 @ 24"	#5 @ 24"	#5 @ 24"	#5 @ 18"
(as) bars (short)			#5 @ 24"	#6 @ 16"
Toe pressure P.S.F.	810	940	1000	1100
Conc. CF/Ft.	9.6	11.2	20.3	27.4
Steel lbs/ft.	13.9	17.3	25.3	42.0

1/2" EXP. JT. MATERIAL LOCATE JOINTS AT 30'-0"± CTRS. OR AS SPECIFIED.



RUBBER WATER STOP. USE ONLY WHEN WATERTIGHT JOINT IS SPECIFIED. SEE C-45

EXPANSION JOINT

SPECIFICATION REFERENCE

COUNTY OF SAN DIEGO — STANDARD DRAWING

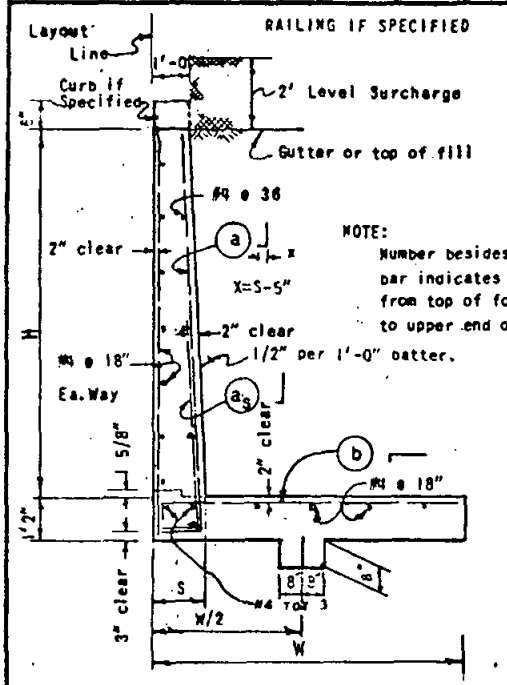
CANTILEVER RETAINING WALL TYPE "L-2"

FOR GENERAL NOTES SEE DRAWING C-52

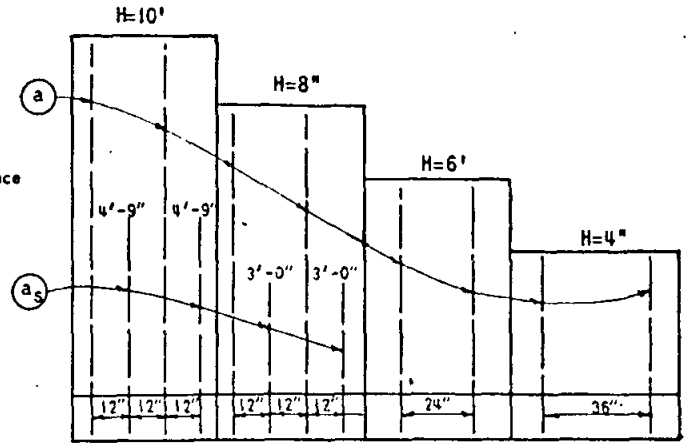
SCALE: No Scale

DRAWING NO. C-64

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11/16/72

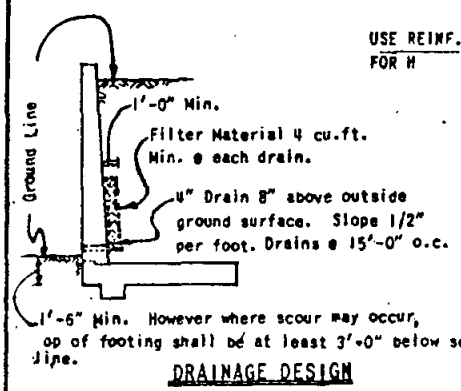


FRONT FACE AND HORIZONTAL REINFORCEMENT NOT SHOWN.

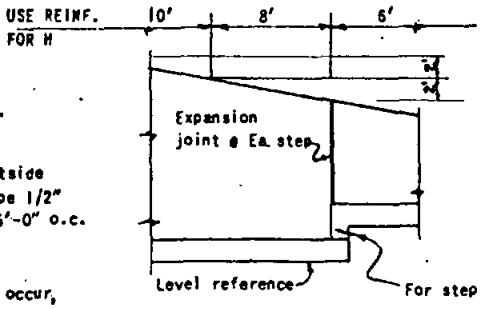


TYPICAL SECTION

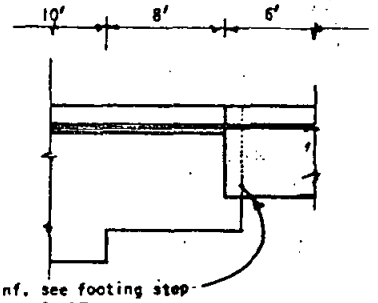
ELEVATION



DRAINAGE DESIGN

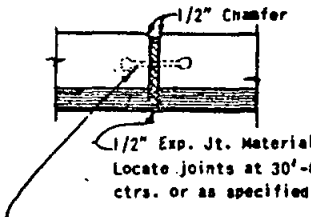


ELEVATION



PLAN

TABLE OF REINF. STEEL DIMENSIONS AND DATA				
H	4'	6'	8'	10'
W	3'-10"	5'-0"	6'-8"	8'-6"
S	1'-2"	1'-3"	1'-4"	1'-5"
(a) bars	#5 @ 36	#5 @ 24	#5 @ 24	#6 @ 24
(a_s) bars (short)			#5 @ 24	#6 @ 24
(b) bars	#5 @ 36	#5 @ 12	#6 @ 12"	#7 @ 12
Toe pressure P.S.F.	1490	2180	2520	2870
Conc. CF/ft.	9.7	13.5	18.0	22.9
Steel lbs/ft.	12.8	20.5	33.0	50.2



EXPANSION JOINT

SPECIFICATION REFERENCE

COUNTY OF SAN DIEGO STANDARD DRAWING

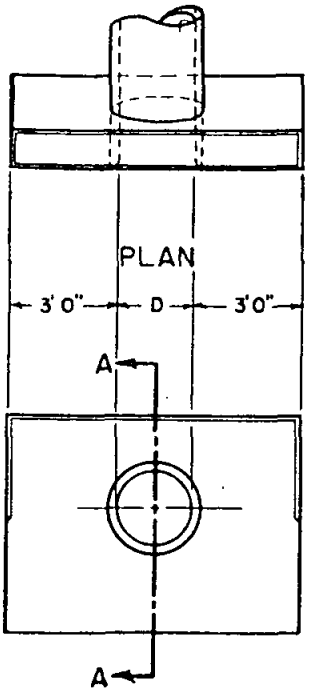
CANTILEVER RETAINING WALL TYPE "L-5"

FOR GENERAL NOTES SEE DRAWING 52-E8

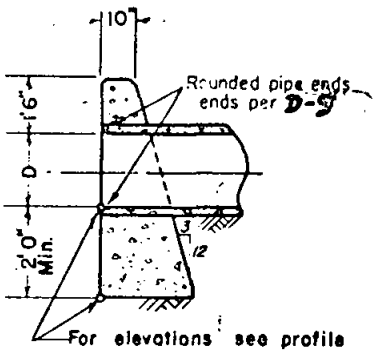
SCALE no scale

DRAWING NO. C-67

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. A. Taylor	Walter



ELEVATION



SECTION A–A

GENERAL NOTES

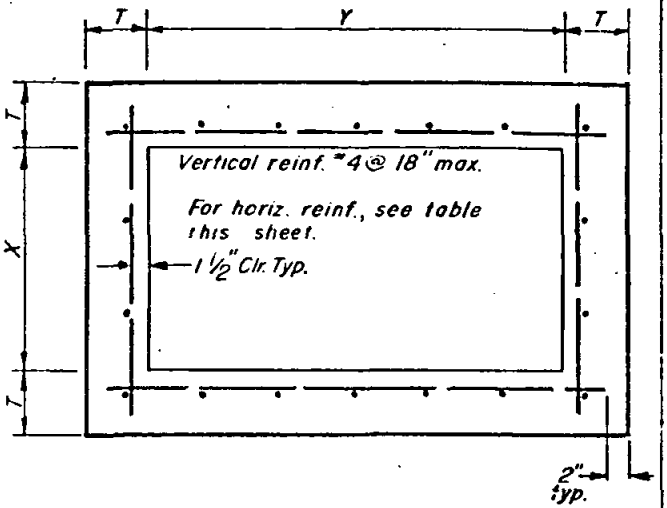
Concrete: All concrete to be Class A
All exposed corners to be chamfered 3/4"
Exposed surfaces to be finished.
"D" = inside diameter of pipe.
Min. denotes Minimum

Legend on plans: ═╣

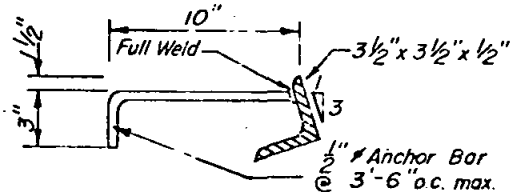
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE 1" = 4'-0"
	GRAVITY TYPE HEADWALL	DRAWING NO. D-1

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	W.M. Taylor	11/10/72
NOTE CHANGE	J.E.B.	A. Kirkland	2/1/61			

BOX SECTION REINFORCEMENT			
MAX SPAN "X" or "Y"	DEPTH "V"	THICKNESS "T"	HORIZ. & FLR REINF.
3'-0" to 4'-0"	4'-0"	6"	#4 @ 18"
4'-1" to 5'-0"		6"	#4 @ 12"
5'-1" to 6'-0"		6"	#4 @ 12"
6'-1" to 7'-0"		6"	#4 @ 12"
7'-1" to 8'-0"		6"	#4 @ 8"
3'-0" to 4'-0"	4'-1" to 6'-0"	6"	#4 @ 18"
4'-1" to 5'-0"		6"	#4 @ 12"
5'-1" to 6'-0"		6"	#4 @ 8"
6'-1" to 7'-0"		6"	#4 @ 6"
7'-1" to 8'-0"		6"	#4 @ 6"
3'-0" to 4'-0"	8'-1" to 12'-0"	6"	#4 @ 15"
4'-1" to 5'-0"		8"	#4 @ 12"
5'-1" to 6'-0"		8"	#4 @ 8"
6'-1" to 7'-0"		8"	#4 @ 6"
7'-1" to 8'-0"		8"	#4 @ 6"
3'-0" to 4'-0"	12'-1" to 16'-0"	6"	#4 @ 12"
4'-1" to 5'-0"		8"	#4 @ 12"
5'-1" to 6'-0"		8"	#4 @ 8"
6'-1" to 7'-0"		8"	#4 @ 6"
7'-1" to 8'-0"		8"	#5 @ 8"
3'-0" to 4'-0"	16'-1" to 20'-0"	8"	#4 @ 12"
4'-1" to 5'-0"		10"	#4 @ 12"
5'-1" to 6'-0"		10"	#4 @ 8"
6'-1" to 7'-0"		10"	#4 @ 6"
7'-1" to 8'-0"		10"	#5 @ 8"
3'-0" to 4'-0"	20'-1" to 24'-0"	8"	#4 @ 12"
4'-1" to 5'-0"		10"	#4 @ 12"
5'-1" to 6'-0"		10"	#4 @ 8"
6'-1" to 7'-0"		10"	#4 @ 6"
7'-1" to 8'-0"		12"	#5 @ 8"



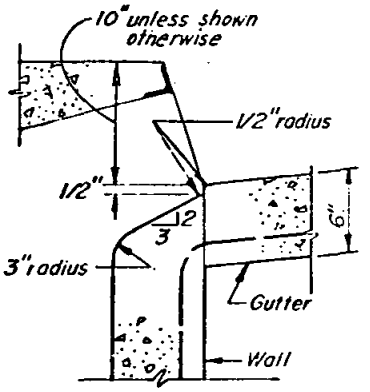
TYPICAL BOX SECTION



FACE ANGLE

NOTES

1. Concrete shall be Class "A" with 1 1/2 inch maximum size aggregate.
2. Unless otherwise specified reinforcing steel shall comply with this drawing.
3. Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
4. All bends shall be in accordance with the latest ACI code.
5. Minimum splice length for reinforcing shall be 30 diameters.
6. Floors shall have a wood trowel finish and except where used as junction boxes, shall have a minimum slope of 1 inch per foot towards the outlet.
7. Face Angle shall be cast into structure continuous for the full length "L".
8. When structure depth "V" exceeds 5 feet, ladder rungs shall be cast into wall @ 15" intervals from 15" above floor to within 12" of top of structure. Where possible place rungs in wall without pipe opening, directly beneath access opening. See D-34 for details.
9. Wall thickness and reinf. steel required may be decreased in accordance with table above as depth "V" to box section is decreased.
10. Face angle and anchor to be hot-dipped galvanized after fabrication.
11. Provide protective steel bar in throat opening when height of opening equals or exceeds 6".

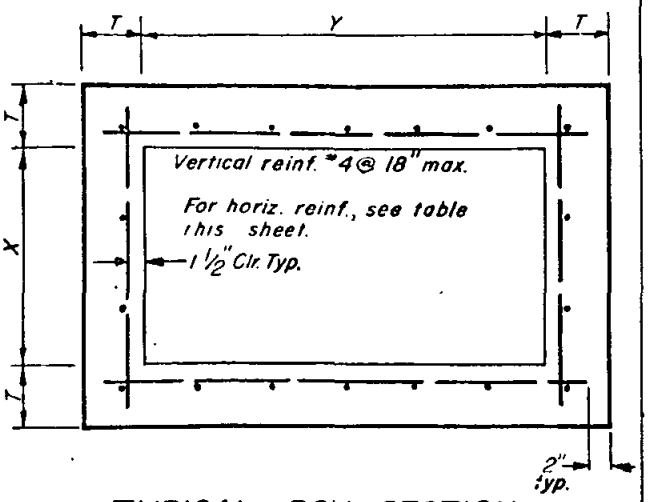


CURB INLET THROAT OPENING

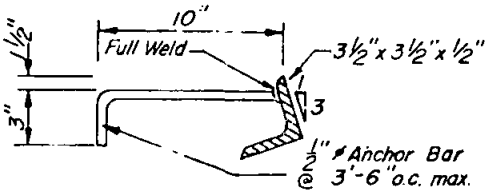
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	INLETS AND CLEANOUTS NOTES AND DETAILS	SCALE None DRAWING NO. D-4

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	Kent Taylor	11/6/77

BOX SECTION REINFORCEMENT			
MAX SPAN "X" or "Y"	DEPTH "V"	THICKNESS "T"	HORIZ. & FLR REINF.
3'-0" to 4'-0"	4'-0"	6"	#4 @ 18"
4'-1" to 5'-0"		6"	#4 @ 12"
5'-1" to 6'-0"		6"	#4 @ 12"
6'-1" to 7'-0"		6"	#4 @ 12"
7'-1" to 8'-0"		6"	#4 @ 8"
3'-0" to 4'-0"	4'-1" to 8'-0"	6"	#4 @ 18"
4'-1" to 5'-0"		6"	#4 @ 12"
5'-1" to 6'-0"		6"	#4 @ 8"
6'-1" to 7'-0"		6"	#4 @ 6"
7'-1" to 8'-0"		6"	#4 @ 6"
3'-0" to 4'-0"	8'-1" to 12'-0"	6"	#4 @ 15"
4'-1" to 5'-0"		8"	#4 @ 12"
5'-1" to 6'-0"		8"	#4 @ 8"
6'-1" to 7'-0"		8"	#4 @ 6"
7'-1" to 8'-0"		8"	#4 @ 6"
3'-0" to 4'-0"	12'-1" to 16'-0"	6"	#4 @ 12"
4'-1" to 5'-0"		8"	#4 @ 12"
5'-1" to 6'-0"		8"	#4 @ 8"
6'-1" to 7'-0"		8"	#4 @ 6"
7'-1" to 8'-0"		8"	#5 @ 8"
3'-0" to 4'-0"	16'-1" to 20'-0"	8"	#4 @ 12"
4'-1" to 5'-0"		10"	#4 @ 12"
5'-1" to 6'-0"		10"	#4 @ 8"
6'-1" to 7'-0"		10"	#4 @ 6"
7'-1" to 8'-0"		10"	#5 @ 8"
3'-0" to 4'-0"	20'-1" to 24'-0"	8"	#4 @ 12"
4'-1" to 5'-0"		10"	#4 @ 12"
5'-1" to 6'-0"		10"	#4 @ 8"
6'-1" to 7'-0"		10"	#4 @ 6"
7'-1" to 8'-0"		12"	#5 @ 8"



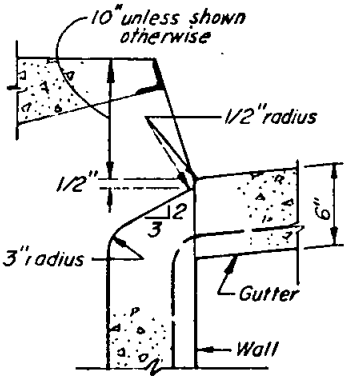
TYPICAL BOX SECTION



FACE ANGLE

NOTES

1. Concrete shall be Class "A" with 1 1/2 inch maximum size aggregate.
2. Unless otherwise specified reinforcing steel shall comply with this drawing.
3. Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
4. All bends shall be in accordance with the latest ACI code.
5. Minimum splice length for reinforcing shall be 30 diameters.
6. Floors shall have a wood trowel finish and except where used as junction boxes, shall have a minimum slope of 1 inch per foot towards the outlet.
7. Face Angle shall be cast into structure continuous for the full length "L".
8. When structure depth "V" exceeds 5 feet, ladder rungs shall be cast into wall @ 15" intervals from 15" above floor to within 12" of top of structure. Where possible place rungs in wall without pipe opening, directly beneath access opening. See D-34 for details.
9. Wall thickness and reinf. steel required may be decreased in accordance with table above as depth "V" to box section is decreased.
10. Face angle and anchor to be hot-dipped galvanized after fabrication.
11. Provide protective steel bar in throat opening when required - See D-37

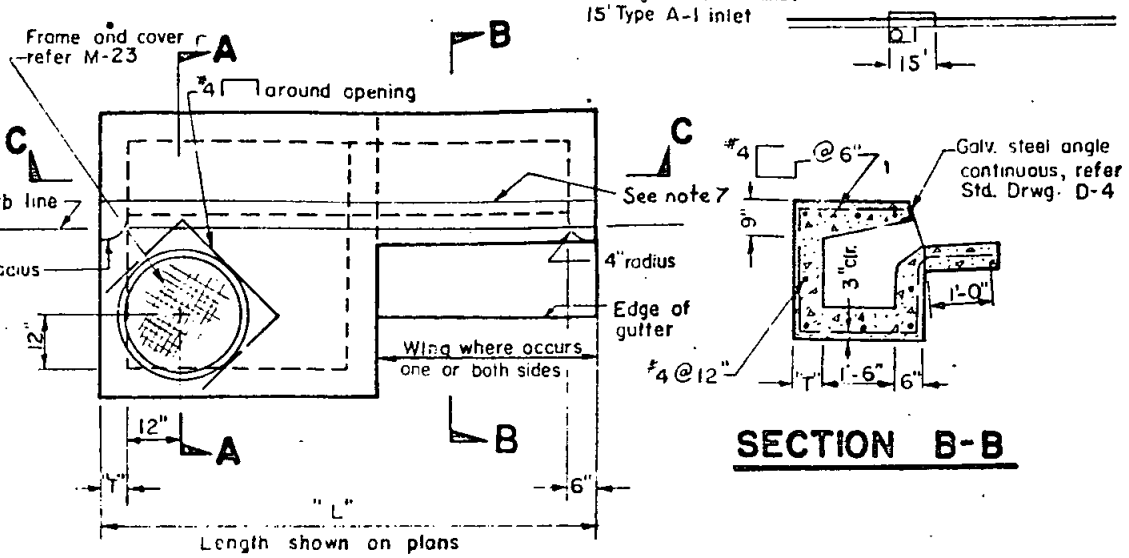


CURB INLET THROAT OPENING

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	INLETS AND CLEANOUTS NOTES AND DETAILS	SCALE None DRAWING NO. D-4

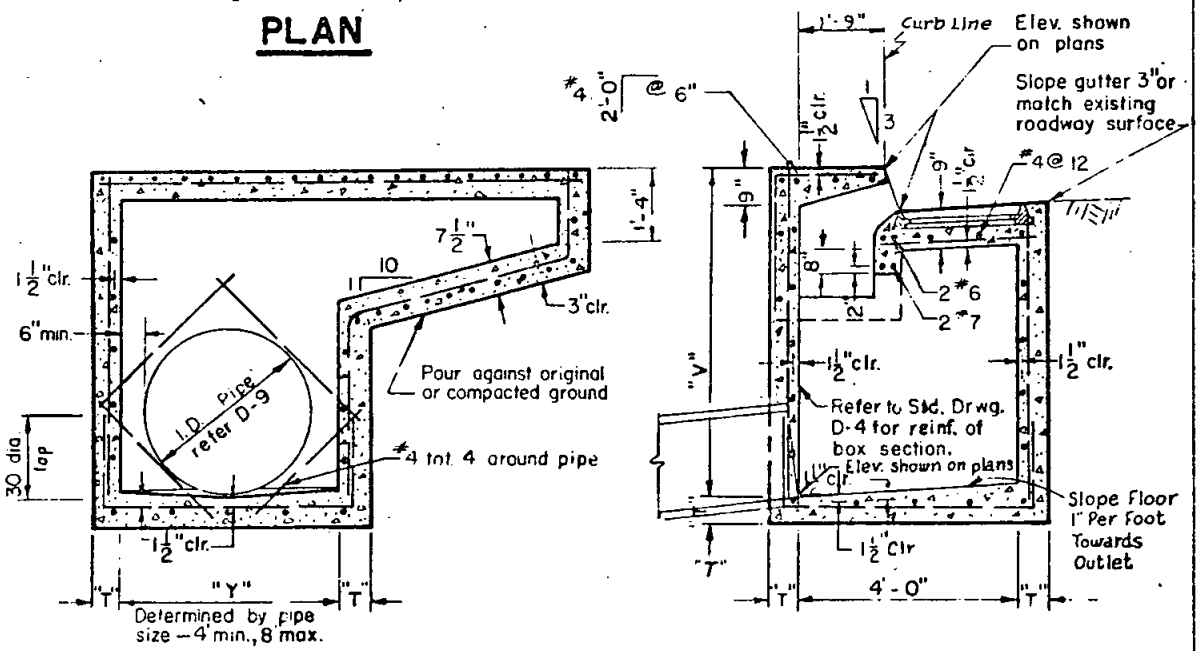
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11/16/72

Legend on Plans:
15' Type A-1 inlet



PLAN

SECTION B-B



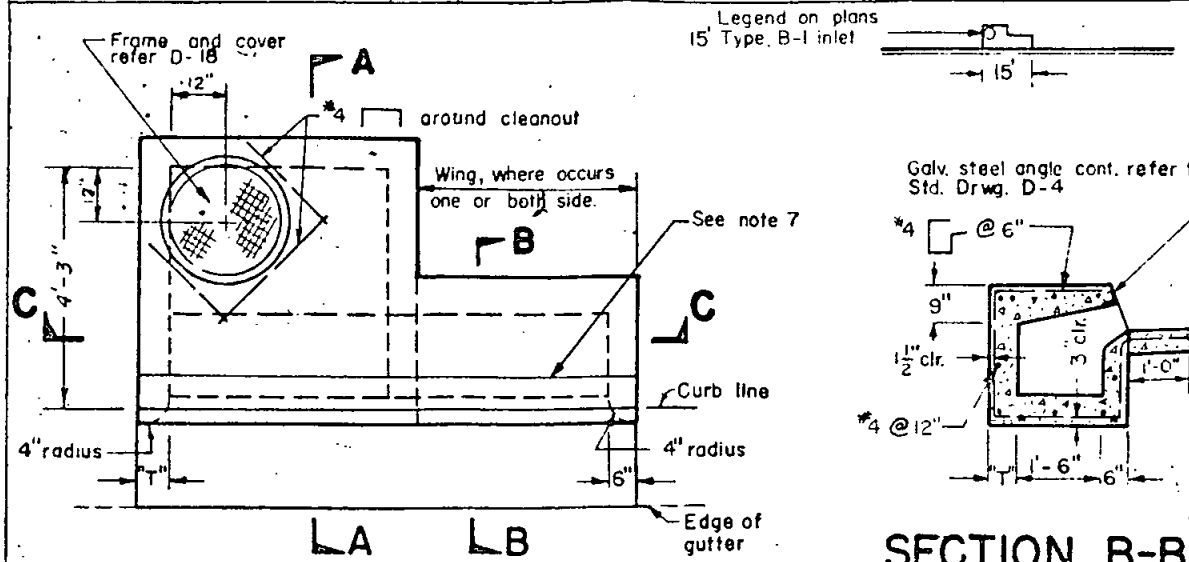
SECTION C-C

SECTION A-A

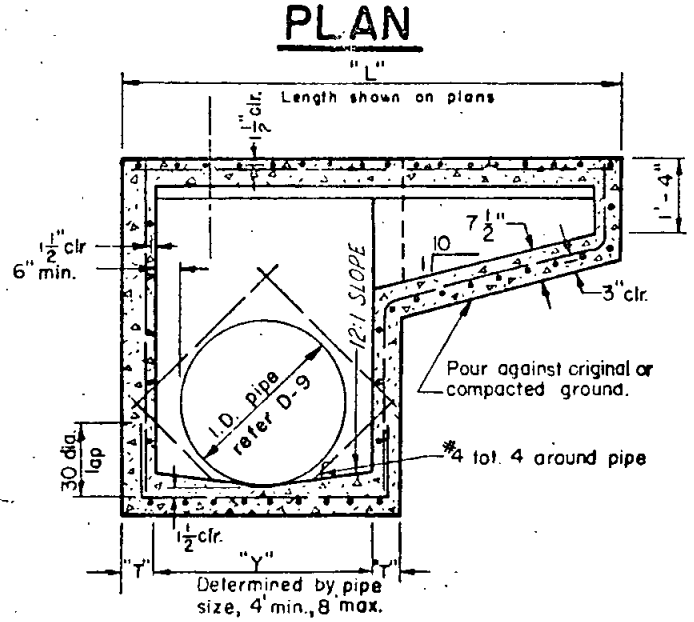
1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types as follows: No wing A, One wing A-1, Two wings A-2.
3. Exposed edges of concrete shall be rounded with a radius of $\frac{1}{2}$ inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards streets at a slope of $\frac{1}{4}$ inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide $\frac{1}{4}$" tooled groove in top slab in line with back of adjacent curb.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	No scale SCALE
	CURB INLET – TYPE A	DRAWING NO. **D-5**

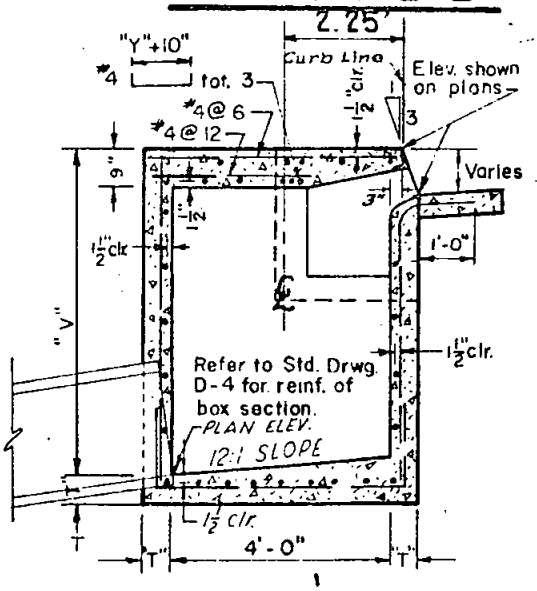
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER		



SECTION B-B



SECTION C-C

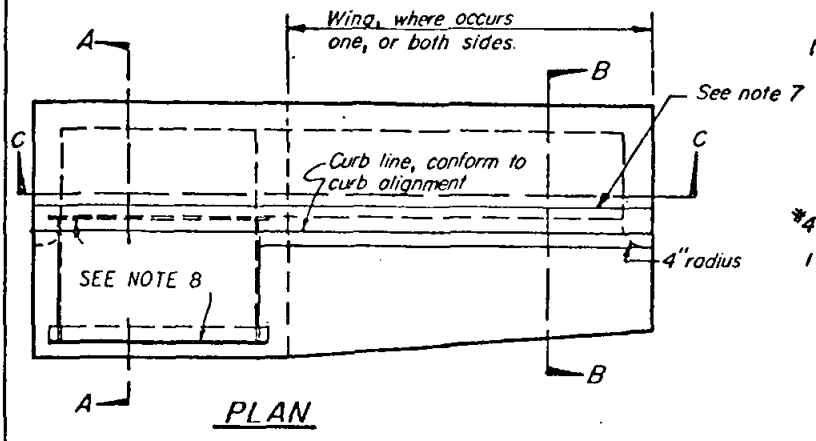


SECTION A-A

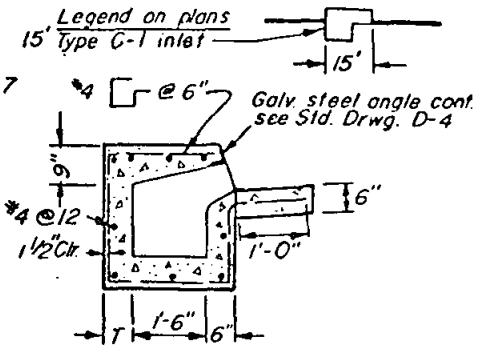
1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types as follows: No wing B, One wing B-1, Two wings B-2.
3. Exposed edges of concrete shall be rounded with a radius of $\frac{1}{2}$ inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards street at a slope of $\frac{1}{4}$ inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide $\frac{1}{4}$" tooled groove in top slab in line with back of adjacent curb.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	No scale SCALE
	CURB INLET-TYPE B	DRAWING NO. D-6

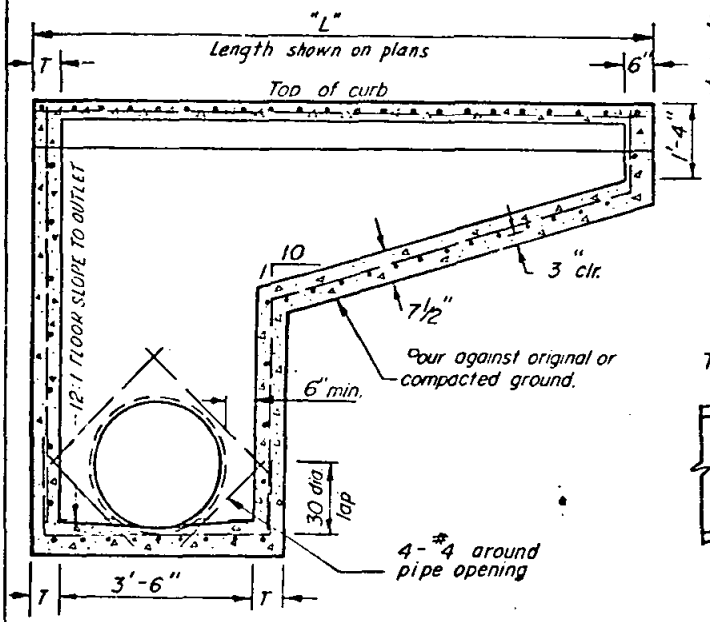
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	1/16/74
NOTE 8 ADDED		J. Kuckuk	2/1/74			



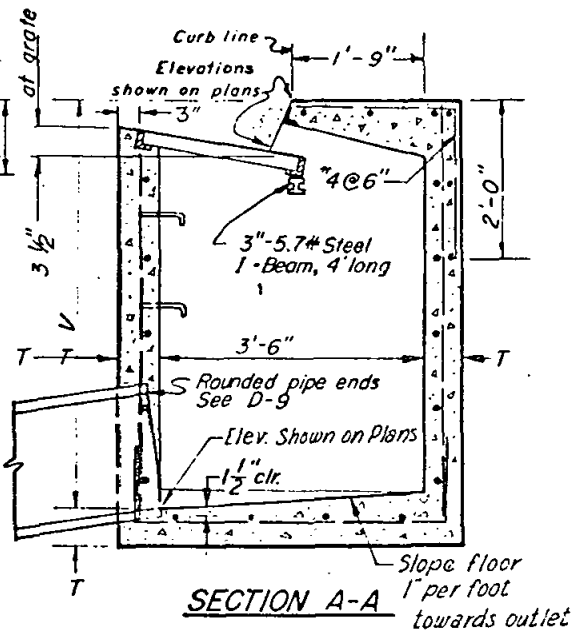
PLAN



SECTION B-B



SECTION C-C



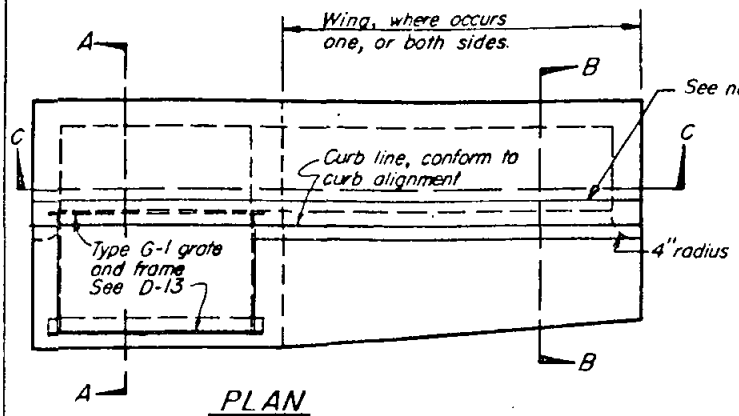
SECTION A-A

NOTES

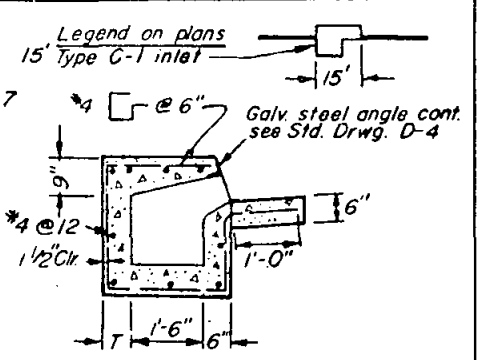
1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types as follows: No wing C, one wing C-1, two wings C-2.
3. Exposed edges of concrete shall be rounded with a radius of 1/2 inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards street at a slope of $\frac{1}{4}$ inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide $\frac{1}{4}$" tooled groove in top slab in line with back of adjacent curb.
8. A special size frame & grate is required.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE None
	CURB INLET— TYPE C	DRAWING NO. D-7

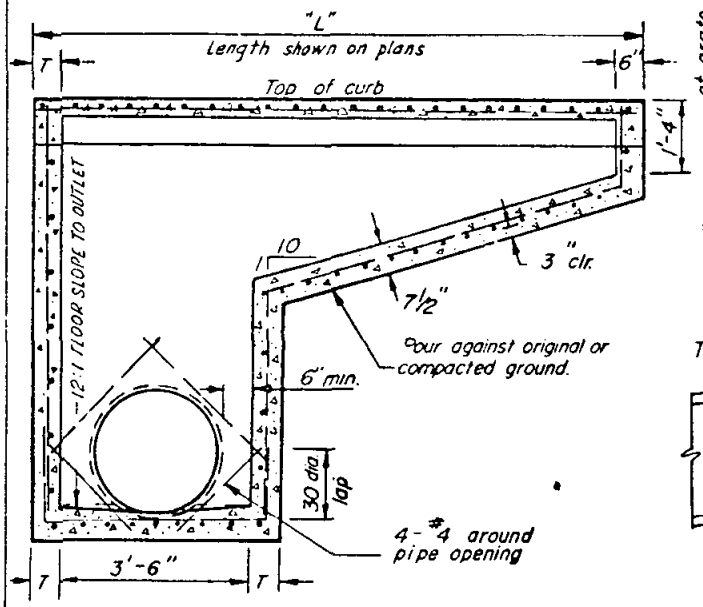
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Tay Jr.	11/16/62



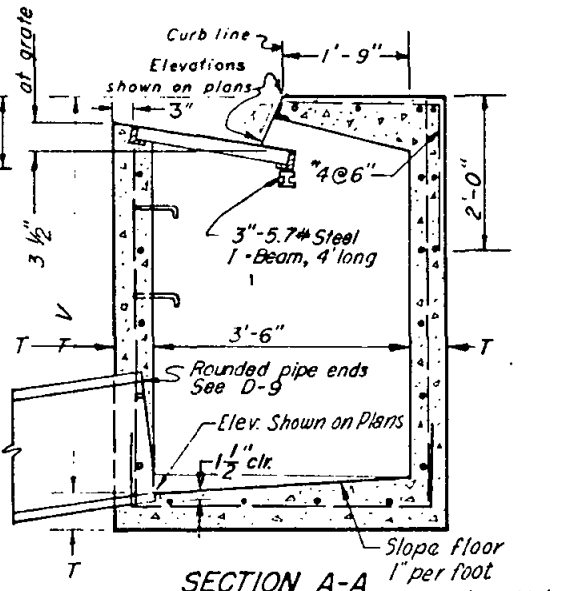
PLAN



SECTION B-B



SECTION C-C



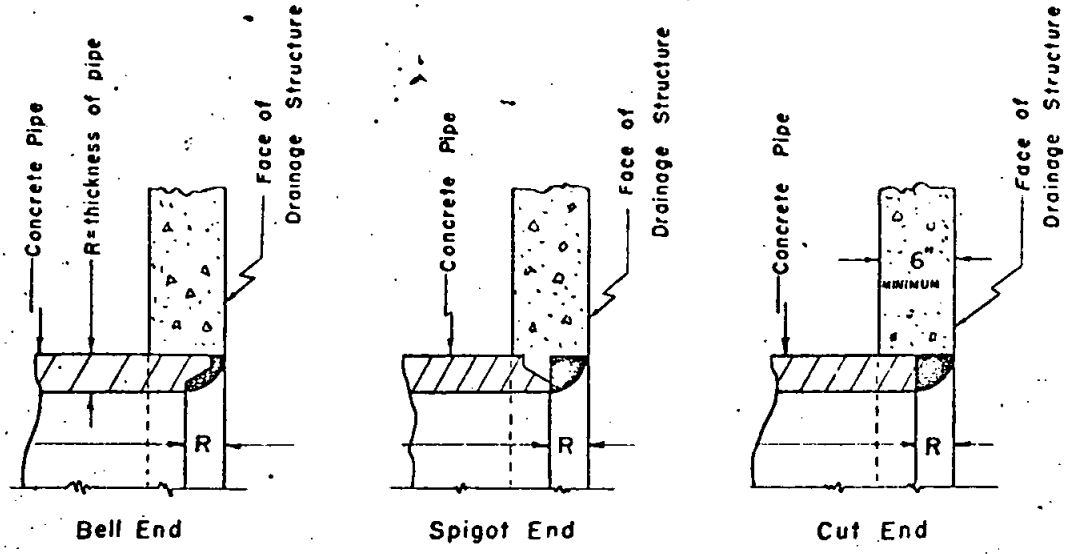
SECTION A-A

NOTES

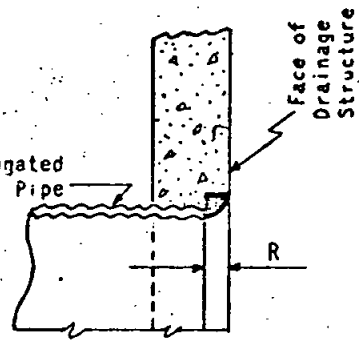
1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types as follows: No wing C, one wing C-1, two wings C-2.
3. Exposed edges of concrete shall be rounded with a radius of 1/2 inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards street at a slope of $\frac{1}{4}$ inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide $\frac{1}{4}$" tooled groove in top slab in line with back of adjacent curb.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURB INLET— TYPE C	SCALE None
		DRAWING NO. D-7

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.W. Taylor	1/16/52



The rounded areas may be built up of Cement Mortar or poured in place with the drainage structure.

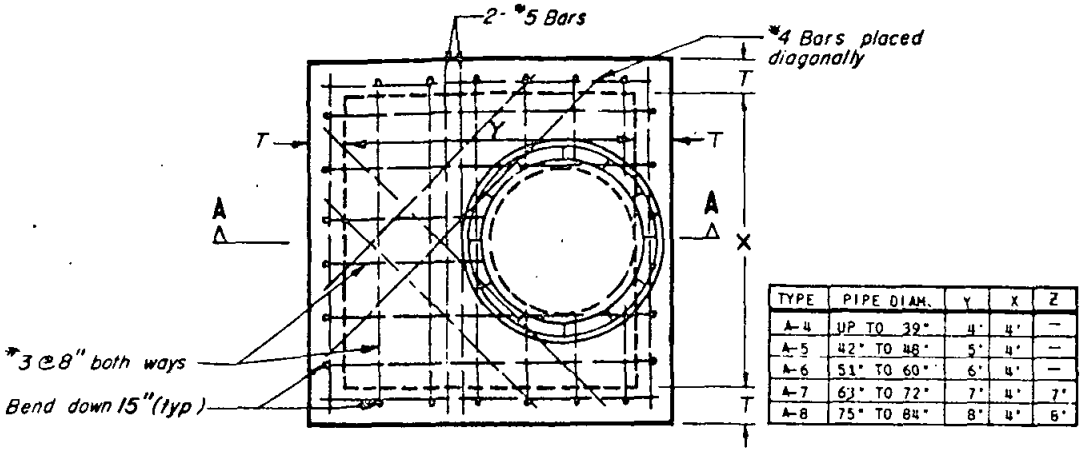


$$R = \frac{\text{INSIDE DIAMETER OF PIPE}}{10}$$

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE 1/2" = 1'-0"
	ROUNDED PIPE ENDS IN DRAINAGE STRUCTURES	DRAWING NO. D-9

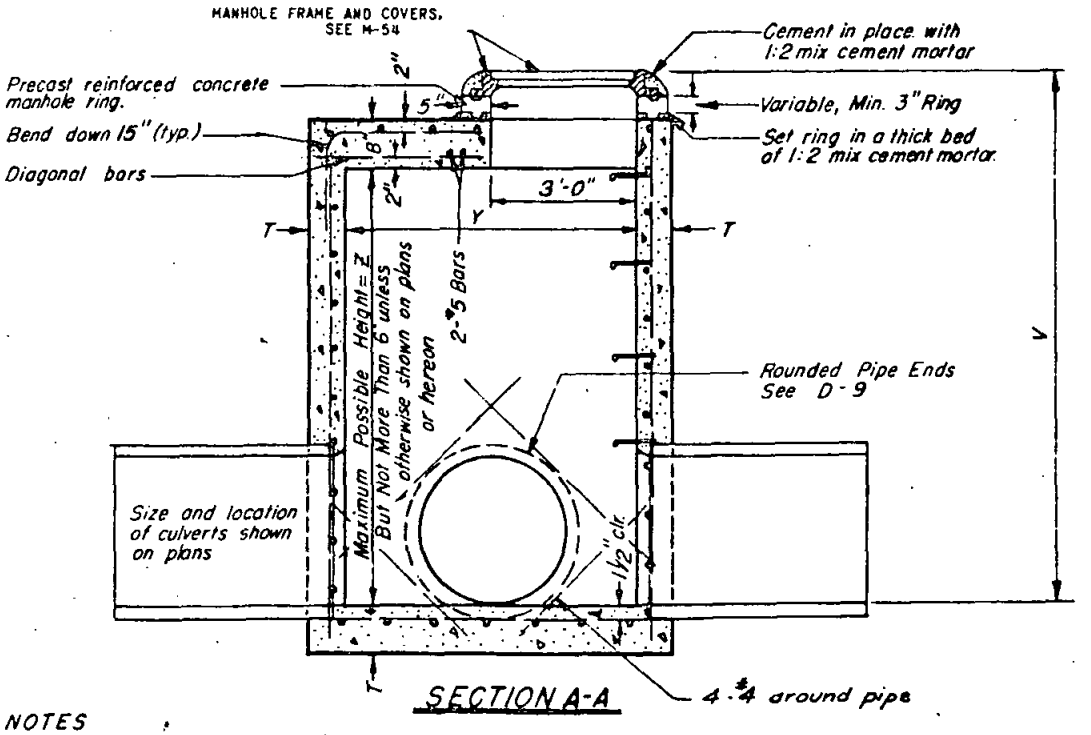
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	R. E. Taylor	11/16/72

Legend on plans ☐



TYPE	PIPE DIAM.	Y	X	Z
A-4	UP TO 39"	4'	4'	—
A-5	42" TO 48"	5'	4'	—
A-6	51" TO 60"	6'	4'	—
A-7	63" TO 72"	7'	4'	7'
A-8	75" TO 84"	8'	4'	6'

PLAN



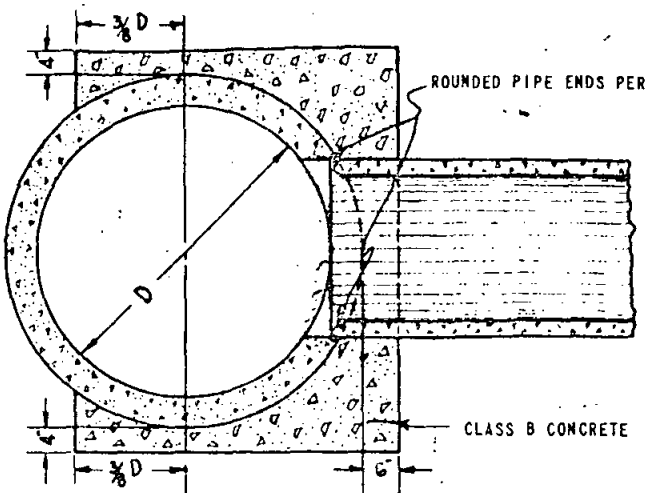
SECTION A-A

NOTES

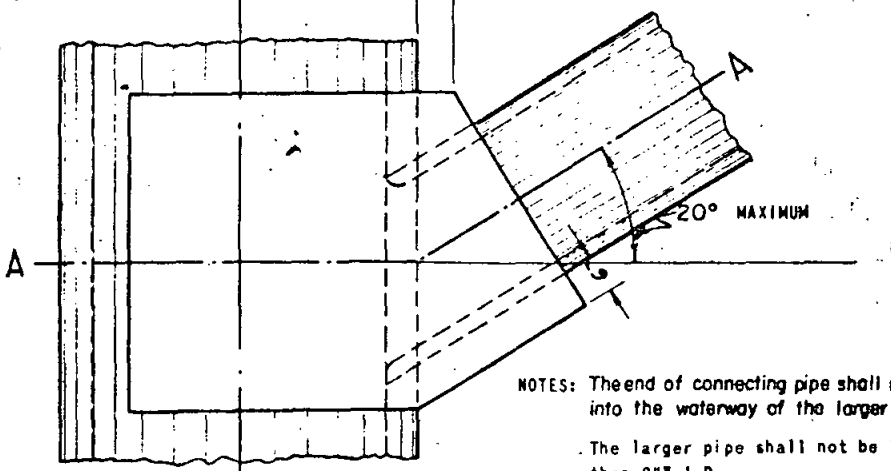
1. Refer to standard drawing D-4 for additional notes and details.
2. In unpaved areas, except streets, raise cover to 6" min. above finish grade. In streets, raise cover to finish grade.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	STORM DRAIN CLEANOUT	0 1 2 Ft.
	TYPE A	SCALE 1/2" = 1'-0"
		DRAWING NO. D-11

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	ulietre



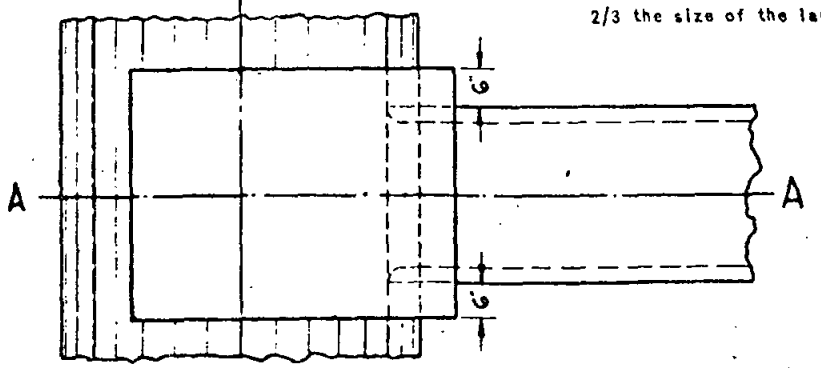
SECTION A-A



NOTES: The end of connecting pipe shall not project into the waterway of the larger pipe.

The larger pipe shall not be less than 24" I.D.

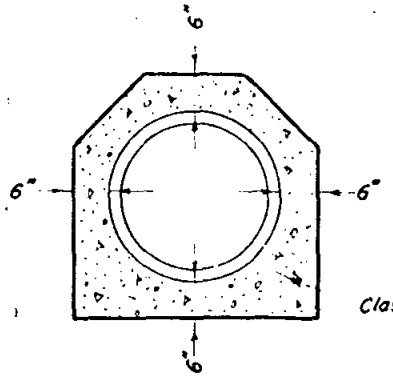
The smaller pipe shall not be more than 2/3 the size of the larger pipe.



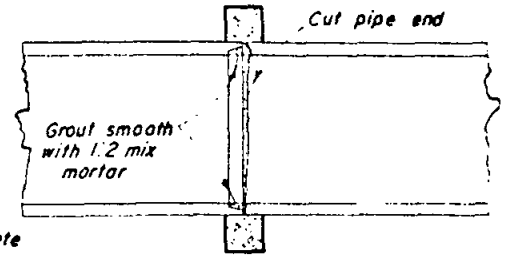
Legend on plans:

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE NONE
	CONCRETE LUG	DRAWING NO. D-12

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11/6/72



ELEVATION



→6" for pipe sizes 30" and smaller
9" for pipe sizes larger than 30"

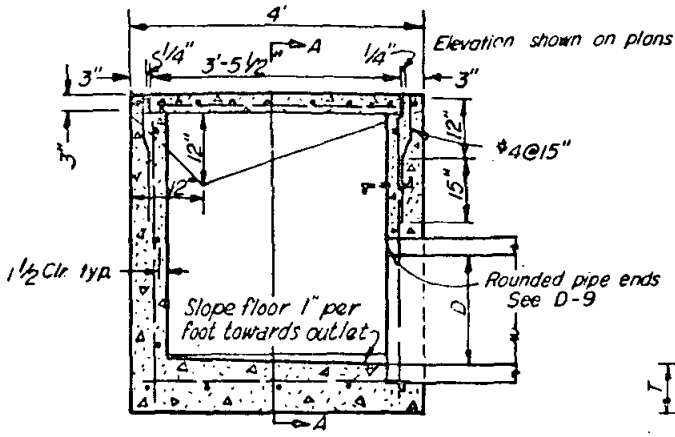
SECTION

Legend on Plans 

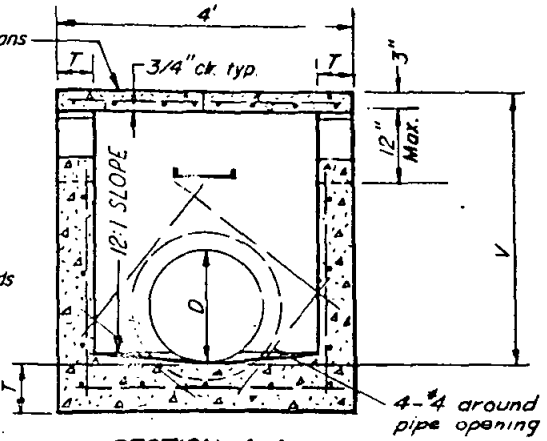
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	0 1'-0"
	PIPE COLLAR	SCALE 3/4" = 1'-0"
		DRAWING NO. D-14

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	4/15/70

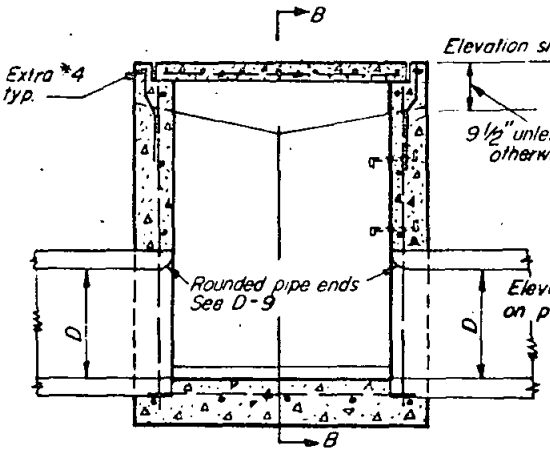
Legend on plans



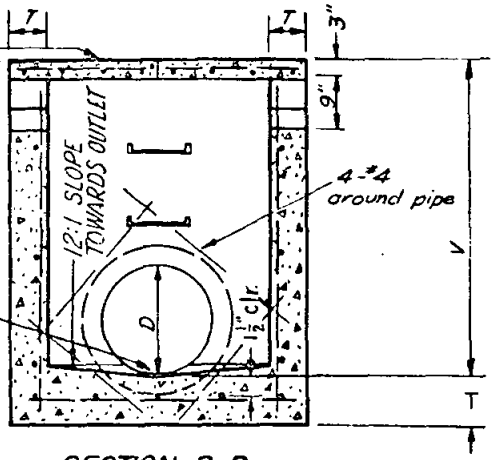
TYPE I DROP INLET



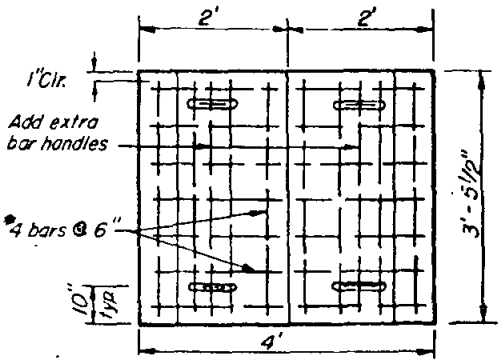
SECTION A A



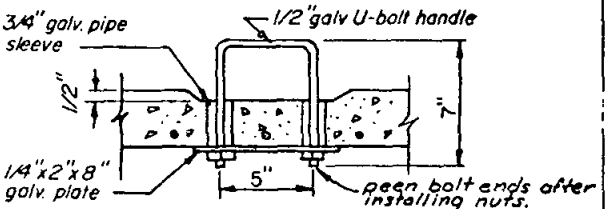
TYPE J DROP INLET



SECTION B-B



CONCRETE COVER



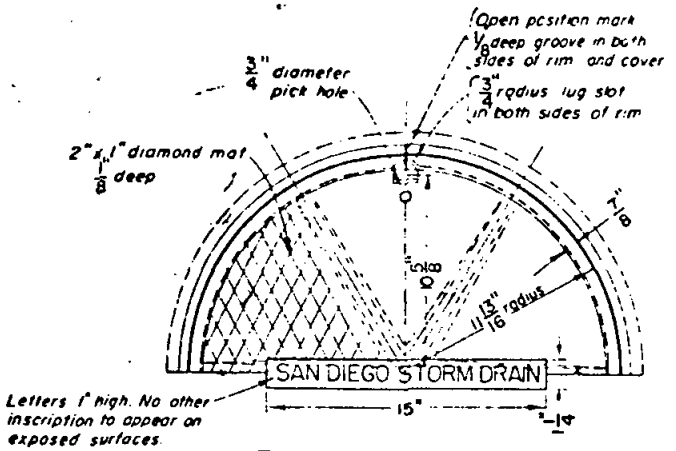
HANDLE DETAIL

NOTES:

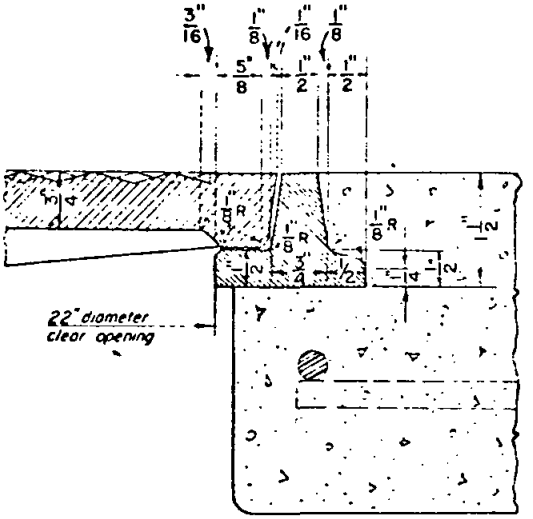
1. Refer to Standard Drawing D-4 for additional notes and details.
2. Type I and type J drop inlets are the same with the exception of the openings.
3. All exposed edges on top of inlet to be rounded to 1/2" radius.
4. Openings on both sides unless shown otherwise on plans.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	0 1 2 FT.
	TYPE I AND TYPE J INLETS	SCALE 1/2" = 1'-0"
		DRAWING NO. D-15

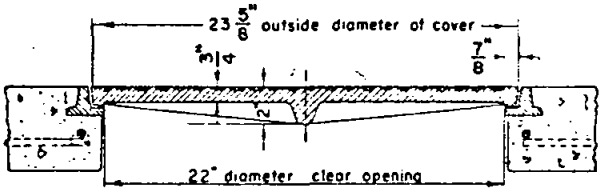
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	A. M. Taylor	11/10/72



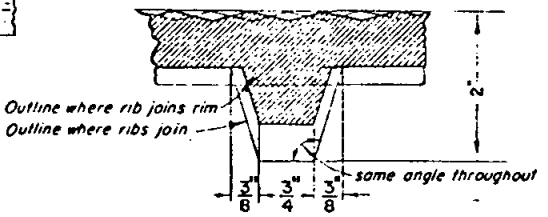
TOP OF FRAME & COVER



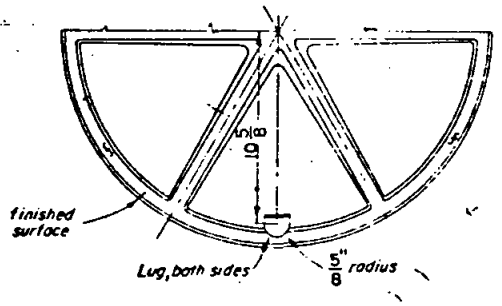
SECTION THROUGH RIM



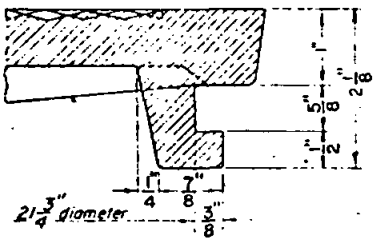
SECTION THROUGH FRAME & COVER



SECTION THROUGH RIB AT MID RADIUS



BOTTOM OF COVER

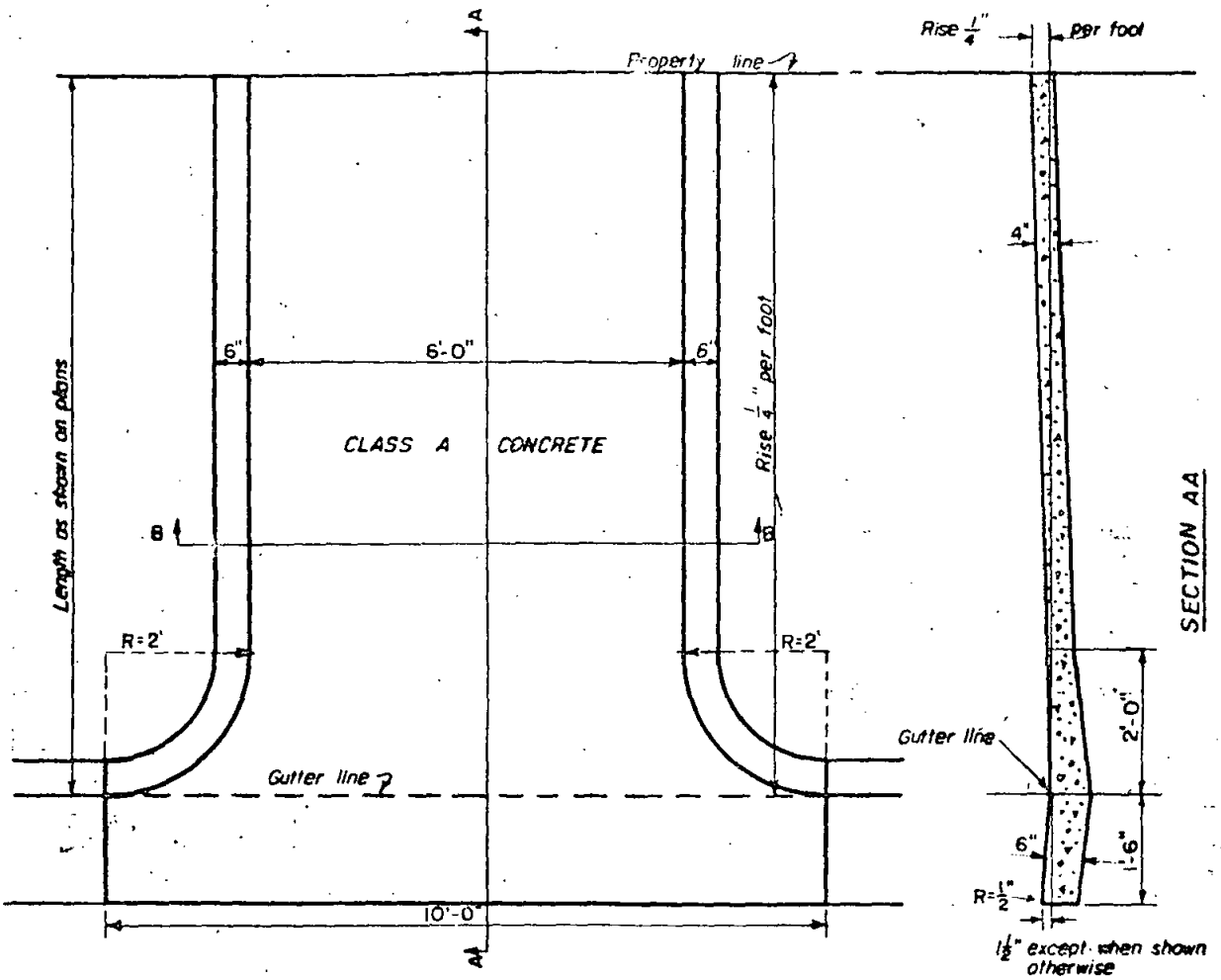


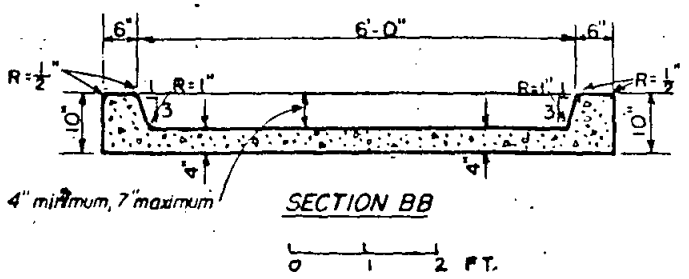
SECTION THROUGH LUG

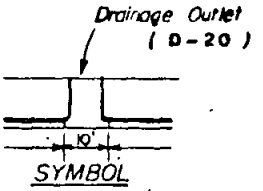
Notes: Frame and cover shall be cast iron
Inlet frame and cover for use in sidewalk area only

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	INLET FRAME AND COVER	SCALE None DRAWING NO. D-18

REVISIONS				APPROVALS	
DATE	DESCRIPTION	BY	APPROVED	COUNTY ENGINEER	H. M. Taylor Jr.







Specification Reference							

COUNTY OF SAN DIEGO — ENGINEERING DEPARTMENT

STANDARD DRAINAGE OUTLET

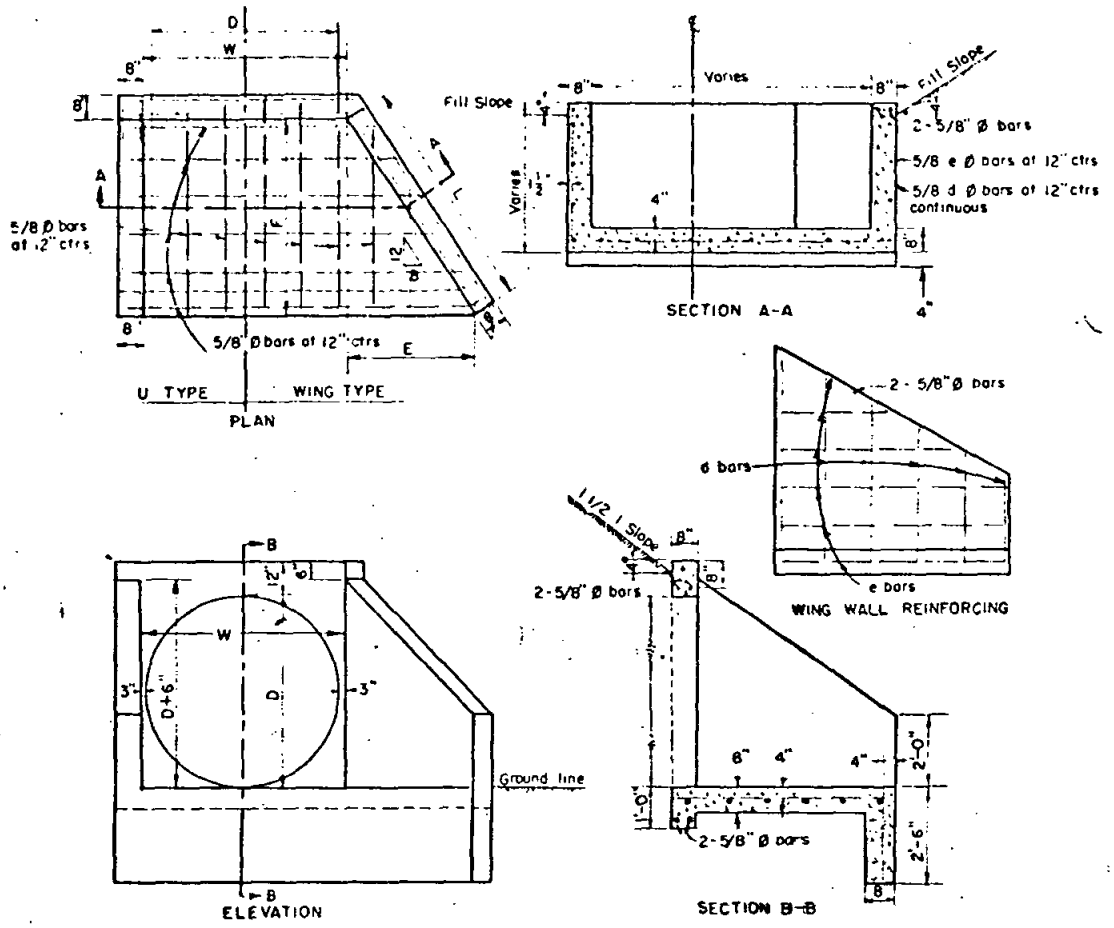
(For Sidewalk Areas)

DRAWING NUMBER

D-20

FORM 167 (SDG 4-82)

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	6/10/70



WING & U TYPE HEADWALLS FOR 42" TO 84" PIPES (1 1/2 : 1 FILL SLOPES)

DIAM OF PIPE	DIMENSIONS L	E	F	SINGLE PIPE AREA OF WATERWAY SQ FT	W	U TYPE CONCRETE CU YDS	U TYPE STEEL LBS	WING TYPE CONCRETE CU YDS	WING TYPE STEEL LBS	DOUBLE PIPE AREA OF WATERWAY SQ FT	W	U TYPE CONCRETE CU YDS	U TYPE STEEL LBS	WING TYPE CONCRETE CU YDS	WING TYPE STEEL LBS
42"	3'-7 1/4"	2'-0"	3'-0"	9.62	4'-0"	1.57	117	1.90	135	19.24	9'-10"	2.69	190	3.16	2.4
48"	4'-6"	2'-6"	3'-9"	12.56	4'-6"	1.97	153	2.48	184	25.12	11'-2"	3.43	252	4.06	285
54"	5'-4 7/8"	3'-0"	4'-6"	15.90	5'-0"	2.41	190	3.07	245	31.80	12'-6"	4.24	319	5.06	368
60"	6'-3 3/4"	3'-6"	5'-3"	19.63	5'-6"	2.88	239	3.75	294	39.26	13'-10"	5.13	386	6.17	442
66"	7'-2 1/2"	4'-0"	6'-0"	23.76	6'-0"	3.38	294	4.52	356	47.52	15'-2"	6.06	454	7.20	516
72"	8'-1 3/8"	4'-6"	6'-9"	28.27	6'-6"	3.93	369	5.52	417	56.54	16'-6"	7.11	522	8.30	588
78"	9'-0"	5'-0"	7'-6"	33.18	7'-0"	4.56	444	6.70	503	67.36	17'-4"	8.20	595	9.50	693
84"	9'-10 3/4"	5'-6"	8'-3"	38.48	7'-6"	5.21	540	8.15	619	76.96	18'-8"	9.50	687	10.80	786

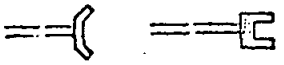
NOTE - Dimensions E and L apply to Wing type only

GENERAL NOTES

Concrete All concrete to be class A
All exposed corners to be chamfered 3/4"
Exposed surfaces to have standard finish
Reinforcing Steel. All reinforcing steel to be round deformed bars of structural grade
Multiple Pipes to be set with longitudinal center lines 1 2/3 diameters of pipe apart.

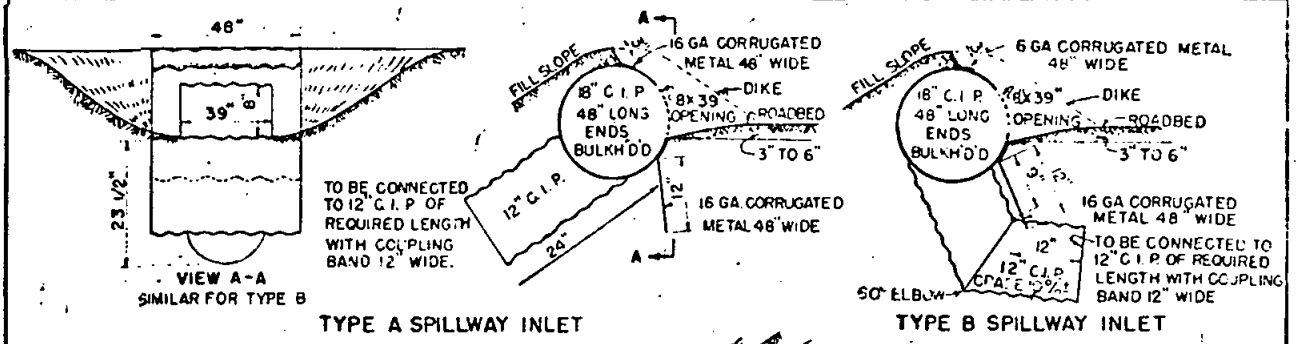
Skewed Pipes Dimension W to be increased to take care of increased width or length due to skew or multiple pipes
Tops of headwalls on grade culverts shall be placed parallel to profile grade when the grades are 3% or more.
Quantities shown in tables are for 1 headwall.

LEGEND ON PLANS



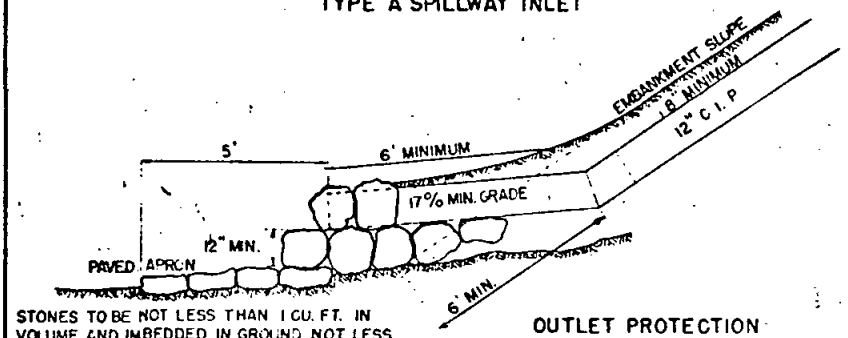
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING WING & U - TYPE HEADWALLS FOR 42" TO 84" PIPES	NONE SCALE DRAWING NO. D-24

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	11/15/72



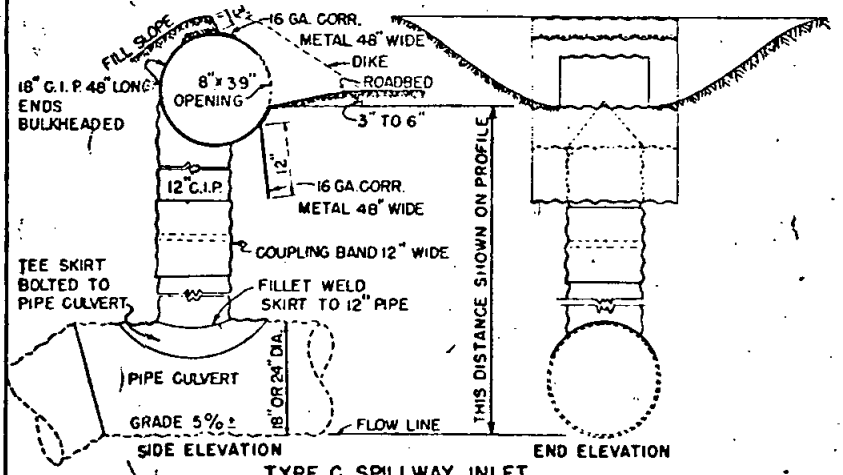
TYPE A SPILLWAY INLET

TYPE B SPILLWAY INLET

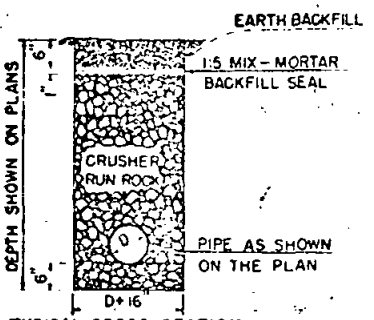


STONES TO BE NOT LESS THAN 1 CU. FT. IN VOLUME AND IMBEDDED IN GROUND NOT LESS THAN 6". APRON TO HAVE A WIDTH OF 4'.

OUTLET PROTECTION FOR TYPE A ASSEMBLIES



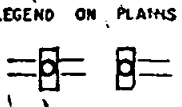
TYPE C SPILLWAY INLET



TYPICAL CROSS SECTION UNDERDRAIN

C.I.P. MEANS CORRUGATED IRON PIPE.
BULKH'D'D MEANS BULKHEADED.
GA. MEANS GAGE.
CORR. MEANS CORRUGATED.
MIN. MEANS MINIMUM.
DIA. MEANS DIAMETER.

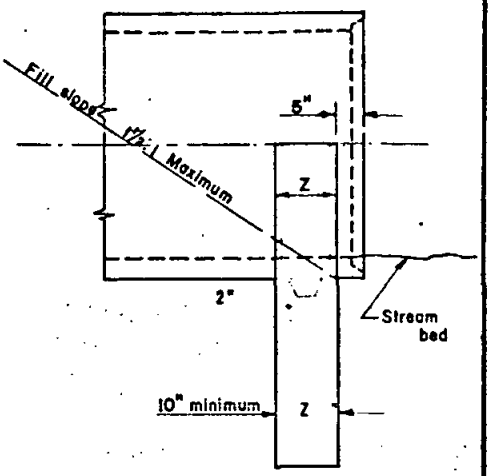
LEGEND ON PLANS



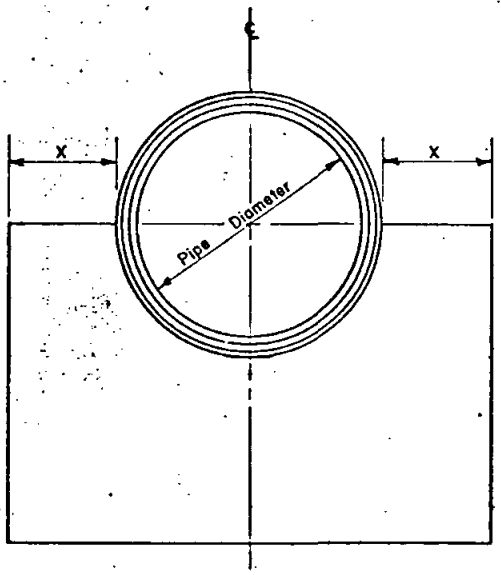
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	NONE
	Type A, B & C Spillway Inlets and Underdrain	SCALE
		DRAWING NO. D-25

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	A. M. Taylor	11-19-73

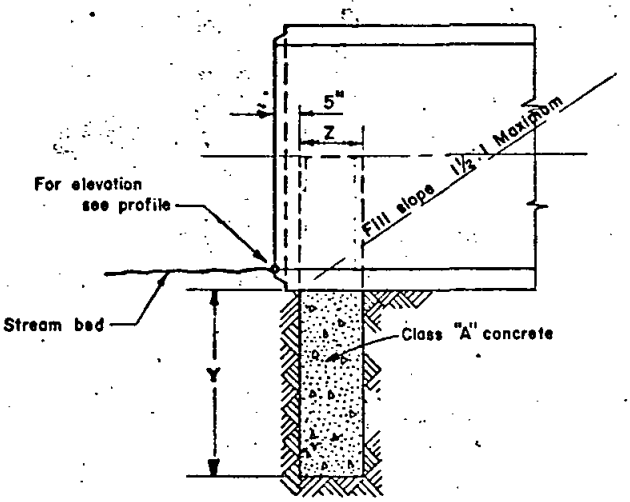
PIPE DIAMETER	X	Y	Z
12" to 24"	1'-0"	2'-0"	10"
21" to 36"	1'-6"	2'-6"	12"
39" to 48"	2'-0"	3'-0"	12"
51" to 60"	2'-6"	3'-0"	14"
63" & LARGER	3'-0"	3'-0"	18"



SIDE ELEVATION



FACE ELEVATION



CENTER LINE SECTION

GENERAL NOTES

A curtain wall shall be used in place of a headwall at culvert ends where extension of the culvert is considered imminent, or no fill slope is retained.

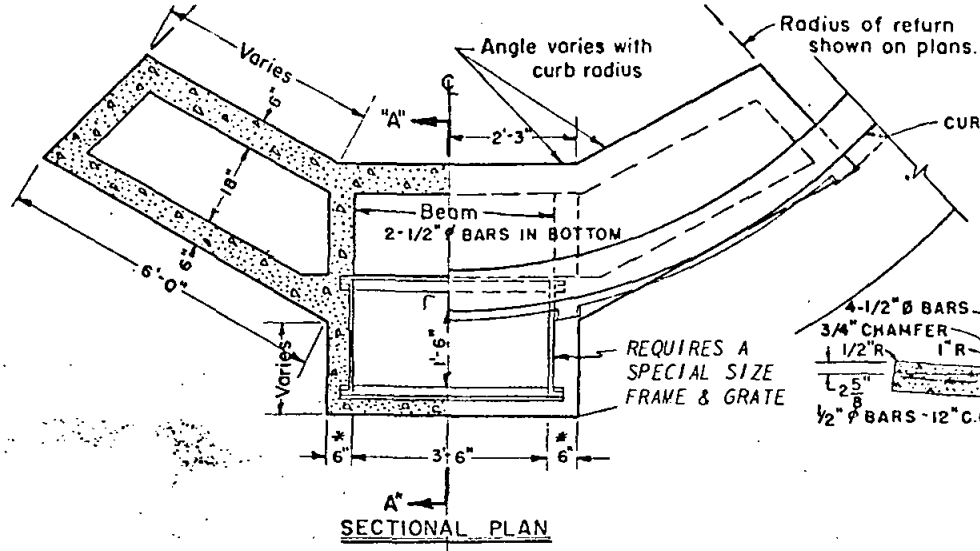
The dimension "Y" shall be increased if unstable material is encountered.

Keep the pipe-end clear of obstruction to permit easy placing of culvert extension.

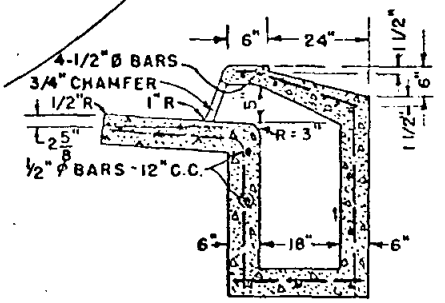
Legend on plans:

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	0 1 2 FT. SCALE ½" = 1'-0"
	CURTAIN WALL	DRAWING NO. D-28

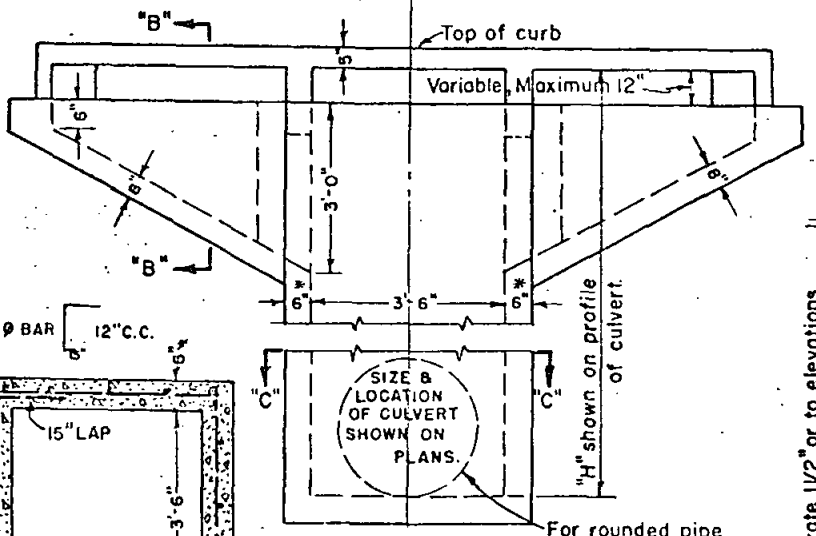
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11-10-72
COMMENT ON FRAME & GRATE	J.E.B.	[illegible]	2/1/73			



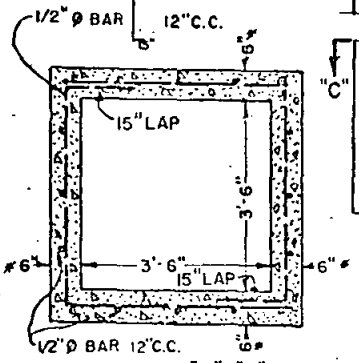
SECTIONAL PLAN



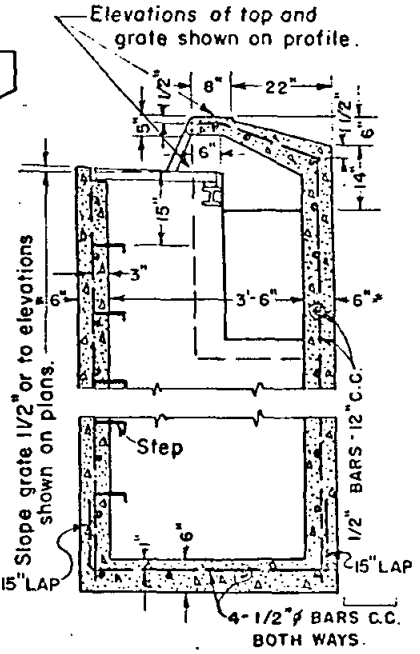
SECTION "B"-"B"



ELEVATION

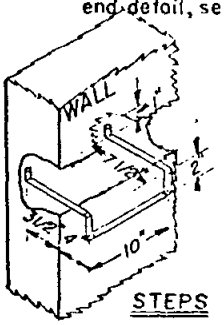


SECTION "C"-"C"



SECTION "A"-"A"

* NOTE: For sections extending deeper than 12'-0" below top of inlet, wall thickness shall be increased to 8". Special design required for "H" greater than 16'-0".



STEPS

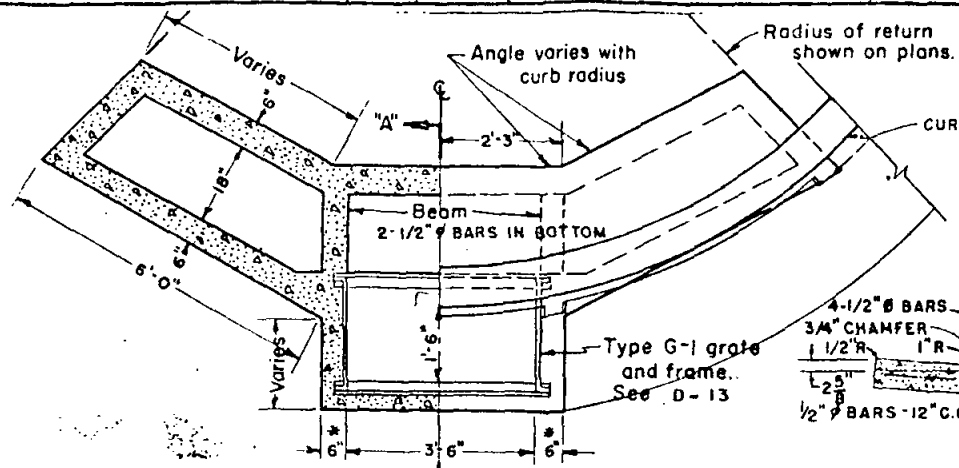
NOTE: When height exceeds 5', cast 5/8" round galvanized iron steps in wall, 15" apart.

NOTE: All concrete shall be Class A.
All reinforcing shall be deformed bars.

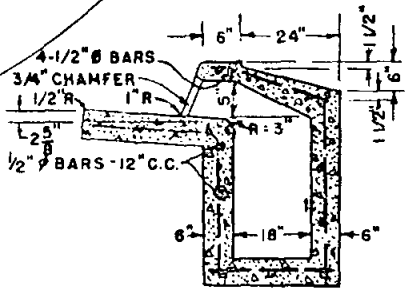
Legend on plans:

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO — STANDARD DRAWING	SCALE
	TYPE G CURB INLET	0 1 2 FT. 3/8" = 1'-0"
		DRAWING NO. D-34

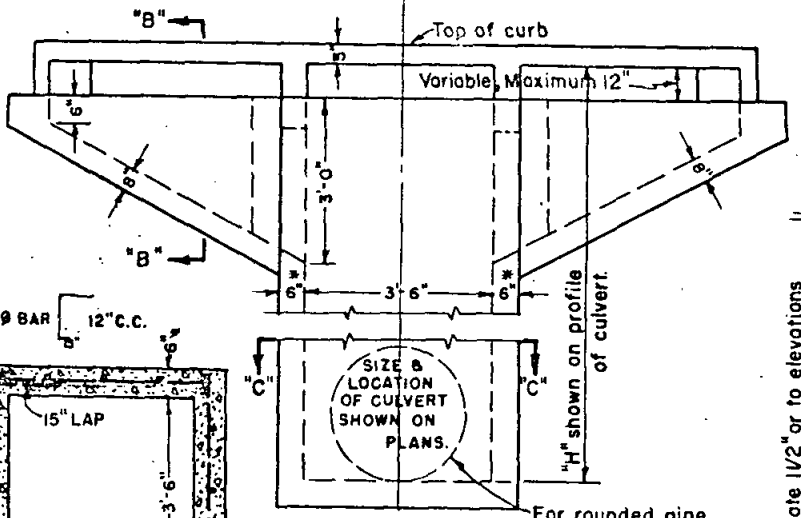
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11-10-72



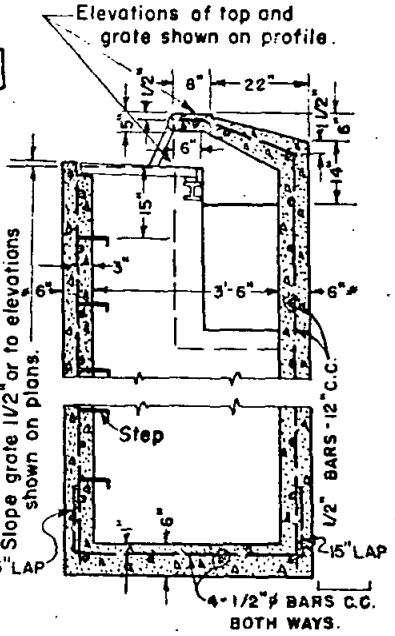
SECTIONAL PLAN



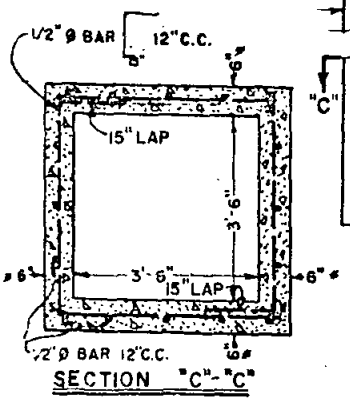
SECTION "B"-"B"



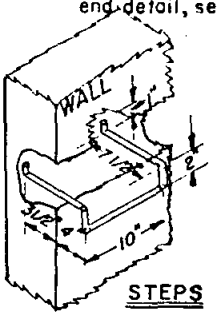
ELEVATION



SECTION "A"-"A"



SECTION "C"-"C"



STEPS

* NOTE: For sections extending deeper than 12'-0" below top of inlet, wall thickness shall be increased to 8". Special design required for "H" greater than 16'-0".

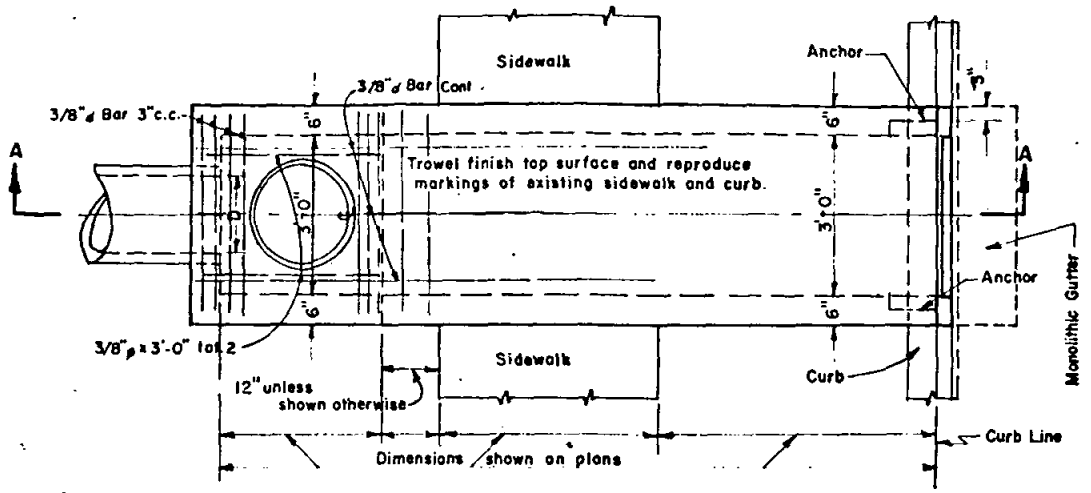
NOTE: When height exceeds 5', cast 5/8" round galvanized iron steps in wall, 15" apart.

NOTE: All concrete shall be Class A.
All reinforcing shall be deformed bars.

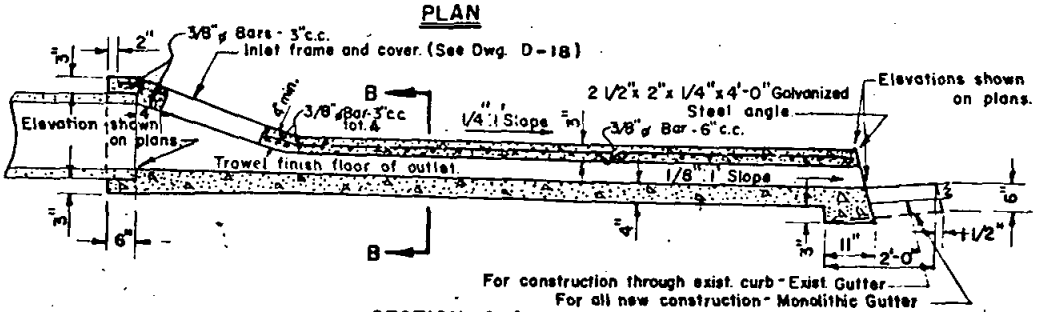
Legend on plans:

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	0 1 2 FT. 3/8" = 1'-0" SCALE
	TYPE G CURB INLET	DRAWING NO. D-34

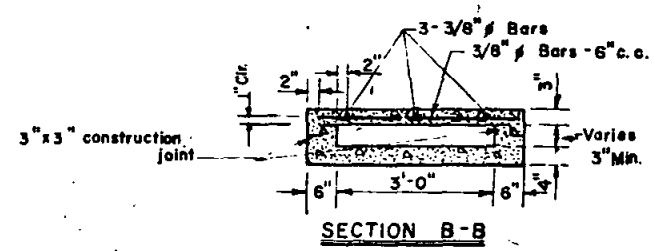
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	11-10-72



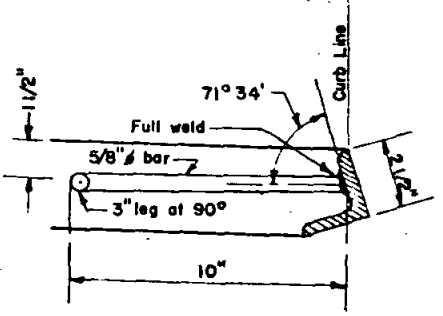
PLAN



SECTION A-A



SECTION B-B



DETAIL OF ANCHOR
No Scale

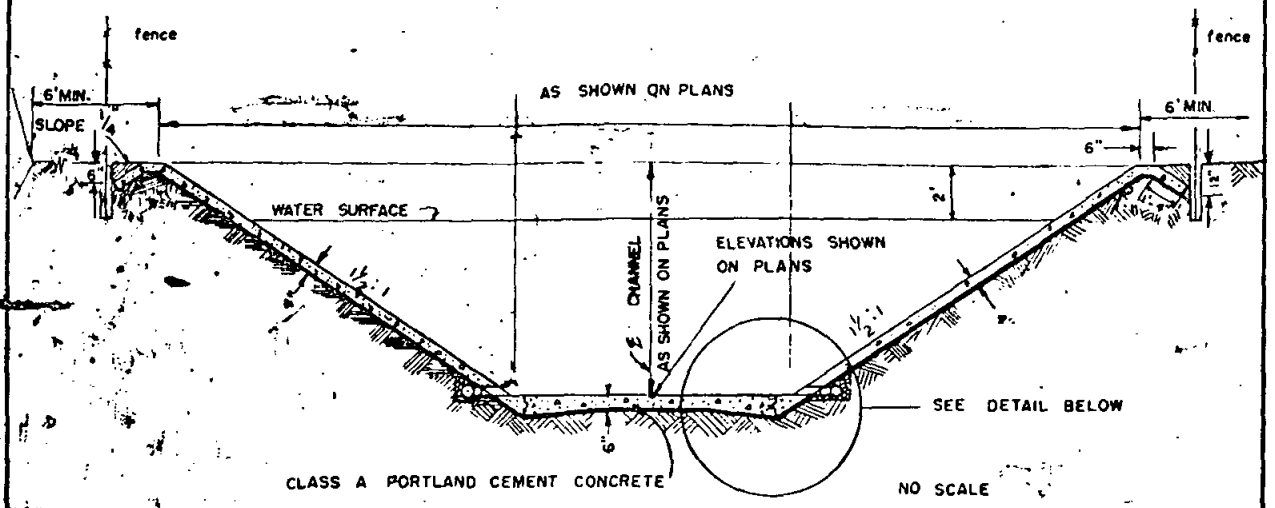
NOTES:

All concrete shall be Class A.
Cut sidewalk and curb in accordance with drawing- G-33
D = inside diameter of pipe.
Section to be sloped laterally with top conforming to the grades of the existing sidewalk and curb.
The use of this type structure is restricted to locations having had the advance approval of the County Engineer.

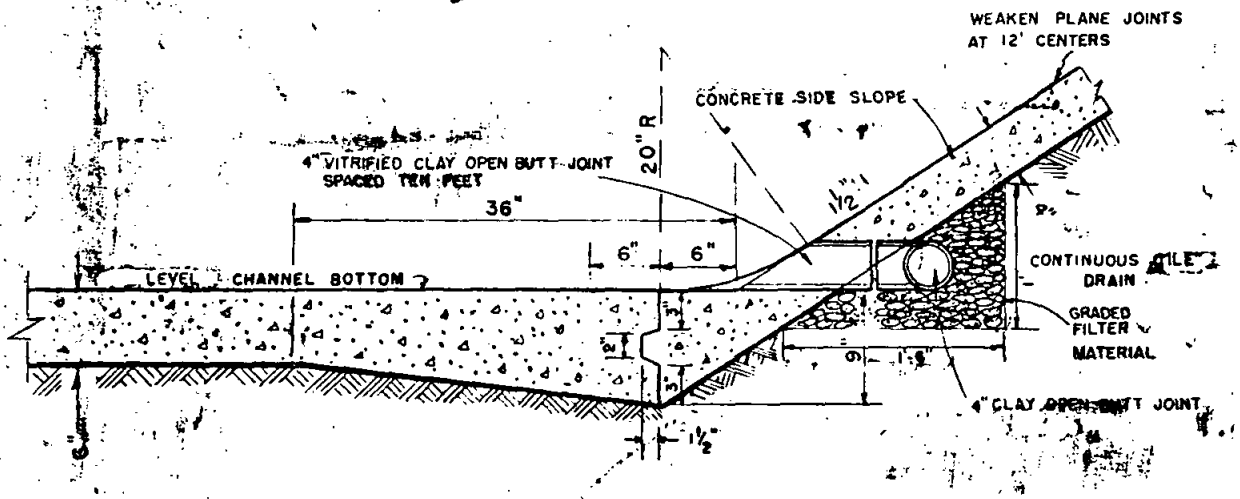
Legend on plans.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE
	CURB OUTLET	0 1 2 FT. 3/8" = 1'-0"
		DRAWING NO. D-35

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11-10-72



TYPICAL CROSS SECTION OF DRAINAGE CHANNEL



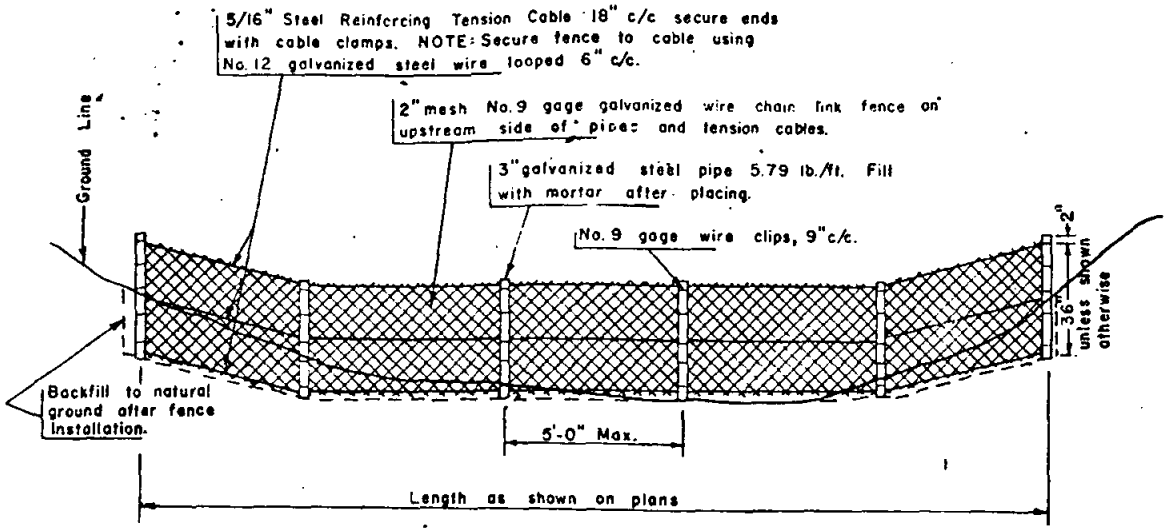
DETAIL

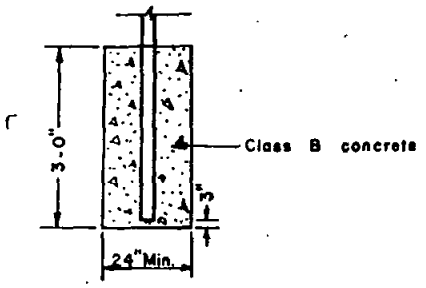
SCALE: 1" = 1'

LEGEND ON PLANS

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	AS SHOWN SCALE
	DRAINAGE CHANNEL	DRAWING NO. D-40

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	R. W. Taylor	8-10-72

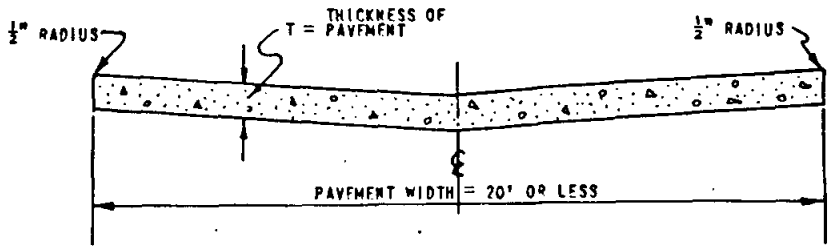




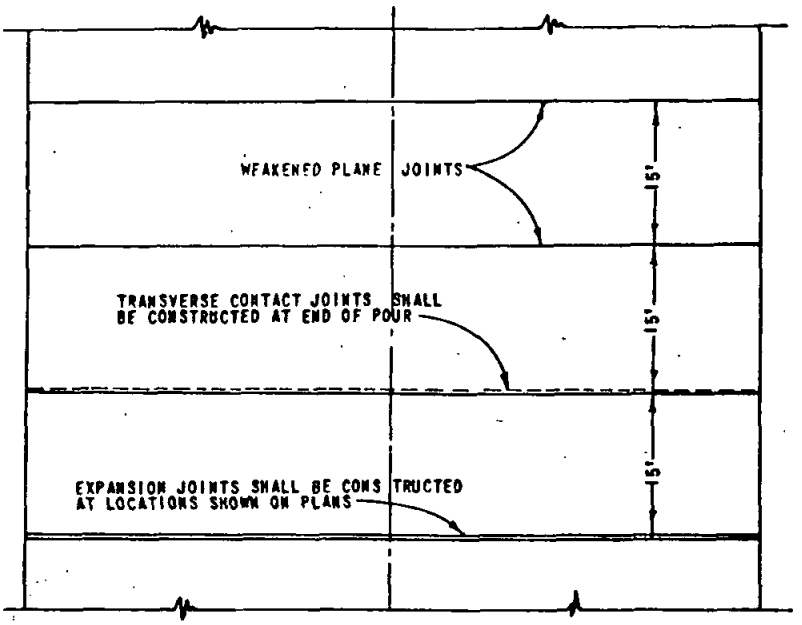
Detail of Footing

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE NONE
	TRASH FENCE	DRAWING NO D-61

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	[signature]	11-10-78



TYPICAL SECTION

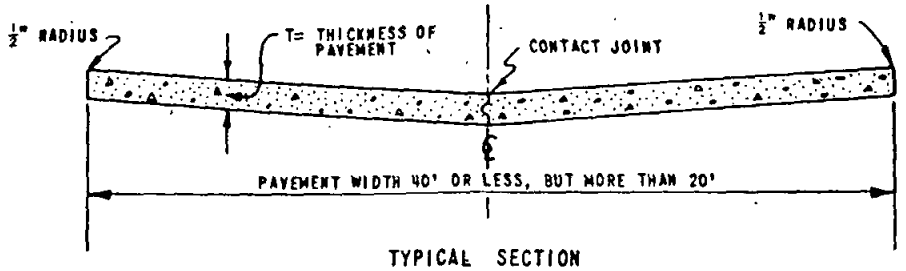


TYPICAL PLAN

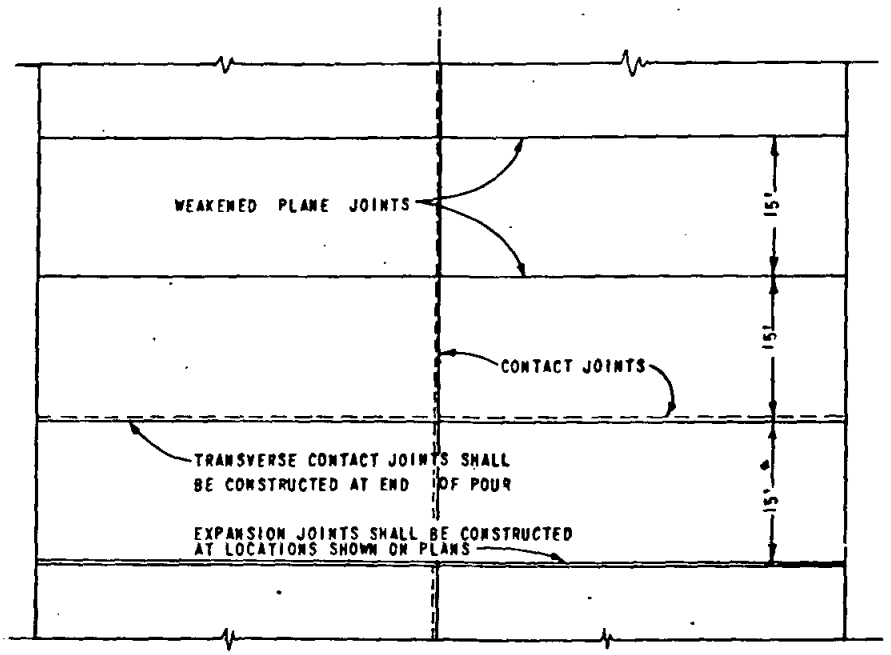
NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE STD. DWG. G-42 FOR JOINT DETAILS
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CONCRETE PAVEMENT-ALLEY SECTION 20' width, or less	SCALE NONE DRAWING NO. G-11

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-19-38



TYPICAL SECTION

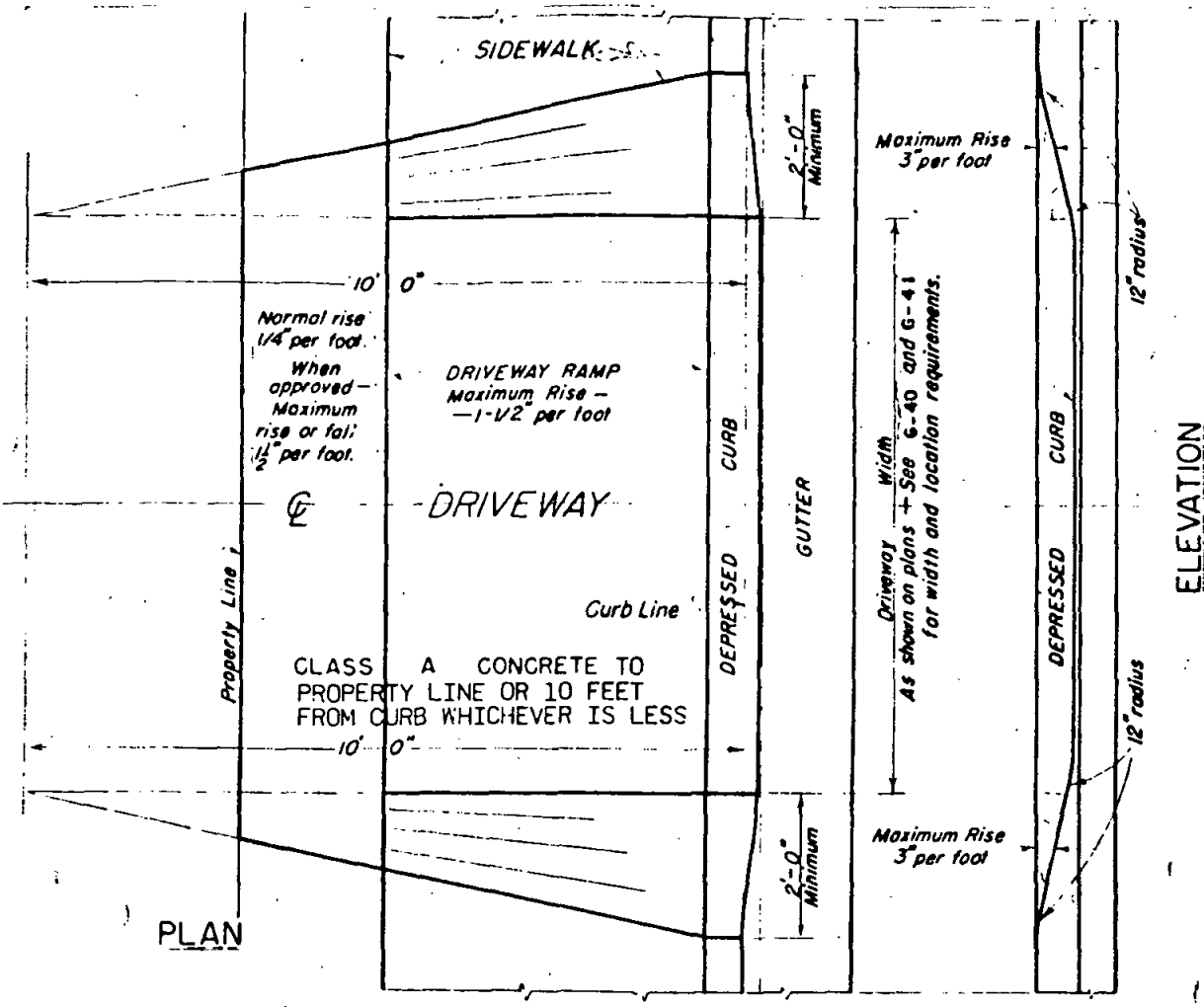


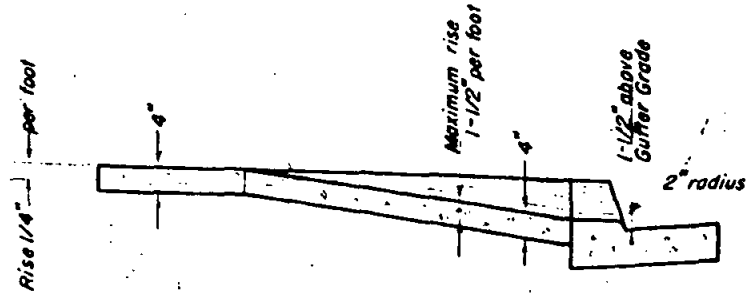
TYPICAL PLAN

NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE STD. DWG. G-42 FOR JOINT DETAILS
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS
TO MATCH ADJACENT EXISTING IMPROVEMENTS.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CONCRETE PAVEMENT - ALLEY SECTION	SCALE NONE
	Pavement Width 40' or less, but more than 20'	DRAWING NO. G-12

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. E. Taylor	4-10-72





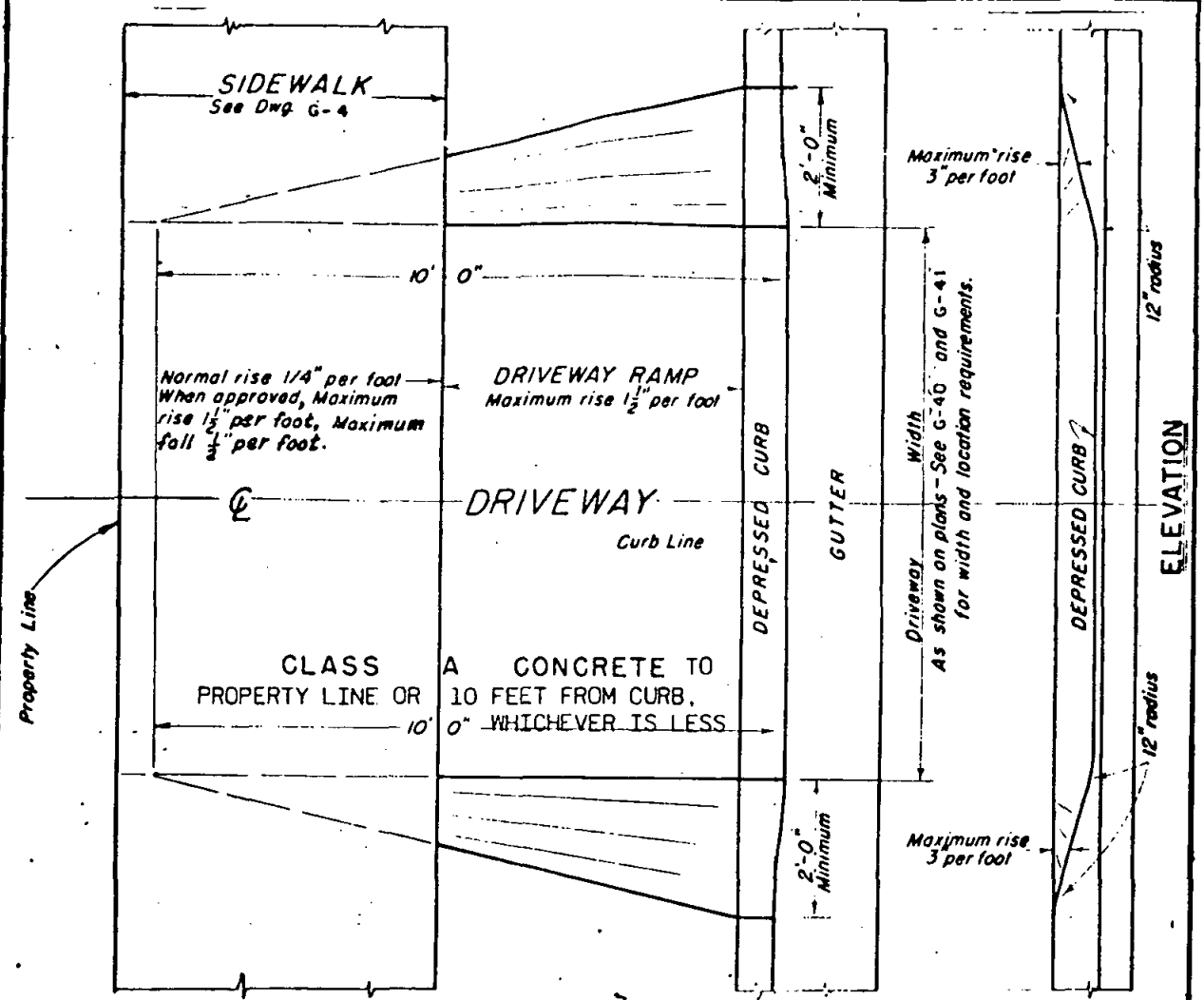
SECTION

LEGEND ON PLANS

℄ of ___ Residential driveway

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	1/2" = 1'-0" SCALE
	RESIDENTIAL DRIVEWAY Curb and sidewalk contiguous	DRAWING NO. G-22

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-10-72

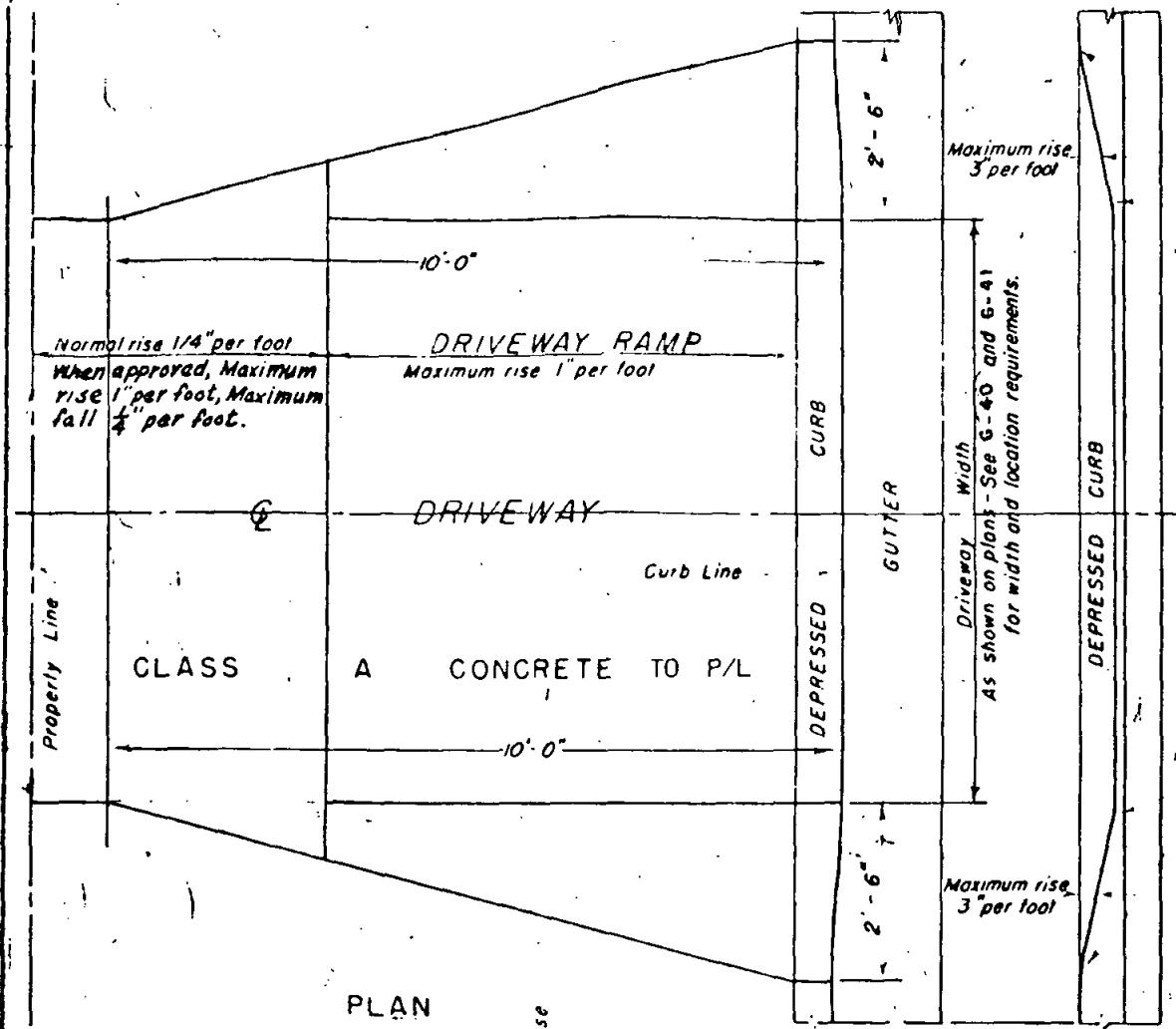


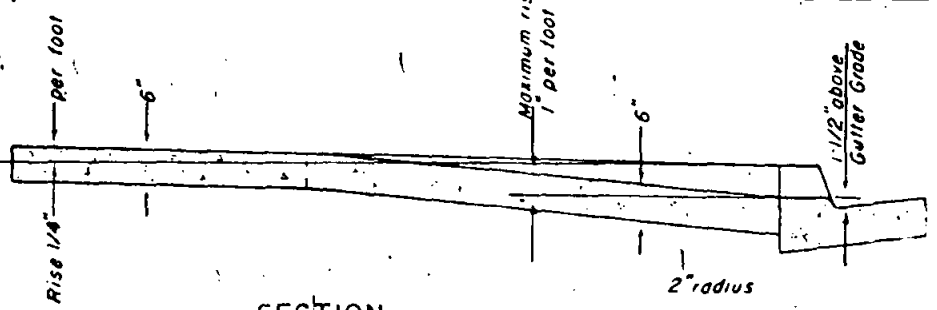
LEGEND ON PLANS

℄ of __ Residential driveway

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE
	RESIDENTIAL DRIVEWAY Curb and sidewalk separated	1/2" = 1'-0"
		DRAWING NO. G-23

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-10-72





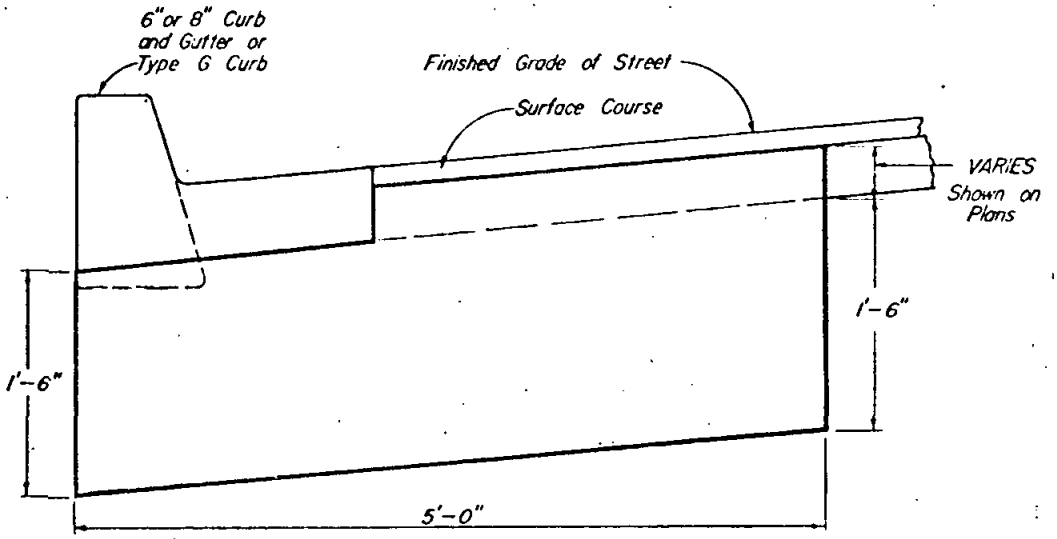
SECTION

LEGEND ON PLANS

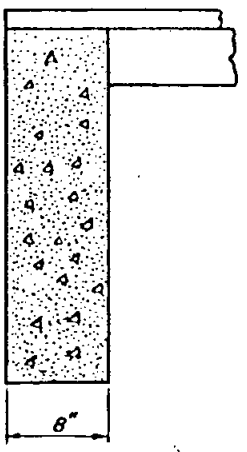
℄ of __ Commercial Driveway

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE
	COMMERCIAL DRIVEWAY	1/2" = 1'-0"
		DRAWING NO. G-24

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	11-10-72
REMOVED REFER. TO CLASS "A"	D.E.B.	A. Newman	2/1/74			



ELEVATION

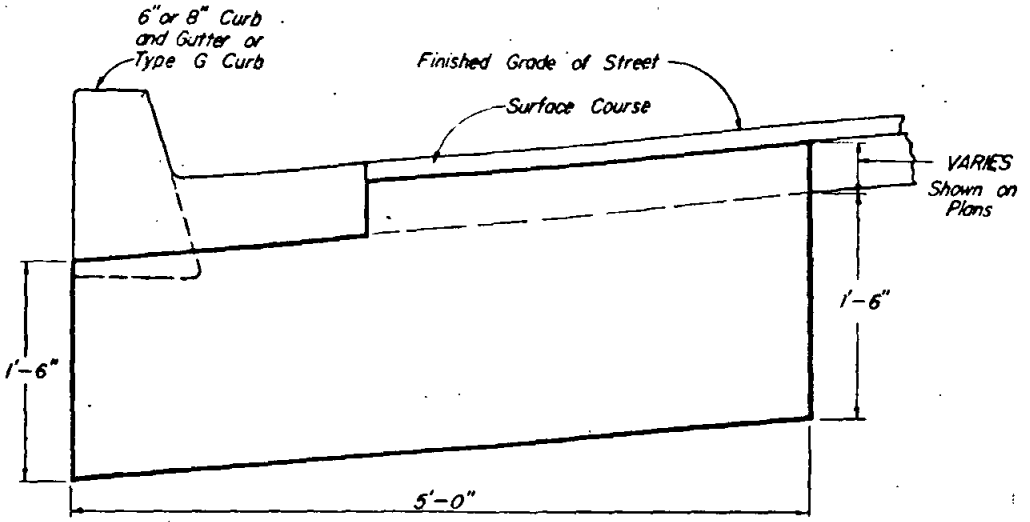


SECTION

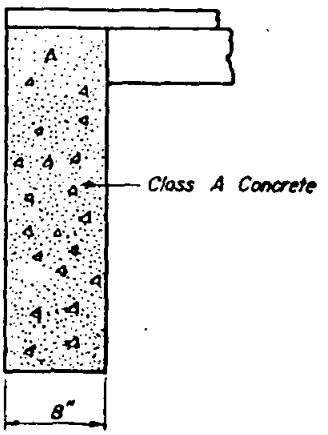
Legend on plan

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE 1" = 1'-0"
	CUTOFF WALL AT END OF PAVEMENT	DRAWING NO. G-27

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-10-72



ELEVATION

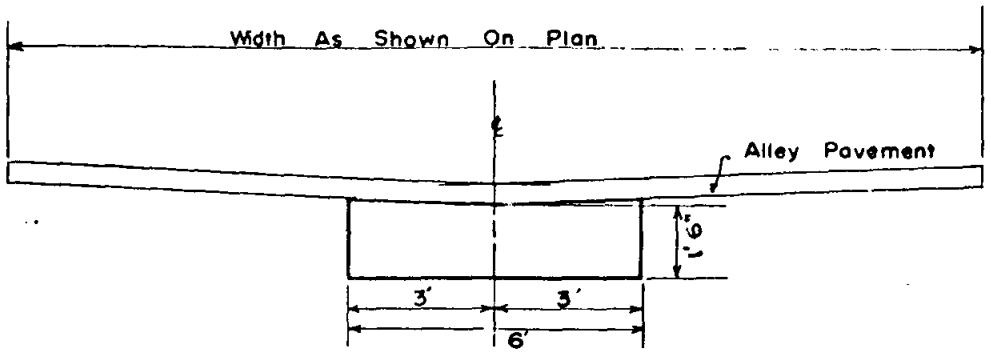


SECTION

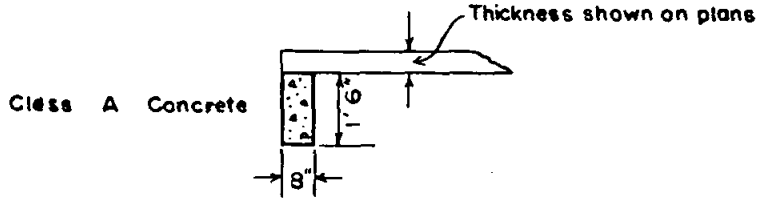
Legend on plan

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE 1"=1'-0"
	CUTOFF WALL AT END OF PAVEMENT	DRAWING NO. G-27

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-10-72



ELEVATION



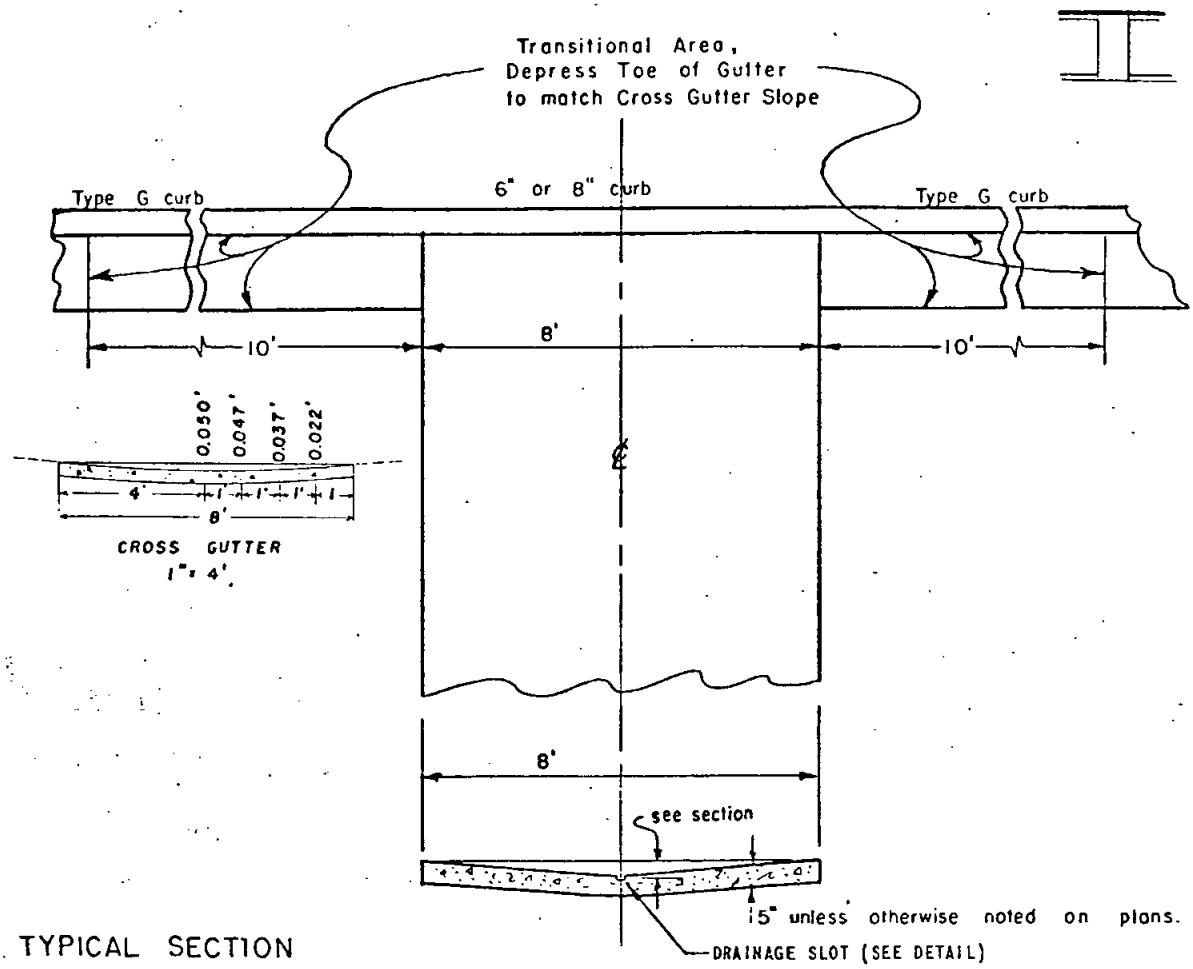
Section at ℄

Legend on plan

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	1" = 3' SCALE
	CUTOFF WALL AT END OF ALLEY PAVEMENT	DRAWING NO. G-28

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. G. Taylor	11-10-72
NOTE CHANGES	J.E.B.					

Legend as shown on the plans.



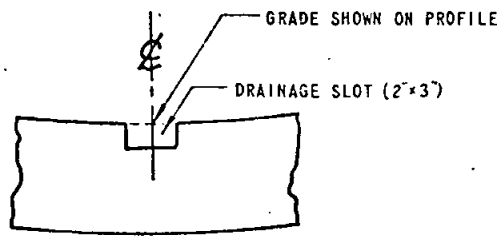
TYPICAL SECTION

NOTES:

Cross gutters shall be constructed in accordance with the County of San Diego Standard Specifications.

Cross gutter to be constructed where the drainage is carried across street and on a grade of at least 0.5%.

Drainage slot shall be constructed only where shown on plans. Slot shall be formed with 2"x3" (S4S).



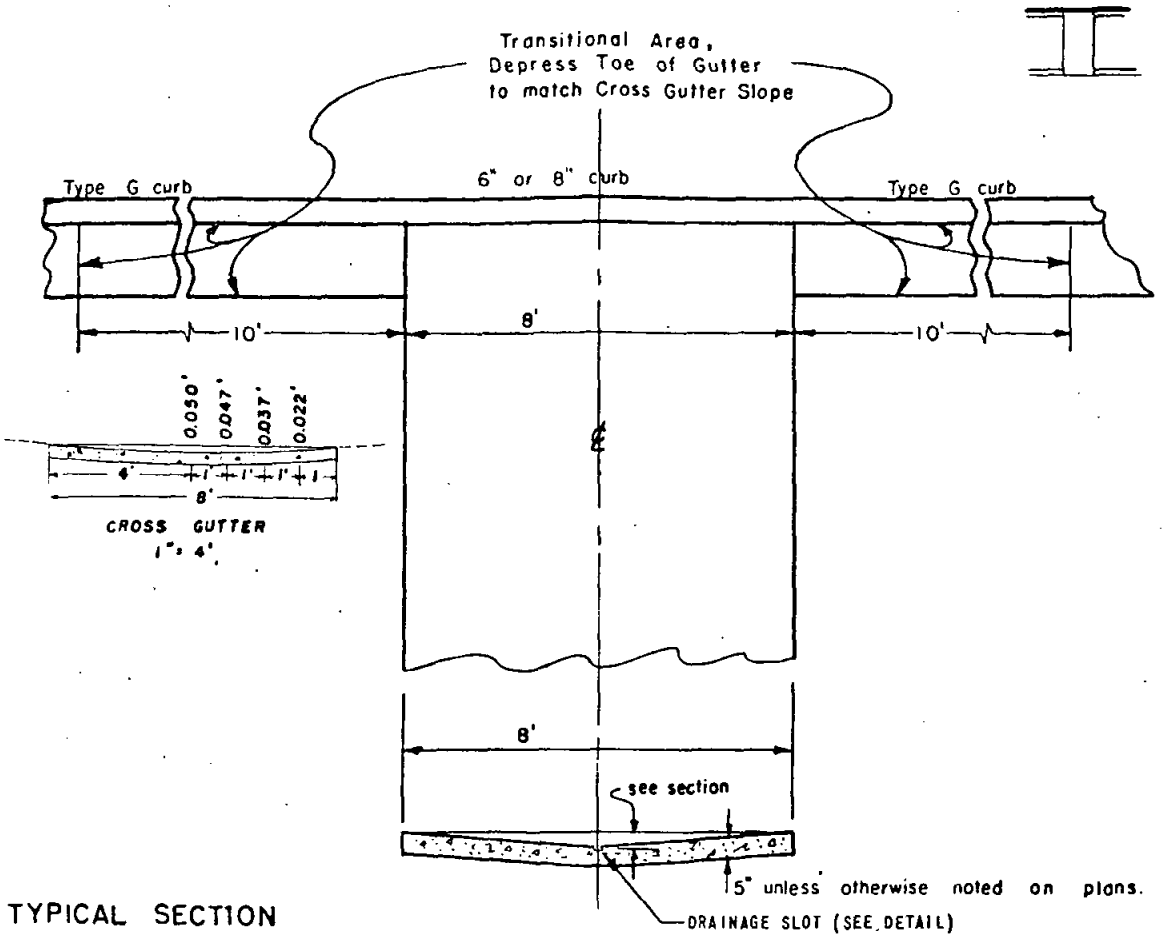
DRAINAGE SLOT DETAIL

(No Scale)

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CROSS GUTTER TYPE A	SCALE 1" = 3'
		DRAWING NO. G-32

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	R.E. Taylor	11-10-72

Legend as shown on the plans.



TYPICAL SECTION

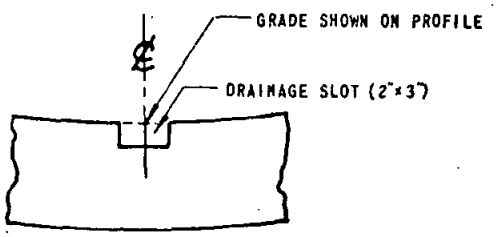
NOTES:

Cross gutters shall be constructed in accordance with Section 8 of the specifications except joint and finishing shall conform to Sections 7-06 and 7-07 of the specifications.

Cross gutter to be constructed where the drainage is carried across street and on a grade of at least 0.5%.

Drainage slot shall be constructed only where shown on plans. Slot shall be formed with 2"x3" (S4S).

All concrete shall be Class A.

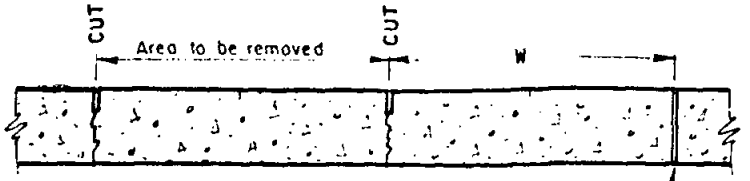


DRAINAGE SLOT DETAIL

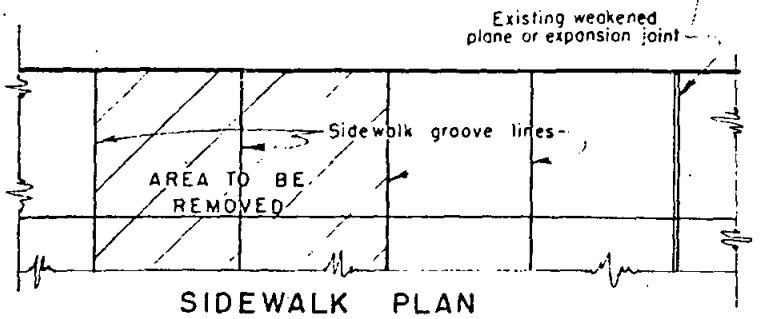
(No Scale)

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CROSS GUTTER TYPE A	SCALE 1" = 3'
		DRAWING NO. G-32

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. Ray Taylor	11-10-70



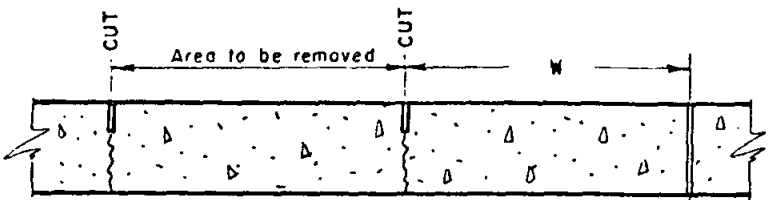
SIDEWALK SECTION



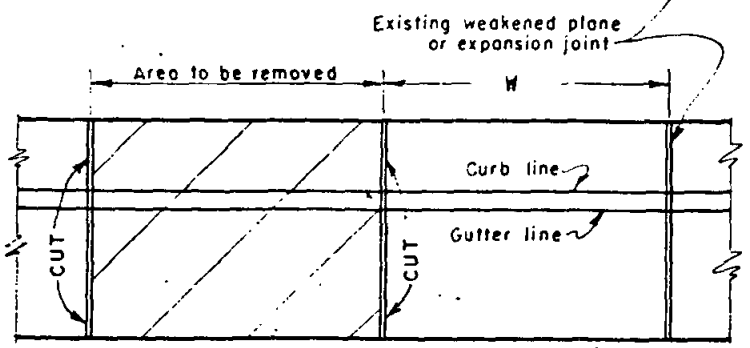
SIDEWALK PLAN

NOTES

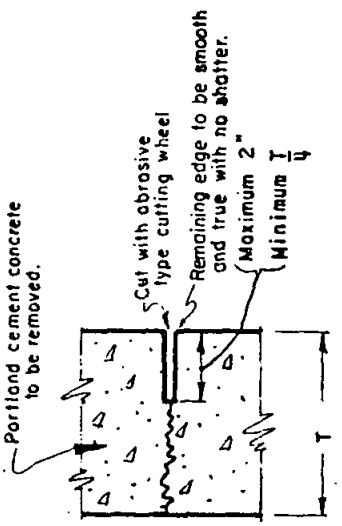
1. Remove entire curb and gutter section to construct driveway or to replace with new curb.
2. Remove entire depressed curb and gutter section of abandoned driveways and replace with approved standard curb when other driveways are constructed to serve same property.
3. Remove existing 4" sidewalk and replace with 6" P.C.C. at locations of driveways constructed in commercial zones.
4. Remove and replace paved area adjacent to weakened plane or expansion joint when "W" is equal to or less than two feet.



PAVEMENT SECTION



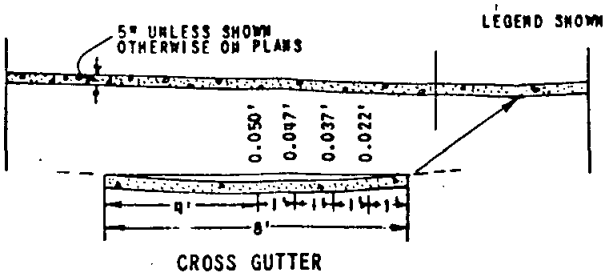
CURB PLAN



SECTION
Showing Cut

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING PORTLAND CEMENT CONCRETE CURB GUTTER, SIDEWALK AND PAVEMENT REMOVAL AND REPLACEMENT.	SCALE: NONE DRAWING NO. G-33

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. F. Taylor	11-10-72



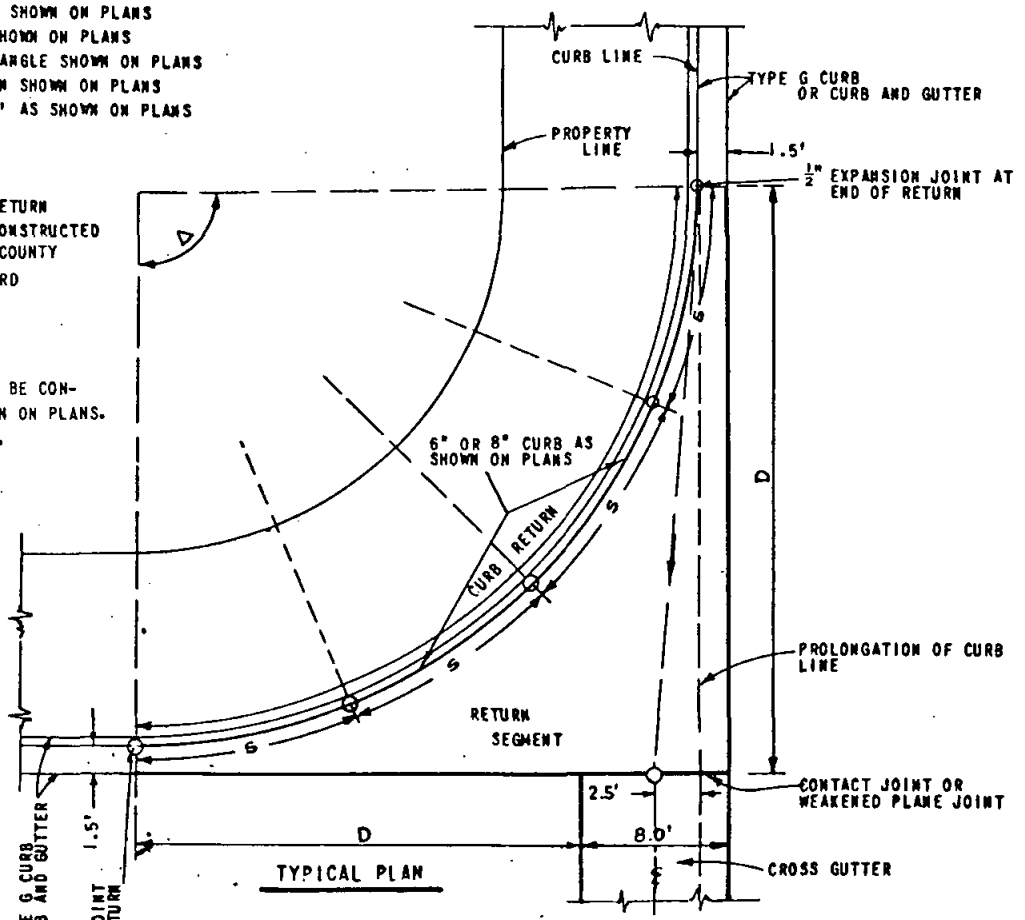
CROSS GUTTER

TYPICAL SECTIONS

NOTE: D = DISTANCE SHOWN ON PLANS
R = RADIUS SHOWN ON PLANS
Δ = CENTRAL ANGLE SHOWN ON PLANS
○ = ELEVATION SHOWN ON PLANS
S = 8' TO 12' AS SHOWN ON PLANS

CROSS GUTTERS AND RETURN SEGMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.

DRAINAGE SLOT SHALL BE CONSTRUCTED WHERE SHOWN ON PLANS. SEE G-32 FOR DETAIL.



TYPICAL PLAN

CROSS GUTTER AND RETURN SEGMENT TO BE CONSTRUCTED WHERE DRAINAGE IS CARRIED ACROSS STREET.

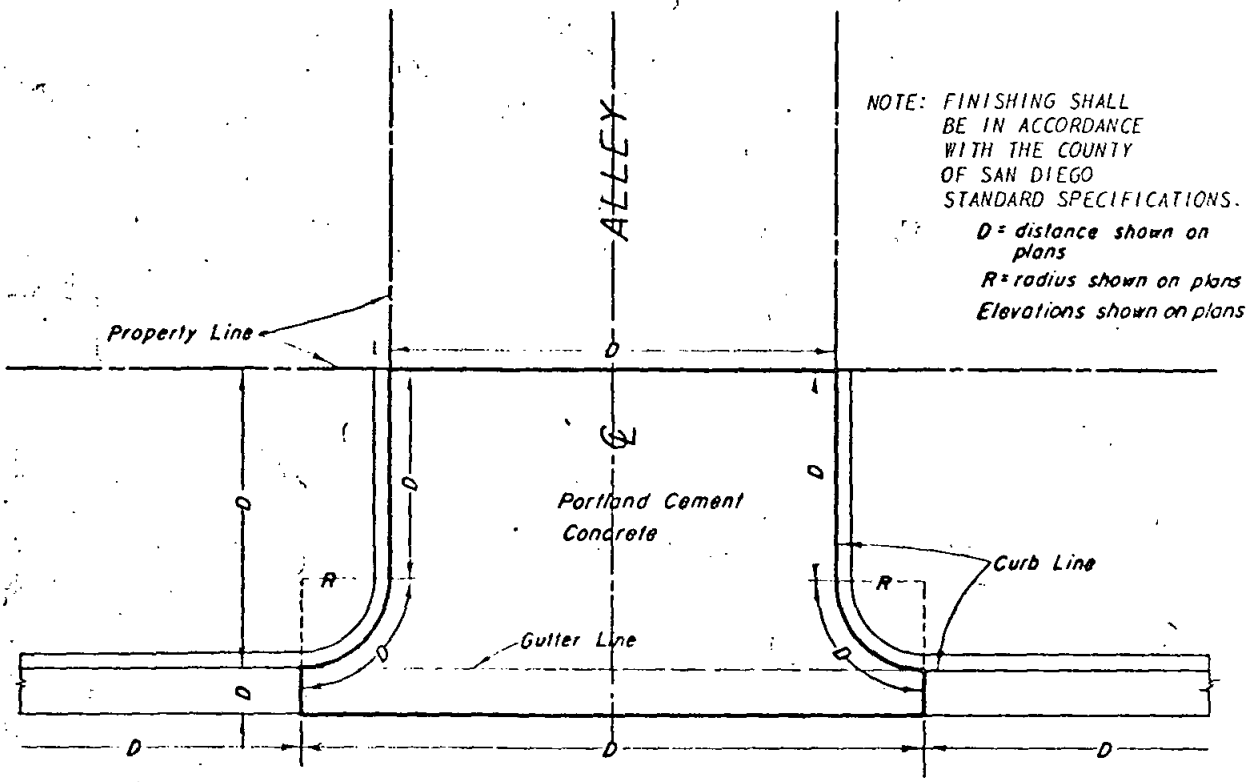
ALL CONCRETE SHALL BE CLASS A

ON ALL CONTACT JOINTS THE TONGUE SHALL BE POURED FIRST.

SEE STD. DWG. G-42 FOR JOINT DETAILS.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CONCRETE CROSS GUTTER AND RETURN SEGMENT	SCALE AS SHOWN DRAWING NO. **G-35**

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER		
NOTE ADDED	D.E.B.	R. Kreitzer	2/1/72			11-10-72



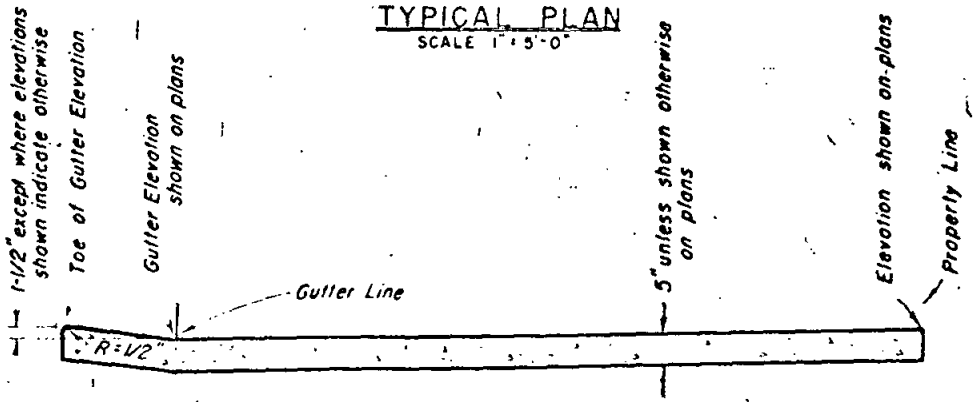
NOTE: FINISHING SHALL BE IN ACCORDANCE WITH THE COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.

D = distance shown on plans

R = radius shown on plans

Elevations shown on plans

TYPICAL PLAN
SCALE 1" = 5'-0"

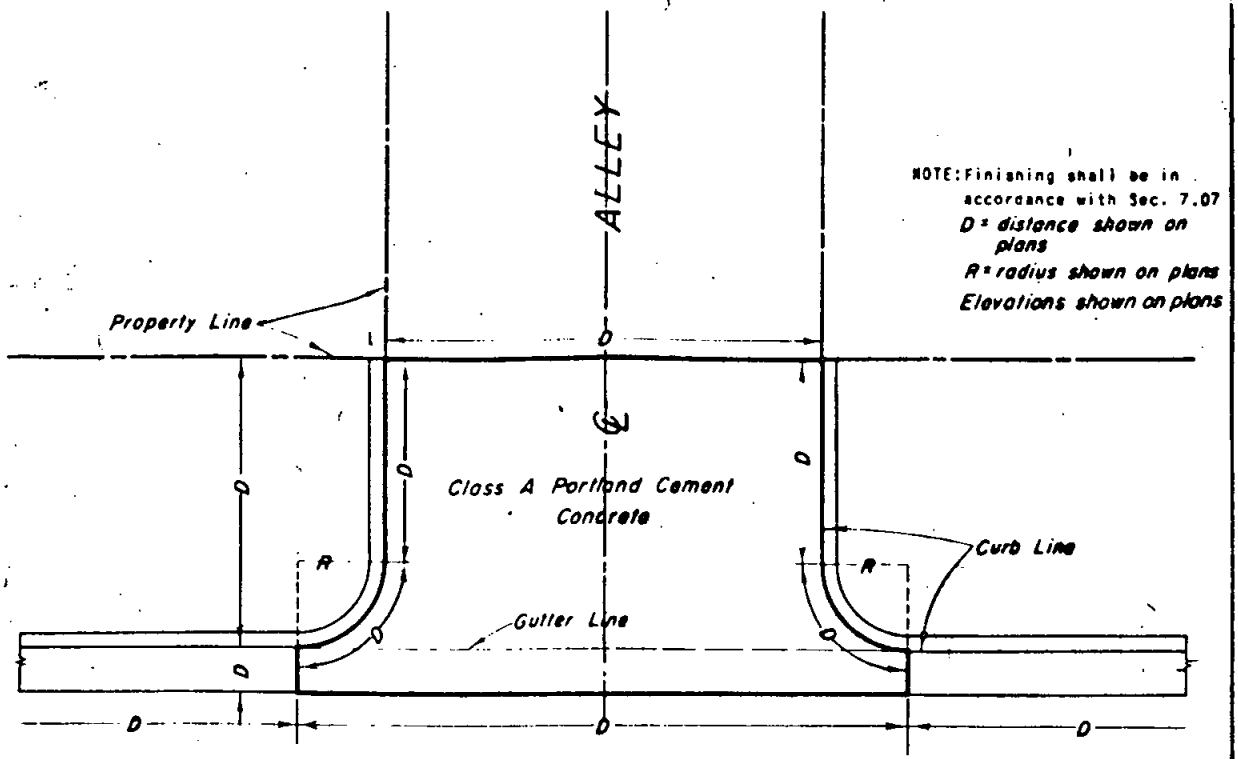


℄ SECTION
SCALE 1" = 2'-0"

Legend on Plans.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE
	ALLEY APRON	DRAWING NO. G-39

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER		



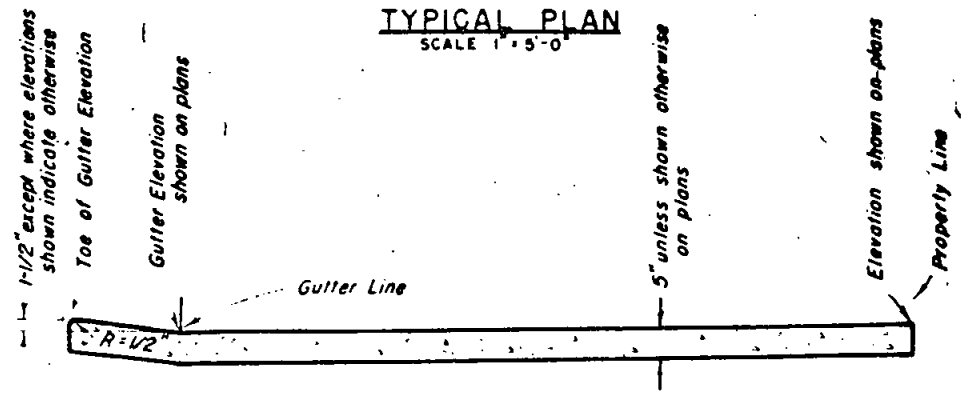
NOTE: Finishing shall be in accordance with Sec. 7.07

D = distance shown on plans

R = radius shown on plans

Elevations shown on plans

TYPICAL PLAN
SCALE 1" = 5'-0"

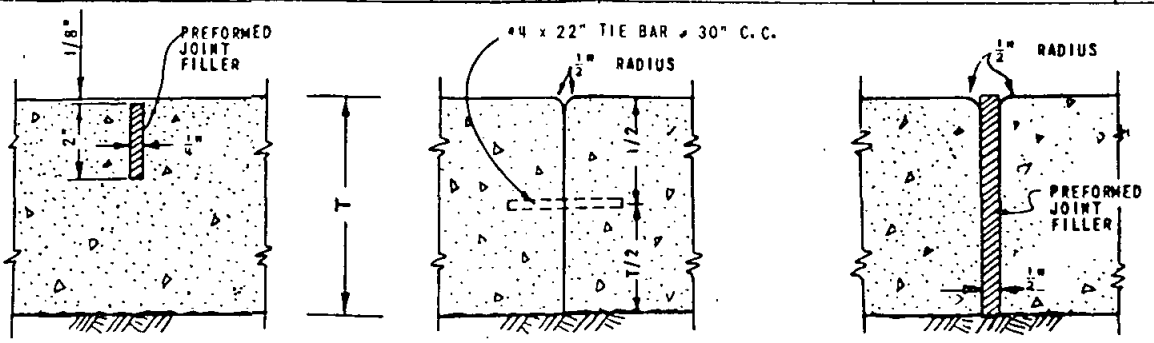


℄ SECTION
SCALE 1" = 2'-0"

Legend on Plans:

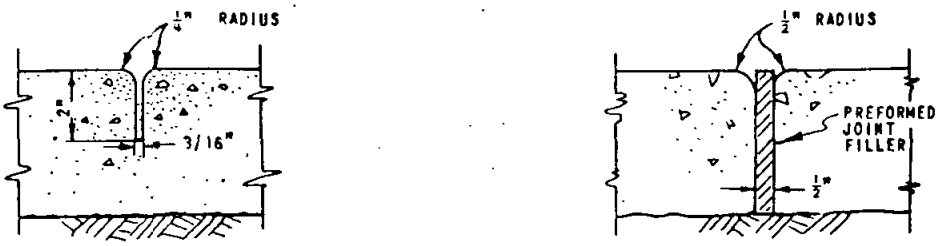
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE
	ALLEY APRON	DRAWING NO. G-39

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H W. Taylor	6-20-72



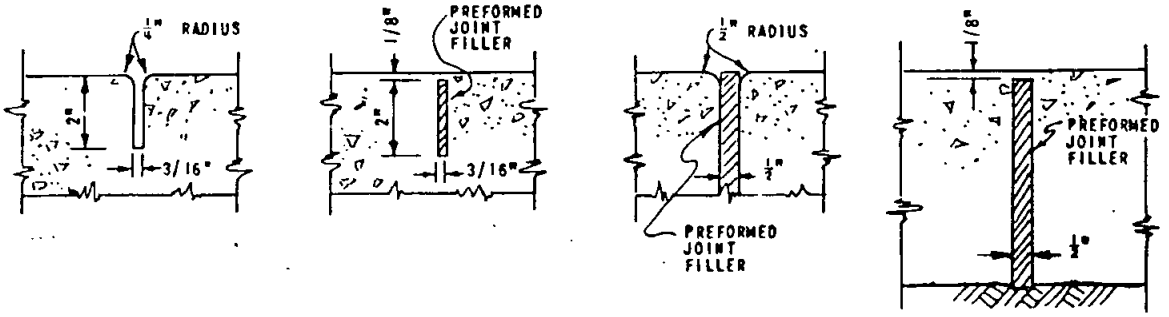
WEAKENED PLANE JOINT | CONTACT JOINT | EXPANSION JOINT

PAVEMENT



WEAKENED PLANE JOINT | EXPANSION JOINT

SIDEWALK



TOP AND CURB FACE | GUTTER SECTION | TOP AND CURB FACE | GUTTER SECTION

WEAKENED PLANE JOINT | EXPANSION JOINT

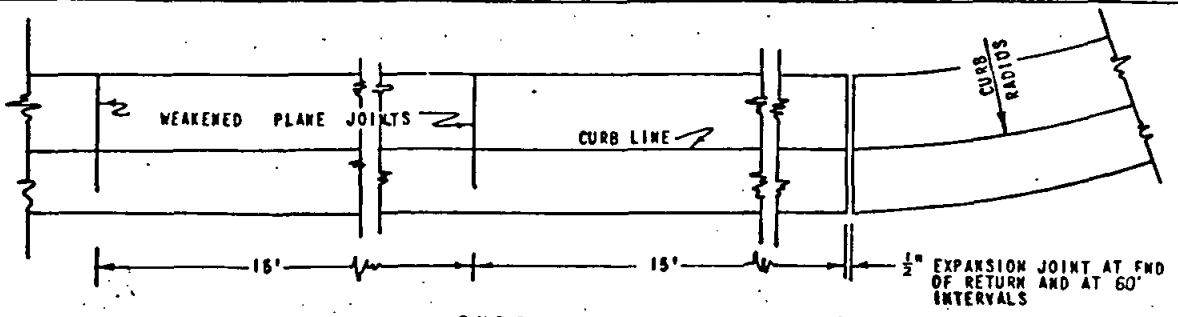
CURB

NOTE: PLACE EXPANSION JOINT FILLER MATERIAL IN TIGHT CONTACT WITH FORMS AND BASE.

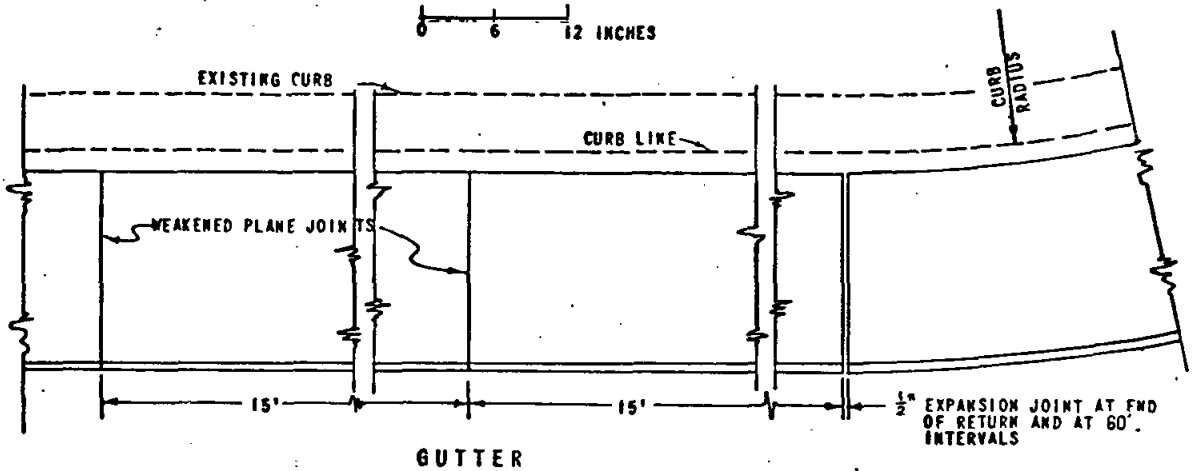
WEAKENED PLANE JOINTS MAY BE SAW CUT.
SEE STANDARD SPECIFICATIONS

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING PORTLAND CEMENT CONCRETE JOINTS FOR PAVEMENT, SIDEWALK, CURB AND CROSS GUTTER	SCALE - INCHES (0, 2, 4) DRAWING NO. G-42

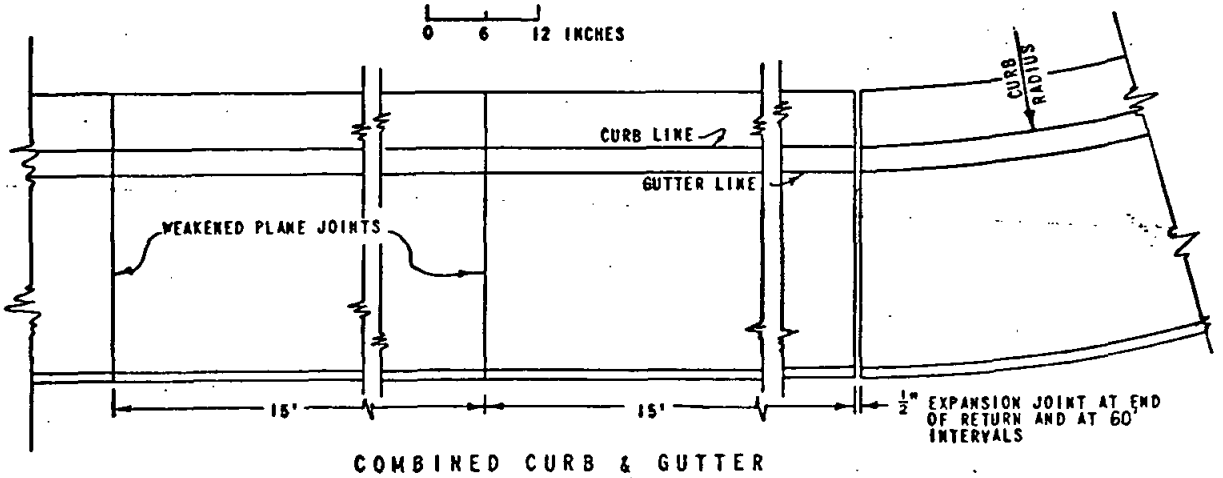
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. Taylor	11-10-72
REMOVE NOTE ON CLASS "A" P.C.C.	J.E.B.	W. Kuelsen	2/1/74			



CURB
SCALE 0 6 12 INCHES



GUTTER
SCALE 0 6 12 INCHES



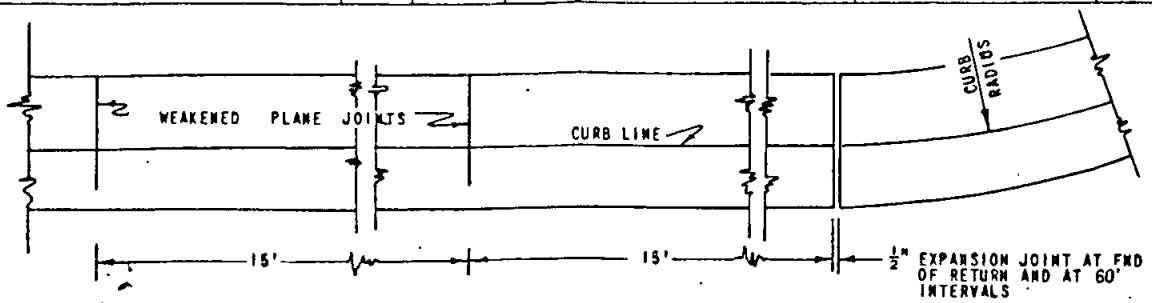
COMBINED CURB & GUTTER
SCALE 0 6 12 INCHES

NOTE:

ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.
SEE STD. DWG. G-42 FOR JOINT DETAILS.
SEE PROJECT PLANS FOR CURB TYPES.
SEE PROJECT PLANS FOR STREET WIDTH DIMENSIONS.
STREET AND SIDEWALK AREA WIDTHS ARE TO CURB LINE. ISLAND WIDTHS ARE TO GUTTER LINE.

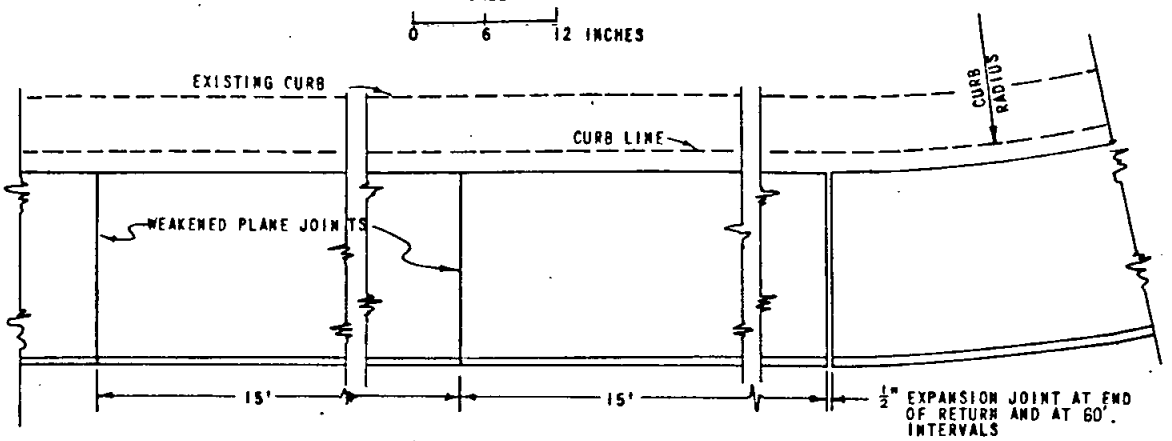
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURBS AND GUTTERS TYPICAL PLANS	SCALE AS SHOWN
		DRAWING NO. G-43

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.W. Taylor	11-10-72



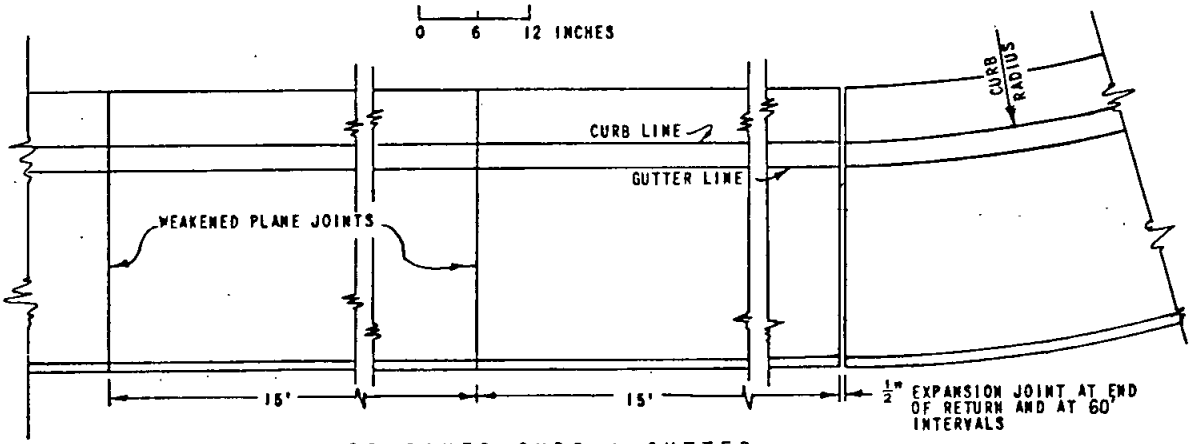
CURB

SCALE 0 6 12 INCHES



GUTTER

SCALE 0 6 12 INCHES



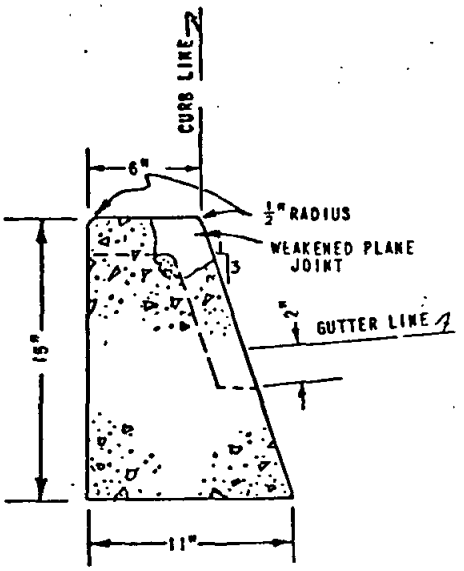
COMBINED CURB & GUTTER

SCALE 0 6 12 INCHES

NOTE: ALL CONCRETE SHALL BE CLASS A.
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.
SEE STD. DWG. G-42 FOR JOINT DETAILS.
SEE PROJECT PLANS FOR CURB TYPES.
SEE PROJECT PLANS FOR STREET WIDTH DIMENSIONS.
STREET AND SIDEWALK AREA WIDTHS ARE TO CURB LINE. ISLAND WIDTHS ARE TO GUTTER LINE.

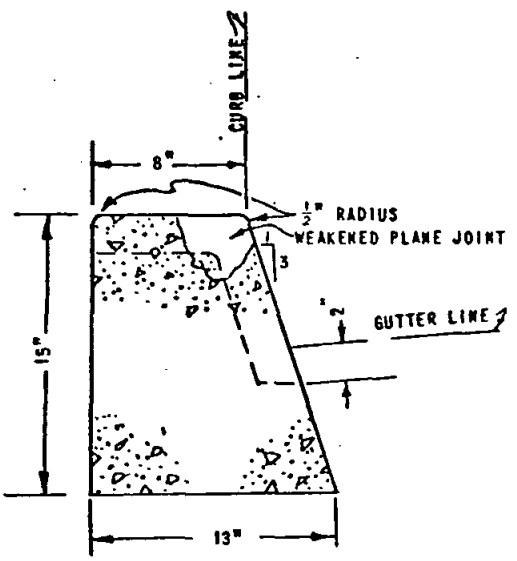
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURBS AND GUTTERS TYPICAL PLANS	SCALE AS SHOWN
		DRAWING NO. G-43

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11-10-72
REMOVED NOTE ON CLASS "A" P.C.C.	D.E.B.	[illegible]	2/1/74			



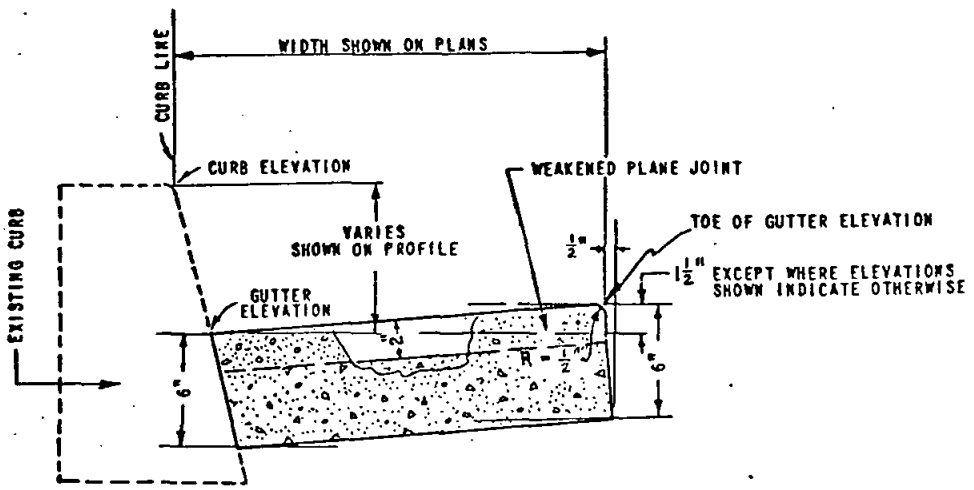
6" CURB

AREA = 0.89 SQ.FT.



8" CURB

AREA = 1.09 SQ.FT.



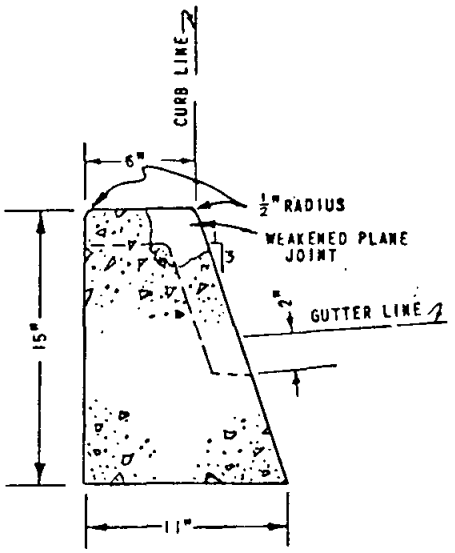
GUTTER

NOTE:

SEE DWG. G-42 FOR JOINT DETAILS.
SEE DWG. G-43 FOR TYPICAL PLANS.

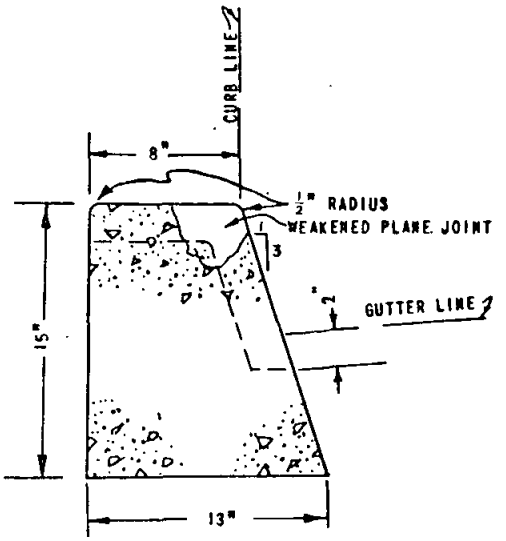
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	6" & 8" CURB SECTIONS & GUTTER SECTION	SCALE - INCHES 0 3 6
		DRAWING NO. G-44

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.C. Taylor	11-20-72



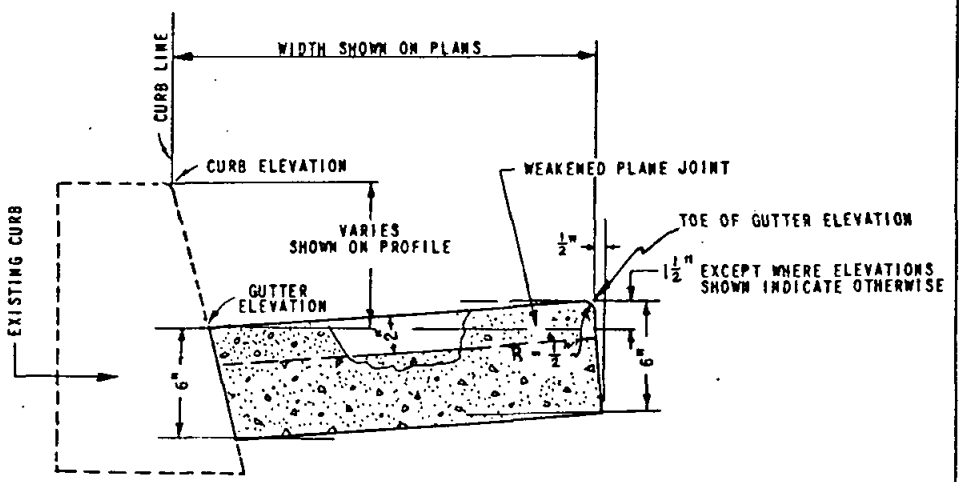
6" CURB

AREA = 0.89 SQ.FT.



8" CURB

AREA = 1.09 SQ.FT.

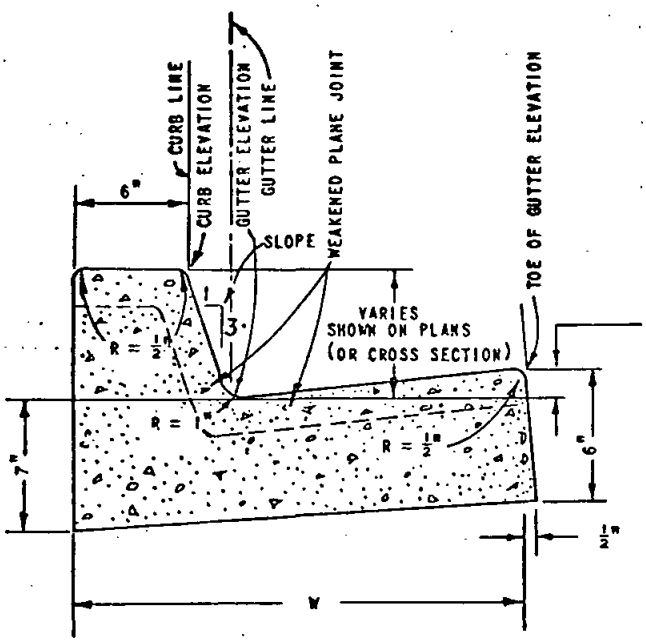


GUTTER

NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE DWG. G-42 FOR JOINT DETAILS.
SEE DWG. G-43 FOR TYPICAL PLANS.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	6" & 8" CURB SECTIONS & GUTTER SECTION	SCALE - INCHES 0 3 6
		DRAWING NO. G-44

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	11-10-72
REMOVED NOTE ON CLASS "A" P.C.C.	J.E.B.	D. Kuchel	2/1/74			



TYPE G & H CURB

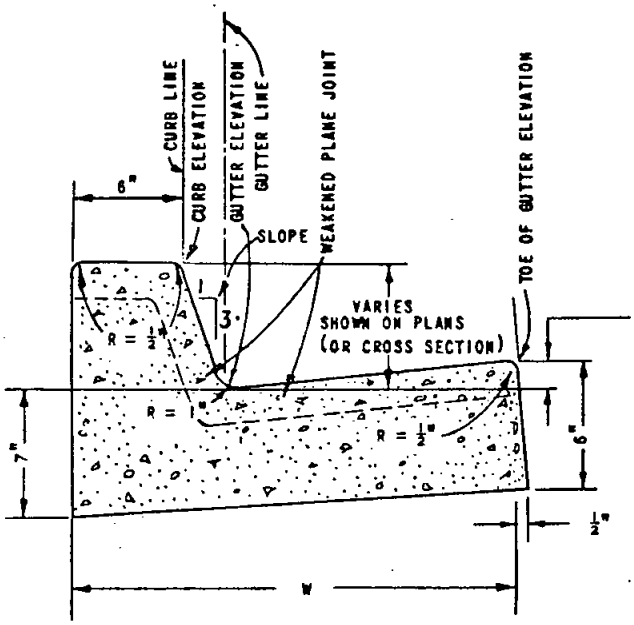
TYPE	W	*AREA SQ.FT.
G	24"	1.37
H	30"	1.64

*WITH 6" CURB FACE

NOTE:
SEE DWG. G-42 FOR JOINT DETAILS
SEE DWG. G-43 FOR TYPICAL PLANS

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURB SECTIONS TYPES G & H	0 3 6 SCALE - INCHES DRAWING NO. G-45

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-10-72



TYPE G & H CURB

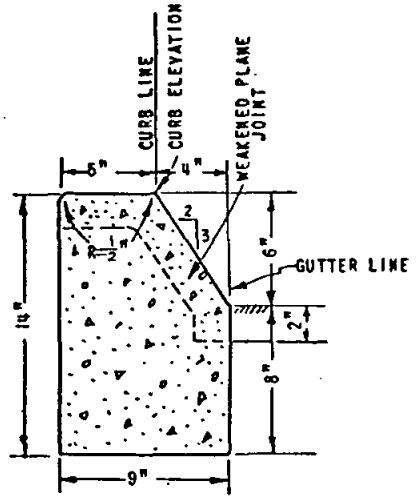
TYPE	W	*AREA SQ.FT.
G	24"	1.37
H	30"	1.64

*WITH 6" CURB FACE

NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE DWG. G-42 FOR JOINT DETAILS
SEE DWG. G-43 FOR TYPICAL PLANS

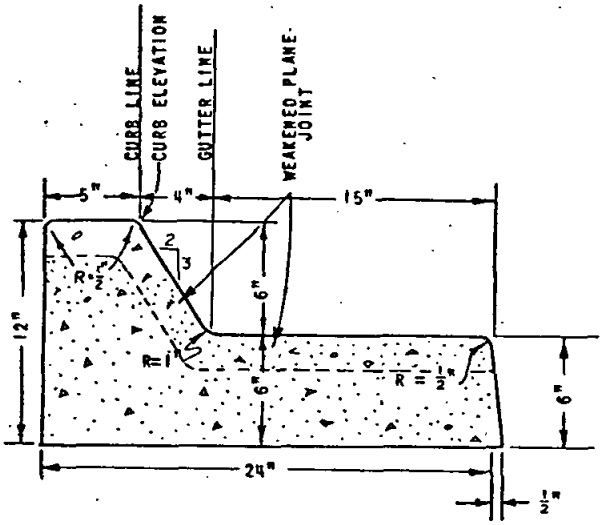
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURB SECTIONS TYPES G & H	SCALE - INCHES 0 3 6
		DRAWING NO. G-45

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	11-10-72
REMOVED NOTE ON CLASS "A" P.C.C.	J.E.B.	R. Kaufman	2/1/74			



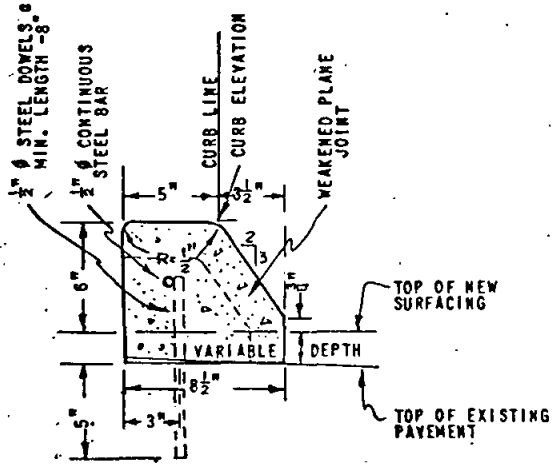
B-1

AREA = 0.79 SQ.FT.

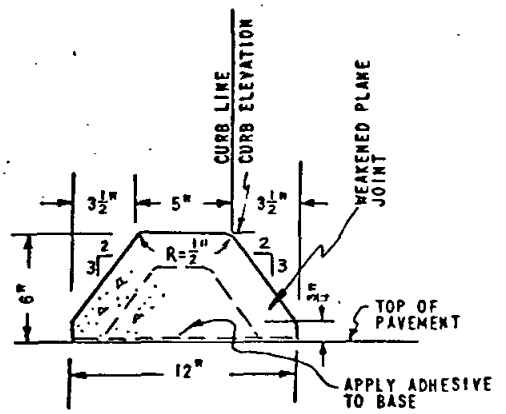


B-2

AREA = 1.29 SQ.FT.



B-3



B-4

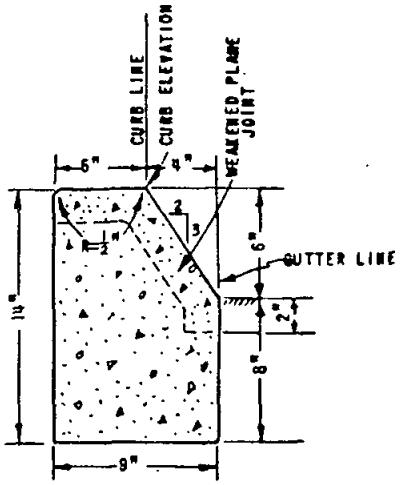
AREA = 0.35 SQ.FT.
(EXTRUDED TYPE)

NOTE:

SEE DWG. G-42 FOR JOINT DETAILS
SEE DWG. G-43 FOR TYPICAL CURB PLANS

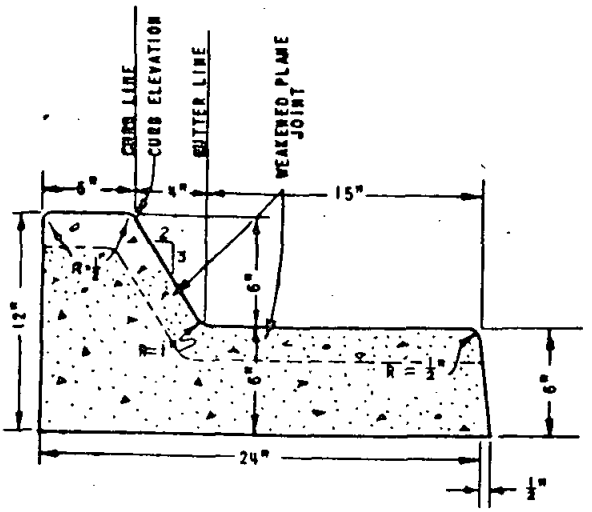
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURB SECTIONS - TYPE B	SCALE - INCHES 0 3 6
		DRAWING NO. G-46

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	12-10-72



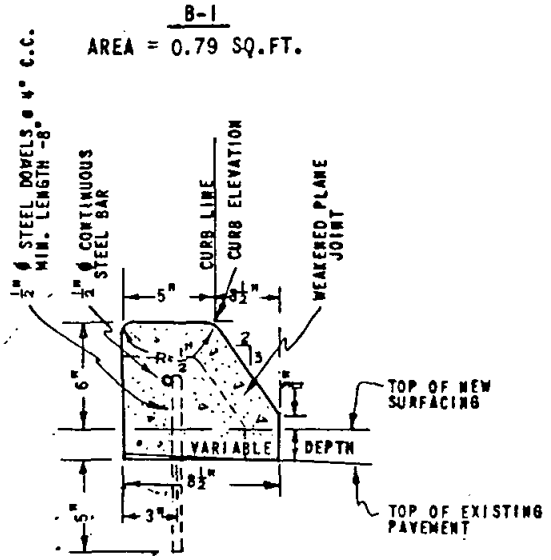
B-1

AREA = 0.79 SQ.FT.

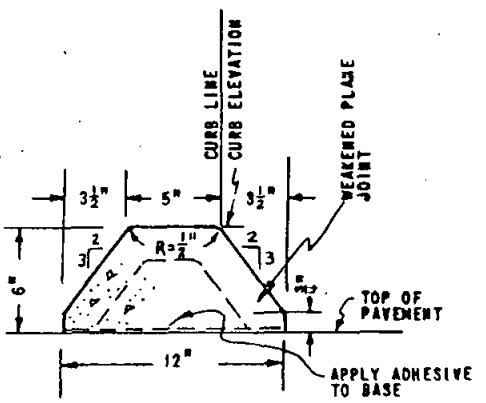


B-2

AREA = 1.29 SQ.FT.



B-3



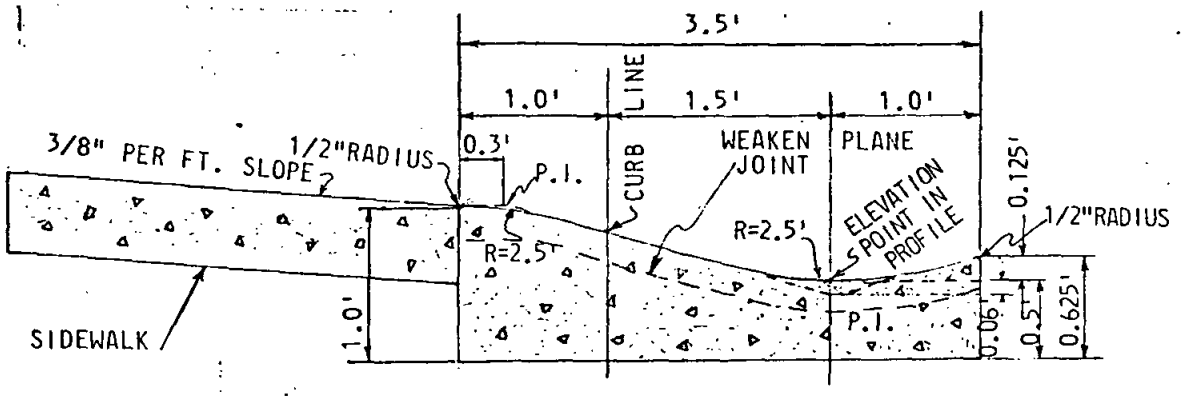
B-4

AREA = 0.35 SQ.FT.
(EXTRUDED TYPE)

NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE DWG. G-42 FOR JOINT DETAILS
SEE DWG. G-43 FOR TYPICAL CURB PLANS

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CURB SECTIONS - TYPE B	SCALE - INCHES 0 3 6
		DRAWING NO. G-46

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	4-10-77
NOTE CHANGE	D.E.B.	A. Kuehn	3/4/64			



TYPICAL SECTION

CURB AREA

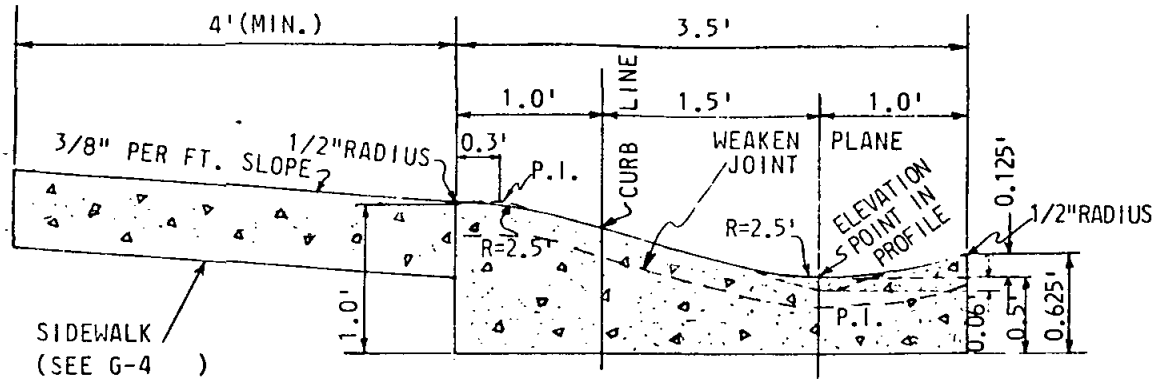
2.33 □FT.

NOTES:-

1. TRANSITION TO A TYPE "G" CURB WILL BE PROVIDED AT ALL CURB RETURNS, AT ALL DRAINAGE STRUCTURES AND AT ALL CUL-DE-SACS WITH DRAINAGE STRUCTURES.
2. ALL CONCRETE SHALL BE CLASS "B".
3. SEE DRAWING G-42 FOR JOINT DETAILS.
4. SEE DRAWING G-43 FOR TYPICAL PLANS.
5. ALL CONCRETE WATER METER BOX COVERS AND LIDS SHALL BE CAST IRON.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING CURB SECTION TYPE "D" ROLL CURBS	SCALE NONE DRAWING NO. G-57

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	R. W. Taylor	11-10-71



TYPICAL SECTION

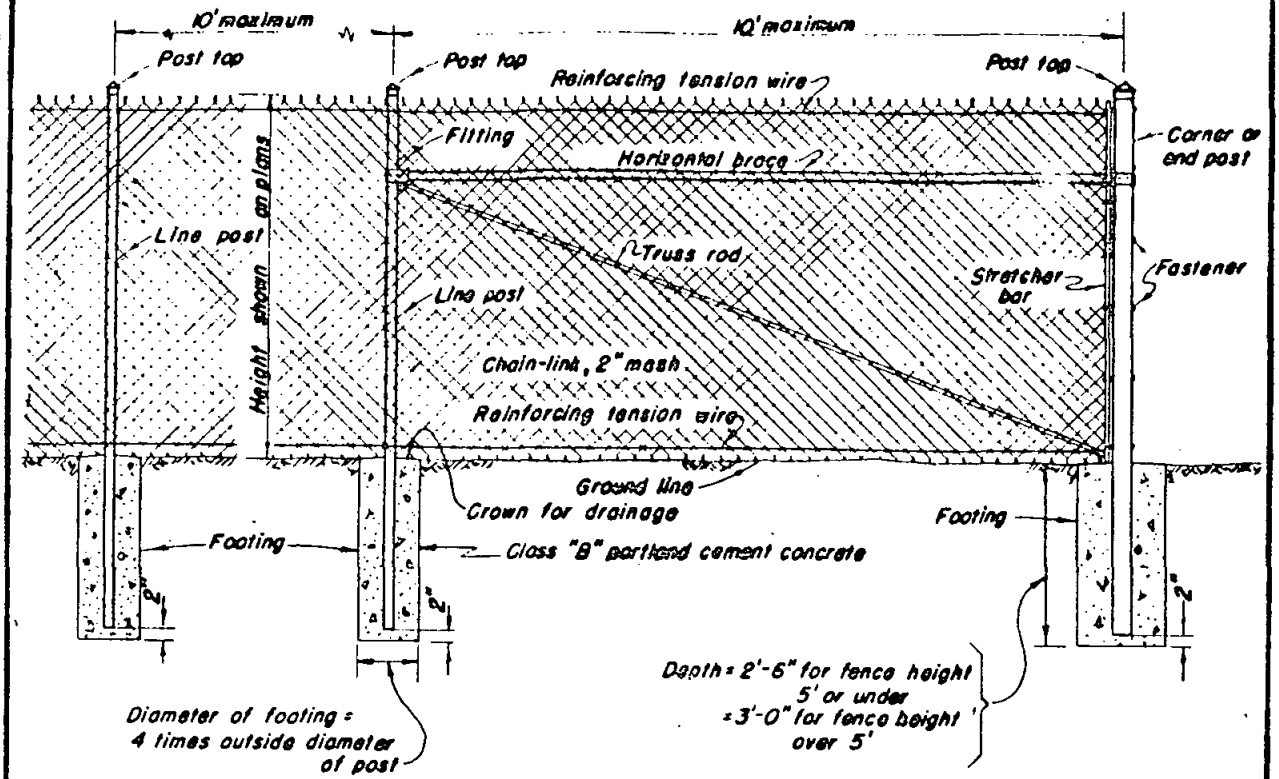
CURB AREA
2.33 □FT.

NOTES:-

1. TRANSITION TO A TYPE "G" CURB WILL BE PROVIDED AT ALL CURB RETURNS, AT ALL DRAINAGE STRUCTURES AND AT ALL CUL-DE-SACS WITH DRAINAGE STRUCTURES.
2. ALL CONCRETE SHALL BE CLASS "A".
3. SEE DRAWING G-42 FOR JOINT DETAILS.
4. SEE DRAWING G-43 FOR TYPICAL PLANS.
5. ALL CONCRETE WATER METER BOX COVERS AND LIDS SHALL BE CAST IRON.

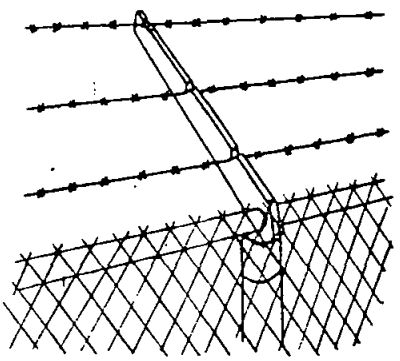
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING CURB SECTION TYPE "D" ROLL CURBS	SCALE NONE DRAWING NO. G-57

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER		



ELEVATION

NOTE: All footings shall be class "B" portland cement concrete



EXTENSION ARM AND BARBED WIRE

No Scale

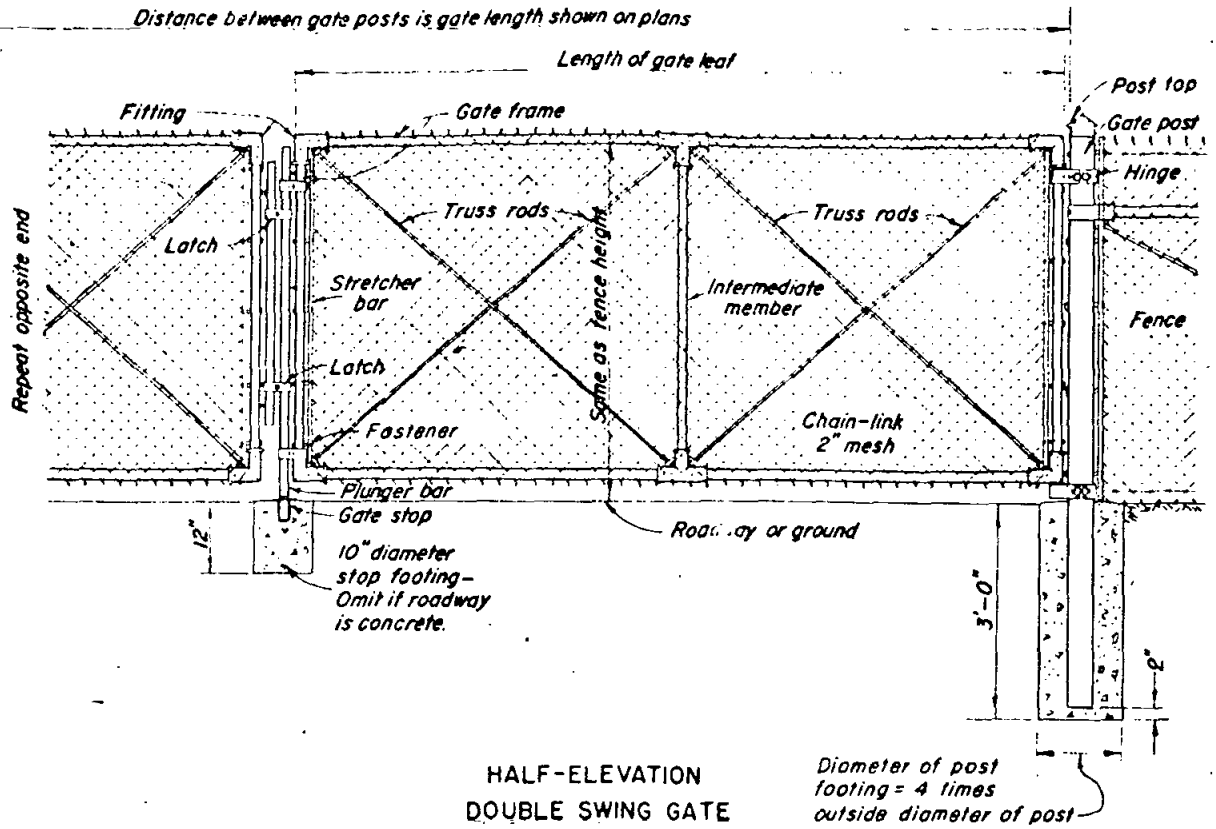
Legend on Plans -

NOTE: The following items shall be furnished and installed only when shown on the plans and/or called for in the special conditions:

1. Barbed wire
2. Extension arm
3. Top horizontal rail

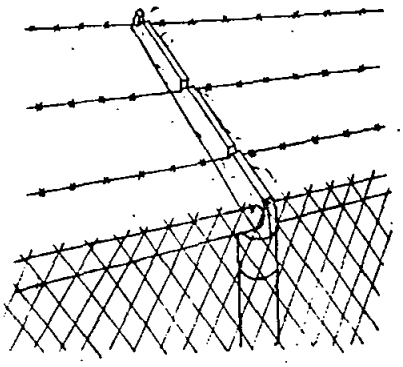
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE $\frac{1}{2}$" = 1'-0"
	CHAIN LINK FENCE	DRAWING NO. M-4

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Taylor	11-10-72



HALF-ELEVATION
DOUBLE SWING GATE

NOTE: All footings shall be class "B" portland cement concrete.



EXTENSION ARM AND BARBED WIRE

No Scale

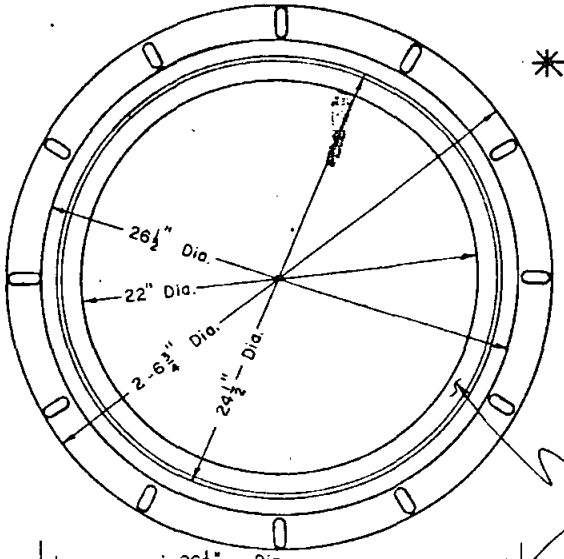
Legend on Plans – —oo—x—o—x—

NOTE: The following items shall be furnished and installed only when shown on the plans and/or called for in the special conditions:

1. Barbed wire
2. Extension arm

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CHAIN LINK GATE	SCALE
		DRAWING NO. M-5

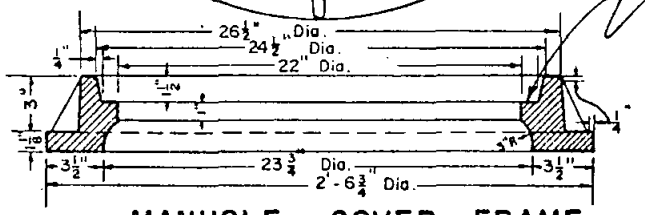
REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. B. Taylor	11-10-72



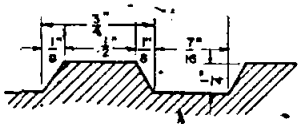
*

FOR	MARK
Sewer Projects	Sewerage
Storm Drain Projects	Drain
Water Projects	Water
Electrical Projects	Electric

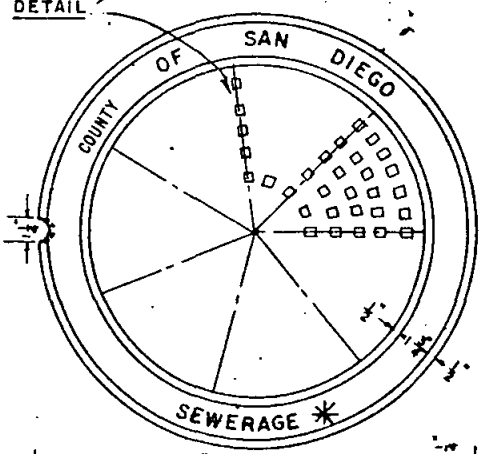
SMOOTH MACHINE FINISH



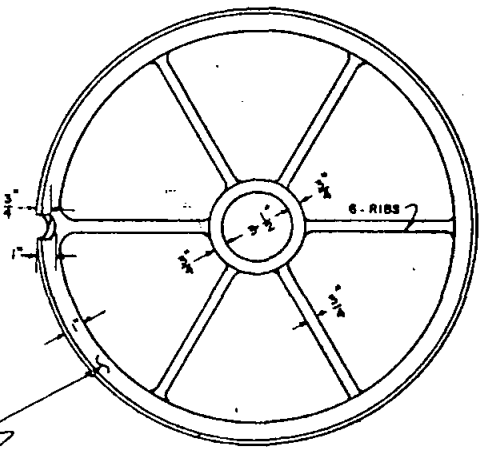
MANHOLE COVER FRAME
CAST IRON WT. 175 LB.



FULL SIZE DETAIL



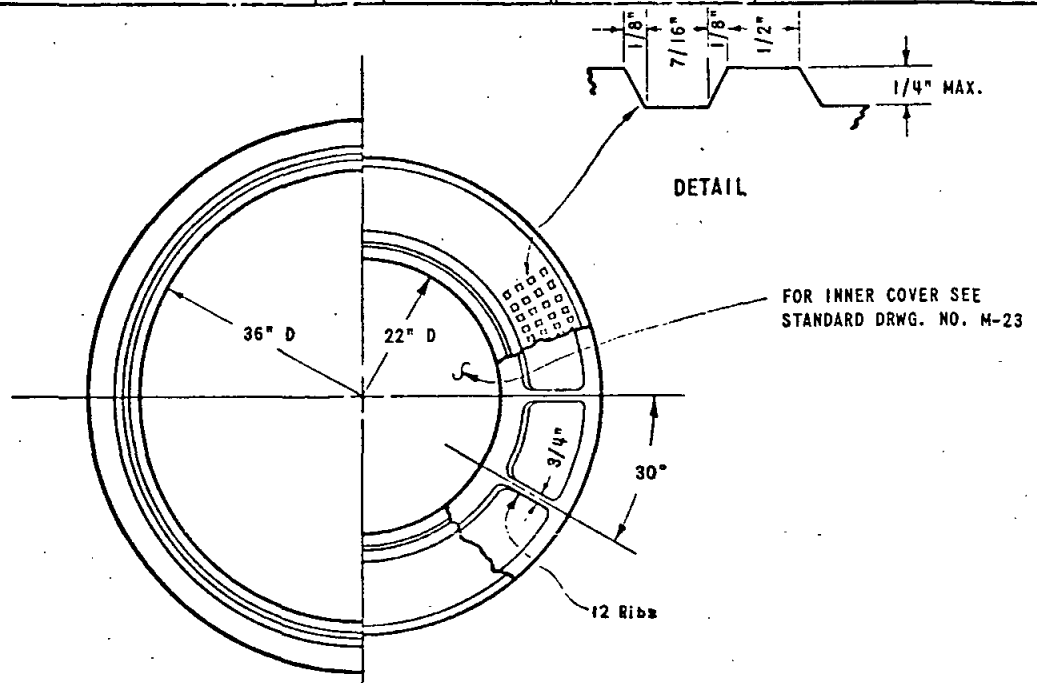
SMOOTH MACHINE FINISH



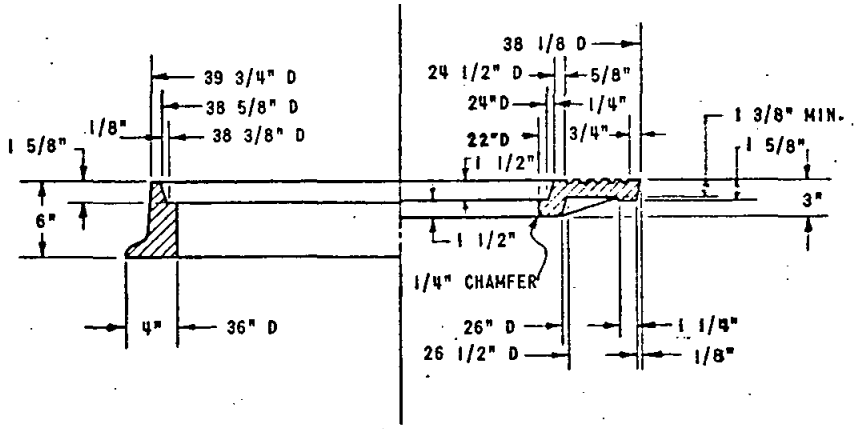
MANHOLE COVER
CAST IRON WT. 155 LB.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO — STANDARD DRAWING	SCALE $1\frac{1}{2}" = 1'$
	MANHOLE FRAME & COVER	DRAWING NO. M-23

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	2-19-74



HALF PLAN
FRAME AND COVER



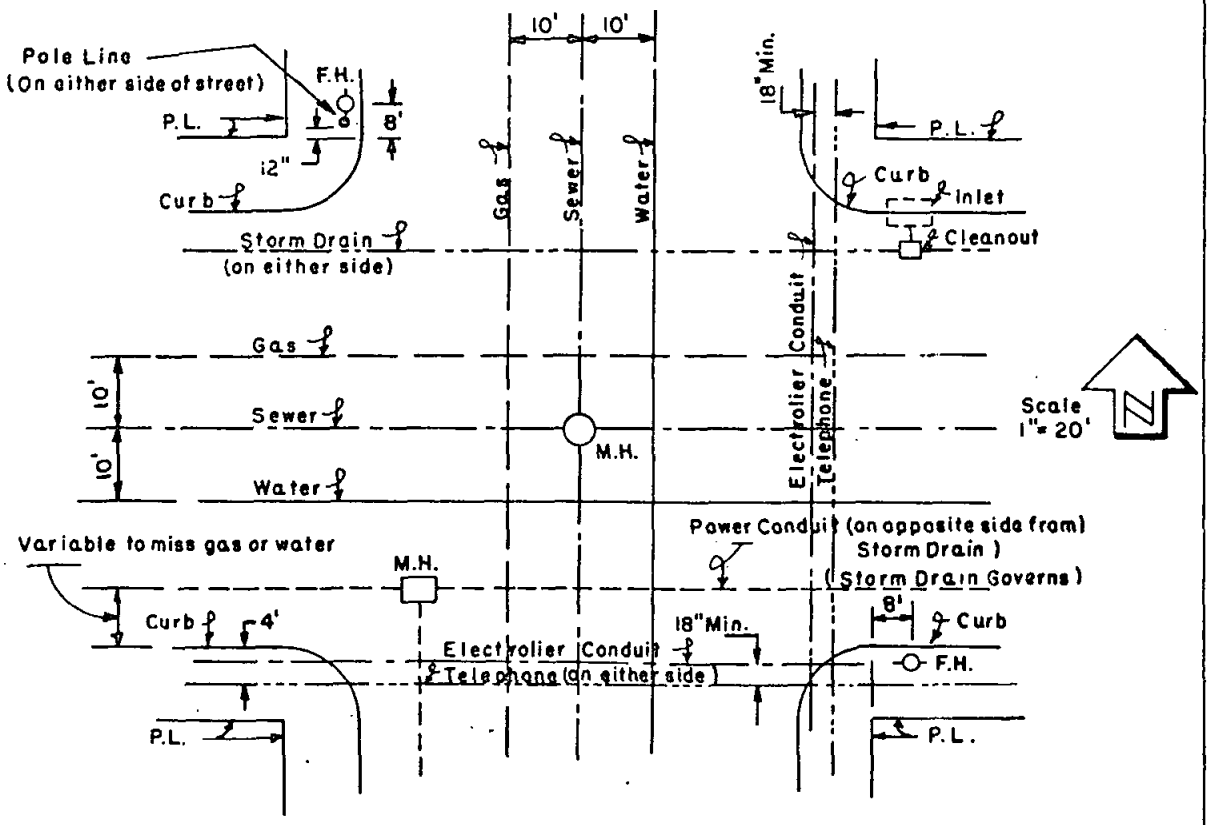
HALF SECTION
FRAME AND COVER

NOTES

1. WEIGHTS:
   INNER COVER - 155 LBS.
   OUTER COVER - 300 LBS.
   FRAME - 330 LBS.
2. MATERIAL: CAST IRON
3. MACHINE SEATS TO PREVENT NOISE
4. FILLET RADII TO BE 1/2"

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO — STANDARD DRAWING	SCALE
	MANHOLE FRAME AND TWO CONCENTRIC COVERS	DRAWING NO. M-54

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.M. Taylor	11-10-72

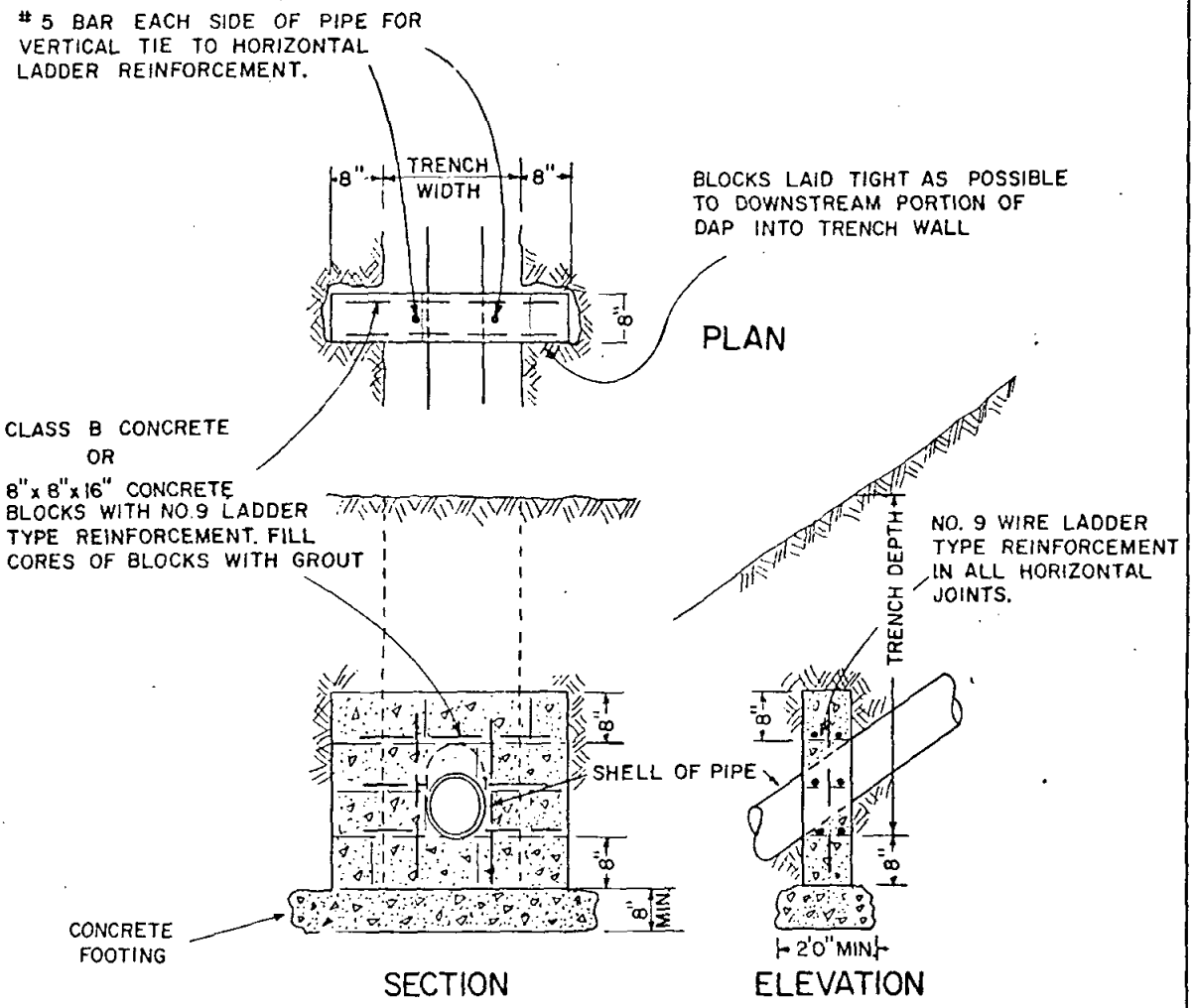


ROADWAY INTERSECTION PLAN

NOTE: This "STANDARD" is a guide only and deviations will be acceptable where conditions dictate. Dimensions shown are desirable but do not govern. The intention is to show the Relative Position of ALL UTILITIES

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	GUIDE FOR LOCATION OF PIPES CONDUITS AND UNDERGROUND WORK IN STREETS	SCALE As shown DRAWING NO. P-24

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER		



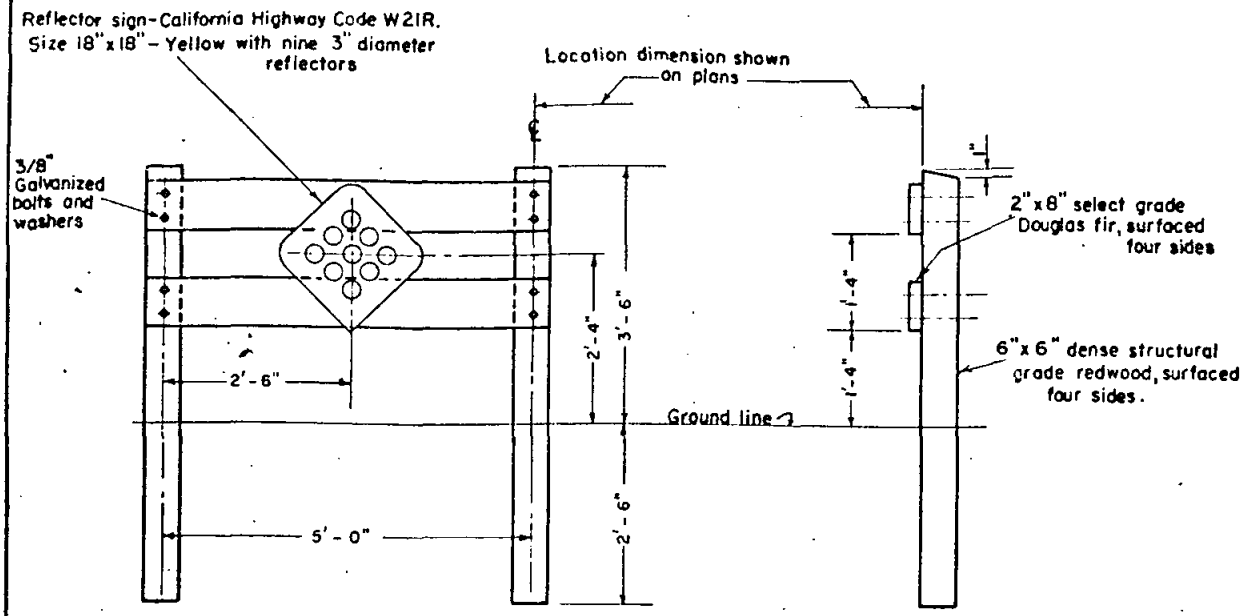
DETAIL PLANS

LEGEND ON PLANS

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	CONCRETE ANCHOR	SCALE NONE
		DRAWING NO. S-27

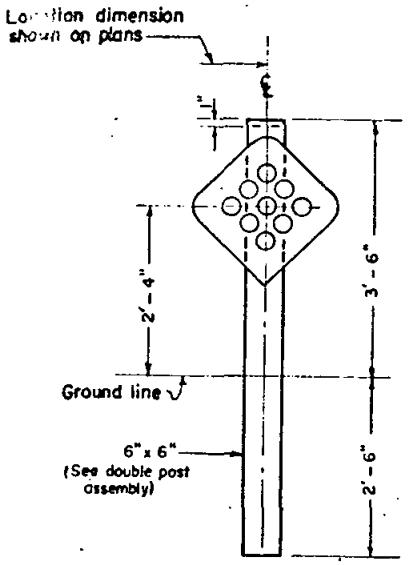
C K

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. W. Craig	11-10-72



FRONT VIEW

END VIEW



FRONT VIEW

Type C (Double post without reflector sign)
Type CS (Double post with reflector sign)

NOTE: Install Type CS assembly with one (1) only code W21R sign in head-on position for each approaching lane of traffic.

Type D (Single post without reflector sign)
Type DS (Single post with reflector sign)

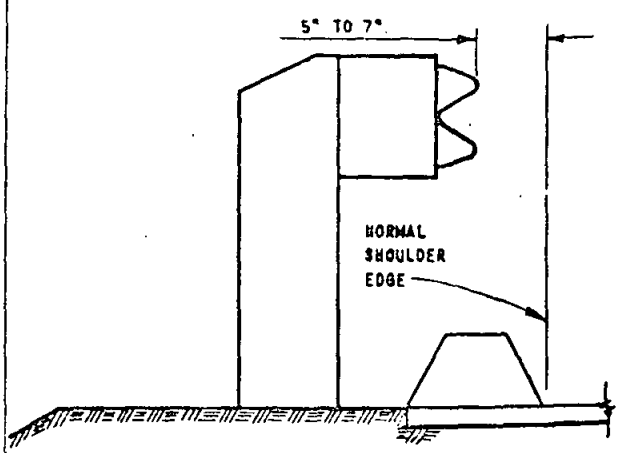
LEGEND ON PLANS

Type CS

Type DS

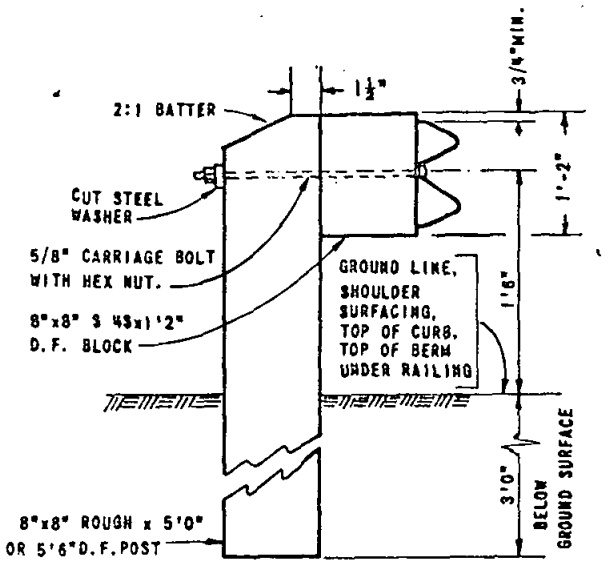
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	SCALE 1/2" = 1'
	GUARD POST AND FENCE ASSEMBLY FOR TERMINATING STREETS	DRAWING NO. T-9

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H. M. Taylor	11-10-71



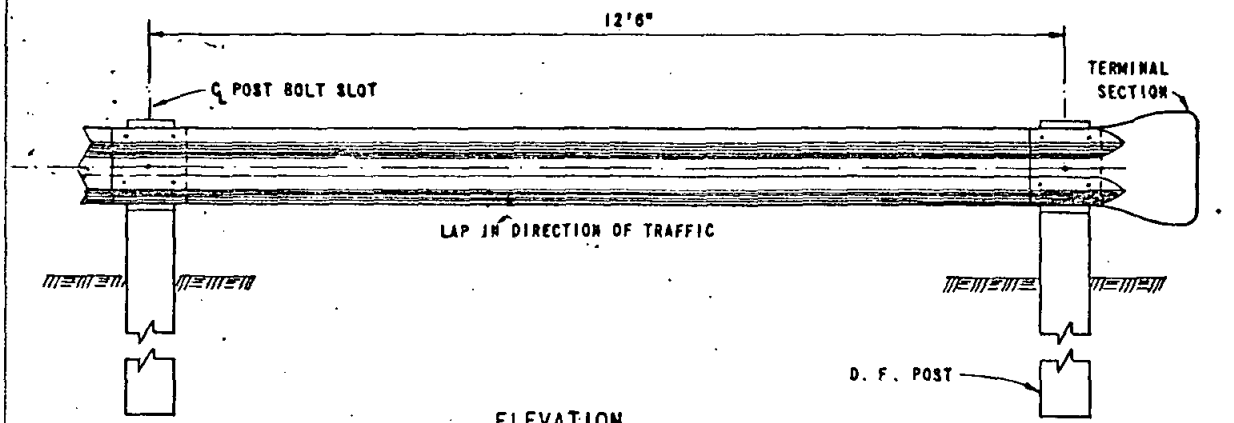
SECTION AT BERM

NOT TO SCALE



SECTION AT SUPPORT

NOT TO SCALE

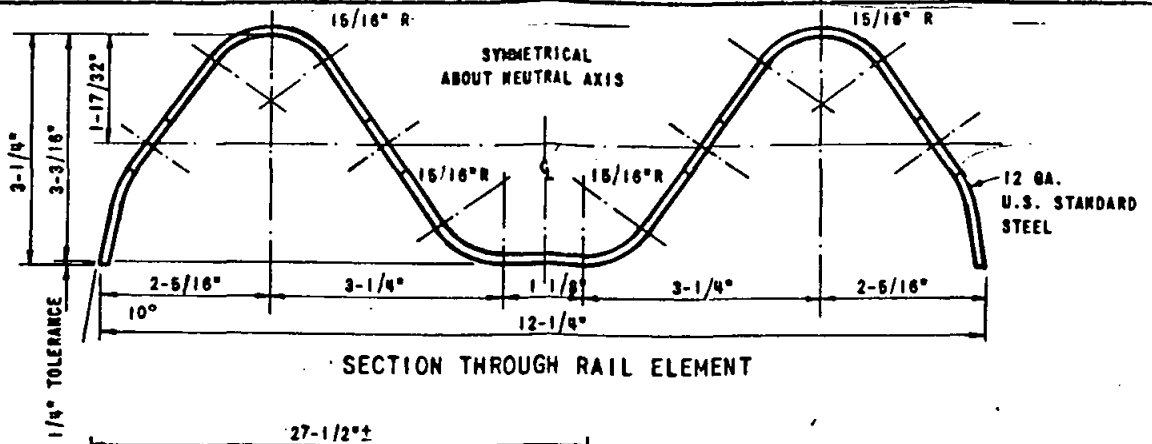


ELEVATION

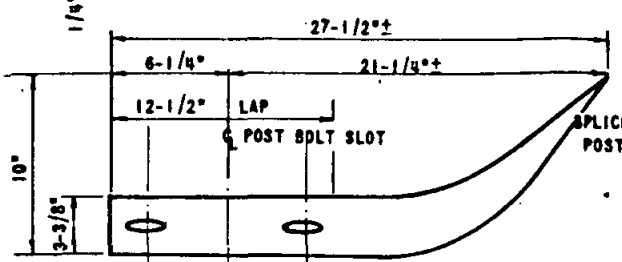
SCALE: 1"= 2'-0"

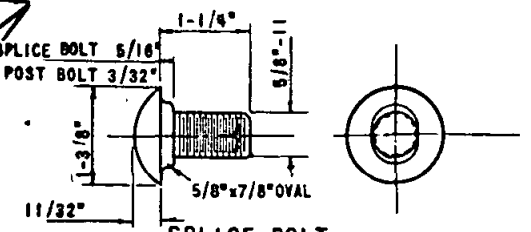
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING	
	METAL BEAM GUARD RAIL INSTALLATION	SCALE AS SHOWN
		DRAWING NO. T-15

REVISIONS				APPROVALS		
DESCRIPTION	BY	APPROVED	DATE	COUNTY ENGINEER	H.G. Taylor	4-20-72

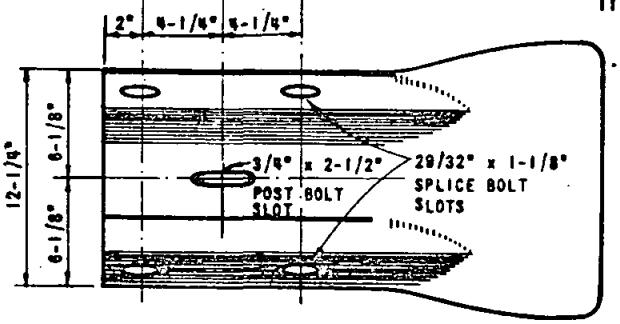


SECTION THROUGH RAIL ELEMENT

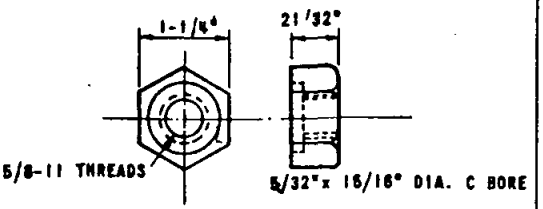




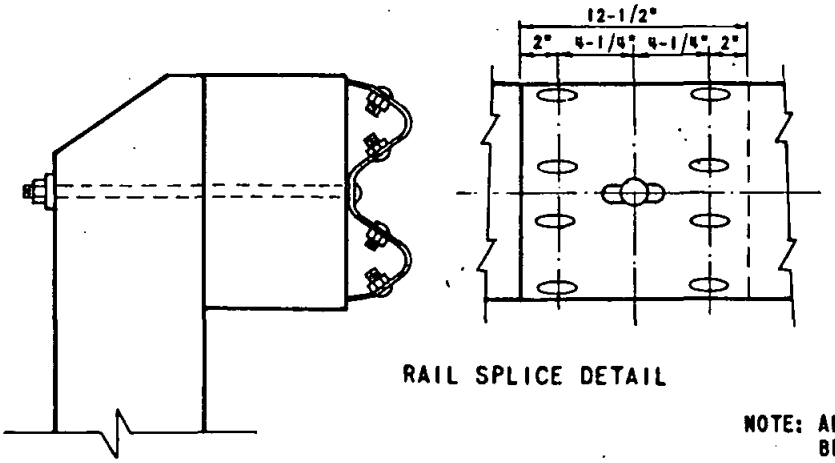
SPLICE BOLT
POST BOLT (SAME EXCEPT FOR LENGTH)



TERMINAL SECTION



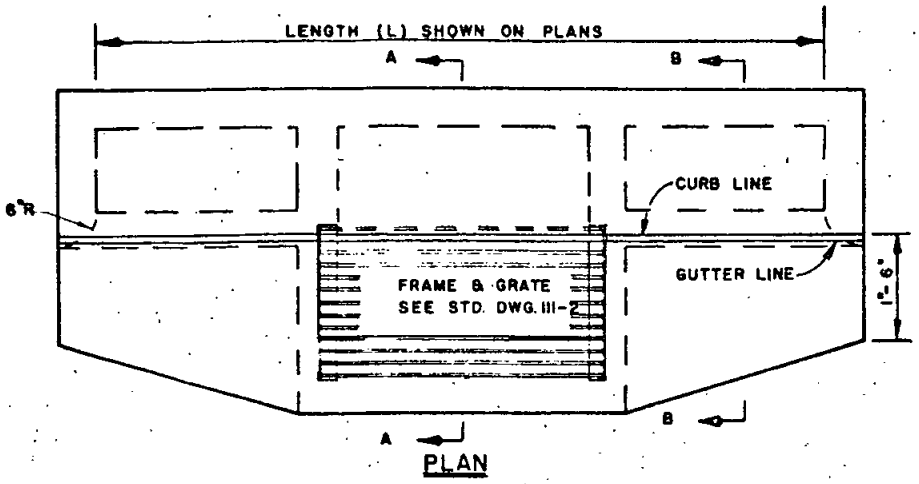
HEXAGON NUT



RAIL SPLICE DETAIL

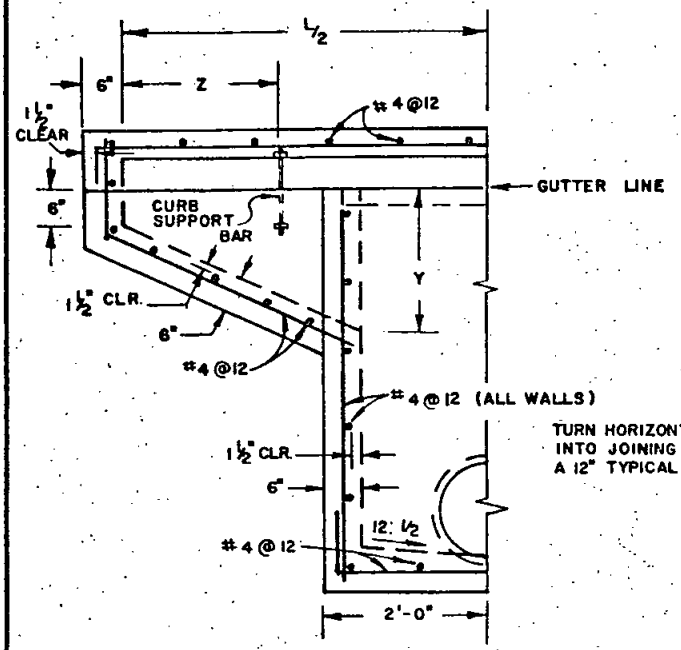
NOTE: ALL RAIL ELEMENTS SHALL BE GALVANIZED.

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO STANDARD DRAWING METAL BEAM GUARD RAIL DETAIL	SCALE NO SCALE DRAWING NO. T-16

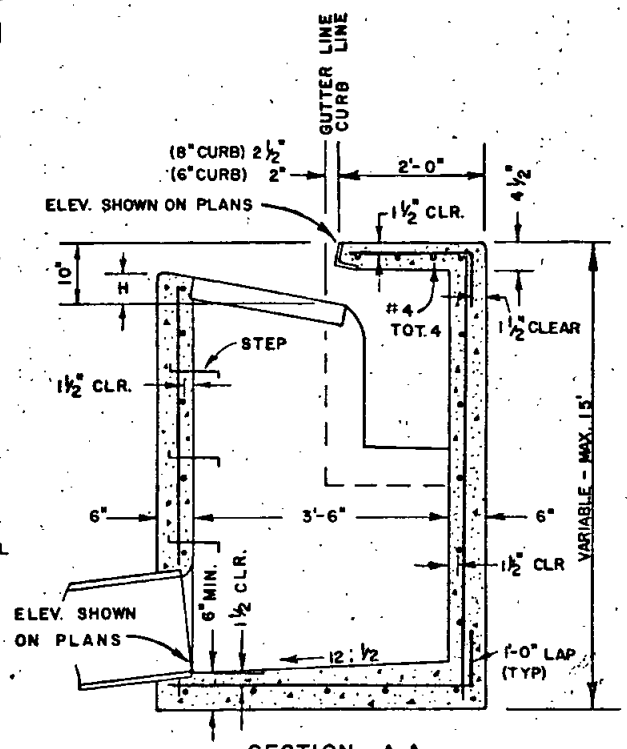


PLAN

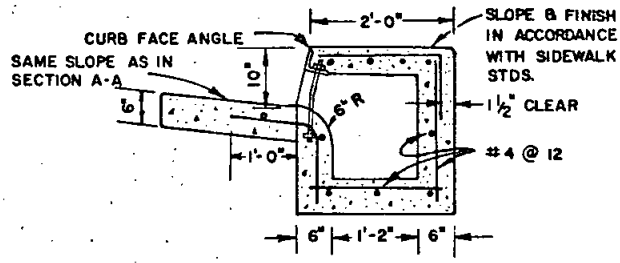
H = 5½" WITH 6" CURB & STD. GUTTER
H = 3½" WITH 8" CURB & STD. GUTTER
H = 2½" WITH STD. GUTTER DEPRESSION



HALF ELEVATION



SECTION A-A

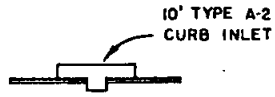


SECTION B-B

L	Y	Z
10'	2'-0"	2'-6"
15'	3'-0"	5'-0"
20'	4'-0"	7'-0"

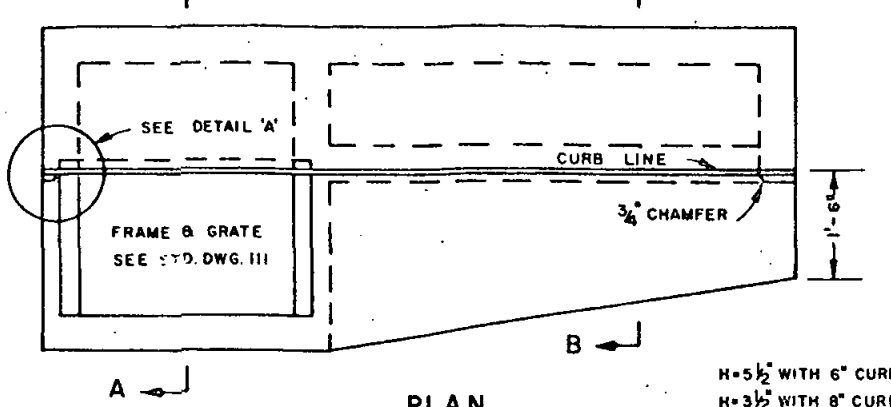
NOTES

1. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131, "DRAINAGE STRUCTURE STANDARD DETAILS"
2. ALL CONCRETE TO BE CLASS "A"
3. STD. GUTTER DEPRESSION TO BE USED WHEN REQ. BY COUNTY ENGINEER SEE STD. DWG. 224
4. CONSTRUCT 10' TRANSITION FROM STD. CURB HEIGHT TO DEPRESSED GUTTER AT EACH END OF INLET.
5. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL OF COUNTY ENGINEER.

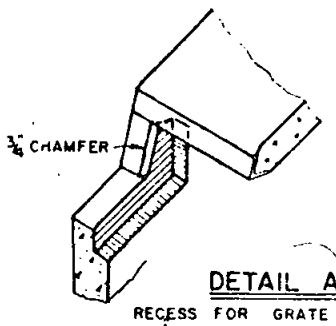


LEGEND ON PLANS

STD. SPEC. SEC. 51, 52, 73, 90						
DRAWN BY DCL	CHECKED BY KL					
RECOMMENDED BY	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED	DATE	
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE: NONE				
D. K. DeSpain R.C.E. 8091	TYPE A-2 CURB INLET	DRAWING NUMBER 100-2				
DATE: 10/18/65						



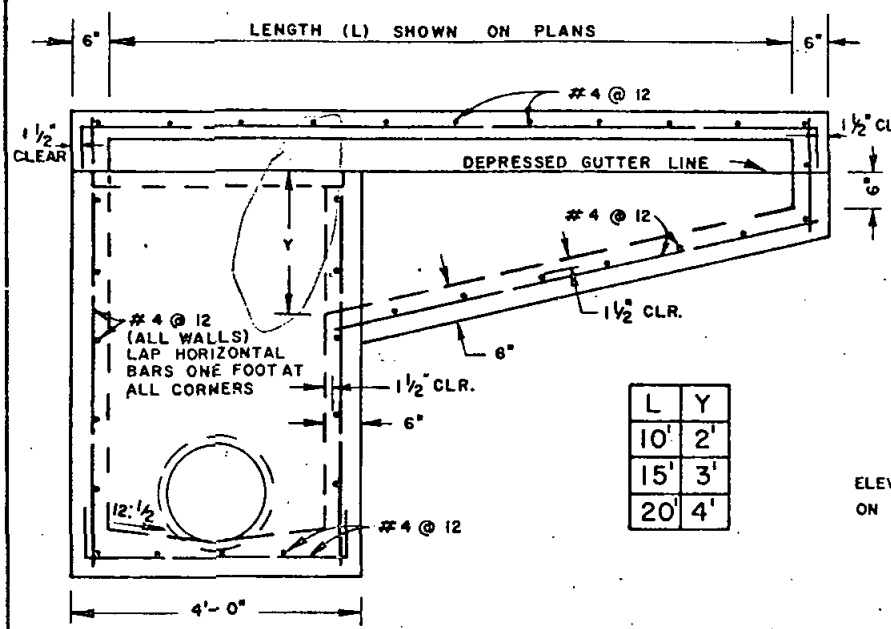
PLAN



DETAIL A

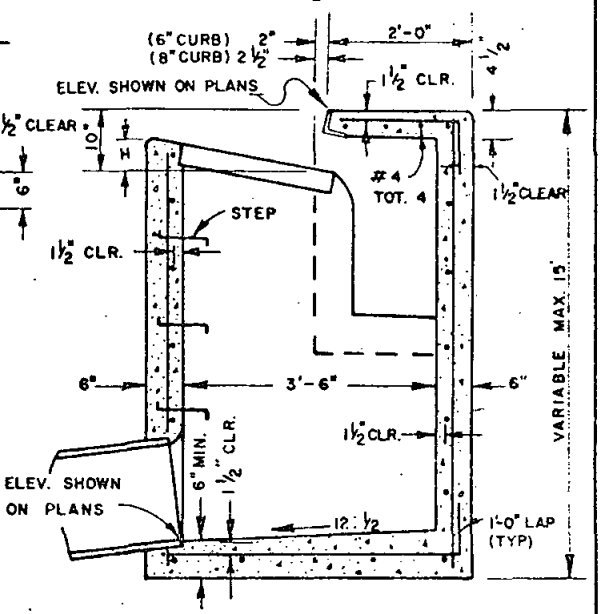
RECESS FOR GRATE REMOVAL

H=5½" WITH 6" CURB & STANDARD GUTTER
H=3½" WITH 8" CURB & STANDARD GUTTER
H=2½" WITH STANDARD GUTTER DEPRESSION

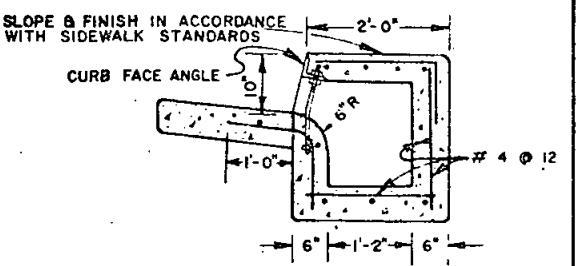


L	Y
10'	2'
15'	3'
20'	4'

ELEVATION



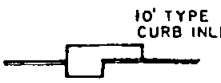
SECTION A-A



SECTION B-B

NOTES

1. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131, "DRAINAGE STRUCTURE STANDARD DETAILS"
2. ALL CONCRETE SHALL BE CLASS "A".
3. CURB SUPPORT SPACING: 10' BOX – 1 BAR CENTERED IN OPENING; 15' AND 20' BOXES – 2 BARS EQUALLY SPACED IN OPENING.
4. CONSTRUCT 10' TRANSITION FROM STANDARD CURB HEIGHT TO DEPRESSED GUTTER AT EACH END OF INLET.
5. STANDARD GUTTER DEPRESSION TO BE USED WHEN REQUIRED BY COUNTY SURVEYOR. SEE STD. DWG. 224.
6. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL OF COUNTY SURVEYOR.

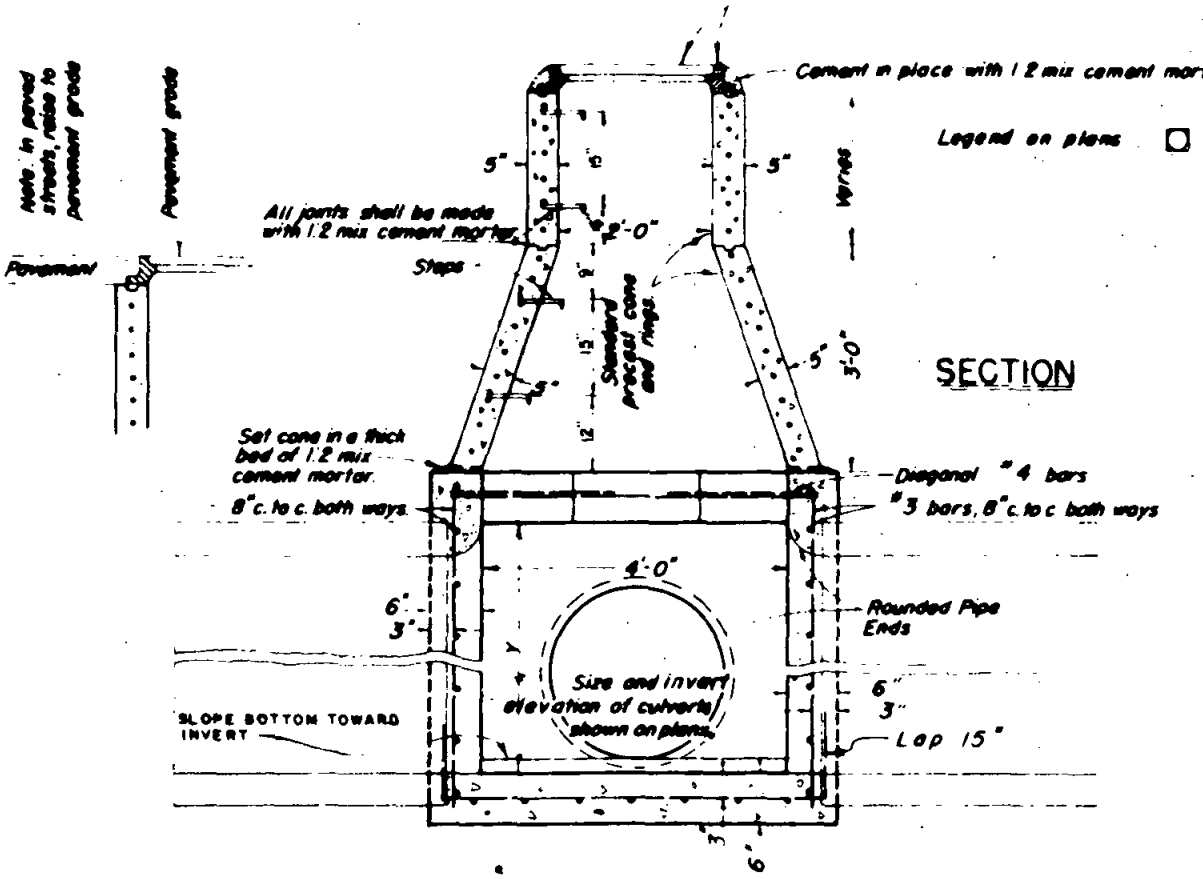


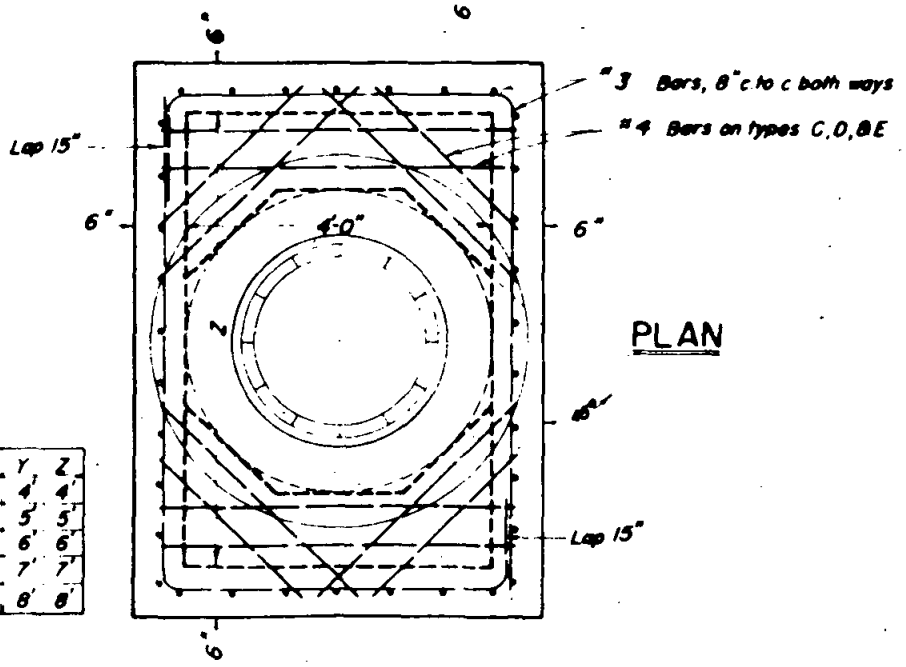
10' TYPE B-2 CURB INLET

LEGEND ON PLANS

STD. SPEC. SEC. 51, 52, 73, 90					
DRAWN BY DCL CHECKED BY [illegible]					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE NONE			
D. K. Sheer R.C.E. 8091	TYPE B-2 CURB INLET	DRAWING NUMBER 101-2			
DATE 12/12/65					

CLEANOUT COVER SEE SAN DIEGO COUNTY STD DWG. 117 "22" CLEANOUT FRAME & COVER"



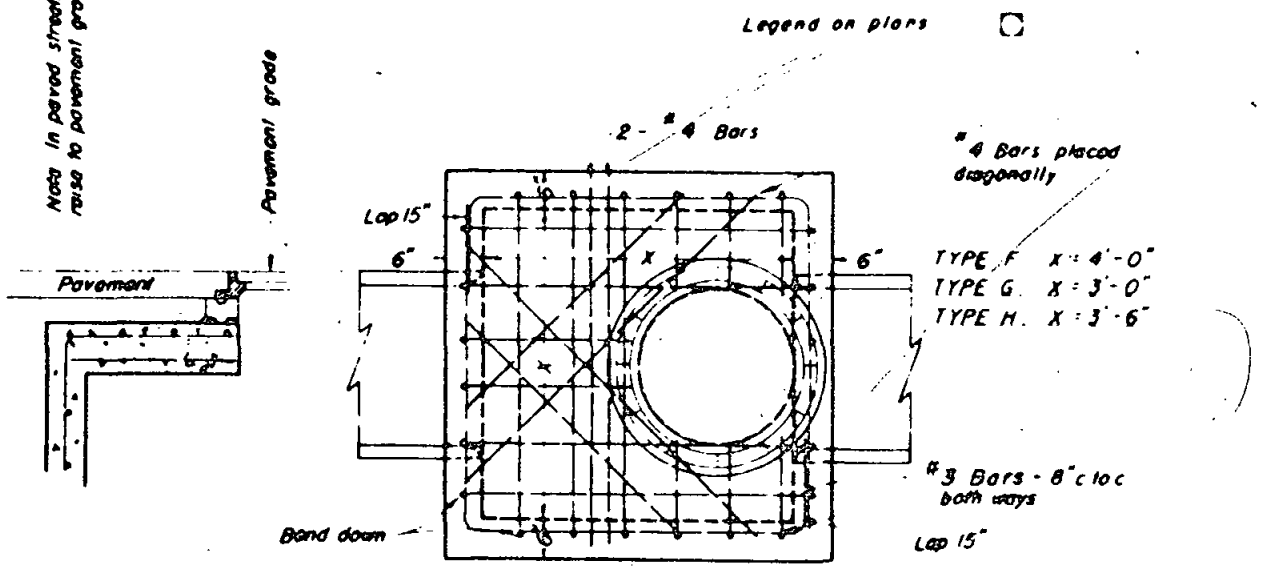


	Y	Z
A for pipes up to 39"	4'	4'
B " " " 42"-48"	5'	5'
C " " " 51"-60"	6'	6'
D " " " 63"-72"	7'	7'
E " " " 75"-84"	8'	8'

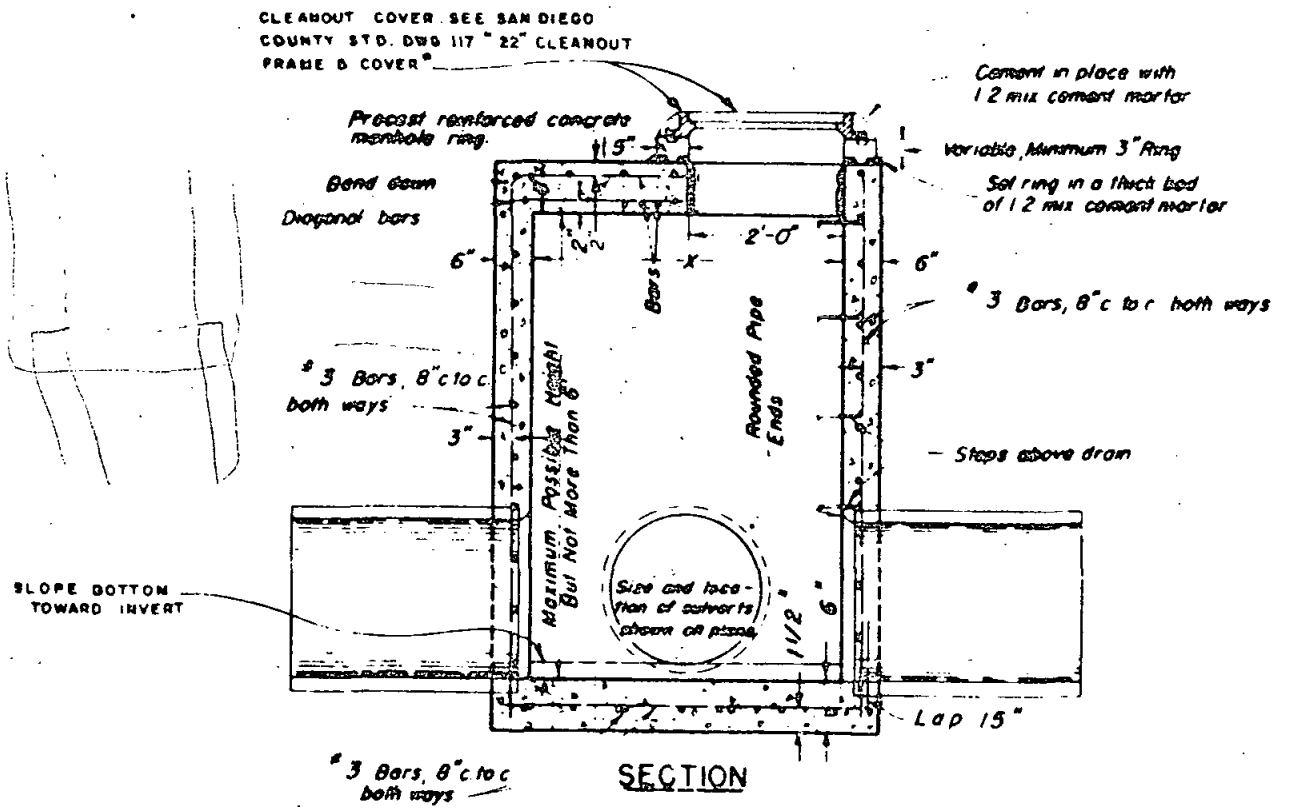
NOTE

WHEN HEIGHT EXCEEDS 4' CAST 3/8" ROUND WROUGHT IRON STEPS IN WALL A MAXIMUM OF 15" APART SEE SAN DIEGO COUNTY DWG 131 "DRAINAGE STRUCTURE STANDARD DETAILS"

STD SPEC SEC 51, 52, 73, 90				
DRAWN BY	CHECKED BY			
RECOMMENDED BY	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED / DATE
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE NONE		
R.C.E. 8091	STORM DRAIN CLEANOUT TYPES A, B, C, D & E	DRAWING NUMBER		102-1
DATE 10/18/65				



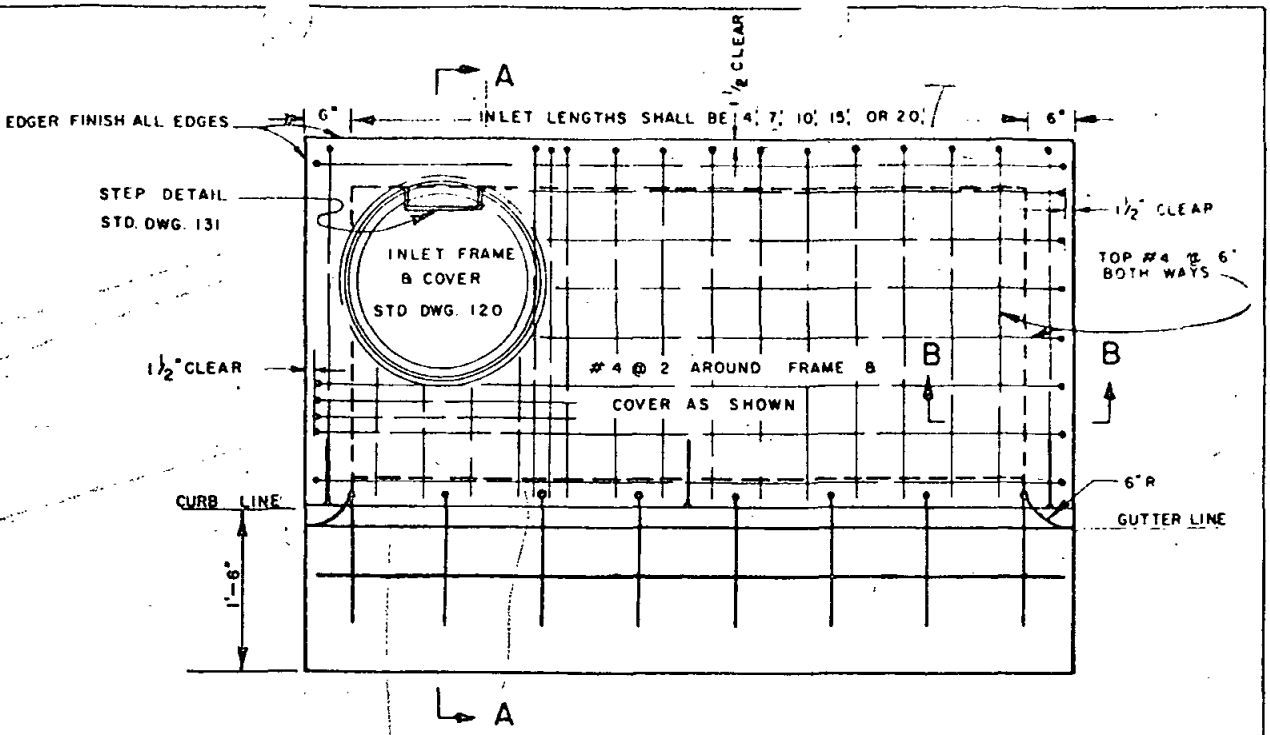
PLAN



SECTION

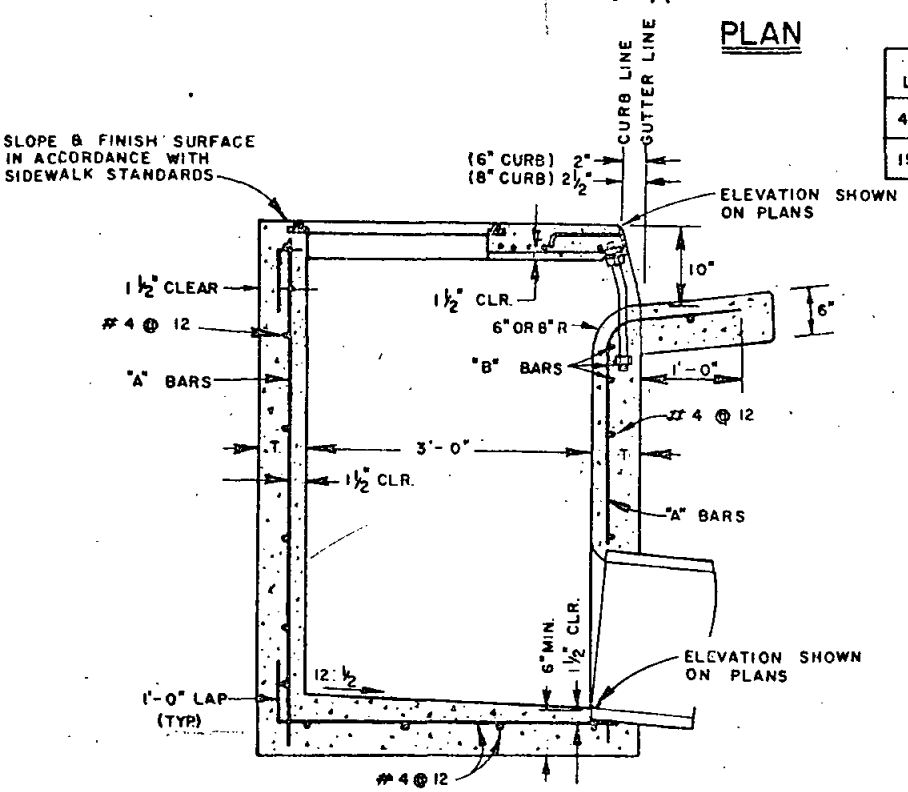
Note All reinforcing shall be deformed bars All concrete shall be Class A
WHEN HEIGHT EXCEEDS 4', CAST 5/8" ROUND WROUGHT IRON STEPS IN WALL A MAXIMUM OF 15" APART SEE SAN DIEGO COUNTY DWG 131 "DRAINAGE STRUCTURE STANDARD DETAILS"

STD SPEC SEC 51, 52, 73, 90					
DRAWN BY BC / CHECKED BY					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE NONE			
D. K. Olsen R.C.E. 6091	STORM DRAIN CLEANOUT TYPES F, G, & H	DRAWING NUMBER 103-1			
DATE 10/18/65					

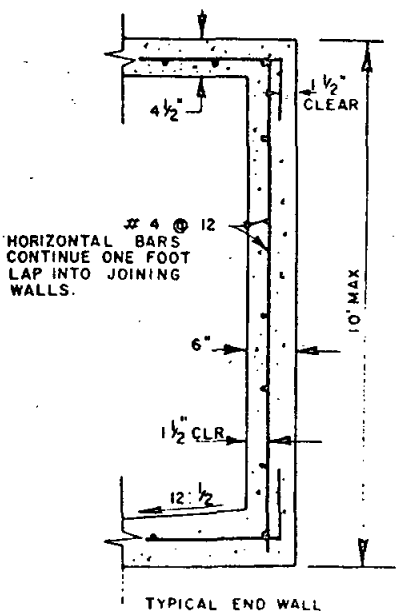


PLAN

INLET LENGTH	T	"A" BARS	"B" BARS
4' TO 10'	6"	#4 @ 12	3 #4 @ 3
15' OR 20'	8"	#4 @ 8	3 #6 @ 3



SECTION A-A



TYPICAL END WALL

SECTION B-B

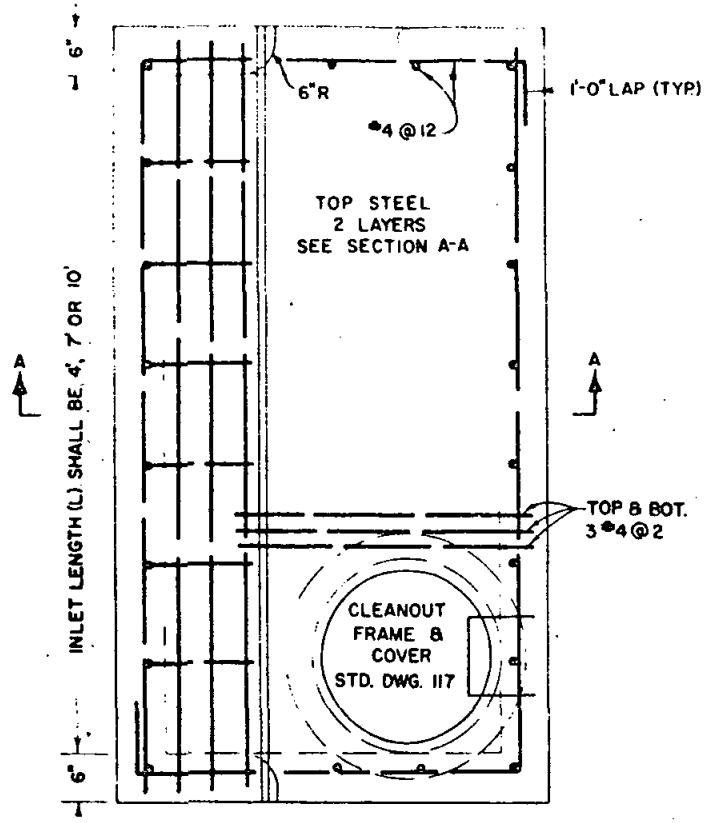
NOTES

1. ALL CONCRETE SHALL BE CLASS A
2. CURB OPENINGS LONGER THAN 7' SHALL HAVE ONE CURB SUPPORT BAR FOR EACH 7' INCREMENT OR FRACTION THERE OF, EVENLY SPACED.
3. CONSTRUCT 10' TRANSITION FROM STD. CURB HEIGHT TO DEPRESSED GUTTER AT EACH END OF INLET
4. STD. GUTTER DEPRESSION TO BE USED WHEN REQUIRED BY COUNTY SURVEYOR. SEE STD. DWG. 224
5. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131 "DRAINAGE STRUCTURE STANDARD DETAILS"
6. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL BY COUNTY SURVEYOR.
7. ½" GALVANIZED STEEL BARS SPACED EVENLY BETWEEN CURB SUPPORT BARS, 21" MAXIMUM

10' TYPE K CURB INLET

LEGEND ON PLANS

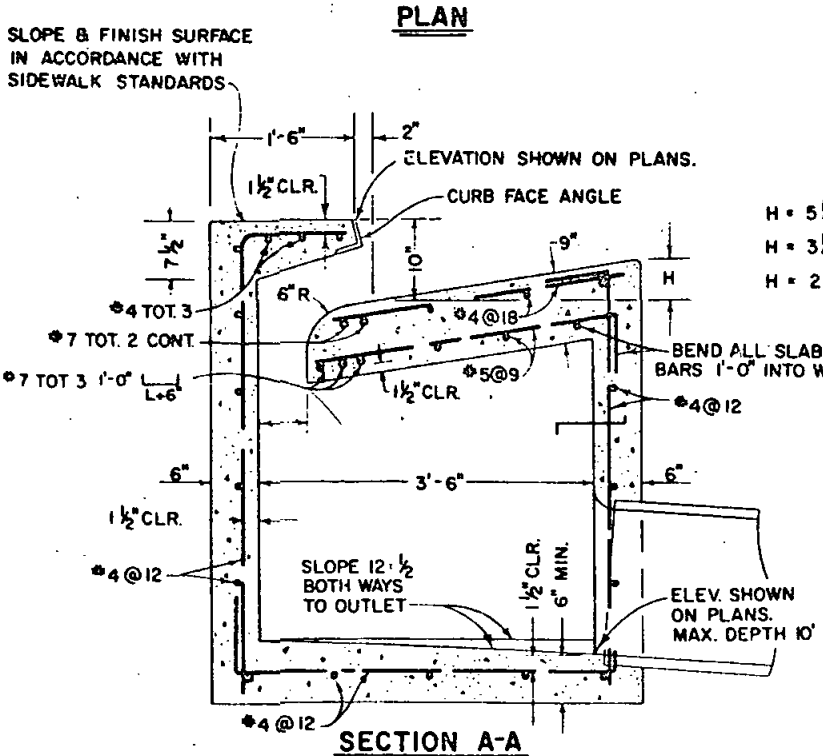
STD. SPEC. SEC. 51, 52, 73, 90					
DRAWN BY BCK	CHECKED BY				
RECOMMENDED BY	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE NONE			
R.C.E 8091	TYPE K CURB INLET	DRAWING NUMBER	104-2		
DATE: 10/18/66					



PLAN

NOTES

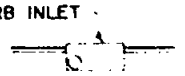
1. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG 131 "DRAINAGE STRUCTURE STANDARD DETAILS"
2. ALL CONCRETE SHALL BE CLASS 'A'
3. STANDARD GUTTER DEPRESSION TO BE USED WHEN REQUIRED BY THE COUNTY ENGINEER. SEE STD. DWG 223-1.
4. CONSTRUCT 10' TRANSITION FROM STD. CURB HEIGHT TO DEPRESSED GUTTER AT EACH END OF INLET.
5. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL BY COUNTY ENGINEER.
6. 1½" GALVANIZED STEEL BARS SPACED EVENLY BETWEEN CURB SUPPORT BARS, 21" MAXIMUM.



SECTION A-A

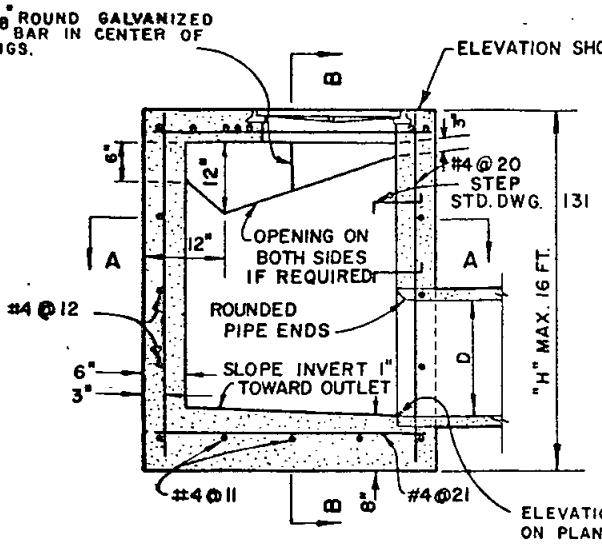
H = 5½" WITH 6" CURB & STD. GUTTER
H = 3½" WITH 8" CURB & STD. GUTTER
H = 2½" WITH STD. GUTTER DEPRESSION

10' TYPE K-1
CURB INLET

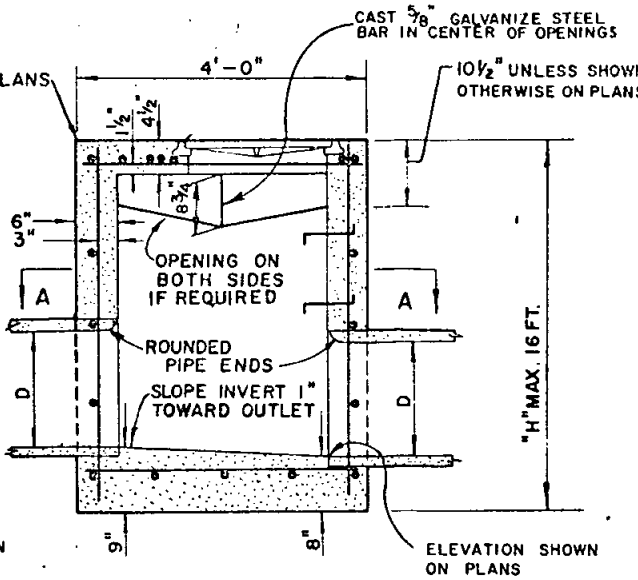


LEGEND ON PLAN

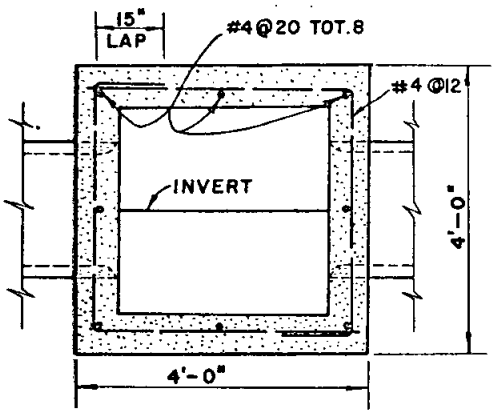
STD. SPEC. SEC. 51, 52, 73, 90					
DRAWN BY RCL CHECKED BY					
RECOMMENDED BY	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE NONE			
D. K. Sperry R.C.E. 8091	TYPE K-1 CURB INLET	DRAWING NUMBER 105-2			
DATE 10/19/84					



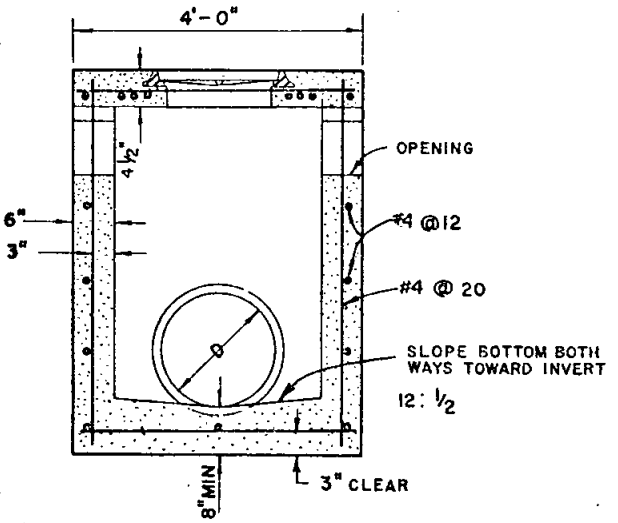
TYPE I DROP INLET



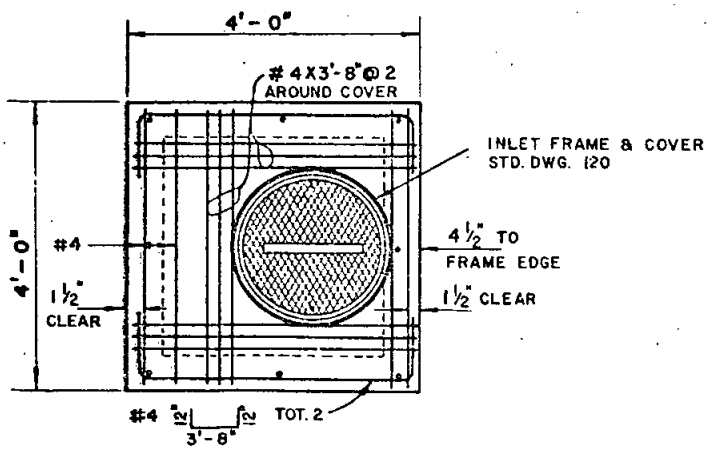
TYPE J DROP INLET



SECTION A-A



SECTION B-B



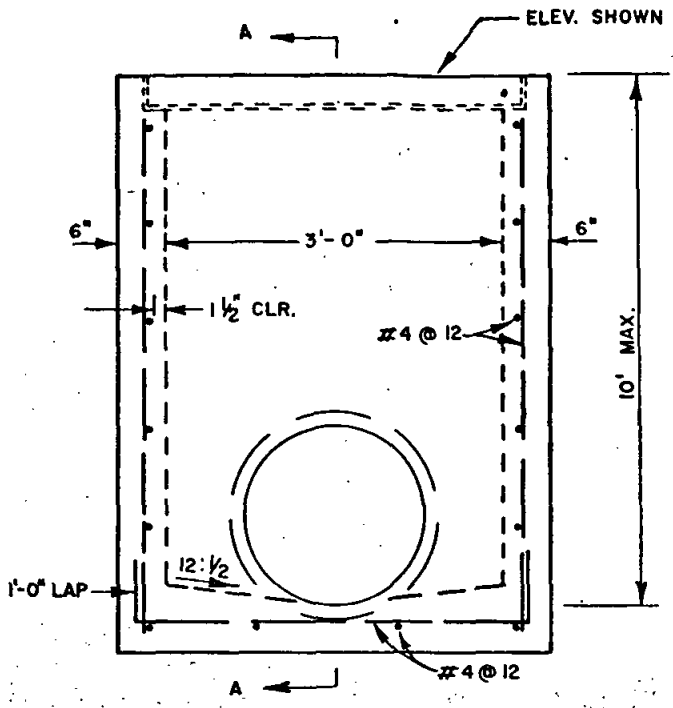
PLAN

LEGEND ON PLANS

NOTES:

1. USE CLASS "A" CONCRETE AND DEFORMED REINFORCING BARS.
2. TYPE I AND J DROP INLETS ARE THE SAME EXCEPT FOR SIDE OPENINGS.

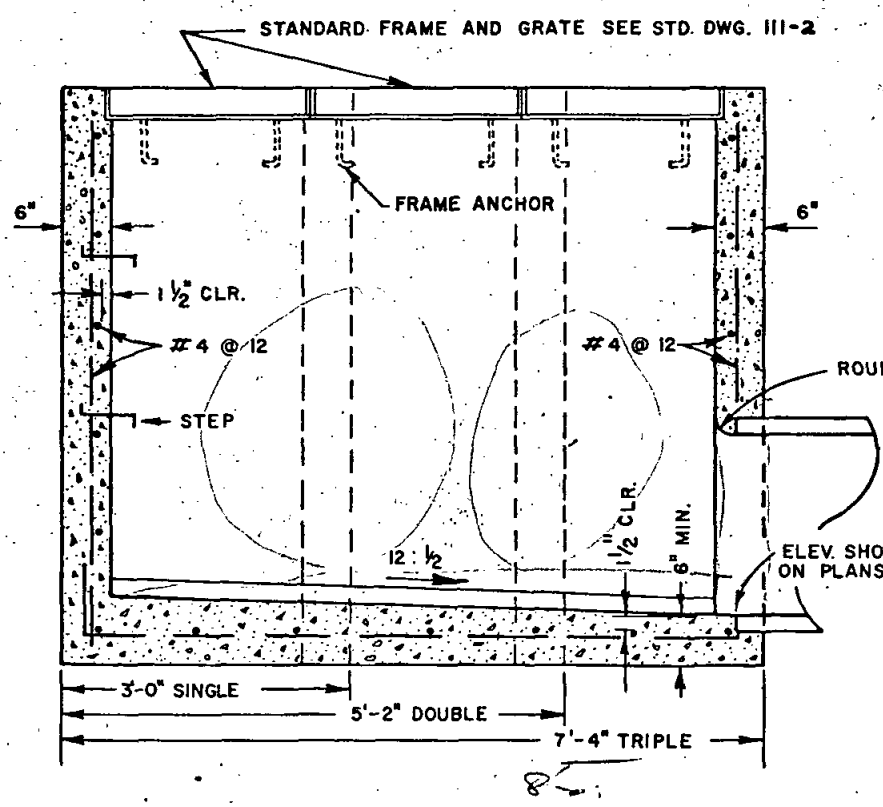
STD. SPEC. SEC. 51, 52, 90		
DRAWN BY DCA CHECKED BY HCP		
RECOMMENDED BY [signature]	SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT	REVISION | BY | APPROVED | DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE
D. K. Sperr R.C.E. 8091	TYPE I & J INLETS	DRAWING NUMBER 106-1
DATE: 10/18/61		



ELEVATION

NOTES

1. ALL CONCRETE SHALL BE CLASS "A"
2. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131 "DRAINAGE STRUCTURE STANDARD DETAILS."
3. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL BY COUNTY ENGINEER.



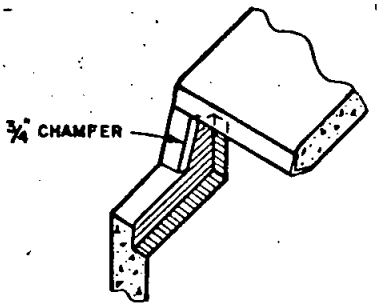
SECTION A-A

LEGEND ON PLANS

NOTE:

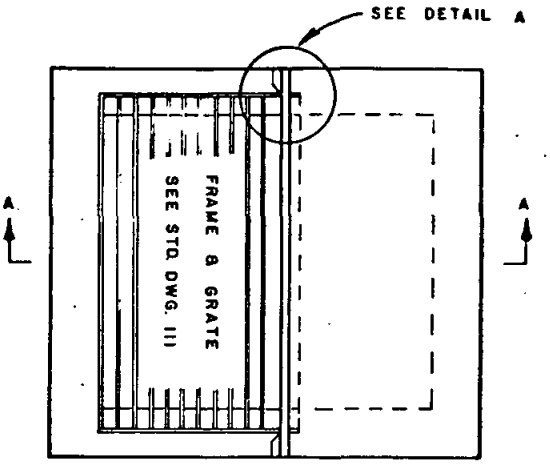
SECTION A-A SHOWS 3 SIZES AND SHALL NOT IMPLY THAT AN INTERIOR WALL IS TO BE BUILT FOR THE STRUCTURES WITH DOUBLE OR TRIPLE FRAME & GRATE.

STD. SPEC. SEC. 51, 52, 73, 90					
DRAWN BY DCL CHECKED BY GHP					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE: NONE			
D. K. Sloan R.C.E. 8091	TYPE "D" CATCH BASIN SINGLE, DOUBLE, OR TRIPLE	DRAWING NUMBER 107-2			
DATE: 10/18/66					



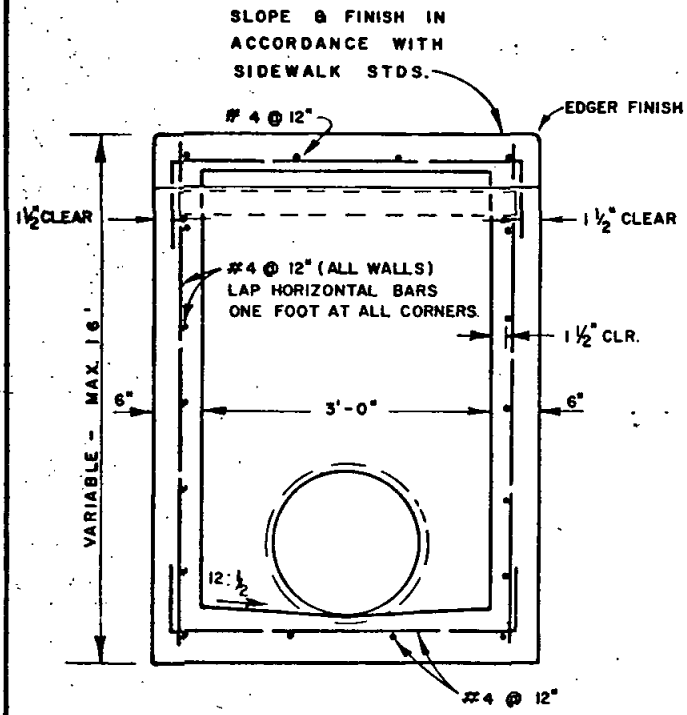
DETAIL A

RECESS FOR GRATE REMOVAL

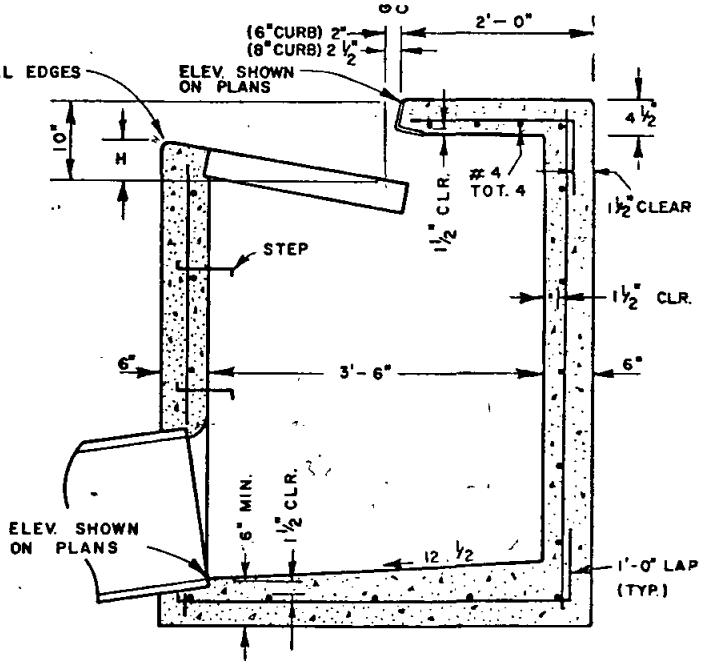


PLAN

H = 5½" WITH 6" CURB & STD. GUTTER
H = 3½" WITH 8" CURB & STD. GUTTER
H = 2½" WITH STD. GUTTER DEPRESSION



ELEVATION



SECTION A-A

NOTES:

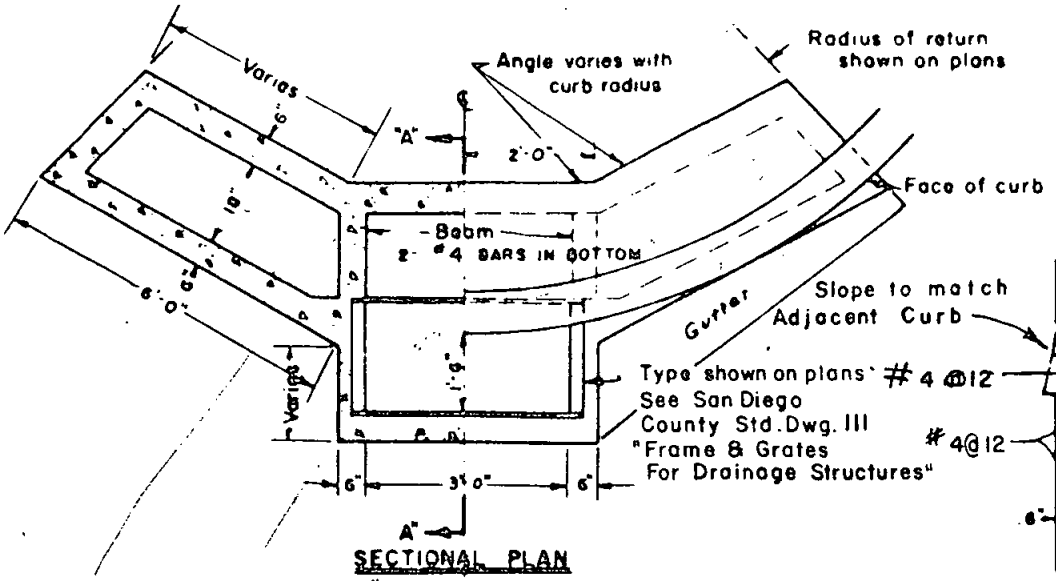
1. ALL CONCRETE SHALL BE CLASS 'A'
2. CONSTRUCT 10' TRANSITION FROM STD. CURB HEIGHT TO DEPRESSED GUTTER AT EACH SIDE OF INLET.
3. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131. "DRAINAGE STRUCTURE STANDARD DETAILS"
4. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL OF COUNTY SURVEYOR.

TYPE H CURB INLET

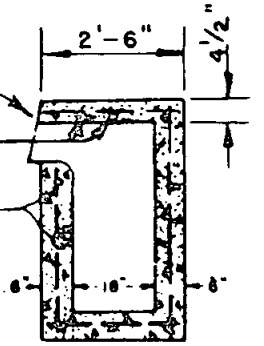
LEGEND ON PLANS

STD. SPEC. SEC. 51, 52, 73, 90		
DRAWN BY DCL CHECKED BY JCL		
RECOMMENDED BY	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE
D. K. Sloan R.C.E. 8091	TYPE H CURB INLET	DRAWING NUMBER 108-1
DATE: 10/18/04		

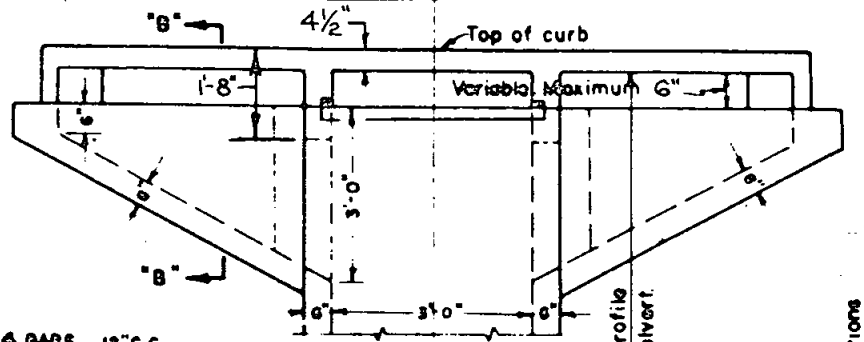
NOTE: SPECIAL DESIGN REQ. FOR H OVER 16'

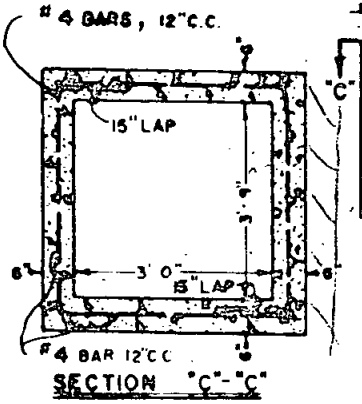


SECTIONAL PLAN

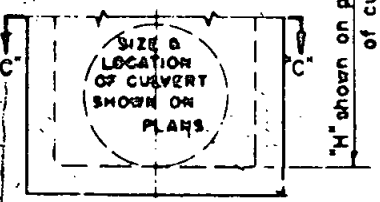


SECTION "B"-"B"

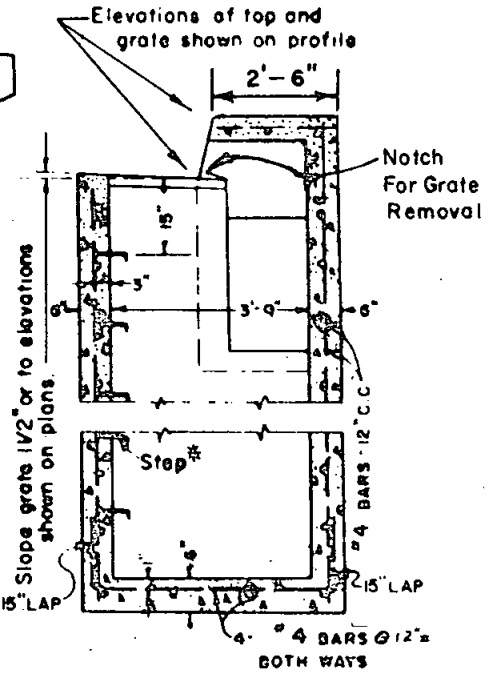




SECTION "C"-"C"



ELEVATION



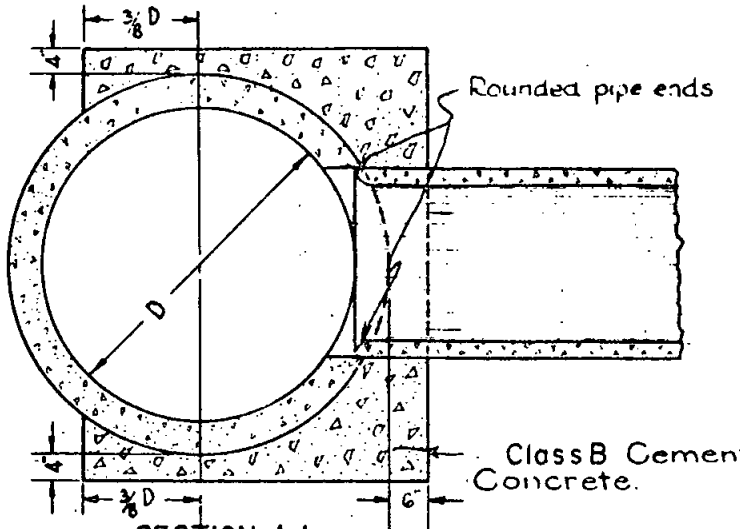
SECTION "A"-"A"

* See San Diego County Std. Dwg. 131 "Drainage Structure Standard Details"

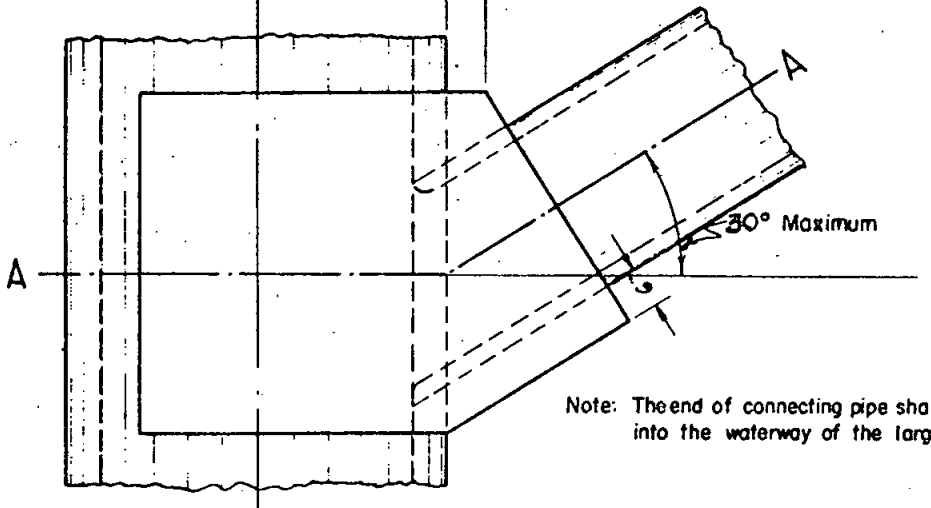
LEGEND ON PLANS

NOTE: All Concrete To Be Class "A"

STD. SPEC. SEC. 51, 52, 73, 90					
DRAWN BY BCL CHECKED BY GH					
RECOMMENDED BY	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
RCE 8091	TYPE G CURB INLET	DRAWING NUMBER		109-1	
DATE: 10/18/65					

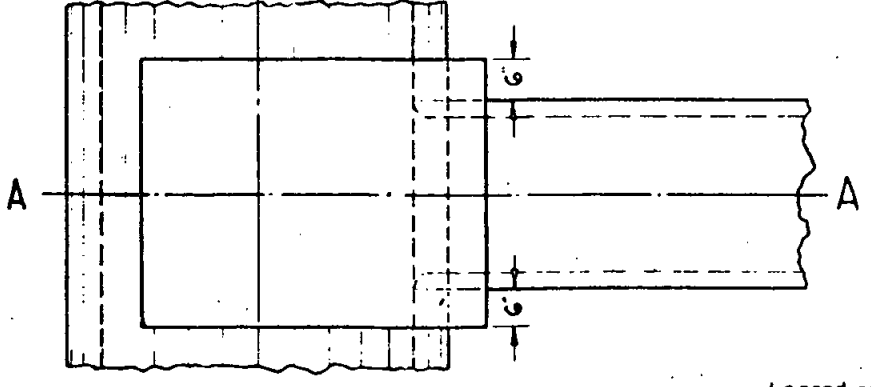


SECTION A-A.



Note: The end of connecting pipe shall not project into the waterway of the larger pipe.

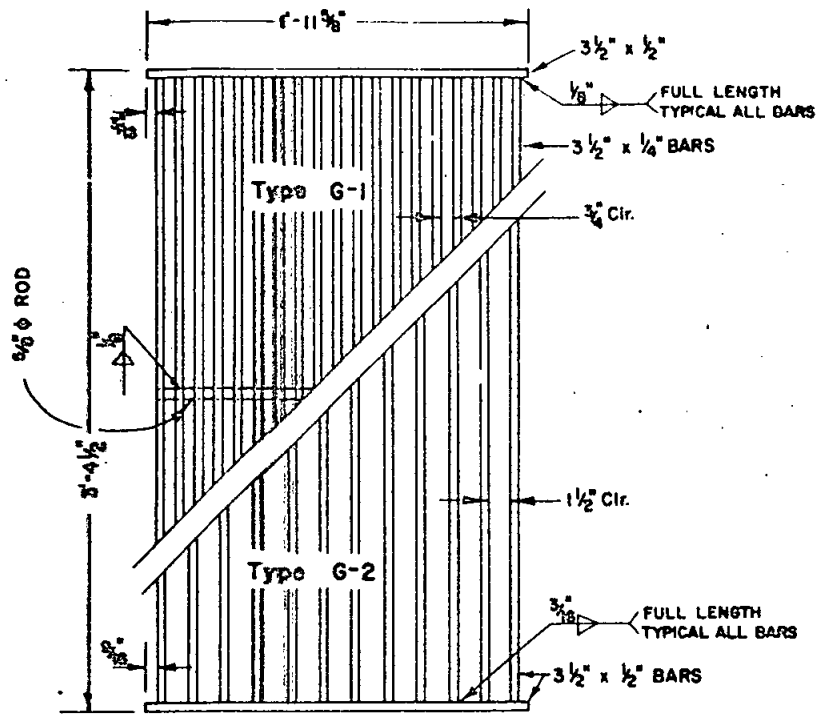
PLAN — SKEWED



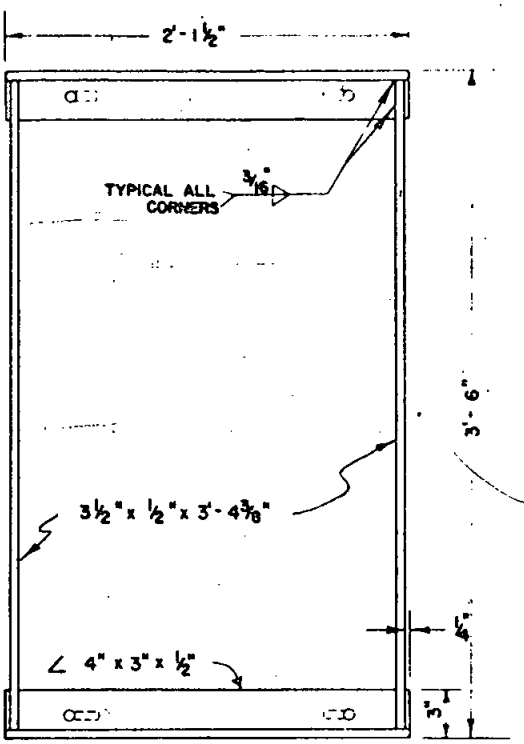
PLAN — NORMAL

Legend on plans:

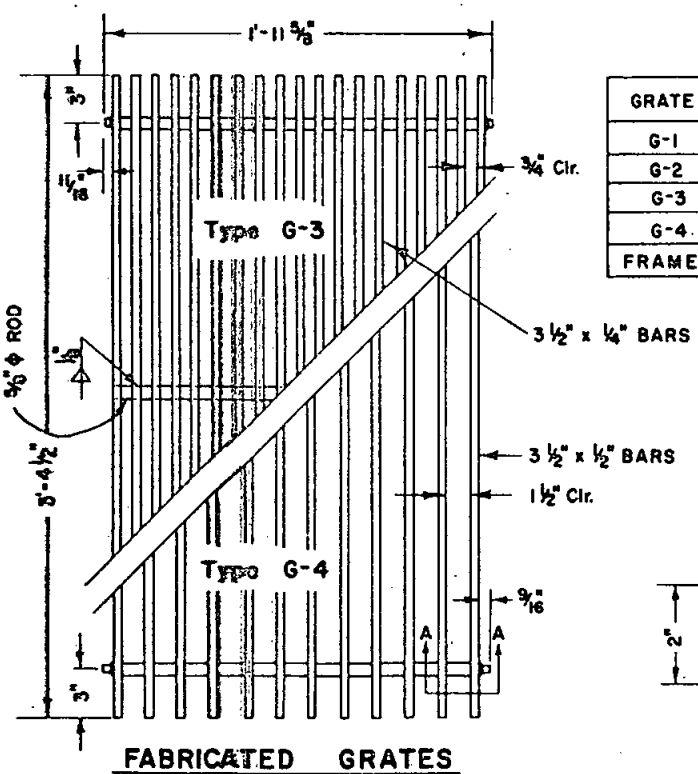
SPECIFICATION REFERENCE	SAN DIEGO COUNTY STANDARD DRAWING	
SECTIONS: 51, 90	CONCRETE LUG	SCALE NONE
County Surveyor		DRAWING NO. 110



WELDED GRATES

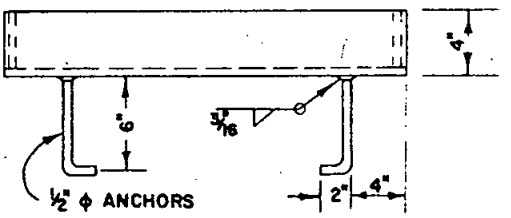


WELDED STEEL FRAME PLAN

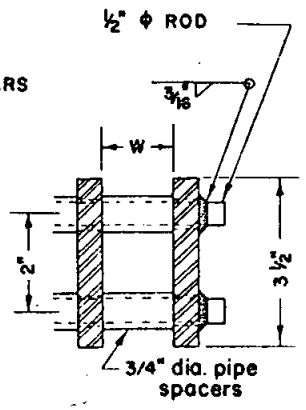


FABRICATED GRATES

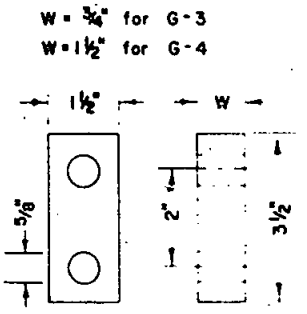
GRATE	WGT.
G-1	255
G-2	255
G-3	239
G-4	243
FRAME	92



END VIEW



SEC. A-A

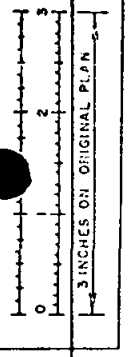


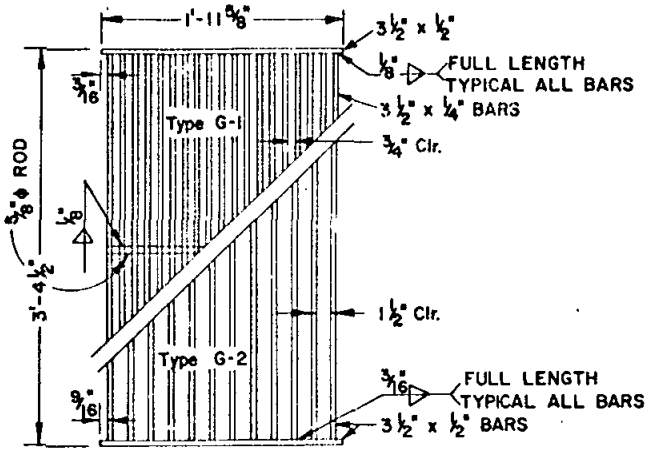
ALTERNATE SPACER

Notes:
1. Grate type shown on plans.
2. Grate type G-1 or G-3 shall be used in all cases.
3. Grate type G-2 or G-4 shall be used only with the approval of the County Engineer.

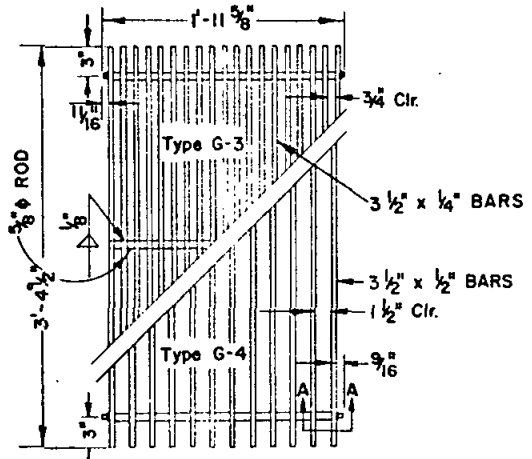
STD. SPEC. SEC. 55,70					
DRAWN BY DCX CHECKED BY DCX					
RECOMMENDED BY	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED	DAT
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE NONE			
D. K. DeGraw R.C.E. 9091	FRAME & GRATES FOR DRAINAGE STRUCTURES	DRAWING NUMBER			III-2

REDUCED SCALE
USE SCALE BELOW

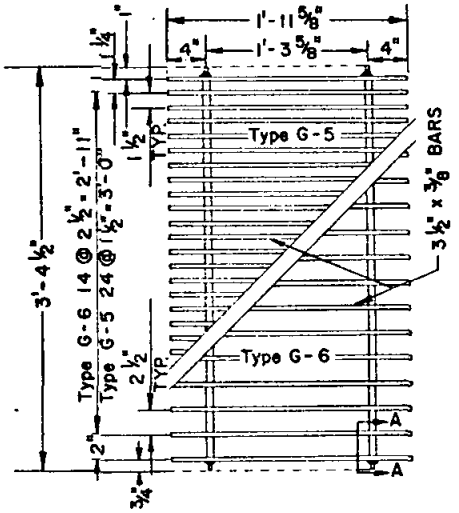




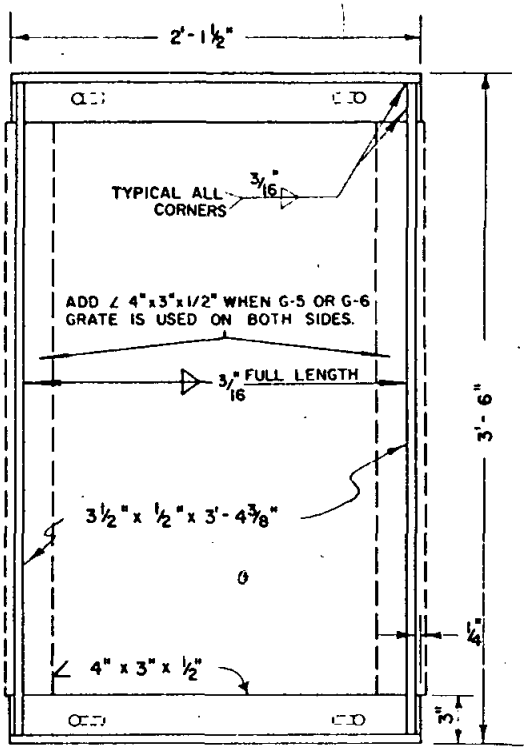
WELDED GRATES



FABRICATED GRATES



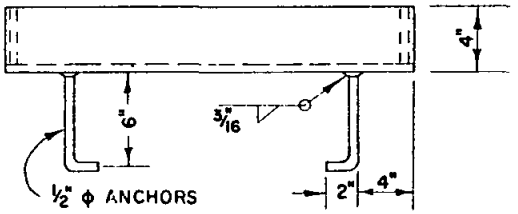
FABRICATED GRATES



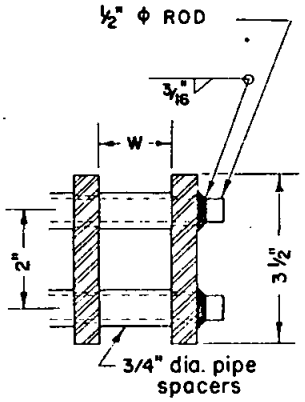
WELDED STEEL FRAME

PLAN

GRATE	WGT.
G-1	255
G-2	255
G-3	239
G-4	243
G-5	261
G-6	173
FRAME	92
G-5 & G-6	159

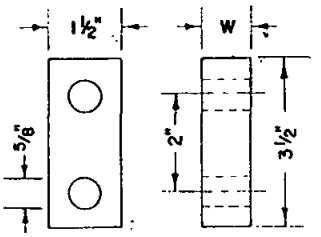


END VIEW



SEC. A-A

W = 2 1/8" for G-6 (Except end section)
W = 1 1/8" for G-5 (" " ")
W = 3/4" for G-3
W = 1 1/2" for G-4

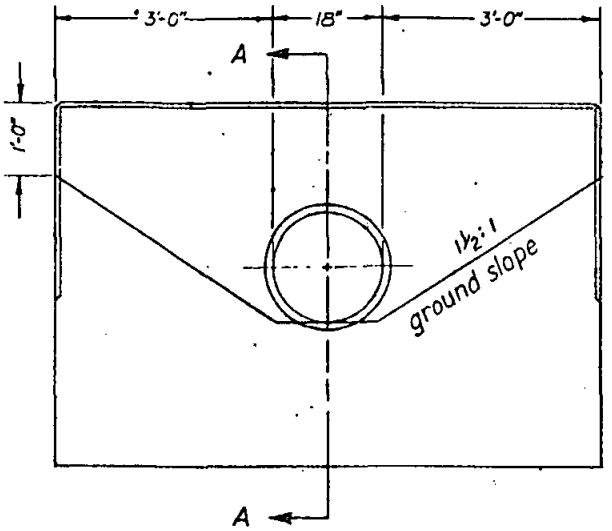


ALTERNATE SPACER

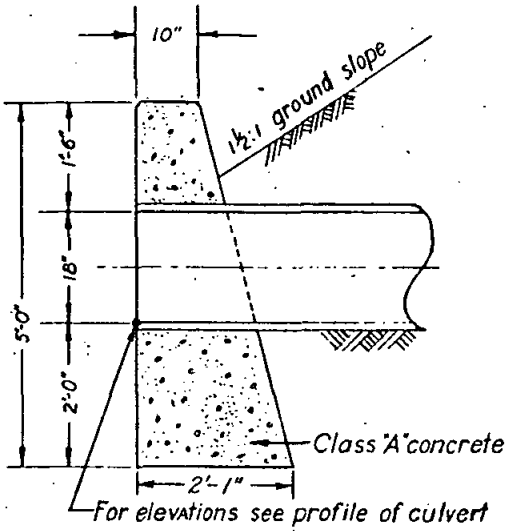
Notes:
1. Grate type shown on plans.
2. Grate type G-1 or G-3 shall be used in all cases.
3. Grate type G-2 or G-4, & G-5, G-6 shall be used only with the approval of the County Engineer.

STD. SPEC. SEC. 55, 70	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY Kel CHECKED BY [illegible]					
RECOMMENDED BY [illegible]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	FRAME & GRATES FOR DRAINAGE STRUCTURES	SCALE: NONE			
H. M. Tapscott R.C.E. 11458		DRAWING NUMBER 111-3			
DATE: Sept 28, 1971					

GRAVITY TYPE HEADWALL FOR 18" CULVERTS



ELEVATION

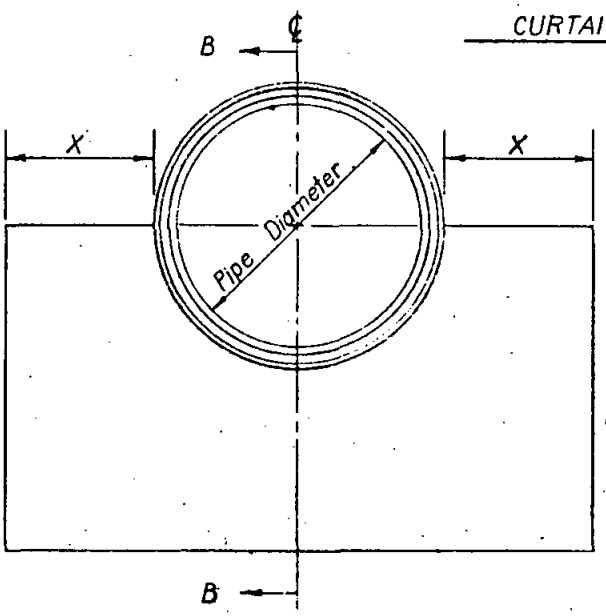


SECTION A-A

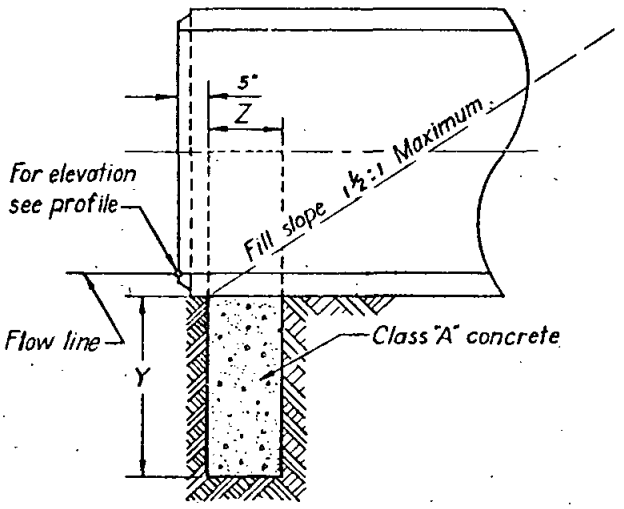
NOTES
1. All exposed corners to be chamfered ¾".
2. Exposed surfaces to be finished.
3. For culverts larger than 18" diameter use standard reinforced concrete headwall.

Legend on plans: ═══▯

CURTAIN WALL



FRONT ELEVATION



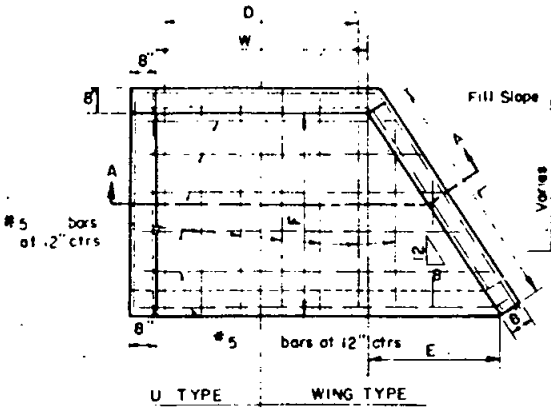
SECTION B-B

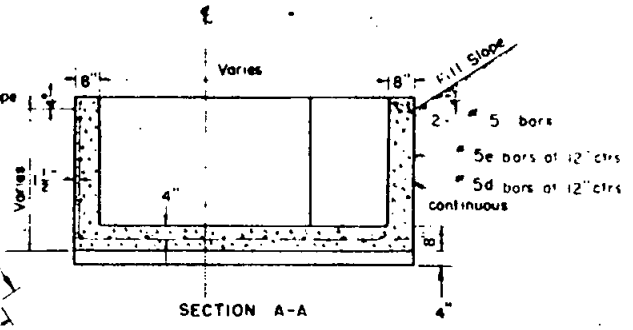
Curtain Wall Dimensions			
Pipe Diameters	X	Y	Z
18" to 24"	1'-0"	1'-6"	12"
27" to 36"	1'-6"	2'-0"	12"
39" to 48"	2'-0"	2'-6"	12"
51" to 60"	2'-6"	3'-0"	14"
63" & larger	3'-0"	3'-0"	14"

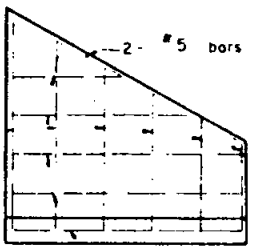
NOTES
1. A curtain wall may be used in place of a headwall at culvert ends where extension of the culvert is considered imminent, or no fill slope is retained.
2. Keep the pipe-end clear of obstruction to permit easy placing of culvert extension.

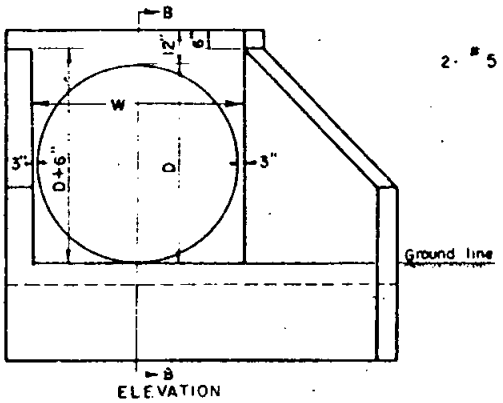
Legend on plans: ═══▯

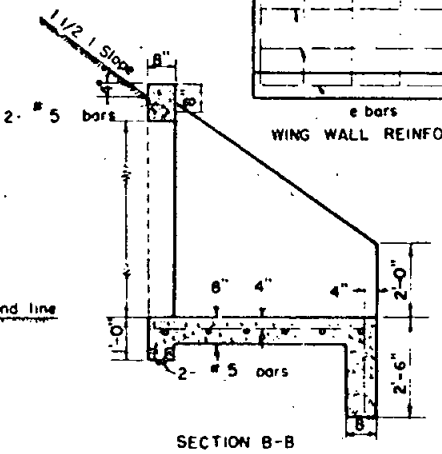
Standard Specifications	SAN DIEGO COUNTY SURVEYOR & ROAD DEPARTMENT	Revision | By | Approved | Date
Sections: 51, 90.	STANDARD DRAWING	Scale: None Approved 4-5-63
Drawn by: [illegible] Checked by: REB		
Recommend by: [illegible]	GRAVITY TYPE HEADWALL FOR 18" CULVERTS CURTAIN WALL	Drawing No. 112-1
Approved by County Surveyor: D. K. Speer R.C.E. 8091		











WING & U TYPE HEADWALLS FOR 42" TO 84" PIPES (1 1/2 : 1 FILL SLOPES)

DIAM OF PIPE	DIMENSIONS L	E	F	SINGLE PIPE AREA OF WATERWAY SQ FT	W	U TYPE CONCRETE CU YDS	U TYPE STEEL LBS	WING TYPE CONCRETE CU YDS	WING TYPE STEEL LBS	DOUBLE PIPE DIAM OF PIPE	AREA OF WATERWAY SQ FT	W	U TYPE CONCRETE CU YDS	U TYPE STEEL LBS	WING TYPE CONCRETE CU YDS	WING TYPE STEEL LBS
42"	3'-7 1/4	2'-0"	3'-0"	9.62	4'-0"	1.57	117	1.90	155	42"	19.24	9'-10"	2.69	190	3.16	214
48"	4'-5"	2'-6"	3'-9"	12.56	4'-6"	1.97	153	2.49	184	48"	25.12	11'-2"	3.43	252	4.06	288
54"	5'-4 3/4"	3'-0"	4'-6"	15.90	5'-0"	2.41	190	3.07	246	54"	31.80	12'-6"	4.24	319	5.06	368
60"	6'-3 3/4"	3'-6"	5'-3"	19.63	5'-6"	2.88	239	3.75	294	60"	39.26	13'-10"	5.13	396	6.17	442
66"	7'-2 1/2"	4'-0"	6'-0"	23.76	6'-0"	3.38	294	4.52	356	66"	47.52	15'-2"	6.08	454	7.20	516
72"	8'-1 3/4"	4'-6"	6'-9"	28.27	6'-6"	3.93	368	5.42	417	72"	56.54	16'-6"	7.11	522	8.30	588
78"	9'-0"	5'-0"	7'-6"	33.18	7'-0"	4.50	444	6.70	503	78"	67.36	17'-4"	8.20	595	9.50	693
84"	9'-0 3/4"	5'-6"	8'-3"	38.48	7'-6"	5.21	540	8.15	619	84"	76.96	18'-8"	9.50	687	10.80	786

NOTE - Dimensions E and L apply to Wing type only

GENERAL NOTES

Skewed Pipes Dimension W to be increased to take care of increased width or length due to skew or multiple pipes

Tops of headwalls on grade culverts shall be placed parallel to profile grade when the grades are 3% or more

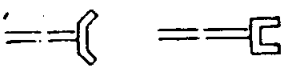
Quantities shown in tables are for 1 headwall

Concrete All concrete to be class A
All exposed corners to be chamfered 3/4"
Exposed surfaces to have standard finish

Reinforcing Steel All reinforcing steel to be round deformed bars of intermediate grade

Multiple Pipes to be set with longitudinal center lines 1 2/3 diameters of pipe apart.

LEGEND ON PLANS



SPECIFICATION REFERENCE
SECTIONS: 51, 52, 90

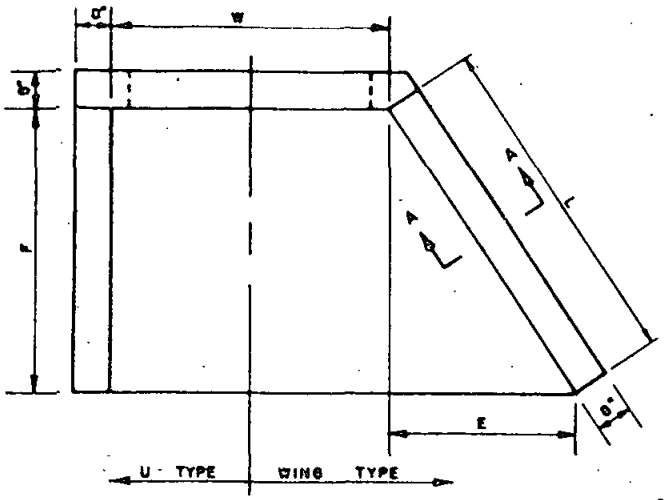
County Surveyor
D. K. Speer
D.K. SPEER R.C.E. 5091

SAN DIEGO COUNTY STANDARD DRAWING

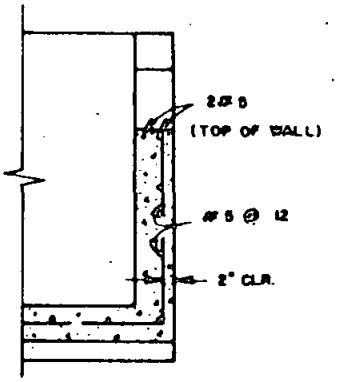
WING & U - TYPE HEADWALLS FOR 42" TO 84" PIPES

NONE
SCALE

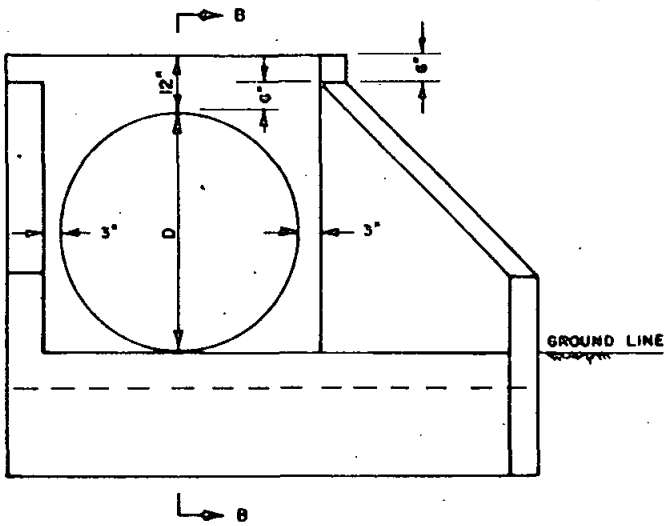
DRAWING NO.
113



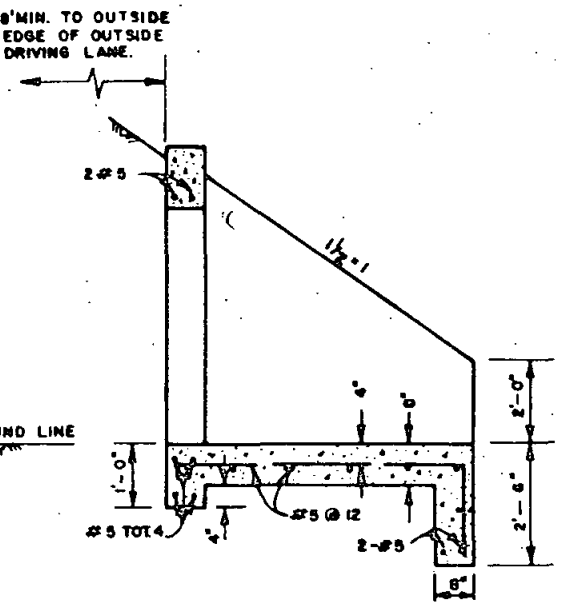
PLAN



SEC. A-A



ELEVATION

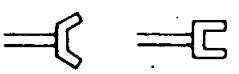


SECTION B-B

DIA. OF PIPE D	DIMENSIONS			SINGLE PIPE					DOUBLE PIPE				
					U TYPE		WING TYPE			U TYPE		WING TYPE	
	L	E	F	W	CONC. C.Y.	STEEL LBS.	CONC. C.Y.	STEEL LBS.	W	CONC. C.Y.	STEEL LBS.	CONC. C.Y.	STEEL LBS.
42	3'-7 1/4"	2'-0"	3'-0"	4'-0"	1.57	117	1.90	135	9'-10"	2.69	190	3.16	214
48	4'-6"	2'-6"	3'-9"	4'-6"	1.97	153	2.40	184	11'-2"	3.43	252	4.06	280
54	5'-4 7/8"	3'-0"	4'-6"	5'-0"	2.41	190	3.07	246	12'-6"	4.24	319	5.06	300
60	6'-3 3/8"	3'-6"	5'-3"	5'-6"	2.00	239	3.76	294	13'-10"	5.13	396	6.17	442
66	7'-2 1/2"	4'-0"	6'-0"	6'-0"	3.58	294	4.52	356	15'-2"	6.08	484	7.20	516
72	8'-1 5/8"	4'-6"	6'-9"	6'-6"	3.93	368	5.52	417	16'-6"	7.11	522	8.30	598
78	9'-0"	5'-0"	7'-6"	7'-0"	4.50	444	6.70	503	17'-4"	8.20	595	9.50	693
84	9'-10 3/4"	5'-6"	8'-3"	7'-6"	5.21	540	8.15	619	18'-8"	9.50	607	10.80	706

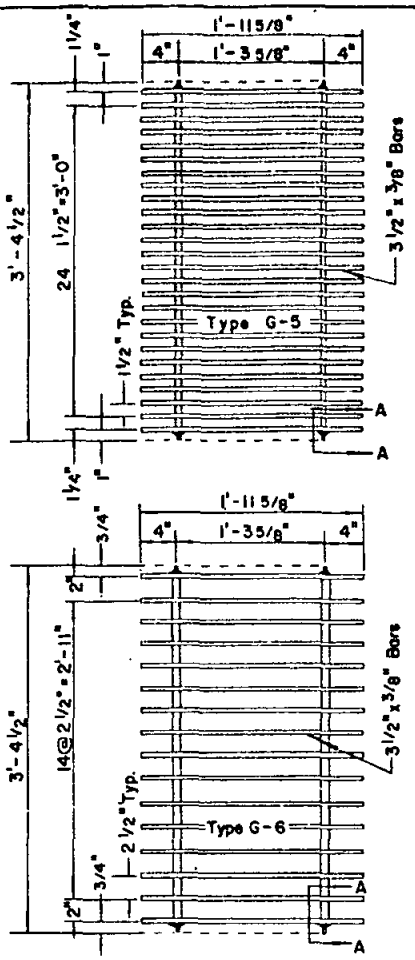
NOTES

1. ALL CONCRETE TO BE CLASS 'A'
2. ALL EXPOSED CORNERS TO BE CHAMFERED 3/4".
3. MULTIPLE PIPES TO BE SET WITH LONGITUDINAL ℄ 1 2/3 DIAMETERS APART.
4. TOPS OF HEADWALLS ON GRADE CULVERTS SHALL BE PLACED PARALLEL TO PROFILE GRADE WHEN THE GRADE IS 3% OR MORE.



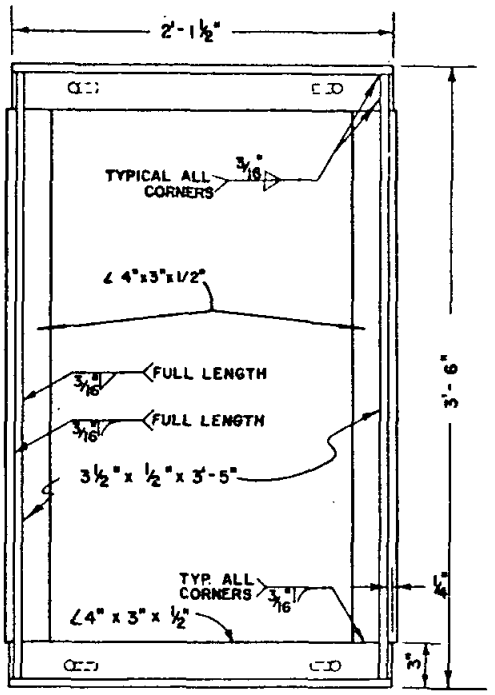
LEGEND ON PLANS

STD. SPEC. SEC: 81, 82, 90.	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING			
DRAWN BY R.S.G. CHECKED BY EM				
RECOMMENDED BY	WING & U-TYPE HEADWALLS FOR 42" TO 84" PIPE	REVISION	BY	APPROVED DATE
APPROVED BY COUNTY ENGINEER		SCALE:		
H. M. Taylor R.C.E. 11408		DRAWING NUMBER	113-2	
DATE: Dec 28, 1970				



FABRICATED GRATES

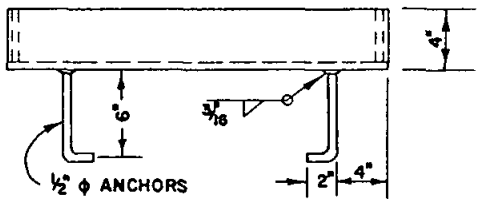
(1)



WELDED STEEL FRAME

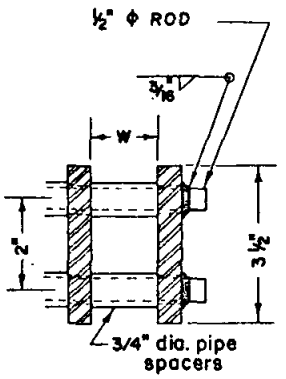
PLAN

GRATE	WGT.
G-5	261
G-6	173
FRAME	159

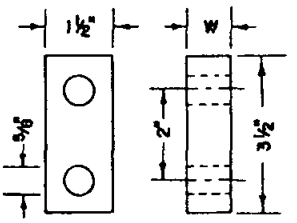


END VIEW

W = 2⅛" for G-6 (Except end section)
W = 1⅛ for G-5 (" " ")



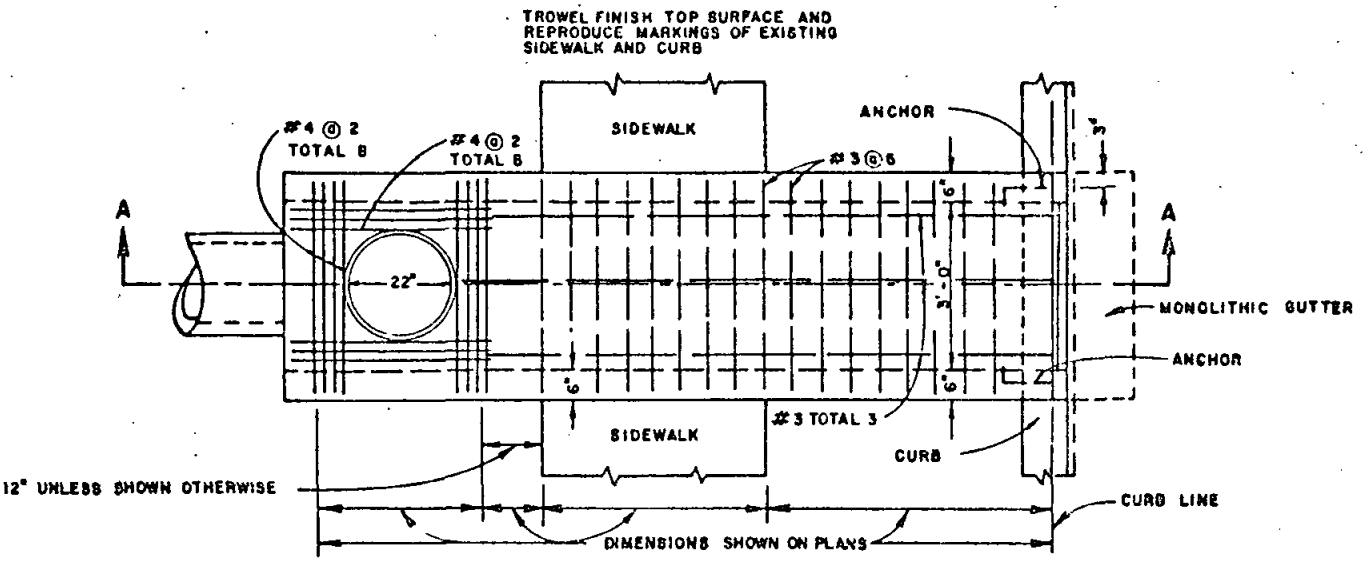
SEC. A-A



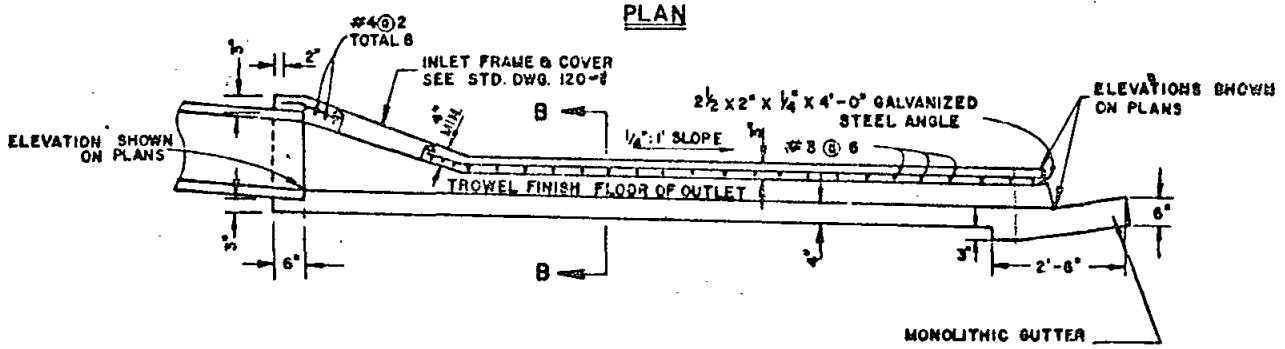
ALTERNATE SPACER

Notes:
1. Grate type shown on plans.

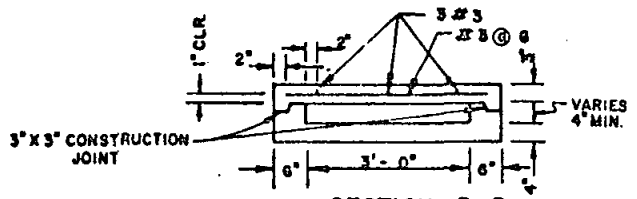
STD. SPEC. SEC. 55, 70	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	⊙ Removed grate detail	RH	[illegible]	2/14/72
DRAWN BY Pat CHECKED BY [illegible]					
RECOMMENDED BY [illegible]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	FRAME & GRATES FOR DRAINAGE STRUCTURES	SCALE: NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER. III-4T			
DATE: Sept. 28, 1971					



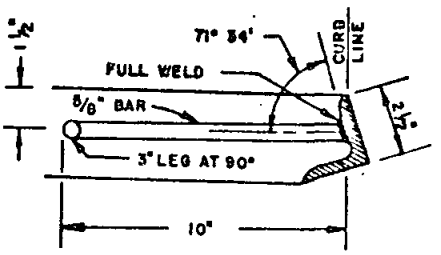
PLAN



SECTION A-A

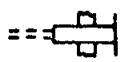


SECTION B-B



DETAIL OF ANCHOR

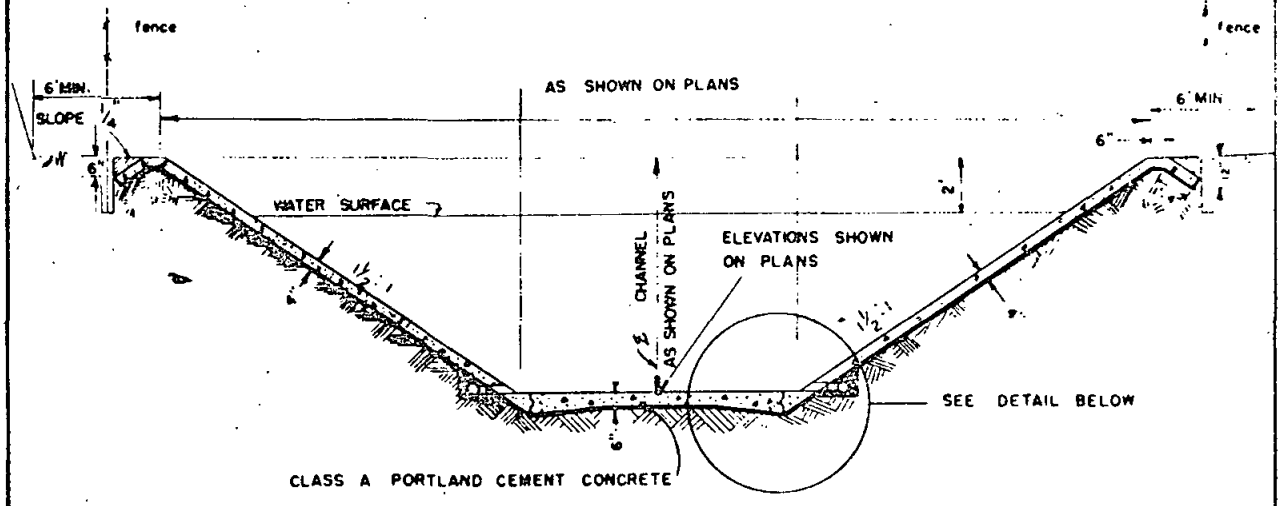
NOTES:
1. ALL CONCRETE SHALL BE CLASS A.
2. SECTION TO BE SLOPED LATERALLY WITH TOP CONFORMING TO THE GRADES AT THE EXISTING SIDEWALK AND CURB.



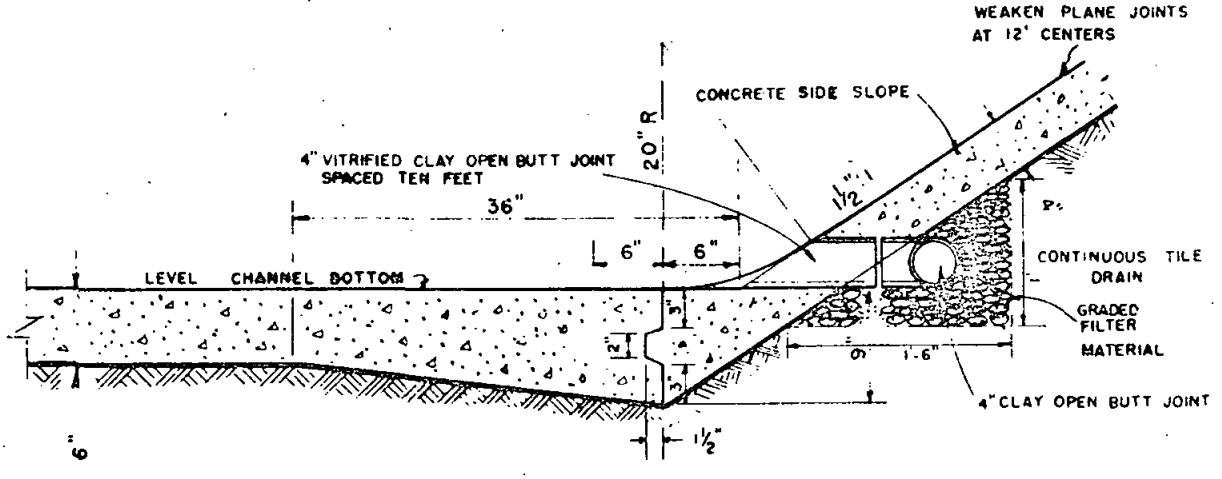
LEGEND ON PLANS

STD. SPEC. SEC: 51, 52, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY BMA CHECKED BY RCL					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CURB OUTLET	SCALE: NONE			
D. X. O'Leary R.C.E. 8091		DRAWING NUMBER 115-1			
DATE: 1/15/68					

FILE No. 11-25



TYPICAL CROSS SECTION OF DRAINAGE CHANNEL

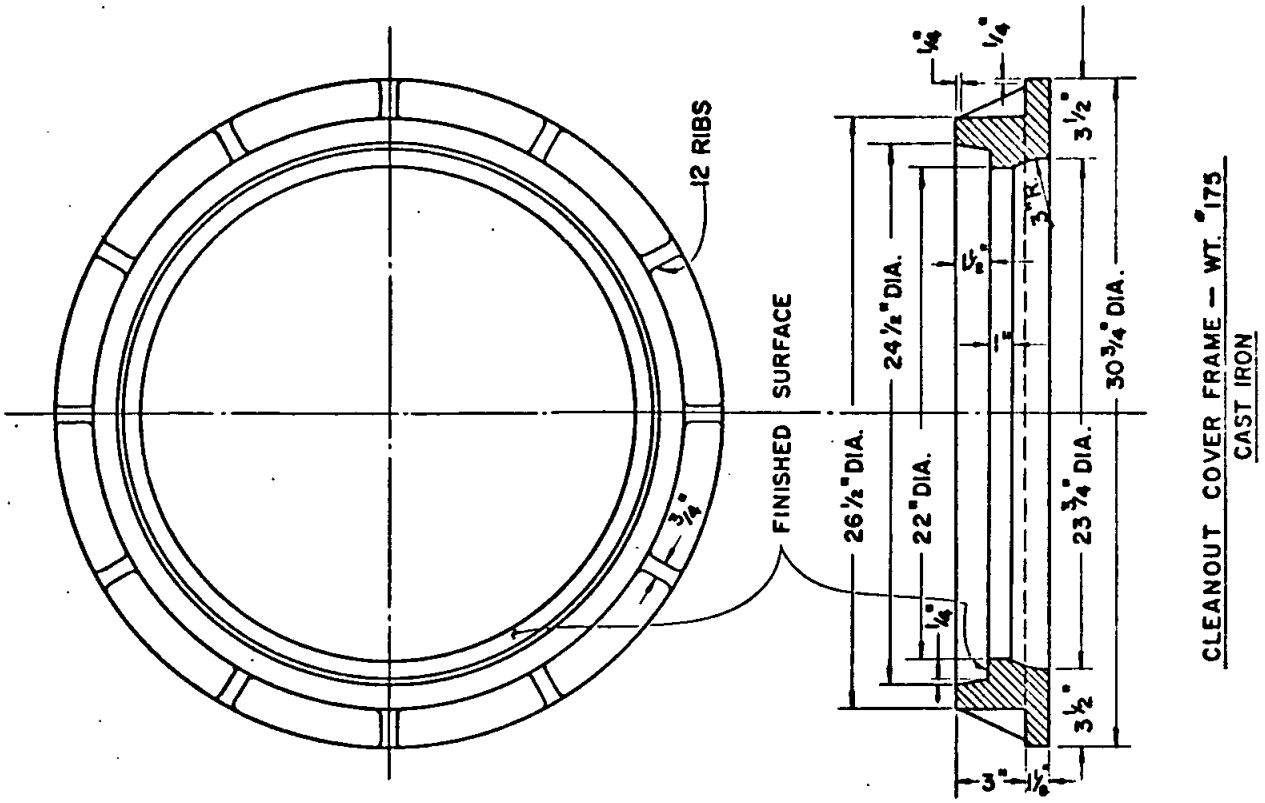


DETAIL

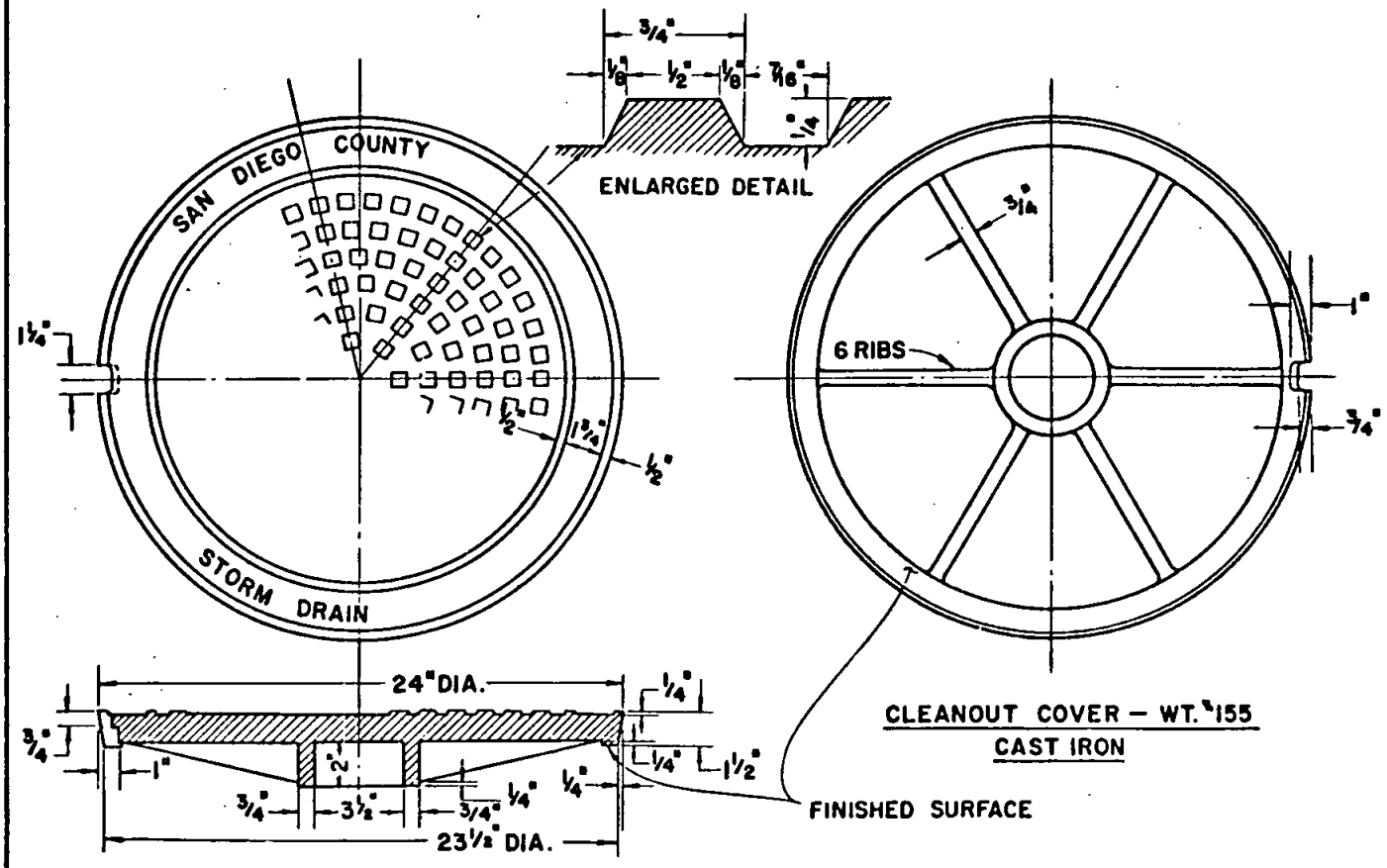
LEGEND ON PLANS

SPECIFICATION REFERENCE	SAN DIEGO COUNTY	STANDARD DRAWING
SECTIONS: 51, 90	DRAINAGE CHANNEL	SCALE NONE
County Surveyor		DRAWING NO. 116
R. E. STEER R.C.E. 6001		

FILE 11-25



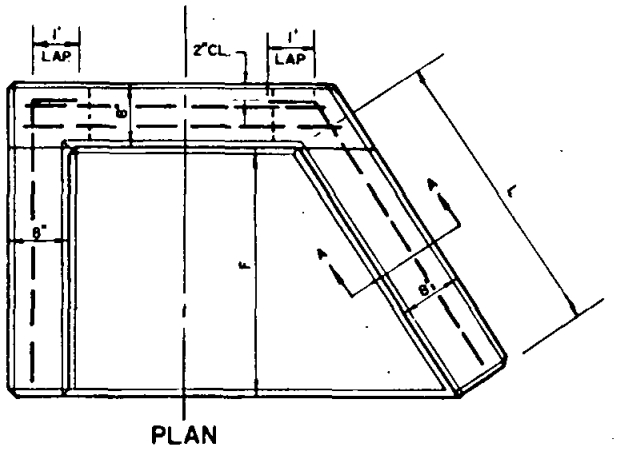
CLEANOUT COVER FRAME — WT. 175
CAST IRON



CLEANOUT COVER — WT. 155
CAST IRON

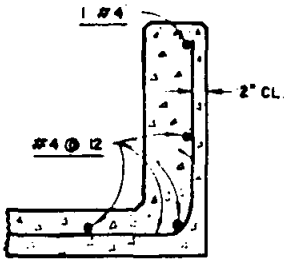
STD. SPEC. SEC: 70		SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING			
DRAWN BY RMG	CHECKED BY ECL				
RECOMMENDED BY [signature]		22" CLEANOUT FRAME AND COVER	REVISION	BY	APPROVED DATE
APPROVED BY COUNTY ENGINEER			SCALE: NONE		
[signature] R.C.E. 8091			DRAWING NUMBER 117-1		
DATE: 1/15/68					

FILE No. 11-25

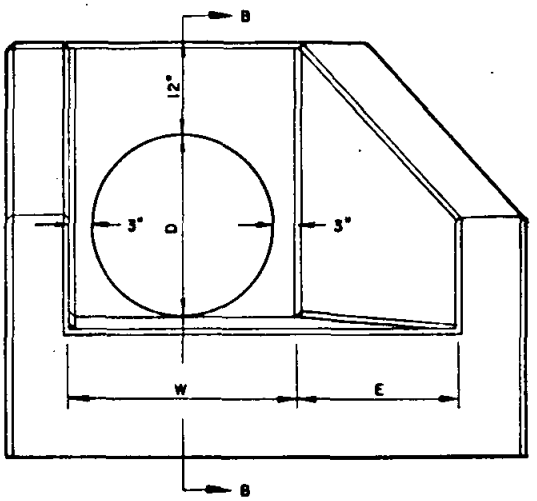


PLAN

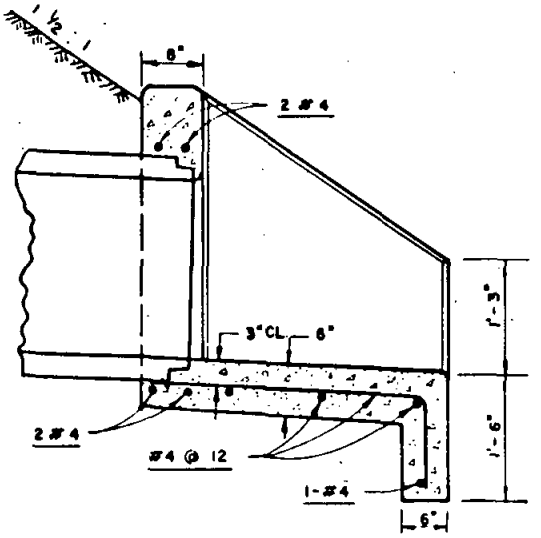
U TYPE | WING TYPE



SECTION A-A



ELEVATION



SECTION B-B

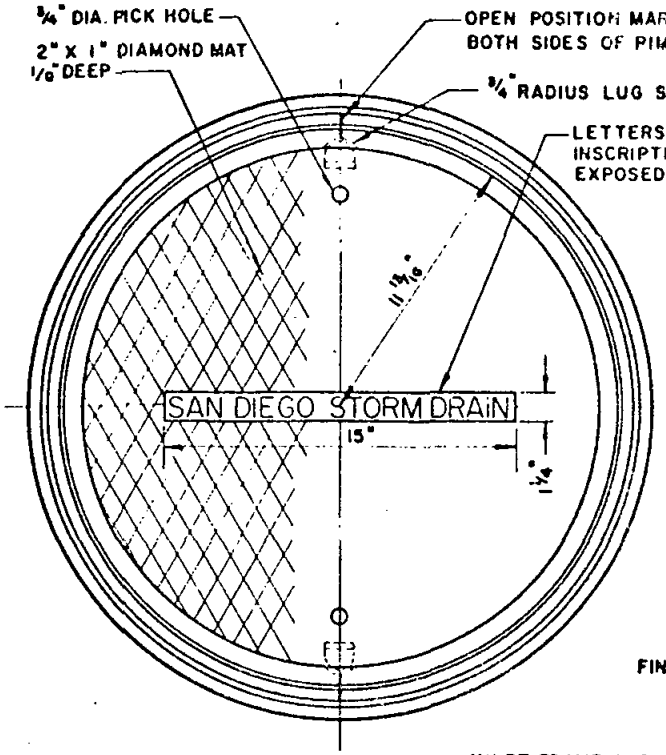
DIAM. OF PIPE	DIMENSIONS			SINGLE PIPE					DOUBLE PIPE				
				W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
	L	E	F		CONC. C.Y.	STEEL LBS.	CONC. C.Y.	STEEL LBS.		CONC. C.Y.	STEEL LBS.	CONC. C.Y.	STEEL LBS.
18"	2'-3 1/8"	1'-3"	1'-10 1/2"	2'-0"	0.55	35	0.63	43	4'-6"	0.82	53	0.90	61
24"	3'-1 7/8"	1'-9"	2'-7 1/2"	2'-6"	0.79	47	0.93	60	5'-10"	1.22	73	1.36	86
30"	4'-0 5/8"	2'-3"	3'-4 1/2"	3'-0"	1.05	71	1.29	85	7'-2"	1.68	109	1.92	123
36"	4'-11 1/2"	2'-9"	4'-1 1/2"	3'-6"	1.33	88	1.69	114	8'-6"	2.19	136	2.55	162

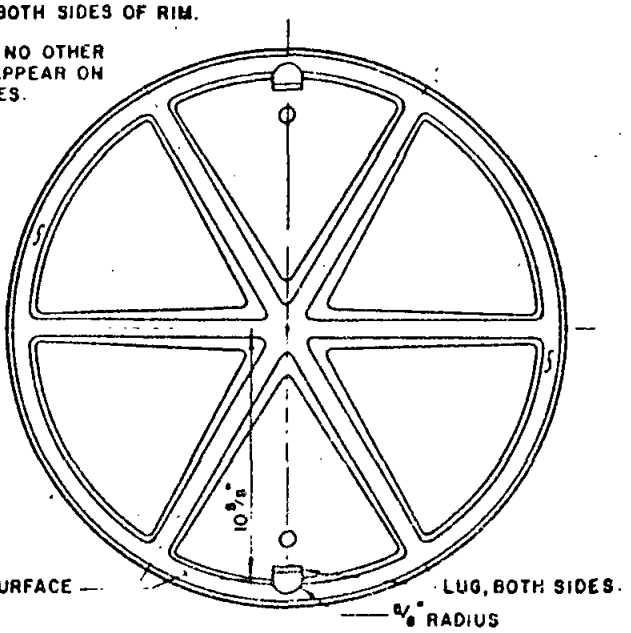
NOTES:

1. ALL CONCRETE SHALL BE CLASS A.
2. ALL EXPOSED CORNERS TO BE CHAMFERED 3/4"
3. MULTIPLE PIPES TO BE SET WITH LONGITUDINAL CENTERS OF PIPE 1 2/3 DIAMETERS APART.
4. TOP OF HEADWALL SHALL BE PLACED APPROXIMATELY PARALLEL TO PROFILE GRADE WHEN THE GRADE IS 3% OR MORE.

STD. SPEC. SEC: 51, 52, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING			
DRAWN BY RMG CHECKED BY ECL				
RECOMMENDED BY [signature]		REVISION	BY	APPROVED DATE
APPROVED BY COUNTY ENGINEER	HEADWALLS & ENDWALLS TYPES U & WING	SCALE: NONE		
D. X. Oleen R.C.E. 8091		DRAWING NUMBER 118-1		
DATE: 1/15/68				

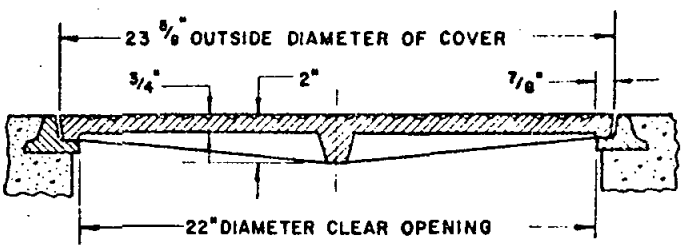
FILE NO. 11-25





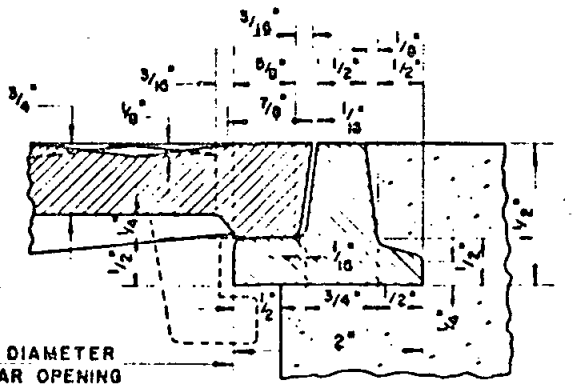
INLET FRAME AND COVER SHALL BE CAST IRON

TOP OF INLET FRAME & COVER



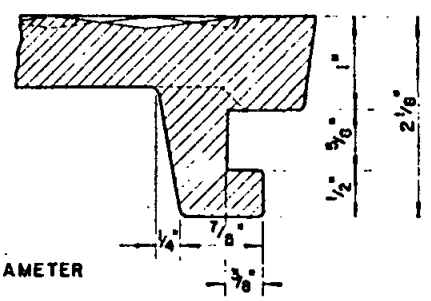
SECTION THRU FRAME AND COVER

BOTTOM OF INLET COVER

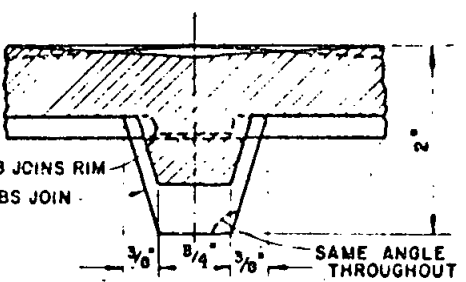


NOTE: ALL RADII = 1/8"

SECTION THRU RIM



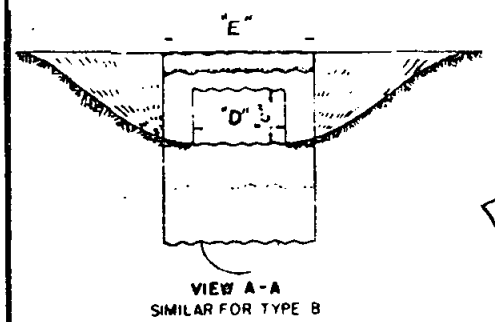
SECTION THRU LUG



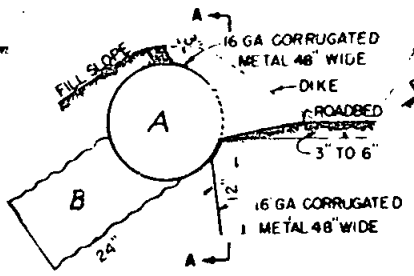
SECTION THRU RIB AT MID RADIUS

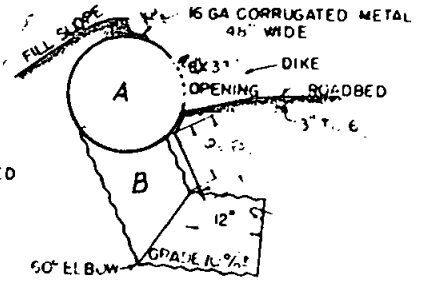
STD. SPEC. SEC: 70	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY [illegible] CHECKED BY [illegible]					
RECOMMENDED BY [signature]	INLET FRAME & COVER	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE NONE			
D. K. O'Leary R.C.E. 8091		DRAWING NUMBER 120-1			
DATE: 1/15/68					

FILE NO. 11-25

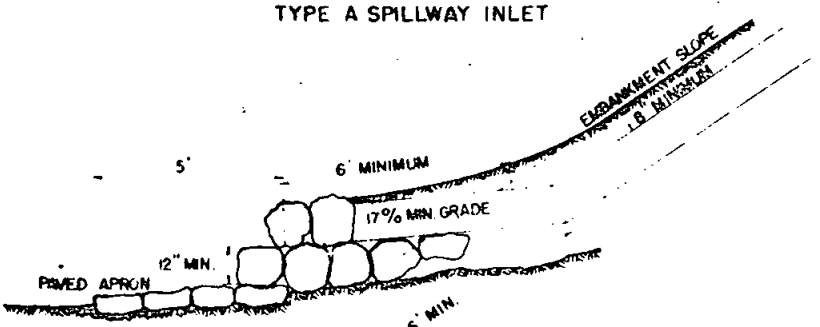


TYPE A SPILLWAY INLET



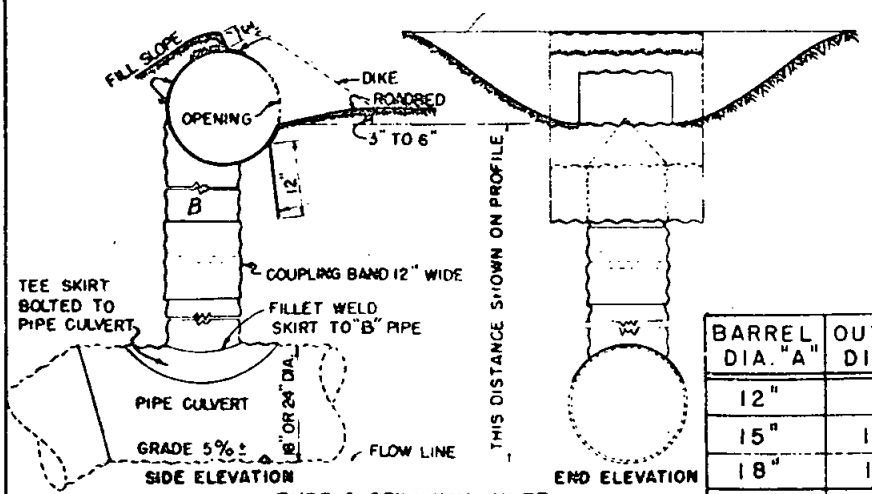


TYPE B SPILLWAY INLET

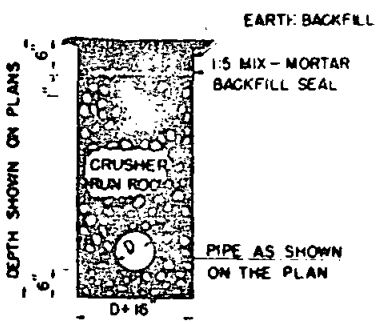


STONES TO BE NOT LESS THAN 1 CU. FT. IN VOLUME AND IMBEDDED IN GROUND NOT LESS THAN 6". APRON TO HAVE A WIDTH OF 4'.

OUTLET PROTECTION FOR TYPE A ASSEMBLIES



TYPE C SPILLWAY INLET

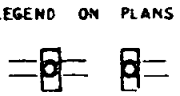


TYPICAL CROSS SECTION
UNDERDRAIN

BARREL DIA. "A"	OUTLET DIA. "B"	OPENING HT. "C"	OPENING WIDTH "D"	OVERALL WIDTH "E"
12"	8"	6"	18"	25 1/2"
15"	10"	7"	30"	37 5/8"
18"	12"	8"	41 1/2"	51.
24"	18"	12"	48"	76 1/2"

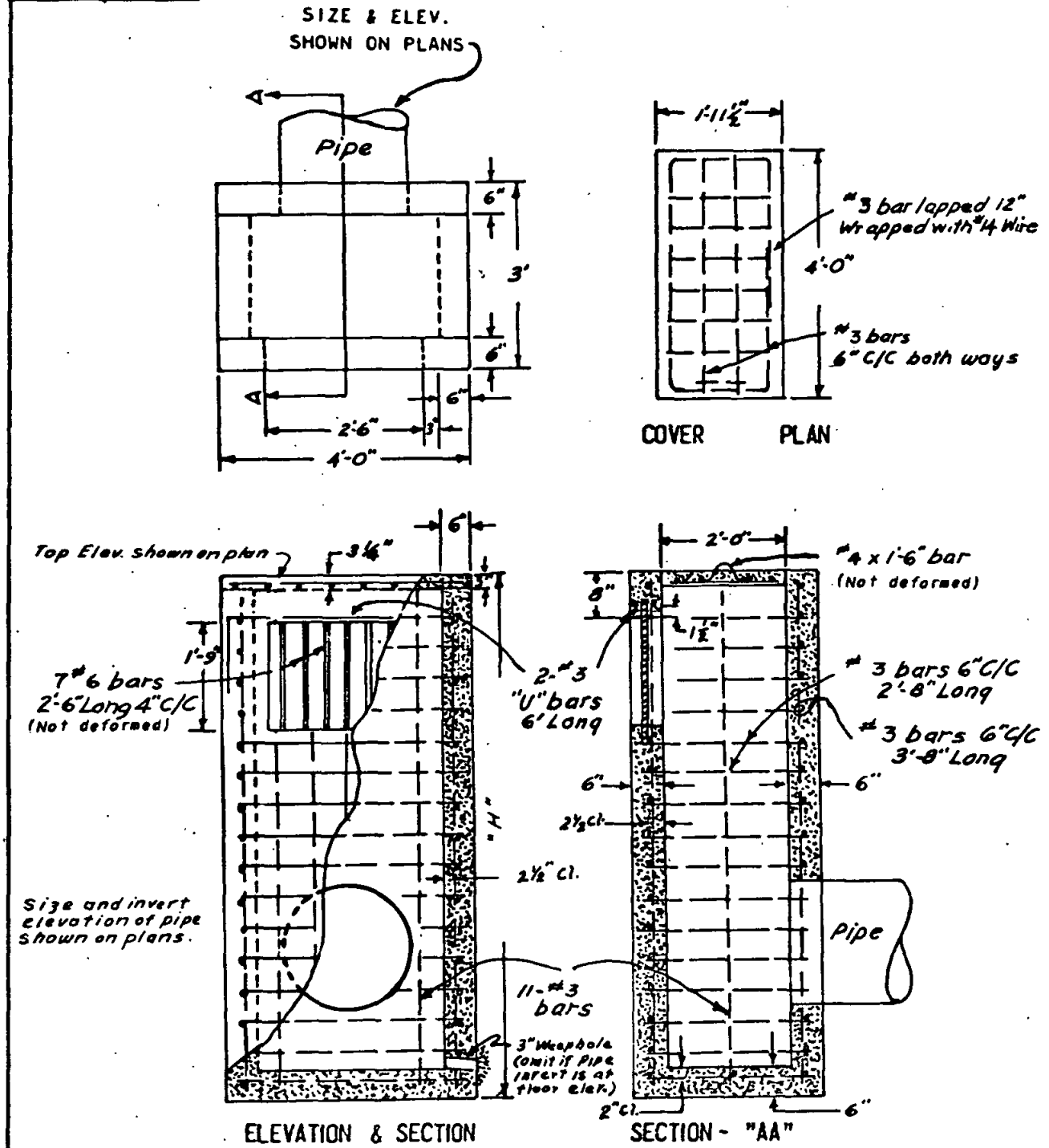
C.M.P. MEANS CORRUGATED METAL PIPE
C.I.P MEANS CORRUGATED IRON PIPE.
BULKH'D MEANS BULKHEADED.
GA. MEANS GAGE.
CORR MEANS CORRUGATED
MIN MEANS MINIMUM
DIA MEANS DIAMETER

LEGEND ON PLANS



SPECIFICATION REFERENCE Sections, 66, 68, 69 County Surveyor D. K. Speer D.K. SPEER, R.C.E. 8091	COUNTY OF SAN DIEGO STANDARD DRAWING Type A, B & C Spillway Inlets and Underdrain	NONE SCALE DRAWING NO. 121

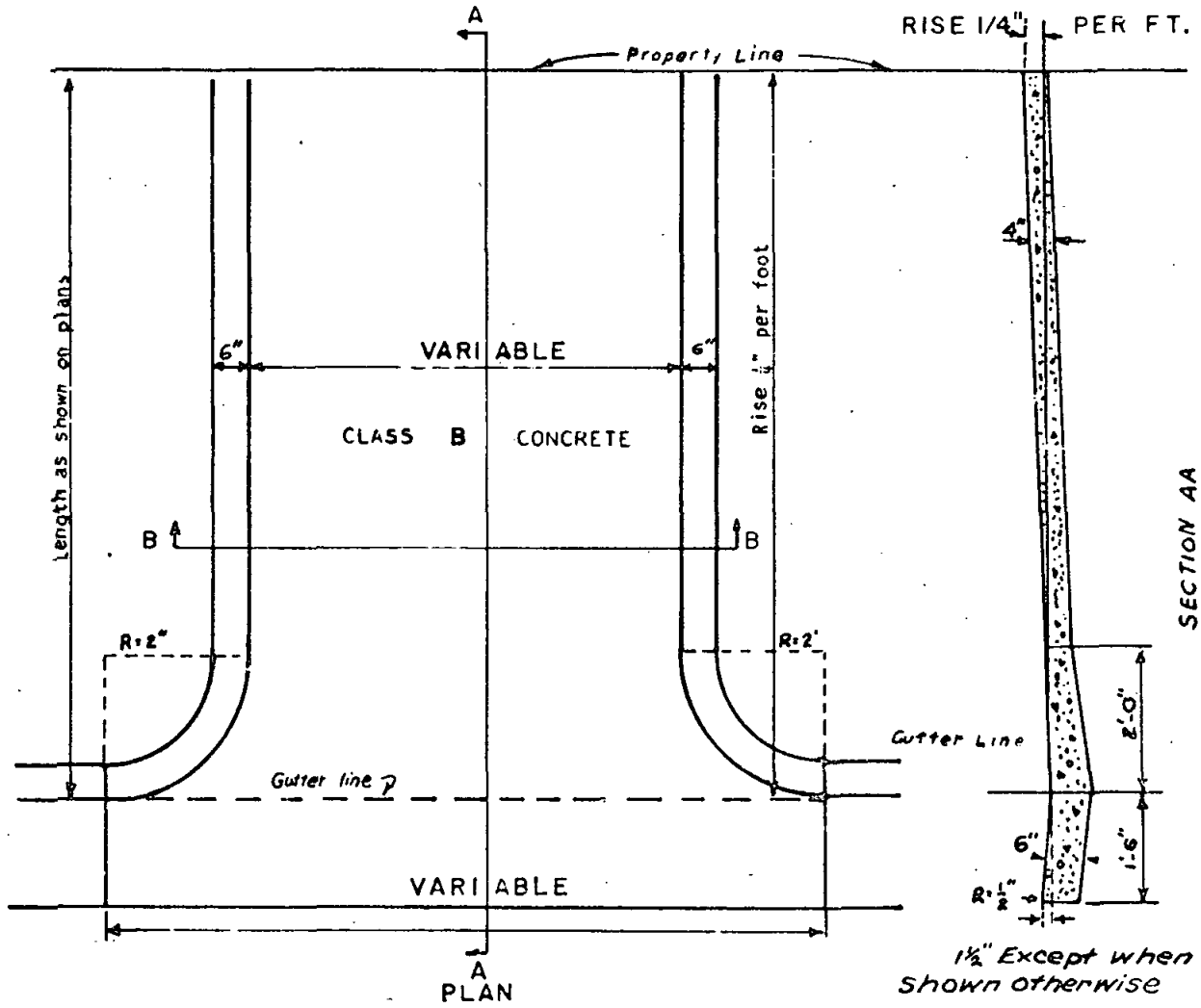
Revisions	
Date	Approved

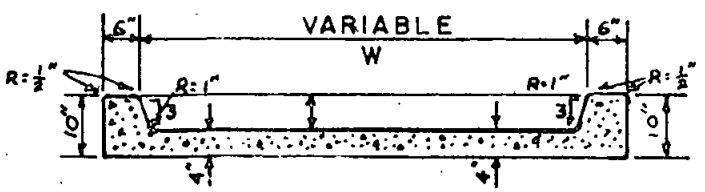


Legend on Plans ====[]

SPECIFICATION REFERENCE	SAN DIEGO COUNTY	STANDARD DRAWING	
Sections: 51, 52, 90	STANDARD TYPE "C" DROP INLET		Scale: NONE
County Surveyor	With end opening grate & Concrete cover		Drawing No. 122
D. K. Speer			
D. K. SPEER, R.C.E. 8091			

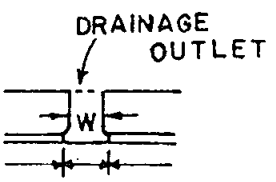
File 11-25





SECTION BB

W= 4, 5, 6.

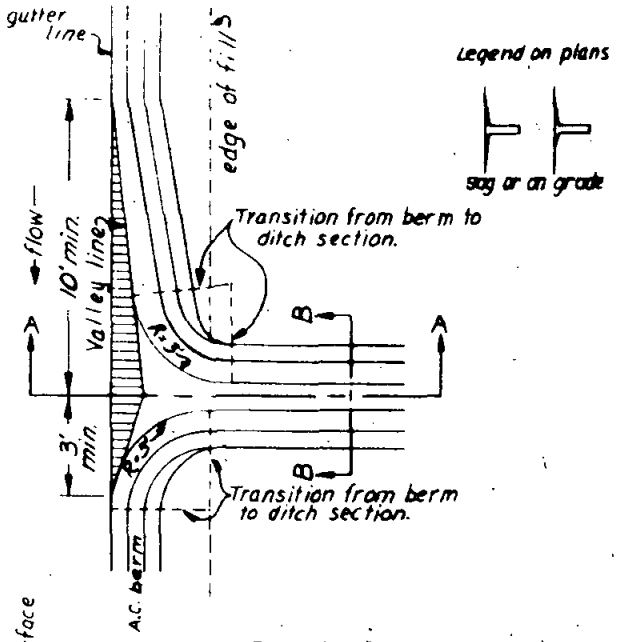


SYMBOL

Specification Reference Sections: 51, 52, 90 County Surveyor D.K. SPEER D.K. SPEER, R.C.E. 8091	COUNTY OF SAN DIEGO — STANDARD DRAWING STANDARD DRAINAGE OUTLET (For Sidewalk Areas)	Scale 3/4" = 1'-0" Drawing No. 123

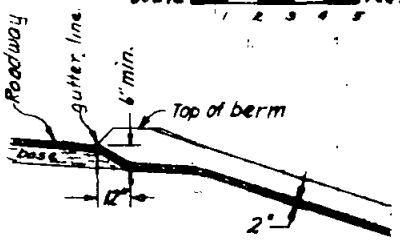
FILE 11-25

ASPHALT CONCRETE SPILLWAY

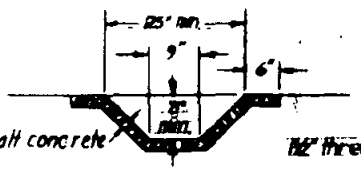


PLAN

scale 1 2 3 4 5 feet



SECTION A-A



Note: Cross-sectional area of ditch may be rounded, or trapezoidal. Min. top width, 25"; min. depth 8".

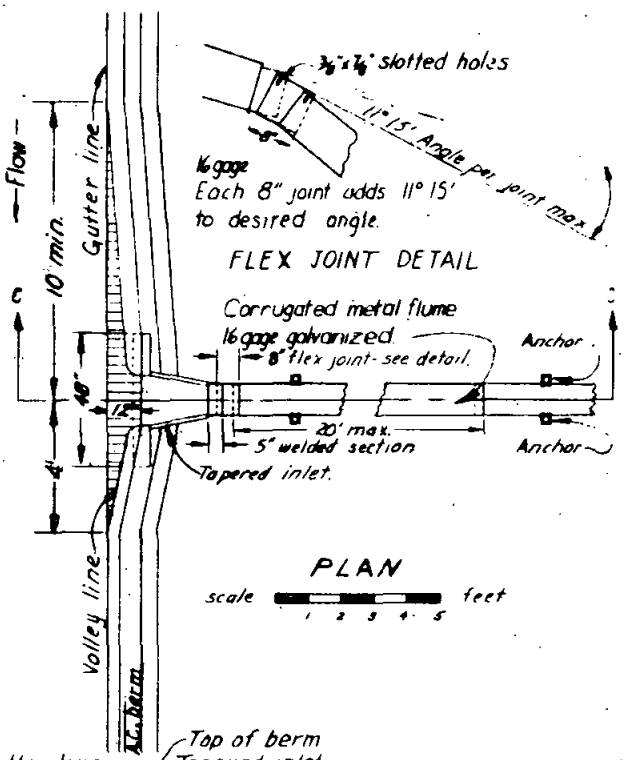
SECTION B-B

scale 1 2 3 feet

NOTES

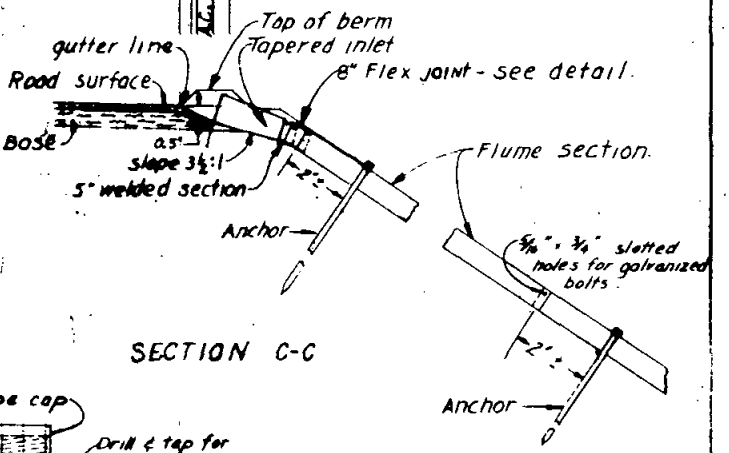
1. A.C. spillway may be used when fill is 5' or less and where fill slope is 1½:1 or flatter.
2. Downdrain flume may be used where fill slope is 1½:1 or flatter.
3. Use 10' min. length of gutter transition on each side of downdrain in sag location.
4. All metal parts to be galvanized after fabrication.
5. Metal products similar in design & purpose may be used.

TAPERED INLET & DOWNDRAIN FLUME

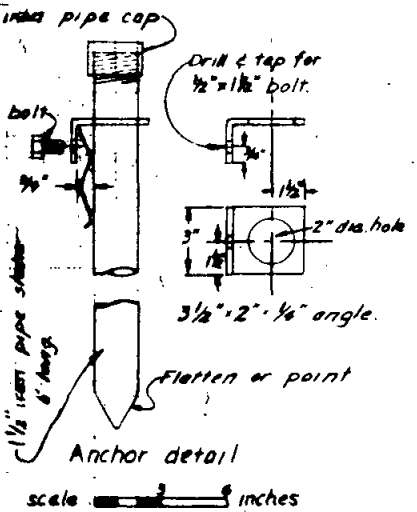


PLAN

scale 1 2 3 4 5 feet

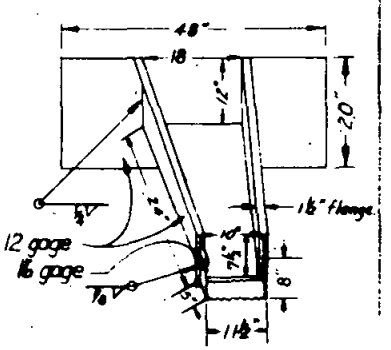


SECTION C-C



Anchor detail

scale 2 0 2 4 6 inches



Tapered inlet.

no scale

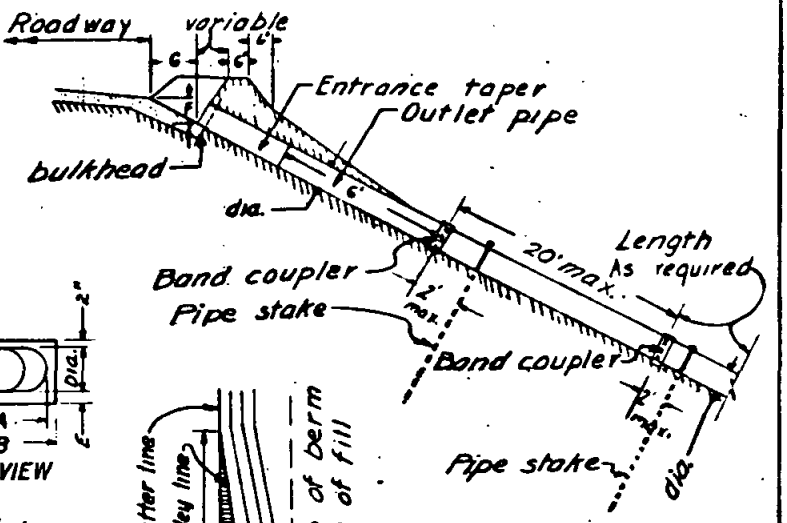
Revision	By	Approved	Date

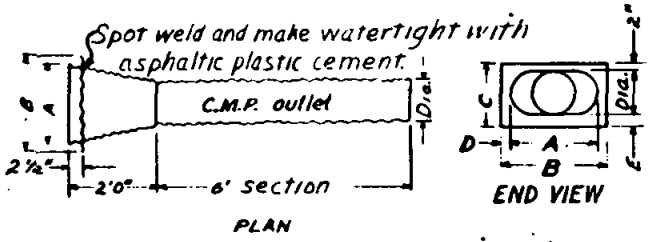
Standard Specifications	SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
Sections: 69	STANDARD DRAWING
Drawn by [illegible] checked by [illegible]	
Recommended by: [illegible]	TAPERED INLET & DOWNDRAIN FLUME
Approved by County Surveyor: [illegible]	ASPHALT CONCRETE SPILLWAY

Scale: AS shown	
Date Approved: 1-14-63	
Drawing No.	124-1

Dimensions to be as tabulated below for Assembly

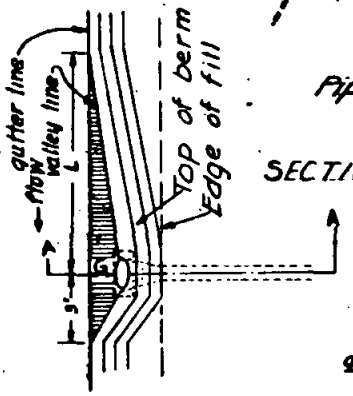
Dia.	A	B	C	D	E	F	G	L
8"	16"	25½"	15"	4¾"	5"	6"	18"	10'
12"	18"	25½"	19"	3¼"	5"	9"	20"	15'
15"	21"	30"	23"	4½"	6"	12"	24"	25'



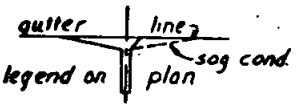


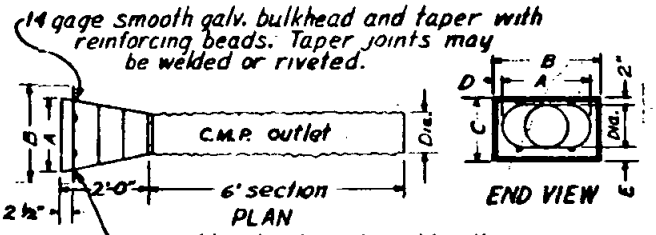
Bulkhead and taper to be galvanized corrugated metal of the same gage as the outlet pipe.

ENTRANCE TAPER ALTERNATIVE A

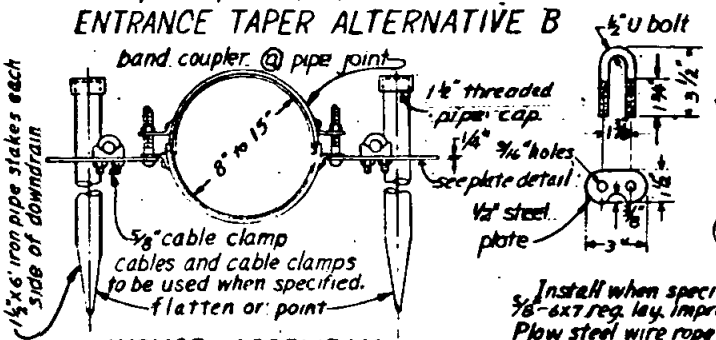


SECTION A-A

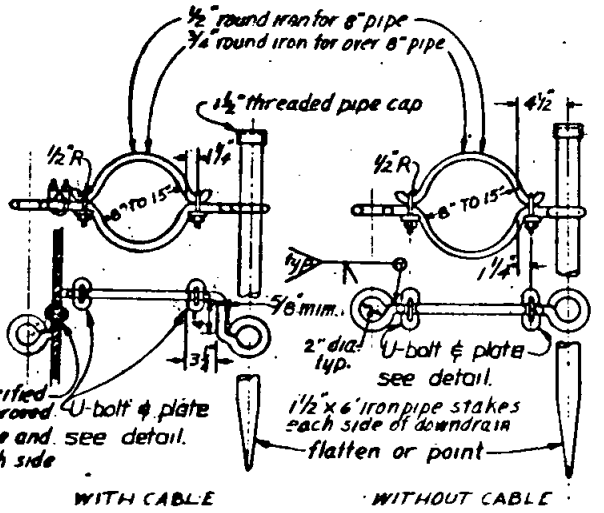




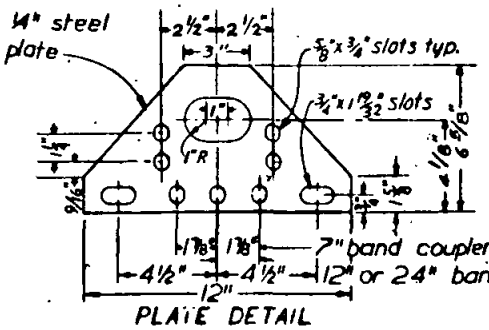
ENTRANCE TAPER ALTERNATIVE B



ANCHOR ASSEMBLY ALTERNATIVE B



ANCHOR ASSEMBLY ALTERNATIVE A

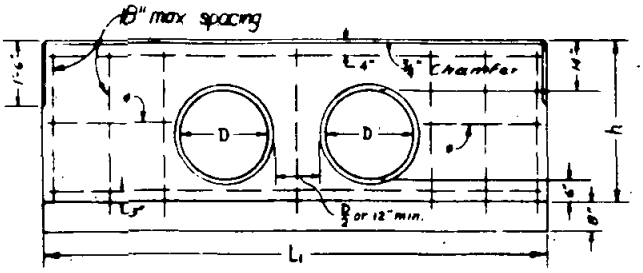


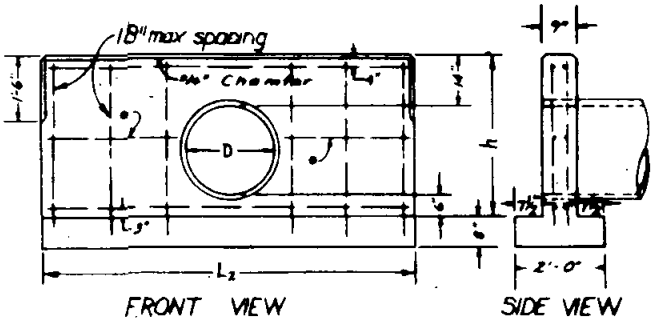
NOTES

1. For payment purposes; an anchor assembly shall include 2 pipe stakes.
2. All metal parts for anchor assemblies shall be galvanized after fabrication.
3. Products similar in design and purpose may be used.
4. Use L dimension on each side of downdrain in sag location.

Revision	By	Approved	Date

Standard Specifications Sections: 69 Drawn by: Dooley check by: RE B Recommended by: R.J. Thurman Approved by County Surveyor: D. K. Sloan R.C.E. 8091	SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT STANDARD DRAWING ENTRANCE TAPER AND DOWNDRAIN PIPE	Scale: none Date Approved: 1-14-63 Drawing No 125-1

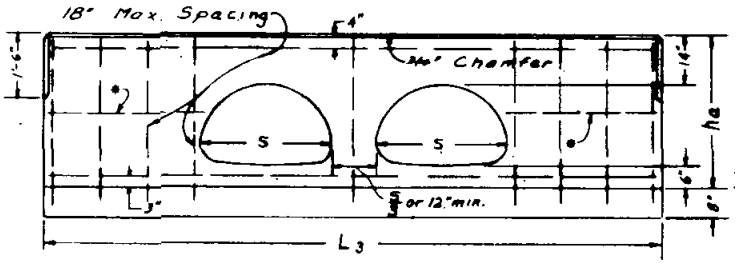


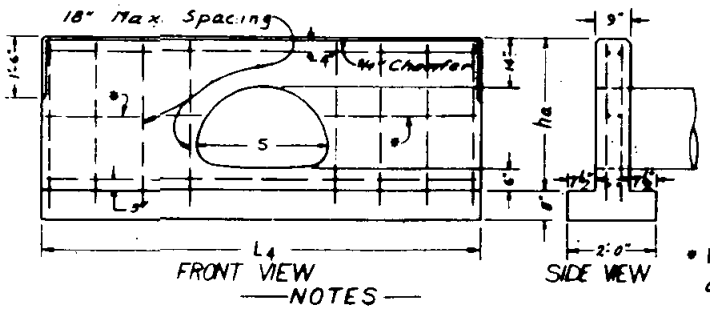


D In	h Ft. In	Single L2 Ft.-In.	Single Vert. Bars	Single Steel lbs.	Single Conc. C.Y.	Double L1 Ft.-In.	Double Vert. Bars	Double Steel lbs.	Double Conc. C.Y.
18	3-2	7-0	12	46	0.91	9-6	14	57	1.21
21	3-5	7-6	12	49	1.02	10-6	14	62	1.38
24	3-8	8-6	12	54	1.20	11-6	14	67	1.57
27	3-11	9-6	16	70	1.39	13-0	18	85	1.84
30	4-2	10-0	16	74	1.52	14-0	18	91	2.04
33	4-5	11-0	16	79	1.73	15-0	18	96	2.25
36	4-8	12-0	16	96	1.95	16-6	18	114	2.56
39	4-11	12-6	16	101	2.09	17-6	20	128	2.79
42	5-2	13-6	16	108	2.34	18-6	20	136	3.03
45	5-5	14-6	20	129	2.60	20-0	26	167	3.38
48	5-8	15-0	20	133	2.75	21-0	26	174	3.64
51	5-11	16-0	20	140	3.03	22-6	26	183	4.02
54	6-2	17-0	20	147	3.31	23-6	26	191	4.30

Use headwall tables for concrete pipe and for C.M.P. No deduction in quantities for variations in thickness of pipe walls.

STRAIGHT HEADWALLS. (Round Pipe)





S In.	ha Ft.-In.	Single L4 Ft.-In.	Single Vert. Bars	Single Steel lbs.	Single Conc. C.Y.	Double L3 Ft.-in.	Double Vert. Bars	Double Steel lbs.	Double Conc. C.Y.
22	2-9	7-0	12	48	0.87	9-6	14	58	1.19
25	3-0	7-6	12	46	0.93	10-6	14	58	1.26
29	3-2	8-6	12	50	1.08	12-0	14	62	1.50
36	3-6	10-0	16	67	1.35	14-0	18	83	1.81
43	3-8	12-6	16	77	1.50	16-6	18	94	2.26
50	4-3	13-6	16	84	2.00	19-0	18	104	2.70
58	4-8	15-0	20	119	2.33	22-0	22	145	3.21
65	5-0	17-0	20	128	2.61	25-0	22	157	3.92
72	5-4	20-0	24	157	3.45	28-0	28	194	4.50

STRAIGHT HEADWALLS. (Arch Pipe)

LEGEND ON PLANS

* When h or ha exceeds 4'-6" add pairs of horizontal bars as shown. Vertical spacing shall be equal.

—NOTES—

1. Extend vertical bars 5" into base.
2. All steel reinforcing shall be #4 deformed bars.
3. Steel shall have not less than 2" concrete cover.
4. When more than 2 pipes are used, the length of headwall shall increase by 1½ D for round or 1⅓ S for arch pipe, for each additional pipe. Quantities of concrete & steel shall be increased as required.

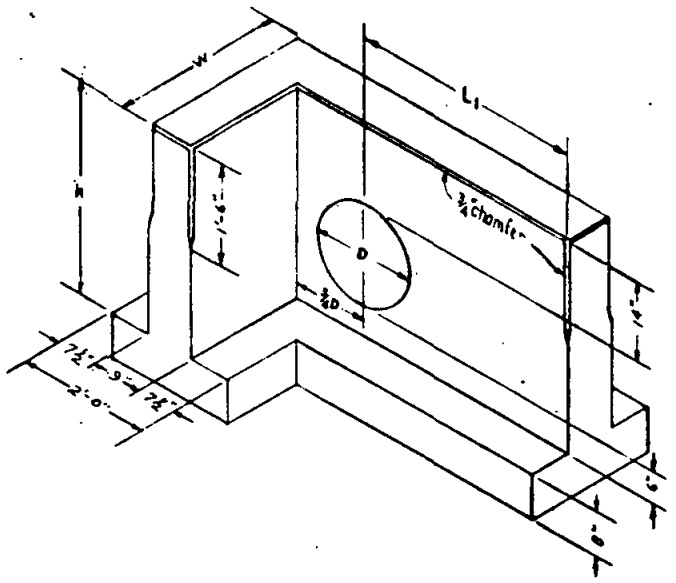
Revision	By	Approved	Date

Standard Specifications. Sections: 51, 52, 90
Drawn by: Drake Check by: FEB
Recommended by:
Approved by County Surveyor.
D. K. Glenn 1-14-63

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT.
STANDARD DRAWING

STRAIGHT HEADWALL SINGLE AND DOUBLE

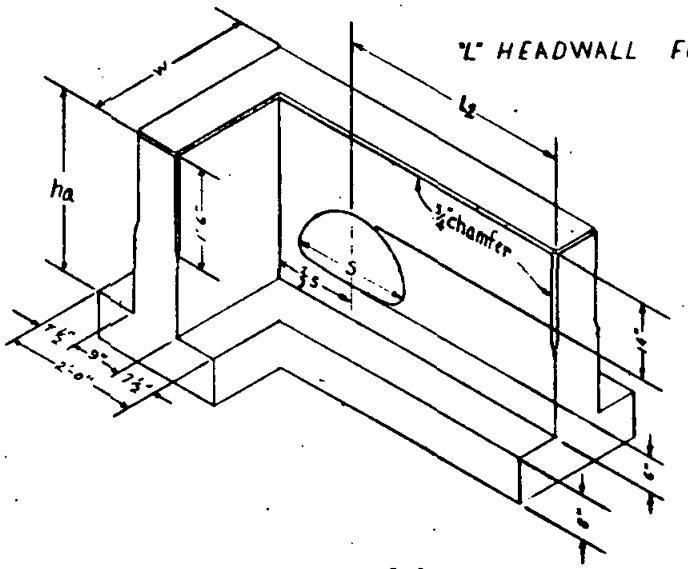
Scale None
Date Approved 1-14-63
Drawing No. 126-1



D	h	L1	LENGTH OF W					CONC. CU. YDS.
			2'-0" to 3'-4"	3'-5" to 4'-10"	4'-11" to 6'-4"	6'-5" to 7'-10"	7'-11" to 9'-4"	
			NUMBER OF VERTICAL BARS FOR W					
			6	8	10	12	14	
ins.	ft-ins.	ft-ins.	Steel LBS. (#4 = .668 lbs. per ft.)					
18	3-2	3-6	40+3W	45+3W				0.59+0.14W
21	3-5	3-9	43+3W	48+3W				0.66+0.14W
24	3-8	4-3	47+3W	52+3W	58+3W			0.79+0.15W
27	3-11	4-9	57+3W	62+3W	68+3W			0.91+0.16W
30	4-2	5-0	60+3W	66+3W	73+3W	78+3W		1.00+0.17W
33	4-5	5-6	64+3W	71+3W	77+3W	83+3W		1.13+0.17W
36	4-8	6-0	74+4W	81+4W	88+4W	94+4W	101+4W	1.23+0.18W
39	4-11	6-3		85+4W	92+4W	99+4W	106+4W	1.39+0.19W
42	5-2	6-9		93+4W	77+4W	104+4W	112+4W	1.54+0.13W
45	5-5	7-3			110+4W	118+4W	126+4W	1.71+0.20W
48	5-8	7-9			113+4W	121+4W	130+4W	1.32+0.21W
51	5-11	8-0				129+4W	138+4W	2.00+0.21W
54	6-2	8-6				135+4W	144+4W	2.18+0.22W

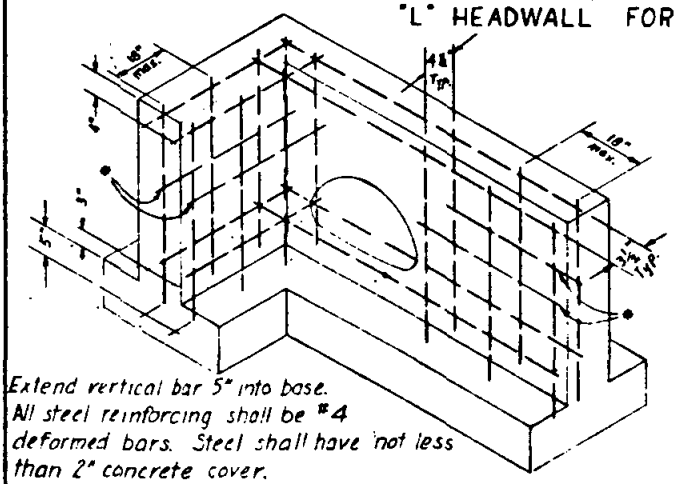
Note: Use headwall table for concrete pipe and for C.M.P. No deduction made in quantity for variation in thickness of pipe wall.

"L" HEADWALL FOR ROUND PIPE



S	ha	L2	LENGTH OF W					CONC. CU. YDS.
			2'-0" to 3'-4"	3'-5" to 4'-10"	4'-11" to 6'-4"	6'-5" to 7'-10"	7'-11" to 9'-4"	
			NUMBER OF VERTICAL BARS FOR W					
			6	8	10	12	14	
ins.	ft-ins.	ft-ins.	Steel LBS. (#4 = .668 lbs. per ft.)					
22	2-9	3-6	38+3W	43+3W				0.51+0.13W
25	3-0	3-9	42+3W	46+3W				0.57+0.13W
29	3-2	4-3	45+3W	50+3W	55+3W			0.70+0.14W
36	3-6	5-0	57+3W	63+3W	69+3W	73+3W		0.88+0.15W
43	3-11	6-3		71+3W	77+3W	82+3W	87+3W	1.10+0.16W
50	4-3	6-9		79+3W	85+3W	91+3W	98+3W	1.33+0.16W
58	4-8	7-6			108+4W	115+4W	122+4W	1.58+0.18W
65	5-0	8-6				126+4W	133+4W	1.85+0.19W
72	5-4	10-0				149+4W	159+4W	2.24+0.20W

"L" HEADWALL FOR ARCH PIPE



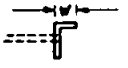
Extend vertical bar 5" into base.
All steel reinforcing shall be #4 deformed bars. Steel shall have not less than 2" concrete cover.

TYPICAL STEEL PLACEMENT DETAIL

Note: When more than one pipe is used, the distance between pipes shall be D/2 or 12" min. for round pipe and S/3 or 12" min. for arch pipe. Dimensions L_1 & L_2 are from the center of the pipe nearest to the end of headwall as shown.

• When h or ha is greater than 4'-6" add pairs of horizontal bars as shown. Vertical spacing shall be equal.

LEGEND ON PLANS



show length of W on plans.

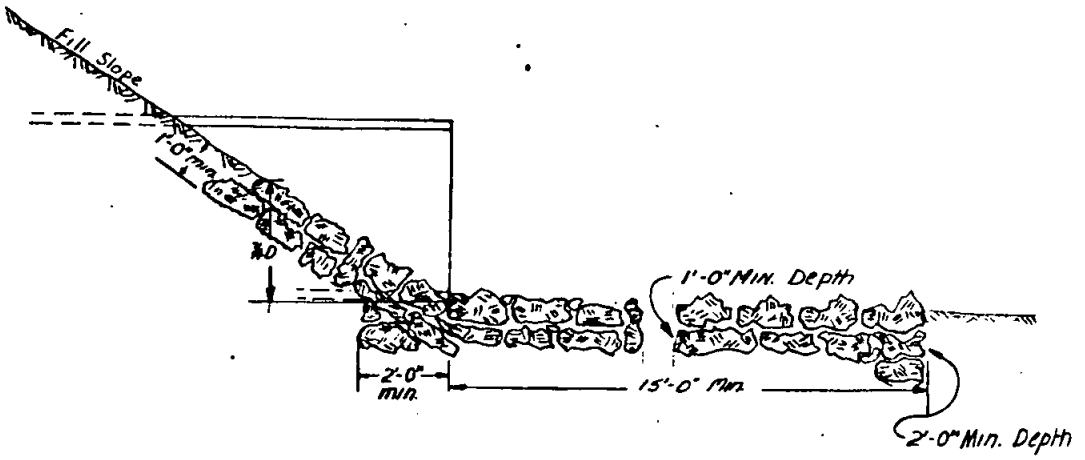
Revision	By	Approved	Date

Standard Specifications
Sections: 51, 52, 90
Drawn by: Drake Checked by REB
Recommended by: R. J. Mossman
Approved by County Surveyor:
D. K. Green R.C.E. 8511

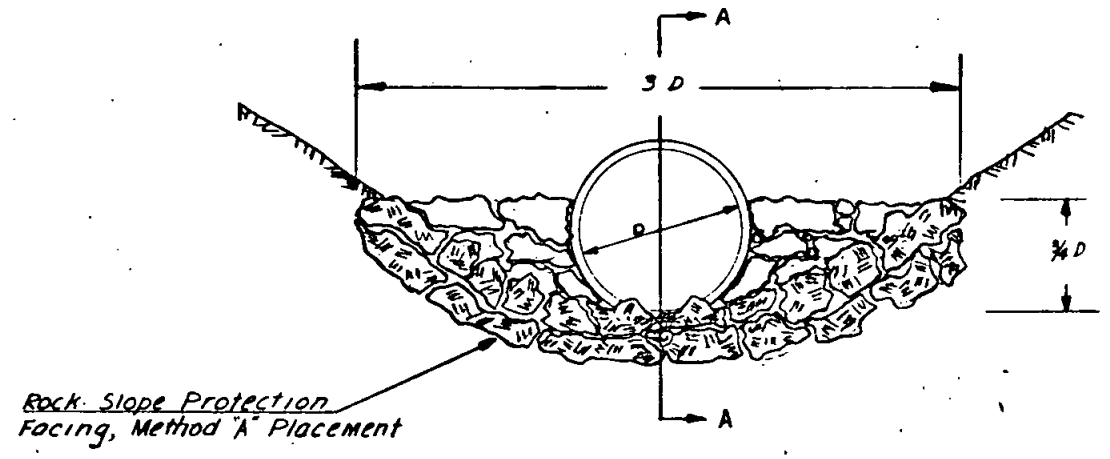
SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

"L" HEADWALL

Scale: None
Date Approved: Nov. 7, 1962
Drawing No.
127-1



SECTION A-A

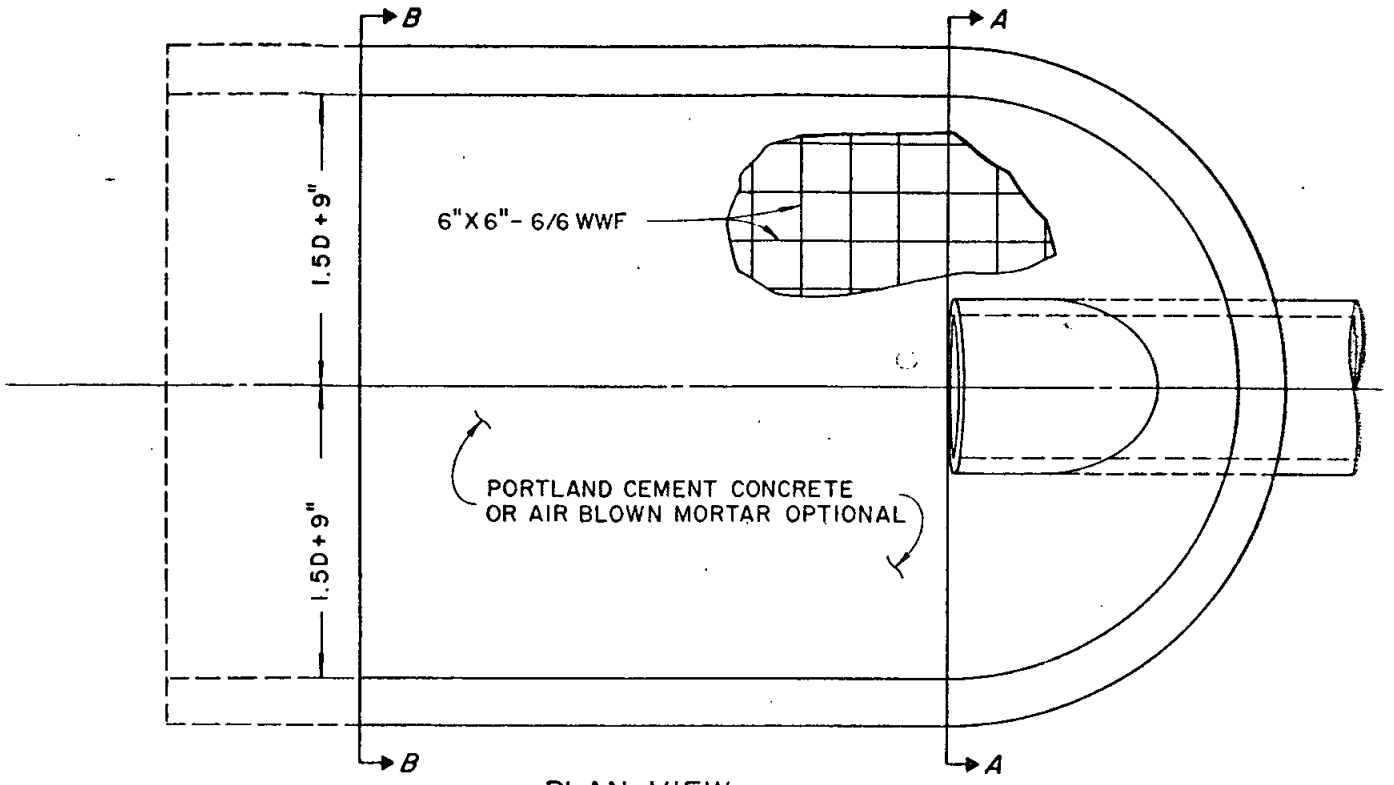


END ELEVATION OF PIPE

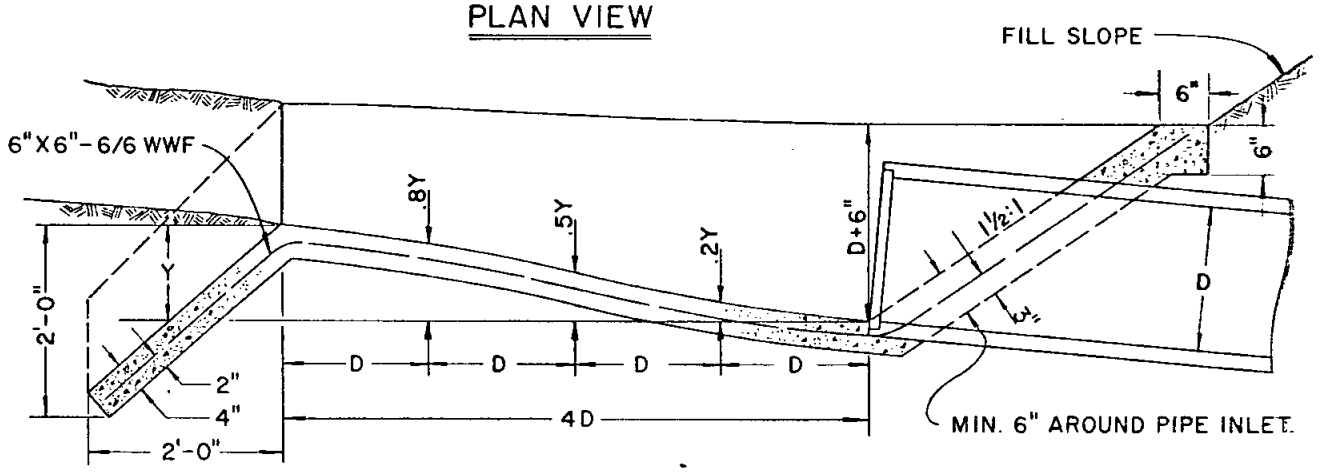
Legend on plan

1. Shape shall conform to outlet channel.
2. Channel or pipe outlet rock slope protection shall be used when outlet velocity exceeds 10 F.P.S. and soil at outlet is susceptible to erosion.

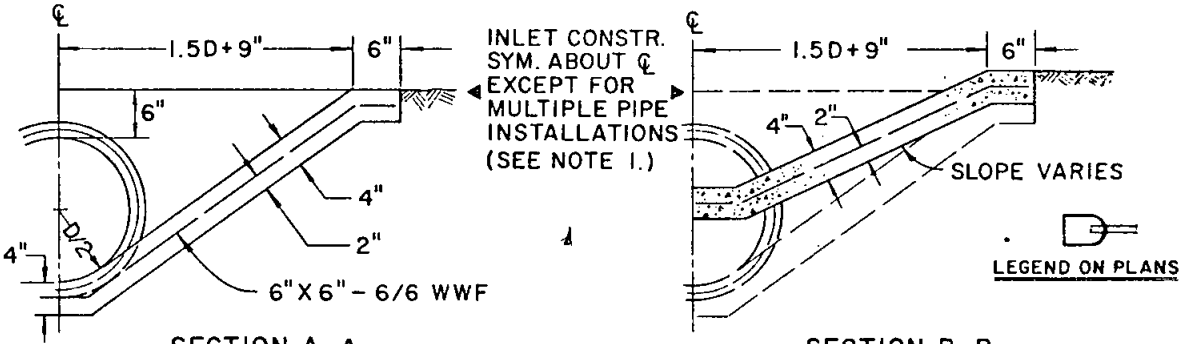
			Revision	By / Approved / Date
Standard Specifications	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT STANDARD DRAWING		Scale None	
Sections 72			Date Approved 2-27-63	
Drawn by: Crate Checked by: RAB			Drawing No.	
Recommended by:	CHANNEL OR PIPE OUTLET FOR ROCK SLOPE PROTECTION AND FLOW INTERUPTION		128-1	
Approved by County Surveyor: D. K. Green R.C.E. 8094				



PLAN VIEW



PROFILE VIEW



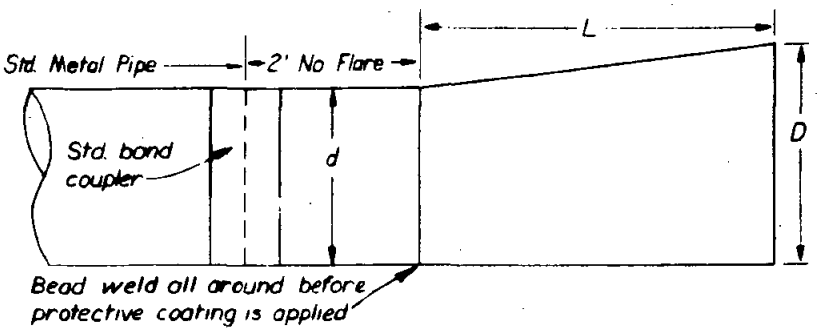
SECTION A-A

SECTION B-B

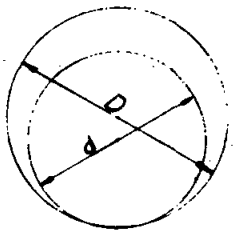
REDUCED SCALE
USE SCALE BELOW
0 1 2 3 INCHES ON ORIGINAL PLAN

NOTE: 1. When more than one pipe is used the profile view shown shall hold for the distance across all pipe openings. Sections A-A and B-B shall be from outermost pipe. The distance between pipes shall be D/2 for round and Span/3 for arch pipe. (12" minimum)
2. Culvert shall be cut off even with apron surface when required by the County Engineer.
3. Applicable only where flared end section cannot be utilized.

STD. SPEC. SEC: 51, 52, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	
DRAWN BY [illegible] CHECKED BY [illegible]		
RECOMMENDED BY [illegible]	TYPE A INLET APRON FOR CULVERTS UP TO 42" DIA.	REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 129-2
DATE: Sept. 28 - '71		

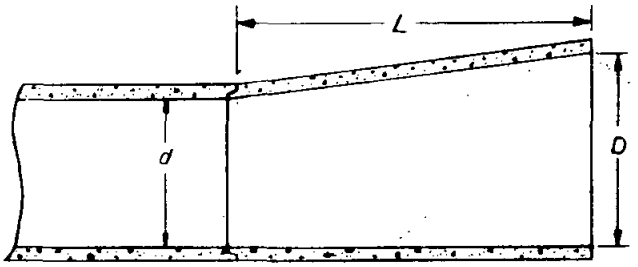


SIDE VIEW

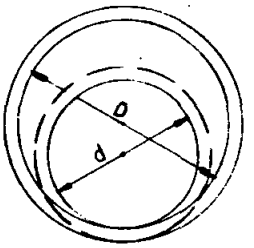


END VIEW

FLARED INLET - CORRUGATED METAL PIPE



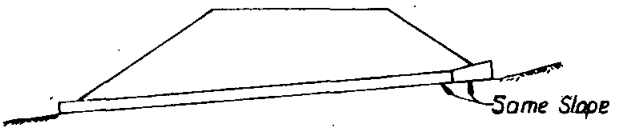
SIDE VIEW SECTION



END VIEW

Note: Wall thickness, steel, & material shall conform to Std. reinforced Conc. pipe.

FLARED INLET - REINFORCED CONCRETE PIPE



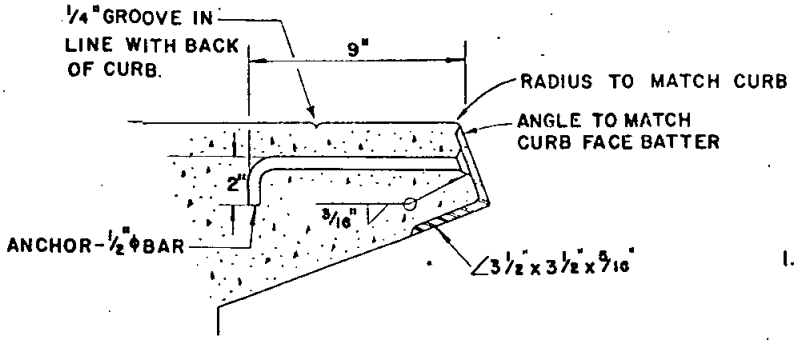
36"x 240' C.M.P. (12 ga) with flared metal inlet (d = 36" D = 42")

INSTALLATION EXAMPLE

General Notes

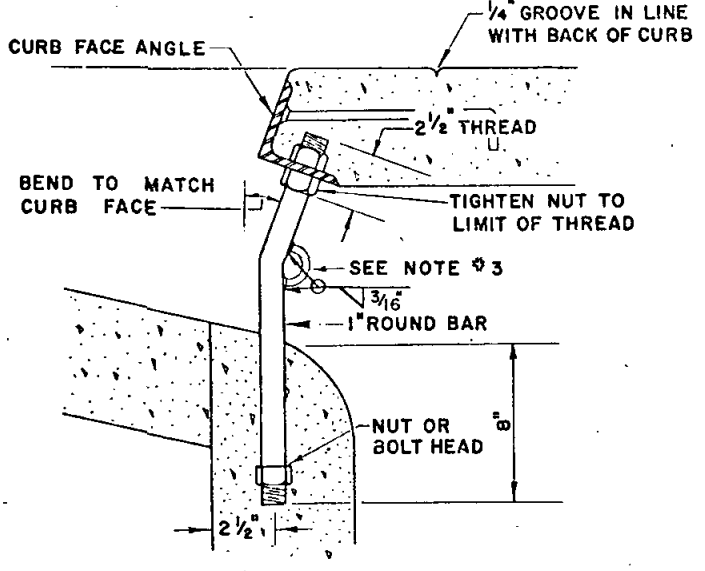
1. Type of pipe, class or gage & protective coating shall conform to the plans and standard specifications.
2. L dimension equals 8' unless noted otherwise.
3. Diameters of a flared section shall be shown on the plans.
4. The difference between the diameters "D" and d" shall be 6" unless noted otherwise.

Standard Specifications	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT STANDARD DRAWING			Revision / By / Approved / Date
Sections: 65, 66				Scale: None
Drawn by: Drake	Checked by: [illegible]			Date Approved: 2-27-63
Recommended by: [signature]	CULVERT FLARED INLETS			Drawing No. 130-1
Approved by County Surveyor: D. X. Lyon R.C.E. 8091				



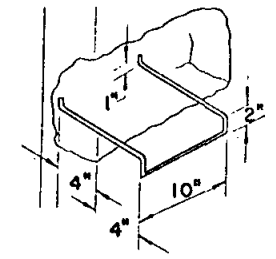
CURB FACE ANGLE

1. FACE ANGLE SHALL BE CAST INTO THE STRUCTURE CONTINUOUS FOR THE FULL LENGTH OF STRUCTURE.
2. ANCHORS SHALL BE PLACED 3" FROM EACH END OF THE STRUCTURE; MAX. SPACING 3'-6" WITH NO LESS THAN 3 ANCHORS PER STRUCTURE.
3. FACE ANGLE AND ANCHORS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.



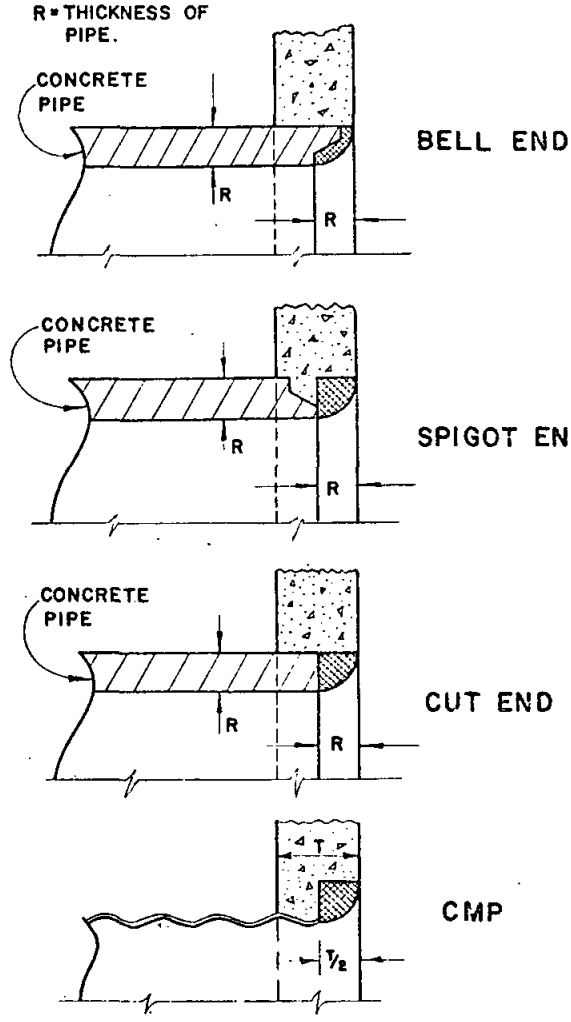
CURB SUPPORT BAR

1. CURB SUPPORT SPACING AS SHOWN ON DRAINAGE STRUCTURE PLAN. MAX SPACING 7' BETWEEN SUPPORTS.
2. NUTS AND CURB SUPPORT BAR SHALL BE HOT-DIP GALVANIZED.
3. WHEN VERTICAL INLET OPENING LARGER THAN 6" IS APPROVED BY THE COUNTY SURVEYOR, INSTALL ONE 3/4" DIAMETER GALVANIZED PROTECTION BAR HORIZONTALLY ACROSS THE ENTIRE LENGTH OF OPENING THROUGH LOOPS OF 1/2" DIAMETER STEEL WELDED TO CURB SUPPORT BAR. BEND PROTECTION BAR BACK 4" INTO INLET WALL ON EACH SIDE.



STEPS

1. WHEN HEIGHT OF STRUCTURE EXCEEDS 4 FT. CAST 5/8" ROUND WROUGHT IRON STEPS IN WALL AT 15" VERTICAL SPACING.



ROUNDED PIPE ENDS

THE ROUNDED AREAS MAY BE BUILT UP OF CEMENT MORTAR AFFIXED WITH EPOXY RESIN APPROVED BY THE COUNTY SURVEYOR OR POURED IN PLACE WITH THE DRAINAGE STRUCTURE

STD. SPEC. SEC. 51, 52, 55, 90					
DRAWN BY DCL CHECKED BY					
RECOMMENDED BY	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Spear R.C.E. 8091	DRAINAGE STRUCTURE STANDARD DETAILS	DRAWING NUMBER. 131			
DATE: 10/18/66					

SPAN	2'		3'			4'					
HEIGHT	1'6	2'	2'	3'		2'	3'		4'		
STRENGTH CLASSIFICATION	A	A	A	A	B	A	A	B	A	B	C
MAX. FILL OVER TOP	66		38	38	66	28	28	37	28	37	50
Conc. Top Slab T_1	6	6	6¼	6¼	8	7	7	8	7	8	9
Conc. Bottom Slab T_2	6	6	6¼	6¼	8	7	7	8	7	8	9
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6	6
Reinforcing Steel "a": Size: Bar #	4	4	4	4	5	5	5	5	5	5	6
"a": Spacing	3½	3½	3½	3½	4	5	5	4½	5	4½	5
"a": Length	3-2	3-2	4-2	4-2	4-3	5-3	5-3	5-3	5-3	5-3	5-2
"d" Dist. Bars: Top Slab - No. of	2	2	3	3	2	3	3	3	3	3	3
"d" Dist. Bars: Bottom Slab - No. of	2	2	2	2	2	3	3		3		3
"e" Bars Spacing	18	18	18	18	12½	18	18	18	17	13	9½
Spacers Number	12	12	12	12		12	12		14		
Quan. Concrete: C.Y. per lin. ft.	.17	.18	.23	.27	.31	.29	.33	.36	.36	.40	.43
Quan. Reinf. lbs per lin. ft.	27	29	34	36	46	44	45	47	48	52	64
Hydraulics Area A	3	4	6	9		8	12		16		
Hydraulic Radius R	.43	.50	.60	.75		.67	.86		1.00		
Neutral Slope %	.83	.91	.73	.82		.64	.70		.77		
Head Factor h	1.30	1.07	.85	.65		.75	.55		.45		
Entrance Capacity Q_{10}	11	17	26	48		35	64		99		
Design Discharge Q_{100}	18	28	43	79		58	107		163		

SPAN	5'											
HEIGHT	2'		3'		4'				5'			
STRENGTH CLASSIFICATION	A	B	A	B	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP	12	27	12	27	11	26	35	46	11	25	35	46
Conc. Top Slab T_1	7½	8	7½	8	7½	8	9½	10½	7¼	8	9½	10½
Conc. Bottom Slab T_2	6	8	6	8	6	8	10	10¾	6	8	10	10¾
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6	6	6
Reinforcing Steel "a": Size: Bar #	5	5	5	5	5	5	6	6	5	5	6	6
"a": Spacing	4	4	4	4	4	4	5	4½	4	4	5	4½
"a": Length	6-3	6-3	6-3	6-3	6-3	6-3	6-2	6-2	6-3	6-3	6-2	6-2
"d" Dist. Bars: Top Slab - No. of	7	3	7	3	7	3		3	7	3		3
"d" Dist. Bars: Bottom Slab - No. of	3		3		3			3	3	3		3
"e" Bars Spacing	18	18	18	18	18	17	13	11	18	12	8½	6½
Spacers Number	14		14		14				16			
Quan. Concrete: C.Y. per lin. ft.	.32	.37	.40	.41	.40	.44	.51	.54	.43	.48	.55	.57
Quan. Reinf. lbs per lin. ft.	57	56	59	57	61	60	68	75	65	65	77	87
Hydraulics Area A	10		15		20				25			
Hydraulic Radius R	.71		.94		1.11				1.25			
Neutral Slope %	.59		.62		.67				.73			
Head Factor h	.69		.49		.39				.34			
Entrance Capacity Q_{10}	43		80		123				172			
Design Discharge Q_{100}	71		132		203				284			

SPAN	6'																				
HEIGHT	2'		3'		4'			5'				6'					7'				
STRENGTH CLASSIFICATION	A	B	A	B	A	B	C	A	B	C	D	A	B	C	D	E	A	B	C	D	E
MAX. FILL OVER TOP	10	18	10	18	10	18	25	9	18	25	36	9	17	25	36	45	9	17	25	36	45
Conc. Top Slab T_1	8¼	8¼	8¼	8¼	8¼	8¼	9¼	8¼	8¼	9¼	11	8¼	8¼	9¼	11	12	8¼	8¼	9¼	11	12
Conc. Bottom Slab T_2	6¾	8	6¾	8	6¾	8	9¾	7¼	8¼	10	11¼	7¼	8¼	10½	11¼	12¼	7¼	8¼	10¼	11¼	12¼
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6¼	7	6	6	6¼	7	7¾
Reinforcing Steel "a": Size: Bar #	5	5	5	5	5	5	6	5	5	6	6	5	5	6	7	7	5	5	6	7	7
"a": Spacing	4	4	4	4	4	4	5	4	4	5	4½	4	4	5	5½	5	4	4	5	5½	5
"a": Length	7-3	7-3	7-3	7-3	7-3	7-3	7-2	7-3	7-3	7-2	7-2	7-3	7-3	7-2	7-3	7-5	7-3	7-3	7-2	7-5	7-6
"d" Dist. Bars: Top Slab - No. of	7	4	7	4	7	4		7	4		4	7	4		4	4	7	4		4	4
"d" Dist. Bars: Bottom Slab - No. of	4		4		4			4			4	4			4	4	4			4	4
"e" Bars Spacing	18	18	18	18	18	18	17	18	15½	11½	8½	17	10½	7½	6	5	12	7½	7	5	4½
Spacers Number	12		12		14			16				18					18				
Quan. Concrete: C.Y. per lin. ft.	.40	.42	.43	.46	.47	.50	.58	.52	.54	.60	.66	.56	.58	.65	.71	.78	.59	.61	.70	.78	.88
Quan. Reinf. lbs per lin. ft.	64	63	66	65	69	67	74	70	70	80	91	73	78	92	112	127	81	90	99	126	139
Hydraulics Area A	12		18		24			30				36					42				
Hydraulic Radius R	.75		1.00		1.20			1.36				1.50					1.62				
Neutral Slope %	.53		.56		.59			.62				.68					.71				
Head Factor h	.645		.45		.358			.305				.271					.247				
Entrance Capacity Q_{10}	52		96		148			207				272					343				
Design Discharge Q_{100}	86		159		244			341				448					565				

Note:
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.

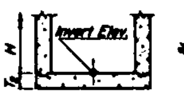
DUPLICATED FROM STATE STANDARD DRAWING
RECOMMENDED BY:

SPAN	7'												
HEIGHT	3'		4'		5'			6'			7'		
STRENGTH CLASSIFICATION	A	B	A	B	A	B	C	A	B	C	A	B	C
MAX. FILL OVER TOP	16	26	16	26	16	26	35	16	26	35	16	26	35
Conc. Top Slab T_1	7¼	8¼	7¼	8¼	7¼	8¼	9¾	7¼	8¼	9¾	7¼	8¼	9¾
Conc. Bottom Slab T_2	7½	8¾	7½	8¾	7½	8¾	10½	7½	8¾	10½	7½	8¾	10½
Conc. Sidewalls T_3	6	7	6	7	6	7	8½	6	7	8½	6	7	8½
"a": Size: Bar #	5	5	5	5	5	5	6	5	5	6	5	5	6
"a": Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9
"a": Length	6-8	6-9	6-8	6-9	6-8	6-9	6-10	6-8	6-9	6-10	6-8	6-5	5-10
"b": Size: Bar #	5	5	5	5	5	5	6	5	5	6	5	5	6
"b": Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9
"b": Dimension "X"	1-3	1-4	1-3	1-4	1-3	1-4	1-8	1-3	1-4	1-8	1-3	1-4	1-8
"b": Length	3-1	3-2	3-1	3-2	3-1	3-2	3-10	3-1	3-2	3-10	3-1	3-2	3-10
"c": Size: Bar #	5	5	5	5	5	5	6	5	5	6	5	5	6
"c": Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9
"c": Dimension "Y"	1-10	1-11	1-10	1-11	1-10	1-11	2-3	1-10	1-11	2-3	1-10	1-11	2-3
"c": Length	5-2	5-4	6-2	6-4	7-2	7-4	7-10	8-2	8-4	8-10	9-2	9-4	9-10
"c1": Size: Bar #	5	5	5	5	5	5	6	5	5	6	5	5	6
"c1": Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9
"c1": Dimension "Y"	1-10	1-11	1-10	1-11	1-10	1-11	2-3	1-10	1-11	2-3	1-10	1-11	2-3
"c1": Length	3-8	3-10	3-8	3-10	3-8	3-10	4-6	3-8	3-10	4-6	3-8	3-10	4-6
"d" Bars: Top Slab - No. of	7	4	7	4	7	4	4	7	4	4	7	4	4
"d" Bars: Bottom Slab - No. of	4	4	4	4	4	4	4	4	4	4	4	4	4
"e" Bars Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18
Spacers Total Number	24		28		28			32			36		
Quan. Concrete: C.Y. per lin. ft.	.47	.56	.51	.60	.55	.64	.78	.58	.68	.84	.62	.73	.89
Quan. Reinf.: lbs. per lin. ft.	107	130	114	138	118	143	168	125	150	176	132	158	184
Hydraulics Area A	21		28		35			42			49		
Hydraulic Radius R	1.05		1.27		1.46			1.62			1.75		
Neutral Slope %	0.52		0.54		0.57			0.61			0.64		
Head Factor h	0.423		0.332		0.281			0.247			0.224		
Entrance Capacity Q_{10}	112		173		241			317			400		
Design Discharge Q_{100}	185		285		398			523			659		

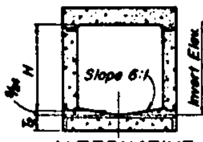
SPAN	8'														
HEIGHT	3'		4'		5'		6'			7'			8'		
STRENGTH CLASSIFICATION	A	B	A	B	A	B	A	B	C	A	B	C	A	B	C
MAX. FILL OVER TOP	13	21	13	21	13	21	13	21	31	13	21	31	13	21	31
Conc. Top Slab T_1	7¼	8½	7¼	8½	7¼	8½	7¼	8½	10¼	7¼	8½	10¼	7¼	8½	10¼
Conc. Bottom Slab T_2	7¼	9½	7¼	9½	7¼	9½	7½	9½	11½	7½	9½	11½	7½	9½	11½
Conc. Sidewalls T_3	6½	7½	6½	7½	6½	7½	6½	7½	9¾	6½	7½	9¾	6½	7½	9¾
"a": Size: Bar #	5	5	5	5	5	5	5	5	6	5	5	6	5	5	6
"a": Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
"a": Length	7-7	7-8	7-7	7-8	7-7	7-8	7-7	7-8	7-10	7-7	7-8	7-10	7-7	7-8	7-10
"b": Size: Bar #	5	5	5	5	5	5	5	5	6	5	5	6	5	5	6
"b": Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
"b": Dimension "X"	1-6	1-7	1-6	1-7	1-6	1-7	1-6	1-7	1-8	1-6	1-7	1-8	1-6	1-7	1-8
"b": Length	3-4	3-5	3-4	3-5	3-4	3-5	3-4	3-5	3-10	3-4	3-5	3-10	3-4	3-5	3-10
"c": Size: Bar #	5	5	5	5	5	5	5	5	6	5	5	6	5	5	6
"c": Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
"c": Dimension "Y"	2-0	2-5	2-0	2-5	2-0	2-5	2-0	2-5	2-8	2-0	2-5	2-8	2-0	2-5	2-8
"c": Length	5-4	5-10	6-4	6-10	7-4	7-10	8-4	8-10	9-3	9-4	9-10	10-3	10-4	10-10	11-3
"c1": Size: Bar #	5	5	5	5	5	5	5	5	6	5	5	6	5	5	6
"c1": Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
"c1": Dimension "Y"	2-0	2-5	2-0	2-5	2-0	2-5	2-0	2-5	2-8	2-0	2-5	2-8	2-0	2-5	2-8
"c1": Length	3-9	4-5	3-9	4-5	3-9	4-5	3-9	4-5	5-0	3-9	4-5	5-0	3-9	4-5	5-0
"d" Bars: Top Slab - No. of	7	5	7	5	7	5	7	5	5	7	5	5	7	5	5
"d" Bars: Bottom Slab - No. of	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
"e" Bars Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Spacers Total Number	28		32		32		36			40			40		
Quan. Concrete: C.Y. per lin. ft.	.52	.65	.56	.70	.60	.74	.65	.79	1.00	.69	.83	1.06	.73	.88	1.12
Quan. Reinf.: lbs. per lin. ft.	118	146	125	154	129	159	136	167	211	143	174	220	147	179	225
Hydraulics Area A	24		32		40		48			56			64		
Hydraulic Radius R	1.09		1.33		1.54		1.71			1.87			2.00		
Neutral Slope %	0.50		0.52		0.54		0.56			0.59			0.62		
Head Factor h	0.404		0.314		0.262		0.229			0.208			0.189		
Entrance Capacity Q_{10}	128		197		276		362			457			558		
Design Discharge Q_{100}	212		326		455		597			753			921		

SPAN	10'																
HEIGHT	4'		5'		6'		7'		8'			9'			10'		
STRENGTH CLASSIFICATION	A	B	A	B	A	B	A	B	A	B	C	A	B	C	A	B	C
MAX. FILL OVER TOP	9	18	9	18	9	18	9	18	8	18	28	8	18	28	8	18	28
Conc. Top Slab T_1	8	9¼	8¼	9¾	8¼	9¾	8½	9¾	8½	9¾	12¼	8½	9¾	12¼	8½	9¾	12¼
Conc. Bottom Slab T_2	8¾	10½	9	10¾	9	10¾	9¼	11	9¼	11	13¼	9¼	11	13¼	9¼	11	13¼
Conc. Sidewalls T_3	7¼	9½	7¼	9½	7¼	9½	7¼	9½	7¼	9½	11½	8	9½	11½	9	9½	11½
"a": Size: Bar #	6	6	6	6	6	6	6	6	6	6	7	6	6	7	6	6	7
"a": Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9
"a": Length	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-9	9-6	9-8	9-9	9-7	9-8	9-9
"b": Size: Bar #	5	6	5	6	5	6	5	6	5	6	6	5	6	6	5	6	6
"b": Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9
"b": Dimension "X"	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-6	2-0	2-0	2-6	2-0	2-0	2-6
"b": Length	3-10	4-2	3-10	4-2	3-10	4-2	3-10	4-2	3-10	4-2	4-8	3-10	4-2	4-8	3-10	4-2	4-8
"c": Size: Bar #	5	6	5	6	5	6	5	6	5	6	6	5	6	6	5	6	6
"c": Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9
"c": Dimension "Y"	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	3-6	2-8	3-4	3-6	2-8	3-4	3-6
"c": Length	6-11	7-10	8-1	8-10	9-1	9-10	10-1	10-10	11-1	11-10	12-3	12-1	12-10	13-3	13-1	13-10	14-3
"c1": Size: Bar #	5	6	5	6	5	6	5	6	5	6	6	5	6	6	5	6	6
"c1": Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9
"c1": Dimension "Y"	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	3-6	2-8	3-4	3-6	2-8	3-4	3-6
"c1": Length	4-7	5-8	4-7	5-8	4-7	5-8	4-7	5-8	4-7	5-8	6-0	4-7	5-8	6-0	4-7	5-8	6-2
"d" Bars: Top Slab - No. of	9	5	9	5	9	5	9	5	9	5	5	9	5	5	9	5	5
"d" Bars: Bottom Slab - No. of	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
"e" Bars Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Spacers Total Number	32		34		36		40		40			44			48		
Quan. Concrete: C.Y. per lin. ft.	.75	.94	.82	1.02	.86	1.08	.92	1.15	.97	1.21	1.50	1.06	1.26	1.57	1.18	1.32	1.65
Quan. Reinf.: lbs. per lin. ft.	143	221	148	228	154	235	160	244	164	250	265	170	259	273	178	267	281
Hydraulics Area A	40		50		60		70		80			90			100		
Hydraulic Radius R	1.43		1.67		1.88		2.06		2.22			2.37			2.50		
Neutral Slope %	0.47		0.49		0.51		0.52		0.54			0.56			0.58		
Head Factor h	0.288		0.238		0.205		0.183		0.165			0.153			0.143		
Entrance Capacity Q_{10}	247		345		453		571		698			834			976		
Design Discharge Q_{100}	407		568		747		941		1150			1380			1610		

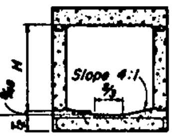
SPAN	12'														
HEIGHT	6'		7'		8'		9'			10'			12'		
STRENGTH CLASSIFICATION	A	B	A	B	A	B	A	B	C	A	B	C	A	B	C
MAX. FILL OVER TOP	5	16	5	16	5	16	5	16	24	5	16	24	5	16	24
Conc. Top Slab T_1	8¾	11¼	8¾	11¼	8¾	11¼	9	11¼	13¼	9	11¼	13¼	9	11¼	13¼
Conc. Bottom Slab T_2	8¾	12¼	8¾	12¼	8¾	12¼	9	12½	14¾	9	12½	14¾	9	12½	14¾
Conc. Sidewalls T_3	7½	10½	7½	10½	7½	10½	8	10½	12½	9	10½	12½	9	10½	12½
"a": Size: Bar #	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
"a": Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
"a": Length	11-3	11-6	11-3	11-6	11-3	11-6	11-4	11-6	11-8	11-5	11-6	11-8	11-5	11-6	11-8
"b": Size: Bar #	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
"b": Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
"b": Dimension "X"	2-8	3-0	2-8	3-0	2-8	3-0	2-8	3-0	3-0	2-8	3-0	3-0	2-8	3-0	3-0
"b": Length	4-10	5-7	4-10	5-7	4-10	5-7	4-10	5-7	5-7	4-10	5-7	5-7	4-10	5-7	5-7
"c": Size: Bar #	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
"c": Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
"c": Dimension "Y"	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9
"c": Length	10-2	10-4	11-2	11-4	12-2	12-4	13-2	13-4	13-6	14-2	14-4	14-6	16-2	16-4	16-6
"c1": Size: Bar #	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
"c1": Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
"c1": Dimension "Y"	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9
"c1": Length	5-11	6-5	5-11	6-5	5-11	6-6	5-11	6-6	6-8	5-11	6-6	6-8	5-11	6-6	6-8
"d" Bars: Top Slab - No. of	10	6	10	6	10	6	10	6	6	10	6	6	10	6	6
"d" Bars: Bottom Slab - No. of	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
"e" Bars Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Spacers Total Number	36		44		44		44			48			52		
Quan. Concrete: C.Y. per lin. ft.	.99	1.38	1.03	1.44	1.08	1.52	1.18	1.58	1.90	1.30	1.65	1.98	1.41	1.78	2.13
Quan. Reinf.: lbs. per lin. ft.	203	293	213	304	218	311	223	317	387	231	326	397	243	341	415
Hydraulics Area A	72		84		96		108			120			144		
Hydraulic Radius R	2.00		2.21		2.40		2.57			2.73			3.00		
Neutral Slope %	0.46		0.48		0.49		0.51			0.52			0.56		
Head Factor h	0.189		0.167		0.161		0.138			0.128			0.114		
Entrance Capacity Q_{10}	543		686		838		1000			1170			1540		
Design Discharge Q_{100}	896		1130		1380		1650			1930			2540		



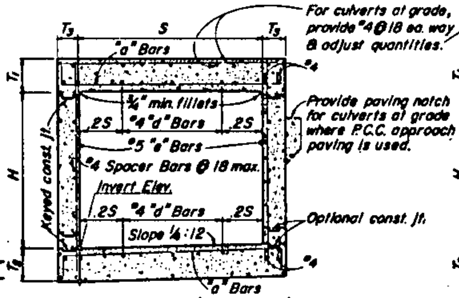
ALTERNATIVE FLAT INVERT



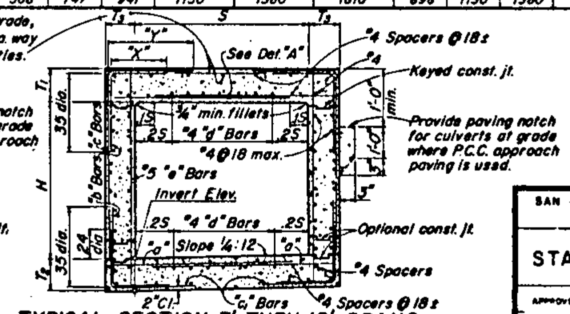
ALTERNATIVE V INVERT



ALTERNATIVE TRAPEZOIDAL INVERT



TYPICAL SECTIONS 2' THRU 6' SPANS



TYPICAL SECTION 7' THRU 12' SPANS

DETAIL "A"

SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT
STANDARD DRAWING

STANDARD SINGLE BOX CULVERTS

APPROVED BY: [signature] COUNTY SURVEYOR R.C.E.

DATE:

DRAWING Nº 140-1

140-1

SPAN	4'							5'							6'							8'						
HEIGHT	2'			3'				2'			3'				4'				5'			3'			4'			
STRENGTH CLASSIFICATION	A	B	C	A	B	C	D	A	B	C	D	A	B	C	A	B	C	D	A	B	C	D	A	B	C	A	B	C	D
MAX. FILL OVER TOP	11	21	32	11	23	34	46	6	24	36	6	24	36	6	23	34	46	6	23	34	46	4	20	34	4	20	34	4	19
Conc. Top Slab T_1	6½	6½	7½	6½	8½	7½	9½	6½	6½	7½	9½	6½	7½	9½	6½	7½	9	10½	6½	7½	9½	10½	7½	8½	10½	7½	8½	10½	12
Conc. Bottom Slab T_2	6	7½	8½	6	7½	8½	9½	6	7½	8½	9½	6	8½	10½	6	7½	8½	10	6	7½	9½	11½	7½	9½	11½	7½	9½	11½	12½
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Steel a — Size Bar #	5	4	4	5	4	4	4	5	4	4	4	5	4	4	5	4	4	4	5	4	4	4	5	4	4	5	4	4	4
Steel a — Spacing	11	11	9	11	10½	8½	7½	11	10½	8½	7½	10	8½	10	10	8½	10	9	10	8½	10	9	9½	11	8½	9½	11	8½	9½
Steel a — Length	10-3	10-2	10-2	10-3	10-2	10-2	10-2	10-3	10-2	10-2	10-2	10-3	12-2	12-2	12-2	12-3	12-2	12-2	12-2	12-3	12-2	12-2	12-4	14-3	14-4	14-2	14-3	14-2	14-2
Steel b or b_1 — Size Bar #	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	5	6	6	7
Steel b or b_1 — Spacing	11	11	9	11	10½	8½	7½	11	10½	8½	7½	10	8½	10	10	8½	10	9	10	8½	10½	9	9½	11	8½	9½	11	8½	9½
Steel b or b_1 — Length "b"	9-4	9-4	9-6	9-6	9-6	9-6	9-7	9-4	9-4	9-6	9-7	11-5	11-6	11-7	11-5	11-6	11-7	11-8	11-7	11-5	11-6	11-7	13-6	13-6	13-6	13-6	13-6	13-6	13-6
Steel b or b_1 — Length "b_1"	9-4	9-5	9-6	9-6	9-5	9-5	9-6	9-7	9-4	9-5	9-6	9-7	11-4	11-6	11-7	11-4	11-6	11-7	11-8	11-4	11-6	11-7	13-5	13-7	13-6	13-5	13-7	13-6	13-6
Steel c — Size Bar #	4	3	3	4	3	3	3	4	3	3	3	4	3	3	4	3	3	3	4	3	3	3	4	3	3	4	3	3	3
Steel c — Spacing	11	11	9	11	10½	8½	7½	11	10½	8½	7½	10	8½	10	10	8½	10	9	10	8½	10½	9	9½	11	8½	9½	11	8½	9½
Steel c — Length	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	6-6	6-6	6-6	6-6	6-6	6-6	6-6
Reinforcing "d" Dist Top Slab-Tot No	10	6	6	10	6	6	6	10	6	6	6	12	6	6	12	6	6	6	12	6	6	6	12	6	6	12	6	6	6
Reinforcing Bars Bottom Slab-Tot No	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Reinforcing "e" Bars Size Bar #	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	5	4	4	5	6	4	4	4	4	4	5	5
Reinforcing Bars Spacing	18	18	18	18	18	16	12	18	12	9	10	18	18	18	18	18	16	12	18	12	10	10¼	18	8½	9	18	16	18	14
Spacers Number	23			26				23			26				29				32			30			33			
Quant. Concrete C.Y. per lin ft	.047	.051	.057	.053	.057	.063	.069	.059	.063	.069	.075	.058	.065	.080	.063	.070	.076	.085	.069	.080	.089	.096	.074	.086	.097	.104	.077	.090	.108
Quant. Reinf. Lbs per lin ft	81	74	84	84	79	91	101	87	85	99	111	99	100	109	103	104	112	106	109	119	133	109	116	126	148	121	119	147	125
Hydraulics Area A	16			24				32				20			30				40			50				36			
Hydraulics Hydraulic Radius R	0.67			0.86				1.00				0.71			0.94				1.11			1.25				1.00			
Hydraulics Neutral Slope %	0.64			0.70				0.77				0.59			0.62				0.67			0.73				0.56			
Hydraulics Head Factor k	0.75			0.55				0.45				0.69			0.49				0.39			0.34				0.450			
Hydraulics Entrance Capacity Q_{ip}	70			128				198				86			160				246			344				192			
Hydraulics Design Discharge Q_{max}	116			214				326				142			264				406			568				318			

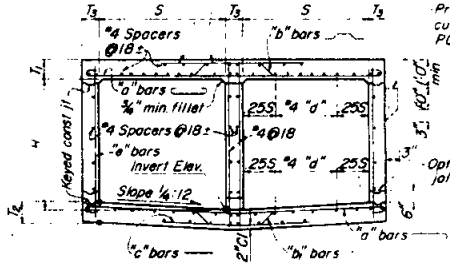
SPAN	8'																											
HEIGHT	4'			5'				6'				7'				8'												
STRENGTH CLASSIFICATION	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	E
MAX. FILL OVER TOP	3	14	25	3	14	25	37	3	14	25	37	3	14	25	37	3	14	25	37	3	14	25	37	3	14	25	37	48
Conc. Top Slab T_1	8½	9½	12	8½	9½	12	14½	8½	9½	12	14½	8½	9½	12	14½	8½	9½	12	14½	8½	9½	12	14½	8½	9½	12	14½	16½
Conc. Bottom Slab T_2	7½	10½	13	7½	10½	13	15	7½	10½	13	15	7½	10½	13	15	7½	10½	13	15	7½	10½	13	15	7½	10½	13	15	17
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	8	8	8	8	8½	8½	8½	8½	9	9	9	9	9
Steel a — Size Bar #	5	4	4	5	4	4	4	5	4	4	4	5	4	4	4	5	4	4	4	5	4	4	4	5	4	4	4	4
Steel a — Spacing	12	9½	10½	12	9½	10	12	9½	10	12	9½	10	12	9½	10	11½	9½	10	8½	11½	9½	10	8½	11½	9½	10	8½	7½
Steel a — Length	18-4	18-2	18-4	18-4	18-2	18-4	18-5	18-4	18-2	18-4	18-5	18-4	18-2	18-4	18-5	18-4	18-2	18-4	18-5	18-4	18-2	18-4	18-5	18-4	18-2	18-4	18-5	18-6
Steel b or b_1 — Size Bar #	6	6	7	6	6	7	7	6	6	7	7	6	6	7	7	6	6	7	7	6	6	7	7	6	6	7	7	7
Steel b or b_1 — Spacing	12	9½	10½	12	9½	10	12	9½	10	12	9½	10	12	9½	10	11½	9½	10	8½	11½	9½	10	8½	11½	9½	10	8½	7½
Steel b or b_1 — Length "b"	17-6	17-8	17-9	17-7	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-11
Steel b or b_1 — Length "b_1"	17-5	17-8	17-9	17-7	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-8	17-8	17-9	17-10	17-11
Steel c — Size Bar #	4	3	3	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	3
Steel c — Spacing	12	9½	10½	12	9½	10	12	9½	10	12	9½	10	12	9½	10	11½	9½	10	8½	11½	9½	10	8½	11½	9½	10	8½	7½
Steel c — Length	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-7	8-7	8-7	8-7	8-8	8-8	8-8	8-8	8-8	8-8	8-8	8-8	8-9	8-9	8-9	8-9	8-9
Reinforcing "d" Dist Top Slab-Tot No	18	8	8	18	8	8	16	8	8	16	8	8	8	16	8	8	8	16	8	8	8	16	8	8	8	16	8	8	8
Reinforcing Bars Bottom Slab-Tot No	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Reinforcing "e" Bars Size Bar #	4	4	4	4	4	5	5	4	5	6	6	4	5	6	6	4	5	6	6	4	5	6	6	4	5	6	7	7
Reinforcing Bars Spacing	18	18	10½	18	12	10	18	11½	10	14	9½	7½	8½	11½	8½	7½	8	11	8½	9	12	8	7	7	8	9	7	8
Spacers Number	41			44			44			47			36		50			60										
Quant. Concrete C.Y. per lin ft	.108	.130	.155	.114	.137	.161	.119	.142	.166	.132	.156	.183	.214	.139	.162	.199	.227											
Quant. Reinf. Lbs per lin ft	169	175	200	172	181	218	173	188	229	185	199	248	299	191	207	264	314											
Hydraulics Area A	64			80			96			112			128															
Hydraulics Hydraulic Radius R	1.33			1.54			1.71			1.87			2.00															
Hydraulics Neutral Slope %	0.52			0.54			0.56			0.59			0.62															
Hydraulics Head Factor k	0.314			0.262			0.229			0.206			0.189															
Hydraulics Entrance Capacity Q_{ip}	394			552			724			914			1116															
Hydraulics Design Discharge Q_{max}				910			1194			1506			1842															

SPAN	10'												12'															
HEIGHT	5'			6'			7'			8'			10'				6'			7'			8'			9'			
STRENGTH CLASSIFICATION	A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	A	B	C	A	B	C	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP	2	17	30	2	17	30	2	17	30	2	16	29	36	2	16	29	36	2	14	26	2	14	26	2	14	26	2	14	26	36
Conc. Top Slab T_1	8½	12½	16	8½	12½	16	8½	12½	16	8½	12½	16	17½	8½	12½	16	17½	10	14	17½	10	14½	17½	10	14½	17½	20½	10	14½	17½	20½
Conc. Bottom Slab T_2	8½	13½	16½	8½	13½	16½	8½	13½	16½	8½	13½	16½	18½	8½	13½	16½	18½	9½	14½	18	9½	15	18½	9½	15	18½	10	15½	18½	21½	10½
Conc. Sidewalls T_3	6	6	6	6	6	6½	7	7	7	7½	8½	8	8	8	9	10	9	6	6	6½	7	7	7	8	8	8½	9	9	9	9½	11	12
Steel a — Size Bar #	6	4	4	6	4	4	6	4	4	6	4	4	4	6	4	4	4	6	4	4	6	4	4	6	4	4	6	4	4	4	6	4	4
Steel a — Spacing	11	10	10	11	9½	10	11	9½	10	11	10	10	9	11	10	10	9	9	11½	9	9	11½	9	9	11	8½	9	11	8½	9	9	11	8½	9
Steel a — Length	22-4	22-2	22-2	22-4	22-2	22-2	22-4	22-2	22-2	22-4	22-3	22-3	22-3	22-7	22-5	22-7	23-0	22-6	22-8	22-9	22-7	22-9	23-1	23-0	23-2	23-3	23-2	23-4	23-3	23-5	23-6	23-7	23-8	23-8
Steel b or b_1 — Size Bar #	6	7	8	6	7	8	6	7	8	6	7	8	9	6	7	8	9	6	8	8	6	8	8	6	8	8	9	6	8	8	9	6	8	8	9
Steel b or b_1 — Spacing	11	10	10	11	9½	10	11	9½	10	11	10	10	9	11	10	10	9	9	11½	9	9	11½	9	9	11	8½	9	11	8½	9	9	11	8½	9
Steel b or b_1 — Length "b"	21-7	21-0	22-0	21-7	21-0	22-0	21-7	21-1	22-0	21-11	22-4	22-5	22-7	22-4	22-8	22-9	23-1	25-8	25-10	26-3	25-11	26-1	26-4	26-5	26-6	26-8	26-10	27-0	26-5	26-7	26-9	27-0	27-2	27-3	27-5	27-10
Steel b or b_1 — Length "b_1"	21-5	21-0	22-0	21-5	21-0	22-0	21-5	21-1	22-0	21-9	22-3	22-4	22-6	22-3	22-6	22-8	23-0	25-6	25-10	26-3	25-9	26-1	26-4	26-4	26-6	26-8	26-11	27-0	26-4	26-6	26-9	27-0	27-2	27-3	27-5	27-11
Steel c — Size Bar #	6	7	8	6	7	8	6	7	8	6	7	8	9	6	7	8	9	5	8	8	5	8	8	5	8	8	9	5	8	8	9	5	8	8	9
Steel c — Spacing	11	10	10	11	9½	10	11	9½	10	11	10	10	9	11	10	10	9	9	11½	9	9	11½	9	9	11	8½	9	11	8½	9	9	11	8½	9
Steel c — Length	10-6	10-6	10-6	10-6	10-6	10-6	10-6	10-7	10-7	10-7	10-7	10-7	10-8	10-9	10-9	10-8	10-9	10-10	12-6	12-8	12-7	12-7	12-7	12-8	12-8	12-8	12-9	12-9	12-9	12-10	12-9	12-9	12-10	12-11	13-0
Reinforcing "d" Dist Top Slab-Tot No	18	10	10	18	10	10	18	10	10	18	10	10	10	18	10	10	10	24	10	10	24	10	10	24	10	10	24	10	10	10	24	10	10	10
Reinforcing Bars Bottom Slab-Tot No	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Reinforcing "e" Bars Size Bar #	4	4	5	4	4	5	4	4	6	4	5	6	7	4	6	6	7	4	4	5	4	4	5	4	4	5	4	5	7	8	4	7	8	8	6	7	8	9
Reinforcing Bars Spacing	18	10	10	18	6	6½	14	6	8	11	8½	6	6	7½	7	5½	5	18	8	8	15	6	6½	12	5½	6	9	7½	8½	8	8½	11	8½	9	12	8	7	7
Spacers Number	48			48			51			54			64	68				52			55			68			68			72			76		
Quant. Concrete C.Y. per lin ft.	.140	.205	.246	.145	.207	.248	.151	.218	.264	.160	.227	.274	.304	.192	.251	.308	.341	.184	.259	.316	.197	.277	.328	.212	.293	.356	.398	.228	.315	.369	.414	.252	.329	.384	.430	.473
Quant. Reinf. Lbs per lin ft	236	254	310	236	274	324	243	280	339	252	278	355	430	279	327	400	476	309	317	401	316	330	415	336	363	460	345	374	485	578	351	394	519	582	371	427	567	673
Hydraulics Area A	100			120			140			160			200	144				168			192			216			240			288					
Hydraulics Hydraulic Radius R	1.67			1.88			2.06			2.22			2.50	2.00				2.21			2.40			2.57			2.73			3.00					
Hydraulics Neutral Slope %	0.49			0.51			0.52			0.54			0.58	0.46				0.48			0.49			0.51			0.52			0.56					
Hydraulics Head Factor k	0.238			0.205			0.183			0.165			0.143	0.189				0.167			0.151			0.138			0.128			0.114					
Hydraulics Entrance Capacity Q_{ip}	690			906			1142			1396			1932	1088				1372			1676			2000			2340			3080					
Hydraulics Design Discharge Q_{max}	1136			1494			1882			2300			3220	1792				2260			2760			3300			3860			5080					

Note

For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities

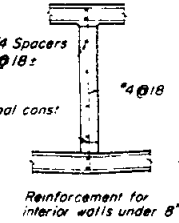
For culverts at grade, extend "c" bars full length, top slab only, provide additional spacers @18± and adjust quantities



TYPICAL SECTION

(Showing reinforcement for interior walls 8" and over)

Provide paving notch for culverts at grade where PCC approach paving is used



Reinforcement for interior walls under 8'

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT

STANDARD DRAWING

STANDARD DOUBLE BOX CULVERTS

APPROVED BY D. X. Sloan COUNTY SURVEYOR R.C.E. 8091

DATE: 4/16/64

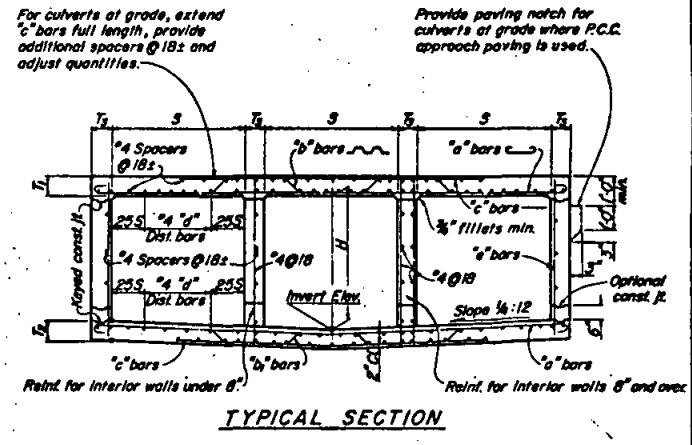
DRAWING No. 141-1

141 - 1

SPAN	4'									5'										6'										8'									
HEIGHT	2'			3'			4'			2'			3'			4'			5'		3'			4'			5'			6'			4'			5'			6'			7'			8'		
STRENGTH CLASSIFICATION	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP	10	24	38	10	24	38	10	24	38	8	17	28	8	17	28	8	17	28	33	8	17	26	33	5	13	23	3	13	23	30	5	13	23	30	2	11	20	2	11	20	2	11	20	28	2	11	20	28
Conc. Top Slab T_1	6½	6¼	7¼	6¼	6¼	7¼	6¼	6¼	7¼	6¾	6¾	7½	6¾	6¾	7½	6¾	6¾	7½	8½	6¾	6¾	7½	8½	7½	7½	8¼	7½	7½	8¼	9¼	7½	7½	8¼	9¼	8¼	8¼	10¼	8¼	8¼	10¼	8¼	8¼	10¼	11½	9¼	8¼	10¼	11½
Conc. Bottom Slab T_2	6	7	8¼	6	7	8¼	6	7	8¼	6¼	7¼	8½	6¼	7¼	8½	6¼	7¼	8½	9½	6¼	7¼	8½	9½	6	7½	9¼	6	7½	9¼	10	6	8	9¼	10	6½	8	9¼	11	6½	9¼	11	6½	9¼	11	12¼	9¼	11	12¼
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6½	6½	7	7
Steel Reinforcing "a" Size: Bar #	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	6	5	5	6	5	5	6	5	5	6	6	5	5	6
Steel Reinforcing "a" Spacing	11	11½	13	11	11½	13	11	11½	13	10	11½	13	10	11½	13	10	11	13	13½	10	11	13	13½	13	14	11½	13	14	11½	13	14	11½	13	14	11½	10	13	14	11½	10	11½	12	12	11½	12	12	11½	12	12	10½
Steel Reinforcing "a" Length	14-9	14-8	14-8	14-9	14-8	14-8	14-9	14-8	14-8	17-9	17-8	17-8	17-9	17-8	17-8	17-9	17-8	17-8	17-9	17-9	17-8	17-8	17-9	17-9	17-8	17-8	17-9	17-9	17-8	17-8	17-9	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0
Steel Reinforcing "b" Size: Bar #	5	5	6	5	5	6	5	5	6	5	5	6	5	5	6	5	5	6	6	5	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	6	6	7	6	6	7	7	6	6	7
Steel Reinforcing "b" Spacing	11	11½	13	11	11½	13	11	11½	13	10	11½	13	10	11½	13	10	11	13	13½	10	11	13	13½	13	14	11½	13	14	11½	13	14	11½	10	13	14	11½	10	11½	12	12	11½	12	12	11½	12	12	11½	12	12	10½
Steel Reinforcing "b" Length "b_1"	14-2	14-2	14-3	14-2	14-2	14-3	14-2	14-2	14-3	17-3	17-3	17-3	17-3	17-3	17-3	17-3	17-3	17-3	17-5	17-3	17-3	17-3	17-5	20-3	20-3	20-6	20-3	20-3	20-5	20-5	20-3	20-3	20-5	20-6	20-3	20-3	20-5	20-6	26-5	26-5	26-7	26-5	26-5	26-7	26-5	26-5	26-7	26-5
Steel Reinforcing "b" Length "b_2"	14-0	14-0	14-5	14-0	14-0	14-5	14-0	14-0	14-5	17-0	17-0	17-2	17-0	17-0	17-2	17-0	17-0	17-2	17-4	17-0	17-0	17-2	17-4	17-5	20-0	20-2	20-0	20-0	20-2	20-5	20-0	20-0	20-2	20-5	20-0	20-0	20-2	20-5	26-0	26-0	26-4	26-1	26-0	26-4	26-7	26-0	26-5	26-1
Reinforcing Steel "d" Dist Bars Top Slab-Tot. No	15	9	9	15	9	9	15	9	9	18	9	9	18	9	9	18	9	9	9	18	9	9	9	18	9	9	18	9	9	9	18	9	9	9	18	9	9	9	24	12	12	24	12	12	24	12	12	12
Reinforcing Steel "d" Dist Bars Bottom Slab-Tot. No.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	12	12	12	12	12	12	12	12	12	12
Reinforcing Steel "e" Bars Size: Bar #	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	5	4	4	4	5	4	4	4	4	4	4	5	4	4	4	5	4	5	6	4	4	6	7	7	4	6	7	7	4	6
Reinforcing Steel "e" Bars Spacing	18	18	18	18	18	13	18	11½	13	18	18	18	18	18	18	18	17	11½	11½	18	11	7	11½	18	18	18	18	18	11½	18	11½	12	10	18	8	12	10	18	18	12	18	12	12	18	12	12	11½	12	12	10½
Spacers Number	34			36			42			34			38			38			42	40			44			48			58			62			66			70			88							
Concrete: C.Y. per lin ft.	0.67	0.71	0.81	0.75	0.79	0.89	0.82	0.86	0.96	0.82	0.87	0.96	0.90	0.95	1.05	0.97	1.02	1.13	1.23	1.04	1.11	1.20	1.31	1.03	1.15	1.29	1.12	1.23	1.37	1.19	1.32	1.44	1.55	1.27	1.39	1.52	1.64	1.47	1.67	1.99	1.54	1.76	2.06	1.62	1.84	2.14	1.71	1.91	2.26	2.57	1.90	2.10	2.46	2.79
Quant. Reinf. : Lbs per lin. ft.	122	110	133	127	115	138	131	122	147	150	126	153	155	130	157	157	136	161	181	161	143	171	192	181	168	196	183	170	200	187	177	209	235	192	187	221	249	261	250	301	266	257	310	287	264	320	276	271	336	409	283	295	347	441
Hydraulics Area A	24			36			48			30			45			60			75	54			72			90			108			96			120			144			168			192					
Hydraulic Radius R	.67			.86			1.00			.71			.94			1.11			1.23	1.00			1.20			1.36			1.50			1.33			1.54			1.71			1.87			2.00					
Hydraulics Neutral Slope %	.64			.70			.77			.59			.62			.67			.73	.56			.59			.62			.68			.52			.54			.56			.59			.62					
Head Factor k	.75			.55			.45			.69			.49			.39			.34	.450			.358			.305			.271			.314			.262			.229			.206			.189					
Entrance Capacity Q_{ie}	103			192			257			129			240			369			516	288			444			621			816			591			828			1086			1371			1674					
Design Discharge Q_{des}	174			321			489			213			396			609			852	477			732			1023			1344			978			1365			1791			2259			2763					

SPAN	10'															12'																								
HEIGHT	5'			6'			7'			8'				10'				6'			7'			8'			9'			10'				12'						
STRENGTH CLASSIFICATION	A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	A	B	C	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP	2	11	20	2	11	20	2	11	20	2	11	20	28	2	11	20	28	2	10	18	2	10	18	2	11	20	30	2	11	20	30	2	11	20	30	2	11	20	30
Conc. Top Slab T_1	9	10	12	9	10	12	9	10	12	9	10	12	14½	9	10¼	12½	14½	10¼	11½	14	10¼	11½	14	10¼	11½	14	10¼	12	14½	17½	10¼	12	14¼	17½	10¼	12	14¼	17½	10¼	12	14¼	17½
Conc. Bottom Slab T_2	7½	10¾	13	7½	10¾	13	7½	10¾	13	7¾	11	13	15	8	11	13½	15	8¼	12	14½	8¼	12	14¾	8¼	12	15	18¼	8¼	12½	15¼	18¼	8¼	12½	15¼	18¼	8¾	12	15¾	18¾
Conc. Sidewalls T_3	6	6	6	6	6	6	6	6	6	6½	7	7	7½	8	8¼	9	10	6	6	6½	6	6	7	7	7	7½	8	8	8	9	10¼	8	8	9	10¼	9	9	10¼	12
Steel Reinforcing "a" Size: Bar #	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	6	7	7	6	7	7	6	7	7	6	7	8	7	8	7	8	7	8	7	8	7	8
Steel Reinforcing "a" Spacing	10½	13	10	10½	13	10	10½	13	10	10½	13	10	11	10½	13	10	11	12	11	11½	12	11	11½	12	11	11½	12	10½	11	11½	12	10½	11	11½	12	10½	11	11½	12
Steel Reinforcing "a" Length	32-0	32-0	32-0	32-0	32-0	32-0	32-0	32-0	32-0	33-0	33-2	33-2	33-4	33-6	33-6	33-8	34-0	34-2	35-7	38-0	38-0	39-0	39-2	39-7	39-10	39-0	39-5	39-2	39-7	39-10	39-0	39-5	39-2	39-7	39-10	40-0	40-4	40-1	40-0	40-7	41-6
Steel Reinforcing "b" Size: Bar #	6	7	7	6	7	7	6	7	7	6	7	7	8	6	7	7	8	7	7	8	7	7	8	7	7	8	9	7	7	8	9	7	7	8	9	7	7	8	9
Steel Reinforcing "b" Spacing	10½	13	10	10½	13	10	10½	13	10	10½	13	10	11	10½	13	10	11	12	11	11½	12	11	11½	12	11	11½	12	10½	11	11½	12	10½	11	11½	12	10½	11	11½	12
Steel Reinforcing "b" Length "b_1"	32-6	32-7	32-10	32-6	32-7	32-10	32-6	32-7	32-10	33-0	33-0	33-2	33-4	33-1	33-2	33-6	33-11	34-0	36-7	38-7	38-9	39-5	39-7	38-7	38-9	39-5	39-7	39-3	39-6	40-0	40-4	39-3	39-6	40-0	41-0	39-7	39-10	40-0	40-4	41-6
Steel Reinforcing "b" Length "b_2"	32-2	32-7	32-11	32-2	32-7	32-11	32-2	32-7	32-11	33-1	32-6	32-11	33-5	33-1	32-11	33-6	33-11	34-6	36-3	38-7	39-2	39-3	39-8	39-7	39-7	39-7	39-10	39-3	39-6	40-0	40-4	39-0	39-6	40-0	41-0	39-4	39-10	40-0	40-9	41-8
Reinforcing Steel "e" Bars Size: Bar #	5	7	7	5	7	7	5	7	7	5	7	7	8	5	7	7	8	6	7	8	6	7	8	6	7	8	9	6	7	8	9	7	7	8	9	7	7	8	9
Reinforcing Steel "e" Bars Spacing	10½	13	10	10½	13	10	10½	15	10	10½	13	10	11	10½	13	10	11	12	11	11½	12	11	11½	12	11	11½	12	10½	11	11½	12	10½	11	11½	12	10½	11	11½	12
Reinforcing Steel "e" Bars Spacers Number	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-1	21-2	21-2	21-2	21-3	21-5	21-4	21-6	21-6	21-8	25-0	25-0	25-1	25-0	25-0	25-2	25-2	25-6	25-3	25-4	25-4	25-6	25-9	25-6	25-4	25-4	25-6	25-9	25-6	25-6	25-9	26-0
Reinforcing Steel "d" Dist Bars Top Slab-Tot. No.	27	15	15	27	15	15	27	15	15	27	15	15	15	27	15	15	15	36	15	15	36	15	15	36	15	15	15	36	15	15	15	36	15	15	15	36	15	15	15
Reinforcing Steel "d" Dist Bars Bottom Slab-Tot. No.	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	18	18	18	18	15	15	15	15
Reinforcing Steel "e" Bars Size: Bar #	4	4	5	4	5	6	4	6	7	4	6	7	8	5	6	8	8	4	4	6	4	4	6	4	4	6	7	8	5	7	8	8	6	7	9	8				
Reinforcing Steel "e" Bars Spacing	18	13	10	18	13	10	13	13	10	10½	12	10	11	10½	9	10	9	18	7	11½	12	5¾	11½	12	5¾	9	10	10½	11	11½	12	10½	11	6½	12	9	11	9			
Spacers Number	68			68			72			76			94	102				76			80			84			104			110				116						
Concrete: C.Y. per lin. ft.	1.98	2.40	2.82	2.06	2.48	2.90	2.13	2.55	3.03	2.34	2.77	3.25	3.76	2.68	3.18	3.73	4.22	2.60	3.10	3.62	2.70	3.26	3.96	2.88	3.45	4.13	3.13	3.79	4.61	5.45	3.23	3.89	4.72	5.65	3.62	4.26	5.24	6.18				
Reinf. :Lbs per lin. ft.	358	372	470	359	379	482	367	391	502	377	402	514	590	421	453	577	652	489	503	626	497	516	657	505	527	654	536	562	719	872	546	606	745	939	573	636	793	963				
Hydraulics Area A	150			180			210			240				300				216			252			288			324			360				432						
Hydraulic Radius R	1.87			1.88			2.06			2.22				2.50				2.00			2.21			2.40			2.57			2.73				3.00						
Hydraulics Neutral Slope %	.49			.51			.52			.54				.58				.46			.48			.49			.51			.52				.56						
Head Factor k	.238			.205			.189			.165				.143				.189			.167			.151			.138			.128				.114						
Entrance Capacity Q_{ie}	1035			1359			1713			2094				2928				1629			2058			2514			3000			3510				4620						
Design Discharge Q_{des}	1704			2241			2823			3450				4830				2688			3390			4140			4950			5790				7620						

Note:
For bores of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.



TYPICAL SECTION

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

STANDARD TRIPLE BOX CULVERTS

APPROVED BY: [signature] COUNTY SURVEYOR R.C.E. 8007
DATE: 8/20/64

DRAWING Nº 142-1

142-1

DESIGN NOTES

SPECIFICATIONS:

DESIGN: A.A.S.H.O. DATED 1957 WITH REVISIONS AND AS SUPPLEMENTED BY BRIDGE PLANNING AND DESIGN MANUAL.

SECTIONS DESIGNED FOR CULVERT IN A TRENCH ON HARD FOUNDATION, OR CULVERT UNTRENCHED ON YIELDING FOUNDATION. FOR CULVERTS ON PILES OR ROCK FOUNDATIONS SPECIAL DESIGN WILL BE REQUIRED.

LOADING:

LIVE LOAD = H20-S16-44 OR ALTERNATIVE WITH 30% IMPACT FOR ALL COVER DEPTHS. NEGLECT LIVE LOAD WHEN ON SINGLE SPANS, COVER IS MORE THAN 8' AND EXCEEDS SPAN, AND ON MULTIPLE SPANS WHEN COVER EXCEEDS DISTANCE BETWEEN EXTERIOR WALLS.

CULVERTS AT GRADE TREATED AS A BRIDGE, WITH THE WHEEL LOAD ON THE INVERT SLAB DISTRIBUTED OVER 7.5' TRANSVERSELY AND THE BREADTH OF THE CULVERT LONGITUDINALLY.

WHEEL LOADS DISTRIBUTED UNIFORMLY OVER A SQUARE, THE SIDES OF WHICH ARE 1.75 TIMES THE DEPTH OF FILL, BUT NOT LESS TRANSVERSELY THAN THE DIMENSION FOR GRADE TOP ON THE TOP SLAB, AND NOT LESS THAN 7.5' ON THE INVERT SLAB. WHEN SUCH AREAS FROM SEVERAL CONCENTRATIONS OVERLAP, THE TOTAL LOAD SHALL BE CONSIDERED AS UNIFORMLY DISTRIBUTED OVER THE AREA DEFINED BY THE OUTSIDE LIMITS OF THE INDIVIDUAL AREAS, BUT THE TOTAL WIDTH SHALL NOT EXCEED THE TOTAL WIDTH OF THE SUPPORTING SLAB.

DEAD LOAD: EARTH LOAD OF 120 LBS PER CU. FT. AND AN EQUIVALENT FLUID PRESSURE OF 36 LBS. PER SQ. FT. (BOTH REDUCED 30% FOR BALANCED DESIGN).
DISTRIBUTION OF WHEEL AT GRADE, E = .1755 + 3.2

UNIT STRESSES: F_s = 20,000 P.S.I., N = 10
F_c = 1,200 P.S.I.

REINFORCEMENT EMBEDMENT IS 1 1/2" DIA. CLEAR, MIN 1", EXCEPT AS NOTED.

DISTRIBUTION "d" BARS EXPRESSED AS A % OF MAIN REINFORCEMENT:

CLASSIFICATION "A" TOP SLAB = $\frac{100}{\sqrt{SPAN}}$, MAX. 50 %

CLASSIFICATION "A" BOTTOM SLAB = MIN. #4 @ 18

CLASSIFICATION "B", OR ABOVE, TOP AND BOTTOM SLABS MIN. #4 @ 18

CONSTRUCTION NOTES

SPECIFICATIONS: STANDARD SPECIFICATIONS, COUNTY OF SAN DIEGO, CURRENT EDITION AND SPECIAL PROVISIONS ACCOMPANYING PLANS.

EXPANSION JOINTS: NONE IN INVERT SLAB UNDER COVER LESS THAN SPAN LENGTH, PLACE 1/2" EXPANSION JOINT FILLER IN TOP SLAB AND SIDE WALLS IN DIVIDING STRIP OR OUTSIDE SHOULDER. UNDER COVER MORE THAN SPAN LENGTH, PLACE EXPANSION JOINTS IN TOP SLAB AND SIDE WALLS ONLY AT 30' ± CENTERS, AND ADDITIONAL JOINTS AS DIRECTED BY THE ENGINEER AT LOCATIONS OF CHANGE OF FOUNDATION CHARACTER.

CONSTRUCTION LOADS: CONSTRUCTION LOADS HEAVIER THAN LEGAL LOADS NOT PERMITTED UNTIL CONCRETE HAS REACHED A STRENGTH OF 3,000 P.S.I. AND STRUCTURE STRUTTED AND CUSHIONED AS DIRECTED BY THE ENGINEER.

LOCATION NOTES

HYDRAULICS: IF SLOPE OF NATURAL CHANNEL EXCEEDS "NEUTRAL SLOPE" OF CULVERT ENTRANCE, CAPACITY FOR 10 YEAR FLOOD (Q10) WILL USUALLY DETERMINE SIZE, OTHERWISE COMPUTE TOTAL HEAD = $\left(\frac{Q100}{BA}\right)^2 \left(\frac{1.06+KL}{100}\right)$, WHERE "h" IS HEAD FACTOR "A" IS AREA, "L" IS LENGTH OF CULVERT AND Q100 THE 100 YEAR FLOOD, AND COMPARE WITH ALLOWABLE HEAD, TABULATED ELEMENTS ARE FOR FULL NOMINAL SECTION.

DESIGNATION: SHOW ON PLANS AS SPAN X HEIGHT STRENGTH CLASSIFICATION X LENGTH: THUS 4 x 4 -A x 60', FOLLOWED BY ALTERNATIVES.

ALTERNATIVES: INVERT WILL BE SLOPED UNLESS "TRAPEZOIDAL INVERT", "FLAT INVERT" OR "V INVERT" IS INCLUDED IN DESIGNATION. ENDS OF CULVERT WILL BE ROUNDED UNLESS "SQUARE ENDS" ARE DESIGNATED. PARAPET ON CULVERTS WITH OVER 2' COVER WILL BE 0'-9" UNLESS "___ FT. PARAPET" IS DESIGNATED. SUCH DESIGNATIONS MAY BE DIFFERENT FOR INLET AND OUTLET ENDS.

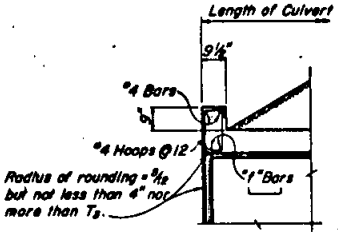
QUANTITIES: QUANTITIES ARE FOR ESTIMATING ONLY. THEY ARE FOR THE SLOPED INVERT SLAB AND DO NOT INCLUDE SPLICES IN LONGITUDINAL BARS NOR CONCRETE AND REINFORCEMENT FOR SPECIAL COVERAGE, NOR TEMPERATURE REINFORCEMENT FOR GRADE TOP CULVERT.

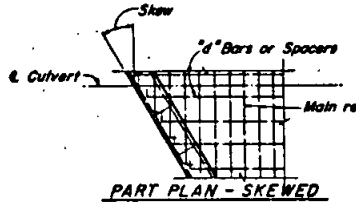
SPECIAL COVERAGE: WHERE CULVERTS ARE EXPOSED TO ACTION OF SALT WATER THICKNESS OF CONCRETE SHALL BE INCREASED TO PROVIDE 4" COVERAGE BETWEEN STEEL AND EXPOSED SURFACES. WHERE SCOUR IS ANTICIPATED, THICKNESS OF BOTTOM SLAB SHALL BE INCREASED TO PROVIDE 2" MINIMUM COVERAGE BETWEEN STEEL AND EXPOSED SURFACE.

USE OF STANDARD PLAN

"STRENGTH CLASSIFICATION", SYMBOLIZED BY THE LETTERS "A", "B", "C" ETC., AT THE TOP OF THE DATA TABLE IS MERELY A CONVENIENT DESIGNATION FOR A PARTICULAR STRUCTURAL SECTION FOR A CULVERT OF ANY GIVEN OPENING. IT IS DICTATED BY THE COVER OR DEPTH OF FILL OVER THE TOP SLAB.

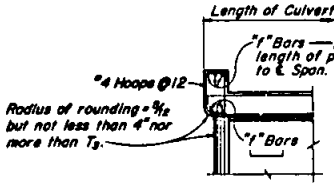
DUPLICATED FROM STATE STANDARD DRAWING NO. B-33
RECOMMENDED BY 7/31/57 6/13/58
H. J. Mansfield 6/13/58

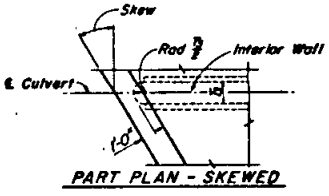




PART PLAN - SKEWED

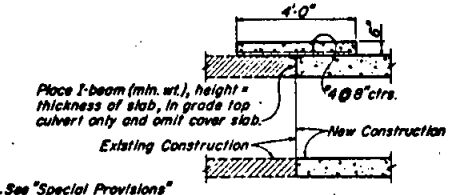
PARAPET DETAILS FOR SINGLE SPAN CULVERTS





PART PLAN - SKEWED

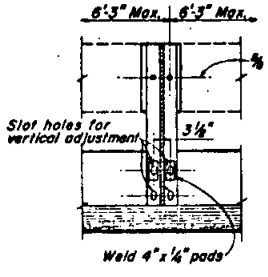
PARAPET DETAILS FOR MULTIPLE SPAN CULVERTS



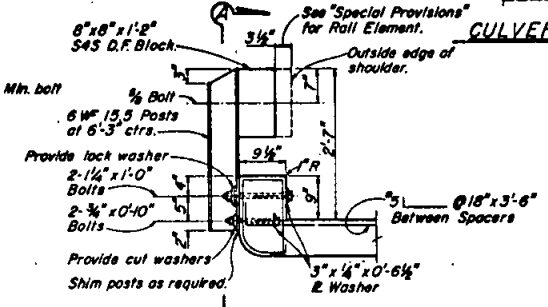
CULVERT EXTENSION

SKEWED PARAPETS								
Skew Angle	Span	3	4	5	6	8	10	12
0°-15°	Bar No.	4	4	5	6	6	7	8
	No. of bars	2	2	2	2	3	3	3
16°-30°	Bar No.	4	4	5	6	7	8	8
	No. of bars	2	3	3	3	3	3	3
31°-45°	Bar No.	4	4	6	6	7	8	8
	No. of bars	3	3	3	3	3	3	3
0°-45°	#4 Hoops	12" ctrs.						

"d" Bars



SECTION A-A
Scale: 1" = 1'-0"



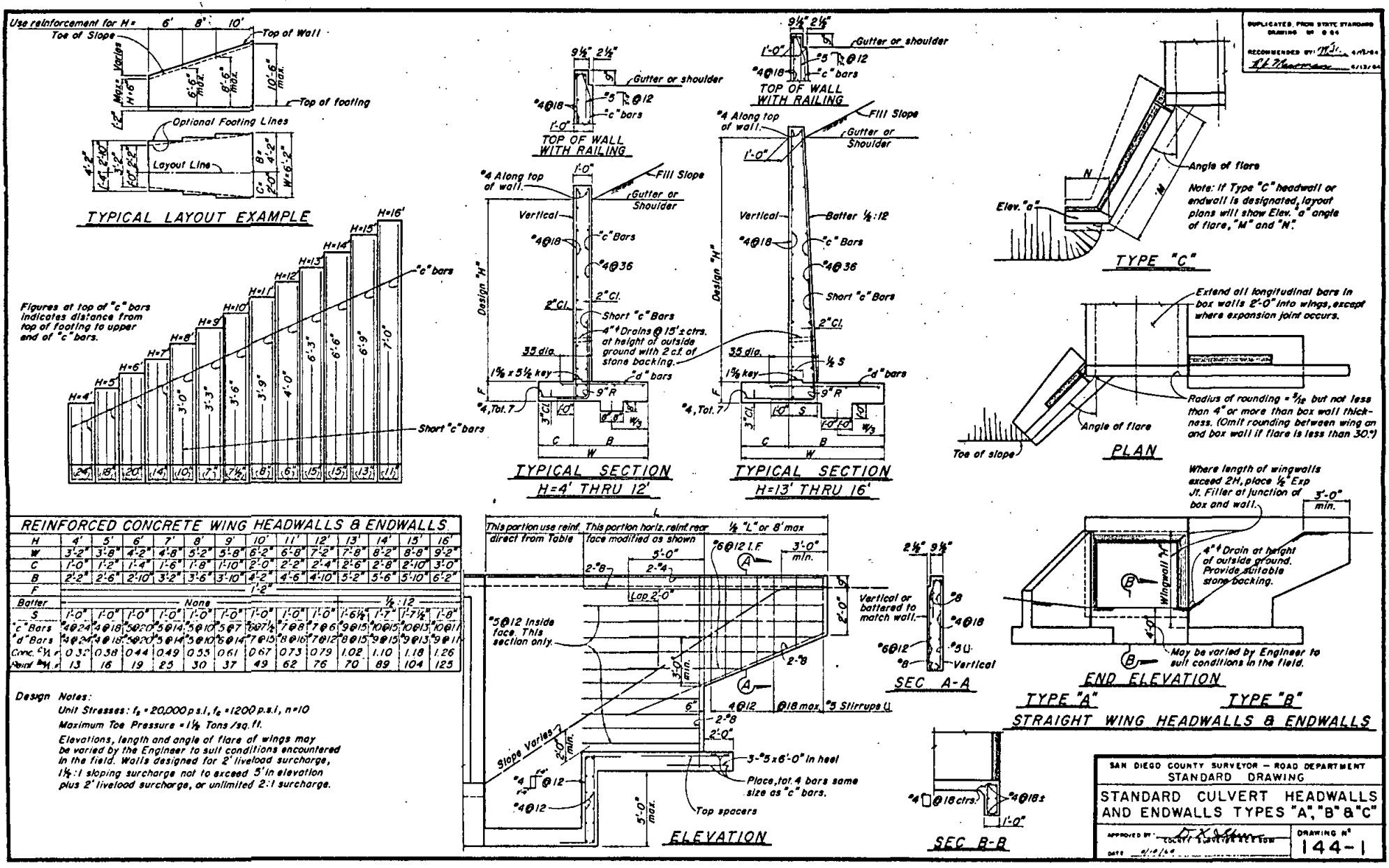
RAILING DETAILS
Scale: 1" = 1'-0"

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

STANDARD BOX CULVERT MISCELLANEOUS DETAILS

APPROVED BY: [signature] COUNTY SURVEYOR & ex-officio ROAD COMMISSIONER
DATE: 6/18/58
DRAWING NO. 143-1

143-1



REINFORCED CONCRETE WING HEADWALLS & ENDWALLS

H	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
W	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	7'-8"	8'-2"	8'-8"	9'-2"
C	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	2'-8"	2'-10"	3'-0"
B	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	4'-10"	5'-2"	5'-6"	5'-10"	6'-2"
F	1'-2"												
Batter	None											1/2 : 12	
S	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6 1/2"	1'-7"	1'-7 1/2"	1'-8"
"c" Bars	#4@24	#4@18	#5@20	#5@14	#5@10	#5@7	#6@7 1/2	#7@8	#7@6	#9@15	#10@15	#10@13	#10@11
"d" Bars	#4@24	#4@18	#5@20	#5@14	#5@10	#6@14	#7@15	#8@16	#7@12	#8@15	#9@15	#9@13	#9@11
Conc. C.Y./ft.	0.32	0.38	0.44	0.49	0.55	0.61	0.67	0.73	0.79	1.02	1.10	1.18	1.26
Reinf. lbs./ft.	13	16	19	25	30	37	49	62	76	70	89	104	125

Design Notes:

Unit Stresses: $f_s = 20{,}000$ p.s.i, $f_c = 1200$ p.s.i, $n = 10$

Maximum Toe Pressure = 1 1/2 Tons /sq. ft.

Elevations, length and angle of flare of wings may be varied by the Engineer to suit conditions encountered in the field. Walls designed for 2' liveload surcharge, 1 1/2 : 1 sloping surcharge not to exceed 5' in elevation plus 2' liveload surcharge, or unlimited 2:1 surcharge.

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

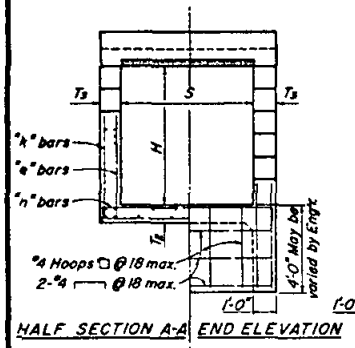
STANDARD CULVERT HEADWALLS AND ENDWALLS TYPES "A", "B" & "C"

APPROVED BY: COUNTY SURVEYOR & ROAD COMMISSION
DATE: 6/12/64

DRAWING NO. 144-1

144-1

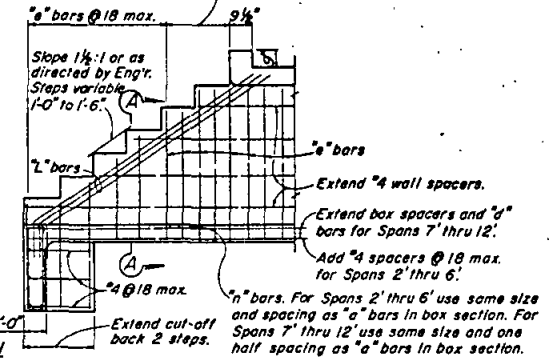
Note: Dimensions S, H, T_E and T_S to be same as adjacent box.



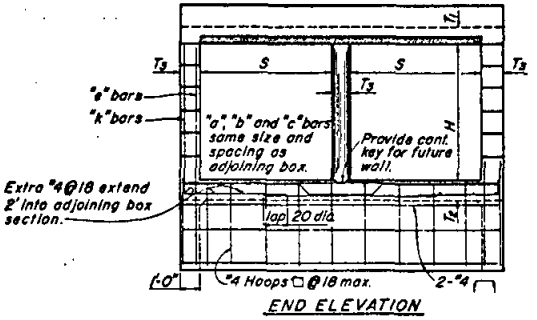
HALF SECTION A-A END ELEVATION

SINGLE BOX

In first two steps "e" bars cont'd. from box at same spacing.



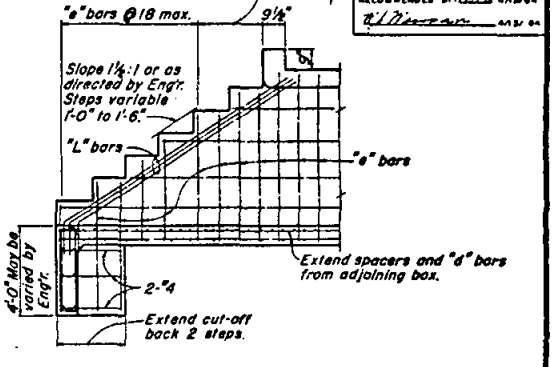
LONGITUDINAL SECTION
(Showing reinforcement in inside face)



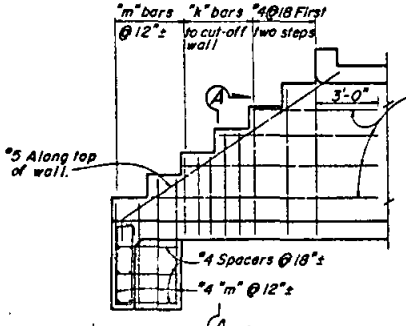
END ELEVATION

MULTIPLE BOXES

In first two steps "e" bars cont'd. from box at same spacing.



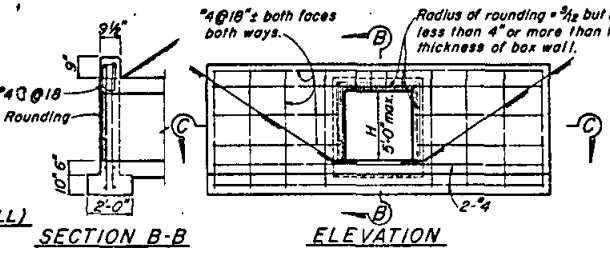
LONGITUDINAL SECTION
(Showing reinforcement in inside face)



LONGITUDINAL SECTION
(Showing reinforcement in outside face)

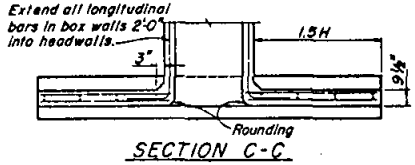
TYPE "E" (STEPPED HEADWALL OR ENDWALL)

Table of Reinforcement for Type "E" Walls									
H		3'	4'	5'	6'	7'	8'	10'	12'
"k" Bars	Bar No.	4	4	5	5	5	5	5	5
	Spacing	12	12	12	10	9	8	7	6
"L" Bars	Bar No.	5	5	6	6	7	7	7	7
	Number ea. wall	2	2	3	3	3	3	3	3



SECTION B-B

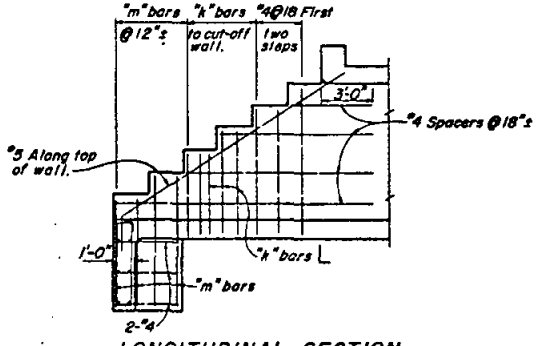
ELEVATION



SECTION C-C
TYPE "D"

STRAIGHT HEADWALL AND ENDWALLS

Details similar for multiple span boxes.



LONGITUDINAL SECTION
(Showing reinforcement in outside face)

TYPE "E" (STEPPED HEADWALL OR ENDWALL)

DUPLICATES FROM STATE STANDARD DRAWING NO. B-85
RECOMMENDED BY: [signature] 6/25/64
[signature] 6/25/64

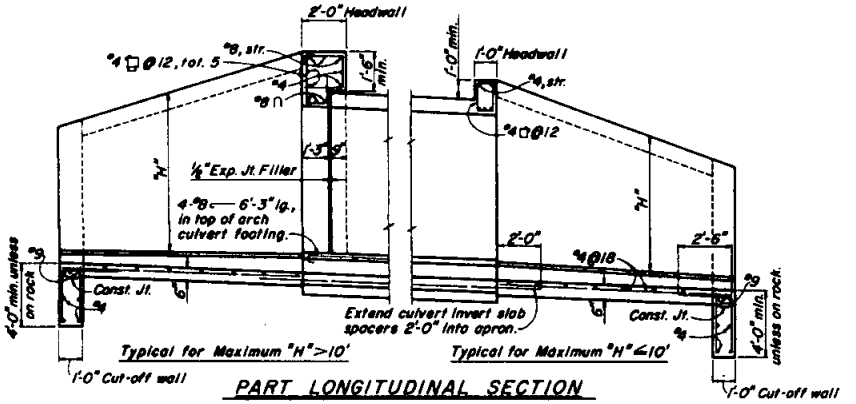
SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

STANDARD CULVERT HEADWALLS AND ENDWALLS TYPES "D" AND "E"

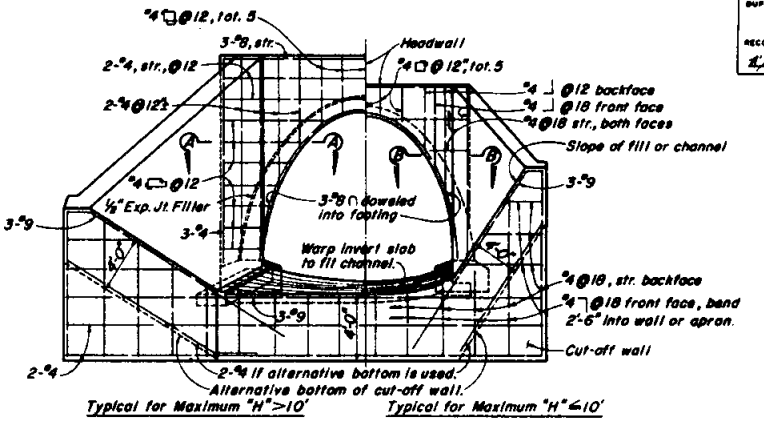
APPROVED BY: [signature] COUNTY SURVEYOR R.C.E. 8081
DATE: 6/26/64

DRAWING NO. 145-1

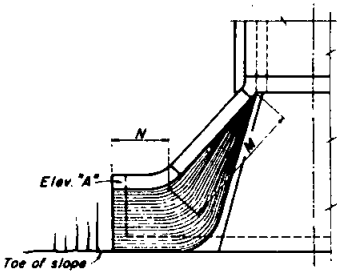
145-1



PART LONGITUDINAL SECTION

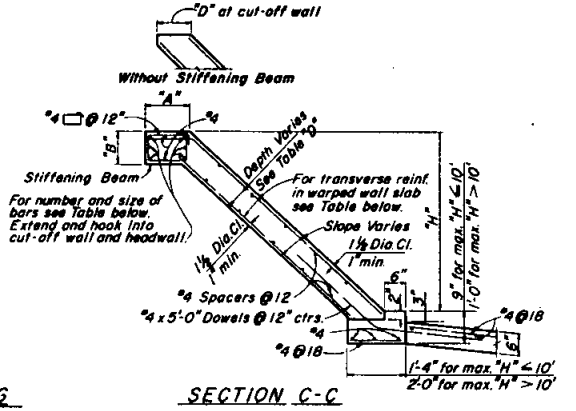


END ELEVATION

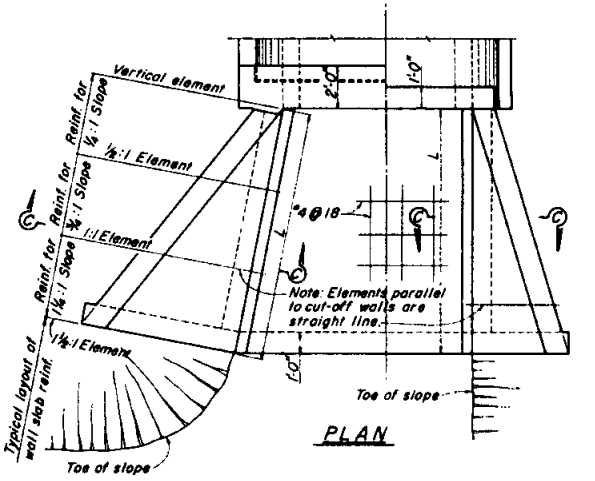


ALTERNATIVE WARPED WING

(Use where additional protection to toe of embankment is required)

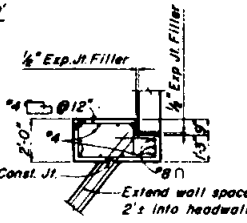


SECTION C-C

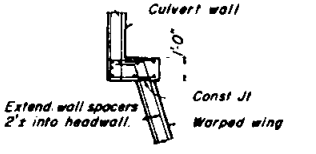


PLAN

Note: Details similar for box culverts.



SECTION A-A



SECTION B-B

WARPED WINGWALLS

WALL SLAB DIMENSIONS AND REINFORCING									STIFFENING BEAM DIMENSIONS & REINFORCING										
Element Slope	H	8' or less	10'	12'	14'	16'	18'	20'	H L max	12'	14'	16'	18'	20'	25'	30'	35'	40' or more
1/4 :1	Front face reinf.	#4@12	#4@7	#5@7	#5@5	#6@6	#7@7	#7@6	6'	No beam. Place 2-#6 in each face along top of wall								
	Rear face reinf.	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	8'									
3/8 :1	Front face reinf.	#4@12	#4@12	#4@12	#4@12	#4@10	#4@8	#4@6	10'		A=1'-0"							
	Rear face reinf.	#4@12	#4@12	#4@12	#4@10	#4@7	#4@6	#5@8	12'		B=9"				A=1'-6"			
1/4 :1	Front face reinf.	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	14'		Tot. 6-#6				B=1'-0"	A=1'-10"		
	Rear face reinf.	#4@8	#4@8	#4@5	#5@6	#6@7	#6@6	#7@6	16'			Tot. 6-#7			B=1'-0"	A=2'-0"		
Slab at Cut-off Wall "D"		6"	6"	6"	7 1/2"	8"	9 1/2"	11"	18'				Tot. 6-#8		B=1'-6"			
Slab at Headwall "D"		6"	6"	6"	8"	9 1/2"	11"	1'-1"	20'					Tot. 8-#9				

Note Walls designed for 2' surcharge; earth load = 120 #/cu. ft.; equivalent fluid pressure = 36 #/cu ft.
Vary depth of warped slab uniformly from depth at cut-off wall to that at headwall.

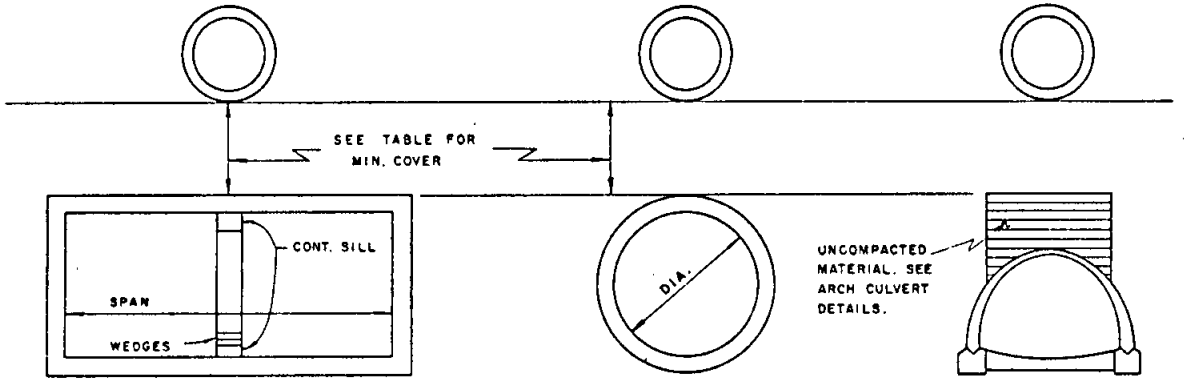
SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

STANDARD REINFORCED CONCRETE WARPED WINGHEADWALLS & ENDWALLS

DRAWING N° 146-1

146-1

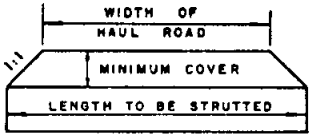
DUPLICATED FROM STATE STANDARD
DRAWING Nº D 88
RECOMMENDED BY: A.S.H.O. 8/64
R. J. Mossman 8-25 /64



BOX CULVERTS

R.C. PIPES & METAL CULVERTS

R.C. ARCH CULVERTS



MINIMUM LENGTH OF STRUTTING

		18—50K AXLE					50—75K AXLE					75—110K AXLE					110—150K AXLE				
	CLASSIFICATION	SPAN	TYPE	MIN. COVER	STRUTS REQ'D.	STRUT SIZE & SPACING	SPAN	TYPE	MIN. COVER	STRUTS REQ'D.	STRUT SIZE & SPACING	SPAN	TYPE	MIN. COVER	STRUTS REQ'D.	STRUT SIZE & SPACING	SPAN	TYPE	MIN. COVER	STRUTS REQ'D	STRUT SIZE & SPACING
BOX CULVERTS	A	2'TO 5'	SINGLE	4'	—	—	2' TO 5'	SINGLE	5'	—	—	2' TO 4'	SINGLE	3'	—	—	2'TO 4'	SINGLE	4'	—	—
	A	6'	SINGLE	5'	—	—	6	SINGLE	5'	1/2 PT.	POSTS 4x6@3 SILLS 4x6, CONT.	5' TO 6	SINGLE	5'	1/3 PTS.	POSTS 4x6@ 3' SILLS 4x6 CONT.	5' TO 6'	SINGLE	5'	1/3 PTS.	POSTS 4x6@ 3 SILLS 4x6, CONT.
	A	7'TO 8'	SINGLE	5'	—	—	7' TO 8'	SINGLE	5'	—	—	7' TO 8'	SINGLE	5'	—	—	7' TO 8'	SINGLE	5'	1/4 PTS.	POSTS 4x6@ 3' SILLS 4x6, CONT.
	A	10'TO12'	SINGLE	5'	—	—	10'TO12'	SINGLE	5'	—	—	10'TO12'	SINGLE	5'	1/5 PTS.	POSTS 6x6@3'-6" SILLS 6x6, CONT.	10'TO12'	SINGLE	5'	1/5 PTS.	POSTS 6x6@3' SILLS 6x6 CONT.
	A	14'	SINGLE	3'	—	—	14'	SINGLE	3'	1/5 PTS.	POSTS 6x6@3'-6" SILLS 6x8 CONT.	14'	SINGLE	3'	1/5 PTS.	POSTS 6x8@3'-6" SILLS 6x8, CONT.	14'	SINGLE	4'	1/5 PTS.	POSTS 6x8@3'-6" SILLS 6x8 CONT.
	A	4'TO12'	MULTIPLE	5'	—	—	4'TO12'	MULTIPLE	5'	—	—	4'TO12'	MULTIPLE	5'	—	—	4'TO 12'	MULTIPLE	5'	—	—
	B, C, D, E.	ALL	ALL	SPAN/1.75 OR 5' MIN.	—	—	ALL	ALL	SPAN/1.75 OR 5' MIN.	—	—	ALL	ALL	SPAN/1.75 OR 5' MIN	—	—	ALL	ALL	SPAN/1.75 OR 5' MIN.	—	—
R.C. PIPES	12" TO 39"	MIN. COVER = 2'					MIN. COVER = 3'					MIN. COVER = 4'					MIN. COVER = 4'				
	42" TO 108"	DIA./1.75 OR 4' MIN.					DIA./1.75 OR 4' MIN.					DIA./1.75 OR 4' MIN.					DIA./1.75 OR 4' MIN.				
METAL CULVERTS	PIPES	TO 120"	MIN. COVER = 2'				MIN. COVER = 2'					DIA./3 OR 2' MIN.					DIA./3 OR 3' MIN.				
		OVER 120"	DIA./5 OR 2' MIN.				DIA./5 OR 2' MIN.					DIA./3 OR 4' MIN.					DIA./3 OR 4' MIN.				
	ARCHES, PIPE—ARCHES.	ALL SPAN	SPAN/7 OR 2' MIN.				SPAN/7 OR 2' MIN.					SPAN/3 OR 2' MIN.					SPAN/3 OR 3' MIN.				
R.C. ARCH CULVERTS	SPANS TO 14'	SPAN/2.5 OR 4' MIN.					SPAN/2.5 OR 4' MIN.					SPAN/2.5 OR 4' MIN.					SPAN/2.5 OR 4' MIN.				
	SPANS TO 22'	SPAN/3.5 OR 5' MIN.					SPAN/3.5 OR 5' MIN.					SPAN/3.5 OR 5' MIN.					SPAN/3.5 OR 5' MIN.				

NOTES: 1. LIMITS OF STRUTTING TO BE DETERMINED BY ENGINEER, BUT SHALL NOT BE LESS THAN AS SHOWN IN SKETCH. REFERENCE— STATE OF CALIFORNIA STD. BOX CULVERTS DATED OCT. 4, 1960.

ASSUMED TIRE PATTERNS _____:

50 K AXLE 8.0' x 1.5'
75 K AXLE 8.0' x 8.0'
110 K AXLE 8.0' x 8.8'
150 K AXLE 8.0' x 9.0'

2. IMPACT = 50%
TIMBER POSTS & SILLS TO BE D.F., 1450 F.
SILLS TO BE GLUED-LAMINATED OR SOLID TIMBERS.

3. ALL STRUTTING AND REMOVAL TO BE AT EXPENSE OF THE CONTRACTOR.

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

STANDARD CONSTRUCTION LOADS ON CULVERTS

APPROVED BY: [illegible] DRAWING Nº 147-1
DATE: [illegible]

147-1

MAX. SAFE HEIGHTS OF OVERFILLS AND GAGE FOR FACTORY-RIVETED CORRUGATED METAL PIPE

Diameter inches (round pipe)	Heights of Overfills in feet: less than 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 60	60 to 70	70 to 80	80 to 100	Span & rise inches (arch pipe)
	Min. required gage												
18	16	16	16	16	16	16	14	14	14	12	12	12	18 x 11
21	16	16	16	16	16	14	14	14	12	12	12	10	
24	14	14	14	14	14	14	14	12	12	12	10	10	22 x 13
30	14	14	14	14	12	12	12	10	10	10	8	8	29 x 18
36	12	12	12	12	10	10	10	8	8	8	8	8	36 x 22
42	12	12	12	10	10	8	8	8	8	8	8	8	
48	12	12	12	10	10	8	8	8	8	8	8	8	43 x 27
54	12	12	10	10	10	8	8	8	8	8	8		50 x 31
60	10	10	10	8	8	8							58 x 36
66	10	10	8	8									65 x 40
72	10	8	8	8									72 x 44
78	8	8	8										
84	8	8											
90	8												
96	8												

Use field assembled plate culverts

STRENGTH & USES OF REINFORCED CONCRETE PIPE

Class	Diameters inches	Cracking D - Load	Principal Highway Uses
I	60 - 108	800D	Not adequate for highway uses.
II	12 - 108	1000D	Use outside the roadbed. Under moderately low depths of cover. This class is required for pipe shaft manholes & drop inlets.
III	12 - 108	1350D	Intended for normal culvert & stormdrain uses.
IV	12 - 84	2000D	Same as Class III but will sustain higher overfills.
V	12 72	3000D	High strength pipe for severe loading conditions.

MAX. SAFE HEIGHTS OF OVERFILL IN FEET FOR R.C.P.

Inside diameter inclusive inches	Class II 1000 D	Class III 1350 D	Class IV 2000 D	Class V 3000 D
	Method A Backfill			
12-18	18	23	32	47
21-27	19	24	33	47
30-39	19	25	34	49
42-48	19	25	35	50
51-63	20	25	35	51
66-72	20	25	36	52
75-84	20	25	36	not listed
87-108	20	26	not listed	not listed

MINIMUM THICKNESS OF COVER

Surface type	Pipes R.C.P.	Pipes C.M.P.	Arches
Flexible pavement or unpaved	diameter / 5, 24" min.	diameter / 5, 12" min.	span / 15, 12" min.
Rigid pavement	diameter / 5, 18" min.	diameter / 7, 6" min. below slab	span / 20

Notes
1. All pipe shall conform to current A.S.T.M. designation C-76.
2. For box culverts see standard drawings pertaining thereto.
3. Source of information for tables: A.A.S.H.O. standard spec.

Standard Specifications Section 19 Drawn by: Drake Checked by: REB Recommended by: [signature] Appoved by County Surveyor D. K. Sefton R.C.E. 8091	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT STANDARD DRAWING SAFE OVERFILLS FOR R.C.P. OR C.M.P.	Revision | By | Approved | Date Scale None Approved 4-5-63 Drawing No. 180-1

MAX. SAFE HEIGHTS OF OVERFILLS FOR FIELD ASSEMBLED PLATE PIPES

STRUTTED CONDITION

STANDARD 6" x 2" CORRUGATIONS

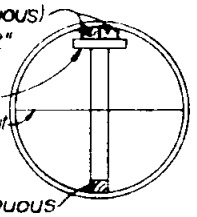
Diameter inches	HEIGHT OF COVER (FEET)																
	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-90	91-100	
60	12	12	12	12	12	12	12	12	12	12	10	10	8	7	5	5	
66	12	12	12	12	12	12	12	12	10	10	8	8	7	5	3	3	
72	12	12	12	12	12	12	12	12	10	10	8	8	7	5	3	1	
78	12	12	12	12	12	12	12	10	10	8	8	7	5	3	1		
84	12	12	12	12	12	12	12	10	10	8	8	7	5	3	1		
90	12	12	12	12	12	10	10	10	8	7	7	5	3	1			
96	12	12	12	12	12	10	10	10	8	7	7	5	3	1			
102	12	12	12	10	10	10	10	8	7	5	5	3	1				
108	12	12	12	10	10	10	10	8	7	5	5	3	1				
114	10	12	10	10	10	10	8	7	5	5	3	1					
120	10	12	10	10	10	10	8	7	5	5	3	1					
126	10	10	10	10	10	8	8	7	5	3	1	1					
132	10	10	10	10	10	8	8	7	5	3	1	1					
138	10	10	10	10	8	8	7	5	3	1	1						
144	10	10	10	10	8	8	7	5	3	1	1						
150	10	10	10	8	8	8	5	3	1	1							
156	10	10	10	8	8	8	5	3	1	1							
162	10	10	10	8	8	7	5	3	1								
168	10	10	10	8	8	7	5	3	1								
174	8	10	8	8	8	5	3	1									
180	8	10	8	8	8	5	3	1									

GAGE

From AASHO Standard Specifications for Highway Bridges, 1959 (Arts. 3.10.3 & 3.11.4) H-15 & H-20 Loading.

Notes

1. Table gives minimum gage of side and top plates with not less than 4 bolts per foot of longitudinal seam. Live load not to exceed H-20 to H-20-S-16
2. Invert plates shall be at least one step thicker gage than the rest of the barrel.
3. The pipe diameter is measured from the inside crests.
4. Limiting height of cover may be increased 50% when 16 bolts per foot of longitudinal seam are provided and No. 1 gage metal is used.



Compression caps & sills to be same diamension timber as struts. Timber for struts & sills shall be Douglas Fir common.

STRUT DETAILS

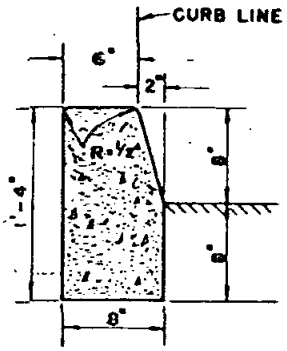
SPACING IN FEET OF TIMBER STRUTS FOR CORR. METAL & FIELD ASSEMBLED PLATE PIPE

Pipe Dia.	Strut size	Height of fill in feet 0-20	20-30	30-40	40-50	50-60	60-70	70-80	80-100
48"	4-4		3.0	3.5					
	4-6		6.0	5.0	6.0	3.5	3.0		
	6-6				6.0	5.0	4.5	4.0	3.5
	6-8							6.0	5.0
60"	4-4	6.0	4.0	3.0					
	4-6		6.0	4.5	5.5	5.0			
	6-6				5.5	4.5	4.0	3.5	3.0
	6-8						5.5	4.5	4.0
72"	4-4	5.0	3.0						
	4-6	6.0	5.0	3.5	3.0				
	6-6			6.0	4.5	4.0	3.5	3.0	3.0
	6-8					5.0	4.5	4.0	3.5
84"	6-6	6.0	6.0	5.0	4.0	3.5	3.0		
	6-8				5.0	4.5	4.0	3.5	3.0
	8-8							4.5	3.5
96"	6-6	6.0	5.5	4.5	3.5	3.0			
	6-8			5.5	4.5	4.0	3.5	3.0	
	8-8						4.5	4.0	3.0

Pipe Dia	Strut size	Height of fill in feet 0-20	20-30	30-40	40-50	50-60	60-70	70-80	80-100
108"	6-6		6.0	4.0	3.5	3.0			
	6-8			6.0	5.0	4.0	3.5	3.0	
	8-8						4.5	4.0	3.5
120"	6-6	6.0	4.0	3.0					
	6-8	6.0	5.5	4.0	3.5	3.0			
	8-8				5.0	4.0	3.5	3.0	
132"	6-6	5.0	3.5						
	6-8	6.0	4.5	3.5	3.0				
	8-8			5.5	4.0	4.0	3.5	3.0	
144"	6-6	4.5	3.0						
	6-8	5.5	4.0	3.0					
	8-8				5.0	4.0	3.5	3.0	
156"	6-8	4.5	3.0						
	8-8			6.0	4.5	3.5	3.0		
168"	6-8	5.5							
	8-8	6.0	5.0	4.0	3.0				
180"	6-8	5.0							
	8-8	6.0	4.5	3.5					

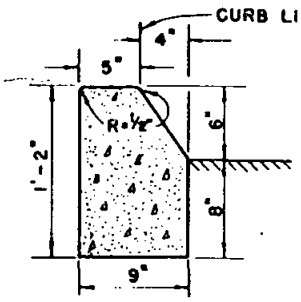
Standard Specifications	SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT		
Section 19	STANDARD DRAWING	Revision | By | Approved | Date	
Drawn by: Drake Checked by: REB		Scale None	Approved 4-5-63
Recommended by: [signature]	SAFE OVERFILLS FOR FIELD ASSEMBLED PLATE PIPE	Drawing No. 181-1	
Appoved by County Surveyor			
D. K. Dolson R.C.E. 8091			

TYPE A CURB



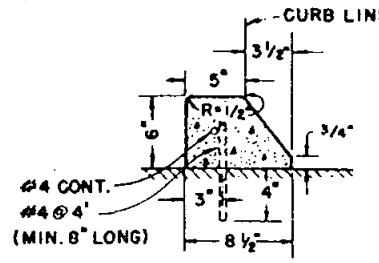
SECTION

TYPE B CURB



SECTION

TYPE C CURB



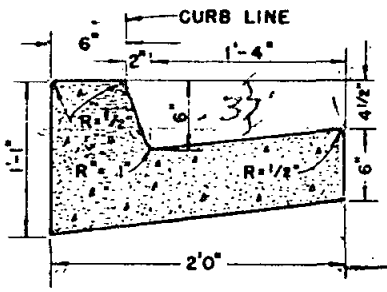
AFFIX TO PAVEMENT WITH DOWELS AND REINFORCEMENT AS SHOWN.

ALTERNATE METHOD:
OMIT STEEL & AFFIX WITH EPOXY RESIN ADHESIVE APPROVED BY COUNTY ENGINEER.

SECTION

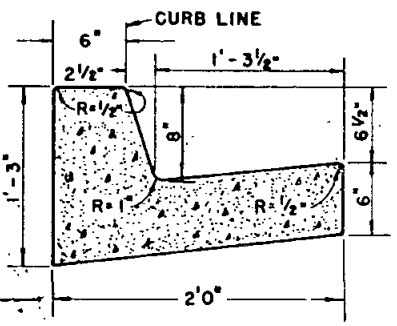
1.38

TYPE E CURB

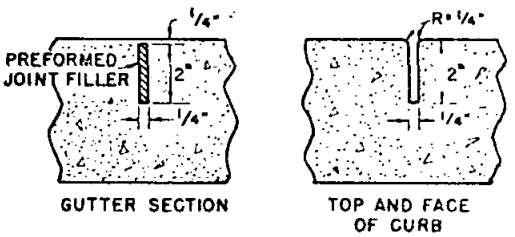


SECTION

TYPE F CURB



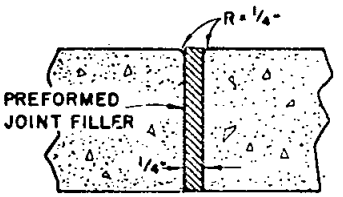
SECTION



GUTTER SECTION

TOP AND FACE OF CURB

WEAKENED-PLANE JOINT



EXPANSION JOINT

FULL CURB SECTION

NOTES:

1. CURB MAY BE FORMED OR EXTRUDED.
2. CLASS B CONCRETE SHALL BE USED FOR FORMED CURBS. CONCRETE FOR EXTRUDED CURBS SHALL CONFORM TO SECTION 73-1.06 OF THE STD. SPECIFICATIONS.
3. CURB SHALL BE PLACED ON COMPACTED BASE MATERIAL OF A THICKNESS EQUAL TO THE STREET STRUCTURAL SECTION MINUS THAT PORTION OF CURB BELOW GRADE. MINIMUM BASE THICKNESS BENEATH CURBS SHALL BE 4".
4. EXPANSION JOINTS SHALL BE PLACED AT 60' INTERVALS AND AT ENDS OF CURB RETURNS. WEAKENED-PLANE JOINTS SHALL BE PLACED AT 15' INTERVALS BETWEEN EXPANSION JOINTS.
5. NO CONCRETE SHALL BE PLACED UNTIL FORMS ARE APPROVED BY COUNTY INSPECTOR.

CURB QUANTITIES	
TYPE	C.Y./LIN. FT.
A	0.03086
B	0.02932
C	0.01075
E	0.05054
F	0.05440

LEGEND ON PLAN
TYPE A, B & C ——
TYPE E & F ——
(LABEL TYPE)

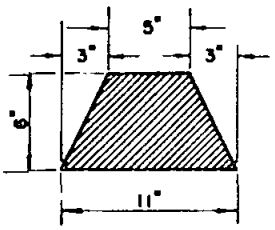
STD. SPEC. SEC: 51, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING
DRAWN BY GH CHECKED BY RMG	
RECOMMENDED BY [signature]	PORTLAND CEMENT CONCRETE CURBS
APPROVED BY COUNTY ENGINEER	
D. K. Spees R.C.E. 8091	
DATE: 3/15/67	

REVISION	BY	APPROVED	DATE

SCALE: NONE

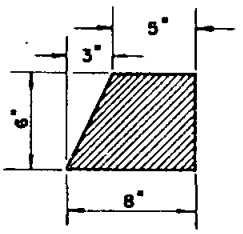
DRAWING NUMBER 200-23

TYPE A DIKE



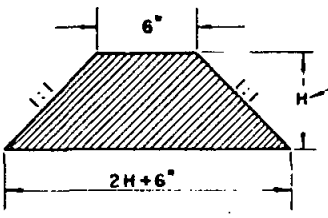
SECTION

TYPE B DIKE



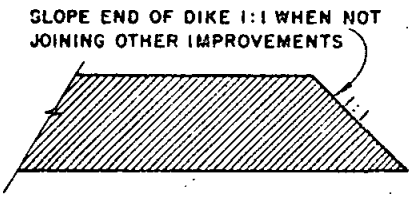
SECTION

TYPE C DIKE



HEIGHT = 6", 8", OR 9" AS INDICATED ON PLANS.

SECTION



SIDE VIEW

NOTE:

A.C. DIKES MAY BE SHAPED AND COMPACTED WITH AN EXTRUSION MACHINE OR OTHER EQUIPMENT CAPABLE OF SHAPING AND COMPACTING THE MATERIAL TO THE REQUIRED CROSS SECTION.

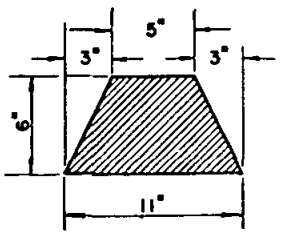
APPROX. DIKE QUANTITIES	
TYPE	TONS/LIN. FT.
A	0.02500.
B	0.02031
C-6"	0.03750
C-8"	0.05833
C-9"	0.07031

LEGEND ON PLAN

LABEL TYPE OF DIKE —2—

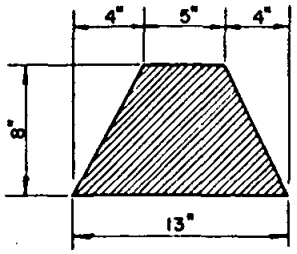
STD. SPEC. SEC: 39	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY CB CHECKED BY RAG			
RECOMMENDED BY [signature]		REVISION / BY / APPROVED / DATE	
APPROVED BY COUNTY ENGINEER	ASPHALT CONCRETE DIKES	SCALE: NONE	
L. K. Spear R.C.E. 8091		DRAWING NUMBER 201-1	
DATE: 9/15/67			

TYPE A DIKE



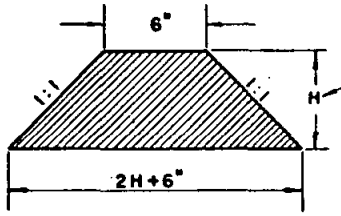
SECTION

TYPE B DIKE



SECTION

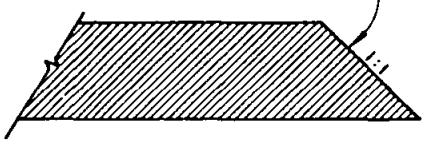
TYPE C DIKE



HEIGHT = 6", 8", OR 9" AS INDICATED ON PLANS.

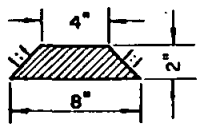
SECTION

SLOPE END OF DIKE 1:1 WHEN NOT JOINING OTHER IMPROVEMENTS



SIDE VIEW

TYPE D DIKE



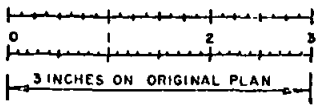
SECTION

NOTE:

A.C. DIKES MAY BE SHAPED AND COMPACTED WITH AN EXTRUSION MACHINE OR OTHER EQUIPMENT CAPABLE OF SHAPING AND COMPACTING THE MATERIAL TO THE REQUIRED CROSS SECTION.

APPROX. DIKE QUANTITIES	
TYPE	TONS/LIN. FT.
A	0.02500
B	0.03740
C-6"	0.03750
C-8"	0.05833
C-9"	0.07031
D	0.00586

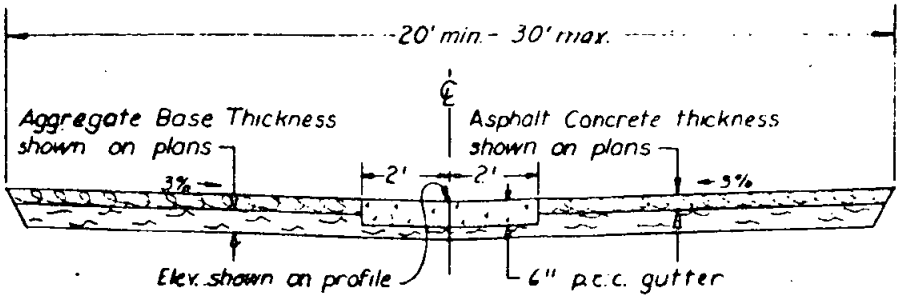
REDUCED SCALE
USE SCALE BELOW



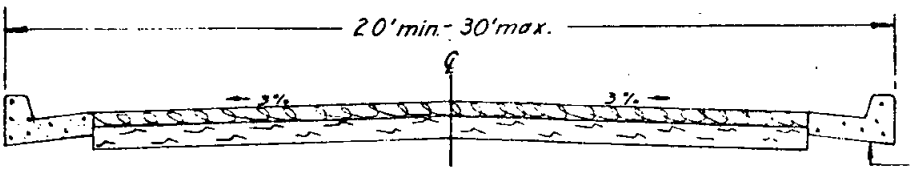
LEGEND ON PLAN

LABEL TYPE OF DIKE

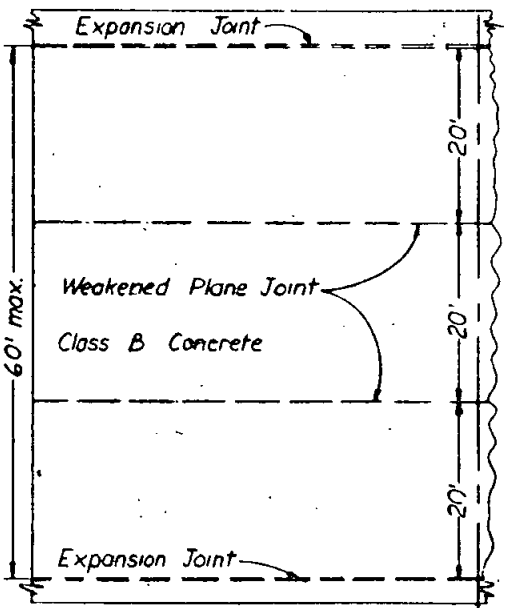
STD. SPEC. SEC: 39	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY KK CHECKED BY CDR			
RECOMMENDED BY [signature]		REVISION / BY / APPROVED / DATE	
APPROVED BY COUNTY ENGINEER	ASPHALT CONCRETE DIKES	SCALE: NONE	
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 201-2	
DATE: Sept. 28, 1971			

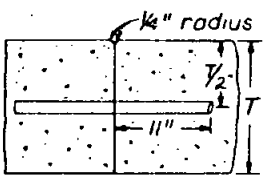


INVERT ALLEY SECTION
COMPOSITE CONSTRUCTION - A.C., P.C.C. & Base



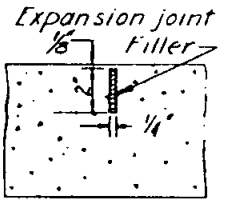
ALLEY SECTION (Normal Crown)
A.C. over base with std. P.C.C. Curbs



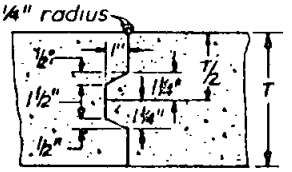


#4 x 22" Nondeformed tie bars spaced at 30"

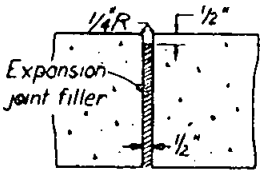
CONTACT JOINT
Alternate 1



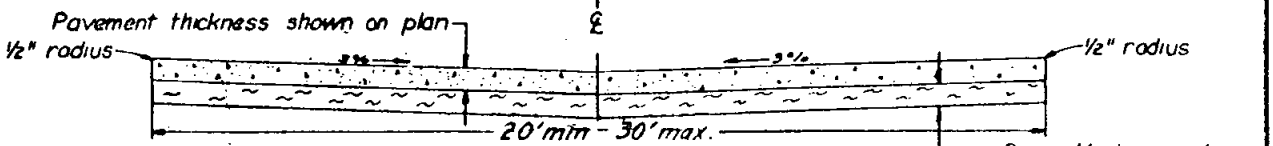
WEAKENED PLANE JOINT



Groove shall be poured first.
CONTACT JOINT
Alternate 2



TRANSVERSE EXPANSION JOINT

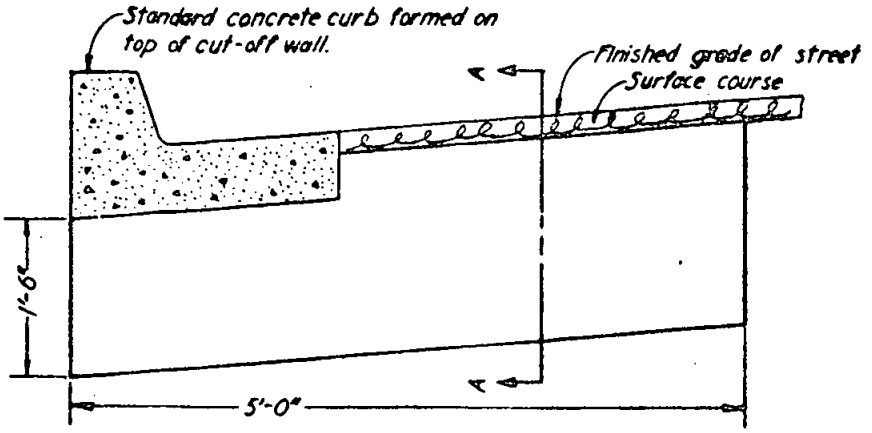


P.C.C. ALLEY SECTION

Base thickness shown on plans.

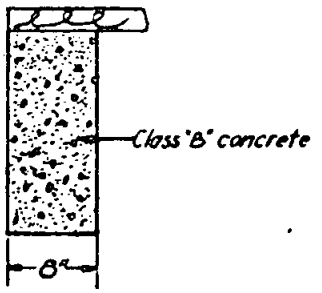
1. Interval between transverse joints may be less than dimensions shown to allow matching of joints in adjacent existing improvements.
2. Transverse contact joints shall be constructed at end of pour.
3. Alternate weakened plane joint may be power driven saw cut, 2" min. depth, ⅛" max width.

Standard Specifications Sections 40, 73, 90	SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT	Revision | By | Approved | Date
Drawn by: Prabha | Checked by: RCB	STANDARD DRAWING	Scale: none
Recommended by [illegible]		Date Approved 12/2/63
Approved by County Surveyor: D.K. Sloan R.C.E. 8001	PAVEMENT FOR ALLEY SECTIONS	Drawing No. 202-1



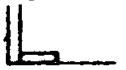
ELEVATION

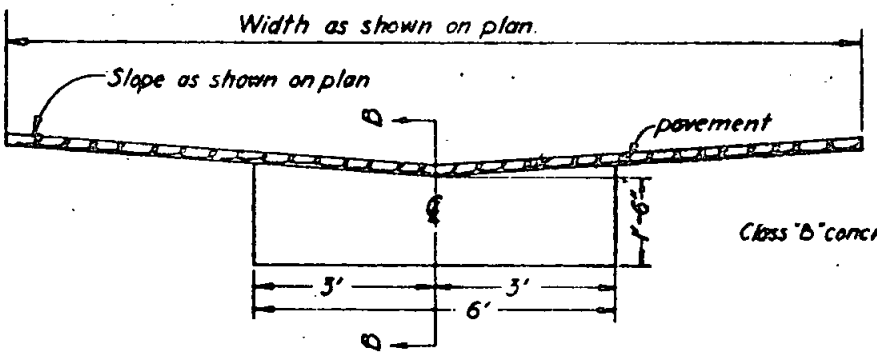
CROWN PAVEMENT



SECTION A-A

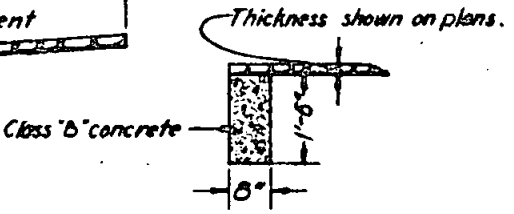
Legend on plan





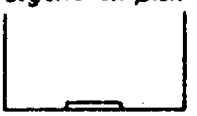
ELEVATION

INVERTED PAVEMENT

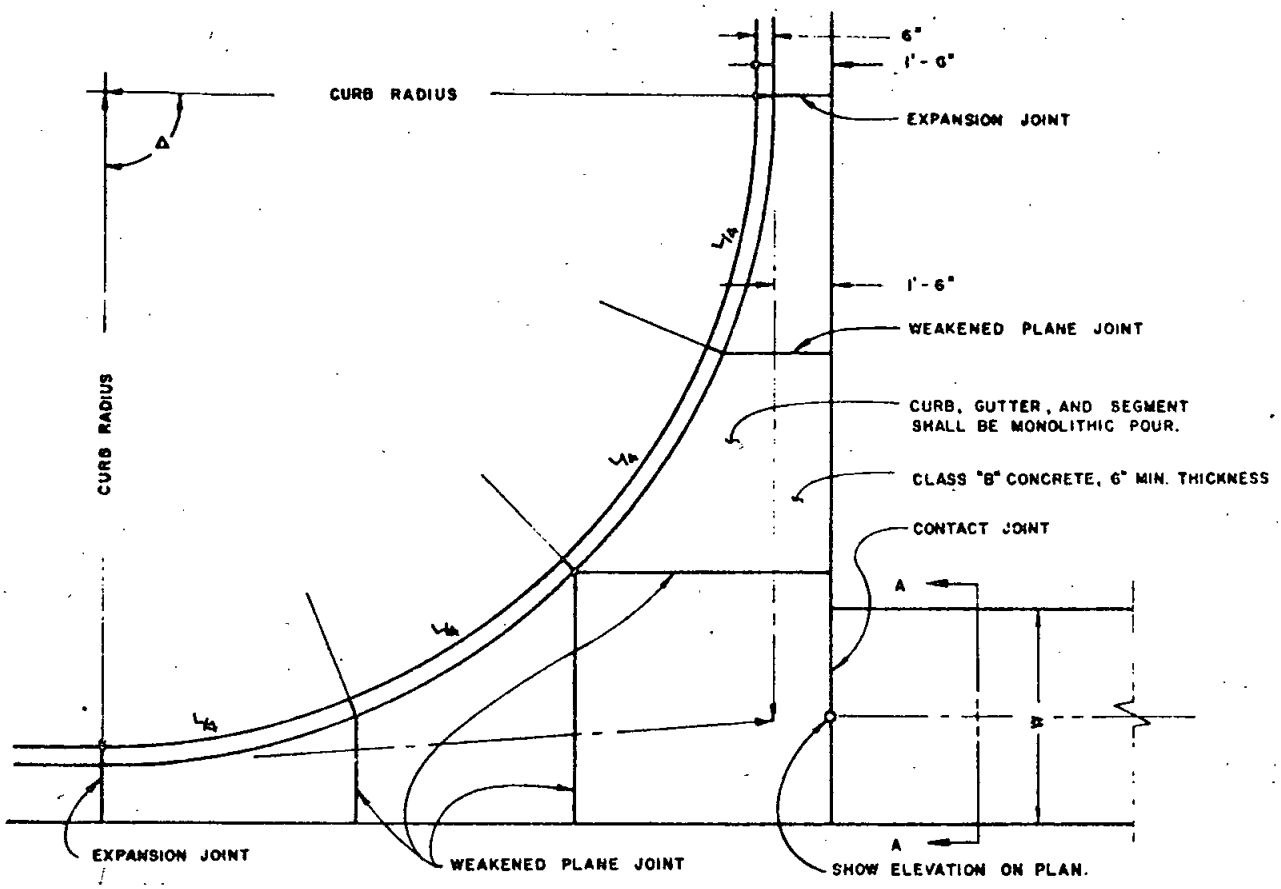


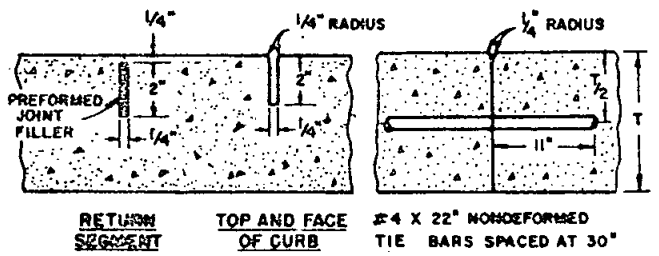
SECTION B-B

Legend on plan



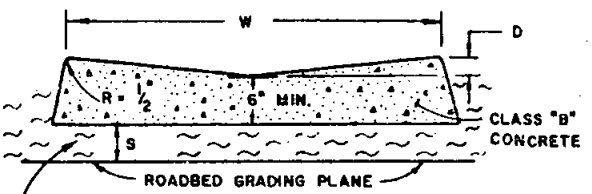
Standard Specifications	SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT	Revision / By / Approved / Date
Sections: 51, 90		Scale: None
Drawn by: [illegible] Checked by: RES	STANDARD DRAWING	Date Approved: 10/2/63
Recommended by: [signature]		Drawing No.
Approved by County Surveyor	CUTOFF WALL AT END OF ~~PAVEMENT~~	203-1
D. K. Ogburn RCE 8091		





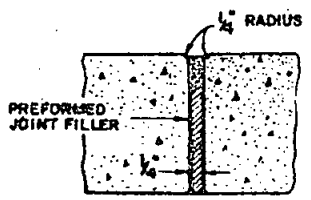
WEAKENED PLANE JOINT

CONTACT JOINT ALTERNATE 1

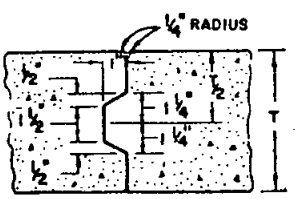


SECTION A-A

NOTE: BASE MATERIAL BENEATH CROSS GUTTER AND RETURN SEGMENT SHALL MATCH STRUCTURAL SECTION OF STREET. THICKNESS (S) DETERMINED BY EXTENDING ROADBED GRADING PLANE UNDER CROSS GUTTER AND RETURN SEGMENT. S = 4" MIN.

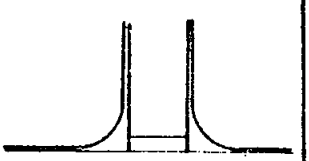


EXPANSION JOINT



CONTACT JOINT ALTERNATE 2

W	D
4'	0.04'
6'	0.06'
8'	0.08'
10'	0.10'
12'	0.12'



LEGEND ON PLANS

STD. SPEC. SEC: 40, 51, 73, 80

DRAWN BY CLR CHECKED BY

RECOMMENDED BY

APPROVED BY COUNTY ENGINEER

D. K. O'Shea R.C.E. 8091

DATE: 8/15/67

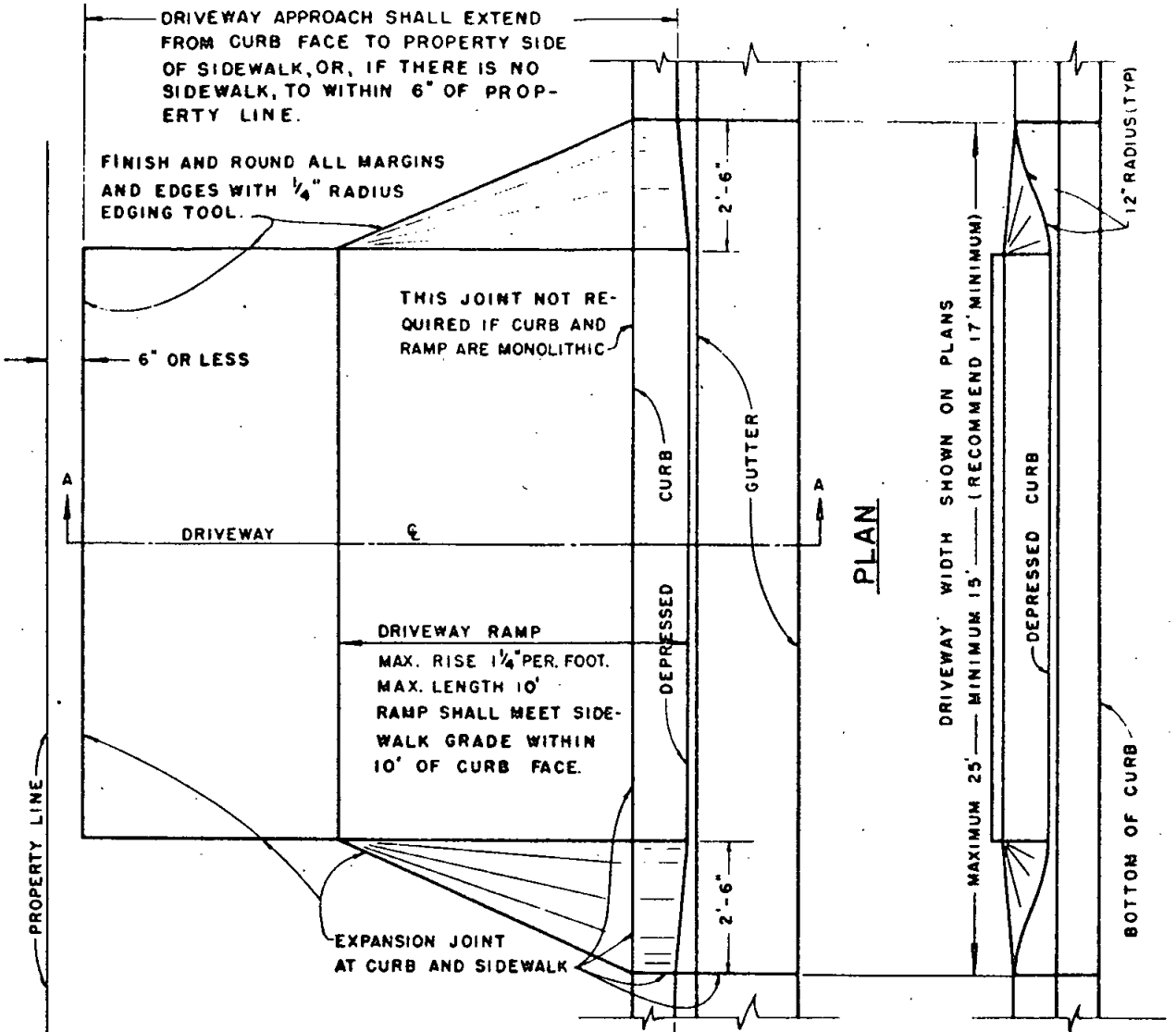
SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

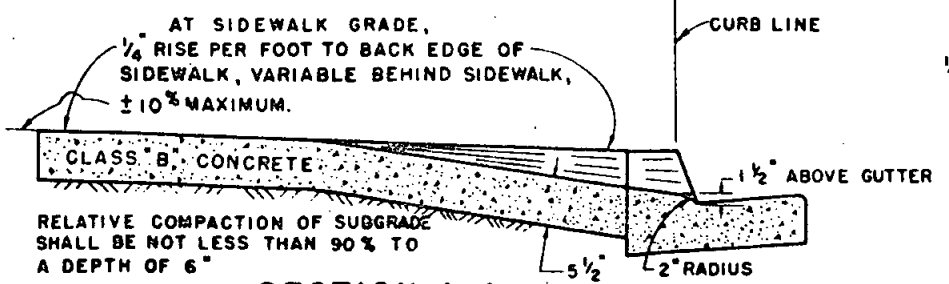
CROSS GUTTER AND RETURN SEGMENT

REVISION	BY	APPROVED	DATE

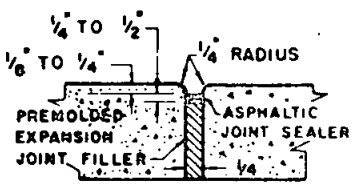
SCALE: NONE

DRAWING NUMBER 205-1T

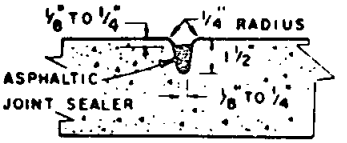




SECTION A-A

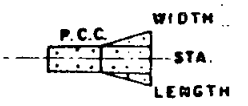


EXPANSION JOINT



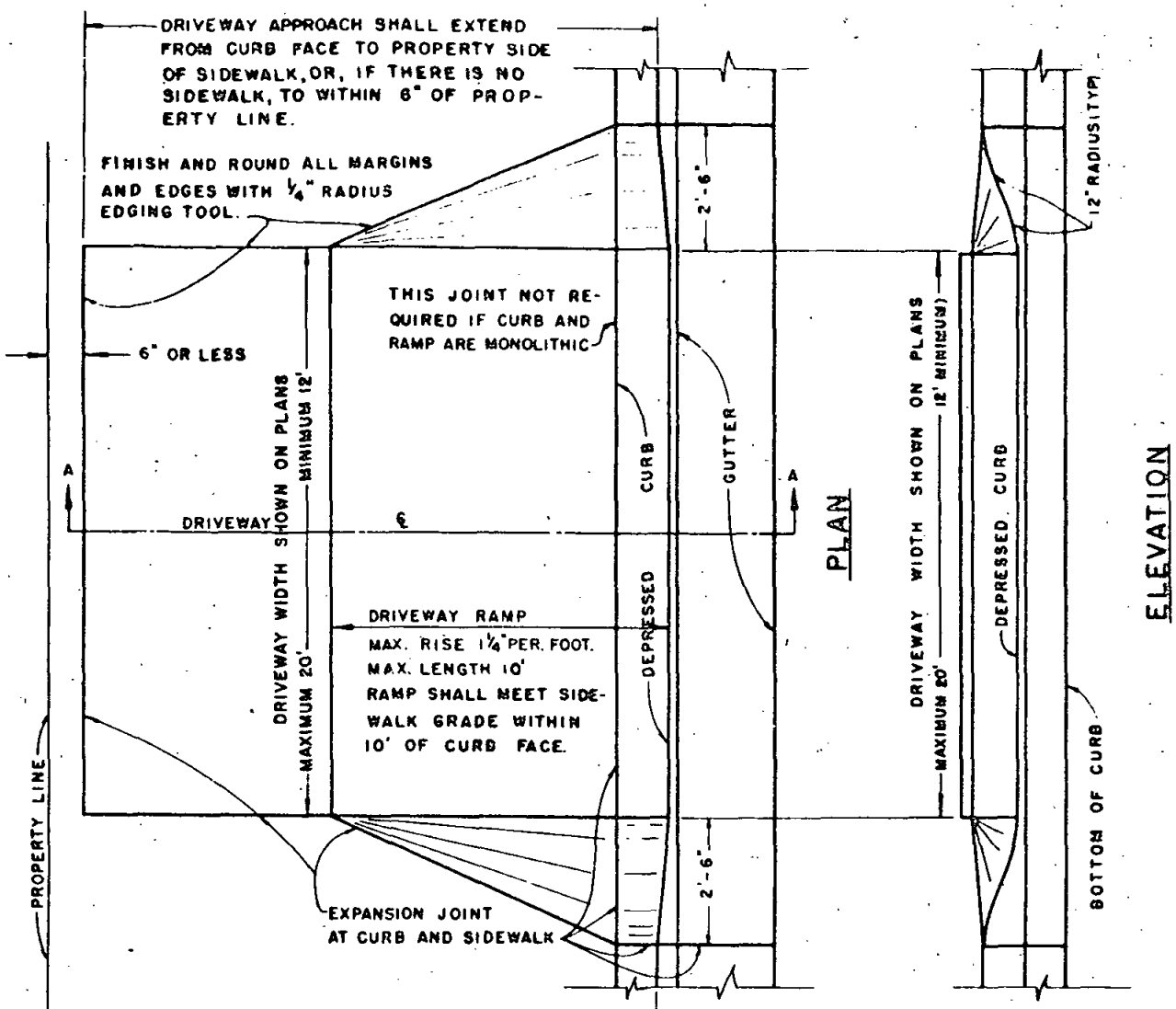
WEAKENED-PLANE JOINT

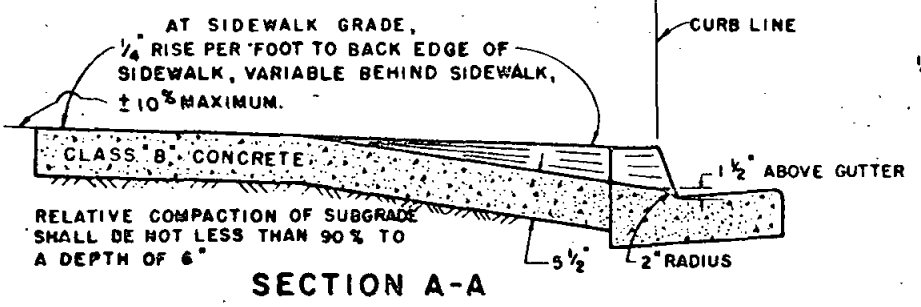
NOTE:
1. THICKER CONCRETE, CLASS "A" CONCRETE AND REINFORCEMENT ARE PERMISSIBLE. 6" BASE AGGREGATE (S.E. 30 +) RECOMMENDED.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY ℄ FOR DRIVEWAYS 18'-25' WIDE.
3. ASPHALTIC JOINT SEALER SHALL BE 40-100 PENETRATION ASPHALT OR POURED FILLER ASTM D1190 OR EQUIVALENT.
4. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1 1/2" MINIMUM DEPTH, 1/4" MAXIMUM WIDTH, FILLED WITH ASPHALTIC JOINT SEALER.
5. SEE STANDARD DRAWINGS 305-1 AND 306-1 FOR LOCATION AND WIDTH REQUIREMENTS.



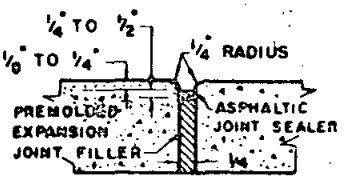
LEGEND ON PLANS

STD. SPEC. SEC.: 51, 73, 90, 92		
DRAWN BY D.R. CHECKED BY A.S.K.		
RECOMMENDED BY R.J. Mancuso	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE NONE
D.K. Sloan R.C.E. 8091	CONCRETE RESIDENTIAL DRIVEWAY	DRAWING NUMBER 207-1
DATE: July 19, 1966		

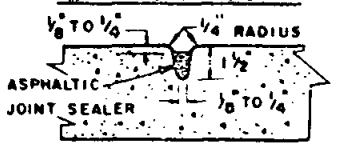




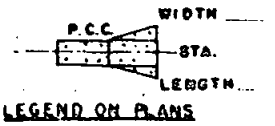
SECTION A-A



EXPANSION JOINT



WEAKENED-PLANE JOINT

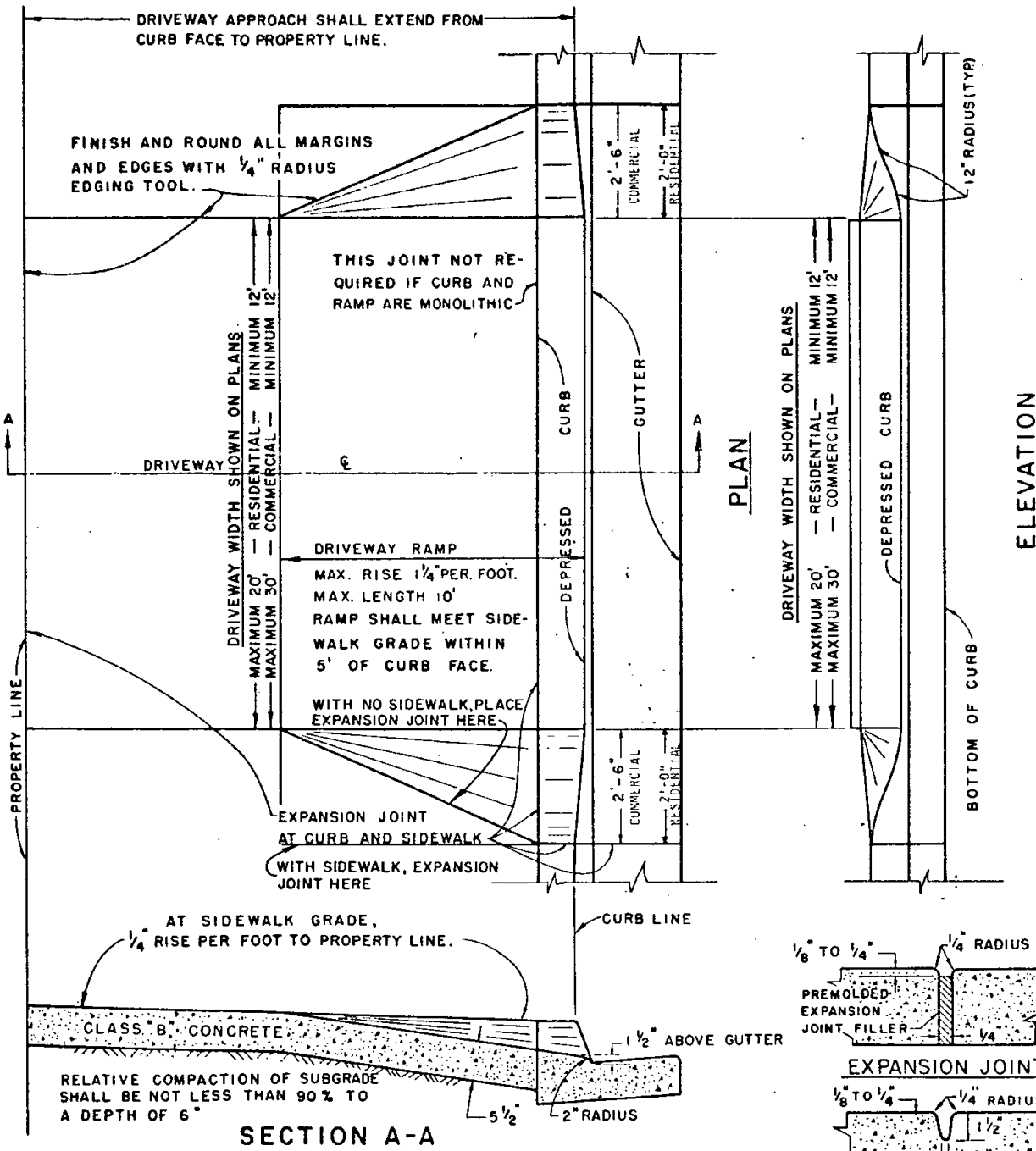


LEGEND ON PLANS

NOTE:

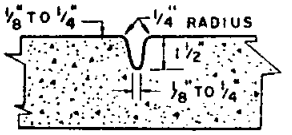
1. THICKER CONCRETE, CLASS "A" CONCRETE AND REINFORCEMENT ARE PERMISSIBLE. 6" BASE AGGREGATE (S.E. 30 +) RECOMMENDED.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY ℄ FOR DRIVEWAYS 13'-20' WIDE.
3. ASPHALTIC JOINT SEALER SHALL BE 40-100 PENETRATION ASPHALT OR POURED FILLER ASTM D1190 OR EQUIVALENT.
4. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1 1/2" MINIMUM DEPTH, 1/4" MAXIMUM WIDTH, FILLED WITH ASPHALTIC JOINT SEALER.
5. SEE STANDARD DRAWINGS 305, 306 FOR LOCATION & WIDTH REQUIREMENTS.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY [illegible] CHECKED BY [illegible]					
RECOMMENDED BY	CONCRETE RESIDENTIAL DRIVEWAY	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
[signature] R.C.E. 11466		DRAWING NUMBER 207-3			
DATE: [illegible] 1970					

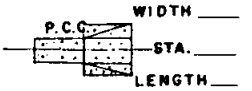


SECTION A-A

EXPANSION JOINT



WEAKENED-PLANE JOINT

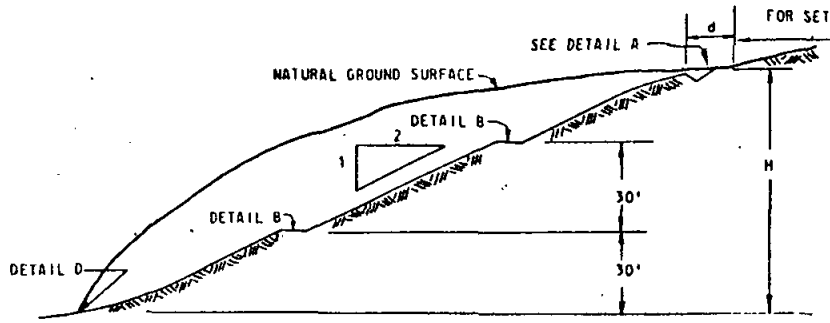


LEGEND ON PLANS

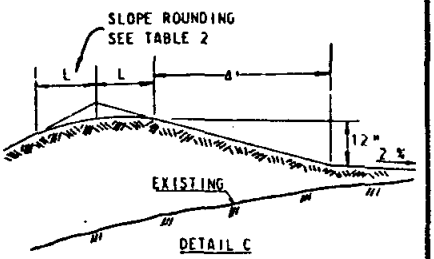
NOTE:

1. THICKER CONCRETE, CLASS "A" CONCRETE AND REINFORCEMENT ARE PERMISSIBLE. 6" CLASS III AGGREGATE BASE RECOMMENDED FOR HEAVY SERVICE.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY ℄ FOR DRIVEWAYS 13'-20' WIDE.
3. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1 1/2" MINIMUM DEPTH, 1/4" MAXIMUM WIDTH.
4. SEE STANDARD DRAWINGS 305, 306 FOR LOCATION & WIDTH REQUIREMENTS.

STD. SPEC. SEC: 51, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY RSG CHECKED BY CM			
RECOMMENDED BY [signature]	CONCRETE DRIVEWAYS	REVISION	BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE	
H.M. Taylor R.C.E. 11458		DRAWING NUMBER	207-4 T
DATE: 1-8-74			

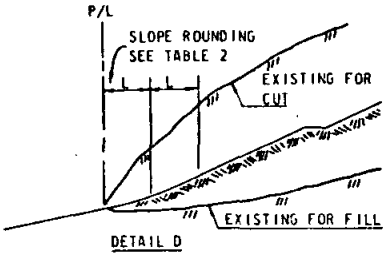


TYPICAL CUT SLOPE

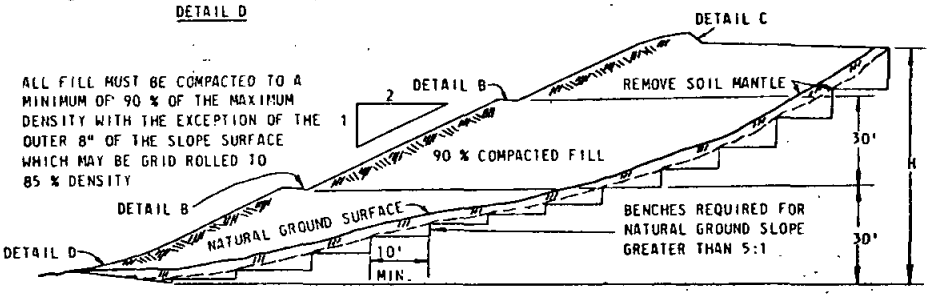


DETAIL C

TYPICAL BERM AT TOP OF ALL FILL SLOPES



DETAIL D



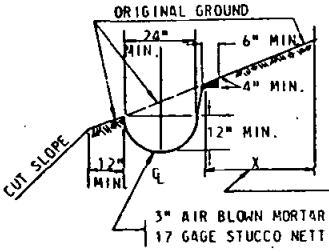
TYPICAL FILL SLOPE

TABLE 1
REQUIRED SETBACK

H FEET	d
0 - 15'	3'
OVER 15'	5'

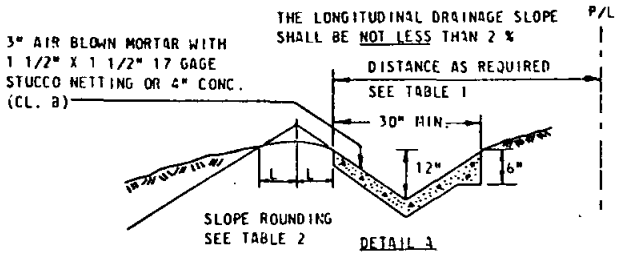
TABLE 2
SLOPE ROUNDING

H FEET	L FEET
0' - 5'	-
5' - 20'	2.5'
20' - 40'	5'
OVER 40'	10'

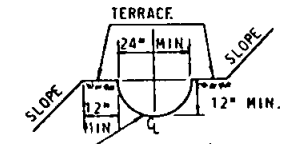


TYPICAL SECTION OF BROW DITCH

ALT. DETAIL A
TYPICAL PAVED BROW DITCH



DETAIL A
TYPICAL PAVED BROW DITCH
L.V.C. = LENGTH OF VERTICAL CURVE

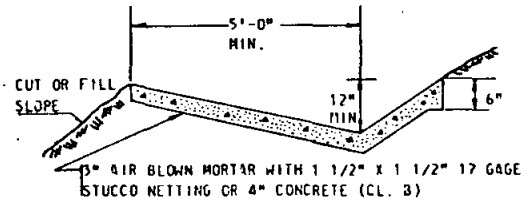


TYPICAL SECTION OF TERRACE DITCH

3" AIR BLOWN MORTAR WITH 1 1/2"X 1 1/2" 17 GAGE STUCCO NETTING OR 4" CONC. (CL. B)

MINIMUM SLOPE OF LINED DITCH SHALL BE 2 %

ALT. DETAIL B
TYPICAL TERRACE DRAIN



DETAIL B
TYPICAL TERRACE DRAIN

STD. SPEC. SEC: 19, 52, 53, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING
DRAWN BY D.W.Q. CHECKED BY [illegible]	
RECOMMENDED BY [signature]	GRADING OF SLOPES
APPROVED BY COUNTY ENGINEER	
H.M. Taylor R.C.E. 11458	
DATE: 1-8-74	

REVISION	BY	APPROVED	DATE

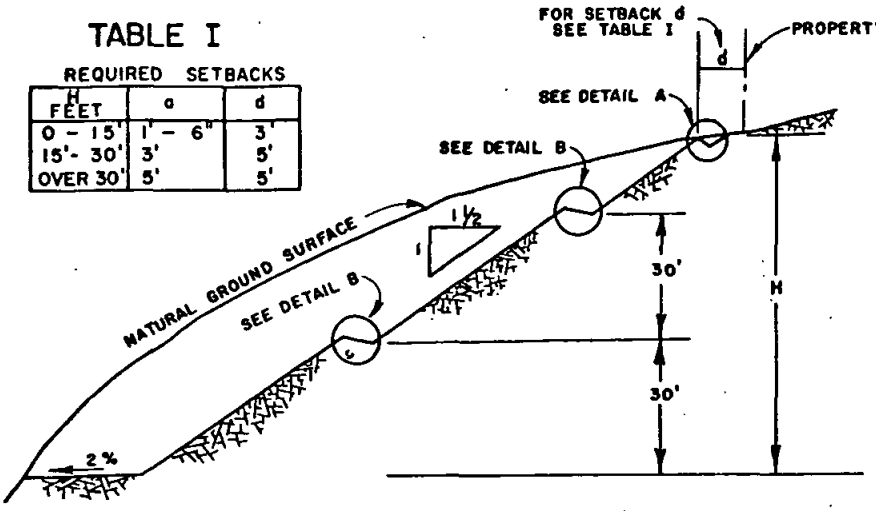
SCALE: NONE

DRAWING NUMBER 208-1 T

TABLE I

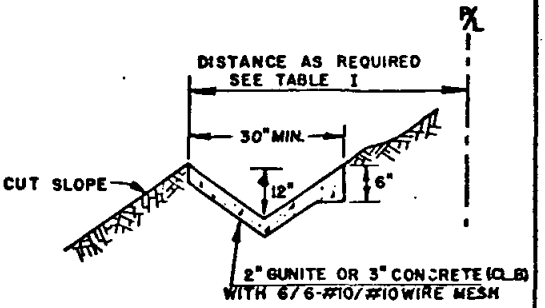
REQUIRED SETBACKS

H FEET	a	d
0 - 15'	1' - 6"	3'
15'- 30'	3'	5'
OVER 30'	5'	5'



TYPICAL CUT SLOPE

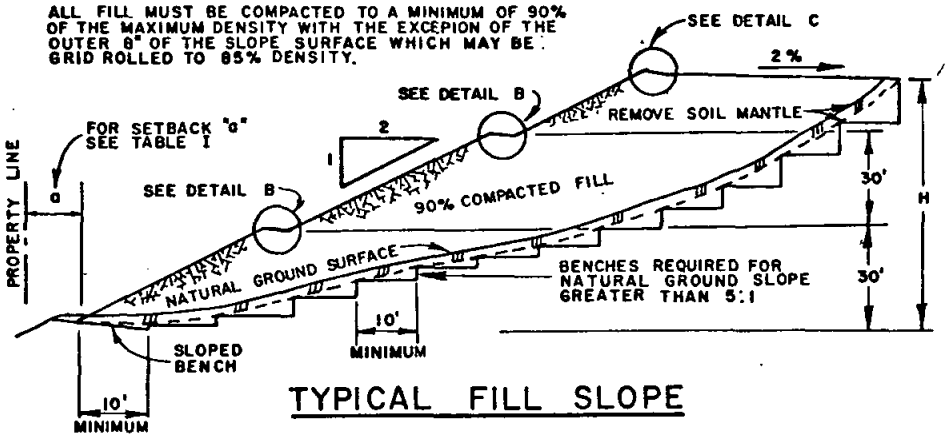
THE LONGITUDINAL DRAINAGE SLOPE SHALL BE NOT LESS THAN 2%



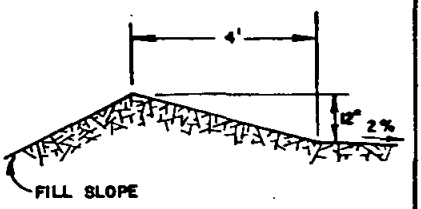
DETAIL A

TYPICAL PAVED BROW DITCH

ALL FILL MUST BE COMPACTED TO A MINIMUM OF 90% OF THE MAXIMUM DENSITY WITH THE EXCEPION OF THE OUTER 8" OF THE SLOPE SURFACE WHICH MAY BE GRID ROLLED TO 85% DENSITY.

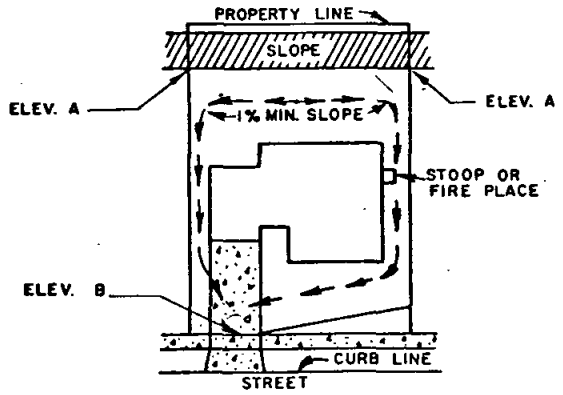


TYPICAL FILL SLOPE



DETAIL C

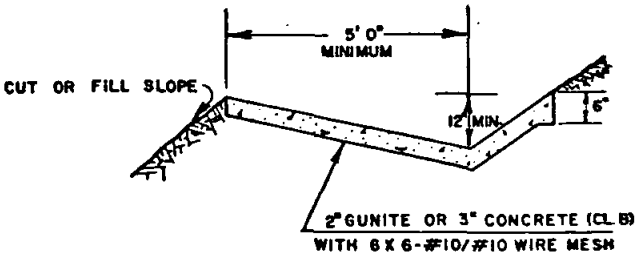
TYPICAL BERM AT TOP OF ALL FILL SLOPES



TYPICAL FINISHED GRADING

1. ELEV. A TO BE ROUGH GRADED AT A SLOPE OF 2% HIGHER THAN ELEV. B FINISH GRADING MUST PROVIDE POSTIVE DRAINAGE TO THE STREET.
2. A PAVED SWALE, A CATCH BASIN AND PIPE, OR OTHER SIMILAR DRAINAGE DEVICE IS REQUIRED WHEN A STOOP, FIREPLACE, OR PORTION OF THE BUILDING EXTENDS WITHIN 5 FEET OF THE PROPERTY LINE.

THE LONGITUDINAL DRAINAGE SLOPE SHALL BE NOT LESS THAN 2 %



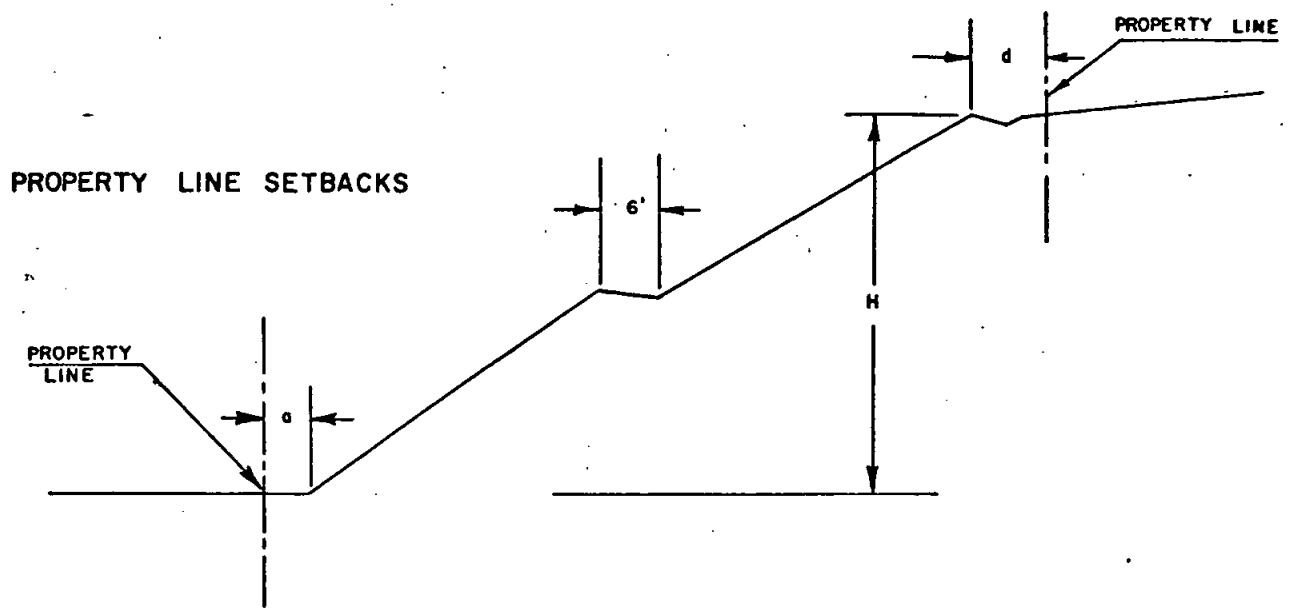
DETAIL B

TYPICAL TERRACE DRAIN

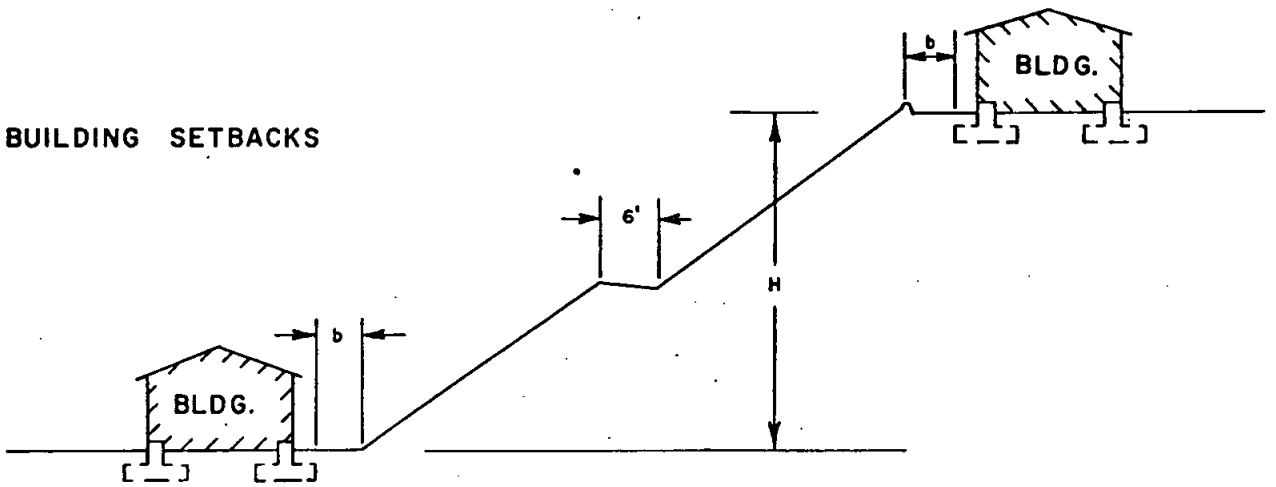
NOTE: ALL SLOPE SURFACES TO BE PROTECTED BY APPROVED EROSION CONTROL

STD. SPEC. SEC. 52, 53, 90					
DRAWN BY RCL CHECKED BY GB					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT STANDARD DRAWING	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR		SCALE: NONE			
D. K. Sloan R.C.E. 8091	GRADING OF SLOPES	DRAWING NUMBER 208			
DATE: Sept. 17, 1965					

PROPERTY LINE SETBACKS



BUILDING SETBACKS



REQUIRED SETBACKS			
H FEET	a	b	d
0 - 15	1' - 6"	5'	3'
15 - 30	3'	5'	5'
OVER 30	5'	5'	5'

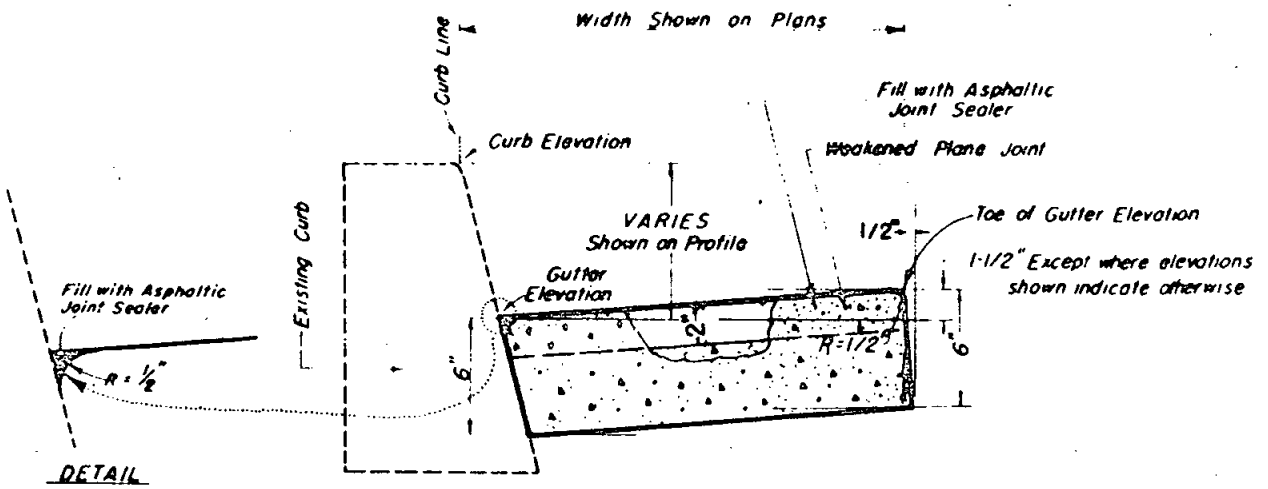
a. DISTANCE FROM TOE OF SLOPE TO PROPERTY LINE

b. DISTANCE FROM EDGE OF FOUNDATION TO TOE OR TOP OF SLOPE.

d. DISTANCE FROM TOP OF SLOPE TO PROPERTY LINE.

H. TOTAL SLOPE HEIGHT MEASURED VERTICALLY.

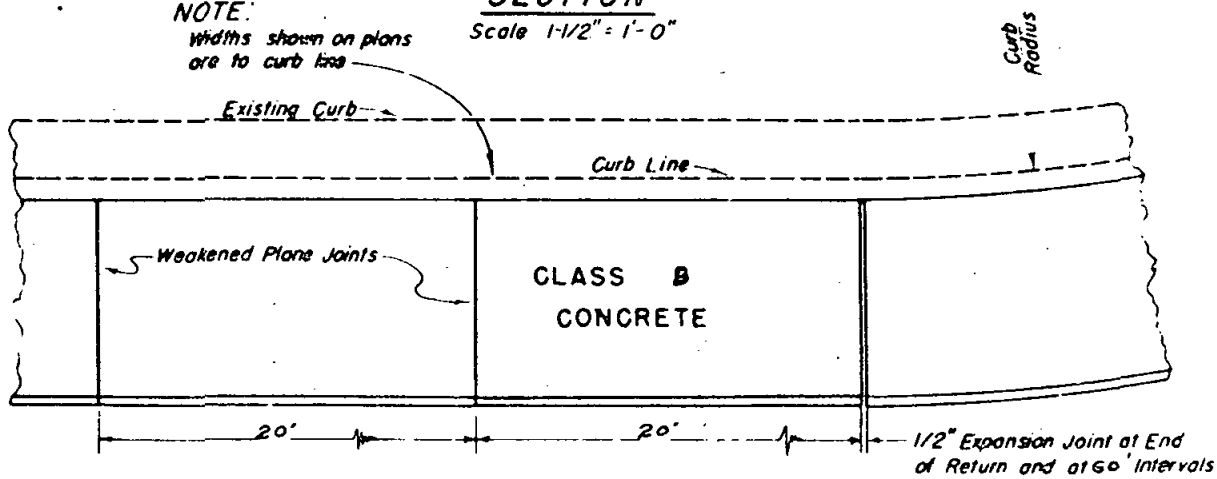
STD. SPEC. SEC.					
DRAWN BY DCL CHECKED BY [illegible]					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Spees R.C.E. 8091	REQUIRED SETBACKS	DRAWING NUMBER 209			
DATE: Sept. 17, 1965					



SECTION

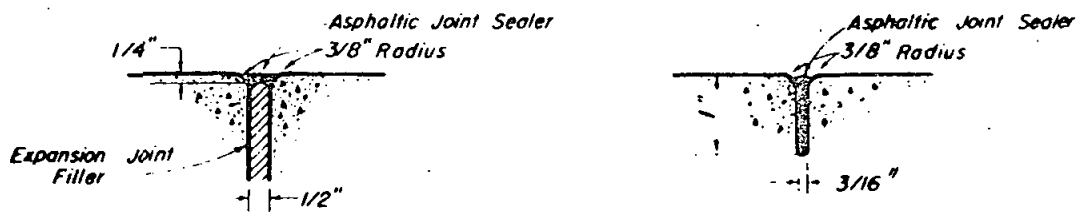
Scale 1-1/2" = 1'-0"

NOTE: Widths shown on plans are to curb line



TYPICAL PLAN

Scale 3/4" = 1'-0"



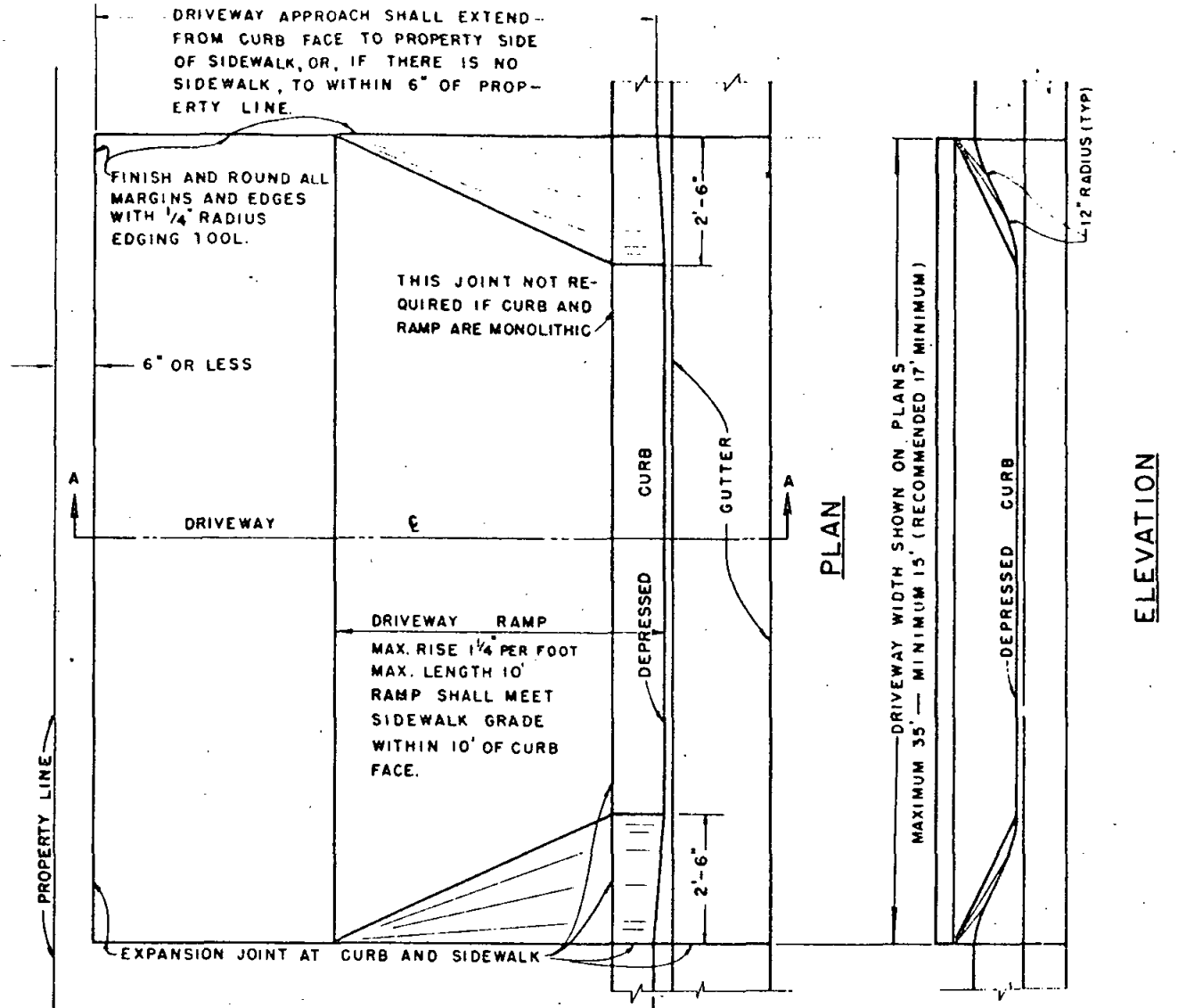
EXPANSION JOINT — WEAKENED PLANE JOINT

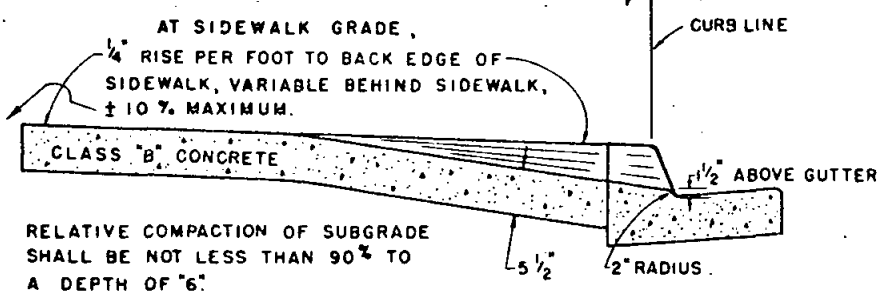
Scale 3" = 1'-0"

20' interval between transverse joints shall be varied to allow matching of joints in adjacent existing improvements.

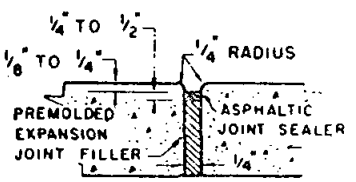
SPECIFICATION REFERENCE	SAN DIEGO COUNTY	STANDARD DRAWING	AS SHOWN
Section 51, 73, 90			SCALE
County Surveyor	# GUTTER		DRAWING NO
D.K. SPEER, R.C.E. 8091			210

FILE 11-2A

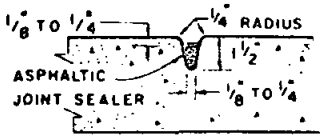




SECTION A-A



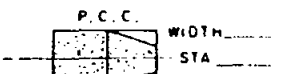
EXPANSION JOINT



WEAKENED-PLANE JOINT

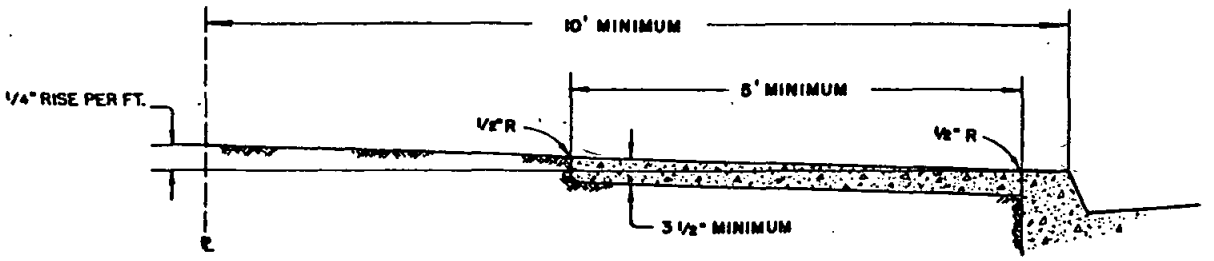
NOTES:

1. THICKER CONCRETE, CLASS "A" CONCRETE, REINFORCEMENT, AND 6" BASE AGGREGATE (SE 304) ARE RECOMMENDED FOR HEAVY SERVICE.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY ℄ FOR DRIVEWAYS 18'-35' WIDE.
3. ASPHALTIC JOINT SEALER SHALL BE 40-100 PENETRATION ASPHALT OR POURED FILLER ASTM D1190 OR EQUIVALENT.
4. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1 1/2" MINIMUM DEPTH, 1/4" MAXIMUM WIDTH, FILLED WITH ASPHALTIC JOINT SEALER.
5. SEE STANDARD DRAWINGS 305-1 AND 306-1 FOR LOCATION AND WIDTH REQUIREMENTS.



LEGEND ON PLANS

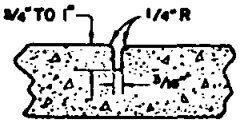
STD. SPEC. SEC.: 51, 73, 90, 92.					
DRAWN BY DR. CHECKED BY A&A					
RECOMMENDED BY R.J. Macaman	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Green R.C.E. 8091	CONCRETE COMMERCIAL DRIVEWAY	DRAWING NUMBER	211-1		
DATE: July 14, 1964					



TYPICAL SECTION

LOCATE TRANSVERSLY AT 60 FT. INTERVALS AND AT RETURNS.

EXPANSION JOINT



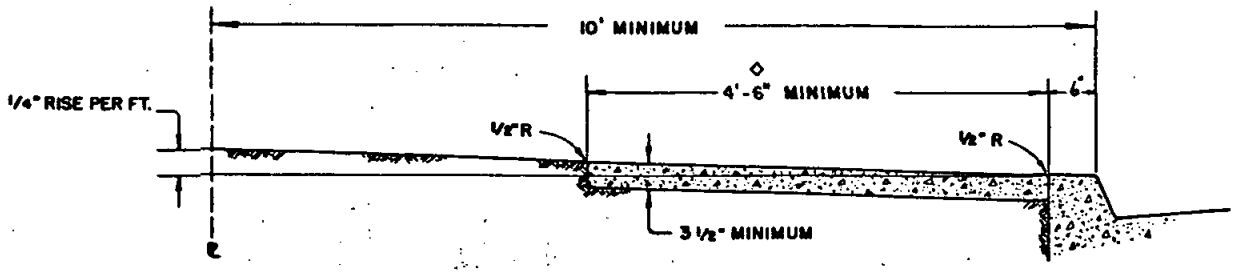
LOCATE TRANSVERSLY AT 20 FT. INTERVALS BETWEEN EXPANSION JOINTS.

WEAKENED-PLANE JOINT

NOTES:

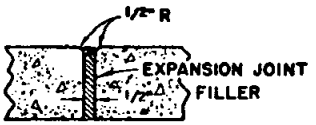
1. ALL CONCRETE SHALL BE CLASS "B".
2. WHERE TRAVERSED BY DRIVEWAYS, SIDEWALKS SHALL CONFORM TO DRIVEWAY REQUIREMENTS.
3. CURB AND SIDEWALK SHALL BE POURED SEPARATELY, EXCEPT THAT WHEN EXPANSIVE SOILS ARE ENCOUNTERED A MONOLITHIC POUR SHALL BE USED.
4. SPECIFIED INTERVALS BETWEEN TRANSVERSE JOINTS SHALL BE VARIED TO MATCH ADJACENT EXISTING IMPROVEMENTS.
5. SIDEWALK SHALL BE MARKED TRANSVERSLY AT 5 FT. INTERVALS BETWEEN EXPANSION AND WEAKENED-PLANE JOINTS WITH A SCORING TOOL THAT WILL LEAVE THE EDGES ROUNDED.
6. SIDEWALK LOCATION MAY BE VARIED, SUBJECT TO APPROVAL BY THE COUNTY ENGINEER, TO MATCH EXISTING ADJACENT IMPROVEMENTS.

STD. SPEC. SEC: 73	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	CHG. NOTE 3	RLA	[illegible]	
DRAWN BY LLO CHECKED BY [illegible]					
RECOMMENDED BY [signature]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONCRETE SIDEWALK	SCALE: NONE			
D. K. Sperry R.C.E. 8091		DRAWING NUMBER	212-2		
DATE: 3/16/67					

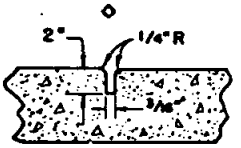


TYPICAL SECTION

LOCATE TRANSVERSLY AT 60 FT. INTERVALS AND AT RETURNS.



EXPANSION JOINT



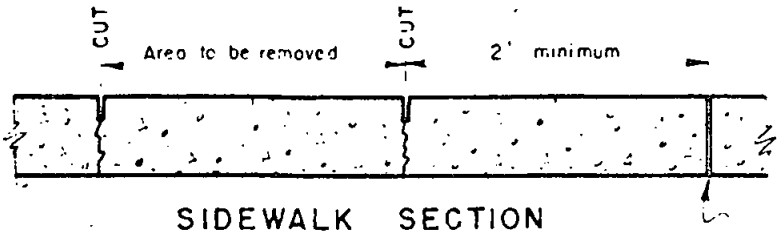
LOCATE TRANSVERSLY AT 15 FT. INTERVALS BETWEEN EXPANSION JOINTS.

WEAKENED-PLANE JOINT

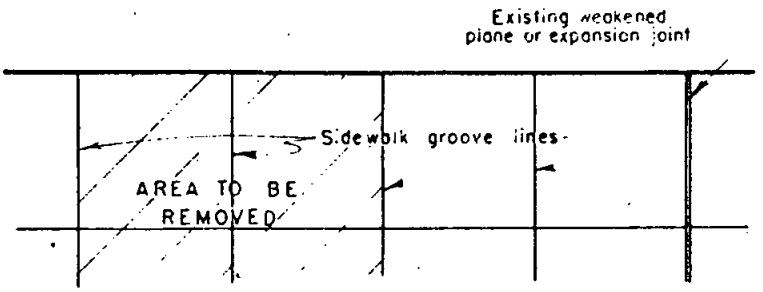
NOTES:

1. ALL CONCRETE SHALL BE CLASS "B".
2. WHERE TRAVERSED BY DRIVEWAYS, SIDEWALKS SHALL CONFORM TO DRIVEWAY REQUIREMENTS.
3. MONOLITHIC CURB, GUTTER AND SIDEWALK MAY BE USED WITH SPECIFIC APPROVAL OF THE COUNTY ENGINEER.
4. SPECIFIED INTERVALS BETWEEN TRANSVERSE JOINTS SHALL BE VARIED TO MATCH ADJACENT EXISTING IMPROVEMENTS.
5. SIDEWALK SHALL BE MARKED TRANSVERSLY AT 5 FT. INTERVALS BETWEEN EXPANSION AND WEAKENED-PLANE JOINTS WITH A SCORING TOOL THAT WILL LEAVE THE EDGES ROUNDED.
6. SIDEWALK LOCATION MAY BE VARIED, SUBJECT TO APPROVAL BY THE COUNTY ENGINEER, TO MATCH EXISTING ADJACENT IMPROVEMENTS.
7. ◇ SIDEWALK LOCATION AND WIDTH MAY BE VARIED TO ALLOW FOR ENCROACHING UTILITIES, SUBJECT TO APPROVAL BY THE COUNTY ENGINEER.
8. ◇ WHERE EXPANSIVE SOILS ARE ENCOUNTERED A MINIMUM OF 4" CLASS 3 AGGREGATE BASE WILL BE REQUIRED AS DIRECTED BY THE COUNTY ENGINEER.
9. ◇ EXPANSION JOINT TO BE INSTALLED AT BEGINNING AND ENDING OF SIDEWALK RETURNS.

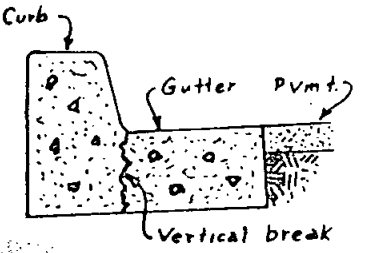
STD. SPEC. SEC: 51, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	CHG. NOTE 3	KLB	H.M. Taylor	8/13/90
DRAWN BY KLB CHECKED BY MEB		◇	MEB		
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONCRETE SIDEWALK	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 212-3 T			
DATE: 1-8-74					



SIDEWALK SECTION

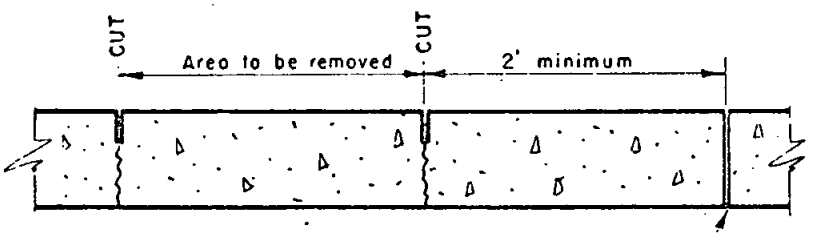


SIDEWALK PLAN

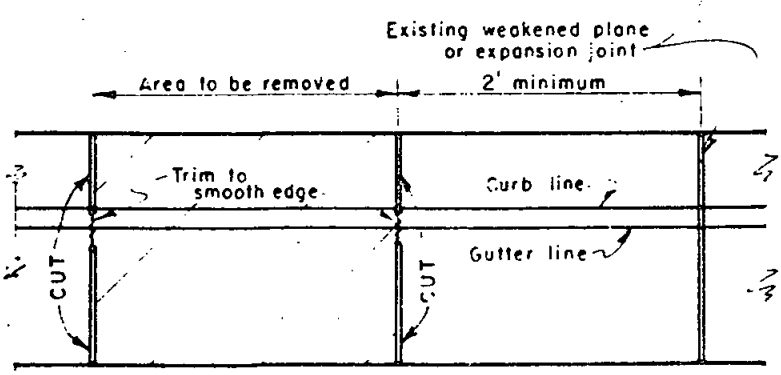


CURB SECTION
ALTERNATE #2

When approved by County Surveyor curb may be removed full height, gutter remaining undisturbed.

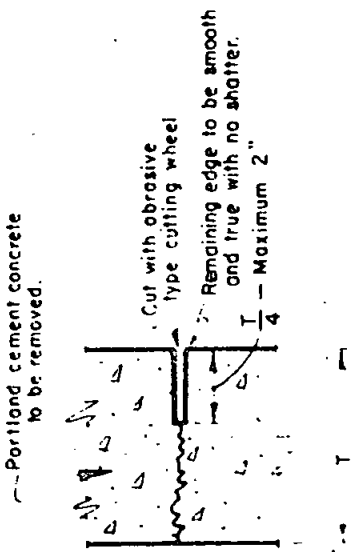


PAVEMENT SECTION



CURB PLAN
ALTERNATE #1

Removal of complete section of curb & gutter.

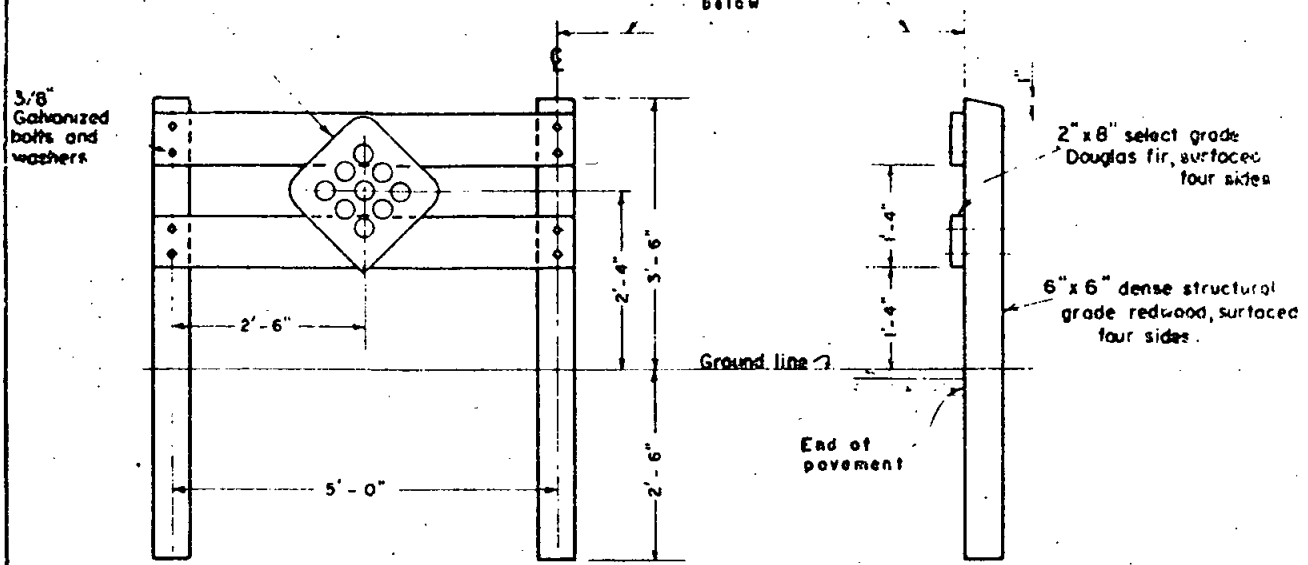


SECTION
Showing Cut

SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO — STANDARD DRAWING	
Sections: 15 County Surveyor D. K. Speer D.K. SPEER, R.C.E. 2081	CUTTING for Removal of existing portland cement concrete Curb, Gutter, Sidewalk and Pavement.	SCALE: NONE DRAWING NO. 213

Reflector sign - California Highway Code W21R.
Size 18" x 18" - Yellow with nine 3" diameter red reflectors

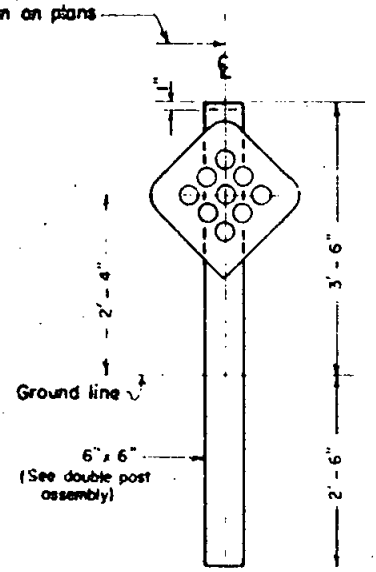
Location dimension shown below



FRONT VIEW

END VIEW

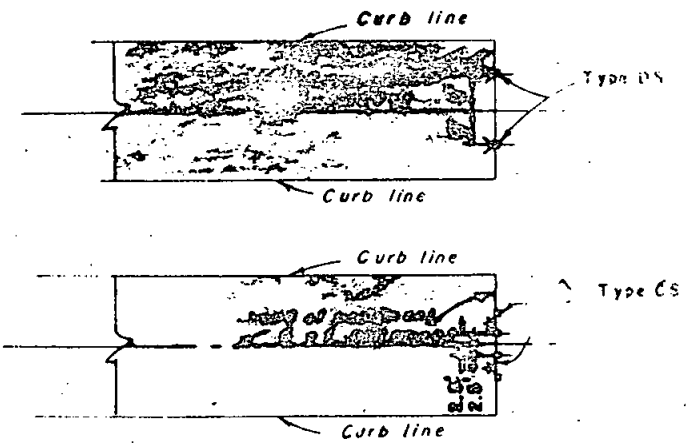
Location dimension shown on plans



FRONT VIEW

Type D (Single post without reflector sign)
Type DS (Single post with reflector sign)

Type C (Double post without reflector sign)
Type CS (Double post with reflector sign)



PLAN - LOCATION

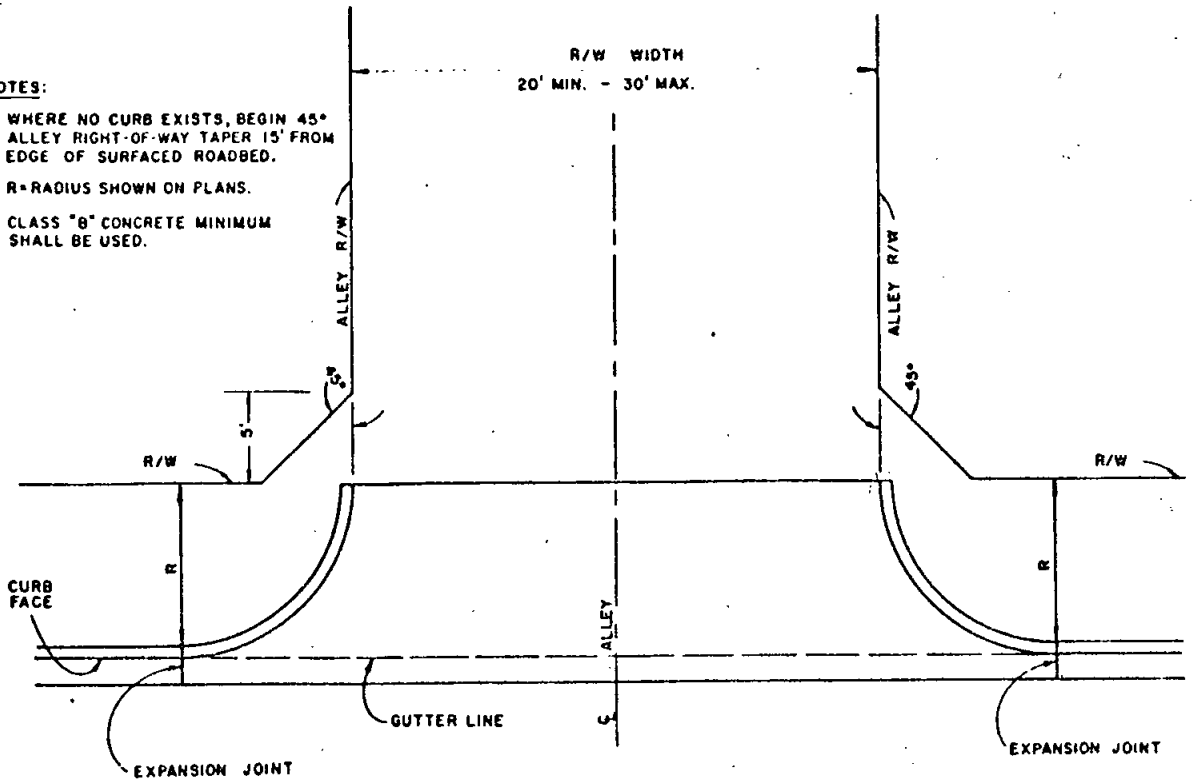
LEGEND ON PLANS

Type CS Type DS

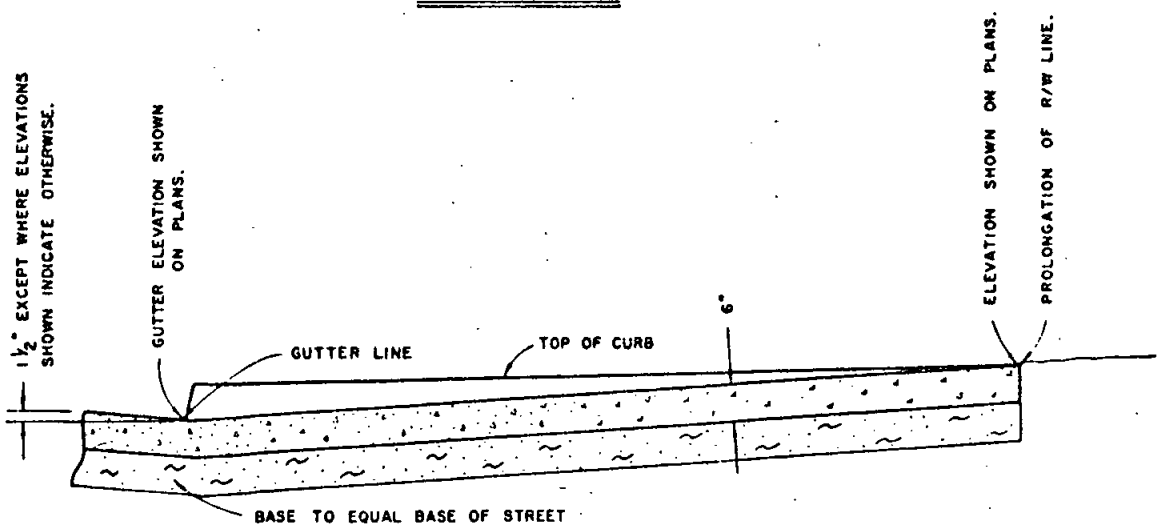
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO	STANDARD DRAWING	
Section: 51, 73, 90	GUARD FENCE ASSEMBLY FOR TERMINATING STREETS		SCALE 1/2" = 1'
County Surveyor			DRAWING NO. 214
D. K. SPEER, R.C.E. 8091			

NOTES:

1. WHERE NO CURB EXISTS, BEGIN 45° ALLEY RIGHT-OF-WAY TAPER 15' FROM EDGE OF SURFACED ROADBED.
2. R = RADIUS SHOWN ON PLANS.
3. CLASS "B" CONCRETE MINIMUM SHALL BE USED.



TYPICAL PLAN



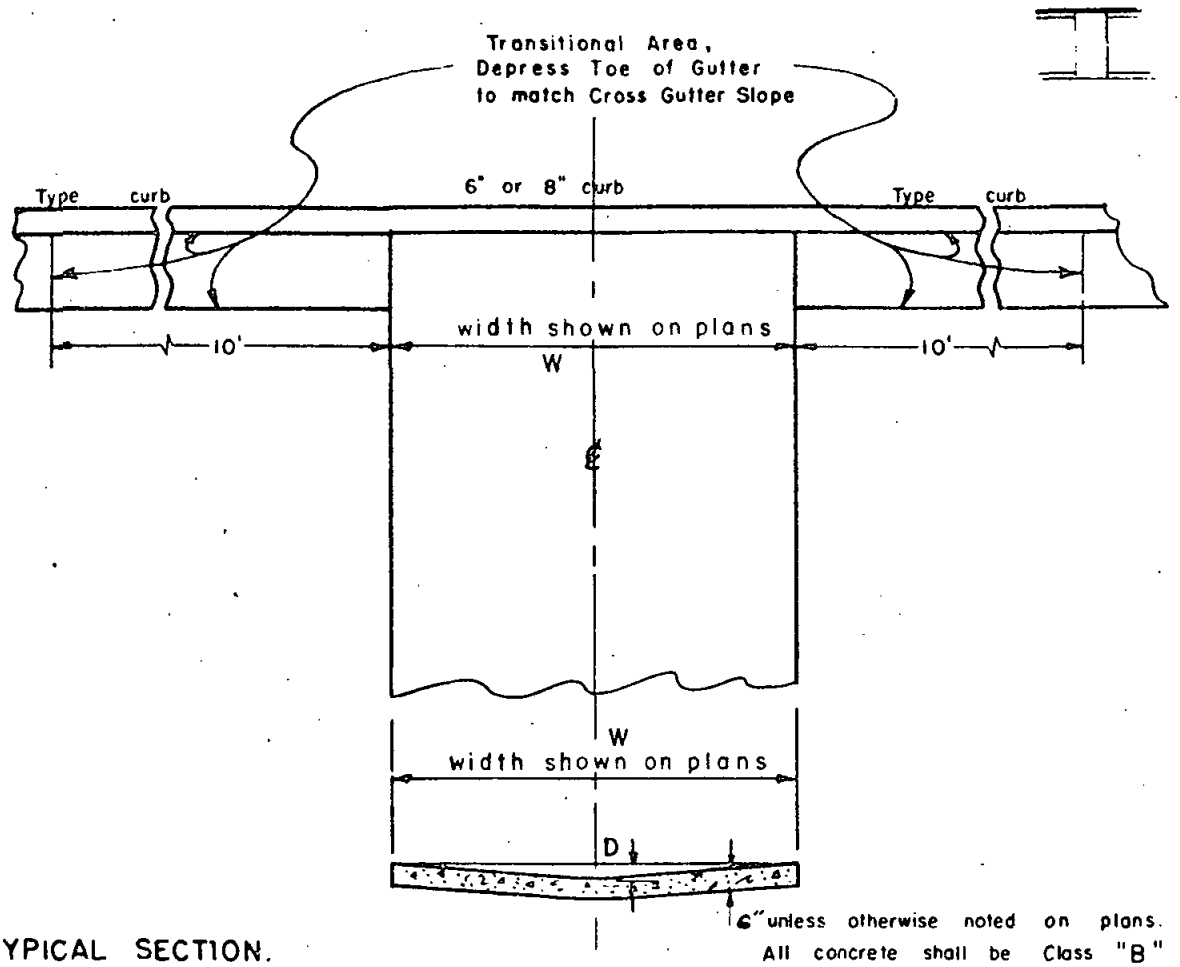
℄ SECTION

LEGEND ON PLANS

STD. SPEC. SEC: 51, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY [illegible] CHECKED BY [illegible]					
RECOMMENDED BY [illegible]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	ALLEY APRON	SCALE: NONE			
D. X. Spear R.C.E. 8091		DRAWING NUMBER 215-1			
DATE: 1/15/68					

FILE No. 11-25

Legend as shown on the plans



TYPICAL SECTION.

Cross gutter to be constructed where the drainage is carried across street and on a grade of at least 0.5%.

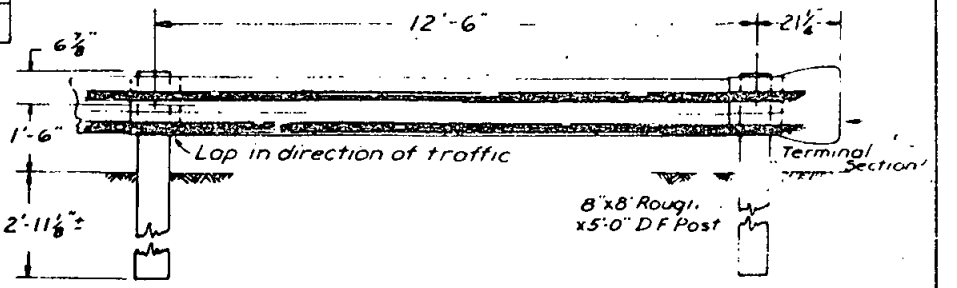
W	D
6'	.05
8'	.06
10'	.07
12'	.08

SPECIFICATION REFERENCE	SAN DIEGO COUNTY STANDARD DRAWING	
Section: 51, 73, 90	CROSS GUTTER TYPE A	SCALE 1" = 3'
County Surveyor D.K.SPEER, R.C.E. 8091		DRAWING NO. 216

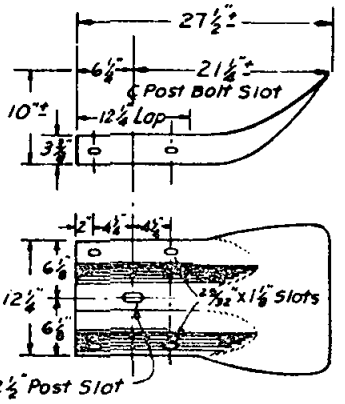
FILE 11-25 216

REVISION	BY	APPROVED	DATE

Lengths of barriers to be in multiples of 12'-6" as specified by County Traffic Engineer.

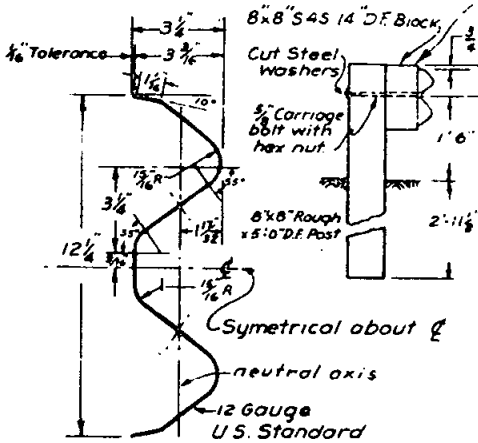


METAL BEAM GUARD RAILING

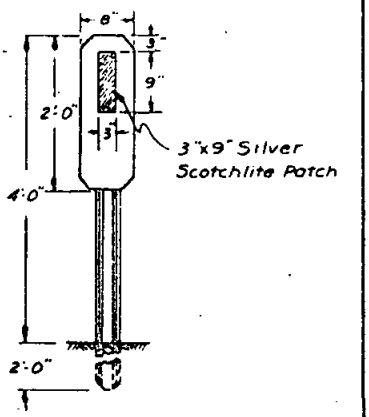


TERMINAL SECTION

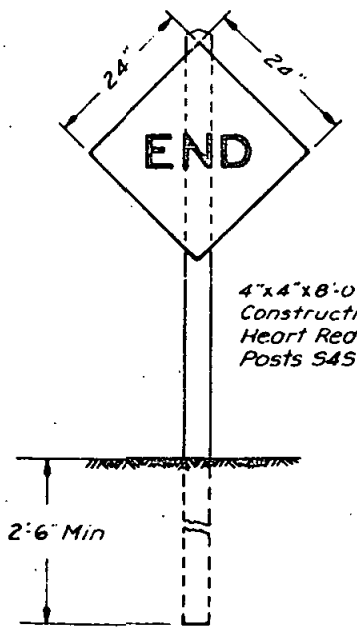
Note: 8"x8" block separator not required for dead end.



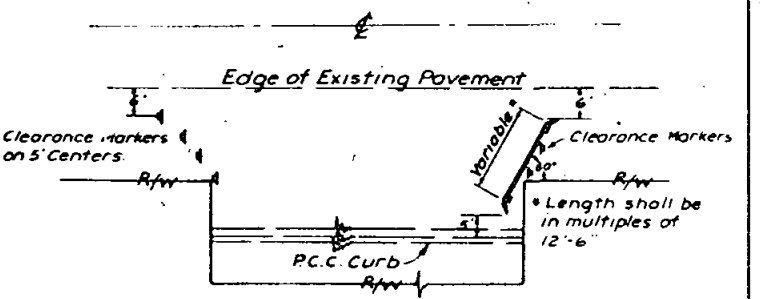
SECTION THROUGH RAIL ELEMENT



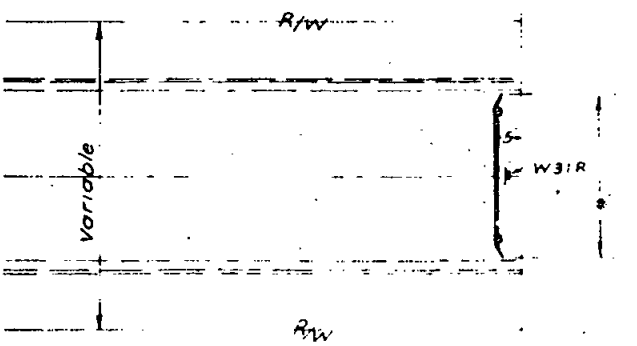
CLEARANCE MARKER



W31R SIGN



TREATMENT FOR WIDENING SECTIONS

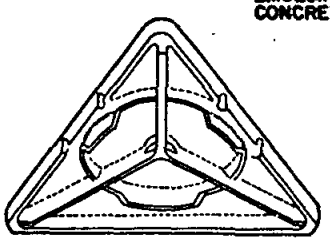


TREATMENT FOR DEAD END

*Over all length of guard rail shall be specified on the plans depending on width of roadway, but shall be of such length that standard increments can be used

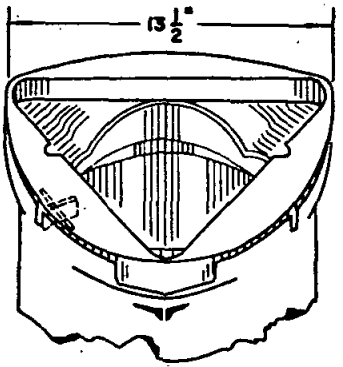
SPECIFICATION REFERENCE	COUNTY OF SAN DIEGO — STANDARD DRAWING	
SECTIONS 83	METAL BEAM GUARD RAIL	SCALE NONE
COUNTY SURVEYOR D. K. Speer D.K. SPEER R.C.E. 8091		DRAWING NO 217

BLACKEN SURFACE OF CONCRETE COLLAR WITH BLACK COAT OF EMULSIFIED ASPHALT WHILE CONCRETE IS FRESH



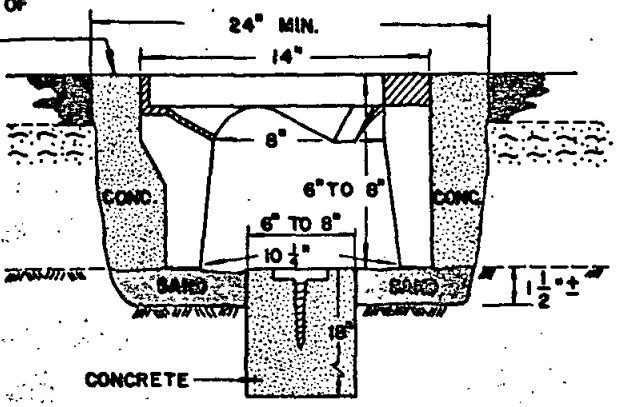
CI COVER (BOTTOM VIEW)

COVER TO BE BROOKS NO. 4TT OR EQUAL AND TO HAVE WORD "MONUMENT" CAST IN LID. BOX TO BE BROOKS 6" 4TT OR EQUAL.



MONUMENT NOTE:

MONUMENT MAY BE FORMED BY METAL SLEEVE, WAXED CARDBOARD OR BY DRILLING THRU HOLE MADE FOR MONUMENT. IF THERE IS AN OVERCUT, THEN OVERCUT SHOULD BE FILLED WITH CONCRETE TO SAND LEVEL.



MONUMENT MARKER

SOLID BRASS, 2" DIA. TOP, 3/4" x 2 1/2" SHANK, LIETZ 526 OR APPROVED EQUAL TO BE SET IN FRESH P.C.C. TOP OF MONUMENT TO BE APPROX. 6" BELOW STREET SURFACE.

SURVEYOR'S NOTE

EXACT POINT TO BE DETERMINED BY ACCURATE SURVEY AND CLEARLY PUNCHED IN TOP OF BRASS MARKER TOGETHER WITH R.E. OR L.S. NUMBER IN 1/8" NUMERALS.

△ ON ALL SUBDIVISIONS WITH DEFERRED MONUMENTATION, WE WILL REQUIRE THE ENGINEER TO ADD THE FOLLOWING NOTE TO THE LEGEND: "IN THE EVENT THE ABOVE TYPE(S) OF MONUMENT(S) CANNOT BE SET, DUE TO UNFORSEEN CIRCUMSTANCES, THEN I WILL AFFIX A TAG OR DISC STAMPED L.S. ____ OR R.E ____ IN EXISTING, CONCRETE, WOOD OR METAL STRUCTURE, OR IN EXISTING NATURAL STONE OUTCROPPING AT THE TRUE POSITION CALLED FOR BY THIS LEGEND SYMBOL."

NOTE:

ALL REQUIRED SURVEY MONUMENTS OR MARKINGS MUST BE COMPLETE AND IN PLACE WITHIN 30 DAYS AFTER COMPLETION OF SUBDIVISION IMPROVEMENTS. (SEE STANDARD DRAWING NO. 219-1)

OTHER REQUIRED SURVEY MARKERS

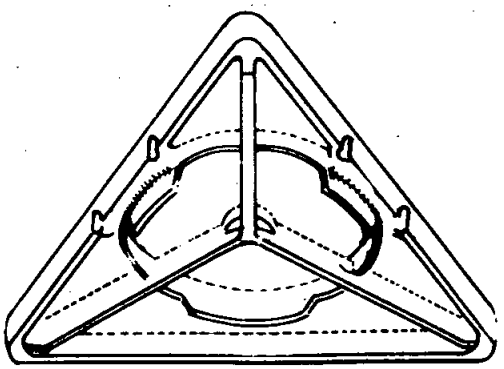
△ EVERY MAP OF SUBDIVISION SHALL SHOW THE FOLLOWING MONUMENTS WHICH SHALL BE SET BY A LICENSED SURVEYOR OR ENGINEER:

BOUNDARY MONUMENTS: THE EXTERIOR BOUNDARY OF THE SUBDIVISION SHALL BE MONUMENTED WITH PERMANENT MONUMENTS NOT SMALLER THAN TWO INCH (2") IRON PIPES AT LEAST TWENTYFOUR INCHES (24") LONG SET AT EACH CORNER, AT INTERMEDIATE POINTS ALONG THE BOUNDARY NOT MORE THAN ONE THOUSAND FEET (1000') APART AND AT THE BEGINNING AND END POINTS OF ALL CURVES; PROVIDED, IF ANY EXISTING RECORD AND IDENTIFIED MONUMENT MEETING THE FOREGOING REQUIREMENTS IS FOUND AT ANY SUCH CORNER OR POINT, SUCH MONUMENT MAY BE USED IN LIEU OF A NEW MONUMENT.

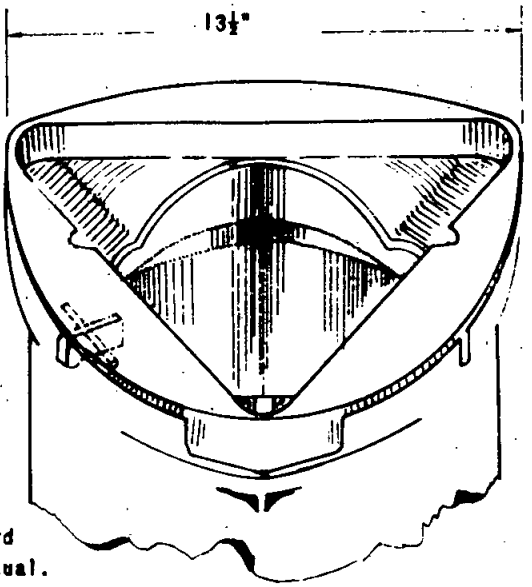
LOT CORNER MONUMENTS: ALL LOT CORNERS, EXCEPT WHEN COINCIDENT WITH EXTERIOR BOUNDARY CORNER, SHALL BE MONUMENTED WITH PERMANENT MONUMENTS OF ONE OF THE FOLLOWING TYPES: (1) THREE-FOURTH INCH (3/4") DIAMETER IRON PIPE AT LEAST EIGHTEEN INCHES (18") LONG (2) ONE-HALF INCH (1/2") DIAMETER STEEL ROD AT LEAST TWELVE INCHES (12") LONG (3) LEAD PLUG AND COPPER IDENTIFICATION DISKS SET IN CONCRETE SIDEWALKS OR CURBS.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY EdH CHECKED BY MES		△	MES		
RECOMMENDED BY [signature]	STREET SURVEY MONUMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
H M Taylor R.C.E. 11458		DRAWING NUMBER 218-1			
DATE: Aug 14, 1978					

REVISION	BY	APPROVED	DATE



CI COVER (BOTTOM VIEW)

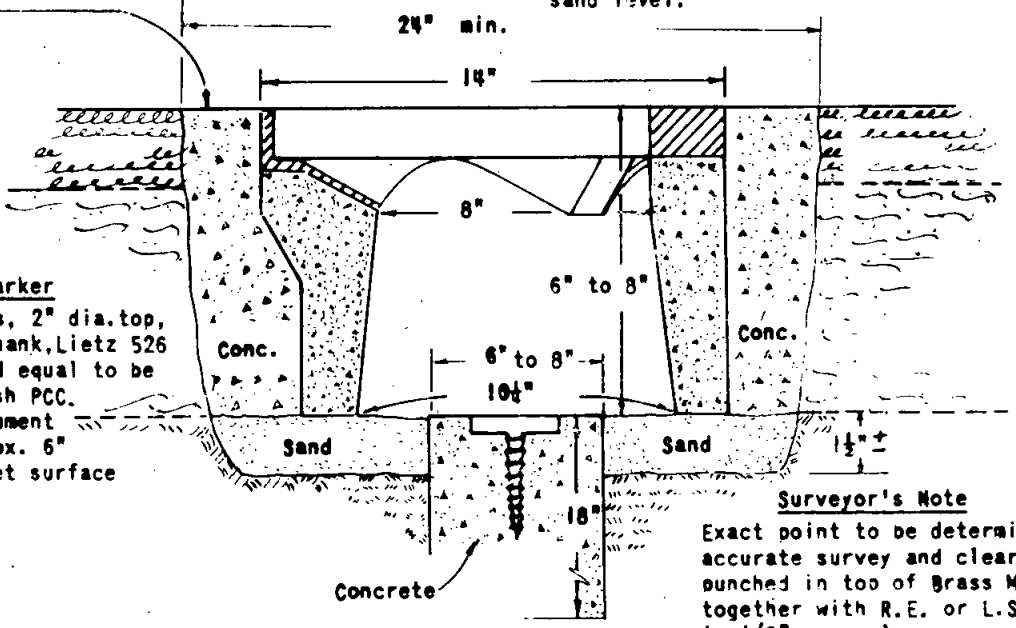


Cover to be Brooks No. 4TT or equal and to have word "Monument"cast in LID. Box to be Brooks 6" 4TT or equal.

Monument Note

Monument may be formed by metal sleeve,waxed cardboard or by drilling thru hole made for monument box. If there is an overcut,then overcut should be filled with concrete to sand level.

Blacken surface of concrete collar with black coat of emulsified asphalt while concrete is fresh



Monument Marker

Solid brass, 2" dia.top, 3/4"x2½" shank,Lietz 526 or approved equal to be set in fresh PCC. Top of monument to be approx. 6" below street surface

Surveyor's Note

Exact point to be determined by accurate survey and clearly punched in top of Brass Marker together with R.E. or L.S.Number in 1/8" numerals.

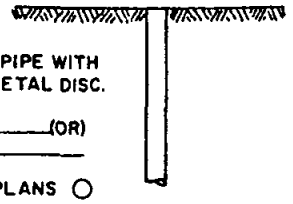
NOTE

All required survey monuments or markings must be complete and in place within 30 days after completion of subdivision improvements. (See Standard Drawing No. 219).

OTHER REQUIRED SURVEY MARKERS

All exterior subdivision boundary points not common to points in previously established subdivisions or records of survey are to be monumented by 2" iron pipes at least 24" long set flush with the ground. All subdivision lots will be marked by 3/4" pipes 18" long set flush with the ground, all pipes to be marked with metal discs stamped RCE _____ or L.S._____. Markers in concrete sidewalks to be lead and discs marked L.S.___or RCE ___. Offsets for lead and discs to be on prolongation of lot lines for lot corners, and on radial lines for points of curve for streets.

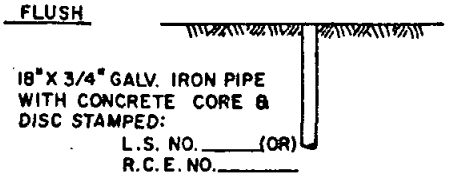
SPECIFICATION REFERENCE	SAN DIEGO COUNTY STANDARD DRAWING	Scale: None
County Surveyor. D.K.Speer D.K. SPEER, R.C.E. 8091	STREET SURVEY MONUMENT	Drawing No. 218



24"X 2" GALV. IRON PIPE WITH CONCRETE CORE & METAL DISC. STAMPED:
L.S. NO. _____ (OR)
R.C.E. NO. _____

LEGEND ON PLANS ○

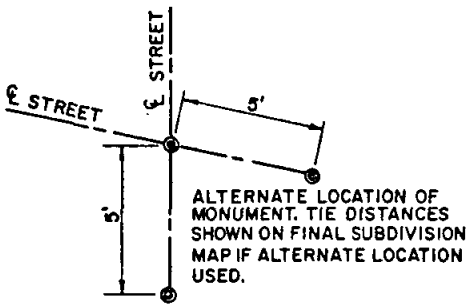
SUBDIVISION BOUNDARY MONUMENT



18"X 3/4" GALV. IRON PIPE WITH CONCRETE CORE & DISC STAMPED:
L.S. NO. _____ (OR)
R.C.E. NO. _____

LEGEND ON PLANS ○

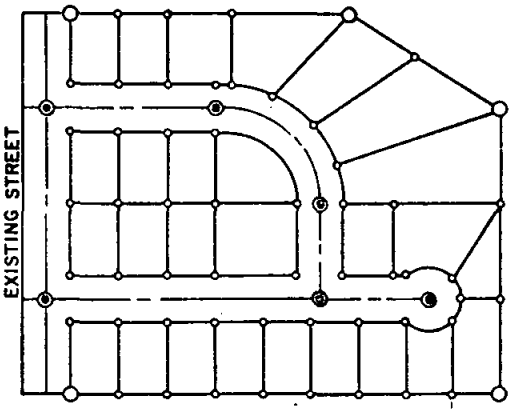
PROPERTY CORNER MONUMENT



ALTERNATE LOCATION OF MONUMENT. TIE DISTANCES SHOWN ON FINAL SUBDIVISION MAP IF ALTERNATE LOCATION USED.

LEGEND ON PLANS ●

LOCATION OF STREET SURVEY MONUMENT
(STD. DRAWING NO. 218-1)



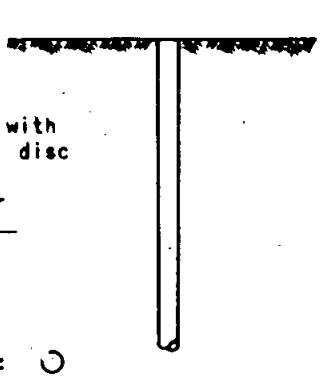
TYPICAL INSTALLATION

NOTES

1. STREET SURVEY MONUMENT:
   FOR DETAILS OF PLACEMENT AND CONSTRUCTION, SEE STANDARD DRAWING NO. 218-1
   (a) SET ON ALL CENTERLINE INTERSECTIONS UNLESS ACTUAL LOCATION IS MODIFIED BY THE COUNTY SUBDIVISION ENGINEER AND SHOWN IN MODIFIED LOCATION ON MAP WHEN CENTER LINE INTERSECTION IS IMPRACTICAL, OFFSET 5 FEET ON CENTER LINE OF MAJOR STREET. (SEE DETAIL ABOVE). IF NEITHER CENTER LINE CAN BE OCCUPIED, TWO MONUMENTS WILL BE SET IN LINE AROUND THE POINT ON THE PERIMETER OF A 10-FOOT DIAMETER CIRCLE, WHOSE CENTER IS THE POINT.
   (b) SET ON CENTER LINE AT INTERVALS NOT EXCEEDING 1000 FEET ON STRAIGHT RUNS.
   (c) SET ON CENTER LINE AT POINTS OF CURVATURE.
   (d) SET ON CENTER AT CENTER POINTS OF CUL-DE-SACS.
   ◇ (e) SET ON CENTER LINE WHEN CENTER POINT OF CUL-DE-SAC IS OFFSET FROM CENTER LINE.
   (f) THESE STANDARDS MAY BE MODIFIED AT THE DISCRETION OF THE COUNTY ENGINEER IN CASES WHERE STRICT COMPLIANCE THEREWITH RESULTS IN MORE MONUMENTS THAN HE CONSIDERS NECESSARY. THE FOLLOWING TECHNIQUE FOR REDUCING THE NUMBER OF MONUMENTS WILL BE ROUTINE.
   ◇ (g) SUBSTITUTION OF ONE MONUMENT ON THE "POINT OF INTERSECTION" FOR MONUMENTS AT THE "BEGINNING OF CURVE" AND THE "ENDING OF CURVE" WHEN THE "POINT OF INTERSECTION" FALLS WITHIN THE PAVEMENT AREA.
   ◇ (h) DELETION OF ANY MONUMENT OTHERWISE REQUIRED BY THESE STANDARDS WHEN ITS POSITION CAN BE DETERMINED BY TURNING ONE ANGLE FROM A POINT ON A STRAIGHT LINE BETWEEN TWO OTHER MONUMENTS, PROVIDING SUCH POINT IS NOT MORE THAN 300 FEET FROM THE POINT ON WHICH THE DELETED MONUMENT WOULD HAVE BEEN PLACED.
2. PRESERVATION OF MONUMENTS:
   WHERE PLANS ARE SUBMITTED, IT SHALL BE THE RESPONSIBILITY OF THE ENGINEER OF WORK TO SHOW ALL MONUMENTS OF RECORD WHICH IT MAY BE NECESSARY TO MOVE. THE PERMITTEE SHALL NOT DISTURB ANY MONUMENTS OF RECORD FOUND ON THE LINE OF IMPROVEMENT WITHOUT PERMISSION FROM THE COUNTY ENGINEER, AND THE PERMITTEE SHALL BEAR THE EXPENSE OF RESETTING ANY MONUMENT OR STAKES WHICH MAY BE DISTURBED.
3. COMPLETION TIME:
   ALL REQUIRED SURVEY MONUMENTS OR MARKINGS MUST BE COMPLETE AND IN PLACE WITHIN 30 DAYS AFTER COMPLETION OF SUBDIVISION IMPROVEMENTS.
4. CALIFORNIA COORDINATE SYSTEM:
   ALTHOUGH THE USE OF THE CALIFORNIA COORDINATE SYSTEM IS OPTIONAL, SAN DIEGO COUNTY WOULD PREFER ITS USE. IF THE ENGINEER OR SURVEYOR WILL USE COORDINATE PROCEDURE, THE COUNTY WILL PROVIDE THE NEEDED TIES AND COORDINATES.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	◇	7/82		
DRAWN BY RLB CHECKED BY MG					
RECOMMENDED BY [signature]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	SURVEY MONUMENT LOCATIONS	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 219-1			
DATE: Aug. 14, 1973					

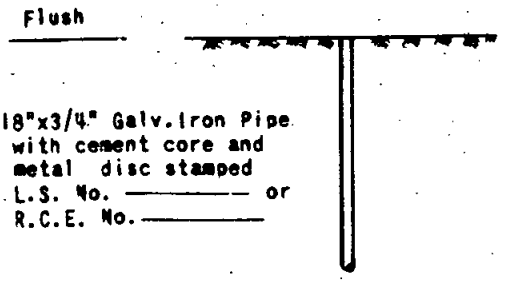
REVISION	BY	APPROVED	DATE



24"x2" Galv. Iron Pipe with cement core and metal disc stamped
L.S. No. _____ or
R.C.E. No. _____

Legend on Plans: ○

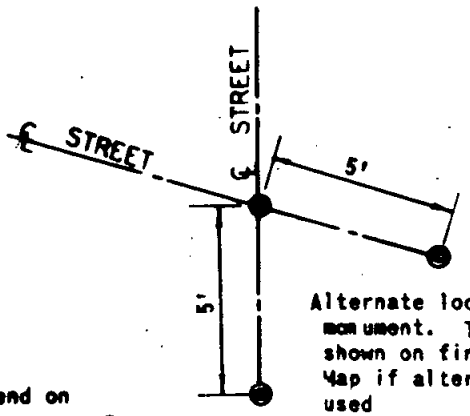
SUBDIVISION BOUNDARY MONUMENT



18"x3/4" Galv. Iron Pipe with cement core and metal disc stamped
L.S. No. _____ or
R.C.E. No. _____

Legend on Plans: o

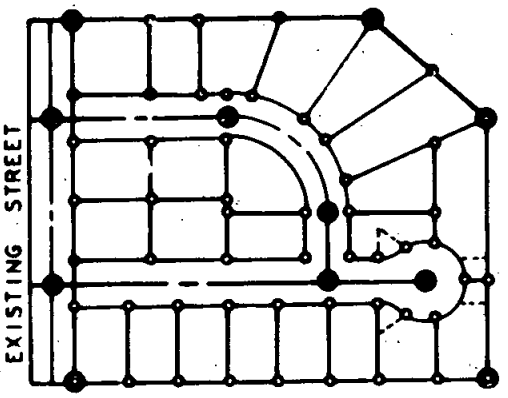
PROPERTY CORNER MONUMENT



Alternate locations of monument. Tie distances shown on final Subdivision Map if alternate location used

Legend on Plans ●

LOCATION OF STREET SURVEY MONUMENT. (Std. Dwg. Nº 218)

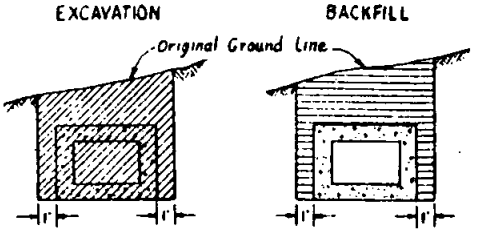


TYPICAL INSTALLATION

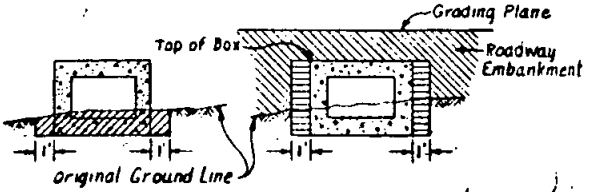
NOTES

1. Street Survey Monument:
   For details of placement and construction, see Standard Drawing No. 218 .
   (a) Set on all center line intersections unless actual location is modified by the County Subdivision Engineer and shown in modified location on map. When center line intersection is impractical, offset 5 feet on center line of major street. (See detail above). If neither center line can be occupied, two monuments will be set in line around the point on the perimeter of a 10-foot diameter circle, whose center is the point.
   (b) set on center line at intervals not exceeding 1000 feet on straight runs.
   (c) set on center line at points of curvature.
   (d) set on center at center points of cul-de-sacs.
   (e) set on center line when center point of cul-de-sac is offset from center line.
2. Preservation of Monuments:
   Where plans are submitted, it shall be the responsibility of the Engineer of work to show all monuments of record which it may be necessary to move. The permittee shall not disturb any monuments of record found on the line of improvement without permission from the County Surveyor, and the permittee shall bear the expense of resetting any monuments or stakes which may be disturbed.
3. Completion Time:
   All required survey monuments or markings must be complete and in place within 30 days after completion of subdivision improvements.
4. California Coordinate System:
   Although the use of the California Coordinate System is optional, San Diego County would prefer its use. If the Engineer or Surveyor will use coordinate procedure, the County will provide the needed ties and coordinates.

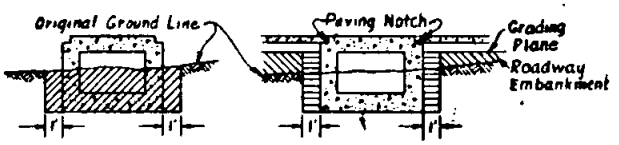
SPECIFICATION REFERENCE	SAN DIEGO COUNTY STANDARD DRAWING	Scale: None
County Surveyor D.K. Speer D.K. SPEER, R.C.E. 8091	SURVEY MONUMENT LOCATIONS	Drawing No. 219



CULVERT IN TRENCH

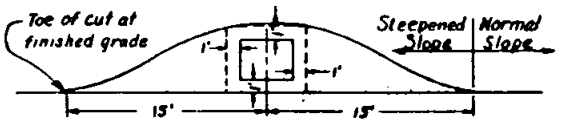


CULVERT IN EMBANKMENT



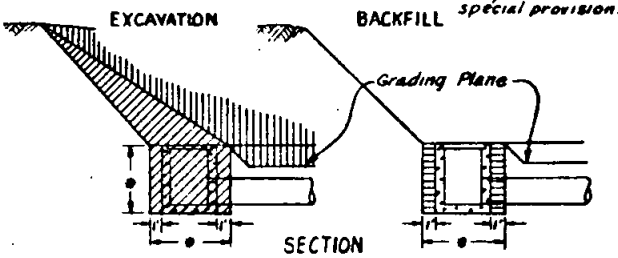
GRADE TOP OF CULVERT

BOX CULVERTS



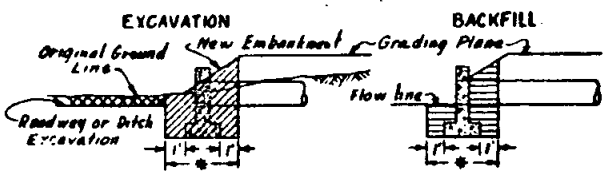
PLAN

NOTE: Slopes & dimensions may vary as shown on the plans or in the special provisions



SECTION

RECESSES AT CULVERT INLETS

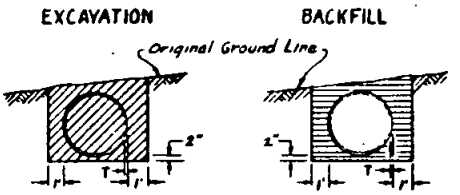


PIPE HEADWALLS

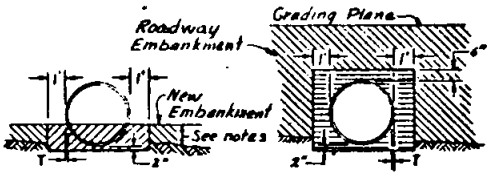
* Note: When concrete is being paid for as class A concrete (Minor Structures), the cost of excavation and backfill is included in the price paid for class A concrete (Minor Structures)

LEGEND

- Structure Excavation
- Structure Backfill
- Ditch Excavation
- Roadway Excavation
- Roadway Embankment
- Original Ground



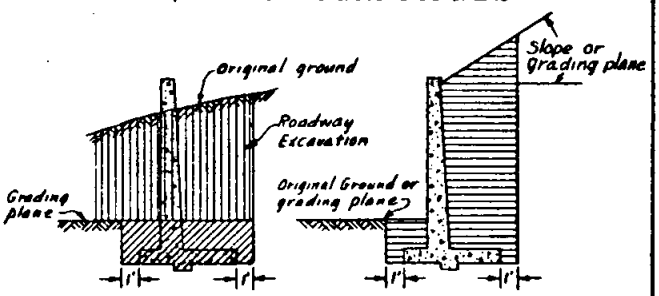
PIPE CULVERT IN TRENCH



PIPE CULVERT IN NEW EMBANKMENT

Height of top of embankment before excavating for pipe shall be as follows:
For pipe 24"dia. or less: 6"above top of pipe or 30"max.
For C.M.P. over 24" to 90"dia: 30"above bottom of pipe.
For C.M.P. over 90"dia. ⅓ point of dia. above bottom pipe.
For R.C.P. over 24"dia: 30"above bottom of pipe.
For field assembled plate culvert: ⅓ point of dia. above bottom of pipe. Structure backfill 6"above top of pipe.
For payment quantities excavation & backfill concrete pipe T= min. wall thickness as shown in A.A.S.H.O. M170 for class III pipe, wall A. For C.M.P. T=0.00

PIPE CULVERTS, RODS & DEADMEN
except underdrains & overside drains

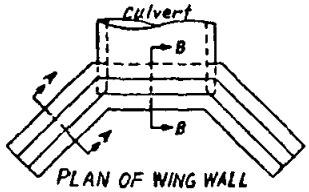


RETAINING WALLS

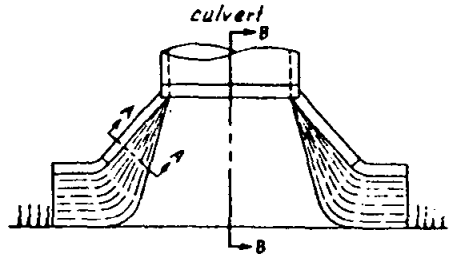
Note: If no roadway excavation is involved at the wall Structure excavation will be measured from the original ground.

Revision	By	Approved	Date

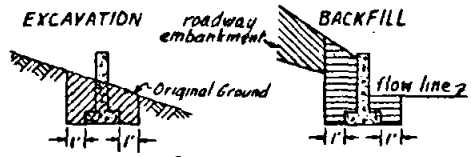
Standard Specifications Sections: 19	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT STANDARD DRAWING	Scale: None
Drawn by: Drake Checked by: RFG		Date Approved: 1-14-63
Recommended by: [signature]	EXCAVATION AND BACKFILL CULVERTS, RETAINING WALLS & HEADWALLS	Drawing No 220-1
Approved by County Surveyor: D. K. Sparer RCE 8071		



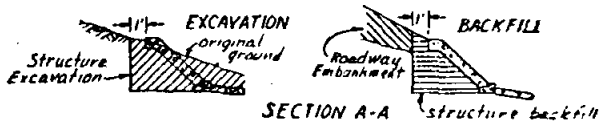
PLAN OF WING WALL



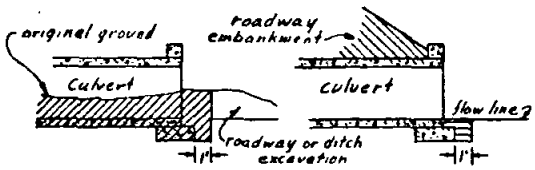
PLAN OF WARPED WINGWALL



SECTION A-A

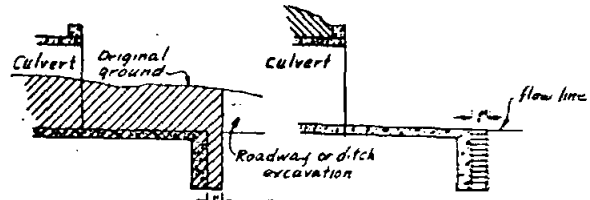


SECTION A-A



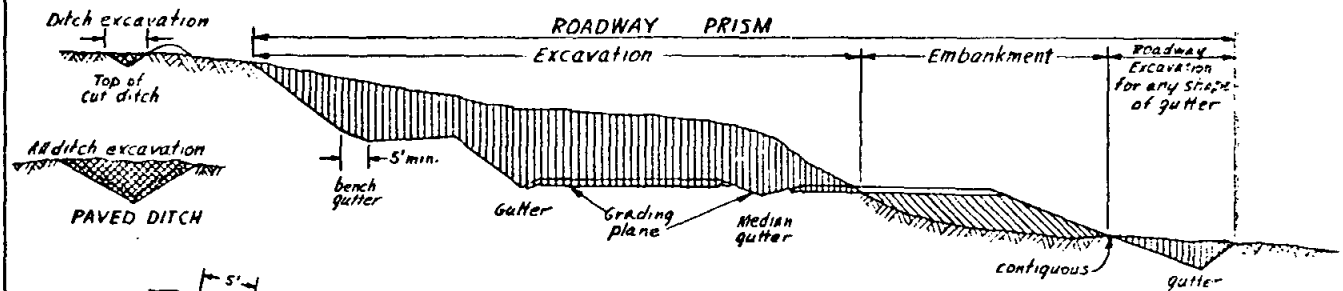
SECTION B-B

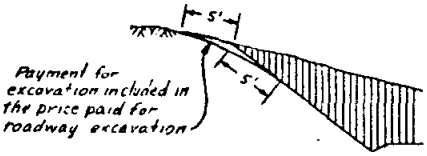
WING WALL



SECTION B-B

WARPED WING WALLS

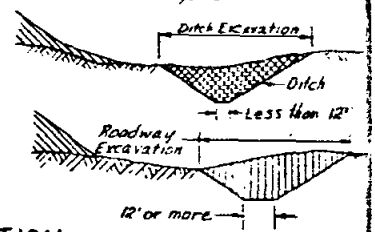




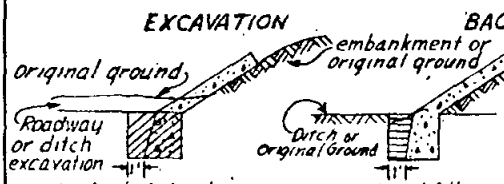
SLOPE ROUNDING

DIKE & GUTTER

Payment for excavation and backfill included in the price for dikes.

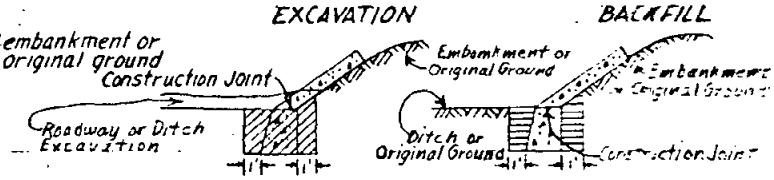


ROADWAY EXCAVATION, EMBANKMENT, & DITCH EXCAVATION



Top limit of structure excavation and backfill is original ground if ditch is not excavated.

MONOLITHIC CONCRETE SLOPE PROTECTION



Top limit of structure excavation and backfill is original ground if ditch is not excavated

CONCRETE SLOPE PROTECTION

LEGEND

- Structure Excavation
- Structure Backfill
- Ditch Excavation
- Roadway Excavation
- Roadway Embankment
- Original Ground

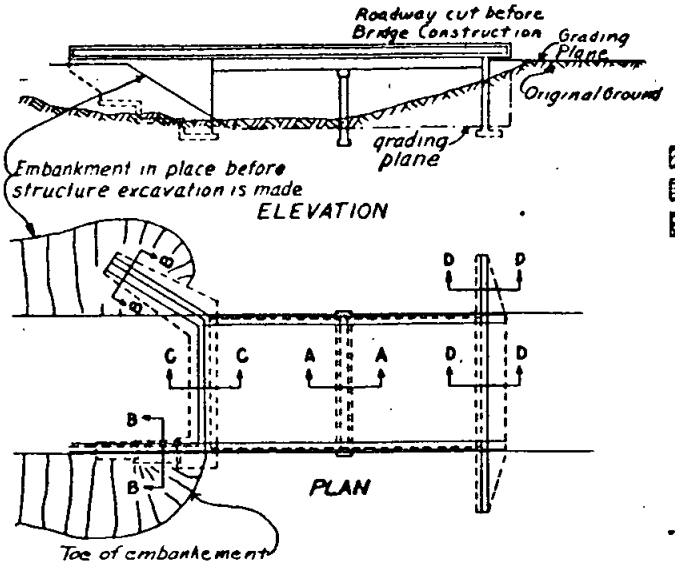
Revision	By	Approved	Date

Standard Specifications
Sections: 19
Drawn by: drake | Checked by: REB
Recommended by: [illegible]
Approved by County Surveyor:
D. K. Shaar R.C.E. 8091

SAN DIEGO COUNTY SURVEYOR → ROAD DEPARTMENT
STANDARD DRAWING

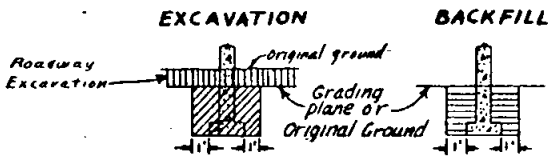
EXCAVATION AND BACKFILL
ROADWAY, WING WALLS & SLOPE PROTECTION

Scale: None
Date Approved 1-14-63
Drawing No
221-1



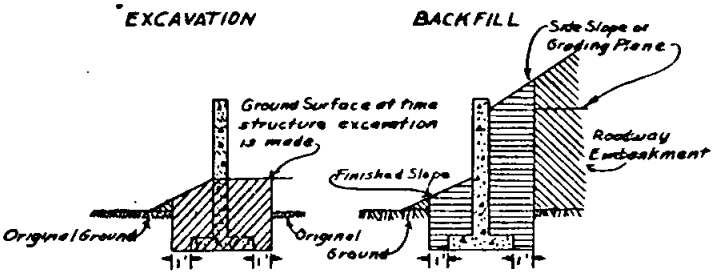
LEGEND

- Structure Excavation
- Roadway Excavation
- Structure Backfill
- Roadway Embankment
- Ditch Excavation
- Original Ground

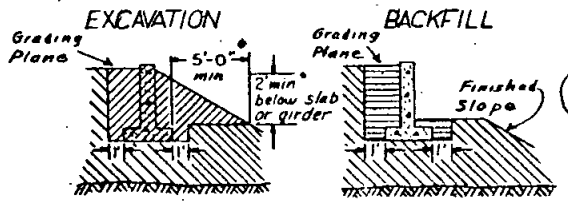


SECTION A-A

When bridge piers are in water course, quality and compaction requirements for backfill will be waived and full compensation for backfilling the excavation will be considered as included in the price paid for structure excavation.

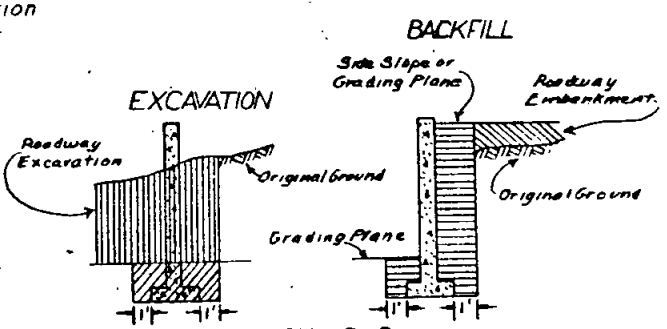


SECTION B-B



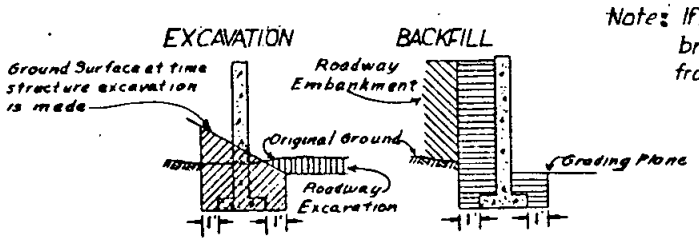
SECTION C-C
ABUTMENT IN EMBANKMENT

* Or as shown on plans



SECTION D-D

Note: If no roadway excavation is involved at bridge, structure excavation will be measured from the original ground.



SECTION C-C
ABUTMENT IN ORIGINAL GROUND

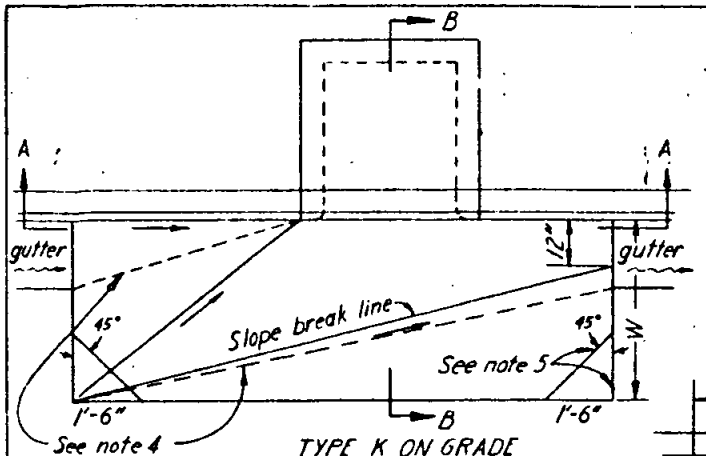
Revision	By	Approved	Date

Standard Specifications	SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT STANDARD DRAWING
Sections: 19	
Drawn by: Drake Checked by:	
Recommended by:	EXCAVATION AND BACKFILL BRIDGE PIERS, ABUTMENTS & ADJOINING WING WALLS
Approved by County Surveyor: D. K. Spear RCE 6971	

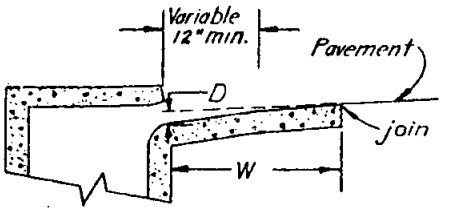
Scale: None

Date Approved: 1-14-63

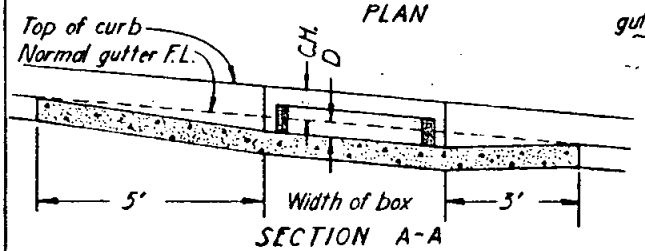
Drawing No 222-1



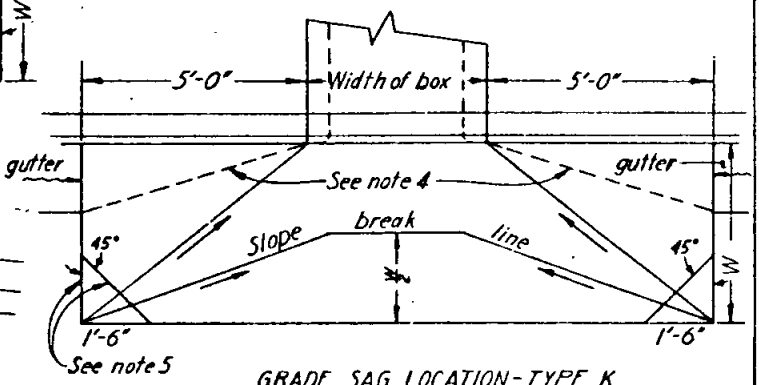
TYPE K ON GRADE
PLAN



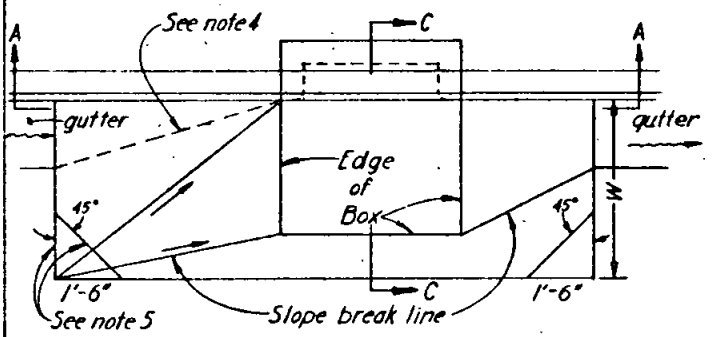
SECTION B-B



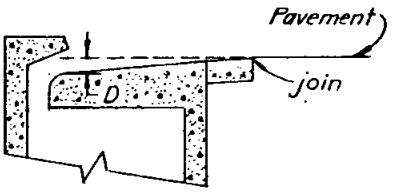
SECTION A-A



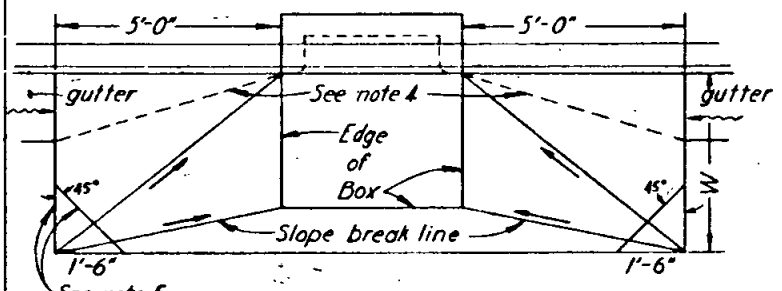
GRADE SAG LOCATION - TYPE K
PLAN



TYPE K-1 ON GRADE
PLAN



SECTION C-C

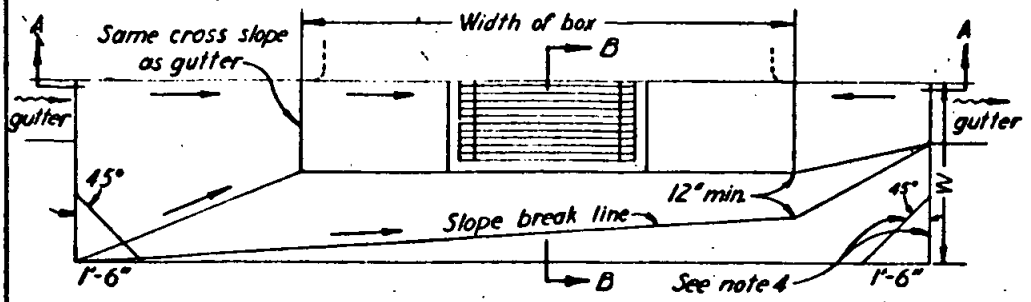


GRADE SAG LOCATION
TYPE K-1
PLAN

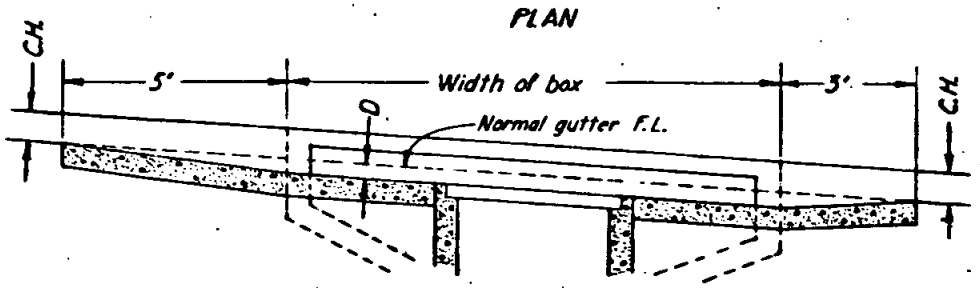
Notes:

1. W = width of depressed aprons, variable 3' to 6' (use 4' unless noted otherwise).
   D = gutter depression. It shall be 4" unless noted otherwise.
   C.H. = curb height.
   ——— = straight grade, downward slope.
   ~~~~ = gutter direction of flow.
2. Gutter depression to be class "A" P.C.C. 6" thick.
3. Refer to standard drawing 104-1 type K curb inlet or 105-1 type K-1 curb inlet for curb opening.
4. Where cross slope of gutter is not the same as cross slope of adjacent pavement, dashed slope break lines also apply.
5. When adjacent pavement is P.C.C., corners shall be 90°. For A.C. pavement corners shall be formed at 45° as shown.

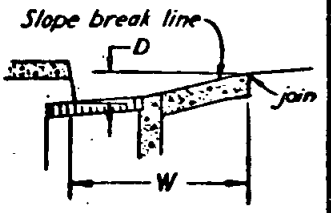
Standard Specifications	SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT				
Sections: 51, 90.		Revision	By	Approved	Date
Drawn by: Date Checked by: REP	STANDARD DRAWING	Scale: None			
Recommended by: C.J. Mecum		Date Approved: 12/2/63			
Approved by County Surveyor:	STANDARD GUTTER DEPRESSIONS	Drawing No.			
D.K. Sloan RCE. 8091	FOR TYPE K AND K-1 CURB INLETS	223-1			
   ~~~~



PLAN

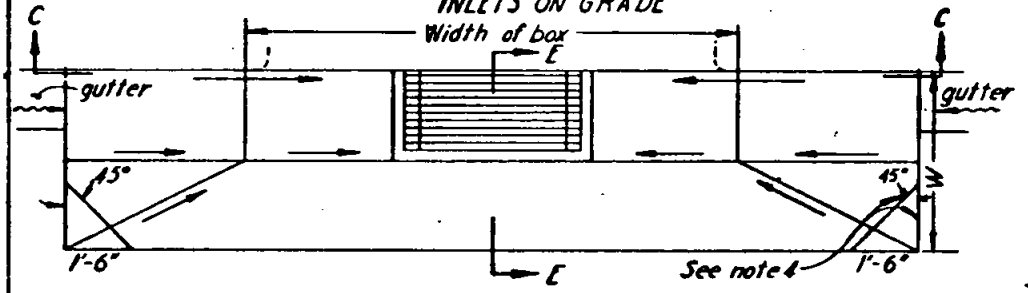


SECTION A-A

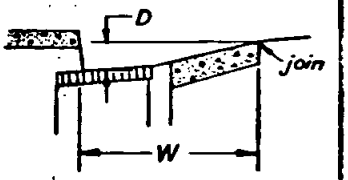


SECTION B-B

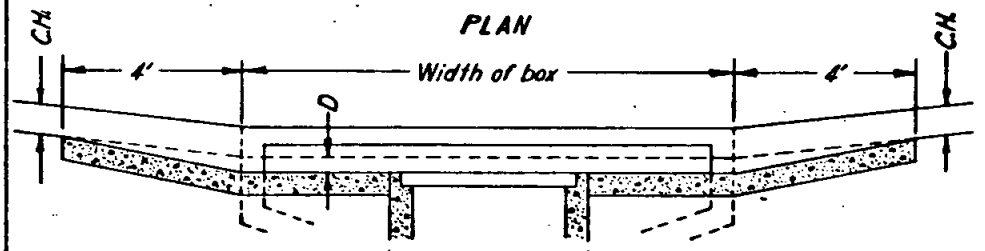
INLETS ON GRADE



PLAN



SECTION E-E



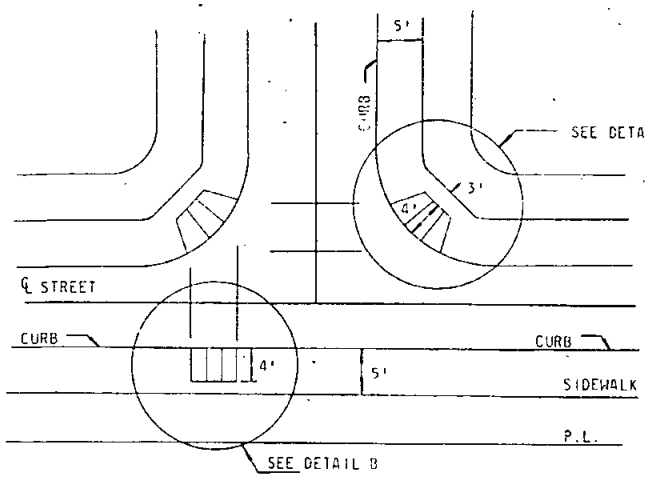
SECTION C-C

GRADE SAG LOCATION

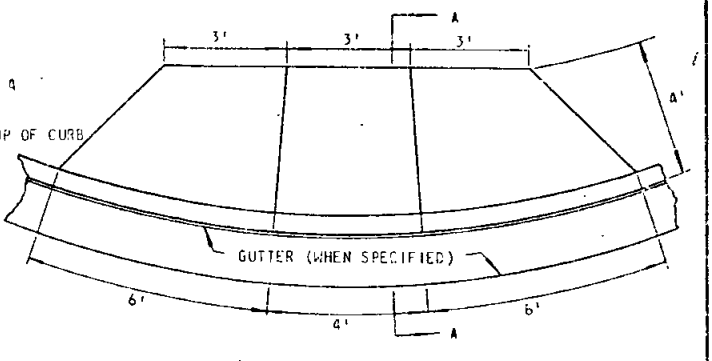
Notes:

1. W = width of depressed aprons, variable 3' to 6' (use 4' unless noted otherwise).
   D = gutter depression. It shall be 4" unless noted otherwise.
   C.H. = curb height.
   ——→ = straight grade, downward slope.
   ~~~→ = gutter direction of flow.
2. Gutter depression to be class "A" P.C.C., 6" thick.
3. This standard drawing shall apply to all standard curb inlets with grate.
4. When adjacent pavement is P.C.C., corners shall be formed at 90°. For A.C. pavement, corners shall be formed at 45° as shown.

Standard Specifications	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	Revision | By | Approved | Date
Sections: 51, 90.		Scale: None
Drawn by: prake Checked by:	STANDARD DRAWING	Date Approved: 12/2/63
Recommended by:	STANDARD GUTTER DEPRESSIONS FOR CURB INLETS WITH GRATE	Drawing No. 224-1
Approved by County Surveyor: D.K. Sloan R.C.E. 8091		
   ~~~

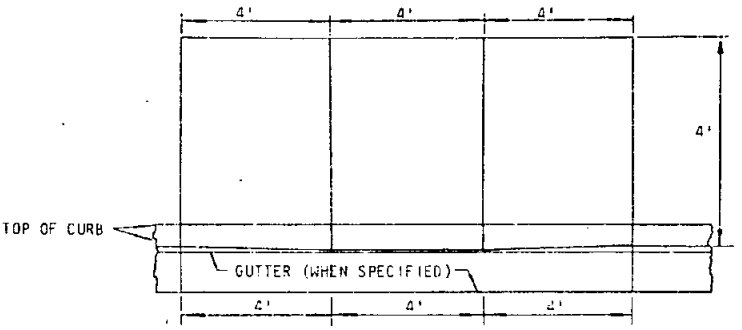


DETAIL A



PLAN

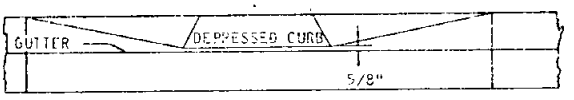
DETAIL B



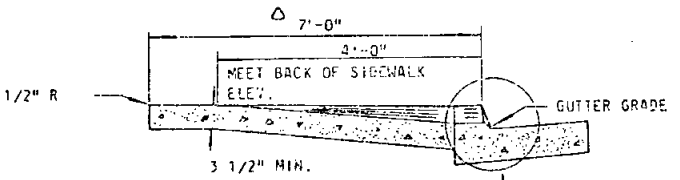
PLAN

NOTES:

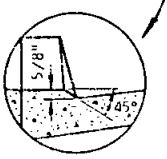
1. IF OBSTRUCTIONS SUCH AS INLETS, UTILITY POLES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED THE LOCATION AND DIMENSIONS MAY BE ADJUSTED UPON THE APPROVAL OF THE COUNTY ENGINEER
2. TEXTURE TO BE HEAVY BROOM FINISH TRANSVERSE TO AXIS OF RAMP.
3. THE RAMP SHOWN IN DETAIL B SHALL BE CENTERED IN THE CROSSWALK.



ELEVATION

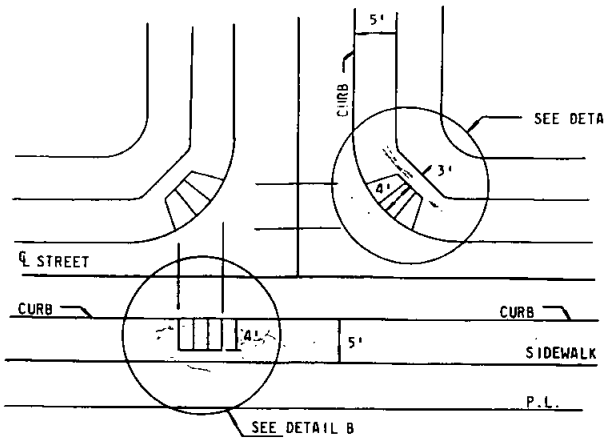


SECTION A-A

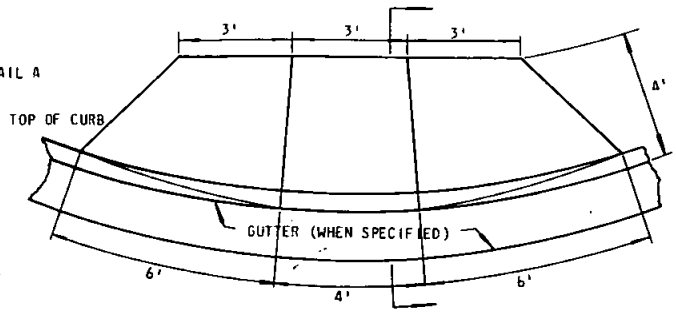


5/8" LIP ON DEPRESSED CURB SECTION WILL BE SLOPED AT 45°

STD. SPEC. SEC: 51, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY RWH CHECKED BY			
RECOMMENDED BY	RAMP FOR CURB, GUTTER AND SIDEWALK	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER					
by Bert Ellis R.C.E. 11458		SCALE: NONE			
DATE: 6-15-73		DRAWING NUMBER 225			

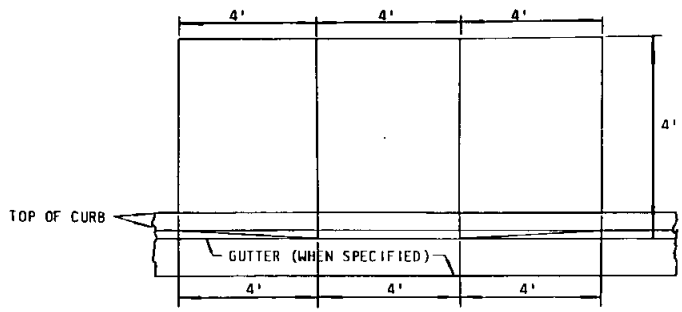


DETAIL A



PLAN

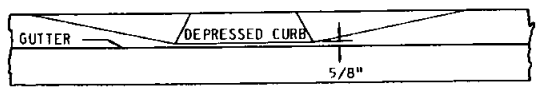
DETAIL B



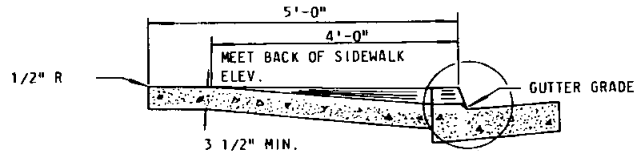
PLAN

NOTES:

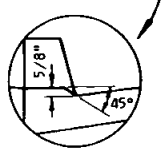
1. IF OBSTRUCTIONS SUCH AS INLETS, UTILITY POLES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED THE LOCATION AND DIMENSIONS MAY BE ADJUSTED UPON THE APPROVAL OF THE COUNTY ENGINEER
2. TEXTURE TO BE HEAVY BROOM FINISH TRANSVERSE TO AXIS OF RAMP.
3. THE RAMP SHOWN IN DETAIL B SHALL BE CENTERED IN THE CROSSWALK.



ELEVATION

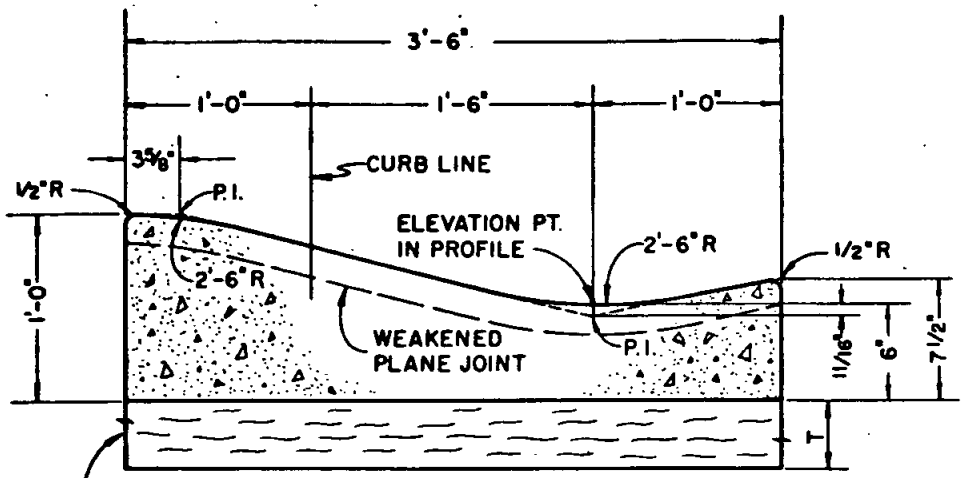


SECTION A-A



5/8" LIP ON DEPRESSED CURB SECTION WILL BE SLOPED AT 45°

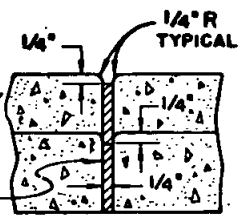
STD. SPEC. SEC: 51, 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY Phil CHECKED BY [illegible]					
RECOMMENDED BY [signature]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	RAMP FOR CURB, GUTTER AND SIDEWALK	SCALE: NONE			
by Bert Elbin R.C.E. 11458	BIS approved 7/3/73 - 37 (39)	DRAWING NUMBER 225			
DATE:					



SECTION

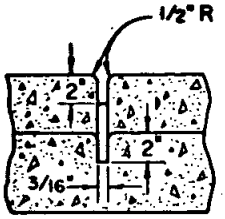
BASE MATERIAL TO MATCH STRUCTURAL SECTION OF STREET. THICKNESS (T) = 6" OR THE THICKNESS DETERMINED BY EXTEND -ING THE ROADBED GRADING PLANE UNDER THE CURB, WHICH -EVER THICKNESS IS GREATER.

BASE ONLY FOR COMMERCIAL OR INDUSTRIAL USE.



LOCATE TRANSVERSELY AT 60' INTERVALS AND AT RETURNS.

PREFORMED JOINT FILLER



LOCATE TRANSVERSELY AT 20' INTERVALS BETWEEN EXPANSION JOINTS.

EXPANSION JOINT **WEAKENED PLANE JOINT**

THE SPECIAL MOUNTABLE CURB MAY BE USED ONLY WHERE THE FOLLOWING CONDITIONS ARE PRESENT:

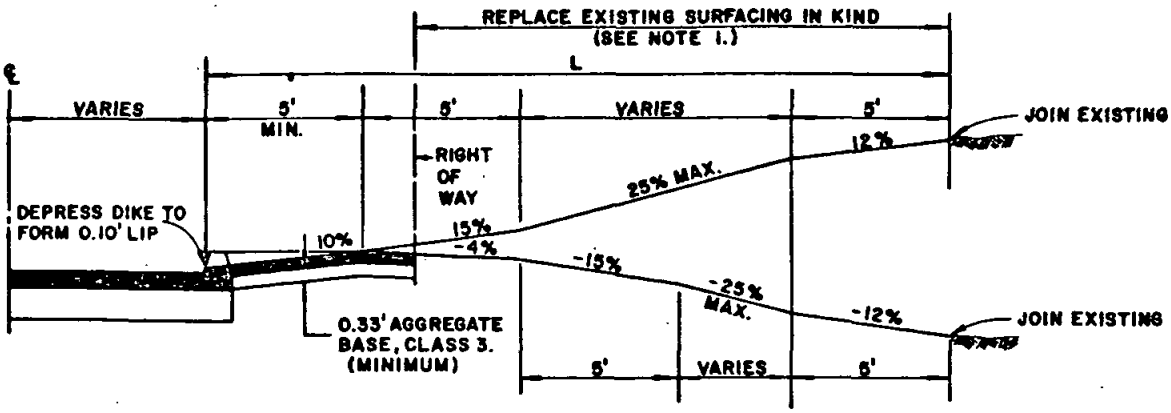
1. FOR COMMERCIAL AND INDUSTRIAL ACCESS ALONG INDUSTRIAL, INDUSTRIAL CUL-DE-SAC AND INDUSTRIAL COLLECTOR STREETS WHERE CURB PARKING IS PROHIBITED.
2. FOR RESIDENTIAL ACCESS WHEN:
   a.) LOT WIDTH IS LESS THAN 40'.
   b.) THE STREET IS CLASSIFIED RESIDENTIAL ONLY.
   c.) THE STREET GRADE DOES NOT EXCEED 5% AND ADEQUATE DRAINAGE IS PROVIDED FOR.

NOTES:

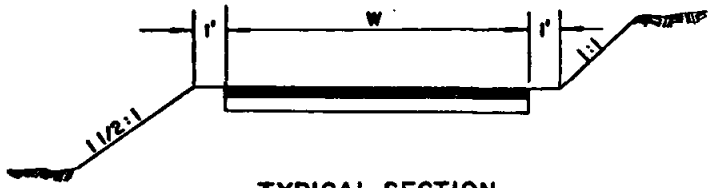
ALL CONCRETE TO BE CLASS "B".
SIDEWALK WILL BE INSTALLED AT PROPERTY LINE.
ALL CURB RETURN RADII TO BE TYPE E CURB & GUTTER WITH MINIMUM 10' TRANSITION TO ROLL CURB PROVIDED FROM END OF RETURN.

LEGEND ON PLANS

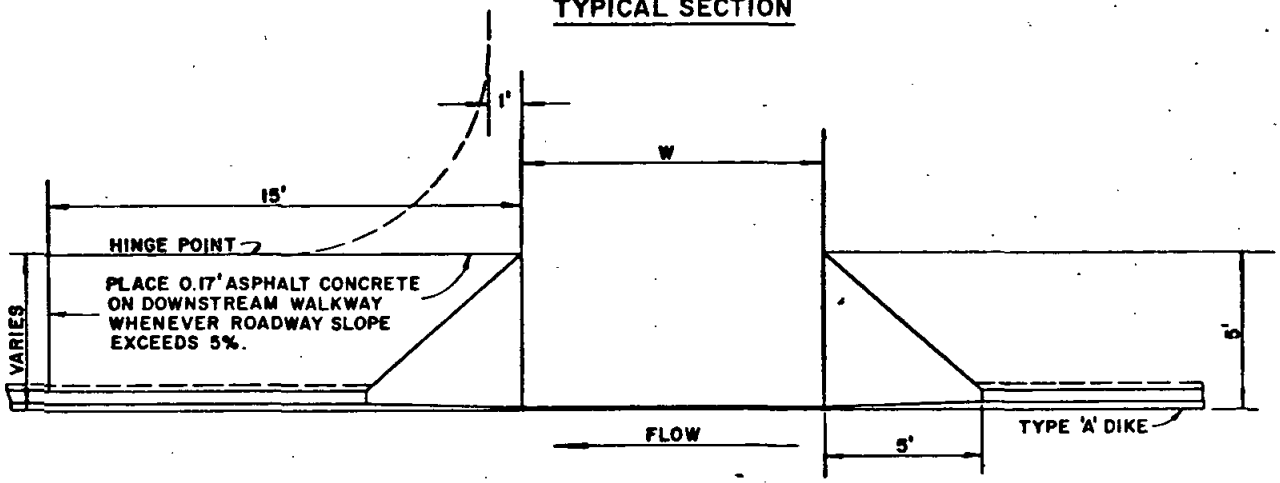
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	REVISION | BY | APPROVED | DATE
DRAWN BY RSH CHECKED BY EGL		
RECOMMENDED BY [signature]	SPECIAL MOUNTABLE CURB	SCALE: NONE
APPROVED BY COUNTY ENGINEER		DRAWING NUMBER 226
H. M. Taylor R.C.E. 11458		
DATE: Jan 12, 1970		



PROFILE



TYPICAL SECTION



PLAN

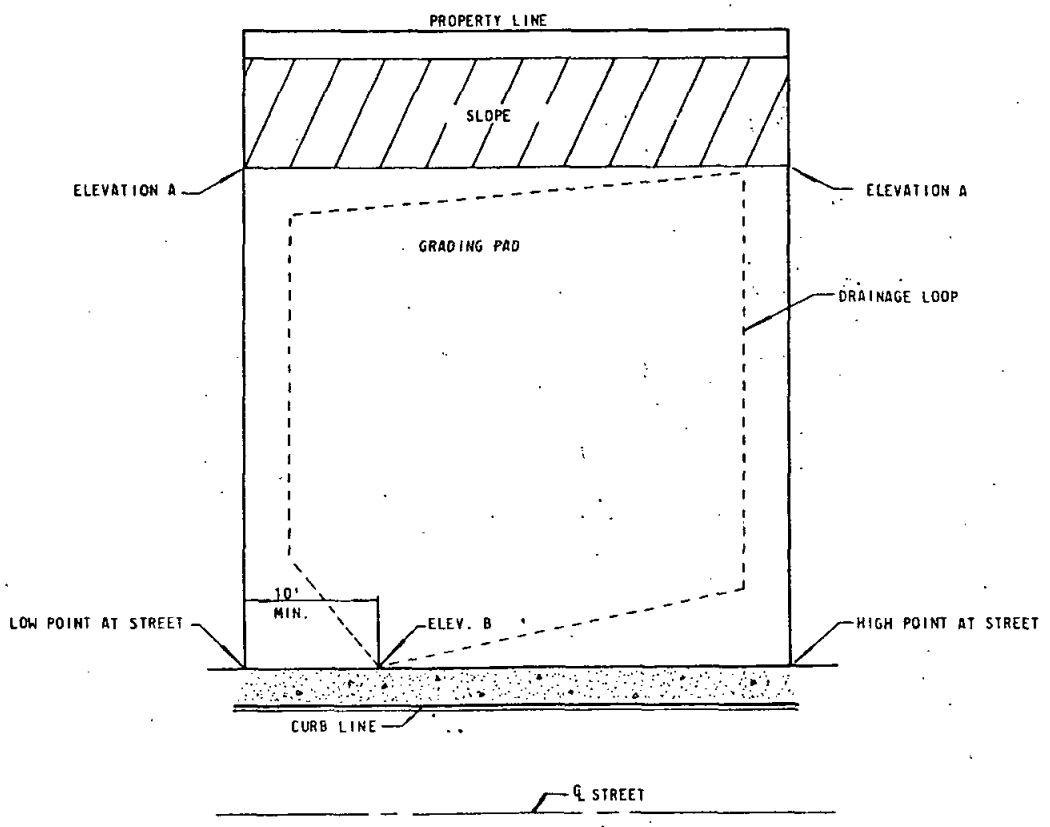
NOTES:

1. DRIVEWAYS WITH GRADES GREATER THAN 15% SHALL BE SURFACED WITH ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE.
2. MAXIMUM GRADE BREAK 14%.
3. SEE STANDARD DRAWING 207 & 211 FOR CONCRETE DRIVEWAYS.
4. SEE STANDARD DRAWING 305 & 306 FOR LOCATION & WIDTH REQUIREMENTS.

DRIVEWAY
PAVING SCHEDULE

DEPTH OF AC.	GRADE
0.17'	0-15%
0.25'	15-20%
0.33'	20-25%

STD. SPEC. SEC:		SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING			
DRAWN BY PSG	CHECKED BY EM				
RECOMMENDED BY			REVISION	BY	APPROVED DATE
APPROVED BY COUNTY ENGINEER		ASPHALT CONCRETE DRIVEWAY	SCALE: NONE		
H. M. Taylor R.C.E. 11458			DRAWING NUMBER 227		
DATE: Dec 28, 1970					

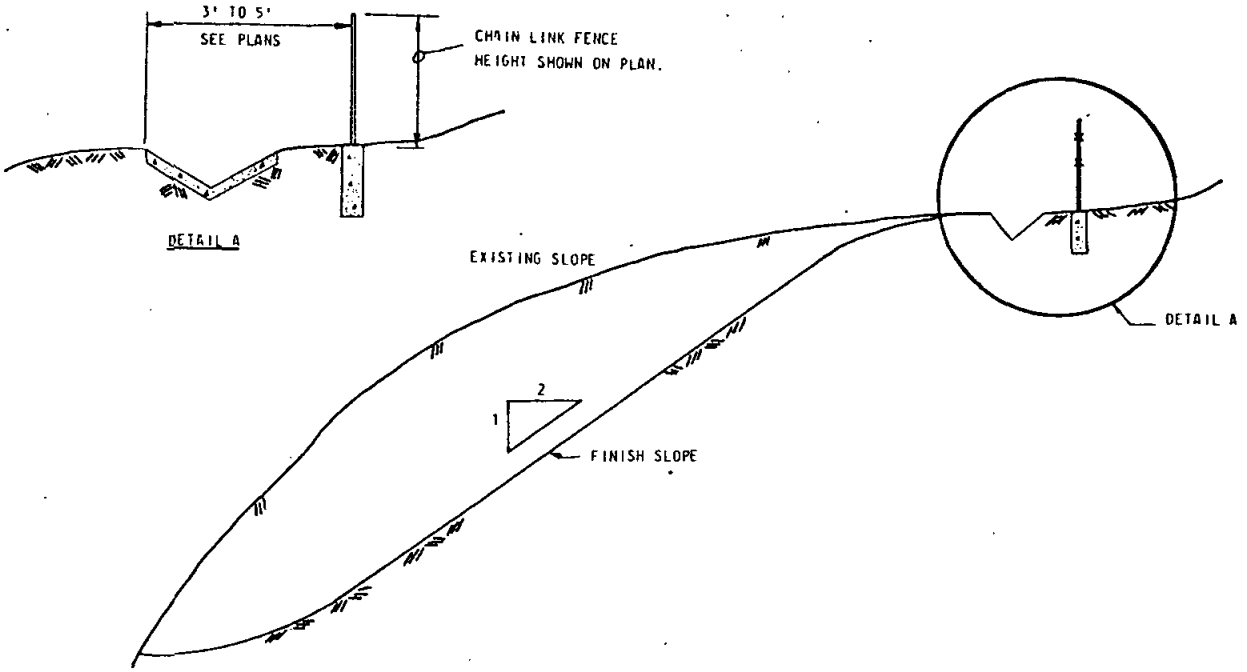


TYPICAL FINISHED GRADING

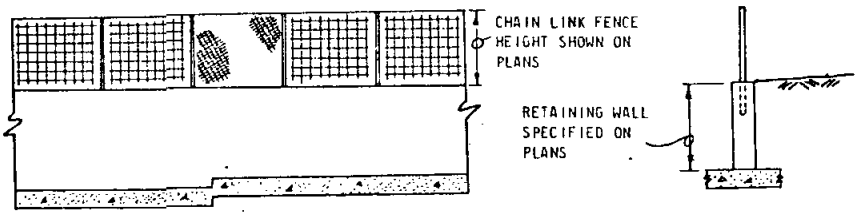
NOTES:

1. ELEV. A IS TO BE DETERMINED FOR THE MOST REMOTE CORNER OF THE LOT FROM THE DRAIN POINT. ELEV. A = ELEV. B PLUS 1% TIMES ONE-HALF THE PERIMETER OF THE LOT.
2. MIN. 1% SWALE TO STREET OR OTHER DISCHARGE POINT.
3. ALL SLOPE SURFACES TO BE PROTECTED BY APPROVED EROSION CONTROL.

STD. SPEC. SEC: 19, 20, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY SWH CHECKED BY					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	LOT GRADING	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 231 T			
DATE: 1-8-74					



FENCING CUT BANKS



RETAINING WALL & CHAIN LINK FENCE
FOR WALL HEIGHTS GREATER THAN 4 FT.

NOTES:

1. CHAIN LINK FENCE OR ALTERNATE ACCEPTABLE TO THE COUNTY ENGINEER SHALL BE INSTALLED ALONG THE TOP OF SLOPES EXCEEDING 15 FEET VERTICAL HEIGHT AND 3 TO 1 SLOPE RATIO, AND ALONG THE TOP OF WALLS EXCEEDING 4' VERTICAL HEIGHT.
2. RETAINING WALLS AND CHAIN LINK FENCE OR ALTERNATE SHALL BE CONSTRUCTED IN ACCORDANCE WITH COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.

STD. SPEC. SEC: 19, 51, 52, 80	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	
DRAWN BY D.W.O. CHECKED BY		
RECOMMENDED BY		REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER	FENCING CUT BANKS	SCALE: NONE
H.M. Toyer R.C.E. 11458		DRAWING NUMBER 232 T
DATE: 1-8-74		

BENCH MARK

Description: _____

Location : _____

Record From: _____

Elev : _____ Datum : _____

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO SURVEYOR DEPARTMENT	SHEETS

PLANS FOR IMPROVEMENTS IN

AND ADJOINING (SUBDIVISION NAME)

Recommended for Approval Subdivision Engineer	Approved County Surveyor
Engineer of Work R.C.E.	Checked by / Approval Date T.M.

FILE NO.

COUNTY APPROVED CHANGES

No.	Description	Approved By	Date

SAN DIEGO COUNTY STANDARD DRAWING

NEW SUBDIVISION IMPROVEMENT PLAN TITLE BLOCK

Scale as shown

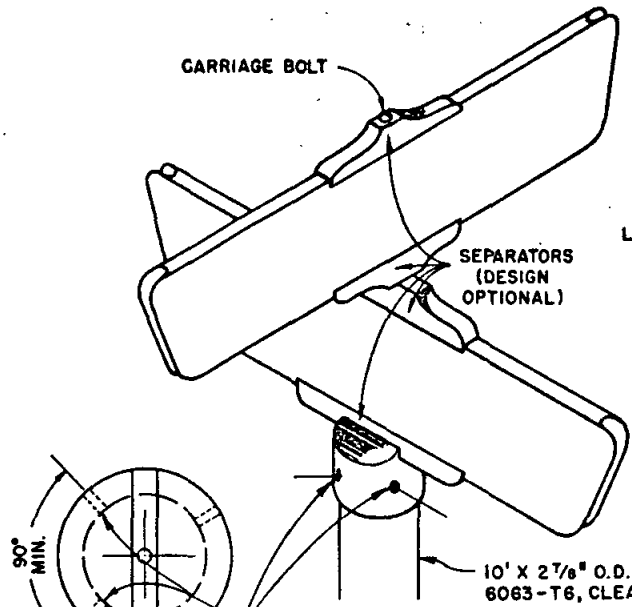
Drawing Number 300

Specification Reference

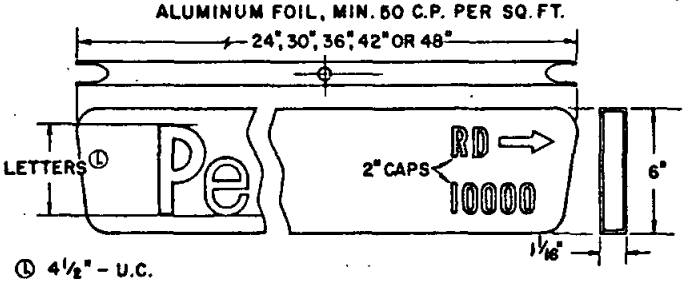
County Surveyor

D.P.W. STD. DWG. NO. B-1

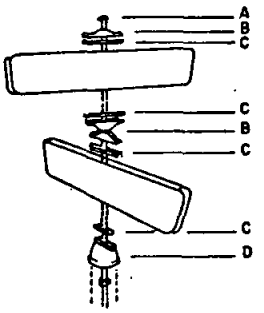
FILE 11-25 300



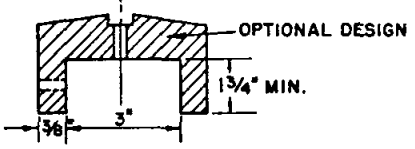
NOTE: BLADE TO BE 0.063 ALUMINUM PLATE BOX CONSTRUCTION WITH BLUE PORCELAIN FINISH. LETTERS TO BE REFLECTIVE WHITE 0.004 THICK ALUMINUM FOIL, MIN. 50 C.P. PER SQ. FT.



Ⓛ 4 1/2" - U.C.
3 3/8" - L.C.



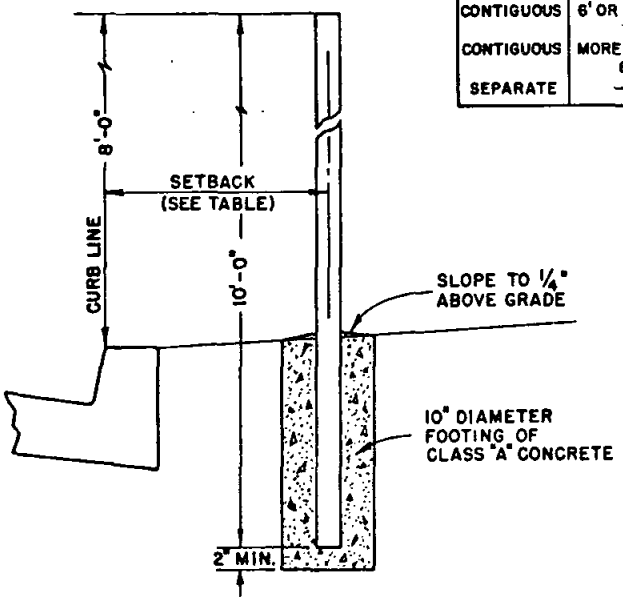
A. 5/8"X15 1/2" CARRIAGE BOLT.
B. 14 GA. ORNAMENTAL TOP AND CENTER CROSS SADDLE - STAINLESS STEEL.
C. WEATHERPROOF COMPOSITION GASKET.
D. GALVANIZED POSTCAP, WITH 3-5/8" ALLEN SET SCREWS. (STAINLESS STEEL, CONE POINT)

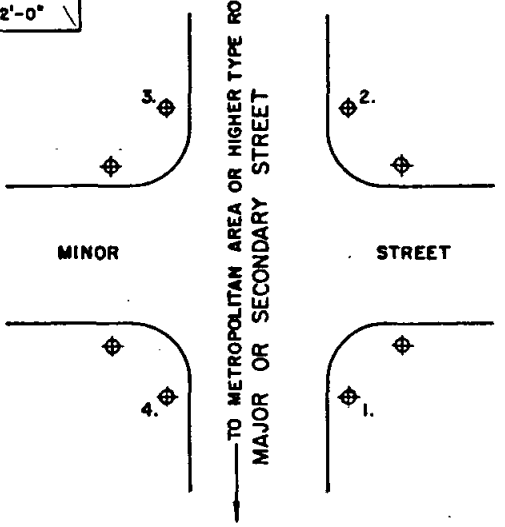


POST CAP DETAIL

CURB & SIDEWALK	SIDEWALK WIDTH	SETBACK
CONTIGUOUS	6' OR LESS	SIDEWALK WIDTH
CONTIGUOUS	MORE THAN 6'	2'-0"
SEPARATE	—	2'-0"

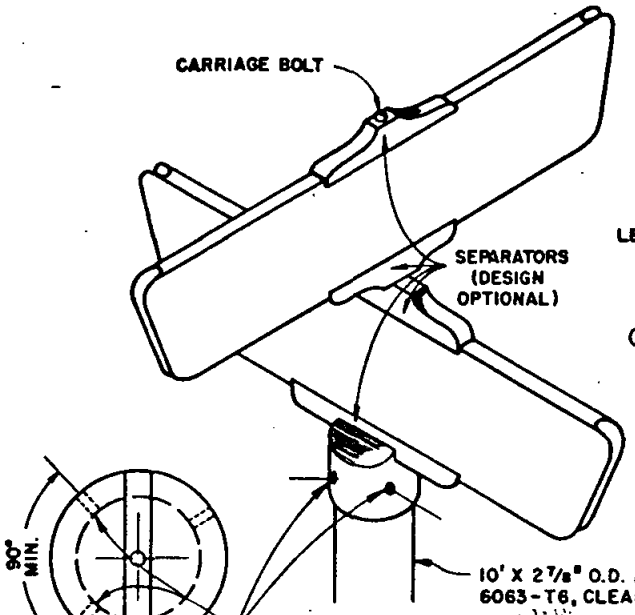
Δ NOTE: ATTACH CAP TO POST USING SUFFICIENT FORCE ON SCREWS TO DIMPLE POST



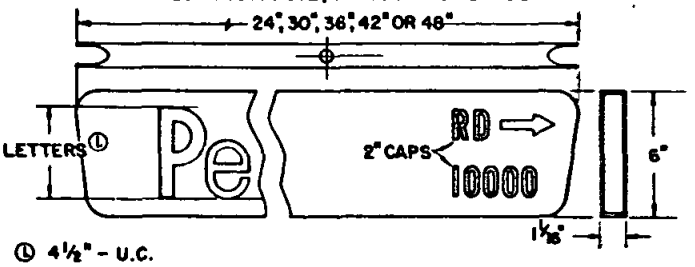


STREET NAME SIGN LOCATION
(NUMBERS INDICATE PRIORITY OF LOCATION SELECTION)

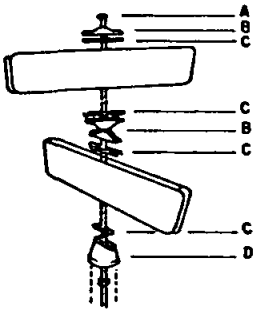
STD. SPEC. SEC: SEC. 56	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Δ	5-19-71 A. Kuchera 2/1/71
DRAWN BY R.M.G. CHECKED BY E.C.L.			
RECOMMENDED BY [signature]	STANDARD STREET SIGN	REVISION BY APPROVED DATE	
APPROVED BY COUNTY ENGINEER		SCALE:	
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 301-2	
DATE: 5-19-71			



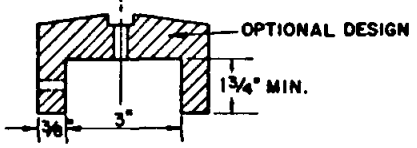
NOTE: BLADE TO BE 0.063 ALUMINUM PLATE BOX CONSTRUCTION WITH BLUE PORCELAIN FINISH. LETTERS TO BE REFLECTIVE WHITE 0.004 THICK ALUMINUM FOIL, MIN. 50 C.P. PER SQ. FT.



① 4 1/2" - U.C.
3 3/8" - L.C.

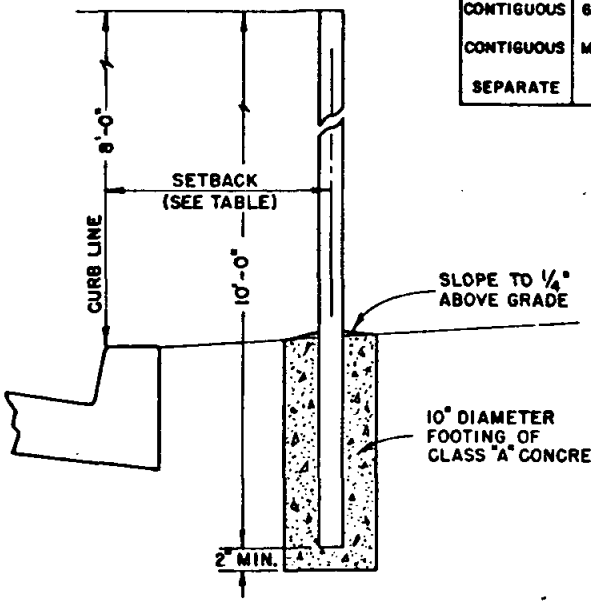


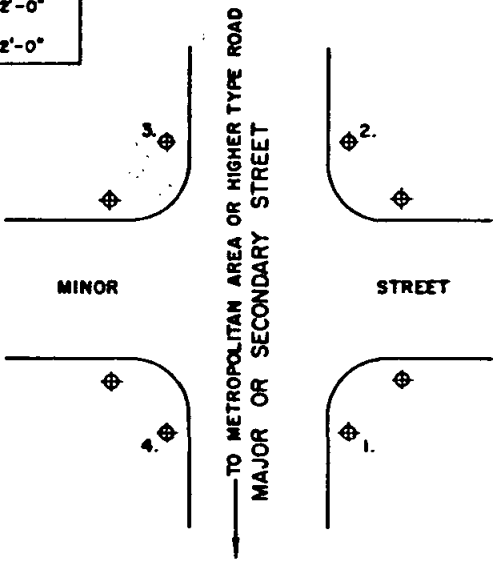
A. 5/8"X151/2" CARRIAGE BOLT.
B. 14 GA. ORNAMENTAL TOP AND CENTER CROSS SADDLE - STAINLESS STEEL.
C. WEATHERPROOF COMPOSITION GASKET.
D. GALVANIZED POSTCAP, WITH 3-3/8" ALLEN SET SCREWS. (STAINLESS STEEL, CONE POINT)



POST CAP DETAIL

CURB & SIDEWALK	SIDEWALK WIDTH	SETBACK
CONTIGUOUS	6' OR LESS	SIDEWALK WIDTH
CONTIGUOUS	MORE THAN 6'	2'-0"
SEPARATE	—	2'-0"

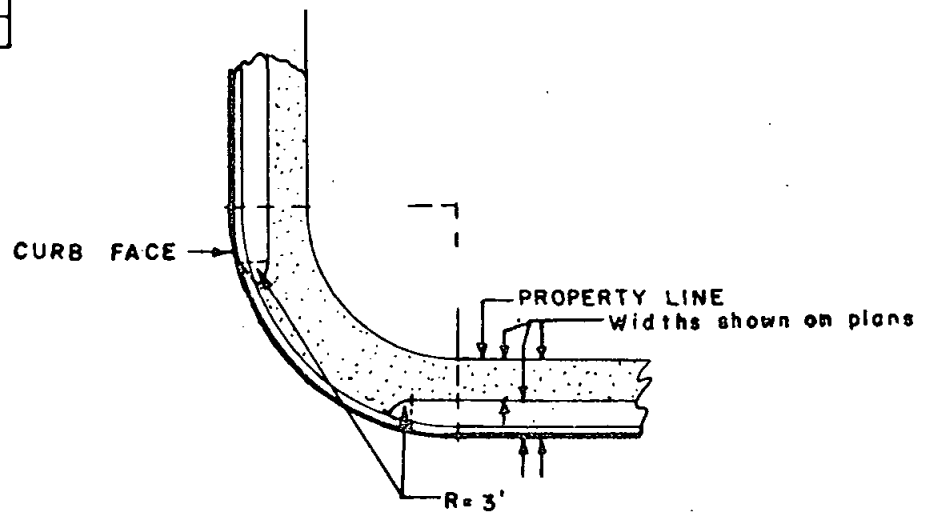




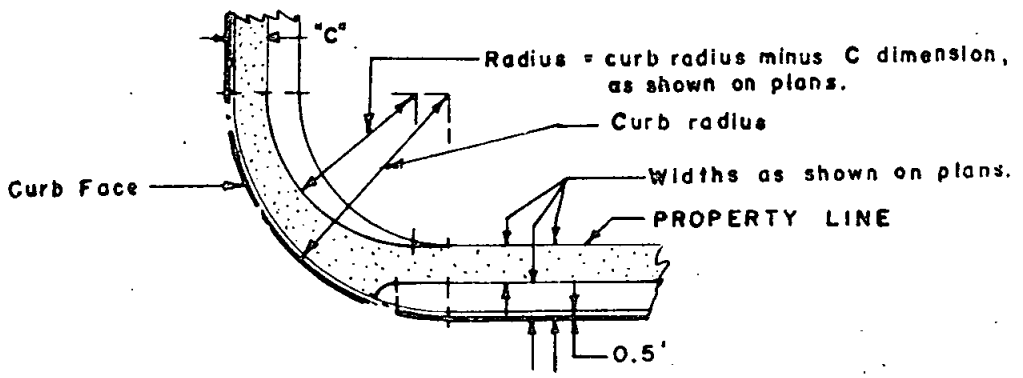
STREET NAME SIGN LOCATION

(NUMBERS INDICATE PRIORITY OF LOCATION SELECTION)

STD. SPEC. SEC: SEC. 56	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY R.M.G. CHECKED BY E.C.L			
RECOMMENDED BY		REVISION	BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER	STANDARD STREET SIGN	SCALE:	
H. M. Taylor R.C.E. 11458		DRAWING NUMBER	301-2
DATE: 5-19-71			



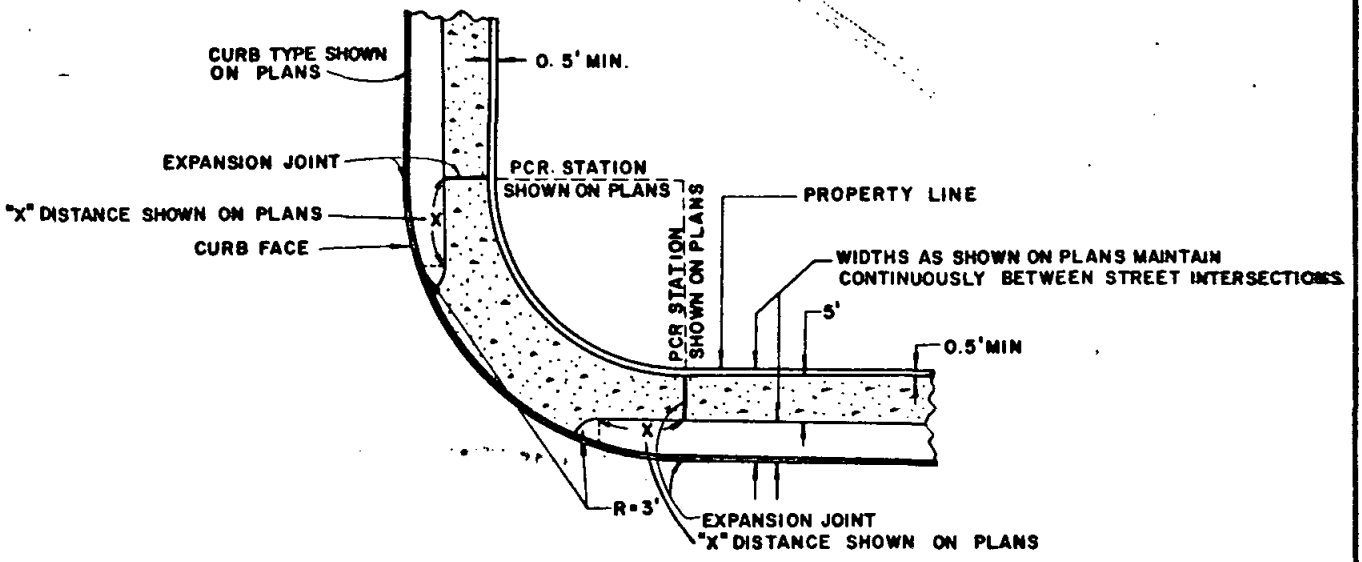
SIDEWALK INTERSECTION DETAIL
NON - CONTIGUOUS



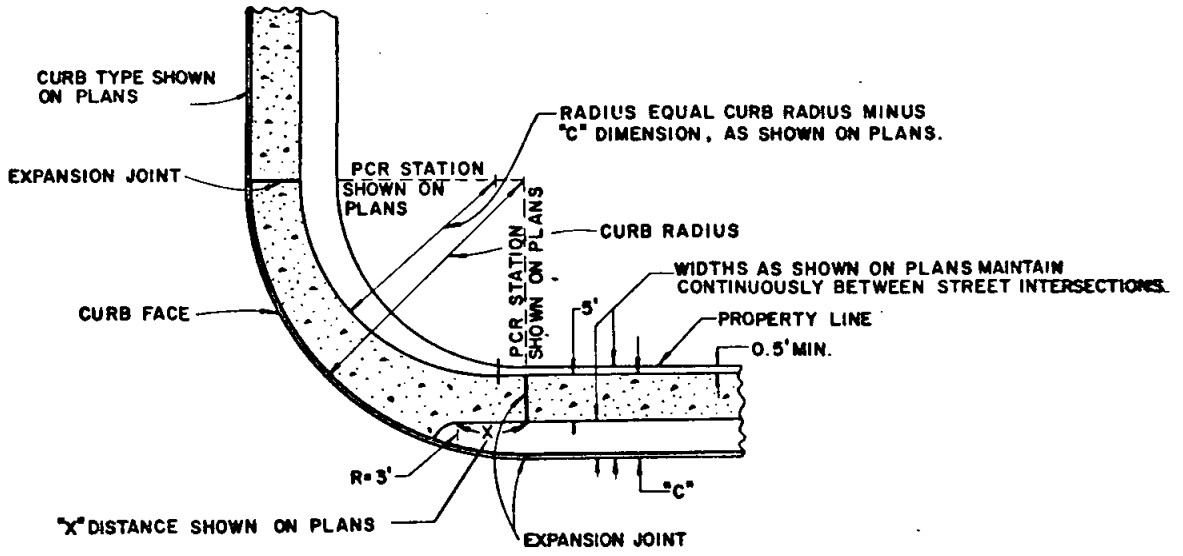
SIDEWALK INTERSECTION DETAIL
TRANSITION— CONTIGUOUS to NON-CONTIGUOUS

Specification Reference COUNTY SURVEYOR D.K. SPEER RCE 6091	SAN DIEGO COUNTY STANDARD DRAWING SIDEWALK RETURNS	NO SCALE 302

FILE 11-25



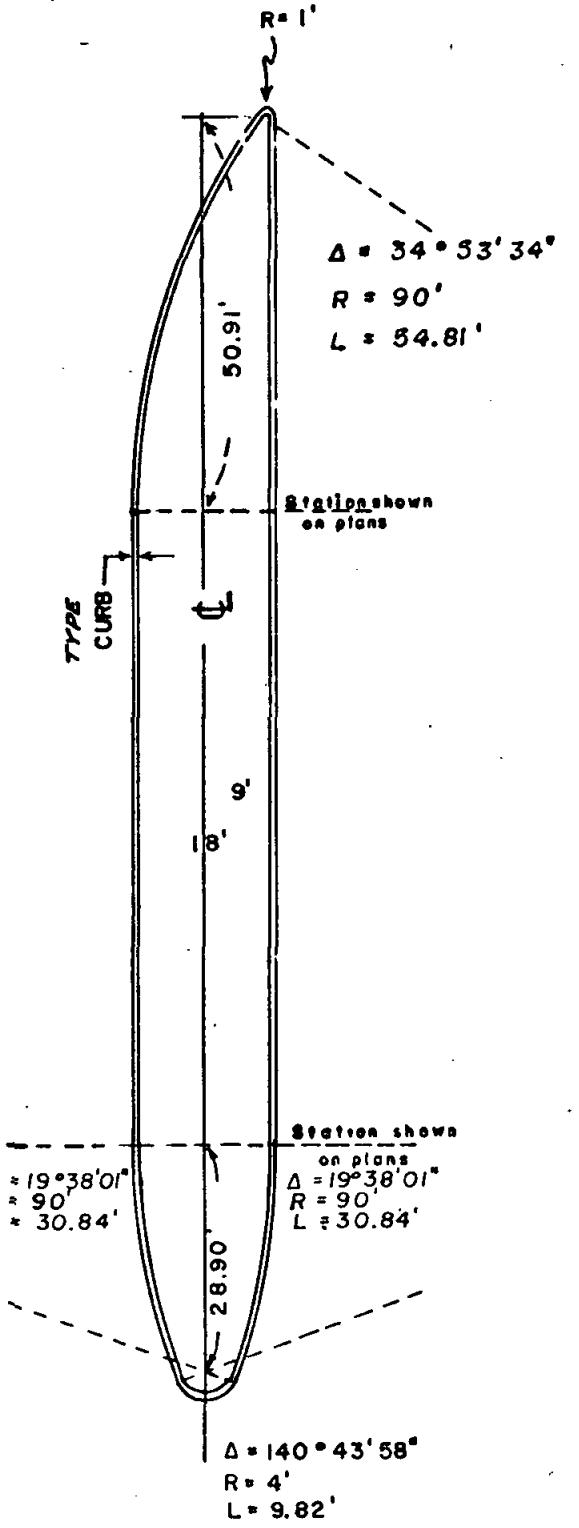
SIDEWALK INTERSECTION DETAIL
NON-CONTIGUOUS

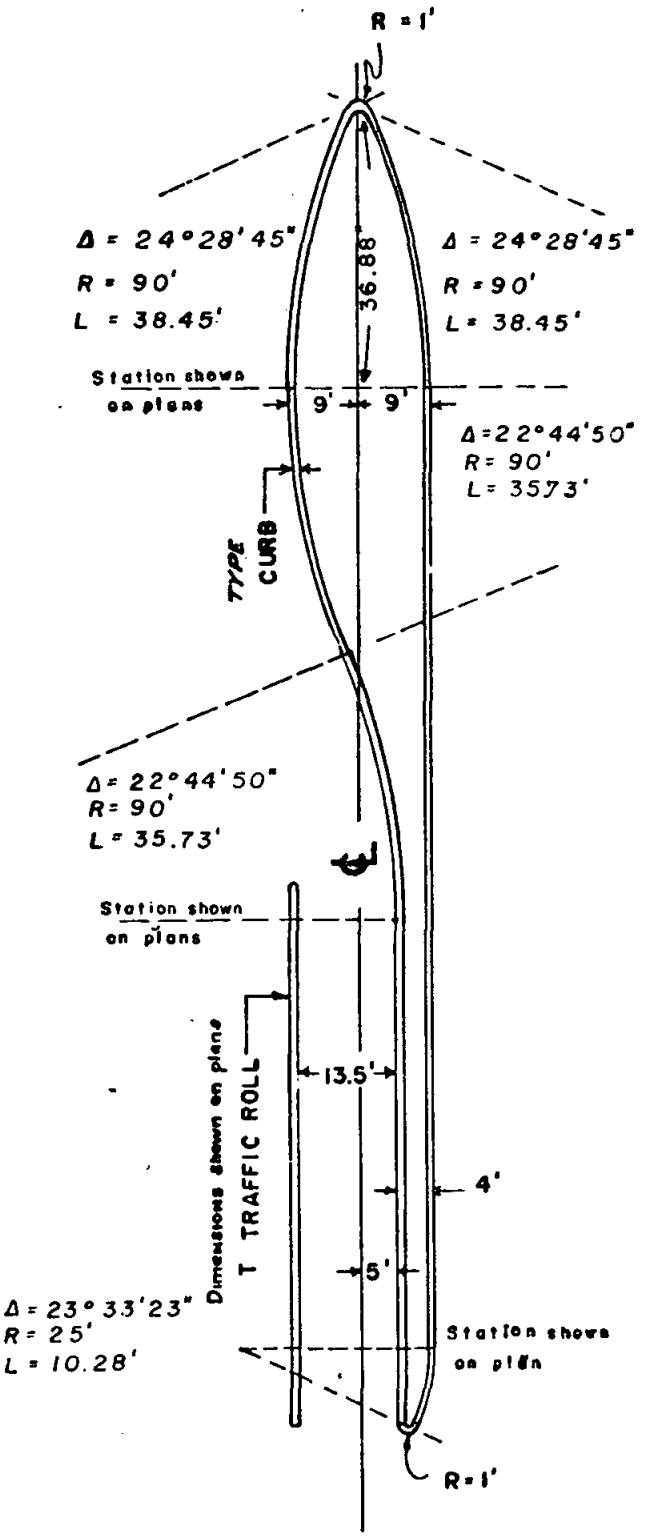


SIDEWALK INTERSECTION DETAIL
TRANSITION-CONTIGUOUS TO NON-CONTIGUOUS

NOTE:
1. SEE STANDARD DRAWING 212 FOR CONSTRUCTION DETAILS.

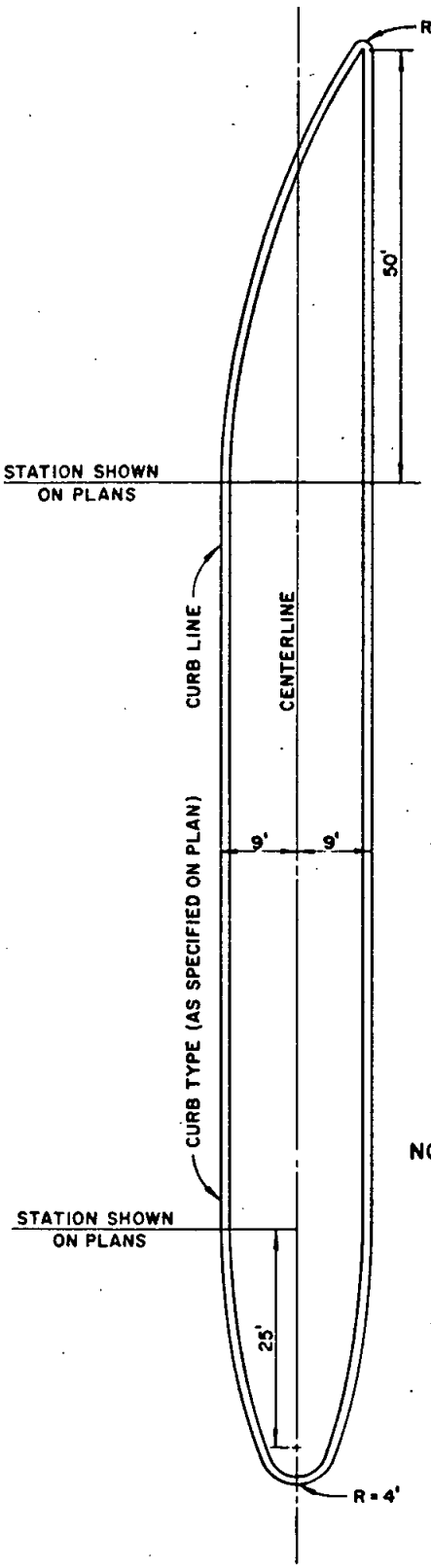
STD. SPEC. SEC: 51,73,90.	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY RSG CHECKED BY E.M.					
RECOMMENDED BY _____	SIDEWALK RETURNS	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE:			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 302-1			
DATE: Dec 28, 1970					





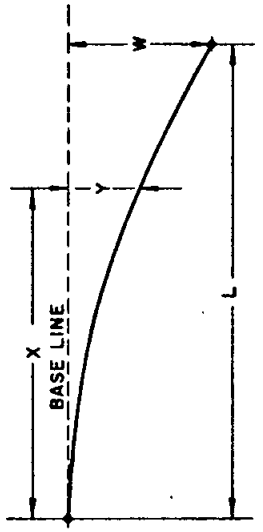
Specification Reference SECTIONS: 73, 90 County Surveyor D. K. Speer D.K. SPEER R.C.E. 8091	SAN DIEGO COUNTY STANDARD MEDIAN ISLAND	STANDARD DRAWING NO SCALE DRAWING NO. 303

5/2 11-25

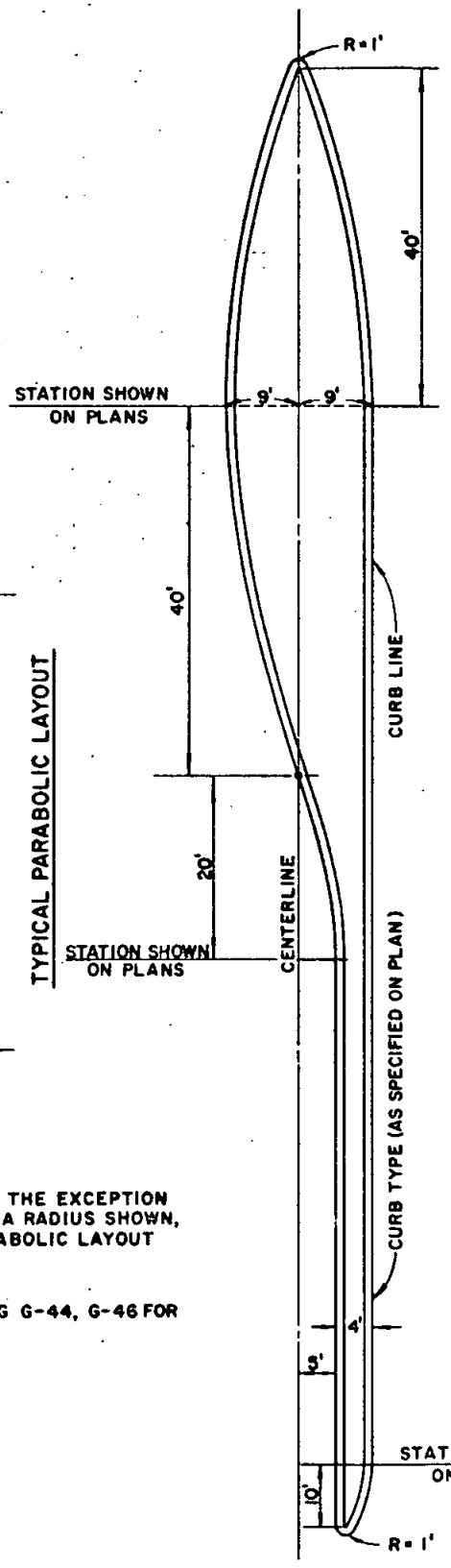


L = LENGTH OF FLARE IN FEET
W = MAXIMUM OFFSET IN FEET
X = DISTANCE ALONG BASE LINE IN FEET
Y = OFFSET FROM BASE LINE IN FEET

$Y = \frac{WX^2}{L^2}$



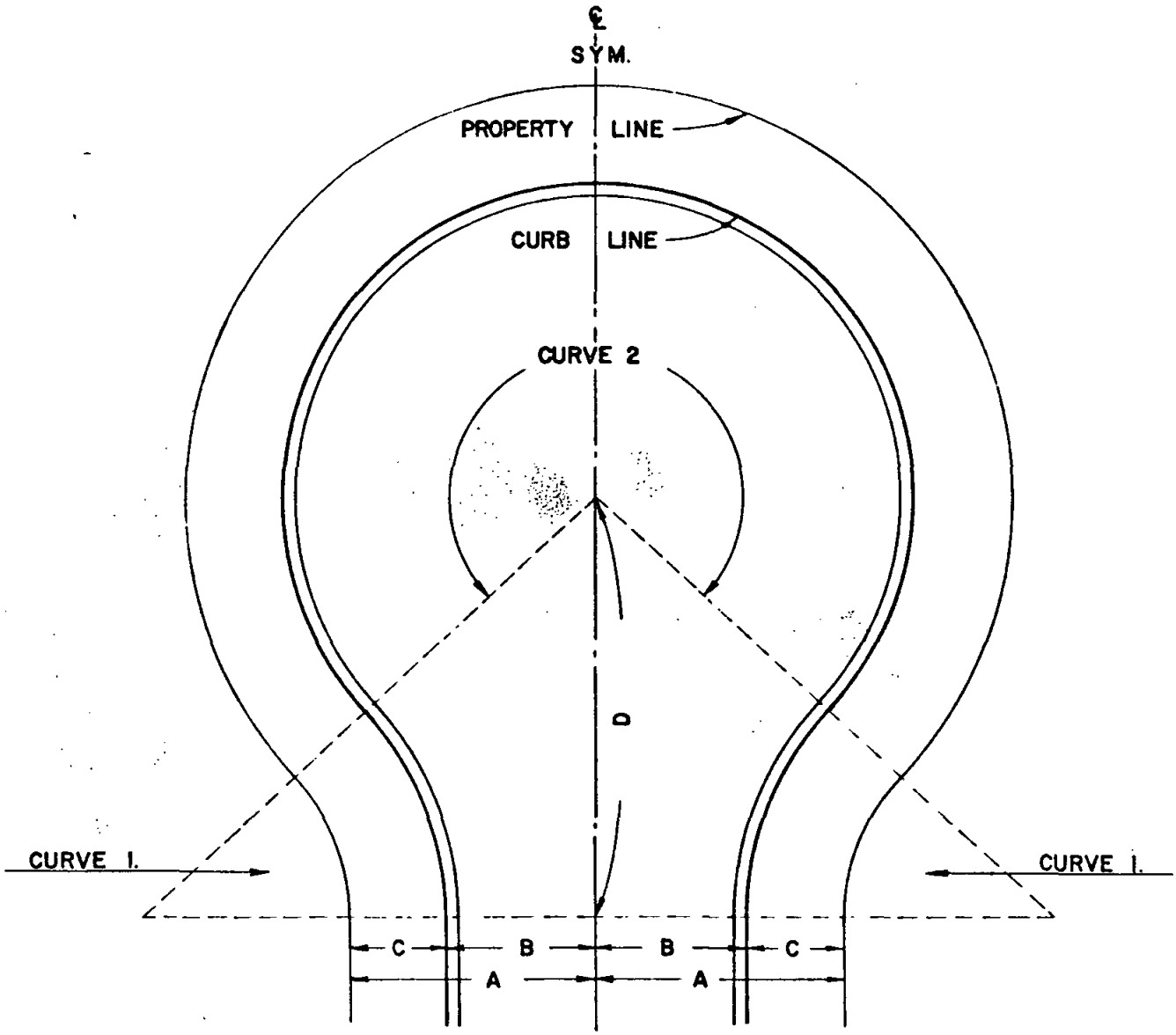
TYPICAL PARABOLIC LAYOUT



NOTES:

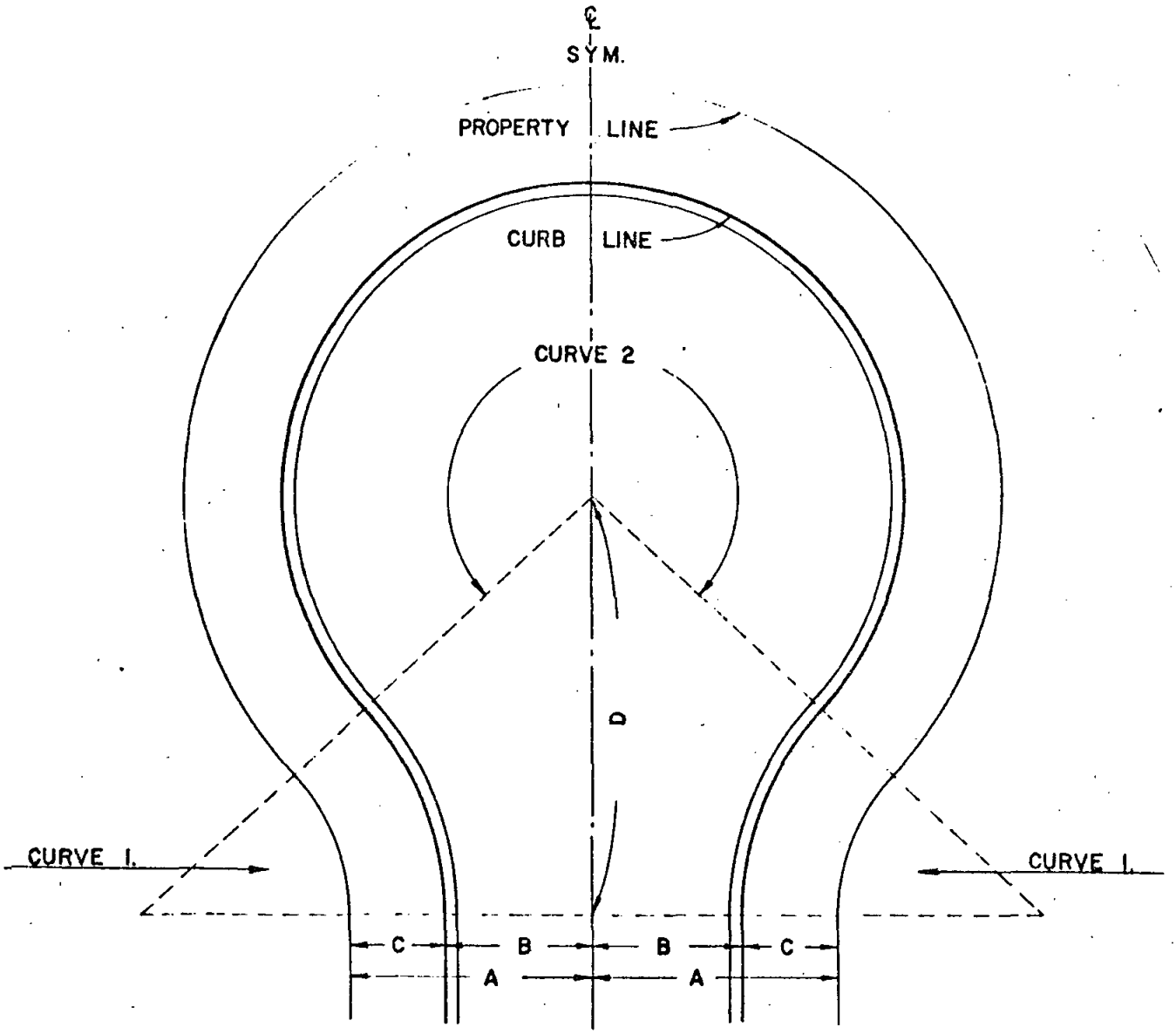
1. ALL CURVATURES, WITH THE EXCEPTION OF THOSE WHICH HAVE A RADIUS SHOWN, USE THE TYPICAL PARABOLIC LAYOUT ABOVE.
2. SEE STANDARD DRAWING G-44, G-46 FOR CURB DETAILS.

STD. SPEC. SEC: 73, 90	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY RCK CHECKED BY MG			
RECOMMENDED BY [signature]	STANDARD RAISED MEDIAN ISLAND	REVISION	BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE	
R.J. Mancuso for R.C.E. 11458		DRAWING NUMBER 303-1	
DATE: July 2, 1973			



DIMENSIONS					CURVE 1.								CURVE 2				
						CURB			PROP.					CURB		PROP.	
$R_{/W}$	A	B	C	D	△	R	L	T	R	L	T		△	R	L	R	L
52'	26'	16'	10'	50.95'	46°42' 30"	32'	26.09'	13.82'	22'	17.93'	9.50'		273°25' 00"	38'	181.34'	48'	229.06'
56'	28'	18'	10'	50.99'	42°50' 00"	37'	27.66'	14.52'	27'	20.18'	10.59'		265°40' 00"	38'	176.20'	48'	222.56'
60'	30'	20'	10'	68.15'	29°35' 31"	100'	51.65'	26.41'	90'	46.48'	23.77'		239° 11' 02"	38'	158.63'	48'	200.38'
72'	36'	26'	10'	81.39'	32°51' 36"	100'	57.35'	29.49'	90'	51.62'	26.54'		245°43' 12"	50'	214.43'	60'	257.32'

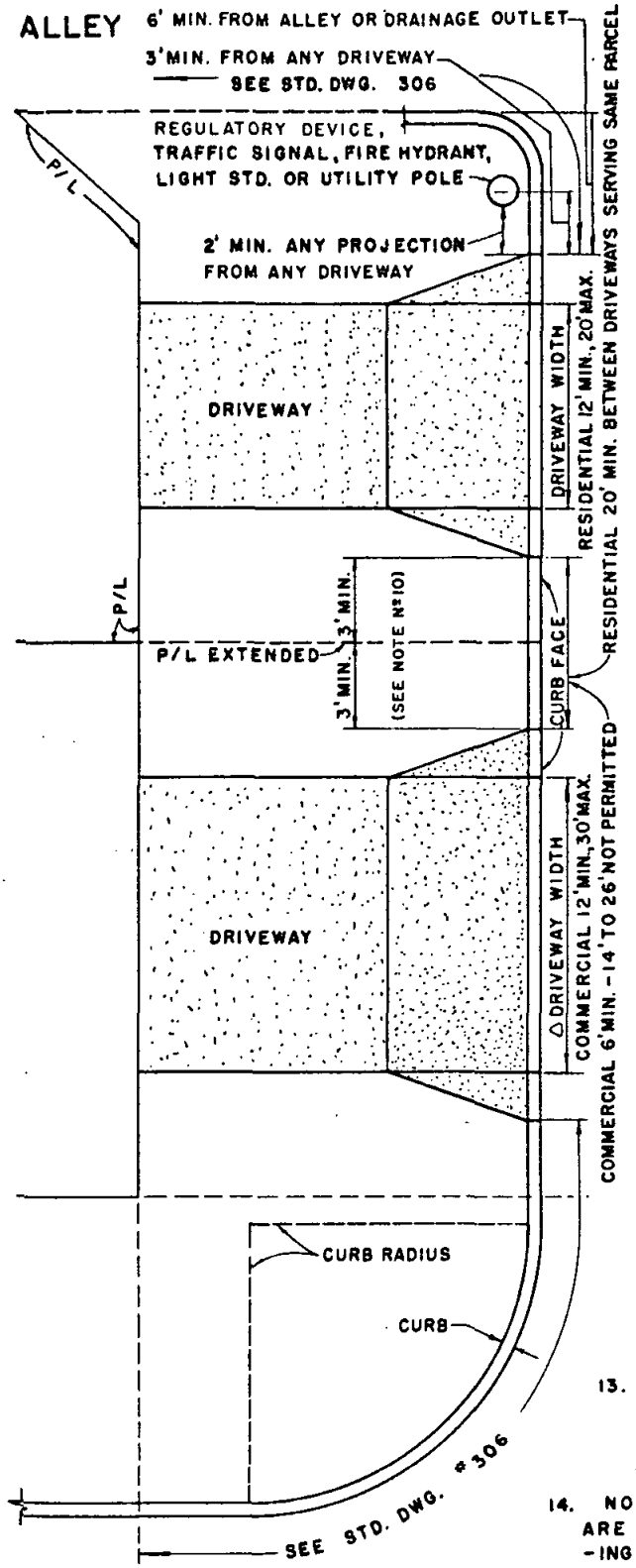
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING			
DRAWN BY FWM CHECKED BY CRJ				
RECOMMENDED BY		REVISION	BY	APPROVED DATE
APPROVED BY COUNTY ENGINEER	TURNAROUND AND CALCULATIONS	SCALE: NONE		
H. M. Taylor R.C.E. 11458		DRAWING NUMBER	304-3	
DATE: Dec 28, 1970				



DIMENSIONS					CURVE 1.							CURVE 2				
$R_{/W}$	A	B	C	D	△	CURB R	CURB L	CURB T	PROP. R	PROP. L	PROP. T	△	CURB R	CURB L	PROP. R	PROP. L
52'	26'	16'	10'	50.95'	46°42' 30"	32'	26.09'	13.82'	22'	17.93'	9.50'	273°25' 00"	38'	181.34'	48'	229.06'
56'	28'	18'	10'	50.99'	42°50' 00"	37'	27.66'	14.52'	27'	20.18'	10.59'	265°40' 00"	38'	176.20'	48'	222.56'
60'	30'	20'	10'	68.15'	29°35' 31"	100'	51.65'	26.41'	90'	46.48'	23.77'	239° 11' 02"	38'	158.63'	48'	200.38'
70'	35'	25'	10'	82.92'	33°33' 26"	100'	58.57'	30.15'	90'	52.71'	27.14'	247°06' 52"	50'	215.65'	60'	258.78'

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY [illegible] CHECKED BY E.C.L.			
RECOMMENDED BY [signature]		REVISION	BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER	TURNAROUND AND CALCULATIONS	SCALE: NONE	
D. X. Schoen R.C.E. 8091		DRAWING NUMBER	304-2
DATE: 1/15/60			

FILE NO. 11-25



GENERAL DRIVEWAY REQUIREMENTS

1. DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND DRAWINGS OF THE COUNTY OF SAN DIEGO.
2. A RESIDENTIAL DRIVEWAY IS ONE THAT SERVES THREE (3) DWELLING UNITS OR LESS, OR FARMS OR RANCHES NOT USED AS RETAIL OUTLETS. ALL OTHER DRIVEWAYS ARE CLASSIFIED AS COMMERCIAL DRIVEWAYS.

△3. STANDARD DRIVEWAY WIDTH SHALL BE TOTAL WIDTH OF CURB OPENING EXCLUDING CURB TRANSITIONS.

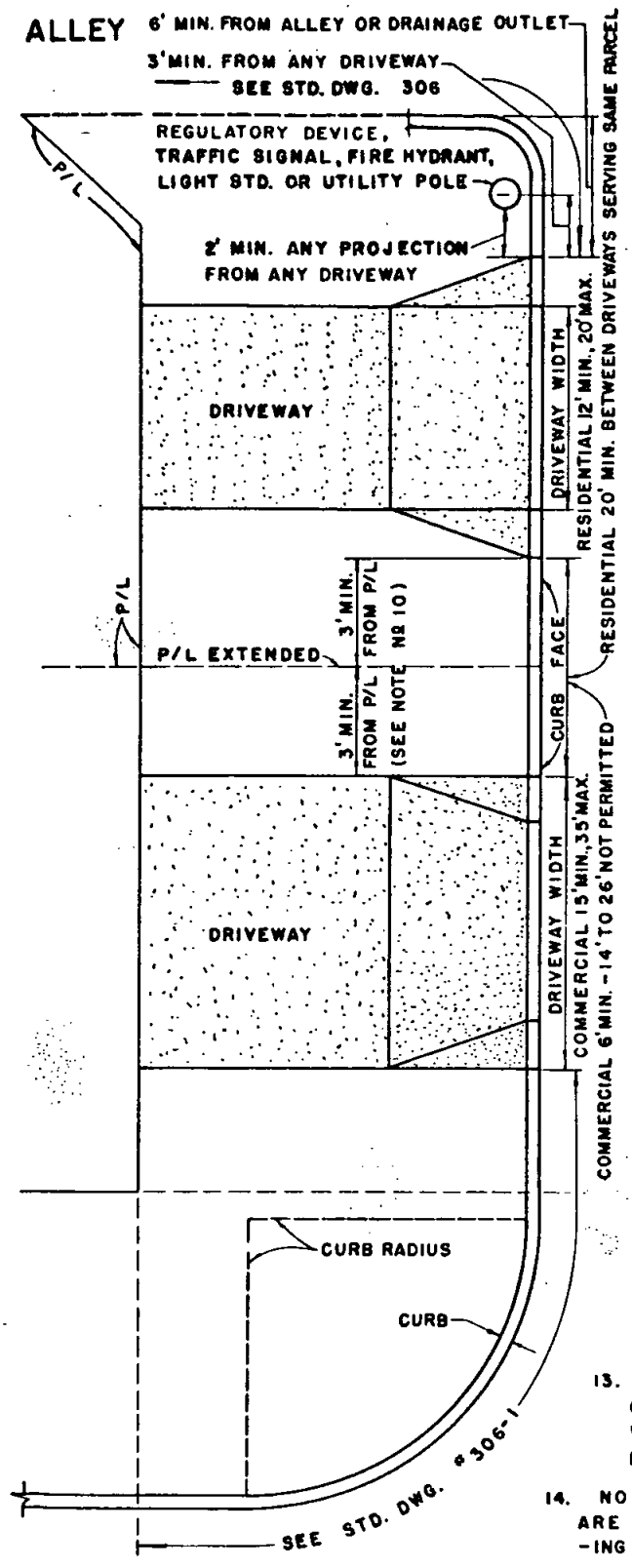
4. THE MAXIMUM WIDTH OF RESIDENTIAL DRIVEWAYS SHALL BE 20 FEET, MINIMUM 12 FEET.

△5. THE MAXIMUM WIDTH OF COMMERCIAL DRIVEWAYS SHALL BE 30 FEET, MINIMUM 12 FEET. (RECOMMENDED 17 FEET MINIMUM.)

6. PORTLAND CEMENT CONCRETE DRIVEWAY APPROACHES SHALL EXTEND TO PROPERTY SIDE OF SIDEWALK OR, IF THERE IS NO SIDEWALK, TO WITHIN SIX INCHES OF THE PROPERTY LINE.
7. WHERE PORTLAND CEMENT CONCRETE CURBS ARE NOT INSTALLED, DRIVEWAY APPROACHES SHALL NOT BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE.
8. LOCATION AND EXTENT OF ALL COMMERCIAL DRIVEWAYS SHALL BE SUBJECT TO APPROVAL OF THE COUNTY ENGINEER.
9. NO PORTION OF ANY DRIVEWAY SHALL BE ALLOWED ACROSS A LINE EXTENDING NORMAL TO THE ROADWAY FROM THE FRONT CORNER OF THE PROPERTY, EXCEPT THAT JOINT-USE DRIVEWAYS MAY BE PERMITTED IN SPECIAL INSTANCES WHERE WRITTEN APPROVAL OF BOTH PROPERTY OWNERS IS FILED WITH THE COUNTY ENGINEER.
10. DRIVEWAYS, EXCEPT JOINT-USE DRIVEWAYS AND DRIVEWAYS ON LOTS HAVING 21 FOOT FRONTAGE OR LESS, SHALL BE LOCATED AT LEAST 3 FEET FROM THE SIDE PROPERTY LINE EXTENDED.
11. NOT MORE THAN 60% OF THE PROPERTY FRONTAGE MAY BE ALLOCATED FOR DRIVEWAYS ON ANY ONE LOT, EXCEPT THAT LOTS HAVING FRONTAGE OF 25 FEET OR LESS ARE ENTITLED TO ONE 15 FOOT DRIVEWAY.
12. DRIVEWAY LOCATIONS AND GRADES SHALL NOT INTERFERE WITH PLANNED ULTIMATE GRADING WITHIN THE RIGHT OF WAY.
13. PORTLAND CEMENT CONCRETE CURB OPENINGS (DEPRESSED CURBS) WILL BE PERMITTED ONLY IN THOSE LOCATIONS WHERE COMPLETE STANDARD PORTLAND CEMENT CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED CONCURRENTLY.
14. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE COUNTY ENGINEER DEPARTMENT OR BUILDING INSPECTION DEPARTMENT.

△15. WHEN A DRIVEWAY THROUGH A PORTLAND CEMENT CONCRETE CURB IS ABANDONED, OR IS MOVED TO ANOTHER LOCATION SERVING THE SAME PROPERTY, THE OWNER SHALL INSTALL FULL HEIGHT CURB ACROSS THE SUPERFLUOUS OPENING AND SHALL FILL THE DEPRESSION BEHIND THE CURB.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	△	7-6	T. Kaulbach	2-1-84
DRAWN BY R.S.G. CHECKED BY E.K.					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	DRIVEWAY LOCATION AND WIDTH REQUIREMENTS	SCALE: NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 305-3T			
DATE: Dec. 28, 1970					

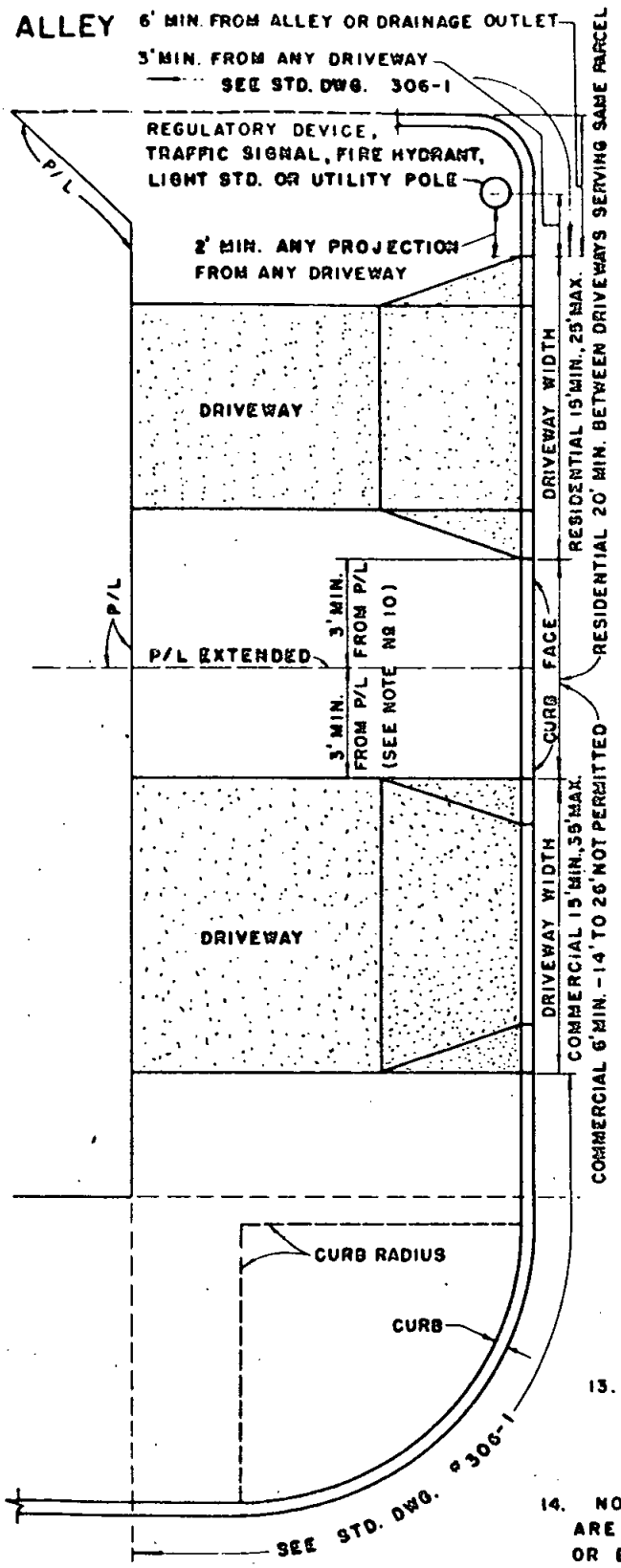


GENERAL DRIVEWAY REQUIREMENTS

1. DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND DRAWINGS OF THE COUNTY OF SAN DIEGO.
2. A RESIDENTIAL DRIVEWAY IS ONE THAT SERVES THREE (3) DWELLING UNITS OR LESS, OR FARMS OR RANCHES NOT USED AS RETAIL OUTLETS. ALL OTHER DRIVEWAYS ARE CLASSIFIED AS COMMERCIAL DRIVEWAYS.
3. RESIDENTIAL DRIVEWAY WIDTH SHALL BE TOTAL WIDTH OF CURB OPENING EXCLUDING CURB TRANSITIONS.
4. THE MAXIMUM WIDTH OF RESIDENTIAL DRIVEWAYS SHALL BE 20 FEET, MINIMUM 12 FEET.
5. THE MAXIMUM WIDTH OF COMMERCIAL DRIVEWAYS SHALL BE 35 FEET, MINIMUM 15 FEET. (RECOMMENDED 17 FEET MINIMUM.)
6. PORTLAND CEMENT CONCRETE DRIVEWAY APPROACHES SHALL EXTEND TO PROPERTY SIDE OF SIDEWALK OR, IF THERE IS NO SIDEWALK, TO WITHIN SIX INCHES OF THE PROPERTY LINE.
7. WHERE PORTLAND CEMENT CONCRETE CURBS ARE NOT INSTALLED, DRIVEWAY APPROACHES SHALL NOT BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE.
8. LOCATION AND EXTENT OF ALL COMMERCIAL DRIVEWAYS SHALL BE SUBJECT TO APPROVAL OF THE COUNTY ENGINEER.
9. NO PORTION OF ANY DRIVEWAY SHALL BE ALLOWED ACROSS A LINE EXTENDING NORMAL TO THE ROADWAY FROM THE FRONT CORNER OF THE PROPERTY, EXCEPT THAT JOINT-USE DRIVEWAYS MAY BE PERMITTED IN SPECIAL INSTANCES WHERE WRITTEN APPROVAL OF BOTH PROPERTY OWNERS IS FILED WITH THE COUNTY ENGINEER.
10. DRIVEWAYS, EXCEPT JOINT-USE DRIVEWAYS AND DRIVEWAYS ON LOTS HAVING 21 FOOT FRONTAGE OR LESS, SHALL BE LOCATED AT LEAST 3 FEET FROM THE SIDE PROPERTY LINE EXTENDED.
11. NOT MORE THAN 60% OF THE PROPERTY FRONTAGE MAY BE ALLOCATED FOR DRIVEWAYS ON ANY ONE LOT, EXCEPT THAT LOTS HAVING FRONTAGE OF 25 FEET OR LESS ARE ENTITLED TO ONE 15 FOOT DRIVEWAY.
12. DRIVEWAY LOCATIONS AND GRADES SHALL NOT INTERFERE WITH PLANNED ULTIMATE GRADING WITHIN THE RIGHT OF WAY.
13. PORTLAND CEMENT CONCRETE CURB OPENINGS (DEPRESSED CURBS) WILL BE PERMITTED ONLY IN THOSE LOCATIONS WHERE COMPLETE STANDARD PORTLAND CEMENT CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED CONCURRENTLY.
14. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE COUNTY ENGINEER DEPARTMENT OR BUILDING INSPECTION DEPARTMENT.
15. WHEN A DRIVEWAY THROUGH A PORTLAND CEMENT CONCRETE CURB IS ABANDONED, OR IS REPLACED BY ANOTHER DRIVEWAY SERVING THE SAME PROPERTY, THE OWNER SHALL INSTALL FULL HEIGHT CURB ACROSS THE SUPERFLUOUS OPENING AND SHALL FILL THE DEPRESSION BEHIND THE CURB.

REFERENCE: COUNTY OF SAN DIEGO TECHNICAL ROAD POLICY OF JANUARY 6, 1964.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY R.S.G. CHECKED BY G.K.					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	DRIVEWAY LOCATION AND WIDTH REQUIREMENTS	SCALE: NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 305-2			
DATE: Dec 20, 1970					



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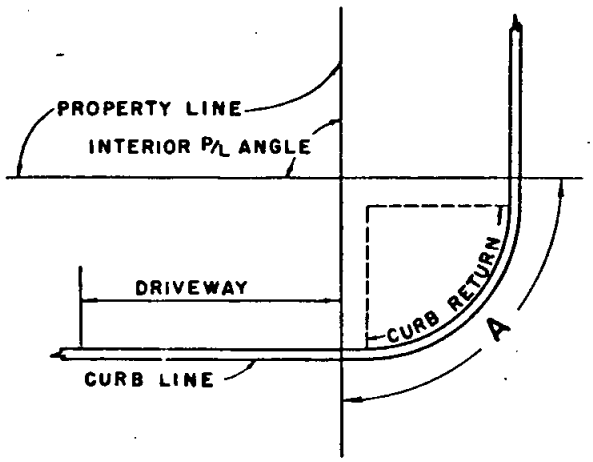
3. DRIVEWAY WIDTH SHALL BE TOTAL WIDTH OF OPENING MEASURED AT THE FULL HEIGHT OF THE CURB.
4. THE MAXIMUM WIDTH OF RESIDENTIAL DRIVEWAYS SHALL BE 25 FEET, MINIMUM 15 FEET. (RECOMMENDED 17 FEET MINIMUM.)
5. THE MAXIMUM WIDTH OF COMMERCIAL DRIVEWAYS SHALL BE 35 FEET, MINIMUM 15 FEET. (RECOMMENDED 17 FEET MINIMUM.)
6. PORTLAND CEMENT CONCRETE DRIVEWAY APPROACHES SHALL EXTEND TO PROPERTY SIDE OF SIDEWALK OR, IF THERE IS NO SIDEWALK, TO WITHIN SIX INCHES OF THE PROPERTY LINE.
7. WHERE PORTLAND CEMENT CONCRETE CURBS ARE NOT INSTALLED, DRIVEWAY APPROACHES SHALL NOT BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE.
8. LOCATION AND EXTENT OF ALL COMMERCIAL DRIVEWAYS SHALL BE SUBJECT TO APPROVAL OF THE SURVEYOR-ROAD COMMISSIONER.
9. NO PORTION OF ANY DRIVEWAY SHALL BE ALLOWED ACROSS A LINE EXTENDING NORMAL TO THE ROADWAY FROM THE FRONT CORNER OF THE PROPERTY, EXCEPT THAT JOINT-USE DRIVEWAYS MAY BE PERMITTED IN SPECIAL INSTANCES WHERE WRITTEN APPROVAL OF BOTH PROPERTY OWNERS IS FILED WITH THE SURVEYOR-ROAD COMMISSIONER.
10. DRIVEWAYS, EXCEPT JOINT-USE DRIVEWAYS AND DRIVEWAYS ON LOTS HAVING 21 FOOT FRONTAGE OR LESS, SHALL BE LOCATED AT LEAST 3 FEET FROM THE SIDE PROPERTY LINE EXTENDED.
11. NOT MORE THAN 60% OF THE PROPERTY FRONTAGE MAY BE ALLOCATED FOR DRIVEWAYS ON ANY ONE LOT, EXCEPT THAT LOTS HAVING FRONTAGE OF 25 FEET OR LESS ARE ENTITLED TO ONE 15 FOOT DRIVEWAY.
12. DRIVEWAY LOCATIONS AND GRADES SHALL NOT INTERFERE WITH PLANNED ULTIMATE GRADING WITHIN THE RIGHT OF WAY.
13. PORTLAND CEMENT CONCRETE CURB OPENINGS (DEPRESSED CURBS) WILL BE PERMITTED ONLY IN THOSE LOCATIONS WHERE COMPLETE STANDARD PORTLAND CEMENT CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED CONCURRENTLY.
14. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE COUNTY SURVEYOR-ROAD DEPARTMENT OR BUILDING INSPECTION DEPARTMENT.
15. WHEN A DRIVEWAY THROUGH A PORTLAND CEMENT CONCRETE CURB IS ABANDONED, OR IS REPLACED BY ANOTHER DRIVEWAY SERVING THE SAME PROPERTY, THE OWNER SHALL INSTALL FULL HEIGHT CURB ACROSS THE SUPERFLUOUS OPENING AND SHALL FILL THE DEPRESSION BEHIND THE CURB.

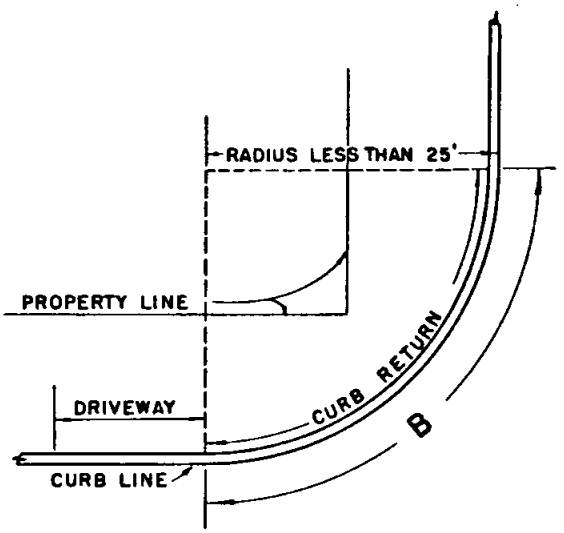
STD. SPEC. SEC.	REFERENCE: COUNTY OF SAN DIEGO TECHNICAL ROAD POLICY OF JANUARY 6, 1964				
DRAWN BY GA CHECKED BY GAM					
RECOMMENDED BY R.J. Macomber	SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Gates R.C.E. 6091	DRIVEWAY LOCATION AND WIDTH REQUIREMENTS	DRAWING NUMBER 305-1			
DATE: July 14, 1964					



REQUIREMENT 1

NO PORTION OF ANY DRIVEWAY SHALL BE PERMITTED WITHIN THE INTERSECTION OF THE PROLONGED PROPERTY LINES AND THE CURB AS SHOWN BY ARC "A".

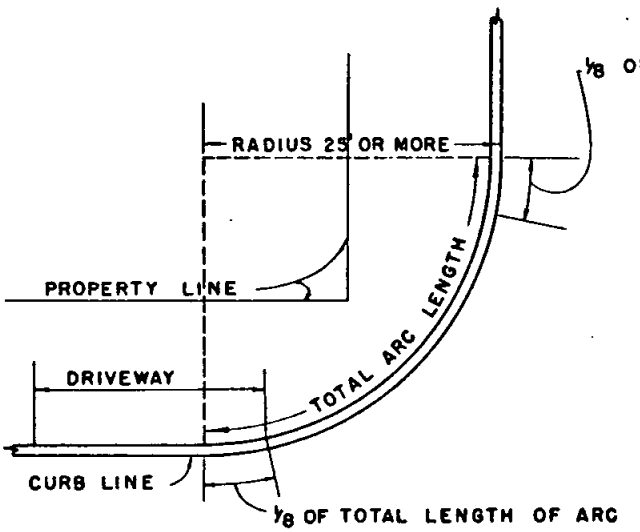
WHEN THE INTERIOR PROPERTY LINE ANGLE BETWEEN TWO STREETS IS LESS THAN 70°, NO DRIVEWAY ENCROACHMENT INTO THE CURB RETURN WILL BE MADE WITHOUT APPROVAL OF THE COUNTY SURVEYOR-ROAD COMISSIONER.



REQUIREMENT 2

NO PORTION OF ANY DRIVEWAY SHALL BE PERMITTED IN THE CURB RETURN WHERE THE RADIUS OF THE CURB IS LESS THAN 25 FEET, AS SHOWN BY ARC "B."

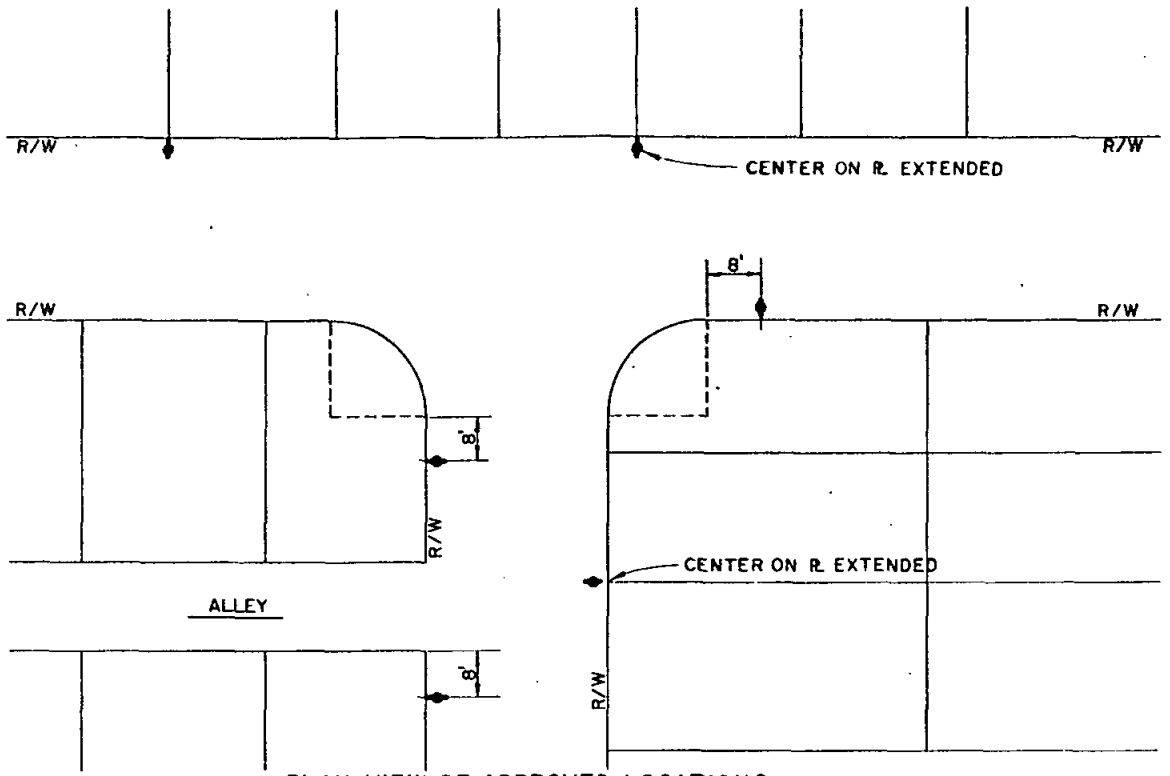
REQUIREMENT 3



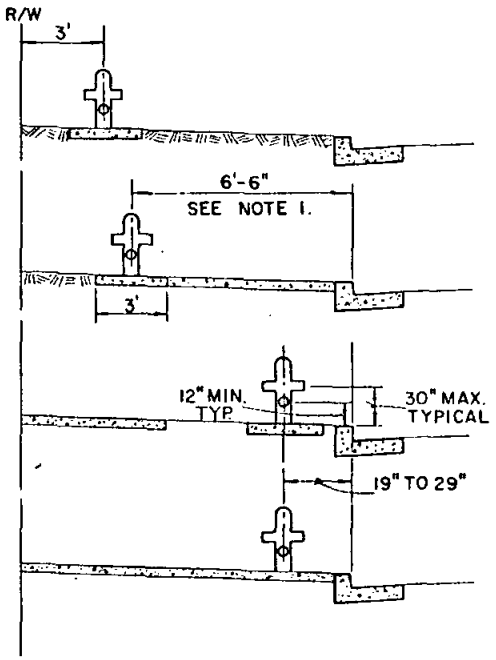
ON ALL CURB RETURNS WHERE THE RADIUS IS 25 FEET OR MORE, DRIVEWAYS MAY ENCROACH UPON EACH END OF THE RETURN A DISTANCE EQUAL TO 12½% OR 1/8 OF THE TOTAL LENGTH OF THE ARC ON THE CURB RETURN, THUS LEAVING AT LEAST 75% OF THE LENGTH OF ARC ON THE RETURN FACE FREE FROM DRIVEWAY ENCROACHMENT, PROVIDED REQUIREMENT 1 IS MET, AND PROVIDED THE CURB ENCROACHMENT IS APPROVED BY THE SURVEYOR-ROAD COMMISSIONER.

NO DRIVEWAY SHALL BE PERMITTED WITHIN A CURB RETURN WITHIN THREE FEET OF A REGULATORY DEVICE.

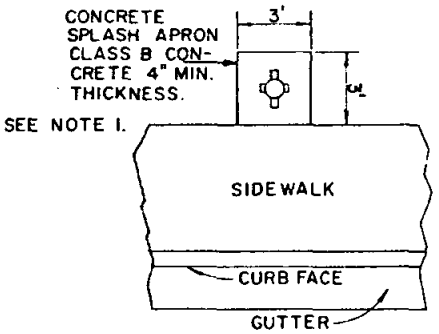
STD. SPEC. SEC.					
DRAWN BY D.R. CHECKED BY A.S.H.					
RECOMMENDED BY R.J. Mossman	SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE NONE			
D.K. Sharer R.C.E. 8091	DRIVEWAY LOCATION ADJACENT TO CURB RETURNS	DRAWING NUMBER 306-1			
DATE: July 14, 1964					



PLAN VIEW OF APPROVED LOCATIONS



PROFILE OF APPROVED LOCATIONS



SPLASH APRON PLAN

NOTES

1. FOR CONTIGUOUS SIDEWALK WHERE DISTANCE FROM BACK OF SIDEWALK TO PROPERTY LINE IS 3'-6" MIN., INSTALL AS SHOWN. WHEN DISTANCE FROM HYDRANT TO TOP OR TOE OF SLOPE IS LESS THAN 2'-0", SPECIAL HYDRANT PROTECTION WILL BE REQUIRED.
2. HARDWARE DETAILS WILL BE THOSE OF THE APPLICABLE DISTRICT INVOLVED.
3. A 3'-0" x 3'-0" SPLASH APRON AROUND ALL INSTALLATIONS WHERE NOT PART OF SIDEWALK.

REDUCED SCALE
USE SCALE BELOW

0 1 2 3

3 INCHES ON ORIGINAL PLAN

STD. SPEC. SEC: 19, 90

DRAWN BY CJ CHECKED BY WB

RECOMMENDED BY E.M. Boyce

APPROVED BY COUNTY ENGINEER

H. M. Taylor R.C.E. 11458

DATE: Sept. 28, 1971

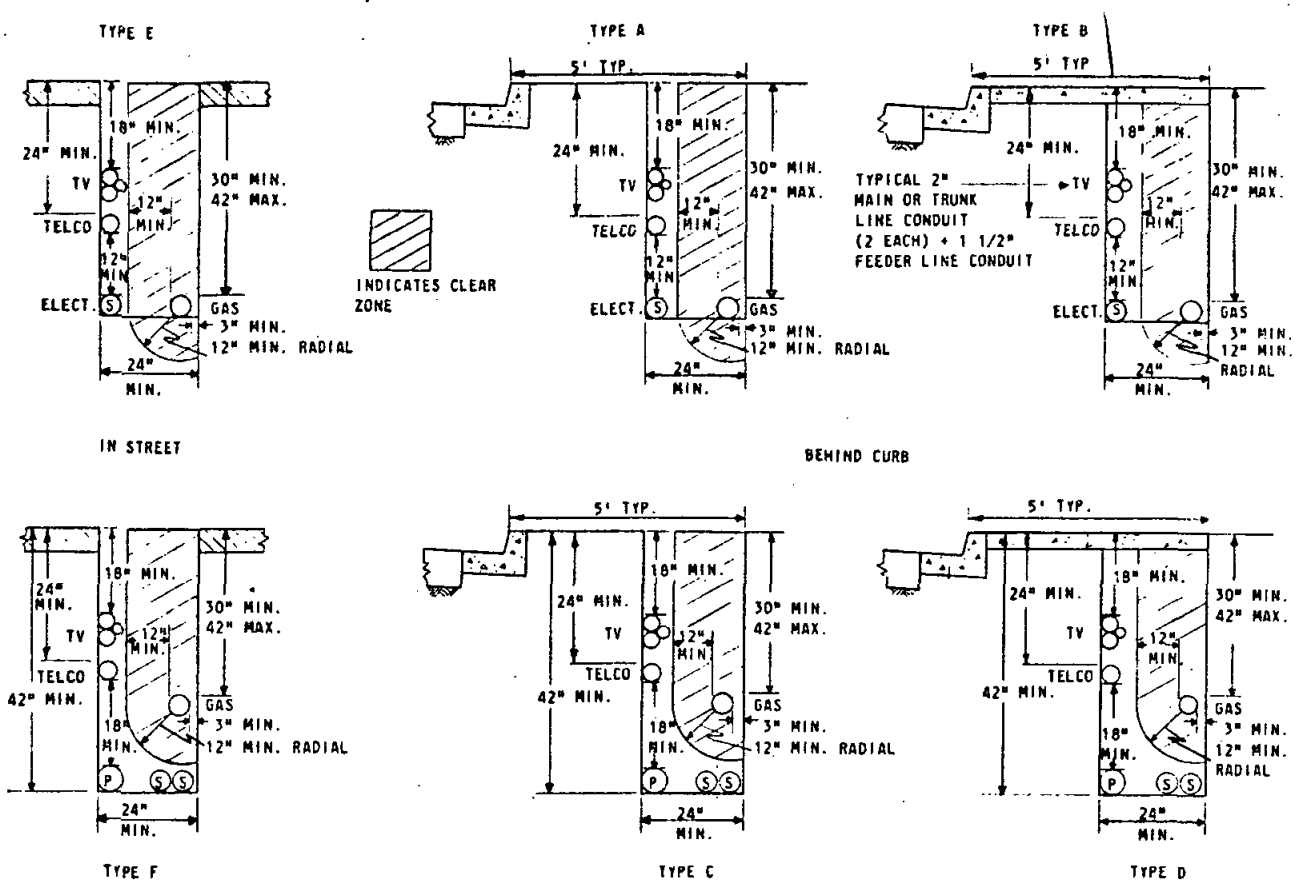
SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

FIRE HYDRANT LOCATION

REVISION	BY	APPROVED	DATE

SCALE: NONE

DRAWING NUMBER 307



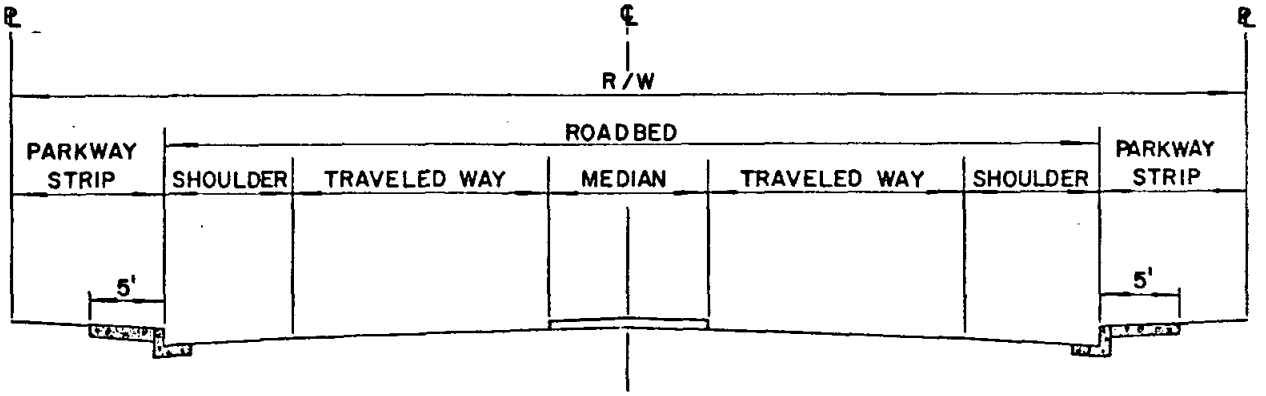
GENERAL NOTES:

1. GENERALLY UTILITIES ARE TO BE INSTALLED UNDER THE APPLICABLE SPECIFICATIONS FOR THE PARTICULAR UTILITY AND THE SPECIFICATIONS OF THE OWNER AGENCY.
2. WHERE MULTIPLE DUCTS (OTHER THAN SHOWN) ARE TO BE PLACED A SPECIAL JOINT TRENCH DETAIL SHALL BE DESIGNED AND APPROVAL OF PARTICIPATING UTILITIES OBTAINED.
3. GAS MAIN TO BE PLACED ON PROPERTY SIDE OF TRENCH. ELECTRIC PRIMARY SHOULD BE DIAGONALLY OPPOSITE GAS MAIN WHERE POSSIBLE (TYPES C, D & F).
4. INSTALLATION OF SEWER AND/OR WATER UTILITIES ARE NOT PERMITED IN THE JOINT TRENCH SHOWN ABOVE.
5. MINIMUM DEPTH TO TOP OF GAS PIPE MAY, SUBJECT TO GAS COMPANY INSPECTORS APPROVAL, BE REDUCED TO 24" WHERE NECESSARY TO CLEAR FOREIGN STRUCTURE CROSSINGS.
6. DEPTH AND WIDTH OF TRENCH VARIES.
7. WHEN APPROVED BY ALL UTILITIES CONCERNED SECONDARY ELECTRIC, TELEPHONE AND CATV MAY BE CONCURRENTLY INSTALLED WITH RANDOM SEPARATION.
8. CATV MAIN OR TRUNK LINE CONDUIT REQUIRED ALONG ALL STREETS EXCEPT CUL-DE-SAC STREETS LESS THAN 2500' IN LENGTH MAY BE SERVED BY FEEDER LINES ONLY.
9. CATV 1 1/2" FEEDER CONDUIT SHALL RUN ACROSS STREETS WITH EACH POWER SERVICE LINE AND CAPPED AT EDGE OF SIDEWALK.
10. ALL CATV TERMINALS AND CONDUITS SHALL BE TERMINATED AT GENERALLY ACCEPTED LOCATIONS AND MARKED. A MAP SHALL BE FILED WITH THE APPROPRIATE AGENCY SHOWING THE LOCATION OF THE CATV SYSTEM.
11. IN NO CASE SHALL CATV CONDUITS BE PLACED WITHIN 12" OF ELECTRIC OR GAS LINES. ALSO CONDUITS ARE NOT TO BE PLACED DIRECTLY OVER GAS LINES.
12. CATV CONDUIT MAY BE PLACED WITH THE TELCO CONDUIT PROVIDED THE TELCO MIN. DEPTH IS HELD.
13. THE LOCATION OF UTILITIES AS SHOWN BY THE STANDARD DRAWING SHALL IN NO WAY VIOLATE EXISTING CODES OR REGULATIONS APPLICABLE TO INDIVIDUAL UTILITIES.
14. TYPES A, B & E APPLY WHEN AN ELECTRIC SECONDARY CONDUIT ONLY IS USED. TYPES C, D, AND F APPLY WHEN AN ELECTRIC PRIMARY (& SECONDARY) CONDUIT IS USED.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY J.E.G. CHECKED BY C.A.K.					
RECOMMENDED BY [signature]	JOINT TRENCH UTILITIES LOCATION	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
[signature] R.C.E. 11458		DRAWING NUMBER 309T			
DATE: 1-14-74					

TYPICAL ROADWAY SECTION

SYMMETRICAL ABOUT CENTERLINE



TYPE OF ROAD OR STREET	R/W	ROADBED	TRAVELED WAY	SHOULDER	MEDIAN	PARKWAY STRIP
PRIME ARTERIAL TRAFFIC VOLUME OF 16,000 V.P.D. OR MORE	126'	106'	36'	8'	18'	10'
MAJOR ROAD TRAFFIC VOLUME 10,000 TO 16,000 V.P.D.	102'	82'	24'	8'	18'	10'
COLLECTOR ROAD TRAFFIC VOLUME 5,000 TO 10,000 V.P.D.	84'	64'	24'	8'	0'	10'
RESIDENTIAL COLLECTOR STREET TRAFFIC VOLUME FROM 150 TO 700 DWELLING UNITS	60'	40'	12'	8'	0'	10'
RESIDENTIAL STREET TRAFFIC VOLUME FROM 150 DWELLING UNITS OR LESS	56'	36'	12'	6'	0'	10'
RESIDENTIAL CUL-DE-SAC STREET TRAFFIC VOLUME FROM 20 UNITS OR LESS. 600' MAX. LENGTH	52'	32'	12'	4'	0'	10'
RESIDENTIAL LOOP STREET TRAFFIC VOLUME FROM 20 UNITS OR LESS. 600' MAX. LENGTH	52'	32'	12'	4'	0'	10'
*COMM. & IND. COLLECTOR STREET TRAFFIC VOLUME FROM COMMERCIAL OR INDUSTRIAL ST'S.	88'	68'	24'	10'	0'	10'
*COMM. & IND. STREET TRAFFIC VOLUME FROM ABUTTING COMMERCIAL LOTS	72'	52'	16'	10'	0'	10'
*COMM. & IND. CUL-DE-SAC STREET TRAFFIC VOLUME FROM ABUTTING COMMERCIAL LOTS	72'	52'	16'	10'	0'	10'
FRONTAGE ROAD ADJACENT TO FREEWAY RIGHT OF WAY		SEE	NOTE	No 4		

*COMM. & IND. = COMMERCIAL & INDUSTRIAL

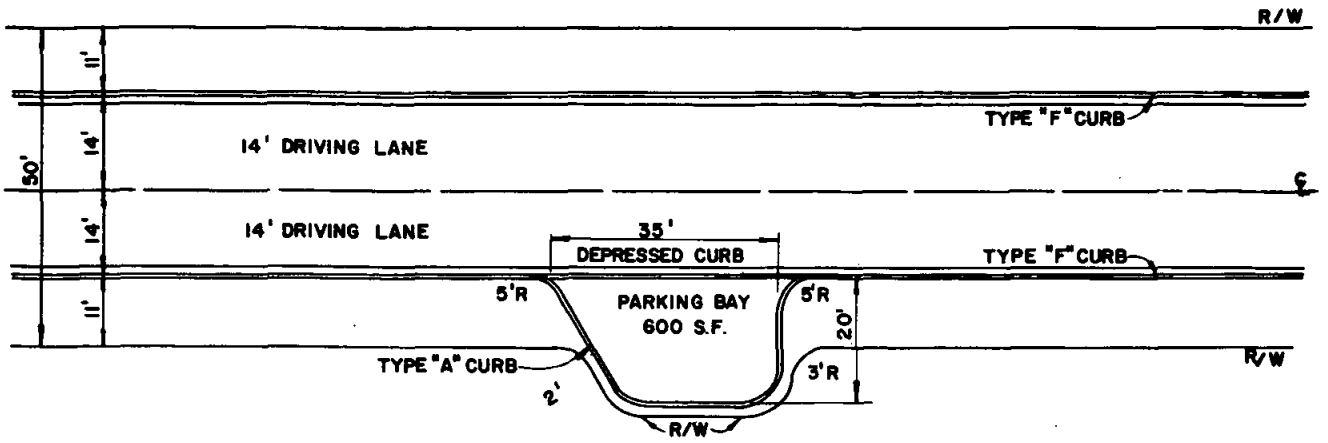
NOTE: 1. STREET CLASSIFICATIONS (EXCEPT PRIME ARTERIAL) AND TYPICAL ROADWAY SECTIONS FROM SAN DIEGO COUNTY TECHNICAL ROAD POLICY (JAN. 6, 1964).

2. PRIME ARTERIAL SECTION BASED UPON MINIMUM STANDARDS "NATIONAL COMMITTEE ON URBAN TRANSPORTATION".

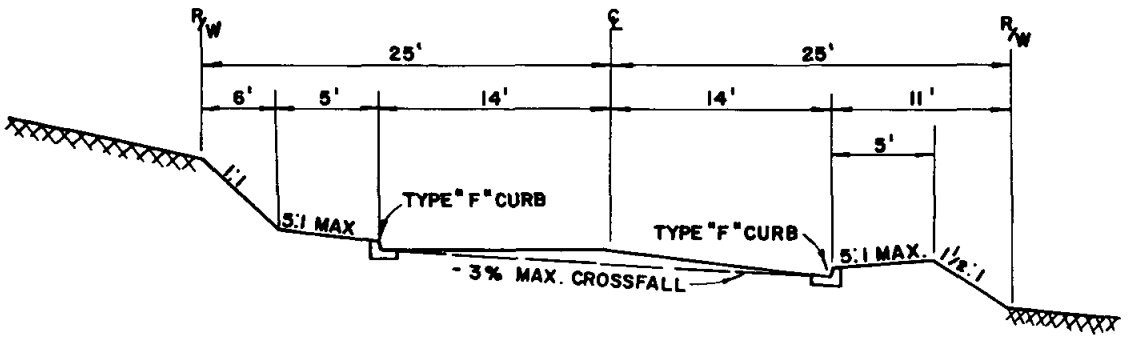
3. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR SIDEWALK, CURB, AND ROADWAY REQUIREMENTS.

4. FRONTAGE ROAD ADJACENT TO FREEWAY R/W. TRAVELED WAY AND MEDIAN STANDARD FOR ROAD CLASSIFICATION AND/OR TRAFFIC VOLUME. SHOULDER ADJACENT TO FREEWAY 2'. PARKWAY STRIP ADJACENT TO FREEWAY VARIES FROM 4' TO 10' SHOULDER AND PARKWAY STRIP AWAY FROM FREEWAY STANDARD FOR TRAFFIC VOLUME AND/OR ROAD CLASSIFICATION.

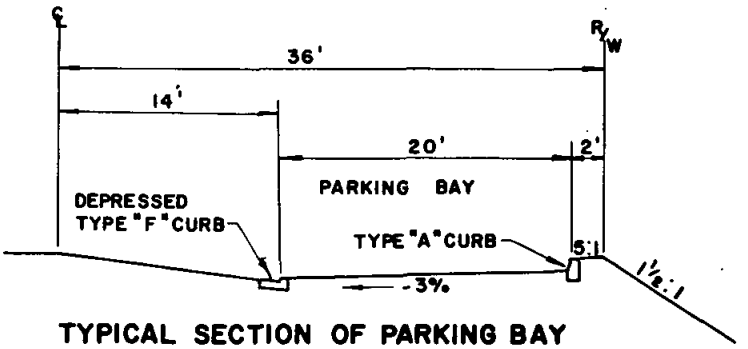
STD. SPEC. SEC. 39,51,73,90					
DRAWN BY C.O.B. CHECKED BY B.F.H.					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY ENGINEER DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	STANDARD DRAWING	SCALE: NONE			
H. M. Taylor by [signature] R.C.E. 11458	TYPICAL ROADWAY SECTIONS	DRAWING NUMBER 310-3			
DATE: 12-30-71					



PLAN



TYPICAL ROADWAY SECTION

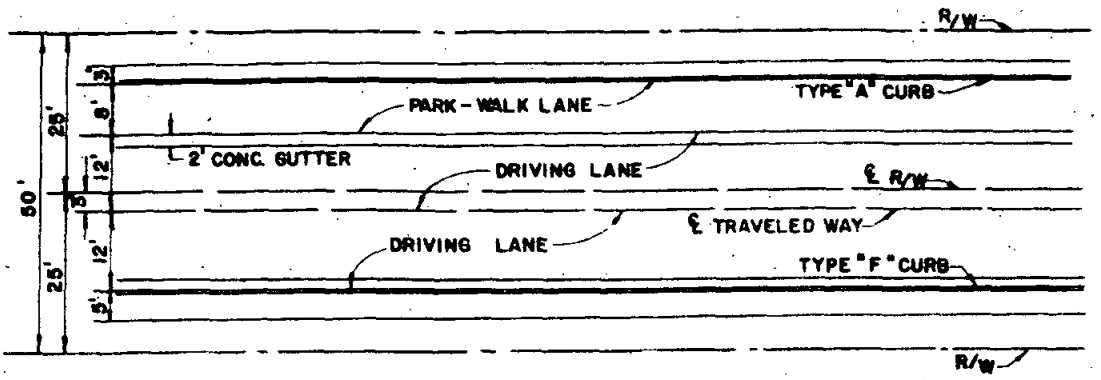


TYPICAL SECTION OF PARKING BAY

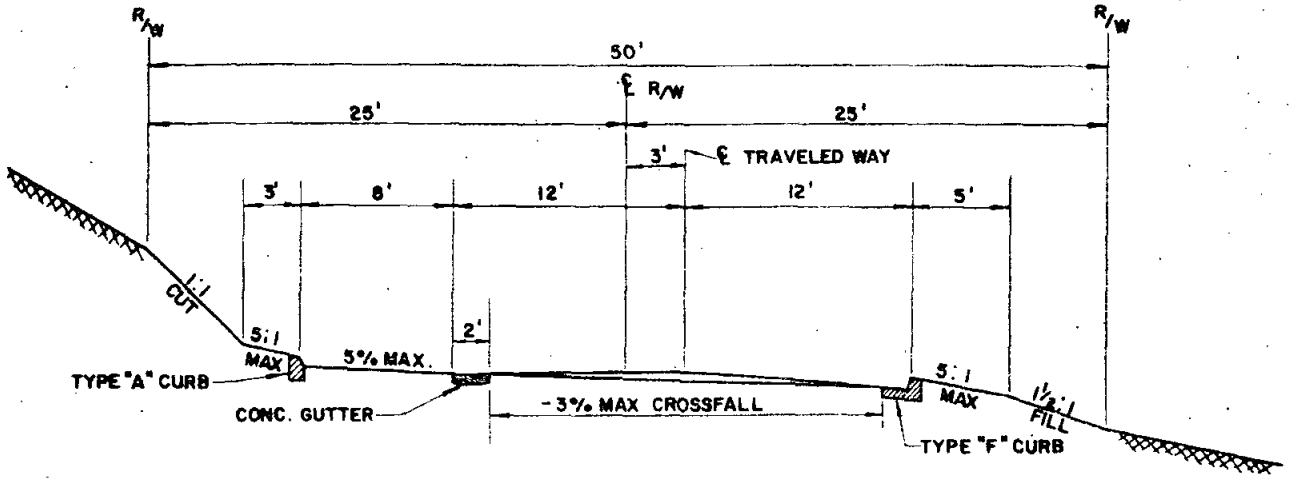
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB, SIDEWALK & ROADWAY REQUIREMENTS.
2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22
3. REQUIRED: ONE 600 SQUARE FOOT PERPENDICULAR PARKING BAY PER LOT. THE SURVEYOR-ROAD COMMISSIONER MAY ALSO ESTABLISH ALTERNATE STANDARD TYPICAL SECTIONS WHICH WILL PROVIDE A MINIMUM OF TWO PARKING STALLS PER LOT.
4. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA NOT LESS THAN 20,000 SQUARE FEET.

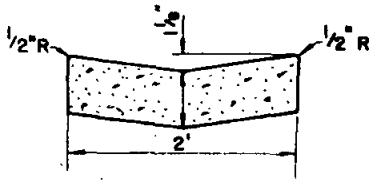
STD. SPEC. SEC. 73, 90, 92.					
DRAWN BY JM'CY CHECKED BY JEP					
RECOMMENDED BY C.J. Mansoor	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D.K. Ofsoos R.C.E. 8091	HILLSIDE RESIDENTIAL STREET ALTERNATE No. 1	DRAWING NUMBER	311-1		
DATE: 12/20/64					



PLAN



TYPICAL ROADWAY SECTION

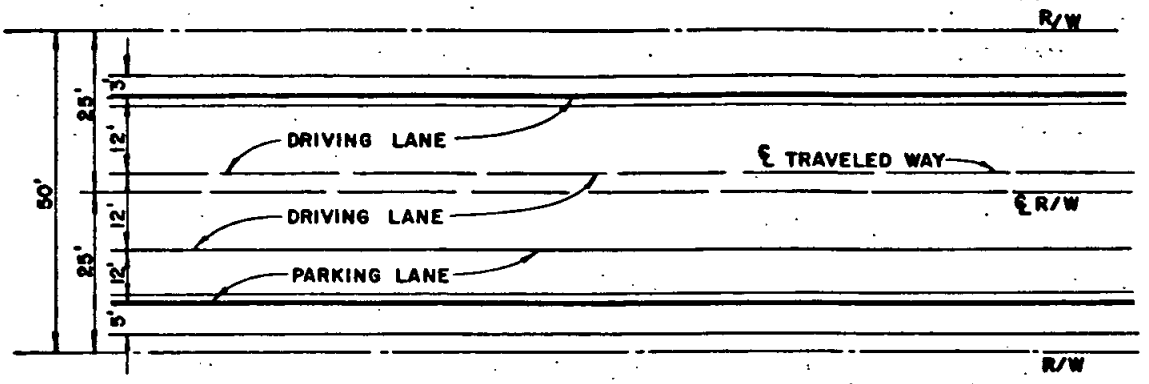


CONCRETE GUTTER DETAIL

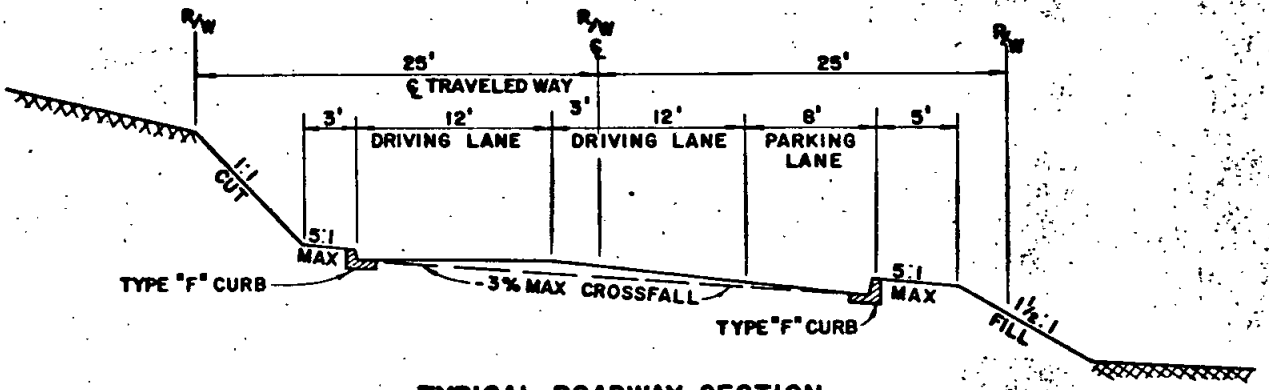
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB, SIDEWALK & ROADWAY REQUIREMENTS.
2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22
3. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA OF NOT LESS THAN 20,000 SQUARE FEET.
4. USE OF HILLSIDE RESIDENTIAL STREE STANDARDS ARE APPLICABLE ONLY TO STREETS CLASSIFIED AS, RESIDENTIAL, RESIDENTIAL CUL-DE-SAC, OR RESIDENTIAL LOOP STREETS AND ARE NOT APPLICABLE TO STREETS IN AREAS ZONED FOR COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL USE

STD. SPEC. SEC. 73, 90, 92					
DRAWN BY MCY CHECKED BY JEP					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Sloan R.C.E. 9091	HILLSIDE RESIDENTIAL STREET ALTERNATE No. 2	DRAWING NUMBER	312-1		
DATE: 12/29/66					



PLAN

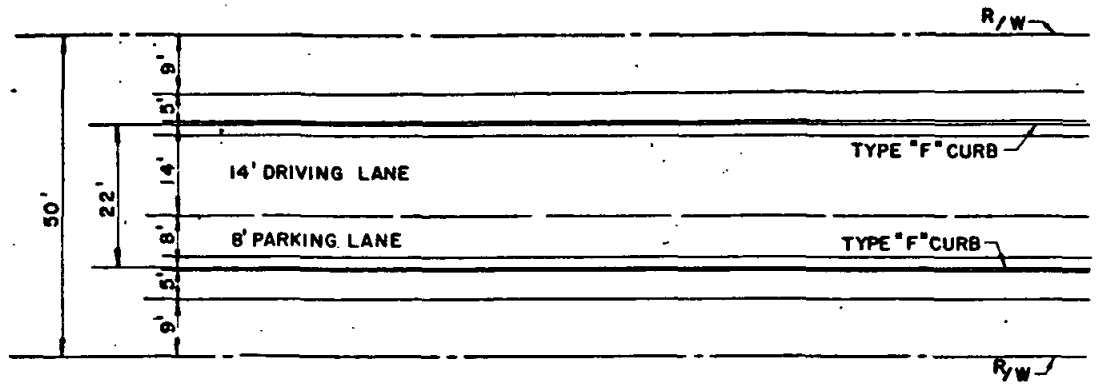


TYPICAL ROADWAY SECTION

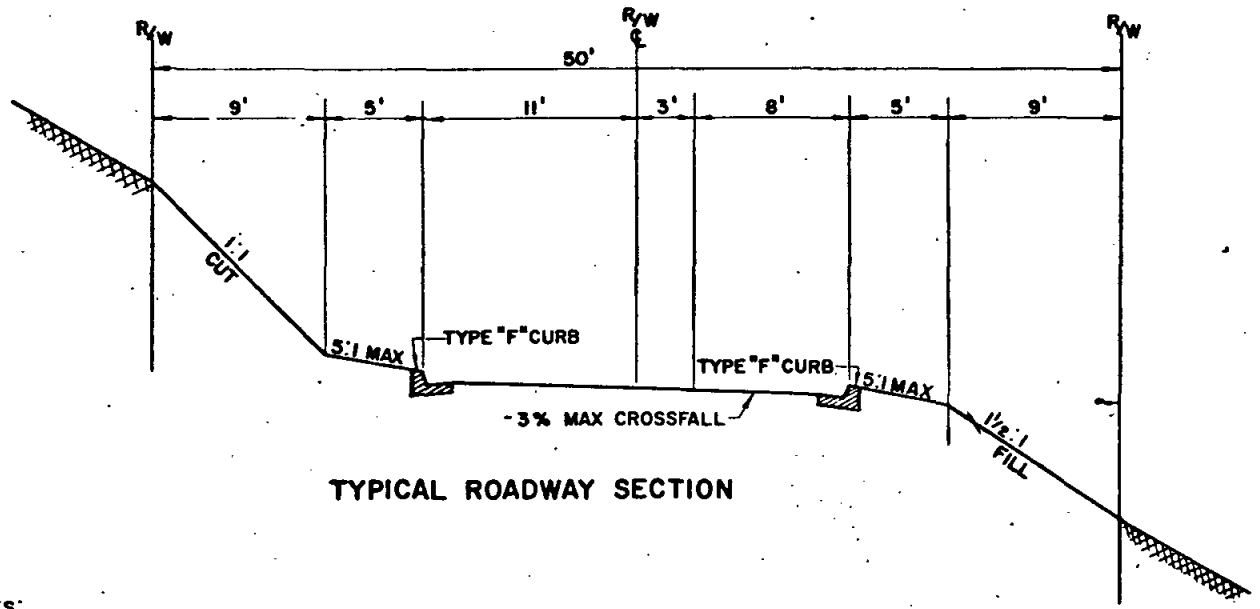
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB, SIDEWALK & ROAD REQUIREMENTS.
2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22.
3. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA OF NOT LESS THAN 20,000 SQUARE FEET.
4. USE OF HILLSIDE RESIDENTIAL STREET STANDARDS ARE APPLICABLE ONLY TO STREETS CLASSIFIED AS RESIDENTIAL, RESIDENTIAL CUL-DE-SAC, OR RESIDENTIAL LOOP STREETS AND ARE NOT APPLICABLE TO STREETS IN AREAS ZONED FOR COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL USE.

STD. SPEC. SEC. 73, 90, 92					
DRAWN BY JM'CY CHECKED BY JEP					
RECOMMENDED BY R.J. Mannan	SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Sloan R.C.E. 8091	HILLSIDE RESIDENTIAL STREET	DRAWING NUMBER	313-1		
DATE: 12/29/64	ALTERNATE No. 3				



PLAN



TYPICAL ROADWAY SECTION

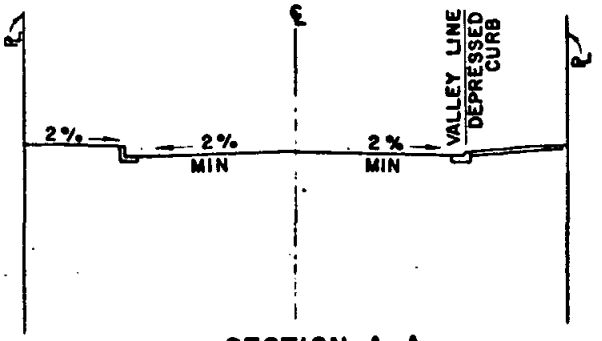
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND *SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB,* SIDEWALK & ROADWAY REQUIREMENTS.
2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22
3. MAXIMUM LENGTH BETWEEN CONNECTIONS TO CROSSING TWO-WAY STREETS SHALL BE 1200 FT.
4. USE OF THIS STREET SECTION LIMITED TO:

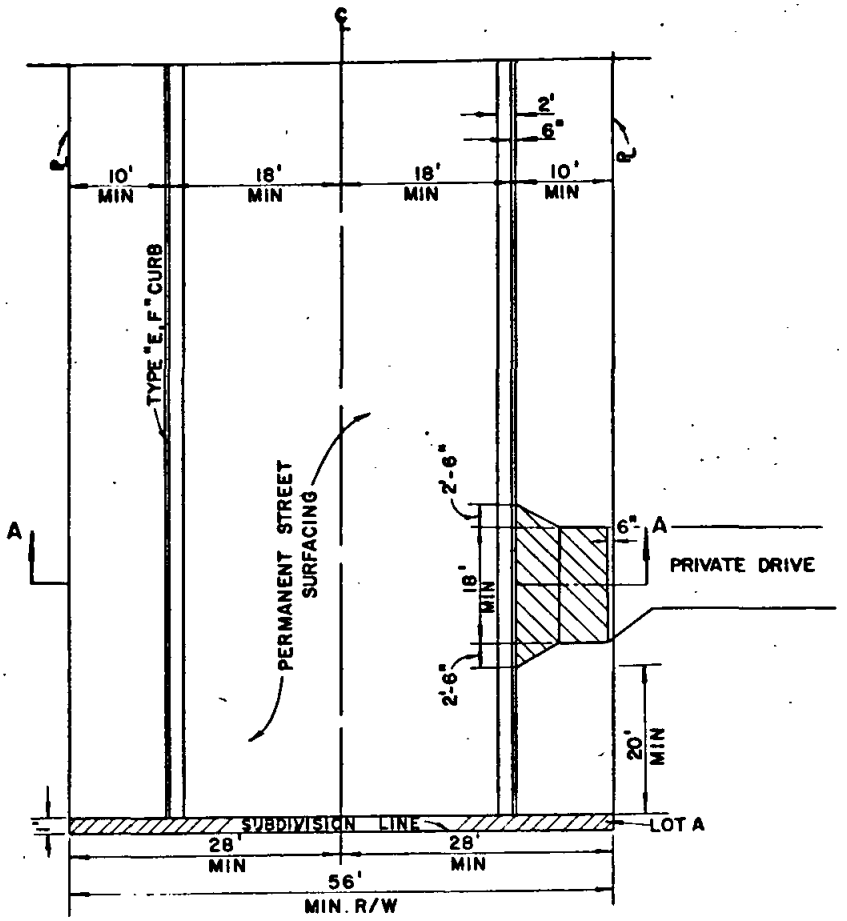
   A. AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA OF NOT LESS THAN 20,000 SQUARE FEET.

   B. STREET PATTERN ALLOWS RETURN TO POINT OF ORIGIN IN ONE MILE OR LESS.
5. USE OF HILLSIDE RESIDENTIAL STREET STANDARDS ARE APPLICABLE ONLY TO STREETS CLASSIFIED AS RESIDENTIAL, RESIDENTIAL CUL-DE-SAC, OR *RESIDENTIAL LOOP STREETS, AND ARE NOT APPLICABLE TO STREETS* IN AREAS ZONED FOR COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL USE.

STD. SPEC. SEC. 73, 90, 92					
DRAWN BY JNSY CHECKED BY JEP					
RECOMMENDED BY [illegible]	SAN DIEGO COUNTY SURVEYOR–ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Spees R.C.E. 8091	HILLSIDE RESIDENTIAL ONE-WAY STREET ALTERNATE No. 4	DRAWING NUMBER 314-1			
DATE: 12/30/64					



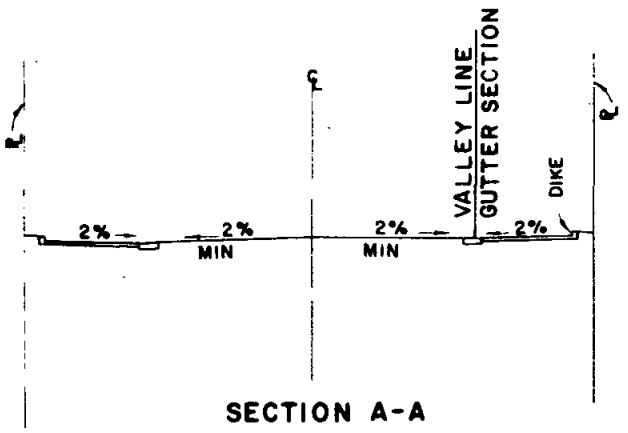
SECTION A-A



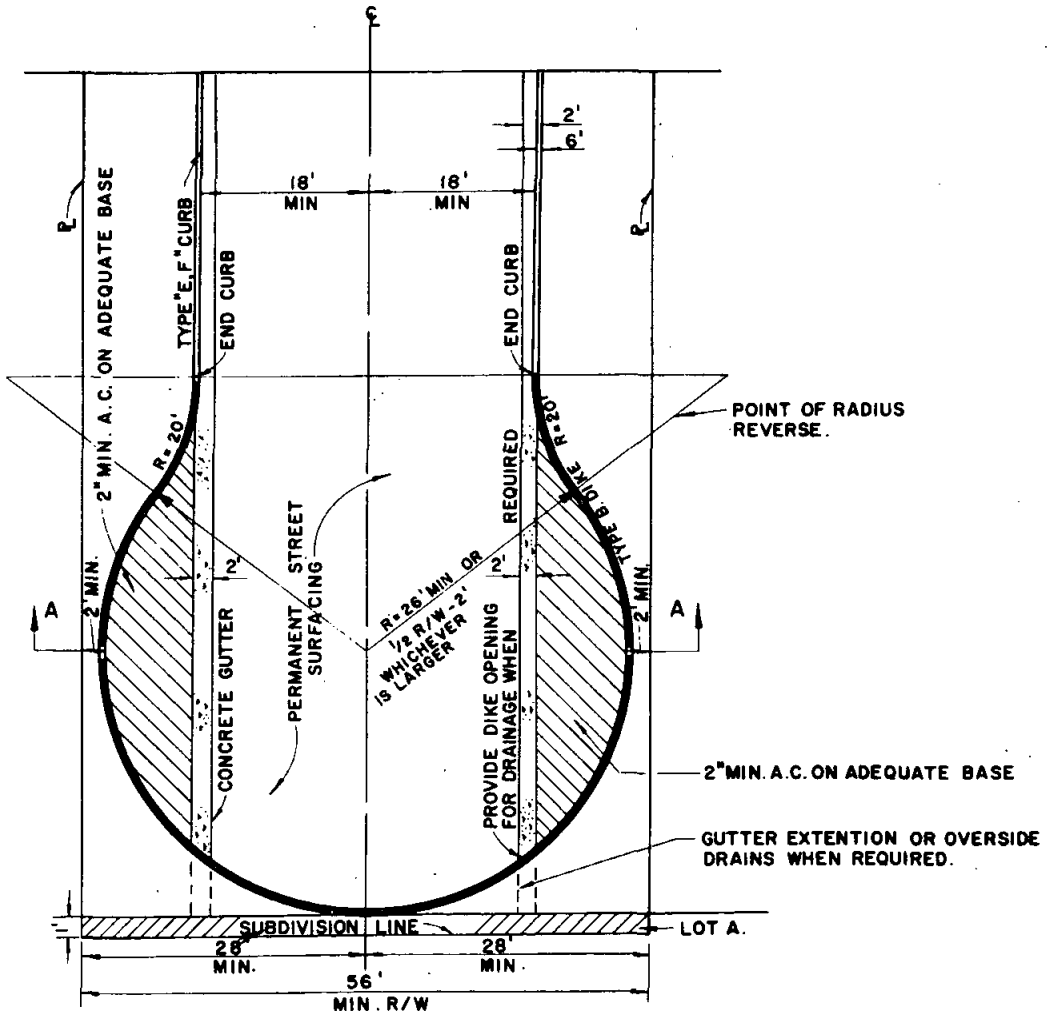
NOTE:

1. TEMPORARY HAMMERHEAD TURN-AROUND TO BE CONSTRUCTED IN COMPLIANCE WITH REQUIREMENTS FOR CONCRETE RESIDENTIAL DRIVEWAYS, CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS. LOCATION TO BE GOVERNED BY DRIVEWAY LOCATION REQUIREMENTS CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS AND THIS STANDARD DRAWING.
2. FOR USE ON EITHER 36' OR 40' WIDTH STREETS.

STD. SPEC. SEC.					
DRAWN BY JMCY CHECKED BY JEP					
RECOMMENDED BY P. Maseman	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Sletten R.C.E. 8091	TEMPORARY HAMMERHEAD TURN-AROUND AT DEAD-END STREET	DRAWING NUMBER 315-1			
DATE: 12/30/86					



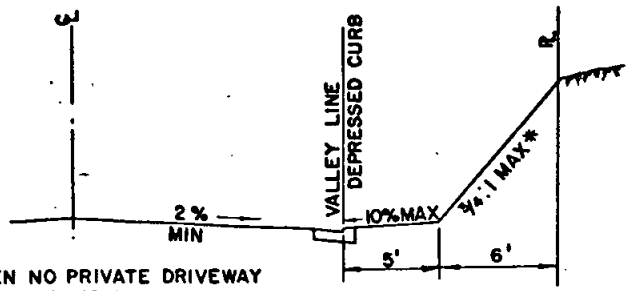
SECTION A-A



NOTE:

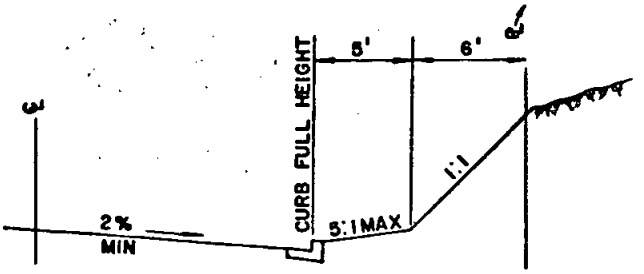
1. FOR USE ON EITHER 36' OR 40' WIDTH STREETS.

STD. SPEC. SEC.					
DRAWN BY JM'CX CHECKED BY JEP					
RECOMMENDED BY [signature]	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT STANDARD DRAWING	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR		SCALE: NONE			
D. K. DeSpain R.C.E. 8091	TEMPORARY TURN-AROUND AT DEAD-END STREET.	DRAWING NUMBER 316-1			
DATE 12/20/66					

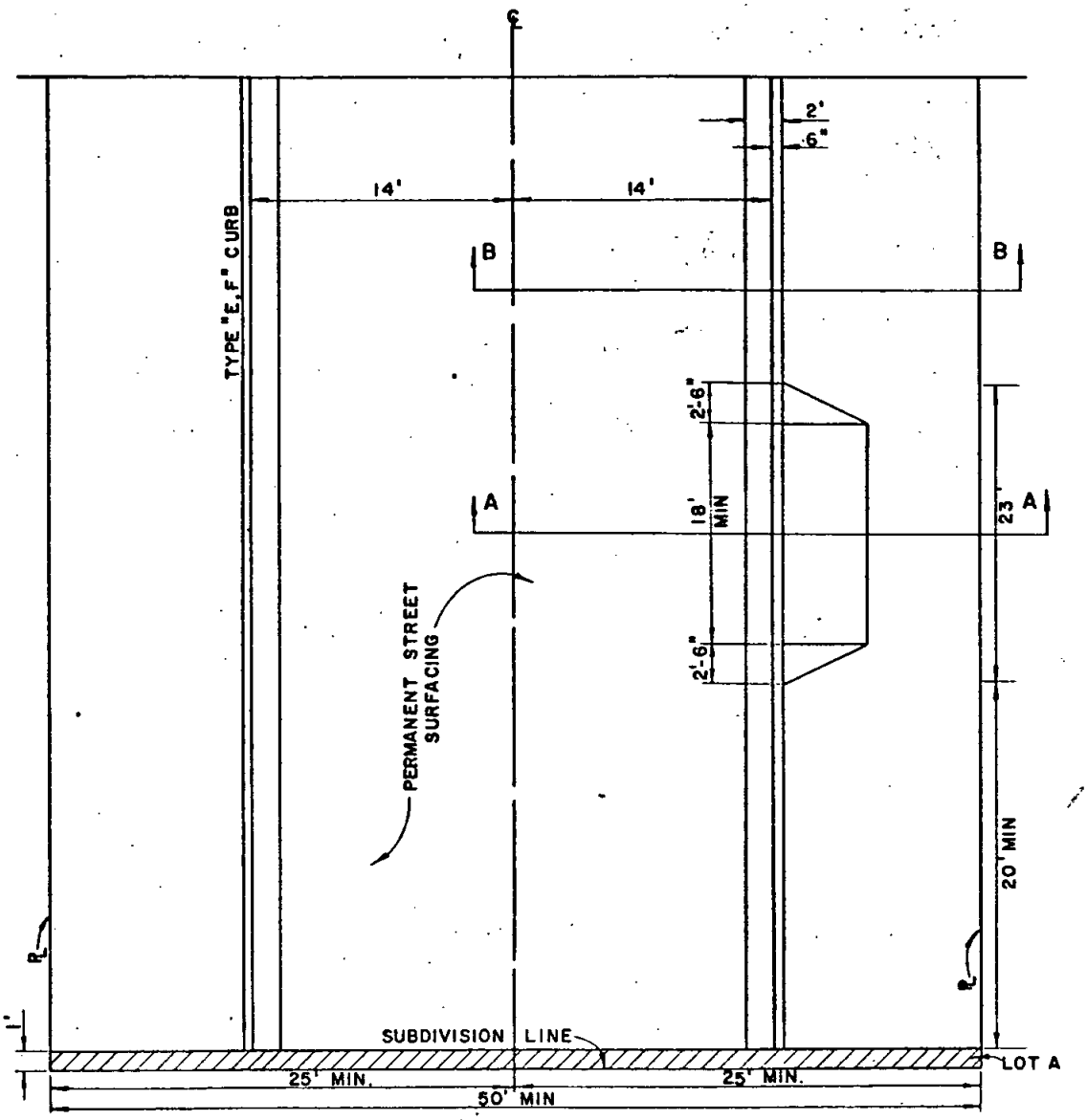


* WHEN NO PRIVATE DRIVEWAY IS CONSTRUCTED

SECTION A-A



SECTION B-B



NOTE: 1. TEMPORARY HAMMERHEAD TURN-AROUND PREFERABLY ON CUT SIDE.
2. TEMPORARY HAMMERHEAD TURN-AROUND TO BE CONSTRUCTED IN COMPLIANCE WITH REQUIREMENTS FOR CONCRETE RESIDENTIAL DRIVEWAYS, CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS. LOCATIONS TO BE GOVERNED BY DRIVEWAY LOCATION REQUIREMENTS CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS AND THIS STANDARD DRAWING.

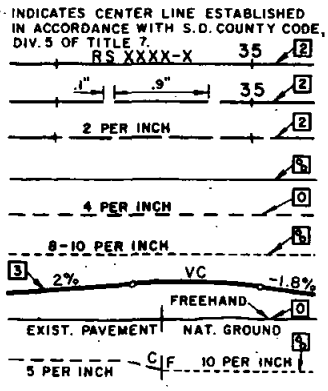
STD. SPEC. SEC.					
DRAWN BY JN'CY / CHECKED BY JEP					
RECOMMENDED BY R.J. Mecoman	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT STANDARD DRAWING	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR		SCALE: NONE			
D.K. Spear R.C.E. 8091	TEMPORARY HAMMERHEAD TURN-AROUND AT DEAD-END STREET. HILLSIDE STANDARD.	DRAWING NUMBER 317-1			
DATE 12/29/64					

PROPOSED CONSTRUCTION

LINES

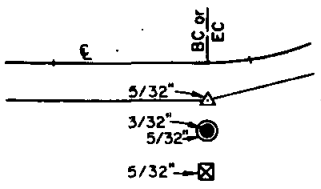
* INDICATES CENTER LINE ESTABLISHED IN ACCORDANCE WITH S.D. COUNTY CODE, DIV. 5 OF TITLE 7.

- ULTIMATE CENTERLINE (℄)*
- STAGE CONSTRUCTION LINE
- INTERSECTING ROADS & STREETS
- RIGHT OF WAY LINE
- EQUATION OR RADIUS LINE
- OFFSET TIE
- GRADE LINES ON PROFILES
- GROUND LINES ON PROFILES
- SLOPE LIMIT LINES



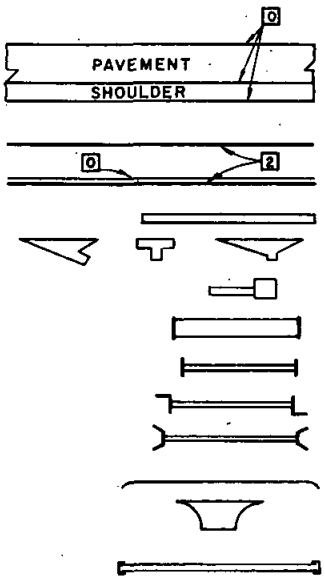
POINTS

- B C & E C
- P I OR ANGLE PT.
- ℄ MONUMENT
- BENCH MARK

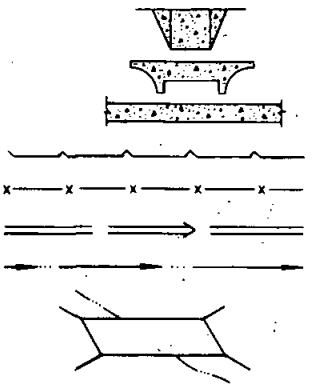


CONSTRUCTION

- PAVEMENT EDGE & SHOULDERS
- A C DIKE (LABEL TYPE)
- CURB & GUTTER (LABEL TYPE)
- CULVERT
- DOWNDRAIN, A C SPILLWAY
- DROP INLET
- BOX CULVERT
- HEADWALL, STANDARD
- HEADWALL "L" TYPE
- HEADWALL & WINGWALL
- GUARD RAIL
- DRIVEWAY APRONS A C
- UTILITY DUCT (LABEL)



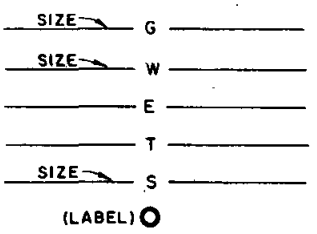
- DRIVEWAY APRONS P C C
- CONCRETE CROSS GUTTER
- SIDEWALK
- RETAINING WALL
- FENCE (LABEL TYPE)
- DITCH, LINED
- DITCH, UNLINED
- BRIDGE



UTILITIES

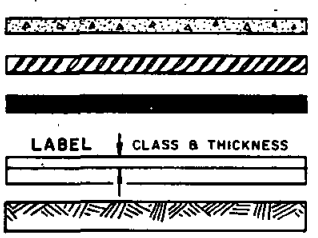
- GAS LINE
- WATER LINE
- ELECTRIC CABLE
- TELEPHONE CABLE
- SEWER LINE
- UTILITY MANHOLE

UNDERGROUND ONLY



STRUCTURAL SYMBOLS

- PORTLAND CEMENT CONCRETE
- ASPHALT CONCRETE (EXISTING)
- ROAD OIL MIX OR ASPHALT CONCRETE SURFACING
- BASE MATERIAL
- ORIGINAL GROUND



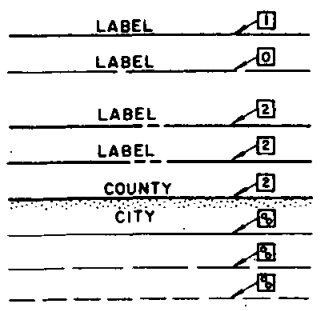
MISCELLANEOUS SYMBOLS

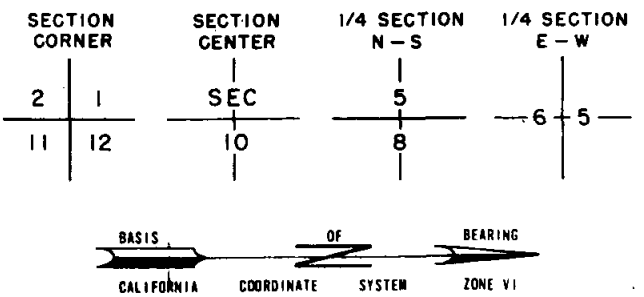
- CONTRACTED LINE (NOT TO SCALE)
- LIMIT ARROWS
- PROJECT, WORK LIMIT
- CUTTING PLANE

CADASTRAL SYMBOLS

LAND LINES

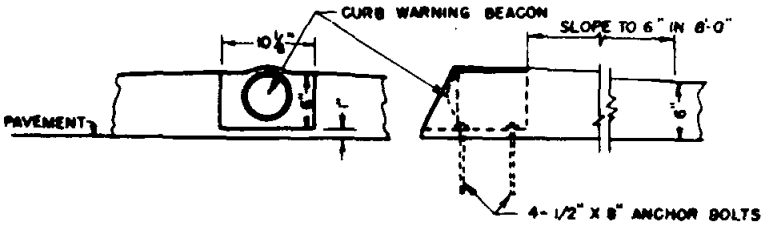
- TOWNSHIP LINES
- SECTION LINES
- GRANT LINE (RHO BOUNDARY OR INDIAN RESERVATION)
- SUBDIVISION BOUNDARY LINE
- CITY / COUNTY BOUNDARY LINE
- PROPERTY LINE
- LOT LINE
- EASEMENT LINE





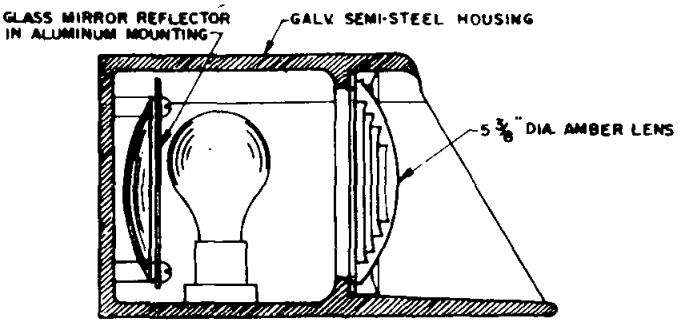
STD. SPEC. SEC: NONE	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY CLL CHECKED BY BEH					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONSTRUCTION PLAN SYMBOLS	SCALE: NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 318			
DATE: 2-18-70					

NOTE: The anchor bolts and nuts shall be galvanized.



TRAFFIC ISLAND DETAIL SHOWING
CURB WARNING BEACON
INSTALLATION

3/4" = 1'-0"



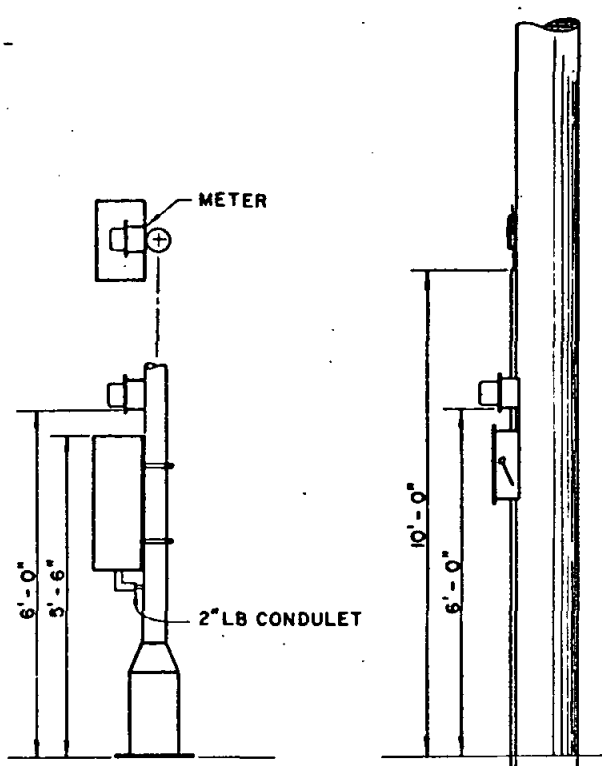
DETAIL CROSS-SECTION
OF CURB WARNING BEACON

3" = 1'-0"

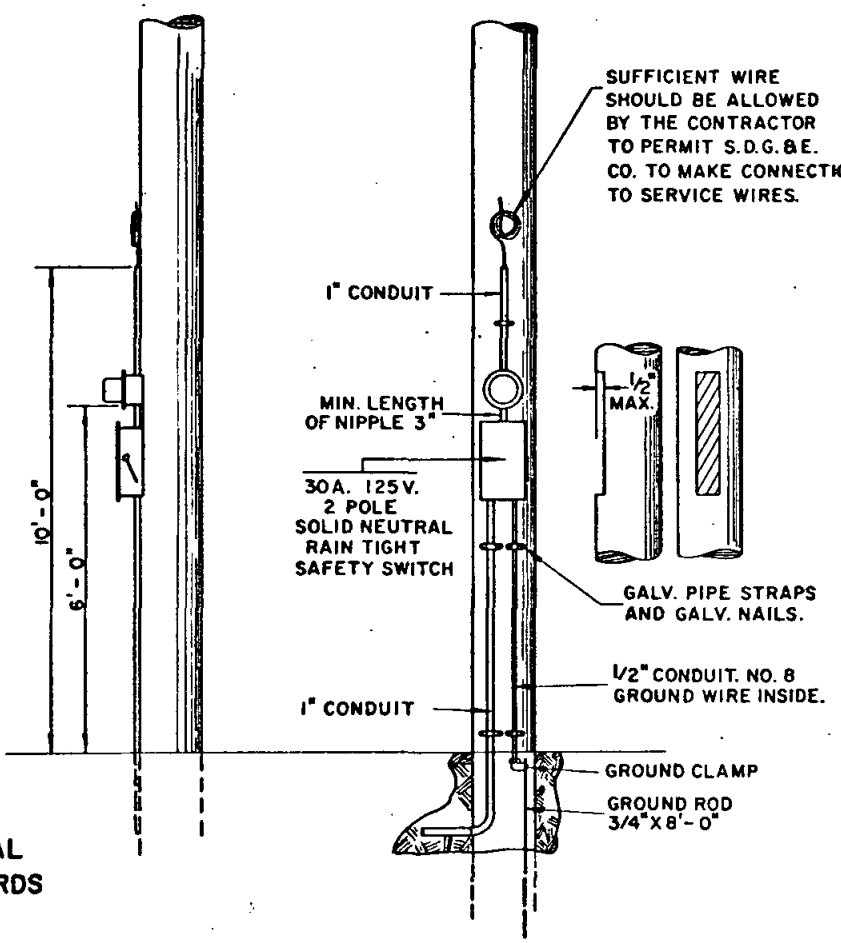
LEGEND ON PLANS-

SPECIFICATION REFERENCE Section: 86 County Surveyor D. K. Speer D.K. SPEER, R.C.E. 8081	SAN DIEGO COUNTY STANDARD DRAWING CURB WARNING BEACON	SCALE NONE DRAWING NO. 400

File 11-25



MOUNTINGS ON TRAFFIC SIGNAL
OR SAFETY LIGHTING STANDARDS



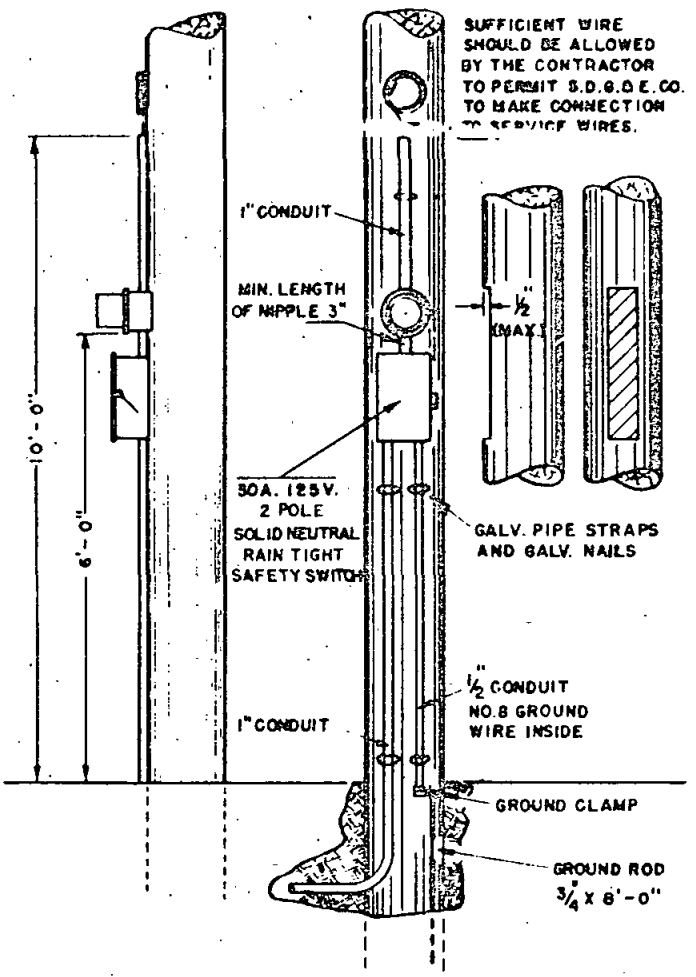
UTILITY POLE MOUNTING

REDUCED SCALE
USE SCALE BELOW

0 1 2 3

3 INCHES ON ORIGINAL PLAN

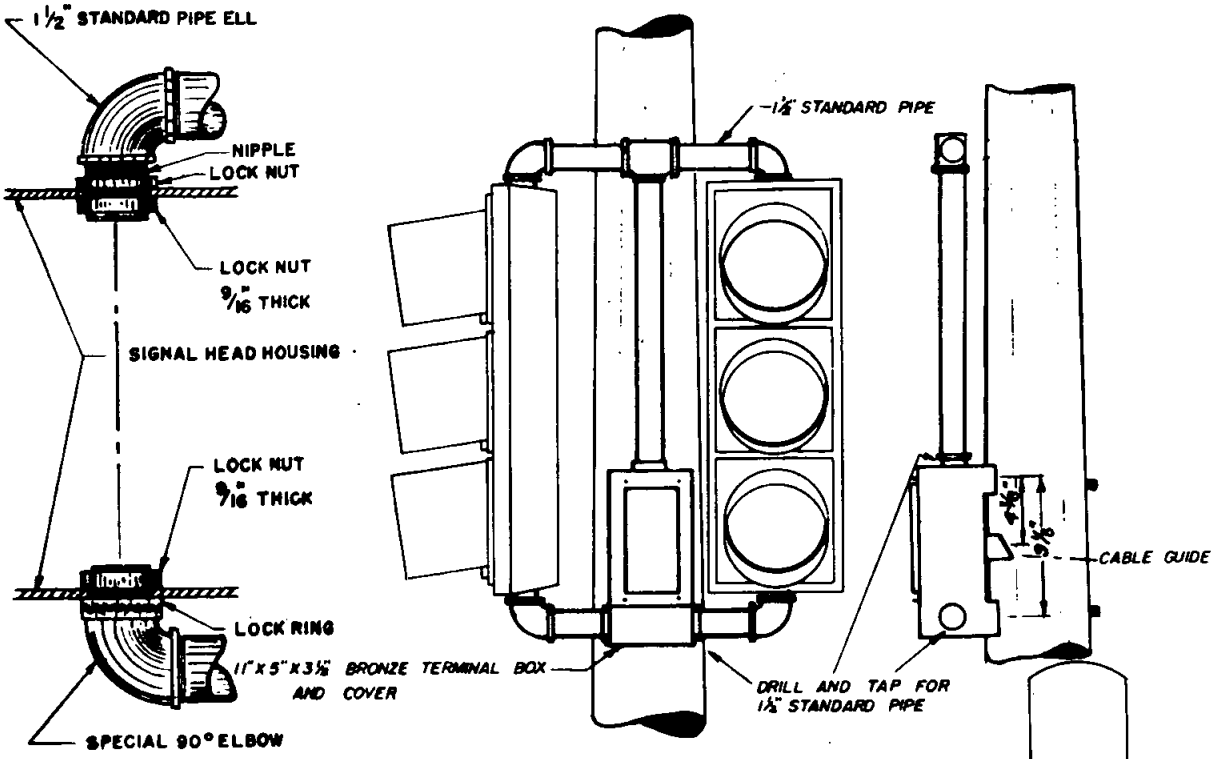
STD. SPEC. SEC: 86	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING			
DRAWN BY RLH CHECKED BY EMM				
RECOMMENDED BY [signature]	SERVICE CONNECTION FOR TRAFFIC SIGNAL SYSTEMS	REVISION	BY	APPROVED DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE		
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 401-1		
DATE: Sept. 28, 1971				



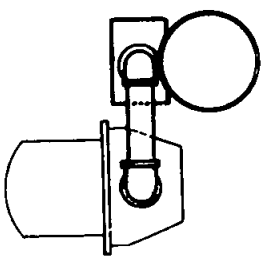
UTILITY POLE MOUNTING

MOUNTINGS ON TRAFFIC SIGNAL OR SAFETY LIGHTING STANDARDS

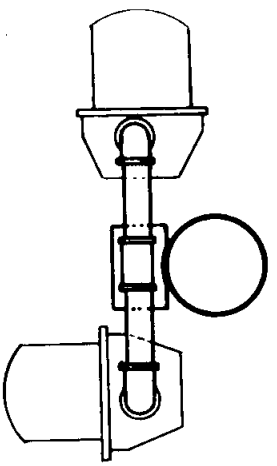
SPECIFICATION REFERENCE Section: 86 County Surveyor D.K. SPEER, R.C.E. 8081	SAN DIEGO COUNTY STANDARD DRAWING SERVICE CONNECTION FOR TRAFFIC SIGNAL SYSTEMS	SCALE: NONE DRAWING NO. 401



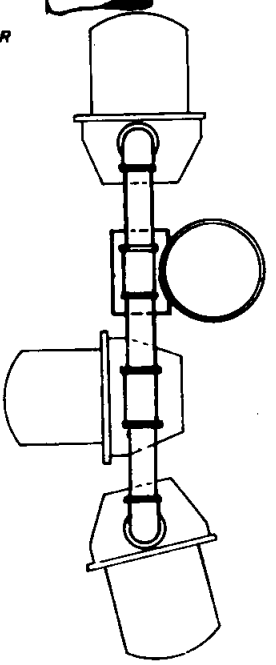
TYPICAL MOUNTING



TYPE F

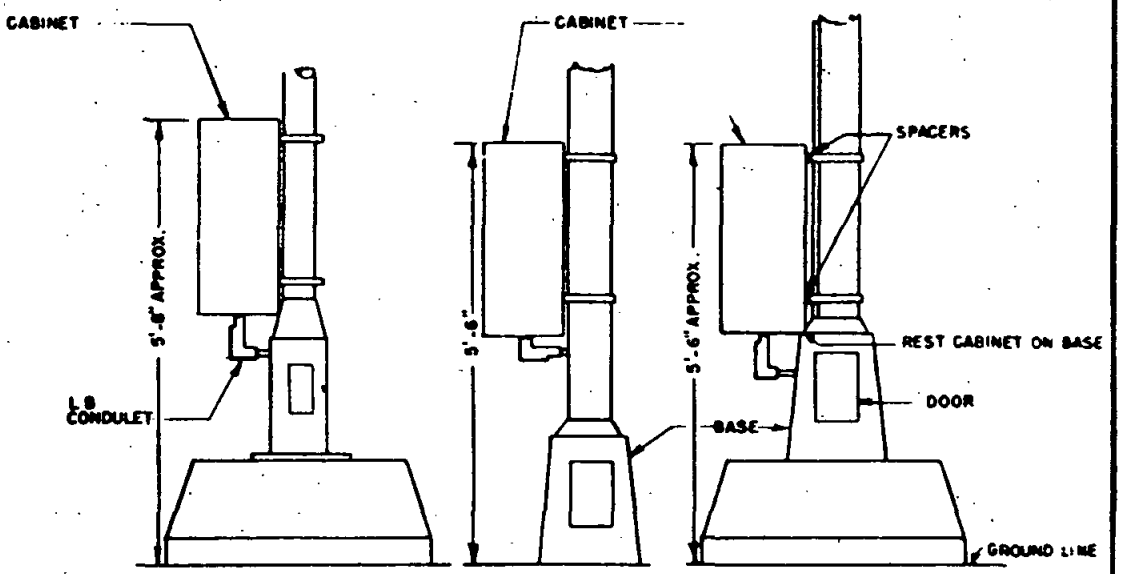


TYPE B

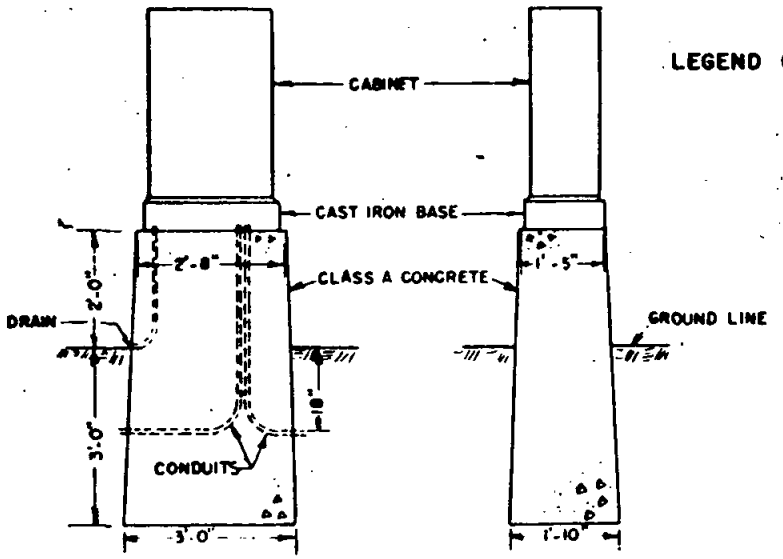


TYPE L

Specification Reference Section: 86 County Surveyor D.K. Speer D.K.SPEER, R.C.E. 8091	SAN DIEGO COUNTY STANDARD DRAWING SIGNAL HEAD MOUNTINGS FOR BRACKET INSTALLATION	Scale: Drwaing No. 402



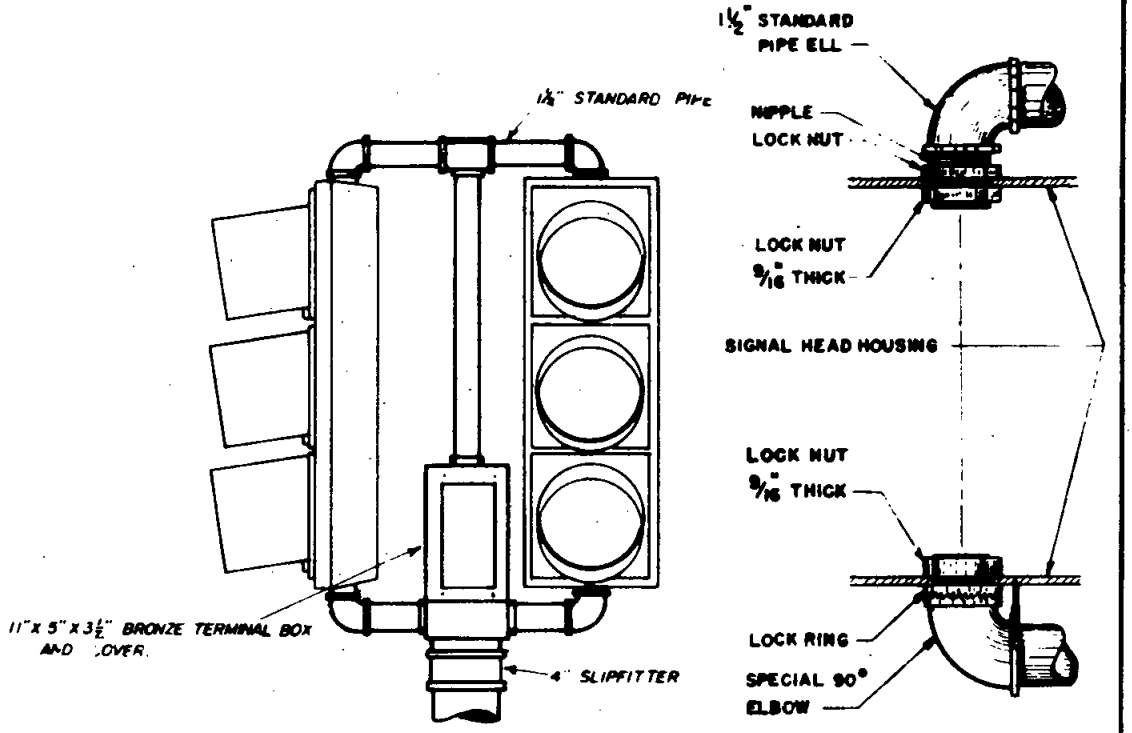
CABINET MOUNTINGS



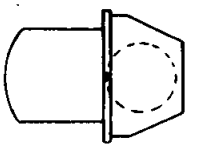
LEGEND ON PLANS - ⊠

CONCRETE BASE CABINET MOUNTING

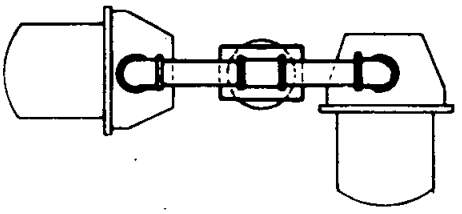
SPECIFICATION REFERENCE Section: 86 County Surveyor's D.K. Speer D.K. SPEER, R.C.E. 8001	SAN DIEGO COUNTY — STANDARD DRAWING MOUNTING OF TRAFFIC SIGNAL CONTROLLER CABINETS	SCALE NONE DRAWING NO 403



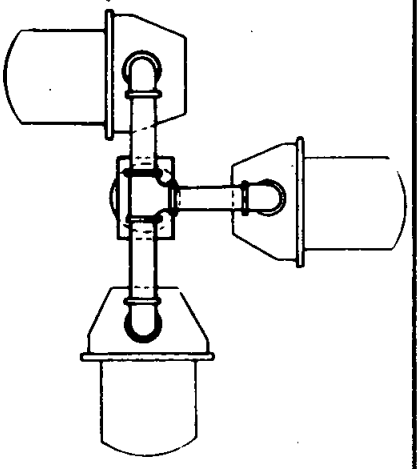
TYPICAL MOUNTING



TYPE J

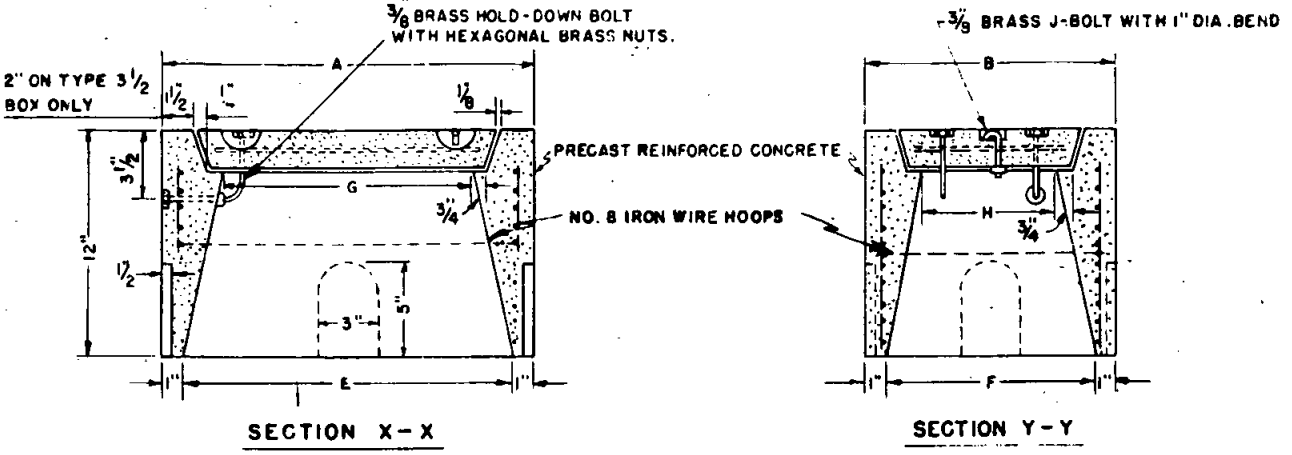


TYPE D



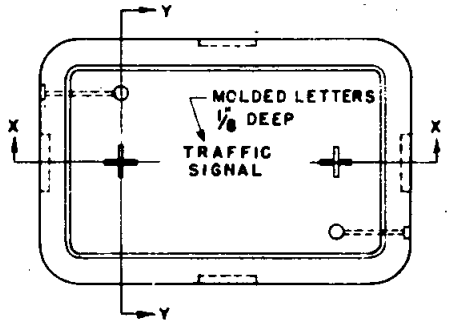
TYPE E

SPECIFICATION REFERENCE Section: 86 County Surveyor D.K. Speer D.K.SPEER, R.C.E. 8091	SAN DIEGO COUNTY STANDARD DRAWING SIGNAL HEAD MOUNTINGS FOR POST TOP INSTALLATION	NO SCALE SCALE DRAWING NO. 404

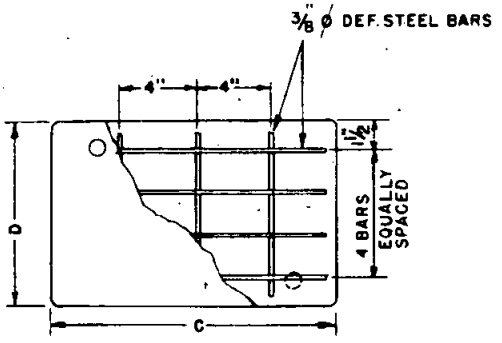


SECTION X – X

SECTION Y – Y



PLAN



COVER REINFORCING PLAN

TYPE	A	B	C	D	E	F	G	H
3 1/2	19 1/4"	13"	14 3/4"	8 3/4"	16"	10"	13"	7"
5	25"	15"	21 3/4"	11 3/4"	23"	13"	20"	10"

NOTE: FOR SAFETY LIGHTING INSTALLATIONS LETTERS IN COVER SHOULD READ "STREET LIGHT HIGH VOLTAGE"

COMPACT EARTH UNDER AND AROUND PULL BOX IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

LEGEND ON PLANS – ◘ P.B.

SPECIFICATION REFERENCE
Section: 86
County Surveyor
D. K. Speer
D.K. SPEER, R.C.E. 8091

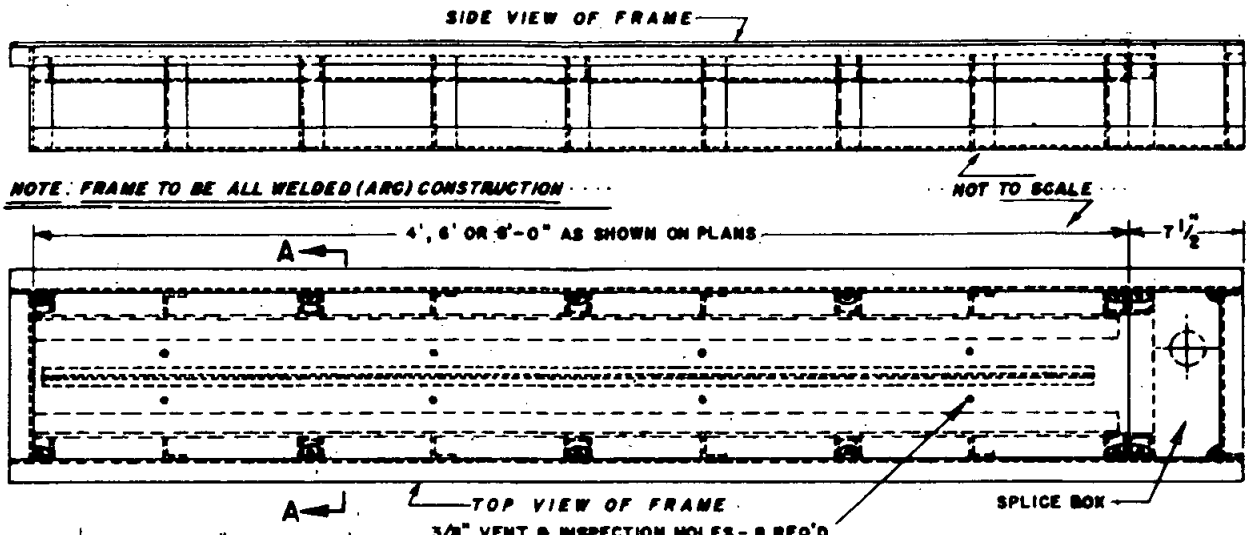
SAN DIEGO COUNTY STANDARD DRAWING

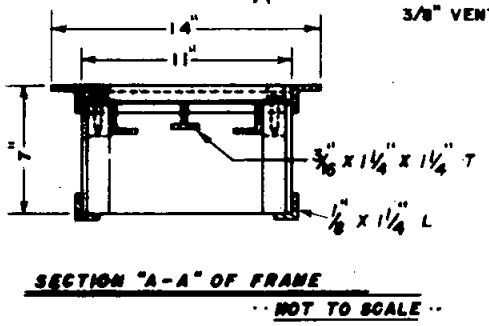
CONCRETE PULL BOXES - FOR TRAFFIC SIGNAL AND SAFETY LIGHTING

SCALE 1 1/2" = 1'-0"

DRAWING NO. 405

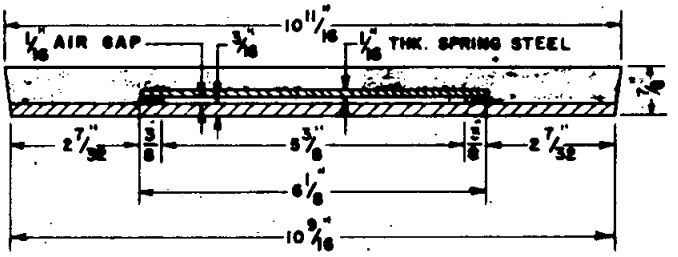
File 11-25



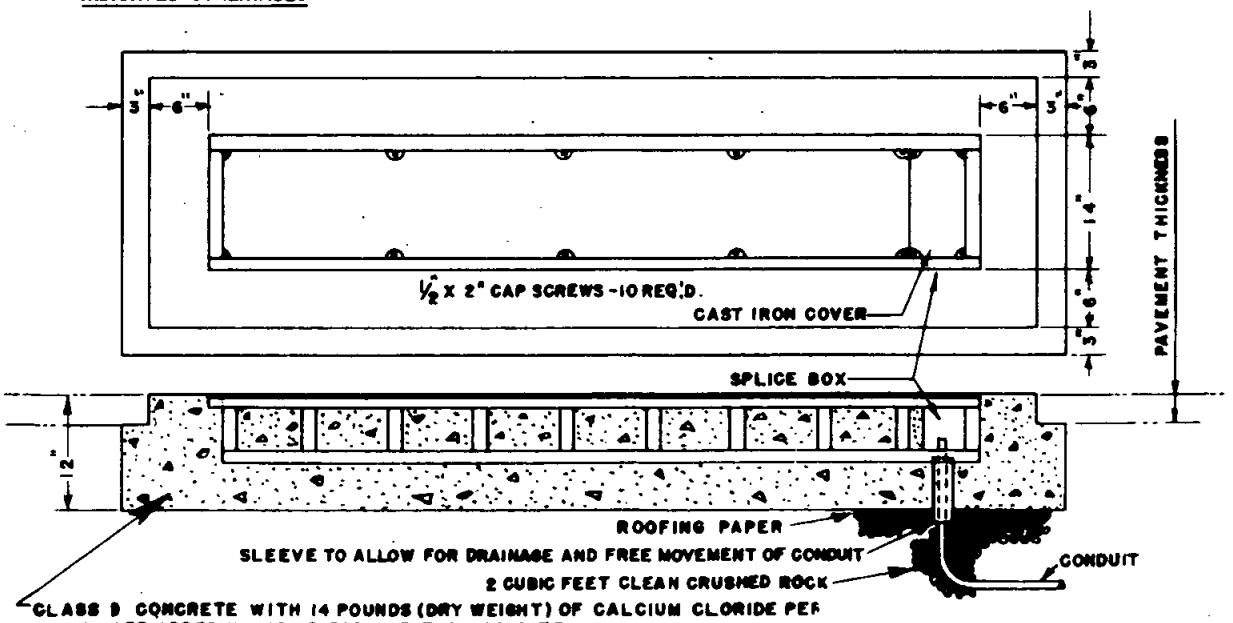


SECTION "A-A" OF FRAME
NOT TO SCALE

NOTE: FRAMEWORK CONSTRUCTED OF 3/16" x 1 1/2" L, EXCEPT ITEMS INDICATED OTHERWISE.

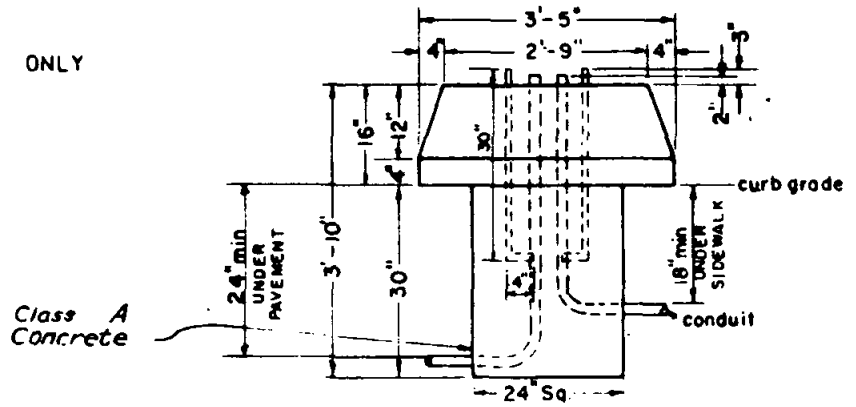


CROSS SECTION OF PRESSURE DETECTOR
SCALE 3/8" = 1"



SPECIFICATION REFERENCE Section. 86-4.05 County Surveyor D.K. Speer D.K. SPEER, R.C.E. 8091	SAN DIEGO COUNTY STANDARD DRAWING PRESSURE VEHICLE DETECTOR	SCALE: AS SHOWN DRAWING NO. 406

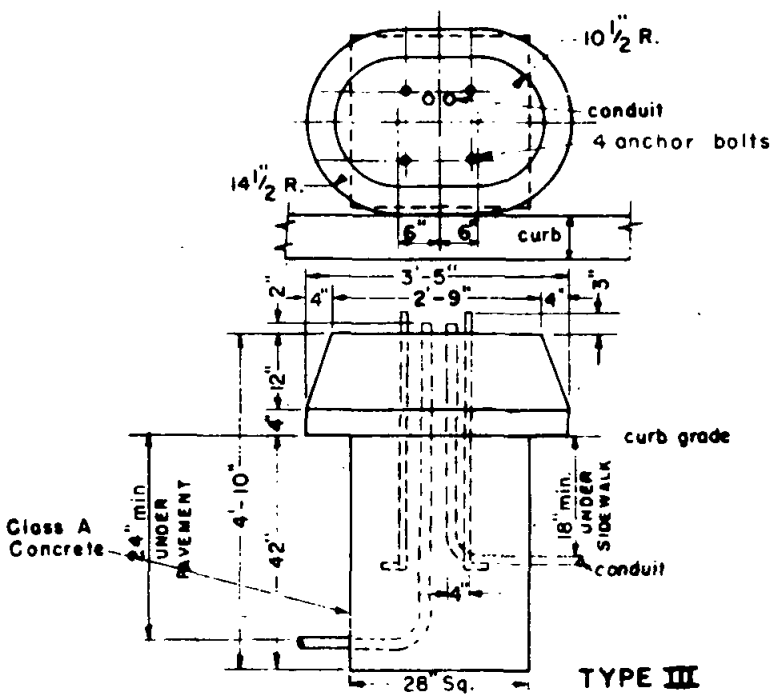
FOR TYPE I
STANDARDS ONLY



TYPE II

TRAFFIC SIGNAL FOUNDATION

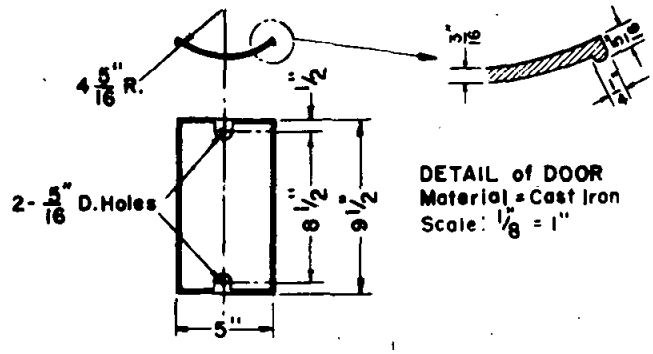
FOR TYPE XVI & XVII
STANDARDS ONLY



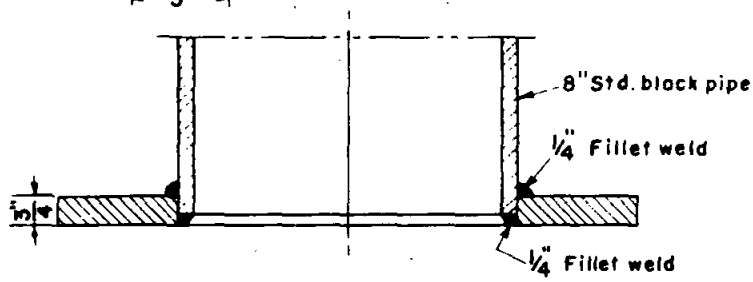
TYPE III

STD SPEC. SEC 86					
DRAWN BY VMY CHECKED BY					
RECOMMENDED BY Paul Fowler	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE NONE			
D. K. Silveen R.C.E 6091	TRAFFIC SIGNAL AND SAFETY LIGHTING FOUNDATIONS — TYPE II AND III	DRAWING NUMBER	407-1		
DATE 9/17/85					

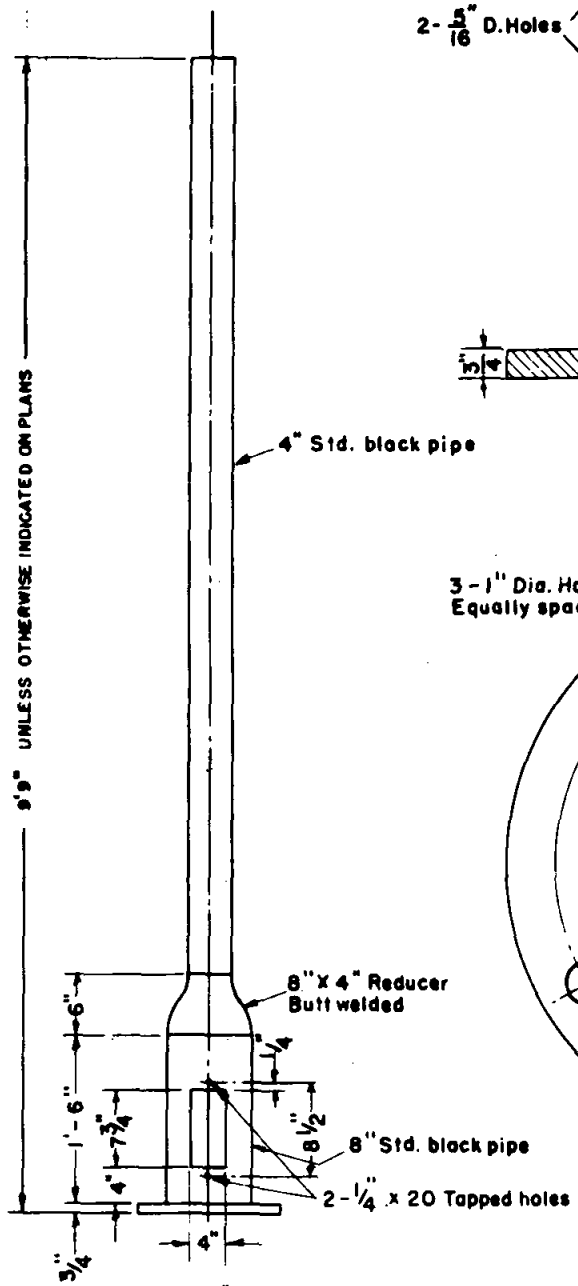
NOTE: When standard is set on Type II Foundation, 4" pipe to be 6'-4 1/4" and overall length to be 8'-5".



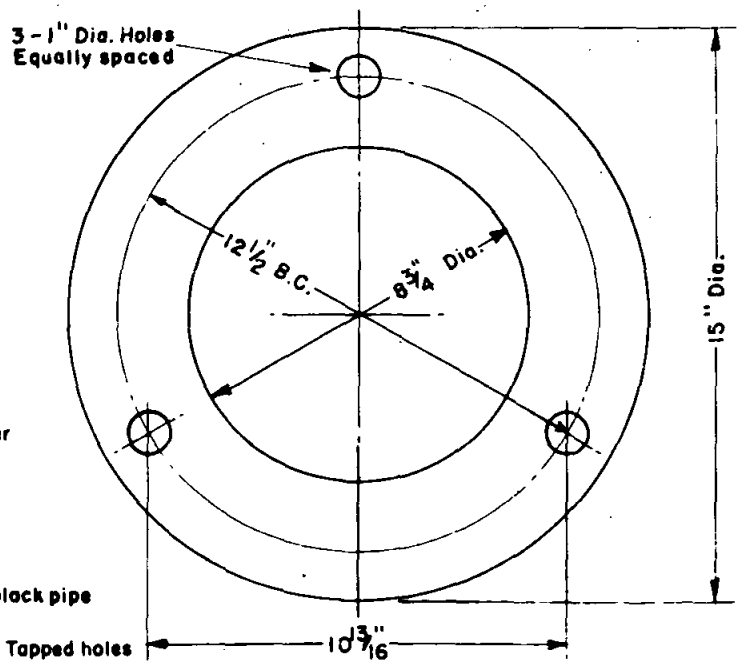
DETAIL of DOOR
Material = Cast Iron
Scale: 1/8" = 1"



BASE SECTION



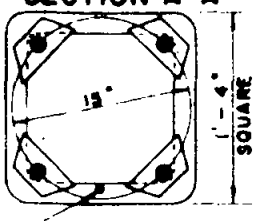
Scale: 3/4" = 1'-0"



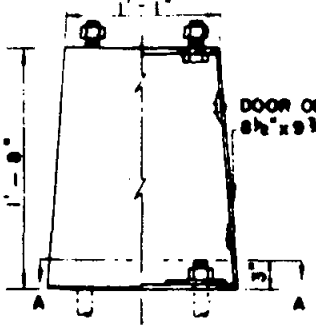
BASE DETAIL
Matl. = 3/4" Mild steel
Scale: 1/4" = 1"

SPECIFICATION REFERENCE Section: 86 County Surveyor D.K. Speer D.K. SPEER, R.C.E. 8091	SAN DIEGO COUNTY — STANDARD DRAWING TRAFFIC SIGNAL STANDARD TYPE - I	SCALE AS SHOWN DRAWING NO. 408

SECTION A-A



½"-13 TAPPED HOLE FOR GROUNDING



TRANSFORMER BASE

LUMINAIRE ARM DATA	
PROJECTED LENGTH	GAGE
6'-0"	10
8'-0"	
10'-0"	
12'-0"	
15'-0"	

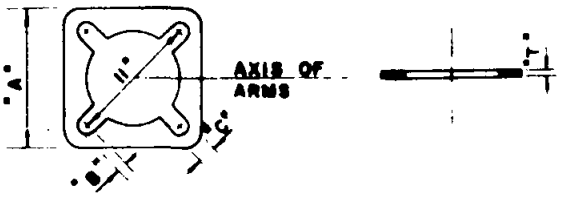
SIGNAL ARM DATA	
PROJECTED LENGTH	GAGE
15'-0"	10
18'-0"	
20'-0"	7

ROUND TAPERED STEEL POLE				LUMINAIRE ARM LENGTH	SIGNAL ARM LENGTH	BASE PLATE				TRANSFORMER BASE ANCHOR BOLTS
TYPE	GAGE	MIN O.D. BASE	MIN O.D. TOP			A	B	C	T	SIZE
XVI	10	7⅜"	5¼"	NONE	15'-20'	11½"	⅝"	1¼"	1"	1"X 36"
XVII	7	7¾"	3⅜"	6'-15'	15'	11½"	¾"	1½"	1"	1¼" X 44"
				6'-12'	18'					
				6'-10'	20'					
	3	7¾"	3⅜"	15'	18'	11½"	⅝"	1½"	1¼"	1¼" X 44"
				12'-15'	20'					

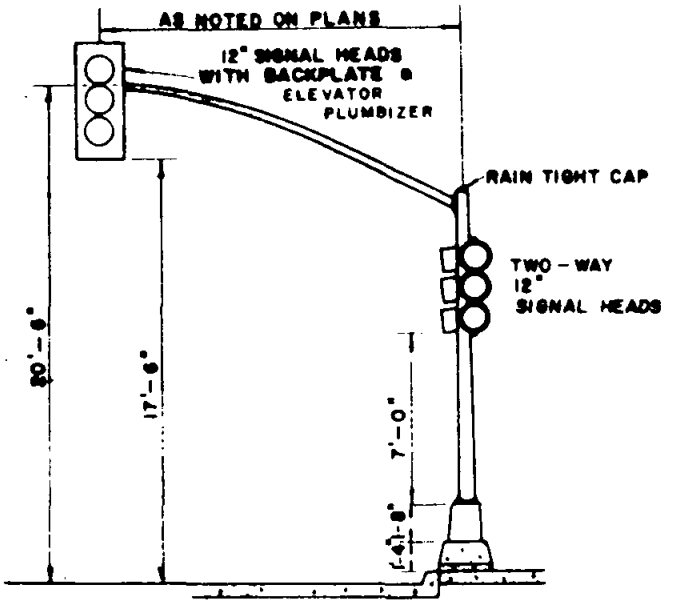
NOTE: ANCHOR BOLT LENGTH DOES NOT INCLUDE REQUIRED 4"-90° BEND. THREAD TOP 6".

ALL STEEL SHAFTS, MAST ARMS, BOLTS, SCREWS, NUTS AND WASHERS SHALL BE GALVANIZED

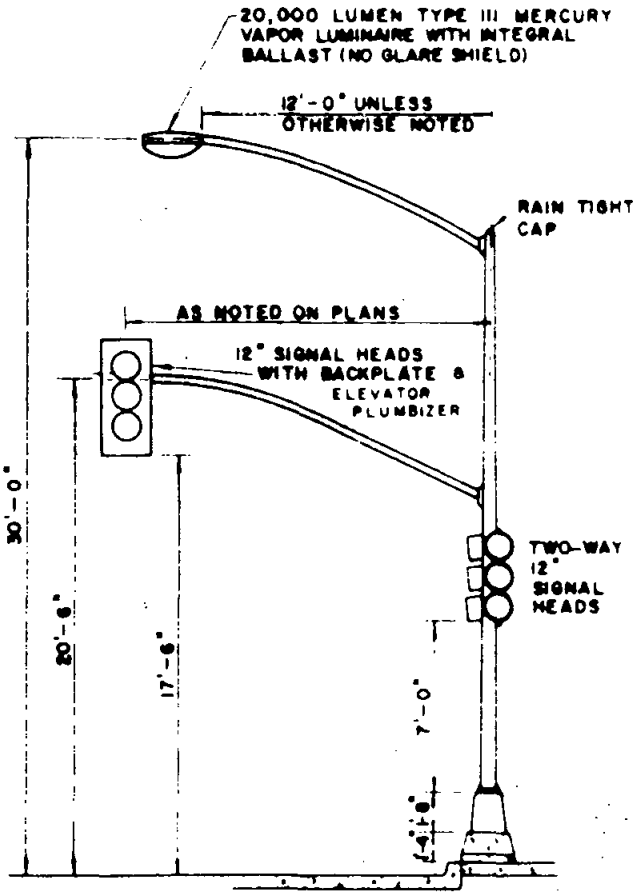
STANDARD GALVANIZED SHIMS SHALL BE USED FOR PLUMBING TRANSFORMER BASE. (GROUTING NOT PERMITTED)



POLE BASE



TYPE XVI

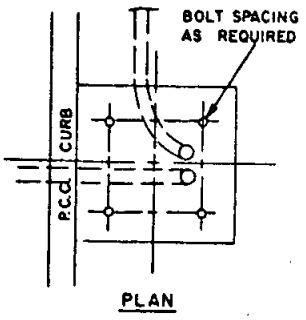


TYPE XVII

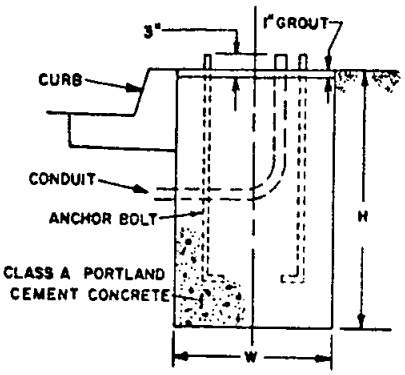
NOTE: SEE COUNTY STANDARD DRAWING "TRAFFIC SIGNAL & SAFETY LIGHTING FOUNDATIONS - TYPES II & III" FOR FOUNDATION DETAILS.

STD. SPEC. SEC. 86					
DRAWN BY DCL CHECKED BY RCP					
RECOMMENDED BY _____	SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE NONE			
R.C.E. 6001	TRAFFIC SIGNAL AND LIGHTING STANDARD TYPES XVI & XVII	DRAWING NUMBER 409-2			
DATE 1/13/66					

FOUNDATION



PLAN

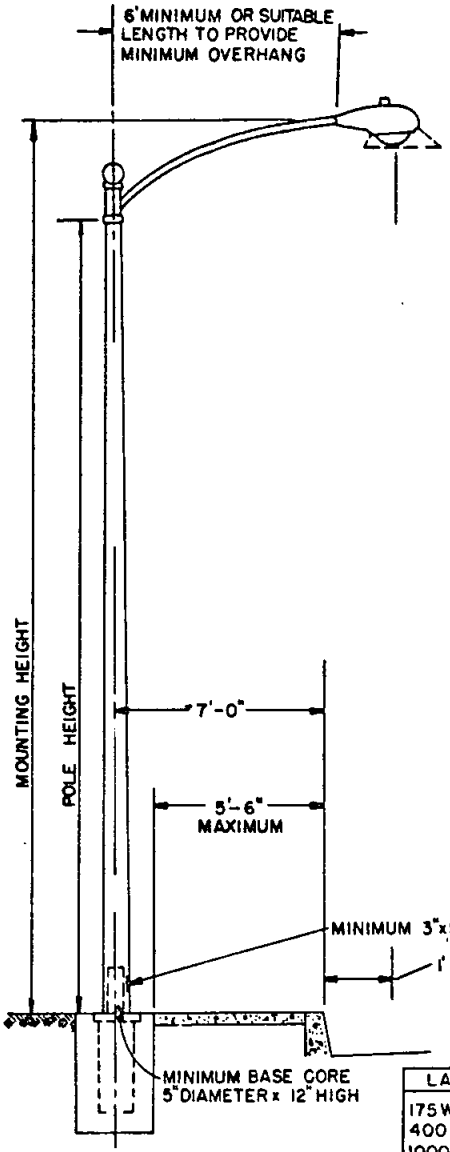


ELEVATION

FOUNDATION DATA

POLE HEIGHT	DIMENSION H	DIMENSION W	ANCHOR BOLTS ① NO.-DIA. x LGTH. x HOOK
THRU 25' ②	4'-0"	2'-6" SQUARE	4- 1" x 36" x 4"
26' THRU 30' ③	4'-0"	3'-0" SQUARE	4- 1" x 36" x 4"
UP TO 35' ③	5'-0"	3'-0" SQUARE	4- 1" x 36" x 4"

NOTES: ① ANCHOR BOLTS & NUTS SHALL BE GALVANIZED.
② LUMINAIRE 6' MAX. CANTILEVER.
③ LUMINAIRE 12' MAX. CANTILEVER.

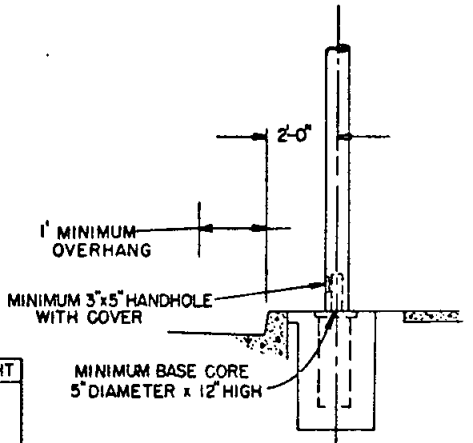


INSTALLATION BEHIND CONTIGUOUS SIDEWALK

TABLE OF MOUNTING HEIGHT

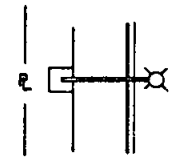
LAMP SIZE *	POLE HEIGHT	MOUNTING HEIGHT
175 WATT (7000 Lumen)	25' ± 2'	27' ± 1'
400 WATT (20,000 ")	28' ± 2'	31' ± 1'
1000 WATT (55,000 ")	35' ± 2'	38' ± 1'

*ALL LAMPS SHALL BE IMPROVED-COLOR PHOSPHOR-COATED MERCURY VAPOR TYPES.

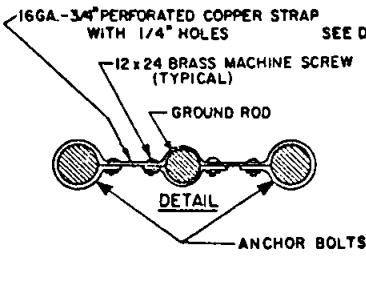


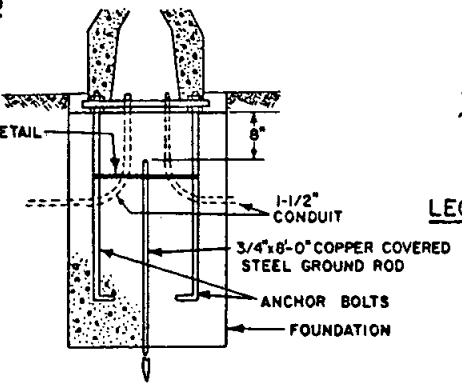
INSTALLATION BEHIND CURB

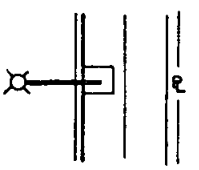
GROUNDING



LEGEND ON PLANS







LEGEND ON PLANS

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING		
DRAWN BY CHECKED BY			
RECOMMENDED BY		REVISION / BY / APPROVED / DATE	
APPROVED BY COUNTY ENGINEER	ORNAMENTAL STREET LIGHTS	SCALE: NONE	
H.M. Taylor R.C.E. 11458		DRAWING NUMBER	410-T PAGE 1
DATE: 12-21-73			

NOTES

LAMPS

175 WATT (7000 LUMEN) PHOSPHOR-COATED MERCURY VAPOR ANSI LAMP DESIGNATION H39-22KC/DX
or
400 WATT (20,000 LUMEN) PHOSPHOR-COATED MERCURY VAPOR ANSI LAMP DESIGNATION H33-1GL/DX
or
1000 WATT (55,000 LUMEN) PHOSPHOR-COATED MERCURY VAPOR ANSI LAMP DESIGNATION H36-15GW/DX
AS SPECIFIED.

LUMINAIRES

HORIZONTAL BURNING TYPE WITH INTEGRAL CONSTANT WATTAGE BALLAST, PHOTOELECTRIC CONTROL, AND GLASS REFRACTOR.

ANSI SHORT DISTRIBUTION, SEMI-CUTOFF CLASSIFICATION, TYPE II DISTRIBUTION FOR 7000 LUMEN UNITS.
ANSI SHORT DISTRIBUTION, SEMI-CUTOFF CLASSIFICATION, TYPE III DISTRIBUTION FOR OTHER SIZES.

MAST ARMS

TWO-INCH DIAMETER, STANDARD GALVANIZED STEEL OR ALUMINUM, SELF-SUPPORTING, WITHOUT BRACES, SCROLLS, OR RODS.

DAVIT-STYLE UNITS ARE NOT PERMITTED.

ARMS PERPENDICULAR TO STREET CENTERLINE UNLESS INDICATED OTHERWISE ON THE PLANS.

POLE TOPS

GALVANIZED STEEL OR CAST ALUMINUM ALLOY, SECURED BY A MINIMUM OF TWO SCREWS.

MISCELLANEOUS HARDWARE

CADMIUM-COATED, HOT DIPPED GALVANIZED, OR STAINLESS STEEL.

POLES

ROUND PRESTRESSED CONCRETE WITH EXPOSED BLACK AND WHITE MARBLE AGGREGATE FINISH.
HANDHOLE TO FACE STREET.

WIRING

MINIMUM NO. 10 GA. TW STRANDED COPPER TO BALLAST.

NEUTRAL LEG OF LIGHTING CONDUCTORS GROUNDED TO BASE OF STANDARD.

HOT LEG OF LIGHTING CONDUCTORS FUSED WITH 10 AMP. SLO-BLO MIDGET FERRULE-TYPE FUSE (BUSS FMN 10 OR EQUIVALENT) IN PLUG CONNECTOR (FUSETRON HEB OR EQUIVALENT) IN BASE OF STANDARD.

SPLICES

PERMITTED IN PULL BOXES AND LIGHTING STANDARD BASES ONLY.

SHALL BE MADE USING AN APPROVED CONNECTOR SIMILAR TO SCOTCHLOCK OR CRIMP-TYPE COMPRESSION TAP SIMILAR TO TXB CAT. NO. 54710, INSERTING THE CONNECTION IN AN EPOXY RESIN MIXTURE MIXED IN A PLASTIC CONTAINER, ALL SUPPLIED AS A KIT. KIT SHALL BE SIMILAR AND EQUAL TO 3M 60. SCOTCHLOCK NO. 3578 CONNECTOR SEALING PACK.

CONDUIT & CONDUCTORS

ALL ABS PLASTIC CONDUIT SHALL BE 1-1/2" HEAVY WALL, EQUAL TO BALDWIN EXTRUDED PRODUCTS, INC., BALDWIN ABSOLUTE ABS ELECTRICAL CONDUIT, AND SHALL CONFORM TO THE WESTERN UNDERGROUND COMMITTEE SPECIFICATION NO. 3.1

CABLE—IN—DUCT SHALL CONSIST OF 2 CONDUCTORS PREASSEMBLED WITHIN A PLIABLE 3/4" HIGH DENSITY POLYETHYLENE DUCT. MINIMUM CONDUCTORS SHALL BE A.W.G. SIZE NO. 10, 7-STRAND COPPER WITH U.S.E. INSULATION OR A.W.G. SIZE NO. 8, 7 STRAND ALUMINUM WITH U.S.E. INSULATION, WITH ONE BLACK AND ONE YELLOW LEAD UNLESS SHOWN OTHERWISE ON THE PLANS.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY DDM CHECKED BY					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	ORNAMENTAL STREET LIGHTS	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER	410-T PAGE 2		
DATE: 12-21-79					

CONDUIT AND CONDUCTORS

POLYETHYLENE DUCT SHALL BE HIGH DENSITY, TYPE III POLYETHYLENE RESISTANT TO ABRASION MOISTURE, ALKALIS, SALTS, DETERGENTS, AND OTHER CHEMICALS. DUCT SHALL NOT ROT, RUST OR CORRODE AND SHALL BE IMPERVIOUS TO ELECTROLYTIC ENVIRONMENT.

CABLE-IN-DUCT SHALL BE LIGHT, EASY TO HANDLE, FLEXIBLE AND SHALL BE SUITABLE FOR INSTALLATION DIRECTLY IN THE GROUND WITHOUT ADDITIONAL PROTECTIVE COATINGS OR WRAPS BEING REQUIRED.

SERVICE LINES SHALL BE LOCATED UNDER SIDEWALKS WHEREVER PRACTICAL.

SERVICE ENTRANCE

CONDUIT SHALL BE 1-1/2" HEAVY WALL ABS PLASTIC.

FOR CABLE-IN-DUCT SERVICE, THE CABLE-IN-DUCT SHALL BE INSTALLED IN THE SERVICE ENTRANCE CONDUIT TO PROVIDE COMPLETE CABLE-IN-DUCT SERVICE TO THE HANDHOLE.

FOUNDATION

SEE DETAIL DRAWING.

GROUNDING

SEE DETAIL DRAWING

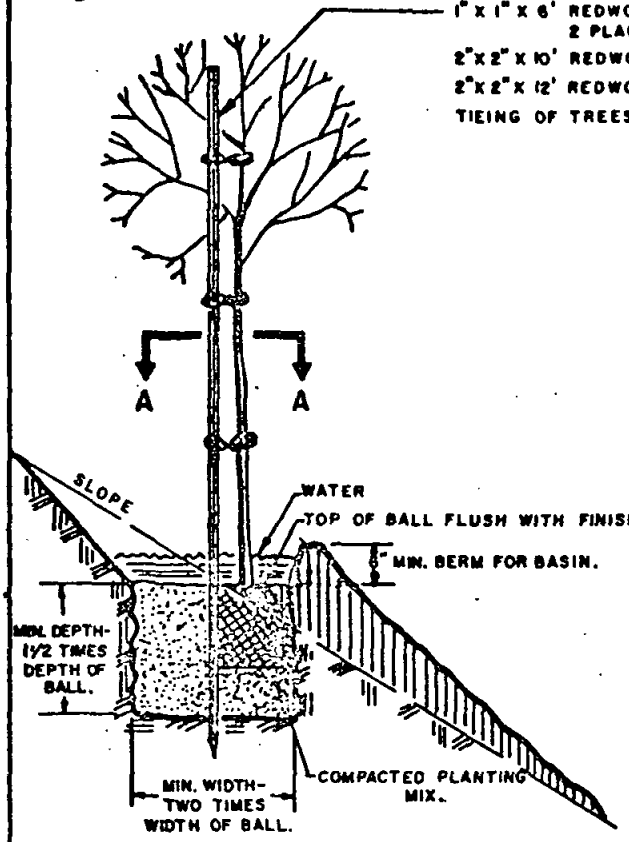
MISCELLANEOUS REQUIREMENTS

PRIOR TO INSTALLATION OF ANY PART OF THE STREET LIGHTING SYSTEM, THE CONTRACTOR SHALL FURNISH THE COUNTY ENGINEER, FOR APPROVAL, A COMPLETE CATALOG LISTING OF ALL PROPOSED EQUIPMENT.

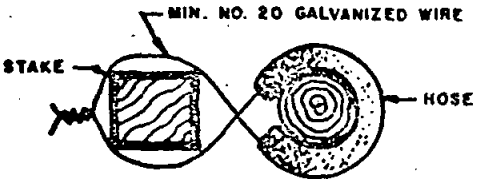
UPON COMPLETION OF THE STREET LIGHTING SYSTEM INSTALLATION, THE CONTRACTOR SHALL FURNISH, AT HIS OWN EXPENSE, THE NECESSARY PERSONNEL AND EQUIPMENT TO DEMONSTRATE SATISFACTORY OPERATION OF THE LIGHTING SYSTEM TO THE ENGINEER.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	
DRAWN BY: [illegible] CHECKED BY: [illegible]		
RECOMMENDED BY: [illegible]		REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER	ORNAMENTAL STREET LIGHTS	SCALE: NONE
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 410-T PAGE 3
DATE: 12-21-73		

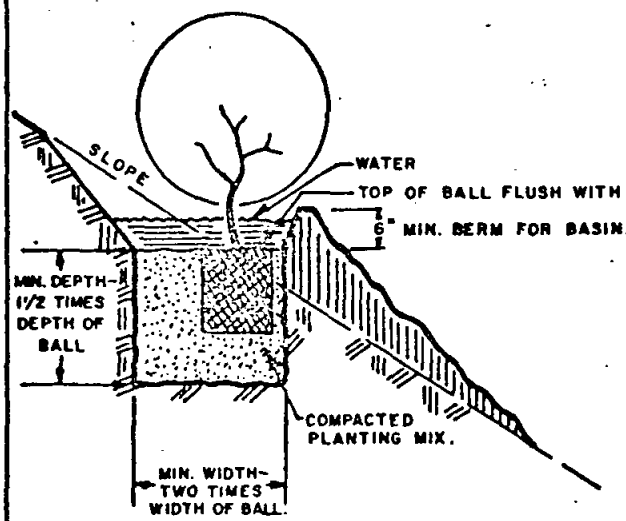
1" X 1" X 6' REDWOOD STAKE FOR TREES 1'- 5' HIGH AND TIE WITH PLASTIC TIE TAPE 2 PLACES.
2"X 2" X 10' REDWOOD STAKE FOR TREES 5'- 8' HIGH AND TIE WITH HOSE TIE 2 PLACES.
2"X 2" X 12' REDWOOD STAKE FOR TREES 8'- 12' HIGH AND TIE WITH HOSE TIE 3 PLACES.
TIEING OF TREES OVER 12' HIGH IS SUBJECT TO INSTRUCTIONS OF COUNTY.



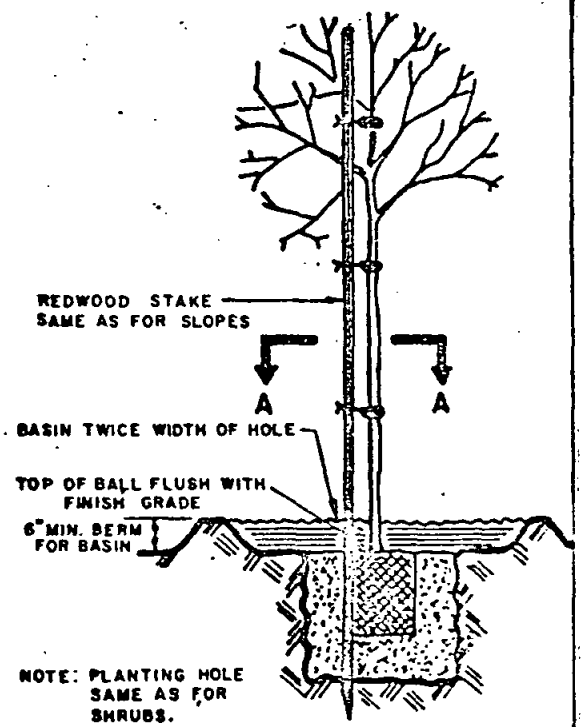
TREE PLANTING DETAIL
FOR SLOPES



DETAIL A-A



SHRUB PLANTING DETAIL



TREE PLANTING DETAIL
LEVEL GROUND

STD. SPEC. SEC.					
DRAWN BY JA CHECKED BY					
RECOMMENDED BY	SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY SURVEYOR	STANDARD DRAWING	SCALE: NONE			
D. K. Sloan R.C.E. 8094	SHRUB AND TREE PLANTING	DRAWING NUMBER 600			
DATE: 12-31-65					

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER					GROWTH			WATER			USEFUL LIFE			MAINT. COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
TREES																												
Acacia melanoxylon	Blackwood Acacia									20'	30'																	
Acacia pendula	Weeping Myall									20'	30'																	
Brachychiton populneus	Kurrajong Bottletree									30'	30'																	
Casuarina equisetifolia	Horsetail Beefwood									20'	40'																	
Eucalyptus citriodora	Lemon Eucalyptus									20'	30'																	
Eucalyptus ficifolia	Scarlet Eucalyptus									30'	40'																	
Eucalyptus lehmanni	Lehmann Eucalyptus									20'	30'																	
Eucalyptus polyanthemos	Redbox Eucalyptus									20'	30'																	
Eucalyptus sideroxylon rosea	Mulga Ironbark Eucalyptus									10'	30'																	
Grevillea robusta	Silkoak Grevillea									10'	25'																	
Platanus acerifolia	London Planetree									20'	30'																	
Platanus racemosa	California Sycamore									15'	30'																	
Pinus canariensis	Canary Pine									10'	20'																	
Pinus radiata	Monterey Pine									15'	25'																	
Pinus torreyana	Torrey Pine									15'	20'																	
Quercus agrifolia	California Liveoak									25'	30'																	
Quercus ilex	Holly Oak									15'	25'																	
Robinia pseudoacacia decaisne	Pink Flowering Locust									30'	30'																	
Schinus molle	California Peppertree									20'	30'																	
Schinus terebinthifolia	Brazil Peppertree									20'	30'																	
SHRUBS																												
Acacia longifolia	Sydney Acacia									10'	15'																	
Acacia l. floribunda	Gossamer Sydney Acacia									10'	15'																	
Callistemon lanceolatus	Lemon Bottlebrush									10'	15'																	
Ceanothus griseus 'Louis Edmunds'	Louis Edmunds Ceanothus									8'	10'																	
Ceanothus griseus horizontalis	Carmel Creeping Ceanothus									5'	5'																	
Cortaderia selloana	Selloa Pampasgrass									8'	10'																	
Cotoneaster horizontalis	Rock Cotoneaster									5'	5'																	
Cotoneaster pannosa	Silverleaf Cotoneaster									8'	10'																	
Cotoneaster-Parneyi	Parney Cotoneaster									5'	8'																	

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones. Example: If the embankment more nearly faces west than north, refer to the South-West column.

SPACING COLUMN - represents the maximum or minimum spacing on center or rate of seed application permitted in planting from top to toe of bank.

SELECTION OF PLANTS - select one or more trees, three or more shrubs, and one or more ground cover plants from the approved list that more nearly meets the zone and exposure limitations indicated.

COASTAL ZONE

PAGE 1 2

STD. SPEC. SEC.

DRAWN BY ___ CHECKED BY RR

RECOMMENDED BY [signature]

APPROVED BY COUNTY SURVEYOR [signature] R.C.E. 8091

DATE: 1/11/66

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 601

SCALE:

REVISION	BY	APPROVED	DATE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER					GROWTH			WATER			USEFUL LIFE			MAINT COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
SHRUBS (cont.)																												
Dodonaea viscosa-purpurea	Red Clammy Hopseedbush									8'	10'																	
Elaeagnus pungens	Thorny Elaeagnus									5'	8'																	
Fremontia mexicana	San Diego Fremontia									10'	15'																	
Hakea suaveolens	Sweet Hakea									8'	10'																	
Juniperus chinensis-pfitzer	Pfitzer Chinese Juniper									10'	10'																	
Juniperus sabina tamarix	Tamarix Savin Juniper									5'	5'																	
Melaleuca nesophila	Pink Melaleuca									8'	10'																	
Nerium oleander-varieties	Common Oleander									5'	8'																	
Photinia arbutifolia	Christmasberry (Toyon)									10'	15'																	
Plumbago capensis	Cape Plumbago									8'	10'																	
Prunus lyoni	Catalina Cherry									10'	20'																	
Rhamnus californica-Seaview	Seaview Calif. Buckthorn									5'	8'																	
Rhus integrifolia	Lemonade Sumac									8'	10'																	
GROUND COVERS																												
Baccharis pilularis	Kidneywort Bacc. (Coyotebush)									1'	2'																	
Ficus pumila (repens)	Climbing Fig									2'	2'																	
Helichrysum petiolatum	Cudweed Everlasting									2'	2'																	
Hypericum calycinum	Aaronsbeard St. Johnswort									2'	2'																	
Lantana sellowiana	Trailing Lantana									2'	2'																	
Lonicera japonica-halliana	Hall's J. Honeysuckle									2'	2'																	
Mesembryanthemum rosea	Rosea Iceplant									6"	12"																	
Osteospermum fruticosus	Trailing African Daisy									12"	12"																	
Rosemarinus officinalis-prostrate	Prostrate Rosemary									2'	2'																	
Thymus serpyllum	Mother-of-Thyme									12"	12"																	
Vinca major	Bigleaf Periwinkle									2'	2'																	
				APPLICATION RATE IN POUNDS PER ACRE																									
SEED																												
Lolium perennae	Perennial Rye									15	20																	
Poterium sanguisorba	Burnet									12	15																	

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones.
Example: If the embankment more nearly faces west than north, refer to the South-West column.

SPACING COLUMN - represents the maximum or minimum spacing on center or rate of seed application permitted in planting from top to toe of bank.

SELECTION OF PLANTS - select one or more trees, three or more shrubs, and one or more ground cover plants from the approved list that more nearly meets the zone and exposure limitations indicated.

COASTAL ZONE

PAGE 2 2

STD. SPEC. SEC.

DRAWN BY ____ CHECKED BY ____

RECOMMENDED BY ____

APPROVED BY COUNTY SURVEYOR ____ R.C.E. 8091

DATE: 1/1/66

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 601

SCALE:

REVISION	BY	APPROVED	DATE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER					GROWTH			WATER			USEFUL LIFE			MAINT. COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
TREES																												
Acacia melanoxylon	Blackwood Acacia									20'	30'																	
Ailanthus altissima (female only)	Treeofheaven Ailanthus									20'	30'																	
Brachychiton populneus	Kurrajong Bottletree									25'	30'																	
Casuarina equisetifolia	Horsetail Beefwood									30'	40'																	
Eucalyptus citriodora	Lemon Gum									20'	30'																	
Eucalyptus lehmanni	Lehmann Eucalyptus									20'	30'																	
Eucalyptus polyanthemos	Redbox Eucalyptus									20'	30'																	
Gleditsia triacan. inerm. moraine	Moraine Honeylocust									30'	40'																	
Grevillea robusta	Silkoak Grevillea									15'	25'																	
Koelreuteria paniculata	Goldenraintree									20'	30'																	
Melia azedarach umbraculiformis	Umbrella Chinaberry									25'	35'																	
Platanus acerifolia	London Planetree									30'	40'																	
Platanus racemosa	California Sycamore									15'	30'																	
Pinus canariensis	Canary Pine									15'	25'																	
Pinus radiata	Monterey Pine									15'	25'																	
Quercus agrifolia	California Live Oak									25'	35'																	
Quercus ilex	Holly Oak									20'	30'																	
Robinia pseudoacacia decaisne	Pink Flowering Locust									30'	40'																	
Schinus molle	California Peppertree									20'	30'																	
Schinus terebinthefolia	Brazil Peppertree									20'	30'																	
SHRUBS																												
Acacia cultriformis	Knife Acacia									10'	15'																	
Acacia longifolia	Sydney Acacia									10'	15'																	
Acacia l. floribunda	Gossamer Sydney Acacia									10'	15'																	
Acacia verticillata	Star Acacia									10'	15'																	
Callistemon lanceolatus	Lemon Bottlebrush									10'	15'																	
Ceanothus griseus horizontalis	Carmel Creeping Ceanothus									10'	15'																	
Ceanothus griseus 'Louis Edmunds'	Louis Edmunds Ceanothus									8'	10'																	
Cistus corbariensis	White Rockrose									3'	5'																	
Cortaderia selloana	Selloa Pampasgrass									8'	10'																	

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones. Example: If the embankment more nearly faces west than north, refer to the South-West column.

SPACING COLUMN - represents the maximum or minimum spacing on center or rate of seed application permitted in planting from top to toe of bank.

SELECTION OF PLANTS - select one or more trees, three or more shrubs, and one or more ground cover plants from the approved list that more nearly meets the zone and exposure limitations indicated.

COASTAL-INLAND ZONE

PAGE 1 2

STD. SPEC. SEC.

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APPROVED BY COUNTY SURVEYOR

DATE: 1/11/66

R.C.E. 8091

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 602

SCALE:

REVISION | BY | APPROVED | DATE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER					GROWTH			WATER			USEFUL LIFE			MAINT. COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
SHRUBS (Cont.)																												
Cotoneaster horizontalis	Rock Cotoneaster									5'	5'																	
Cotoneaster pannosa	Silverleaf Cotoneaster									8'	10'																	
Cotoneaster Parneyi	Parney Cotoneaster									5'	8'																	
Dodonaea viscosa-purpurea	Red Clammy Hopseedbush									8'	10'																	
Echium fastuosum	Pride-of-Madeira									5'	8'																	
Elaeagnus pungens	Thorny Elaeagnus									5'	8'																	
Fremontia mexicana	San Diego Fremontia									10'	15'																	
Juniperus chinensis-pfitzer	Pfitzer Chinese Juniper									10'	10'																	
Juniperus sabina-tamarix	Tamarix Savin Juniper									5'	5'																	
Leucophyllum frutescens	Texas Silverleaf									3'	5'																	
Nerium oleander-varieties	Common Oleander									5'	8'																	
Photinia arbutifolia	Christmasberry (Toyon)									10'	15'																	
Plumbago capensis	Cape Plumbago									5'	8'																	
Prunus lyoni	Catalina Cherry									10'	15'																	
Romneya coulteri	Matilija Poppy									5'	5'																	
Rhamnus alaternus	Italian Buckthorn									8'	10'																	
Rhamnus californica-Seaview	Seaview Calif. Buckthorn									5'	8'																	
Rhus integrifolia	Lemonade Sumac									8'	10'																	
GROUND COVERS																												
Baccharis pilularis	Kidneywort Bacc.(Coyotebush)									1'	2'																	
Delaspermum alba	White Iceplant									6"	12"																	
Lonicera japonica halliana	Hall's J. Honeysuckle									2'	2'																	
Mesembryanthemum rosea	Rosea Iceplant									6"	12"																	
Rosemarinus officinalis-prostrate	Prostrate Rosemary									2'	2'																	
Thymus serphyllum	Mother-of-Thyme									12"	12"																	
Vinca major	Bigleaf Periwinkle									2'	2'																	
				APPLICATION RATE IN POUNDS PER ACRE																									
SEED																												
Lolium perennae	Perennial Rye									15	20																	
Poterium sanguisorba	Burnet									12	15																	

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones. Example: If the embankment more nearly faces west than north, refer to the South-West column.

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COASTAL-INLAND ZONE

PAGE 2 2

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D. K. Spees RCE 8091

DATE 10/1/62

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 602

SCALE

REVISION BY APPROVED DATE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER						GROWTH			WATER			USEFUL LIFE			MAINT COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AM. E.	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
TREES																													
Acer saccharinum	Silver Maple									25'	30'																		
Acer saccharum	Sugar Maple									25'	35'																		
Ailanthus altissima (female only)	Treeofheaven Ailanthus									20'	30'																		
Betula pendula	European White Birch									10'	15'																		
Cupressus forbesi	Tecati Cypress									10'	20'																		
Gleditsia triacan. inerm. moraine	Moraine Locust									30'	40'																		
Koelreuteria bipinnata	Evergreen Goldenraintree									20'	30'																		
Koelreuteria paniculata	Goldenraintree									20'	30'																		
Libocedrus decurrens	California Incensecedar									10'	15'																		
Pinus ponderosa	Ponderosa Pine									15'	25'																		
Platanus acerifolia	London Planetree									30'	40'																		
Platanus racemosa	California Sycamore									15'	30'																		
Populus alba	Silver Poplar									25'	30'																		
Robinia pseudoacacia	Black Locust									30'	40'																		
Robinia pseudoa. decaisne	Pink Flowering Locust									30'	40'																		
SHRUBS																													
Arbutus unedo	Strawberry Madrone									10'	15'																		
Cotoneaster pannosa	Silver Leaf Cotoneaster									8'	10'																		
Cotoneaster Parneyi	Parney Cotoneaster									5'	8'																		
Elaeagnus pungens	Thorny Elaeagnus									5'	8'																		
Fremontia mexicana	San Diego Fremontia									10'	15'																		
Juniperus chinensis-pfitzer	Pfitzer Chinese Juniper									10'	10'																		
Juniperus sabina	Savin Juniper									5'	5'																		
Juniperus sabina tamarix	Tamarix Savin Juniper									5'	5'																		
Juniperus scopulorum-prostrate vars.	Rockymountain Juniper									5'	5'																		
Lavandula officinalis	Common Lavender									2'	5'																		
Malus scheideckeri	Scheidecker Crabapple									15'	25'																		
Mahonia aquifolium	Oregon Grape									5'	5'																		
Mahonia pinnata	California Grape									5'	5'																		
Photinia serrulata	Chinese Photinia									10'	15'																		

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones. Example: If the embankment more nearly faces west than north, refer to the South-West column.

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MOUNTAIN ZONE

PAGE 1 2

STD. SPEC. SEC.

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APPROVED BY COUNTY SURVEYOR

R.C.E. 8991

DATE: 1/11/66

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 603

SCALE:

REVISION BY APPROVED DATE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER					GROWTH			WATER			USEFUL LIFE			MAINT. COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
SHRUBS (cont.)																												
Pyracantha crenato-serrata	Firethorn									5'	8'																	
Syringa vulgaris	Lilac									5'	8'																	
GROUND COVERS																												
Arctostaphylos' Pt. Reyes'	Pt. Reyes Manzanita									1'	2'																	
Ceanothus griseus-horizontalis	Carmel Creeping Ceanothus									5'	5'																	
Cotoneaster conspicua-decora	Necklace Cotoneaster									5'	5'																	
Cotoneaster horizontalis	Rock Cotoneaster									5'	5'																	
Euonymus fortunei coloratus	Purpleleaf Wintercreeper E.									3'	5'																	
Euonymus fortunei 'carrierei'	Glossy Wintercreeper E.									3'	5'																	
Hedra helix - varieties	English Ivy									12"	18"																	
Hypericum calycinum	Aaronsbeard St. Johnswort									18"	24"																	
Lonicera japonica-halliana	Hall's J. Honeysuckle									18"	24"																	
Teucrium chamaedrys prostratum	Prostrate Germander									12"	18"																	
Vinca major	Bigleaf Periwinkle									18"	24"																	
Vinca minor	Common Periwinkle									18"	24"																	
				APPLICATION RATE IN POUNDS PER ACRE																									
SEED																												
Festuca elatior arundinacea	Alta Fescue									12	15																	
Poterium sanguisorba	Burnet									12	15																	

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones.
Example: If the embankment more nearly faces west than north, refer to the South-West column.

SPACING COLUMN - represents the maximum or minimum spacing on center or rate of seed application permitted in planting from top to toe of bank.

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MOUNTAIN ZONE

PAGE 2 2

STD. SPEC. SEC.

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APPROVED BY COUNTY SURVEYOR

DATE: 1/1/66

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 603

REVISION | BY | APPROVED | DATE

SCALE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER				GROWTH			WATER			USEFUL LIFE			MAINT. COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
TREES																													
Brachychiton populneus	Kurrajong Bottletree	■	■	■			■			25'	30'			■						■		■			■				■
Casuarina equisetifolia	Horsetail Beefwood	■	■	■			■			20'	30'		■			■				■		■			■				■
Cercidium floridum	Border Palo Verde	■			■		■			15'	25'	■				■				■		■			■				■
Chilopsis linearis	Desertwillow	■			■		■			10'	15'	■				■				■		■			■				■
Cupressus arizonica	Arizona Cypress	■	■	■			■			15'	20'			■						■		■			■				■
Eucalyptus polyanthemos	Redbox Eucalyptus	■	■	■			■			20'	30'		■			■				■		■			■				■
Eucalyptus rudis	Moitch Eucalyptus (Desertgum)	■	■	■			■			10'	20'		■			■				■		■			■				■
Grevillea robesta	Silkoak Grevillea	■	■	■			■			15'	25'		■			■				■		■			■				■
Melia azedarach umbraculiformis	Umbrella Chinaberry	■			■		■			25'	30'	■				■				■		■				■			■
Olea europaea-fruitless	Fruitless Common Olive	■	■	■			■			25'	30'	■				■				■		■			■				■
Parkinsonia aculeata	Jerusalemthorn	■	■	■			■			15'	20'		■			■				■		■			■				■
Pinus halepensis	Aleppo Pine	■	■	■			■			15'	20'		■			■				■		■			■				■
Pistacia atlantica	Mt.-Atlas Pistache	■			■		■			20'	30'	■				■				■		■			■				■
Populus alba	White Poplar	■			■		■			25'	30'	■				■				■		■				■			■
Populus fremonti	Fremont Poplar	■			■		■			25'	30'	■				■				■		■				■			■
Schinus molle	California Peppertree	■	■	■			■			20'	30'		■			■				■		■			■				■
Tamarix aphylla	Athel Tamarisk	■	■	■			■			10'	20'		■			■				■		■			■				■
Ulmus parvifolia sempervirens	Chinese Evergreen Elm	■	■	■			■			25'	35'		■			■				■		■			■				■
SHRUBS																													
Callistemon viminalis	Weeping Bottlebrush	■	■	■				■		8'	12'		■			■				■		■			■				■
Cortaderia selloana	Selloa Pampasgrass	■	■	■				■		8'	10'		■			■				■		■			■				■
Encelia farinosa	White Brittlebush	■			■			■		3'	5'	■				■				■		■			■				■
Juniperus chinensis pfitzer	Pfitzer Chinese Juniper	■	■	■				■		10'	10'		■			■				■		■			■				■
Juniperus sabina tamarix	Tamarix Savin Juniper	■	■	■				■		5'	5'		■			■				■		■			■				■
Leucophyllum frutescens	Texas Silverleaf	■	■	■				■		3'	5'	■				■				■		■			■				■
Myrtus communis	True Myrtle	■	■	■				■		3'	5'		■			■				■		■			■				■
Nerium oleander-varieties	Common Oleander	■	■	■				■		5'	8'	■				■				■		■			■				■
Prosopis glandulosa	Honey Mesquite	■			■			■		8'	10'		■			■				■		■			■				■
Prosopis pubescens	Screwbean Mesquite	■			■			■		8'	10'		■			■				■		■			■				■
Punica granatum	Common Pomegranate	■			■			■		8'	10'		■			■				■		■			■				■

INSTRUCTIONS

EXPOSURE COLUMN - is the prime basis for selection of all plants within specific climatic zones.
Example: If the embankment more nearly faces west than north, refer to the South-West column.

SPACING COLUMN - represents the maximum or minimum spacing on center or rate of seed application permitted in planting from top to toe of bank.

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DESERT ZONE

PAGE 1 2

STD. SPEC. SEC.

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RECOMMENDED [illegible]

APPROVED by COUNTY SURVEYOR [illegible] RCE 8091

DATE: 1/11/66

PLANT LIST FOR CUT AND FILL SLOPES

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

DRAWING NUMBER 604

SCALE:

REVISION	BY	APPROVED	DATE

STD. SPEC. SEC.

DRAWN BY ___ CHECKED BY

RECOMMENDED [signature]

APPROVED BY COUNTY SURVEYOR [signature] R.C.E. 8001

DATE 11/1/66

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

PLANT LIST FOR CUT AND FILL SLOPES

DRAWING NUMBER 604

SCALE

REVISION	BY	APPROVED	DATE

PLANT LIST

PLANT NAME		EXPOSURE		TYPE						SPACING ON CENTER		CHARACTER					GROWTH			WATER			USEFUL LIFE			MAINT. COST		
BOTANICAL	COMMON	NORTH-EAST	SOUTH-WEST	EVERGREEN	DECIDUOUS	CONIFER	TREE	SHRUB	GROUND COV.	MINIMUM	MAXIMUM	SPREADING	ROUND	PYRAMIDAL	UP RIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	AMPLE	MODERATE	DROUGHT	SHORT	AVERAGE	LONG	HIGH	MODERATE	LOW
SHRUBS (Cont.)																													
Pyracantha coccinea pauciflora	Sparse Firethorn	■	■	■						5'	8'		■				■		■			■			■			■	
Tamarix pentandra	Fivestamen Tamarisk	■	■		■			■		8'	12'	■	■		■		■		■			■			■			■	
Tecomaria capensis	Cape Honeysuckle	■	■	■						5'	8'	■	■			■			■			■			■			■	
Sophora secundiflora	Mescalbean Sophora	■	■	■				■		5'	8'	■					■		■			■			■			■	
GROUND COVER																													
Calocephalis browni	Browns Garlandflower	■	■	■					■	5'	8'	■							■			■			■			■	
Lippia canescens	Creeping Lippia	■	■	■					■	12"	18"		■			■			■			■			■			■	
Pyracantha crenato-serrata	Firethorn	■	■	■						2'	2'		■			■			■			■			■			■	
SEED				APPLICATION RATE IN POUNDS PER ACRE																									
Atriplex semibaccata	Australian Saltbush	■	■							3	5								■			■			■			■	
Festuca elatior arundinacea	Alta Fescue	■	■							12	15								■			■			■			■	
Poterium sanguisorba	Burnet	■	■							12	15								■			■			■			■	

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DESERT ZONE

PLANT LIST

PLANT NAME		PLANTING SPECIFICATION				TYPE				CHARACTERISTICS						GROWTH			USEFUL LIFE			SOIL				WATER			MAINT. COST		
BOTANICAL	COMMON	MINIMUM PARKWAY WIDTH 3'	5'	8'	SPACING ON CENTER	EVERGREEN	DECIDUOUS	CONIFER	PALM	TREE HEIGHT	SPREADING	ROUND	PYRAMIDAL	UPRIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	SHORT	AVERAGE	LONG	DEEP LOAM	SANDY LOAM	CLAY	WELL-DRAIN	AMPLE	MODERATE	DROUGHT	HIGH	MODERATE	LOW
Brachychiton populneus	Kurrajong Bottletree				30'					50'																					
Callistemon lanceolatus	Lemon Bottlebrush				20'					25'																					
Calodendrum capense	Capechestnut				30'					40'																					
Ceratonia siliqua	Carob				30'					45'																					
Chiranthodendron platanoides	Monkeyhandtree				30'					35'																					
Cinnamomum camphora	Camphortree				40'					40'																					
Cunonia capensis	Cape Red Alder				30'					50'																					
Cupaniopsis anacardioides	Carrotwood				30'					30'																					
Erythea edulis	Guadalupe Erythea Palm				20'					40'																					
Erythrina corallodendrum	Giant Coraltree				30'					20'																					
Eucalyptus ficifolia	Scarlet Eucalyptus				40'					35'																					
Ficus retusa	Indianlaurel Fig				30'					30'																					
Firmiana simplex	Chinese Parasoltree				30'					40'																					
Fraxinus uhdei	Shamel Ash				30'					40'																					
Ligustrum lucidum	Glossy Privet				20'					25'																					
Liquidambar styraciflua	American Sweetgum				25'					40'																					
Magnolia grandiflora	Southern Magnolia				30'					60'																					
Melaleuca leucadendron	Cajeputtree				25'					40'																					
Melia azederach umbraculiformis	Umbrella Chinaberry				30'					40'																					
Metrosideros tomentosa	New Zealand Christmastree				30'					30'																					
Phoenix canariensis	Canary Date Palm				30'					60'																					
Pinus pinea	Italian Stone Pine				30'					60'																					
Platanus acerifolia	London Planetree				30'					50'																					
Podocarpus elongatus	Fern Podocarpus				20'					60'																					
Quercus agrifolia	California Live Oak				40'					75'																					
Quercus ilex	Holly Oak				30'					60'																					
Seaforthia elegans	Solitairepalm (Kingpalm)				25'					30'																					
Sophora japonica	Japanese Pagodatree				25'					60'																					
Tipuana tipu	Tiputree				50'					50'																					
Washingtonia robusta	Mexican Washingtonpalm				20'					100																					

INSTRUCTIONS

PLANTING SPECIFICATIONS COLUMNS-are the prime basis for selection of trees in accordance with the COUNTY'S climatic zone map used for this purpose.

PARKWAY WIDTH-refers to the median strip; strip between the curb and sidewalk; or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.

SPACING ON CENTER COLUMN-refers to the permitted maximum and minimum spacing on center of trees.

TREE SELECTION-The Surveyor-Road Commissioner shall approve the selection and placement of trees before planting.

COASTAL ZONE

PAGE 1 1

STD SPEC SEC

DRAWN BY — CHECKED BY

RECOMMENDED

APPROVED BY COUNTY SURVEYOR

DATE

SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT
STANDARD DRAWING

STREET TREE PLANT LIST

DRAWING NUMBER 605

REVISION | BY | APPROVED | DATE

SCALE

File 11-25

PLANT LIST

PLANT NAME		PLANTING SPECIFICATION			TYPE				CHARACTERISTICS						GROWTH			USEFUL LIFE			SOIL				WATER			MAINT. COST		
BOTANICAL	COMMON	3'	5'	8'	EVERGREEN	DECIDUOUS	CONIFER	PALM	TREE HEIGHT	SPREADING	ROUND	PYRAMIDAL	UPRIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	SHORT	AVERAGE	LONG	DEEP LOAM	SANDY LOAM	CLAY	WELL-DRAIN	AMPLE	MODERATE	DROUGHT	HIGH	MODERATE	LOW
		MINIMUM PARKWAY WIDTH																												
				SPACING ON CENTER																												
Albizzia julibrissin	Silk Tree Albizzia			30'		●			35'	●							●			●			●		●				●	
Brachychiton populneus	Kurrajong Bottletree		●	30'		●			50'		●					●				●			●		●				●	
Callistemon lanceolatus	Lemon Bottlebrush	●		20'		●			30'	●						●				●		●			●				●	
Catalpa bignonioides	Southern Catalpa			35'		●			60'	●						●				●		●			●				●	
Celtis australis	European Hackberry		●	35'		●			60'		●					●				●			●		●				●	
Ceratonia siliqua	Carob		●	30'		●			45'	●						●				●		●			●				●	
Chamaerops excelsa	Windmill Palm	●		20'				●	25'	●						●				●		●			●				●	
Cinnamomum camphora	Camphortree			40'		●			40'		●					●				●			●		●				●	
Cunonia capensis	Cape Red Alder		●	30'		●			50'	●						●				●		●			●				●	
Cupaniopsis anacardioides	Carrotwood		●	30'		●			30'		●					●				●			●		●				●	
Fraxinus uhdei	Shamel Ash		●	30'		●			40'		●					●				●			●		●				●	
Fraxinus velutina glabra	Smooth Ash (Modesto Ash)		●	30'		●			40'		●					●				●			●		●				●	
Gleditsia triac. inerm. Moraine	Moraine Honeylocust			50'		●			75'	●						●				●			●		●				●	
Koelreuteria paniculata	Goldenraintree		●	20'		●			30'		●					●				●			●		●				●	
Ligustrum lucidum	Glossy Privet	●		20'		●			25'		●					●				●			●		●				●	
Liquidambar styraciflua	American Sweetgum		●	25'		●			40'		●					●				●			●		●				●	
Magnolia grandiflora	Southern Magnolia		●	30'		●			60'		●					●				●			●		●				●	
Melia azedarach-umbraculiformis	Umbrella Chinaberry		●	30'		●			40'		●					●				●			●		●				●	
Olea europaea-fruitless	Fruitless Common Olive		●	30'		●			30'		●					●				●			●		●				●	
Phoenix canariensis	Canary Date Palm			30'				●	50'	●						●				●			●		●				●	
Platanus acerifolia	London Planetree			30'		●			50'		●					●				●			●		●				●	
Pinus pinea	Italian Stone Pine			30'		●			50'		●					●				●			●		●				●	
Pistacia chinensis	Chinese Pistache		●	30'		●			50'		●					●				●			●		●				●	
Prunus caroliniana	Carolina Laurel Cherry	●		20'		●			35'	●						●				●			●		●				●	
Prunus lyoni	Catalina Cherry	●		20'		●			35'	●						●				●			●		●				●	
Quercus agrifolia	California Live Oak			40'		●			75'	●						●				●			●		●				●	
Quercus ilex	Holly Oak			30'		●			60'	●						●				●			●		●				●	
Schinus terebinthifolia	Brazil Peppertree		●	30'		●			30'		●					●				●			●		●				●	
Washingtonia filifera	California Washingtonpalm			25'				●	80'	●						●				●			●		●				●	
Washingtonia robusta	Mexican Washingtonpalm		●	20'				●	100'		●					●				●			●		●				●	

INSTRUCTIONS

PLANTING SPECIFICATIONS COLUMNS-are the prime basis for selection of trees in accordance with the COUNTY'S climatic zone map used for this purpose.

PARKWAY WIDTH-refers to the median strip; strip between the curb and sidewalk; or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.

SPACING ON CENTER COLUMN-refers to the permitted maximum and minimum spacing on center of trees.

TREE SELECTION-The Surveyor-Road Commissioner shall approve the selection and placement of trees before planting.

COASTAL-INLAND ZONE

PAGE 1 | 1

STD. SPEC. SEC.

DRAWN BY ___ CHECKED BY

RECOMMENDED

APPROVED BY COUNTY SURVEYOR

DATE: 6/8/66

SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT
STANDARD DRAWING

STREET TREE PLANT LIST

DRAWING NUMBER 606

SCALE:

REVISION | BY | APPROVED | DATE

PLANT LIST

PLANT NAME		PLANTING SPECIFICATIONS				TYPE				CHARACTERISTICS						GROWTH			USEFUL LIFE			SOIL				WATER			MAINT. COST		
BOTANICAL	COMMON	MINIMUM PARKWAY WIDTH 4'	5'	10'	SPACING ON CENTER	EVERGREEN	DECIDUOUS	CONIFER	PALM	TREE HEIGHT	SPREADING	ROUND	PYRAMIDAL	UPRIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	SHORT	AVERAGE	LONG	DEEP LOAM	SANDY LOAM	CLAY	WELL-DRAIN	AMPLE	MODERATE	DROUGHT	HIGH	MODERATE	LOW
Acer platanoides	Norway Maple				30'					60'																					
Acer saccharum	Sugar Maple				50'					100																					
Albizzia julibrissin	Silktree Albizzia				30'					35'																					
Betula pendula	European White Birch				20'					60'																					
Broussonetia papyrifera	Paper Mulberry				40'					50'																					
Catalpa bignonioides	Common Catalpa				35'					60'																					
Cercidiphyllum japonicum	Katsuratree				30'					40'																					
Cercis occidentalis	California Redbud				20'					20'																					
Firmiana simplex	Chinese Parasoltree				30'					40'																					
Fraxinus velutina glabra	Modesto Ash				30'					40'																					
Ginkgo biloba	Maidenhairtree				50'					120																					
Gleditsia triacan. inerm. Moraine	Moraine Locust				50'					75'																					
Koelreuteria paniculata	Goldenraintree				20'					30'																					
Liquidambar styraciflua	American Sweetgum				25'					40'																					
Liriodendron tulipifera	Tuliptree				30'					60'																					
Magnolia grandiflora	Southern Magnolia				30'					60'																					
Magnolia soulangeana	Saucer Magnolia				20'					20'																					
Malus hopa	Hopa Crabapple				20'					40'																					
Nyssa sylvatica	Black Tupelo				20'					40'																					
Photinia serrulata	Chinese Photinia				20'					30'																					
Platanus acerifolia	London Planetree				30'					50'																					
Platanus racemosa	California Sycamore				40'					50'																					
Populus alba	White Poplar				30'					50'																					
Prunus cerasifera blireiana	Double Pink Cherry Plum				20'					25'																					
Prunus cerasifera thundercloud	Purpleleaf Plum				20'					30'																					
Prunus serrulata-Kwanzan	Flowering Cherry				20'					25'																					
Prunus yedoensis-Akebono	Yoshino Cherry				30'					25'																					
Quercus borealis	Red Oak				30'					60'																					
Quercus suber	Cork Oak				30'					50'																					
Robinia pseudoacacia decaisne	Pink Flowering Locust				30'					80'																					
Sophora japonica	Japanese Pagodatree				25'					40'																					
Ulmus parvifol. sempervir. Drake	Drake Evergreen Elm				30'					60'																					

STD SPEC SEC.

DRAWN BY ____ CHECKED BY ____

RECOMMENDED ____

APPROVED BY COUNTY SURVEYOR ____ R.C.E. 8091

DATE: 6/8/66

SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT

STANDARD DRAWING

STREET TREE PLANT LIST

DRAWING NUMBER 607

SCALE:

REVISION	BY	APPROVED	DATE

INSTRUCTIONS

PLANTING SPECIFICATIONS COLUMNS-are the prime basis for selection of trees in accordance with the COUNTY'S climatic zone map used for this purpose.

PARKWAY WIDTH-refers to the median strip, strip between the curb and sidewalk; or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.

SPACING ON CENTER COLUMN-refers to the permitted *maximum* and *minimum* spacing on center of trees.

TREE SELECTION-The Surveyor-Road Commissioner shall approve the selection and placement of trees before planting.

MOUNTAIN ZONE

PAGE 1 1

PLANT LIST

PLANT NAME		PLANTING SPECIFICATION				TYPE				CHARACTERISTICS						GROWTH			USEFUL LIFE			SOIL			WATER			MAINT. COST		
BOTANICAL	COMMON	MINIMUM PARKWAY WIDTH 3'	5'	∅	SPACING ON CENTER	EVERGREEN	DECIDUOUS	CONIFER	PALM	TREE HEIGHT	SPREADING	ROUND	PYRAMIDAL	UPRIGHT	DENSE-COMPACT	OPEN	SLOW	MODERATE	RAPID	SHORT	AVERAGE	LONG	DEEP LOAM	SANDY LOAM	CLAY	WELL-DRAIN	AMPLE	MODERATE	DROUGHT	HIGH	MODERATE	LOW
Ailanthus altissima (female only)	Treeofheaven Ailanthus				40'		●			70'									●						●					●	
Brachychiton populneus	Kurrajong Bottletree				30'		●			50'									●						●					●	
Callistemon viminalis	Weeping Bottlebrush	●			20'		●			25'									●						●					●	
Casuarina equisetifolia	Horsetail Beefwood		●		30'	●				50'									●						●					●	
Catalpa speciosa	Northern Catalpa			●	35'		●			60'									●						●					●	
Celtis australis	European Hackberry			●	35'		●			60'									●						●					●	
Ceratonia siliqua	Carob			●	30'	●				45'									●						●					●	
Chamaerops excelsa	Windmill Palm	●			20'				●	25'									●						●					●	
Erythea armata	Blue Fan Palm	●			20'				●	40'									●						●					●	
Eucalyptus rostrata	Beakpod Euc. (Red Gum)			●	30'	●				70'									●						●					●	
Eucalyptus rudis	Moitch Euc. (Desert Gum)			●	30'	●				50'									●						●					●	
Fraxinus velutina	Velvet Ash (Arizona Ash)			●	30'		●			40'									●						●					●	
Fraxinus velutina glabra	Smooth Ash (Modesto Ash)			●	30'		●			40'									●						●					●	
Grevillea robusta	Silkoak Grevillea			●	25'	●				50'									●						●					●	
Lysiloma latisiliqua	Sabicu Lysiloma			●	30'	●				50'									●						●					●	
Melia azedarach-umbraculiformis	Umbrella Chinaberry			●	30'		●			40'									●						●					●	
Morus alba Kingan	Kingan White Mulberry			●	30'		●			30'									●						●					●	
Olea europaea	Common Olive			●	30'	●				30'									●						●					●	
Olea europaea-fruitless	Fruitless Common Olive			●	30'	●				30'									●						●					●	
Parkinsonia aculeata	Jerusalemthorn	●			20'	●				30'									●						●					●	
Phoenix canariensis	Canary Date Palm			●	30'				●	50'									●						●					●	
Phoenix dactilifera	Date Palm			●	25'				●	75'									●						●					●	
Pistacia chinensis	Chinese Pistache		●		30'		●			50'									●						●					●	
Populus alba	White Poplar			●	30'		●			50'									●						●					●	
Schinus molle	California Peppertree			●	30'	●				50'									●						●					●	
Schinus terebinthifolia	Brazil Peppertree			●	30'	●				30'									●						●					●	
Sophora secundiflora	Mescalbean Sophora	●			20'	●				35'									●						●					●	
Tamarix aphylla	Athel Tamarix			●	20'	●				35'									●						●					●	
Ulmus parvifolia-sempervirens	Chinese Evergreen Elm		●		30'	●				60'									●						●					●	
Washingtonia filifera	California Washingtonpalm			●	25'				●	80'									●						●					●	
Washingtonia robusta	Mexican Washingtonpalm			●	20'				●	100'									●						●					●	

STD. SPEC. SEC.

DRAWN BY ___ CHECKED BY ___

RECOMMENDED [signature]

APPROVED BY COUNTY SURVEYOR [signature] R.C.E. 8091

DATE: 6/8/66

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

STANDARD DRAWING

STREET TREE PLANT LIST

DRAWING NUMBER 608

SCALE:

REVISION	BY	APPROVED	DATE

INSTRUCTIONS

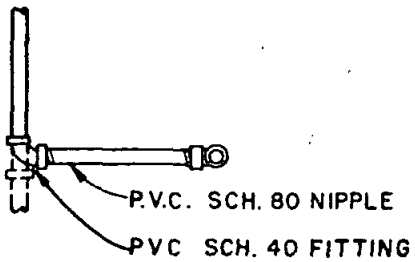
PLANTING SPECIFICATIONS COLUMNS-are the prime basis for selection of trees in accordance with the COUNTY'S climatic zone map used for this purpose.

PARKWAY WIDTH-refers to the median strip; strip between the curb and sidewalk; or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.

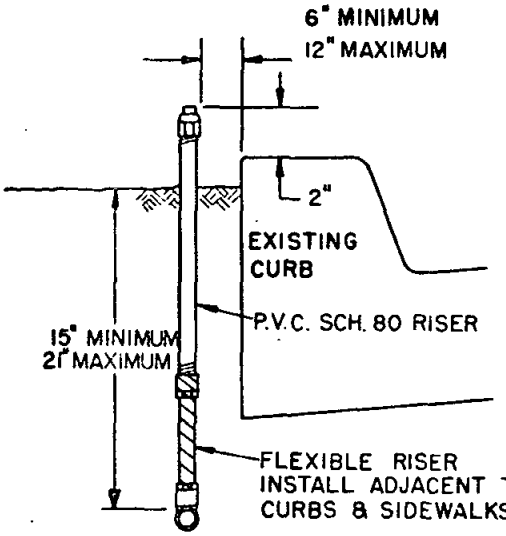
SPACING ON CENTER COLUMN-refers to the permitted maximum and minimum spacing on center of trees.

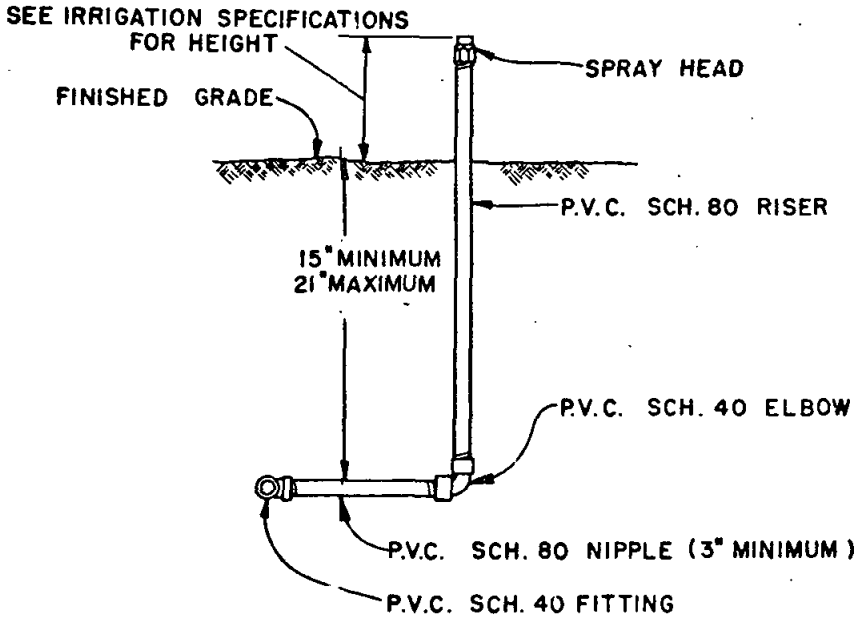
TREE SELECTION-The Surveyor-Road Commissioner shall approve the selection and placement of trees before planting.

DESERT ZONE



PLAN VIEW



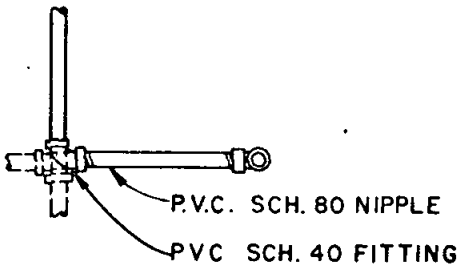


ELEVATION

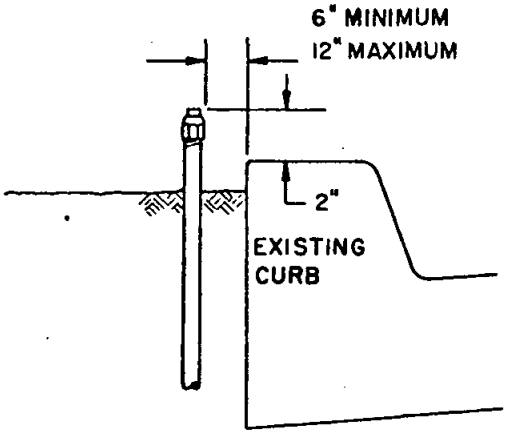
SYMBOLS:

SHRUBBERY SPRAY
STREAM SPRAY
RECTANGULAR SPRAY

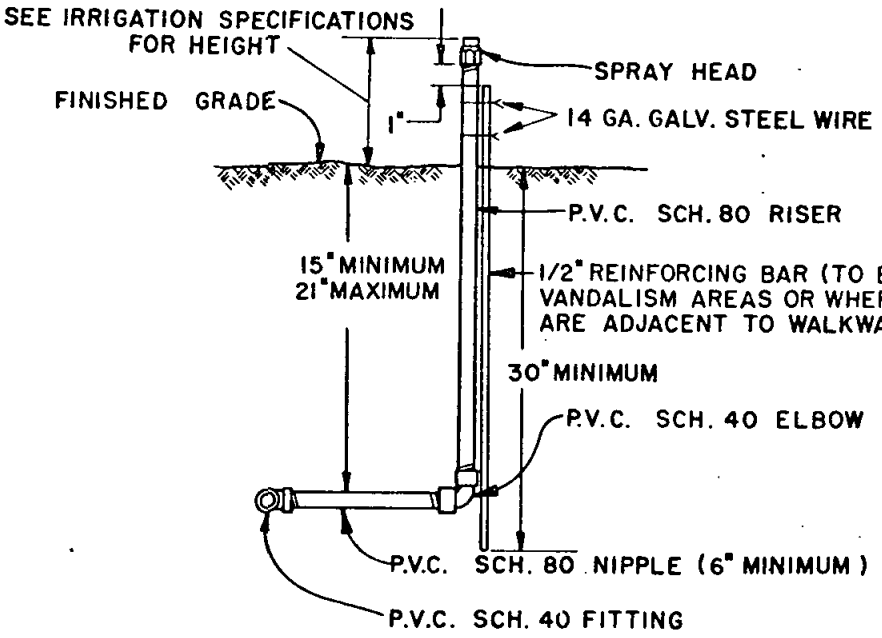
STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Added Flex. Riser			1/13/73
DRAWN BY J.M.M. CHECKED BY R.C.					
RECOMMENDED BY W.P. Seeor		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	SHRUBBERY SPRINKLER HEADS FIXED SPRAY TYPE	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 700-T-2			
DATE 1-25-72					



PLAN VIEW



LOCATION OF SHRUB SPRAY HEAD ADJACENT TO PARKING LOT CURBS (OR STREET CURBS)



ELEVATION

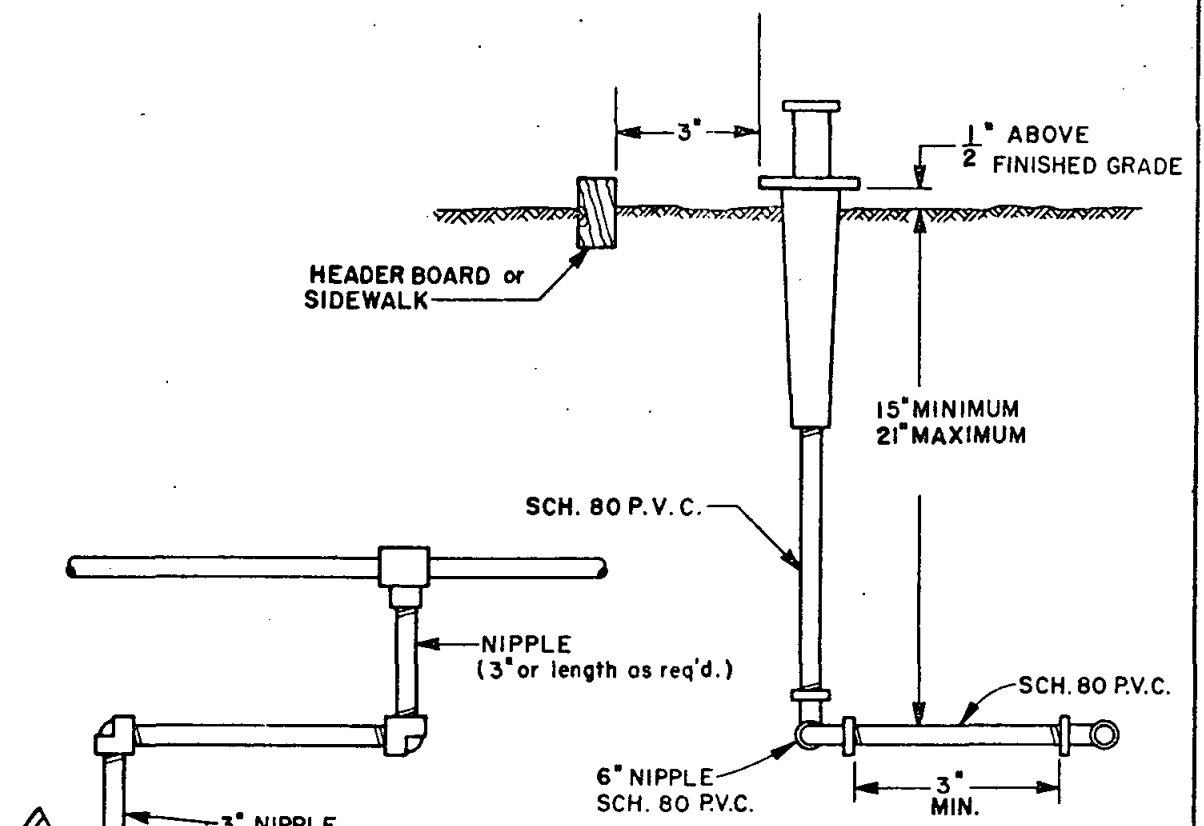
SYMBOLS:

SHRUBBERY SPRAY

STREAM SPRAY

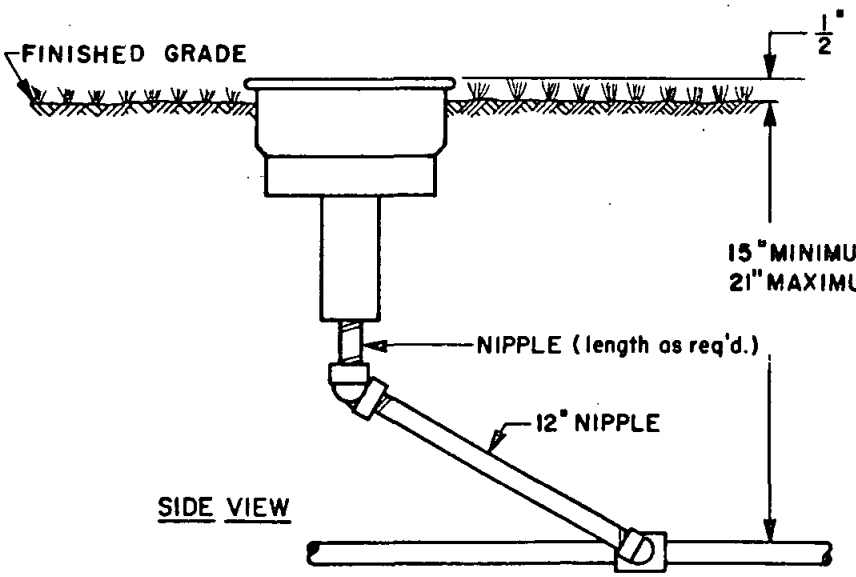
RECTANGULAR SPRAY

STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY T.M.M. CHECKED BY R.C.					
RECOMMENDED BY W.P. Leeds		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	SHRUBBERY SPRINKLER HEADS FIXED SPRAY TYPE	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 700-T			
DATE 1-25-72					



TOP VIEW

POP-UP LAWN SPRAY
mounted on swing-joint riser



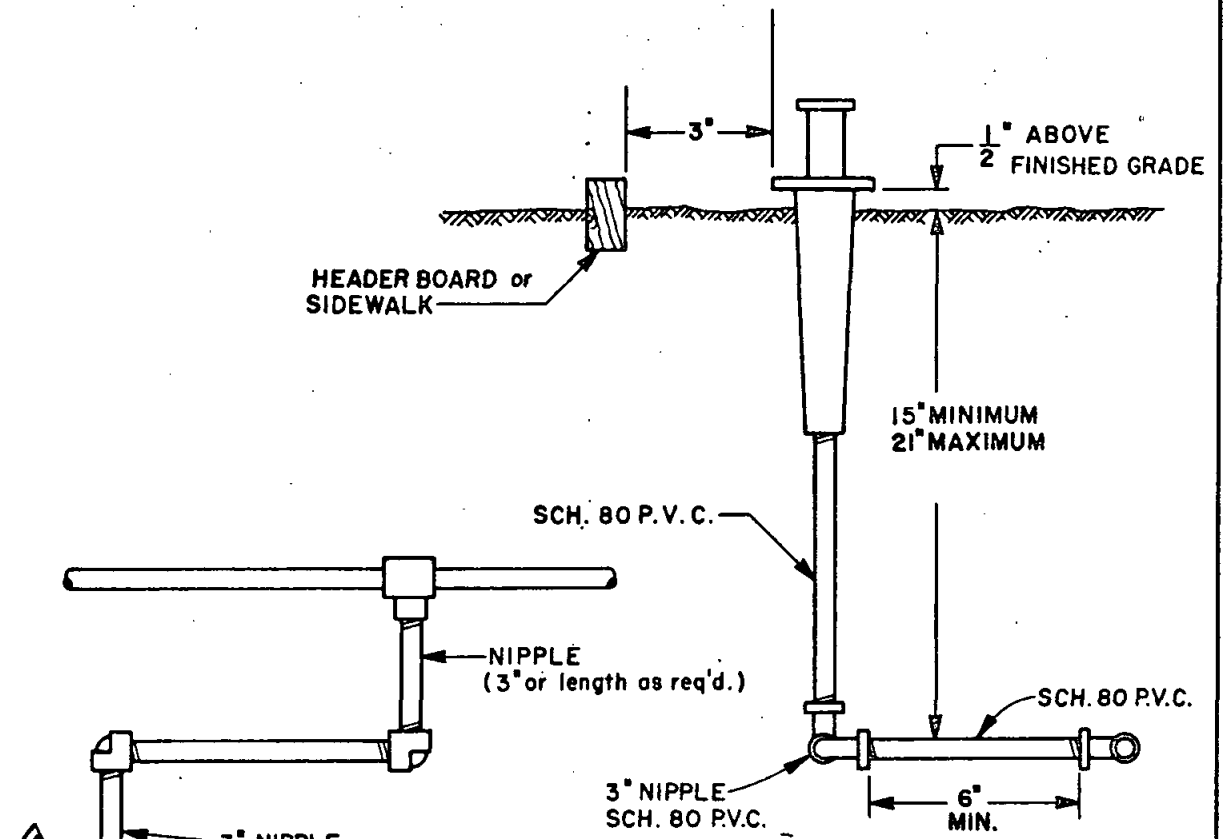
SIDE VIEW

NOTES:
1. ALL NIPPLES AND FITTINGS FOR ROTARY POP-UP SPRINKLER TO BE THREADED SCH. 80 P.V.C. PIPE.
2. ALL SPRAY HEADS SHALL CLEAR EDGE OF SIDEWALKS OR OTHER IMPROVEMENTS BY 3".

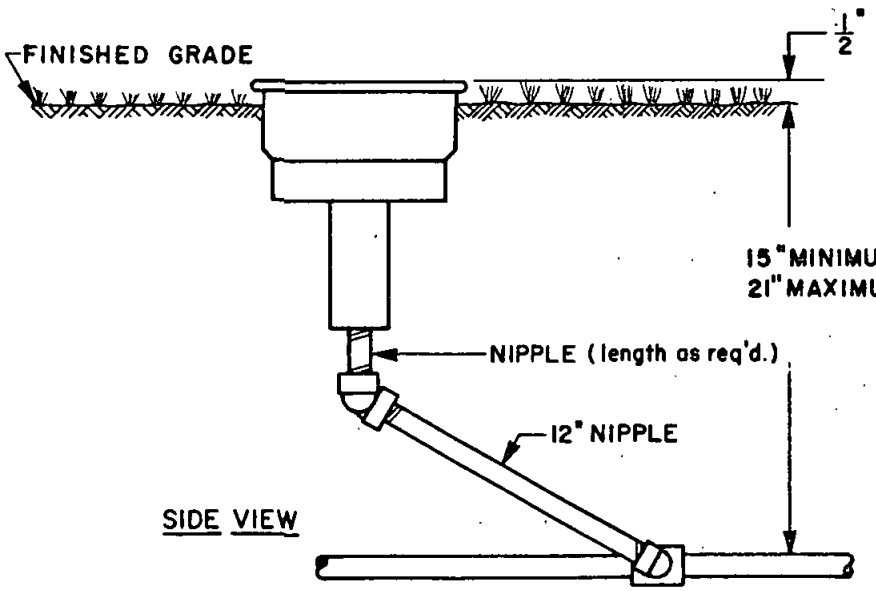
SYMBOL: ROTARY POP-UP
POP-UP

ROTARY POP-UP SPRINKLER
mounted on swing-joint riser

STD. SPEC. SEC. :	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Changed North to South			4/13/73
DRAWN BY JMM CHECKED BY					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	LAWN SPRINKLER HEADS POP-UP ROTARY & POP-UP SPRAY TYPES	SCALE: NONE			
R.C.E. 11458		DRAWING NUMBER		701-T-1	
DATE: 1-26-72					



POP-UP LAWN SPRAY
mounted on swing-joint riser

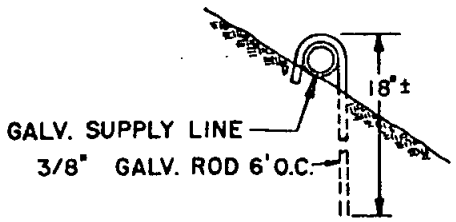


NOTES:
1. ALL NIPPLES AND FITTINGS FOR ROTARY POP-UP SPRINKLER TO BE THREADED SCH. 80 P.V.C. PIPE.
2. ALL SPRAY HEADS SHALL CLEAR EDGE OF SIDEWALKS OR OTHER IMPROVEMENTS BY 3".

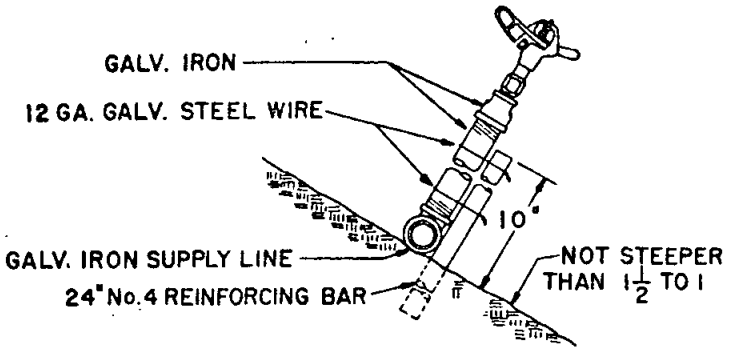
SYMBOL: ROTARY POP-UP ◎
POP-UP ◎

ROTARY POP-UP SPRINKLER
mounted on swing-joint riser

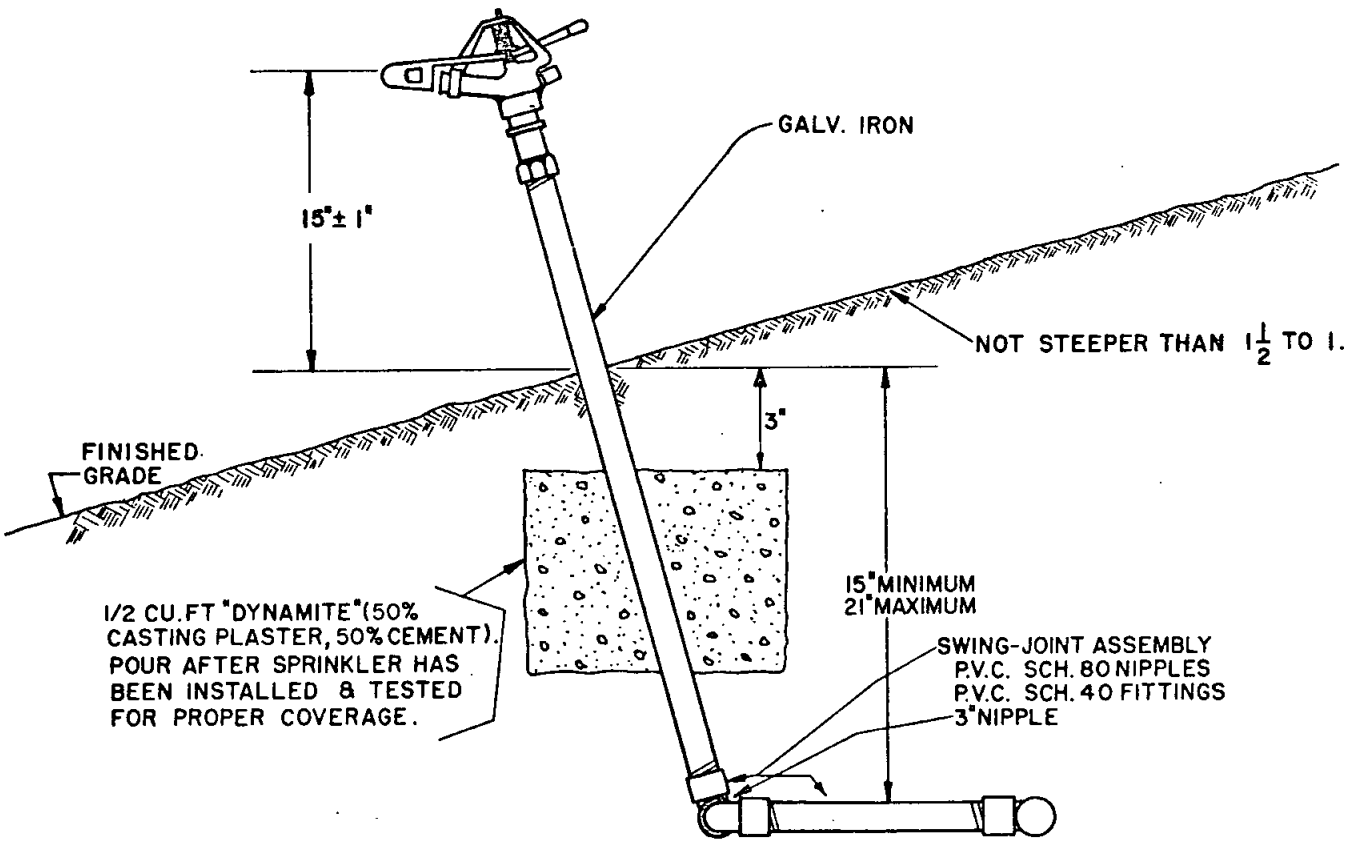
STD. SPEC. SEC. :	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY JMM CHECKED BY					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	LAWN SPRINKLER HEADS POP-UP ROTARY & POP-UP SPRAY TYPES	SCALE: NONE			
R.C.E. 11458		DRAWING NUMBER	701-T		
DATE: 1-25-72					



SPECIAL ABOVE-GROUND INSTALLATION
SUPPLY LINE ANCHOR DETAIL



SPECIAL ABOVE-GROUND INSTALLATION
SPRINKLER STAKING DETAIL

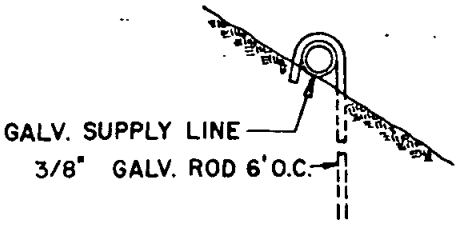


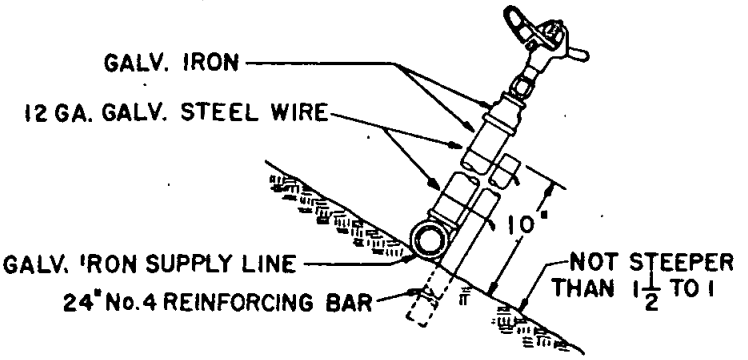
NORMAL INSTALLATION

NOTE:
USE OF SPECIAL ABOVE-GROUND SPRINKLER INSTALLATION MUST HAVE THOROUGH JUSTIFICATION. INSTALLATION SHALL NOT COMMENCE UNTIL AUTHORIZED IN WRITING BY THE COUNTY ENGINEER

SYMBOLS:

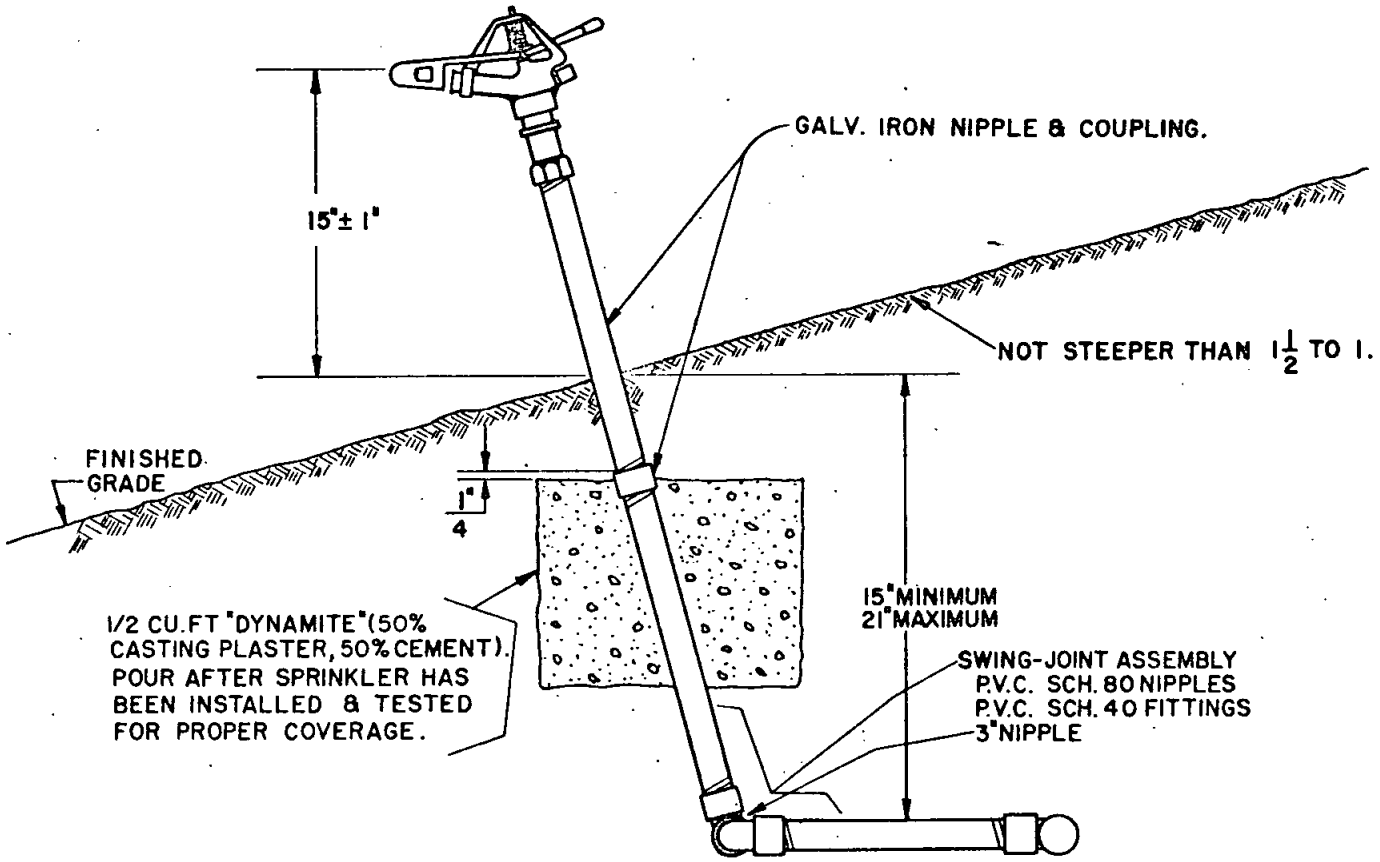
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Change from nipple	12/3/73
DRAWN BY: BMM CHECKED BY:			
RECOMMENDED BY: W. P. Lacey		REVISION / BY / APPROVED / DATE	
APPROVED BY COUNTY ENGINEER: H. M. Taylor R.C.E. 11458	IMPACT SPRINKLER HEAD	SCALE: NONE	
DATE: 7-25-72		DRAWING NUMBER 702-T-2	





SPECIAL ABOVE-GROUND INSTALLATION
SUPPLY LINE ANCHOR DETAIL

SPECIAL ABOVE-GROUND INSTALLATION
SPRINKLER STAKING DETAIL

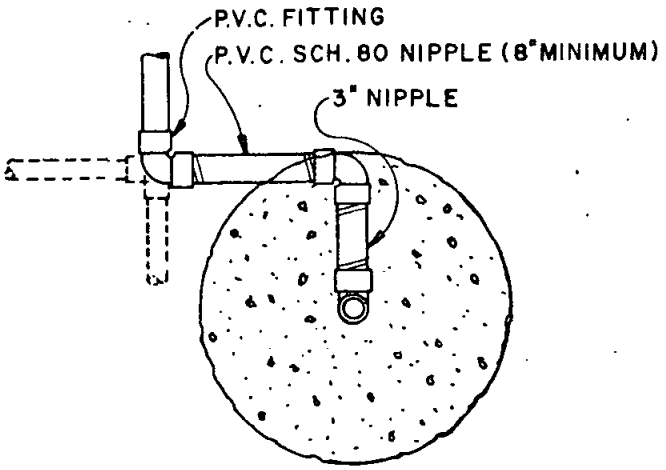


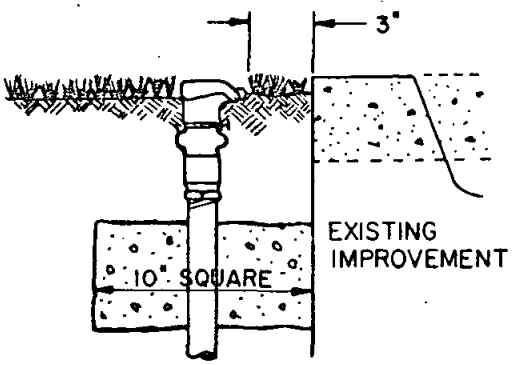
NORMAL INSTALLATION

NOTE:
USE OF SPECIAL ABOVE-GROUND SPRINKLER INSTALLATION MUST HAVE THOROUGH JUSTIFICATION. INSTALLATION SHALL NOT COMMENCE UNTIL AUTHORIZED IN WRITING BY THE COUNTY ENGINEER

SYMBOLS: ○ ⌐

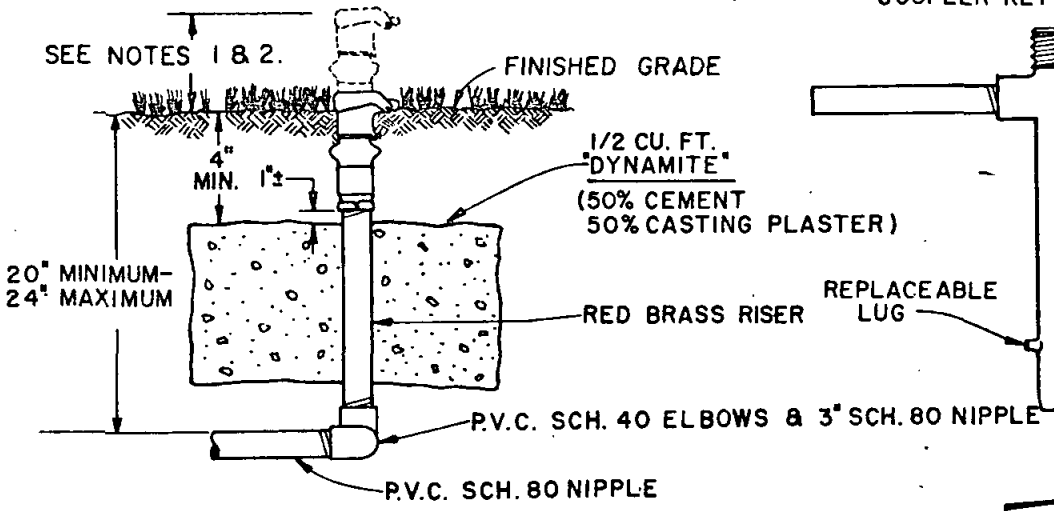
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	
DRAWN BY: JMM CHECKED BY: [illegible]		
RECOMMENDED BY: [signature]		REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER	IMPACT SPRINKLER HEAD	SCALE: NONE
[signature] R.C.E. 11458		DRAWING NUMBER 702-T
DATE: 7-25-78		





LOCATION OF QUICK COUPLING VALVES ADJACENT TO EXISTING IMPROVEMENTS.

PLAN VIEW



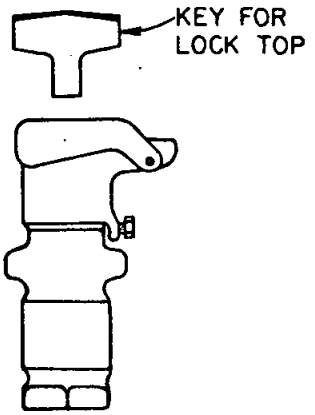
COUPLER KEY — SINGLE LUG

ELEVATION

NOTES:

1. ALL QUICK COUPLING VALVES INSTALLED IN NEW LAWN AREAS SHALL BE INSTALLED ONE-HALF (1/2) INCH ABOVE THE PROPOSED FINISHED GRADE.

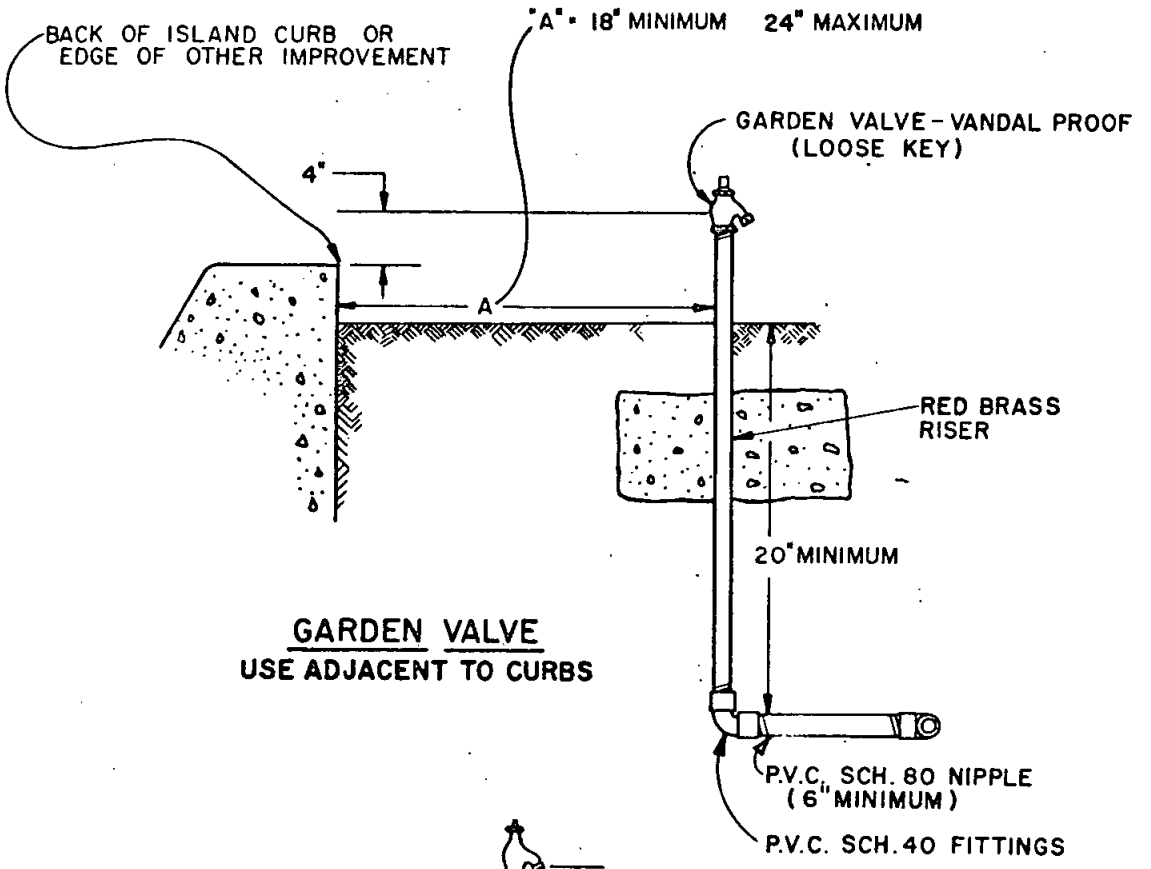
2. ALL QUICK COUPLING VALVES INSTALLED IN SHRUB BEDS SHALL BE INSTALLED FOUR (4) INCHES ABOVE FINISHED GRADE.



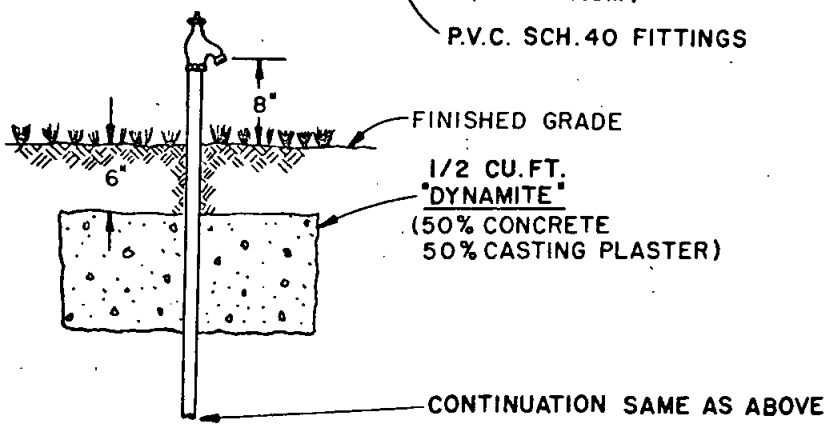
TWO PIECE LOCK TOP QUICK-COUPLING VALVE

SYMBOL: ⊗ Q.C.V.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY FMM CHECKED BY MK					
RECOMMENDED BY A. Peterson		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	QUICK COUPLING VALVES	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER	703-T		
DATE: 7-25-72					



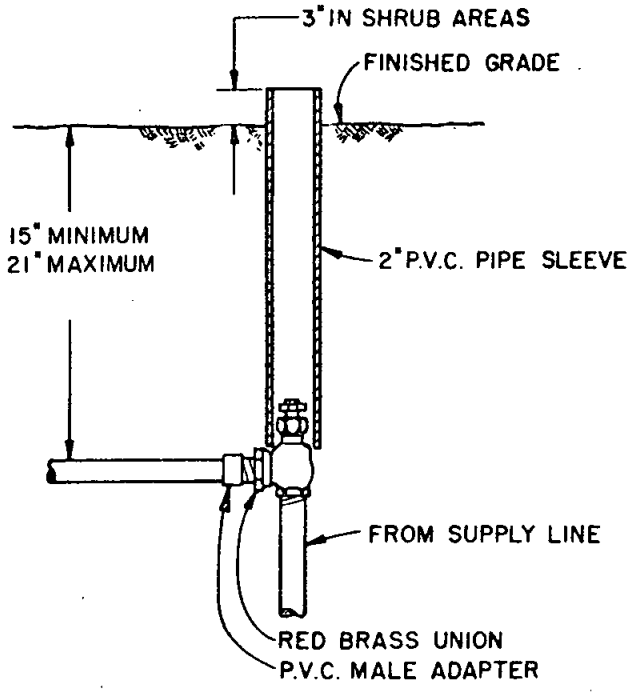
GARDEN VALVE
USE ADJACENT TO CURBS



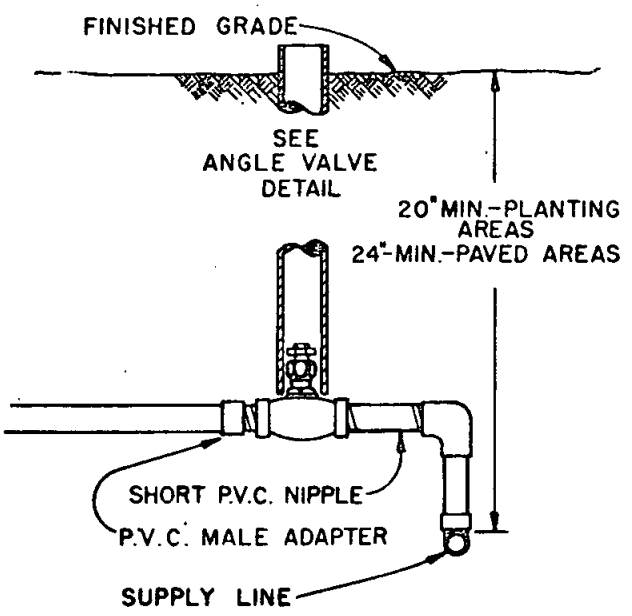
GARDEN VALVE
USE IN OPEN AREAS

SYMBOL: ♂

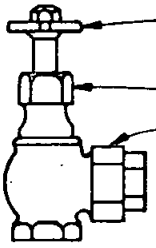
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY: J.M.M. CHECKED BY: A.G.					
RECOMMENDED BY: W.P. Seaver	GARDEN VALVES	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 704-T			
DATE: 7-25-72					



ANGLE VALVE



GLOBE VALVE



ALL MANUAL VALVES SHALL BE FURNISHED WITH A STANDARD MANUAL CONTROL VALVE CROSS

REMOVABLE BONNET AND PACKING GLAND NUT.

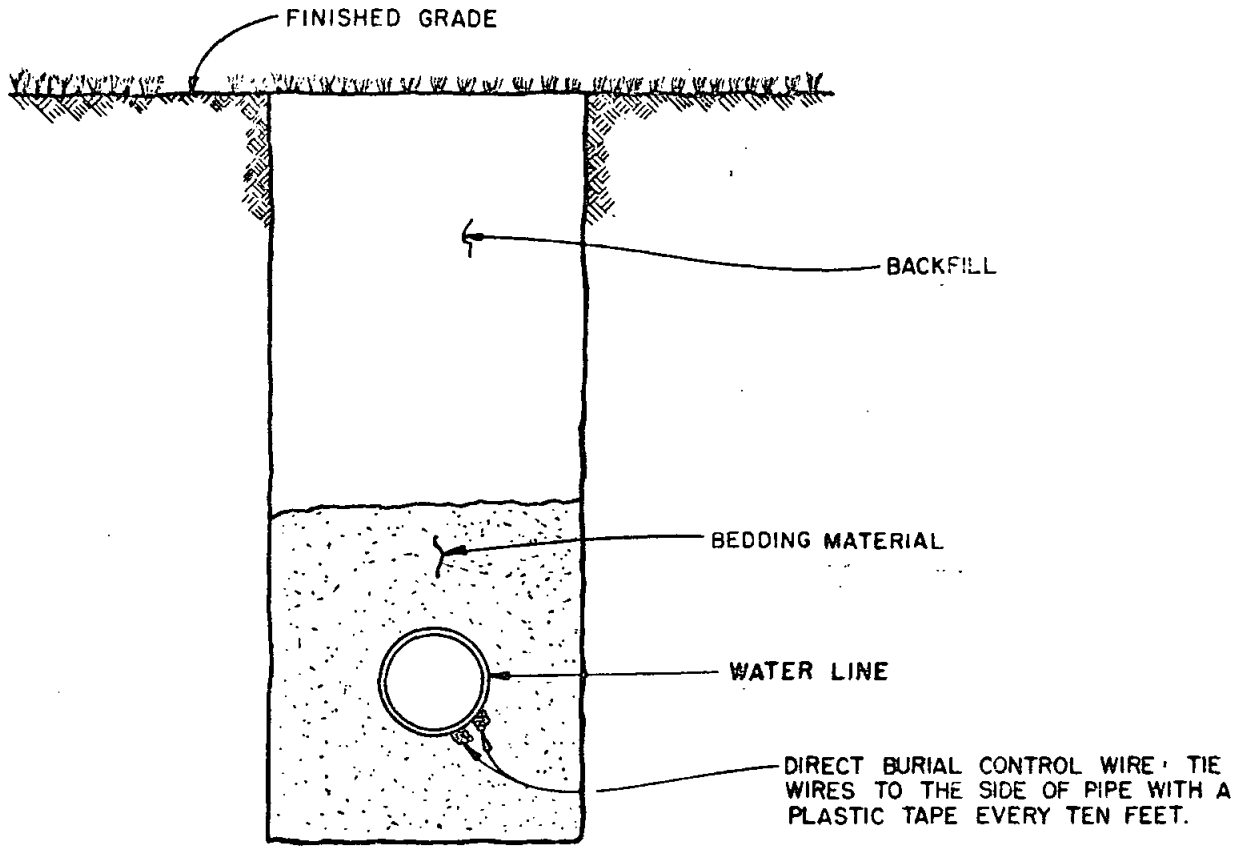
ALL MANUAL ANGLE VALVES SHALL BE INSTALLED WITH A UNION ON THE DOWNSTREAM SIDE OF THE VALVE. THE UNION MAY BE PART OF THE VALVE OR FURNISHED SEPARATELY-UNIONS SHALL BE GROUND JOINT, RED BRASS.

ORISEAL VALVES, MANUAL CONTROL VALVES, AND OTHER MANUAL VALVES SHALL BE INSTALLED ACCORDING TO THIS STANDARD WITH VALVE SIZES AS SHOWN ON THE PLANS.

UNLESS SHOWN OTHERWISE ON THE PLANS, ALL VALVES SHALL BE INSTALLED WITHIN TWELVE (12) INCHES OF THE WATER MAIN

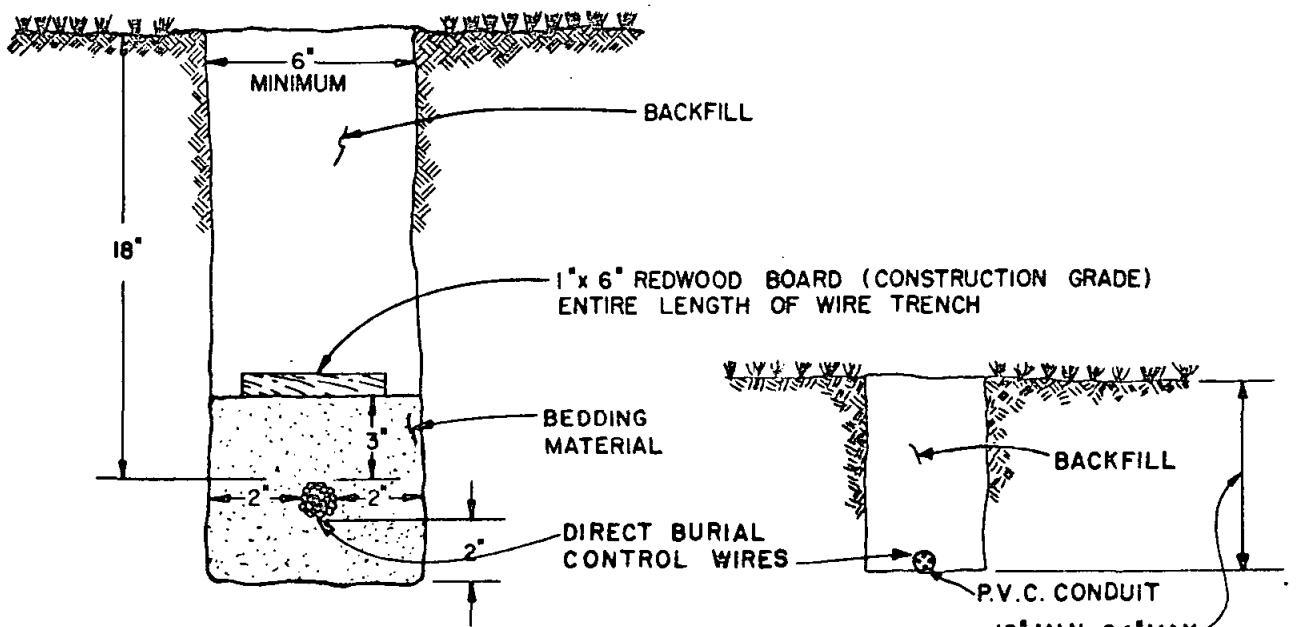
SYMBOLS:
MANUAL CONTROL ANGLE VALVE ⊗ MCV
MANUAL CONTROL GLOBE VALVE ⊗ MCV
ORISEAL VALVE ⊗ OV
GATE VALVE ⊗ GV

STD. SPEC. SEC. :	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY MM CHECKED BY					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	MANUAL VALVES	SCALE: NONE			
R.C.E. 11458		DRAWING NUMBER		705-T	
DATE: 7-25-72					



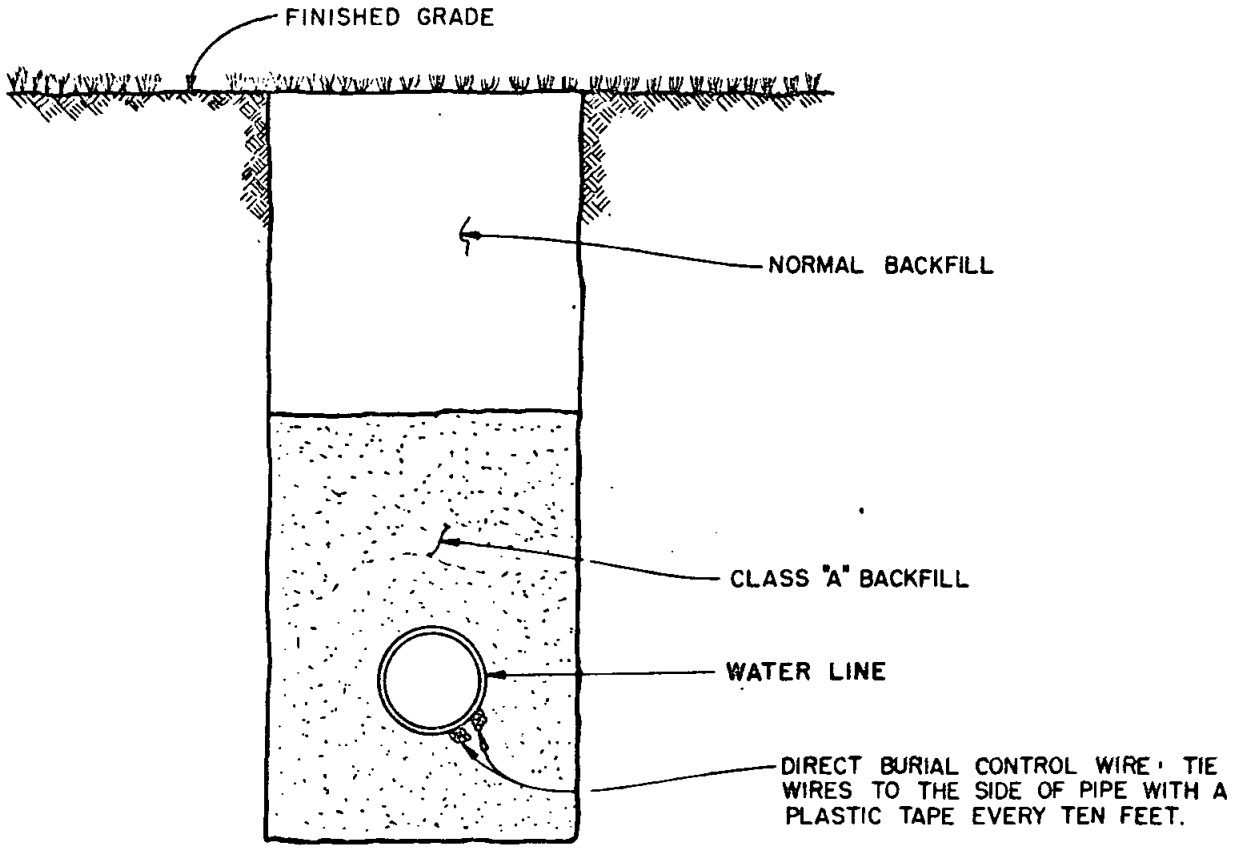
NORMAL LOCATION OF CONTROL WIRES

SEE IRRIGATION SPECIFICATIONS FOR ADDITIONAL INFORMATION ON TRENCH SIZE, BACK-FILL AND DIRECT BURIAL WIRE INSTALLATION.



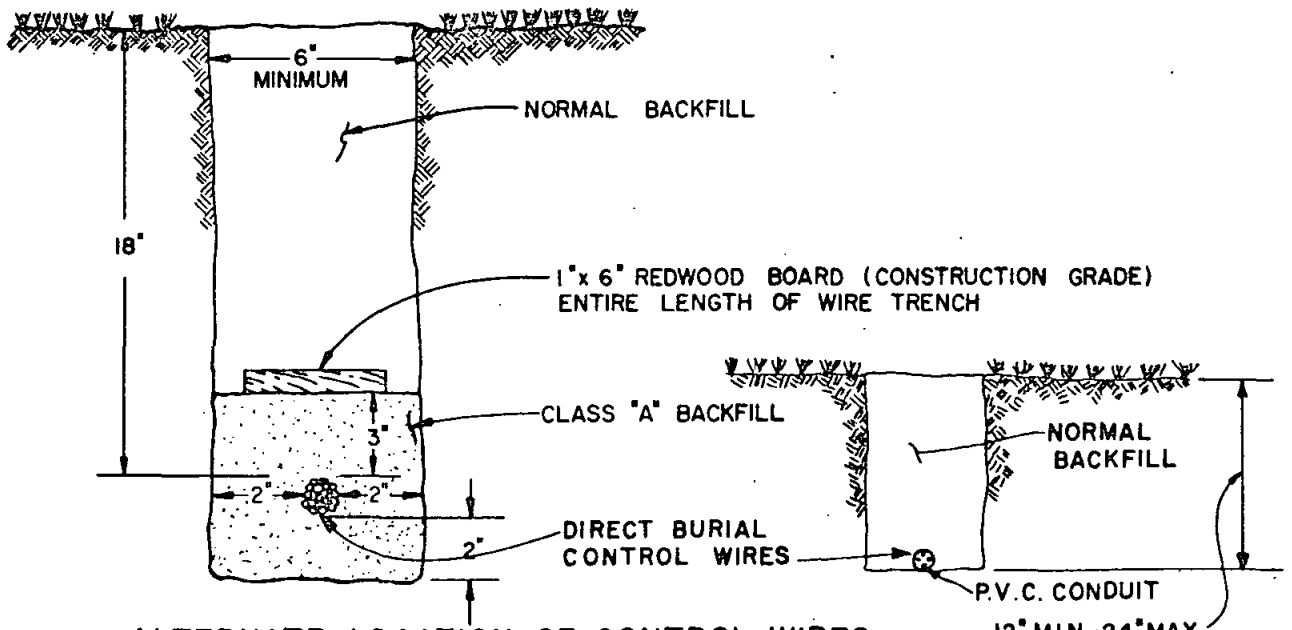
ALTERNATE LOCATION OF CONTROL WIRES

STD. SPEC. SEC.	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	BEDDING MATERIAL	JSP	A. Kercheval	2/8/74
DRAWN BY J.M.M. CHECKED BY O.L.R.					
RECOMMENDED BY A.P. Secor	DIRECT BURIAL CONTROL WIRE & TRENCH DETAIL	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER	706-1T		
DATE: 2-25-74					



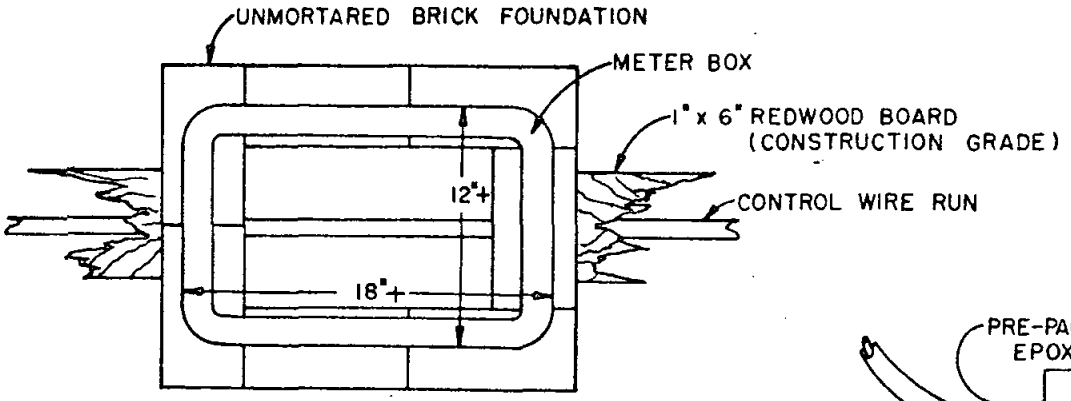
NORMAL LOCATION OF CONTROL WIRES

SEE IRRIGATION SPECIFICATIONS FOR ADDITIONAL INFORMATION ON TRENCH SIZE, BACK-FILL AND DIRECT BURIAL WIRE INSTALLATION.

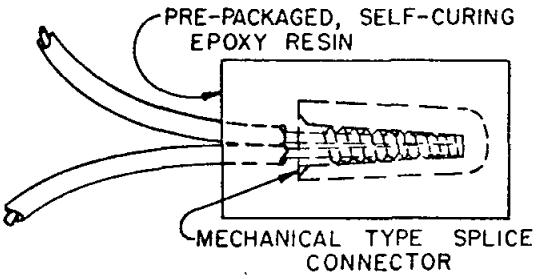


ALTERNATE LOCATION OF CONTROL WIRES

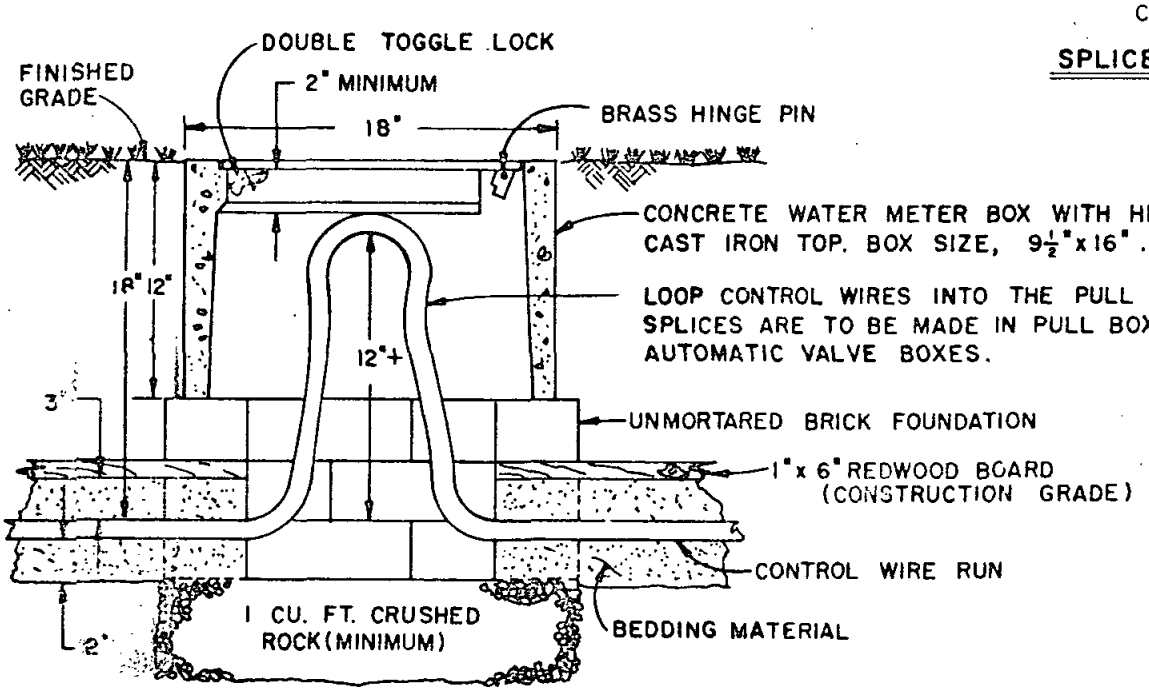
STD. SPEC. SEC.	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY M.M. CHECKED BY					
RECOMMENDED BY		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	DIRECT BURIAL CONTROL WIRE & TRENCH DETAIL	SCALE: NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER		706-T	
DATE: 7-25-72					



PLAN VIEW



SPLICE DETAIL



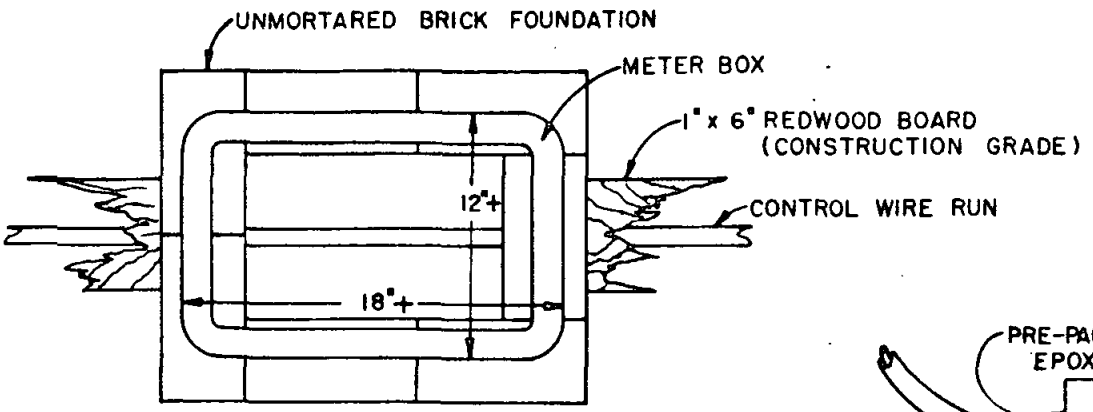
ELEVATION

NOTES:

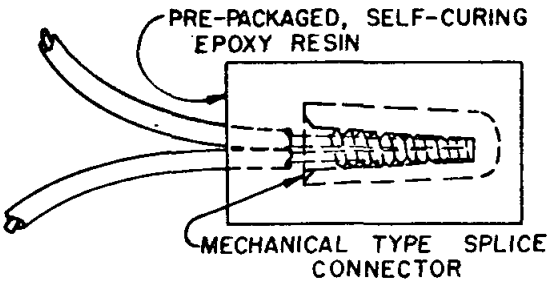
1. INSTALL PULL BOXES AS SHOWN ON THE PLANS.
2. AT JUNCTIONS WHERE RUNS COMBINE, SPLICE COMMON GROUND IN PULL BOX.
3. PULL BOX COVER SHALL BE PERMANENTLY MARKED "ELECTRIC".
4. CONDUCTORS FOR EACH CONTROLLER CLOCK SHALL BE HARNESSED SEPARATELY AND AT SUFFICIENT INTERVALS TO MAINTAIN A DEFINITE BUNDLE.

SYMBOL: P.B.

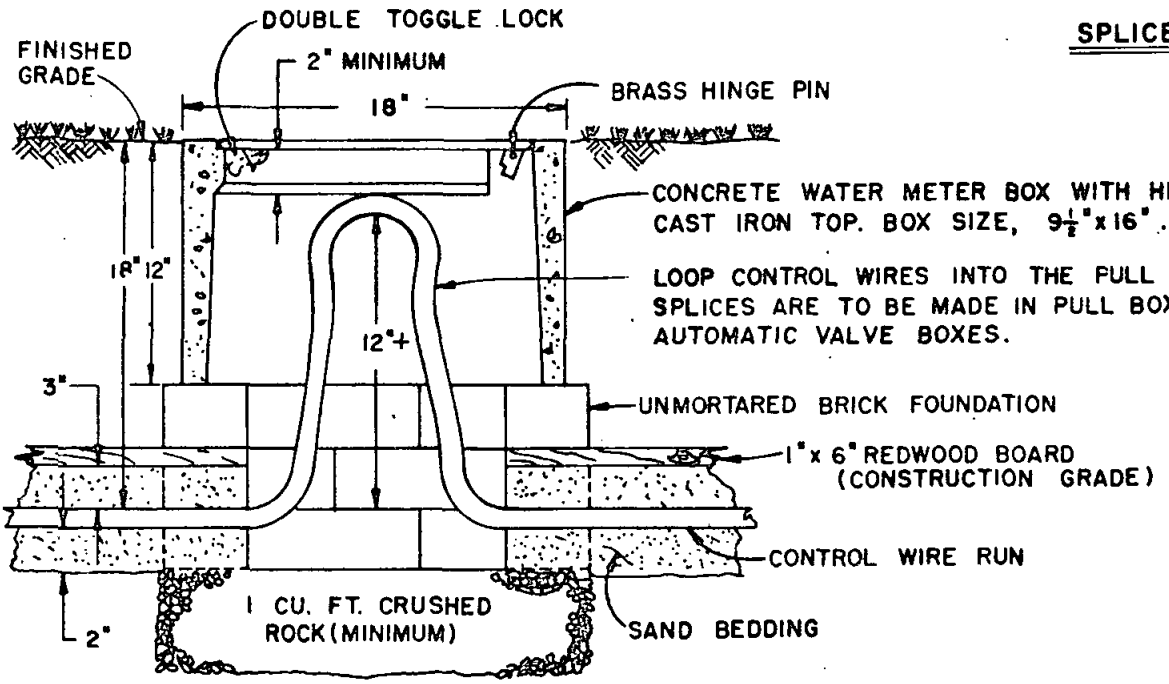
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT	Class "A" Backfill	O.K.	2-23	5/31/73
DRAWN BY: JMM CHECKED BY: OK	STANDARD DRAWING	BEDDING MATERIAL	J.E.B.	O. Eschenbrenner	2/1/74
RECOMMENDED BY: W.H. Severn		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	ELECTRICAL PULL BOX FOR DIRECT BURIAL CONTROL WIRES & SPLICE DETAIL	SCALE: NONE			
K.M. Taylor R.C.E. 11458		DRAWING NUMBER	707-2T		
DATE: 7-25-72					



PLAN VIEW



SPLICE DETAIL



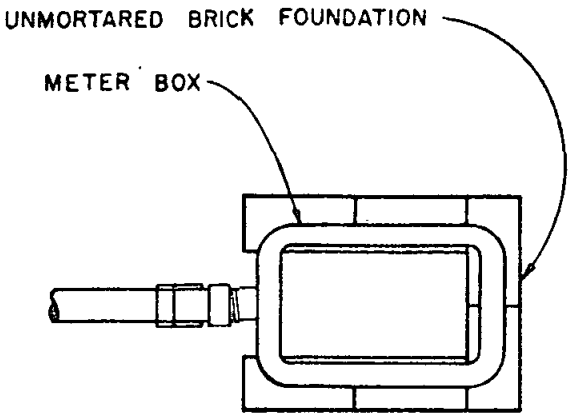
ELEVATION

NOTES:

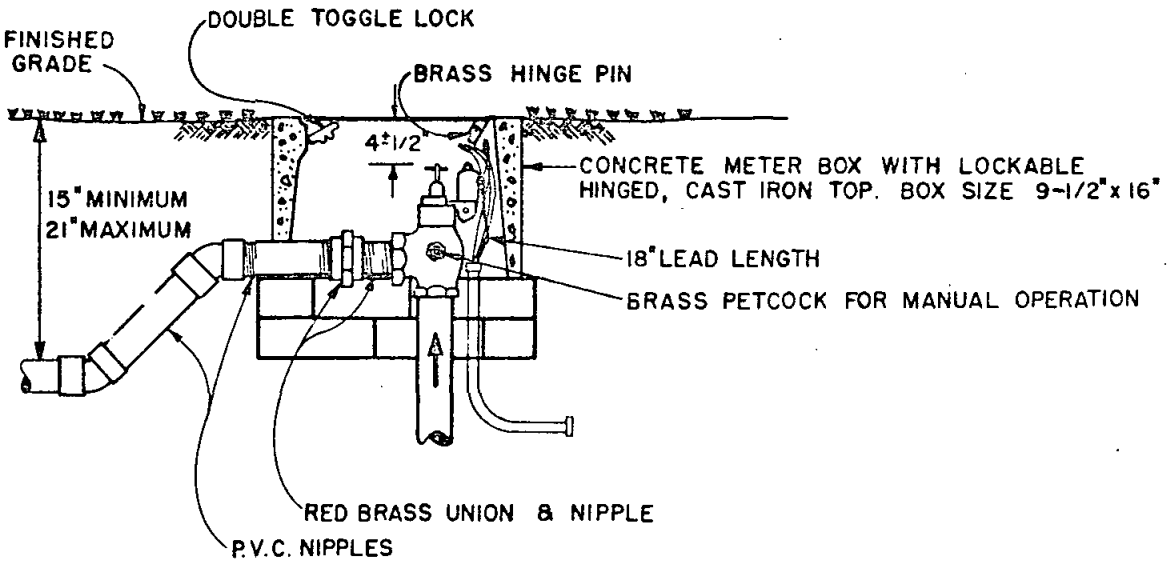
1. INSTALL PULL BOXES AS SHOWN ON THE PLANS.
2. AT JUNCTIONS WHERE RUNS COMBINE, SPLICE COMMON GROUND IN PULL BOX.
3. PULL BOX COVER SHALL BE PERMANENTLY MARKED "ELECTRIC".
4. CONDUCTORS FOR EACH CONTROLLER CLOCK SHALL BE HARNESSED SEPARATELY AND AT SUFFICIENT INTERVALS TO MAINTAIN A DEFINITE BUNDLE.

SYMBOL: —— P.B. ——

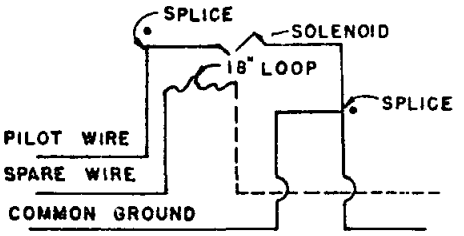
STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT				
DRAWN BY JAM CHECKED BY AG	STANDARD DRAWING				
RECOMMENDED BY W.P. Seeon	ELECTRICAL PULL BOX FOR DIRECT BURIAL CONTROL WIRES & SPLICE DETAIL	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 707-T			
DATE: 7-25-72					



PLAN VIEW



ELEVATION

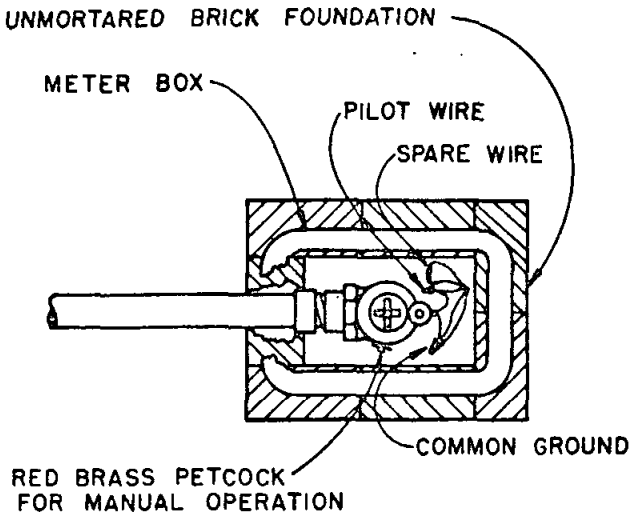


TYPICAL ELEMENTARY DIAGRAM FOR WIRING ELECTRIC AUTOMATIC CONTROL VALVE

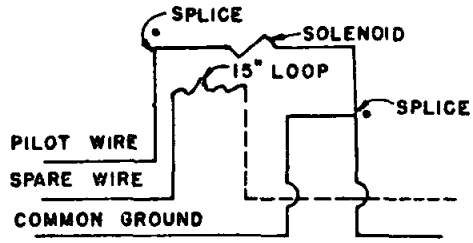
NOTE: NO SPLICING SHALL BE MADE OUTSIDE OF THE VALVE BOX EXCEPT THAT MADE IN A PULL-BOX (SEE STD. DWG. 707).

SYMBOL: ▽ A.V. No.____

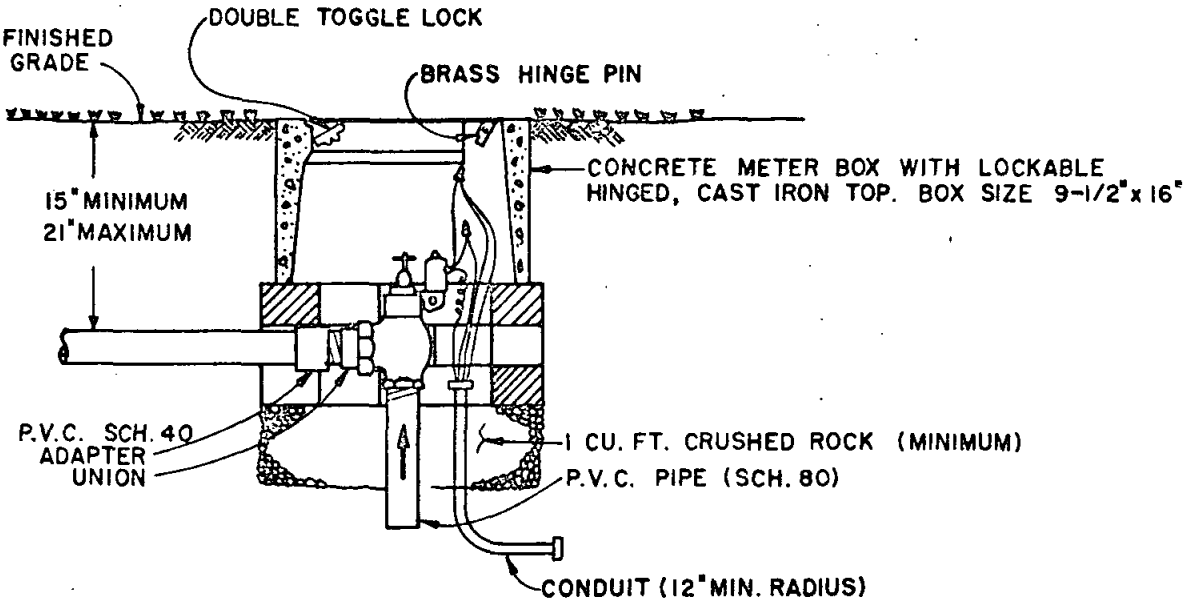
STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Position of Valve	OLO	[illegible]	1/31/73
DRAWN BY [illegible] CHECKED BY [illegible]					
RECOMMENDED BY [illegible]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	AUTOMATIC CONTROL VALVE — — ELECTRIC (ANGLE VALVE)	SCALE: NONE			
[illegible] R.C.E. 11458		DRAWING NUMBER 708-T-1			
DATE: 7-25-72					



PLAN VIEW



TYPICAL ELEMENTARY DIAGRAM FOR WIRING
ELECTRIC AUTOMATIC CONTROL VALVE

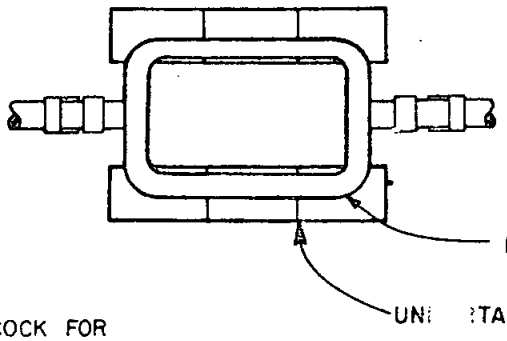


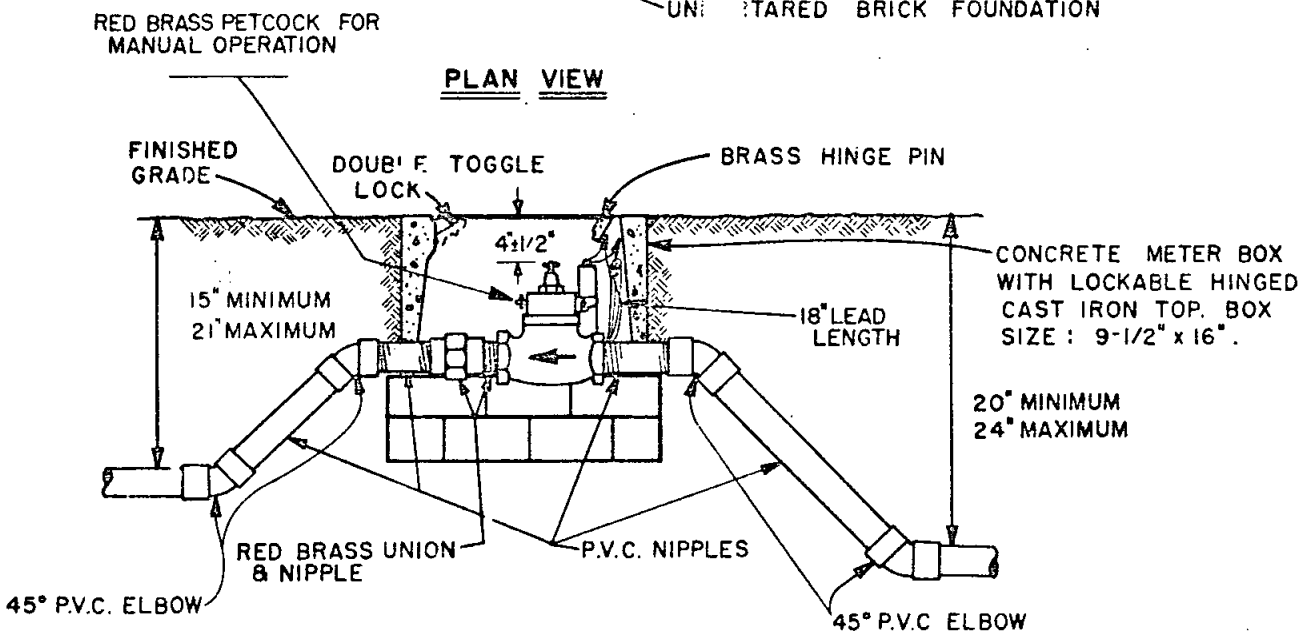
ELEVATION

NOTE: NO SPLICING SHALL BE MADE OUTSIDE OF THE VALVE BOX EXCEPT THAT MADE IN A PULL-BOX (SEE STD. DWG. 707).

SYMBOL: A.V. No.____

STD. SPEC. SEC. :	SAN DIEGO COUNTY ENGINEER DEPARTMENT				
DRAWN BY [illegible] CHECKED BY [illegible]	STANDARD DRAWING				
RECOMMENDED BY [illegible]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	AUTOMATIC CONTROL VALVE — — ELECTRIC (ANGLE VALVE)	SCALE: NONE			
[illegible] R.C.E. 11458.		DRAWING NUMBER		708-T	
DATE: 7-25-58					



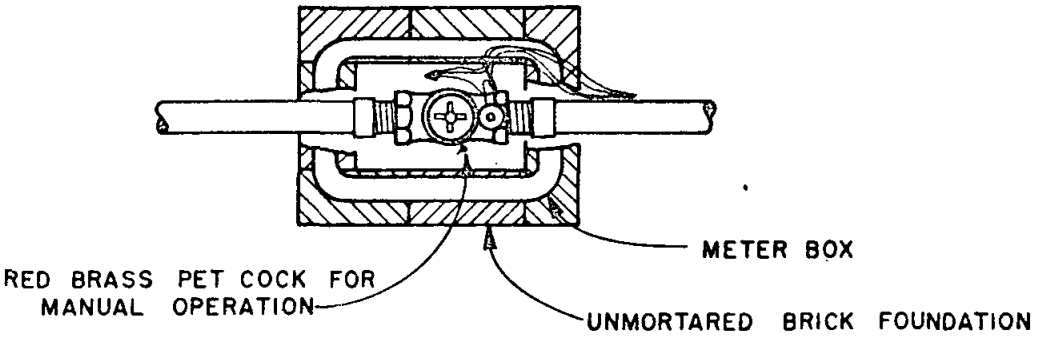


ELEVATION

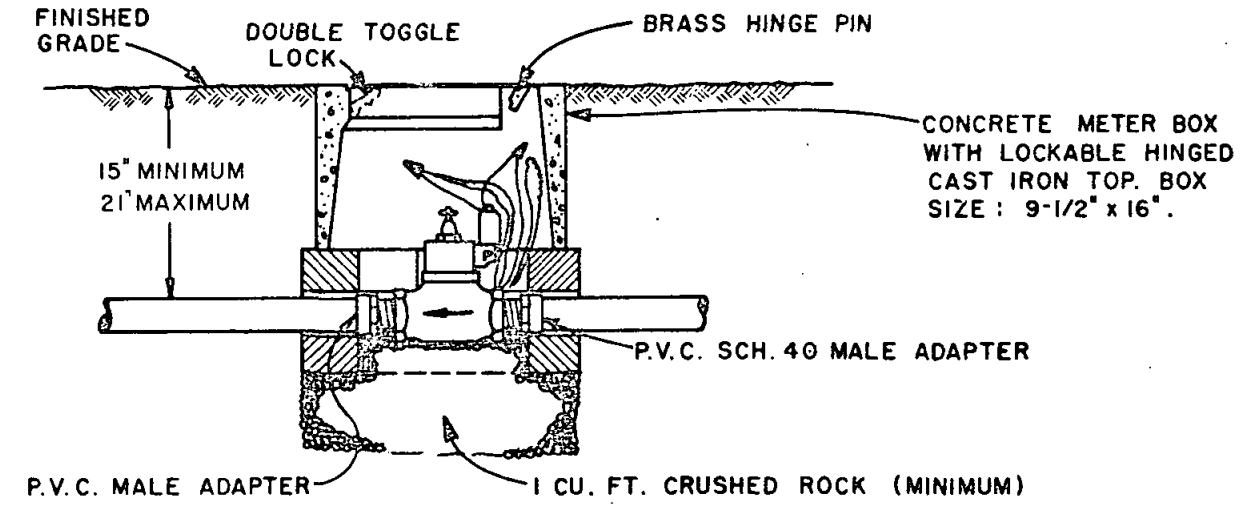
NOTE: SEE STD. DWG. NO. 708 FOR ELEMENTARY WIRING DIAGRAM & ADDITIONAL NOTES

SYMBOL: ▽ A.V. Nº ___

STD. SPEC. SEC. ___	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Location of Valve | MO | ... | ...
DRAWN BY [illegible] CHECKED BY [illegible]		
RECOMMENDED BY [illegible]	AUTOMATIC CONTROL VALVE — ELECTRIC (GLOBE VALVE)	REVISION | BY | APPROVED | DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 709-T-1
DATE 7-25-72		



PLAN VIEW

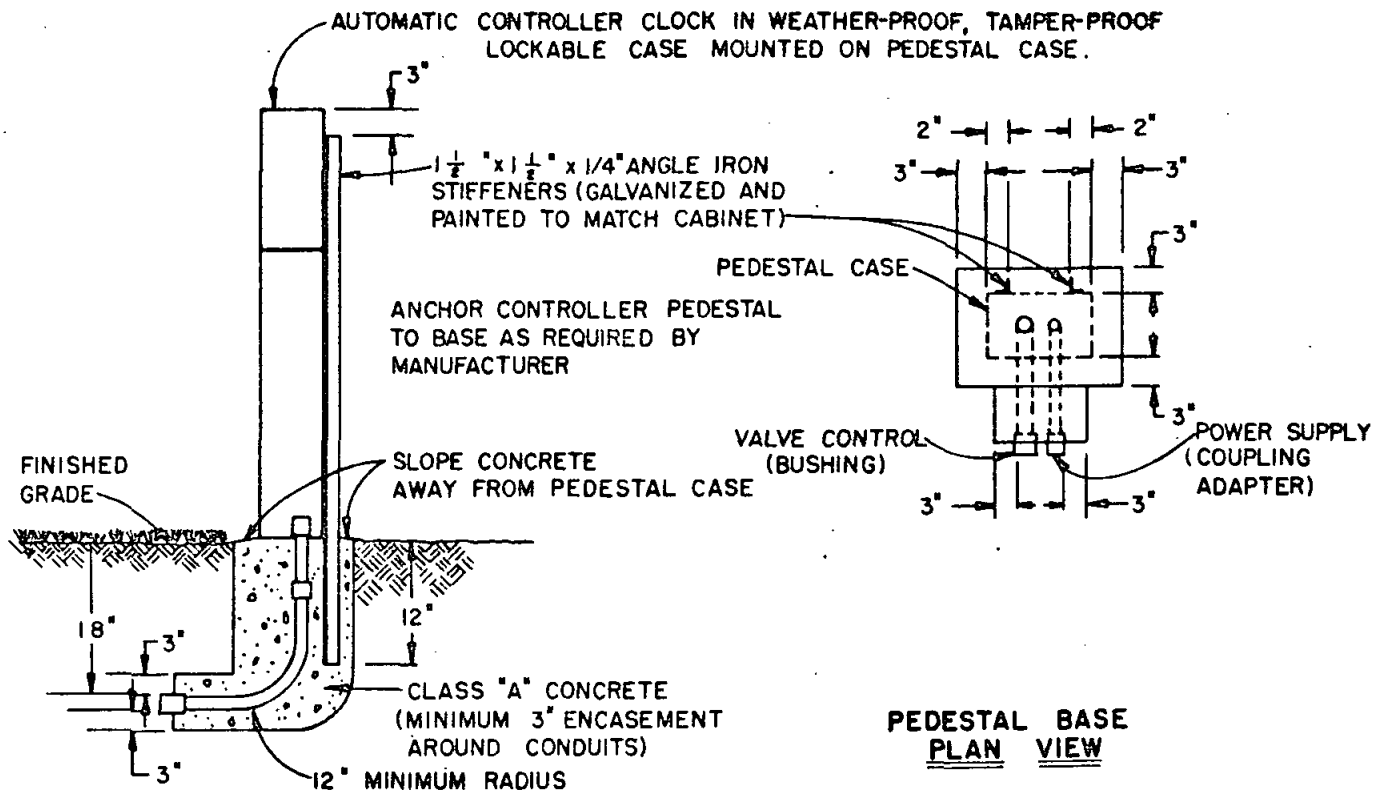


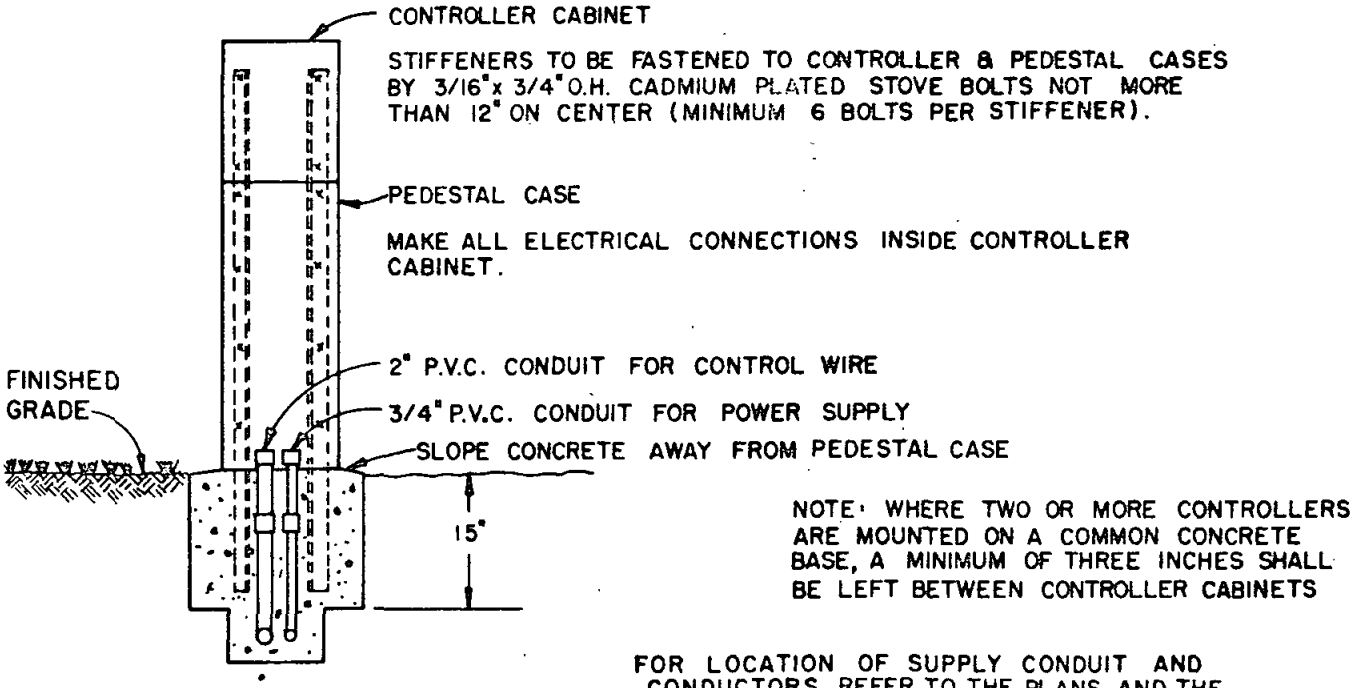
ELEVATION

NOTE: SEE STD. DWG. NO. 708 FOR ELEMENTARY WIRING DIAGRAM & ADDITIONAL NOTES

SYMBOL: ▽ A.V. Nº —

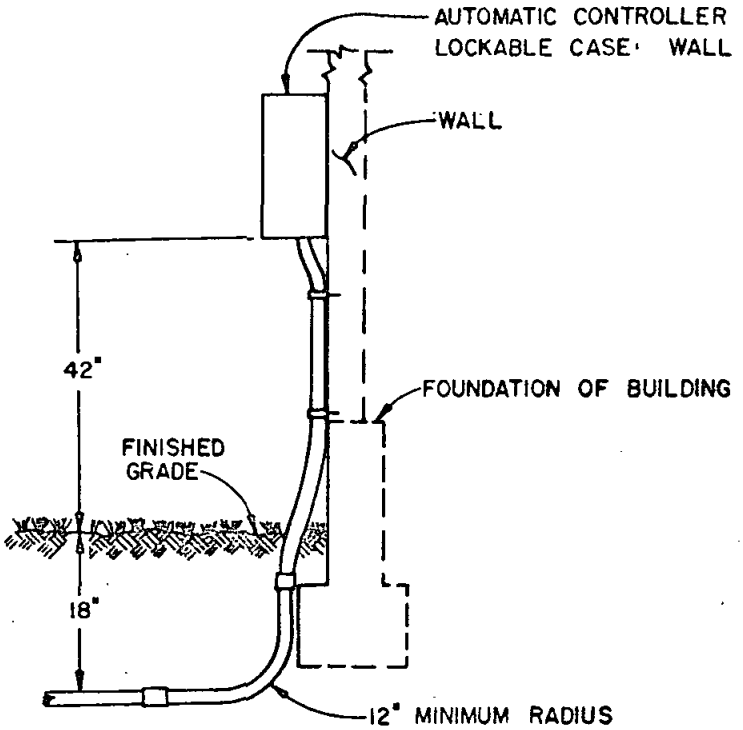
STD. SPEC. SEC.	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY JMM CHECKED BY MB					
RECOMMENDED BY W.P. Keen	AUTOMATIC CONTROL VALVE— ELECTRIC (GLOBE VALVE)	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 709-T			
DATE 7-25-72					



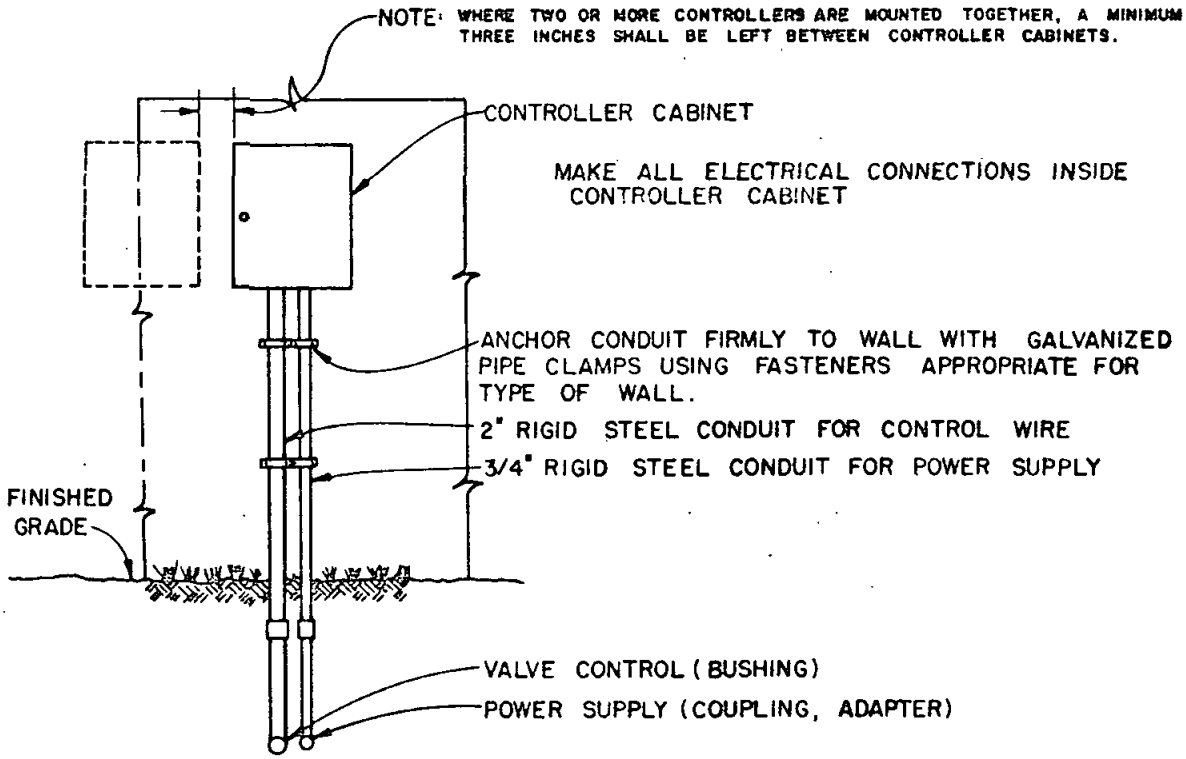


SYMBOL: ☒P

STD. SPEC. SEC.	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	
DRAWN BY JMM CHECKED BY MG		REVISION / BY / APPROVED / DATE
RECOMMENDED BY W P Sloan	ELECTRIC CONTROLLER CLOCK PEDESTAL MOUNTING	SCALE: NONE
APPROVED BY COUNTY ENGINEER		DRAWING NUMBER 710-T
H. Ray Taylor R.C.E. 11458		
DATE: 7-2-72		



SIDE VIEW

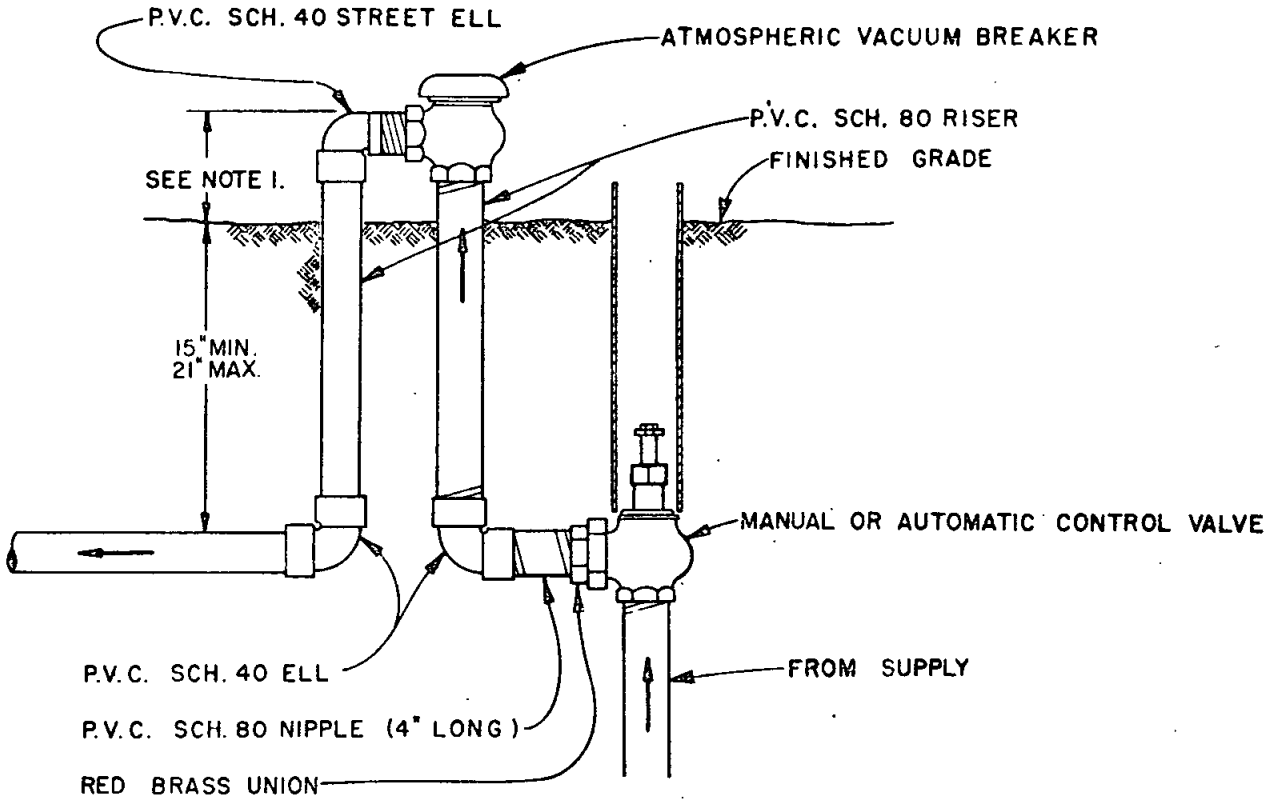


FRONT VIEW

FOR LOCATION OF SUPPLY CONDUIT & CONDUCTOR, REFER TO THE PLANS & THE SAN DIEGO COUNTY ELECTRICAL CODE

SYMBOL: ☒ W

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT				
DRAWN BY EMM CHECKED BY [illegible]	STANDARD DRAWING				
RECOMMENDED BY [signature]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	ELECTRIC CONTROLLER CLOCK WALL MOUNTING	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER	711-T		
DATE: 1-25-72					



NOTE:

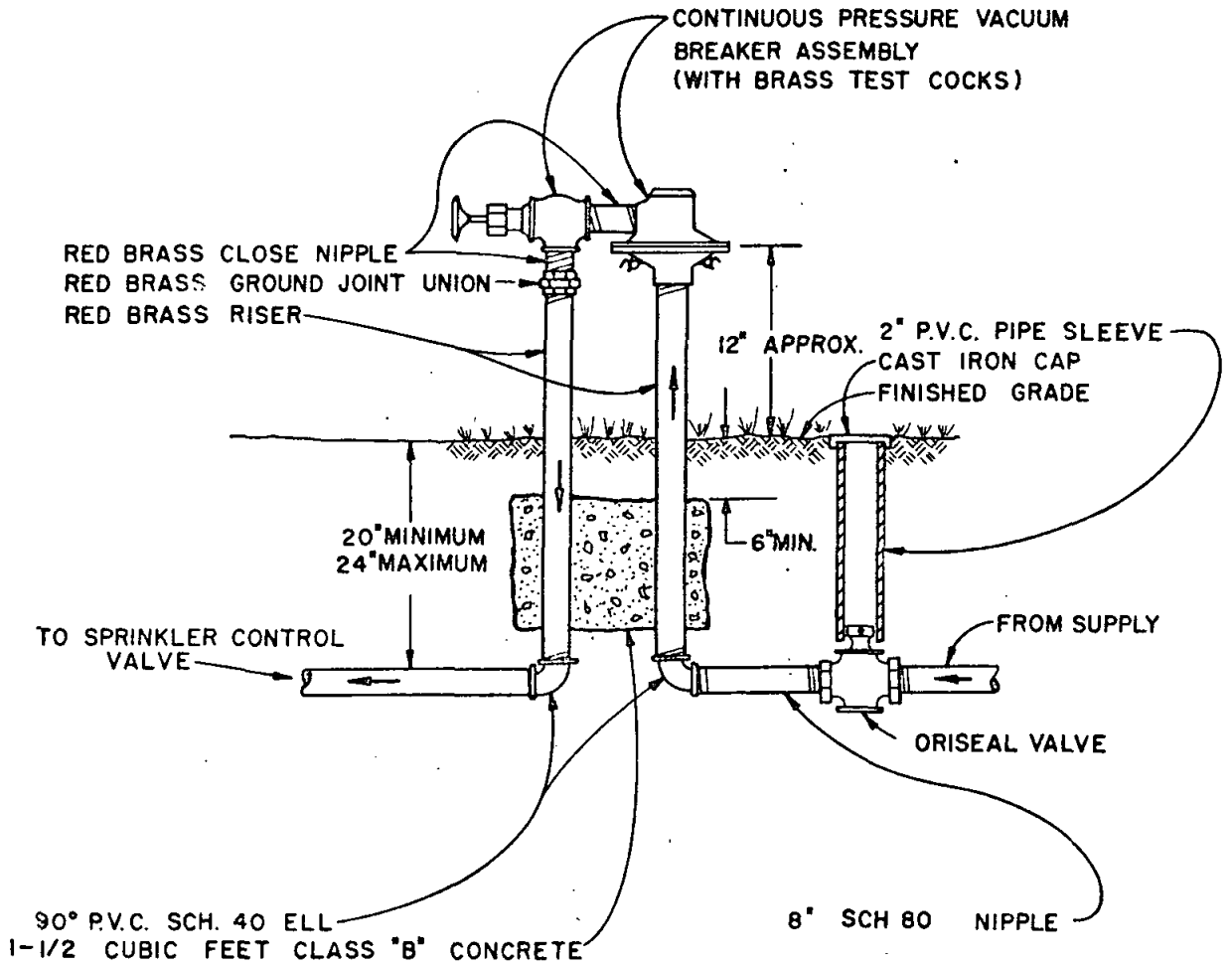
1. ATMOSPHERIC VACUUM BREAKERS SHALL BE INSTALLED APPROX. 6" ABOVE THE FINISHED GRADE AND ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.

2. ALL FITTINGS INCLUDING THE ATMOSPHERIC VACUUM BREAKER SHALL NOT BE OF SMALLER SIZE THAN THE VALVE.

3. FOR USE ON LINES 2 INCHES AND SMALLER.

SYMBOL: Ⓐ A.V.B.

STD. SPEC. SEC.	SAN DIEGO COUNTY ENGINEER DEPARTMENT				
DRAWN BY M.M. CHECKED BY	STANDARD DRAWING				
RECOMMENDED BY W.P. Secor		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	ATMOSPHERIC VACUUM BREAKER	SCALE: NONE			
M.M. Taylor R.C.E. 11458	(TYPE I BACKFLOW PROTECTION)	DRAWING NUMBER	712-T		
DATE: 7-25-72					

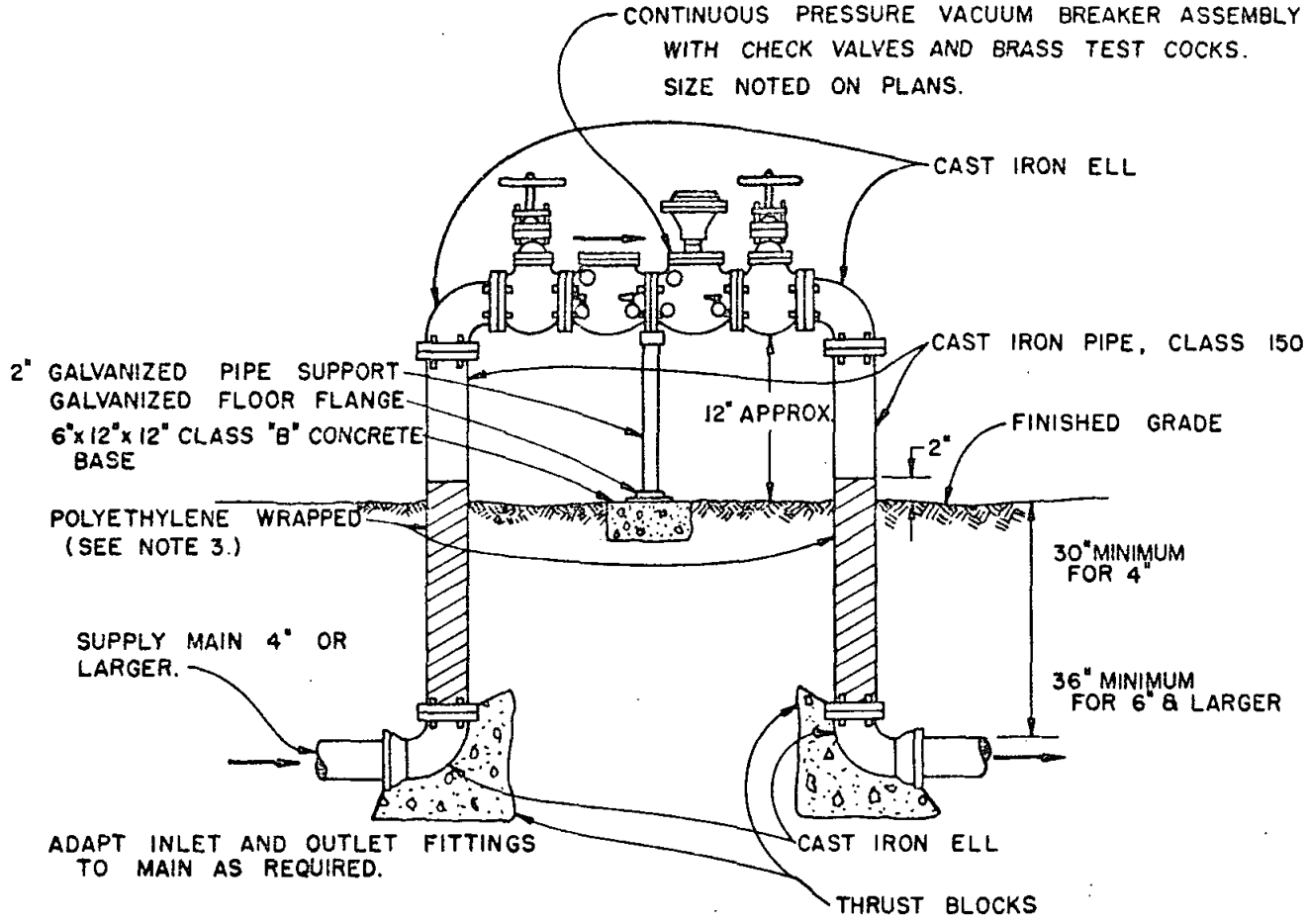


1. PRESSURE VACUUM BREAKERS SHALL BE INSTALLED ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.

2. FOR USE ON LINES TWO INCHES AND SMALLER.

SYMBOL: (V) P.V.B.

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT				
DRAWN BY J.M.M. CHECKED BY [illegible]	STANDARD DRAWING				
RECOMMENDED BY [signature]	CONTINUOUS PRESSURE VACUUM BREAKER ASSEMBLY (TYPE II BACKFLOW PROTECTION)	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
[signature] R.C.E. 11456		DRAWING NUMBER	713-T		
DATE: 1-24-78					

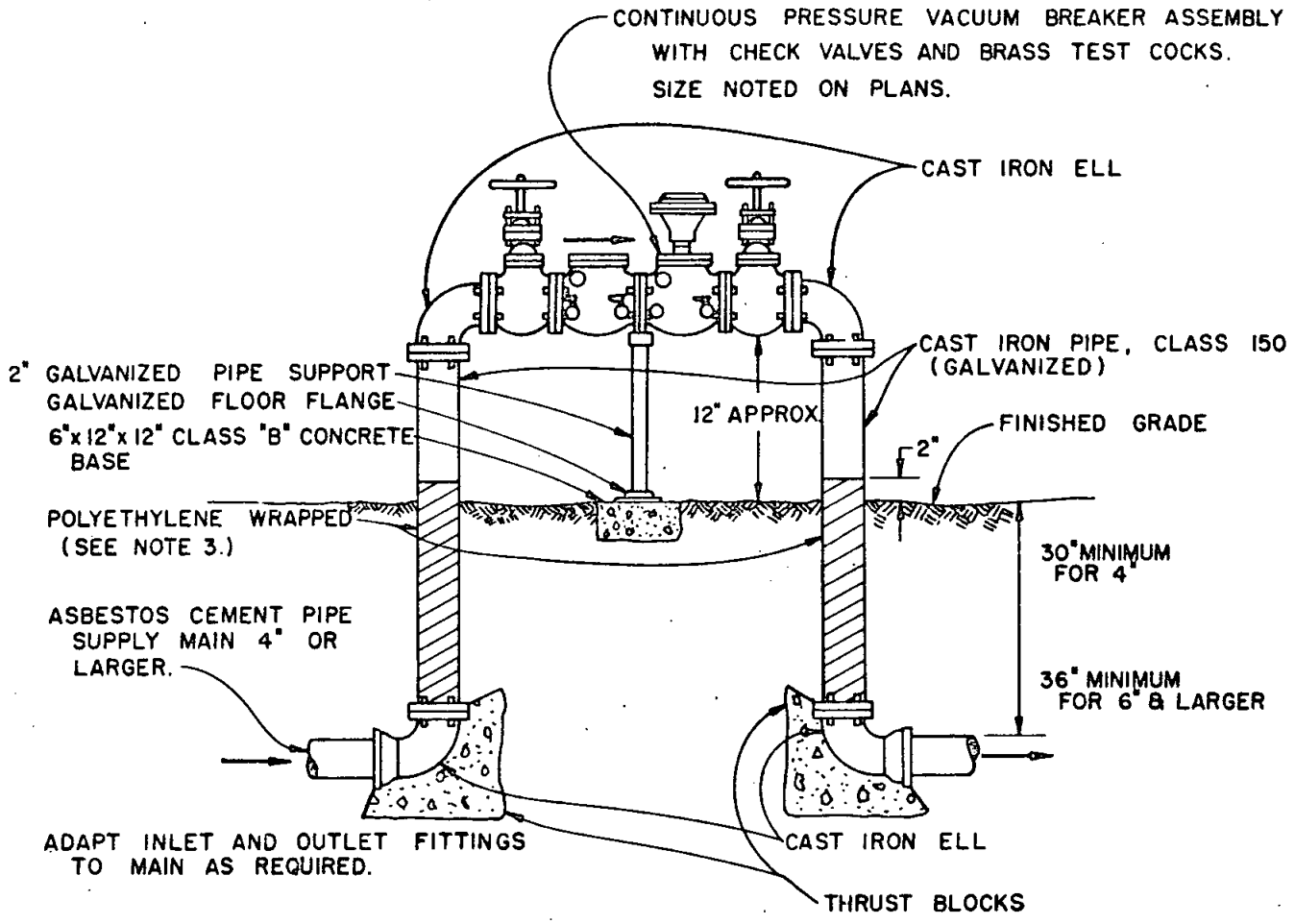


NOTES:

1. ALL FITTINGS ON ASSEMBLY SHALL BE FLANGED.
2. CAST IRON PIPE SHALL BE POLYETHYLENE WRAPPED.
3. CAST IRON PIPE AND FITTINGS SHALL BE CEMENT LINED.
4. PRESSURE VACUUM BREAKER ASSEMBLY SHALL BE INSTALLED ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.
5. FOR USE ON LINES FOUR INCHES AND LARGER.

SYMBOL: ⊗⊘⊘⊗

STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	Delete Galv.	NO	[illegible]	[illegible]
DRAWN BY: [illegible] CHECKED BY: [illegible]					
RECOMMENDED BY: [illegible]	CONTINUOUS PRESSURE VACUUM BREAKER ASSEMBLY WITH CHECK VALVES (TYPE III BACKFLOW PROTECTION)	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
[illegible] R.C.E. 11458		DRAWING NUMBER	714-T-1		
DATE: [illegible]					

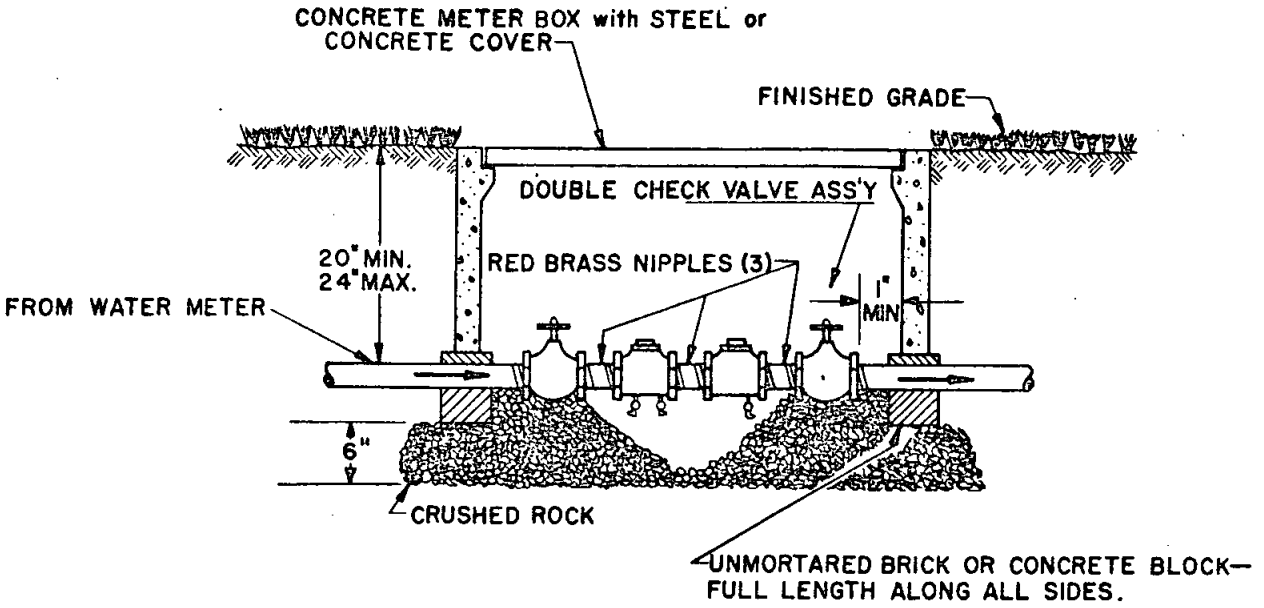


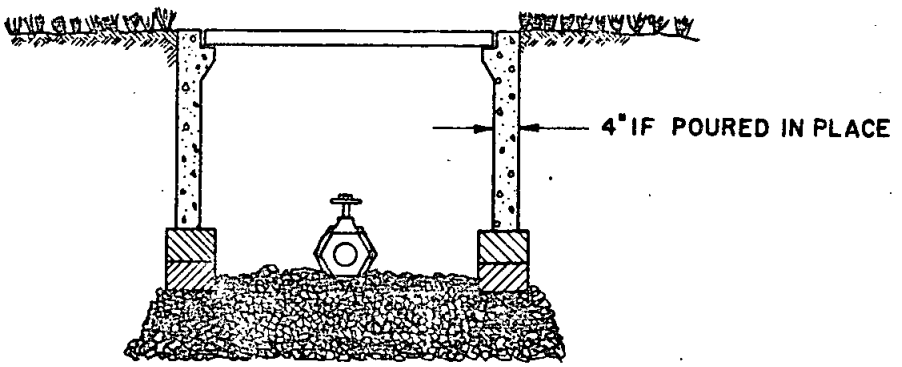
NOTES:

1. ALL FITTINGS ON ASSEMBLY TO BE FLANGED
2. PIPE SUPPORT, CAST IRON PIPE AND FITTINGS TO BE GALVANIZED.
3. CAST IRON PIPE SHALL BE POLYETHYLENE WRAPPED.
4. CAST IRON PIPE AND FITTINGS SHALL BE CEMENT LINED.
5. PRESSURE VACUUM BREAKER ASSEMBLY SHALL BE INSTALLED ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.
6. FOR USE ON LINES FOUR INCHES AND LARGER.

SYMBOL: ⊗⊘⊘⊗

STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY: P.M.M. CHECKED BY: MG					
RECOMMENDED BY: W.P. Secor	CONTINUOUS PRESSURE VACUUM BREAKER ASSEMBLY WITH CHECK VALVES (TYPE III BACKFLOW PROTECTION)	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
H.M. Tauscher R.C.E. 11458		DRAWING NUMBER 714-T			
DATE: 1-26-72					



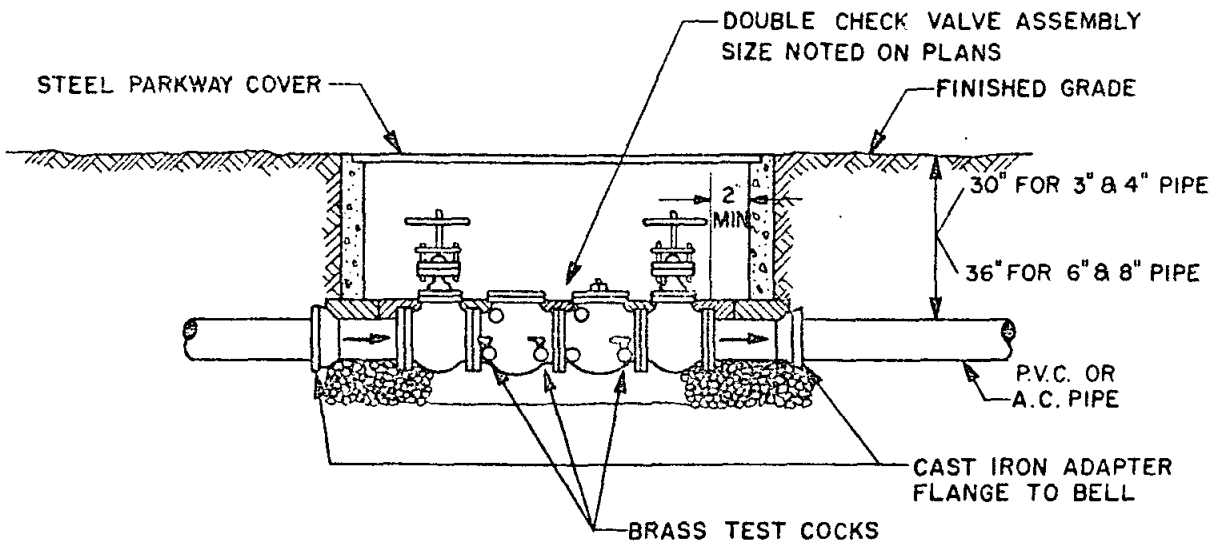


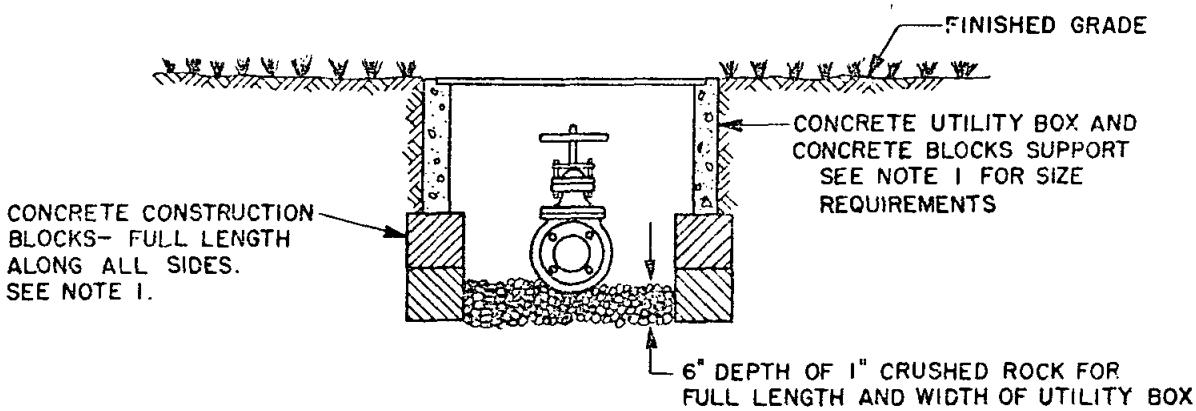
NOTES:

1. NOT FOR USE IN TRAFFIC AREAS.
2. FOR USE ON WATER MAINS OF ALL SIZES.

SYMBOL:

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	
DRAWN BY JMM CHECKED BY RG		
RECOMMENDED BY W. P. Seeor	DOUBLE CHECK VALVE ASSEMBLY (TYPE IV BACKFLOW PROTECTION)	REVISION / BY / APPROVED / DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 715-T
DATE: 7-25-78		





NOTES:

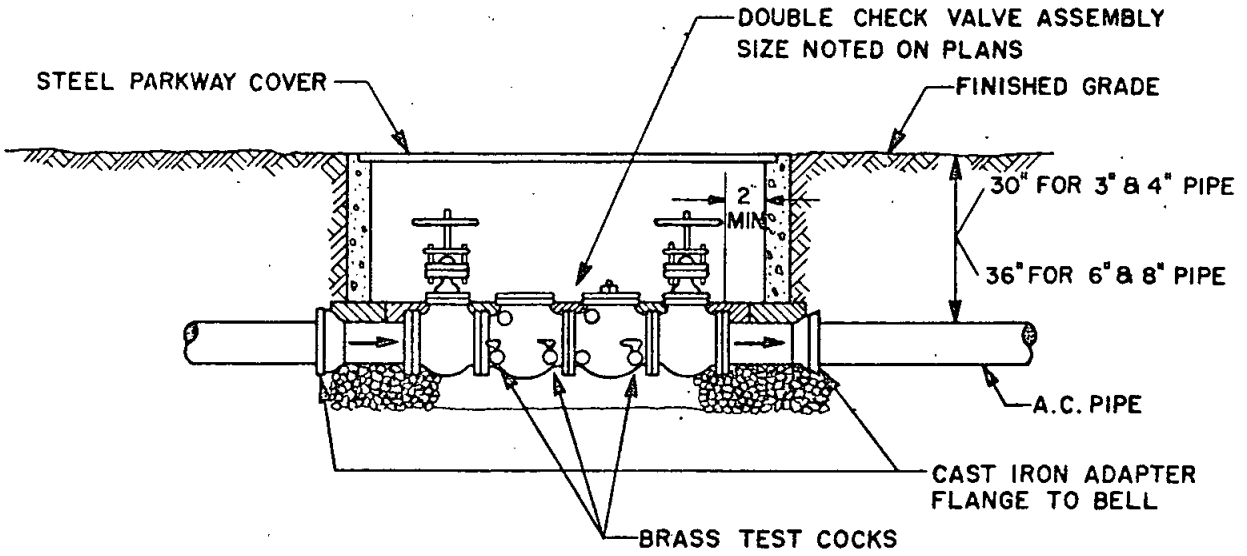
1. 3" & 4" PIPE: 2'-6" x 4'-0" UTILITY BOX WITH 4" WALLS.
   6" & 8" PIPE: 3'-2" x 6'-0" UTILITY BOX WITH 4" WALLS.

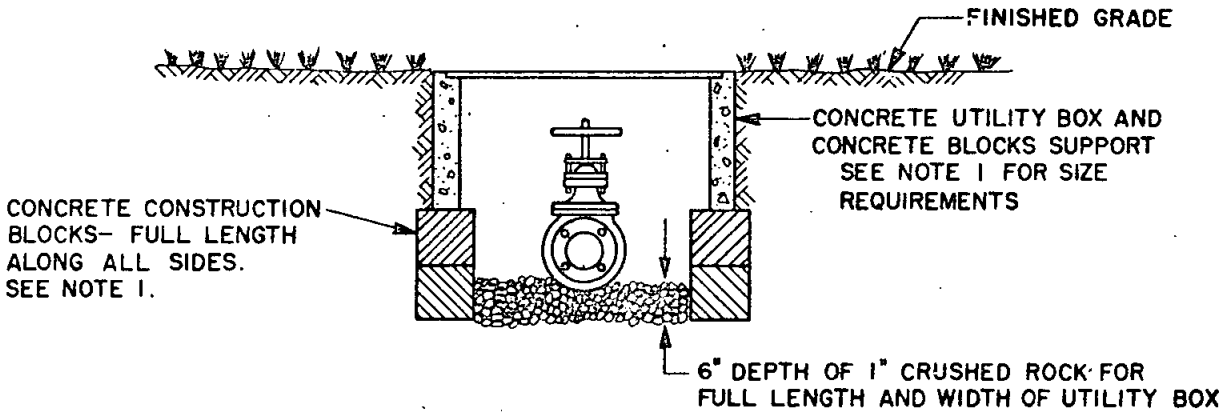
2. NOT FOR USE IN TRAFFIC AREAS.

3. FOR USE ON WATER MAINS 3" OR LARGER.

SYMBOL:

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING	AC or PVC Service	
DRAWN BY [illegible] CHECKED BY [illegible]			
RECOMMENDED BY [illegible]	DOUBLE CHECK VALVE ASSEMBLY P.V.C. or A.C. PIPE SERVICE (TYPE IV BACKFLOW PROTECTION)	REVISION / BY / APPROVED / DATE	
APPROVED BY COUNTY ENGINEER		SCALE: NONE	
[illegible] R.C.E. 11458		DRAWING NUMBER	716-T-1
DATE: 7-25-78			





NOTES:

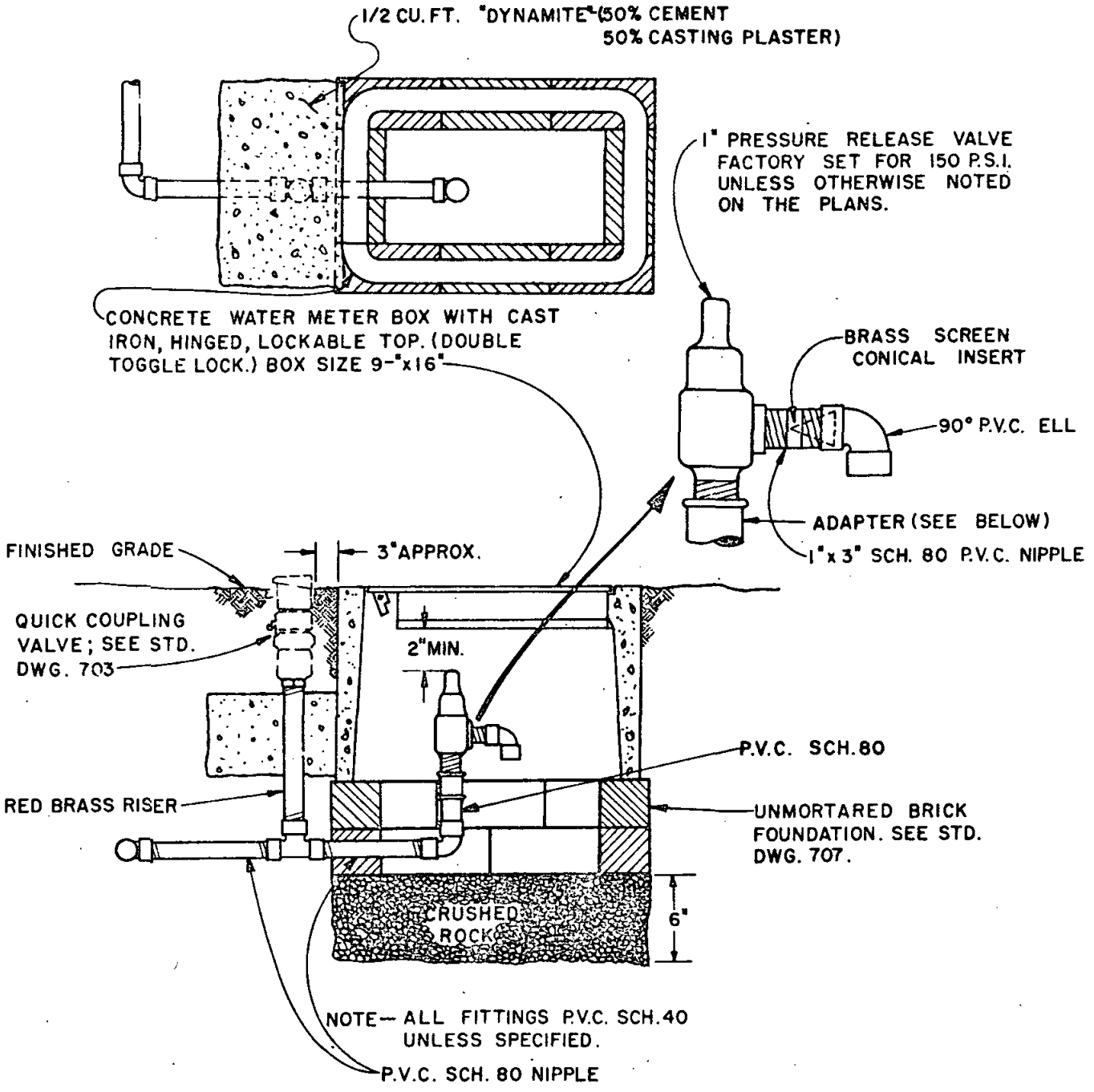
1. 3" & 4" PIPE: 2'-6"x 4'-0" UTILITY BOX WITH 4"WALLS.
   6" & 8" PIPE: 3'-2" x 6'-0" UTILITY BOX WITH 4" WALLS.

2. NOT FOR USE IN TRAFFIC AREAS.

3. FOR USE ON WATER MAINS OF ALL SIZES.

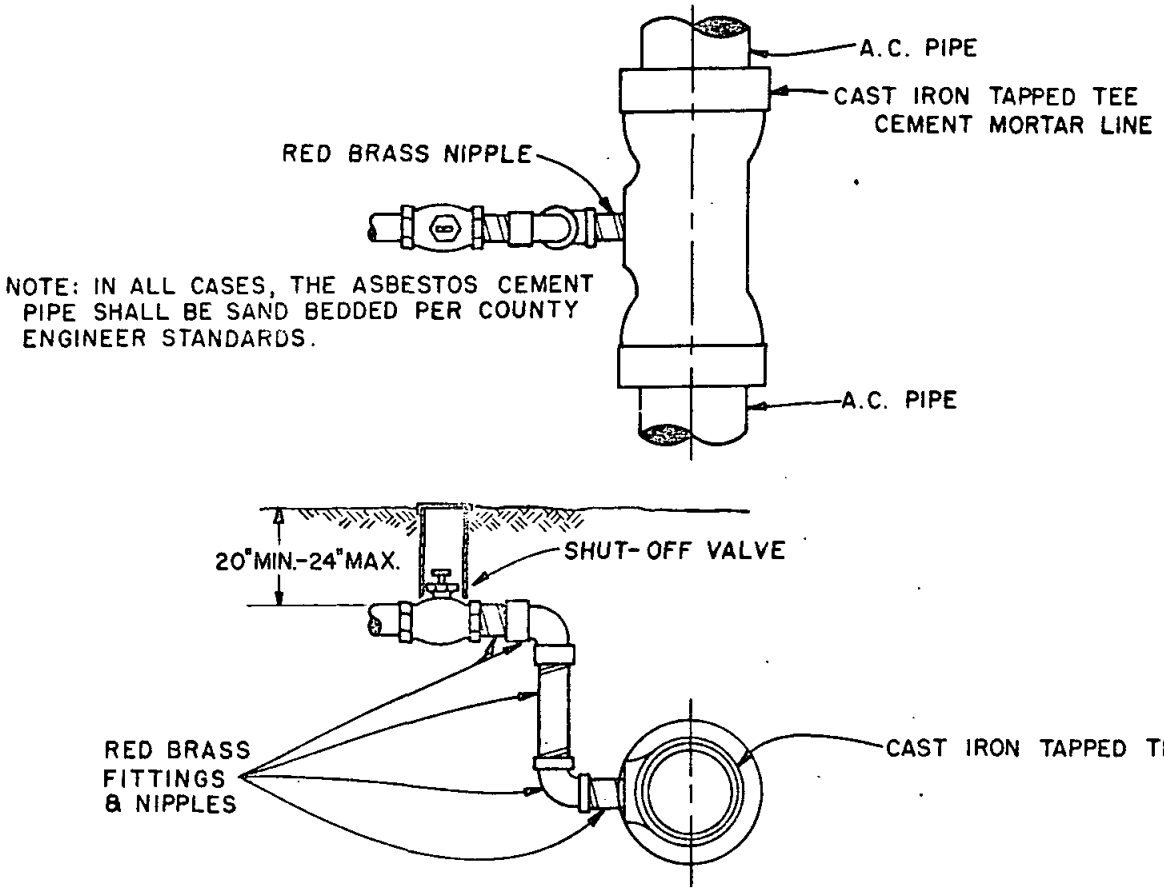
SYMBOL:

STD. SPEC. SEC:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY [illegible] CHECKED BY [illegible]					
RECOMMENDED BY [illegible]	DOUBLE CHECK VALVE ASSEMBLY A.C. PIPE SERVICE (TYPE IV BACKFLOW PROTECTION)	REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER		SCALE: NONE			
[illegible] R.C.E. 11458		DRAWING NUMBER	716-T		
DATE: 7-25-78					



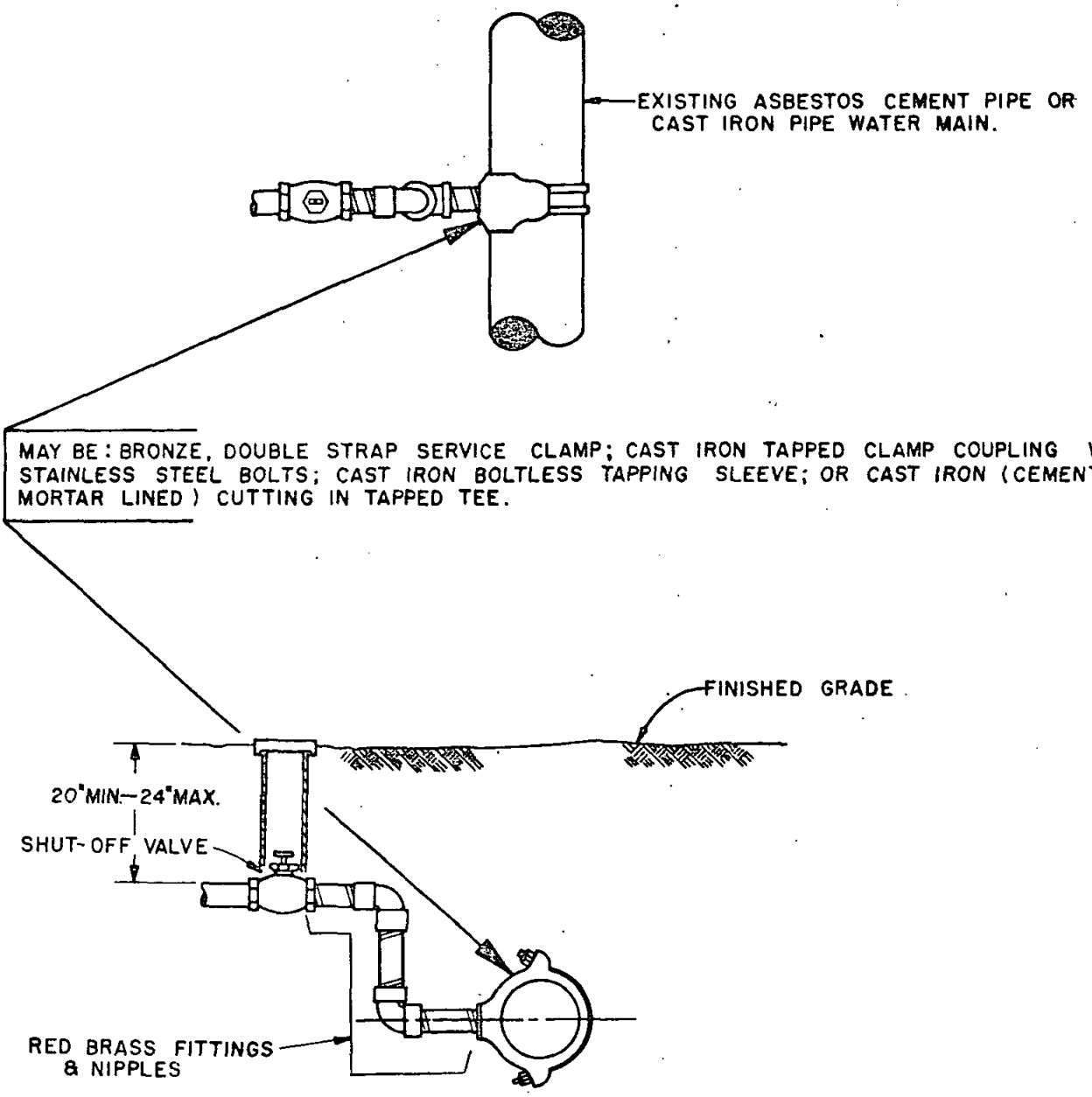
SYMBOL: Ⓥ P.R.V.

STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY: [illegible] CHECKED BY: [illegible]					
RECOMMENDED BY: [illegible]		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	PRESSURE RELIEF VALVE Installed with QUICK COUPLING VALVE	SCALE: NONE			
[illegible] R.C.E. 11458		DRAWING NUMBER	717-T		
DATE: 7-26-72					



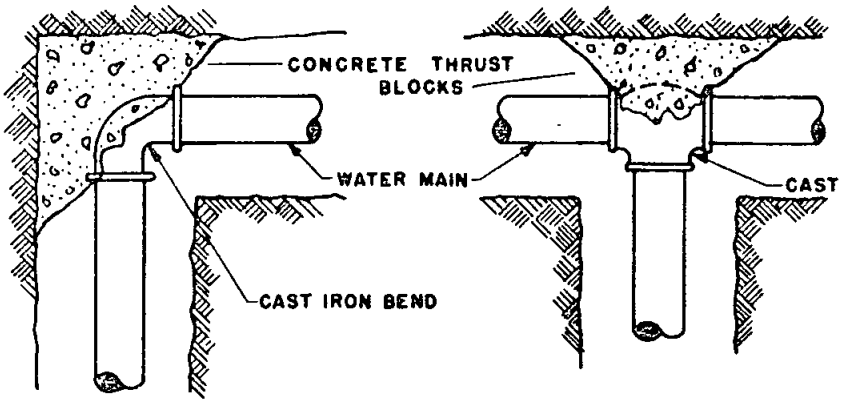
SYMBOL:

STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY: J.M.M. CHECKED BY: A.C.					
RECOMMENDED BY: A.P. Seeor		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONNECTION DETAIL FOR NEW ASBESTOS CEMENT WATER MAINS	SCALE: NONE			
H.M. Taylor R.C.E. 11458		DRAWING NUMBER 718-T			
DATE: 1-25-72					

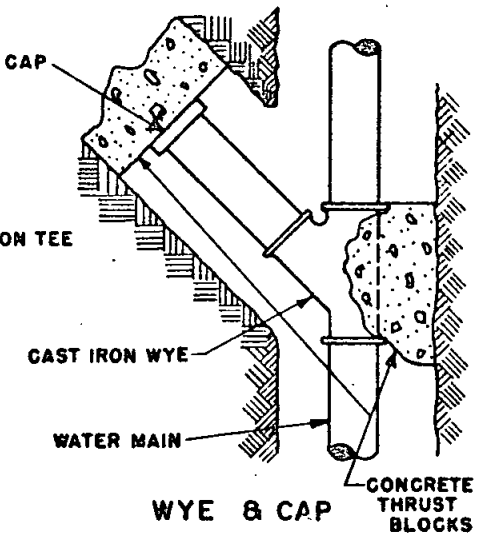


SYMBOL:

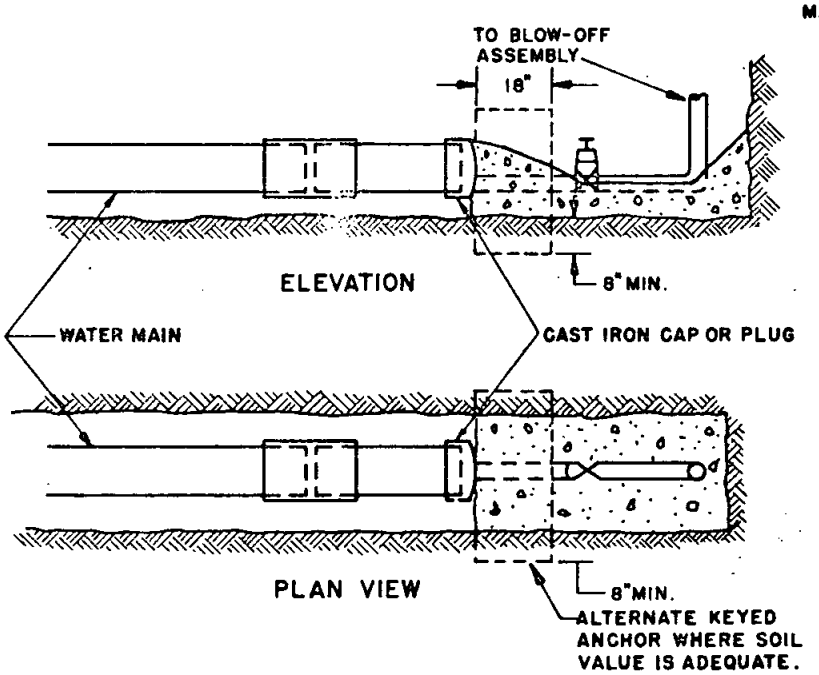
STD. SPEC. SEC.:	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY: J.M.M. CHECKED BY: G.G.					
RECOMMENDED BY: W. L. Seor		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONNECTION DETAIL FOR EXISTING WATER MAINS	SCALE NONE			
H. M. Taylor R.C.E. 11458		DRAWING NUMBER 719T			
DATE 7-25-72					



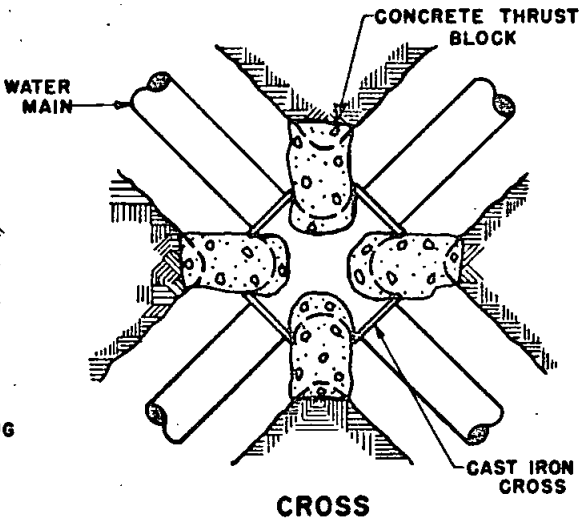
BEND TEE



WYE & CAP



BLOW-OFF



CROSS

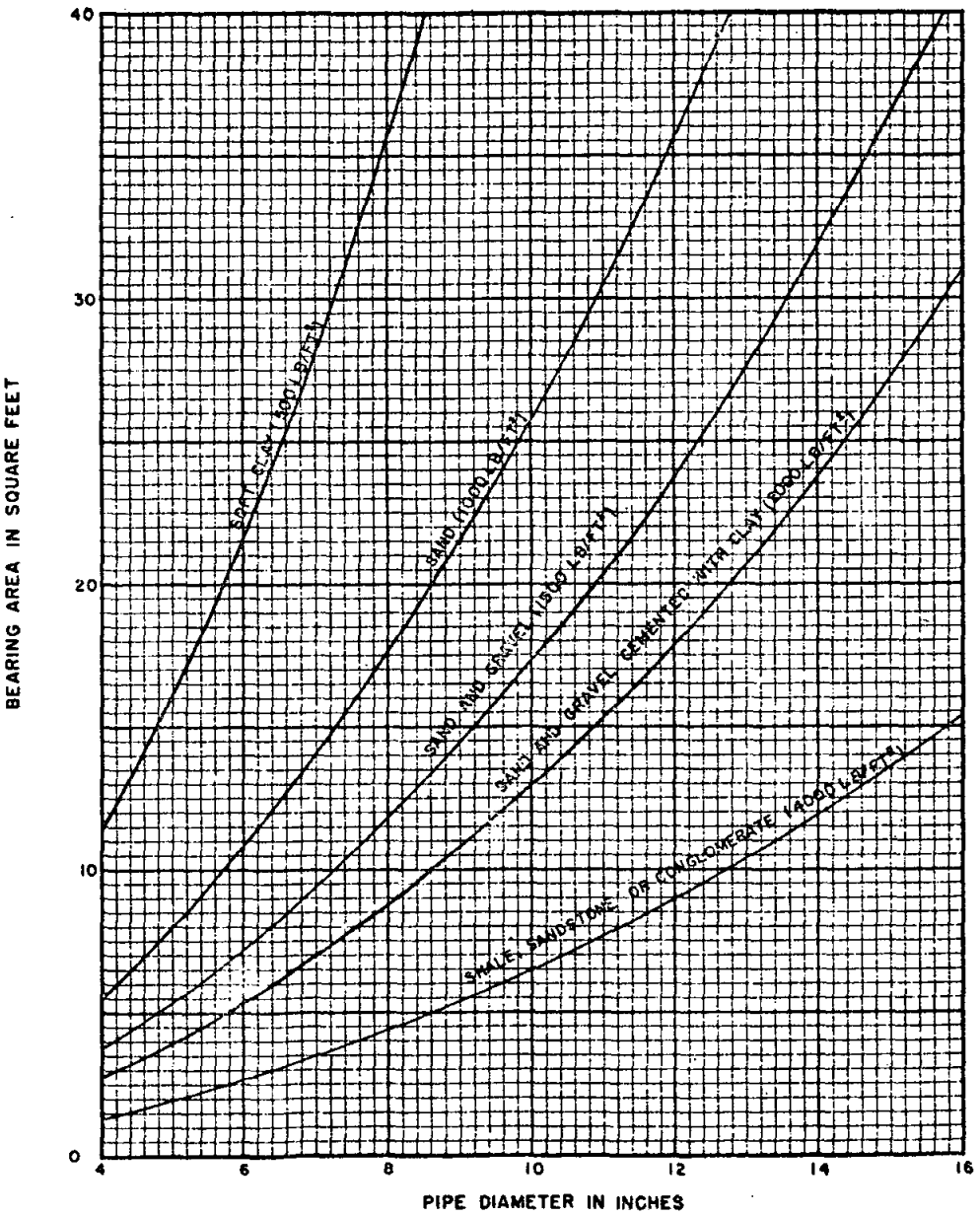
NOTES:

1. BEARING AREAS FOR THRUST BLOCKS SHALL DEPEND ON PRESSURE & PIPE SIZE. FOR BEARING AREAS SEE STD. DWG. 721 .
2. ALL CONCRETE FOR THRUST BLOCKS SHALL BE CLASS "B".
3. CONCRETE ANCHORS ARE TO BE KEPT CLEAR OF ALL PIPE & VALVE JOINTS.
4. THRUST BLOCKS ARE TO BE USED WHERE PIPE SIZES DIFFER IN CROSS AND WHEN ONE OR MORE OPENINGS ARE PLUGGED.

STD. SPEC. SEC. :	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY JMM CHECKED BY MC					
RECOMMENDED BY W P Seese		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONCRETE THRUST BLOCKS for CAST IRON FITTINGS	SCALE : NONE			
J M Taylor R.C.E. 11458		DRAWING NUMBER		720-T	
DATE 7-25-78					

NOTES:

1. BASED ON 225 PSI TEST PRESSURE AND BEARING VALUES OF DRY SOILS.
2. VALUES FROM CURVES ARE FOR TEES & DEAD ENDS, i.e. STRAIGHT-LINE THRUST.
   FOR 90° BEND: 1.4 VALUE FROM CURVE.
   45° 0.8
   22½° 0.4
3. FOR CONDITIONS NOT COVERED BY CURVES, SPECIAL THRUST BLOCKS MUST BE COMPUTED & APPROVED BY THE COUNTY ENGINEER DEPARTMENT
4. THRUST BLOCKS DIMENSIONED ON PLANS ARE BASED ON 2000 LB/SQ.FT. BEARING VALUES, OR AS OTHERWISE NOTED.
5. FOR LOCATION OF THRUST BLOCKS SEE STD. DWG. 720.



STD. SPEC. SEC. :	SAN DIEGO COUNTY ENGINEER DEPARTMENT STANDARD DRAWING				
DRAWN BY JMM CHECKED BY CMB					
RECOMMENDED BY W.P. Seeman		REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER	CONCRETE THRUST BLOCKS BEARING AREAS	SCALE: NONE			
N.M. Taylor R.C.E. 11458		DRAWING NUMBER		721-T	
DATE: 7-25-72					