



SAN DIEGO AREA

**REGIONAL
STANDARD
DRAWINGS**

STANDARD DRAWINGS FOR AGENCIES IN THE SAN DIEGO REGION

Recommended by the Regional Standards Committee

Maintained and Published by the San Diego County

Department of Public Works

MAY, 1986

AMERICAN INSTITUTE OF ARCHITECTS
AMERICAN PUBLIC WORKS ASSOCIATION
ASSOCIATED GENERAL CONTRACTORS OF AMERICA
BUILDING CONTRACTORS ASSOCIATION
CALIF. COUNCIL OF CIVIL ENGINEERS & LAND SURVEYORS
CARLSBAD, CITY OF
CHULA VISTA, CITY OF
CORONADO, CITY OF
DEL MAR, CITY OF
EL CAJON, CITY OF

ENGINEERING & GENERAL CONTRACTORS ASSOCIATION
ESCONDIDO, CITY OF
HELIX WATER DISTRICT
IMPERIAL BEACH, CITY OF
LA MESA, CITY OF
LEMON GROVE, CITY OF
NATIONAL CITY, CITY OF
OCEANSIDE, CITY OF
OTAY MUNICIPAL WATER DISTRICT
PACIFIC TELEPHONE COMPANY

SAN DIEGO, CITY OF
SAN DIEGO, COUNTY OF
SAN DIEGO COUNTY ROCK PRODUCERS ASSOCIATION
SAN DIEGO GAS & ELECTRIC COMPANY
SAN MARCOS, CITY OF
SANTEE, CITY OF
VISTA, CITY OF
VISTA IRRIGATION DISTRICT

Regional Standards Committee

May 1986

These standard drawings have been adopted by the San Diego Regional Standards Committee for the benefit of all agencies in the San Diego area. The Regional Standards Committee membership is comprised of the County's sixteen cities, the County of San Diego, various representative districts and private industry organizations, the Pacific Telephone Company and the San Diego Gas and Electric Company as named above. The San Diego County Department of Public Works is currently providing coordination and staff support for the Regional Standards Committee.

REVISIONS

The Regional Standards Committee will continuously accept proposed revisions and/or proposed new standard drawings for review. They should be submitted to the Regional Standards staff at the Department of Public Works, County of San Diego, 5555 Overland Avenue, San Diego, California 92123, Attention Manoochehr Bahmanian. Should the proposed revision be very minor in nature, i.e., a grammatical error, etc., the staff will make the necessary change without taking it to the Regional Standards Committee. Once enough proposals have been submitted to warrant a Regional Standards Committee meeting, the staff will prepare an agenda and schedule a meeting.

At the meeting the Committee will take one of three possible actions: approve the change, reject the change or recommend that a subcommittee further study the change and make recommendations to the Committee. the individual or organization who submitted the change will then be notified of the Committee action. After approval of the proposed change by the Regional Standards committee the staff will print and distribute the change to the governmental agencies within San Diego County.

It is intended that the standard drawing package will be reprinted and distributed periodically incorporating all the changes approved by the Regional Standards Committee since the last printing. The reprinting will take place when the Regional Standards Committee determines enough revisions have been approved to warrant issuance of an updated drawing package. It is further intended that the Regional Standards be accepted by all agencies at the earliest date possible.


Ray Hall
Chairman, Regional Standards Committee

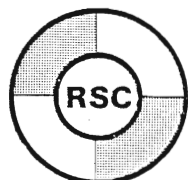


TABLE OF CONTENTS

CONCRETE STRUCTURES

- C-1 Masonry Retaining Wall Type 1B (Level Backfill)
- C-2 Masonry Retaining Wall Types I & II (Sloping Backfill)
- C-3 Masonry Retaining Wall Types III, IV & V, (Level Backfill)
- C-4 Masonry Retaining Wall Type 4B (Live Load Surcharge or Sloping Backfill)
- C-5 Masonry Retaining Wall Type 5B (Level Backfill)
- C-6 Masonry Retaining Wall Type 6 (Live Load Surcharge or Sloping Backfill)
- C-7 General Notes for Masonry Retaining Walls
- C-8 Details for Masonry Retaining Wall
- C-9 Gravity Retaining Walls
- C-10 General Notes and Details for Gravity Retaining Walls
- C-11 Reinforced Concrete Retaining Wall Type 1
- C-12 Reinforced Concrete Retaining Wall Type 1A
- C-13 Reinforced Concrete Retaining Wall Details No. 1
- C-14 Reinforced Concrete Retaining Wall Details No. 2
- C-15 Reinforced Concrete Retaining Wall Details No. 3

DRAINAGE SYSTEMS

- D-1 Curb Inlet - Type A
- D-2 Curb Inlet - Type B
- D-3 Curb Inlet - Type C

- D-4 Curb Inlet - Type D
- D-5 Curb Inlet - Type D (Details)
- D-7 Catch Basin - Type F
- D-8 Curb Inlet - Type G
- D-9 Storm Drain Cleanout - Type A
- D-10 Storm Drain Cleanout - Type B
- D-11 Inlets and Cleanouts - Notes and Details
- D-12 Curb Inlet Opening
- D-13 Welded Steel Grate Frame
- D-15 Drainage Structure Grate
- D-16 Corrugated Steel Pipe Inlets - Types A & B
- D-17 Corrugated Steel Pipe Inlets - Details
- D-18 Slotted Corrugated Steel Pipe Drains 12" through 24"
- D-19 Slotted Drain Connections to Standard Inlets
- D-20 Concrete Apron for Curb Inlet
- D-22 Asphalt Concrete Spillway
- D-23 Tapered Inlet and Downdrain Flume
- D-24 Entrance Taper and Downdrain Pipe
- D-25 Curb Outlet - Type A
- D-27 Sidewalk Underdrain Pipe
- D-29 Catch Basin - Type I
- D-30 Straight Headwall - Type A (Circular Pipe)
- D-31 Straight Headwall - Type A (CSP - Arch)
- D-32 Straight Headwall - Type B (Circular Pipe)

TABLE OF CONTENTS - Continued

D-33	Straight Headwall - Type B (CSP - Arch)
D-34	Wing and U Type Headwalls for 12" to 36" Pipe
D-35	Wing and U Type Headwalls for 42" to 84" Pipe
D-36	L Type Headwalls - Circular Pipe
D-37	L Type Headwalls - CSP Arch
D-38	Curtain Wall
D-39	Inlet Apron for Culverts Up to 42" Diameter
D-40	Rip Rap Energy Dissipator
D-41	Concrete Energy Dissipator
D-42	Concrete Energy Dissipator (Reinforcement) 18" to 30" Diameter Pipe
D-43	Concrete Energy Dissipator (Reinforcement) 36" to 72" Diameter Pipe
D-44	Pipe Culvert Headwalls, Endwalls and Warped Wingwalls
D-45	Curb Inlet - Type J Median
D-60	Pipe Bedding and Trench Backfill for Storm Drains
D-61	Rounded Pipe Ends in Drainage Structures
D-62	Pipe Collar
D-63	Concrete Lug
D-70	Minor Drainage Channel
D-71	Major Drainage Channel
D-72	Cutoff Wall for Drainage Channel
D-73	Pipe to Channel Connection
D-74	Graded Earth Channel

D-75	Drainage Ditches
D-76	Single Box Culvert
D-77	Double Box Culvert
D-78	Triple Box Culvert
D-79	Box Culvert Wingwall Types A, B and C
D-80	Box Culvert Warped Wingwalls
D-81	Box Culvert Miscellaneous Details
D-82	Debris Fence

ELECTRICAL SYSTEMS

E-1	Street Lighting Standard
E-2	Grounding of Concrete Lighting Standards
E-33	Pedestal for Electrical Equipment

GENERAL SURFACE IMPROVEMENTS

G-1	Curbs and Gutters - Separate
G-2	Curbs and Gutters - Combined
G-3	Monolithic Curb, Gutter and Sidewalk
G-4	Curb and Gutter - Rolled
G-5	Dikes (Berms) - Asphalt Concrete
G-6	Curbs and Gutter - Medians
G-7	Sidewalk - Typical Sections
G-9	Sidewalk Joint Locations
G-10	Concrete Joint Details
G-11	Portland Cement Concrete Curb, Gutter, Sidewalk & Pavement Removal and Replacement
G-12	Cross Gutter

TABLE OF CONTENTS - Continued

G-13	Mid-Block Cross Gutter		
G-14	Concrete Driveways		
G-15	Driveway Location - Adjacent to Curb Returns and Street Lines		
G-16	Driveway Location and Width Requirements		
G-17	Alley Apron		
G-18	Concrete Pavement, Width 40' or Less		
G-19	Concrete Pavement, Width 40' to 62'		
G-20	Concrete Pavement, Width 53' to 69'		
G-21	Concrete Pavement, Alley Section, Width 40' or Less		
G-22	Cutoff Wall at End of Pavement		
G-23	Cutoff Wall at End of Alley Pavement		
G-24	Trench Resurfacing - Types A and B		
G-25	Trench Resurfacing - Types C and D		
G-26	Concrete Driveway Commercial Alternate		
G-27	Pedestrian Ramp, Types A and B		
G-28	Pedestrian Ramp, Type A-1 and B-1		
G-29	Pedestrian Ramp, Type C		
G-30	Pedestrian Ramp, Type C-1		
G-31	Pedestrian Ramp, Type D		
G-32	General Notes for Pedestrian Ramp		
G-33	Narrow Trenching Types A & B, Backfill and Resurfacing		
G-34	Narrow Trenching Types C & D, Backfill and Resurfacing		
G-35	Narrow Trenching Types E & F, Backfill and Resurfacing		
			<u>SPRINKLER IRRIGATION SYSTEMS</u>
		I-1	Shrubbery Sprinkler Head, Fixed Spray Type
		I-2	Sprinkler Head, Pop Up Spray Type
		I-3	Lawn Sprinkler Head, Pop Up Rotary (With Swing Joint)
		I-5	Quick Coupling Valve
		I-6	Hose Bibb (Garden Valve)
		I-7	Backflow Preventer Atmospheric Vacuum Breaker (2" and Smaller)
		I-8	Backflow Preventer Continuous Pressure Vacuum Breaker Assembly (2" and Smaller)
		I-9	Backflow Preventer Pressure Type Vacuum Breaker Assembly
		I-12	Gate Valve (2" and Smaller)
		I-13	Manual Valves
		I-14	Remote Control Valve
		I-15	Electrical Pull Box for Direct Burial Control Wires and Splice Details
		I-16	Direct Burial Control Wire
		I-17	Irrigation Systems Electric Controller Clock Pedestal Mounting
		I-18	Irrigation System Electric Controller Clock Wall Mounting
		I-19	Impact Head - Above Ground Pipe Installation
		I-20	Pinning of Pipe - Above Ground Pipe Installations
		I-21	Manual Control Valve and Gate Valve Installation for Above Ground Pipe Installations

TABLE OF CONTENTS - Continued

- I-22 Quick Coupler Assembly - Above Ground Pipe Installations
- I-23 Swing Joint and Pipe Installation on Slopes Above Ground Pipe Installations
- I-24 Double Swing Joint - Above Ground Pipe Installations
- I-25 Trench Detail Non-Pressure Pipe (2" and Smaller)
- I-26 Trench Detail Pressure Pipe
- I-27 Valve Well and Cover
- I-28 Connection Detail for New Asbestos Cement Supply Mains
- I-29 Connection Detail for Existing Supply Mains
- I-30 Impact Head (With Swing Joint)
- I-31 Backflow Preventer Reduced Pressure Principle

LANDSCAPING

- L-1 Tree and Shrub Planting
- L-2 Tree Staking
- L-3 Concrete Mowing Strip
- L-4 Steel Grate Tree Well Cover

MISCELLANEOUS

- M-1 24" Manhole Frame and Cover - Heavy Duty
- M-2 24" Manhole Frame and Cover - Light Duty
- M-3 36" Manhole Frame and Two Concentric Covers - Heavy Duty
- M-4 Manhole Cover Locking Device
- M-5 Chain Link Gate

- M-6 Chain Line Fence
- M-7 Metal Beam Guard Rail - Installation
- M-8 Metal Beam Guard Rail - Details
- M-9 Guard Post and Barricade
- M-10 Street Survey Monument
- M-11 Bench Mark - Brass Plug
- M-12 Datums
- M-13 Survey Monuments
- M-14 Metric Equivalents
- M-15 Joint Trench Utilities Location
- M-16 Demountable Post
- M-17 Tennis Court Fence - Chain Link
- M-18 Drinking Fountain
- M-19 Fire Hydrant Markers
- M-20 Chain Link Fence Details

SEWERAGE SYSTEMS

- S-1 Manhole - 4'x2' Diameter
- S-2 Manhole - 5'x3' Diameter
- S-3 Sewer Main Cleanout
- S-4 Pipe Bedding and Trench Backfill for Sewers
- S-6 Concrete Cradle
- S-7 Concrete Encasement
- S-8 Concrete Backfill
- S-9 Concrete Anchor
- S-10 Cutoff Wall

TABLE OF CONTENTS - Continued

S-11	Concrete Protection for Existing Sewer Pipe
S-12	Concrete Support for Undercut Sewer Pipe
S-13	House Connection (Sewer Lateral)
S-14	Deep Cut House Connection (Sewer Lateral)
S-15	House Connection Sewer Repair
S-16	Cleanout - Force Main
S-17	Manhole - 4'x3' Diameter (for 15" Maximum Diameter Pipe)
S-19	Metallic Tape Locator for Non-Metallic Sewer Pipe

WATER SYSTEMS

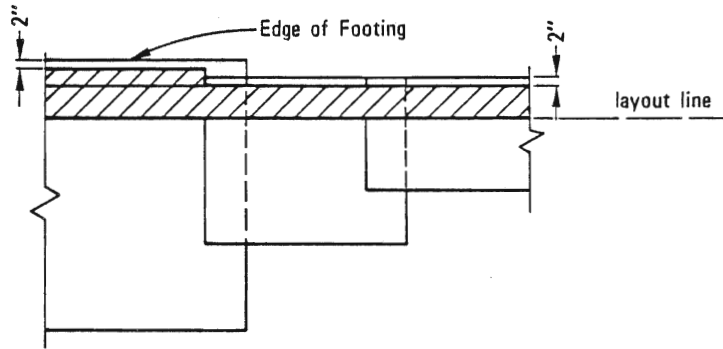
W-1	1" Water Service
W-2	1 1/2" and 2" Water Services
W-3	1" and 2" Manual Air Releases
W-4	1" and 2" Air and Vacuum Valves
W-5	4" and 6" Air and Vacuum Valves
W-6	2" Blow-Off Assemblies - Type A
W-7	2" Blow-Off Assemblies - Types B, C and D
W-8	4" and 6" Blow-Off Assemblies - Type A
W-9	4" and 6" Blow-Off Assemblies - Type B
W-10	6" Fire Hydrant
W-11	Fire Hydrant Locations
W-12	Valve Well Installation
W-13	Valve Stem Extension
W-14	Air and Vacuum Valve Enclosures

W-15	Meter Box Locations
W-16	Protection Post
W-17	Concrete Thrust Blocks
W-18	Thrust Block Bearing Areas
W-19	Concrete Valve Blocking
W-20	Anchor Block (Vertical Bend Only)
W-21	Pipe Bedding and Trench Backfill for Water Mains
W-22	Thrust Anchor for Water Main Reducer - 4" thru 6"
W-23	Multiple Service Assembly - Dead End Main
W-24	Split Butt Strap
W-25	Metallic Tape Locator for Non-Metallic Water Pipe

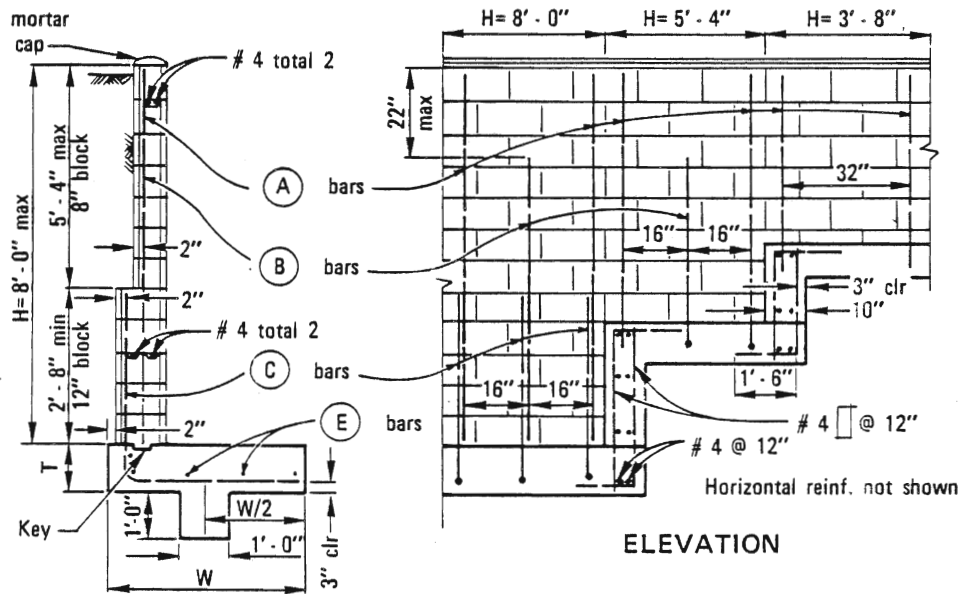
CONCRETE STRUCTURES

C

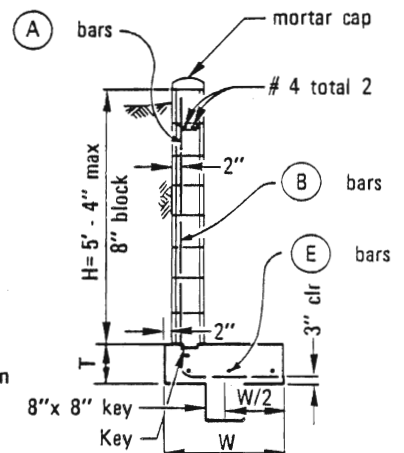
CONCRETE STRUCTURES



PLAN



ELEVATION



TYPICAL SECTION
5' - 4" max

TYPICAL SECTION
over 5' - 4"

NOTES

1. See Standard Drawings C-7 and C-8 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"
(A) bars	# 4 @ 32"	# 4 @ 32"	# 4 @ 32"
(B) bars	—	# 4 @ 32"	# 4 @ 32"
(C) bars	—	—	# 6 @ 16"
(E) bars	# 4 total 4	# 4 total 5	# 4 total 6
max soil press. (psf)	500	600	800

Revision	By	Approved	Date
	SC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

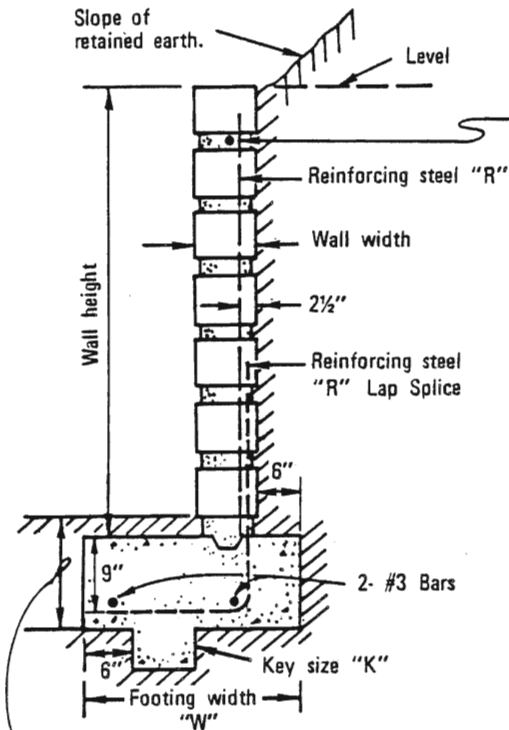
MASONRY RETAINING WALL TYPE 1B
(LEVEL BACKFILL)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard G. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-1**

TYPE I WALL



Horizontal Steel
(see note 2)

WALL TYPE "T"

- A. Type I 6" Width
- B. Type I 8" Width
- C. Type II (Note 1.)

REINFORCING STEEL "R"

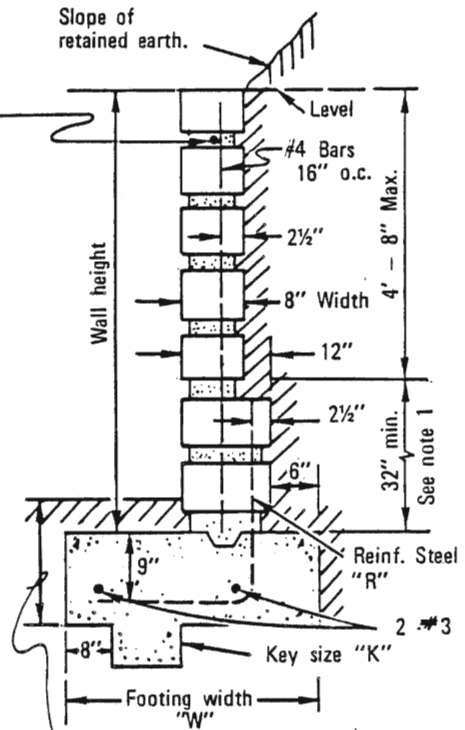
1. # 3 Bars @ 24" o/c
2. # 4 Bars @ 32" o/c
3. # 3 Bars @ 16" o/c
4. # 4 Bars @ 24" o/c
5. # 4 Bars @ 16" o/c
6. # 5 Bars @ 16" o/c

KEY SIZE "K"

Width x Depth

- D. 6" x 6"
- E. 8" x 8"
- F. 12" x 12"
- G. 12" x 18"
- N. None Required

TYPE II WALL



12" min. concrete depth.
12" min. into natural ground
or approved compacted fill.

SLOPE OF RETAINED EARTH HORIZONTAL RUN TO VERTICAL RISE

Wall Height	Level				5 to 1				4 to 1				3 to 1				2 to 1				1 1/2 to 1				1 to 1			
	T	R	K	W	T	R	K	W	T	R	K	W	T	R	K	W	T	R	K	W	T	R	K	W	T	R	K	W
1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 6"	A	1	D	1' - 7"
2' - 0"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	N	1' - 4"	A	1	D	1' - 8"	A	1	D	1' - 10"
2' - 8"	A	1	N	2' - 0"	A	1	N	2' - 0"	A	1	N	2' - 0"	A	1	N	2' - 0"	A	1	D	2' - 0"	A	1	E	2' - 2"	A	1	F	2' - 5"
3' - 4"	A	1	N	2' - 1"	A	1	N	2' - 1"	A	1	N	2' - 1"	A	1	D	2' - 1"	A	3	D	2' - 1"	B	1	E	2' - 4"	B	4	F	2' - 4"
4' - 0"	A	3	N	2' - 4"	B	1	N	2' - 3"	B	1	N	2' - 3"	B	1	D	2' - 3"	B	1	D	2' - 3"	B	4	F	2' - 5"	C	4	G	3' - 4"
4' - 8"	B	4	D	2' - 9"	B	4	D	2' - 9"	B	5	E	2' - 9"	B	5	E	2' - 9"	B	5	F	2' - 9"	C	5	G	3' - 5"				
5' - 4"	B	5	D	3' - 0"	C	4	D	3' - 0"	C	4	E	3' - 0"	C	4	E	3' - 0"	C	4	F	3' - 2"	C	5	G	3' - 9"				
6' - 0"	C	4	E	3' - 3"	C	4	E	3' - 3"	C	4	E	3' - 4"	C	5	E	3' - 4"	C	5	F	3' - 6"	C	6	G	4' - 2"				
6' - 8"	C	5	E	3' - 9"	C	5	F	3' - 10"	C	6	F	3' - 10"	C	6	G	3' - 11"	C	6	G	4' - 1"								
8' - 0"	C	6	G	4' - 6"																								

Footing sizes are based on 1000 lb. per square foot maximum soil bearing value.

NOTES:

1. When wall Type II is required, the first four courses of block, regardless of wall height, shall consist of 12" wide masonry units.
2. Horizontal Steel - Two # 3 bars shall be placed longitudinally in the footing as shown. One # 3 bar or ladder mesh shall be placed longitudinally in the mortar joint every 16 inches as the blocks are laid up.
3. See Standard Drawing C-7 for additional requirements.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

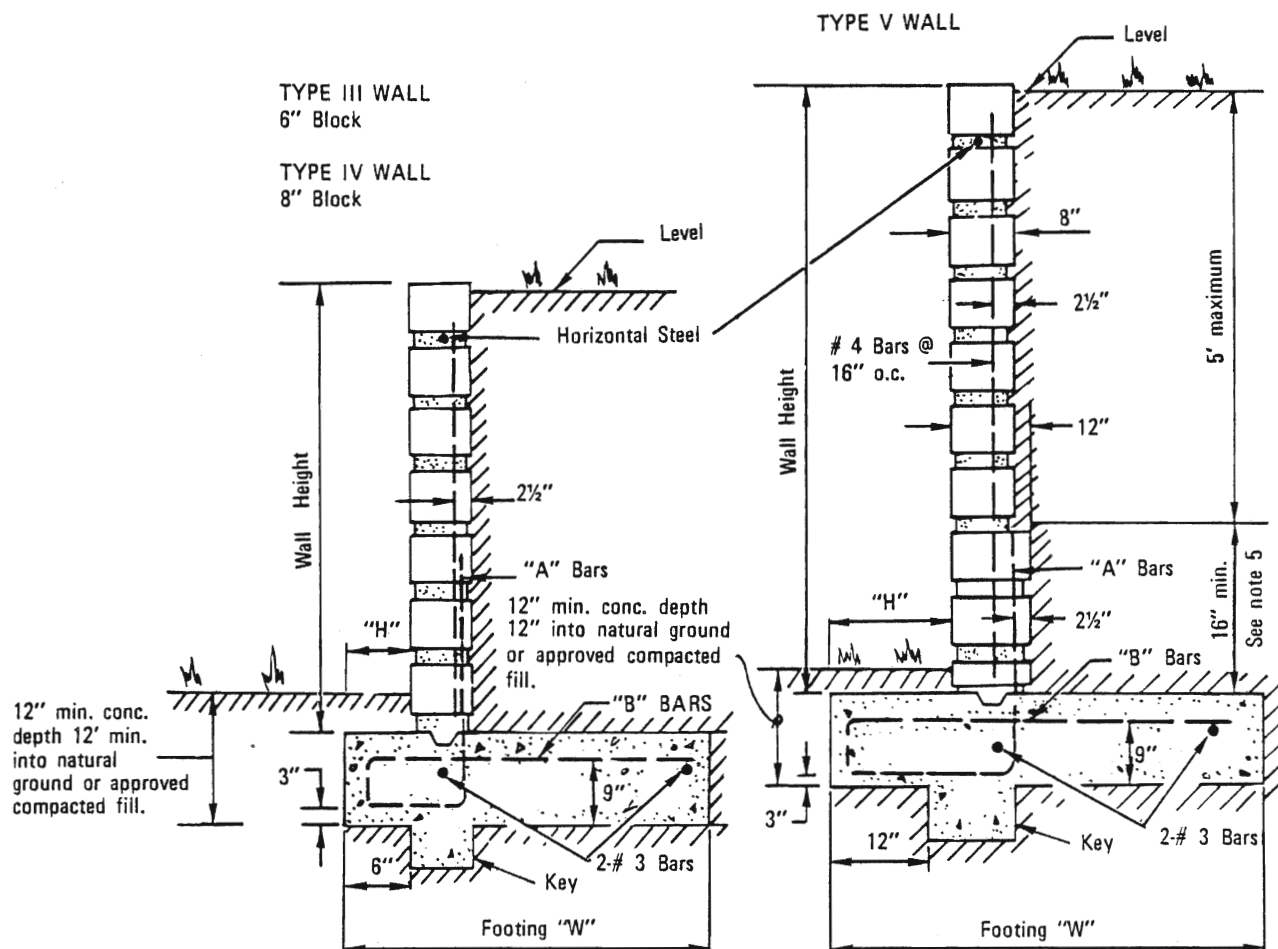
Allan A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER C-2

SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE I & TYPE II (SLOPING BACKFILL)

Revision	By	Approved	Date
New Des.	TRP	M.B.	10-82

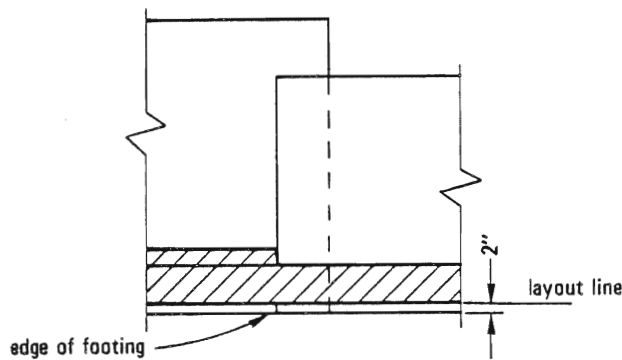


Wall Height	Wall Type	H	Footing W	Key Size	"A" Bars	"B" Bars
1'- 4"	III	3"	1'- 6"	None	# 3 @ 32" o/c	None
2'- 0"	III	3"	1'- 6"	None	# 3 @ 24" o/c	None
2'- 8"	III	3"	2'- 0"	None	# 3 @ 24" o/c	# 3 @ 48" o/c
3'- 4"	III	3"	2'- 3"	None	# 3 @ 24" o/c	# 3 @ 48" o/c
4'- 0"	III	3"	2'- 6"	None	# 3 @ 16" o/c	# 3 @ 32" o/c
4'- 8"	IV	6"	3'- 6"	None	# 4 @ 24" o/c	# 4 @ 24" o/c
5'- 4"	IV	8"	4'- 0"	6"x 6"	# 4 @ 16" o/c	# 4 @ 24" o/c
6'- 0"	V	8"	4'- 6"	8"x 8"	# 4 @ 24" o/c	# 4 @ 24" o/c
6'- 8"	V	1'- 1"	5'- 0"	8"x 8"	# 4 @ 16" o/c	# 4 @ 16" o/c
8'- 0"	V	1'- 8"	5'- 2"	12"x 12"	# 5 @ 16" o/c	# 4 @ 16" o/c

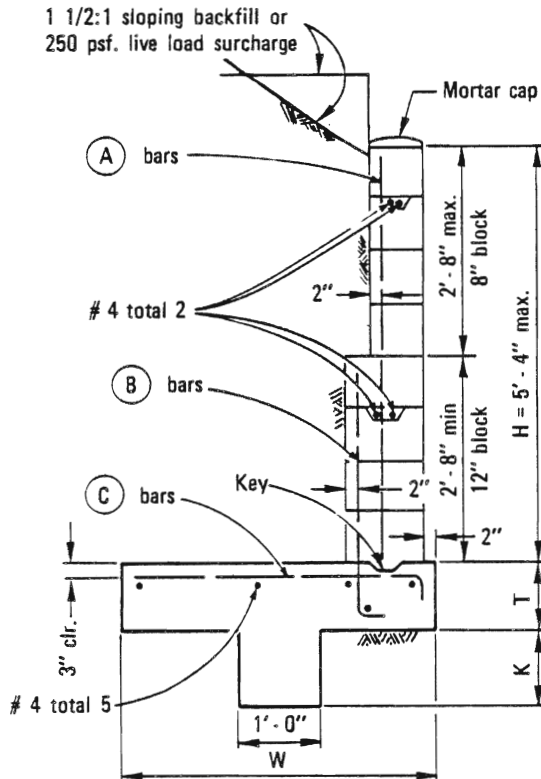
NOTES:

1. Footing sizes are based on 1000 lbs. per square foot maximum soil bearing value.
2. Wall height is measured from the top of the footing to the top of the wall.
Walls not shown in the table above, must be designed specifically for the existing condition.
3. The walls shown here are designed as walls retaining level earth for a distance equal to wall height.
4. See Standard Drawing C-7 for additional requirements.
5. When wall Type V is required, the lower 16" of wall height is required to consist of 12" width masonry units.
6. Horizontal Steel: # 3 bars shall be placed longitudinally in the footing as shown.
3 bars or ladder mesh shall be placed longitudinally in the mortar joint every sixteen inches as the blocks are laid up.

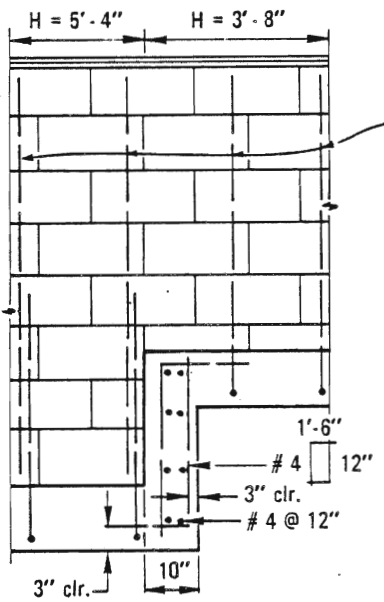
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
New Des.	TRP	M.B.	10-82			<i>Allan A. Kersch</i>	<i>Dec. 1975</i>
				MASONRY RETAINING WALL TYPES III IV & V (LEVEL BACKFILL)		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	C-3



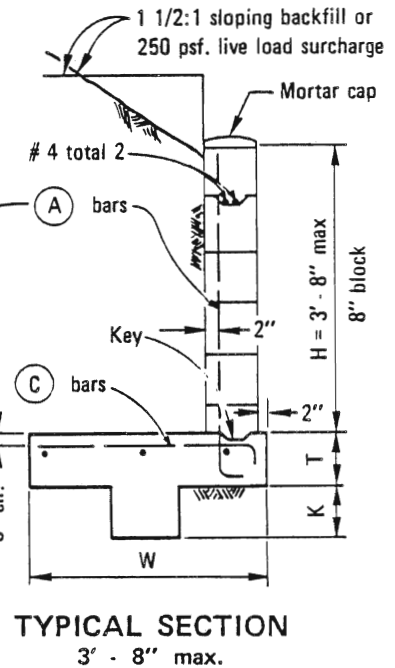
PLAN



TYPICAL SECTION
over 3' - 8"



ELEVATION



TYPICAL SECTION
3' - 8" max.

NOTES

1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all block 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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

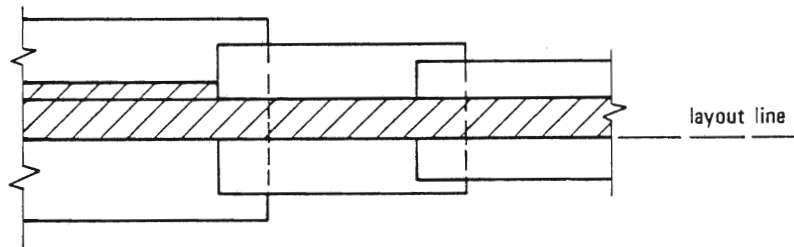
Allen G. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-4**

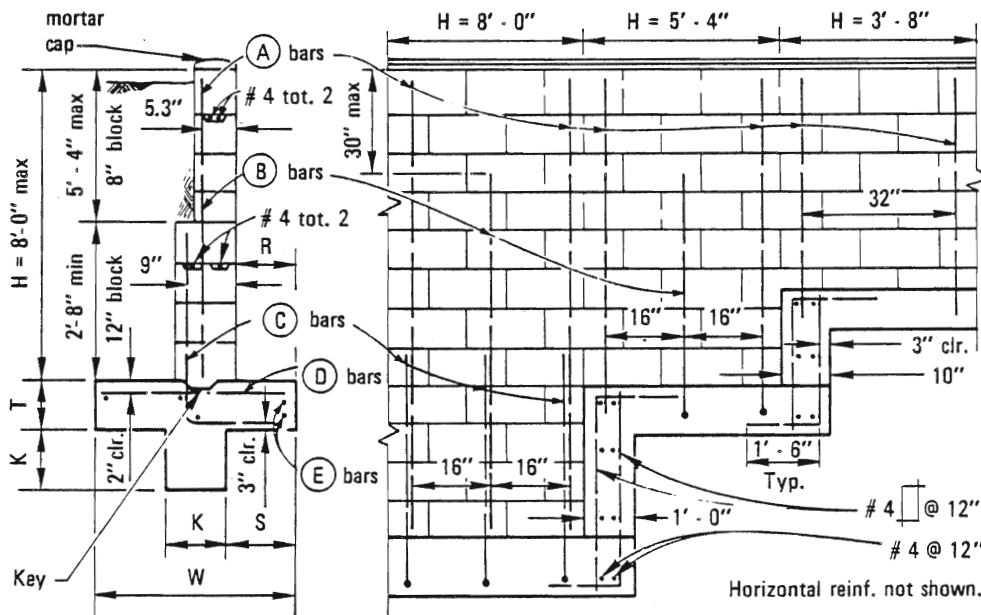
SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 4B
(LIVE LOAD SURCHARGE OR SLOPING BACKFILL)

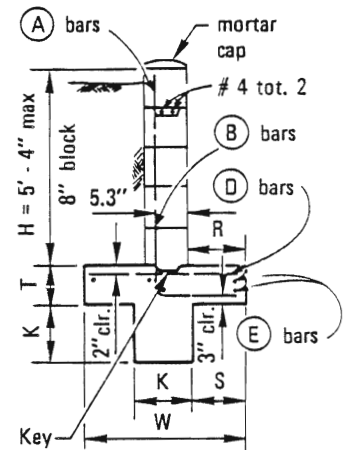
Revision	By	Approved	Date
	<i>MB</i>	<i>MB</i>	5/86



PLAN



TYPICAL SECTION
over 5' - 4"



TYPICAL SECTION
5' - 4" max

ELEVATION

NOTES

1. See Standard Drawing C-7 and C-8 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' - 1"	3' - 1"	4' - 3"
R	0' - 9"	1' - 2"	1' - 5"
S	0' - 8 1/2"	1' - 1/2"	1' - 7 1/2"
K	0' - 8"	0' - 8"	0' - 12"
(A) bars	# 4 @ 32"	# 4 @ 32"	# 4 @ 32"
(B) bars	—	# 4 @ 32"	# 4 @ 32"
(C) bars	—	—	# 7 @ 16"
(D) bars	# 4 @ 32"	# 4 @ 16"	# 4 @ 16"
(E) bars	# 4 total 5	# 4 total 5	# 4 total 6
max soil press. (psf)	774	1030	1660

Revision	By	Approved	Date
1	M.B.		5-86

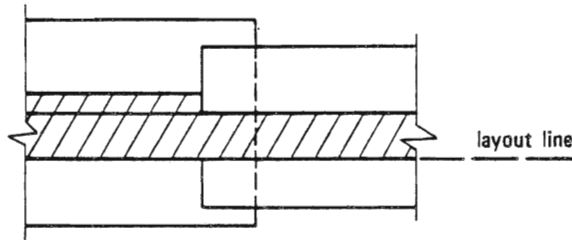
SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 5B
(LEVEL BACKFILL)

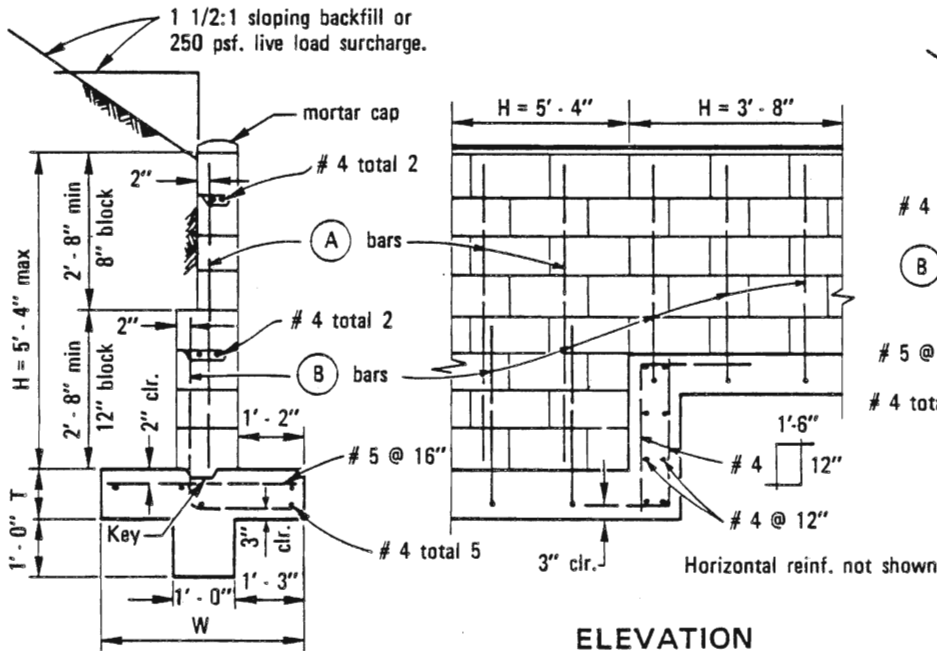
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allard A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

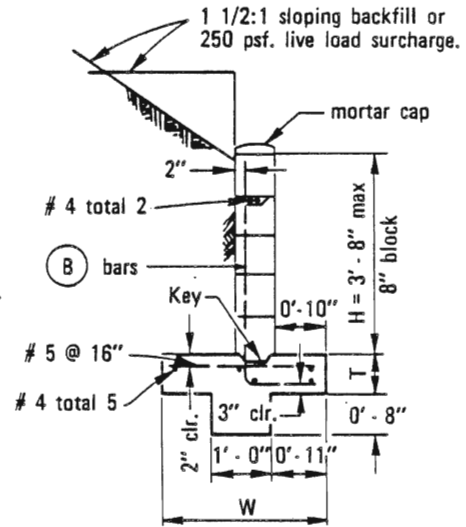
DRAWING NUMBER **C-5**



PLAN



ELEVATION



TYPICAL SECTION
3' - 8" max

TYPICAL SECTION
over 3' - 8"

NOTES

1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all block 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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-6**

SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 6 (LIVE LOAD SURCHARGE OR SLOPING BACKFILL)

Revision By Approved Date

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: (Wall Types 1B, 4B, 5B and 6):

Reinforced Concrete:

$F_c = 1200 \text{ psi}$ $F'_c = 3000 \text{ psi}$
 $F_s = 20,000 \text{ psi}$ $n = 10$

Reinforced Masonry:

$F'_m = 600 \text{ psi}$ $F_m = 200 \text{ psi}$
 $F_s = 20,000 \text{ psi}$ $n = 50$
Earth = 120 pcf an 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 a $\phi = 33^\circ$ 42'.

REINFORCEMENT:

Intermediate grade, hard grade, or rail steel deformation shall conform to ASTM A615, A616, A617. 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.

MASONRY:

All reinforced masonry retaining walls shall be constructed of regular or light weight standard units conforming to the "Standard Specifications for Public Works Construction."

JOINTS:

Vertical control joints shall be placed at 32 foot intervals maximum. Joints shall be designed to resist shear and other lateral forces while permitting longitudinal movement. Vertical expansion joints shall be placed at 96 foot intervals maximum.

CONCRETE:

Footing concrete shall be 560-C-3250, using B aggregate when placing conditions permit.

BACKFILL:

No backfill material shall be placed against masonry retaining walls until grout has reached design strength or until grout has cured for a minimum of 28 days. 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%.

FENCING:

Safety fencing shall be installed at the top of the wall as required by the agency.

INSPECTIONS:

Call for inspections as follows:

- A. When the footing has been formed, with the steel tied securely in final position, and is ready for the concrete to be placed.
- B. Where cleanout holes are not provided:
 - (1) After the blocks have been laid up to a height of 4', or full height for walls up to 5', with steel in place but before the grout is poured, and
 - (2) After the first lift is properly grouted, the blocks have been laid up to the top of the wall with the steel tied securely in place but before the upper lift is grouted.

Where cleanout holes are provided:

After the blocks have been laid up to the top of the wall, with the steel tied securely in place, but before grouting.

- C. After grouting is complete and after rock or rubble wall drains are in place but before earth backfill is placed.
- D. Final inspection when all work has been completed.

CONCRETE GROUT AND MORTAR MIXES:

Concrete grout and mortar mixes shall be as specified in the "Standard Specifications for Public Works Construction". All cells shall be filled with grout. Rod or vibrate grout within 10 minutes of pouring to insure consolidation. Bring grout to a point 2" from the top of masonry units when grouting of second lift is to be continued at another time.

MORTAR KEY:

To insure proper bonding between the footing and the first course of block, a mortar key shall be formed by embedding a flat 2 X 4 flush with and at the top of the freshly poured footing. The 2 X 4 should be removed after the concrete has started to harden (approximately 1 hour).

A mortar key may be omitted if the first course of block is set into the fresh concrete when the footing is poured, and a good bond is obtained.

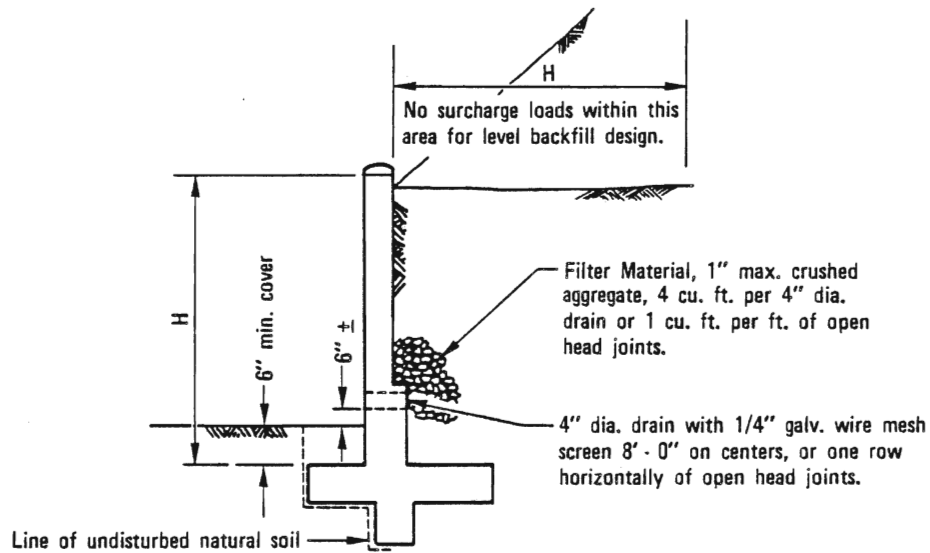
WALL DRAINS:

Wall drains shall be provided at 6 foot intervals along the length of the wall and located at the level of the bottom course of block. The drains shall be 4" in diameter, formed by placing a block on its side, or leaving out every head joint in the first course of block. Backfill behind wall drains or open head joints shall be loose rubble or gravel.

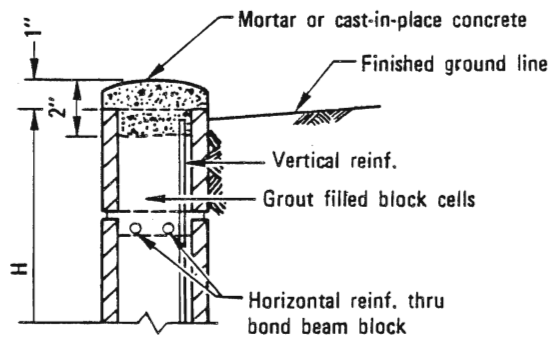
SOIL:

All footings shall extend at least 12 inches into undisturbed natural soil or approved compacted fill. Soil should be dampened prior to placing concrete in footings.

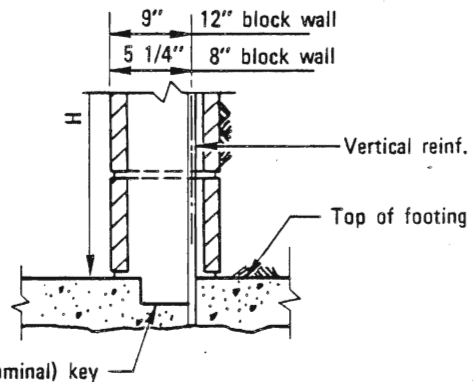
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING GENERAL NOTES FOR MASONRY RETAINING WALLS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allen A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
New Des.	TRP	M. B.	10-82		
Notes		M. B.	5-86		
					DRAWING NUMBER C-7



TYPICAL SECTION



CAP DETAIL



KEY DETAIL

NOTE

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

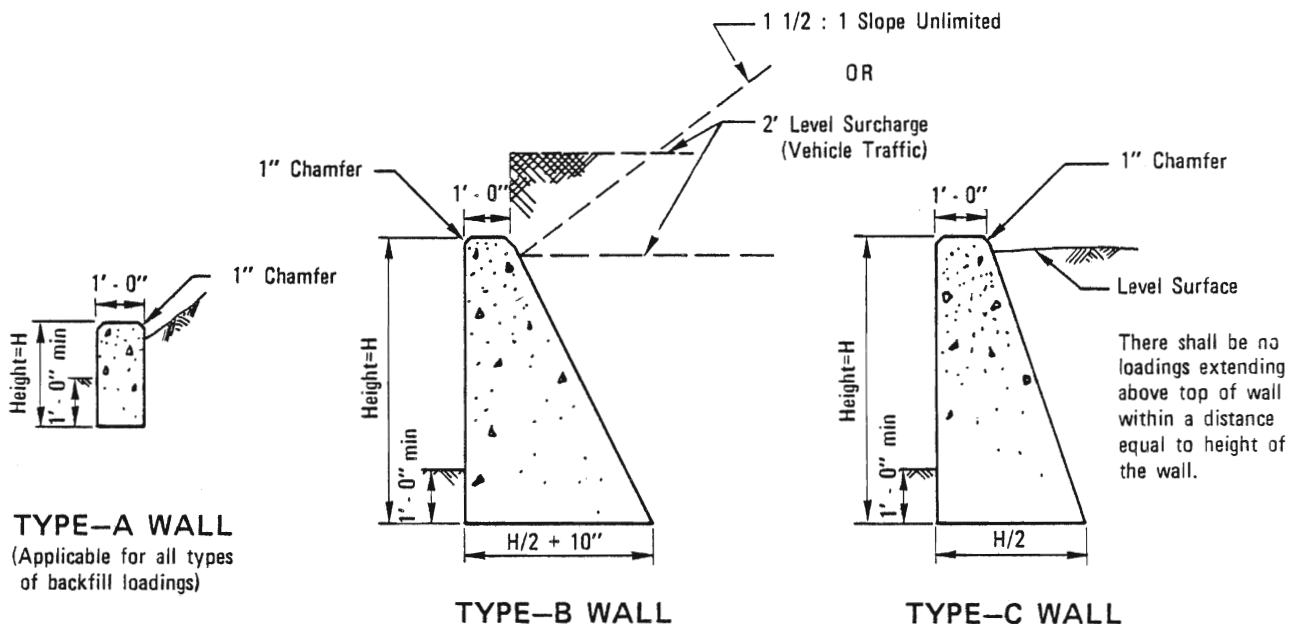
SAN DIEGO REGIONAL STANDARD DRAWING

DETAILS FOR MASONRY RETAINING WALL

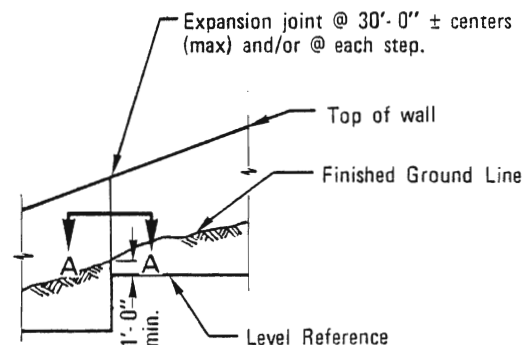
DRAWING
NUMBER

C-8

Revision	By	Approved	Date



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"	10.82
	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 ELEVATION

NOTE

See Standard Drawing C-10 for Section A-A, notes and details.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				GRAVITY RETAINING WALLS		<i>Allan D. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
						DRAWING NUMBER C-9

CONCRETE

Concrete shall be 560-C-3250.

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.

DESIGN DATA

$F_c = 1200$ psi $F'_c = 3000$ psi
Earth = 120 pcf and equivalent fluid pressure = 36 psf per foot of height

Walls shown for 1 1/2:1 unlimited sloping surcharge are designed in accordance with Rankine's Formula for unlimited sloping surcharge with $\phi = 33^\circ 42'$.

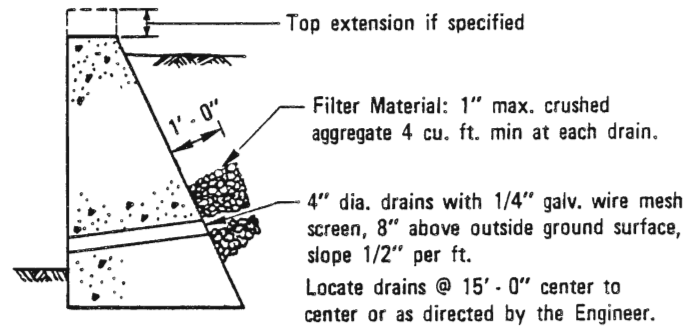
Note: Maximum toe pressure under wall footing = 1 1/2 tons. Special design required where footing material is incapable of supporting this pressure.

EXCAVATION AND BACKFILL

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

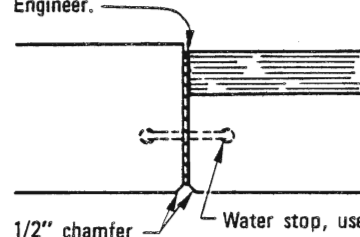
Each layer of backfill shall be moistened as directed by the Engineer and thoroughly tamped, rolled or otherwise compacted until the relative compaction is not less than 90 percent.

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 cyclinders, or until 28 days after wall has been placed.

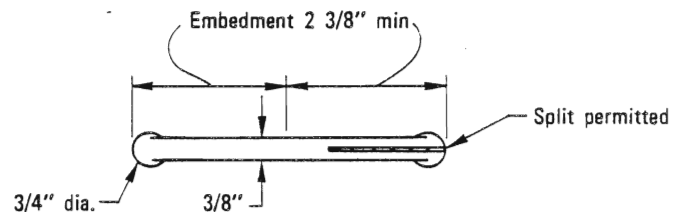


TYPICAL DRAINAGE WHEN H IS GREATER THAN 4' - 0"

1/2" Expansion joint, fill with premolded expansion joint filler. Locate joints at 30' - 0" $\pm$ centers or as directed by the Engineer.



SECTION A-A



RUBBER WATERSTOP

Use only when watertight joint is required.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

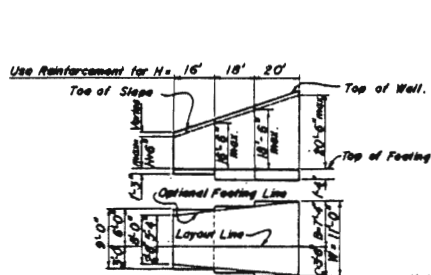
Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-10**

SAN DIEGO REGIONAL STANDARD DRAWING

**GENERAL NOTES AND DETAILS
FOR GRAVITY RETAINING WALLS**

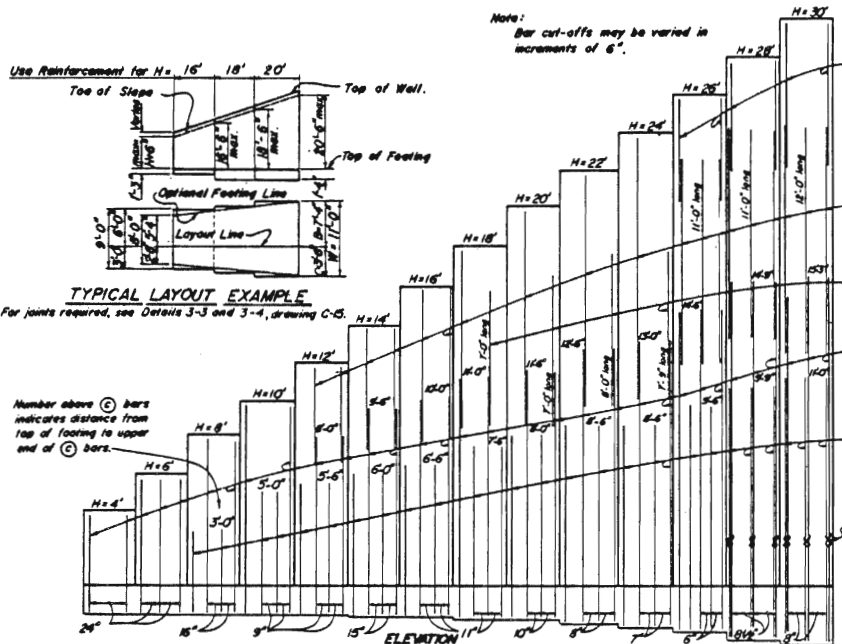
Revision	By	Approved	Date
Conc.	R	M.B.	5-86



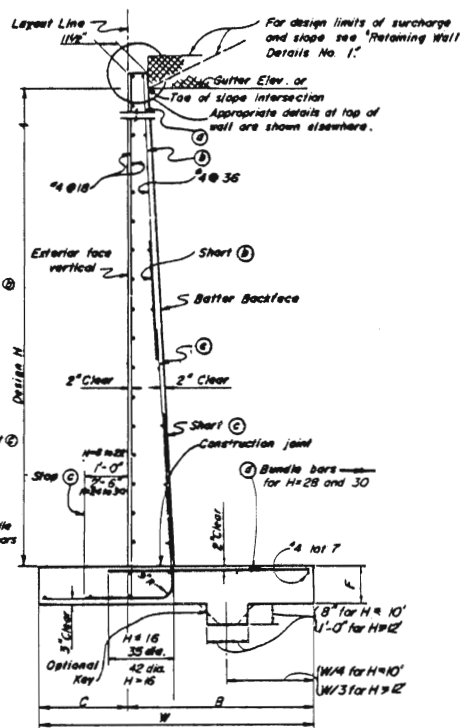
TYPICAL LAYOUT EXAMPLE

For joints required, see Details 3-3 and 3-4, drawing C-5.

Number above (C) bars indicates distance from top of footing to upper end of (C) bars.



Design H	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
W	3'-2"	4'-2"	5'-2"	6'-2"	7'-2"	8'-2"	9'-2"	10'-2"	11'-2"	12'-2"	13'-2"	14'-2"	15'-2"	16'-2"
C	1'-0"	1'-4"	1'-8"	2'-0"	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-0"	5'-4"
B	2'-2"	2'-10"	3'-2"	3'-6"	4'-0"	4'-4"	4'-8"	5'-0"	5'-4"	5'-8"	6'-0"	6'-4"	6'-8"	7'-0"
F Spread Pile	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"
Butter	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"	12'-12"
(C) bars	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"
(C) bars	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"
(C) bars	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"	#4 @ 24"
Total (C) bars	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4	6-#4
Rebar (C) bars	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7
1" Limit surcharge	1.6	1.9	2.2	2.3	2.8	3.3	3.5	4.0	4.3	4.6	4.9	5.3	5.7	6.2
2" Limit surcharge	1.1	1.5	2.0	2.5	2.7	3.3	3.6	4.2	4.7	5.5	5.9	6.5	7.1	7.5
1 1/2" Limit surcharge	1.3	1.7	2.1	2.5	2.9	3.4	3.8	4.3	4.8	5.4	5.8	6.5	7.2	7.5
Spread Footing	17	20	28	37	51	80	105	147	187	246	303	407	449	507
Rebar	8.9	12.5	16.3	20.2	25.4	30.1	34.6	40.1	45.0	52.1	63.3	77.0	88.1	104.8
Pile Pile	29	32	41	70	84	113	140	172	212	270	322	427	469	529
Pile Pile	10.2	12.7	16.7	20.8	25.2	30.1	34.8	40.6	45.7	53.1	64.7	78.6	89.9	107.0

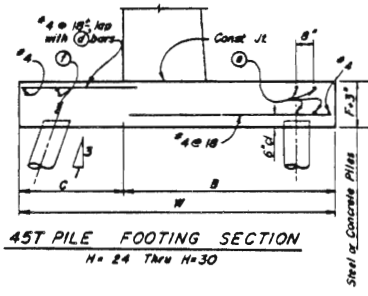
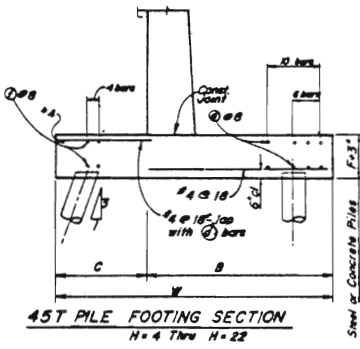


SPREAD FOOTING SECTION

Note: For details not shown and drainage notes see 'Retaining Wall Details No. 1,' drawing C-13. Quantities apply to Design H portion and exclude the added portion above 'Gutter Elevation.'

Note: Reinforcement detailed is to be placed in addition to that shown for spread footing. All piles not shown, see Pile Layout on plans.

● For pile footing Design H=4' use same footing dimensions as Design H=6'



Revision	By	Approved	Date

SAN DIEGO REGIONAL STANDARD DRAWING

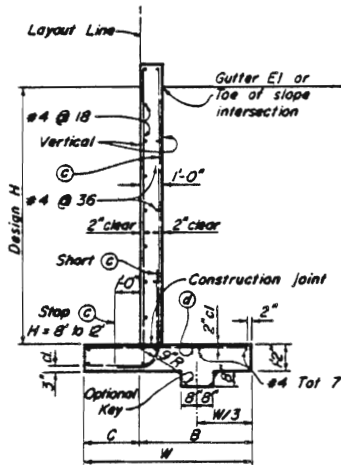
REINFORCED CONCRETE RETAINING WALL

TYPE 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen J. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING NUMBER C-11



SPREAD FOOTING SECTION

Place concrete in toe against undisturbed material, except as permitted by the Engineer.

Note:

Quantities apply to Design H portion and exclude the added portion above "Gutter Elevation."

TABLE OF REINFORCING STEEL DIMENSIONS AND DATA					
Design H	4'	6'	8'	10'	12'
W	3'-2"	4'-2"	5'-2"	6'-2"	7'-2"
C	1'-0"	1'-4"	1'-8"	2'-0"	2'-4"
B	2'-2"	2'-10"	3'-6"	4'-2"	4'-10"
© bars	#5 @ 24	#5 @ 22	#5 @ 11	#6 @ 9	#7 @ 7 1/2
Ⓢ bars	#5 @ 24	#5 @ 22	#5 @ 22	#7 @ 18	#8 @ 15
Total © bars	6 - #6	6 - #6	6 - #6	10 - #7	10 - #7
Total Ⓢ bars				4 - #7	4 - #7
CASE I - Toe Press. psf	1590	1930	2240	2550	2840
CASE II - Toe Press. psf	1060	1460	1860	2280	2700
Spread Steel lbs./ft.	15	21	27	46	70
Footing Conc CF/ft.	8.6	11.8	14.9	18.1	21.3
Pile Ftg Steel lbs./ft.	25	32	38	75	101
Pile Ftg Conc CF/ft.	9.9	11.9	15.3	18.8	22.2

Note:

Reinforcement detailed is to be placed in addition to that shown for spread footing. All piles not shown, see Pile Layout on plans.

© For pile footing Design H = 4' use same footing dimensions as Design H = 6'

NOTES

Design Conditions

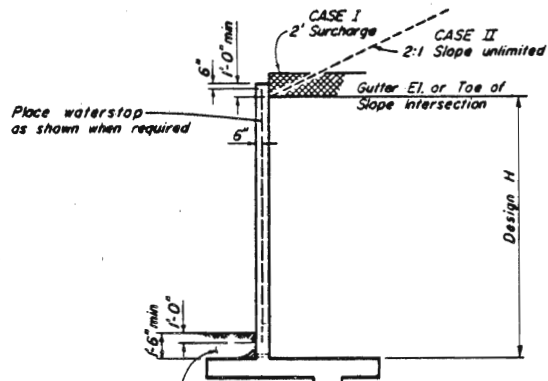
Design H may be exceeded by 6" before going to the next size. Footing key is required except when found unnecessary by the Engineer. Special footing design is required where foundation material is incapable of supporting toe pressure loads listed in table.

Design Data

$f_c = 1300$ psi $f'_c = 3250$ psi $f_s = 24,000$ psi
 $n = 10$ earth = 120 pcf

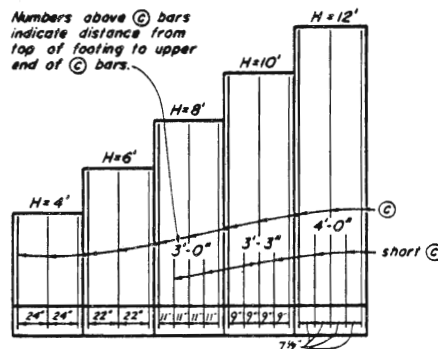
Case I - Equivalent fluid pressure = 36 psf max for determination of toe pressure. 27 psf min for determination of heel pressure.

Case II - Earth pressure determined from Rankine's formula with $\phi = 33^\circ - 42^\circ$.

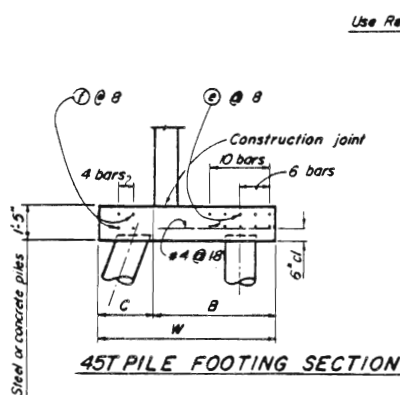


DESIGN

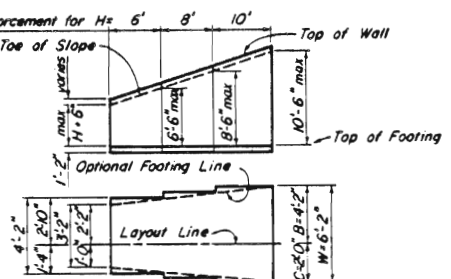
For drainage notes and other details, see "Retaining Wall Details No. 1," drawing C-13.



ELEVATION



45° PILE FOOTING SECTION



TYPICAL LAYOUT EXAMPLE

For joints required, see Details 3-3 and 3-4, drawing C-15

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

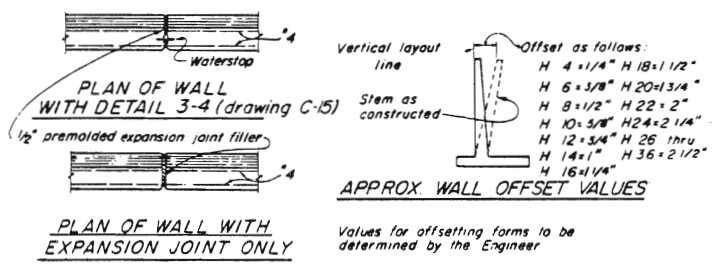
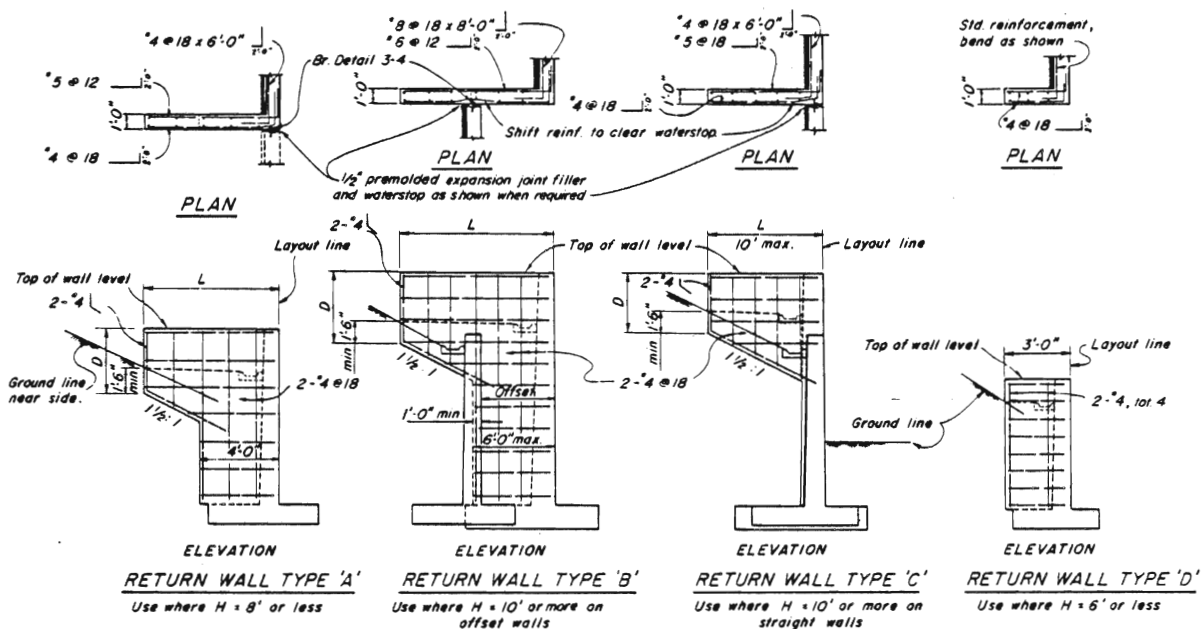
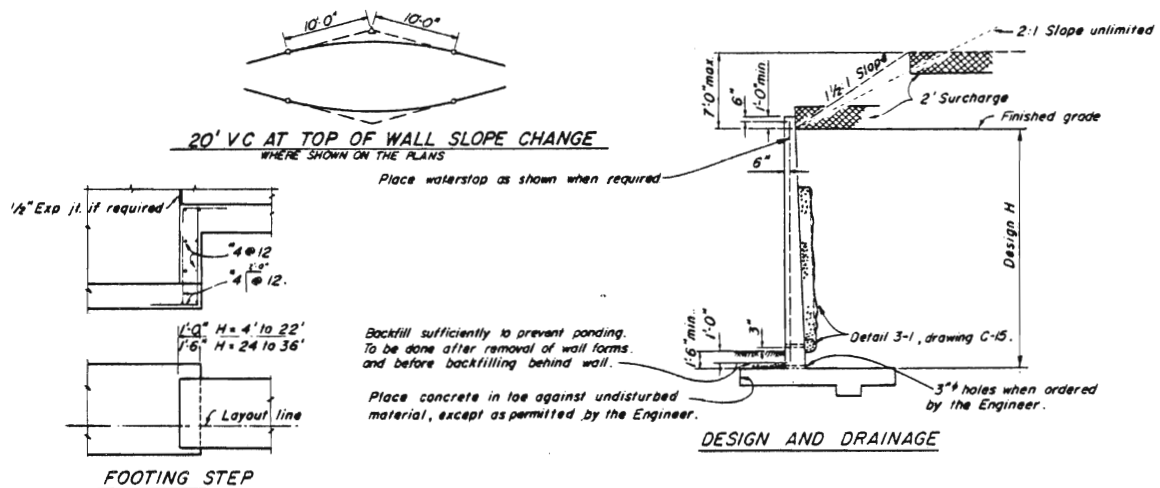
Alfred A. Kershner Dec. 1975
 Coordinator R.C.E. 19807 Date

DRAWING NUMBER **C-12**

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL TYPE 1A

Revision	By	Approved	Date



NOTES:

Design Conditions:

Design H may be exceeded by 6" before going to the next size.

Footing key is required except when found unnecessary by the Engineer.

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

Return wall not required unless shown elsewhere.

Design Data:

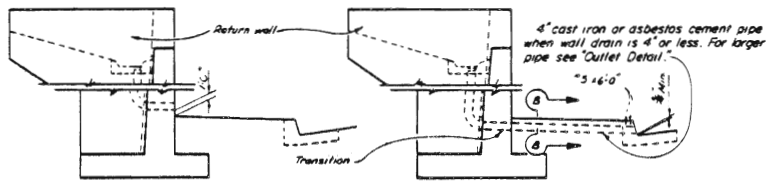
$f_c = 1300$ psi $f_t = 3250$ psi $f_s = 24,000$ psi $n = 10$ earth = 120 pcf

2' Surcharge = 36 pcf max. for determination of toe pressure.

Equivalent fluid pressure = 27 pcf min. for determination of heel pressure.

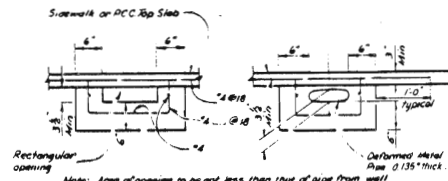
Earth pressures for 2:1 unlimited slope, 1 1/2:1 slope, and 1 1/2:1 unlimited slope, determined from Rankine's formula with $\phi = 33^\circ - 42^\circ$.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Title	EC	M.B.	5-86		
				REINFORCED CONCRETE RETAINING WALL DETAILS NO. 1	Allard J. Kuehnel Coordinator R.C.E. 19807 Date
					Dec. 1975 Date
					DRAWING NUMBER
					C-13

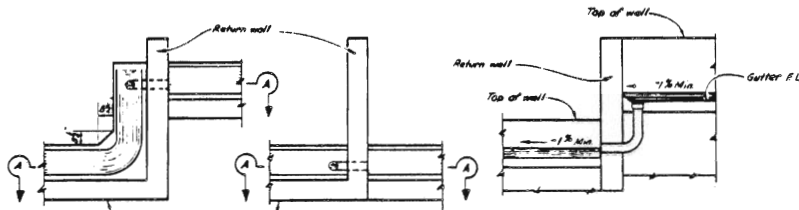


RETAINING WALL
FACE OF WALL OUTLET

RETAINING WALL
GUTTER OUTLET



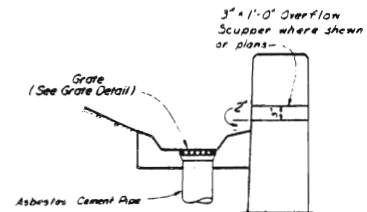
OUTLET DETAIL-SECTION B-B



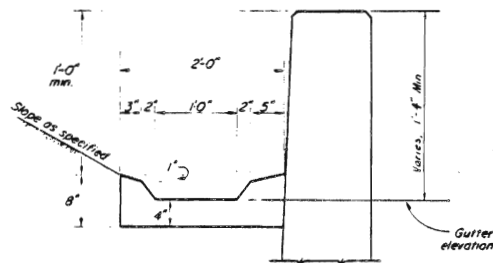
PLAN
OFFSET WALL
DRAIN THROUGH RETURN WALL

PLAN
CONTINUOUS WALL

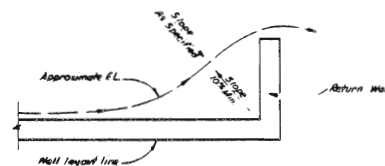
SECTION A-A



WALL DRAIN DETAIL



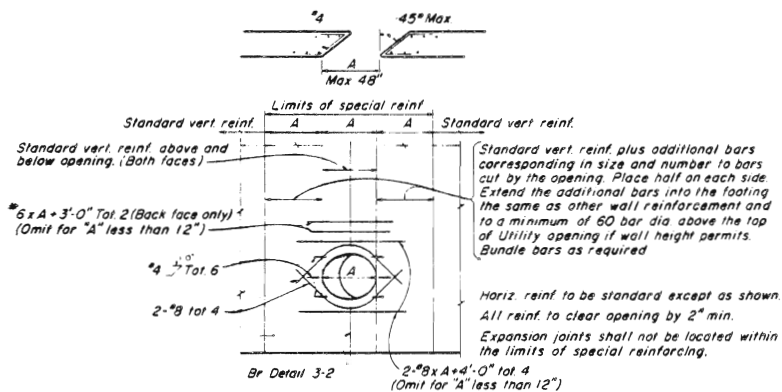
TYPICAL GUTTER DETAIL



WALL DRAINAGE
WHERE GUTTER NOT REQUIRED



GRATE DETAIL
Sizes to fit Standard Hubs



RETAINING WALL-UTILITY OPENING
To be used in conjunction with the "Retaining Wall Type 1" sheet.
Max. size of Opening (A)=48"

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

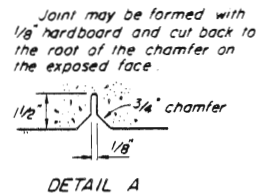
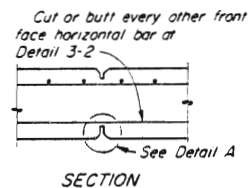
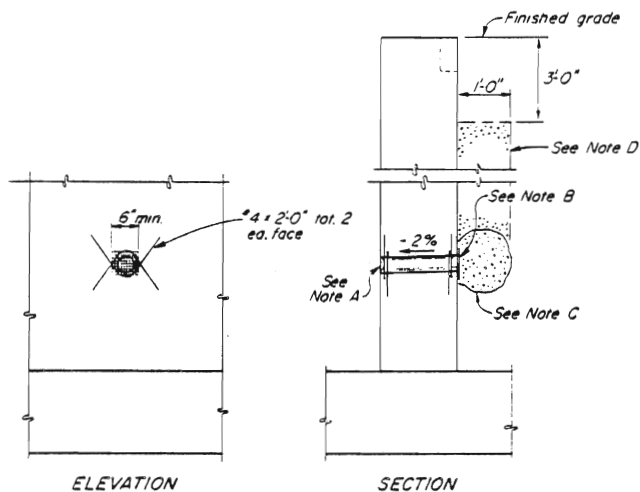
Oliver A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER C-14

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE
RETAINING WALL DETAILS NO. 2

Revision	By	Approved	Date
Title	SC	TH.B.	5-86



WEAKENED PLANES

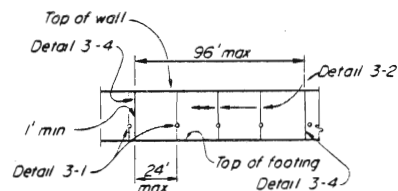
DETAIL 3-2

WEEP HOLE AND PERVIOUS BACKFILL

DETAIL 3-1

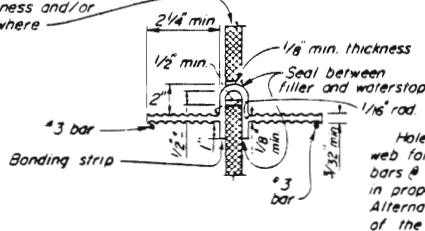
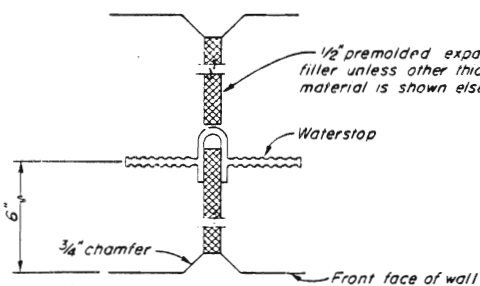
Notes:

- 4" drains @ 25' max. center to center (9' c-c for Type 3 and 9'-3" c-c for Type 4 Retaining Walls). For walls adjacent to sidewalks or curbs, provide 4" cast iron or asbestos cement pipe under the sidewalk to discharge thru curb face. Exposed wall drains shall be located 3" ± above finished grade.
- 6" square aluminum or galvanized steel wire 4 mesh hardware cloth (Min wire diameter 0.03"). Anchor firmly to backface.
- One cubic foot pervious backfill material in a burlap sack, securely tied.
- Pervious backfill material continuous behind retaining wall.



WALL EXPANSION JOINTS AND WEAKENED PLANES

DETAIL 3-3



Waterstop to have 5 or more pairs of raised ribs to provide 0.1 sq. in. min. rib cross-section area on each half of the waterstop. Height of ribs to be 3/32" min.

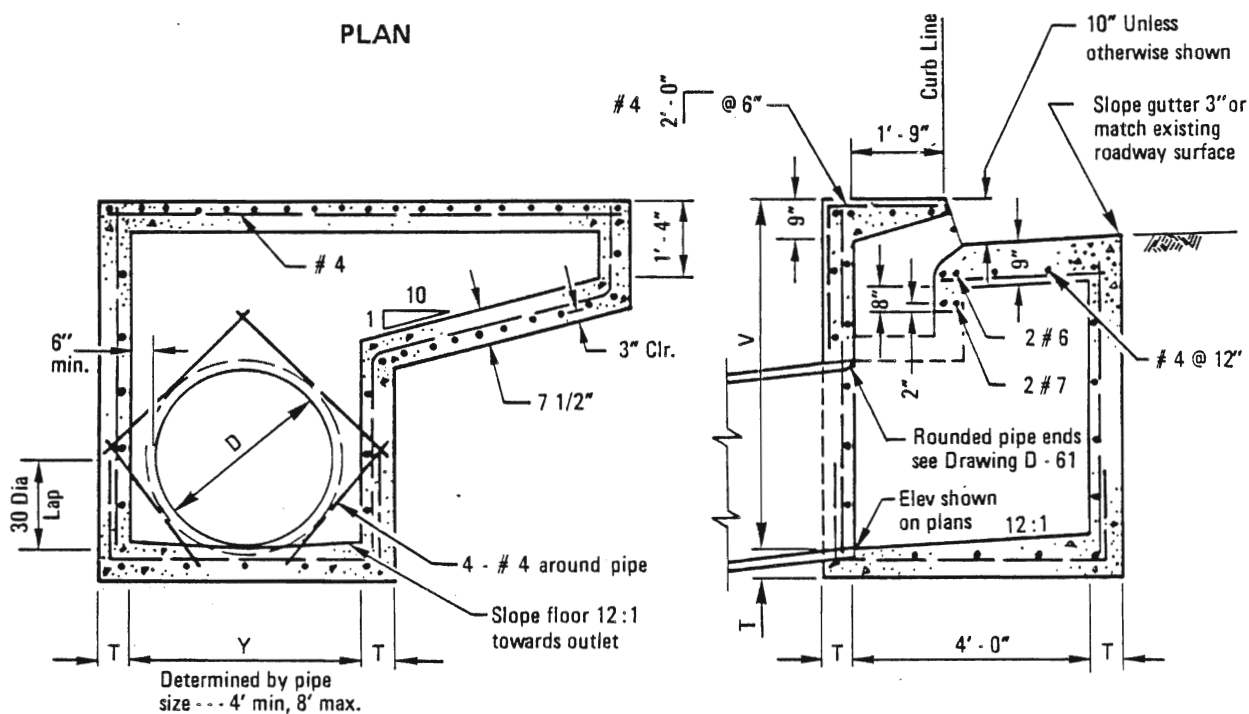
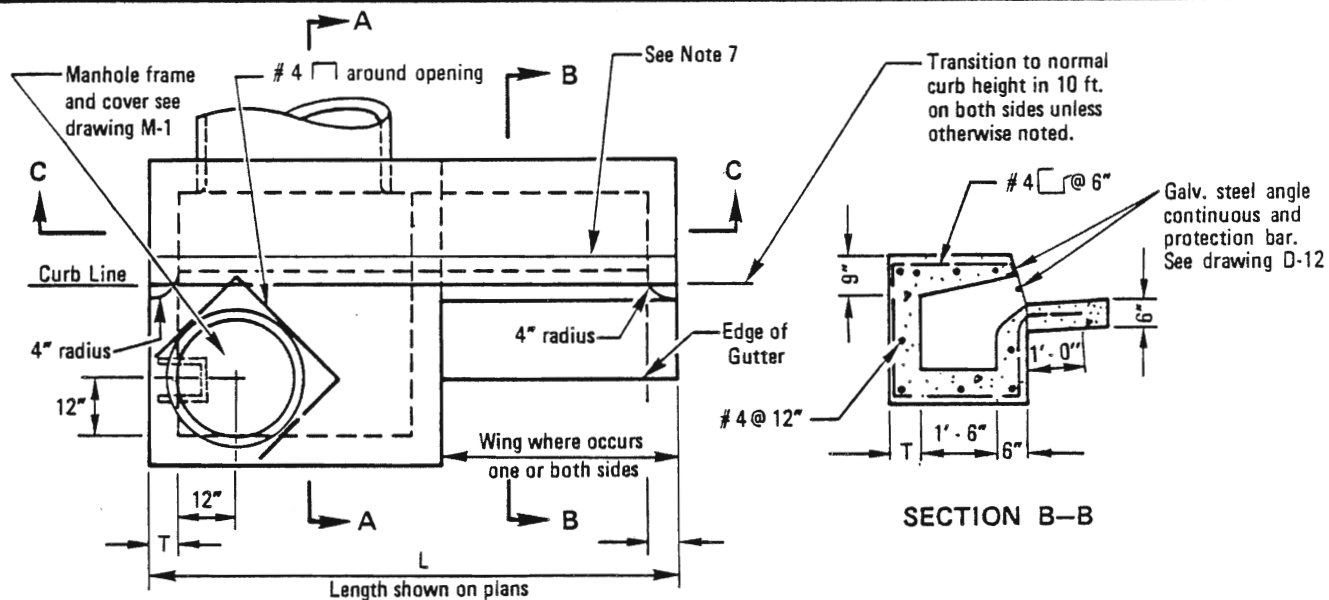
Holes will be permitted in the outer 1/2" of the web for wire, rings, etc. Tie web to #3 reinforcing bars @ 12" max. intervals to support the waterstop in proper position during concrete placement. Alternative detail may be submitted for approval of the Engineer.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING REINFORCED CONCRETE RETAINING WALL DETAILS NO. 3	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Alfred A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
Title	<i>M.B.</i>	5-86			
				DRAWING NUMBER	C-15

DRAINAGE SYSTEMS

DRAINAGE SYSTEMS

D

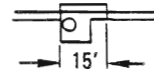


NOTES:

1. See Standard Drawings D-11 & D-12 for additional notes and details.
2. Types are designated 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 1/2".
4. When V exceeds 4' steps shall be installed. See Standard Drawing D-11 for details.
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.
8. Surface of top slab shall be sidewalk finished to drain toward street at a slope of 1/4" per foot.
9. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS

15' Type A-1 inlet



Revision	By	Approved	Date
Reference	TRP	M.B.	10-82
Rebar	SC	M.B.	5-86

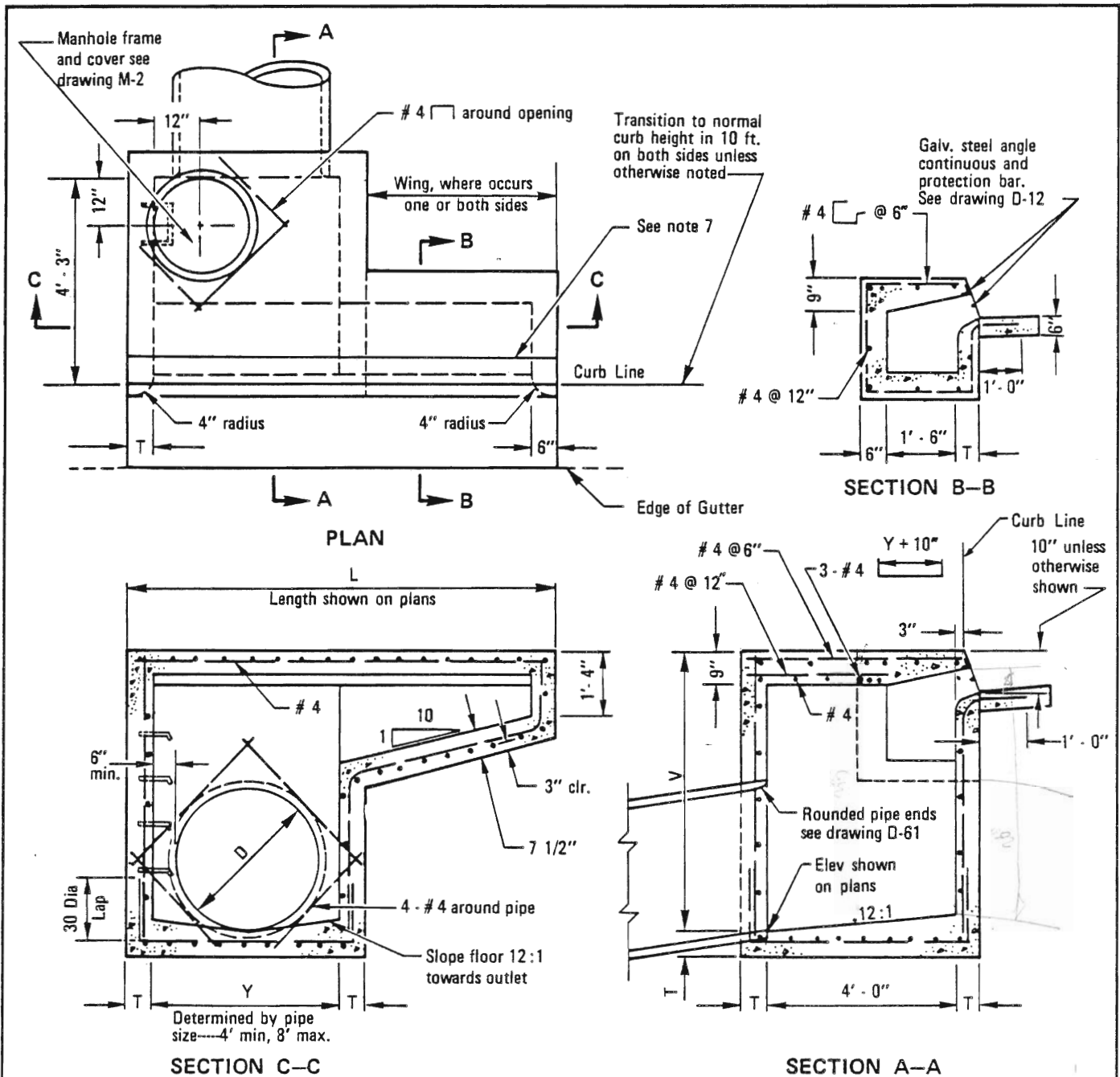
SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **D-1**

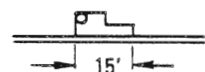


NOTES:

1. See Standard Drawings D-11 & D-12 for additional notes and details.
2. Types are designated 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 1/2".
4. When V exceeds 4' steps shall be installed. See Standard Drawing D-11 for details.
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.
8. Surface of top slab shall be sidewalk finished to drain toward street at a slope of 1/4" per foot.
9. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS

15' Type B-1 inlet



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Edward A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

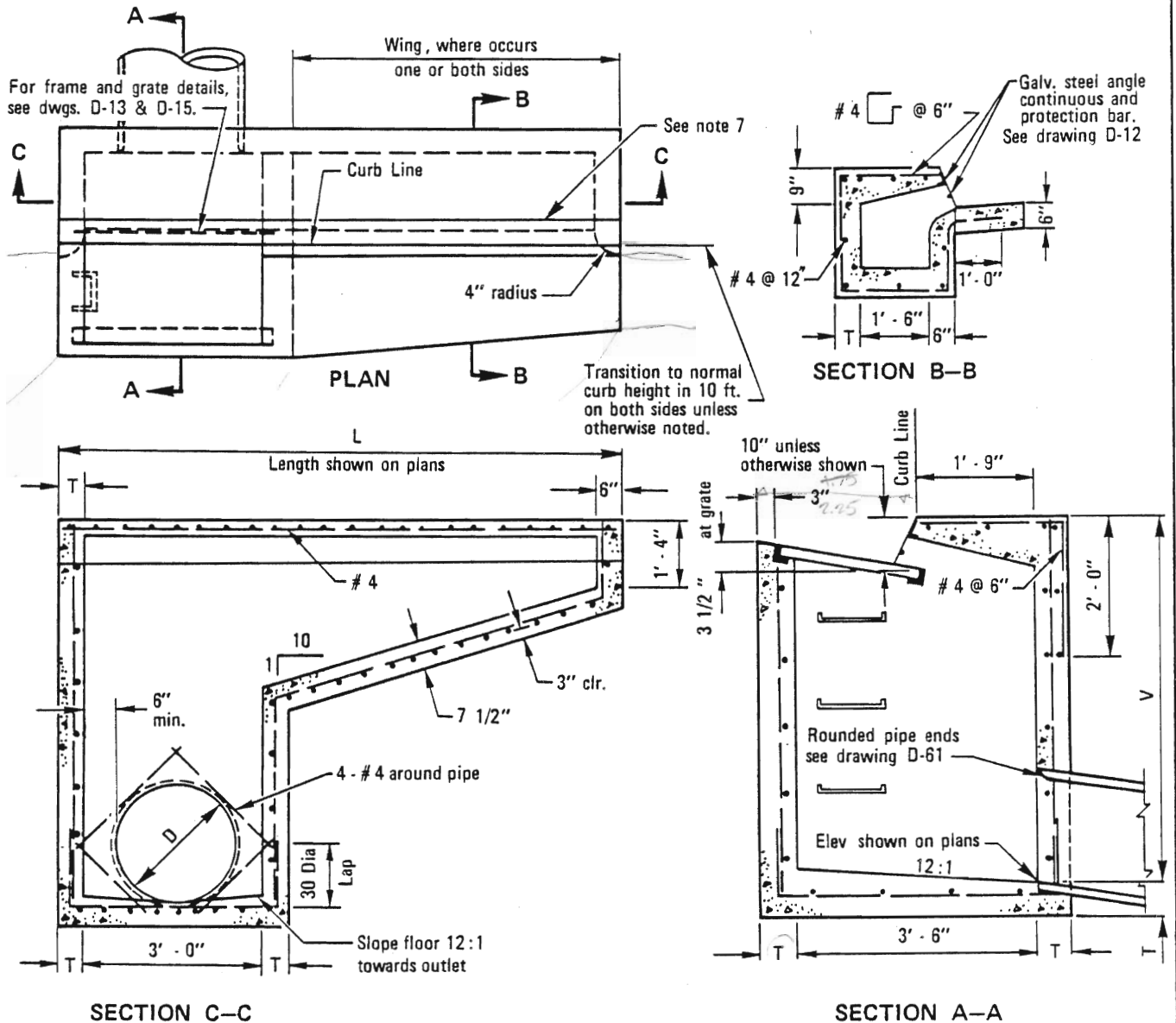
SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE B

DRAWING
NUMBER

D-2

Revision	By	Approved	Date
Notes	<i>D.S.</i>	<i>M.B.</i>	7-79
Reference	<i>TRP</i>	<i>M.B.</i>	10-82
Rebar	<i>MC</i>	<i>M.B.</i>	5-86

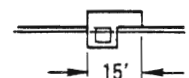


NOTES:

1. See Standard Drawings D-11 through D-15 for additional notes and details.
2. Types are designated 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".
4. When V exceeds 4 ft. steps shall be installed. See Standard Drawing D-11 for details.
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.
8. Surface of top slab shall be sidewalk finished to drain toward street at a slope of 1/4" per foot.
9. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.
10. Where inlet is to be constructed on grade and Standard Drawing D-20 concrete apron is required, lift down-grade end of grate as shown on D-20.

LEGEND ON PLANS

15' Type C-1 Inlet



Revision	By	Approved	Date
Notes	DC	D.S.	7-79
Reference	TRP	H.B.	10-82
Note 11	SC	H.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE C

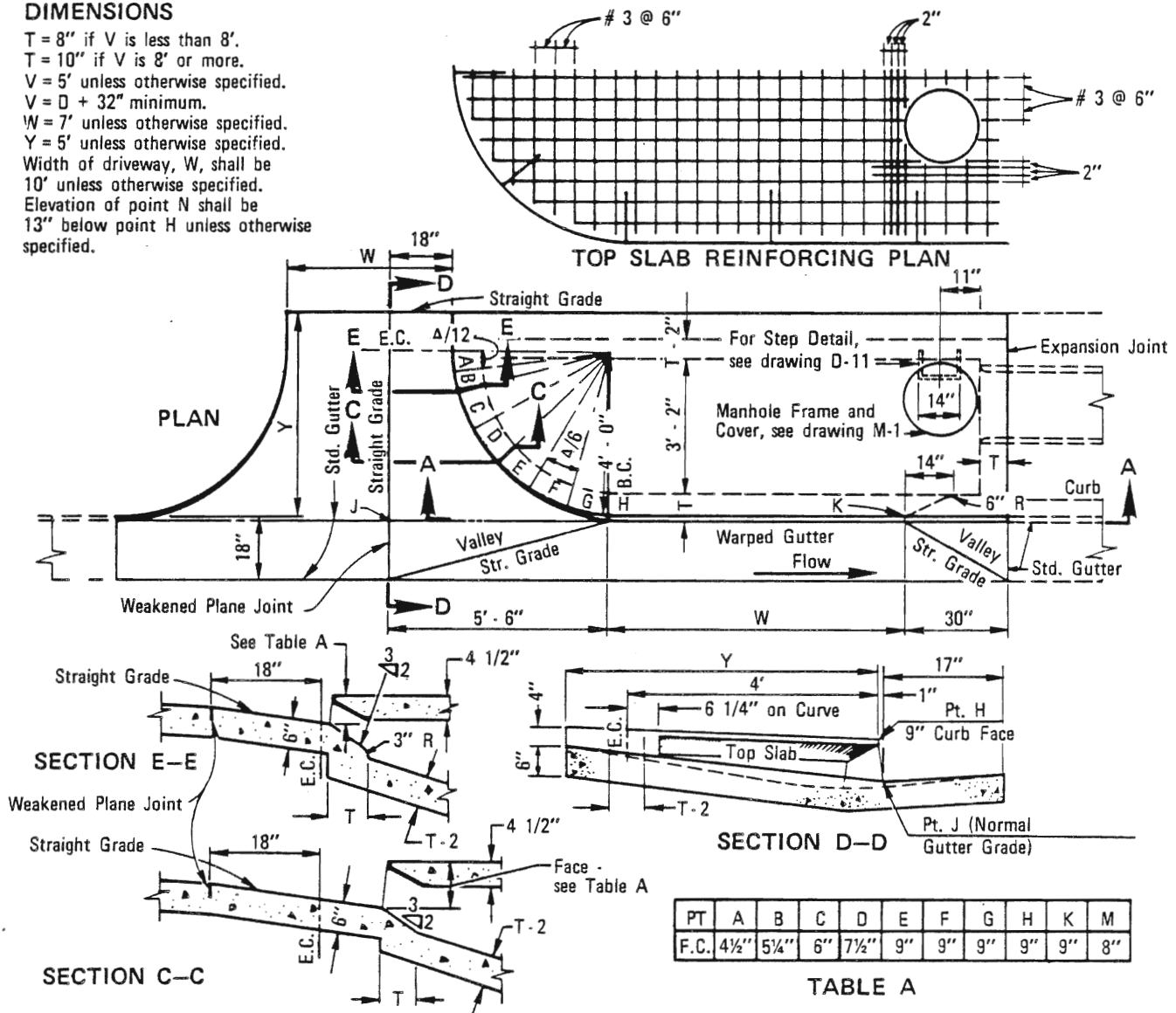
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allan S. Kucharski DEC. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **D-3**

DIMENSIONS

T = 8" if V is less than 8'.
T = 10" if V is 8' or more.
V = 5' unless otherwise specified.
V = D + 32" minimum.
W = 7' unless otherwise specified.
Y = 5' unless otherwise specified.
Width of driveway, W, shall be
10' unless otherwise specified.
Elevation of point N shall be
13" below point H unless otherwise
specified.



NOTES

1. Steel Plate should be of one continuous piece with curve portion a circular arc. Length = Width + 18" + circular arc.
2. # 4 rebar 30" long, 1' O.C. shall be installed in top of walls for ties to top and gutters.
3. The reinforcing steel in the top slab shall be # 3 bars 6" O.C. unless otherwise specified. Clearance shall be 1 1/2" from the bottom of the slab.
4. Concrete for the inlet too to be placed at the same time as the s/w curb and gutter.
5. Concrete shall be 560-C-3250
6. Exposed edges of concrete shall be rounded with a radius of 1/2".
7. Surface of top slab shall be sidewalk finished to drain toward street at a slope of 1/4" per foot.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

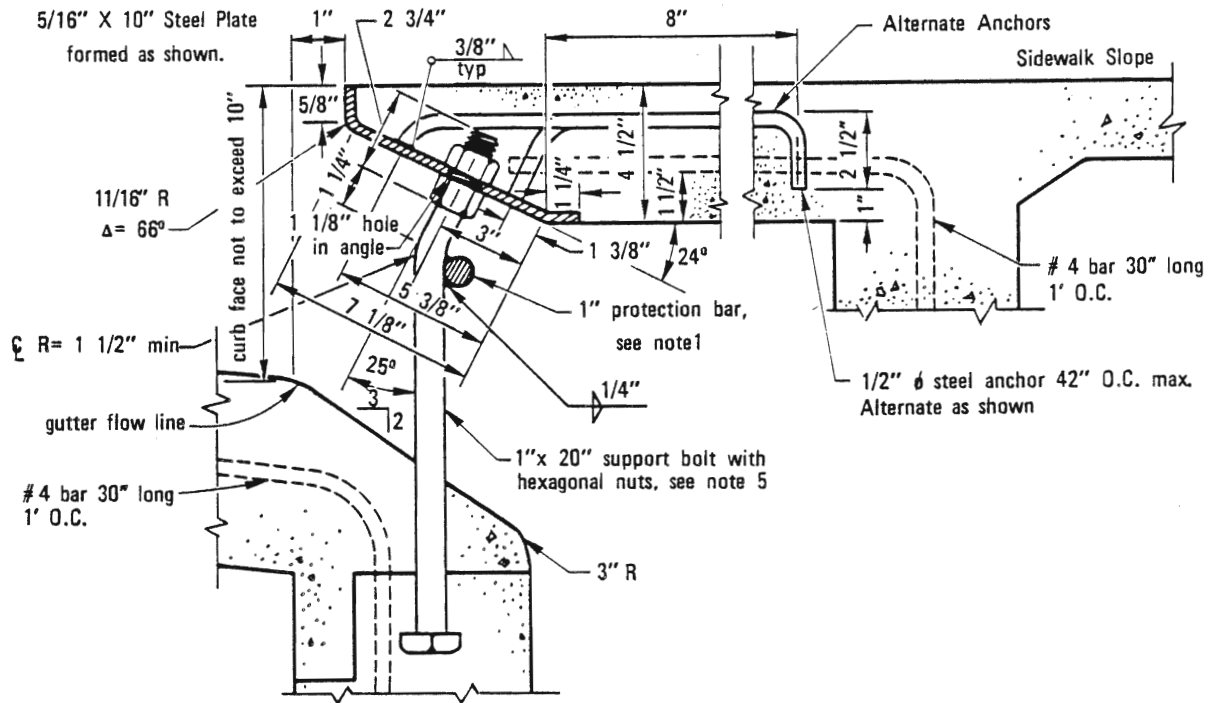
DRAWING
NUMBER

D-4

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE D

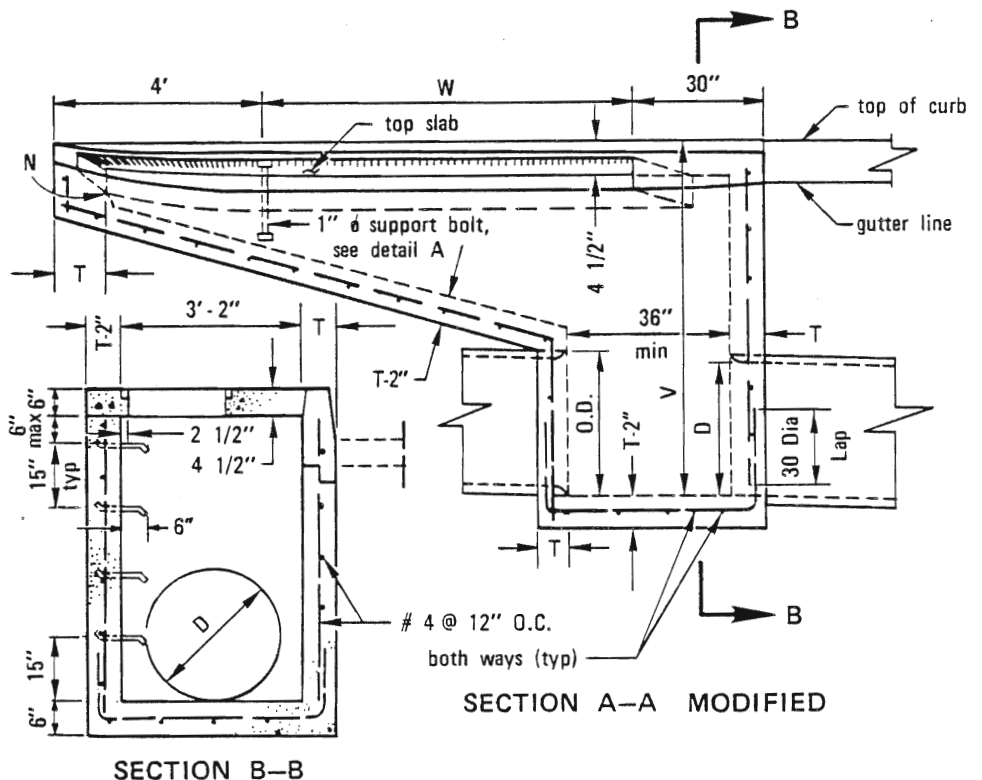
Revision	By	Approved	Date
Conc.	<i>LC</i>	<i>M.B.</i>	5-86



DETAIL-A

NOTES

1. A plain, round steel protection bar 1" in dia. shall be installed. Bar shall be embedded 5" at each end.
2. Leave 8" hole blocked out in bottom placing of concrete for bolts placed at same time as gutter.
3. All exposed metal parts shall be galvanized.
4. All galvanizing damaged by welding shall receive two coats of aluminum paint.
5. Support bolts shall be spaced at not more than 5' - 0" O.C.
6. Adjusting nuts to be tightened and secured in place when steel plate is in proper position.



Revision	By	Approved	Date
Rebar	TKM	M.B.	10-82
Lap	SK	M.B.	5-86

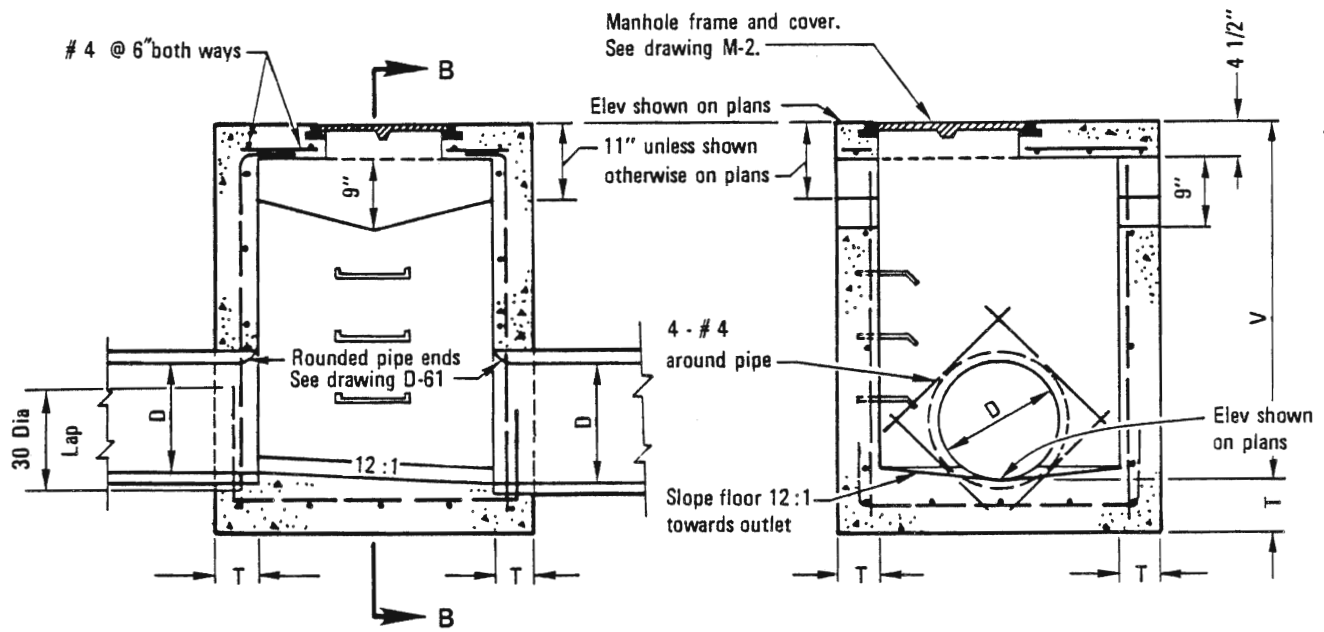
SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE D (DETAILS)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

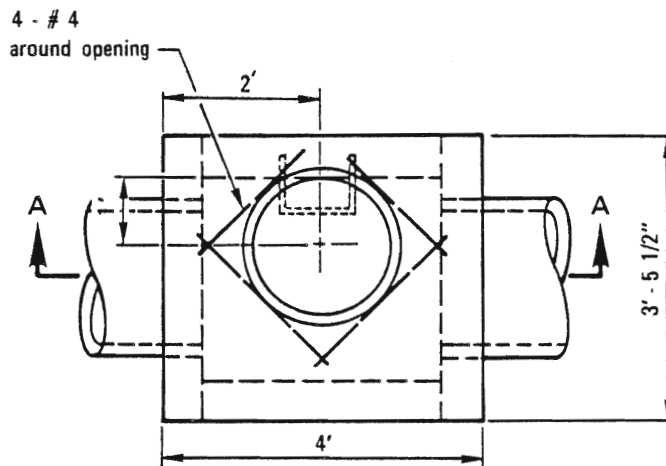
Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **D-5**



SECTION A-A

SECTION B-B

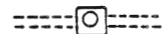


PLAN

NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. When V exceeds 4' steps shall be installed. See Standard Drawing D-11 for details.
3. Exposed edges of concrete shall be rounded with a radius of 1/2".
4. Openings on both sides unless otherwise shown on plans.
5. Maintain 1 1/2" clear spacing between reinforcing and surface.

LEGEND ON PLANS



Revision	By	Approved	Date
Rebar	TRF	M.B.	10-82
Lap	TRF	M.B.	5-86

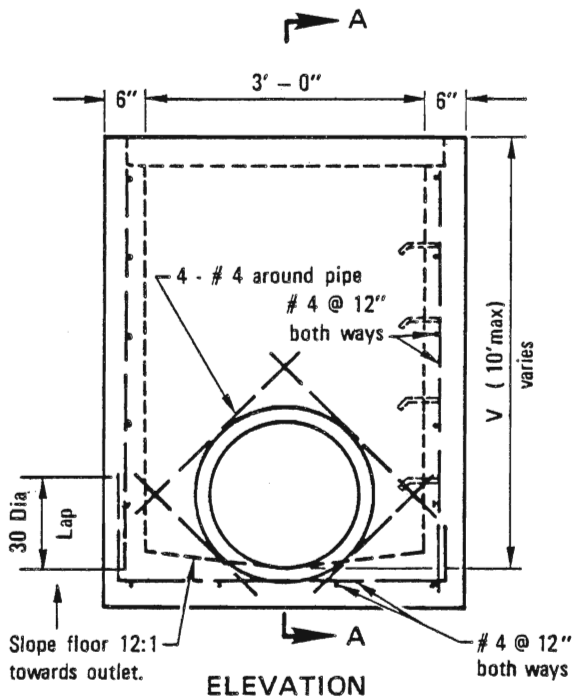
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE F

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

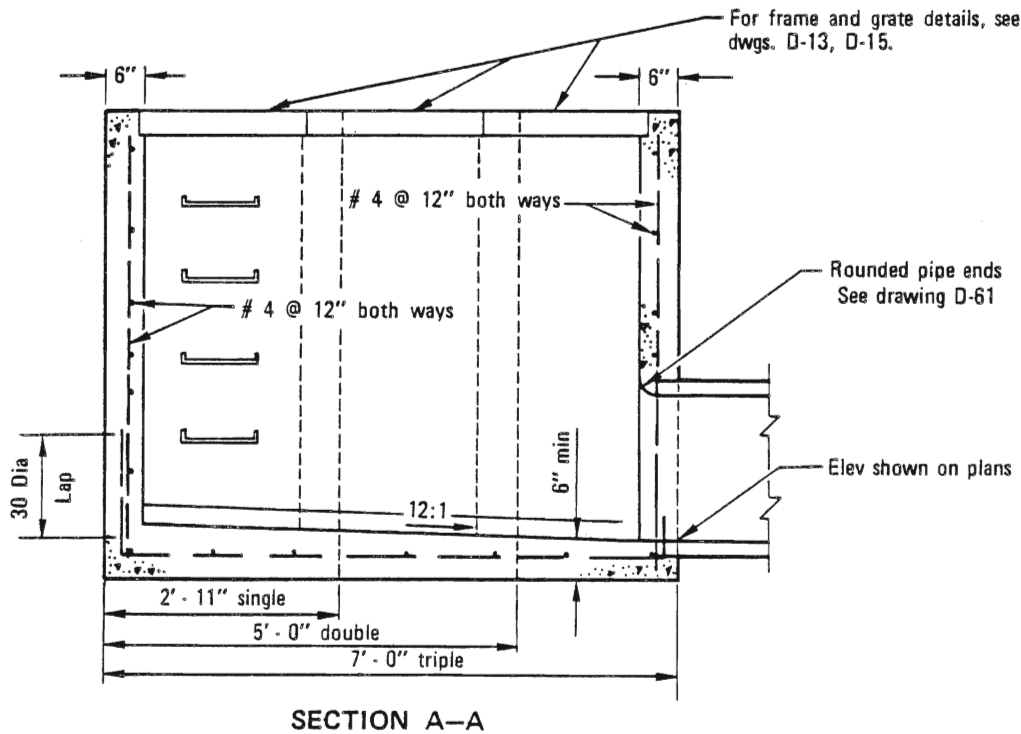
Allan A. Kuehn DEC. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-7**

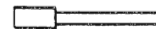


NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. When V exceeds 4', steps shall be installed. See Standard Drawing D-11 for details.
3. Maintain 1 1/2" clear spacing between reinforcing and surface.
4. Increase in allowable depth subject to approval by Agency.
5. 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 and grate.
6. Exposed edges of concrete shall be rounded with a radius of 1/2".
7. Designate types as follows: Single G-1, Double G-2 and Triple G-3.
8. Only end bearing grates shall be used. See Std. Drawing D-15.



LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

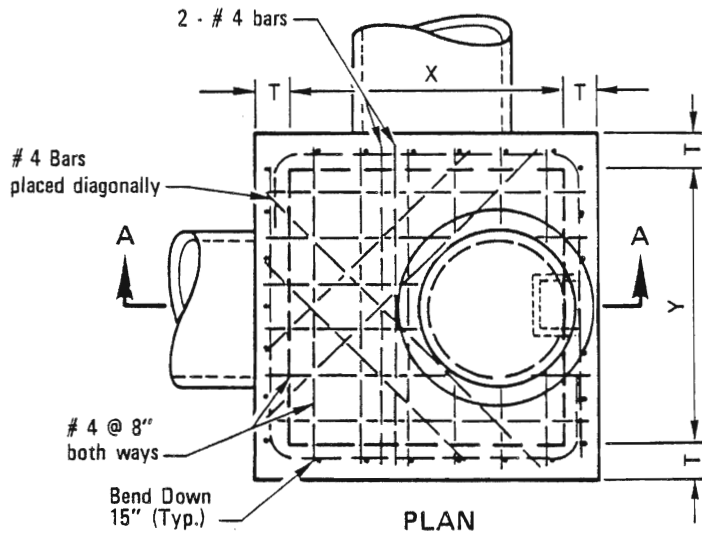
Alfred A. Kuehn Dec. 1975
Coordinator H.C.E. 19807 Date

DRAWING
NUMBER **D-8**

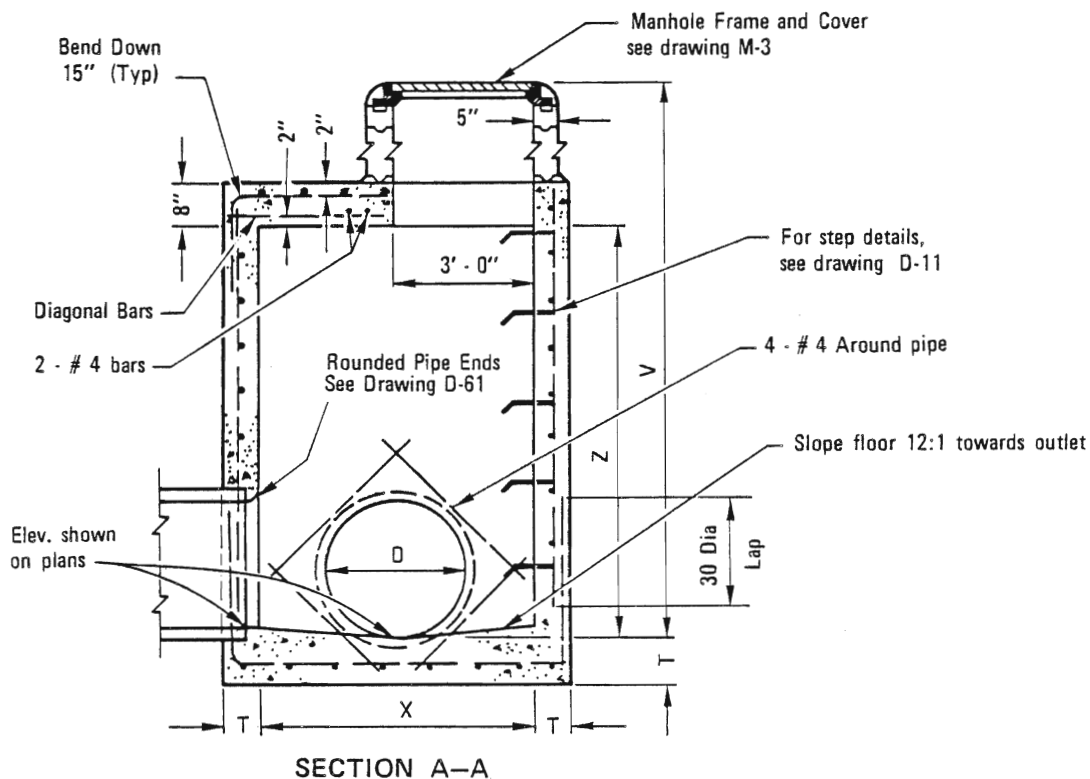
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE G

Revision	By	Approved	Date
Reference	TRP	M.B.	10-82
Lap	RC	M.B.	5-86



TYPE	PIPE DIA	X	Y	Z
A 4	up to 39"	4'	4'	6'
A 5	42" to 48"	5'	4'	6'
A 6	51" to 60"	6'	4'	6'
A 7	63" to 72"	7'	4'	7'
A 8	75" to 84"	8'	4'	8'



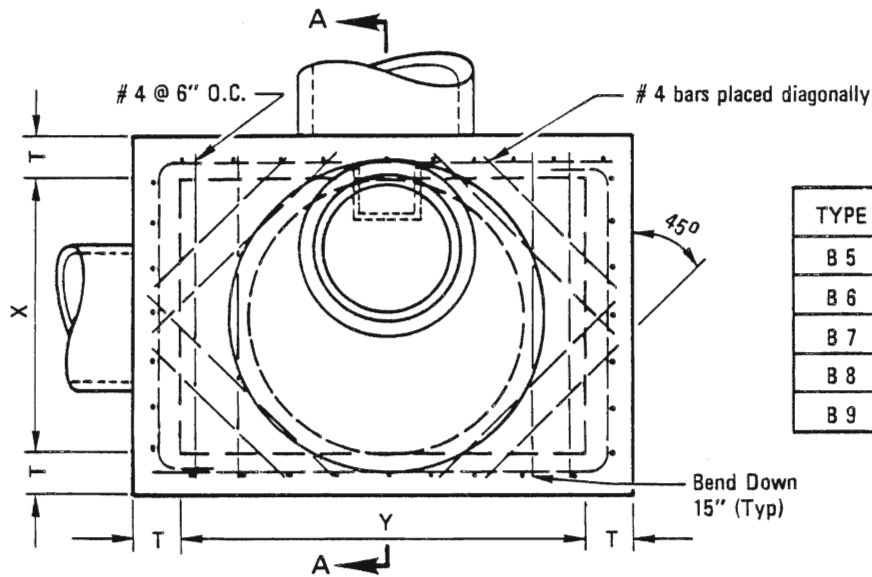
NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. Concrete base shall be 560-C-3250
3. All precast components shall be reinforced with 1/4" diameter steel, wound spirally on 4" centers.
4. All joints shall be set in Class C mortar.
5. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.
6. Exposed edges of concrete shall be rounded with a radius of 1/2".

LEGEND ON PLANS



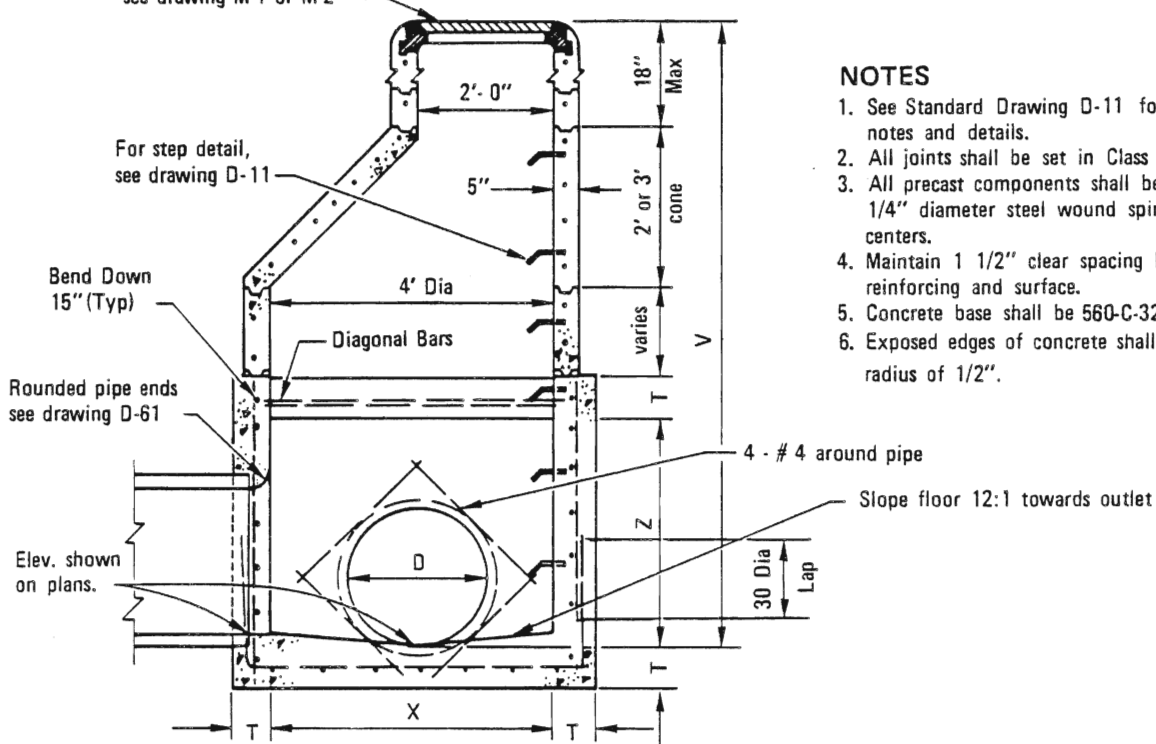
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Lap	LC	M.B.	5-86			<i>Alfred A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
				STORM DRAIN CLEANOUT - TYPE A		DRAWING NUMBER	
						D-9	



TYPE	PIPE DIA	X	Y	Z
B 5	up to 51"	4'	5'	5'
B 6	54" to 60"	4'	6'	6'
B 7	63" to 69"	4'	7'	7'
B 8	72" to 81"	4'	8'	8'
B 9	84" to 90"	4'	9'	9'

Manhole frame and cover
see drawing M-1 or M-2

PLAN

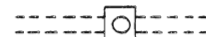


SECTION A-A

NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. All joints shall be set in Class C mortar.
3. All precast components shall be reinforced with 1/4" diameter steel wound spirally on 4" centers.
4. Maintain 1 1/2" clear spacing between reinforcing and surface.
5. Concrete base shall be 560-C-3250
6. Exposed edges of concrete shall be rounded with a radius of 1/2".

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

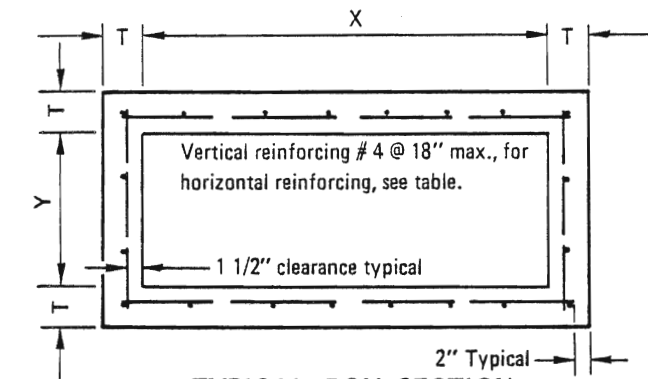
Allen D. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-10**

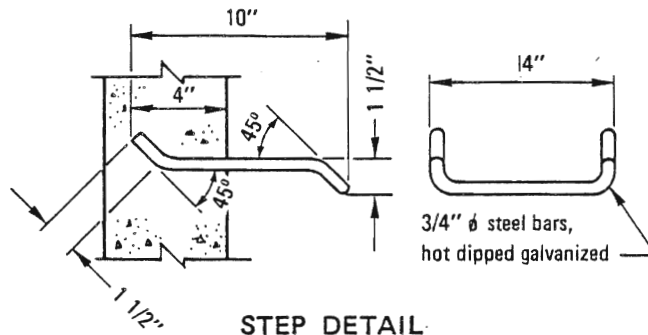
SAN DIEGO REGIONAL STANDARD DRAWING

STORM DRAIN CLEANOUT - TYPE B

Revision	By	Approved	Date
Lap	SC	M.B.	5-86



TYPICAL BOX SECTION



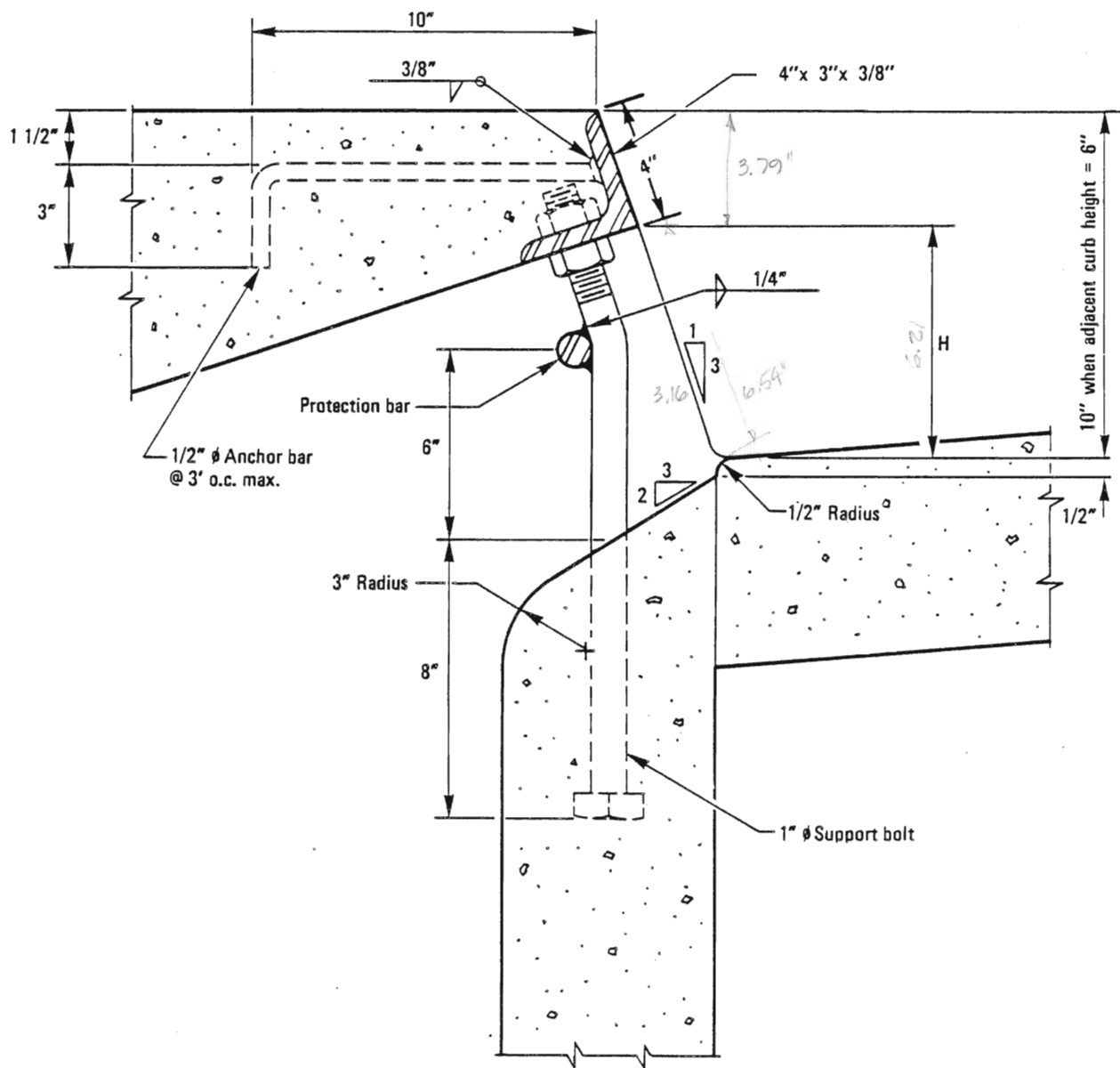
STEP DETAIL

BOX SECTION REINFORCEMENT			
MAXIMUM SPAN X or Y	DEPTH V	THICK- NESS T	HOR. & FLR. REINF.
3' - 0" to 4' - 0"	4' - 0"	6"	# 4 @ 18"
4' - 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 8' - 0"	8' - 1" to 12' - 0"	6"	# 4 @ 6"
3' - 0" to 4' - 0"		6"	# 4 @ 15"
4' - 1" to 5' - 0"		8"	# 4 @ 12"
5' - 1" to 6' - 0"	12' - 0" to 16' - 0"	8"	# 4 @ 8"
6' - 1" to 8' - 0"		8"	# 4 @ 6"
3' - 0" to 4' - 0"		6"	# 4 @ 12"
4' - 1" to 5' - 0"	12' - 1" to 16' - 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"	16' - 0" to 20' - 0"	8"	# 5 @ 8"
3' - 0" to 4' - 0"		8"	# 4 @ 12"
4' - 1" to 5' - 0"		10"	# 4 @ 12"
5' - 1" to 6' - 0"	20' - 0" to 24' - 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"	24' - 0" to 28' - 0"	10"	# 4 @ 6"
7' - 1" to 8' - 0"		12"	# 5 @ 8"

NOTES

- Concrete shall be 560-C-3250 unless otherwise noted.
- Reinforcing steel shall comply with this drawing unless otherwise specified.
- Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
- Bends shall be in accordance with latest ACI code.
- Minimum splice length for reinforcing shall be 30 diameters.
- Floor shall have a wood trowel finish and, except where used as junction boxes, shall have a minimum slope of 1" per foot toward the outlet.
- Depth V is measured from the top of the structure to the flowline of the box.
- Wall thickness and reinforcing steel required may be decreased in accordance with table above.
- Wall thickness shall be stepped on the outside of the box.
- When the structure depth V exceeds 4', steps shall be cast into the wall at 15 inch intervals from 15" above floor to within 12 inches of top of structure. Where possible place steps in wall without pipe opening, otherwise over opening of smallest diameter.
- Alternate step may be an approved steel reinforced polypropylene step.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Notes	JS	D.S.	7-79			Allan A. Kerschman Dec. 1975	
Conc.	JS	M.R.	5-86	INLETS AND CLEANOUTS NOTES AND DETAILS		Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER	
						D-11	



NOTES:

1. Face angle shall be cast into structure continuous for the full length "L".
2. All exposed metal parts to be hot-dipped galvanized after fabrication.
3. When curb inlet opening height (H) exceeds 6" install 1" ϕ steel protection bar.
4. Install additional bars at 3 1/2" clear spacing above first bar when opening exceeds 13".
5. When curb inlet opening length exceeds 8' install 1" ϕ steel support bolts, spaced at not more than 5' o.c.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

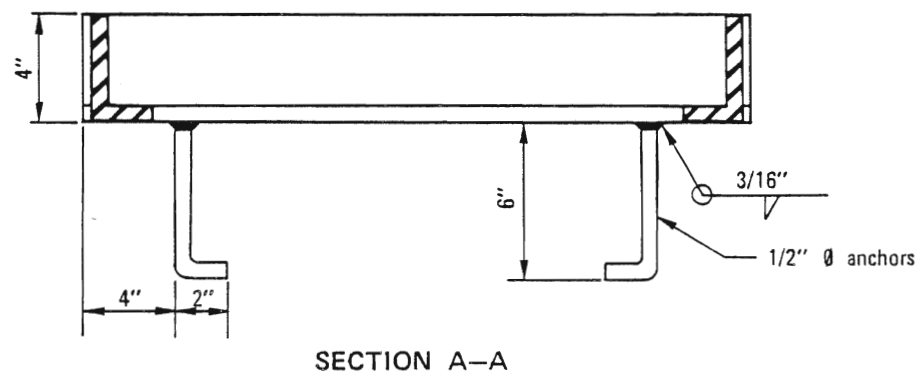
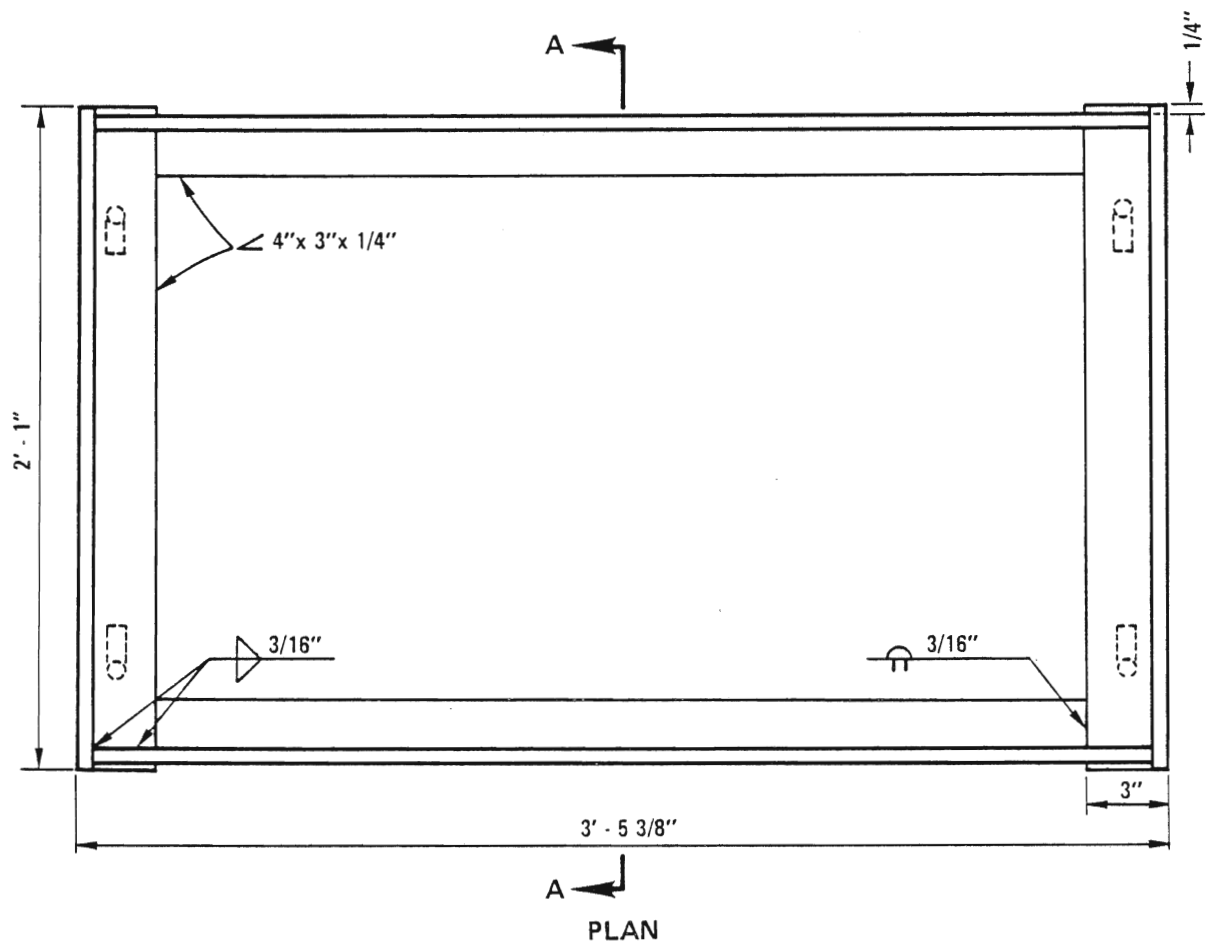
Allen A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET OPENING

Revision	By	Approved	Date
Angle	IC	D.S.	7-79
Note 3	TRP	M.B.	10-82
Angle	TRP	M.B.	10-82

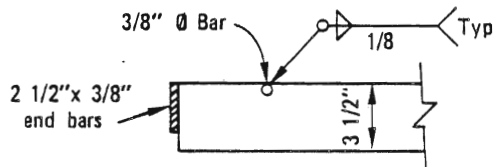
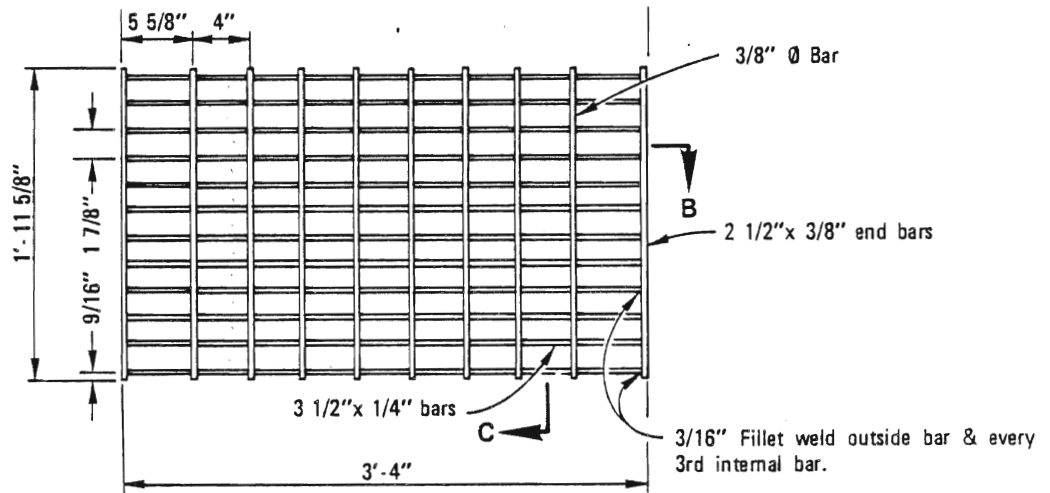
DRAWING
NUMBER **D-12**



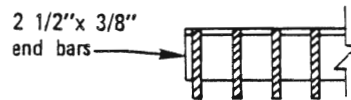
NOTES

1. Hot dip galvanize all parts after fabrication.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Note 1	SC	M.B.	5-86	WELDED STEEL GRATE FRAME		Allard A. Kerschman Dec. 1975 Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER D-13	



SECTION B



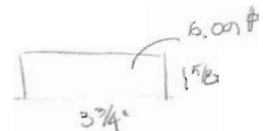
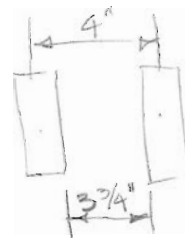
SECTION C

NOTES:

1. Hot dip galvanize all parts after fabrication.
2. Dimensions to Centerline of bars unless otherwise noted.
3. Weight: 141 lbs.

$$6.00 \times 77 + 8.53 \times 22 = \frac{656.6}{144} = 4.56 \text{ } \phi = A$$

$$P = 3.25 \times 1.97 = 10.44$$



Revision	By	Approved	Date
Delete G-5	TRP	M.B.	10-82
Title	RC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

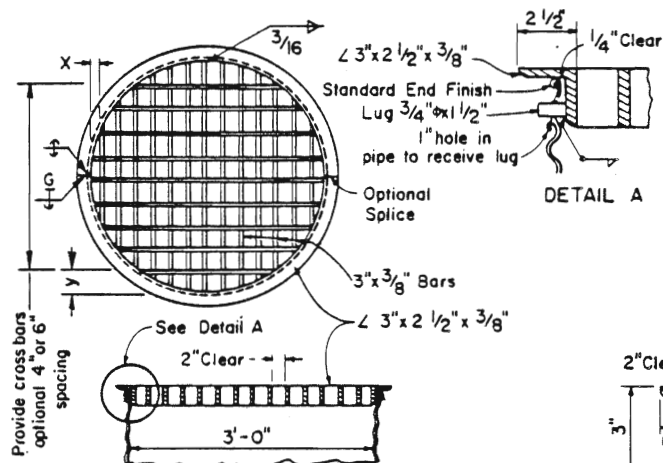
DRAINAGE STRUCTURE GRATE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER D-15

Notes	<u>Sc</u>	0.5	7-79
-------	-----------	-----	------

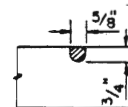


GRATE DETAILS

ALTERNATIVE CAST NODULAR
IRON GRATE OR CAST STEEL

3/8" ϕ Cross bars may be fillet welded, resistance welded or electroforged to bearing bars.

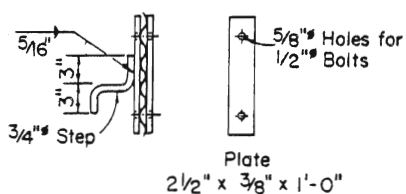
CROSS BAR DETAIL
GRATE (WELDED STEEL)



CROSS BAR DETAIL
ALTERNATIVE CAST
NODULAR IRON GRATE
OR CAST STEEL GRATE

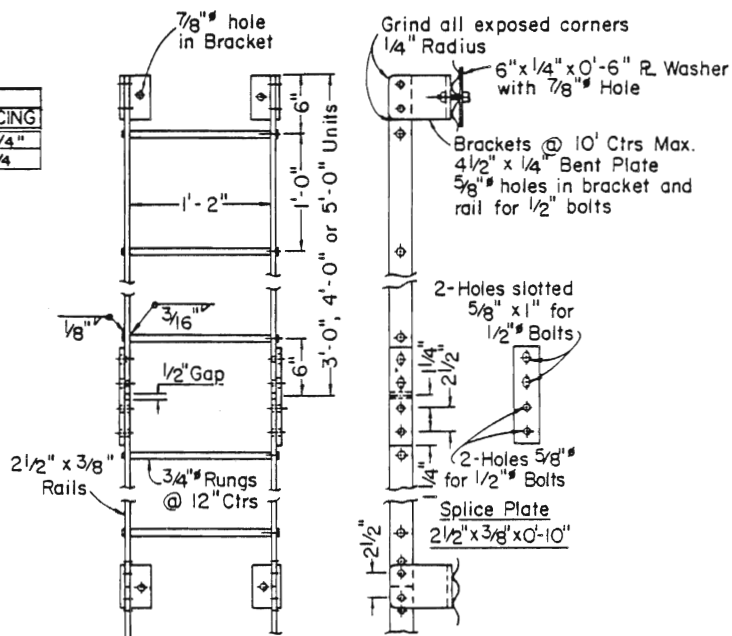
GRATE BAR SPACING TABLE

TYPE	NO. BARS	CLEAR BAR SPACING	X	Y	
				4" SPACING	6" SPACING
welded	15	2	9/16	3 3/4"	5 3/4"
Cast	13	2	2 1/8	3 3/4"	5 3/4"



STEP DETAIL

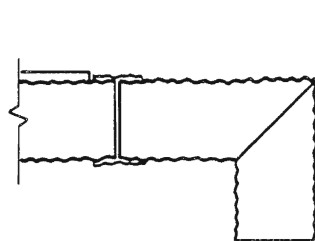
H = 3' - 6" to 4' - 11"



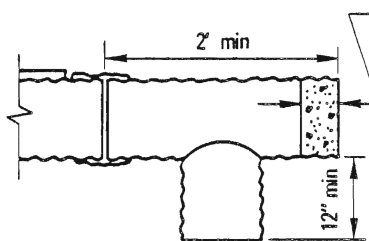
LADDER DETAIL

H = 5' - 0" or GREATER

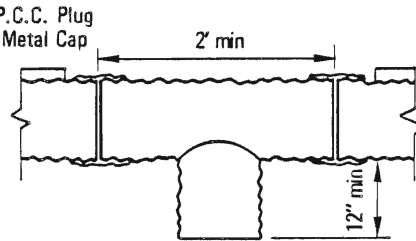
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				CORRUGATED STEEL PIPE INLETS DETAILS		Allen A. Kuehnert	Dec. 1975
						Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	D-17



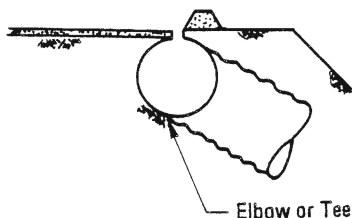
ELBOW



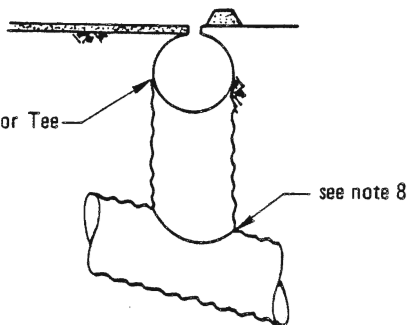
TEE



TEE-SAG CONDITION

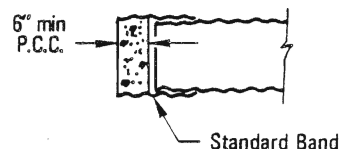


Elbow or Tee



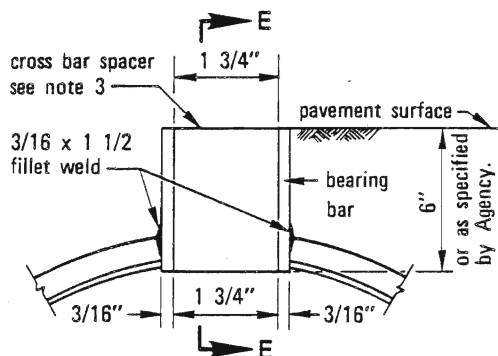
Elbow or Tee

see note 8



BAND PLUG

OVERSIDE DRAIN

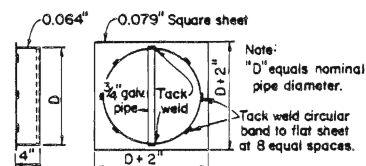


SECTION D-D
GRATE SLOT DETAIL

RISER



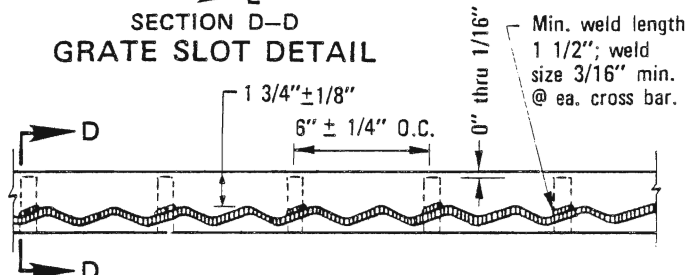
SECTION E-E



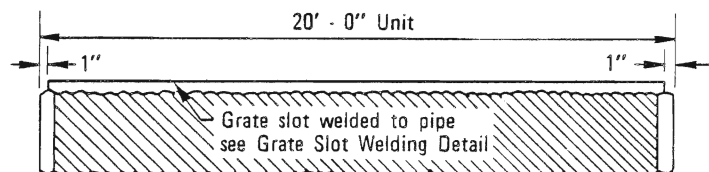
METAL CAP DETAIL

NOTES

1. Drain seams may be riveted or resistance spotwelded at equal centers, continuous helical lock seam or helical welded seam.
2. Each drain section shall be assembled with standard coupling bands.
3. Cross bar spacer of grate shall be pressure fusion or plug welded to bearing bars in such a manner as to develop the strength of the cross bar spacer.
4. Cross bar spacer (Section E-E) may differ from that shown provided section area is equal or greater.
5. Grate material shall be a weldable grade of steel complying to the requirements of ASTM A 36.
6. The maximum variance from a straight line from the extreme top corners of the bearing bar shall be 1/2" in 20 feet.
7. Installation lengths shall be 10 feet or multiples thereof.
8. Either field joint sealed with a pliable mixture of sand, portland cement and emulsified asphalt (Mixture of 1 part portland cement, 3 - 5 parts sand and 1 1/2 parts SSI emulsified asphalt), or continuous weld.



GRATE SLOT WELDING DETAIL



GRATE SLOT DRAIN

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

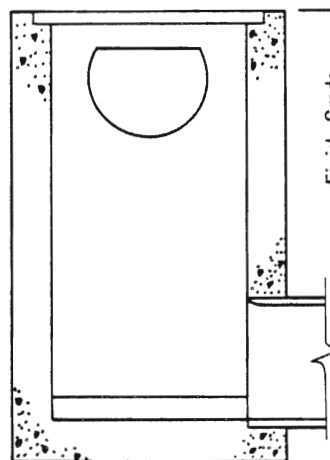
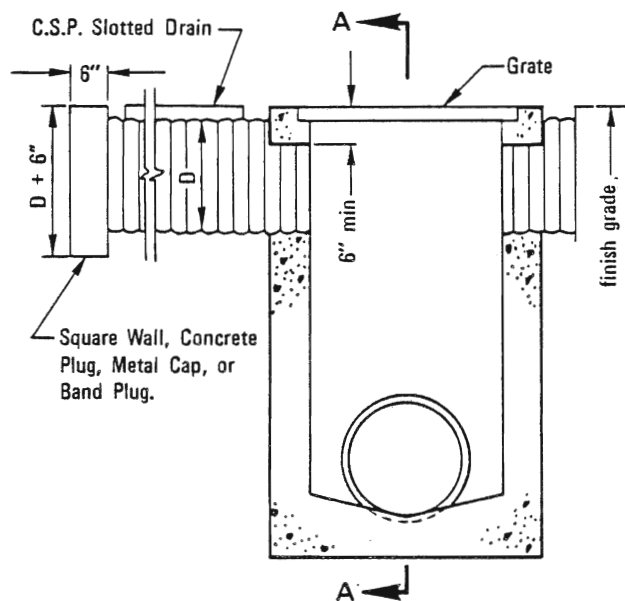
Alvin S. Kuehn Dec. 1975
Contributor H.C.E. 19807 Date

DRAWING
NUMBER D-18

SAN DIEGO REGIONAL STANDARD DRAWING

**SLOTTED CORRUGATED STEEL PIPE DRAIN
12" THROUGH 24"**

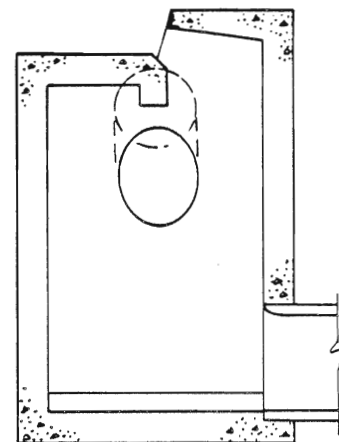
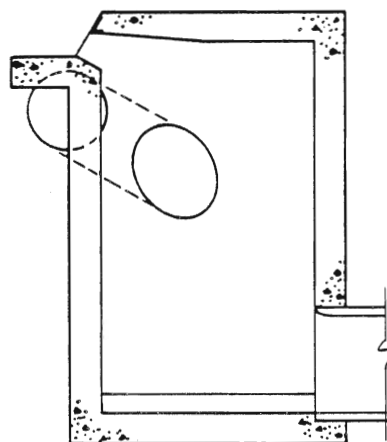
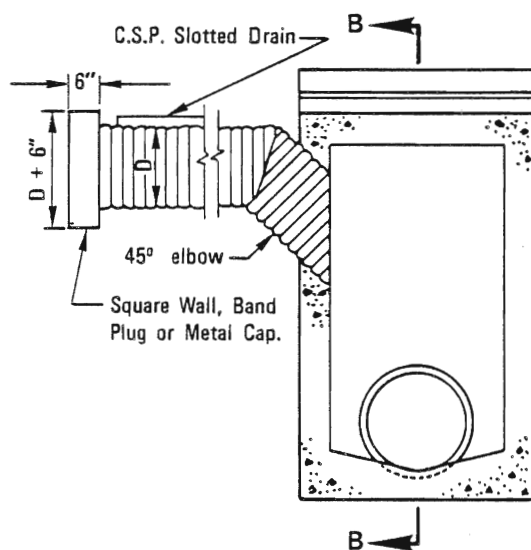
Revision	By	Approved	Date
Sect. D-D	TRP	M.B.	10-82



SECTION A-A

CATCH BASIN

C.S.P. INLET



SECTION B-B

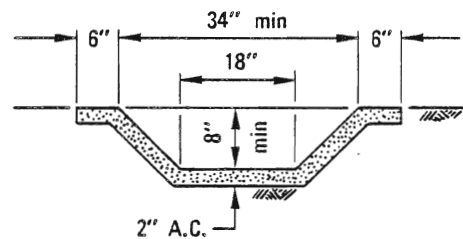
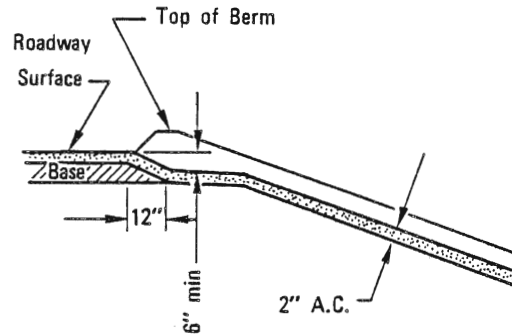
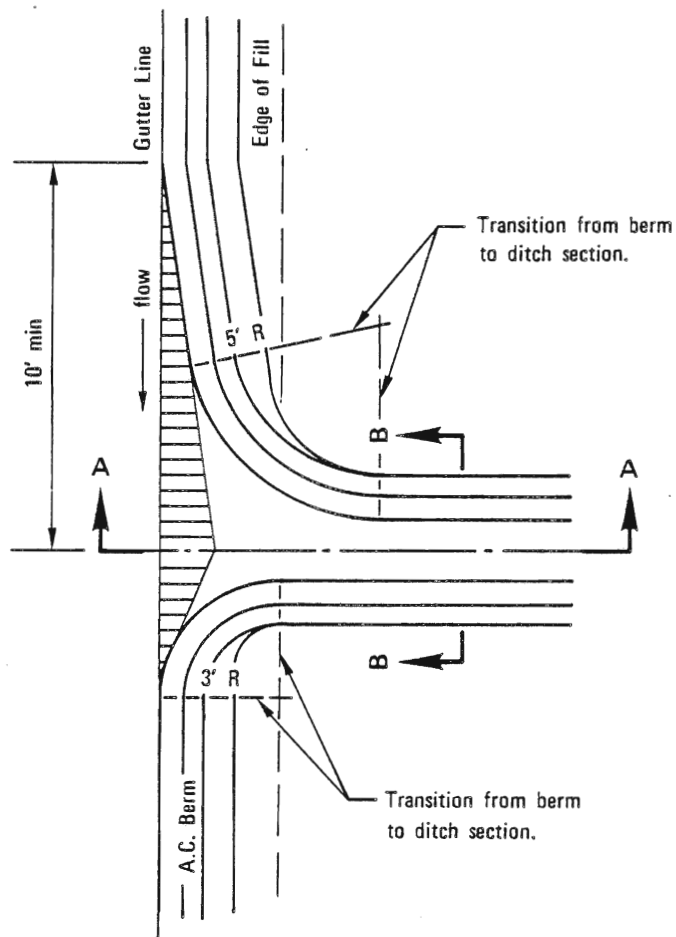
ALTERNATE SECTION B-B

INLETS

NOTES

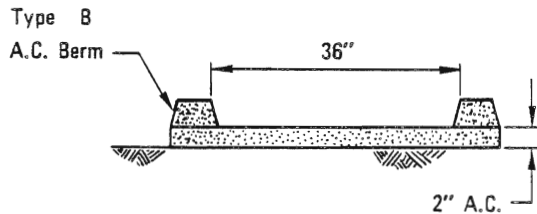
1. Either field joint with a pliable mixture of sand, portland cement and emulsified asphalt (mixture of 1 part portland cement, 3 - 5 parts sand, and 1 1/2 parts SSI emulsified asphalt), or continuous weld.
2. See Standard Drawing D - 18 for additional notes and details.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				SLOTTED DRAIN CONNECTIONS TO STANDARD INLETS		<i>Allen A. Kerschman</i> Dec. 1975
						Coordinator R.C.E. 19807 Date
						DRAWING NUMBER D-19



NOTE

Cross - sectional area of ditch may be rounded, or trapezoidal.



NOTES

1. A.C. spillway may be used when fill is 10' or less, and where fill slope is 1 1/2:1 or flatter.
2. Use 10' min. length of gutter transition on each side of downdrain in sag condition.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred G. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

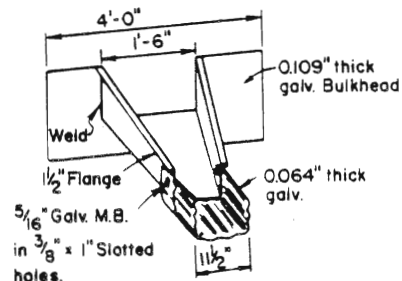
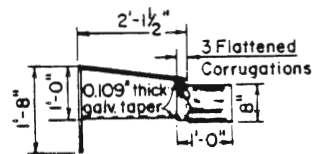
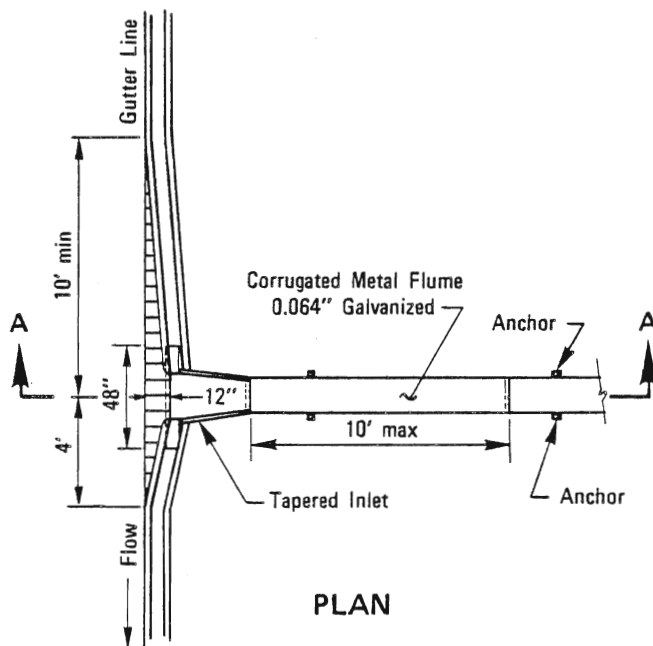
DRAWING
NUMBER

D-22

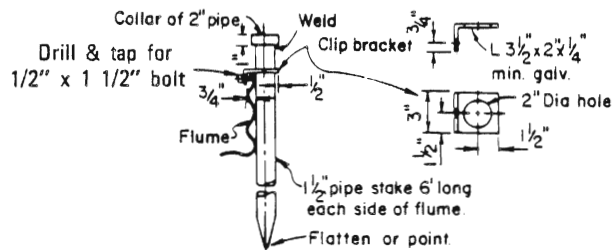
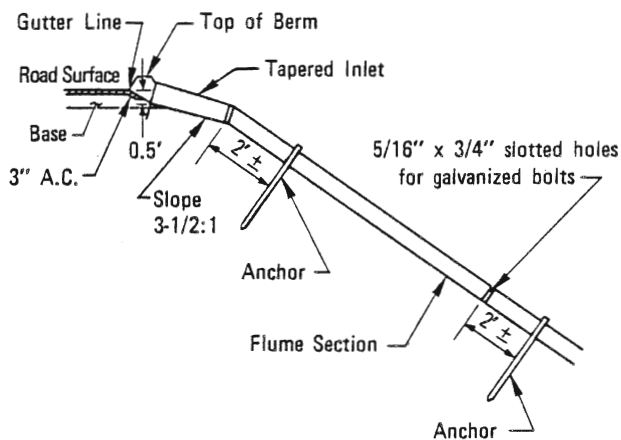
SAN DIEGO REGIONAL STANDARD DRAWING

ASPHALT CONCRETE SPILLWAY

Revision	By	Approved	Date
Plan	<i>D. S.</i>	<i>D. S.</i>	7-79



TAPERED INLET

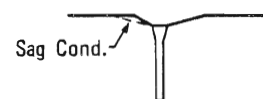


ANCHOR DETAIL

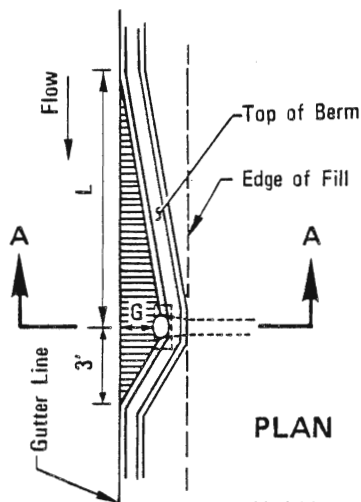
NOTES

1. Downdrain flume may be used where fill slope is 1 1/2 : 1 or flatter.
2. Use 10' min length of gutter transition on each side of downdrain in sag location.
3. All metal parts to be galvanized after fabrication.

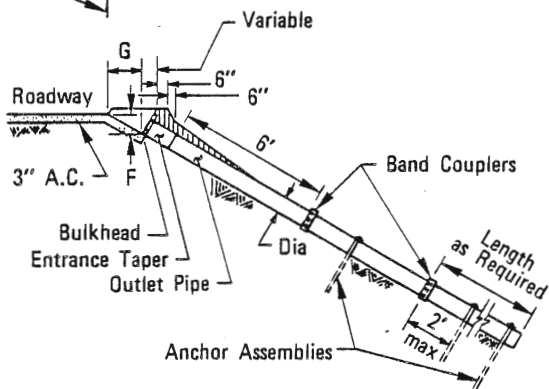
LEGEND ON PLANS



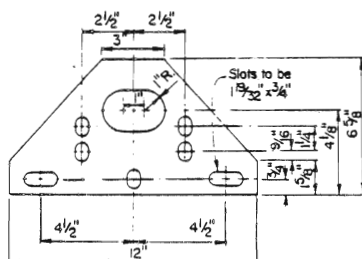
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				TAPERED INLET AND DOWNDRAIN FLUME		<i>Alfred A. Kuehn</i> <i>Dec. 1975</i>
						Coordinator R.C.E. 19807 Date
						DRAWING NUMBER
						D-23



PLAN



SECTION A-A



Material to be $\frac{1}{4}$ \"/>

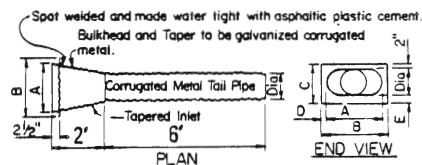
PLATE DETAIL

Dimensions to be as tabulated below for Assembly.

Dia	A	B	C	D	E	F	G	L
8"	16"	25 1/2"	15"	4 3/4"	5"	6"	18"	10'
12"	18"	25 1/2"	19"	3 3/4"	5"	9"	20"	15'
18"	24"	36"	26"	6"	6"	12"	24"	25'

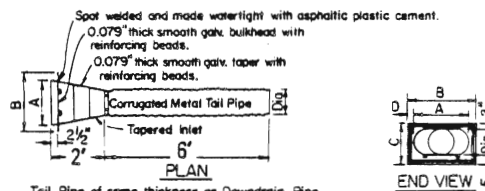
NOTES

1. All metal parts for anchor assemblies shall be galvanized after fabrication.
2. One anchor assembly required per length of pipe. When final length exceeds 10 ft. two anchors shall be required.



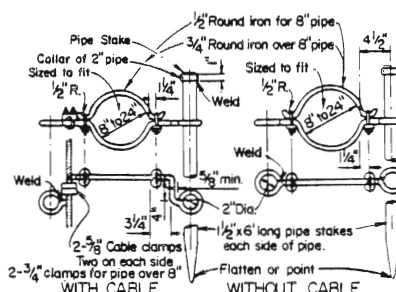
Bulkhead and Taper of same thickness as Tail Pipe with 0.079\"/>

ENTRANCE TAPER—TYPE 1
ALTERNATIVE A



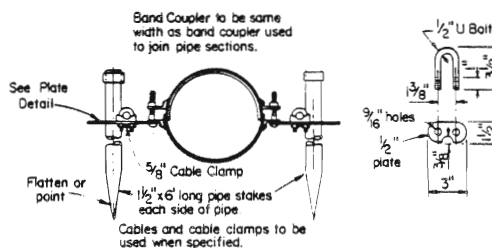
Tail Pipe of same thickness as Downdrain Pipe.

ENTRANCE TAPER—TYPE 1
ALTERNATIVE B



Cables and Cable Clamps to be used when specified.

ANCHOR ASSEMBLY
ALTERNATIVE-A



ANCHOR ASSEMBLY
ALTERNATIVE-B

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

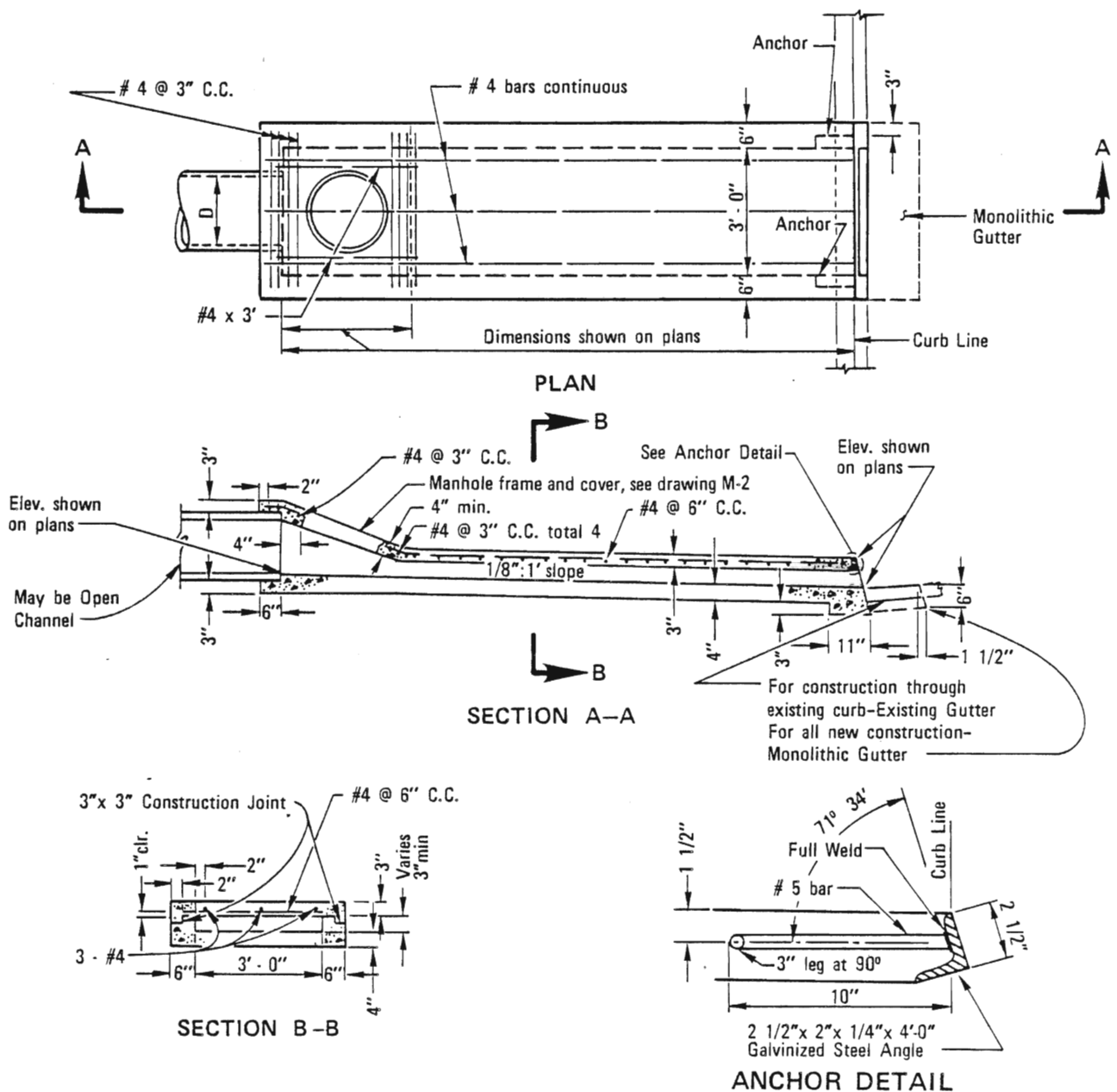
Allan A. Kerschbaum *DEC. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-24**

SAN DIEGO REGIONAL STANDARD DRAWING

ENTRANCE TAPER AND DOWNDRAIN PIPE

Revision By Approved Date



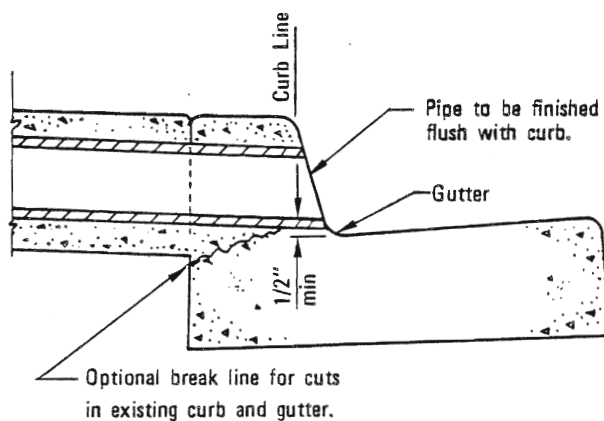
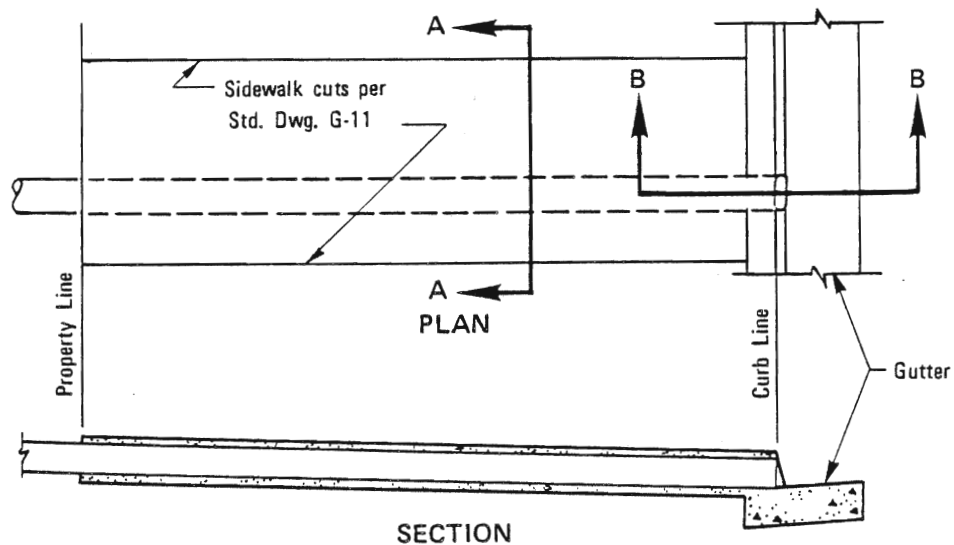
NOTES

1. Concrete shall be 560-C-3250.
2. D=inside diameter of pipe or depth of channel.
3. Section to be sloped laterally with top conforming to the grades of the existing sidewalk and curb.
4. Manhole frame and cover may be deleted with open channel.
5. Trowel finish top surface and reproduce markings of existing sidewalk and curb.
6. Trowel finish floor of outlet.

$$Q = \frac{1.486 \cdot 1.75 \cdot (.75)^{2/3}}{1.013} \cdot 1.02 = 2.87 \text{ cfs}$$

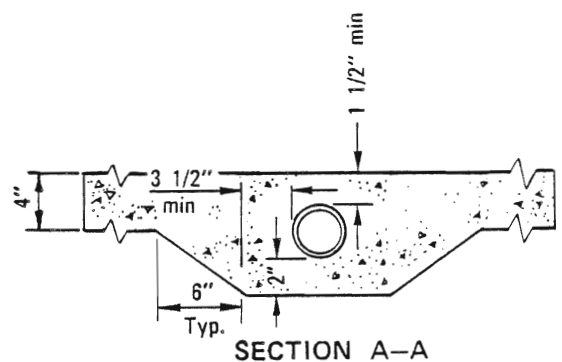
$$A = .25 \cdot 3 = .75 \text{ ft}^2$$

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Bar Size	SC	D.S.	7-79			Allan A. Kuehnert Dec. 1975	
Conc.	SC	M.B.	5-86	CURB OUTLET - TYPE A		Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER	
						D-25	

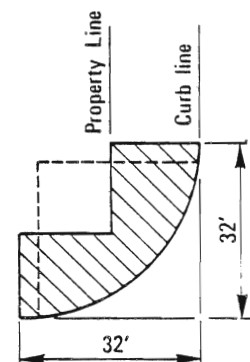


SECTION B-B

APPROVED DRAIN PIPE SIZES	
3"	6" to 8" CURB FACE
4"	8" CURB FACE
6"	10" CURB FACE



SECTION A-A



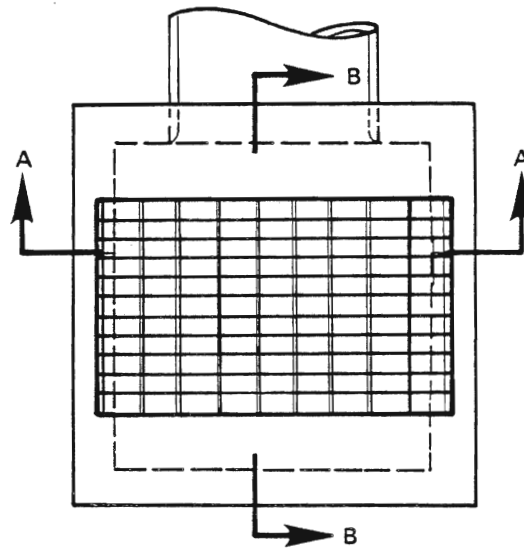
Drain shall not occupy
the hatched area

BLOCK CORNER

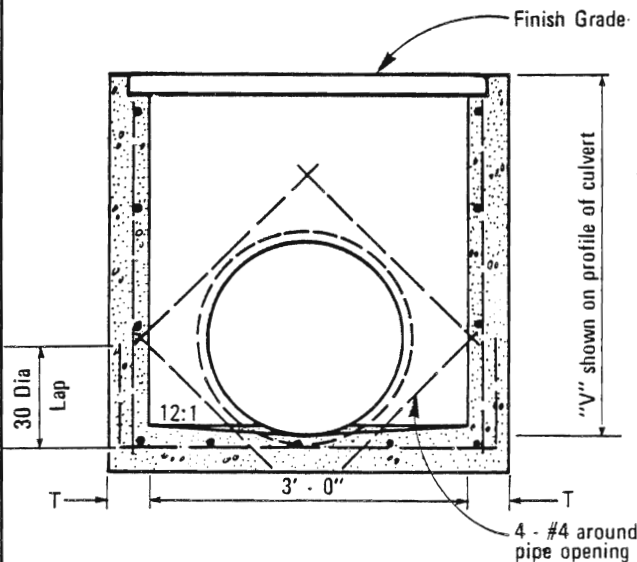
NOTES

1. Pipe shall be one continuous length from property line to curb line.
2. Multiple pipes to be set a minimum distance of D/2 apart.
3. Concrete shall be 520-C-2500
4. Pipe shall be circular asbestos cement, cast iron or rigid plastic.

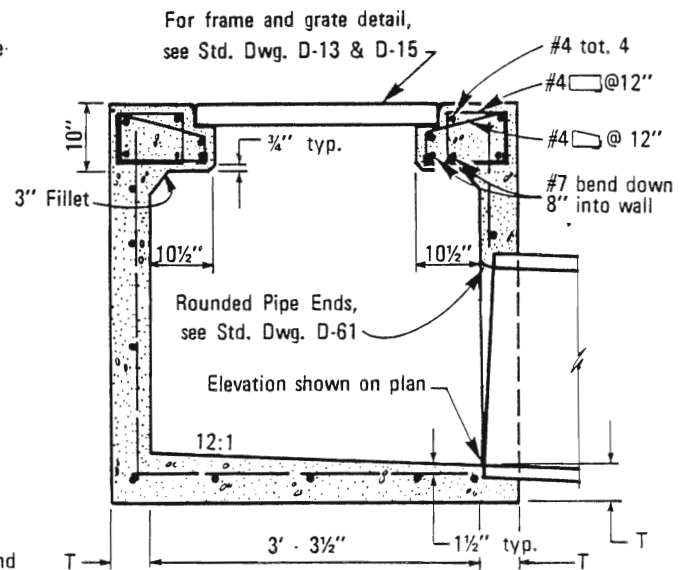
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Modif.	SL	M.B.	5-86			Allard J. Kerschbaum Dec. 1975 Coordinator R.C.E. 19807 Date	
				SIDEWALK UNDERDRAIN PIPE		DRAWING NUMBER	
						D-27	



PLAN



SECTION A-A

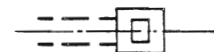


SECTION B-B

NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. When "V" exceeds 4', steps shall be installed.

LEGEND ON PLANS



Revision	Approved	Date
Reference	TRP M.B.	10-82
Modif.	TRP M.B.	5-86

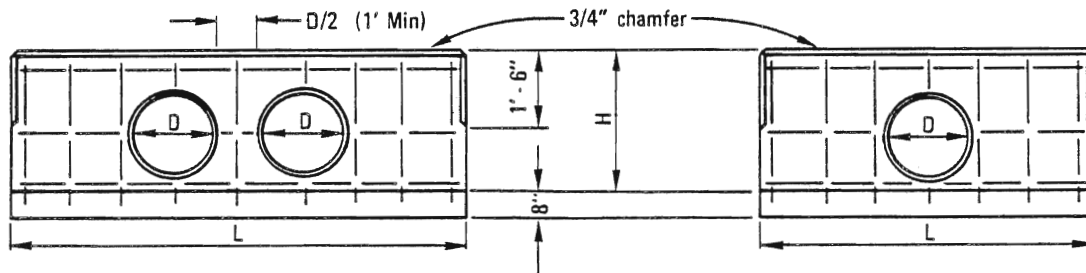
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE I

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

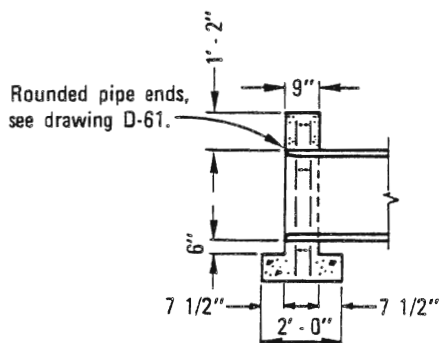
David L. Salomon July 1979
Coordinator R.C.E. 25291 Date

DRAWING
NUMBER D-29



ELEVATION DOUBLE HEADWALL

ELEVATION SINGLE HEADWALL



SECTION

D	H	SINGLE			DOUBLE		
		L	Steel Lbs.	Conc C. Y.	L	Steel Lbs.	Conc C. Y.
12"	2' - 8"	5' - 0"	35	0.60	8' - 0"	50	0.94
15"	2' - 11"	6' - 0"	40	0.75	9' - 6"	60	1.17
18"	3' - 2"	7' - 0"	50	0.91	10' - 6"	75	1.35
21"	3' - 5"	7' - 6"	60	1.02	11' - 6"	90	1.52
24"	3' - 8"	8' - 6"	75	1.20	12' - 6"	100	1.72
27"	3' - 11"	9' - 6"	85	1.39	14' - 0"	115	2.00
30"	4' - 2"	10' - 0"	85	1.52	15' - 0"	126	2.21
33"	4' - 5"	11' - 0"	100	1.73	16' - 0"	130	2.42
36"	4' - 8"	12' - 0"	105	1.95	17' - 0"	145	2.65
39"	4' - 11"	12' - 6"	130	2.09	18' - 0"	170	2.88
42"	5' - 2"	13' - 6"	140	2.34	19' - 0"	185	3.13
45"	5' - 5"	14' - 6"	150	2.60	20' - 0"	195	3.38
48"	5' - 8"	15' - 0"	160	2.75	21' - 0"	200	3.64
51"	5' - 11"	16' - 0"	180	3.03	22' - 6"	225	4.02
54"	6' - 2"	17' - 0"	190	3.31	23' - 6"	240	4.30

NOTES

- Concrete shall be 560-C-3250
- All reinforcing steel # 4 bars. All vertical and horizontal tie bars 18" maximum spacing.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

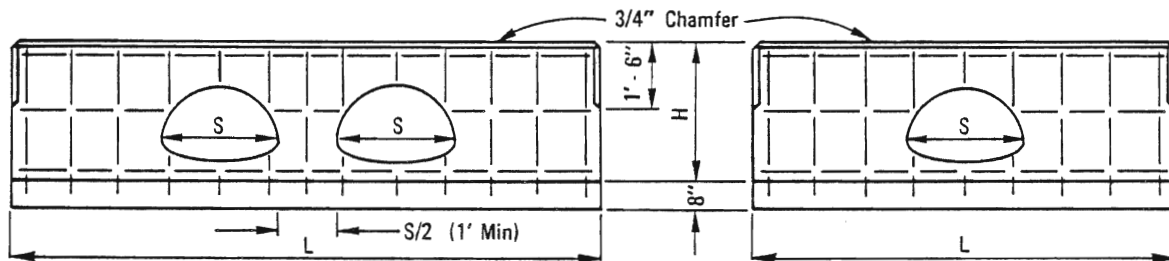
Clifford A. Kuehn Dec. 1975
Coordinator R.C.C. 19807 Date

DRAWING
NUMBER **D-30**

SAN DIEGO REGIONAL STANDARD DRAWING

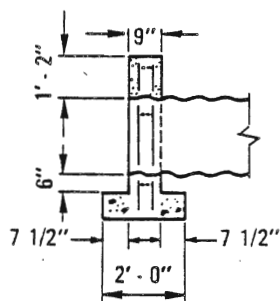
STRAIGHT HEADWALL - TYPE A
(CIRCULAR PIPE)

Revision	By	Approved	Date
Conc.	<i>MC</i>	<i>M.B.</i>	5-86



ELEVATION DOUBLE HEADWALL

ELEVATION SINGLE HEADWALL



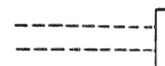
SECTION

C.S.P. ARCH SIZE	H	SINGLE			DOUBLE		
		L	Steel Lbs	Conc Cu. Yds.	L	Steel Lbs	Conc Cu. Yds.
18" x 11"	2' - 7"	5' - 6"	37	0.64	8' - 0"	52	.91
21" x 15"	2' - 11"	6' - 6"	45	0.80	10' - 0"	60	1.22
24" x 18"	3' - 2"	7' - 6"	50	0.96	11' - 6"	70	1.45
28" x 20"	3' - 4"	8' - 6"	60	1.12	13' - 6"	90	1.76
35" x 24"	3' - 8"	10' - 6"	85	1.47	15' - 6"	120	2.16
42" x 29"	4' - 1"	12' - 6"	110	1.76	18' - 0"	145	2.57
49" x 33"	4' - 5"	14' - 6"	130	2.26	21' - 0"	170	3.13
57" x 38"	4' - 10"	17' - 0"	155	2.81	24' - 6"	210	3.86
64" x 43"	5' - 3"	19' - 0"	175	3.31	27' - 0"	230	4.42
71" x 47"	5' - 7"	21' - 0"	195	3.81	30' - 0"	255	5.09

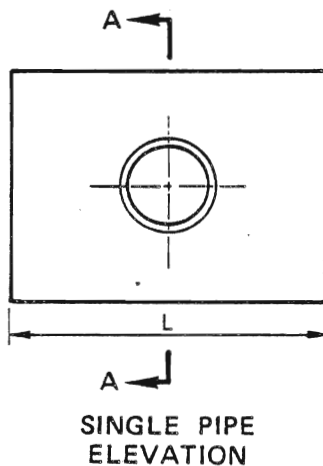
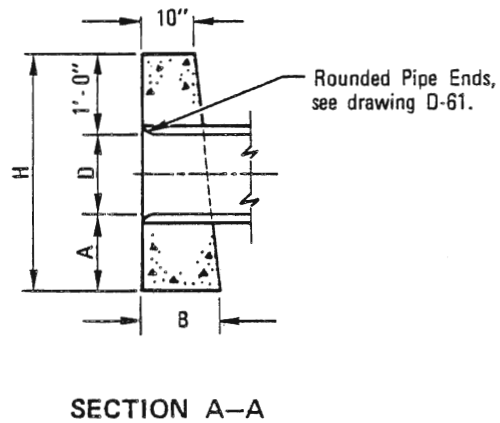
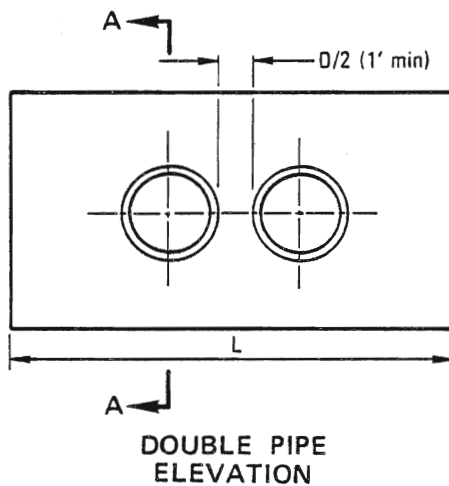
NOTES

- Concrete shall be 560-C-3250
- All reinforcing steel # 4 bars. All vertical and horizontal tie bars 18" maximum spacing.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	JD	M.B.	5-86			Alfred A. Kerschbaum	Dec. 1975
				STRAIGHT HEADWALL - TYPE A (C.S.P.-ARCH)		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	D-31



D	A	B	H	SINGLE		DOUBLE	
				L	Conc C.Y.	L	Conc C.Y.
12"	2'-0"	1'-0"	4'-0"	4'-0"	.45	5'-8"	.62
15"	2'-0"	1'-1"	4'-3"	5'-0"	.63	7'-1"	.85
18"	2'-0"	1'-2"	4'-6"	6'-0"	.83	8'-6"	1.12
24"	2'-6"	1'-5"	5'-6"	8'-0"	1.54	11'-4"	2.09
30"	2'-6"	1'-9"	6'-0"	10'-0"	2.41	14'-2"	3.26
36"	3'-0"	2'-0"	7'-0"	12'-0"	3.74	17'-0"	5.05

NOTES

- Concrete shall be 560-C-3250
- Exposed corners to be chamfered 3/4".

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Richard A. Kuehnel Dec. 1975
Coordinator R.C.C. 15807 Date

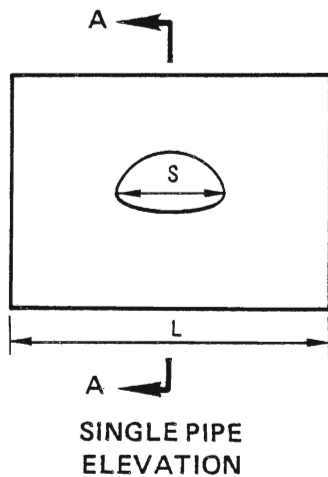
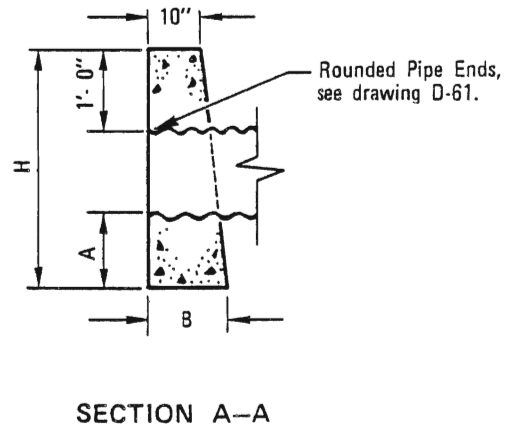
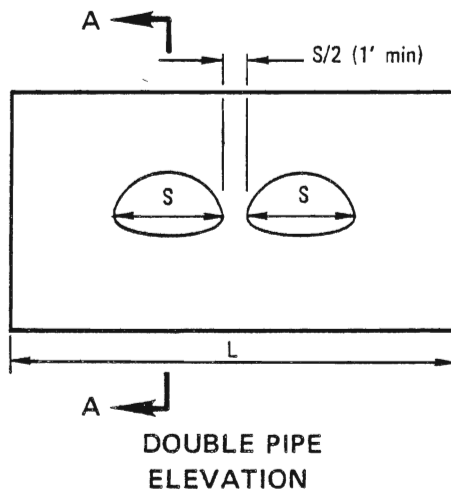
DRAWING
NUMBER

D-32

SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE B (CIRCULAR PIPE)

Revision	By	Approved	Date
Conc.	PC	M.B.	5-86

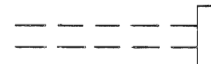


C.S.P. ARCH SIZE	A	B	H	SINGLE		DOUBLE	
				L	Conc C.Y.	L	Conc C.Y.
18"x 11"	2' - 0"	1' - 2"	3' - 11"	6'	0.83	7' - 3"	0.97
21"x 15"	2' - 0"	1' - 4"	4' - 1"	7'	1.08	9' - 8"	1.46
24"x 18"	2' - 0"	1' - 6"	4' - 4"	8'	1.41	11' - 6"	1.98
28"x 20"	2' - 6"	1' - 8"	5' - 0"	9'	1.97	12' - 6"	2.66
35"x 24"	2' - 6"	2' - 0"	5' - 4"	10'	2.56	14' - 5"	3.60

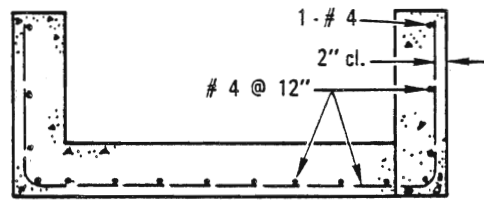
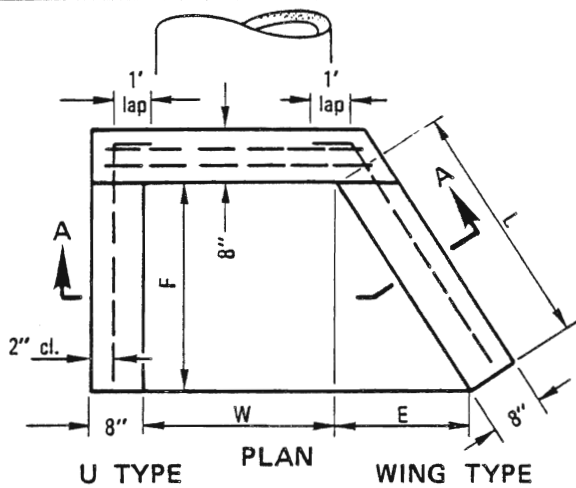
NOTES

1. Concrete shall be 560-C-3250
2. Exposed corners to be chamfered 3/4".

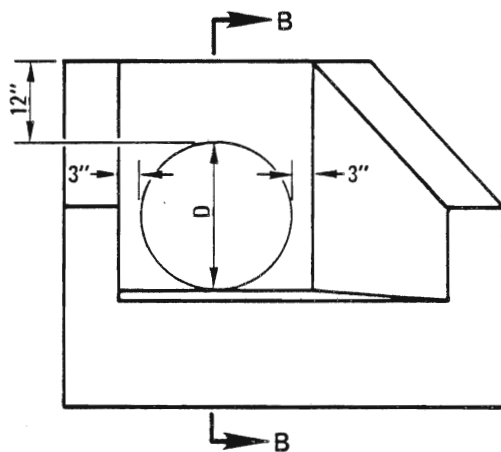
LEGEND ON PLANS



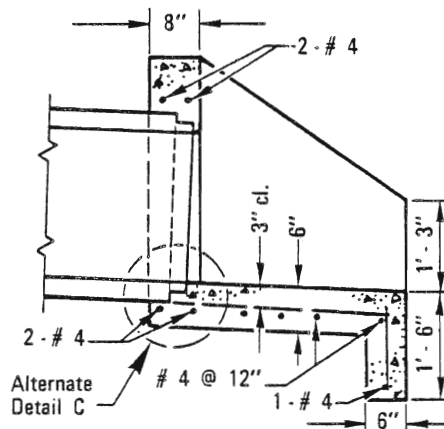
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	2	M.B.	5-86			<i>Allan G. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date	
				STRAIGHT HEADWALL - TYPE B (C.S.P. ARCH)		DRAWING NUMBER	
						D-33	



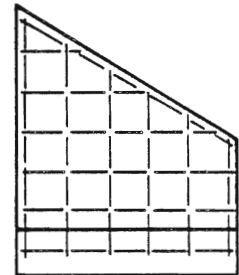
SECTION A-A



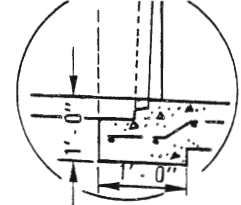
ELEVATION



SECTION B-B



WING WALL REINFORCING



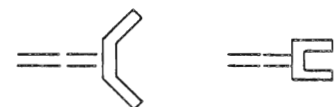
ALT. DETAIL C

DIA OF PIPE	DIMENSIONS			SINGLE PIPE						DOUBLE PIPE					
				W	U TYPE		WING TYPE		W	U TYPE		WING TYPE			
	CONC		STEEL		CONC	STEEL	CONC			STEEL	CONC	STEEL			
	L	E	F		C. Y.	LBS.	C. Y.	LBS.		C. Y.	LBS.	C. Y.	LBS.	C. Y.	LBS.
18"	2'-3 1/8"	1'-3"	1'-10 1/2"	2'-0"	0.55	35	0.63	43	As shown on plans	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		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		1.66	109	1.92	123		
36"	4'-11 1/2"	2'-9"	4'-1 1/2"	3'-6"	1.33	88	1.69	114		2.19	136	2.55	162		

NOTES:

1. Concrete shall be 560-C-3250
2. Exposed corners to be chamfered 3/4".
3. Multiple pipes to be set a distance of D/2, with a 1' minimum between outside diameters of pipes.
4. Top of headwall shall be placed approximately parallel to profile grade when the grade is 3% or more.
5. Skewed pipes: Dimension W to be increased in width or length due to skew or multiple pipes.
6. For pipe wall thickness greater than 3" use alternate Detail-C.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Clifford S. Kuchel Dec. 1975
Coordinator R.C.E. 19807 Date

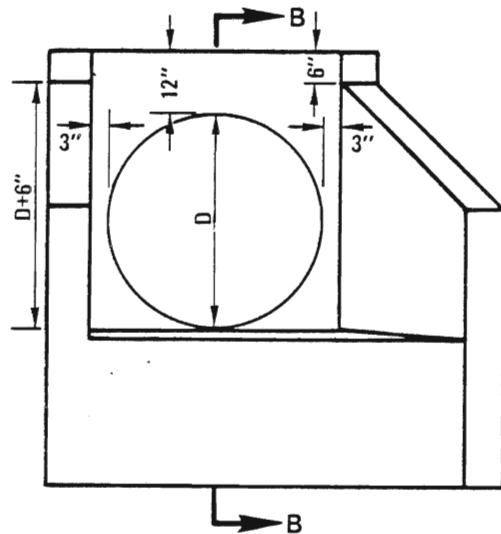
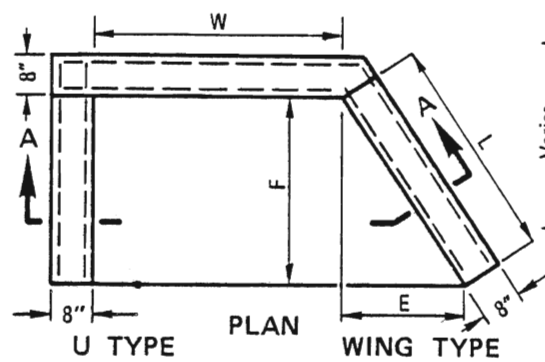
DRAWING NUMBER

D-34

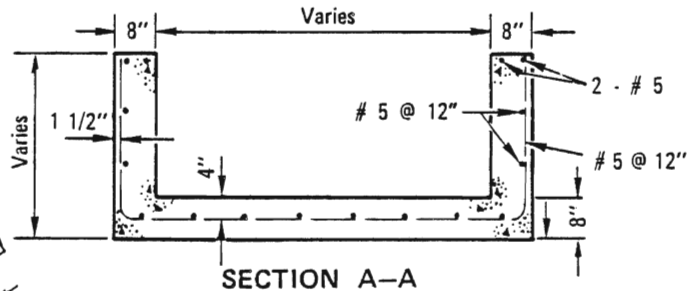
SAN DIEGO REGIONAL STANDARD DRAWING

WING AND U TYPE HEADWALLS FOR 12" TO 36" PIPES

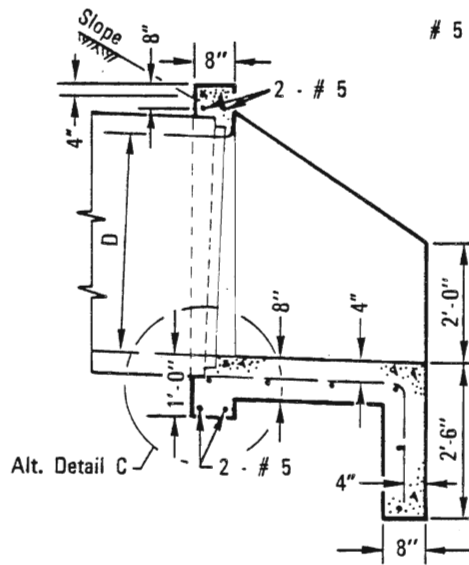
Revision	By	Approved	Date
Conc.	20	M.B.	5-86



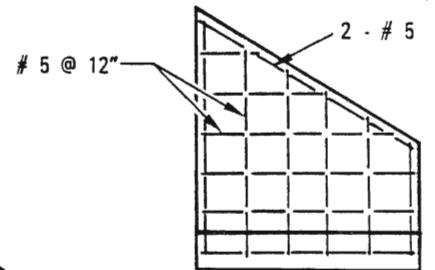
ELEVATION



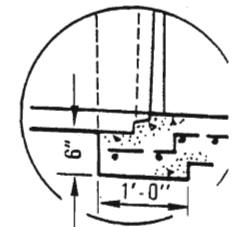
SECTION A-A



SECTION B-B



WING WALL REINFORCING



ALT. DETAIL C

DIA. OF PIPE	DIMENSIONS			SINGLE PIPE				DOUBLE PIPE					
				W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
	L	E	F		CONC. STEEL		CONC. STEEL			CONC. STEEL		CONC. STEEL	
					C. Y.	LBS.	C. Y.	LBS.		C. Y.	LBS.	C. Y.	LBS.
42"	3'-7 1/4"	2'-0"	3'-0"	4'-0"	1.57	117	1.90	135	AS SHOWN ON PLANS	2.69	190	3.16	214
48"	4'-6"	2'-6"	3'-9"	4'-6"	1.97	153	2.48	184		3.43	252	4.06	288
54"	5'-4 7/8"	3'-0"	4'-6"	5'-0"	2.41	190	3.07	246		4.24	319	5.06	368
60"	6'-3 3/4"	3'-6"	5'-3"	5'-6"	2.88	239	3.75	294		5.13	386	6.17	442
66"	7'-2 1/2"	4'-0"	6'-0"	6'-0"	3.38	294	4.52	356		6.08	454	7.20	516
72"	8'-1 3/8"	4'-6"	6'-9"	6'-6"	3.93	368	5.52	417		7.11	522	8.30	588
78"	9'-0"	5'-0"	7'-6"	7'-0"	4.50	444	6.70	503		8.20	595	9.50	693
84"	9'-10 3/4"	5'-6"	8'-3"	7'-6"	5.21	540	8.15	619		9.50	687	10.80	786

Note: Dimensions E and L apply to wing type only.

NOTES

- Skewed Pipes: Dimension W to be increased to take care of increased width or length due to skew of multiple pipes.
- Tops of headwalls, on grade culverts, shall be placed parallel to profile grade when the grades are 3% or more.
- Concrete shall be 560-C-3250
- Exposed corners shall be chamfered 3/4".
- Multiple pipes shall be set a distance of D/2, with a 1' minimum, between outside diameters of pipes.
- For pipe wall thickness greater than 3" use Alternate Detail-C.

LEGEND ON PLANS



Revision	By	Approved	Date
Conc.	RC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

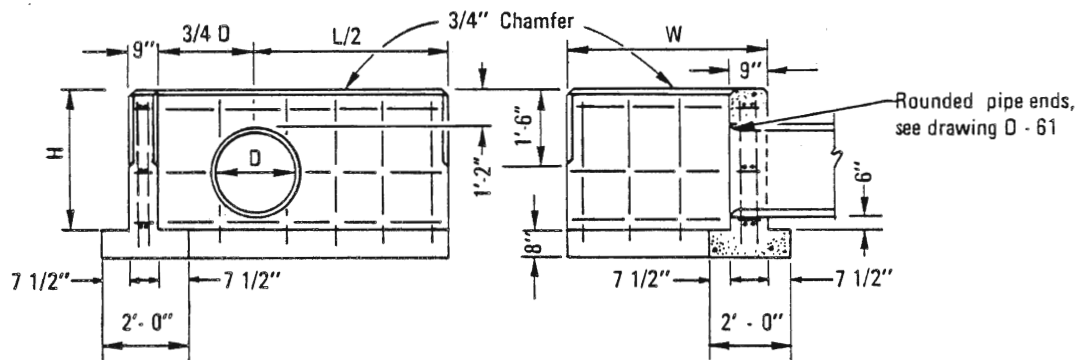
WING AND U TYPE HEADWALLS FOR 42" TO 84" PIPES

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

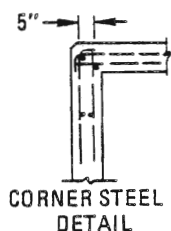
DRAWING
NUMBER

D-35



ELEVATION

SECTION



CORNER STEEL
DETAIL

D	H	L/2	LENGTH OF W									
			3' - 4"		4' - 10"		6' - 4"		7' - 10"		9' - 4"	
			Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.
12"	2' - 8"	2' - 6"	50	.79	60	.98						
15"	2' - 11"	3' - 0"	55	.91	65	1.11						
18"	3' - 2"	3' - 6"	65	1.04	75	1.25						
21"	3' - 5"	3' - 9"	75	1.15	90	1.36						
24"	3' - 8"	4' - 3"	85	1.29	100	1.51	110	1.74				
27"	3' - 11"	4' - 9"	90	1.44	105	1.67	115	1.91				
30"	4' - 2"	5' - 0"	95	1.55	110	1.80	120	2.05	135	2.29		
33"	4' - 5"	5' - 6"	105	1.71	120	1.97	135	2.23	150	2.48		
36"	4' - 8"	6' - 0"	110	1.88	125	2.15	140	2.41	155	2.68	170	2.95
39"	4' - 11"	6' - 3"			150	2.28	170	2.56	185	2.84	200	3.12
42"	5' - 2"	6' - 9"			155	2.42	175	2.76	190	3.05	210	3.34
45"	5' - 5"	7' - 3"					180	2.97	200	3.27	215	3.57
48"	5' - 8"	7' - 6"					190	3.13	216	3.44	230	3.75
51"	5' - 11"	8' - 0"							220	3.67	235	3.99
54"	6' - 2"	8' - 6"							235	3.91	250	4.24

NOTES

- Concrete shall be 560-C-3250
- All reinforcing steel # 4 bars. All vertical and horizontal tie bars 18" maximum spacing.
- When multiple pipes are used, the distance between pipes shall be D/2 (1' min.). Dimension L/2 is from the center of the pipe nearest to the end of the headwall as shown.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Clifford A. Kuchel Dec. 1975
Chairman R.C.E. 19807 Date

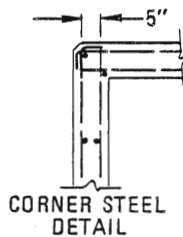
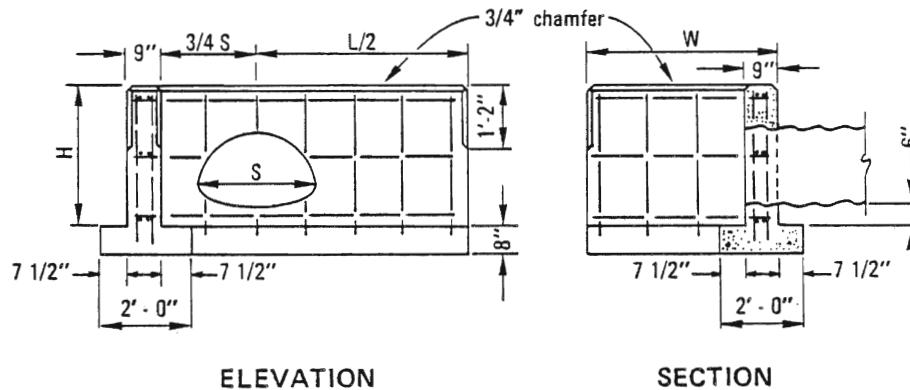
DRAWING
NUMBER

D-36

SAN DIEGO REGIONAL STANDARD DRAWING

L TYPE HEADWALLS CIRCULAR PIPES

Revision	By	Approved	Date
Conc.	SC	M.B.	5-86

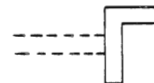


C.S.P. ARCH SIZE	H	L/2	LENGTH OF W									
			3' - 4"		4' - 10"		6' - 4"		7' - 10"		9' - 4"	
			Steel lbs.	Conc. C. Y.	Steel lbs.	Conc. C. Y.	Steel lbs.	Conc. C. Y.	Steel lbs.	Conc. C. Y.	Steel lbs.	Conc. C. Y.
18"x 11"	2'-7"	2'-9"	50	0.84	60	1.03	70	1.21	80	1.39	90	1.57
21"x 15"	2'-11"	3'-3"	60	1.00	65	1.18	75	1.38	90	1.58	100	1.77
24"x 18"	3'-2"	3'-9"	60	1.07	70	1.32	80	1.53	95	1.74	110	1.94
28"x 20"	3'-4"	4'-3"	70	1.26	80	1.47	90	1.68	100	1.90	115	2.11
35"x 24"	3'-8"	5'-3"	100	1.51	110	1.74	120	1.97	140	2.20	155	2.42
42"x 29"	4'-1"	6'-3"	115	1.82	130	2.06	140	2.31	155	2.55	170	2.83
49"x 33"	4'-5"	7'-3"	130	2.12	145	2.37	155	2.64	170	2.90	185	3.15
57"x 38"	4'-10"	8'-6"	145	2.52	160	2.79	175	3.07	190	3.35	205	3.61
64"x 43"	5'-3"	9'-6"	185	2.89	200	3.11	215	3.48	235	3.77	250	4.06
71"x 47"	5'-7"	10'-6"	200	3.25	215	3.56	235	3.86	250	4.17	270	4.48

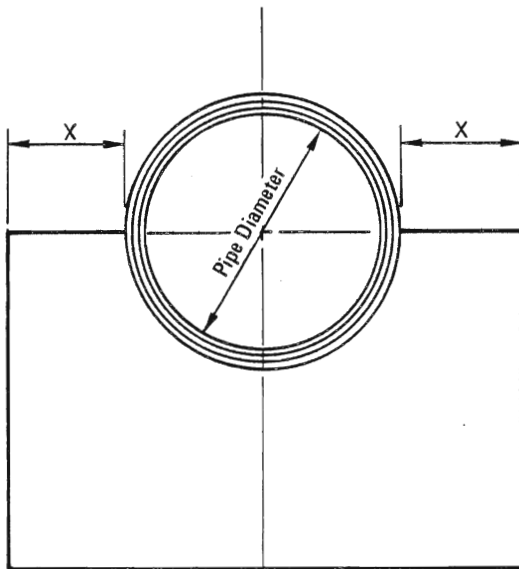
NOTES

- Concrete shall be 560-C-3250
- All reinforcing steel # 4 bars. All vertical and horizontal tie bars 18" maximum spacing.
- When multiple pipes are used, the distance between pipes shall be S/2 (1' min.). The dimension L/2 is from the center of the pipe nearest to the end of the headwall as shown.

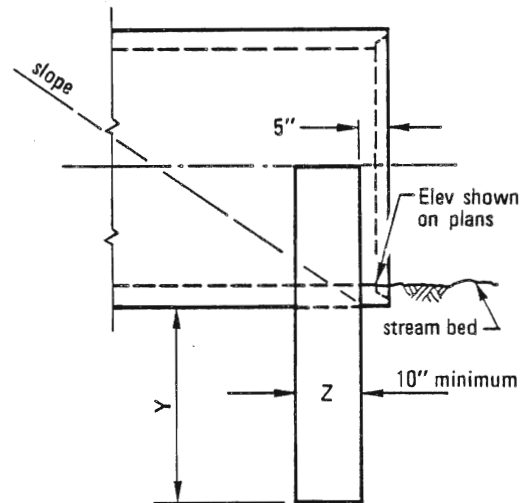
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Elev.	RC	D.S.	7-79					Allen G. Kneeland	Dec. 1975
Conc.	RC	M.B.	5-86	L TYPE HEADWALLS (C.S.P. ARCH)				Coordinator R.C.E. 19807	Date
				DRAWING NUMBER D-37					



FACE ELEVATION



SIDE ELEVATION

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"	14"

NOTES:

1. 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 is retained.
2. Concrete shall be 560-C-3250
3. Keep the pipe-end clear of obstructions to permit easy placing of culvert extension.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Clifford A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

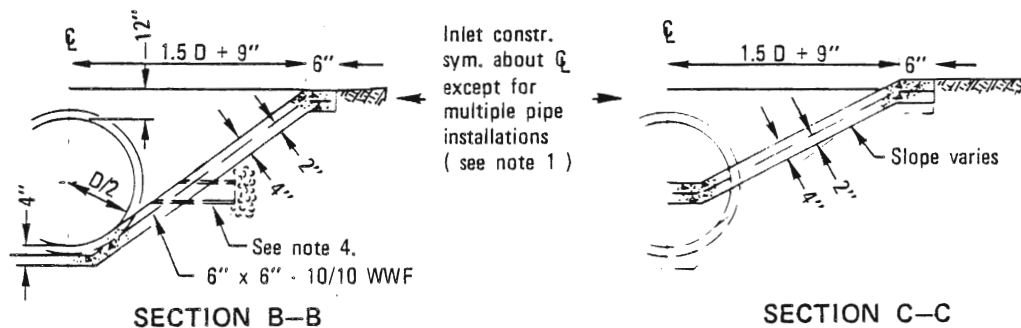
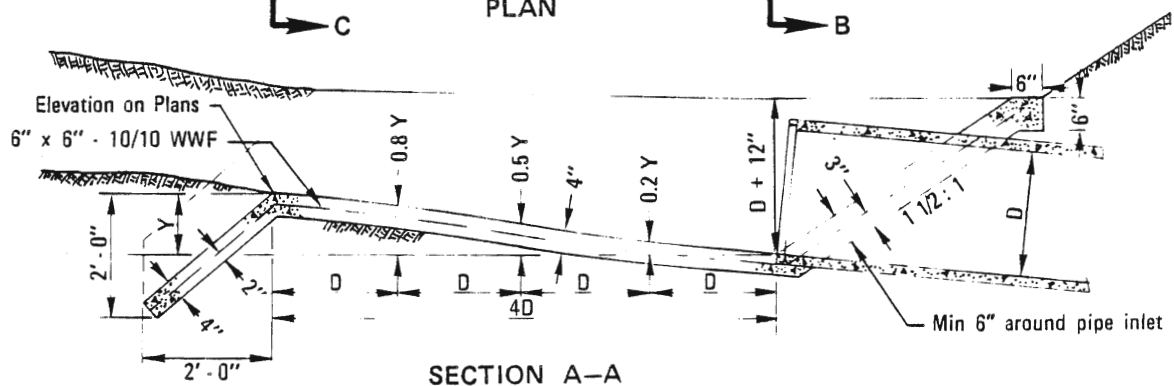
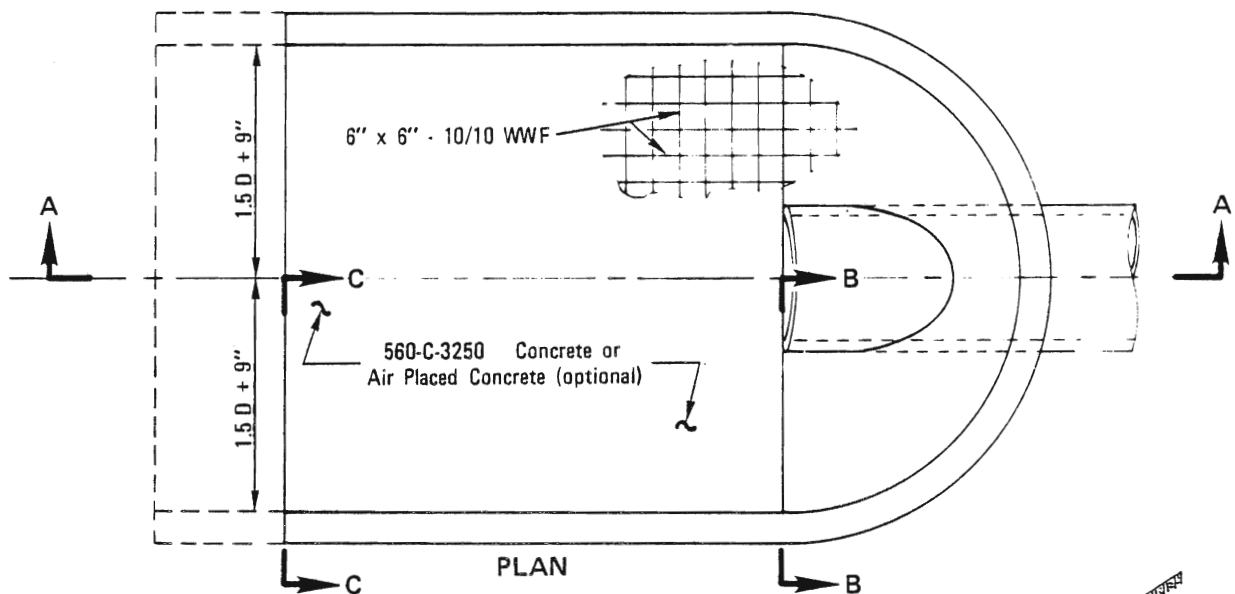
SAN DIEGO REGIONAL STANDARD DRAWING

CURTAIN WALL

Revision	By	Approved	Date
Conc.	SC	M. B.	5-86

DRAWING
NUMBER

D-38



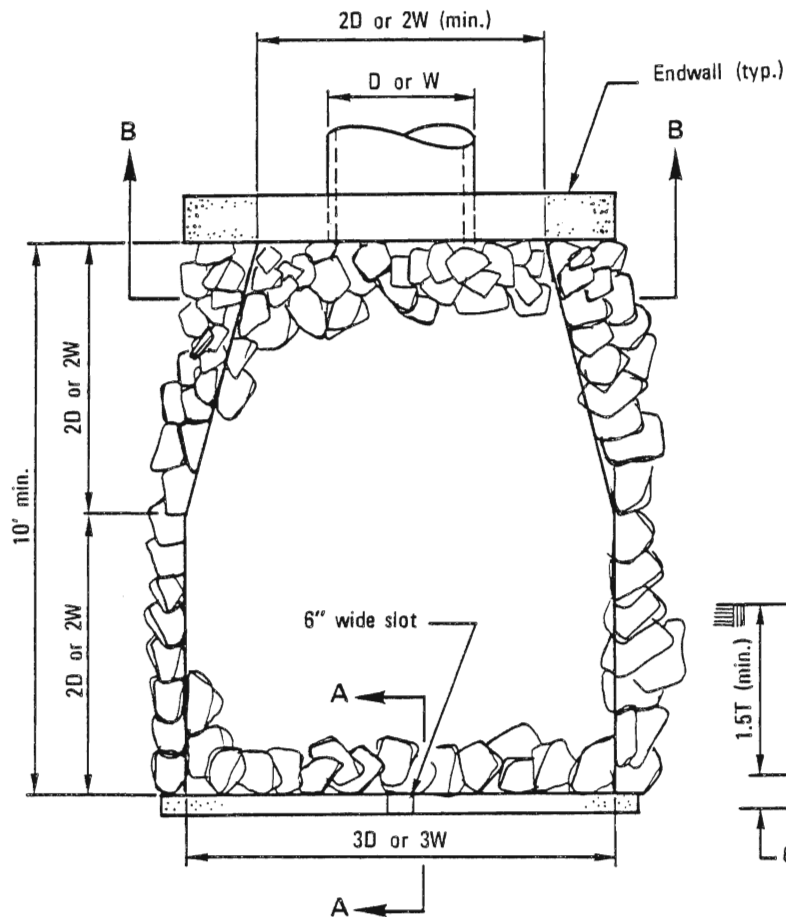
NOTES

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 the outermost pipe. The distance between pipes shall be $D/2$ for round and $\text{Span}/3$ for arch pipe. (12" minimum)
2. Culvert shall be cut off even with apron surface when required by the Agency.
3. Use Inlet Apron only where a flared end section can not be utilized.
4. Place weep holes when required by the Agency.

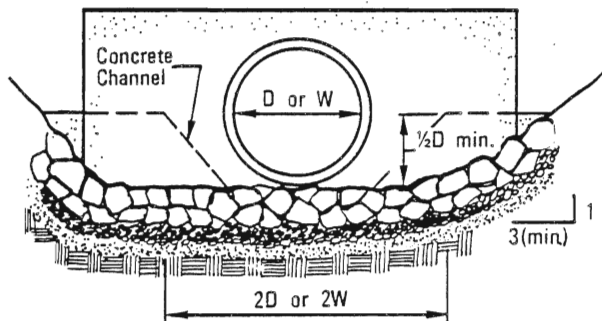
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Sec. A-A	JS	D.S.	7-79			Allard G. Kerschbaum	
Sect. B-B	TRP	M.B.	10-82	INLET APRON FOR CULVERTS UP TO 42" DIAMETER		Coordinator	R.C.E. 19807
Conc.	RA	M.B.	5-86			Date	Dec. 1975
						DRAWING NUMBER	D-39

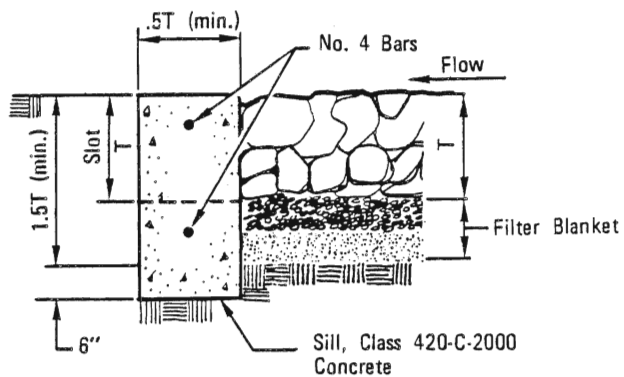


PLAN



SECTION B-B

D = Pipe Diameter
W = Bottom Width of Channel



SECTION A-A

NOTES:

- Plans shall specify:
 - Rock class and thickness (T).
 - Filter material, number of layers and thickness.
- Rip rap shall be either quarry stone or broken concrete (if shown on the plans.) Cobbles are not acceptable.
- Rip rap shall be placed over a filter blanket which may be either granular material or plastic filter cloth.
- See standard special provisions for selection of rip rap and filter blanket.
- Rip rap energy dissipators shall be designated as either Type 1 or Type 2. Type 1 shall be with concrete sill; Type 2 shall be without sill.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

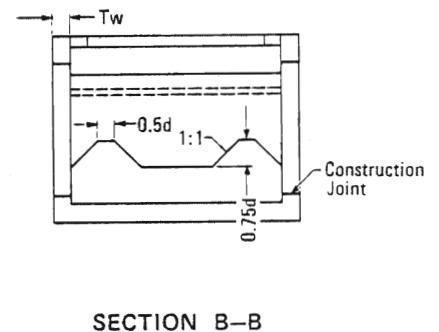
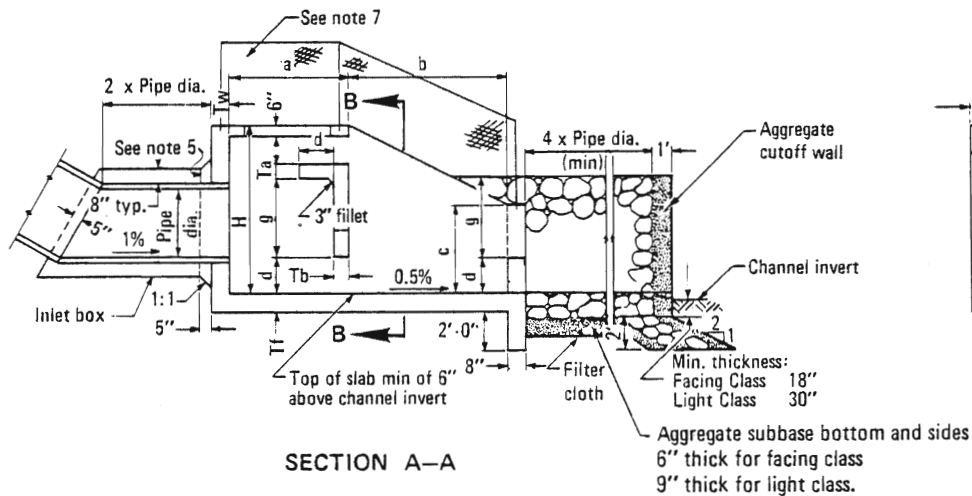
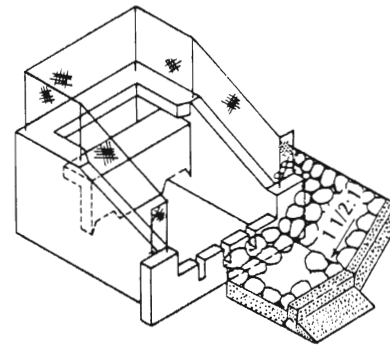
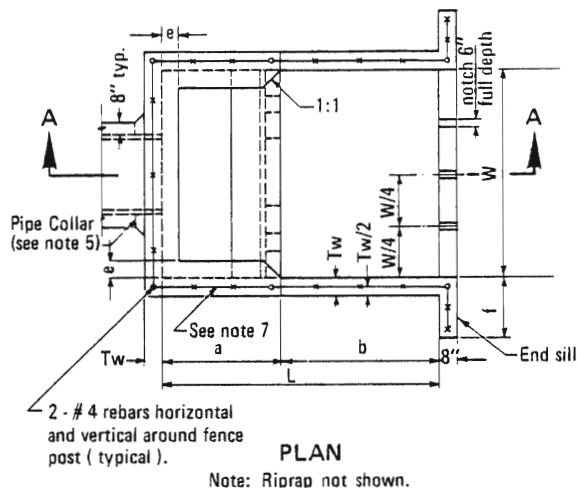
Clifford S. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER D-40

SAN DIEGO REGIONAL STANDARD DRAWING

RIP RAP
ENERGY DISSIPATOR

Revision	By	Approved	Date
Sill, filter	RP	M.B.	10-82

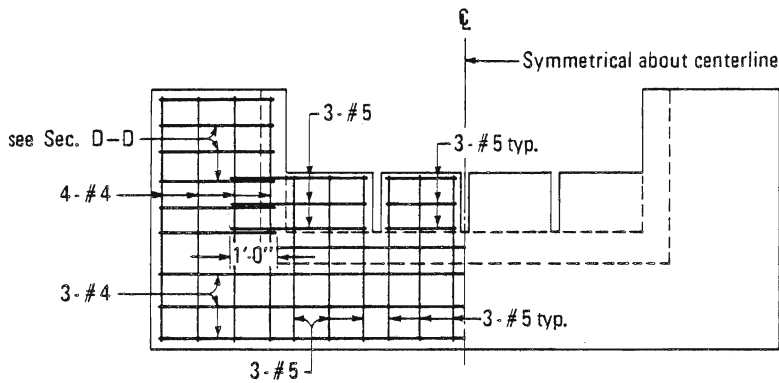


NOTES

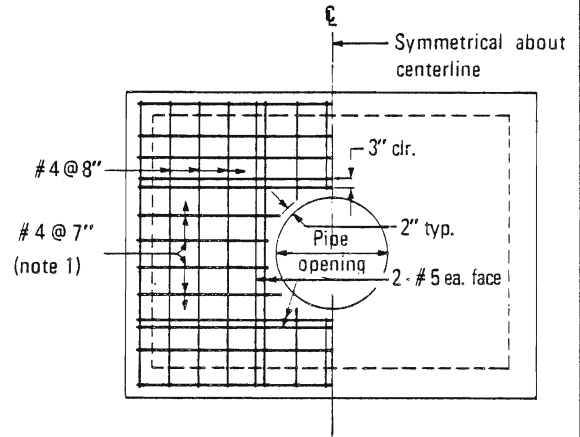
- Design:
Equivalent Fluid Pressure = 60 p.c.f.
Maximum Outlet Velocity = 35 f.p.s.
- Concrete shall be 560-C-3250
- Reinforcing shall conform to ASTM designation A615 and may be grade 40 or 60. Reinforcing shall be placed with 2" clear concrete cover unless noted otherwise. Splices shall not be permitted except as indicated on the plans.
- For pipe grades not exceeding 20%, inlet box may be omitted.
- If inlet box is omitted, construct pipe collar as shown.
- Unless noted otherwise, all reinforcing bar bends shall be fabricated with standard hooks.
- Five foot high chain link fencing, embed post 18" deep in walls and encase with Class B mortar.
- In Sandy and Silty soil:
 - Riprap and aggregate base cutoff wall required at the end of rock apron.
 - Filter cloth (Polyfilter X or equivalent) shall be installed on native soil and base, minimum of 1 ft. overlaps at joints.
- Rip rap and subbase classification shall be as shown on plans.

Pipe Dia (in)	18	24	30	36	42	48	54	60	72
Area (sq.ft.)	1.77	3.14	4.91	7.07	9.62	12.57	15.90	19.63	28.27
Max. Q (cfs)	21	38	59	85	115	151	191	236	339
W	5' - 6"	6' - 9"	8' - 0"	9' - 3"	10' - 6"	11' - 9"	13' - 0"	14' - 3"	16' - 6"
H	4' - 3"	5' - 3"	6' - 3"	7' - 3"	8' - 0"	9' - 0"	9' - 9"	10' - 9"	12' - 3"
L	7' - 4"	9' - 0"	10' - 8"	12' - 4"	14' - 0"	15' - 8"	17' - 4"	19' - 0"	22' - 0"
a	3' - 3"	3' - 11"	4' - 7"	5' - 3"	6' - 0"	6' - 9"	7' - 4"	8' - 0"	9' - 3"
b	4' - 1"	5' - 1"	6' - 1"	7' - 1"	8' - 0"	8' - 11"	10' - 0"	11' - 0"	12' - 9"
c	2' - 4"	2' - 10"	3' - 4"	3' - 10"	4' - 5"	4' - 11"	5' - 5"	5' - 11"	6' - 11"
d	0' - 11"	1' - 2"	1' - 4"	1' - 7"	1' - 9"	2' - 0"	2' - 2"	2' - 5"	2' - 9"
e	0' - 6"	0' - 6"	0' - 8"	0' - 8"	0' - 10"	0' - 10"	1' - 0"	1' - 0"	1' - 3"
f	1' - 6"	2' - 0"	2' - 6"	3' - 0"	3' - 0"	3' - 0"	3' - 0"	3' - 0"	3' - 0"
g	2' - 1"	2' - 6"	3' - 0"	3' - 6"	3' - 11"	4' - 5"	4' - 11"	5' - 4"	6' - 2"
Tf	8"		10"		12"				
Tb	7"		9 1/2"		10 1/2"				
Tw	7"		9 1/2"		10 1/2"				
Ta	7"				8"				

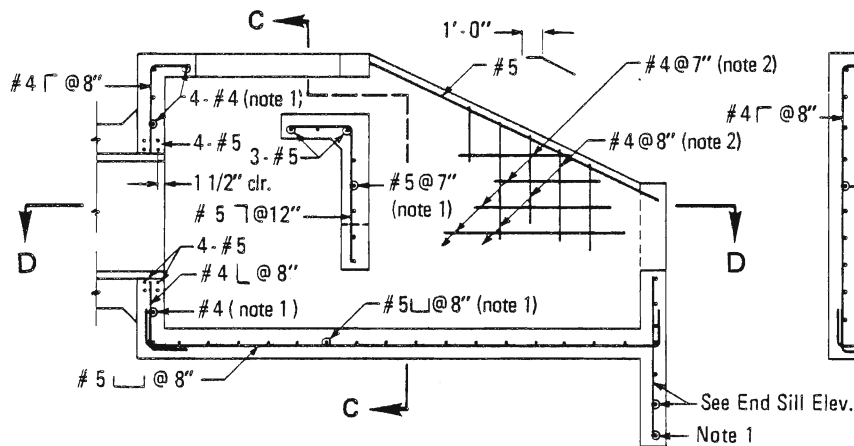
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Note 9	SC	D.S.	7-79			Allard A. Kuehnle	
Conc.	SC	M.B.	5-86	CONCRETE ENERGY DISSIPATOR		Coordinator R.C.E. 19807	
						Date	
						DRAWING NUMBER	
						D-41	



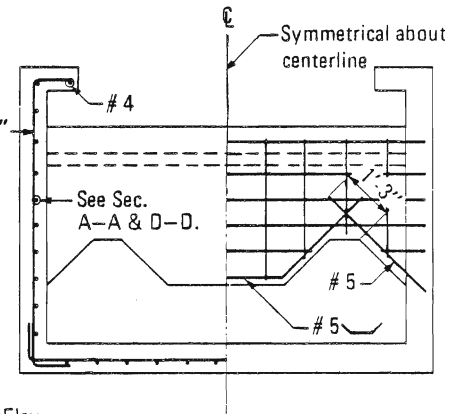
END SILL ELEVATION



HEADWALL ELEVATION



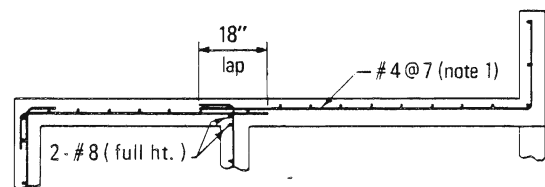
SECTION A-A



SECTION C-C

NOTES

1. Place reinforcing, as noted, at center wall (or slab).
2. Match location of reinforcing with that in headwall, end sill and foundation slab.
3. All reinforcing shall be placed with 2" concrete cover, unless noted otherwise.



SECTION D-D

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

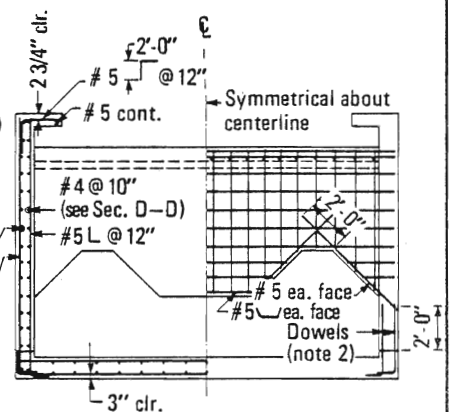
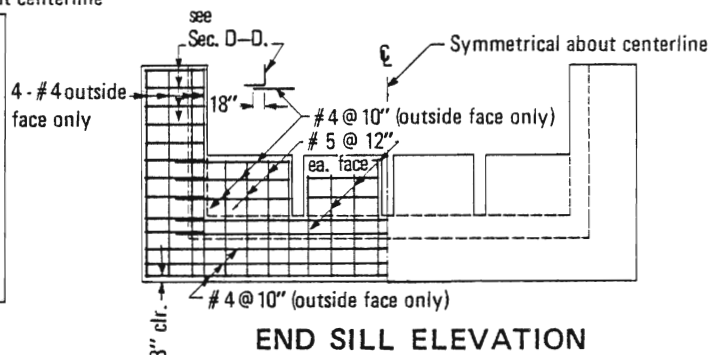
DRAWING
NUMBER

D-42

SAN DIEGO REGIONAL STANDARD DRAWING

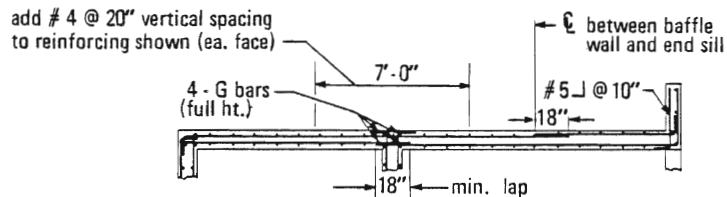
CONCRETE ENERGY DISSIPATOR
(REINFORCEMENT)
18" TO 30" DIAMETER PIPE

Revision	By	Approved	Date



SECTION C-C

SECTION A-A

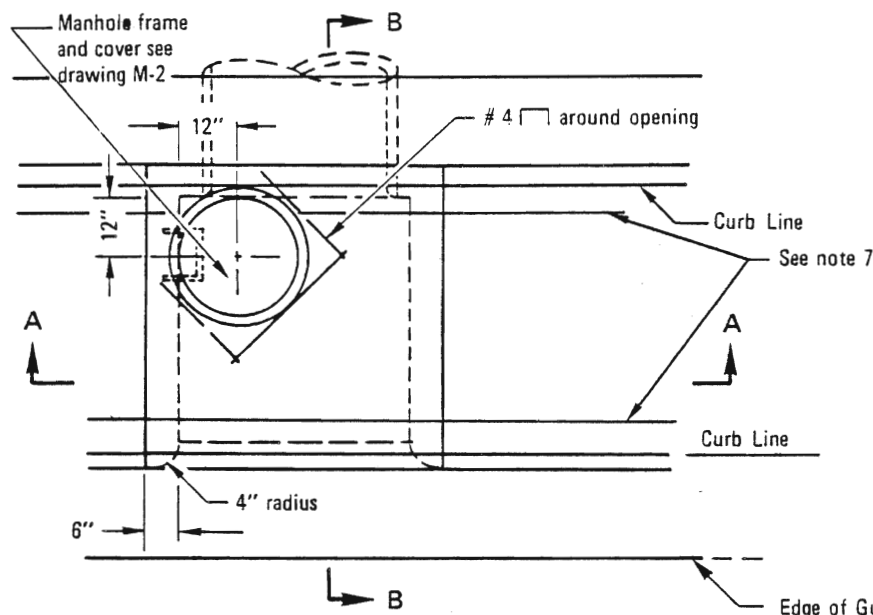


SECTION D-D

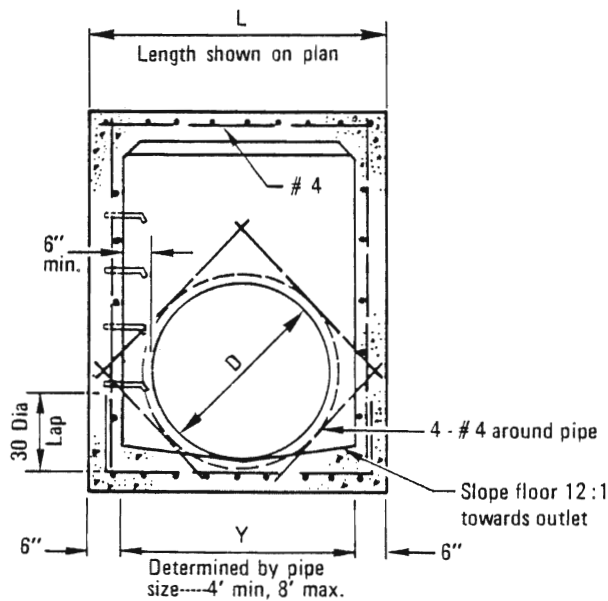
1. Match location of sidewall reinforcing.
2. Dowels having same size and spacing as wall reinforcing may be used in lieu of continuous bars at contractors option.
3. Match location of headwall or end sill reinforcing.

Pipe dia. (in.)	36	42	48	54	60	72
A bar	# 5 @ 12"	# 6 @ 12"	# 7 @ 12"			
B bar	# 5 @ 12"		# 6 @ 12"			
C bar	# 4 @ 12"		# 5 @ 12"			
D bar	# 4 @ 12"	# 5 @ 12"	# 6 @ 12"			
E bar	# 4 @ 12"		# 5 @ 12"			
F bar	# 4 @ 9"		# 5 @ 9"		# 6 @ 9"	
G bar		# 7		# 11		

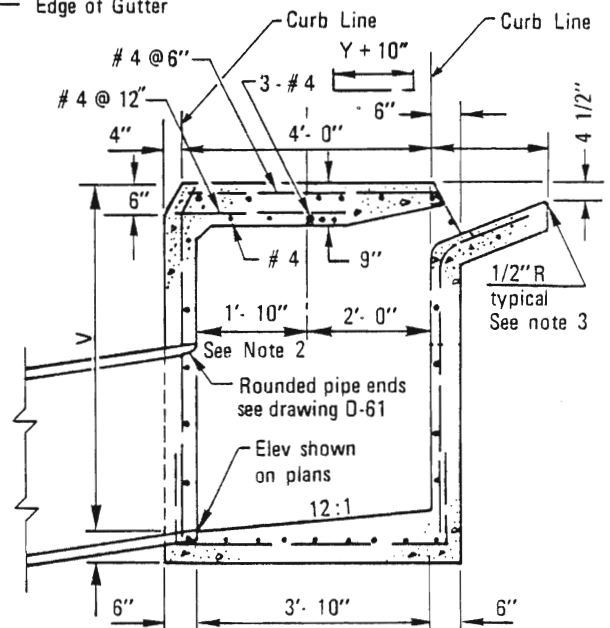
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING CONCRETE ENERGY DISSIPATOR (REINFORCEMENT) 36" TO 72" DIAMETER PIPE	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allen S. Kerschman</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date



PLAN



SECTION A-A



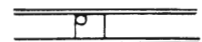
SECTION B-B

NOTES:

1. See Standard Drawings D-11 & D-12 for additional notes and details.
2. Dimension shown becomes 2'-0" when opening on both sides. Adjust manhole as required.
3. Exposed edges of concrete shall be rounded with a radius of 1/2".
4. When V exceeds 4' steps shall be installed. See Standard Drawing D-11 for details.
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.
8. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS

4' Type J Inlet

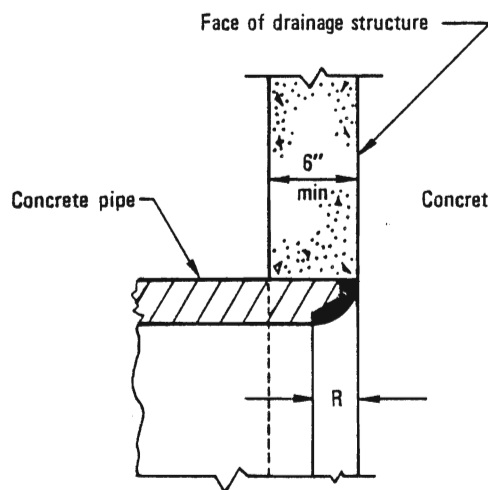


Revision		Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Rebar	RC	M.S.	5-86			 Chairman C.E. C13768 Date Oct 1982	
				CURB INLET-TYPE J MEDIAN		DRAWING NUMBER	
						D-45	

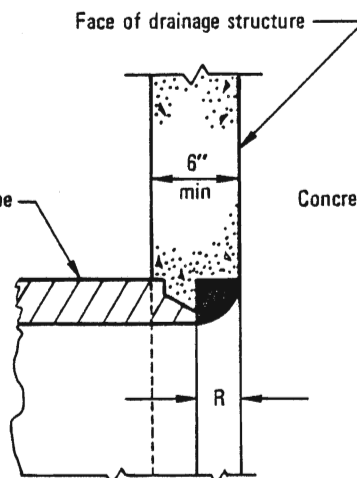


1. For trenching on improved streets see Standard Drawing G-24 or G-25 for resurfacing details.
2. (*) indicates minimum relative compaction.

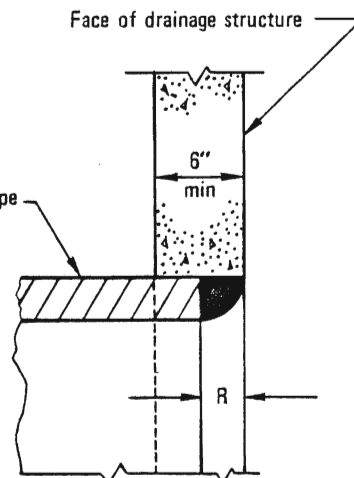
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Charles A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	SAN DIEGO REGIONAL STANDARD DRAWING		Revision Reference	By TRP	Approved M.B.	Date 10-82
	PIPE BEDDING AND TRENCH BACKFILL FOR STORM DRAINS		Compac. SC	M.B.	5-86	
DRAWING NUMBER D-60						



BELL END



SPIGOT END

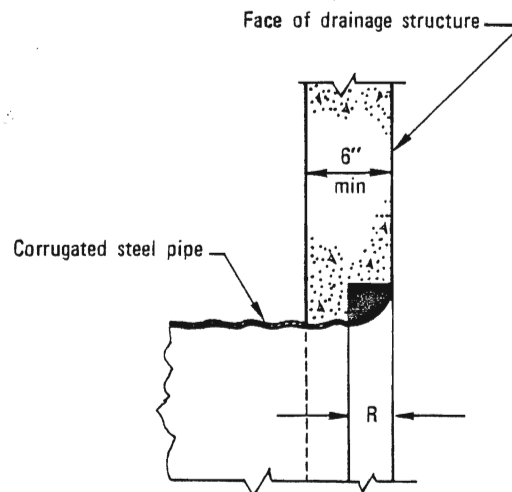


CUT END

R = Thickness of pipe

NOTE

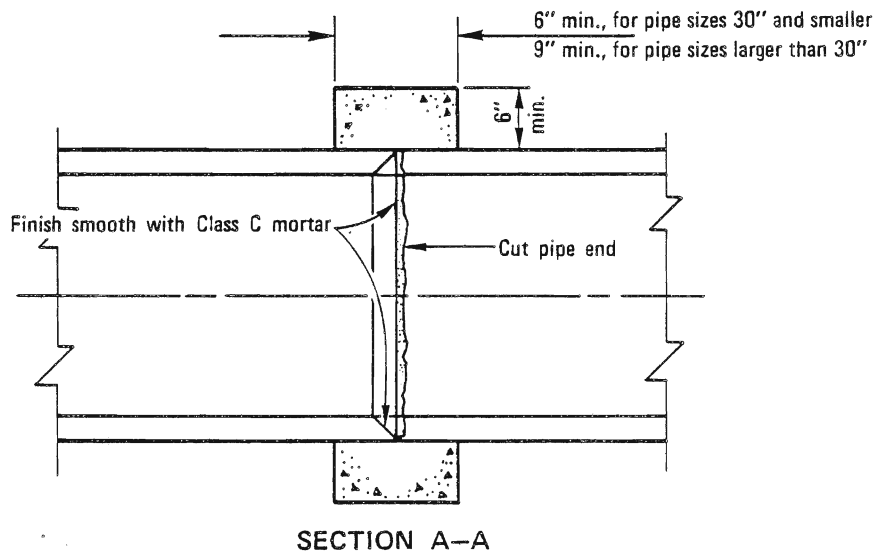
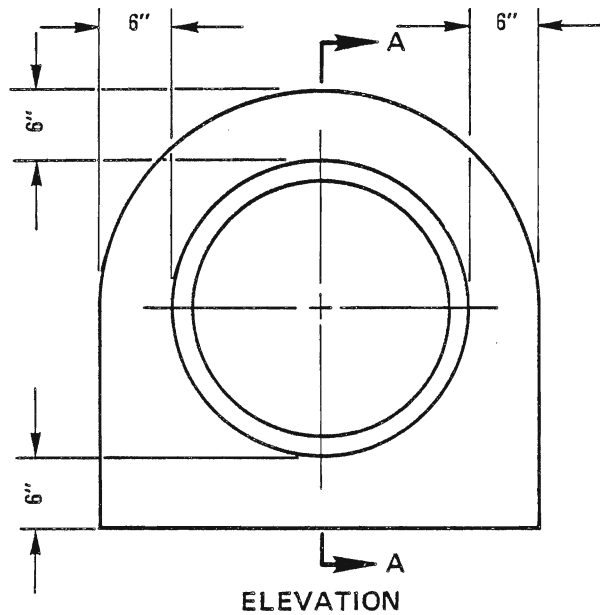
The rounded areas may be built up of cement mortar or poured in place with the drainage structure.



R = Inside diameter of pipe

10

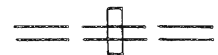
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Note	3c	D.S.	7-79			<i>Allard A. Kuehn</i>	<i>Dec. 1975</i>
				ROUNDED PIPE ENDS IN DRAINAGE STRUCTURES		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	D-61



NOTES:

1. Pipe collar does not have to be finished if covered, but must have a minimum of 6" of concrete around joint.
2. Concrete shall be 560-C-3250

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

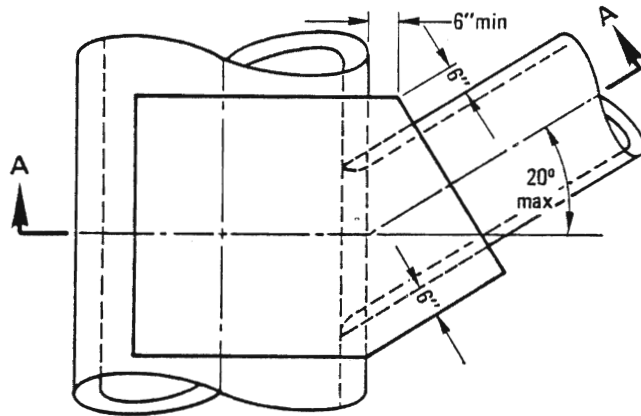
Richard A. Kuehnel Dec. 1975
Coordinator R.C.C. 13807 Date

DRAWING
NUMBER **D-62**

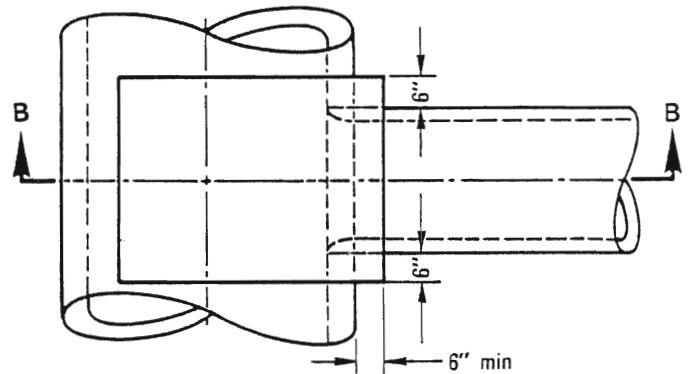
SAN DIEGO REGIONAL STANDARD DRAWING

PIPE COLLAR

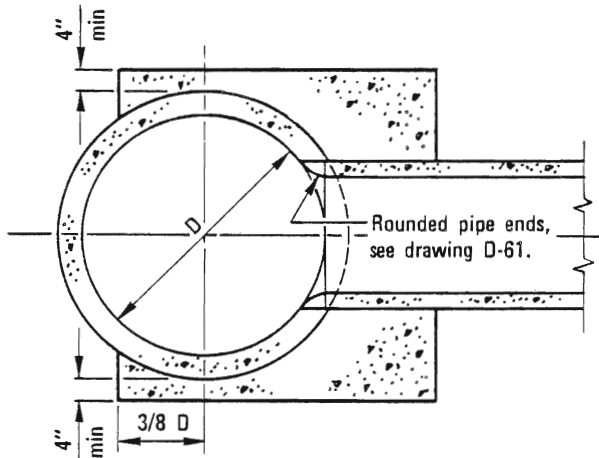
Revision	By	Approved	Date
Conc.	SC	M.B.	5-86



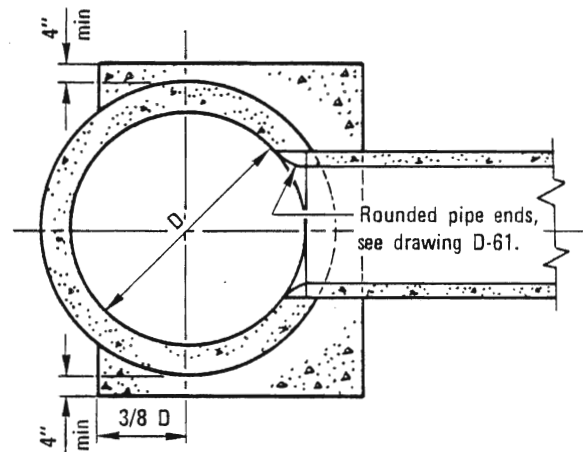
PLAN
SKEWED CONNECTION



PLAN



SECTION A-A



SECTION B-B

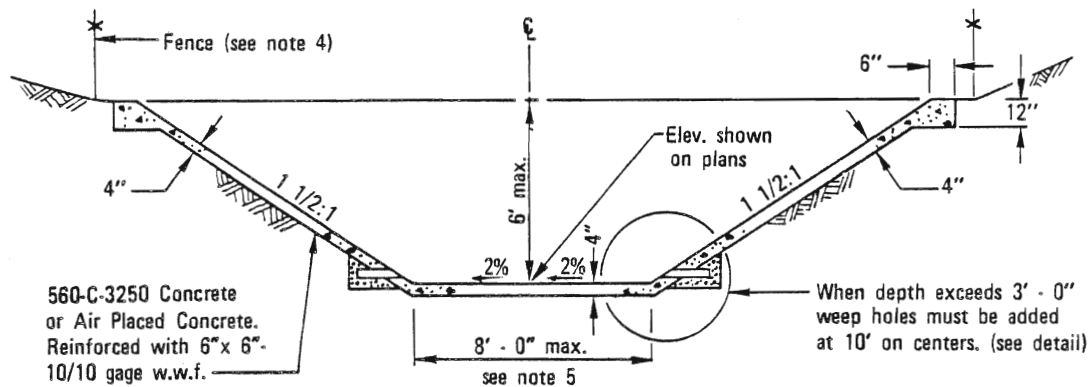
NOTES

1. The end of connecting pipe shall not project into the waterway of the larger pipe.
2. The larger pipe shall not be less than 24" I.D.
3. The smaller pipe shall not be more than 2/3 the size of the larger pipe.
4. Concrete shall be 470 - C - 2000.

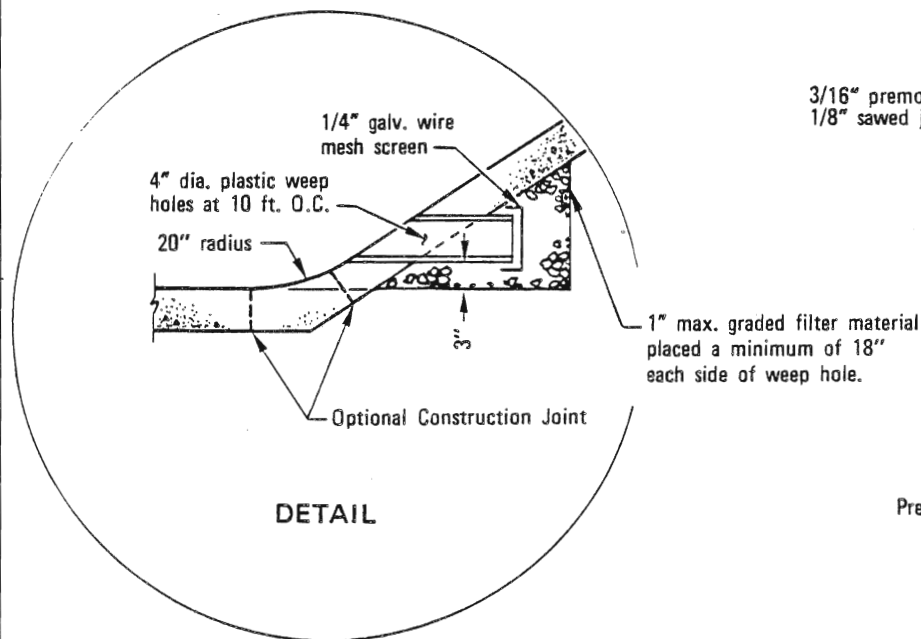
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allard G. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
				CONCRETE LUG	DRAWING NUMBER D-63



TYPICAL SECTION

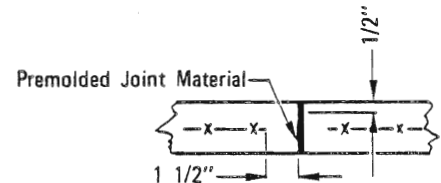


DETAIL

3/16" premolded joint material or 1/8" sawed joint.



WEAKENED PLANE JOINT

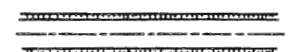


EXPANSION JOINT

NOTES

1. A.C. or clay pipe may be substituted for plastic pipe at weep holes.
2. Weakened plane joints shall be placed every 12' to 15'. Expansion joints shall be placed at all changes of section and at ends of curves.
3. Cutoff walls shall be constructed at each end of the channel along the full width of section. See Standard Drawing D-72.
4. Chainlink fence shall be as required by Agency.
5. For bottom widths greater than 8 feet see Standard Drawing D-71.
6. Reinforcement shown is minimum.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

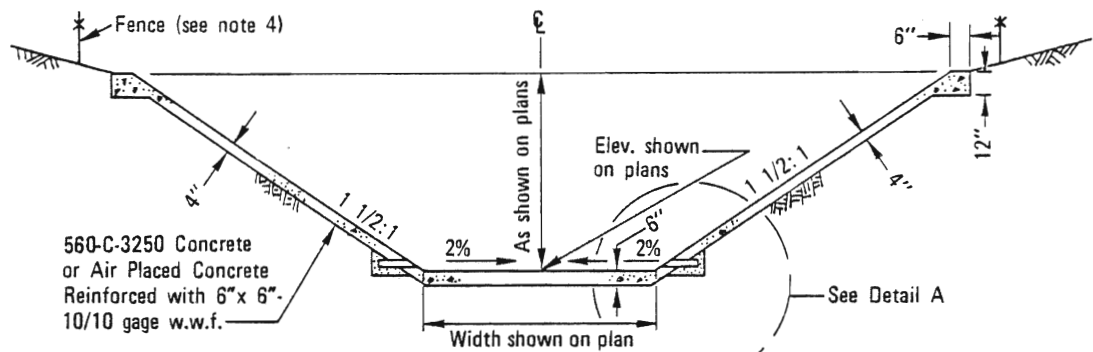
Richard A. Keshner DEC. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

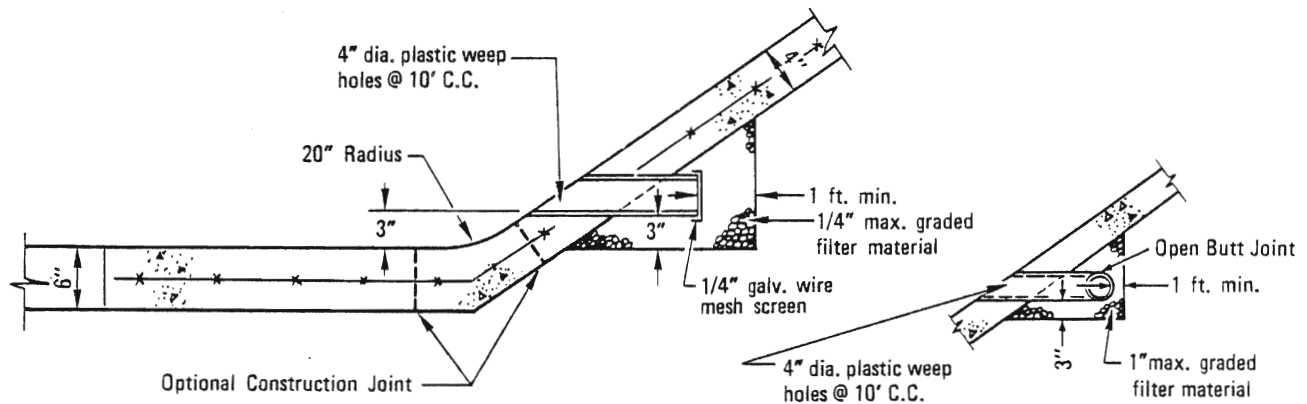
MINOR DRAINAGE CHANNEL

Revision	By	Approved	Date
Conc.	<i>MB</i>	<i>M.B.</i>	5-86

DRAWING NUMBER **D-70**



TYPICAL SECTION

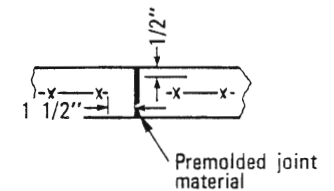


DETAIL A

ALT. CONTINUOUS DRAIN

3/16" premolded joint material or
1/8" sawed joint

WEAKENED PLANE JOINT



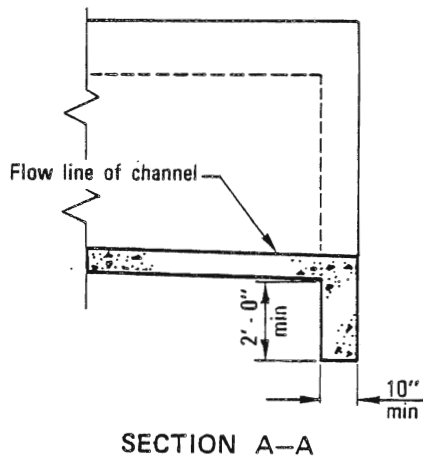
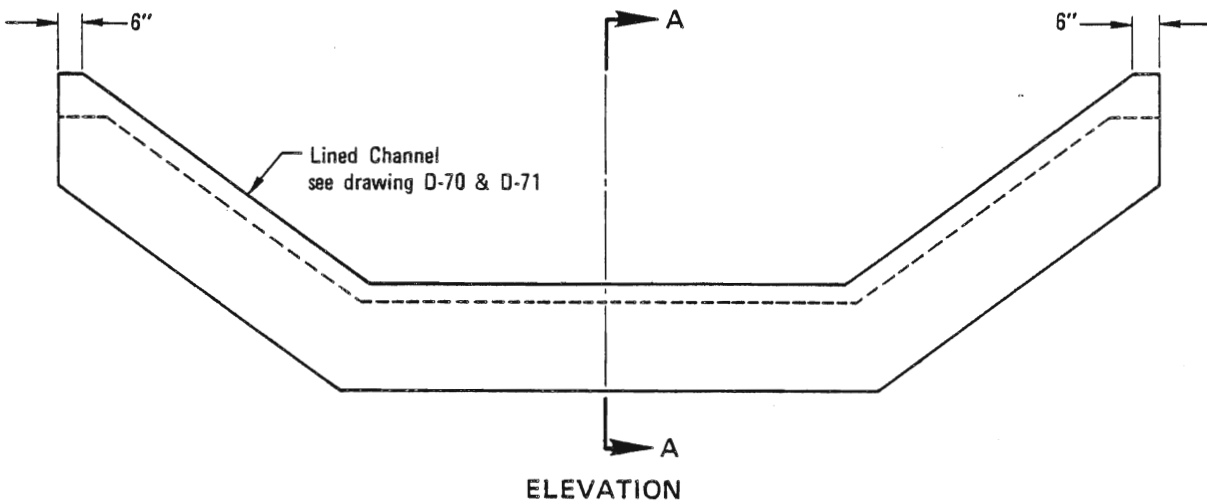
EXPANSION JOINT

LEGEND ON PLANS

NOTES

1. A.C. or clay pipe may be substituted for plastic pipe at weep holes.
2. Weakened plane joints shall be placed every 12' to 15'. Expansion joints shall be placed at all changes of section and at ends of curves.
3. Cutoff walls shall be constructed at each end of the channel along the full width of section. See Standard Drawing D-72.
4. Chainlink fence shall be as required by Agency.
5. Reinforcement shown is minimum.

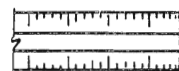
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	LC	M.B.	5-86			Allard A. Kuehnel DEC. 1975 Coordinator R.C.E. 19807 Date	
				MAJOR DRAINAGE CHANNEL		DRAWING NUMBER	
						D-71	



NOTES

1. Thickness and wall depth shall be as shown on plan.
2. Reinforcing in cutoff wall shall be the same as that required in channel.
3. Concrete shall be 560-C-3250

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Robert D. Keshner *Dec. 1975*
Coordinator R.C.C. 19807 Date

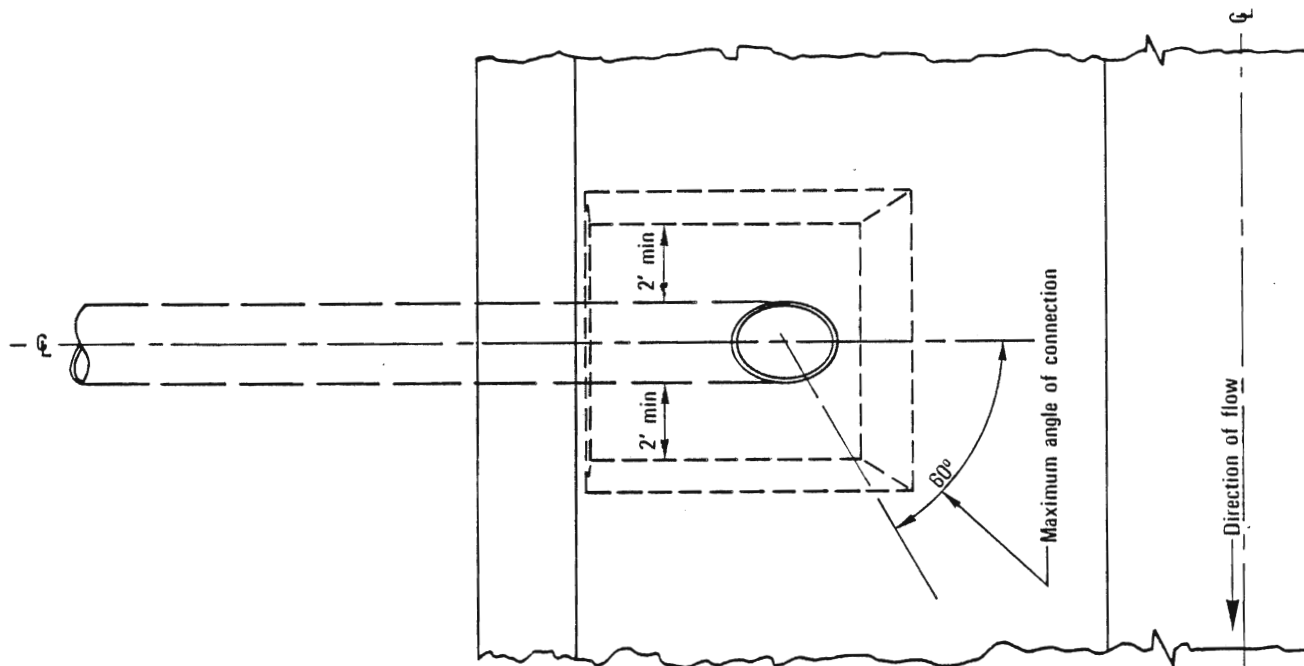
SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL FOR DRAINAGE CHANNEL

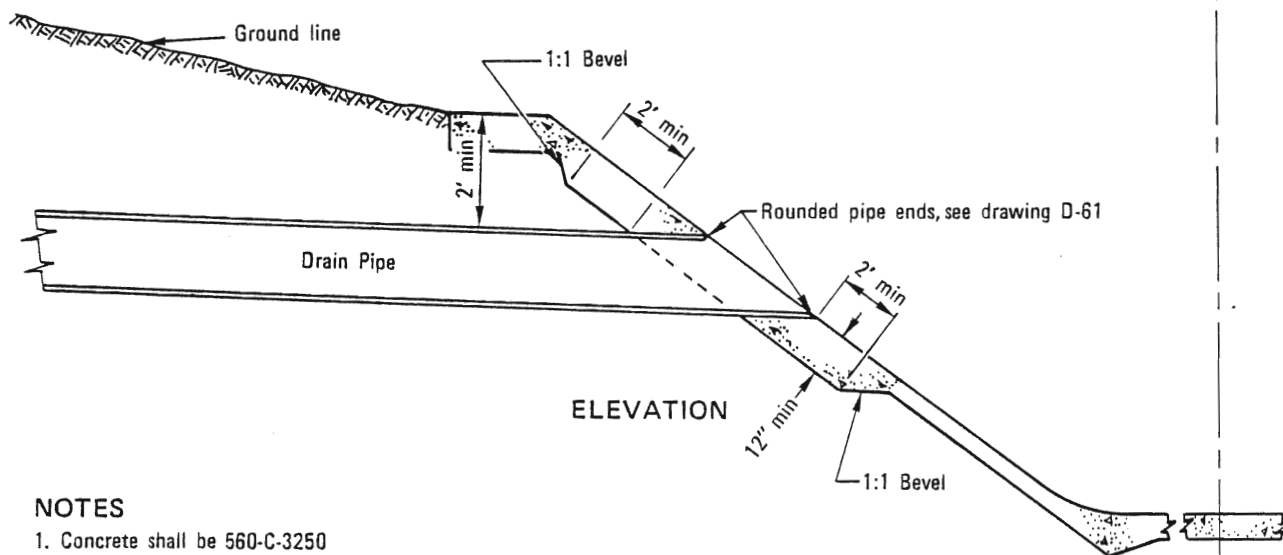
Revision	By	Approved	Date
Conc.	RC	M.B.	5-86

DRAWING
NUMBER

D-72



PLAN



ELEVATION

NOTES

1. Concrete shall be 560-C-3250
2. Pipe shall connect to channel as high as possible.
3. The maximum angle of connection is 60° downstream.
In no case shall a pipe angle upstream.

LEGEND ON PLANS



Revision	By	Approved	Date
Conc.	SC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

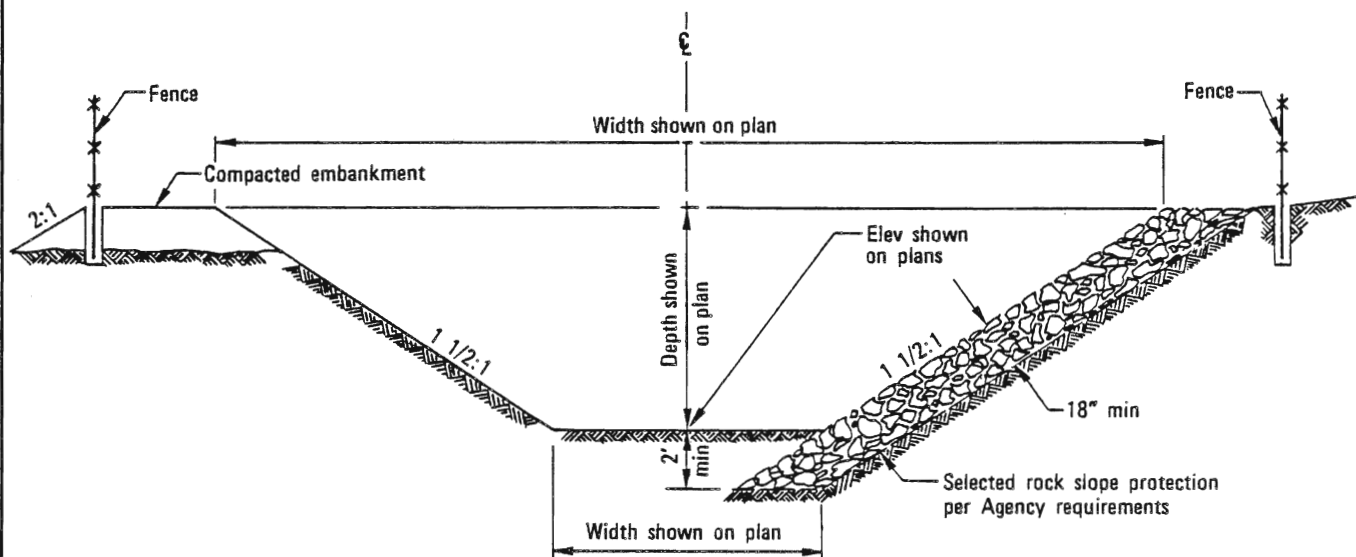
PIPE TO CHANNEL CONNECTION

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER

D-73



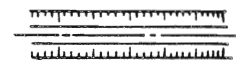
TYPICAL SECTION

NOTE

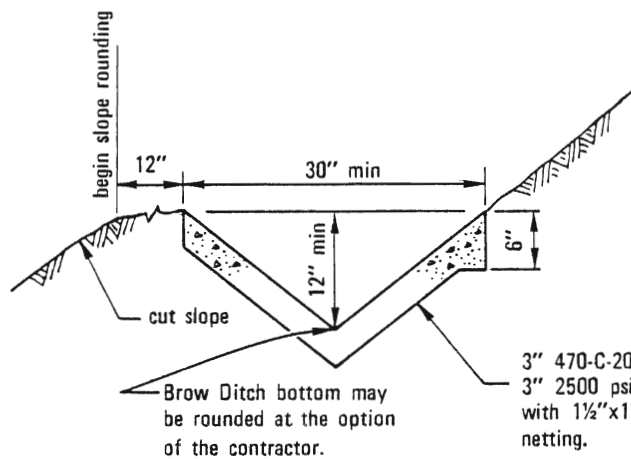
The following shall be as required by Agency:

- a) Low flow channel
- b) Filter blanket
- c) Cutoff wall
- d) Fence

LEGEND ON PLANS

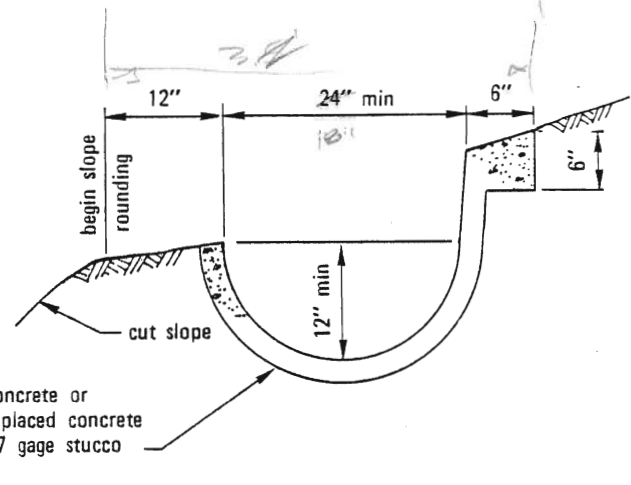


RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allan A. Kerschbaum</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	SAN DIEGO REGIONAL STANDARD DRAWING		Revision	By	Approved	Date	
	GRADED EARTH CHANNEL						
DRAWING NUMBER D-74							

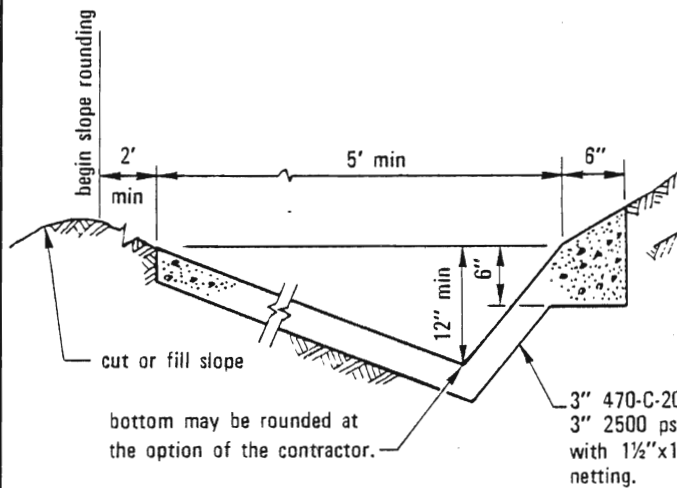


TYPE A

BROW DITCH

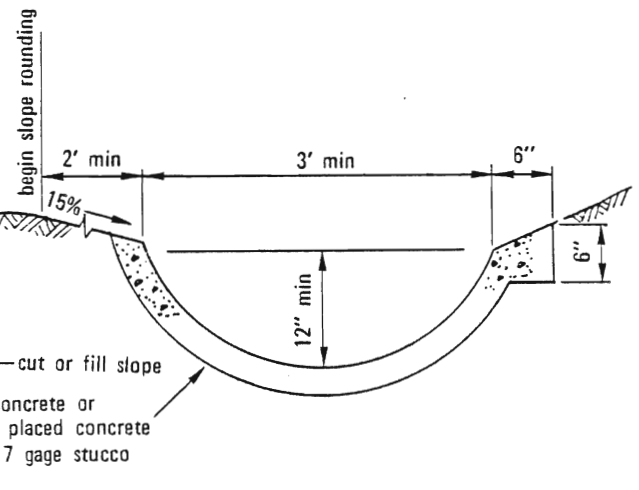


TYPE B



TYPE C

TERRACE DITCH

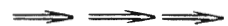


TYPE D

NOTES

1. Longitudinal slope of lined ditch shall be 2% minimum.
2. Over slope down ditches shall employ 6" thickened edge section at both sides of ditch.

LEGEND ON PLANS



Revision	By	Approved	Date
Ditch type	RS	DS	7-77
A.P.C.	TRP	M.B.	10-82

SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE DITCHES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

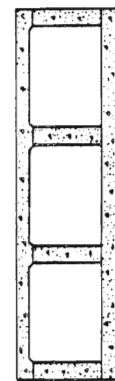
Allard A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **D-75**

[illegible][illegible]

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. Number of "d" bars in table is slab total for all three cells.



"FLAT INVERT" ALTERNATIVE
(When shown)

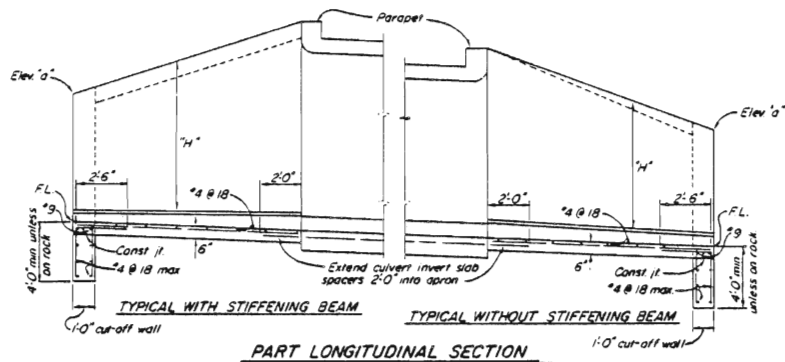
TYPICAL SECTION

SAN DIEGO REGIONAL STANDARD DRAWING

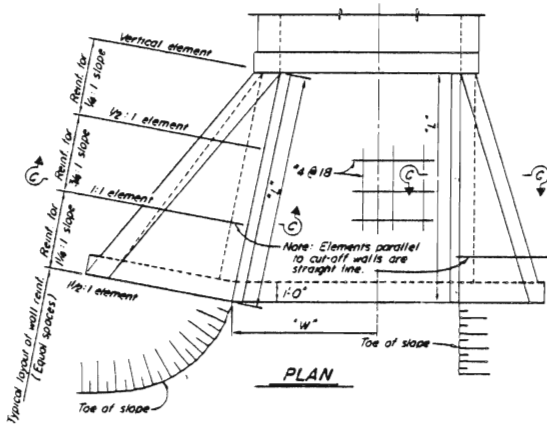
TRIPLE BOX CULVERT

Revision	By	Approved	Date
Cover	JC	M. B.	5-26

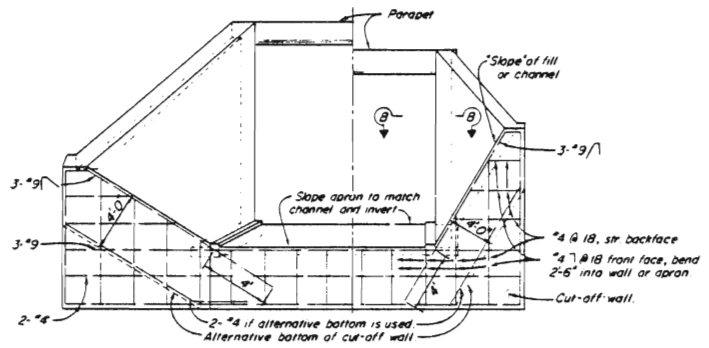
DRAWING NUMBER **D-79**



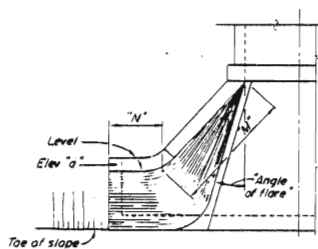
PART LONGITUDINAL SECTION



PLAN

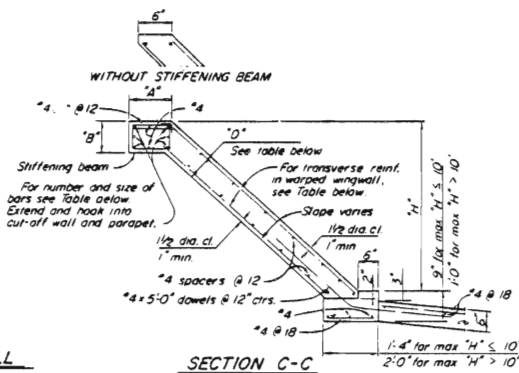


END ELEVATION



ALTERNATIVE WARPED WINGWALL

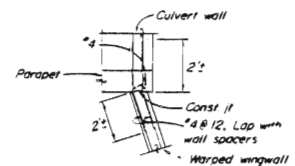
Use where additional protection to toe of embankment is required



SECTION C-C

WALL DIMENSIONS AND REINFORCING													
Element	H	8' or less	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
Front face reinf.	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12
Rear face reinf.	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12
Front face reinf.	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12
Rear face reinf.	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12
Front face reinf.	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12
Rear face reinf.	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12	4 #12
10' at Cut-off Wall	6	6	6	7 1/2	8	9 1/2	11	18					
10' at Culvert	6	6	6	8	9 1/2	11	11	20					

Notes: Walls designed for 2' surcharge, earth load = 120 lb/cu ft, equivalent fluid pressure = 36 lb/cu ft. Vary "D" of warped wall uniformly from that at cut-off wall to that at culvert, for max. "H" > 12'. Where abrasion is anticipated, increase apron thickness to 7" min. to provide 2" min. reinforcement coverage. Dimensions "L", "W", "H", "M", "N", "Elev. a", "Angle of flare", and end "Slope" (as apply) are shown on the plans. Concrete shall be class 3600-3-20's.



SECTION B-B

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Chad P. Kuehner Dec. 1975
Contributor H.P.C. 19407 Date

DRAWING NUMBER D-80

SAN DIEGO REGIONAL STANDARD DRAWING

BOX CULVERT WARPED WINGWALLS

Revision	By	Approved	Date
Concrete	TRP	M.B.	10-82

DESIGN NOTES

SPECIFICATIONS:

DESIGN: AASHTO DATED 1973 WITH REVISIONS AND AS SUPPLEMENTED BY STATE OF CALIFORNIA 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: FOR LEGAL HIGHWAY LOADS, USE HS20-44 OR ALTERNATIVE, WITH 30% IMPACT FOR ALL COVER DEPTHS. NO IMPACT ON INVERT.

COVER LESS THAN 2' - WHEEL LOAD DISTRIBUTION ON THE TOP SLAB IS $E = 0.175S + 3.2$ LONGITUDINALLY AND CONCENTRATED ALONG THE SPAN. WHEEL LOAD DISTRIBUTION ON THE INVERT SLAB IS 7.5' LONGITUDINALLY AND UNIFORMLY OVER THE BREADTH OF THE CULVERT.

COVER 2' OR MORE - WHEEL LOADS DISTRIBUTED UNIFORMLY OVER A SQUARE, THE SIDES OF WHICH ARE 1.75 TIMES THE DEPTH OF COVER, BUT NOT LESS LONGITUDINALLY THAN ON THE TOP SLAB OR 7.5' ON THE INVERT SLAB. WHEN SUCH AREAS FROM SEVERAL WHEEL 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 OVERALL LONGITUDINAL DIMENSION SHALL NOT EXCEED THE TOTAL LENGTH OF THE SUPPORTING SLAB. NEGLECT LIVE LOAD ON SINGLE SPANS WHEN COVER IS MORE THAN 8' AND EXCEEDS SPAN, AND ON MULTIPLE SPANS WHEN COVER EXCEEDS DISTANCE BETWEEN EXTERIOR WALLS.

DEAD LOAD: EARTH LOAD OF 120 PCF AND AN EQUIVALENT FLUID PRESSURE OF 34 PCF, REDUCED TO 84 PCF AND 25 PCF RESPECTIVELY FOR CLEAR SPANS OF 20' OR LESS.

UNIT STRESSES: $F_s = 20,000 \text{ PSI}$, $n = 10$
 $F_c = 1,200 \text{ PSI}$

REINFORCEMENT EMBEDMENT IS $1\frac{1}{2}$ DIA CLEAR, MIN $1"$ AND IN $\frac{1}{4}"$ INCREMENTS, EXCEPT AS NOTED.

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

CLASSIFICATION "A" TOP SLAB = $\frac{100}{\text{SPAN}}$, MAX 50% (UNLESS TRAFFIC LONGITUDINAL)

BOTTOM SLAB = $\frac{100}{\text{SPAN}}$ MAX

CLASSIFICATION "B" TO "E": TOP AND BOTTOM SLABS $\frac{100}{\text{SPAN}}$ MAX.

GENERAL NOTES

QUANTITIES: QUANTITIES ARE FOR THE SLOPED INVERT SLAB AND DO NOT INCLUDE SPLICES IN LONGITUDINAL BARS, NOR TEMPERATURE REINFORCEMENT FOR EXPOSED TOP CULVERT, NOR CONCRETE OR REINFORCEMENT FOR PARAPETS OR CUTOFF WALLS.

SPECIAL COVERAGE: BOX STANDARD PLANS ARE NOT TO BE USED FOR CULVERTS IN A CORROSIVE ENVIRONMENT OR WHERE THERE IS A SEVERE ABRASIVE FLOW CONDITION.

DESIGNATION: SHOW ON PLANS AS SPAN x HEIGHT - STRENGTH CLASSIFICATION x LENGTH. THUS $4 \times 4 \times A \times 60'$, 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. PARAPETS WILL BE AS SHOWN UNLESS "___ FT. PARAPET" IS DESIGNATED IN PLANS. SUCH DESIGNATIONS MAY BE DIFFERENT FOR INLET AND OUTLET ENDS.

REINFORCEMENT: MAIN REINFORCEMENT IS POSITIONED TRANSVERSE OR, FOR CURVED CULVERTS, RADIAL, WHEN RADIAL REINFORCING SPACING IS MEASURED ALONG THE $\frac{1}{4}$.

CONSTRUCTION NOTES

CONCRETE: BOTTOM SLAB & WALLS SHALL BE CLASS 560-B-3250
TOP SLAB SHALL BE CLASS 560-C-3250

EXPANSION JOINTS: BOTTOM SLAB - NO EXPANSION JOINTS SHALL BE PLACED TOP SLAB AND WALLS - WHEN COVER IS LESS THAN SPAN LENGTH, PLACE $\frac{1}{2}$ EXPANSION JOINT FILLER AT 30' CENTERS OUTSIDE THE PAVED ROADWAY LANES AND PLACE BRIDGE DETAIL 3-2 AT 30' CENTERS UNDER PAVED ROADWAY LANES. WHEN COVER IS MORE THAN SPAN LENGTH, PLACE $\frac{1}{2}$ EXPANSION JOINT FILLER AT 30' CENTERS AND ADDITIONAL $\frac{1}{2}$ EXPANSION JOINTS AT LOCATIONS OF CHANGE IN FOUNDATION CHARACTER, AS DIRECTED BY THE ENGINEER.

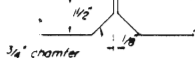
CONSTRUCTION LOADS

NOT PERMITTED UNTIL CONCRETE HAS REACHED A STRENGTH OF 3,000 PSI OR AGE OF 28 DAYS, WHICHEVER OCCURS FIRST, AND TO SLAB PLANS HAVE BEEN PERMITTED BY THE CONTRACTOR TO THE ENGINEER AND APPROVED.

CONSTRUCTION JOINTS

TEMPORARY JOINTS MAY BE PERMITTED IF NORMAL (OR RADIAL) TO $\frac{1}{4}$ OF RCB, OTHERWISE, THE CONTRACTOR IS TO SUBMIT A PROPOSAL FOR CONSIDERATION.

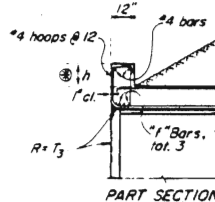
Joint may be formed with $\frac{1}{8}"$ hardboard and cut back to the root of the chamfer on the exposed face.



BRIDGE DETAIL 3-2
(Portion)

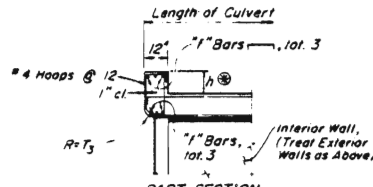
See Standard Drawing C 15

Length of Culvert



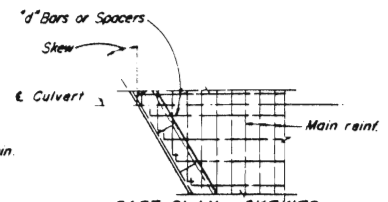
PART SECTION

PARAPET DETAILS FOR SINGLE SPAN CULVERTS

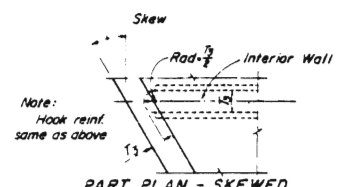


PART SECTION

PARAPET DETAILS FOR MULTIPLE SPAN CULVERTS

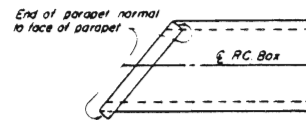


PART PLAN - SKEWED

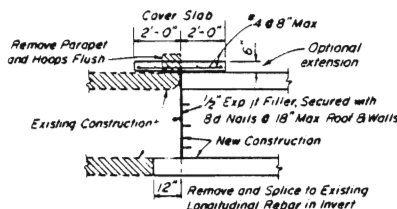


PART PLAN - SKEWED

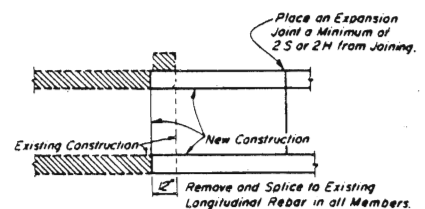
SPAN	PARAPET "1" BAR NOS			
	SKW	ANGLE	TO	TO
4'	0°	16°	31°	45°
6'	0°	16°	31°	45°
8'	0°	16°	31°	45°
10'	0°	16°	31°	45°
12'	0°	16°	31°	45°
14'	0°	16°	31°	45°



PARAPET DETAIL FOR SKEWED CULVERTS W/O WINGWALLS



COVER: 1' AND GREATER



COVER: EXPOSED TOP AND GREATER

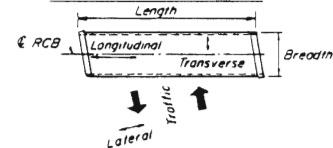
CULVERT EXTENSION

20° SKEW MAXIMUM

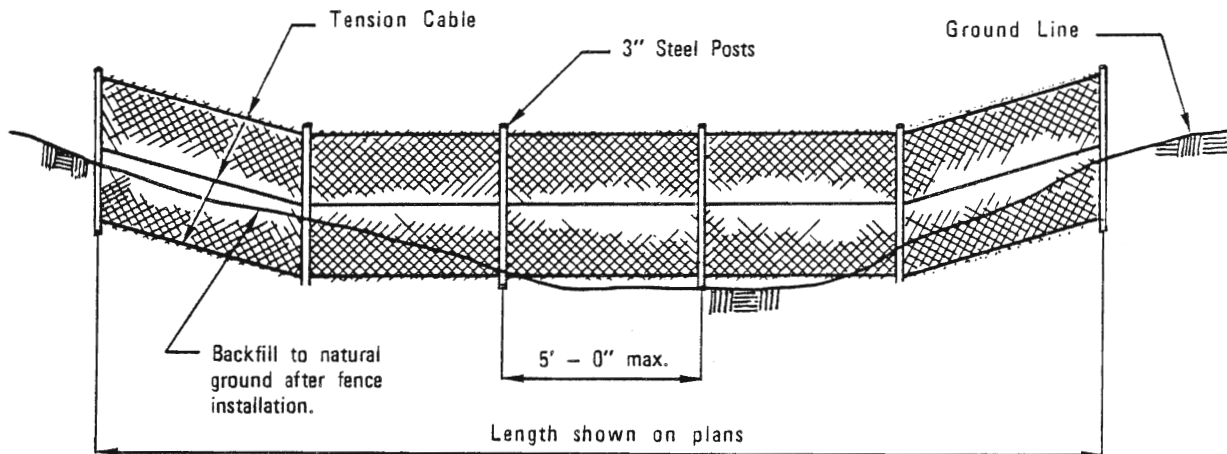
USE OF STANDARD DRAWING

"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.

LIVE LOAD & RCB DIRECTIONAL TERMINOLOGY



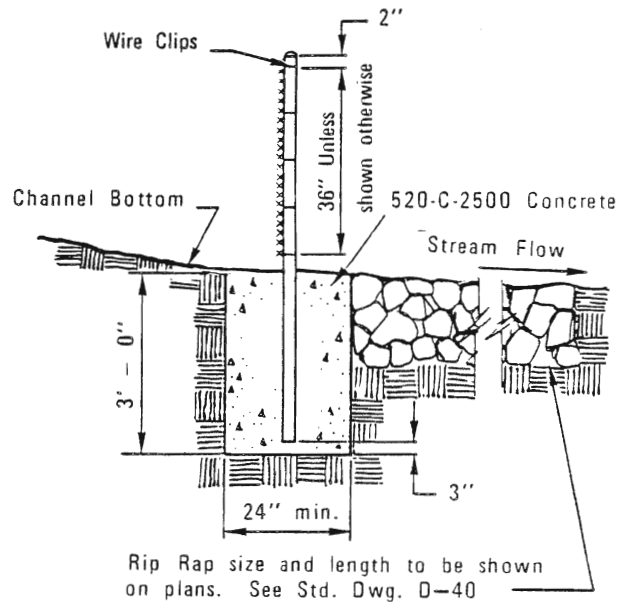
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Concrete	TRP	M.B.	10-82		
				BOX CULVERT MISCELLANEOUS DETAILS	Allen A. Kuehn Coordinator R.C.E. 19807 Dec. 1975 Date
				DRAWING NUMBER	D-81



ELEVATION

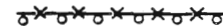
NOTES:

1. Fence fabric shall be 2" mesh, 9 gage galvanized wire, chainlink placed on the upstream side of the posts and tension cables.
2. Tension cable shall be 5/16" diameter steel at 18" c/c secured at ends with cable clamps. Secure fence to cable with No. 12 galv. steel wire looped at 6" c/c.
3. Posts shall be 3" diameter steel pipe, 5.79 lb./ft. Fill with mortar after placing.
4. Fence fabric shall be secured to posts with 9 gage wire clips at 9" c/c.



SECTION

LEGEND ON PLANS

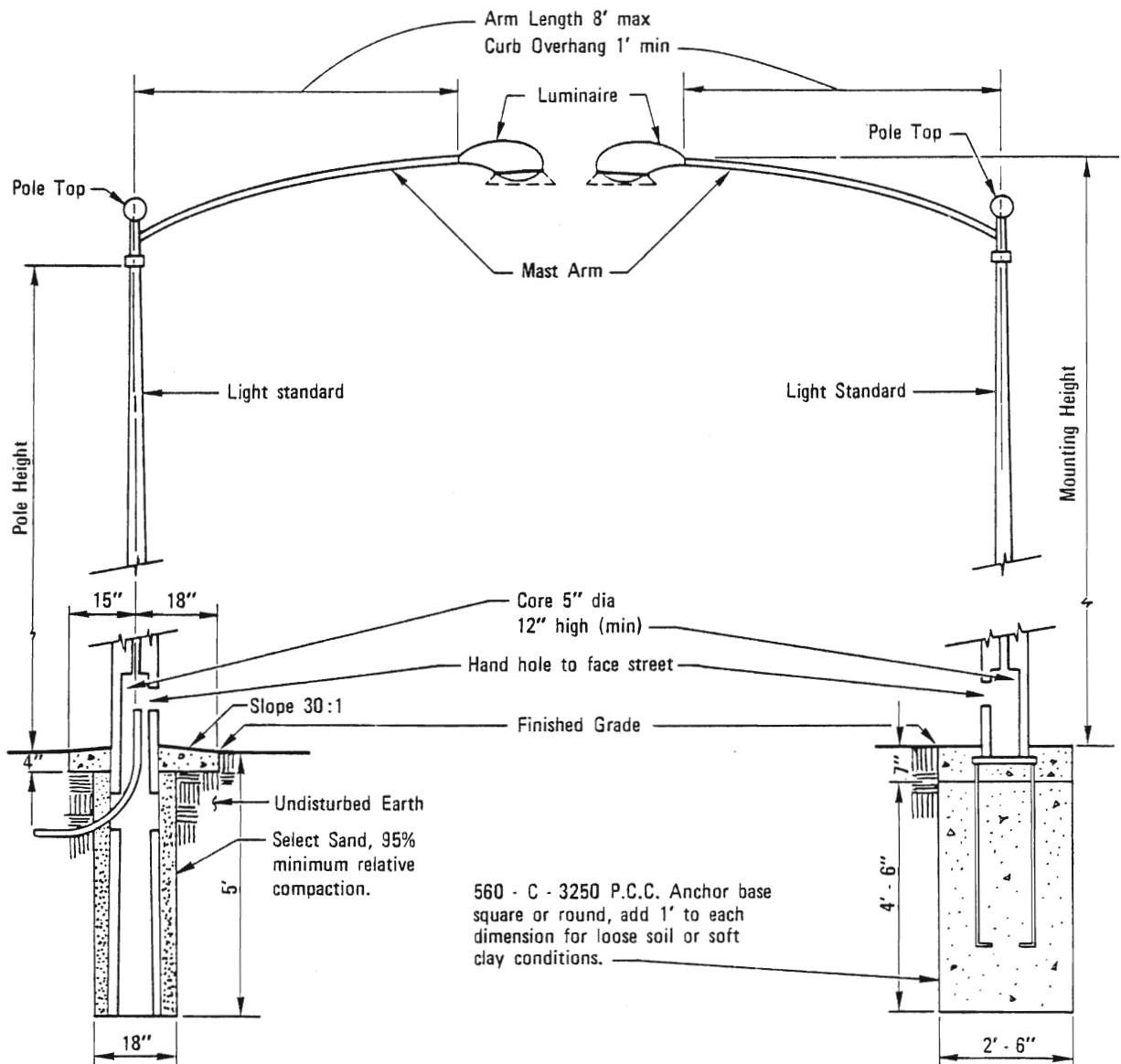


RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Harry R. Heit</i> Oct 1982 Chairman A.C.E. C13768 Date	SAN DIEGO REGIONAL STANDARD DRAWING		Revision	By	Approved	Date
DRAWING NUMBER	DEBRIS FENCE					
D-82						

ELECTRICAL SYSTEMS

ELECTRICAL SYSTEMS

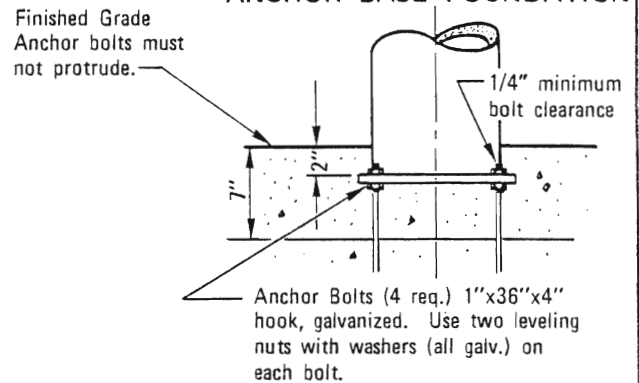
E



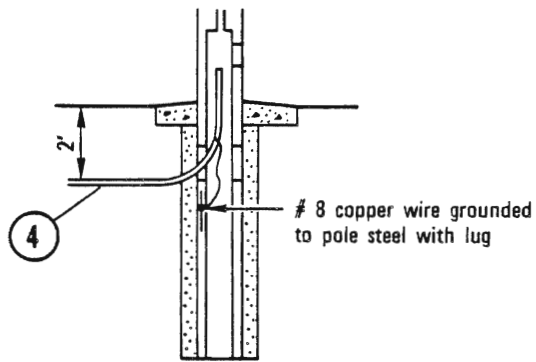
DIRECT BURIAL FOUNDATION

POLE HEIGHT	MOUNTING HEIGHT	LAMP SIZE (WATTS)
25' ± 2'	27' ± 1'	170 M.V. 100 H.P.S. 90 L.P.S.
28' ± 2'	30' ± 1'	400 M.V. 250 H.P.S. 180 L.P.S.
23' - 0"	26' - 9"	70 H.P.S.
26' - 6"	30' - 0"	150 H.P.S.

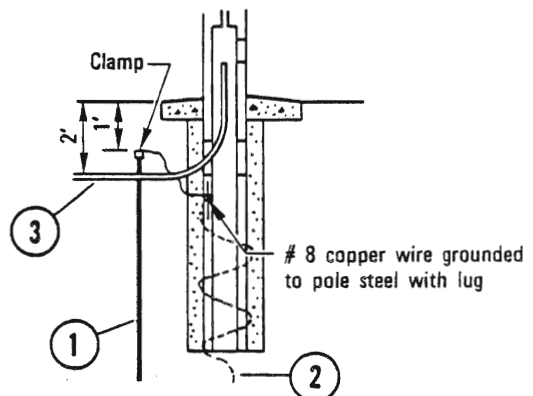
ANCHOR BASE FOUNDATION



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Table	2	M.B.	5-86			Allan P. Kerschbaum Coordinator R.C.E. 1980/	
				STREET LIGHTING STANDARD		Dec. 1975 Date	
						DRAWING NUMBER	
						E-1	

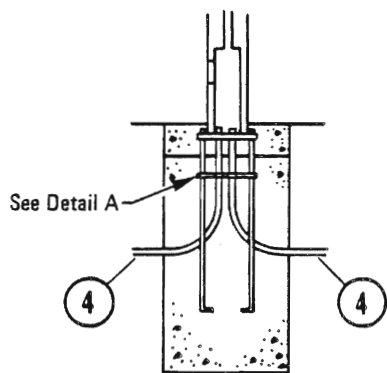


STEEL CONDUIT

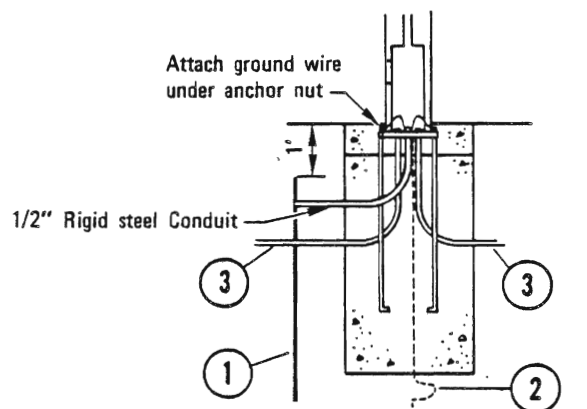


NON-METALLIC CONDUIT

DIRECT BURIAL FOUNDATION



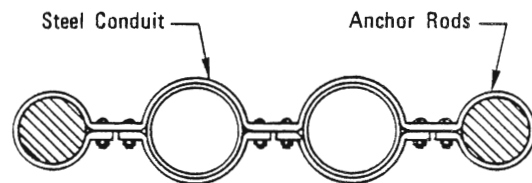
STEEL CONDUIT



NON-METALLIC CONDUIT

ANCHOR BASE FOUNDATION

- ① 3/4" x 8' copper covered steel ground rod.
- ② Alternate Ground: 15' no. 4 bare stranded copper wire, coiled.
- ③ Approved non-metallic conduit.
- ④ Steel conduit.



DETAIL A

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Allan J. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

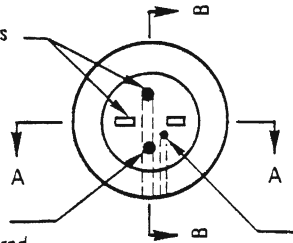
SAN DIEGO REGIONAL STANDARD DRAWING

Revision	By	Approved	Date

**GROUNDING
OF CONCRETE LIGHTING STANDARDS**

DRAWING
NUMBER **E-2**

1½" min. cover for bars and conduits.



Galvanized steel conduits.
Size and number as required.

NOTE:

Concrete shall be class 560-C-3250

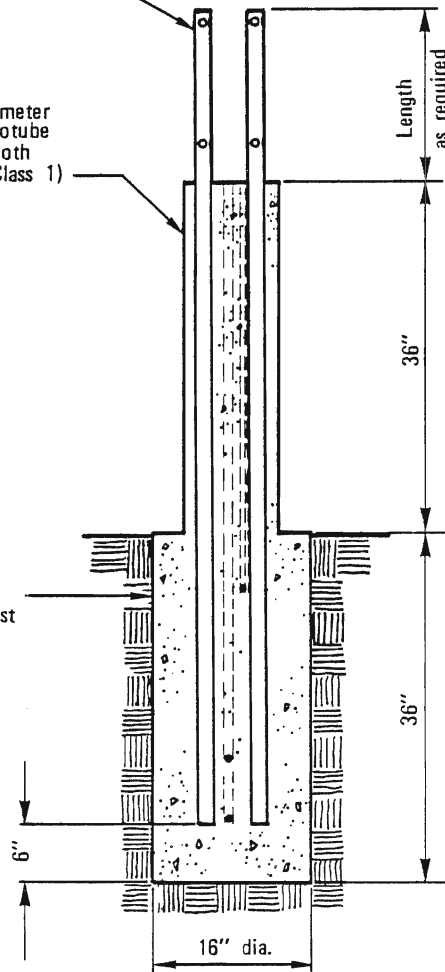
1" galvanized steel conduit for service ground (where required).

PLAN

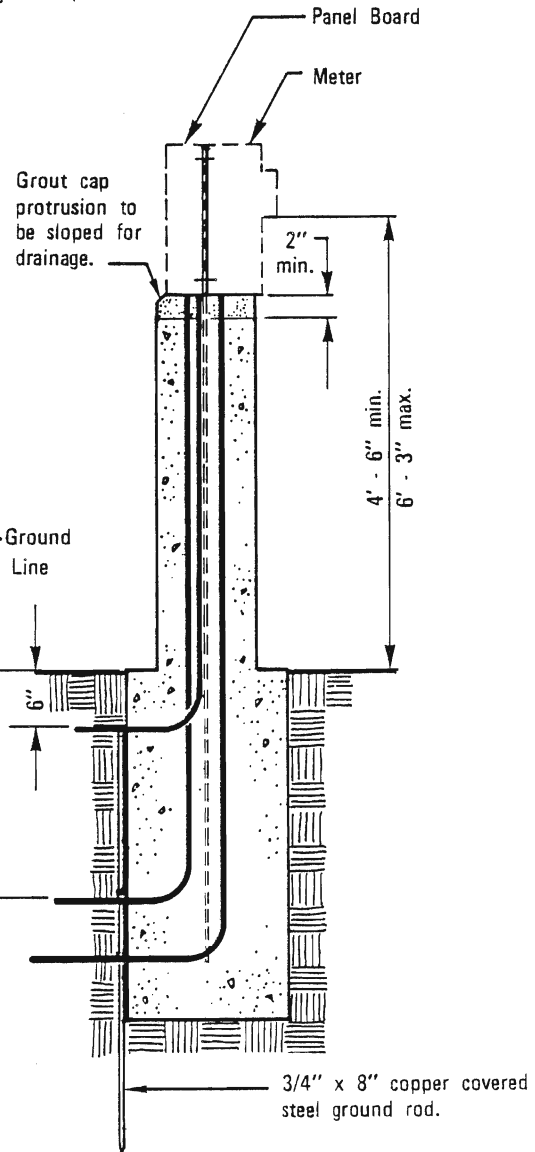
1/4" X 2" galvanized steel bars.

10" Diameter use Sonotube for smooth finish. (Class 1)

Permissible to auger hole and pour against soil.



SECTION A-A
STEEL & CONCRETE
DIMENSIONS



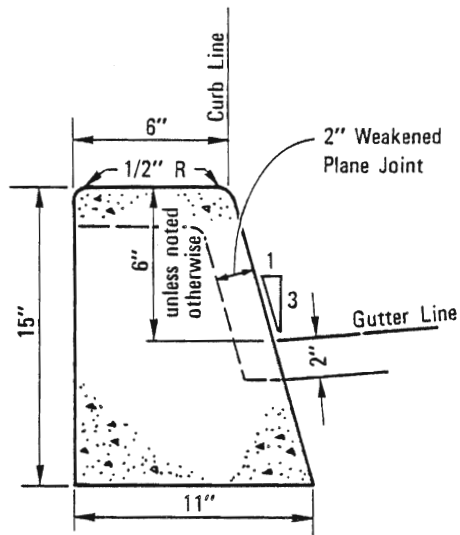
SECTION B-B
CONDUIT & EQUIPMENT

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	<i>M.B.</i>		<i>5-86</i>			<i>Allan A. Kuehn</i>	<i>Dec. 1975</i>
				PEDESTAL FOR ELECTRICAL EQUIPMENT		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	E-33

G

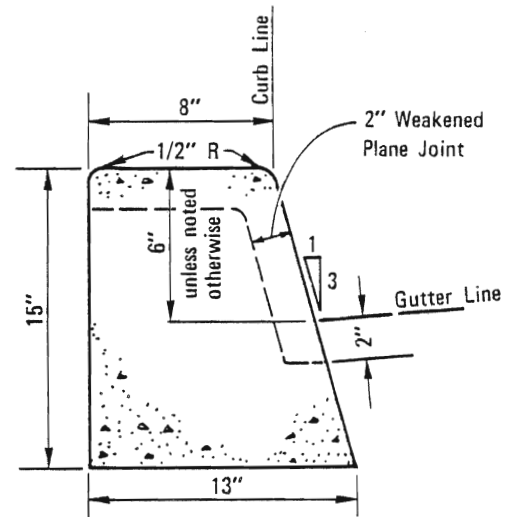
GENERAL SURFACE IMPROVEMENTS

GENERAL SURFACE IMPROVEMENTS



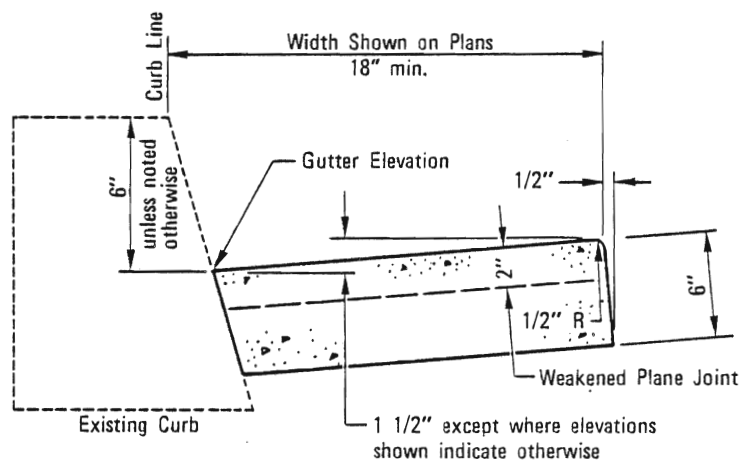
6" CURB

Area = 0.89 SQ. FT.



8" CURB

Area = 1.09 SQ. FT.



GUTTER

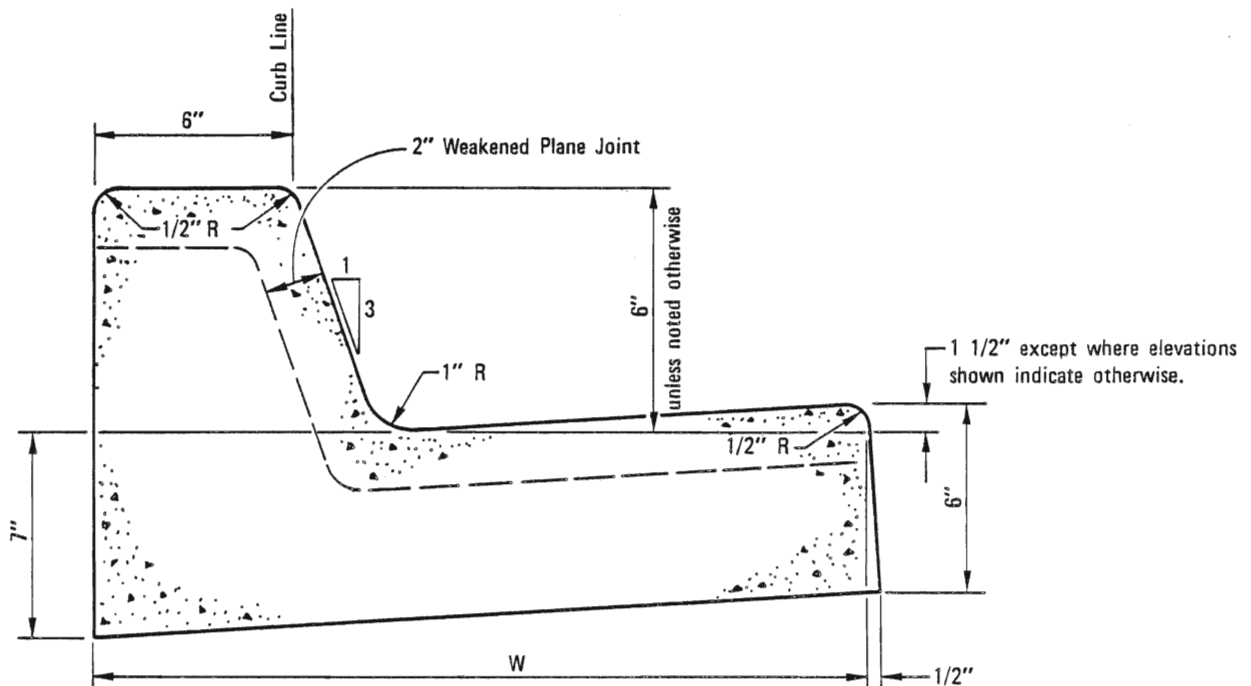
LEGEND ON PLANS

6" curb

NOTES:

1. Concrete shall be 520-C-2500.
2. See Standard Drawing G-10 for joint details.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	<i>M.B.</i>	<i>M.B.</i>	5-86			<i>Alfred A. Kuehn</i>	<i>Dec. 1975</i>
				CURBS AND GUTTER - SEPARATE		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	G-1



TYPE G & H CURB

TYPE	W	* AREA SQ. FT.
G	24"	1.34
H	30"	1.61

* with 6" Curb Face

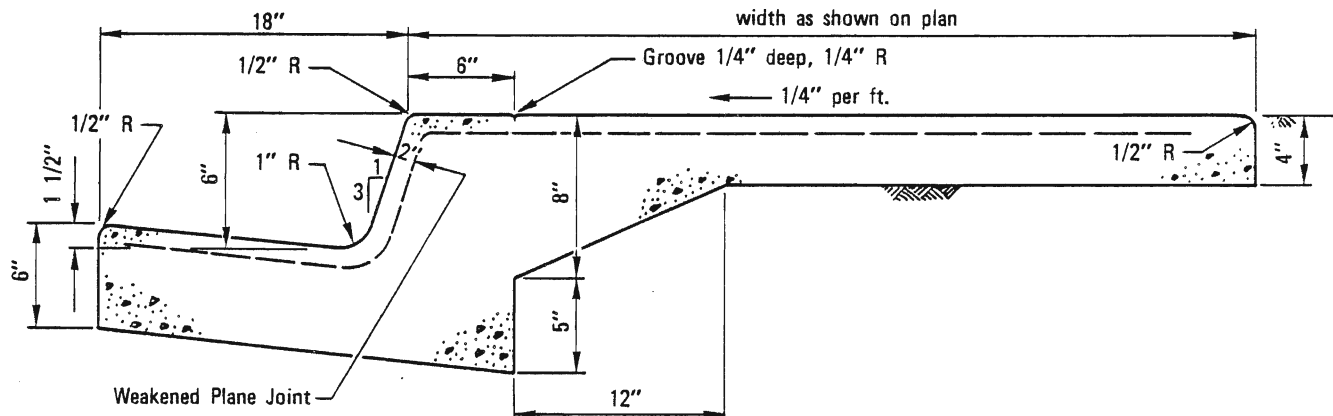
NOTES:

1. Concrete shall be 520-C-2500.
2. See Standard Drawing G-10 for joint details.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Robert J. Kuehnel</i> <i>Dec. 1975</i> Coordinator HCE 19807 Date	SAN DIEGO REGIONAL STANDARD DRAWING	Revision	By	Approved	Date
		Conc.	SC	M.B.	5-86
DRAWING NUMBER G-2	CURB AND GUTTER - COMBINED				

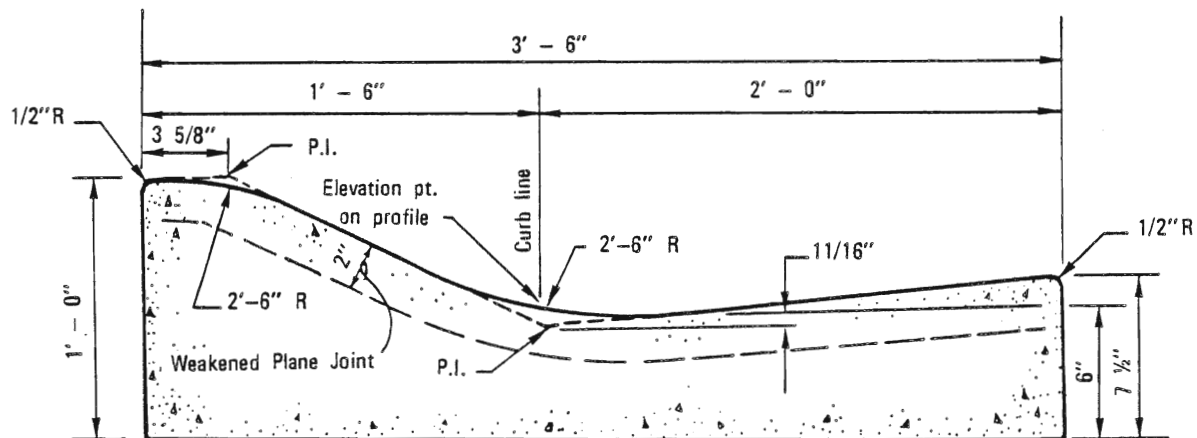


NOTES

1. Concrete shall be 520-C-2500.
2. See Standard Drawing G-10 for joint details.
3. Monolithic curb, gutter and sidewalk is to be used with Agency approval only.

LEGEND ON PLANS

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Thickness	SE	D.S.	7-79		
Thickness	SH	M.B.	6-82	MONOLITHIC CURB, GUTTER AND SIDEWALK	<i>Allan A. Kerschman</i> Dec. 1975 Coordinator R.C.E. 19807 Date
Conc.	SC	M.B.	5-86		
					DRAWING NUMBER G-3



CURB AREA
(2.23 sq. ft.)

NOTES:

1. Transition to type G curb at all curb returns, except where sidewalk ramps are provided, and at all cul-de-sacs with drainage structures.
2. See Standard Drawing D-6.1 for Rolled Curb Inlet.
3. Concrete shall be 520-C-2500.
4. See Standard Drawing G-10 for joint details.

LEGEND ON PLANS

=====

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

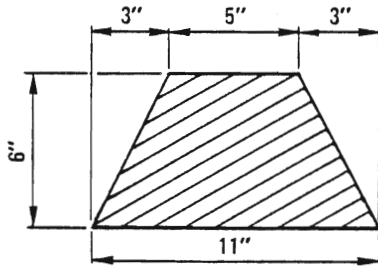
Charles A. Kuehner Dec. 1975
Coordinator RCE 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

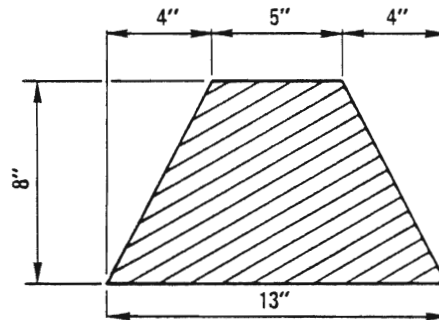
CURB AND GUTTER-ROLLED

Revision	By	Approved	Date
X-Sect.	TRP	M.B.	10-82
Conc.	J	M.B.	5-86

DRAWING
NUMBER G-4

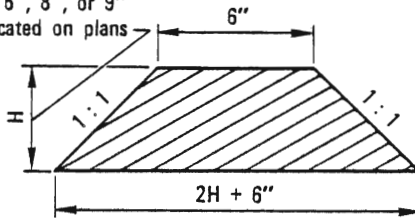


TYPE A-SECTION

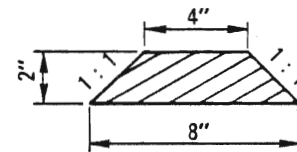


TYPE B-SECTION

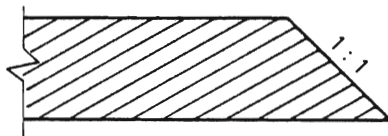
Height 6", 8", or 9"
as indicated on plans



TYPE C-SECTION



TYPE D-SECTION



ALL TYPES—SIDE VIEW

Slope end of dike 1 : 1
when not joining
other improvements

APPROX. DIKE QUANTITIES	
TYPE	TONS/LIN. FT.
A	0.0250
B	0.0375
C-6"	0.0375
C-8"	0.0583
C-9"	0.0702
D	0.0062

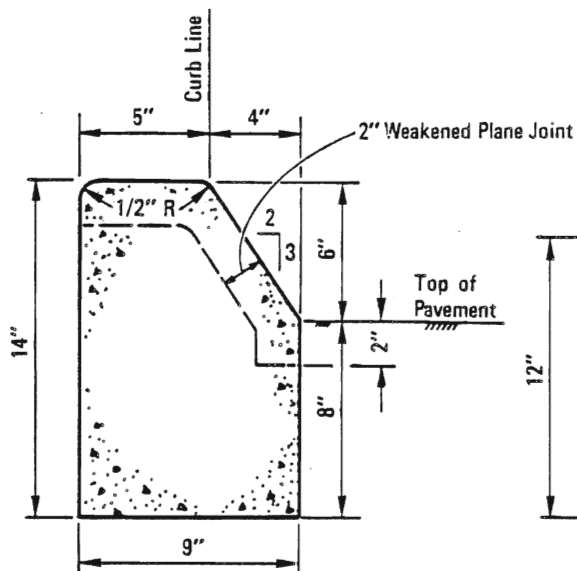
NOTES

1. Dike is to be placed on a minimum 2" of A.C. road surfacing, extending throughout the width of the dike.
2. AR-8000 grade asphalt to be used for all dikes
3. 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.

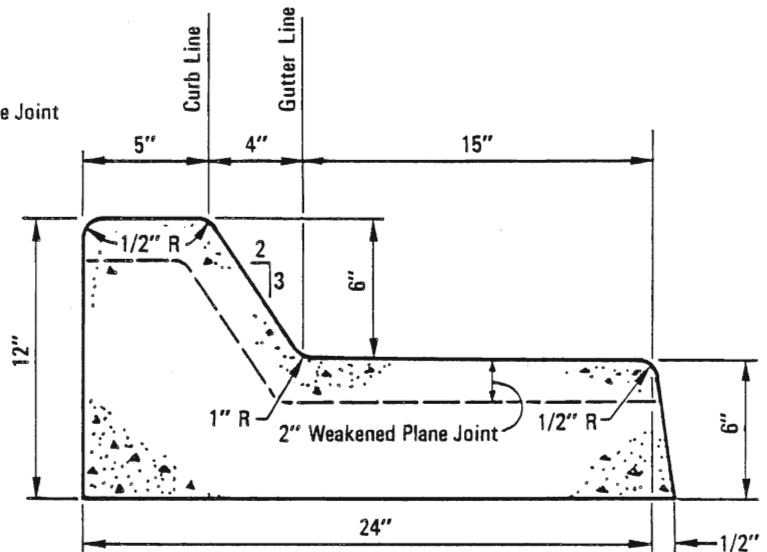
LEGEND ON PLANS

— Type A Dike

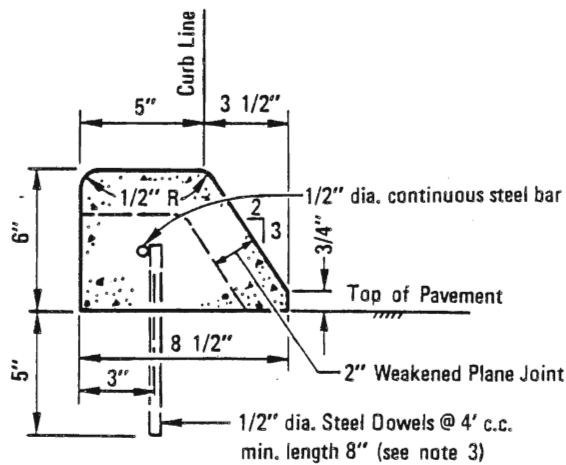
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
				DIKES (BERMS) - ASPHALT CONCRETE	
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				<i>Allan A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
				DRAWING NUMBER G-5	



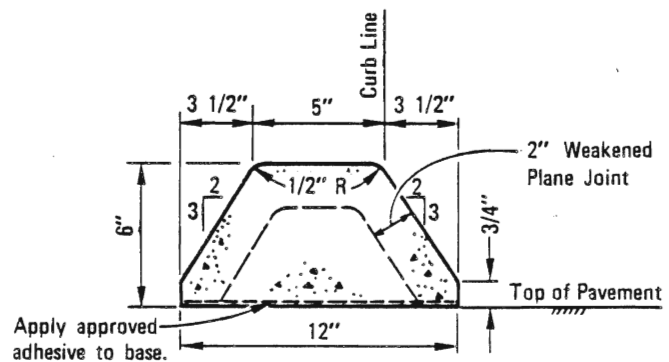
B-1
AREA = 0.79 SQ.FT.



B-2
AREA = 1.29 SQ.FT.



B-3
AREA = 0.29 SQ.FT.



B-4
AREA = 0.35 SQ.FT.

NOTES

1. Concrete shall be 520-C-2500.
2. See Standard Drawing G-10 for joint details.
3. Extruded type B-3 curb shall be anchored to existing pavement by placing steel dowels and reinforcing steel as shown or by using an approved adhesive.

LEGEND ON PLANS

Type B-2 Curb and Gutter

Type B-1, B-3, B-4 Curb

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

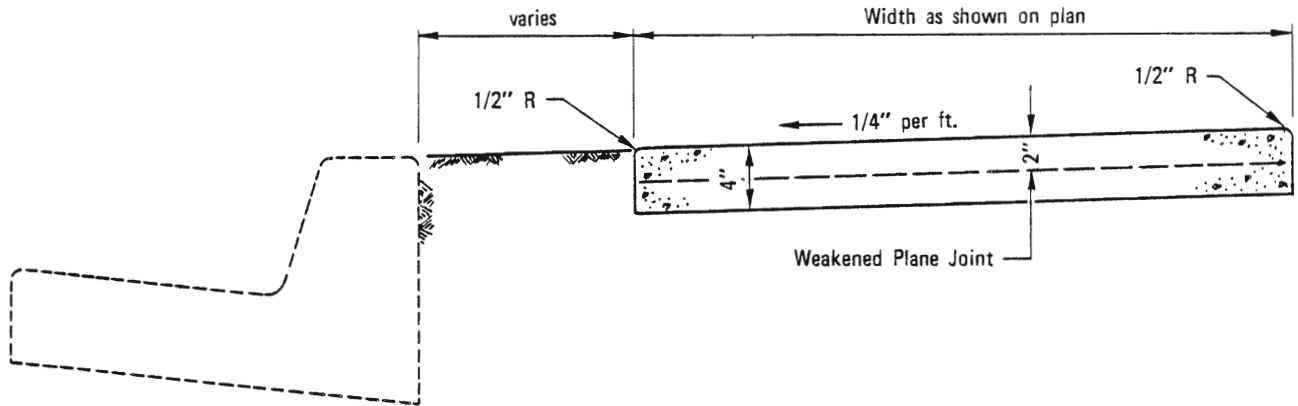
Allen A. Kersch *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **G-6**

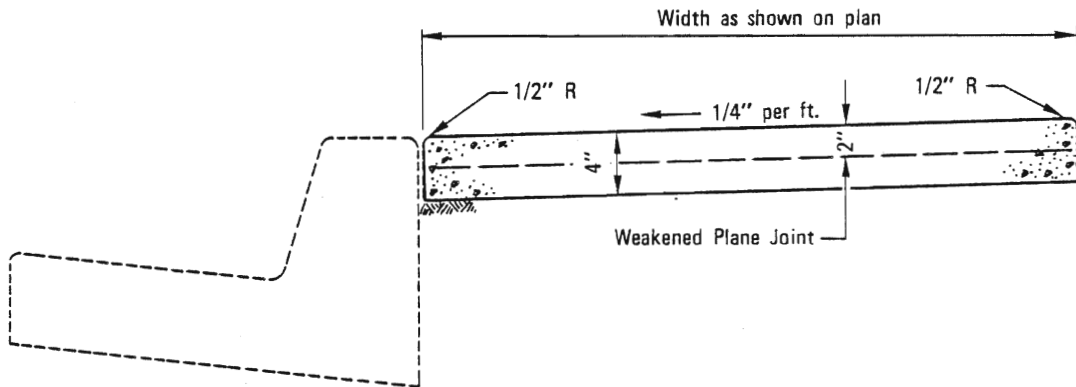
SAN DIEGO REGIONAL STANDARD DRAWING

CURBS AND GUTTER - MEDIANS

Revision	By	Approved	Date
Note 1	<i>CS</i>	<i>D.S.</i>	7-79
Conc.	<i>CS</i>	<i>MLB</i>	5-86



NON-CONTIGUOUS

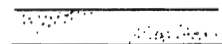


CONTIGUOUS

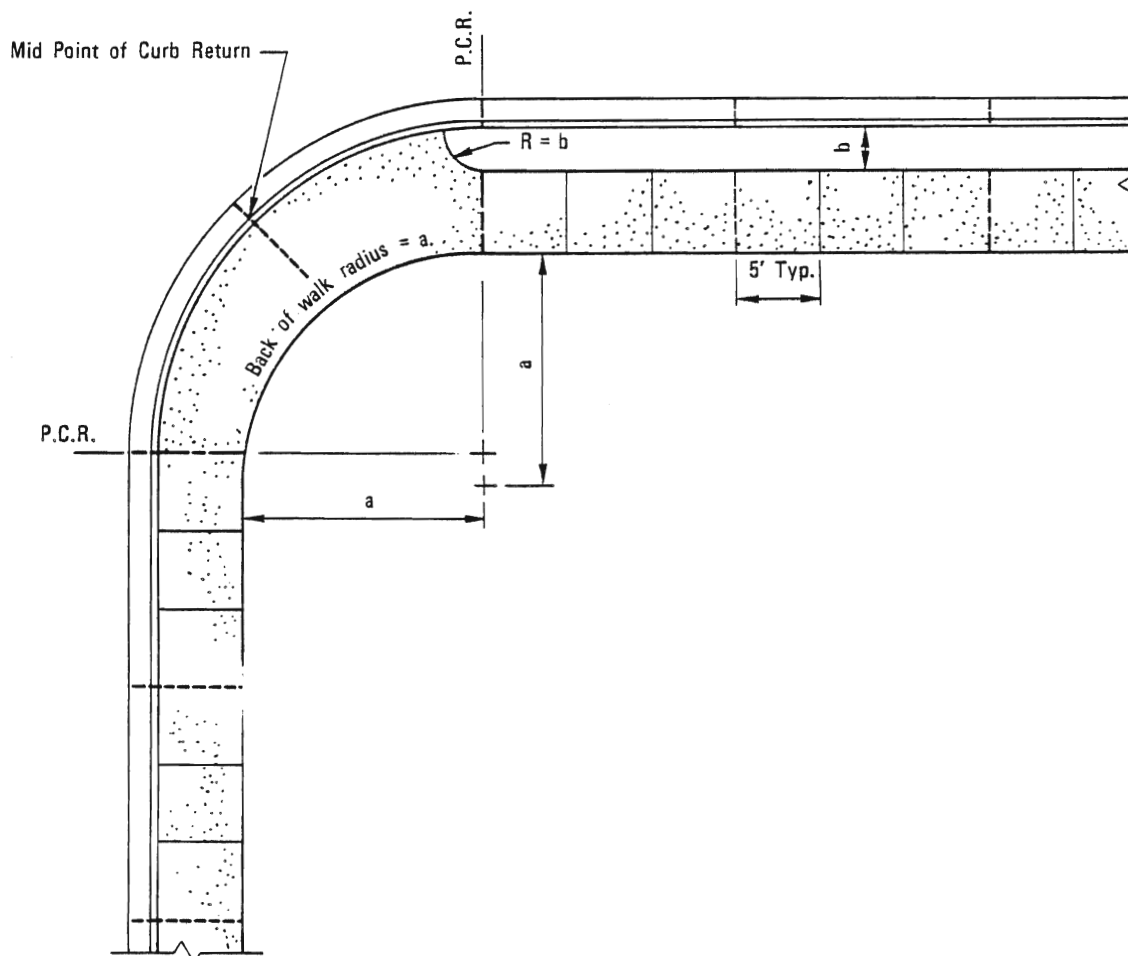
NOTES

1. Concrete shall be 520-C-2500.
2. See Standard Drawing G-10 for joint details.

LEGEND ON PLANS



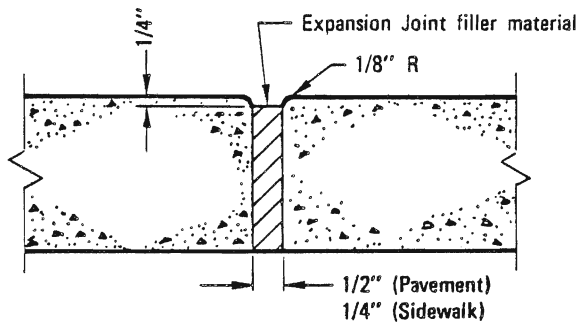
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Thickness	SC	D.S.	7-79		
Thickness	SC	M.B.	6-80		
Conc.	SC	M.B.	5-86		
				SIDEWALK - TYPICAL SECTIONS	Coordinator R.C.E. 19807 Date Dec. 1975
					DRAWING NUMBER G-7



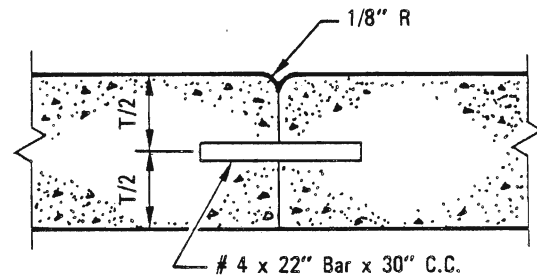
NOTES

1. Expansion Joints ——— at curb returns, adjacent to structures and at 45' intervals. (See Standard Drawing G-10).
2. Weakened Plane Joints - - - - - at mid point of curb return, when required, and at 15' intervals from P.C.R.'s (See Standard Drawing G-10).
3. 1/4" grooves ——— with 1/4" radius edges at 5' intervals.

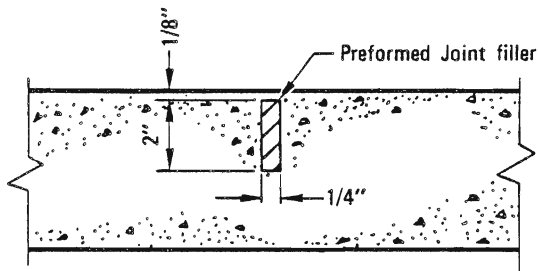
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Note 4	LC	M.B.	5-86		
				SIDEWALK JOINT LOCATIONS	<i>Alfred J. [Signature]</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
					DRAWING NUMBER
					G-9



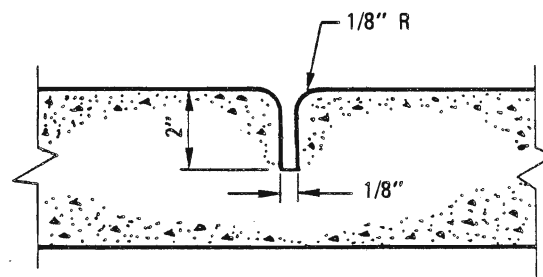
EXPANSION JOINT



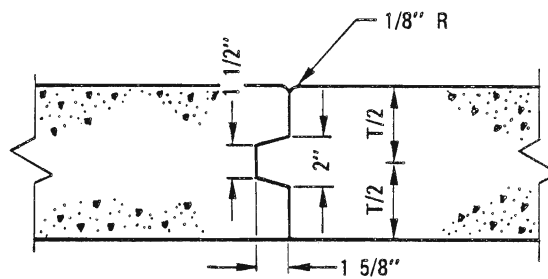
CONTACT JOINT



WEAKENED PLANE JOINT
PAVEMENT



WEAKENED PLANE JOINT
SIDEWALK



KEYED JOINT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

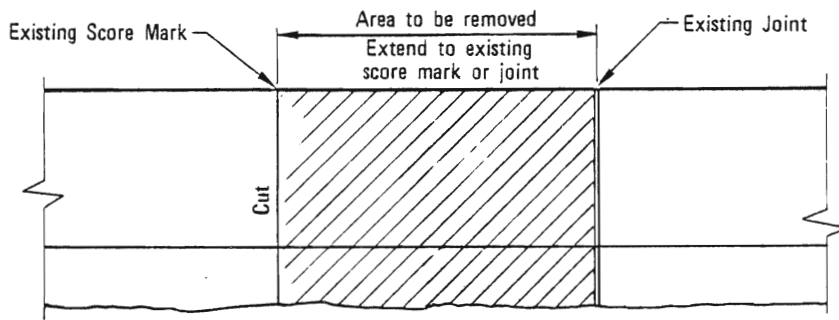
Allen A. Keshner Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER G-10

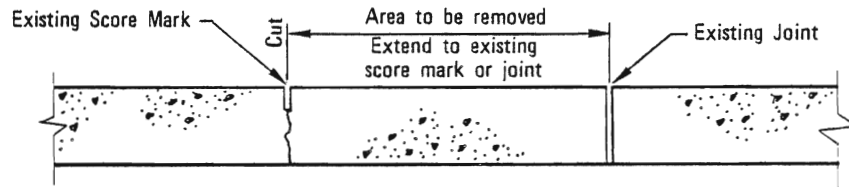
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE JOINT DETAILS

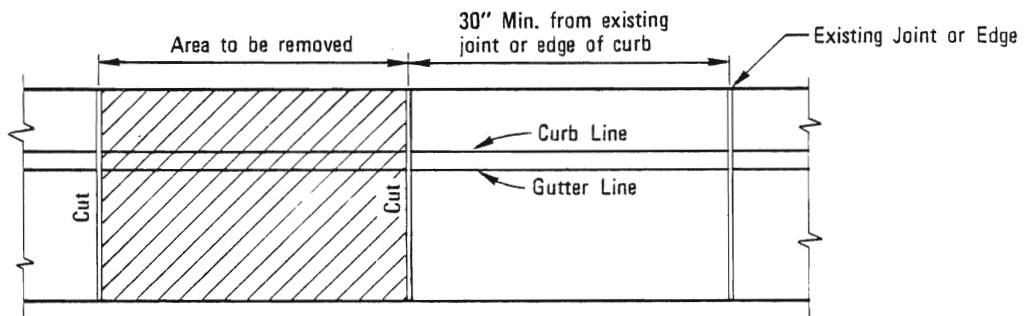
Revision	By	Approved	Date
Radius	<i>SC</i>	<i>D. S.</i>	<i>7.79</i>



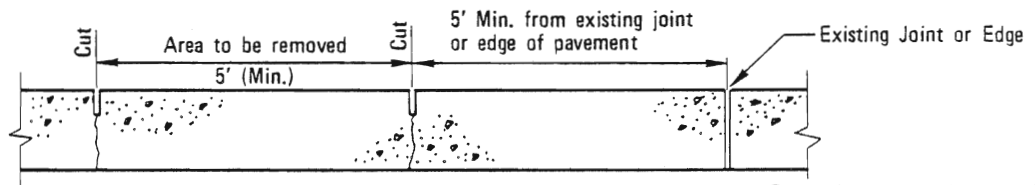
SIDEWALK PLAN



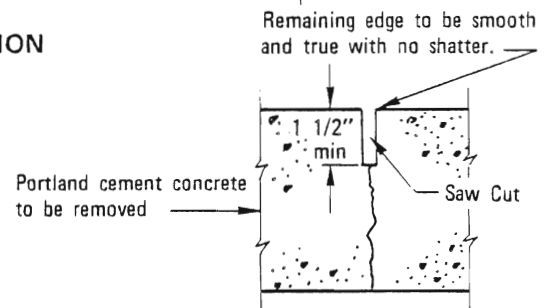
SIDEWALK SECTION



CURB PLAN



PAVEMENT SECTION



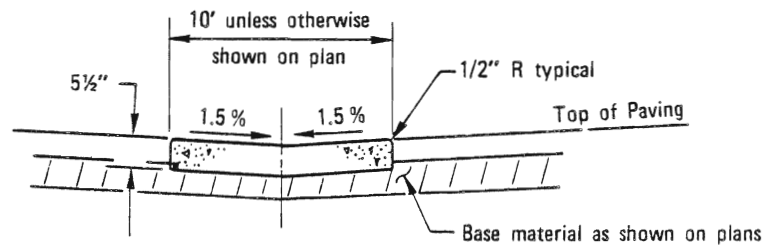
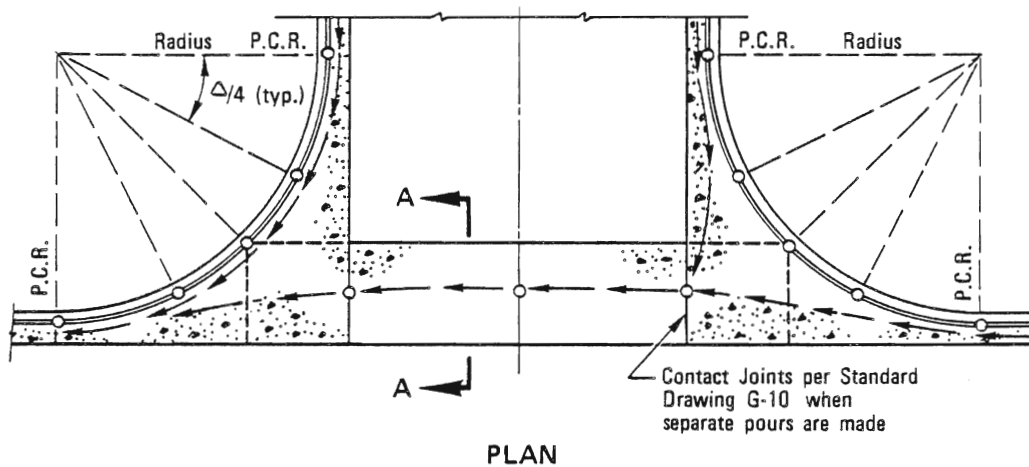
SECTION

Showing Cut

NOTE

When distance from, "Area to be removed", to existing joint, edge or score mark is less than minimum shown, "Area to be removed", shall be extended to that joint, edge or score mark.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Pymt. min.	LC	TH.B.	5-86			Allen D. Kerschman	Dec. 1975
				PORTLAND CEMENT CONCRETE CURB, GUTTER, SIDEWALK AND PAVEMENT REMOVAL AND REPLACEMENT		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	G-11



NOTES:

1. Concrete shall be 560-C-3250.
2. ----- = Weakened plane joints.
3. ----- = Typical flowlines.
4. ○ = Elevations to be shown on plans.
5. Return segments to be 5 1/2" thick.
6. Curb between P.C.R.s shall be considered as part of cross gutter.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

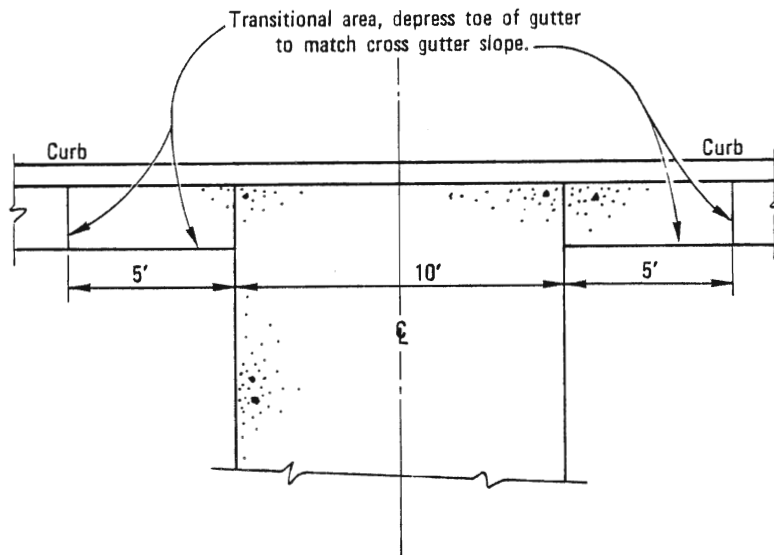
Clifford A. Kuehn Dec. 1975
Coordinator H.C.C. 19807 Date

DRAWING
NUMBER **G-12**

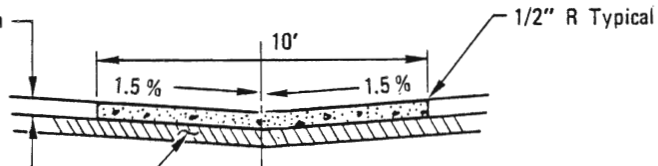
SAN DIEGO REGIONAL STANDARD DRAWING

CROSS GUTTER

Revision	By	Approved	Date
Thickness	3C	D.S.	7-79
Note 1	TRF	M.B.	10-82
Note 6	RC	M.B.	5-86



5 1/2" unless otherwise shown on plan

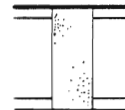


Base material as shown on plans

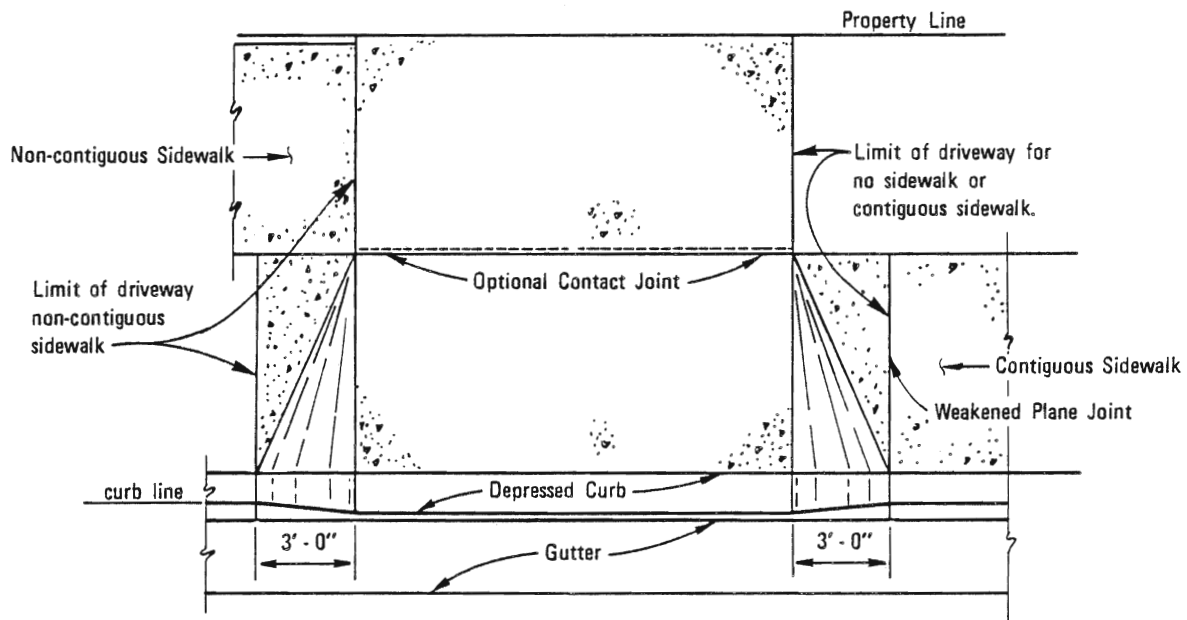
NOTES:

1. Cross gutter to be constructed where the drainage is carried across street.
2. Minimum allowable cross slope is 0.5 %.
3. Concrete shall be 560-C-3250.

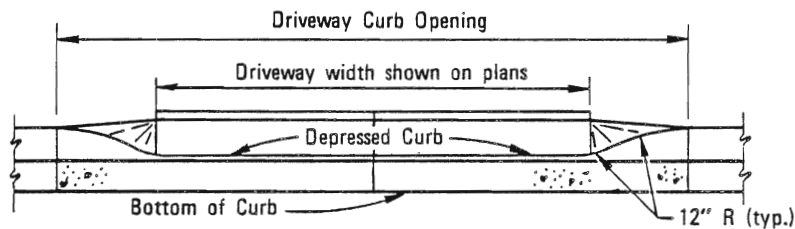
LEGEND ON PLANS



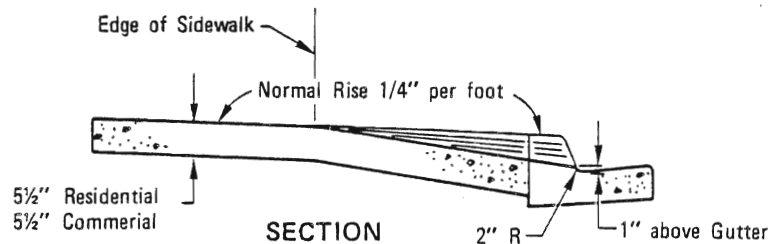
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Thickness	OS	7-79				Coordinator R.C.E. 19807 Date	
Conc.	TRA	M.B.	10-82	MID-BLOCK CROSS GUTTER		<i>Alfred A. Kuehnel</i> Dec. 1975 Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER G-13	



PLAN



ELEVATION

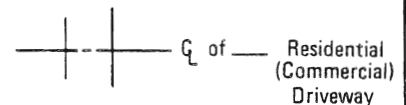


SECTION

NOTES

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 520-C-2500.
3. See standard drawings G-15 and G-16 for width and location requirements.
4. Driveway ramp to extend to 10 feet from curb face or to property line whichever is less. (For commercial driveways only)

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

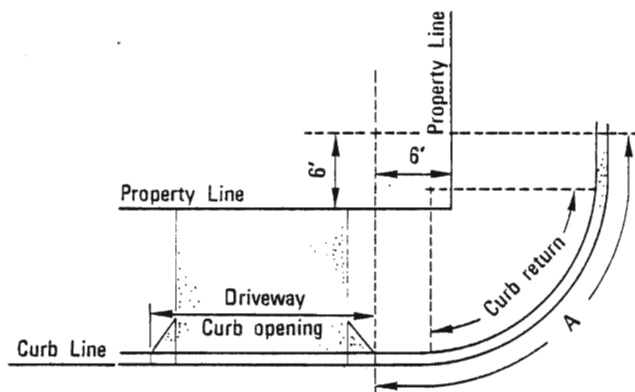
Richard A. Richardson Sec. 1975
Coordinator R.C.E. 1987 Date

DRAWING
NUMBER **G-14**

SAN DIEGO REGIONAL STANDARD DRAWING

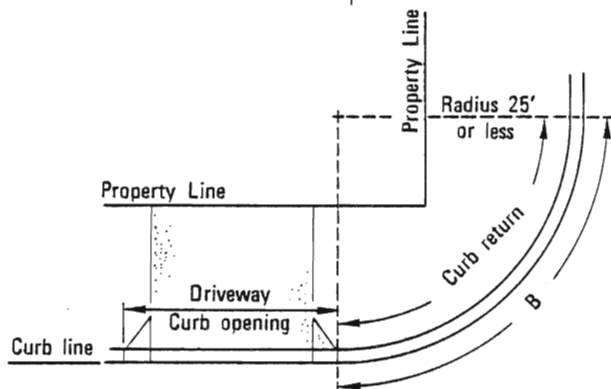
CONCRETE DRIVEWAYS

Revision	By	Approved	Date
Thickness	<i>SC</i>	<i>D.S.</i>	7-79
Thickness	<i>SC</i>	<i>M.B.</i>	6-82
Conc.	<i>TRP</i>	<i>M.B.</i>	10-82
Limits	<i>SC</i>	<i>M.B.</i>	5-86



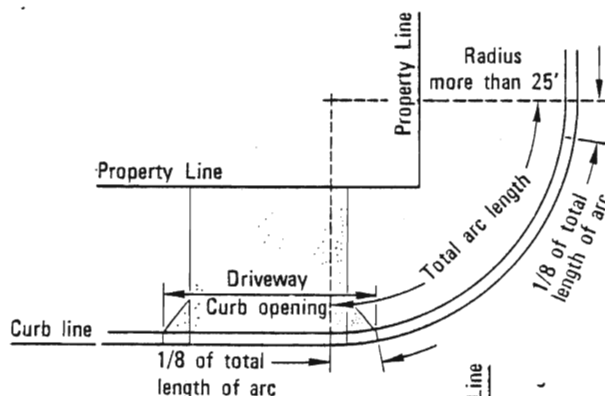
REQUIREMENT 1

No portion of any curb opening shall be permitted within 6' of the intersection of the prolonged property lines and the curb as shown by arc A.



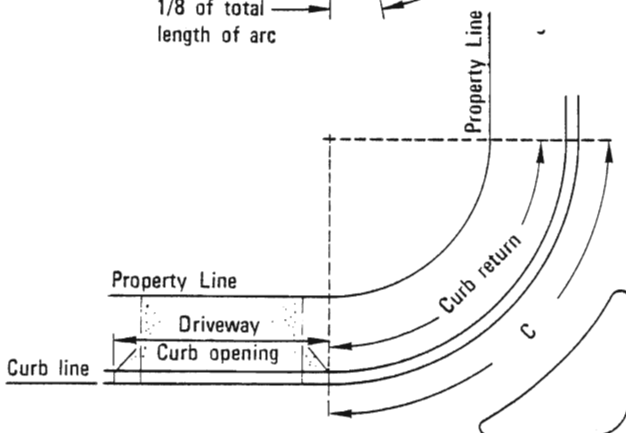
REQUIREMENT 2

No portion of any curb opening shall be permitted in the curb return where the radius of curb is 25' or less, as shown by arc B.



REQUIREMENT 3

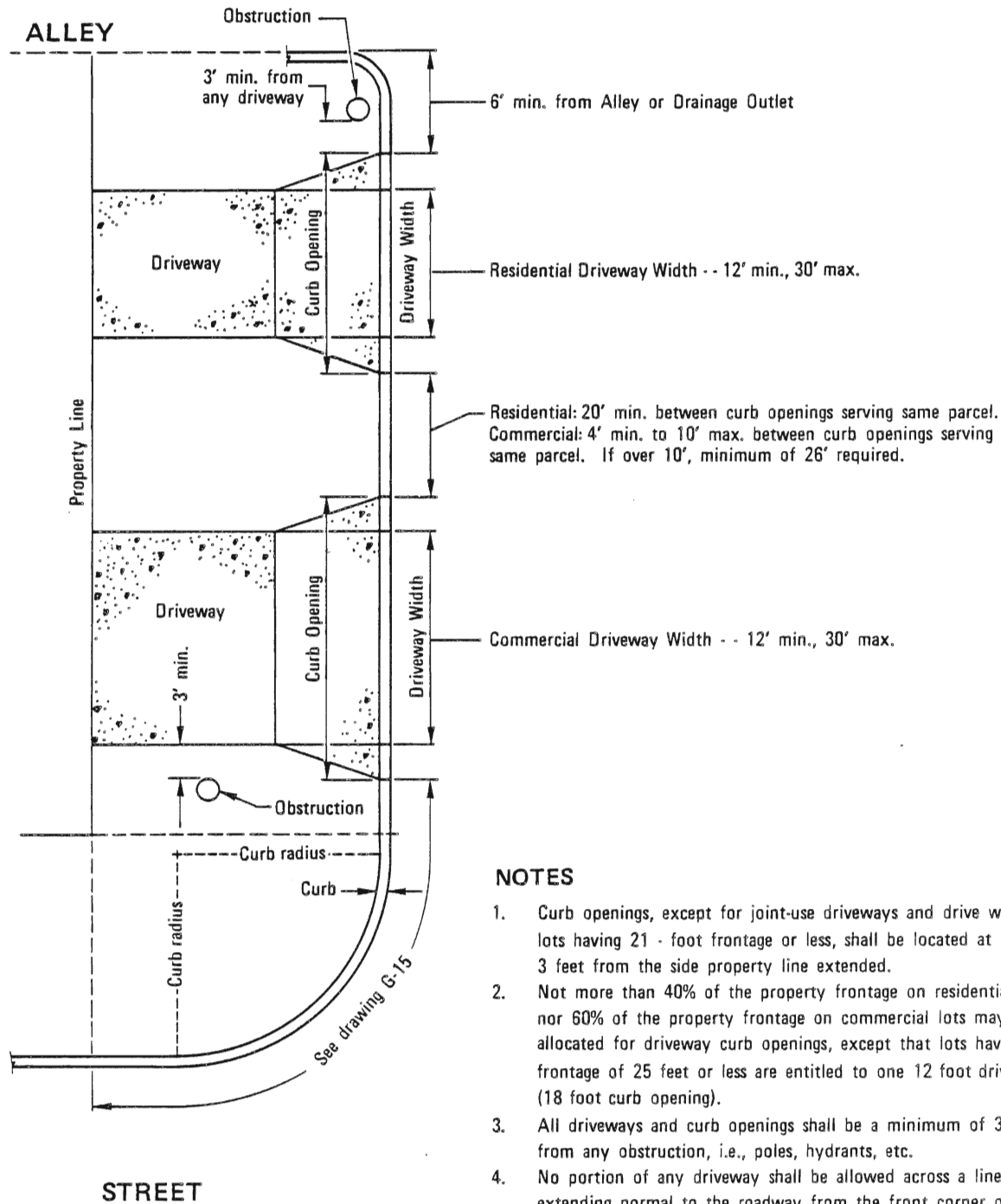
On all curb returns where the radius is more than 25', curb openings may encroach upon each end of the return a distance equal to 12 1/2% or 1/8 of the total length of the arc on the curb return, thus leaving at least 75% of the length of arc on the return face free from driveway encroachment, provided Requirement 1 is met.



REQUIREMENT 4

No portion of any curb opening shall be permitted in the curb return where a separate turning movement is provided, as shown by arc C.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE		
Reqmt. 3	SC	M.B.	5-86	DRIVEWAY LOCATION - ADJACENT TO CURB RETURNS AND STREET LINES		<i>Allard A. Kuehn</i>	<i>Dec. 1975</i>	
						Coordinator	R.C.E. 19807	Date
						DRAWING NUMBER	G-15	



NOTES

1. Curb openings, except for joint-use driveways and drive ways on lots having 21 - foot frontage or less, shall be located at least 3 feet from the side property line extended.
2. Not more than 40% of the property frontage on residential lots, nor 60% of the property frontage on commercial lots may be allocated for driveway curb openings, except that lots having frontage of 25 feet or less are entitled to one 12 foot driveway (18 foot curb opening).
3. All driveways and curb openings shall be a minimum of 3 feet from any obstruction, i.e., poles, hydrants, etc.
4. 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 Agency.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

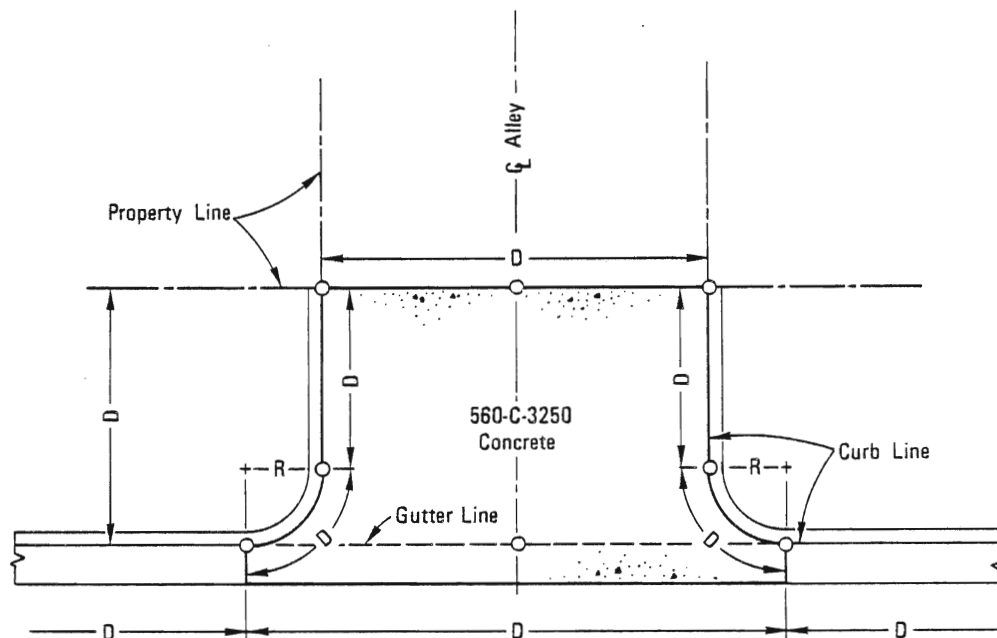
DRAWING
NUMBER

G-16

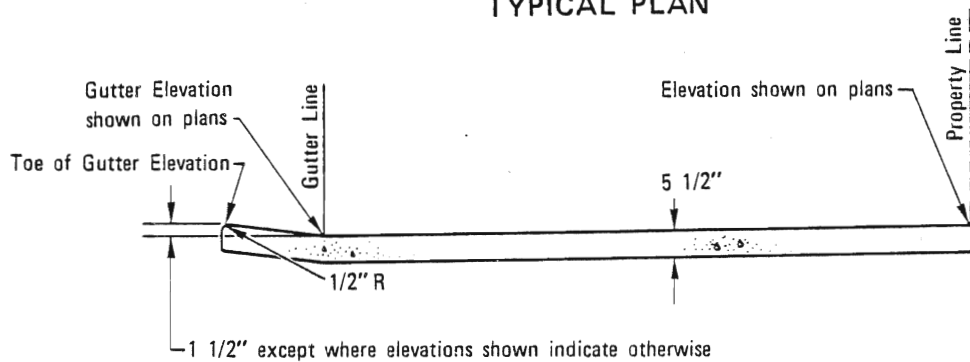
SAN DIEGO REGIONAL STANDARD DRAWING

**DRIVEWAY LOCATION
AND WIDTH REQUIREMENTS**

Revision	By	Approved	Date



TYPICAL PLAN

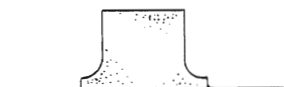


SECTION

NOTES

1. Sidewalk Ramps shall be installed as required by Agency.
2. D = distance shown on plans.
3. R = radius shown on plans (3 ft. minimum).
4. O = elevations shown on plans (top of curb, and gutter elev.).

LEGEND ON PLANS



Revision	By	Approved	Date
Thickness	IC	D.S.	7-79
Conc.	LM.B.	5-86	

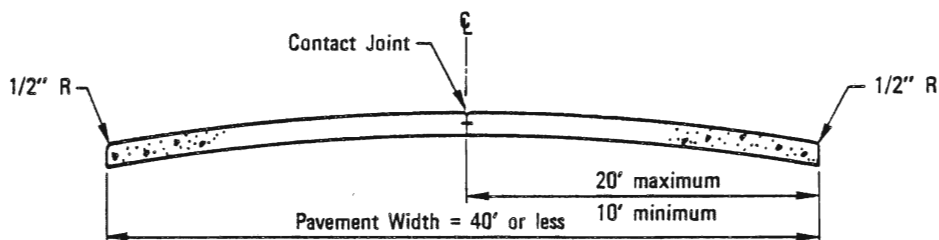
SAN DIEGO REGIONAL STANDARD DRAWING

ALLEY APRON

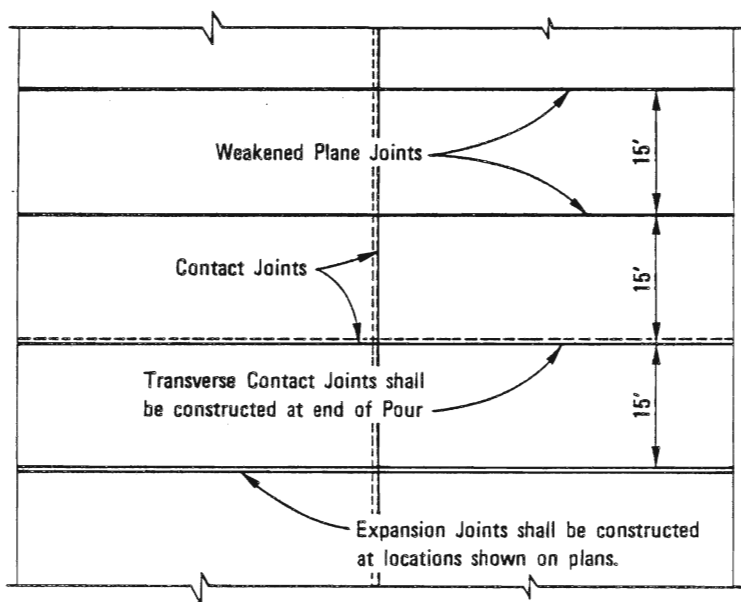
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER G-17



TYPICAL SECTION



TYPICAL PLAN

NOTES

1. Concrete shall be 560-C-3250.
2. See Standard Drawing G-10 for joint details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

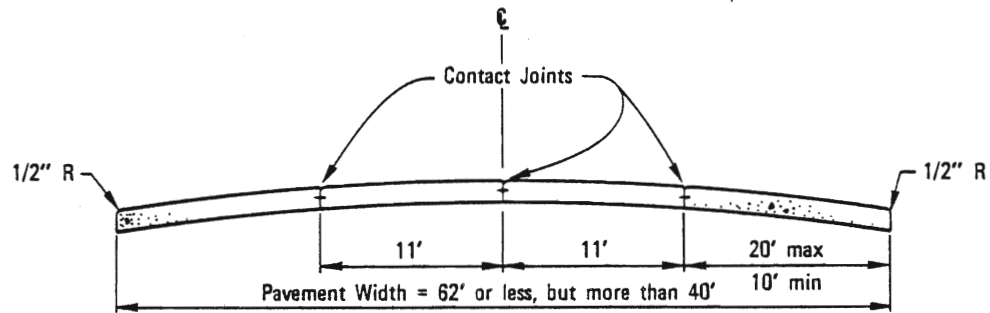
Allan A. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **G-18**

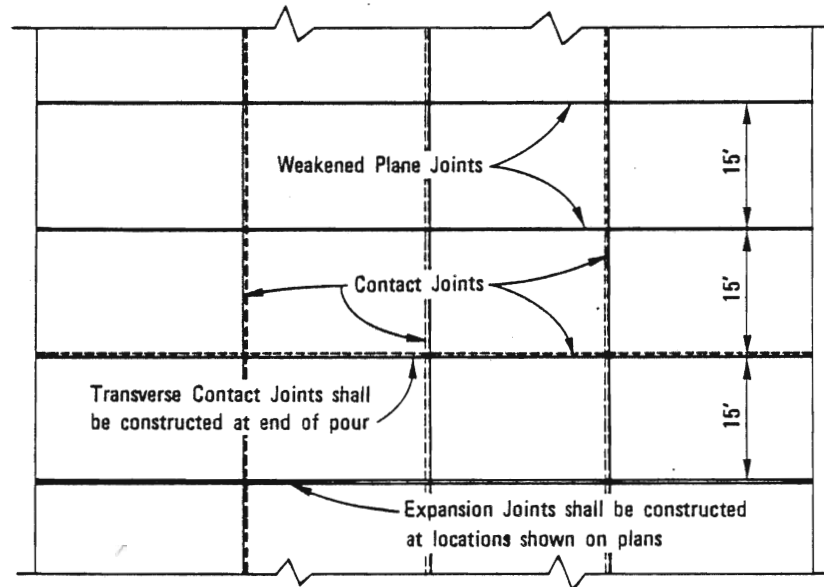
SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE PAVEMENT,
WIDTH 40' OR LESS**

Revision	By	Approved	Date
Conc.	<i>MC</i>	<i>M.B.</i>	<i>5-86</i>



TYPICAL SECTION

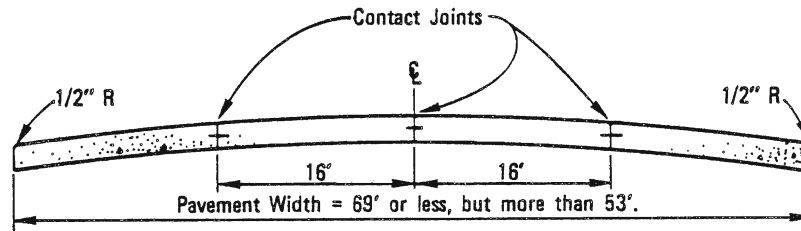


TYPICAL PLAN

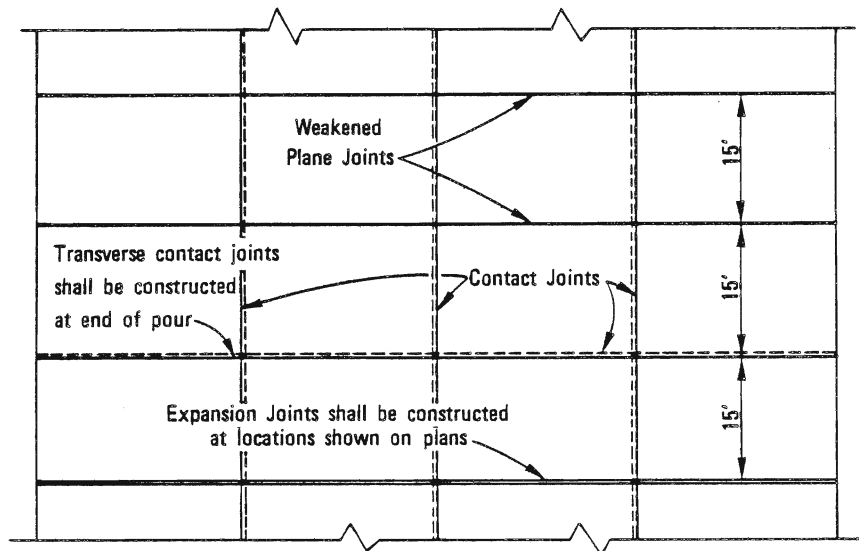
NOTES

1. Concrete shall be 560-C-3250.
2. See Standard Drawing G-10 for joint details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	SC	M.A.	5-26			<i>Allan A. Kuehn</i>	<i>Dec. 1975</i>
				CONCRETE PAVEMENT WIDTH 40' TO 62'		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	G-19



TYPICAL SECTION



TYPICAL PLAN

NOTES

1. Concrete shall be 560-C-3250.
2. See Standard Drawing G-10 for Joint Details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

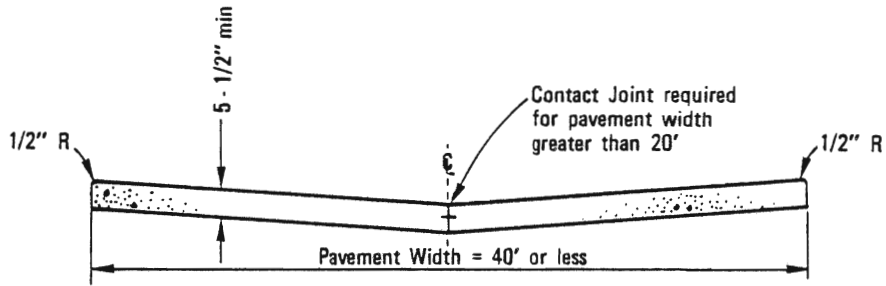
DRAWING
NUMBER

G-20

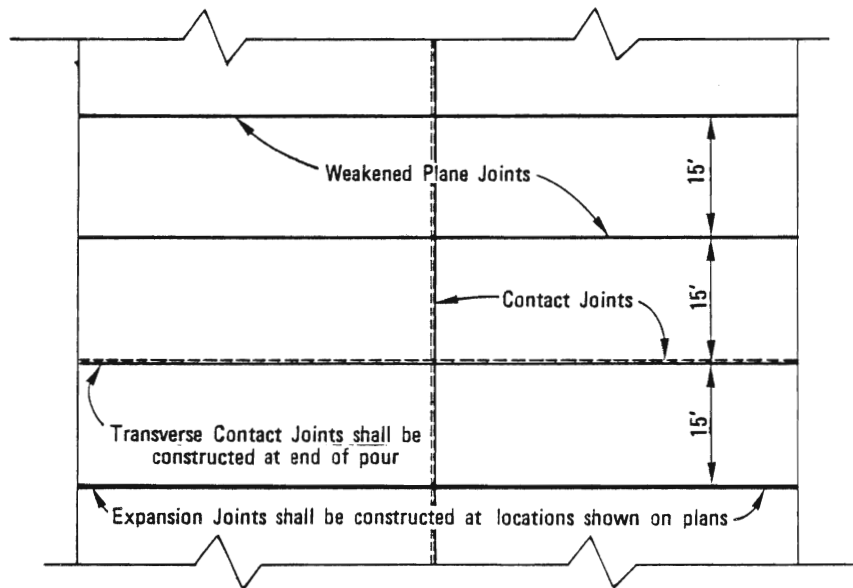
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE PAVEMENT
WIDTH 53' TO 69'

Revision	By	Approved	Date
Conc.	RC	M.B.	5-86



TYPICAL SECTION

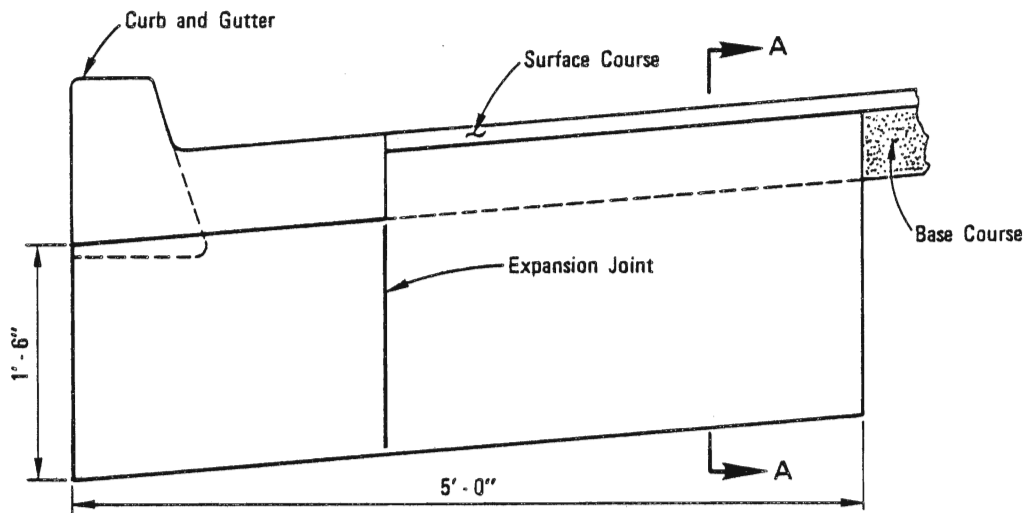


TYPICAL PLAN

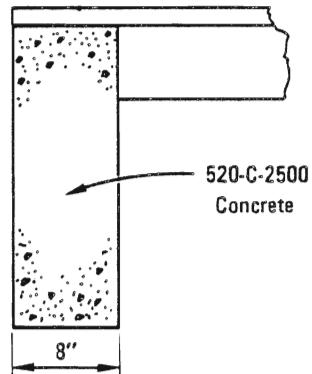
NOTES

1. Concrete shall be 560-C-3250
2. See Standard Drawing G-10 for joint details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	<i>S. M. B.</i>		<i>5-86</i>			<i>Allan A. Kuehn</i>	<i>Dec. 1975</i>
				CONCRETE PAVEMENT, ALLEY SECTION, WIDTH 40' OR LESS		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	G-21



ELEVATION



SECTION A-A

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

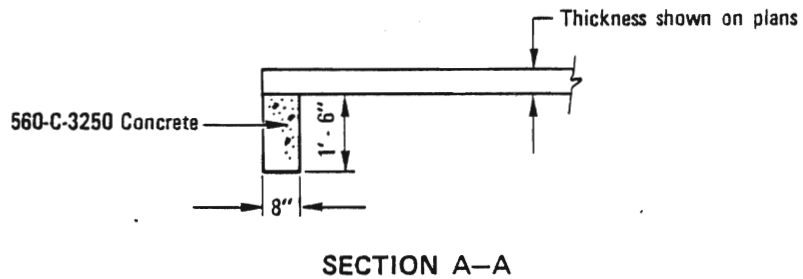
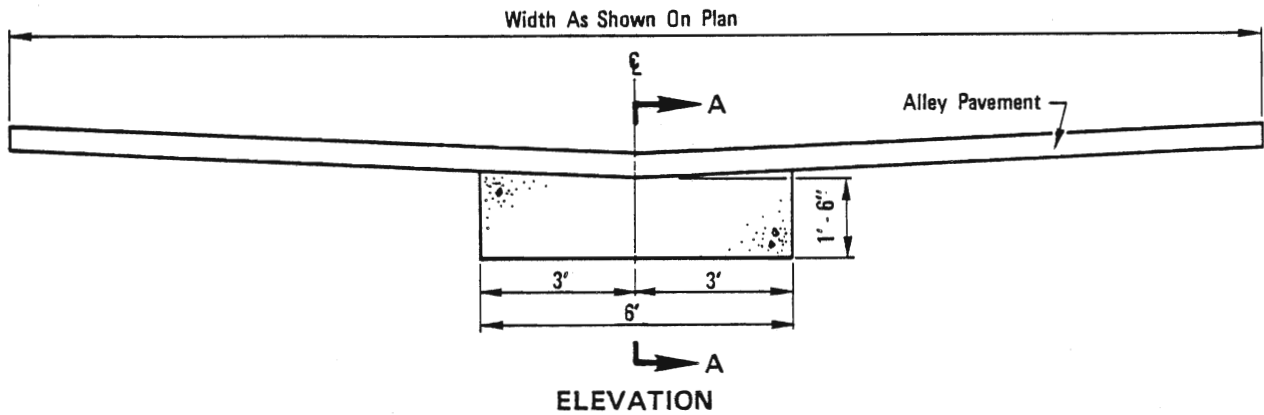
SAN DIEGO REGIONAL STANDARD DRAWING

**CUTOFF WALL AT END
OF PAVEMENT**

Revision	By	Approved	Date
Conc.	<i>R</i>	<i>M.B.</i>	5-86

DRAWING
NUMBER

G-22



LEGEND ON PLANS

Revision	By	Approved	Date
Conc.	<i>M.B.</i>	<i>5-86</i>	

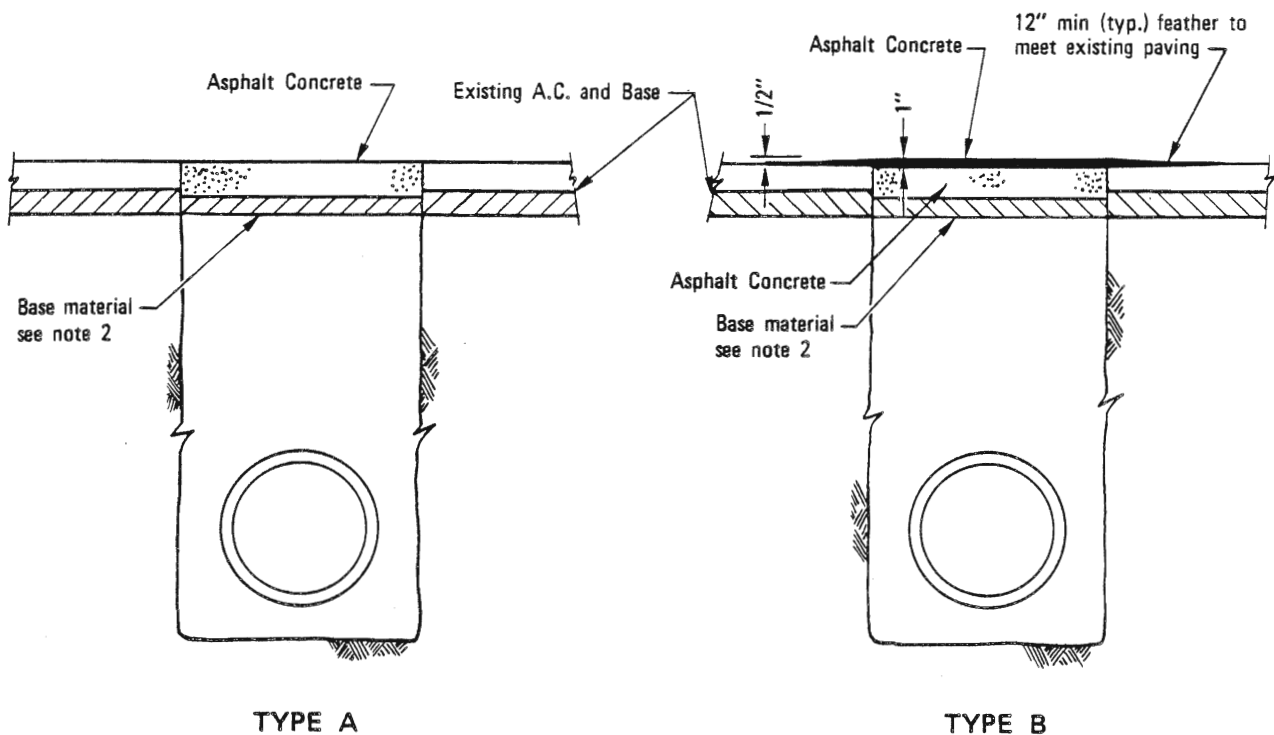
SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL AT END
OF ALLEY PAVEMENT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **G-23**



NOTES

1. Existing A.C. shall be cut and removed in such a manner so as not to tear, bulge or displace adjacent pavement. Edges shall be clean and vertical. All cuts shall be parallel or perpendicular to street centerline, when practical.
2. Base material to be replaced to depth of existing base. A.C. may be substituted for base material.
3. A tack coat of asphaltic emulsion or paving asphalt shall be applied to existing A.C. at all contact surfaces, prior to resurfacing.
4. Asphaltic Concrete Resurfacing:
 - a) Minimum total thickness shall be one inch greater than existing A.C.
 - b) A.C. shall be hot plant mix.
 - c) Finish course for Type B resurfacing shall be laid down using a spreader box.
5. All A.C. resurfacing shall be seal coated with an emulsified asphalt and covered with sand. Chip sealing shall be applied as required by Agency.
6. Type B not to be used on lateral crossings.
7. Sloughing of trench under pavement shall be cause for requiring additional pavement and base.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

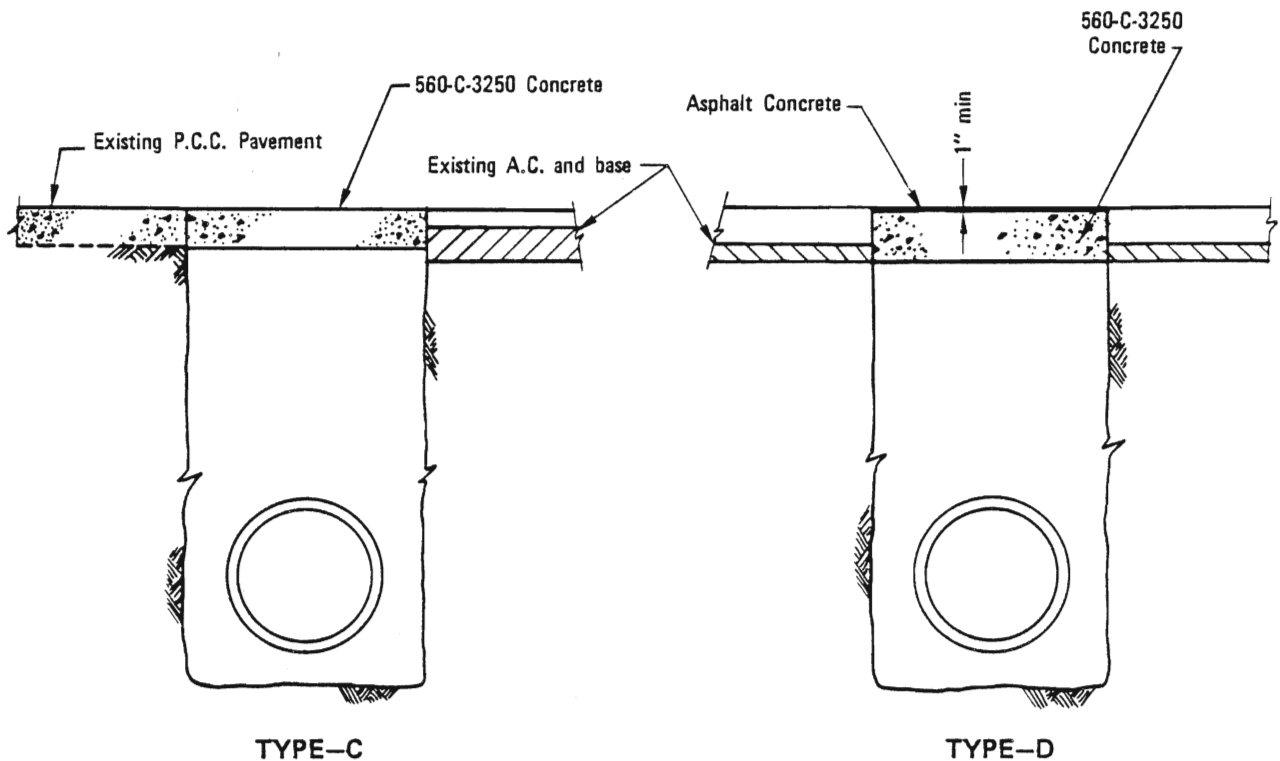
Allen A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

TRENCH RESURFACING TYPES A & B

Revision	By	Approved	Date
Overcut	JRP	M.B.	10-82

DRAWING
NUMBER **G-24**



GENERAL NOTES

- Existing A.C. shall be cut and removed in such a manner so as not to tear, bulge or displace adjacent pavement. Edges shall be clean and vertical. All cuts shall be parallel or perpendicular to street centerline, when practical.
- Sloughing of trench under pavement shall be cause for requiring additional pavement and base.

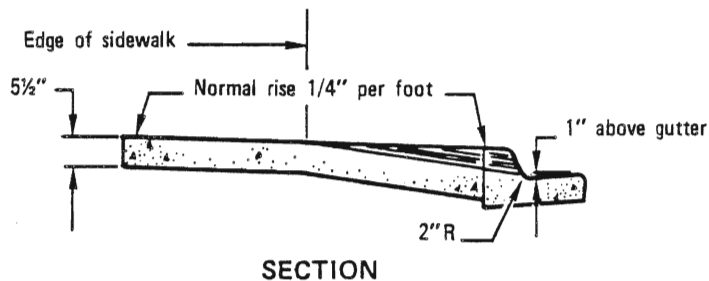
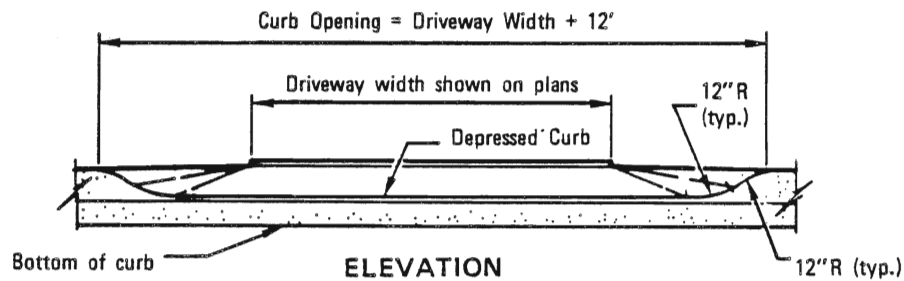
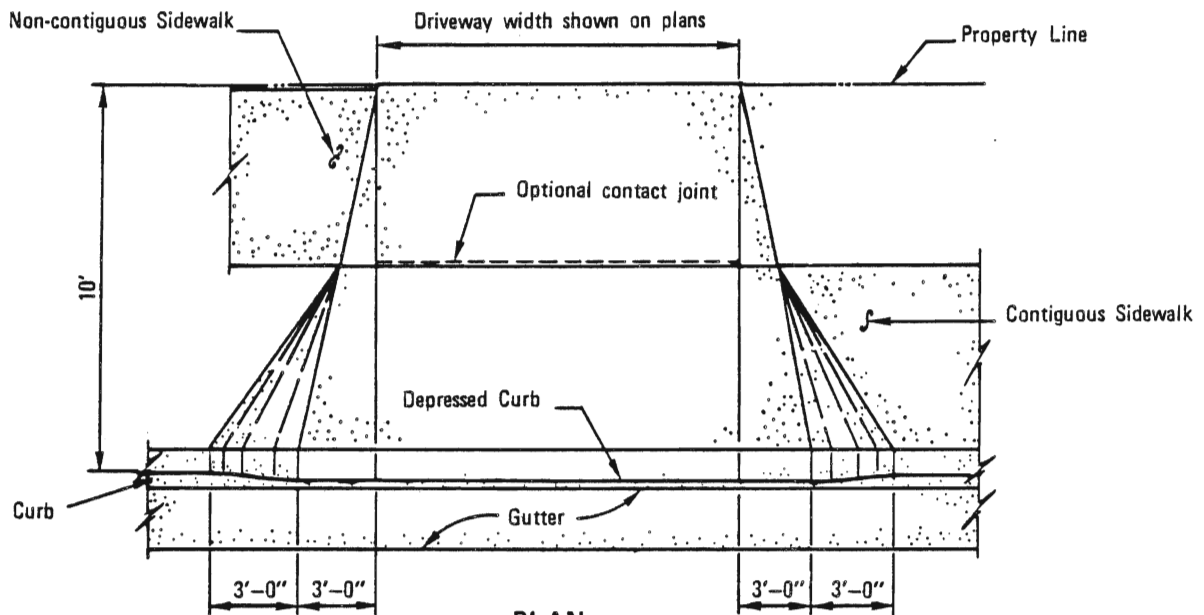
NOTES TYPE-C

- Concrete shall be colored black where required to match existing pavement. Method to be specified by Agency.
- Minimum concrete thickness:
 Alleys and local residential street-----5 inches
 Major streets and highway-----7 inches
 Trench resurfacing in P.C.C. pavement shall have the above minimum thickness or match the existing concrete thickness plus one inch whichever is greater.

NOTES TYPE-D

- A.C. shall be hot plant mix.
- A tack coat of asphaltic emulsion or paving asphalt shall be applied to the existing A.C. at all contact surfaces and to the portland concrete prior to placing the new A.C.
- A.C. resurfacing shall be seal coated with an emulsified asphalt and covered with sand.
 Chip sealing shall be applied as required by Agency.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	TRENCH RESURFACING TYPES C & D	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Overcut	TRP	M.B.	10-82			<i>Allan A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
Conc.	SC	M.B.	5-86				
						DRAWING NUMBER	G-25



NOTES:

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 520-C-2500.
3. See Standard Drawing G-15 and G-16 for width and location requirements.

LEGEND ON PLANS



Alt. Commercial Driveway

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Harry R. Holt Oct 1982
Chairman M.C.E. C13768 Date

SAN DIEGO REGIONAL STANDARD DRAWING

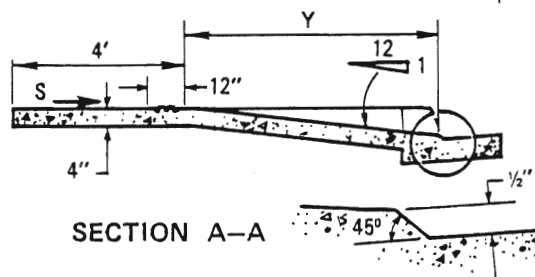
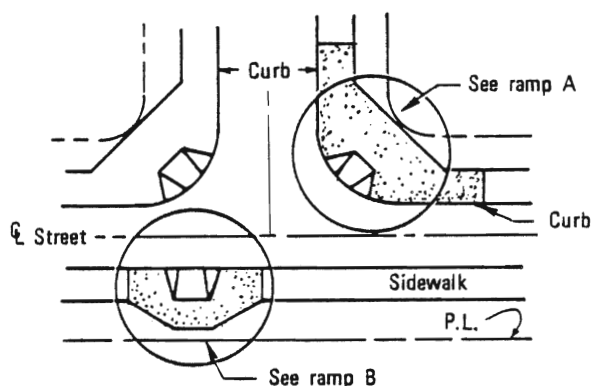
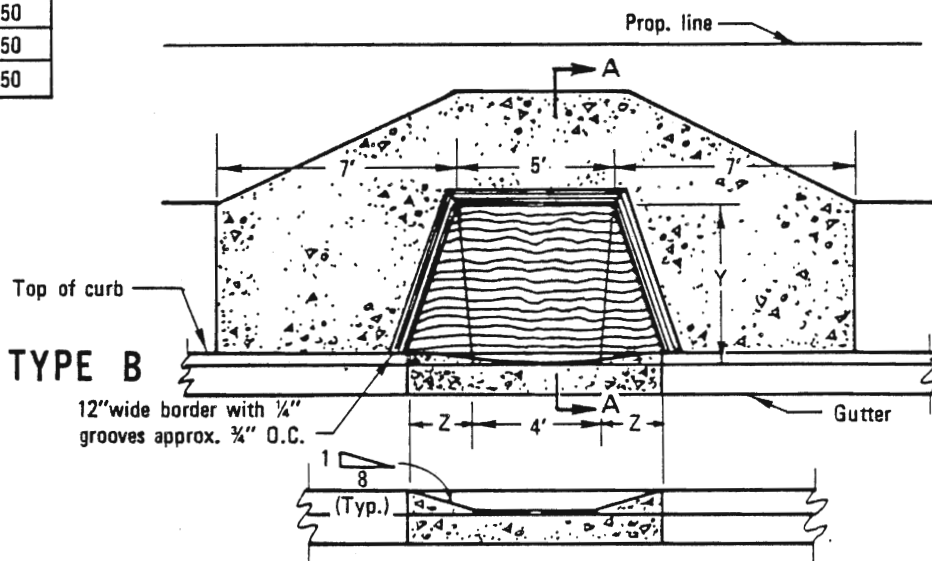
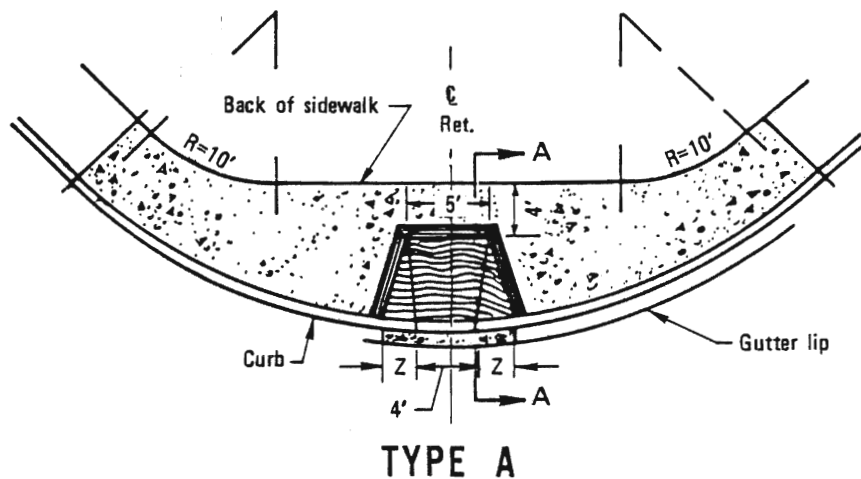
CONCRETE DRIVEWAY COMMERCIAL ALTERNATE

Revision	By	Approved	Date
Conc.	<i>MB</i>	<i>M.B.</i>	5-86

DRAWING
NUMBER

G-26

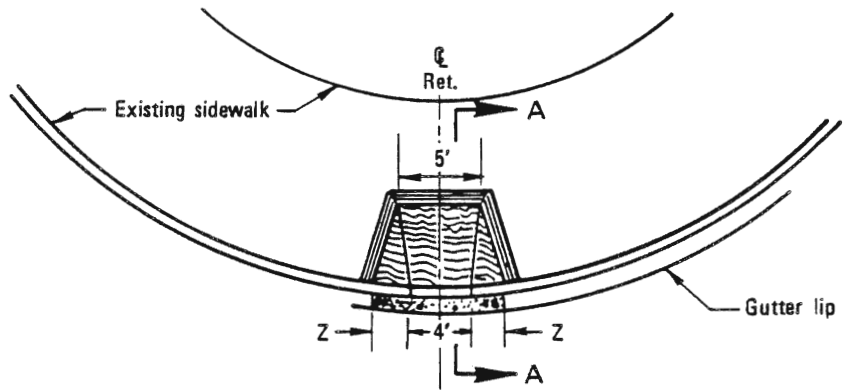
X	Y	Z	S (%)
Curb Height	Ramp Length	Side Slope	Back Slope
1"	0' - 6"	1' - 6"	2.25
2"	1' - 6"	1' - 6"	2.75
3"	2' - 6"	1' - 8"	3.25
4"	3' - 6"	2' - 4"	3.75
5"	4' - 6"	3' - 0"	4.25
6"	5' - 6"	3' - 0"	4.50
7"	6' - 6"	3' - 0"	4.50
8"	7' - 6"	3' - 0"	4.50



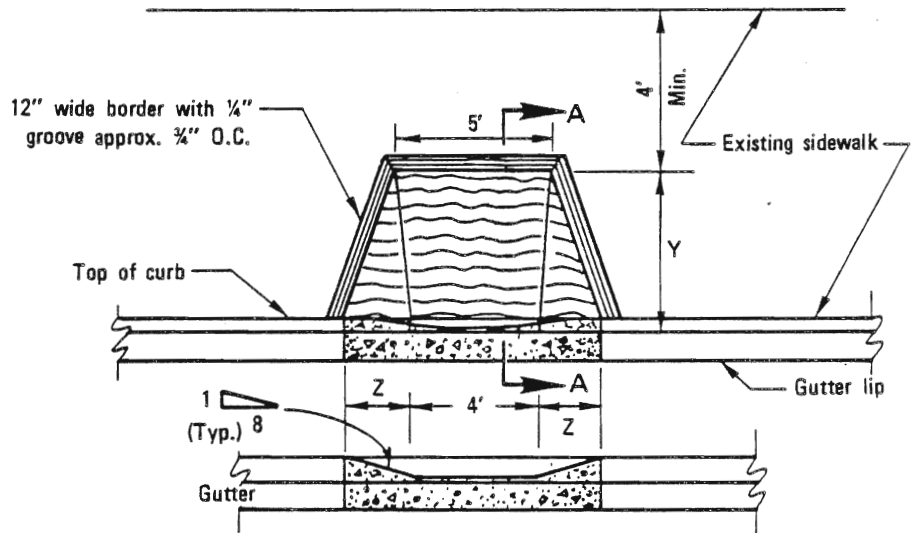
NOTE
See Standard Drawing G-32 for general notes.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				PEDESTRIAN RAMP TYPES A AND B		<i>M. B. ...</i> 4-25-86 Coordinator R.C.E. C21133 Date
						DRAWING NUMBER G-27

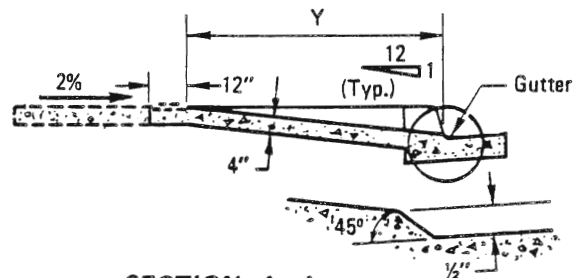
X	Y	Z
Curb Height	Ramp Length	Side Slope
1"	0' - 9"	1' - 6"
2"	2' - 0"	1' - 6"
3"	3' - 4"	1' - 8"
4"	4' - 8"	2' - 4"
5"	6' - 0"	3' - 0"
6"	7' - 4"	3' - 0"
7"	8' - 7"	3' - 0"
8"	9' - 11"	3' - 0"



TYPE A-I



TYPE B-I



SECTION A-A

NOTES

See Standard Drawing G-32 for general notes

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

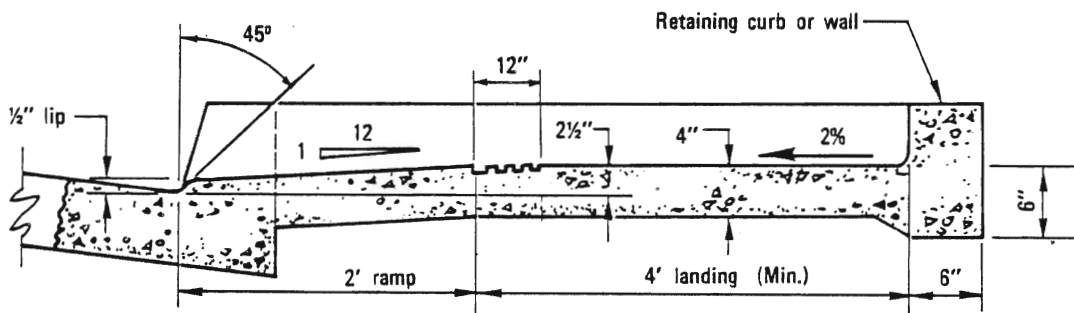
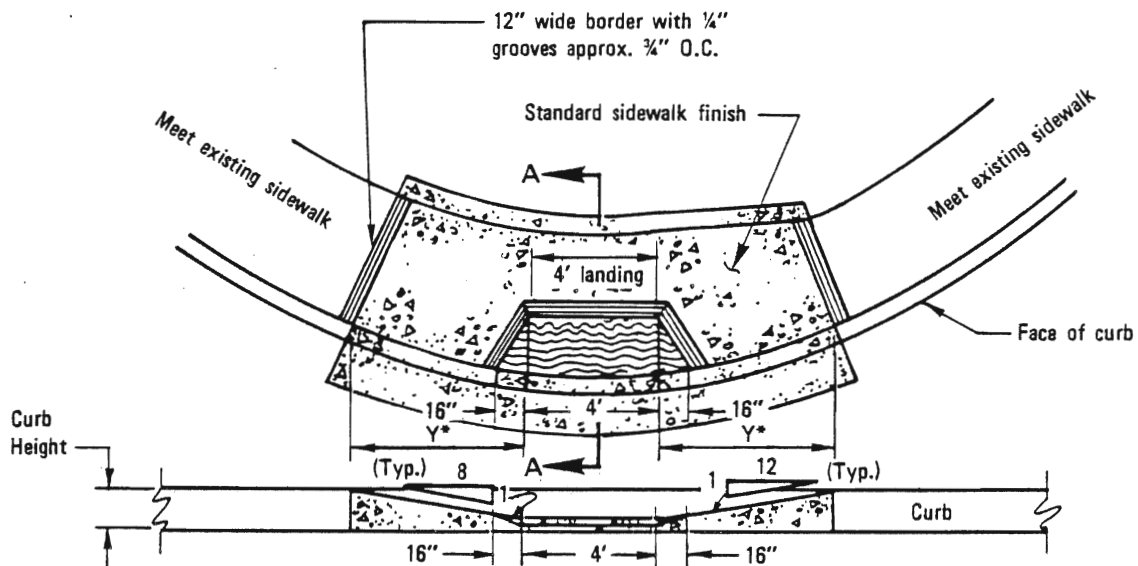
M. B. ... 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **G-28**

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTRIAN RAMP
TYPES A-I AND B-I

Revision	By	Approved	Date



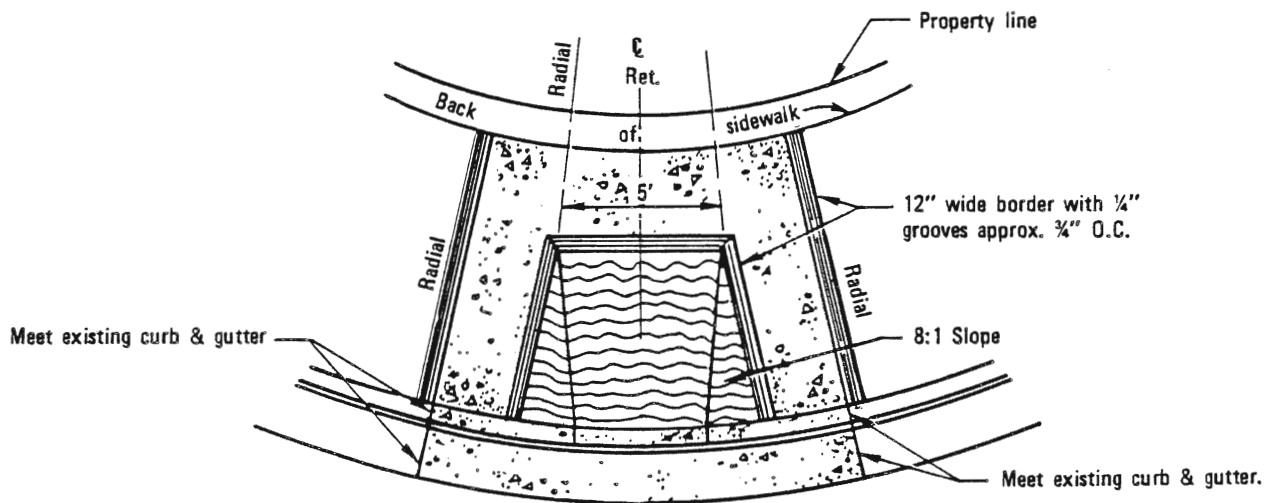
SECTION A-A

NOTES

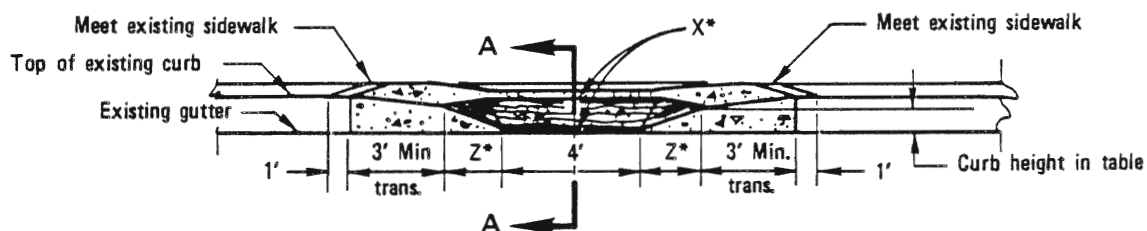
1. Type C ramps are only to be used to mitigate existing conditions and are not to be used in new construction.
2. See Standard Drawing G-32 for general notes.

X* Curb Height	Y* Ramp Length
4"	1' - 6"
5"	2' - 6"
6"	3' - 6"
7"	4' - 6"
8"	5' - 6"
9"	6' - 6"
10"	7' - 6"
11"	8' - 6"
12"	9' - 6"
13"	10' - 6"

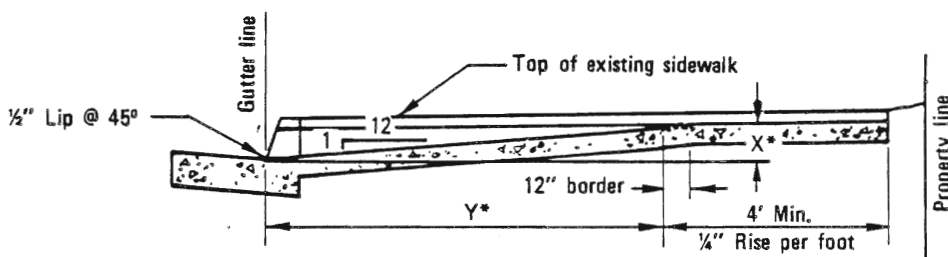
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>M. Behrman</i> 4-25-86 Coordinator R.C.E. C21133 Date
				PEDESTRIAN RAMP TYPE C	DRAWING NUMBER G-29



PLAN



ELEVATION



SECTION A-A

NOTES

1. See Standard Drawing G-32 for general notes.
2. * Indicates points to be set prior to pouring of concrete.

Curb Height	X*	Y*	Z*	Curb Height	X*	Y*	Z*
3.0"	3 13/16"	3' - 3 1/2"	1' - 8"	5.0"	6 3/8"	5' - 11 1/8"	3' - 0"
3.5"	4 3/8"	3' - 11 3/8"	2' - 0"	5.5"	7 1/8"	6' - 7"	3' - 4"
4.0"	5 1/8"	4' - 7 1/4"	2' - 4"	6.0"	7 11/16"	7' - 2 7/8"	3' - 8"
4.5"	5 13/16"	5' - 3 1/8"	2' - 8"	6.5"	8 3/8"	7' - 10 3/4"	4' - 0"

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

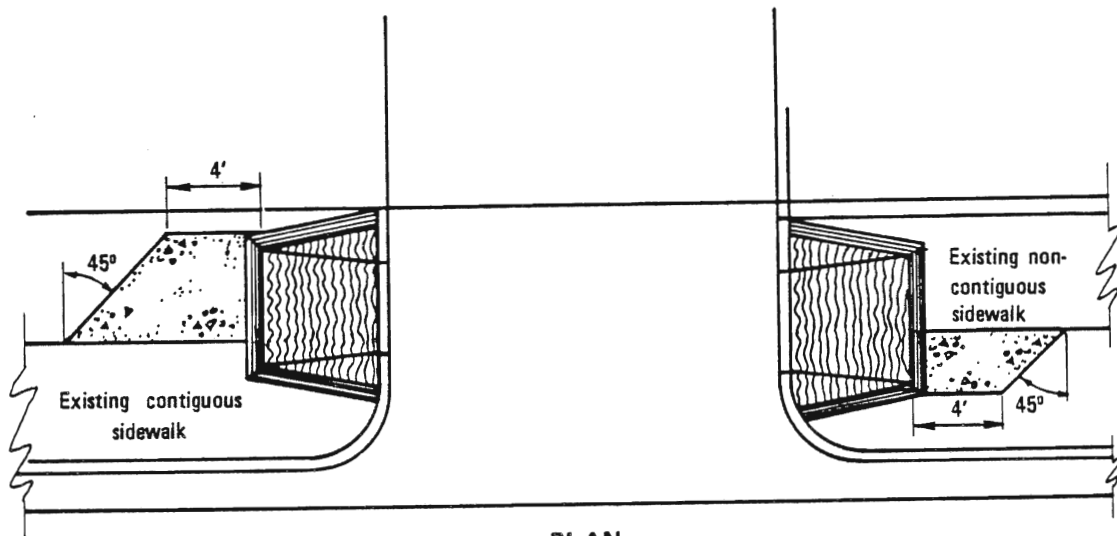
Om. B. ... 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **G-30**

SAN DIEGO REGIONAL STANDARD DRAWING

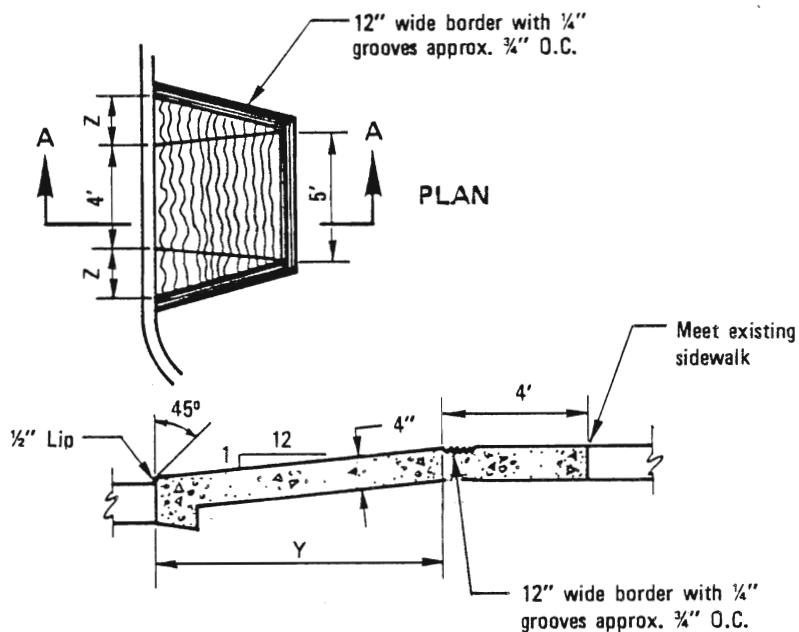
**PEDESTRIAN RAMP
TYPE C-I**

Revision	By	Approved	Date



PLAN

X Curb Height	Y Ramp Length	Z Side Slope
2.0"	1' - 6"	1' - 0"
2.5"	2' - 0"	1' - 4"
3.0"	2' - 6"	1' - 8"
3.5"	3' - 0"	2' - 0"
4.0"	3' - 6"	2' - 4"
4.5"	4' - 0"	2' - 8"
5.0"	4' - 6"	3' - 0"
5.5"	5' - 0"	3' - 0"
6.0"	5' - 6"	3' - 0"
6.5"	6' - 0"	3' - 0"
7.0"	6' - 6"	3' - 0"
7.5"	7' - 0"	3' - 0"
8.0"	7' - 6"	3' - 0"

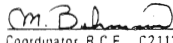


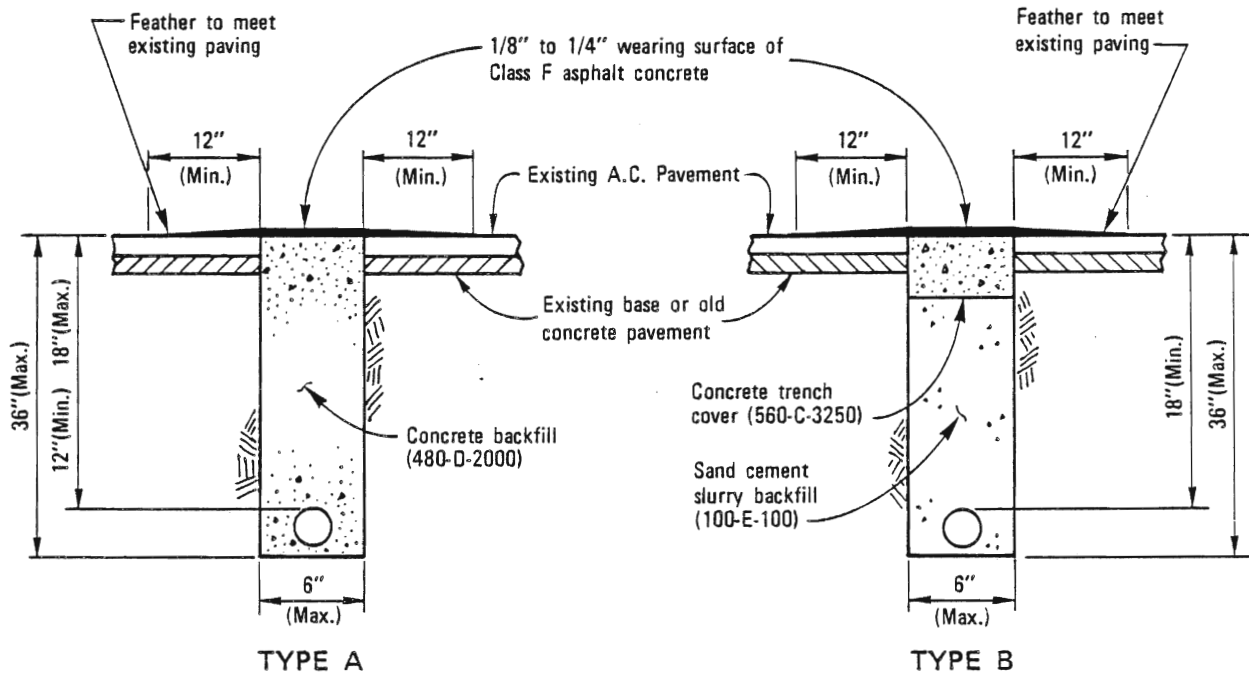
NOTE

See Standard Drawing G-32 for general notes.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				PEDESTRIAN RAMP TYPE D		<i>M. Behrman</i> 4-25-86 Coordinator R.C.E. C21133 Date
						DRAWING NUMBER G-31

1. Pedestrian ramps shown on Standard Drawings G-27 through G-30 do not conform to the requirements of the State Building Code (Part 2, Title 24, C.A.C.) and are not recommended for use on projects with Federal or State funding.
2. Areas shown thus:  Shall have a heavy broom "ripple" texture finish, transverse to axis of ramp.
3. Areas shown thus:  Are the minimum required for a complete ramp installation and shall be concrete class 520-C-2500.
4. When pedestrian ramps are installed in or adjacent to existing colored concrete, the new ramp shall be tinted to match existing concrete color.
5. The removal of existing concrete curb, gutter, sidewalk and pavement for pedestrian ramp installation shall comply with San Diego Regional Standard Drawing G-11.
6. If obstructions such as inlets, utility poles, fire hydrants, etc., are encountered, the ramp locations may be adjusted upon the approval of the Engineer.

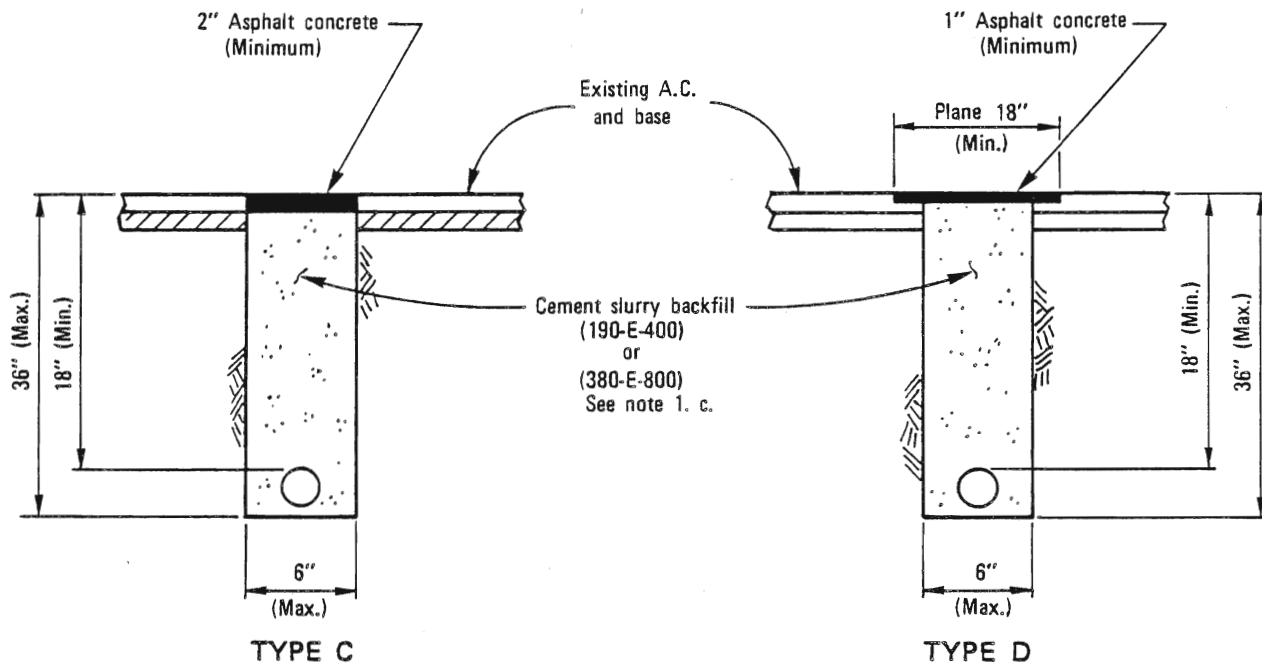
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  4-25-86 Coordinator R.C.E. C21133 Date	SAN DIEGO REGIONAL STANDARD DRAWING	Revision	By	Approved	Date
DRAWING NUMBER G-32	GENERAL NOTES FOR PEDESTRIAN RAMP				



NOTES

1. Concrete backfill or sand cement slurry backfill shall have a maximum slump of 4 inches.
2. Concrete backfill and sand cement slurry backfill shall be thoroughly consolidated to encase conduits. Tampers or vibrators shall be used.
3. Concrete shall be screeded off to match existing pavement grade and floated to assure proper edge match.
4. A tack coat shall be applied to the concrete and existing asphalt pavement prior to placing the new asphalt pavement wearing surface.
5. Existing A.C. pavement will not require sawcutting when using rockwheel for excavation.
6. Concrete trench cover shall be a minimum 5½ inches thick in alleys or local residential streets and 7 inches thick in all other streets.
7. Allow concrete backfill or concrete trench cover seven calendar days minimum but no longer than thirty calendar days to cure and dry before applying the asphalt concrete wearing surface.
8. In major or prime arterial streets, an approved set accelerating admixture, such as Calcium Chloride, may be used only with prior approval of the agencies Engineer.
9. Only Type A shall be permitted for supply cables of 750 volts or less. See California Public Utility Commission General Order No. 128, Rule 33.4 D. (1) (a).

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING NARROW TRENCHING TYPES A & B BACKFILL & RESURFACING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Cm. Behm</i> 4-25-86 Coordinator R.C.E. C21133 Date
					DRAWING NUMBER G-33



NOTES

1. Cement Slurry Backfill:
 - a. Cement slurry backfill shall have a maximum slump of 4 inches.
 - b. Cement slurry backfill shall be thoroughly consolidated to encase conduits. Tampers or vibrators shall be used.
 - c. Cement slurry backfill shall be as follows:
 - Alleys and local residential streets Class (190-E-400)
 - All other streets Class (180-E-800)
2. A tack coat shall be applied to the cement slurry backfill and existing asphalt pavement prior to placing the new asphalt surface.
3. Asphaltic Concrete Resurfacing:
 - Type C
 - a. Allow cement slurry backfill 24 hours minimum to cure before resurfacing.
 - b. Thickness shall match the existing A.C. with a minimum of 2 inches.
 - c. A.C. shall be hot mix.
 - Type D
 - a. Allow cement slurry backfill seven days minimum to cure before planing.
 - b. Plane existing asphalt pavement and slurry backfill 1 inch minimum or one half thickness of existing A.C. not to exceed 2 inches.
 - c. A.C. shall be hot mix.
4. A.C. resurfacing shall be sealed or chip sealed when required by the agencies Engineer.
5. Existing A.C. pavement will not require sawcutting when using rockwheel for excavation.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

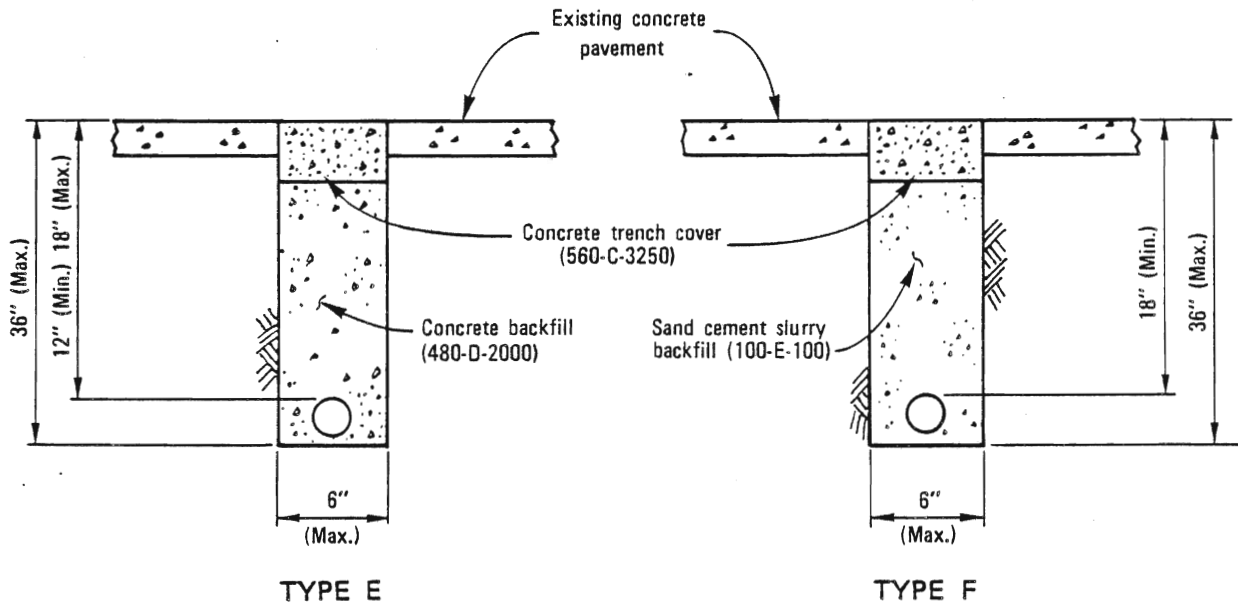
M. Belmont 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **G-34**

SAN DIEGO REGIONAL STANDARD DRAWING

NARROW TRENCHING TYPES C & D BACKFILL & RESURFACING

Revision	By	Approved	Date



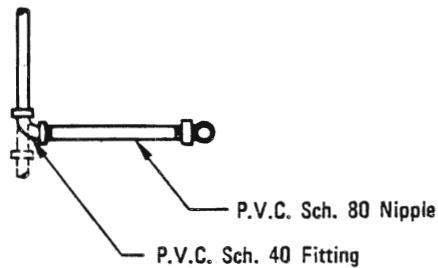
NOTES

1. Concrete backfill or sand cement slurry backfill shall have a maximum slump of 4 inches.
2. Concrete backfill and sand cement slurry backfill shall be thoroughly consolidated to encase conduits. Tampers or vibrators shall be used.
3. Concrete shall be screeded off to match existing pavement grade and floated to assure proper edge match.
4. Concrete trench cover shall be a minimum of 5½ inches thick in alleys or local residential streets and 7 inches thick in all other streets.
5. Existing concrete pavement will not require sawcutting when using rockwheel for excavation.
6. In major or prime arterial streets, an approved set accelerating admixture, such as Calcium Chloride, may be used only with prior approval of the agencies Engineer.
7. Only Type E shall be permitted for supply cables of 750 volts or less. See California Public Utility Commission General Order No. 128, Rule 33.4 D. (1) (a).

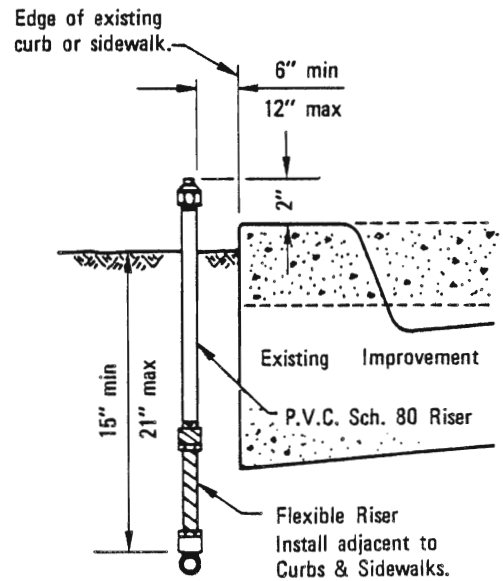
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				NARROW TRENCHING TYPES E & F BACKFILL & RESURFACING		<i>cm. B. B. B.</i> 4-25-86 Coordinator R.C.E. C21133 Date
						DRAWING NUMBER G-35

SPRINKLER IRRIGATION SYSTEMS

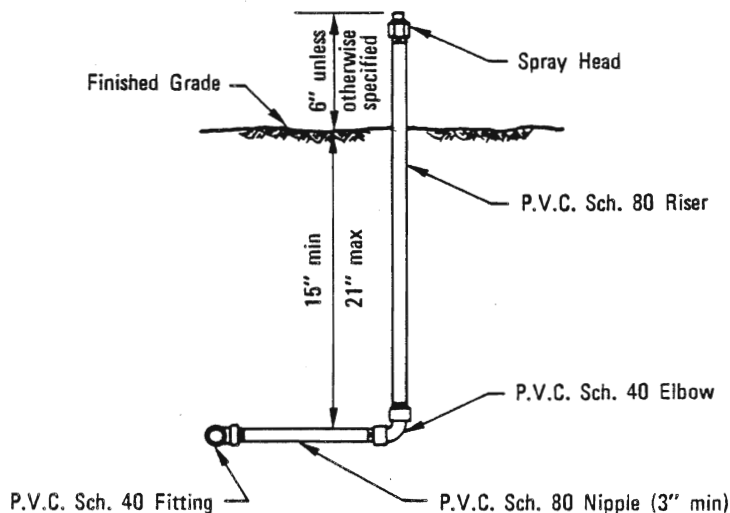
SPRINKLER IRRIGATION SYSTEMS



PLAN VIEW



LOCATION OF SPRINKLER
HEADS ADJACENT TO
EXISTING IMPROVEMENTS



ELEVATION

NOTES

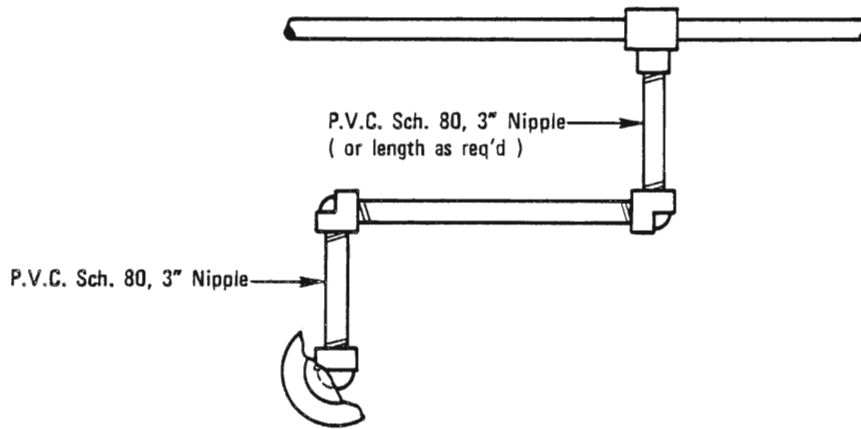
1. Teflon tape, 3/4" wide, shall be used on all threaded connections.
2. Close nipples shall not be used.

LEGEND ON PLANS

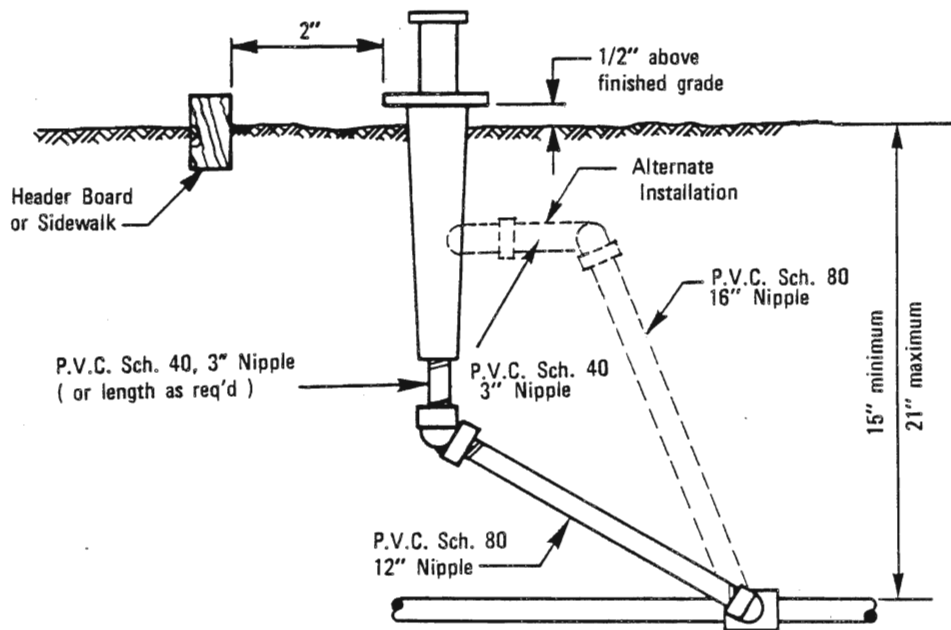
Show a number to
indicate type head.



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				SHRUBBERY SPRINKLER HEAD FIXED SPRAY TYPE		<i>Alfred A. Kuehn</i> Dec. 1975	
						Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER I-1	



PLAN



ELEVATION

NOTES

1. All fittings shall be P.V.C. Sch. 40.
2. Teflon tape, 3/4" wide, shall be used on all threaded connections.
3. Short nipples shall not be used.

LEGEND ON PLANS

Show a number to indicate type head 

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

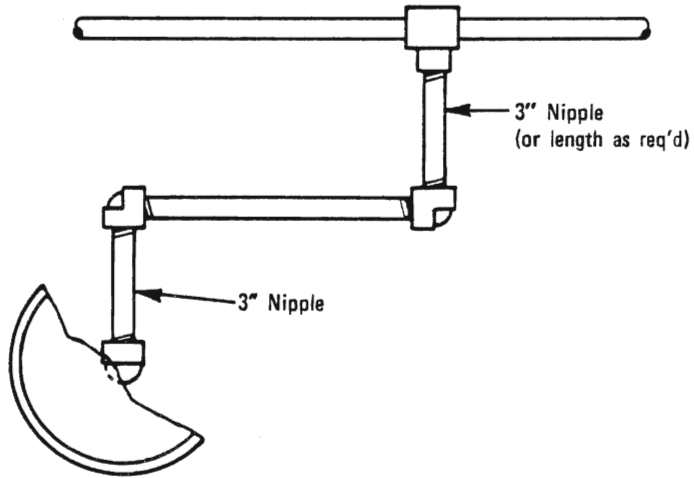
DRAWING
NUMBER

1-2

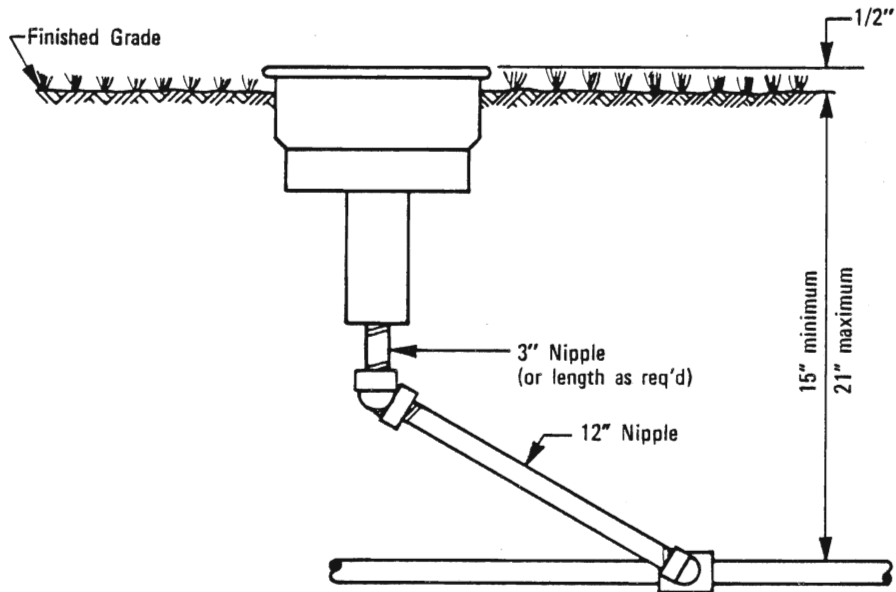
SAN DIEGO REGIONAL STANDARD DRAWING

**SPRINKLER HEAD
POP UP SPRAY TYPE**

Revision	By	Approved	Date
Alt. Instl.	TRP	M.B.	10-82



PLAN



ELEVATION

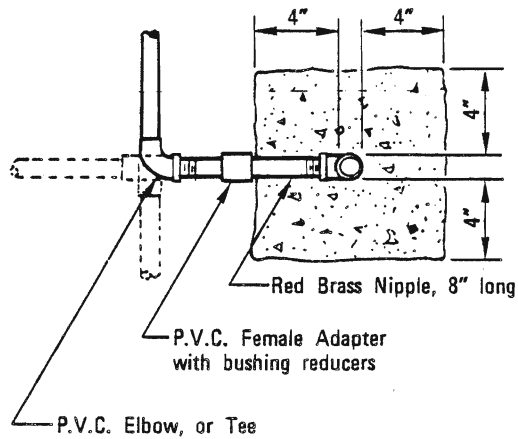
NOTES

1. All fittings shall be P.V.C. Sch. 40.
2. All nipples shall be P.V.C. Sch. 80.
3. Teflon tape, 3/4" wide, shall be used on all threaded connections.
4. Short nipples shall not be used.

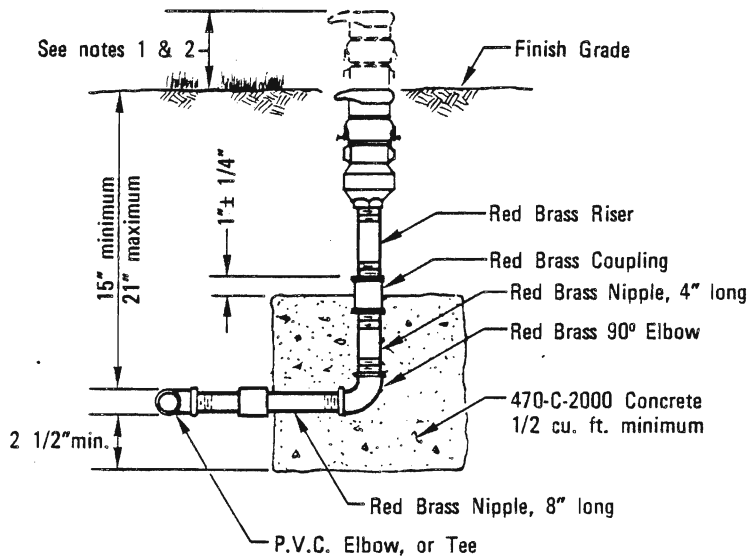
LEGEND ON PLANS

Show a number to indicate type head

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				LAWN SPRINKLER HEAD POP UP ROTARY (WITH SWING JOINT)		<i>Allard A. Kerschbaum</i> <i>Dec. 1975</i>
						Coordinator R.C.E. 19807 Date
						DRAWING NUMBER I-3



PLAN

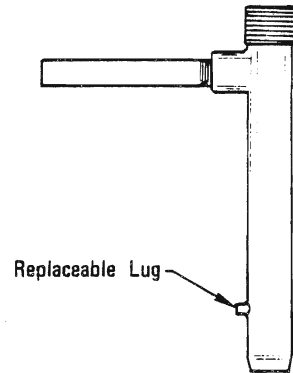


ELEVATION

NOTES

1. Quick coupling valves in lawn areas shall be set to grade.
2. Quick coupling valves in shrub areas shall be set 2 inches above grade.
3. Dimensions of concrete anchors are minimum.
4. Close nipples shall not be used.

COUPLER KEY-SINGLE LUG

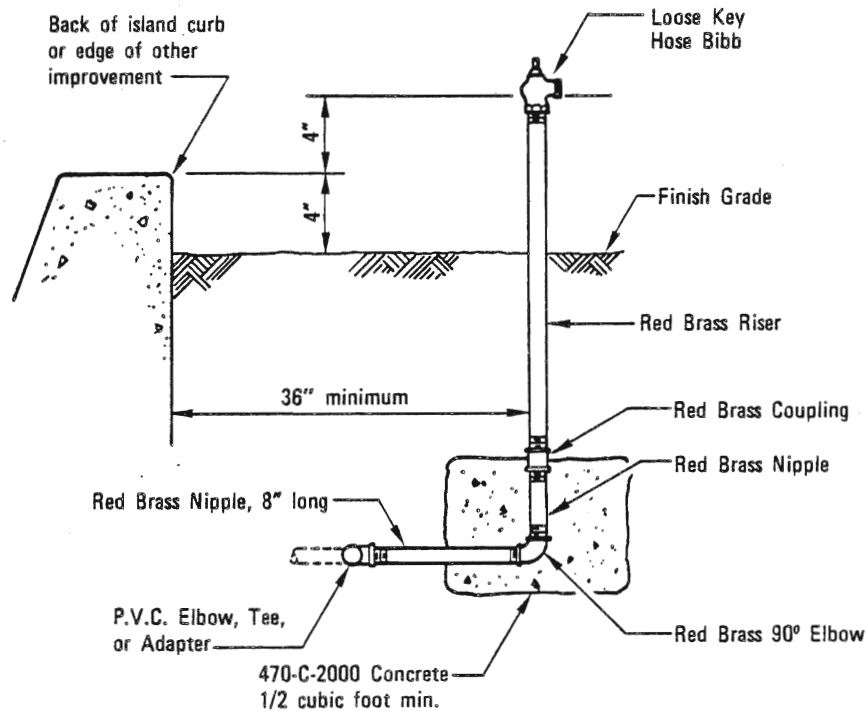


KEY FOR LOCK TOP

LEGEND ON PLANS

Q.C.V.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Note 2	TRP	M.B.	10-82			<i>Allen A. Kuehn</i>	<i>Dec. 1975</i>
				QUICK COUPLING VALVE		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	1-5



NOTES

- Hose bibb shall be loose key operated, all brass or bronze construction, angle pattern with removable bonnet and stem assembly, replaceable seat washers and stem packing glands.
- Unless otherwise specified, the hose connection thread shall be 3/4" male hose thread (pacific coast), and the riser opening thread shall be 3/4" female I.P.S. Discharge opening shall be 90° to riser opening.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

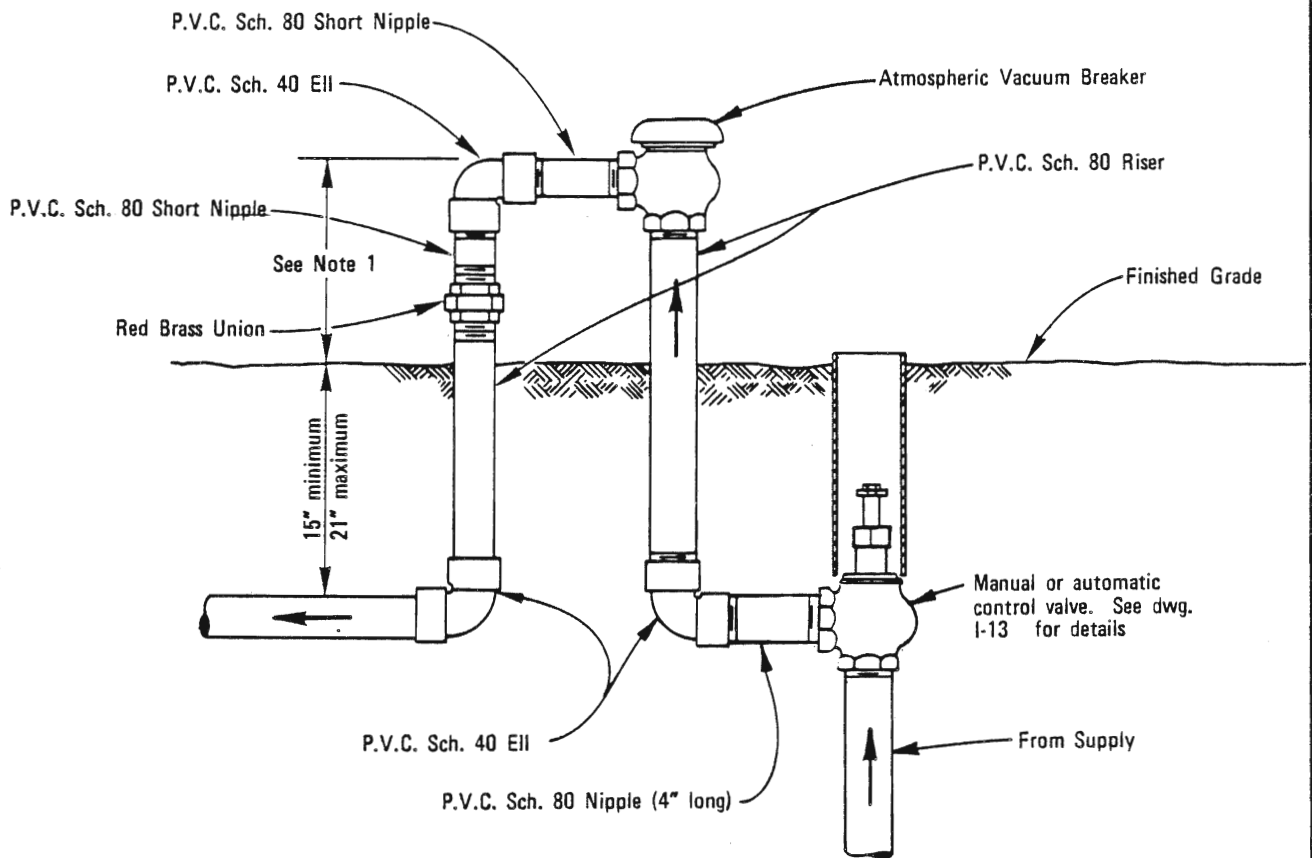
Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

Revision	By	Approved	Date
Set Back	TK	M.B.	10-82

DRAWING
NUMBER 1-6

HOSE BIBB
(GARDEN VALVE)



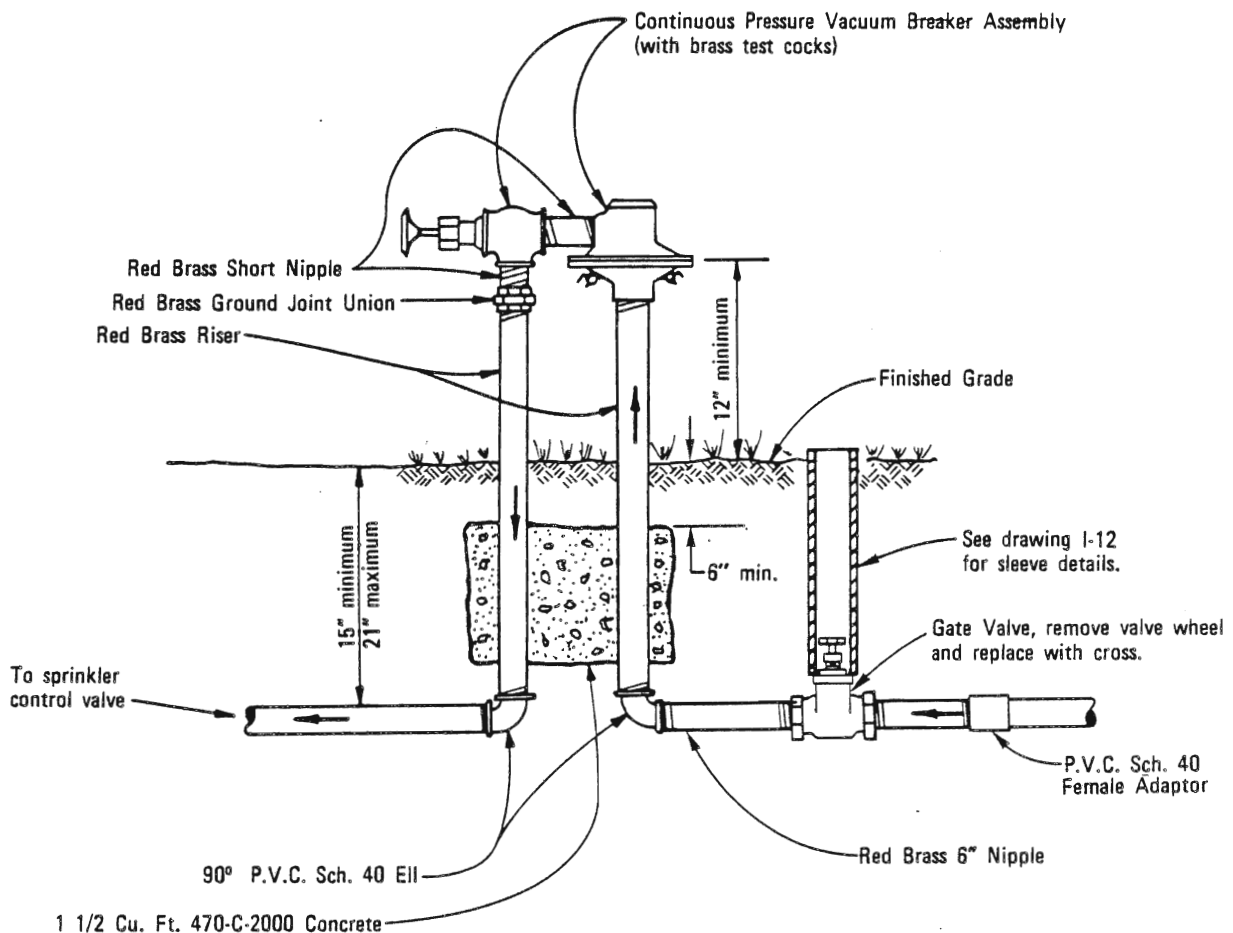
NOTES

1. Atmospheric vacuum breakers shall be installed approximately 6" above the finished grade and above a sufficient number of sprinkler heads closest to the vacuum breaker so that at no time will it be subjected to back pressure or drainage.
2. Close nipples shall not be used.
3. All fittings, including the atmospheric vacuum breaker, shall not be of smaller size than the valve.
4. Teflon tape, 3/4" wide, shall be used on all threaded connections.
5. For use on lines 2 inches and smaller.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Union	TRP	M.B.	10-82			<i>Allen A. Kuehn</i>	<i>Dec. 1975</i>
				BACKFLOW PREVENTER ATMOSPHERIC VACUUM BREAKER (2" & SMALLER)		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	1-7



NOTES

1. Continuous pressure vacuum breakers shall be installed approximately 12 inches above finished grade and at the highest point in the line.
2. Continuous pressure vacuum breakers shall not be subjected to back pressure or drainage.
3. Teflon tape 3/4" wide shall be used on all threaded connections.
4. Close nipples shall not be used.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

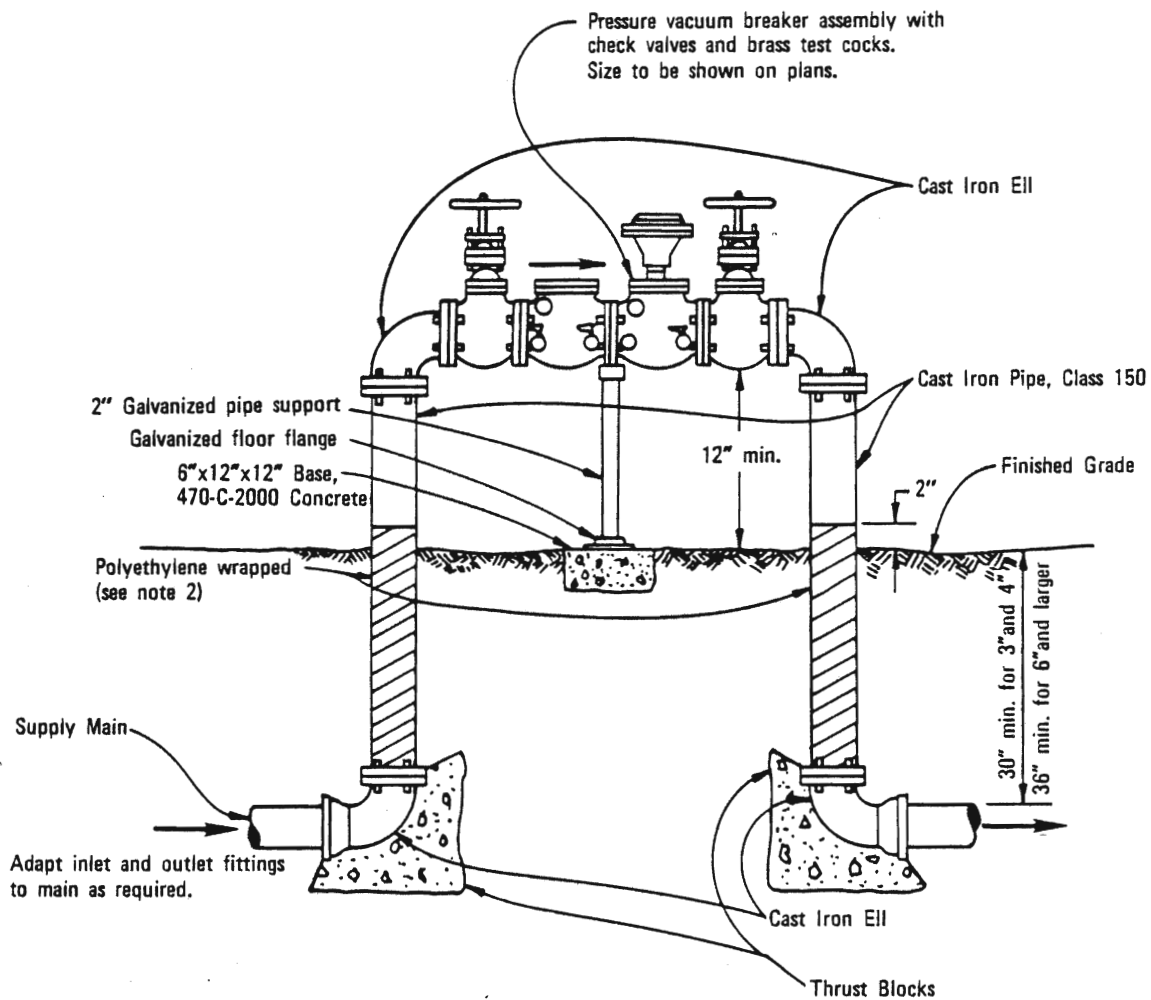
DRAWING
NUMBER

1-8

SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER · CONTINUOUS
PRESS. VAC. BREAKER ASSY.
(2" & SMALLER)

Revision	By	Approved	Date
Note 1	<i>D.S.</i>	<i>D.S.</i>	7-79
Reference	<i>TRP</i>	<i>M.B.</i>	10-82



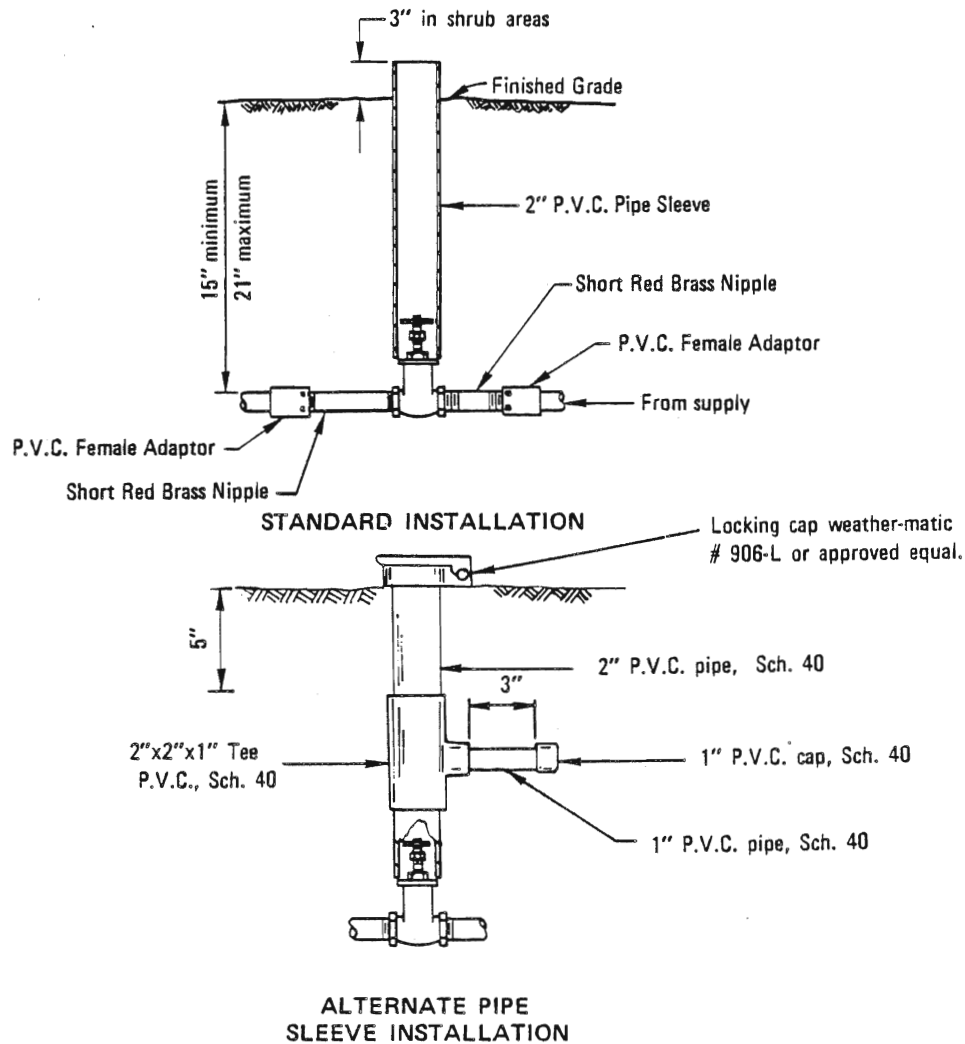
NOTES

1. All fittings on assembly 3" and larger shall be flanged.
2. Cast iron pipe shall be polyethylene wrapped with a 2" wide plastic backed adhesive tape. Use 1/2" overlap.
3. Cast iron pipe and fittings shall be cement mortar lined.
4. Pressure vacuum breaker assembly shall be installed above a sufficient number of sprinkler heads closest to the vacuum breaker assembly so that at no time will it be subjected to back pressure or drainage.
5. All exposed cast iron shall be painted with one coat of red lead and two finish coats of exterior enamel.
6. All fittings 2" and smaller shall be red brass.
7. Backflow preventer assembly shall be tested upon installation by a certified backflow device tester. Contractor shall provide Engineer with written test results completed by certified backflow tester prior to the backflow preventer assembly's acceptance by the Engineer.

LEGEND ON PLANS



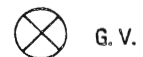
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Note 1,6	TRP	M.B.	10-82		<i>Allen A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
Note 7	RE	M.B.	5-86		
					DRAWING NUMBER 1-9
				BACKFLOW PREVENTER PRESS. TYPE VAC. BREAKER ASSEMBLY	



NOTES

1. All valves shall be furnished with a standard manual control valve bronze cross handle.
2. All valves shall be installed within 12" of the water main, unless otherwise shown on the plans.
3. Close nipples shall not be used.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

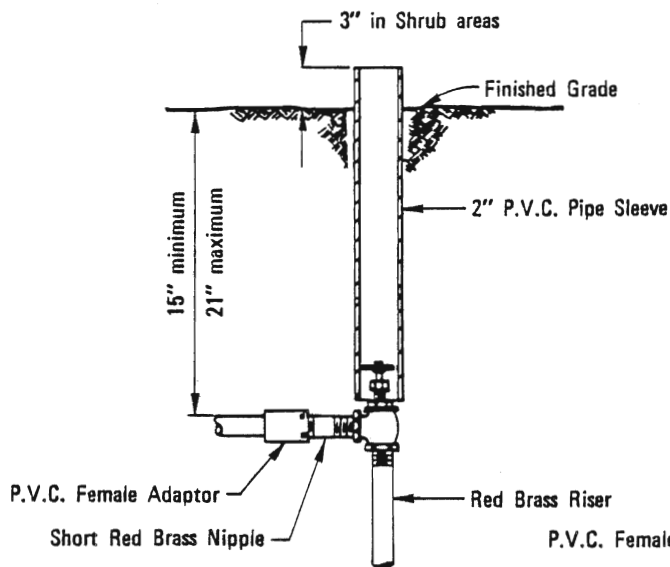
DRAWING
NUMBER

1-12

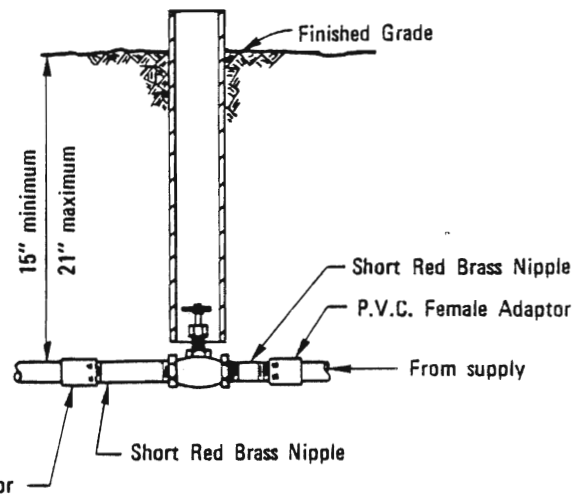
SAN DIEGO REGIONAL STANDARD DRAWING

GATE VALVE (2" AND SMALLER)

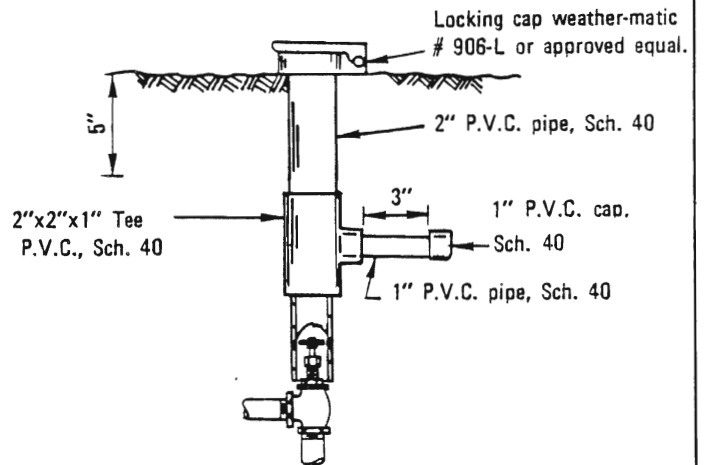
Revision	By	Approved	Date
Union	TRP	TH.B.	10-82



ANGLE VALVE



GLOBE VALVE
(special cases only)



ALTERNATE PIPE
SLEEVE INSTALLATION

NOTES

1. All Manual Valves shall be furnished with a standard manual control valve bronze cross handle.
2. All valves shall be installed with 12" of the water main, unless otherwise shown on the plans.
3. All Manual Valves shall be furnished with a removable bonnet and packing gland nut.
4. Close Nipples shall not be used.
5. Locking cap shall be mounted flush with finish grade in turf areas & 1 inch above finish grade in shrub areas.

LEGEND ON PLANS



M.C.V.

Revision	By	Approved	Date
Union	TR	M.B.	10-82
Note 5	SC	M.B.	5-86

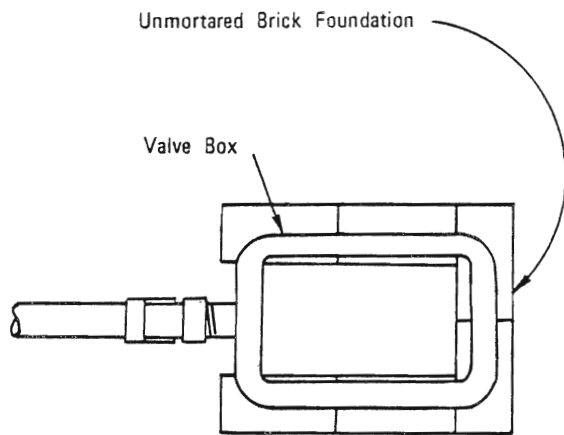
SAN DIEGO REGIONAL STANDARD DRAWING

MANUAL VALVES

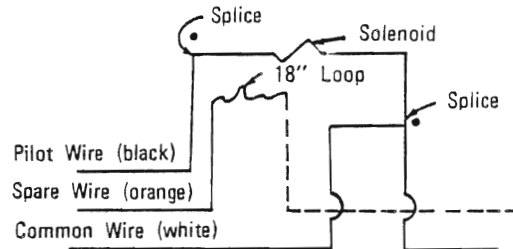
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

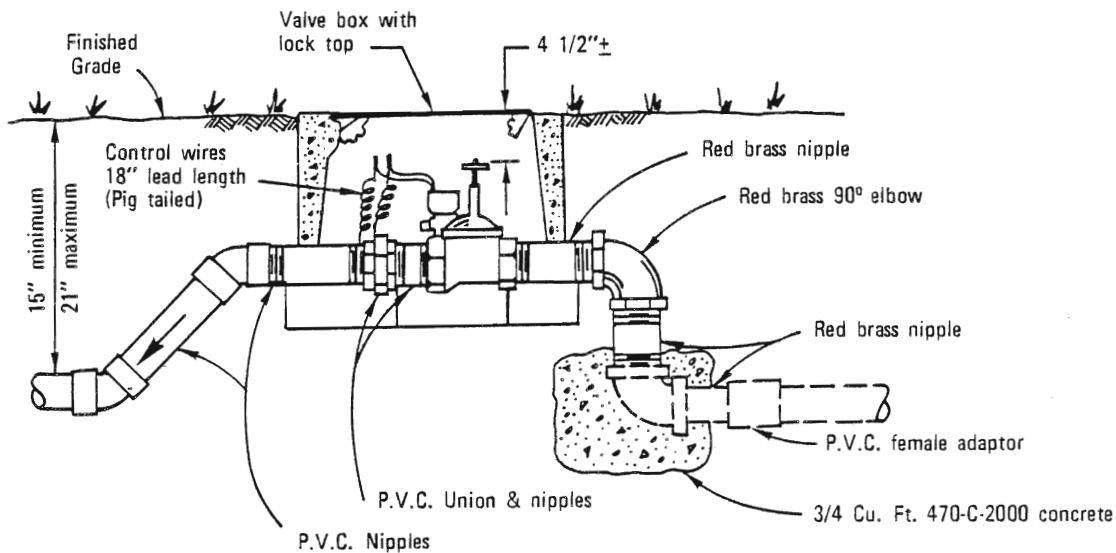
DRAWING
NUMBER I-13



PLAN



TYPICAL ELEMENTARY DIAGRAM FOR WIRING
ELECTRICAL REMOTE CONTROL VALVE



ELEVATION

NOTES

1. No splicing shall be made outside of the valve box except that made in a pull-box. See Standard Drawing I-15 for splice details.
2. Close nipples shall not be used.
3. Spare wires terminating in valve boxes shall have their ends insulated, the same as for a splice.
4. When two or more valves are installed in the same location, they shall be in manifold using red brass fittings, with a gate valve installed at the start of the manifold.
5. All valves shall be installed with a union on the downstream side of the valve. The union shall be P.V.C.

LEGEND ON PLANS

▼ R.C.V.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

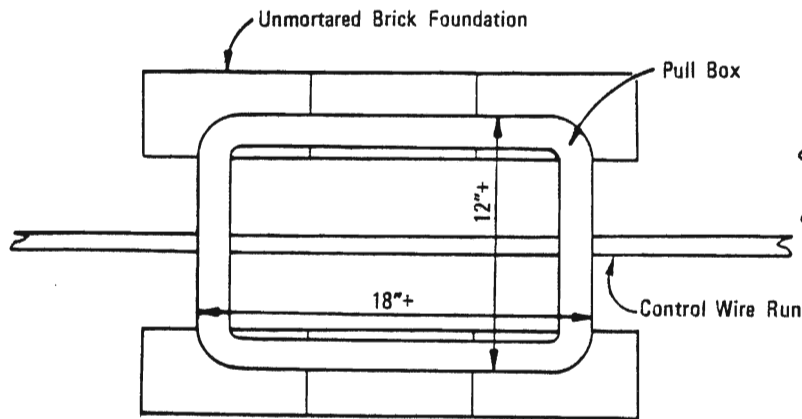
Robert D. Henderson Dec. 1975
Date

DRAWING
NUMBER 1-14

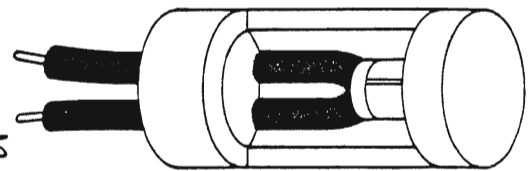
SAN DIEGO REGIONAL STANDARD DRAWING

REMOTE CONTROL VALVE

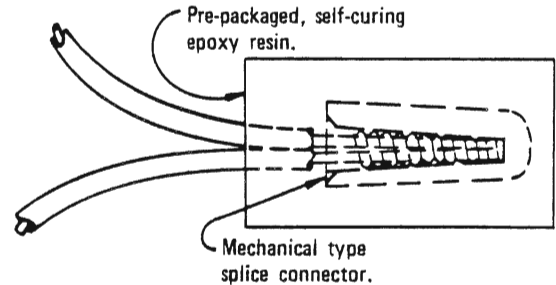
Revision	By	Approved	Date
Valve	TRP	T.M.B.	10-82



PLAN VIEW

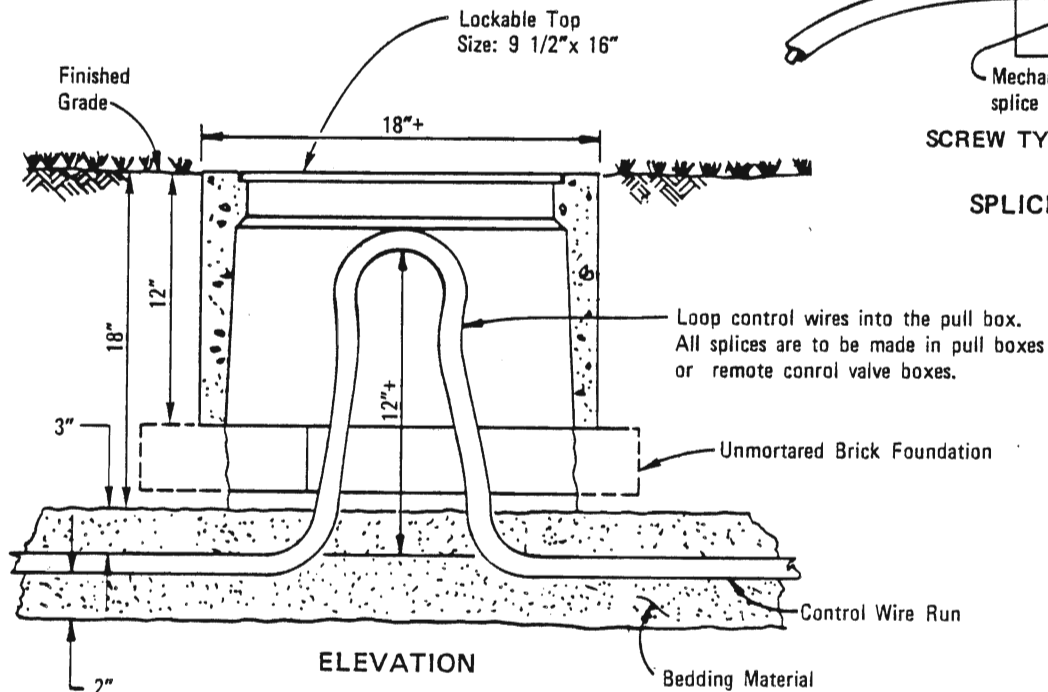


PEN-TITE WIRE CONNECTOR



SCREW TYPE CONNECTOR

SPLICE DETAILS



ELEVATION

NOTES

1. Install pull boxes as shown on 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.
5. All splices shall be made with a properly set mechanical splice connector entirely enclosed in self-curing epoxy resin and shall be completely water-proof.
6. All spare wire ends shall be insulated in the same manner as wire splices.

LEGEND ON PLANS



Revision	By	Approved	Date

SAN DIEGO REGIONAL STANDARD DRAWING

ELECTRICAL PULL BOX FOR DIRECT BURIAL CONTROL WIRES AND SPLICE DETAILS

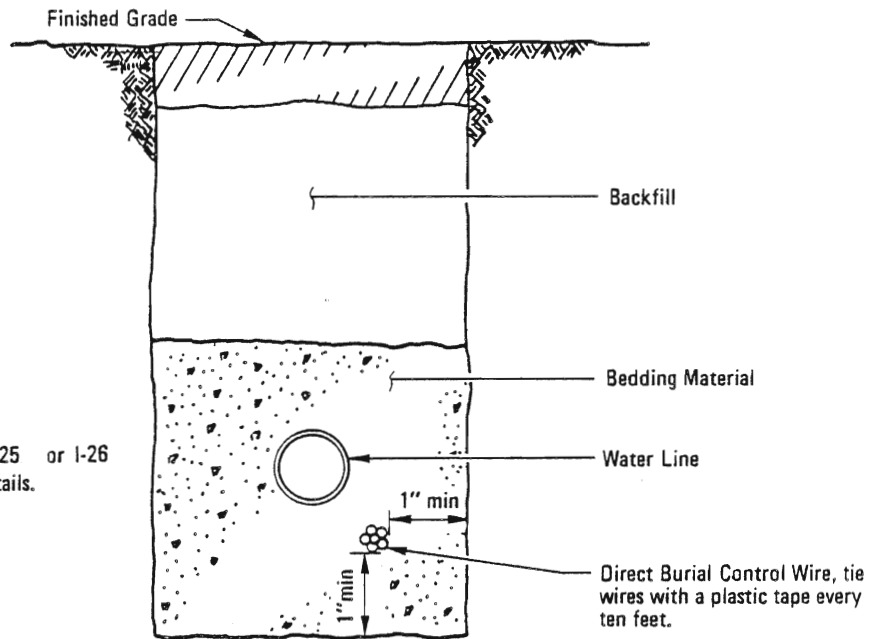
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan O. Kerschman *Dec. 1975*
Coordinator R.C.E. 19807 Date

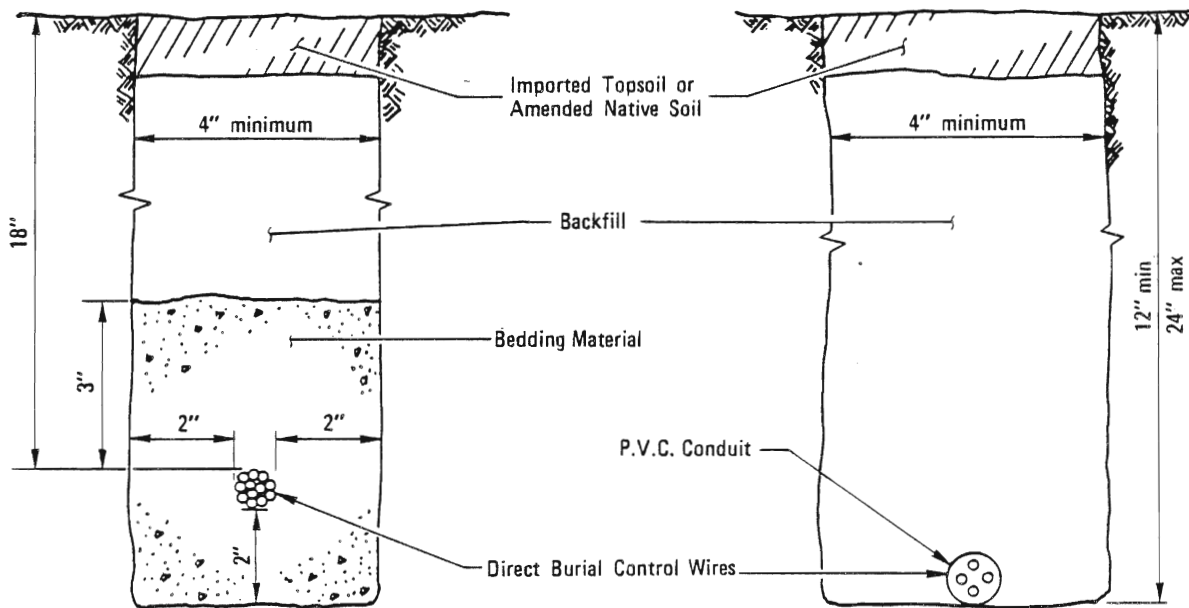
DRAWING
NUMBER I-15

NOTE

See Standard Drawing I-25 or I-26
for water line trench details.



NORMAL LOCATIONS OF CONTROL WIRES



ALTERNATE LOCATION OF CONTROL WIRES

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

DIRECT BURIAL CONTROL WIRE

Revision	By	Approved	Date
Reference	TRP	M.B.	10-82

**DRAWING
NUMBER I-16**

Automatic controller clock in weatherproof, tamperproof lockable case mounted on pedestal case.

Slope concrete away from conduits.

Finished Grade

18"

3"

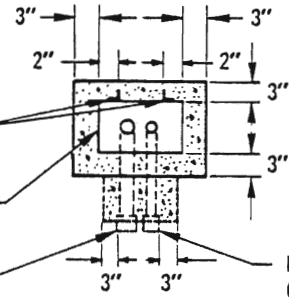
SIDE VIEW

3"

1 1/2" x 1 1/2" x 1/4" angle iron stiffeners (galvanized and painted to match case)

560-C-3250 Concrete (min 3" encasement around conduits)

12" R min.



PLAN VIEW

Pedestal Case

Valve Control (Bushing)

Power Supply (Coupling Adapter)

Controller Cabinet

Pedestal Case

2" P.V.C. Conduit for control wire

Finished Grade

1" P.V.C. or Galvanized Steel Conduit for power supply.

Slope concrete away from conduits.

15"

ELEVATION

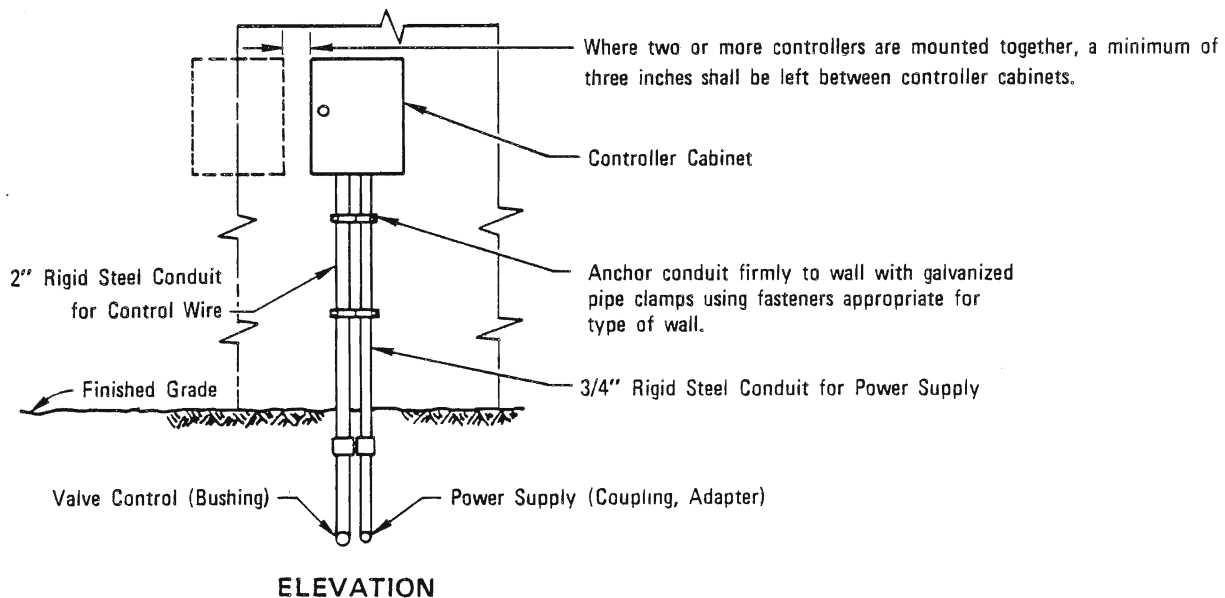
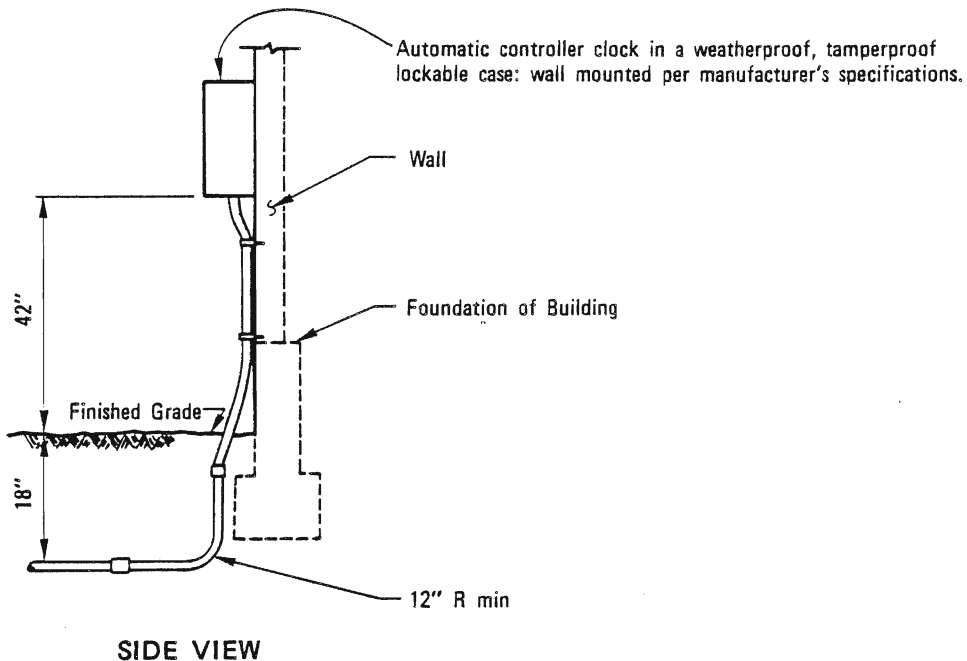
NOTES

1. Where two or more controllers are mounted on a common concrete base, a minimum of three inches shall be left between controller cabinets.
2. Anchor controller pedestal to base as required by manufacturer.
3. Make all electrical connections inside controller cabinet.
4. For location of supply conduit and conductors, see electrical plans.
5. Stiffeners shall be fastened to controller and pedestal cases by 3/16" x 3/4" O.N. cadmium plated stove bolts not more than 12" on center (minimum 6 bolts per stiffener).
6. Controller shall be grounded at power supply by ground wire.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conduit	TRP	M.B.	10-82	IRRIGATION SYSTEMS ELECTRIC CONTROLLER CLOCK PEDESTAL MOUNTING		Allard A. Kerschbaum Dec. 1975 Coordinator R.C.E. 19807 Date	
Conc.	RE	M.B.	5-86			DRAWING NUMBER I-17	



NOTES

1. For location of supply conduit and conductor, refer to the plans.
2. Controller shall be grounded at power supply by ground wire.
3. Make all electrical connections inside controller cabinet.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

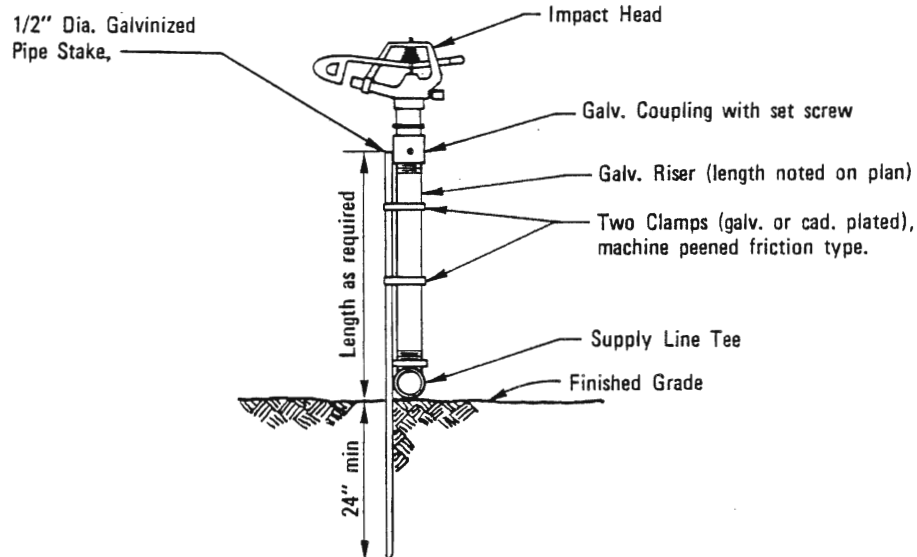
DRAWING
NUMBER

I-18

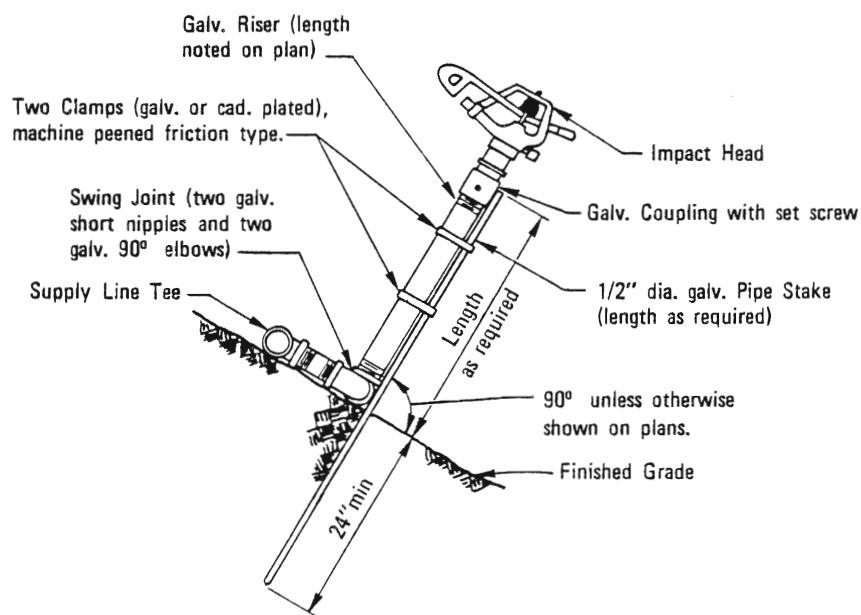
SAN DIEGO REGIONAL STANDARD DRAWING

IRRIGATION SYSTEMS ELECTRIC CONTROLLER CLOCK WALL MOUNTING

Revision	By	Approved	Date



LEVEL INSTALLATION

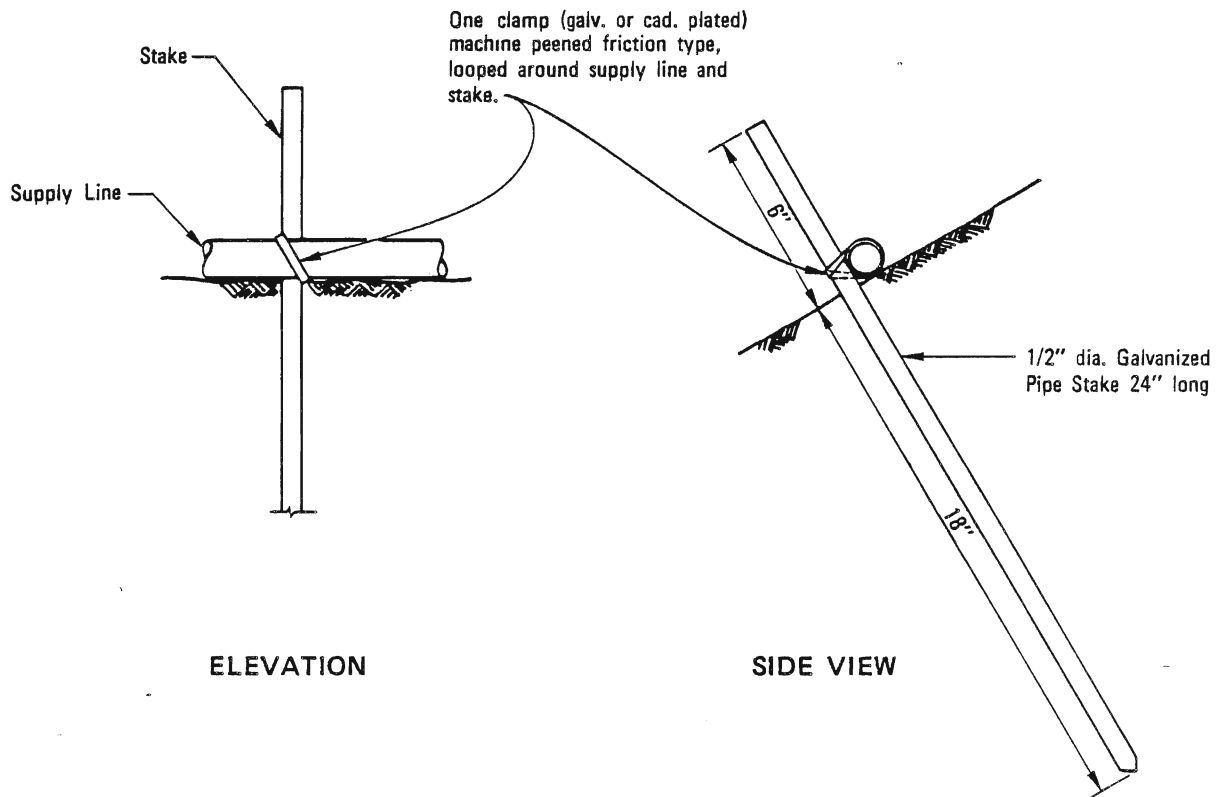


SLOPE INSTALLATION

LEGEND ON PLANS

Show a number to indicate type head

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Stake	TRP	M.B.	10-82			<i>Allan A. Kerschbaum</i>	<i>Dec. 1975</i>
				IMPACT HEAD ABOVE GROUND PIPE INSTALLATIONS		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	I-19



NOTE

Stake shall be placed no greater than 15' apart and at each riser.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

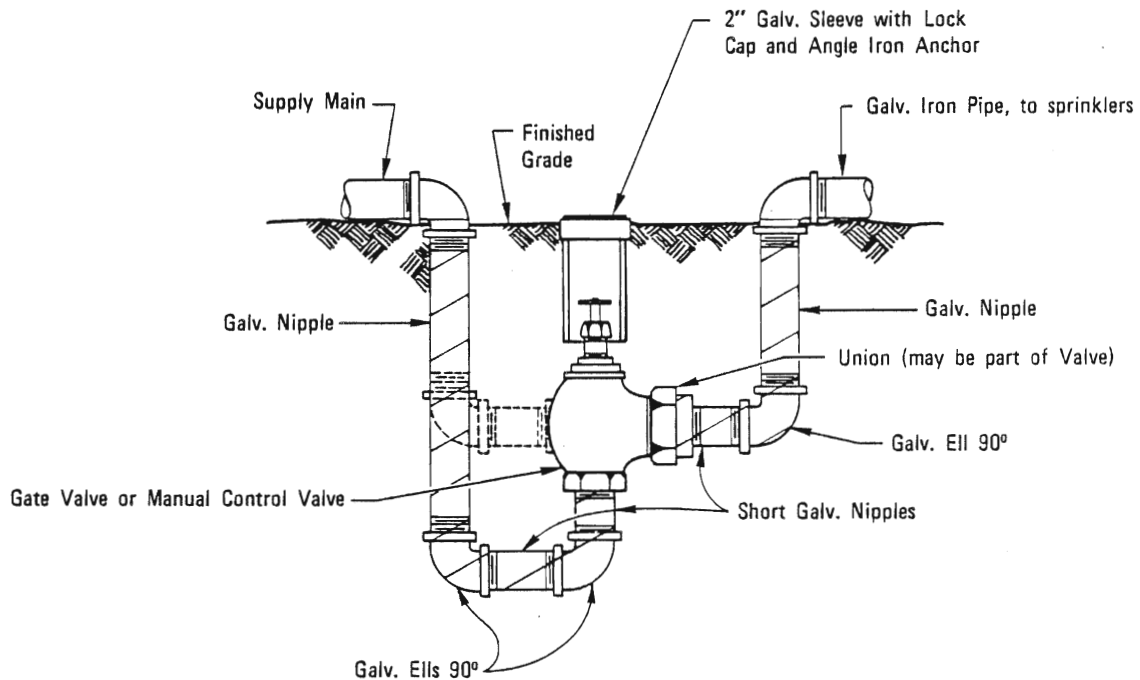
SAN DIEGO REGIONAL STANDARD DRAWING

PINNING OF PIPE ABOVE GROUND PIPE INSTALLATIONS

Revision	By	Approved	Date

DRAWING
NUMBER

I-20



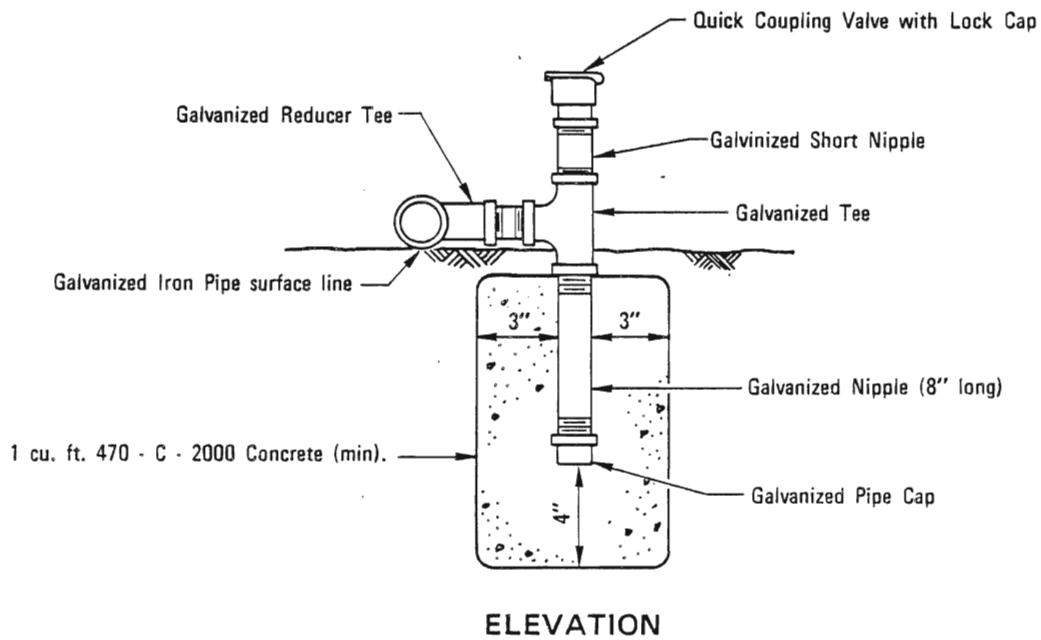
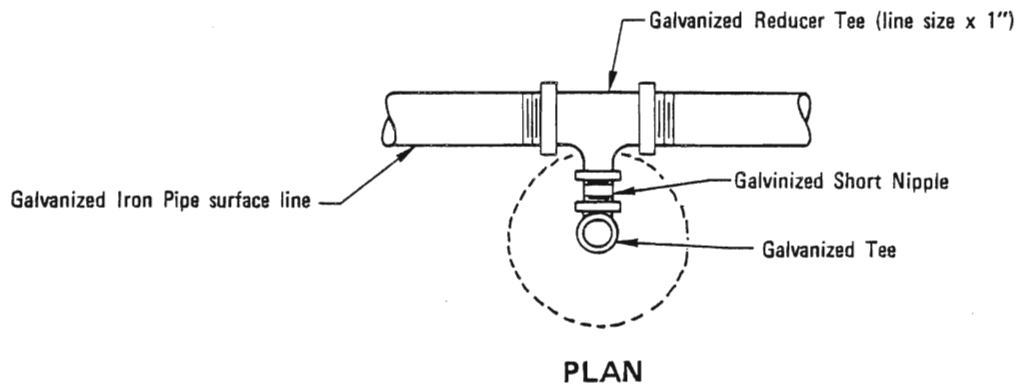
NOTE

All Galvanized Pipe, Nipples and Fittings installed underground shall be wrapped with 2" wide plastic backed adhesive tape, use 1/2" overlap.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Note	30	D.S.	7-79			<i>Allan D. Kerschman</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
				MANUAL CONTROL VALVE AND GATE VALVE INSTALLATION FOR ABOVE GROUND PIPE INSTALLATIONS		DRAWING NUMBER I-21	



LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

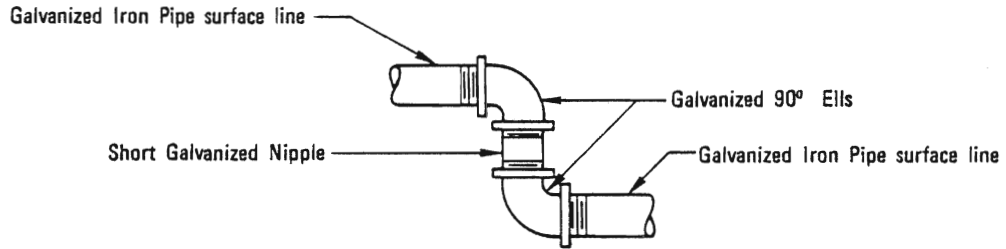
DRAWING
NUMBER

I-22

SAN DIEGO REGIONAL STANDARD DRAWING

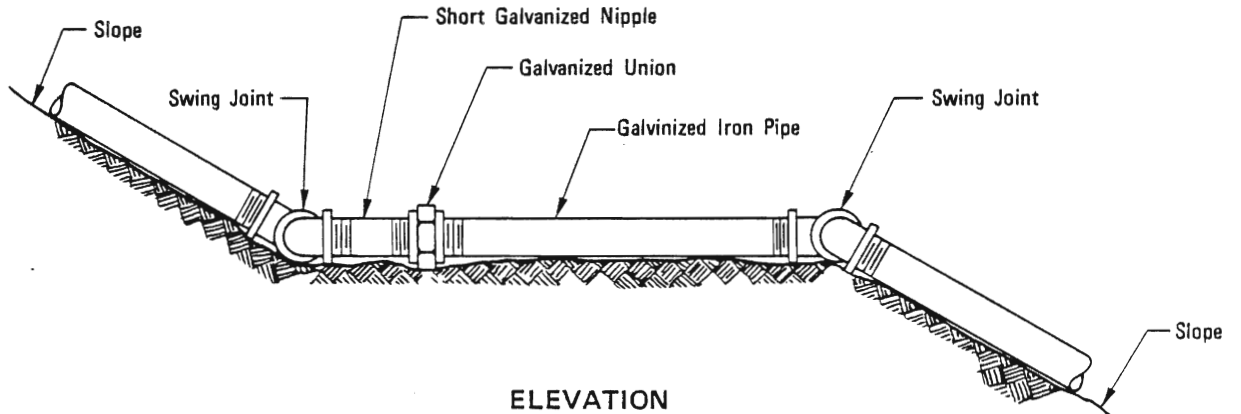
**QUICK COUPLER ASSEMBLY
ABOVE GROUND PIPE INSTALLATIONS**

Revision	By	Approved	Date



SWING JOINT DETAIL

PLAN

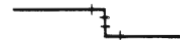


ELEVATION

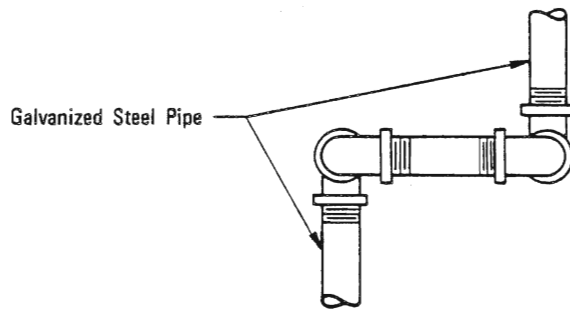
NOTE

Swing Joints shall be used at each change of grade.

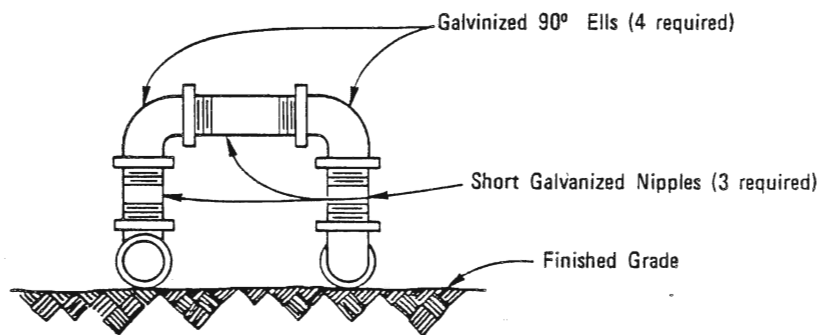
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING SWING JOINT AND PIPE INSTALLATION ON SLOPES ABOVE GROUND PIPE INSTALLATIONS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allan O. Kerschman</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
				DRAWING NUMBER	1-23



PLAN

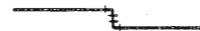


ELEVATION

NOTES

1. Double swing joint shall be used where changes of grade and alignment occur simultaneously.
2. Double swing joint shall be used for expansion joint on long runs of galvanized pipe.
(300' maximum runs)

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

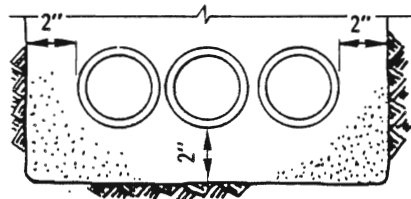
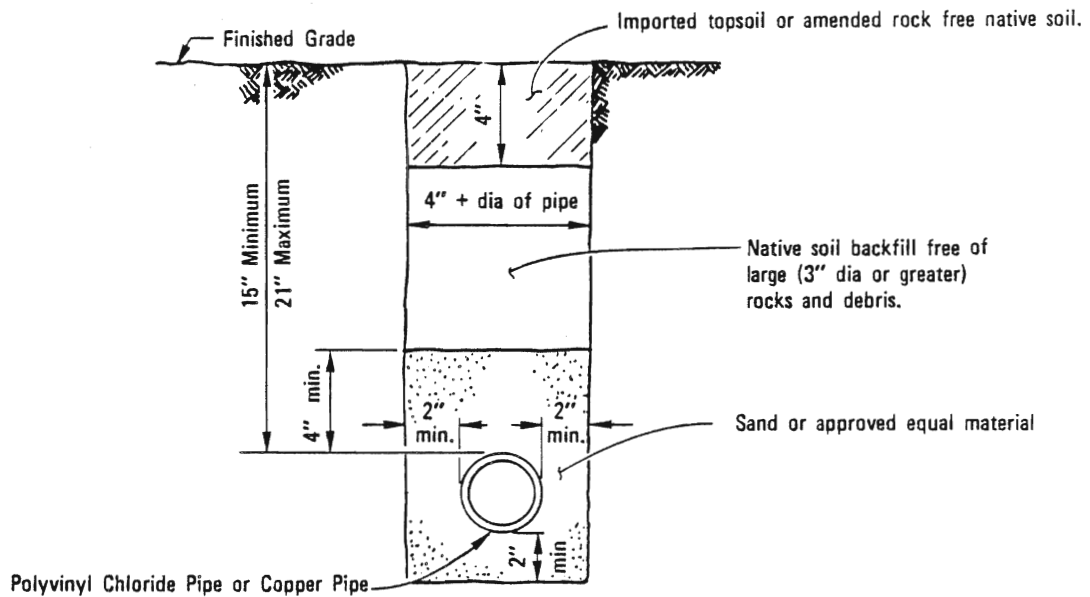
Alfred A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE SWING JOINT
ABOVE GROUND PIPE INSTALLATIONS**

Revision	By	Approved	Date

DRAWING
NUMBER **I-24**



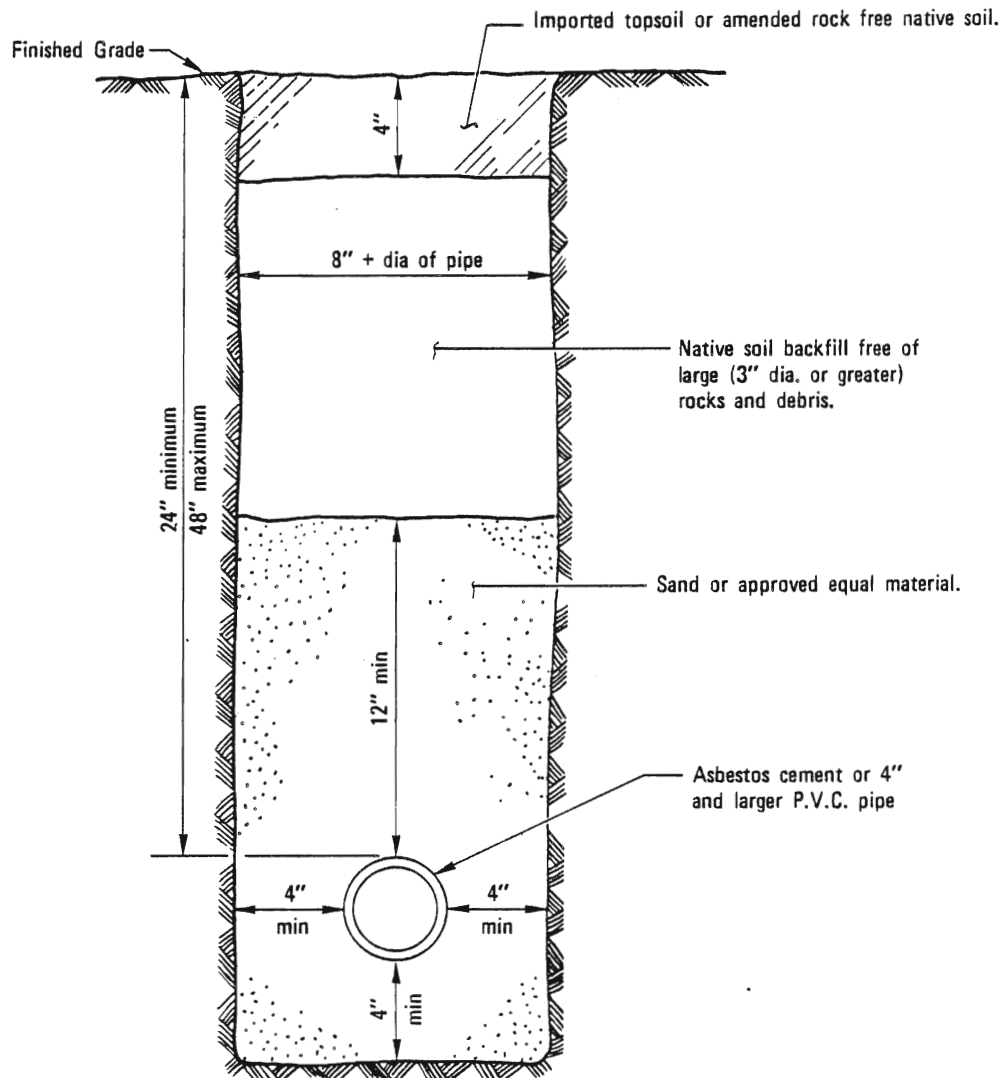
Details not shown
are same as above.

Multiple Pipe Installation Detail
(non-pressure pipe only)

NOTES

1. Backfill material shall be compacted to a relative compaction of 90% or more.
2. All P.V.C. pipe shall lay free in the trench with no induced strain and with sufficient allowance for expansion and contraction as recommended by the manufacturer.
3. Teflon tape, $\frac{3}{4}$ " wide, shall be used on all threaded connections.
4. The letter W shall be stamped or chiseled on the improvement (curb-sidewalk) directly above the pressure pipeline.
5. All plastic pressure pipe under pavement shall be installed in a P.V.C. sleeve.
6. Minimum clearance between pipes shall be 2 inches.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
Title	TRP	M.B.	10-82	TRENCH DETAIL NON - PRESSURE PIPE (2" AND SMALLER)	
Note 6	R	M.B.	5-86		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				<i>Allard A. Kerschbaum</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
				DRAWING NUMBER I-25	



NOTES

1. Backfill material shall be compacted to a relative compaction of 90% or more.
2. All pipeline fittings shall be cast iron, short body, Class 250, cement mortar lined and polyethylene wrapped. All fittings shall have thrust blocks or anchors.
3. The letter W shall be stamped or chiseled on the improvement (curb-sidewalk) directly above the pressure pipeline.
4. No P.V.C. pressure pipeline shall be installed within 3' of any line, unless otherwise specified.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

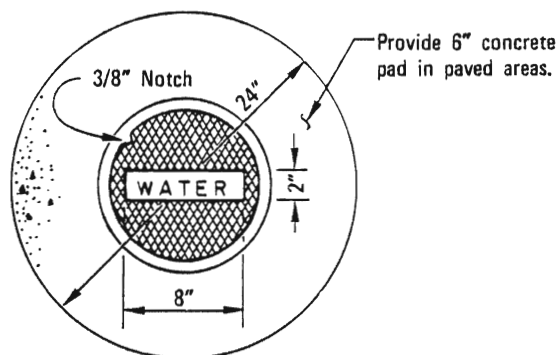
Allard A. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER I-26

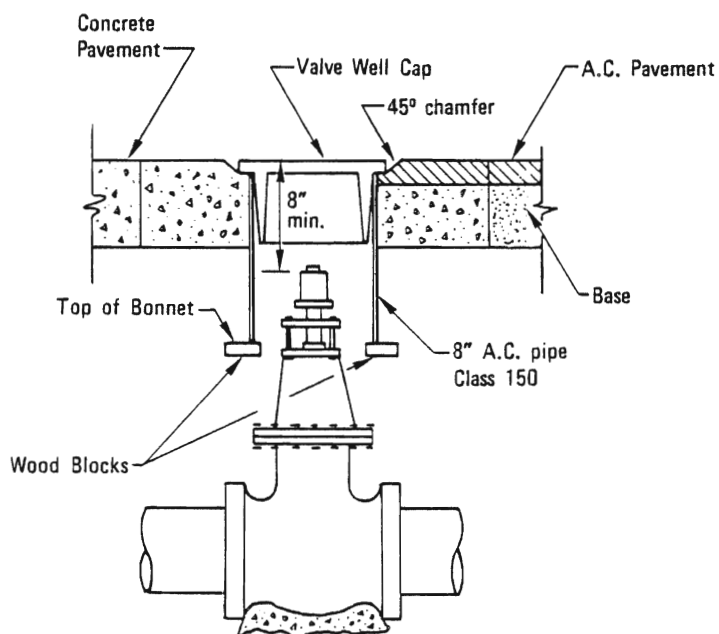
SAN DIEGO REGIONAL STANDARD DRAWING

TRENCH DETAIL PRESSURE PIPE

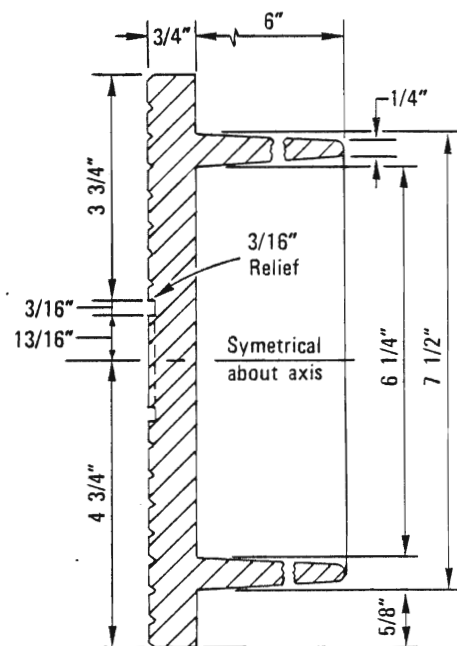
Revision	By	Approved	Date
Title	TRP	M.B.	10-82



PLAN



ELEVATION

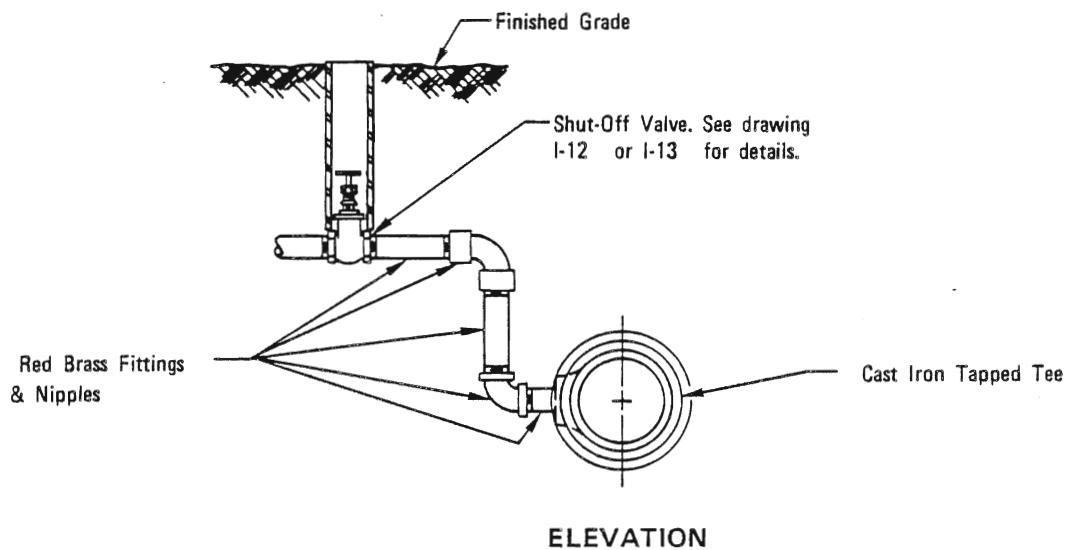
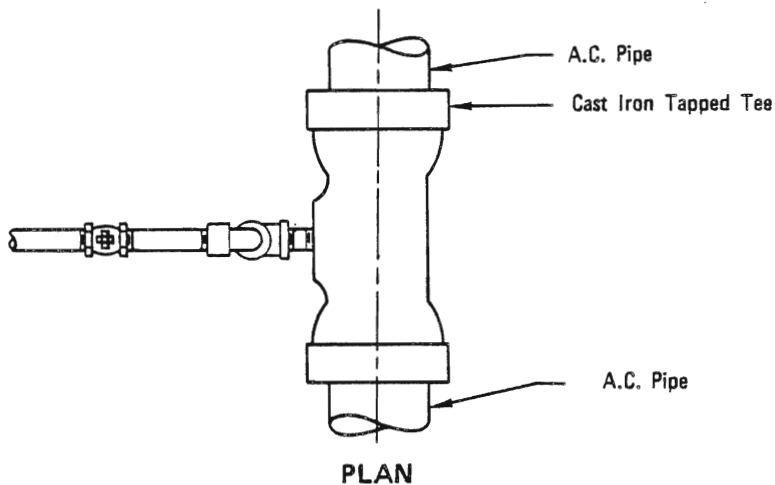


CAST IRON
VALVE WELL CAP

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				VALVE WELL AND COVER	<i>Alfred A. Kerschbaum</i> <i>DEC. 1975</i> Coordinator R.C.E. 19807 Date
				DRAWING NUMBER	I-27



NOTES

1. Close nipples shall not be used.
2. Cast iron tapped tee shall be short body, class 250, cement mortar lined and polyethylene wrapped.
3. All tapped tees shall have a type - A support block. See Standard Drawing W-19.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

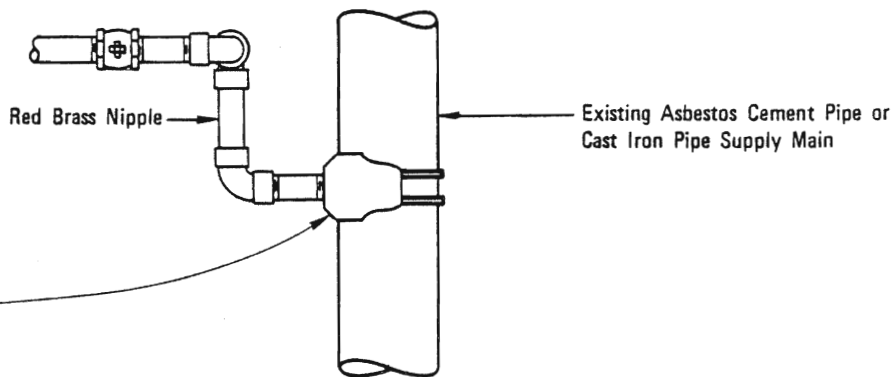
Allen A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **I-28**

SAN DIEGO REGIONAL STANDARD DRAWING

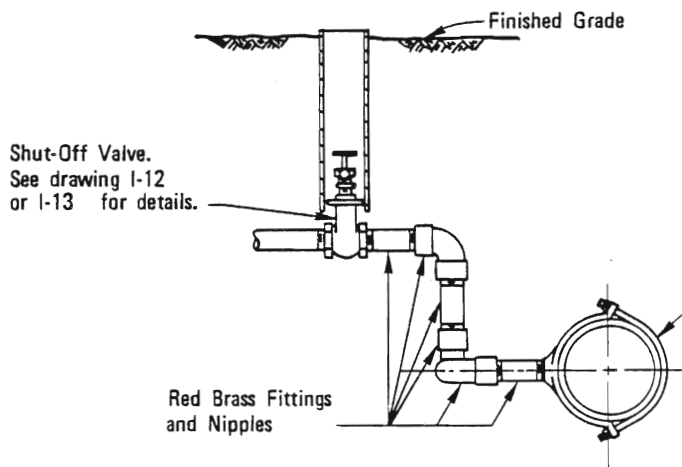
CONNECTION DETAIL FOR NEW ASBESTOS CEMENT SUPPLY MAINS

Revision	By	Approved	Date
Reference	RR	M.B.	10-82



PLAN

May Be: Bronze, double strap service clamp; cast iron tapped clamp coupling with stainless steel bolts; cast iron boltless tapping sleeve; or cast iron (cement mortar lined) cutting in tapped tee.



ELEVATION

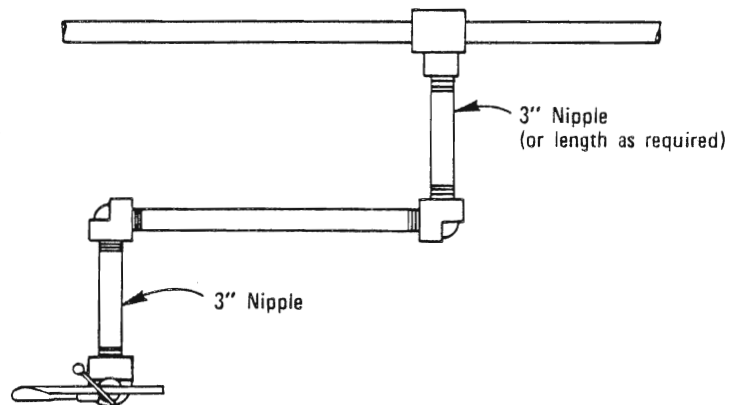
NOTE

Close nipples shall not be used.

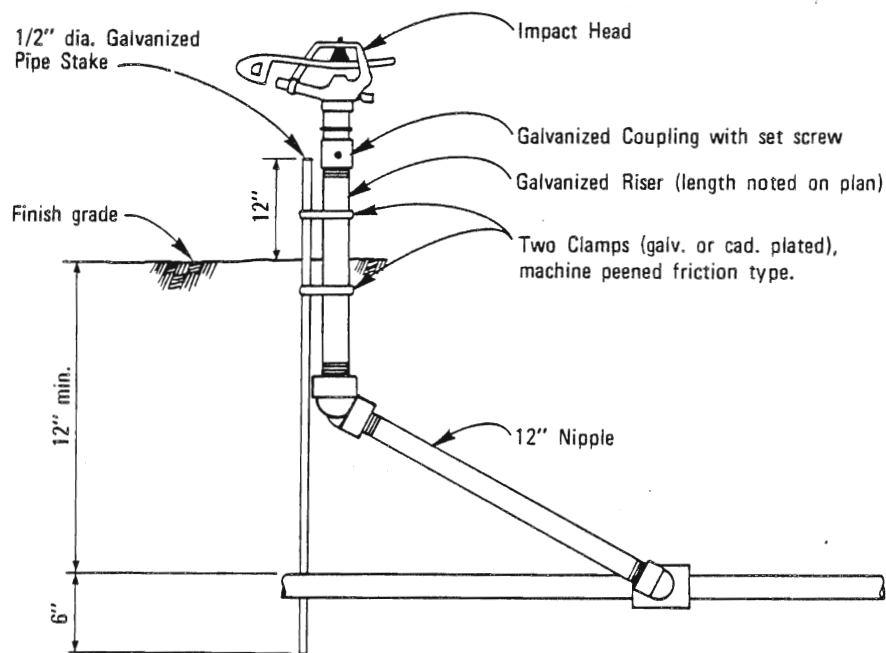
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Reference	TRP	M. B.	10-82			<i>Allan A. Kuehn</i>	<i>Dec. 1975</i>
				CONNECTION DETAIL FOR EXISTING SUPPLY MAINS		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	1-29



PLAN



ELEVATION

NOTES

1. All fittings shall be P.V.C. Sch. 40 (except as noted).
2. All nipples shall be P.V.C. Sch. 80 (except as noted).
3. Teflon tape, 3/4" wide, shall be used on all threaded connections.
4. Short nipples shall not be used.

LEGEND ON PLANS

Show a number to indicate type head 

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

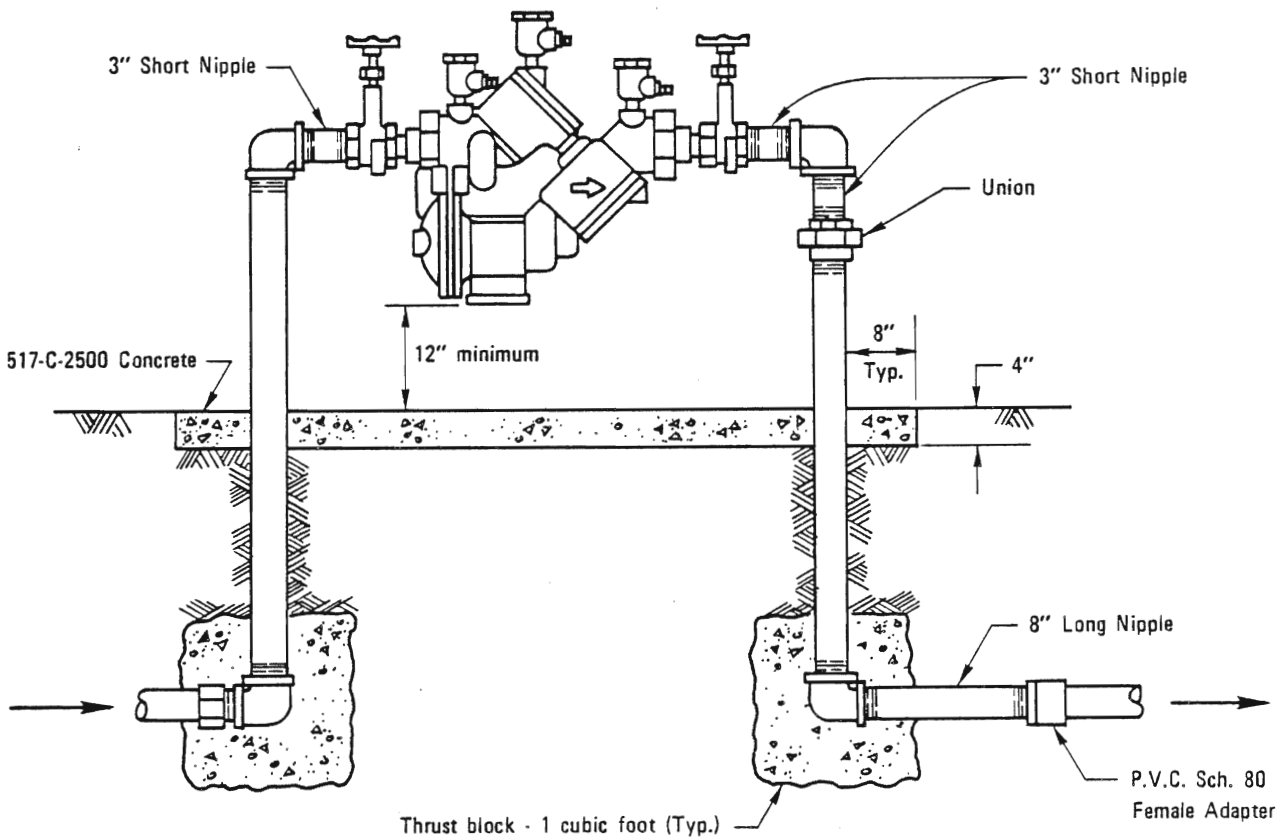
David J. Solomon July 1979
Coordinator R.C.E. 25291 Date

SAN DIEGO REGIONAL STANDARD DRAWING

IMPACT HEAD (WITH SWING JOINT)

DRAWING
NUMBER 1-30

Revision	By	Approved	Date



NOTES

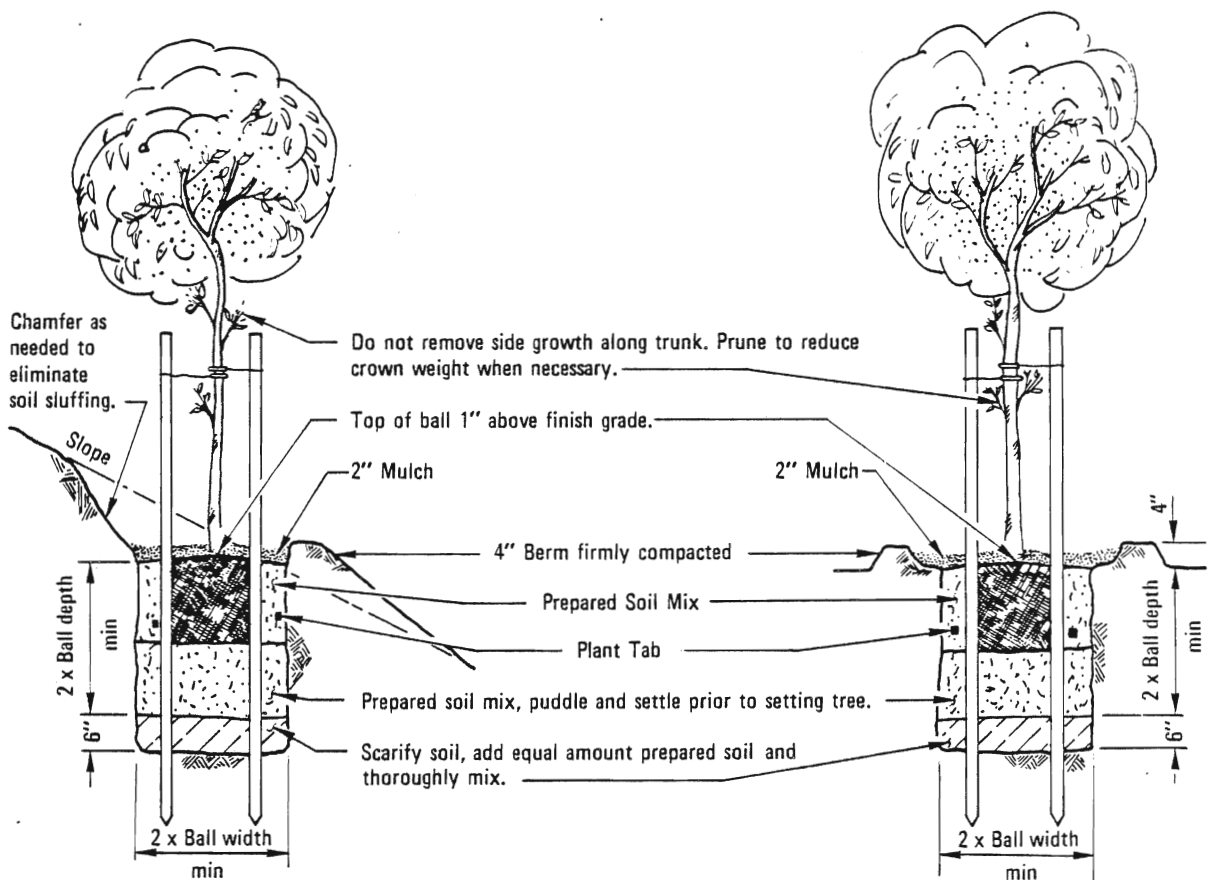
1. All risers, unions, elbows and nipples shall be red brass.
2. Close nipples shall not be used.
3. Backflow preventer assembly shall be tested upon installation by a certified backflow device tester. Contractor shall provide the Engineer with written test results completed by certified backflow tester prior to the backflow preventer assembly's acceptance by the Engineer.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE M. B. [Signature] 4-25-86 Coordinator R.C.E. C21133 Date
				BACKFLOW PREVENTER REDUCED PRESS. PRINCIPLE	DRAWING NUMBER 1-31

LANDSCAPING

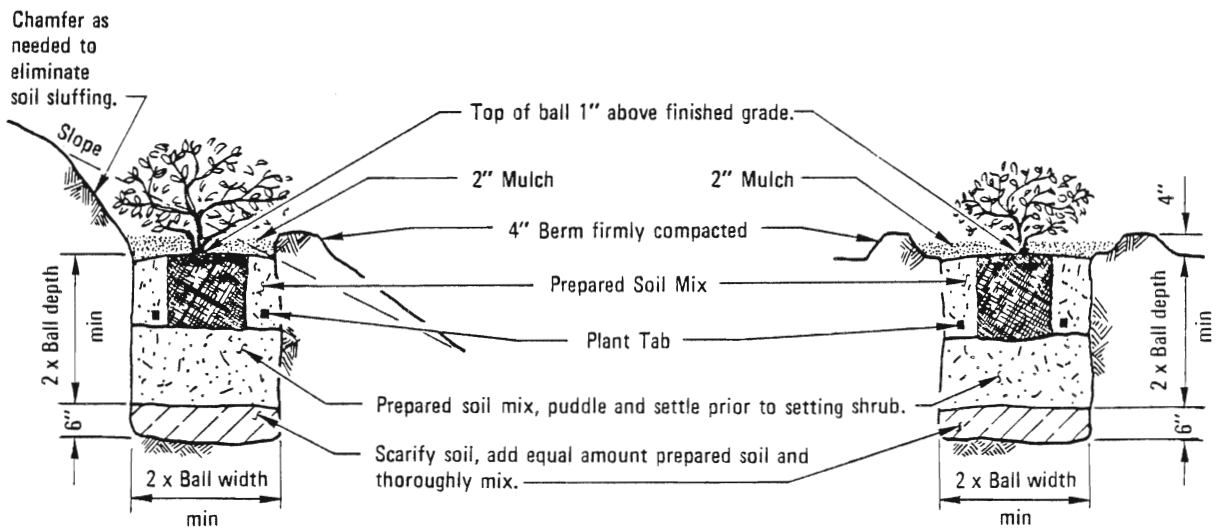
LANDSCAPING

L



TREE PLANTING - SLOPES

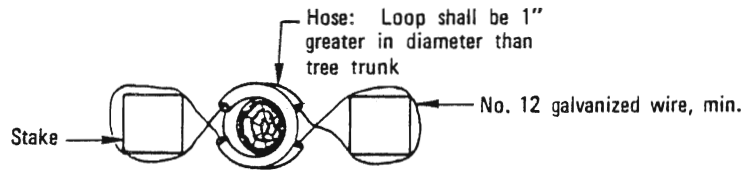
TREE PLANTING - LEVEL GROUND



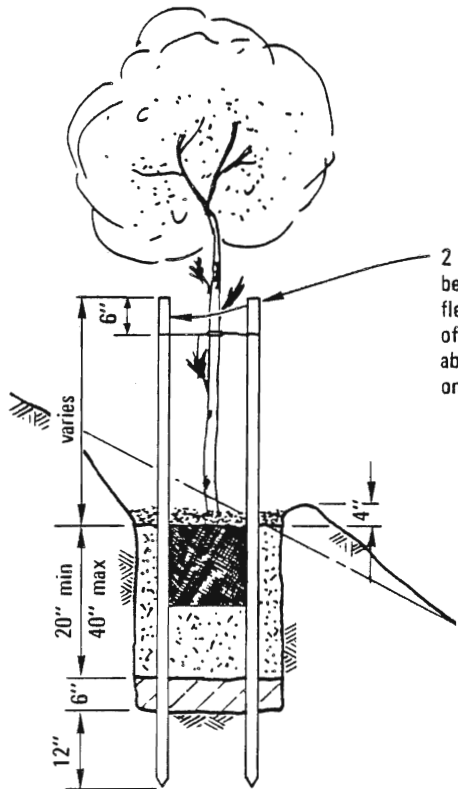
SHRUB PLANTING - SLOPES

SHRUB PLANTING - LEVEL GROUND

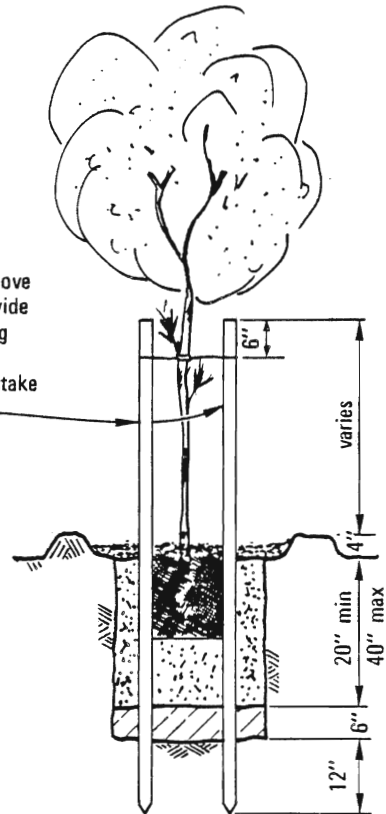
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allan A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
				TREE AND SHRUB PLANTING	DRAWING NUMBER L-1



PLAN



TREE STAKING - SLOPES



TREE STAKING - LEVEL GROUND

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Oliver A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

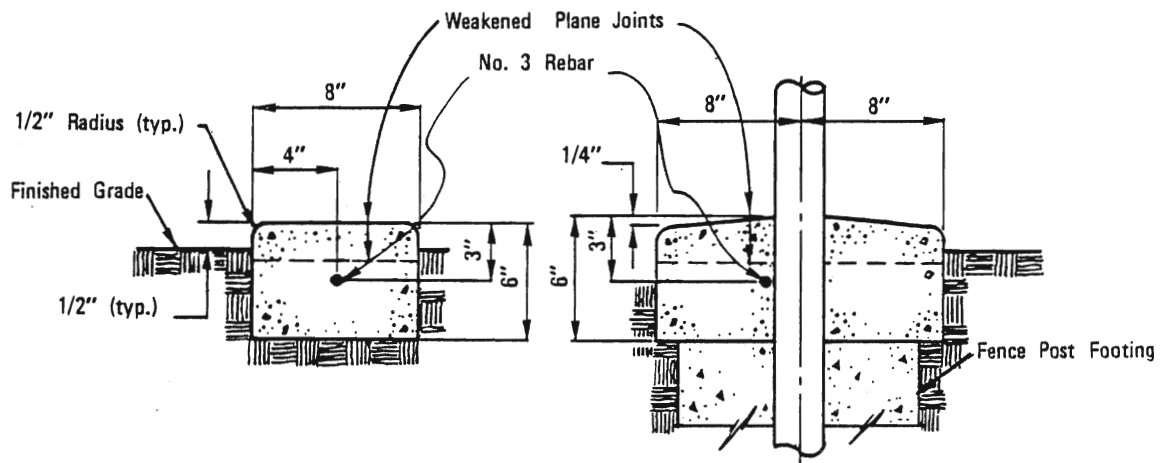
DRAWING
NUMBER

L-2

SAN DIEGO REGIONAL STANDARD DRAWING

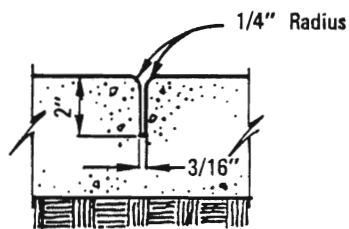
TREE STAKING

Revision	By	Approved	Date
Plan	RC	D.S.	7.79

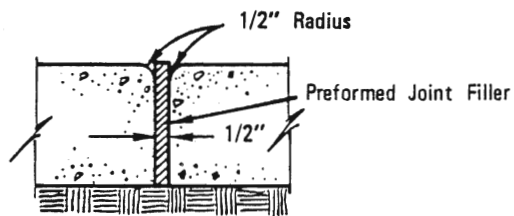


TYPE A
SHRUB AREAS

TYPE B
UNDER FENCES



WEAKENED PLANE JOINT
MAX. 20 FT. O. C.



EXPANSION JOINT
MAX. 120 FT. O. C.

NOTES:

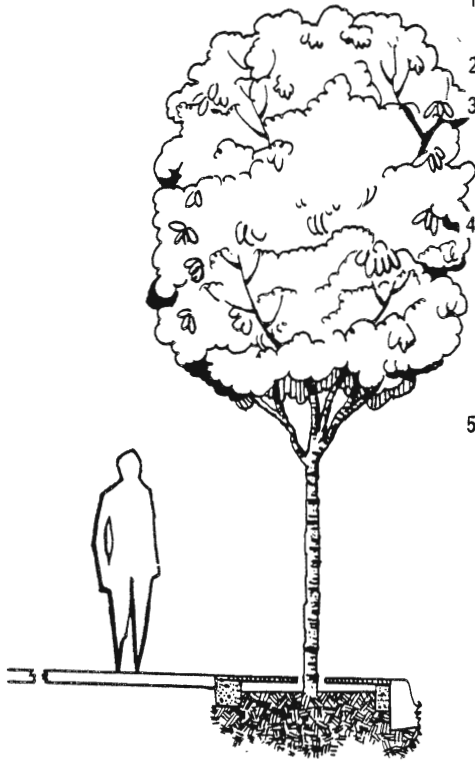
1. Rebar shall be continuous with 12 inch overlap at splices.
2. Concrete shall be class 520-C-2500 and same color as any adjacent concrete.
3. Install weakened plane joints at each fence post.
4. Install expansion joints where the mowing strip abuts any concrete improvement.

Revision	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Conc.	<i>M.B.</i>	5-86			
			CONCRETE MOWING STRIP		<i>Harry R. Holt</i> Oct 1982 Chairman A.C.E. C13768 Date
					DRAWING NUMBER L-3

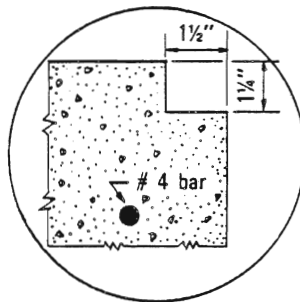
NOTES

1. The location and species of each tree shall have prior approval of the Agency.
2. Sidewalk to be removed for tree planting shall be saw-cut full depth.
3. Fill below grate with 3/4" x No. 4 clean crushed rock. If the grate is used for security, all bolts, nuts, and washers shall be hot dipped galvanized. All steel items shall be hot dipped galvanized after fabrication.
4. Grate shall be two separate pieces, 2' x 4' in size, with the following exception: where outside face of basement walls are 4' 0" from curb line, one piece of grate (not adjacent to curb) shall be 1' 4" x 4'. The grating bearing bars shall be 1-1/4" x 3/16" minimum and 1/2" O.C. maximum; cross bearing bars (round, hexagonal and/or square) shall be 3/8" minimum size and shall not exceed 6" O.C., welded to each bearing bar.
5. Immediate notification shall be given to the engineer of any below grade improvements encountered.

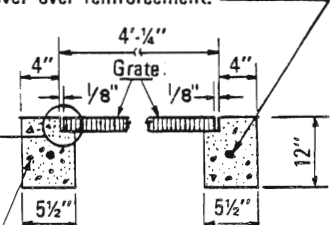
4 - Reinforcing bars on four sides, lap 15" at corners, 2 1/2" min. concrete cover over reinforcement.



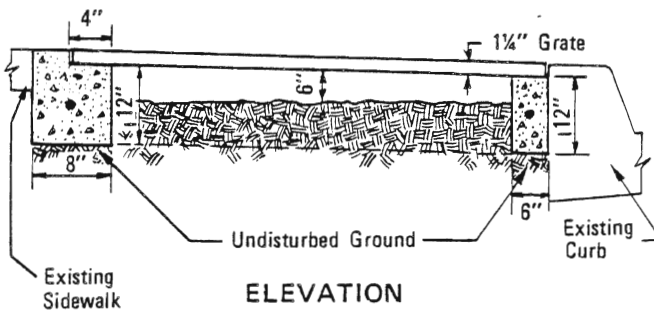
TREE SIZE



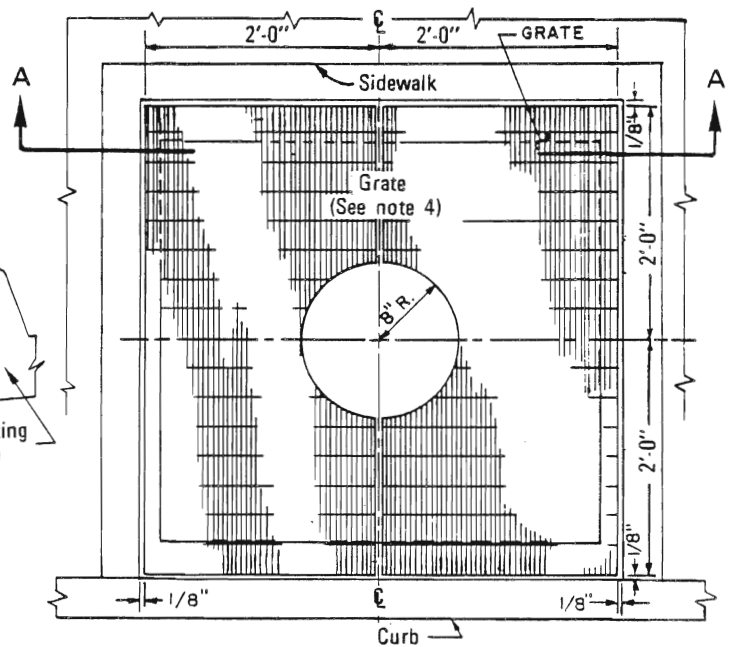
Class
525-C-2500
Concrete



SECTION A-A



ELEVATION



PLAN

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

M. B. ... 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER L-4

SAN DIEGO REGIONAL STANDARD DRAWING

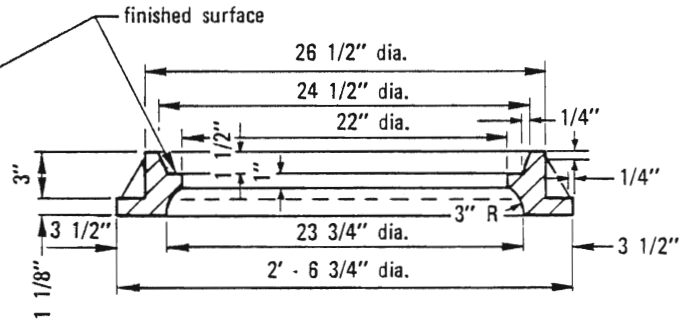
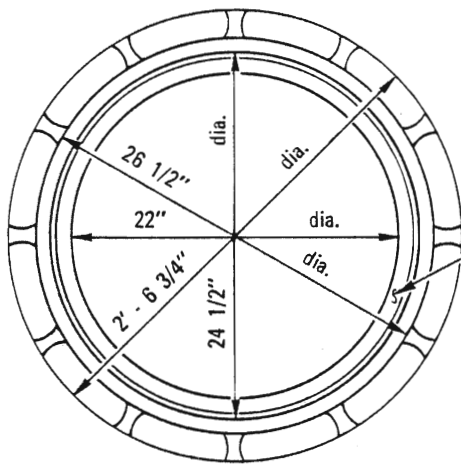
STEEL GRATE
TREE WELL COVER

Revision	By	Approved	Date

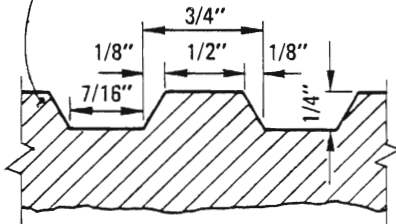
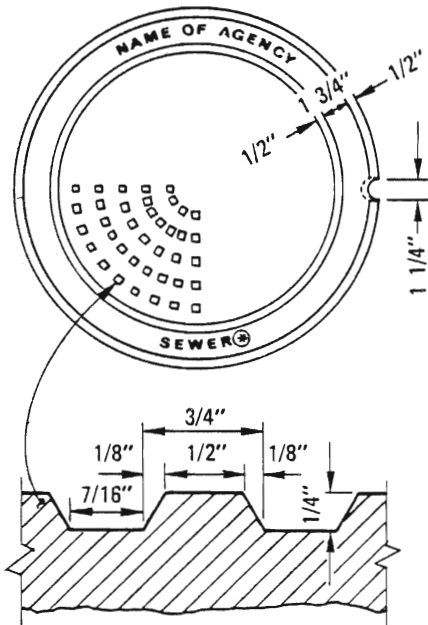
MISCELLANEOUS

M

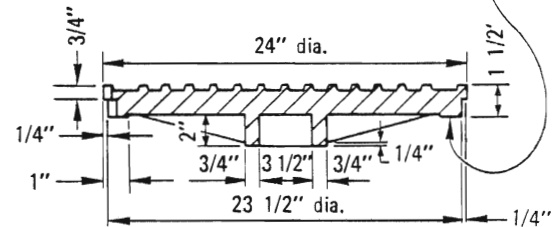
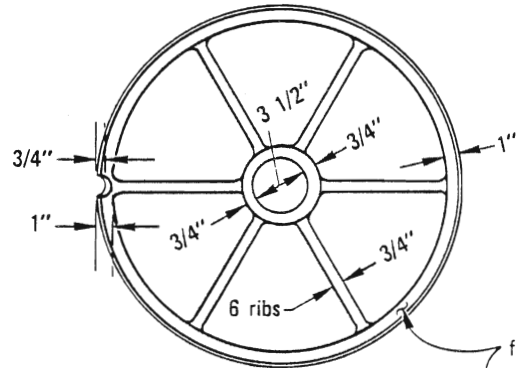
MISCELLANEOUS



MANHOLE COVER FRAME
CAST IRON WT. 175 LB.



DETAIL



finished surface

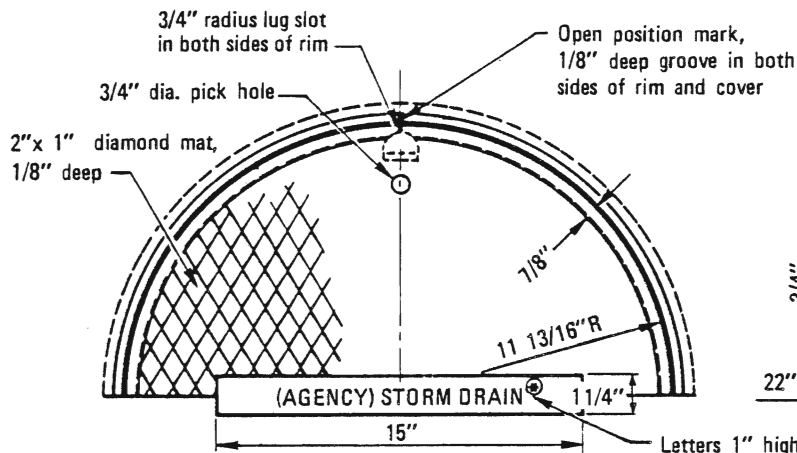
MANHOLE COVER
CAST IRON WT. 155 LB.

NOTES

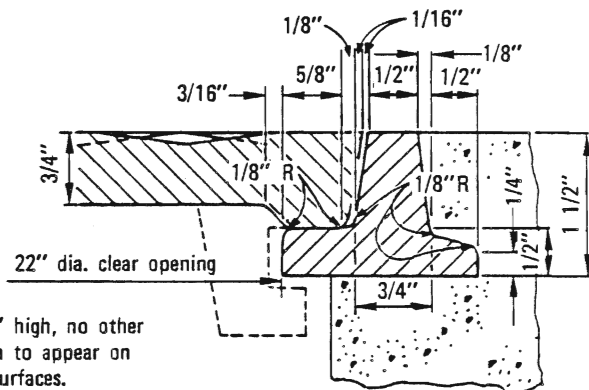
1. Frame and cover shall be cast iron.
2. Weights: Frame 175 lbs.
Cover 155 lbs.

FOR	MARK
Sewer Projects	Sewer
Storm Drain Projects	Storm Drain
Water Projects	Water

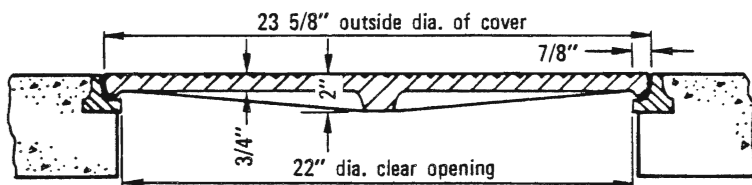
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				24" MANHOLE FRAME AND COVER HEAVY DUTY		<i>Allan A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER M-1	



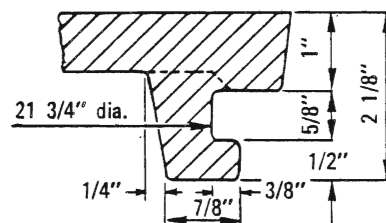
TOP OF FRAME & COVER



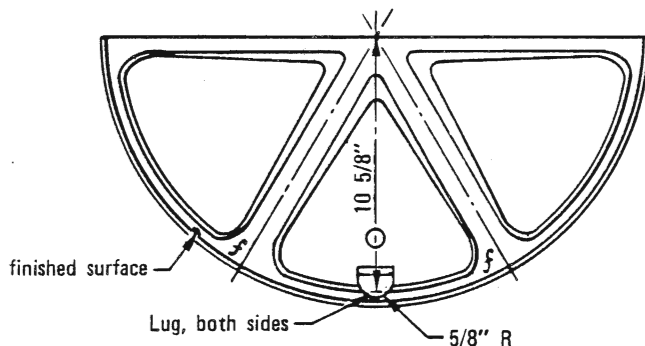
SECTION THROUGH RIM



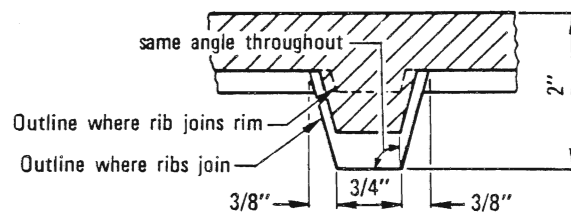
SECTION THROUGH FRAME & COVER



SECTION THROUGH LUG



BOTTOM OF COVER



SECTION THROUGH RIB AT MID RADIUS

NOTES

1. Frame and cover shall be cast iron.
2. Frame and cover for use in non-traffic area only.
3. Weights: Frame 30 lbs
Cover 100 lbs

FOR	MARK
Sewer Projects	Sewer
Storm Drain Projects	Storm Drain
Water Projects	Water

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Allen A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

24" MANHOLE FRAME AND COVER LIGHT DUTY

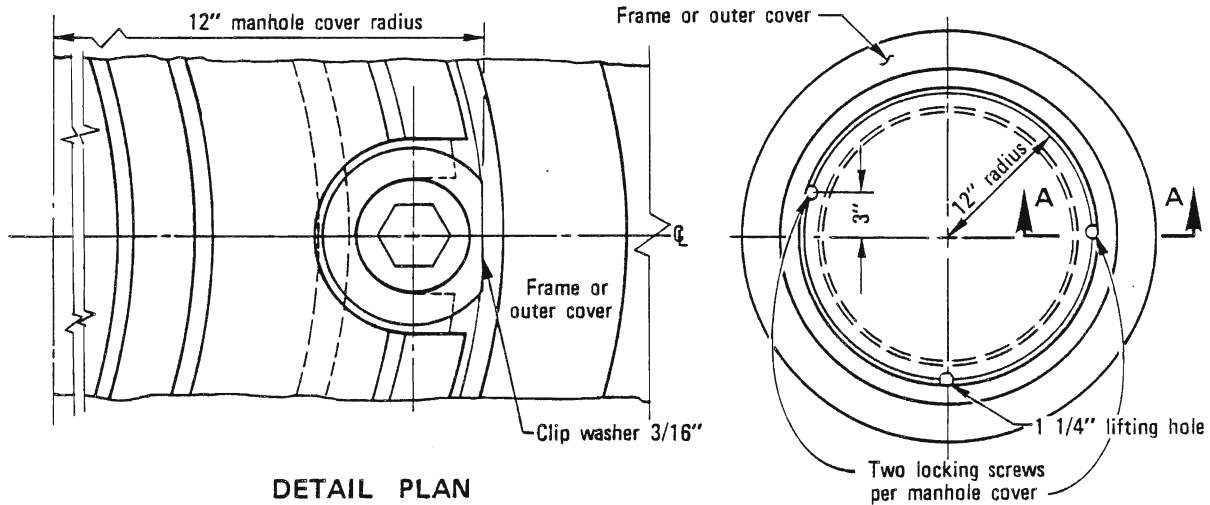
DRAWING
NUMBER **M-2**

Revision	By	Approved	Date



- ## DETAIL

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 36" MANHOLE FRAME AND TWO CONCENTRIC COVERS HEAVY DUTY	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allen B. Kershner</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
					DRAWING NUMBER M-3

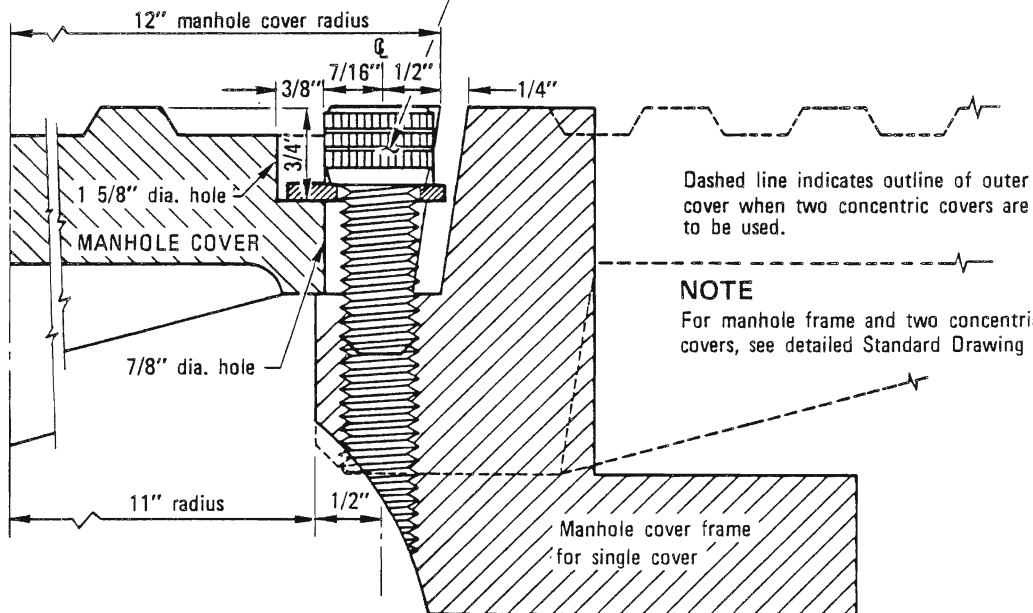


Drill and tap hole, install 5/8"x 1 1/2" stainless steel, hexagonal socket head cap screw (2 required), Unified National Coarse Thread - 11 per inch -- with 1 1/2" O.D. x 11/16" I.D. x .078" thick stainless steel washer.

Use 18-8 stainless steel, A.S.T.M. Standard Specification A-276, Type 300 series.

NOTE

For manhole frame and cover details, see Standard Drawing M-1 (single cover).



NOTE

For manhole frame and two concentric covers, see detailed Standard Drawing M-3.

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

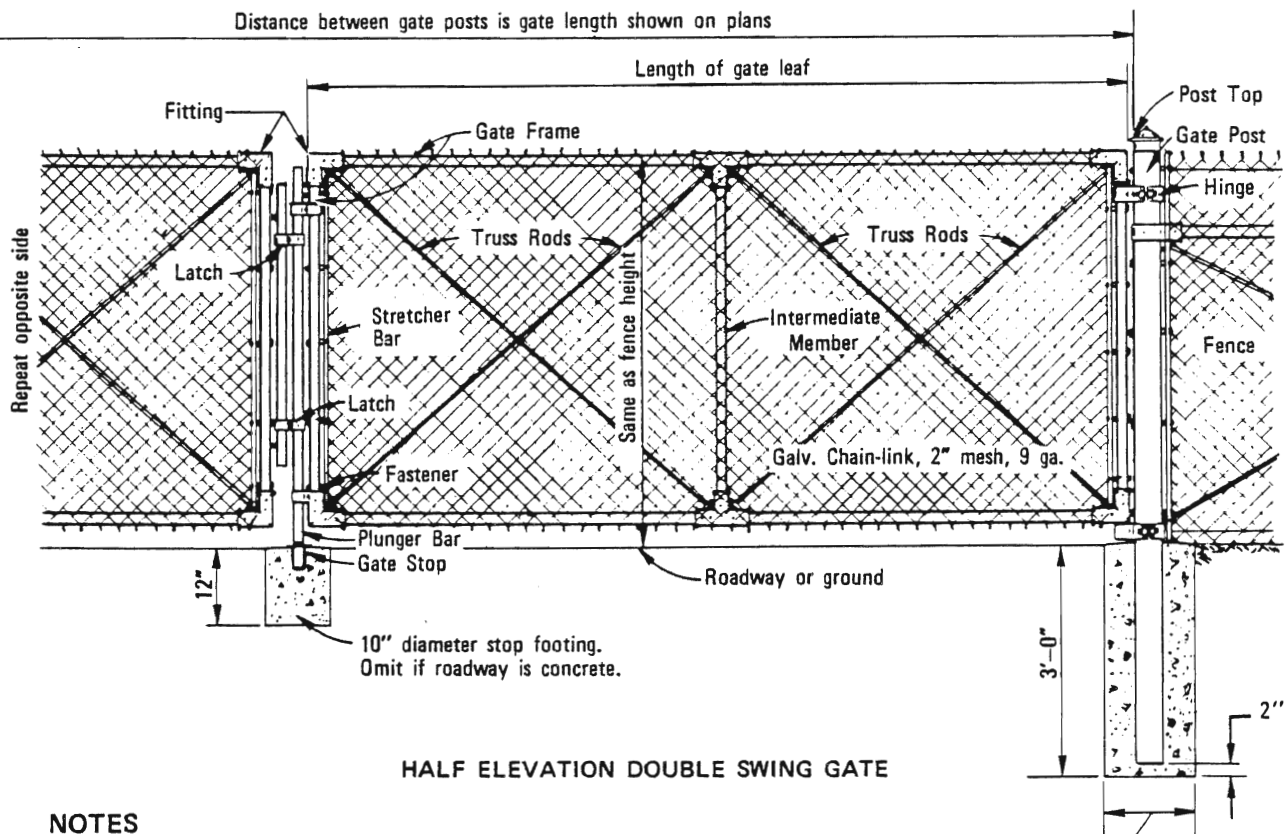
SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE COVER LOCKING DEVICE

Revision	By	Approved	Date

DRAWING
NUMBER

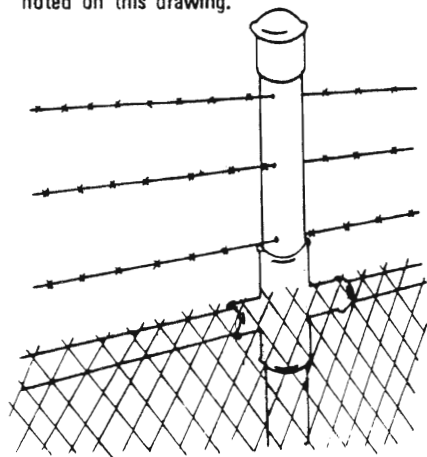
M-4



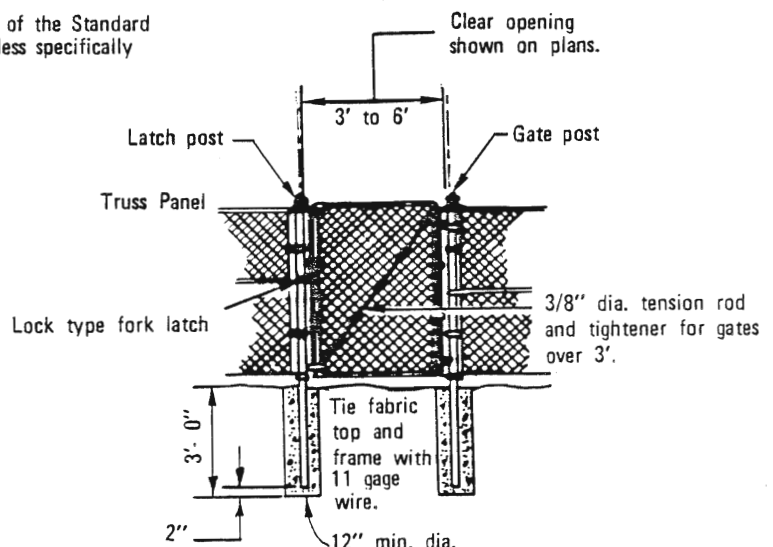
NOTES

- All footings shall be 520-C-2500 concrete.
- The following items shall be furnished and installed only when shown on the plans and/or called for in the special provisions:
 - Barbed wire
 - Extension post
- Chain link fence shall conform to Section 206-6 of the Standard Specifications for Public Works Construction unless specifically noted on this drawing.

Diameter of footing = 4 times outside diameter of post.



EXTENSION POST AND BARBED WIRE



WALK GATE

LEGEND ON PLANS



Revision	By	Approved	Date
Walk gate	TRA	M.B.	10-82
Conc.	L	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

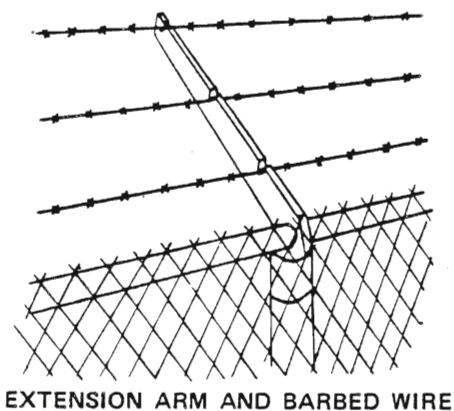
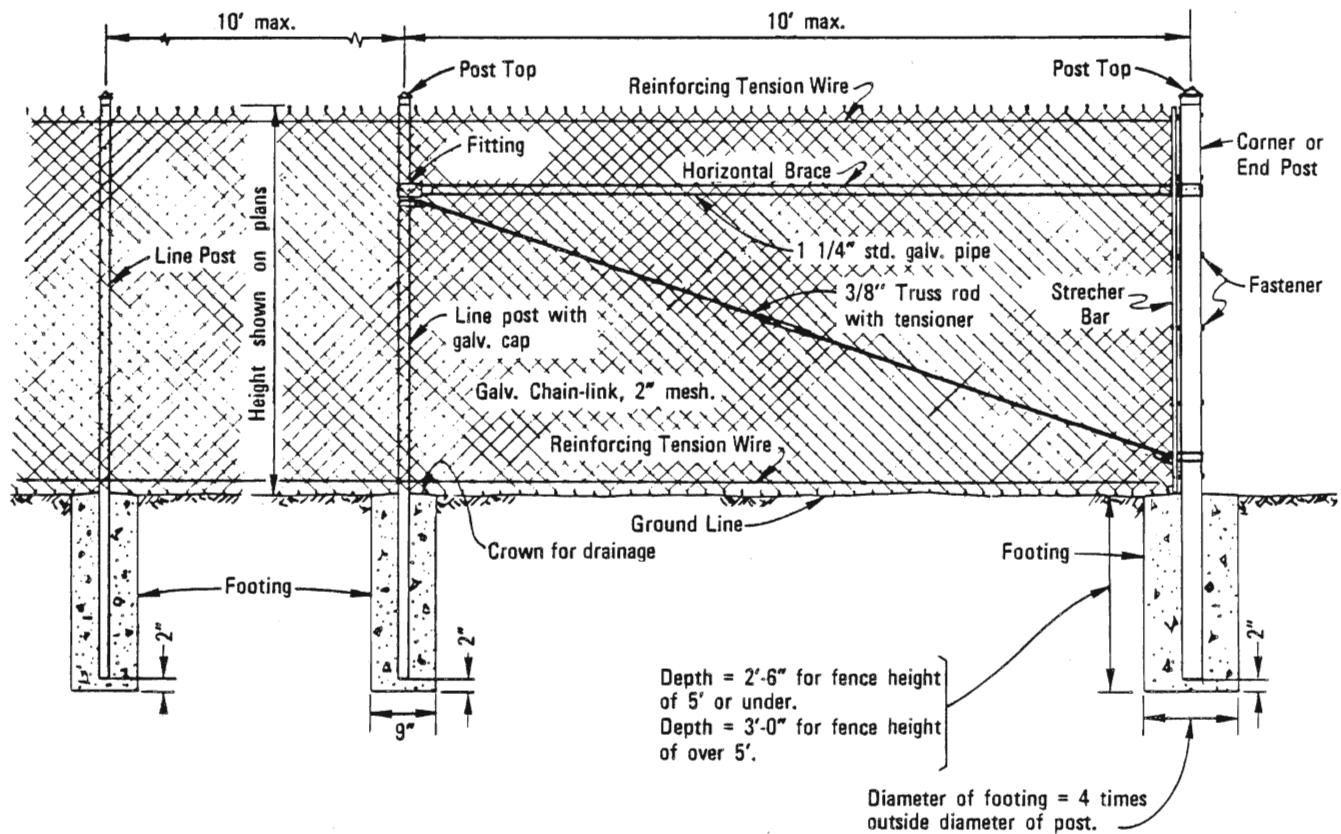
CHAIN LINK GATE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Coordinator R.C.E. 19807 Date Dec. 1975

DRAWING NUMBER

M-5



NOTES

1. All footings shall be 520-C-2500 concrete.
2. The following items shall be furnished and installed only when shown on the plans and/or called for in the special provisions:
 - a. Barbed Wire
 - b. Extension Arm
 - c. Top Horizontal Rail
3. Chain link fence shall conform to Section 206-6 of the Standard Specifications for Public Works Construction unless specifically noted on this drawing.
4. See Standard Drawing M-23 for additional details.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Keshner Dec. 1975
Coordinator R.C.E. 19807 Date

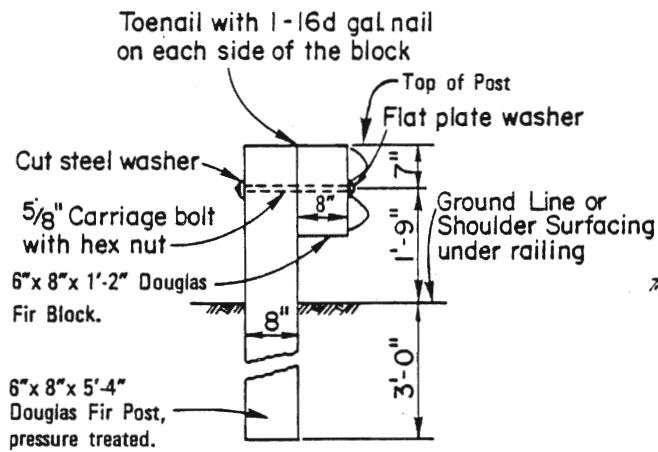
DRAWING
NUMBER

M-6

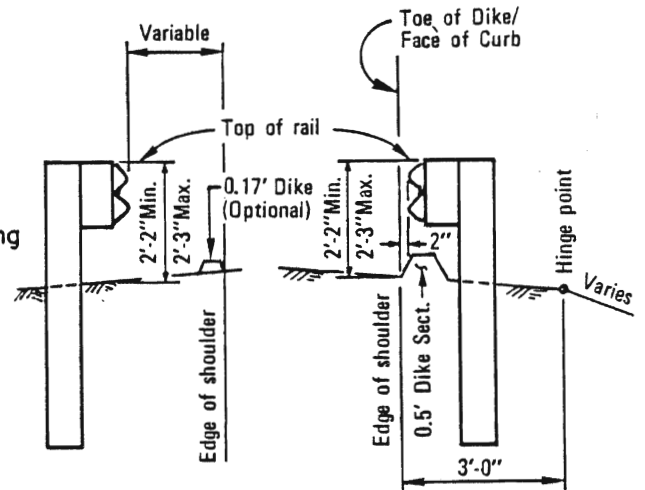
SAN DIEGO REGIONAL STANDARD DRAWING

CHAIN LINK FENCE

Revision	By	Approved	Date
Note 3	TRP	M.B.	10-82
Notes	R	M.B.	5-86



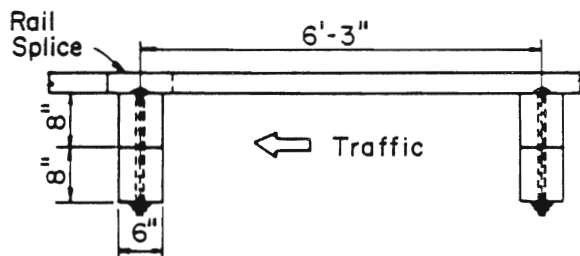
SECTION AT SUPPORT



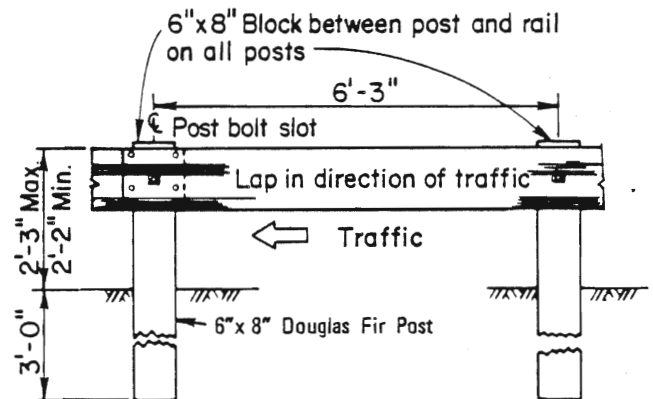
SECTION WITH / WITHOUT DIKE

Post spacing 6'-3" C. to C.

LINE POSTS



PLAN

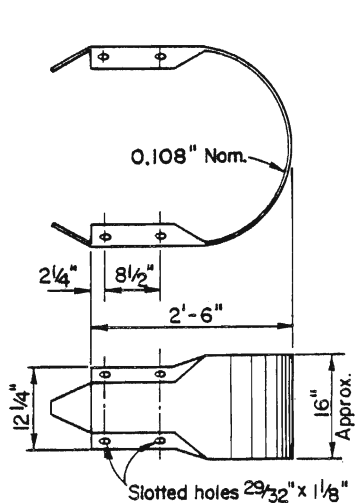


ELEVATION

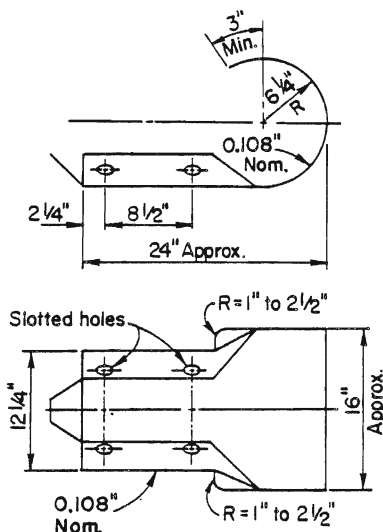
NOTE

See Standard Drawing M-8 for additional details.

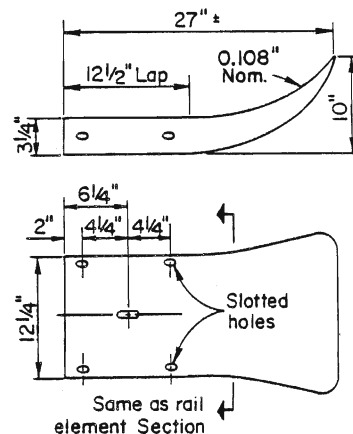
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Sections	Q	M.B.	5-86			Allen G. Kuchel	Dec. 1975
				METAL BEAM GUARD RAIL INSTALLATION		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	M-7



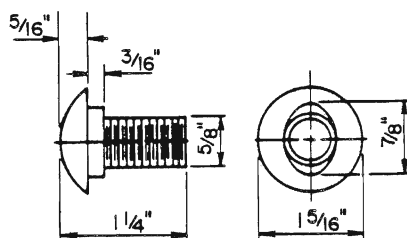
RETURN SECTION



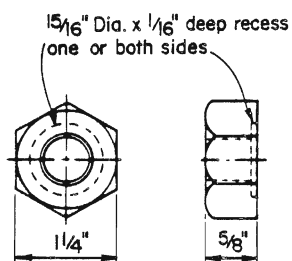
**TERMINAL SECTION
TYPE "A"**



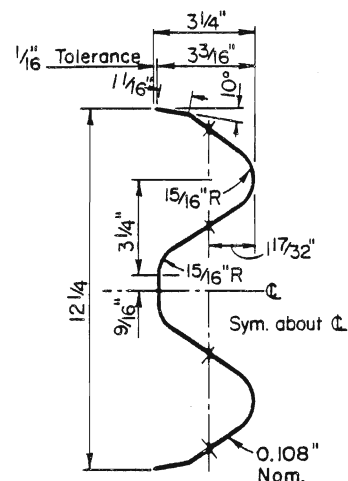
**TERMINAL SECTION
TYPE "B"**



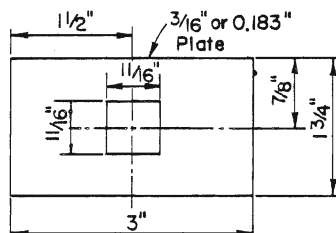
5/8" Ø BUTTON HEAD BOLT



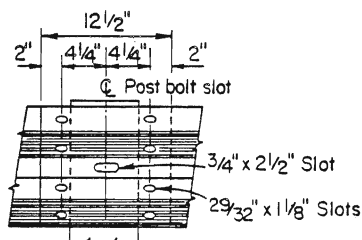
5/8" Ø RECESS NUT



**SECTION THRU
RAIL ELEMENT**



FLAT PLATE WASHER



5/8" x 1 1/4" Button head oval shoulder bolts with 1 1/4" recessed hex nuts - Total: 8 per splice and 4 per terminal section
Lap in direction of traffic.

RAIL SPLICE

NOTES

1. See Standard Drawing M-7 for guard rail installation.
2. All metal elements shall be galvanized.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

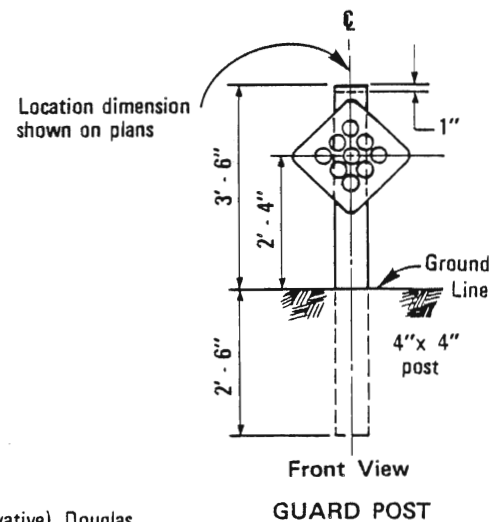
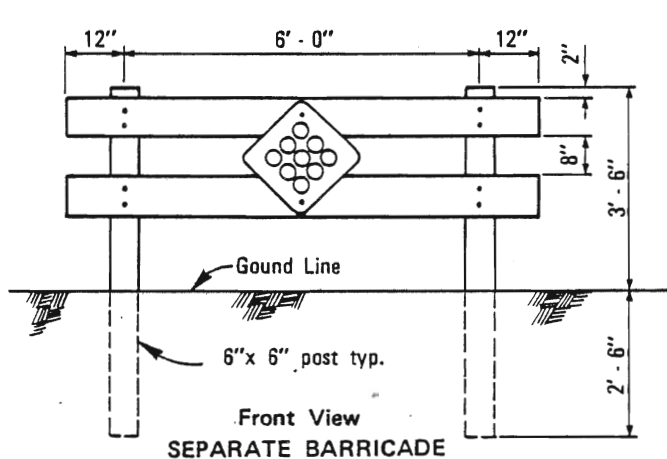
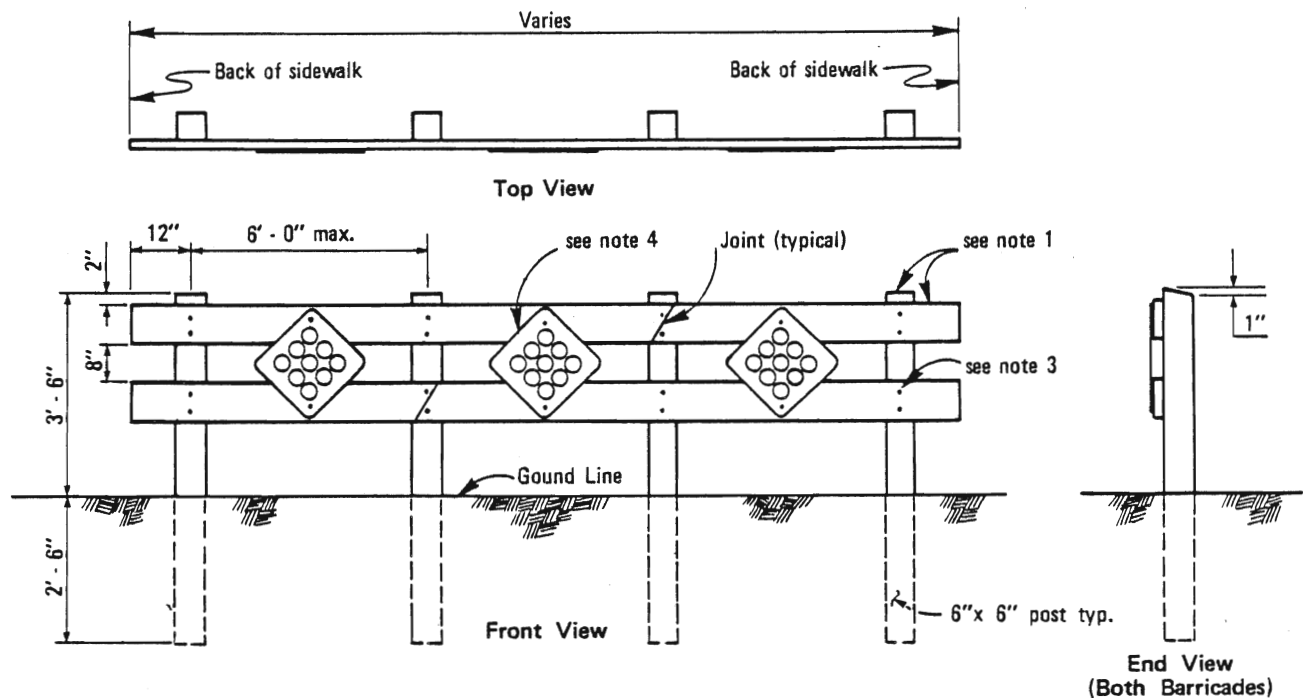
Oliver A. Kuehn Dec. 1975
Coordinator R.C.E. 15807 Date

DRAWING
NUMBER **M-8**

SAN DIEGO REGIONAL STANDARD DRAWING

**METAL BEAM GUARD RAIL
DETAILS**

Revision	By	Approved	Date



NOTES

1. Posts to be structural grade redwood or pressure treated (with wood preservative) Douglas Fir, surfaced four sides; cross pieces to be 2"x 8" select grade Douglas Fir, surfaced four sides.
2. All exposed portions of barricades shall be painted with two coats of white exterior enamel over prime coat.
3. Connections shall be made with 3/8"x 6" galvanized lag screws with one (1) washer each. Reflector sign fasteners to be 3/8"x 1 1/2" galvanized lag screws.
4. Reflector signs - California Type N. Size 18"x 18" - Yellow with nine (9) - 3/4" reflectors (center mount).
 - a. Reflectors shall be red for use on dead end streets, in all other cases they shall be yellow. Reflector material shall be plastic or other approved reflectorized material.
 - b. Sign material shall be aluminum alloy 6061-T6 or 5052-H38, aluminum thickness 0.063 inches.
5. Six foot long hat section metal post per Caltrans Std. Plan A74-A optional for guard post.

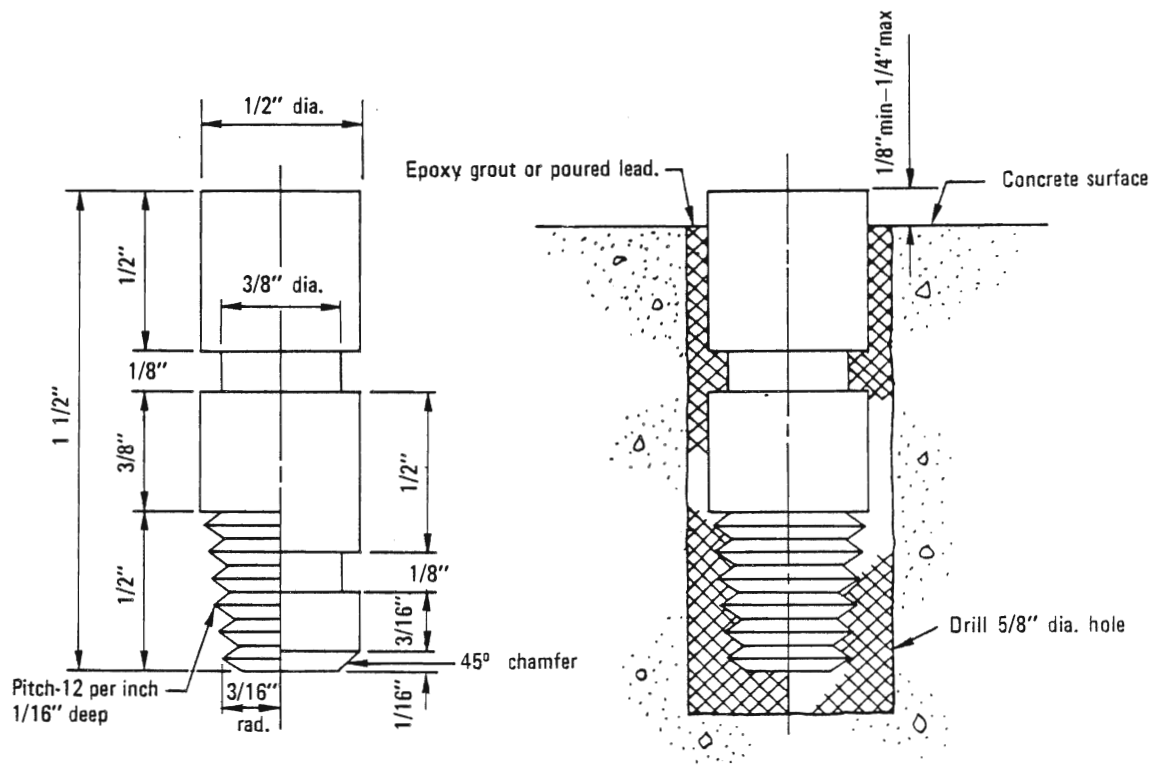
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Cont. Barric.	<i>D.S.</i>	<i>D.S.</i>	7-79			<i>Allen P. Kuehn</i>	<i>Dec. 1975</i>
Post	<i>TRP</i>	<i>M.B.</i>	10-82	GUARD POST AND BARRICADE		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	M-9

LOCATION OF STREET
SURVEY MONUMENT

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allen D. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	SAN DIEGO REGIONAL STANDARD DRAWING		Revision	By	Approved	Date
	STREET SURVEY MONUMENT		Notes	<i>JK</i>	<i>D.S.</i>	<i>7-79</i>
			Section	<i>SK</i>	<i>M.D.</i>	<i>5-86</i>
DRAWING NUMBER M-10						



TYPE-A TYPE-B

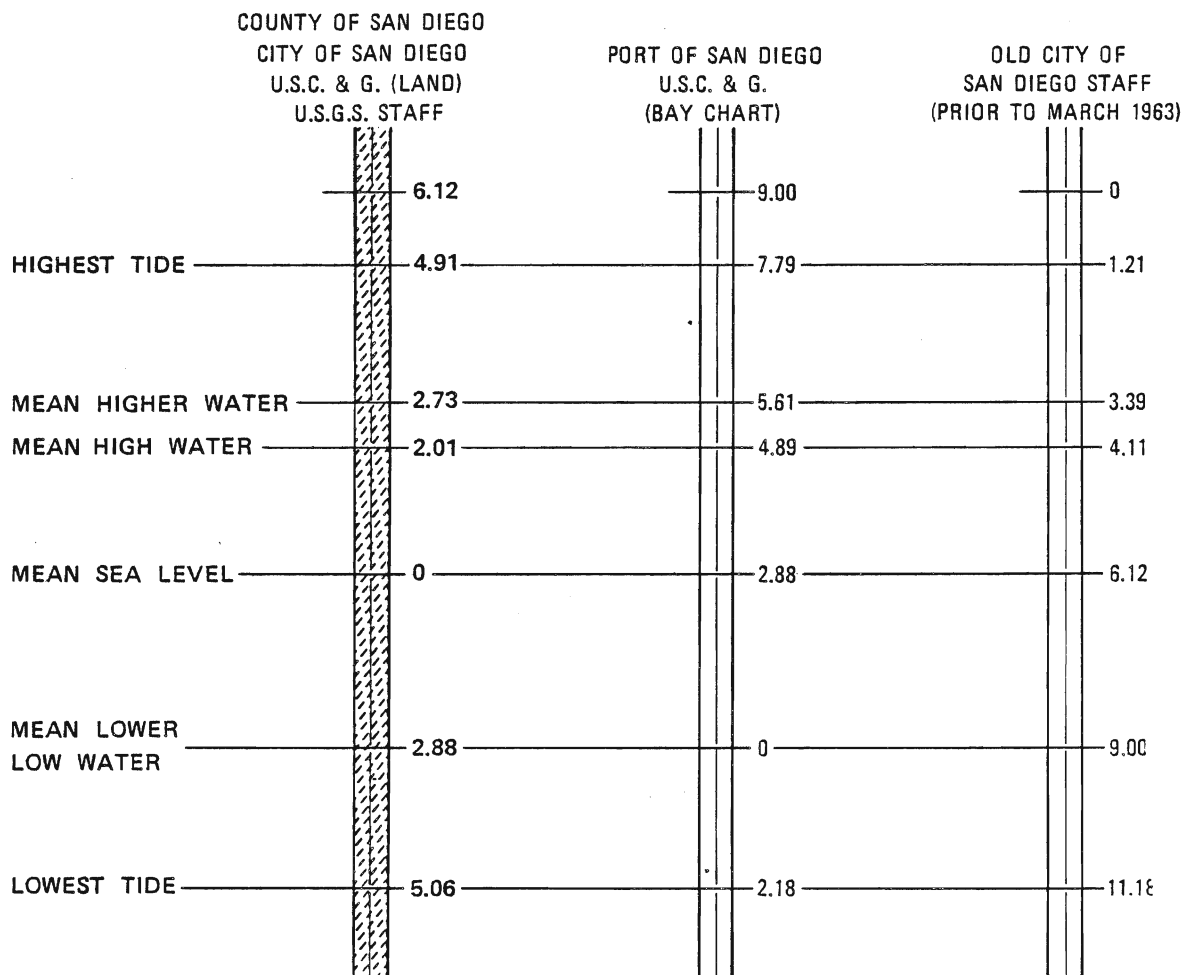
ELEVATION

INSTALLATION IN EXISTING CONCRETE
(Typical for Type A or B)

NOTES

1. Material - Brass A.S.T.M. B-16. All machine tolerances $1/64"$ ±, machine finish.
2. May be installed in fresh concrete at time of installation of concrete structure.
3. Location—in most stable, permanent location in vicinity, such as in base for street light standard or traffic signal (behind sidewalk), in curb (not near joint, on curve or near trees), on top of drainage headwall, in foundation for building or retaining wall or in concrete pads for transformers, pump stations etc.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
				BENCH MARK - BRASS PLUG	
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				<i>Allan A. Keck</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
				DRAWING NUMBER M-11	



LEGEND

U.S.C. & G.

U.S.G.S.

MEAN HIGH WATER

MEAN HIGHER WATER

= United States Coast and Geodetic Survey.

= United States Geological Survey.

= Mean of all high water in San Diego Bay.

= Mean of all higher water in San Diego Bay.
Bay charts and topography up to the mean
high tide based on zero at the mean lower
low water.

SOURCE

Data based on U.S.C. & G. "Sea Level Datum of 1929".

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kerschbaum *DEC. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

DATUMS

DRAWING
NUMBER

M-12

Revision	By	Approved	Date

FOUND MONUMENTS

Found monuments must denote the character of the monument, how it is identified and the record, or no record as applicable.

SET MONUMENTS - Criteria for Locating and Character

On subdivision boundaries, permanent monuments are required; and must be shown on the map at intervals as specified by the local agency. The location of such points that are unacceptable or will be destroyed by construction may be established by ties to permanent reference monuments shown on the final map.

A permanent monument shall be no less substantial than the following:

a. An iron pipe of minimum two inch diameter not less than two feet in length placed upright in the ground so that the top of said pipe is flush with the surface. Said pipe shall be filled with a metal or cement plug at least three inches in depth and centered with a metal tack and disc; or

b. A metal plug with tack and disc set flush with the surface in portland cement concrete sidewalk, curb or pavement; or other monument satisfactory to the City Engineer or County Surveyor.

Lot corners and points of curves along street and alley right of way lines where portland cement concrete sidewalks, curbs or pavement exist, or will be constructed as part of the subdivision requirements, shall be identified with tack and disc set flush with the surface along an extension of the lot line at an approved offset, to be measured radially or at right angles to the right of way line in said sidewalk, curb or pavement. In case the sideline of the lot is not radial or at right angles to the right of way line a disc shall be set along an extension of the sideline at an offset to be measured radially or at right angles to the right of way line. Where no such concrete work exists, and none will be required to be constructed, all lot corners, angle points and points of curve shall be marked with a monument no less substantial than a one-half inch steel rod or pipe, 18 inches long, set flush with the surface.

LEGEND

-  Fd 2" Iron Pipe Marked RCE XXXX or per Map XXX unless otherwise noted
-  Fd Street Survey Monument Stamped RCE XXXX or LS XXXX
-  Set 2" x 24" Iron Pipe Marked RCE XXXX or LS XXXX
-  Set Lead and Disc Stamped RCE XXXX or LS XXXX
-  Set 1/2" x 18" Iron Pipe Marked RCE XXXX or LS XXXX
-  Set Street Survey Monument Stamped RCE XXXX or LS XXXX per Standard Drawing M-10

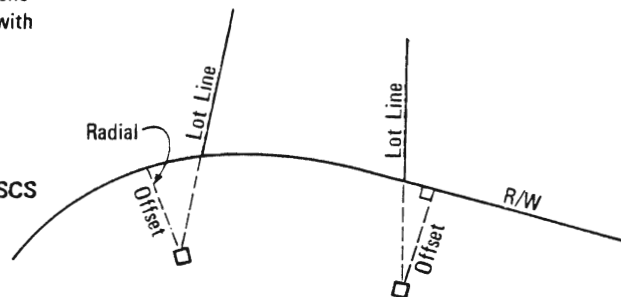
The addition of other symbols is permissible where such will result in a clearer map.

The following notes should be used in the legend where applicable.

Unless otherwise shown on this map:

1. All lot corners except as described below will be monumented by a 1/2 inch by 18 inch iron pin stamped (RCE or LS number).
2. Lot corners along the sideline of dedicated street right of way will be monumented by a disc stamped (RCE or LS number), set along an extension of the lot line at an offset of ___ in the (curb, sidewalk). The offset shall be measured radially, or at right angles, to the right of way line. (See example below.)
3. All points of curve of the sidelines of dedicated streets will be monumented by a disc stamped (RCE or LS number), set at an offset of ___ in the (curb, sidewalk). The offset shall be measured radially.

EXAMPLE OF OFFSET DISCS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING SURVEY MONUMENTS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allard A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
Notes	SC	D.S.	7-79		
DRAWING NUMBER M-13					

1 Gram = 15.4324 grains
 1 Gram = 0.0353 oz.
 1 Kg. = 2.2046 lb.
 1 Kg. = 0.0011 ton
 1 Ton (met) = 1.1023 ton

WEIGHT

1 Grain = 0.0648 g.
 1 Ounce = 28.3495 g.
 1 Pound = 0.4536 kg.
 1 Ton = 907.1848 kg.
 1 Ton = 0.9072 ton (met)

1 Sq. cm. = 0.1550 sq. in.
 1 Sq. m. = 10.7639 sq. ft.
 1 Sq. m. = 1.1960 sq. yd.
 1 Hectare = 2.4710 acres
 1 Sq. km. = 0.3861 sq. mile
 1 Sq. km. = 247.10 acres

AREA

1 Sq. in. = 6.4516 sq. cm.
 1 Sq. ft. = 0.0929 sq. m.
 1 Sq. yd. = 0.8361 sq. m.
 1 Acre = 0.4047 hectare
 1 Sq. mile = 2.5900 sq. km.
 1 Acre = 0.0040 sq. km.

1 Cu. cm. = 0.0610 cu. in.
 1 Cu. m. = 35.3134 cu. ft.
 1 Cu. m. = 1.3079 cu. yd.

VOLUME

1 Cu. in. = 16.3872 cu. cm.
 1 Cu. ft. = 0.0283 cu. m.
 1 Cu. yd. = 0.7646 cu. m.

1 Liter = 61.0250 cu. in.
 1 Liter = 0.0353 cu. ft.
 1 Liter = 0.2642 gal. (U.S.)
 1 Liter = 0.0284 bu. (U.S.)

CAPACITY

1 Cu. in. = 0.0164 liter
 1 Cu. ft. = 28.3162 liters
 1 Gal. = 3.7853 liters
 1 Bu. = 35.2383 liters

1 MM. = 0.0394 in.
 1 CM. = 0.3937 in.
 1 Meter = 3.2808 ft.
 1 Meter = 1.0936 yd.
 1 Km. = 0.6214 mile

LENGTH

1 In. = 25.4000 mm.
 1 In. = 2.5400 cm.
 1 Ft. = 0.3048 m.
 1 Yd. = 0.9144 m.
 1 Mile = 1.6093 km.

MULTIPLE PREFIX
 1000000 mega
 1000 kilo
 100 hecto
 10 deka

METRIC PREFIX

MULTIPLE PREFIX
 1/10 deci
 1/100 centi
 1/1000 milli
 1/1000000 micro

TEMPERATURE

Degrees Fahrenheit = $9/5$ (Degrees Celcius) + 32

Degrees Centigrade = $5/9$ (Degrees Fahrenheit - 32)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

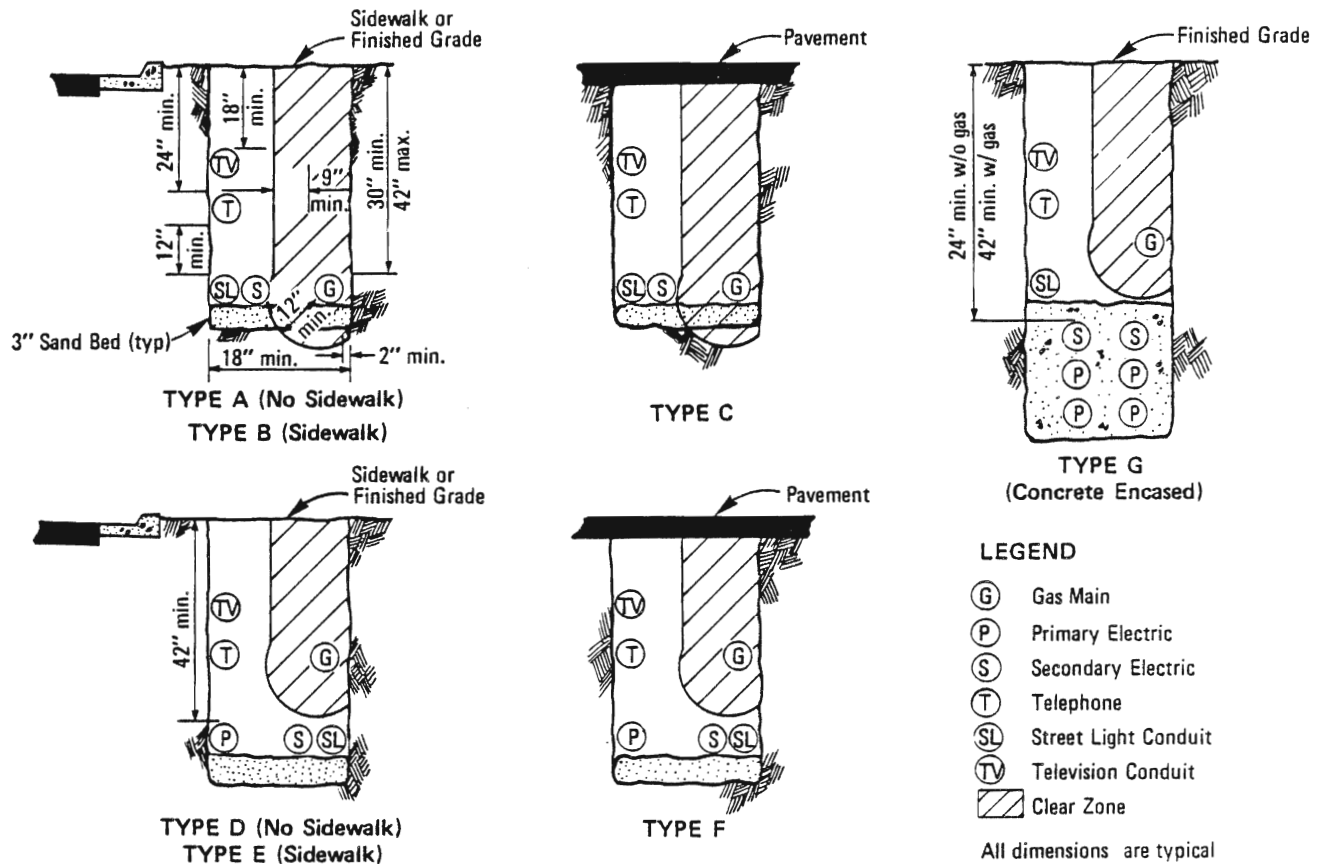
DRAWING
NUMBER

M-14

SAN DIEGO REGIONAL STANDARD DRAWING

METRIC EQUIVALENTS

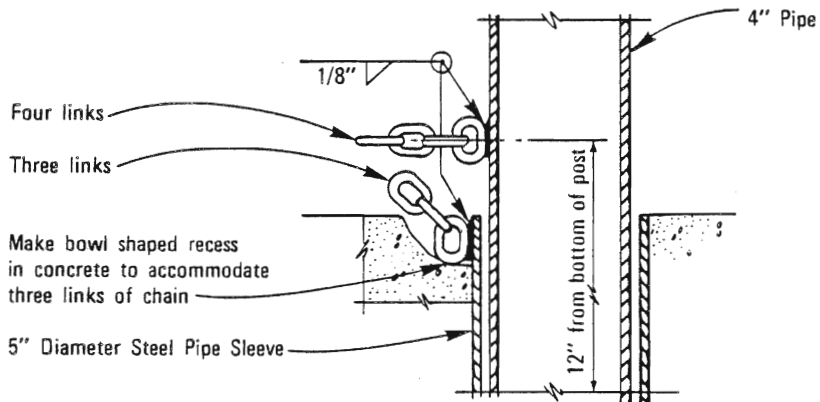
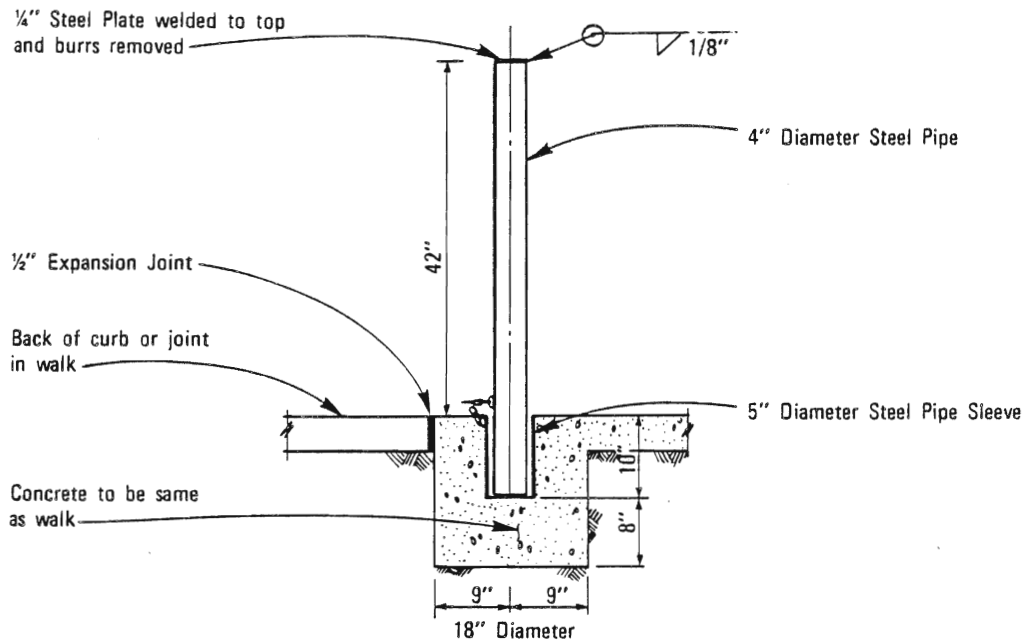
Revision	By	Approved	Date
Equation	<i>JK</i>	<i>D.J.</i>	<i>7-79</i>



NOTES

- Generally utilities are to be installed under the applicable specifications for the particular utility and the specifications of the owner Agency.
- The location of utilities as shown by the Standard Drawing shall in no way violate existing codes or regulations applicable to individual utilities.
- Gas main to be placed on property side of trench. Electric primary should be diagonally opposite gas main where possible (Types D, E and F).
- Installation of sewer and/or water utilities are not permitted in the joint trench shown above.
- Minimum depth of gas pipe may, subject to gas company inspectors approval, be reduced to 24" where necessary to clear foreign structure crossings.
- Depth and width of trench varies.
- When approved by all utilities concerned secondary electric, telephone and CATV may be concurrently installed with random separation.
- CATV main or trunk line conduit required along all streets, except cul-de-sac streets less than 2500' in length which may be served by feeder lines only.
- CATV 1½" feeder conduit shall run across streets with each power service line and capped at edge of sidewalk.
- 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.
- 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.
- CATV conduit may be placed with the TELCO conduit provided the TELCO minimum depth is held.
- Types A, B and C apply when an electric secondary conduit only is used. Types D, E and F apply when an electric primary (and secondary) conduit is used.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
St. Light	SC	D.S.	7-74			<i>Allan A. Kuehn</i>	<i>Dec. 1975</i>
				JOINT TRENCH UTILITIES LOCATION		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	M-15



HASP DETAIL
(Showing Welds)

NOTES

1. Chain to be 1/4" proof coil chain galvanized steel. Weld four links to post and three links to pipe sleeve.
2. All metal to be hot-dip galvanized after fabrication.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

David J. Salas July 1979
Coordinator R.C.E. 25291 Date

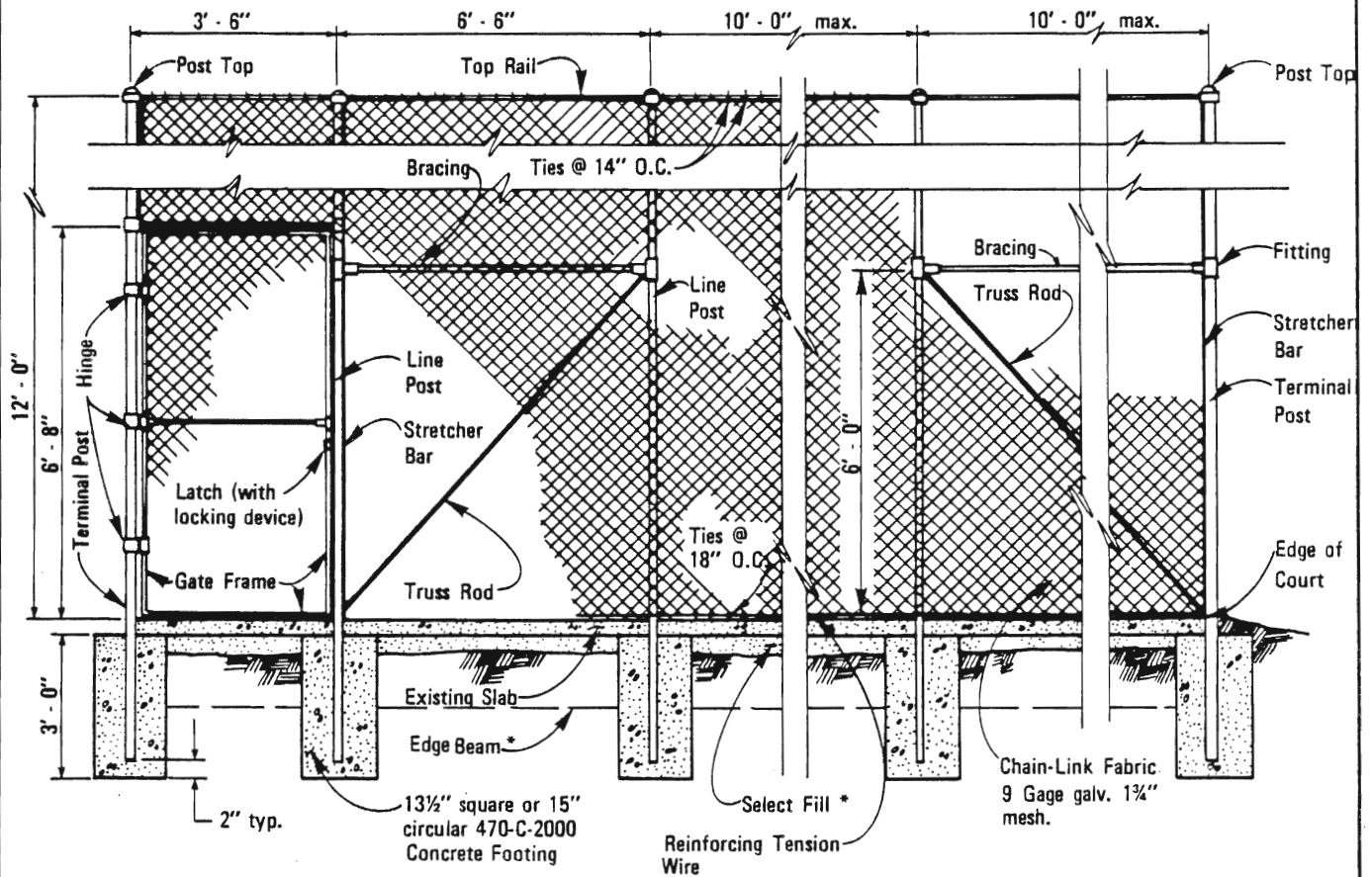
SAN DIEGO REGIONAL STANDARD DRAWING

DEMOUNTABLE POST

DRAWING
NUMBER

M-16

Revision	By	Approved	Date



*For Edge Beam, Slab, and
Select Fill details, see plans.

ELEVATION

NOTE:
Chain link fabric shall be erected on the interior side of the courts.

CAUTION:
This standard is not to be used if any wind screen is to be
applied to the fence.

DESCRIPTION	MIN. SIZE IN INCHES	MIN. WEIGHT PER LIN FT IN LBS
Line Post	2.375 O.D.	3.65
Terminal Post	2.875 O.D.	5.79
Top Rail	1.660 O.D.	2.27
Bracing	1.660 O.D.	2.27
Gate Frame	1.660 O.D.	2.27

Revision	Approved	Date
Fabric	<i>M.B.</i>	5-86

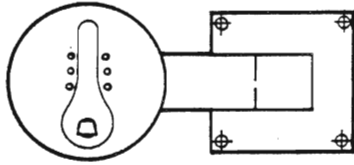
SAN DIEGO REGIONAL STANDARD DRAWING

TENNIS COURT FENCE CHAIN-LINK

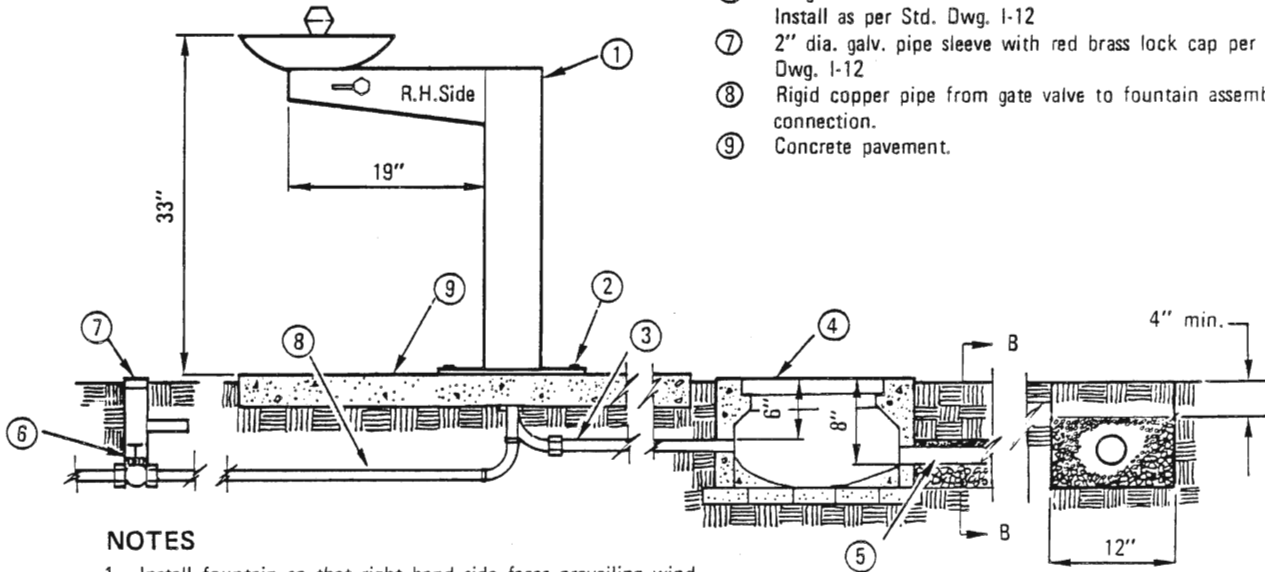
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

David L. Salomon July 1979
Coordinator R.C.E. 25291 Date

DRAWING
NUMBER **M-17**



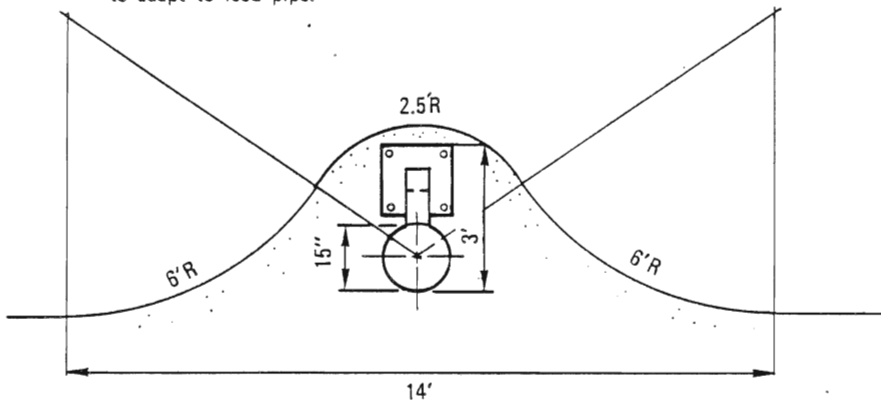
- ① Drinking Fountain - Haws model 3376 or approved equal.
- ② 3/8" dia. expansion anchors with flat (recessed heads) screws 4 places.
- ③ 1 1/4" P.V.C. pipe with sweep 90° ell connection to fountain drain.
- ④ 9 1/2" x 16" concrete yard box with hinged locking top (Brooks No. 3HL or equal) set on red brick foundation.
- ⑤ 4" x 40 lin. ft. perforated underdrain pipe, encased in crushed rock (3/4" size). Pipe to be A.D.S. or equal.
- ⑥ 1" gate valve with red brass cross handle and union. Install as per Std. Dwg. I-12
- ⑦ 2" dia. galv. pipe sleeve with red brass lock cap per Std. Dwg. I-12
- ⑧ Rigid copper pipe from gate valve to fountain assembly connection.
- ⑨ Concrete pavement.



SECT B-B

NOTES

1. Install fountain so that right hand side faces prevailing wind.
2. Hand form a concrete bowl at bottom of yard box to facilitate sand clean out.
3. Perforated drain pipe and trench are to drain away from fountain at 1% min. slope. Keep drain in lawn areas.
4. Item no. 6 is a one inch gate valve. Use red brass bushing reducers to adapt to feed pipe.



TYPICAL PLAN

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Harry R. Holt Oct 1982
Chairman R.C.E. C13768 Date

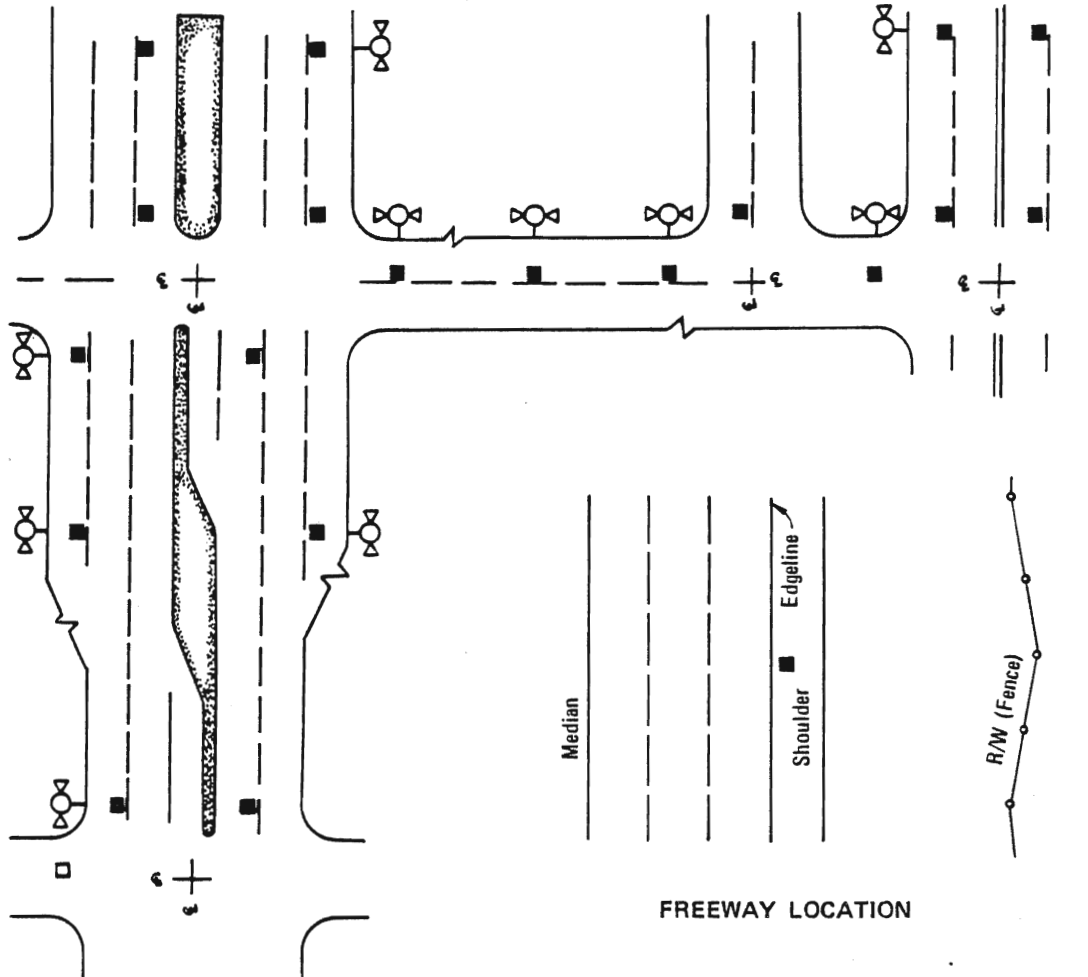
SAN DIEGO REGIONAL STANDARD DRAWING

DRINKING FOUNTAIN

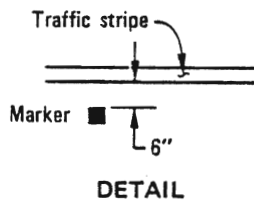
DRAWING
NUMBER M-18

Revision	By	Approved	Date

STREET LOCATIONS



FREEWAY LOCATION



MARKERS - Shall be blue 2-way stimsonite lifelite 88AB or equal.

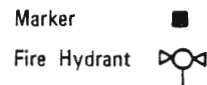
ADHESIVE - An ample amount of two part (A&B) epoxy or equal.

SURFACES - Clean and dry prior to installation per manufacturer's recommendations. Install markers with reflective surfaces facing oncoming vehicles and offset 2" from lane lines toward fire hydrant.

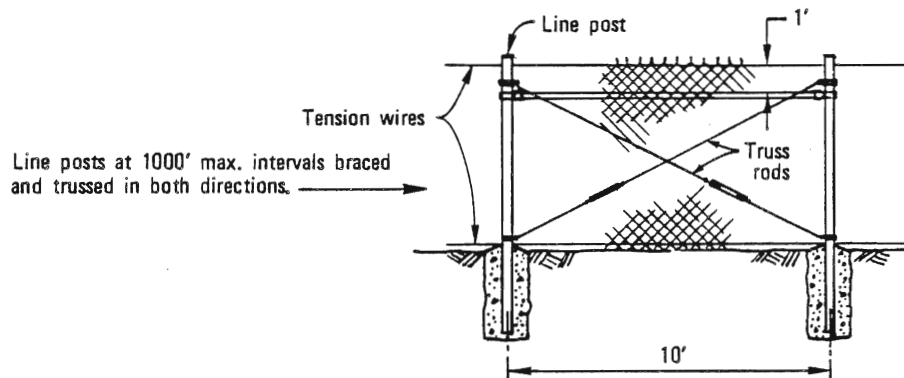
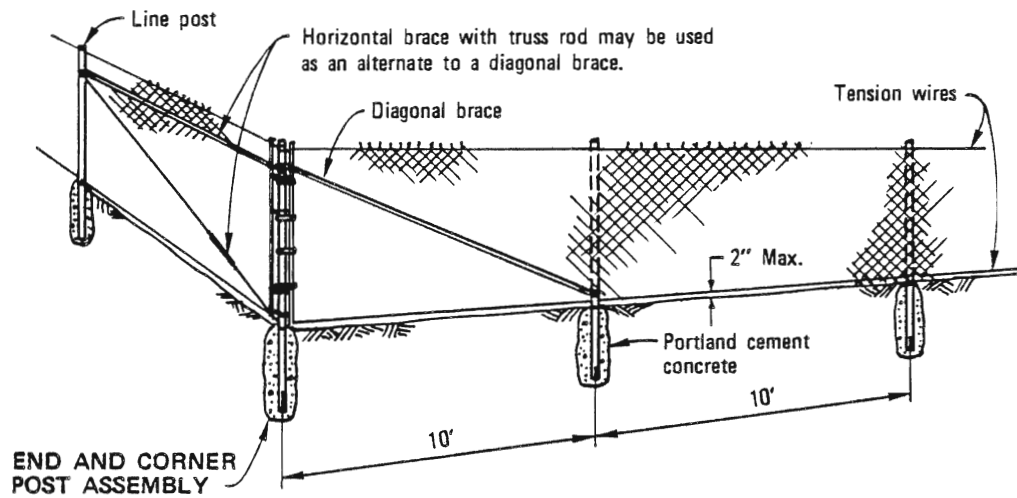
NOTES:

1. Fire Department will provide location(s) for all markers in PRD's, Commercial Lots and other areas outside of Public Right of Way.
2. Markers must be installed at all new and relocated hydrants and within all resurfacing projects.
3. For streets without lane lines or streets with raised pavement markers and no painted lane lines, install markers 6" from centerline or existing markers.

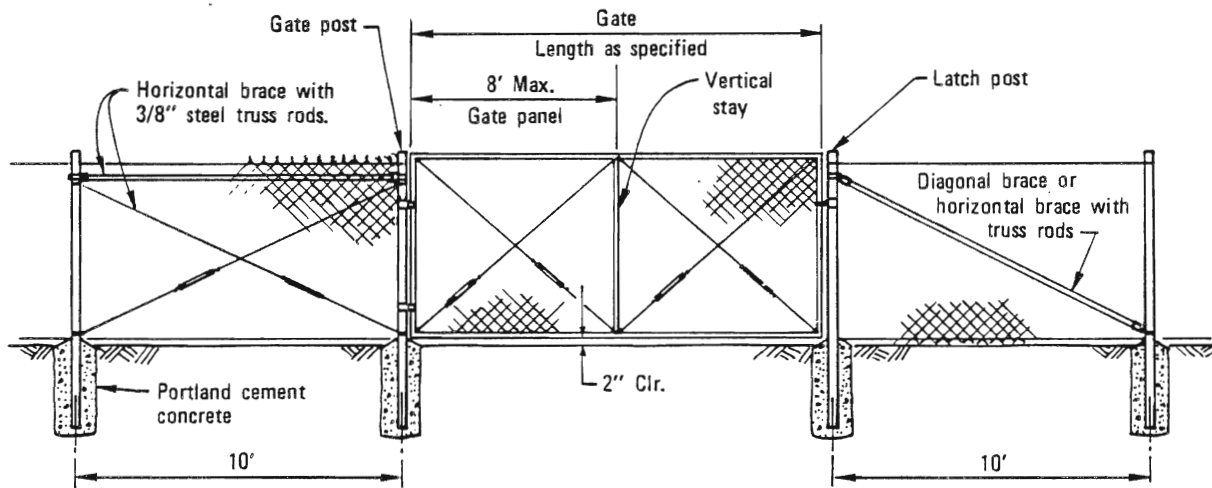
LEGEND ON PLANS



Revision	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Frwy loc.	M.B.	5-86	FIRE HYDRANT MARKERS		Chairman R.C.E. C13768 Date Oct 1982
			DRAWING NUMBER		M-19



LINE POST BRACING



GATE ASSEMBLY

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

M. B. ... 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **M-20**

SAN DIEGO REGIONAL STANDARD DRAWING

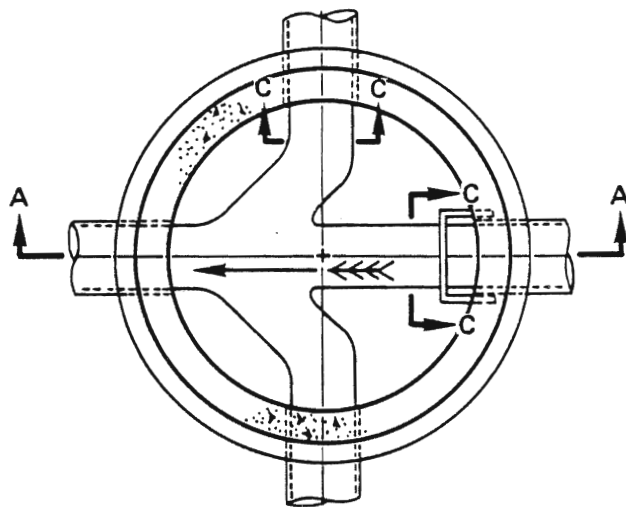
**CHAIN LINK FENCE
DETAILS**

Revision	By	Approved	Date

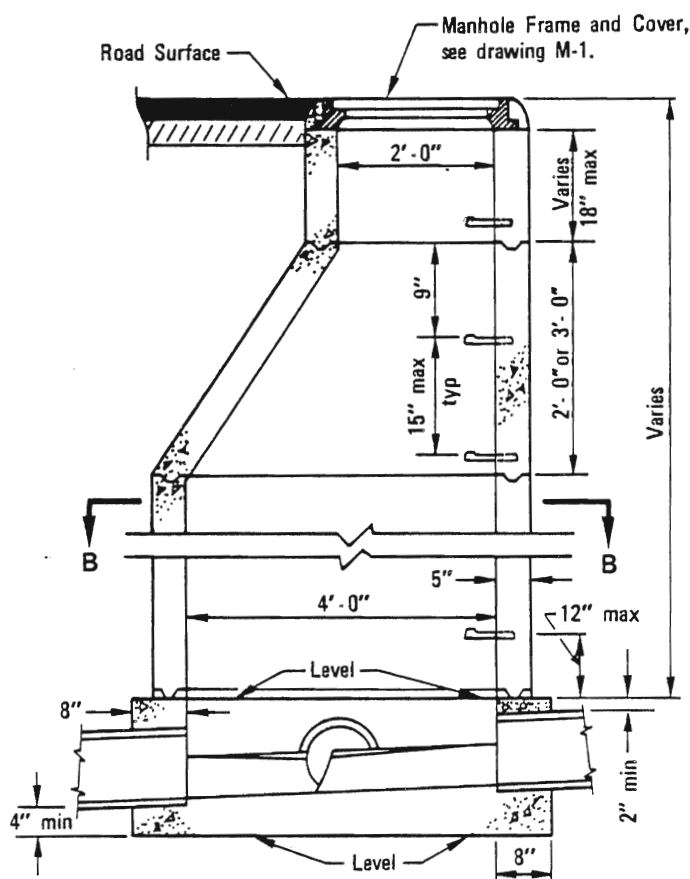
SEWERAGE SYSTEMS

SEWERAGE SYSTEMS

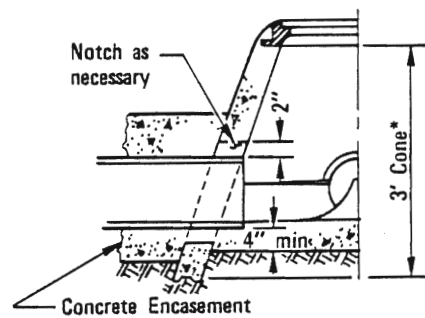
S



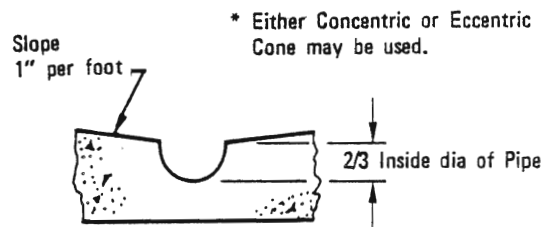
SECTION B-B



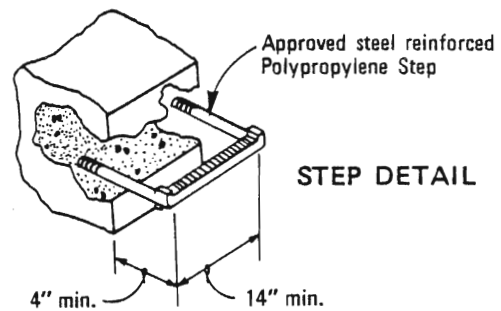
SECTION A-A



HALF SECTION SHALLOW MANHOLE



SECTION C-C

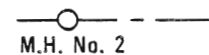


STEP DETAIL

NOTES:

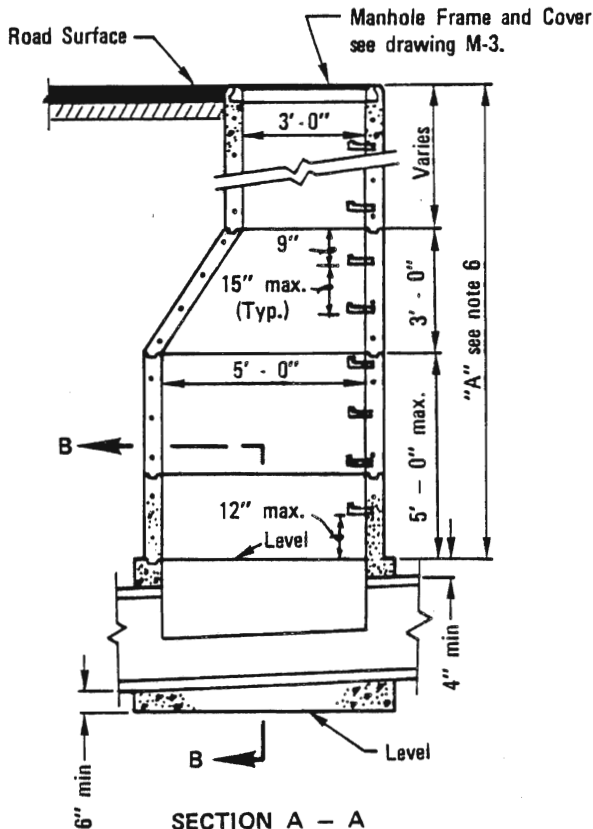
1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478 except step spacing.
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 560-C-3250.
5. Approved water stop required for plastic pipe connections.
6. Flexible pipe joints shall be required within 12" of inside face of manhole, except for plastic pipe.
7. Precast base permitted as approved by Agency.

LEGEND ON PLANS

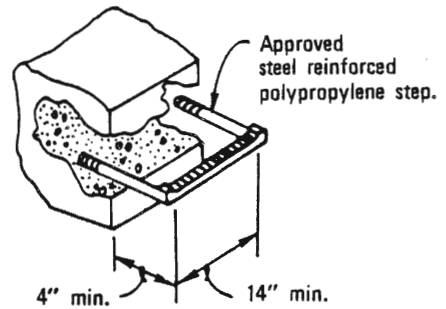


M.H. No. 2

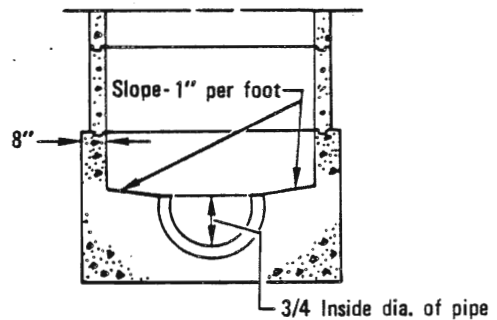
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Step Det.	JS	D.S.	7-79			Allen A. Kuehn	Dec. 1975
Note 6	TRP	M.B.	10-82	MANHOLE 4' x 2' DIAMETER		Coordinator R.C.E. 19807	Date
Conc.	JS	M.B.	5-86				
						DRAWING NUMBER	S-1



SECTION A - A



STEP DETAIL

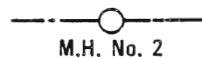


SECTION B - B

NOTES:

1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478.
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 560-C-3250.
5. Approved water stop required for plastic pipe connections.
6. Precast sections shall be used within dimension "A" as required, in order of preference listed:
 - A. Cone (notched for pipe if dimension "A" is less than 3').
 - B. 6" to 24" of 3' diameter grade rings.
 - C. 5' diameter shaft to maximum height of 60".
 - D. Additional 3' diameter risers.
7. Flexible pipe joints shall be required within 12" of inside face of manhole except for plastic pipe.

LEGEND ON PLANS



M.H. No. 2

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

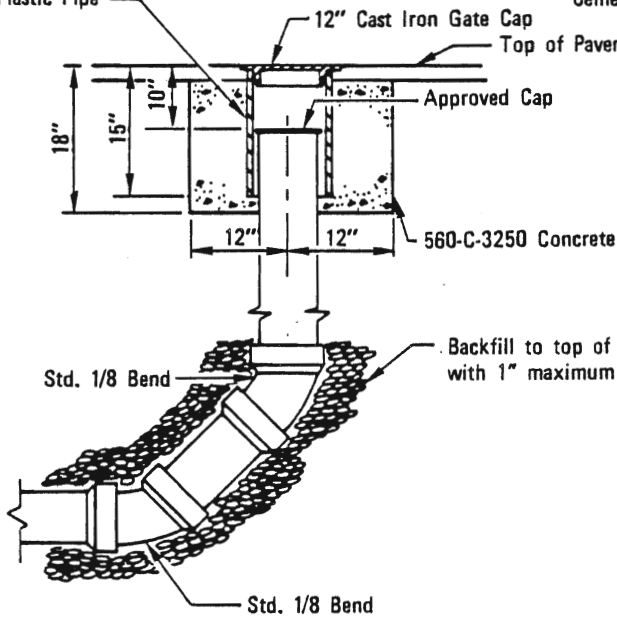
DRAWING
NUMBER S-2

SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE 5'x 3' DIAMETER

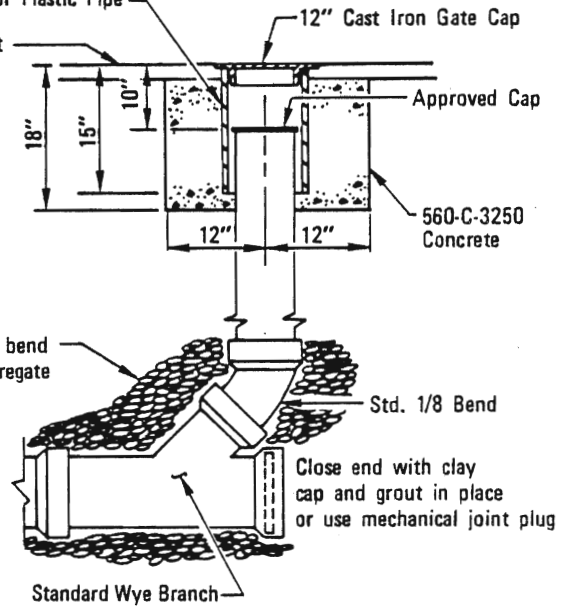
Revision	By	Approved	Date
Note 7	TRP	M.B.	10-82
Conc.	SC	M.B.	5-86

Section of 12" Metallic, Asbestos
Cement or Plastic Pipe



TYPE A

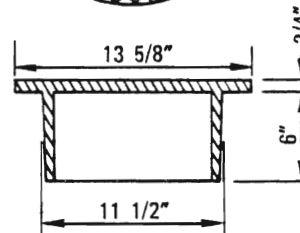
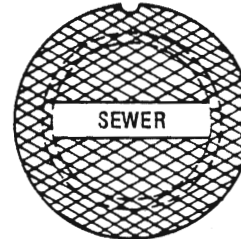
Section of 12" Metallic, Asbestos
Cement or Plastic Pipe



TYPE B

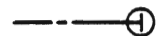
NOTES

1. Gate cap shall be labeled "Sewer".
2. Cleanouts may be used for either V.C.P. or plastic sewer mains.
3. Riser to be same diameter as sewer main.



GATE CAP
(Heavy Duty)

LEGEND ON PLANS



Revision	By	Approved	Date
Conc.	<i>J. M. B.</i>	<i>J. M. B.</i>	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

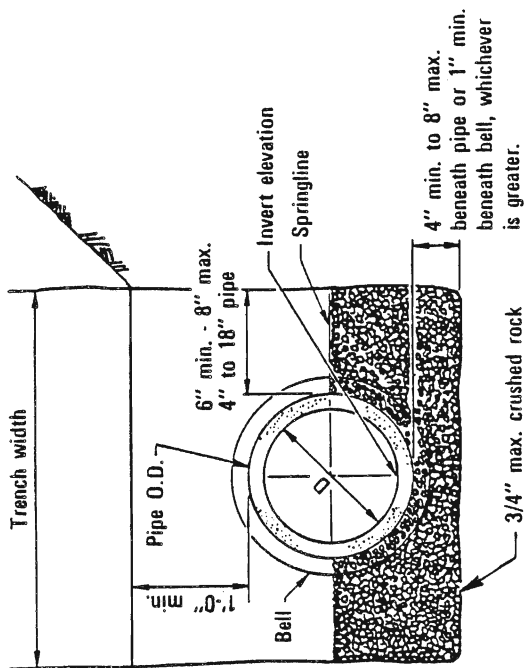
SEWER MAIN CLEANOUT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

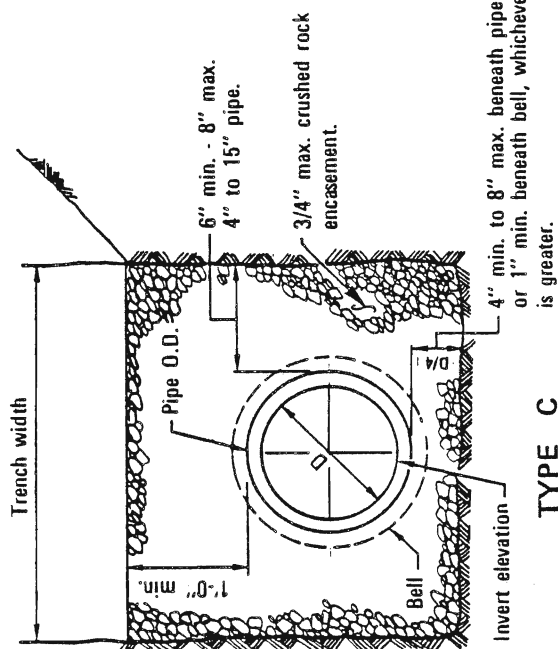
Allen G. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER

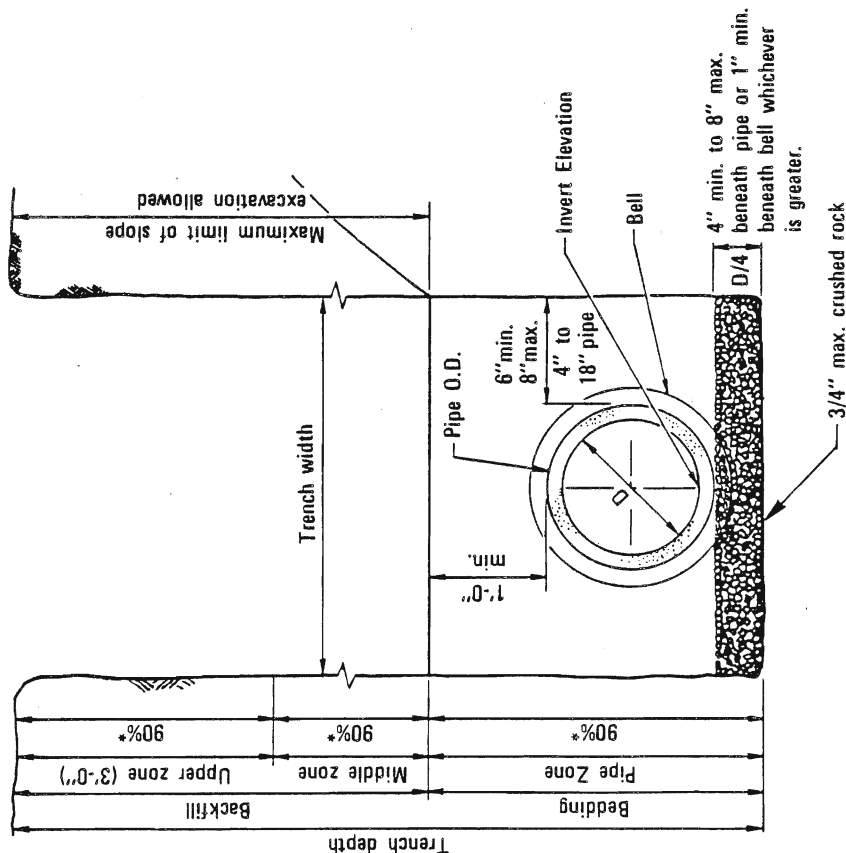
S-3



TYPE B
ROCK TO SPRINGLINE



TYPE C
ROCK ENVELOPE



TYPE A
STANDARD INSTALLATION

NOTES

1. For trenching in improved streets, see Standard Drawings G-24 or G-25 for trench resurfacing.
2. (*) indicates minimum relative compaction.
3. Minimum depth of cover from the top of pipe to finish grade for all sanitary sewer installations shall be 3 feet. For cover less than 3 feet, see Standard Drawing S-7 for concrete encasement.
4. See Type A installation for details not shown for Types B and C.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

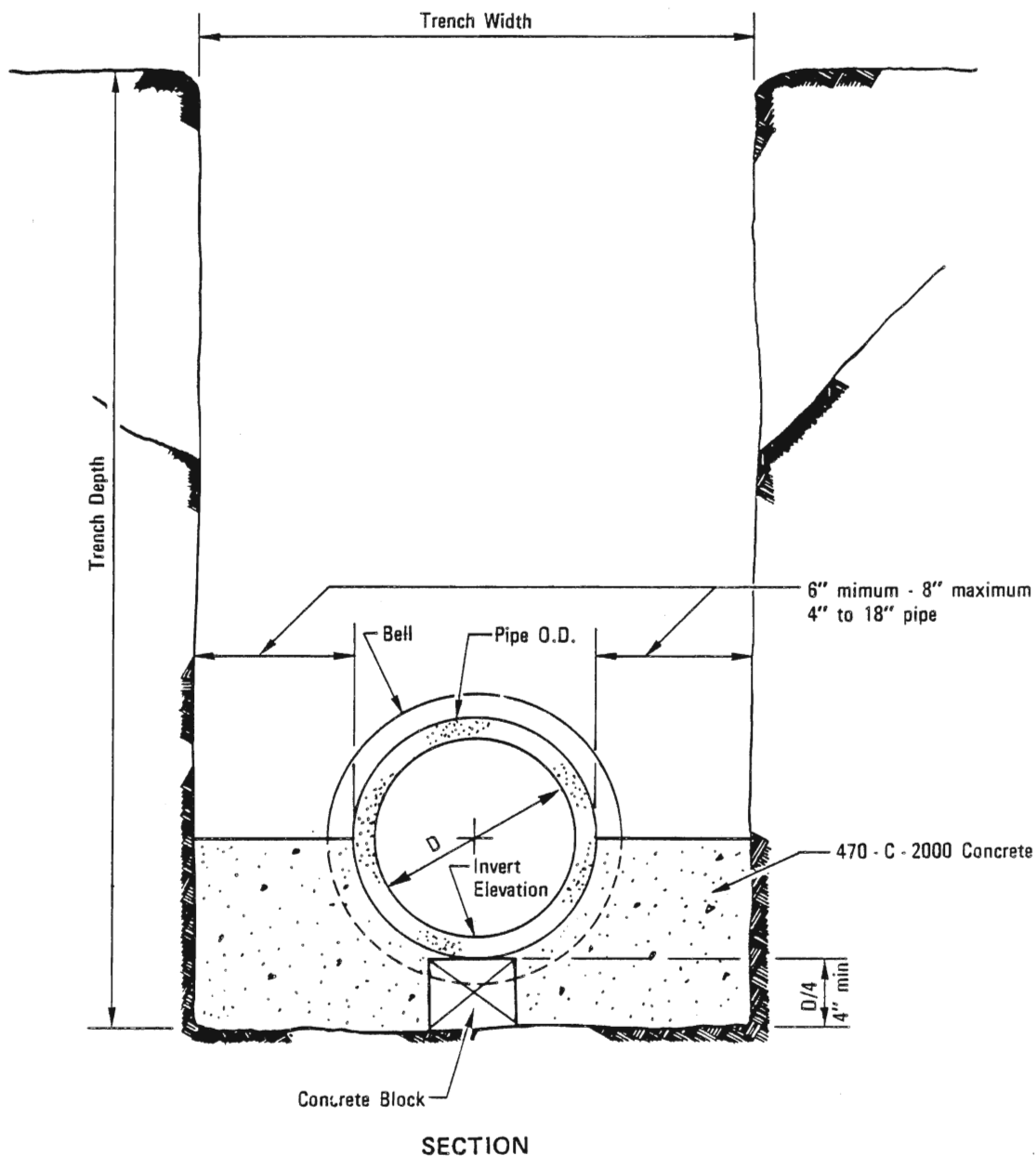
Oliver J. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **S-4**

SAN DIEGO REGIONAL STANDARD DRAWING

**PIPE BEDDING AND TRENCH BACKFILL
FOR SEWERS**

Revision	By	Approved	Date
A, B, & C	RC	M.B.	5-86



LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

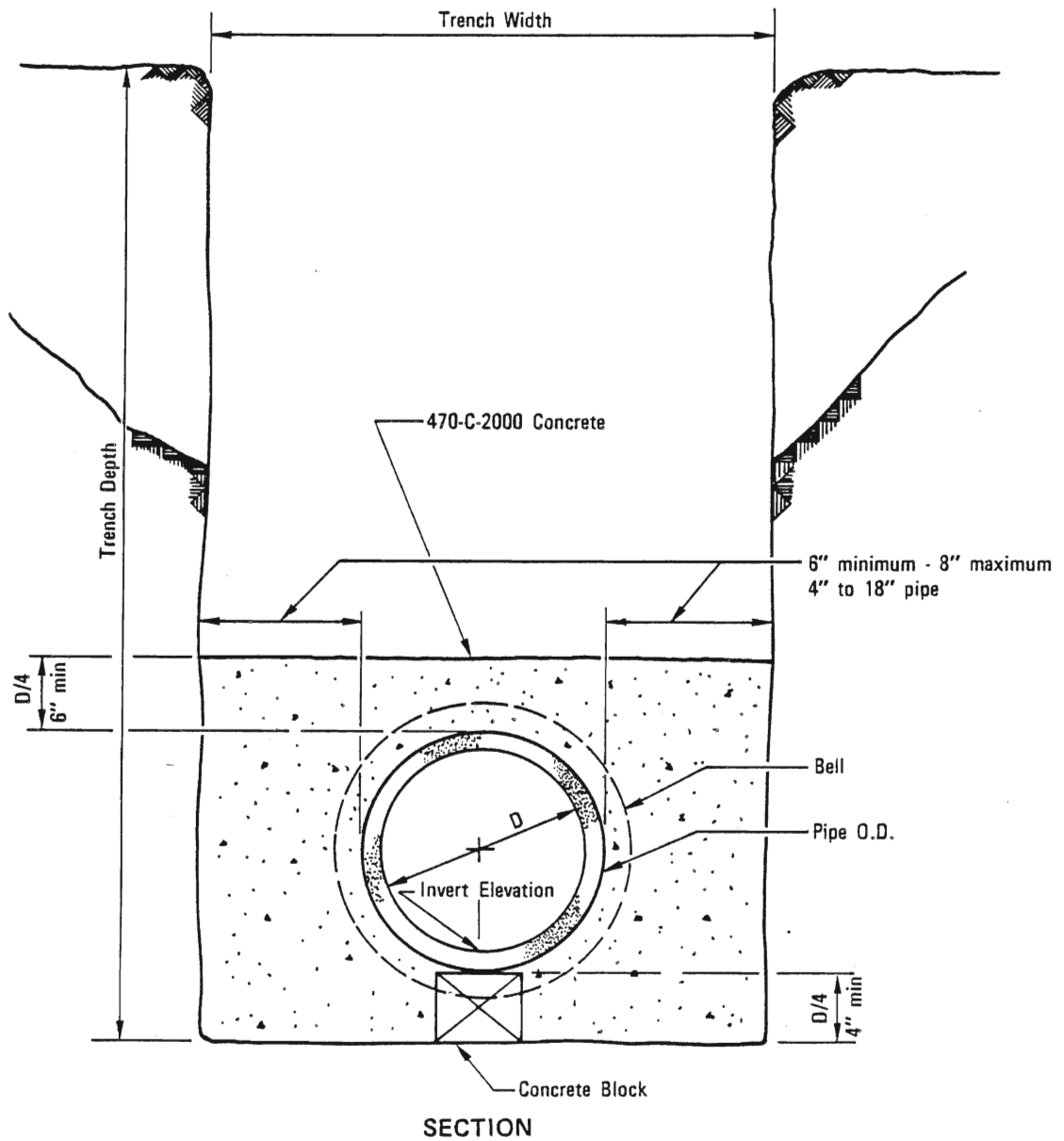
DRAWING
NUMBER

S-6

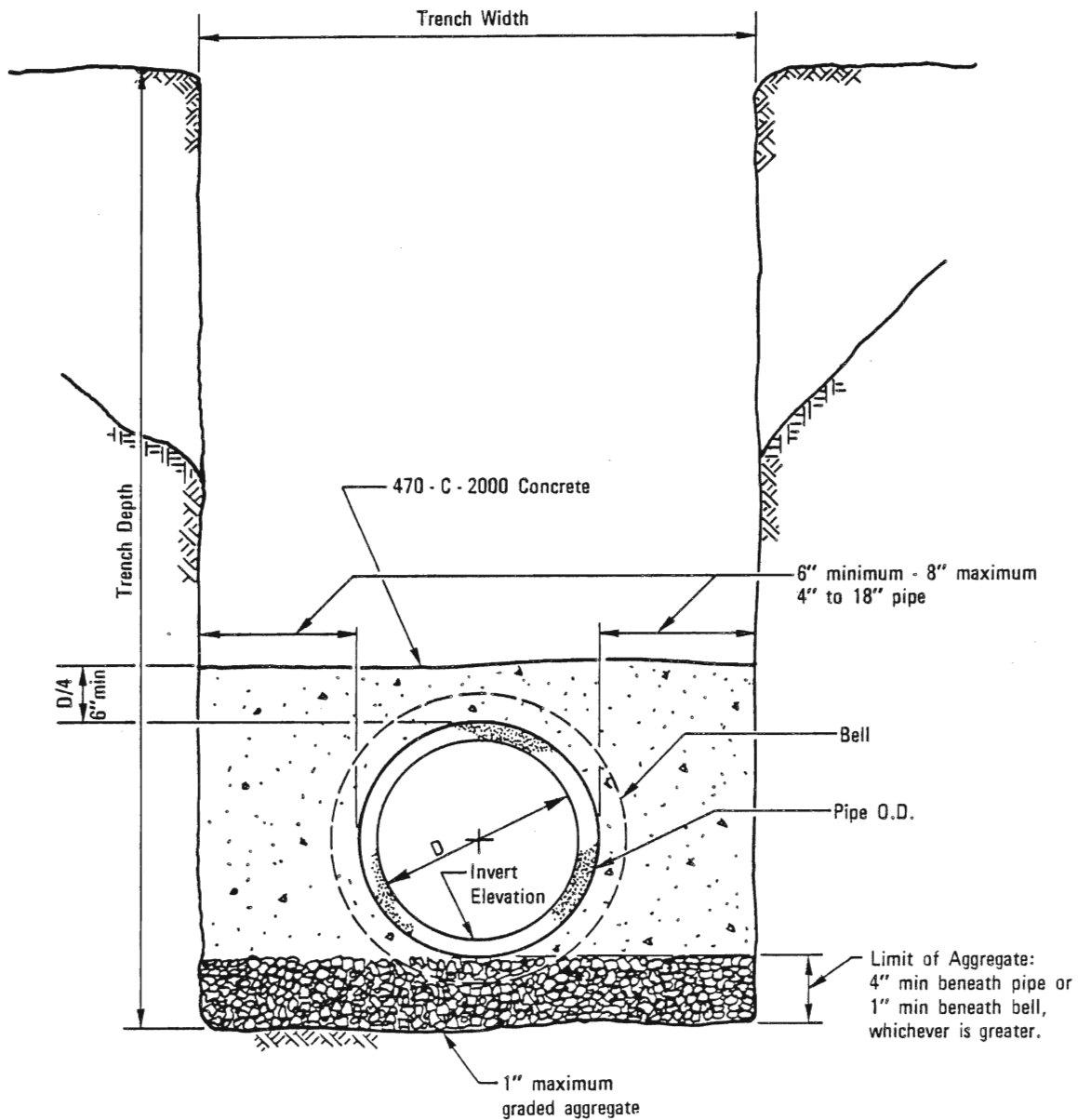
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE CRADLE

Revision	By	Approved	Date

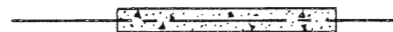


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Note	TRP	M.B.	10-82		
				CONCRETE ENCASEMENT	<i>Allan G. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
					DRAWING NUMBER S-7



SECTION

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

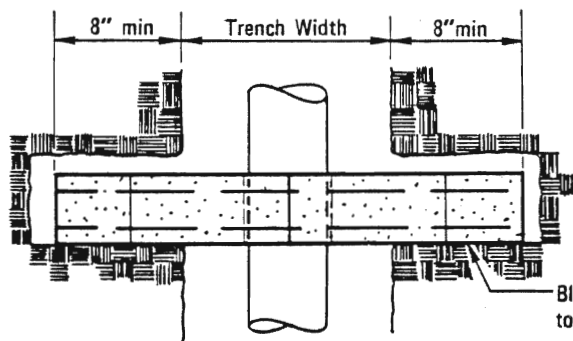
Allan A. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE BACKFILL

Revision	By	Approved	Date

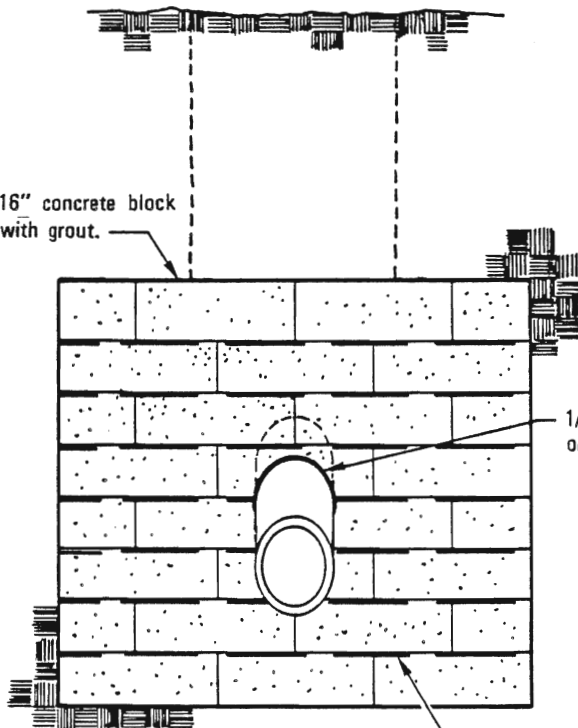
DRAWING
NUMBER S-8



Blocks to be laid as tightly as possible to downstream side of notch.

PLAN

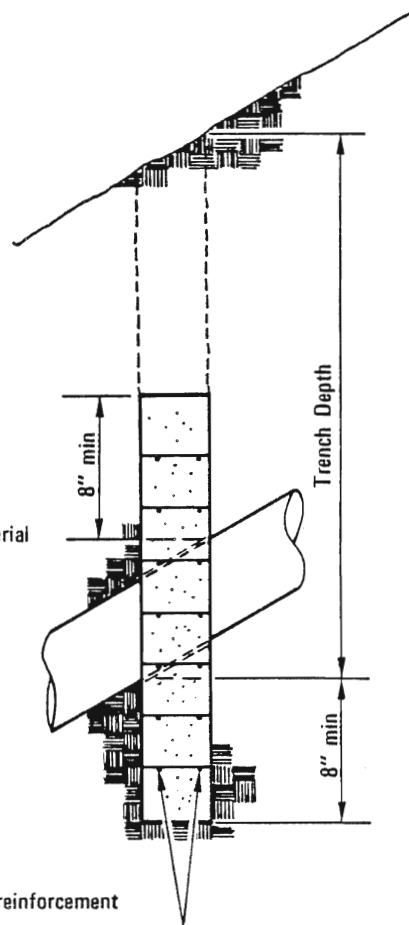
8"x 8"x 16" concrete block
Fill cores with grout.



1/2" expansion joint material
or jute around pipe.

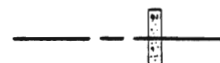
No. 9 wire ladder type reinforcement
in all horizontal joints.

FRONT ELEVATION

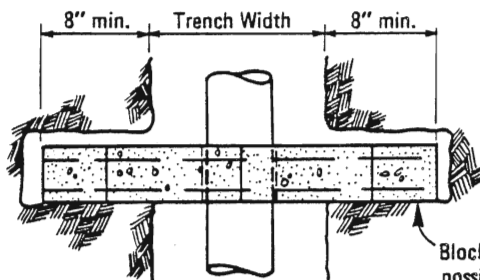


SIDE ELEVATION

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Expan. jt.	JRP	M.B.	10-82		
				CONCRETE ANCHOR	<i>Allard A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
					DRAWING NUMBER S-9

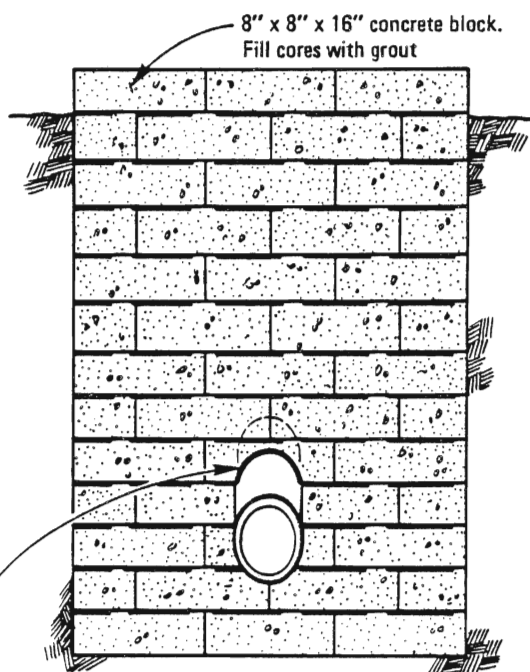


PLAN

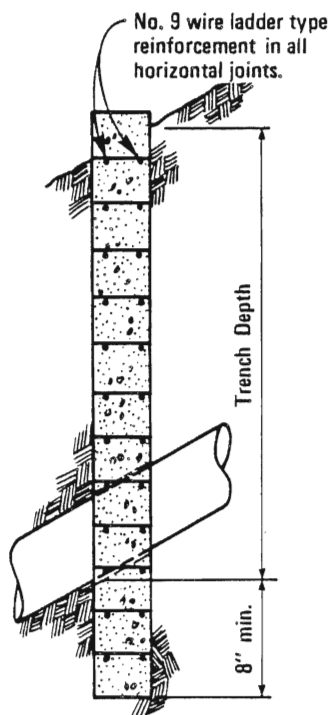
NOTES

Type B:

1. No vertical joints permitted.
2. Horizontal joints must overlay by 2 corrugations.
3. Corrugations to run horizontally.
4. Front Elevation and Plan views similar to Type A.

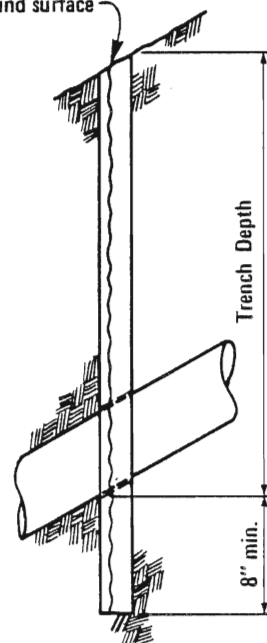


FRONT ELEVATION



SIDE ELEVATION

Galvanized Corrugated Sheet Metal 18 Gage or heavier to be laid as tightly as possible to downstream side of notch. Make flush with ground surface



ELEVATION

TYPE A

TYPE B

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

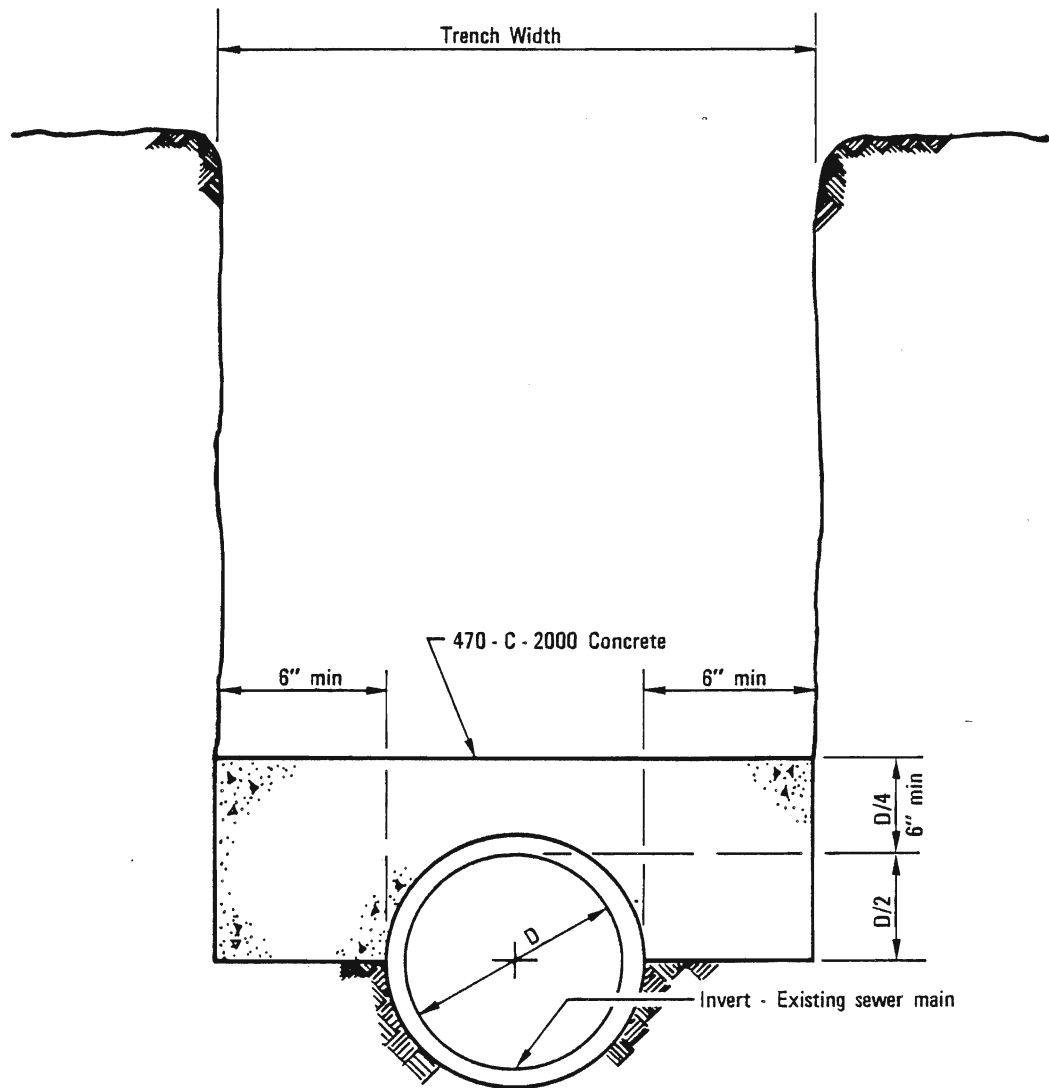
Allen P. Keshner *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL

Revision	By	Approved	Date
Type A	<i>SC</i>	<i>D.S.</i>	<i>7-79</i>
Chg. notes	<i>TRP</i>	<i>M.B.</i>	<i>10-82</i>

DRAWING
NUMBER S-10



SECTION

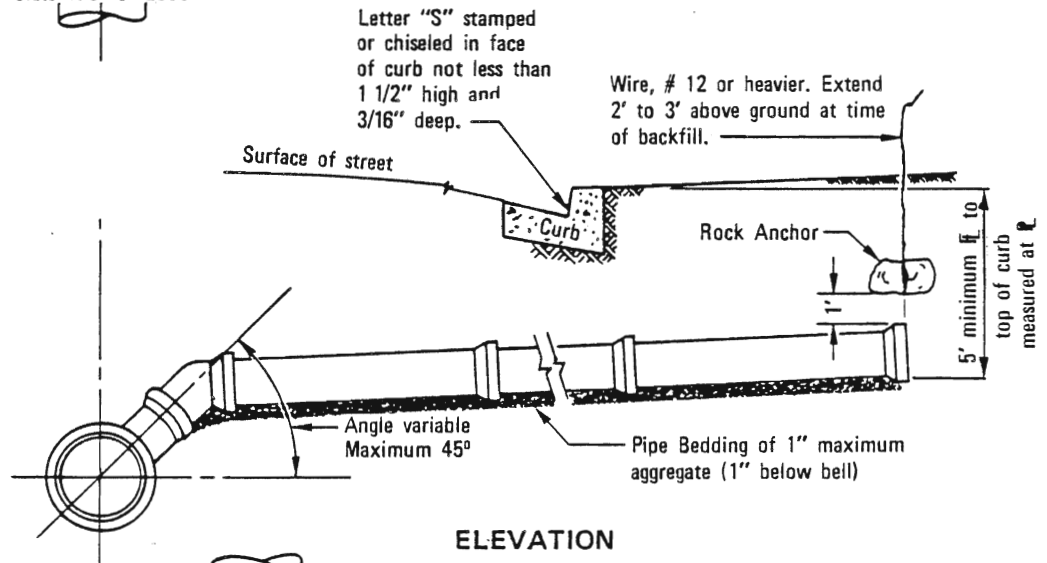
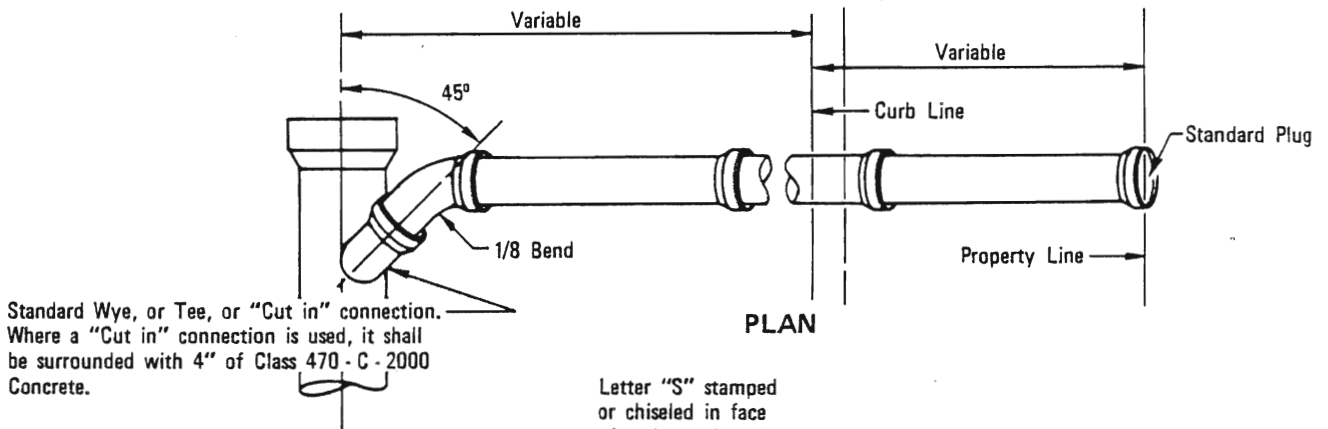
LEGEND ON PLANS



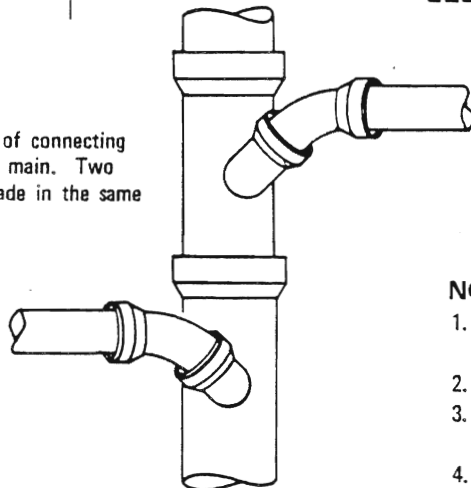
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				CONCRETE PROTECTION FOR EXISTING SEWER PIPE		<i>Allen A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER S-11	



DRAWING NUMBER S-12



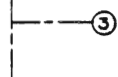
Detail showing the manner of connecting opposite laterals to a sewer main. Two connections shall not be made in the same length of pipe.



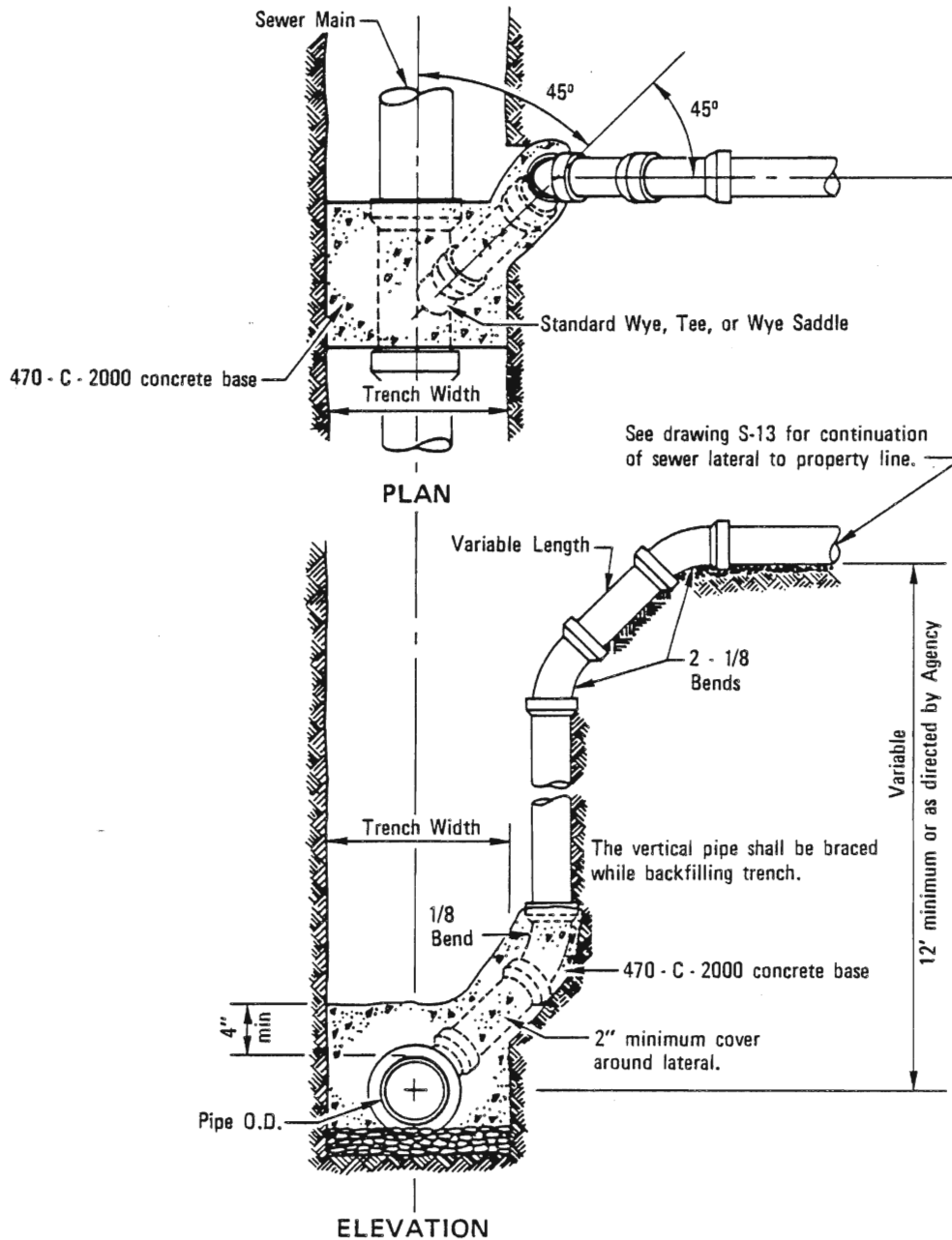
NOTES

1. In no case shall a lateral connect to the sewer main directly on top of the pipe.
2. Sewer laterals shall have a minimum slope of 2%.
3. All joints on sewer lateral pipe shall be compression type or approved solvent weld.
4. Lateral shall extend to property line unless otherwise shown on plans.

LEGEND ON PLANS



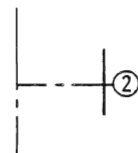
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				HOUSE CONNECTION (SEWER LATERAL)		<i>Allard A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
						DRAWING NUMBER S-13



NOTE

All joints on sewer lateral pipe shall be compression type or approved solvent weld.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE.

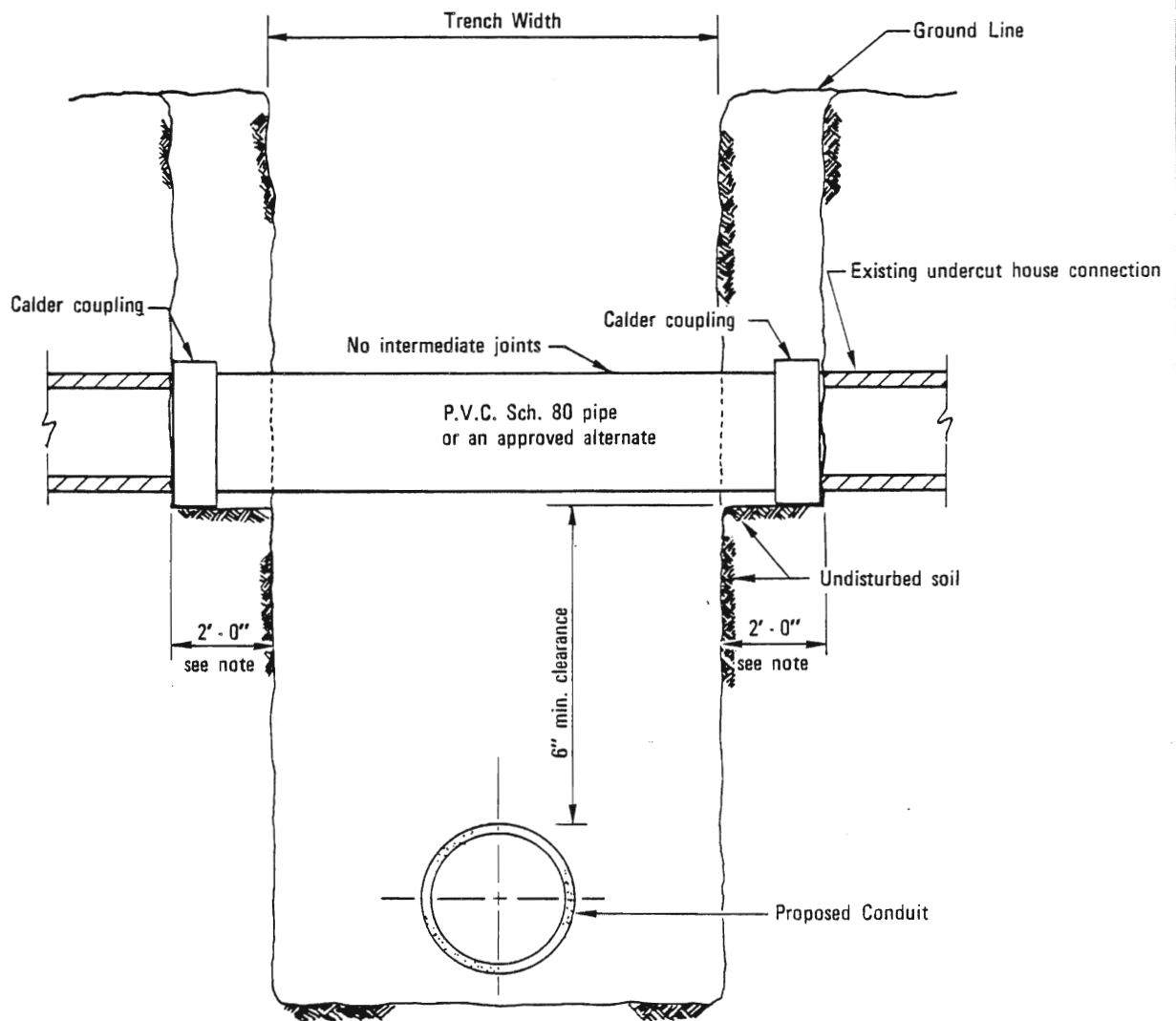
Allard A. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

DEEP CUT HOUSE CONNECTION (SEWER LATERAL)

DRAWING
NUMBER **S-14**

Revision	By	Approved	Date



TYPICAL SECTION

NOTE

For water line construction repair pipe shall extend to first joint beyond 2 ft. at both sides of trench or to a distance of 4 ft., whichever is less.

Revision	By	Approved	Date

SAN DIEGO REGIONAL STANDARD DRAWING

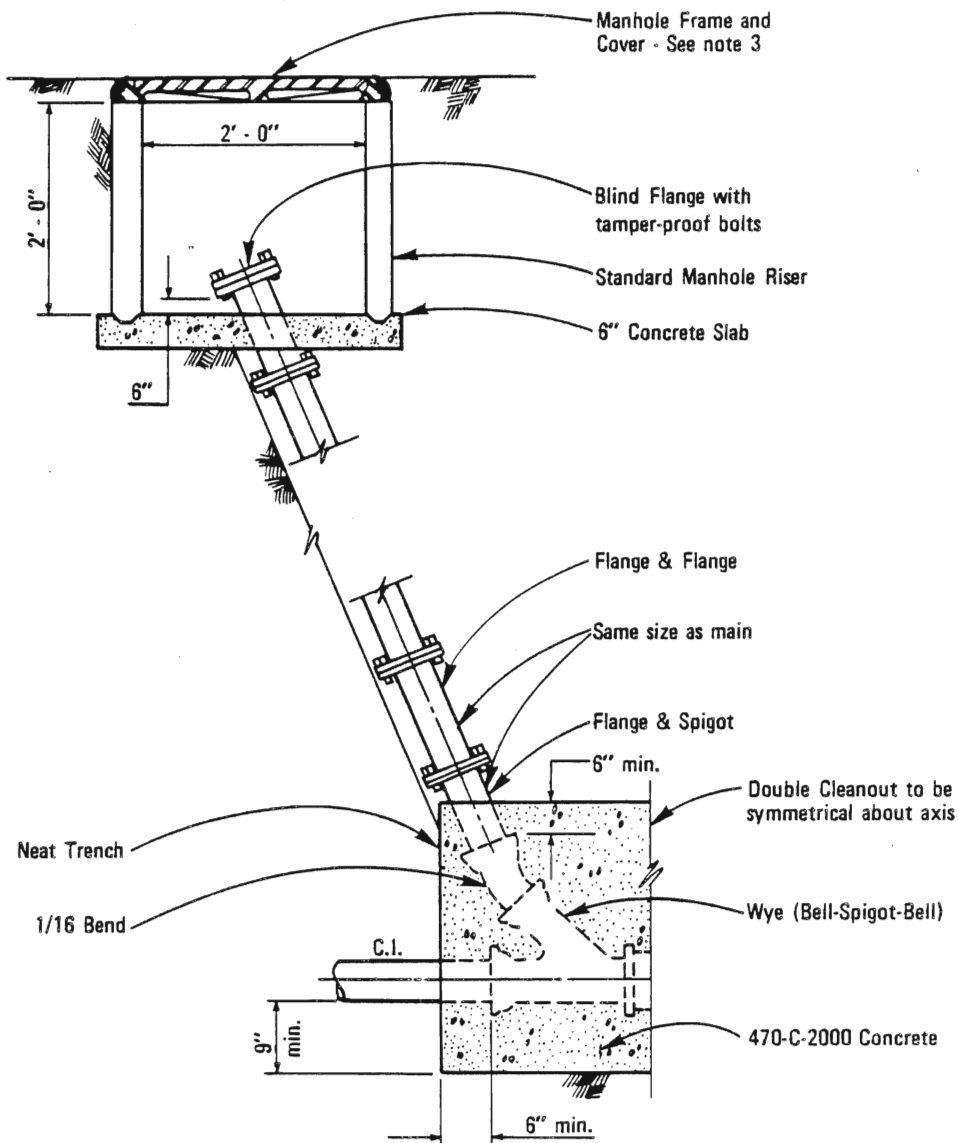
HOUSE CONNECTION SEWER REPAIR

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER

S-15



NOTES

1. Similar poly vinyl chloride components may be used in accordance with A.S.T.M. Standard Specification D-3033.
2. Concrete slab to be 560-C-3250
3. Use heavy duty manhole frame and cover, Std. Dwg. M-1, in areas subject to vehicular traffic; use light duty manhole frame and cover, Std. Dwg. M-2, in all other locations.

LEGEND ON PLANS



C.O.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

David L. Solomon *July 1979*
Coordinator R.C.E. 25291 Date

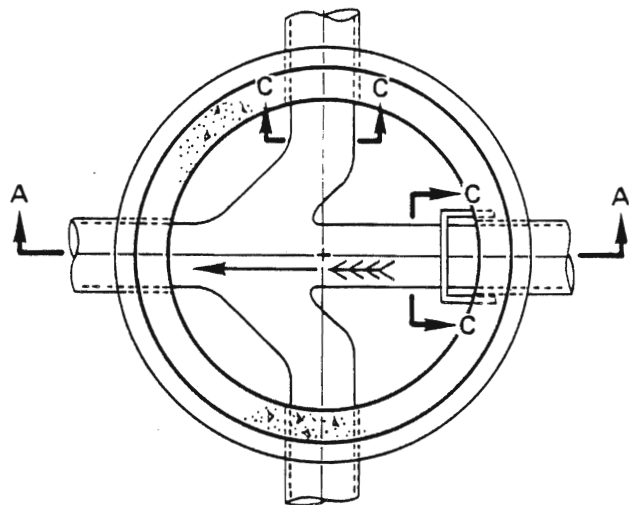
SAN DIEGO REGIONAL STANDARD DRAWING

CLEANOUT-SEWER FORCE MAIN

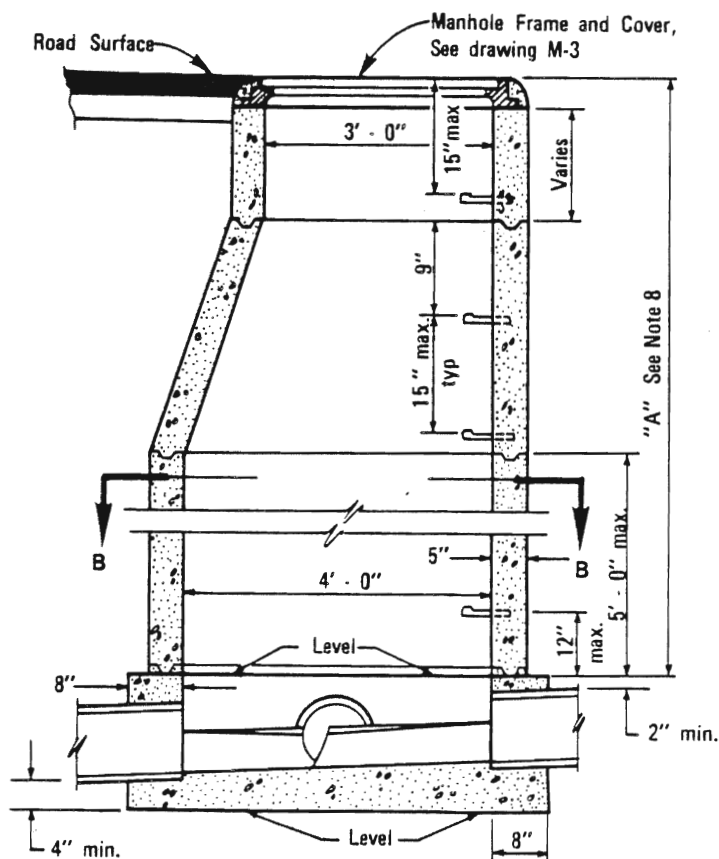
Revision	By	Approved	Date
Conc., slab	<i>SC</i>	<i>M.B.</i>	<i>5-86</i>

DRAWING
NUMBER

S-16



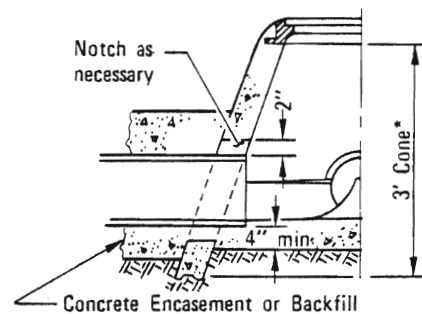
SECTION B-B



SECTION A-A

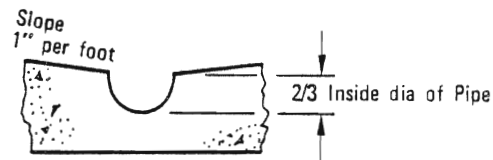
LEGEND ON PLANS

—○— M.H. No. 2

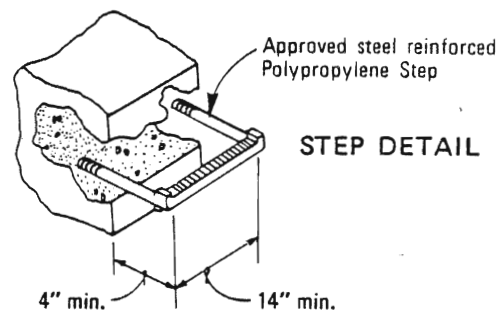


HALF SECTION SHALLOW MANHOLE

* Either Concentric or Eccentric Cone may be used.



SECTION C-C



STEP DETAIL

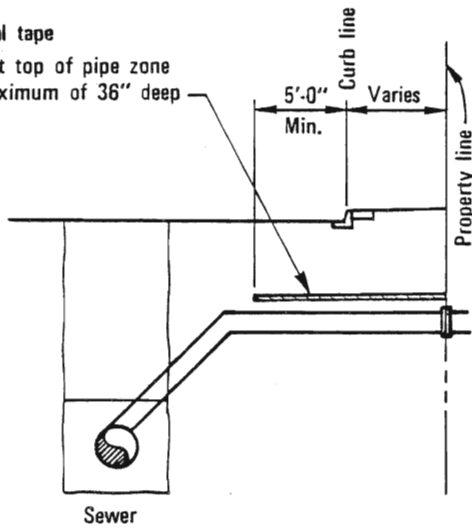
NOTES

1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478 except step spacing.
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 560-C-3250.
5. Approved water stop required for plastic pipe connections.
6. Flexible pipe joints shall be required within 12" of inside face of manhole. (except for plastic pipe)
7. Precast base permitted as approved by Agency.
8. Precast sections shall be used within dimension "A" as required, in order of preference listed:
 - A. Cone (notched for pipe if dimension "A" is less than 3').
 - B. 6" to 24" of 3' diameter grade rings.
 - C. 4' diameter shaft to maximum height of 60".
 - D. Additional 3' diameter risers.

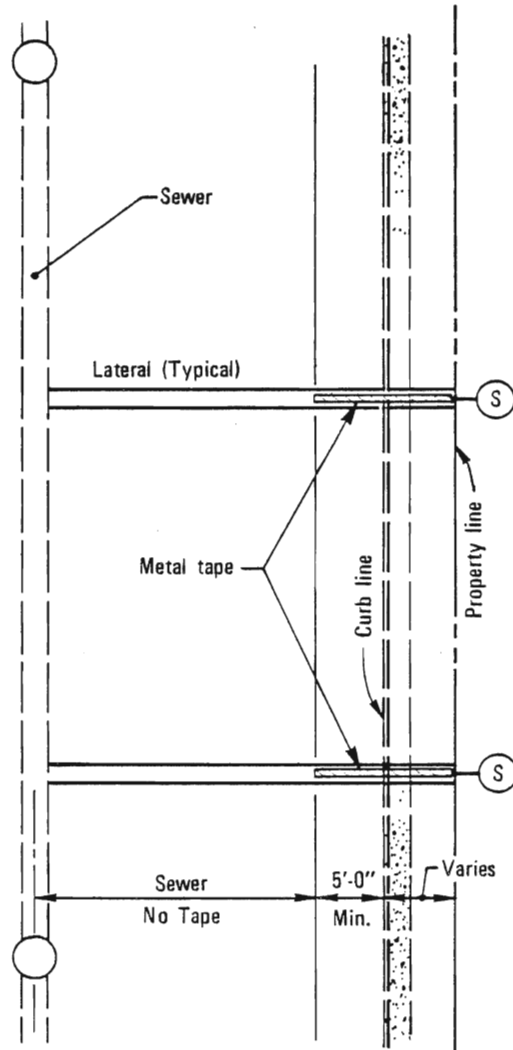
Revision	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Notes	TRP	M.B.			
Conc., Step	M.B.	5-86	MANHOLE - 4' x 3' DIAMETER (FOR 15" MAX. DIA. PIPE)		<i>David S. Salomon</i> July 1979 Coordinator R.C.E. 25291 Date
					DRAWING NUMBER S-17

6" Metal tape

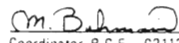
Install at top of pipe zone
or a maximum of 36" deep



SECTION



PLAN

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Coordinator R.C.E. C21133 Date
				METALLIC TAPE LOCATOR FOR NON-METALLIC SEWER PIPE		 4-25-86 S-19

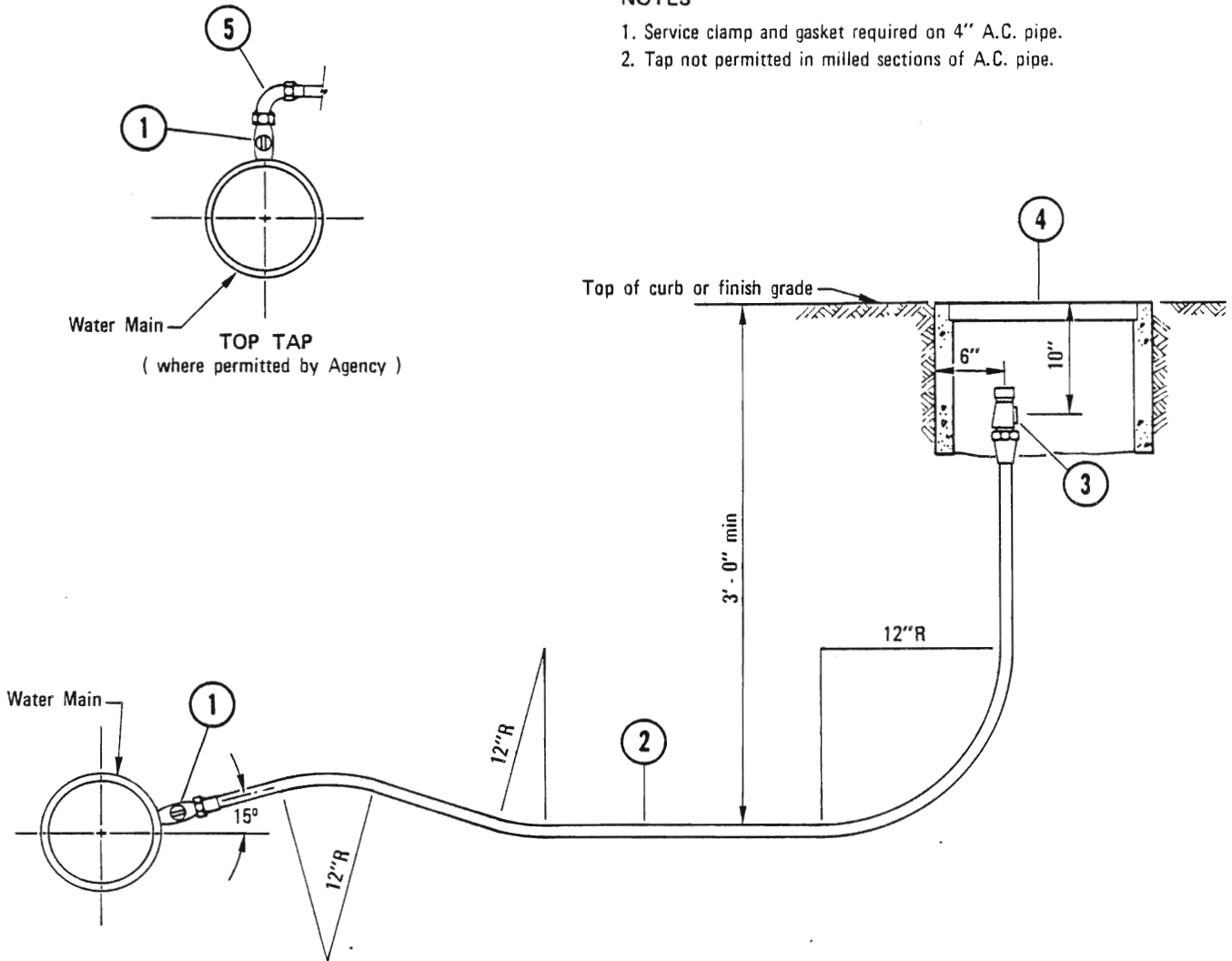
WATER SYSTEMS

WATER SYSTEMS

W

NOTES

1. Service clamp and gasket required on 4" A.C. pipe.
2. Tap not permitted in milled sections of A.C. pipe.



- 1 Bronze Corporation Stop (installed with key on side and open tap) and Adaptor as required by Agency.
Note: On steel mains use clamp or weld on coupling as required by Agency.
Install insulating bushing as required by Agency.
- 2 Copper Tubing or Plastic Pipe (no intermediate joints permitted without approval of the Agency).
- 3 Bronze Angle Service Stop with Locking Device and Meter Coupling attached.
- 4 Meter Box (see Standard Drawing W-15 for location).
- 5 90° Ell

LEGEND ON PLANS

1" (W)

Revision	By	Approved	Date
Notes	SC	D.S.	7-79

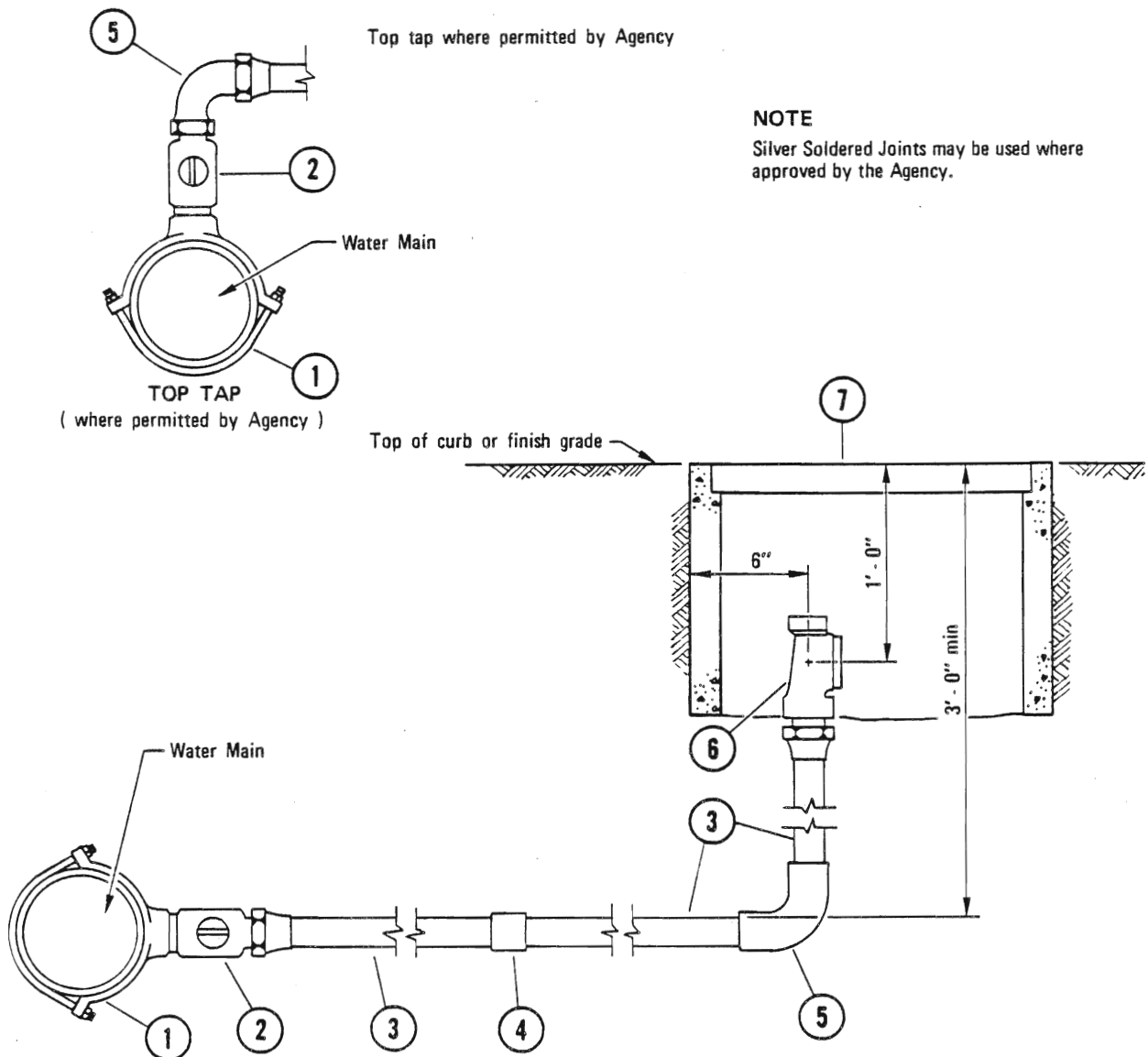
SAN DIEGO REGIONAL STANDARD DRAWING

1" WATER SERVICE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allard A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **W-1**



- 1 Bronze Service Clamp (double strap). On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
- 2 Bronze Corporation Stop (installed with key on side and open tap).
- 3 Copper Tubing or Plastic Pipe except where otherwise specified by the Agency.
- 4 Coupling as required by Agency when service is 20' or longer, except on Polyethylene Pipe.
- 5 90° Ell
- 6 Bronze Angle Service Stop with Locking Device and adaptable to 1 1/2" and 2" Meter Flange.
- 7 Meter Box (see Standard Drawing W-15 for location).

LEGEND ON PLANS

2" (W)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Clifford A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

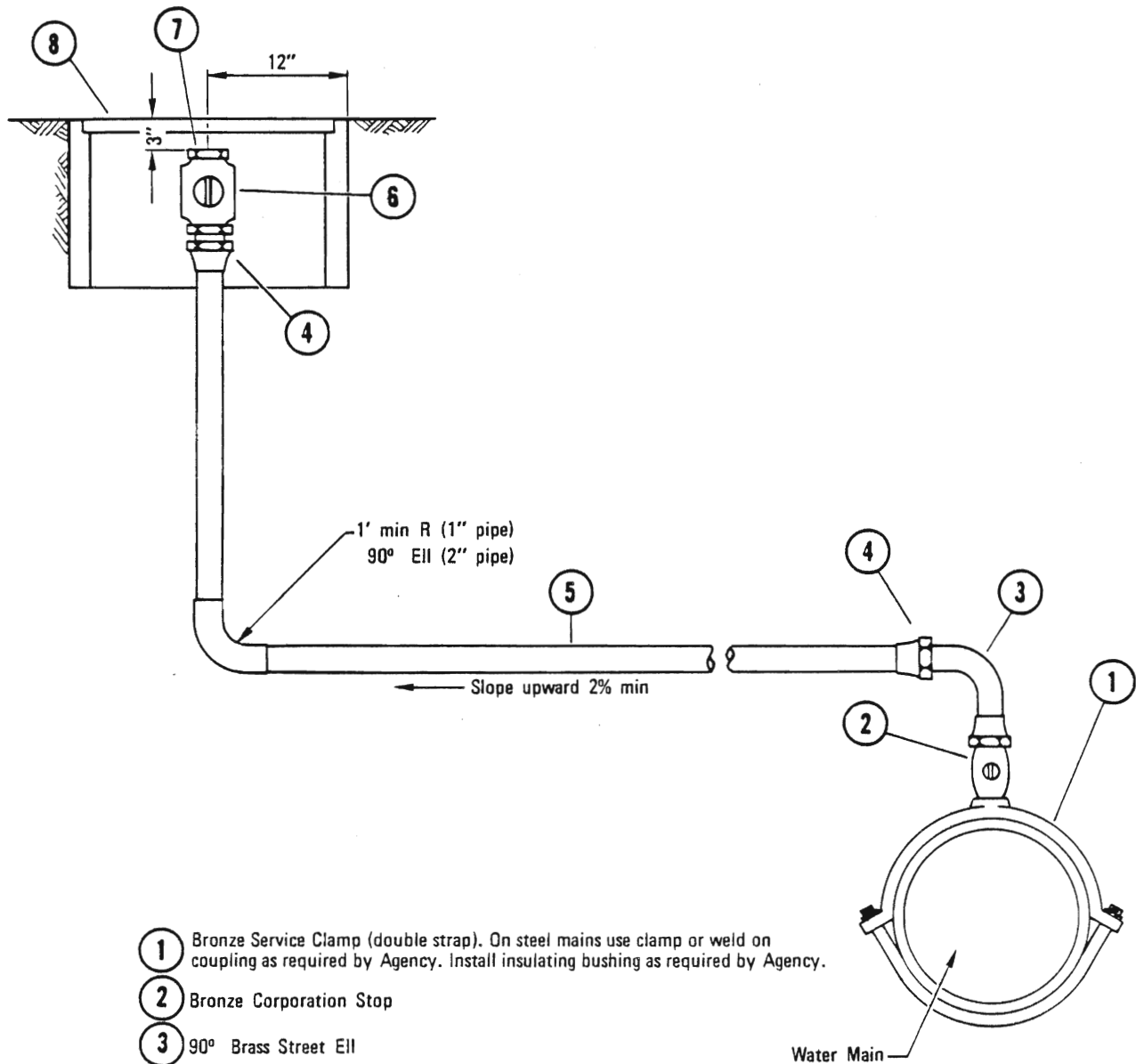
DRAWING
NUMBER

W-2

SAN DIEGO REGIONAL STANDARD DRAWING

1 1/2" AND 2" WATER SERVICES

Revision	By	Approved	Date
Notes	SC	D.S.	7-79



- ① Bronze Service Clamp (double strap). On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
- ② Bronze Corporation Stop
- ③ 90° Brass Street Ell
- ④ Pipe to Tubing Adaptor
- ⑤ Copper Tubing
- ⑥ Ball Valve
- ⑦ Brass Plug
- ⑧ Meter Box (see Standard Drawing W-15 for location).

LEGEND ON PLANS



Revision	By	Approved	Date
Notes	SC	D.S.	7-77

SAN DIEGO REGIONAL STANDARD DRAWING

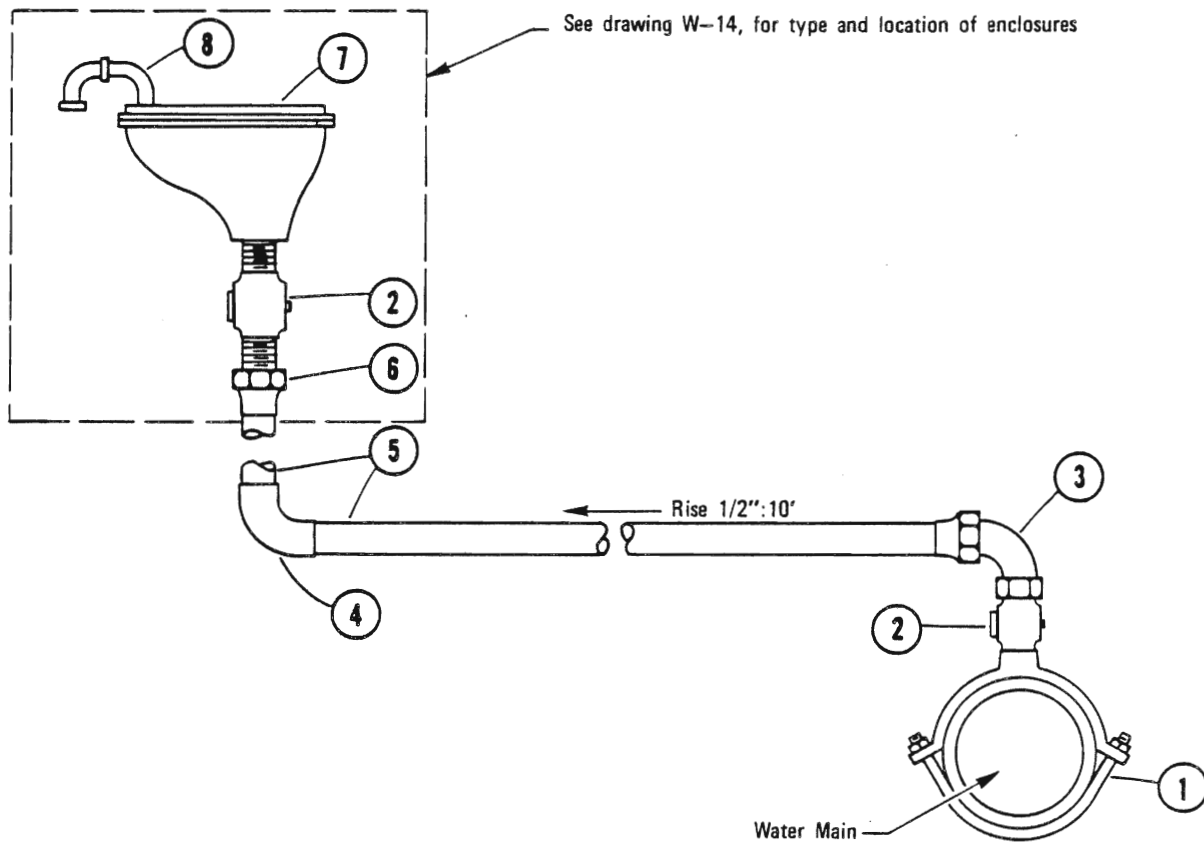
1" AND 2" MANUAL AIR RELEASES

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehn *Dec. 1975*
Coordinator R.C.E. 1987 Date

DRAWING
NUMBER

W-3



- ① Double Strap Bronze Service Clamp. On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
- ② Corporation Stop
- ③ Pipe x Tubing 90° Ell
- ④ 90° Sweat Ell
- ⑤ Copper Tubing
- ⑥ Female Adaptor
- ⑦ Air and Vacuum Valve
- ⑧ 2-90° Ells (not required in above metal ground enclosures).

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen J. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

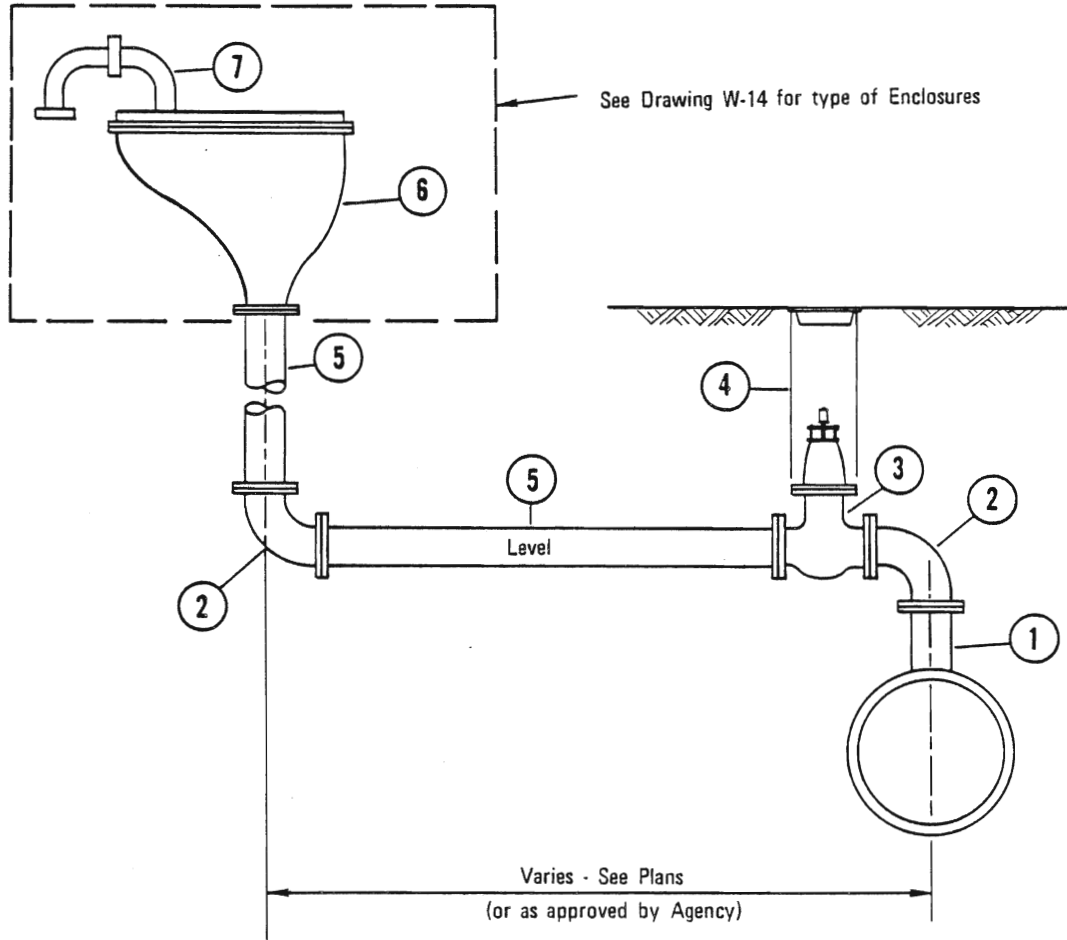
DRAWING
NUMBER

W-4

SAN DIEGO REGIONAL STANDARD DRAWING

1" AND 2" AIR AND VACUUM VALVES

Revision	By	Approved	Date
Notes	<i>SC</i>	<i>O.S.</i>	<i>2-79</i>

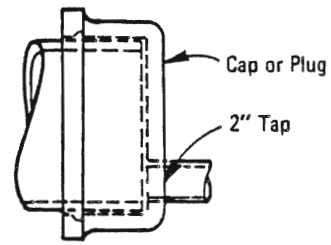
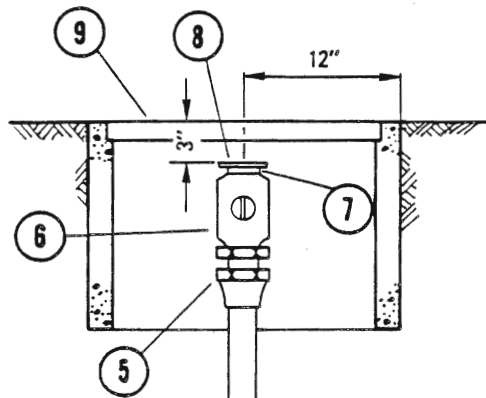


- ① Flanged Outlet, Cement Lined and Coated Steel
- ② Flanged, 90° Ell, Cement Lined and Coated Steel
- ③ Valve
- ④ Valve Well and Cap (see Standard Drawing W-12)
- ⑤ Steel Pipe, Cement Lined and Coated
- ⑥ Air and Vacuum Valve
- ⑦ 2 90° Ells (not required with above ground metal enclosures)

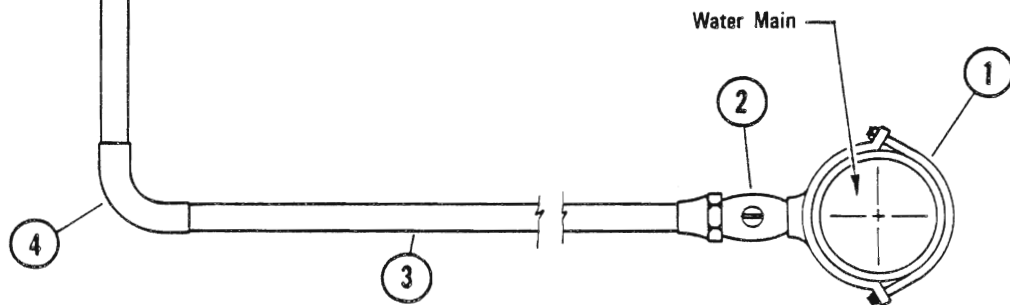
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
						<i>Allard A. Kerschbaum</i> <i>Dec. 1975</i>
				4" AND 6" AIR AND VACUUM VALVES		Coordinator R.C.E. 19807 Date
				DRAWING NUMBER		W-5



END OF MAIN DETAIL



- 1 Bronze Service Clamp (double strap). On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
- 2 Bronze Corporation Stop (installed with key on side and open tap) and adaptor as required by Agency.
- 3 Copper Tubing
- 4 90° Ell
- 5 Pipe to Tubing Adaptor
- 6 Ball Valve
- 7 Brass 2" Iron Pipe Thread x 2 1/2" Hose Pipe Thread Adaptor.
- 8 2 1/2" Hose Cap with chain, Brass.
- 9 Meter Box (see Standard Drawing W-15 for location).

LEGEND ON PLANS



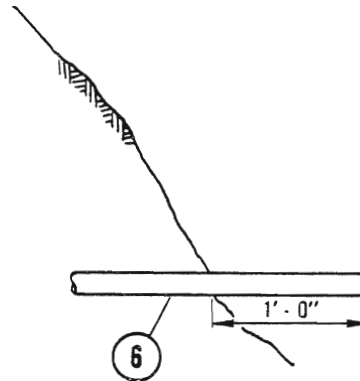
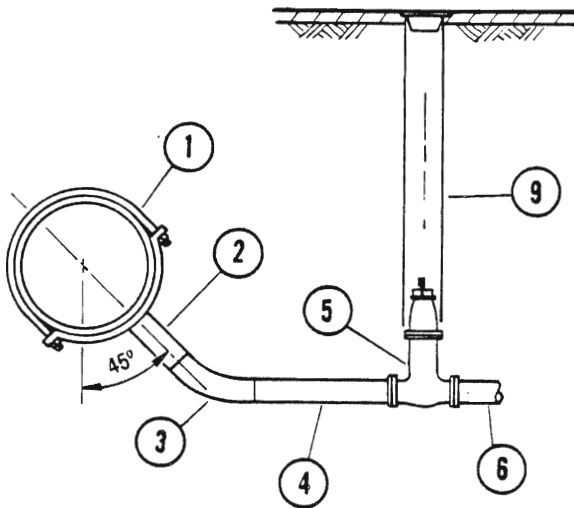
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Robert A. Kuehnel DEC. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

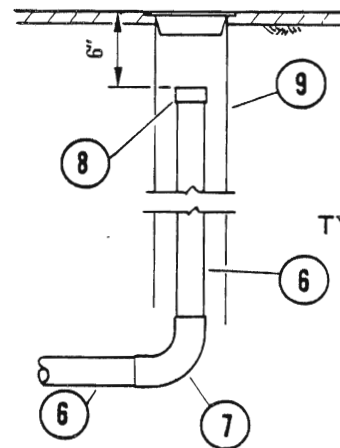
2" BLOW-OFF ASSEMBLY - TYPE A

Revision	By	Approved	Date
Detail	D.S.		7-79

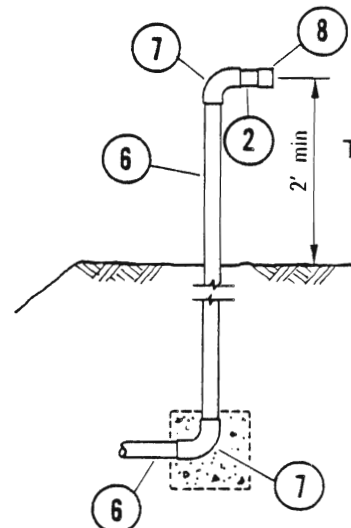
DRAWING
NUMBER W-6



TYPE-B



TYPE-C



TYPE-D

- 1 Bronze Service Clamp (double strap) or Pretapped Coupling. On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
- 2 2" Nipple (2"x 3")
- 3 45° Ell
- 4 2" Nipple (2"x 6")
- 5 2" Valve
- 6 2" Pipe
- 7 90° Ell
- 8 2" Threaded Cap
- 9 Valve Well Installation, See Standard Drawing W-12

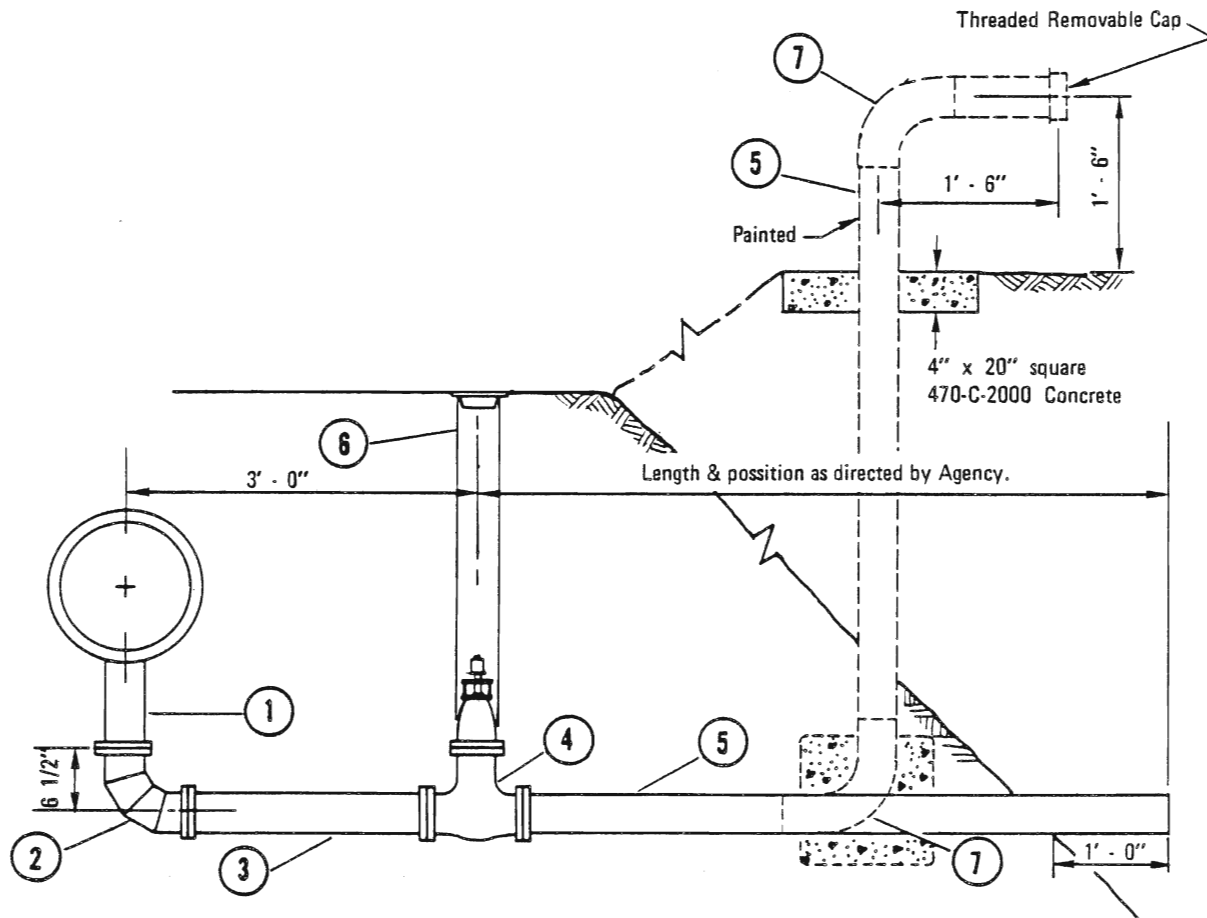
NOTES

- 1. Type of installation and materials to be specified by Agency.
- 2. See Standard Drawing W-6 for end of main detail.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Notes	SC	D.S.	7-79		<i>Allard A. Kerschbaum</i> <i>DEC. 1975</i> Coordinator R.C.E. 19807 Date	
					2" BLOW-OFF ASSEMBLIES TYPES B, C AND D	DRAWING NUMBER W-7



- ① Flanged Tee or Welded Saddle.
- ② Short Radius 90° Flanged Bend, Cement Lined and Coated.
- ③ Steel Pipe, Cement Lined and Coated.
- ④ Flanged Valve.
- ⑤ Steel Pipe (or P. V. C. Schedule 80 Pipe Where Permitted by Agency).
- ⑥ Valve Well (See Standard Drawing W-12).
- ⑦ 90° Bend (Same Material as Item 5).

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

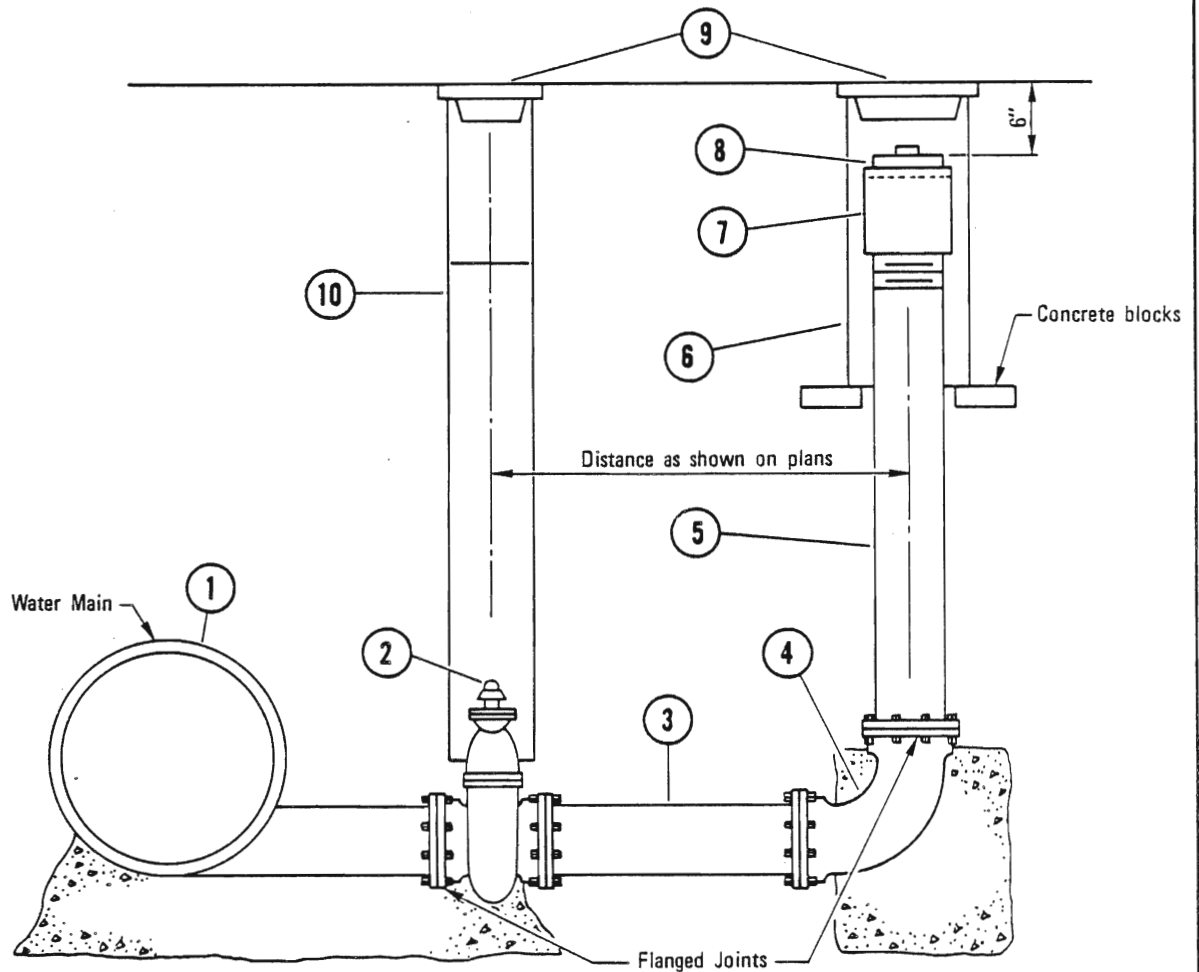
DRAWING
NUMBER

W-8

SAN DIEGO REGIONAL STANDARD DRAWING

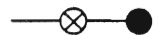
**4" AND 6" BLOW-OFF ASSEMBLIES
TYPE A**

Revision	By	Approved	Date

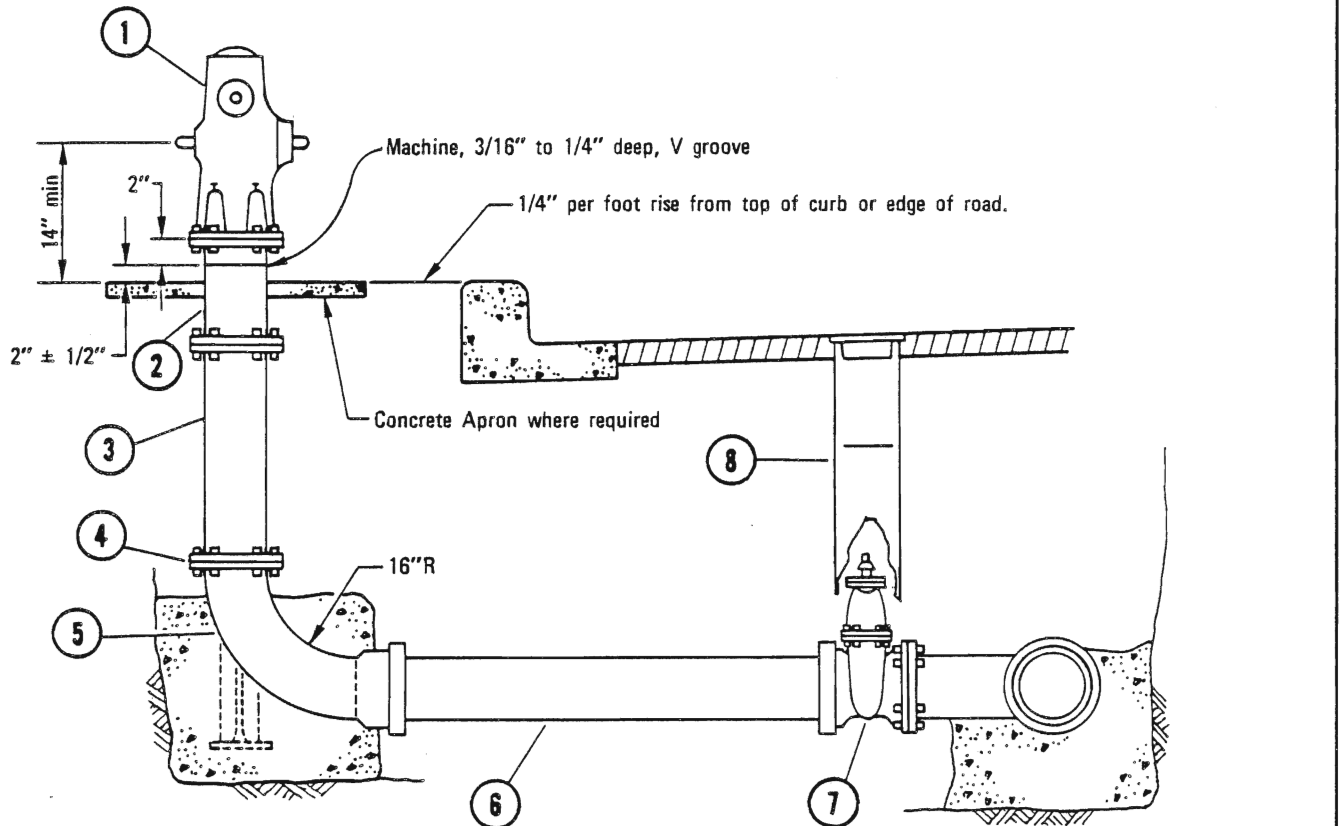


- ① Main Size x Flanged Outlet, cement lined and coated.
- ② Flanged Gate Valve (F x RT for A.C. Pipe).
- ③ Cast Iron Pipe or A.C. Pipe (6 1/2' min for A.C. Pipe).
- ④ F x F 90° Bend (F x RT for A.C. Pipe).
- ⑤ Galvanized Iron Pipe, threaded and flanged.
- ⑥ 10" Class 200 A.C. Pipe Gate Well.
- ⑦ Galvanized Iron Coupling, threaded.
- ⑧ Galvanized Iron Plug.
- ⑨ Gate Well Cap with 4" skirt.
- ⑩ Valve Well (see Standard Drawing W-12).

LEGEND ON PLANS

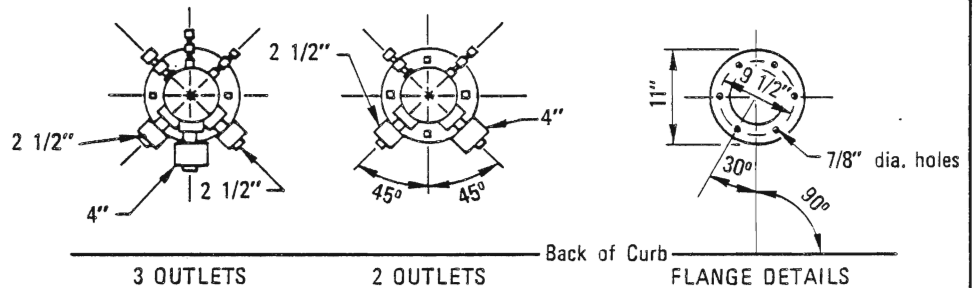


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
					4" AND 6" BLOW-OFF ASSEMBLIES TYPE B	<i>Allard A. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
				DRAWING NUMBER		W-9



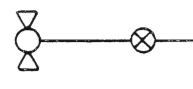
NOTE

Items 2, 3 & 6 may be cement lined and coated flanged steel pipe where permitted by Agency.



- ① Fire Hydrant
- ② 12" long Extension Spool
- ③ Extension Spool
- ④ 3/4"x 3" Hex. Head Machine Bolts and Nuts, Typical.
- ⑤ Hydrant Ell
- ⑥ Asbestos Cement Pipe
- ⑦ Valve
- ⑧ Valve Well Installation (see Standard Drawing W-12)

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

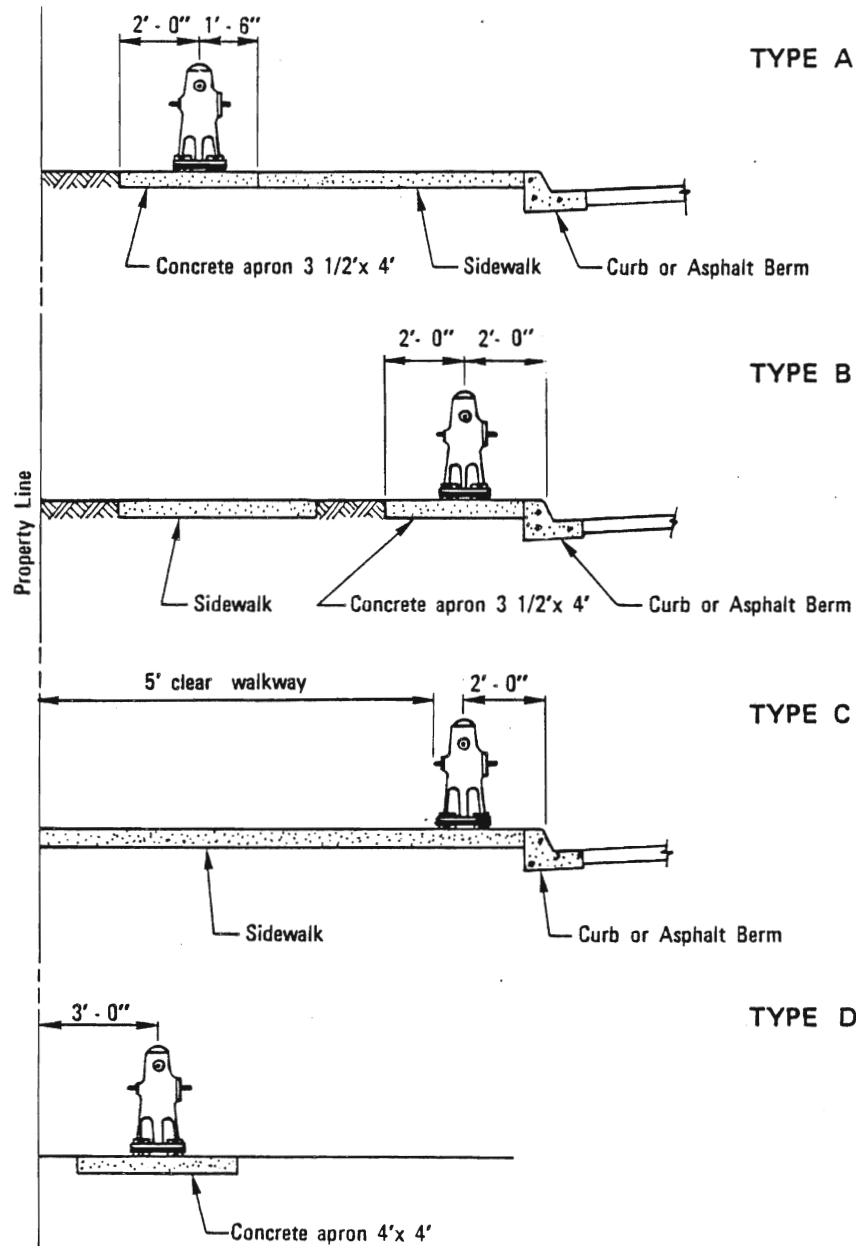
DRAWING NUMBER

W-10

SAN DIEGO REGIONAL STANDARD DRAWING

6" FIRE HYDRANT

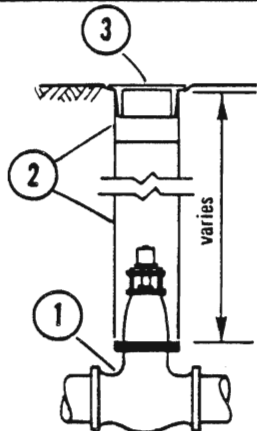
Revision	By	Approved	Date



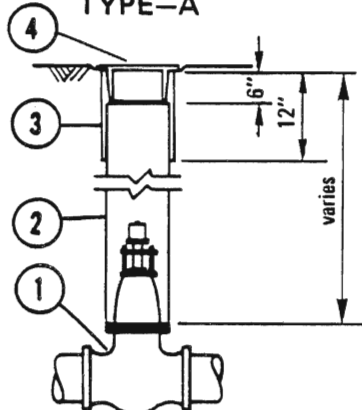
NOTES:

1. Apron, where required by Agency, shall be 4" thick (520-C-2500) concrete.
2. When distance from hydrant to the top or toe of slope is less than 2'-0", special hydrant installation will be required by Agency.
3. Where hydrant is not protected by a vertical face of curb protective posts are required. See Standard Drawing W-16 for details.
4. Hydrant shall be located 5' minimum from curb return and 3' minimum from driveway or any fixed obstruction.

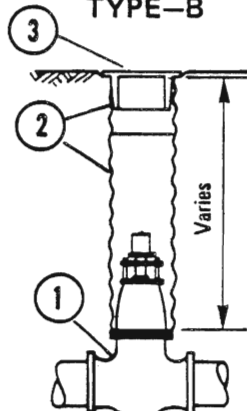
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Notes	TRP	M.B.	10-82		
				FIRE HYDRANT LOCATIONS	<i>Allan G. Kuehn</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
					DRAWING NUMBER W-11



TYPE-A



TYPE-B



TYPE-C

- 1 Valve
- 2 8" Asbestos Cement Pipe, Class 150
- 3 Valve Well Cap per Detail

NOTES

1. Provide clamp or felt to hold pipe sections (item 2) together during backfill.
2. Pipe shall be saw or machine cut on each end, no beveled sections will be permitted.
3. The final adjustment to finish grade may be made with an asbestos cement ring of 1" minimum height.

- 1 Valve
- 2 8" O.D. Steel Pipe, or 10 Ga. Asphalt Coated and Lined.
- 3 8 5/8" O.D. Steel Pipe or 10 Ga. Asphalt Coated and Lined.
- 4 Valve Well Cap per Detail

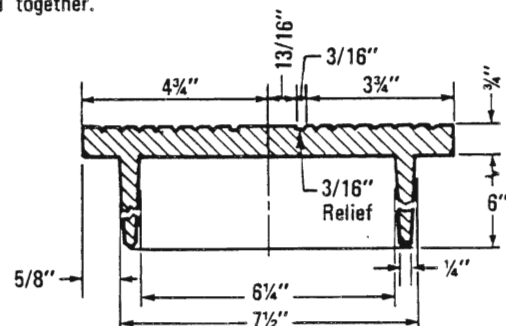
- 1 Valve
- 2 8" Corrugated Steel Pipe, 16 Gage
- 3 Valve Well Cap per Detail

NOTE

Pipe sections shall be tack welded together.

NOTES

1. Clearance around cover shall permit lifting by hand without damage to pipe. Maximum clearance shall be 3/16".
2. See Standard Drawing W-13 for valve stem extension, when required by Agency.



CAST IRON
VALVE WELL CAP
DETAIL

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

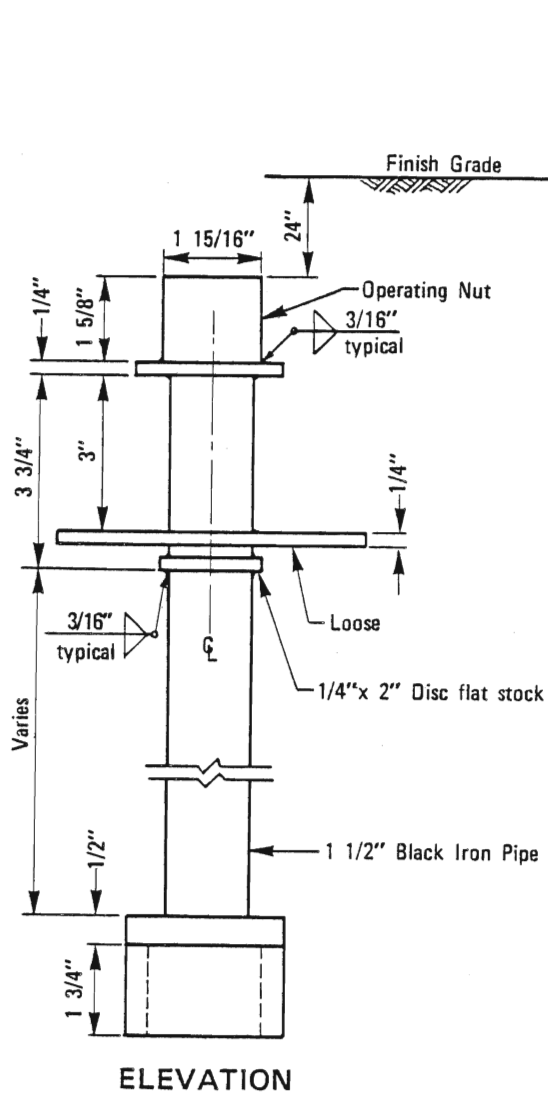
DRAWING
NUMBER

W-12

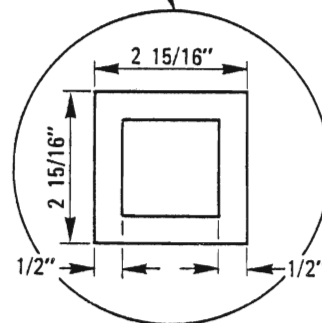
SAN DIEGO REGIONAL STANDARD DRAWING

VALVE WELL INSTALLATION

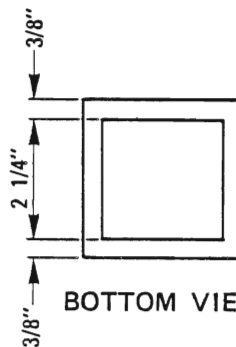
Revision	By	Approved	Date
Cap Det.	<i>R. M. B.</i>		5-86



Diameter varies. Make 1/4" less than I.D. of can.



TOP VIEW

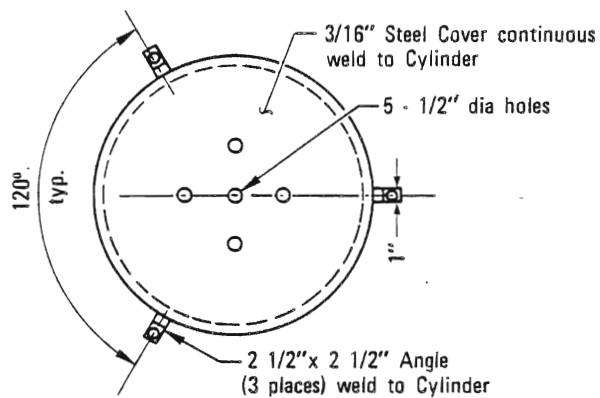


BOTTOM VIEW

NOTES

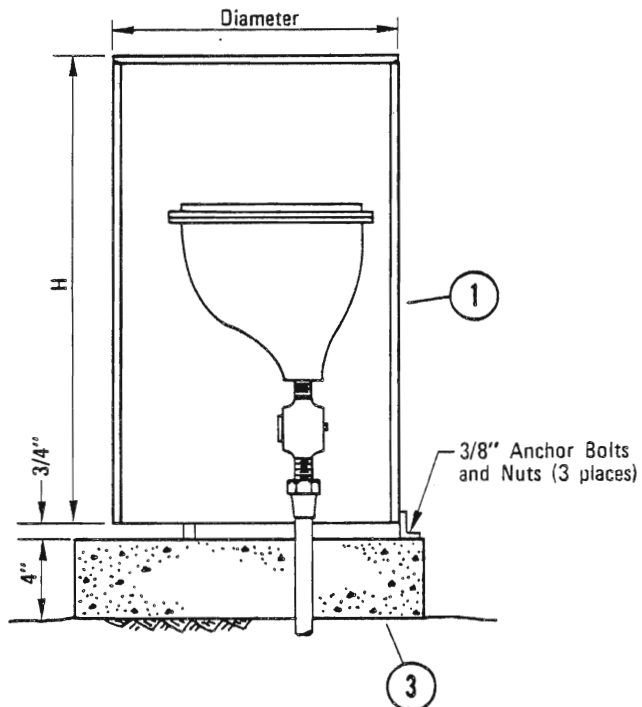
1. Extension to be used when top of valve nut is 5' or more below finish grade.
2. Paint all finished surfaces with asphalt varnish.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
				VALVE STEM EXTENSION	
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				<i>Alfred A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date	
				DRAWING NUMBER W-13	

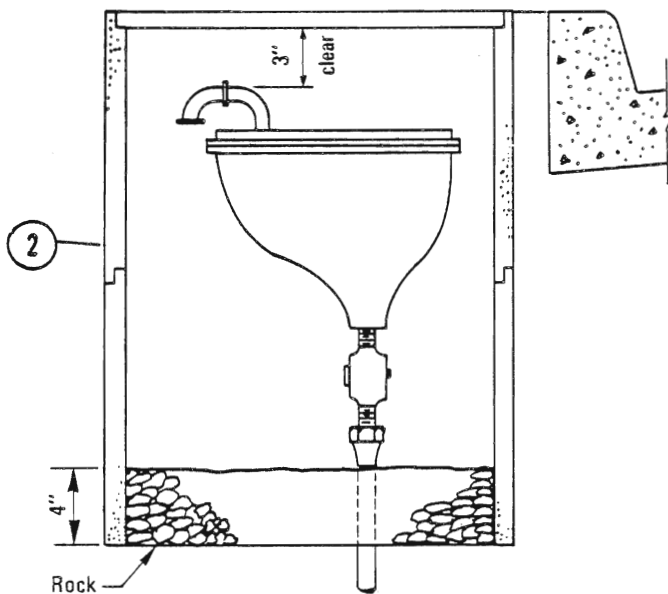


PLAN

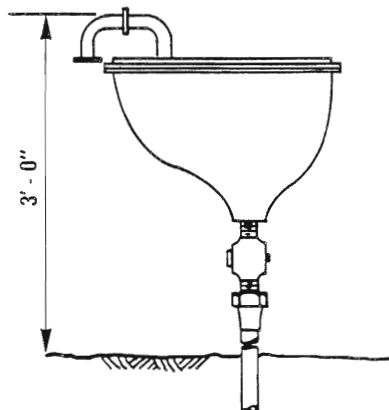
Valve Size	Dia	H
1" & 2"	14"	24"
4"	14"	30"
6"	16"	36"



TYPE A



TYPE B



TYPE C

- 1 Steel enclosure, paint as specified by Agency.
- 2 Meter box, see Standard Drawing W-15 for location.
- 3 2' x 2' pad, 470 - C - 2000 Concrete

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

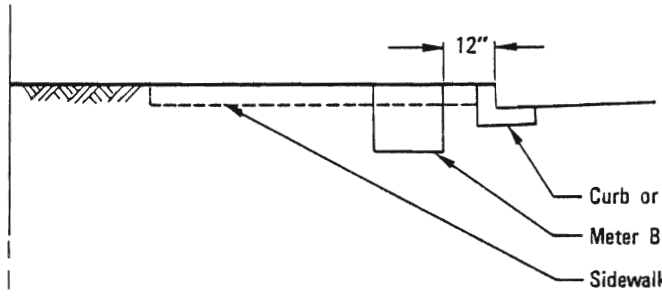
SAN DIEGO REGIONAL STANDARD DRAWING

AIR AND VACUUM VALVE ENCLOSURES

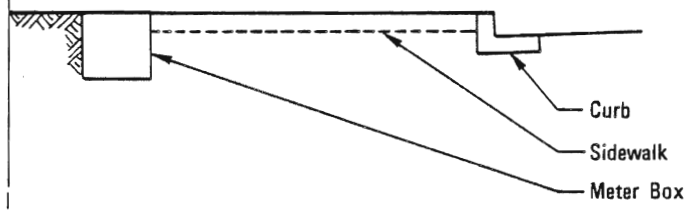
Revision	By	Approved	Date

DRAWING
NUMBER

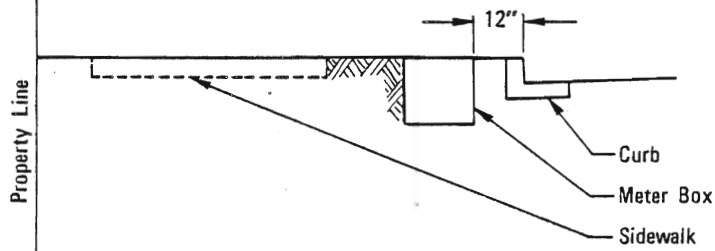
W-14



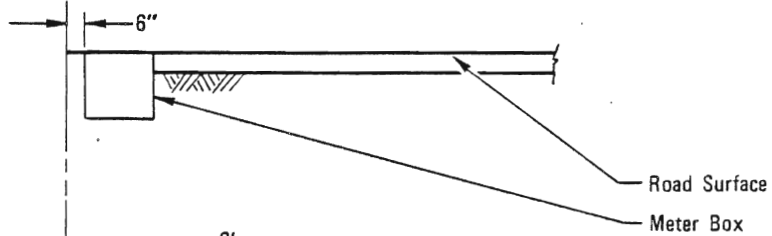
TYPE *A1
WITH OR WITHOUT COMMERCIAL
OR RESIDENTIAL SIDEWALK



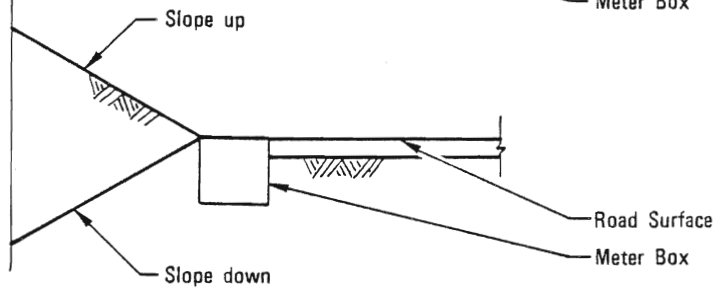
TYPE *A2
CONTIGUOUS SIDEWALK



TYPE B
NON-CONTIGUOUS SIDEWALK



TYPE C
NO CURB



TYPE D
NO CURB

* Agency to determine alternate

Revision	By	Approved	Date

SAN DIEGO REGIONAL STANDARD DRAWING

METER BOX LOCATIONS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

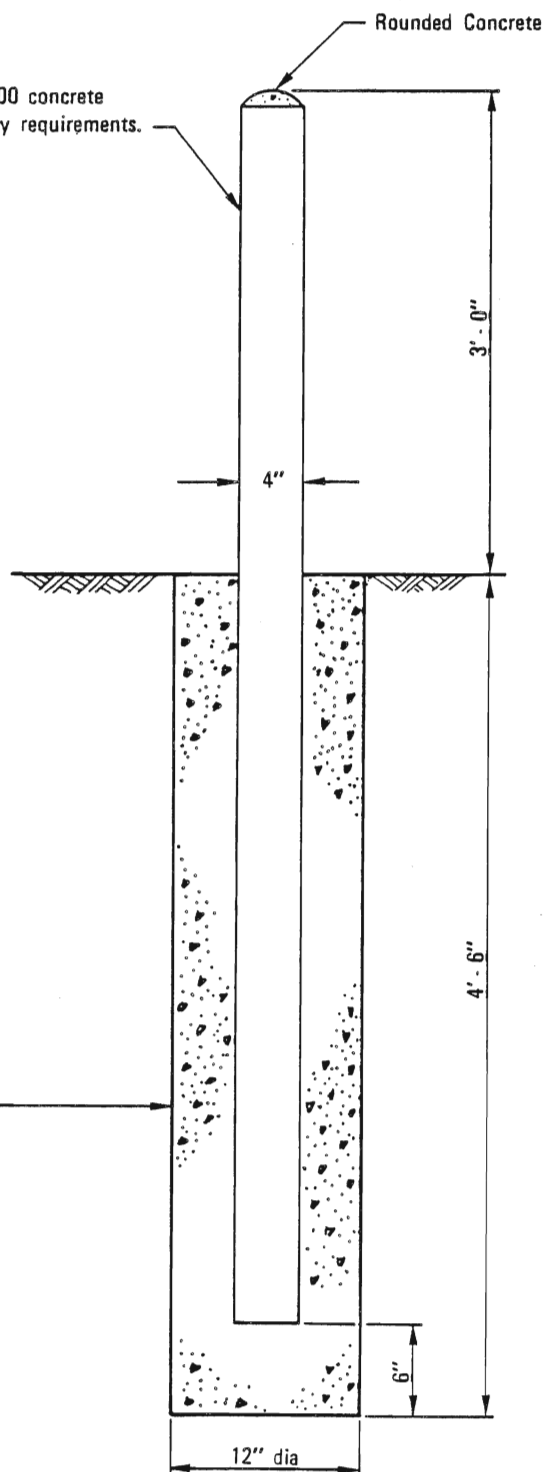
DRAWING
NUMBER

W-15

4" steel pipe filled with 470 - C - 2000 concrete
and painted in accordance with Agency requirements.

Rounded Concrete

470 - C - 2000 concrete



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Oliver A. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

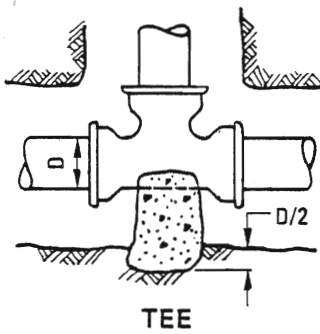
SAN DIEGO REGIONAL STANDARD DRAWING

PROTECTION POST

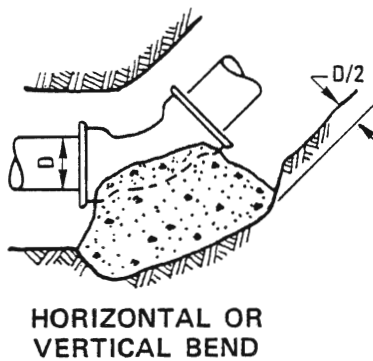
Revision	By	Approved	Date

DRAWING
NUMBER

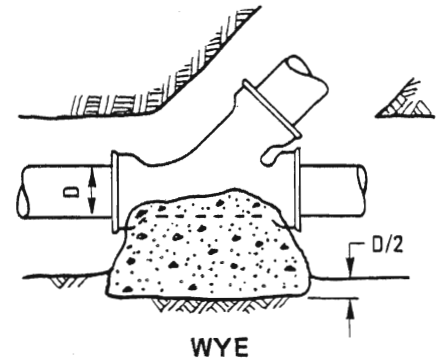
W-16



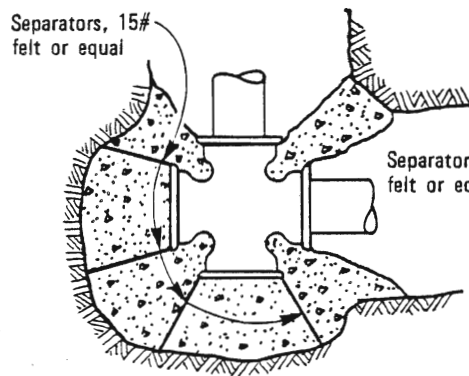
TEE



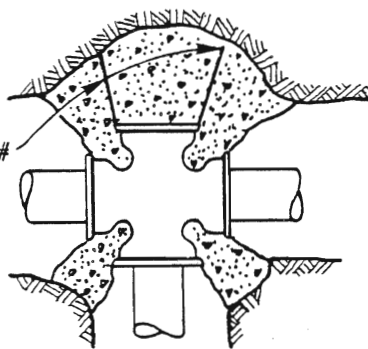
HORIZONTAL OR
VERTICAL BEND



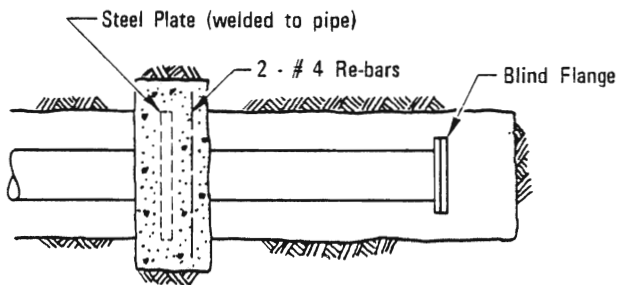
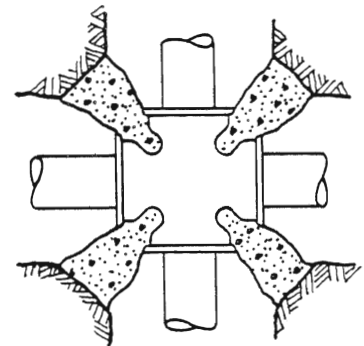
WYE



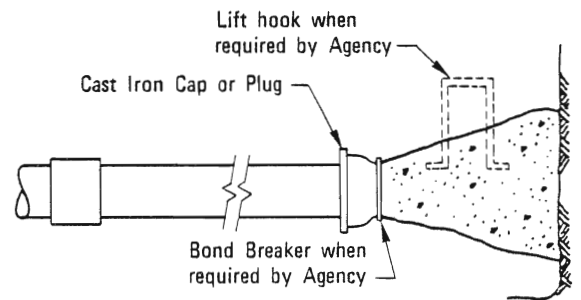
Separators, 15#
felt or equal



CROSS BLOCKING



STEEL PIPE
PLAN



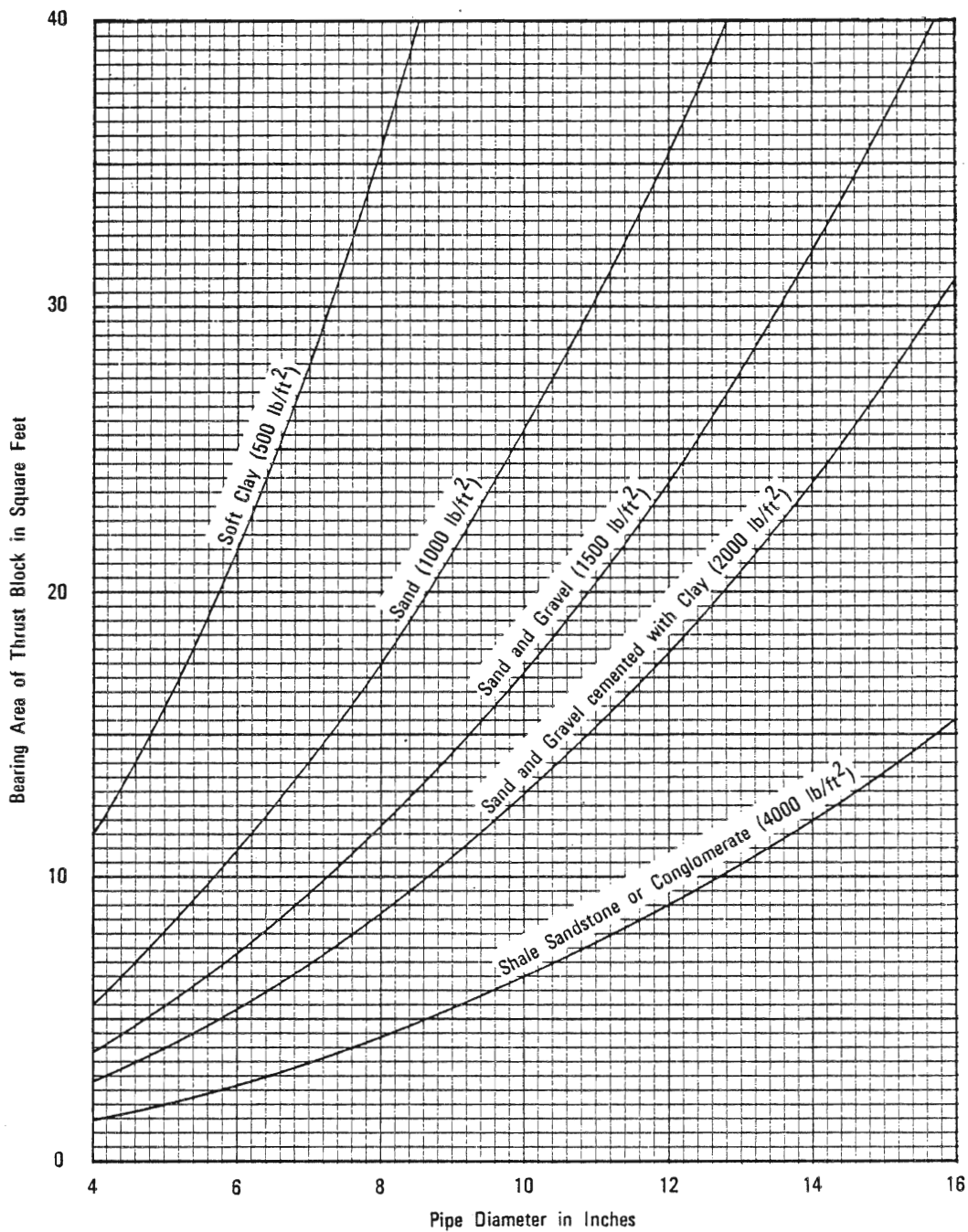
A.C. PIPE
ELEVATION

DEAD END BLOCKING

NOTES

1. Concrete shall be 470 - C - 2000.
2. See Standard Drawing W-18 for bearing areas.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				CONCRETE THRUST BLOCKS		<i>Allen G. Kerschbaum</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
						DRAWING NUMBER W-17



NOTES

- Based on 225 psi test pressure and bearing values of dry soils.
- Values from curves are for tees and deadends, i.e.; straight line thrust.
For 90° bend: 1.4 value from curve.
For 45° bend: 0.8 value from curve.
For 22 1/2° bend: 0.4 value from curve.
- For conditions not covered by curves, special thrust blocks must be computed and approved.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

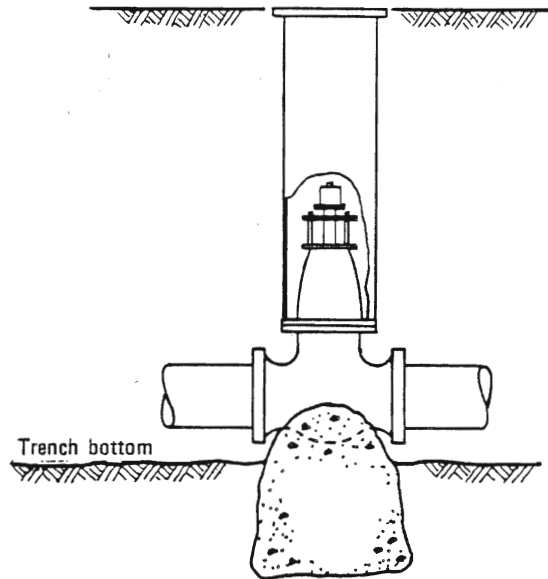
SAN DIEGO REGIONAL STANDARD DRAWING

THRUST BLOCK BEARING AREAS

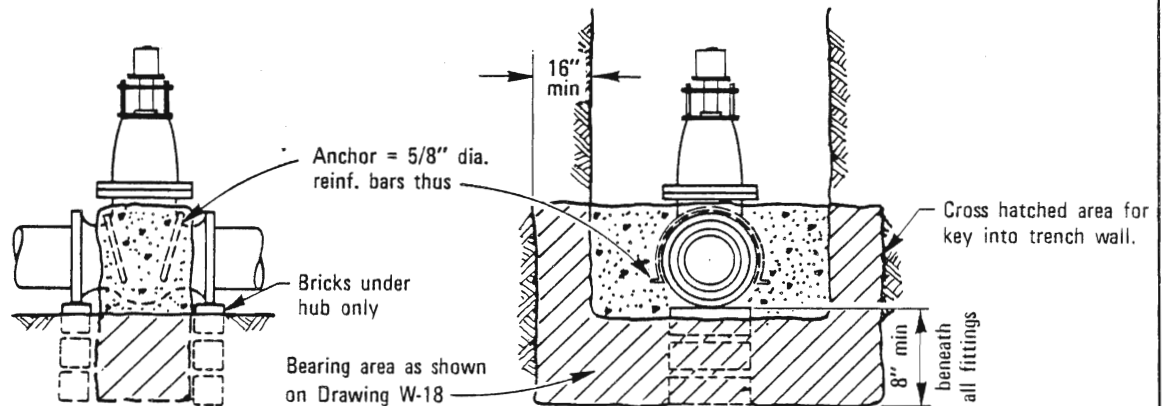
Revision	By	Approved	Date

DRAWING
NUMBER

W-18



TYPE-A SUPPORT BLOCK

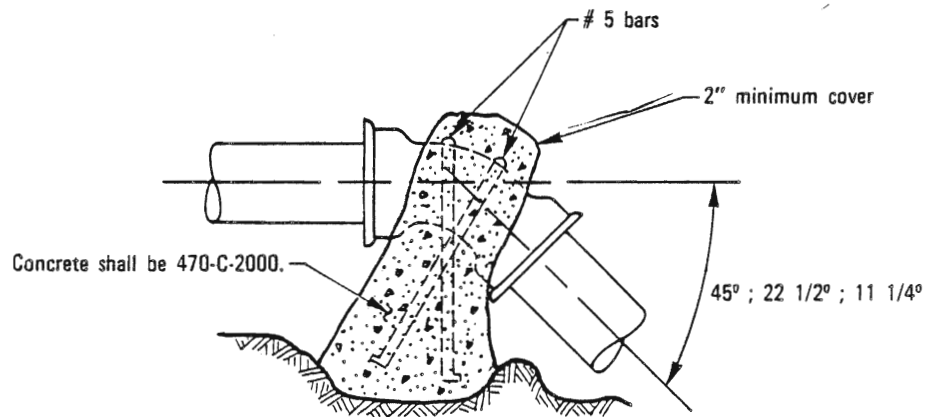


TYPE-B THRUST BLOCK

NOTE

Concrete shall be 470-C-2000.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				CONCRETE VALVE BLOCKING		<i>Allard A. Kuehn</i> <i>Dec. 1975</i>
						Coordinator R.C.E. 19807 Date
						DRAWING NUMBER
						W-19



Pipe Nominal Dia	Cubic Ft. Of Concrete Required per 100 P.S.I. Pressure *		
	45°	22 1/2°	11 1/4°
4	7	4	2
6	15	8	4
8	27	14	7
10	**	21	11
12	**	**	16

* Increase volumes shown in proportion to pressures existing when pressure testing pipeline.

** Special design required.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

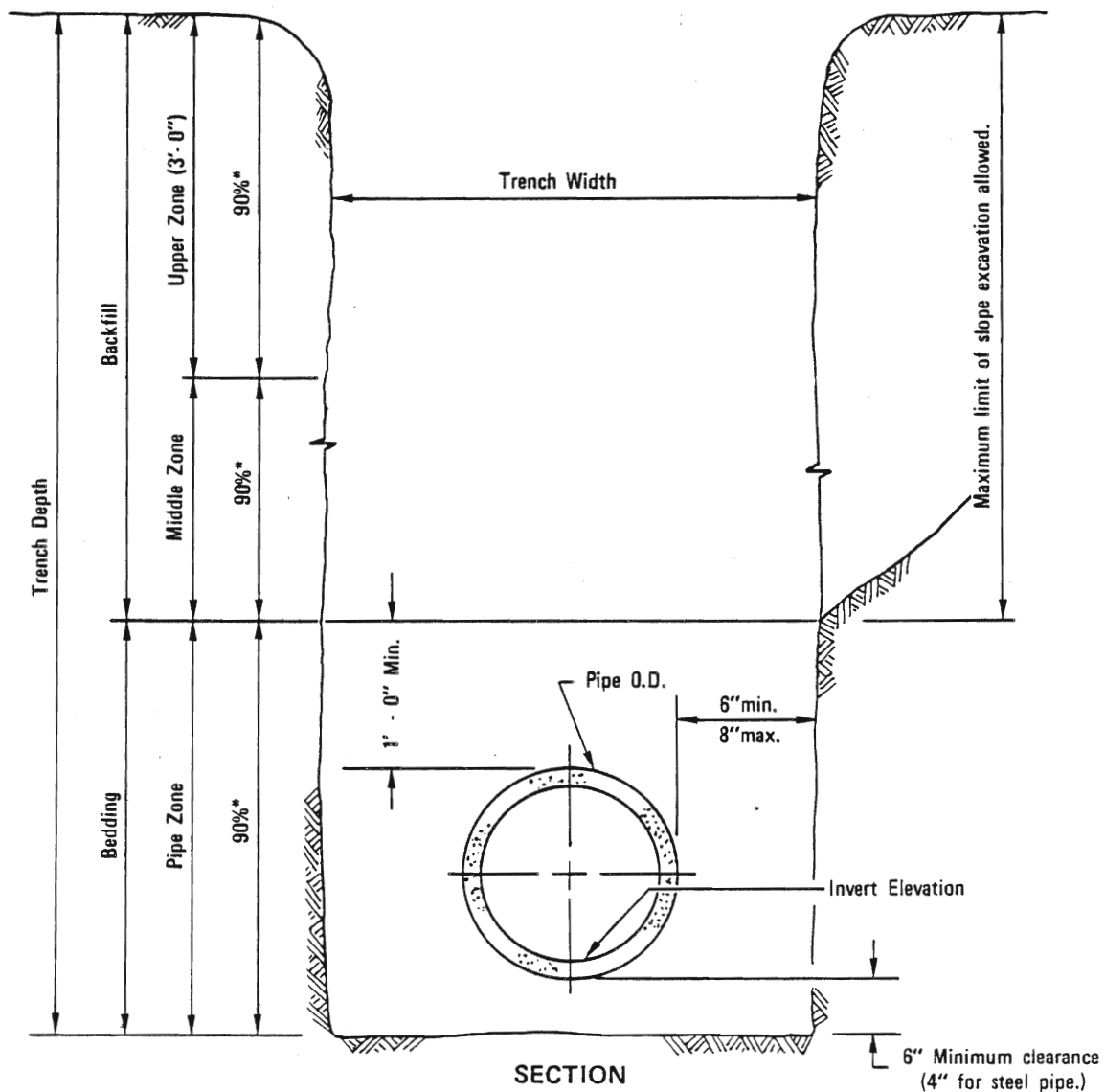
DRAWING
NUMBER

W-20

SAN DIEGO REGIONAL STANDARD DRAWING

**ANCHOR BLOCK
(VERTICAL BEND ONLY)**

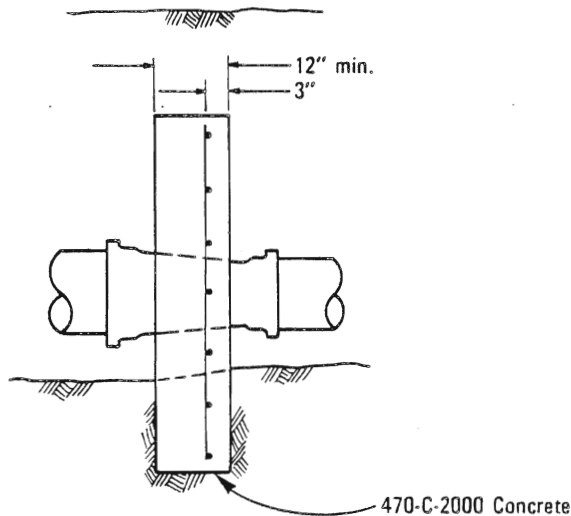
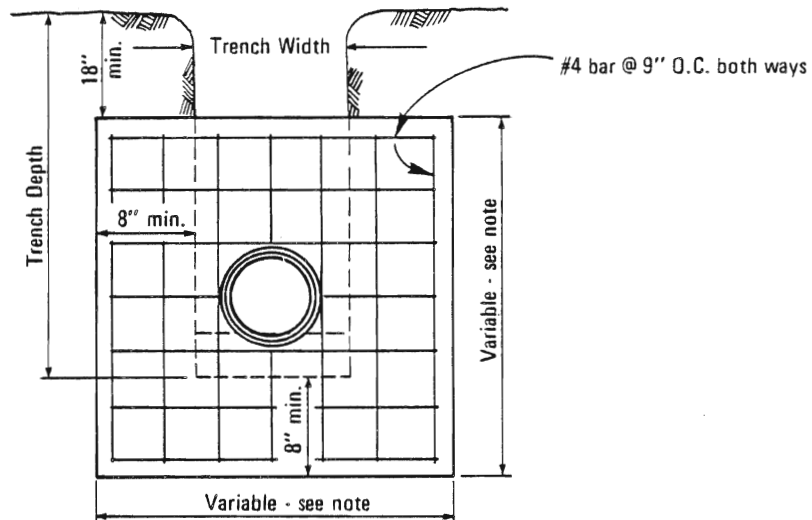
Revision	By	Approved	Date



NOTES

1. For trenching on improved streets see standard drawing G-24 or G-25 for resurfacing details.
2. (*) indicates minimum relative compaction.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Section	SC	D.S.	7-77			<i>Allen A. Kuehn</i> Dec. 1975	
Reference	TR	M.B.	10-82	PIPE BEDDING AND TRENCH BACKFILL FOR WATER MAINS		Coordinator R.C.E. 19807 Date	
Compact.	C	M.B.	5-86			DRAWING NUMBER W-21	



NOTE:

Bearing area shall be the difference between the bearing areas required for thrust anchorage of mains on each side of reducer as found from Std. Dwg. W-18 plus the area of the trench opening, except that minimum dimensions shown shall be adhered to.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

David J. Solomon *July 1979*
Coordinator R.C.E. 25291 Date

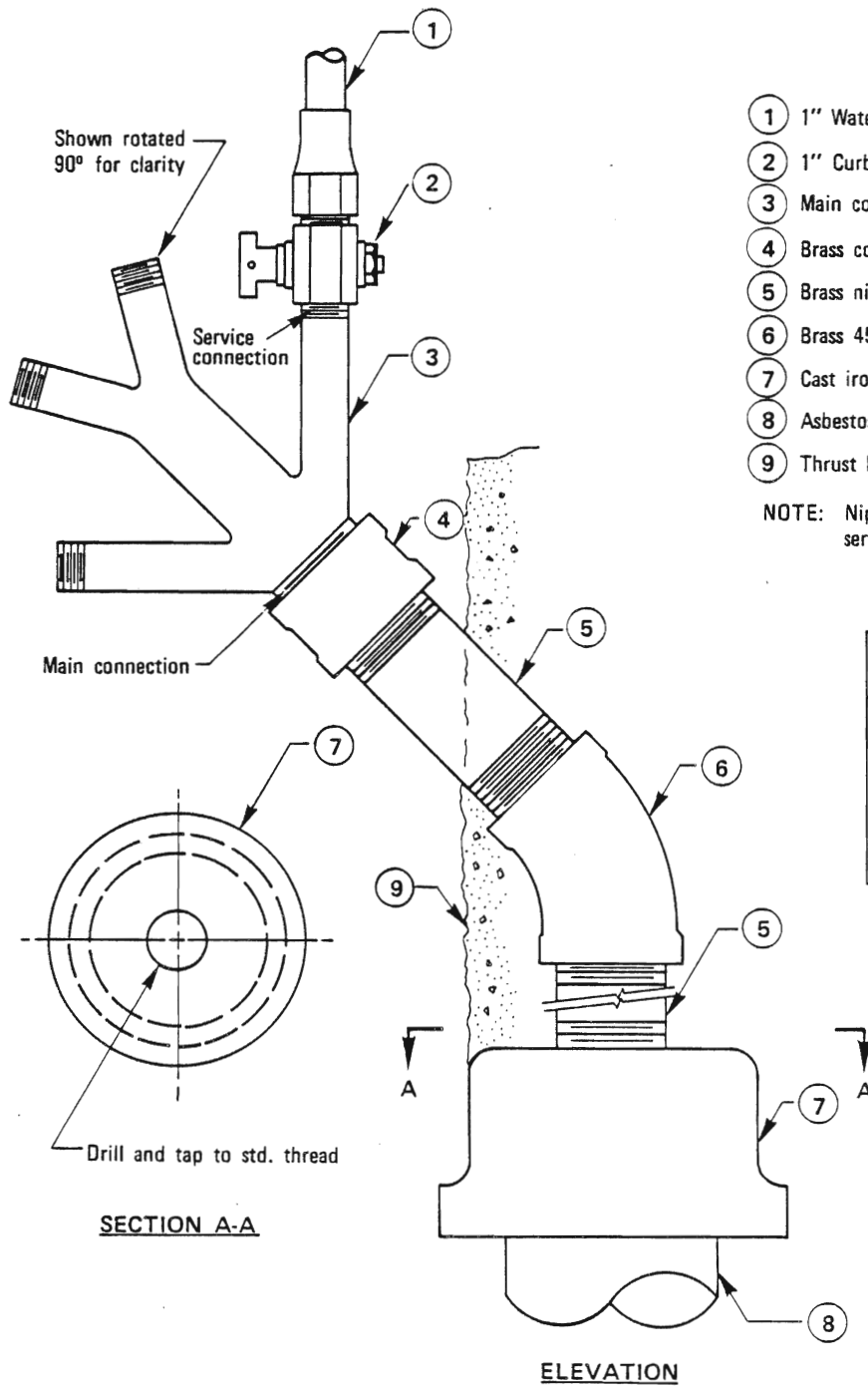
SAN DIEGO REGIONAL STANDARD DRAWING

**THRUST ANCHOR FOR
WATER MAIN REDUCER - 4 THRU 16 INCH**

DRAWING
NUMBER

W-22

Revision	By	Approved	Date

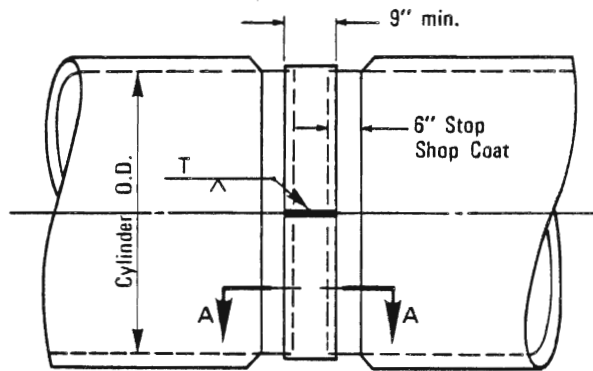


- ① 1" Water service per Dwg W-1
- ② 1" Curb stop
- ③ Main connection X multiple branch connection
- ④ Brass coupling or 45° elbow
- ⑤ Brass nipple - 4" min. length
- ⑥ Brass 45° elbow
- ⑦ Cast iron cap
- ⑧ Asbestos cement pipe
- ⑨ Thrust block per Dwg W-17

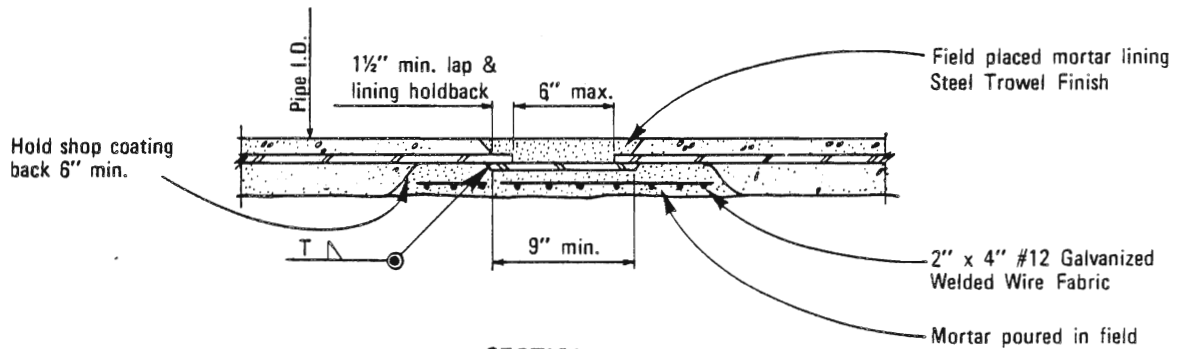
NOTE: Nipple lengths to be sufficient to allow service connection to clear thrust block.

Service Connection	Main Connection Item 5
2	1¼"
3	1½"
4	2"
6	2½"
8	3"

Revision	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>David S. Solomon July 1979</i> Coordinator R.C.E. 25291 Date
			MULTIPLE SERVICE ASSEMBLY DEAD END MAIN	DRAWING NUMBER W-23



ELEVATION



SECTION A-A

NOTE:

Contractor shall provide handholes as required to complete the work

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

David J. Solomon July 1979
Coordinator R.C.E. 25291 Date

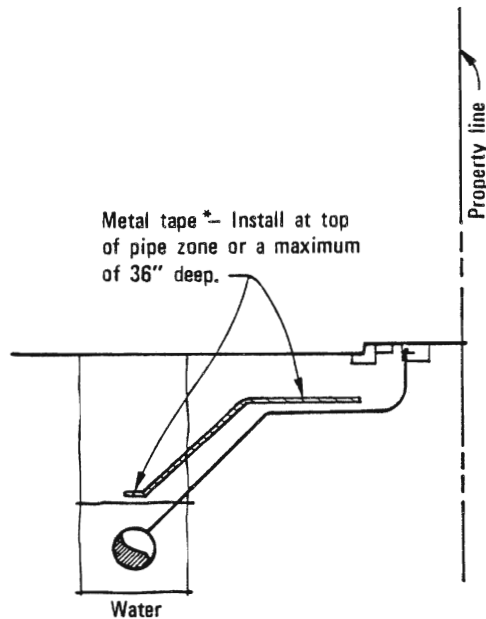
SAN DIEGO REGIONAL STANDARD DRAWING

SPLIT BUTT STRAP

DRAWING
NUMBER

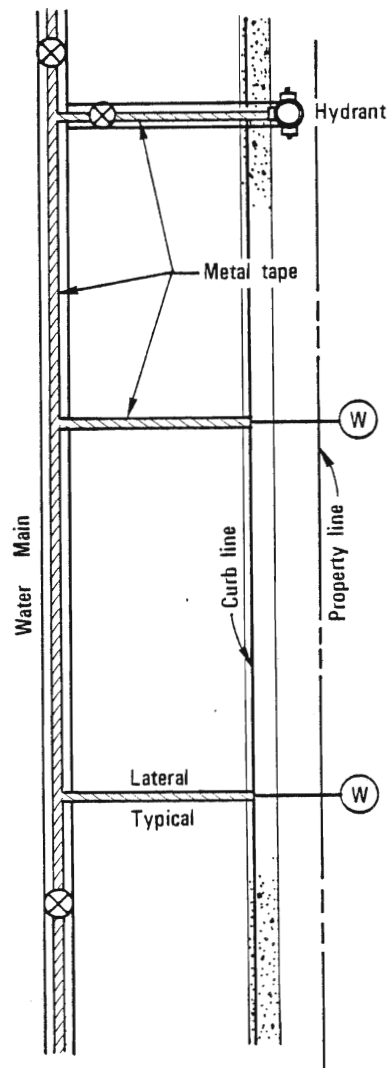
W-24

Revision	By	Approved	Date



SECTION

- * 1. Use 2" tape for depths of 30" or less.
2. Use 3" tape for depths greater than 30".



PLAN

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE M. Behman 4-25-86 Coordinator R.C.E. C21133 Date
				METALLIC TAPE LOCATOR FOR NON-METALLIC WATER PIPE		DRAWING NUMBER W-25

INDEX

-A-	Drawing No.
AIR AND VACUUM VALVE	
1" and 2"	W-4
4" and 6"	W-5
Enclosure	W-14
AIR RELEASE VALVE	
Manual.	W-3
ALLEY	
Apron, Concrete	G-17
Concrete, Pavement.	G-21
ANCHOR, PIPE	
Concrete.	S-9
Thrust.	W-22
Valve	W-19
Vertical Bend	W-20
-B-	
BACKFILL, PIPE TRENCH	
Irrigation.	1-25, 1-26
Sewer	S-4, S-5, S-18
Storm Drain	D-60
Water Main.	W-21
BACKFLOW PREVENTER	
Continuous Pressure	1-8, 1-9
Reduced Pressure.	1-31
Vacuum Breaker.	1-7
BARRICADE, STREET	M-9
BENCH MARK, BRASS PLUG.	M-11
BERM, ASPHALT CONCRETE.	G-5
BLOCK, CONCRETE	
Anchor.	W-20, W-22
Thrust.	W-17, W-22
Valve	W-19
BLOW-OFF, WATER	
2"	W-6, W-7
4" and 6"	W-8, W-9
BROW DITCH.	D-75

	Drawing No.
BUTT STRAP, SPLIT	W-24
-C-	
CATCH BASIN	
Corrugated Steel Pipe,	
Type A, B	D-16
Grate Top, Type G, I.	D-8, D-29
Side Opening, Type F.	D-7
CHANNEL, DRAINAGE	
Cutoff Wall	D-72
Debris Fence.	D-82
Earthen	D-74
Lined, Concrete	D-70, D-71
Pipe Connection	D-73
CLEANOUT	
Sewer, Force Main	S-16
Sewer, Gravity.	S-3
Storm Drain, Type A, B.	D-9, D-10
Storm Drain,	
Notes and Details	D-11
CONCRETE	
Backfill, Sewer	S-8
Collar, Pipe.	D-62
Cradle, Sewer	S-6
Encasement, Sewer	S-7, S-12
Lug, Pipe	D-63
Mowing Strip.	L-3
Removal and Replacement	G-11
CORRUGATED STEEL PIPE	
Inlets, Type A, B	D-16, D-17
Slotted Drain	D-18, D-19
CULVERT, BOX	
Double.	D-77
Miscellaneous Details	D-81
Single.	D-76
Triple.	D-78
Wingwalls, Type A, B & C.	D-79
Wingwalls, Warped	D-80
CURB AND GUTTER	
Combined.	G-2
Median.	G-6

INDEX

	Drawing No.
Monolithic With Sidewalk.	G-3
Removal and Replacement	G-11
Rolled.	G-4
Separate.	G-1
CURB INLET	
Apron, Concrete	D-20
Grate	D-15
Median, Type J.	D-45
Notes and Details	D-11
Opening	D-12
Side Opening Only.	D-1, D-2, D-4
Side Opening w/Grate.	D-3
CURB OUTLET	
Concrete, Type A.	D-25
Pipe.	D-27
CURTAIN WALL.	D-38
CUTOFF WALL	
Alley Pavement.	G-23
Channel	D-72
Street Pavement	G-22
Trench.	S-10
-D-	
DATUMS.	M-12
DEBRIS FENCE.	D-82
DIKE, A.C.	G-5
DISSIPATOR, ENERGY	
Concrete.	D-41, D-42, D-43
Rip Rap	D-40
DITCH; BROW, TERRACE.	D-75
DOWNDRAIN	
Asphalt Concrete.	D-22
Flume	D-23
Pipe.	D-24
DRINKING FOUNTAIN	M-18

	Drawing No.
DRIVEWAY	
Concrete.	G-14, G-26
Location.	G-15, G-16
Width	G-16
-E-	
ELECTRICAL EQUIPMENT, PEDESTAL.	E-33
ENCASEMENT	
Sewer Pipe.	S-7
Sewer Pipe, Undercut.	S-12
-F-	
FENCE	
Chain Link.	M-6
Debris Fence.	D-82
Details	M-20
Tennis Court.	M-17
FIRE HYDRANT	
6" Hydrant.	W-10
Locations	W-11
Markers	M-19
FLUME DOWN DRAIN.	D-23
FRAME	
Grate	D-13
Manhole	M-1, M-2, M-3
-G-	
GRATE	
Drainage.	D-15
Frame	D-13
Tree Well	L-4
GUARD RAIL, METAL BEAM	
Details	M-8
Installation.	M-7
GUTTER	
Cross	G-12
Cross, Mid-Block.	G-13

INDEX

	Drawing No.
-H-	
HEADWALL	
Gravity Type.	D-32, D-33
L Type.	D-36, D-37
Straight, Type A, B	D-30, D-31
Warped.	D-44
Wing and U Type	D-34, D-35
HYDRANT MARKERS, FIRE	M-19
-I-	
INLET APRON	D-39
INLET, DRAIN	
Corrugated Steel Pipe,	
Type A & B.	D-16, D-17
Slotted,	
Corrugated Steel Pipe	D-18, D-19
-J-	
JOINT TRENCH.	M-15
-L-	
LATERAL	
Sewer	S-13
Sewer, Deep Cut	S-14
Sewer, Repair	S-15
Water	W-1, W-2
LIGHTING	
Grounding	E-2
Standard.	E-1
LUG, CONCRETE	D-62
-M-	
MANHOLE, FRAME AND COVER	
24" Heavy Duty.	M-1
24" Light Duty.	M-2
36" Two Concentric Covers	M-3
Locking Device.	M-4

	Drawing No.
MANHOLE, SEWER	
4' x 2' Diameter.	S-1
4' x 3' Diameter.	S-17
5' x 3' Diameter.	S-2
MEDIAN CURB INLET	D-45
METER BOX LOCATION.	W-15
METRIC EQUIVALENTS.	M-14
MONUMENT	
Bench Mark.	M-11
Street Survey	M-10
Survey.	M-13
MOWING STRIP, CONCRETE.	L-3
-P-	
PAVEMENT, CONCRETE	
Alley Section	G-21
Joints.	G-10
Width 40' or Less	G-18
Width 40' to 62'.	G-19
Width 53' to 69'.	G-20
PEDESTAL, ELECTRICAL EQUIP.	E-33
PIPE	
Collar.	D-62
Lug	D-63
Rounded Ends.	D-61
Slotted	D-18, D-19
PLANTING, TREE AND SHRUB.	L-1, L-2
POST	
Demountable	M-16
Guard	M-9
Protection.	W-16
PULL BOX.	I-15
-R-	
RAILING, METAL BEAM	M-7, M-8

INDEX

	Drawing No.
RAMP, PEDESTRIAN.	G-27, G-28, G-29, G-30, G-31
General Notes	G-32

RETAINING WALL

Concrete.	C-11, C-12
Details, Concrete	C-13, C-14
Details, Gravity.	C-10
Details, Masonry.	C-7, C-8
Gravity	C-9
Masonry	C-1, C-2, C-3, C-4, C-5, C-6

-S-

SEWER LATERAL	S-13, S-14
-------------------------	------------

SIDEWALK

Drain Outlet.	D-27
Joint Details	G-10
Joint Locations	G-9
Monolithic Curb	G-3
Pipe Underdrain	D-27
Removal and Replacement	G-11
Typical Section	G-3, G-7

SPRINKLER

Above Ground Installation	I-21, I-22, I-23
Controller Mounting	I-17, I-18
Connection, Main.	I-28, I-29
Head, Fixed Spray	I-1
Head, Pop Up Rotary	I-3
Head, Pop Up Spray.	I-2
Head, Impact.	I-19, I-30
Pull Box, Electrical.	I-15
Trench Detail	I-25, I-26

STAKING, TREE	L-2
-------------------------	-----

STREET LIGHT

Foundation.	E-2
Grounding	E-2
Standard.	E-1

-T-

TAPE LOCATOR, METALLIC

Sewer Pipe.	S-19
Water Pipe.	W-25

TENNIS COURT FENCE.	M-17
-----------------------------	------

TERRACE DITCH	D-75
-------------------------	------

THRUST ANCHORS

Bearing Area.	W-18
Concrete.	W-17, W-19 W-20, W-22

TRENCH DETAILS

Irrigation.	I-25, I-26
Joint Utilities	M-15
Narrow.	G-33, G-34 G-35
Resurfacing	G-24, G-25
Sewer	S-4, S-5, S-18
Storm Drain	D-60
Water Main.	W-21

-U-

UNDERDRAIN, SIDEWALK

Pipe.	D-27
Concrete, Reinforced.	D-25

-V-

VALVE, SPRINKLER

Check	I-10, I-11
Gate.	I-12
Hose Bibb	I-6
Manual.	I-13, I-21
Remote Control.	I-14
Quick Coupling.	I-5, I-22
Well.	I-27

VALVE, WATER

Air and Vacuum.	W-4, W-5
Blocking, Concrete.	W-19
Enclosure, Air and Vacuum	W-14
Stem Extension.	W-13
Well Installation	W-12

INDEX

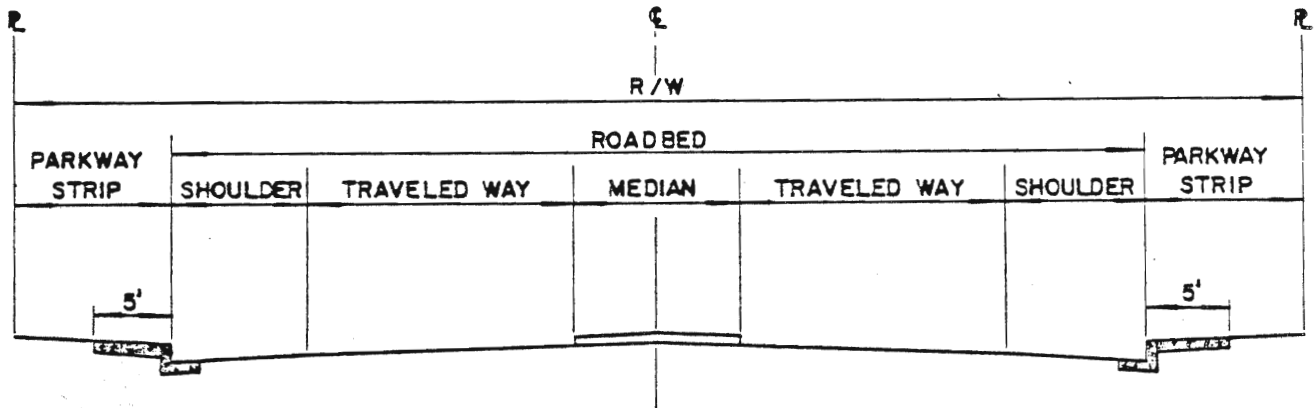
	Drawing No.	Drawing No.
	-W-	
WATER SERVICE		
1"	W-1	
1-1/2" and 2"	W-2	
Multiple.	W-23	

COUNTY OF SAN DIEGO

INDEX OF DESIGN STANDARDS

<u>Number</u>	<u>Title</u>
DS-1	Typical Roadway Sections
DS-2	Hillside Residential Street, Alt. No. 1
DS-3	Hillside Residential Street, Alt. No. 2
DS-4	Hillside Residential Street, Alt. No. 3
DS-5	Temporary Turn-Around at Dead-End Street
DS-6	Turn-Around aand Calculations
DS-7	Asphalt Concrete Driveway
DS-8	Lot Grading
DS-9	Fencing, Cut Banks
DS-10	Grading of Slopes
DS-11	Required Setbacks
DS-12	Construction Plan Symbols
DS-13	Standard Street Sign
DS-14	Dip Section (For Private Streets)
DS-15	Street Knuckle

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	N# 4		

* COMM. & IND. = COMMERCIAL & INDUSTRIAL

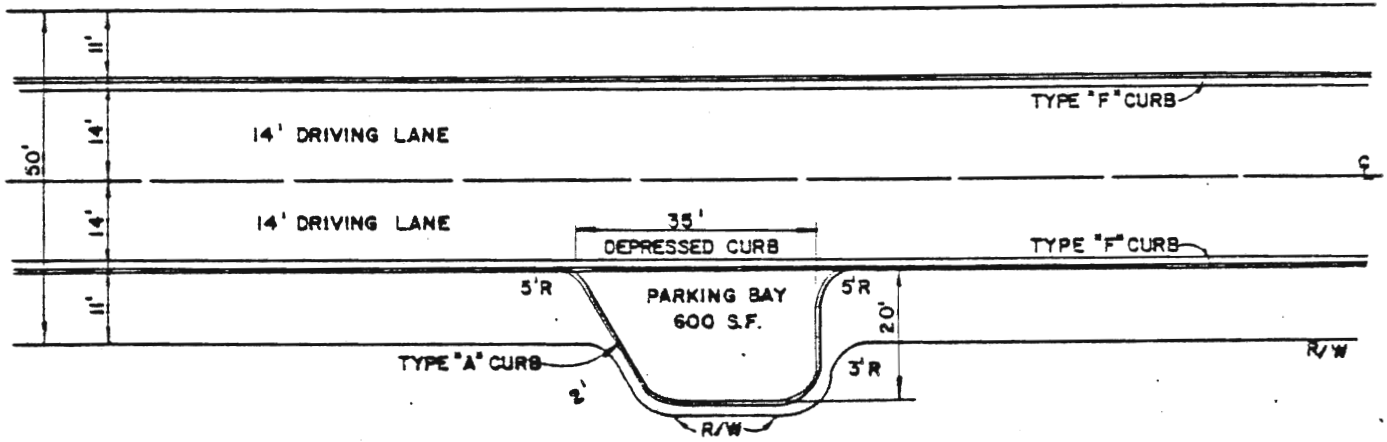
NOTE: 1. STREET CLASSIFICATIONS (EXCEPT PRIME ARTERIAL) AND TYPICAL ROADWAY SECTIONS FROM SAN DIEGO COUNTY TECHNICAL ROAD POLICY (JAN. 6, 1964).

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

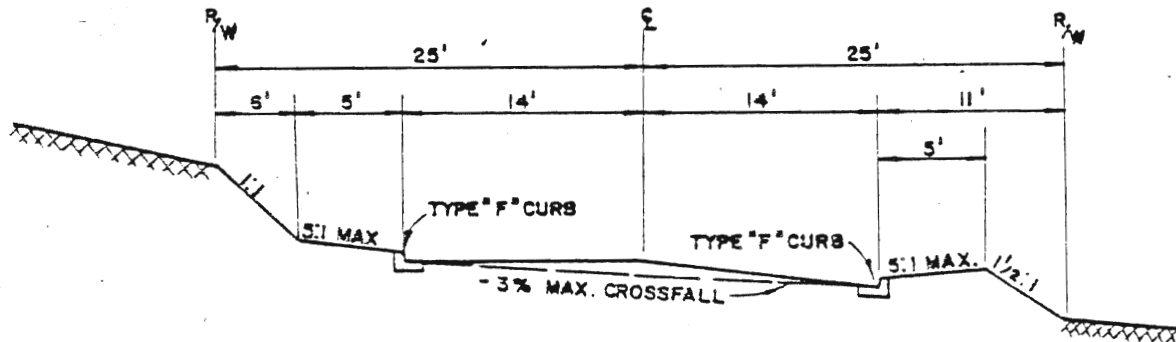
3. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR SIDEWALK, CURB, AND ROADWAY REQUIREMENTS.

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.

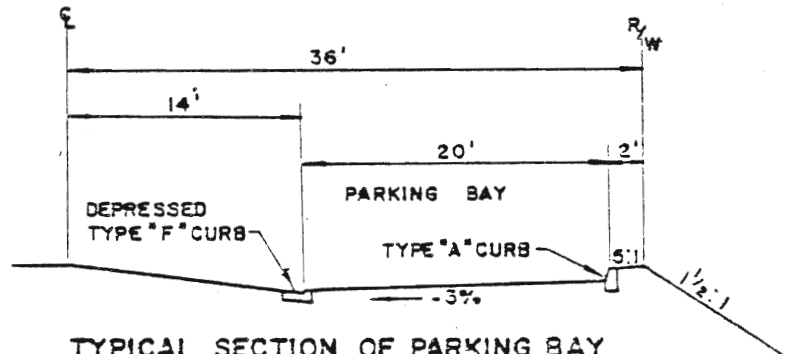
DRAWN BY _____	CHECKED BY _____	SAN DIEGO COUNTY DESIGN STANDARD TYPICAL ROADWAY SECTIONS	TITLE <u>BLK 216.000</u>			
RECOMMENDED BY <u>WBB</u>			REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER			FORMERLY STANDARD DRAWING 310-3			
DATE <u>2/24/76</u>	R.C.E. 10358		NUMBER DS-1			



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.

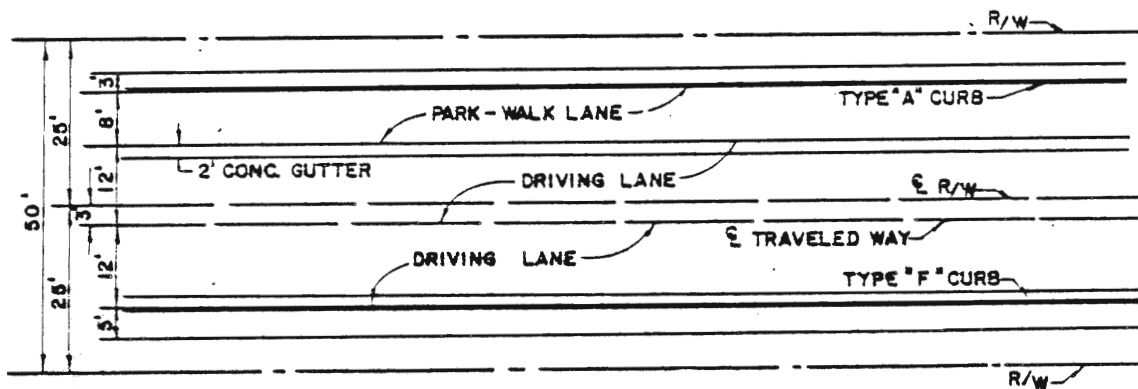
DRAWN BY _____	CHECKED BY _____
RECOMMENDED BY <i>WJB</i>	
APPROVED BY COUNTY ENGINEER <i>H. J. M. C.</i>	R.C.E. 10358
DATE <i>2/27/76</i>	

SAN DIEGO COUNTY DESIGN STANDARD

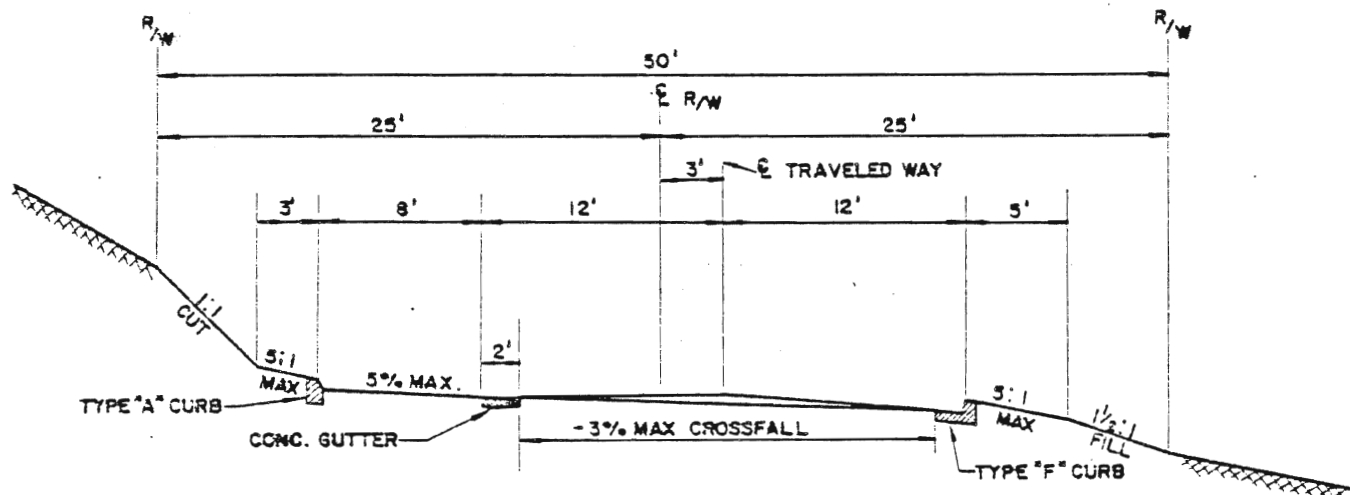
HILLSIDE RESIDENTIAL STREET

ALTERNATE No. 1

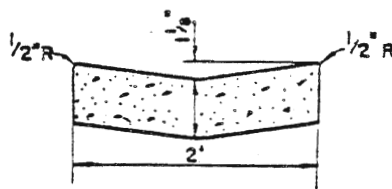
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 311-1			
NUMBER		DS-2	



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 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.

DRAWN BY	CHECKED BY
RECOMMENDED BY	
APPROVED BY COUNTY ENGINEER	
DATE	

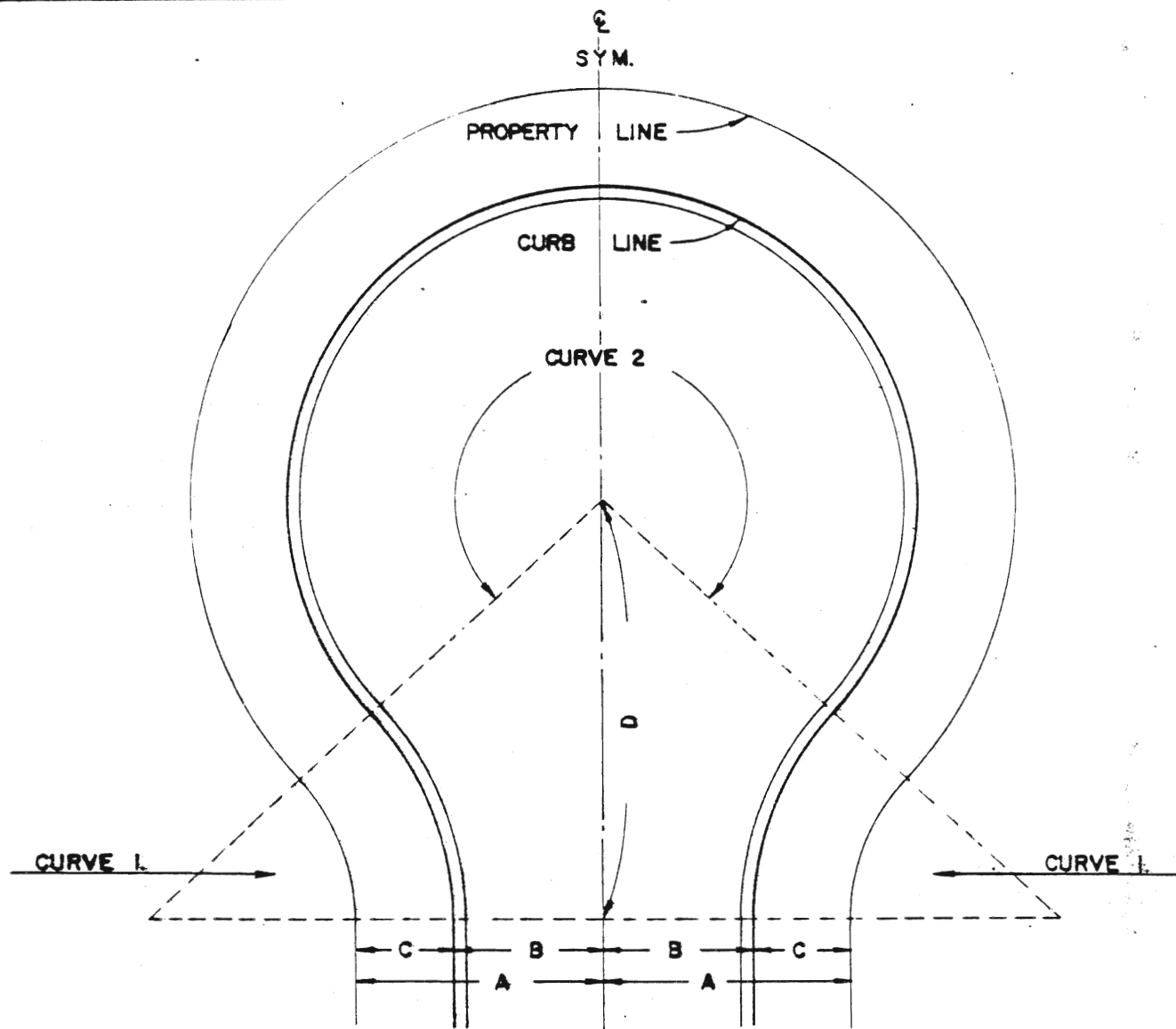
SAN DIEGO COUNTY DESIGN STANDARD
HILLSIDE RESIDENTIAL STREET
ALTERNATE No. 2

REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 312-1			
NUMBER		DS-3	

DRAWN BY _____	CHECKED BY _____	SAN DIEGO COUNTY DESIGN STANDARD	TITLE	<u>Hillside Residential Street</u>		
RECOMMENDED BY <u>WFB</u>			REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER <u>H. H. Allen</u> S.R.C.E. 10358		HILLSIDE RESIDENTIAL STREET ALTERNATE No. 3	FORMERLY STANDARD DRAWING 313-1			
DATE <u>2/27/96</u>			NUMBER DS - 4			



TITLE	BLK	PC	A. K. S. S. S.	2nd 7/68
REVISION	BY	APPROVED	DATE	
FORMERLY STANDARD DRAWING 316-1				
NUMBER		DS - 5		



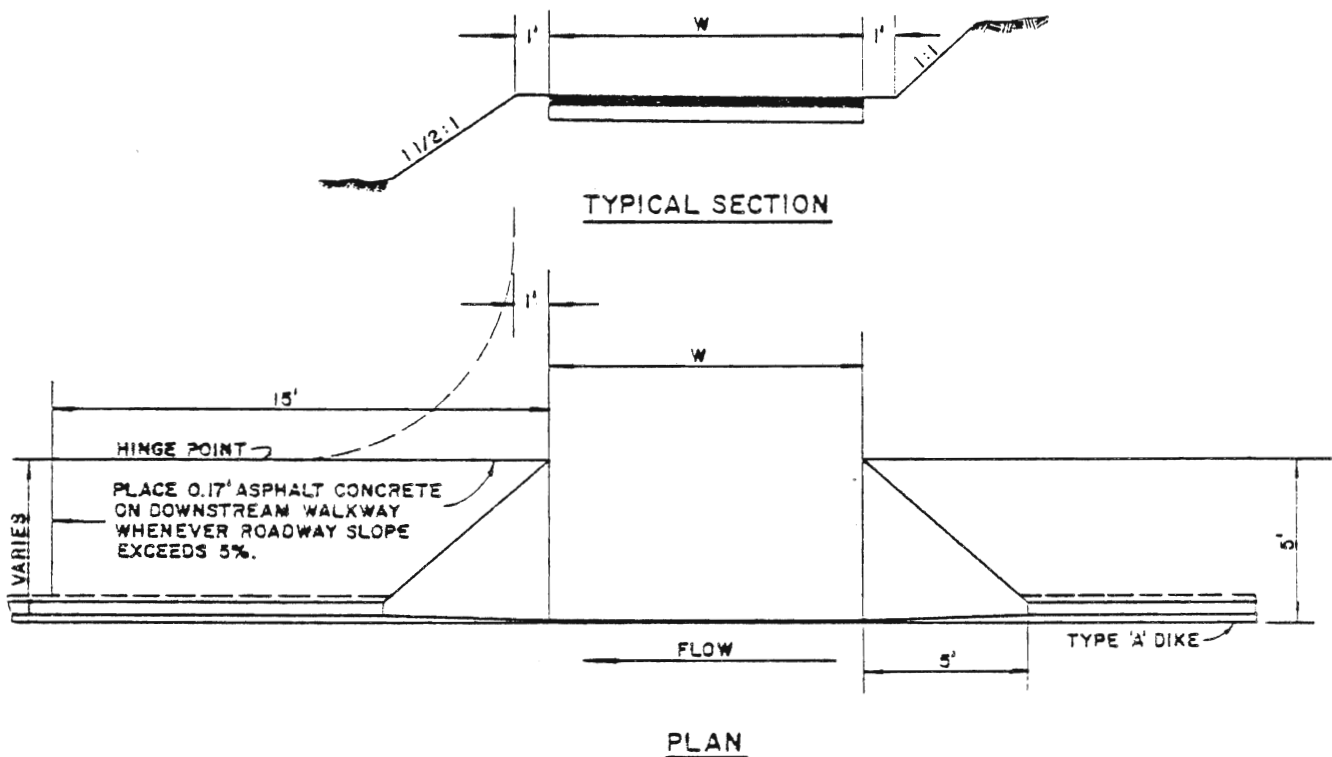
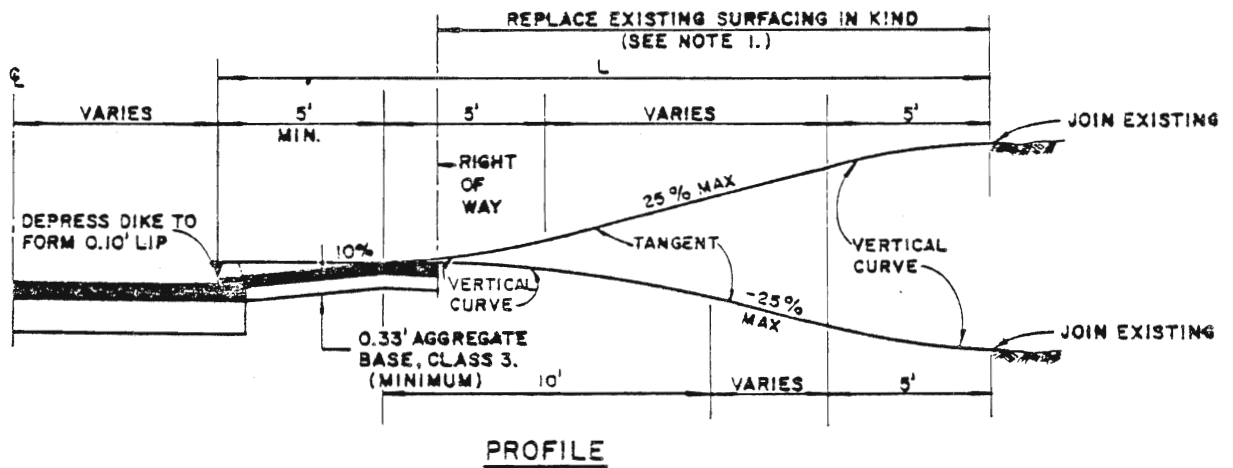
DIMENSIONS					CURVE 1.						CURVE 2					
R_w	A	B	C	D	Δ	CURB			PROP.			Δ	CURB		PROP.	
						R	L	T	R	L	T		R	L	R	L
52'	26'	16'	10'	50.95'	46°42'30"	32'	26.09'	13.82'	22'	17.93'	9.50'	273°25'00"	38'	181.34'	48'	229.06'
56'	28'	18'	10'	50.99'	42°50'00"	37'	27.66'	14.52'	27'	20.18'	10.59'	265°40'00"	38'	176.20'	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'

DRAWN BY _____	CHECKED BY _____
RECOMMENDED BY <u>WCB</u>	
APPROVED BY COUNTY ENGINEER <u>[Signature]</u>	R.C.E. 10358
DATE <u>2/22/76</u>	

SAN DIEGO COUNTY DESIGN STANDARD

TURNAROUND AND CALCULATIONS

TITLE <u>304-3</u>	DATE <u>2/22/76</u>
REVISION	BY
APPROVED	DATE
FORMERLY STANDARD DRAWING 304-3	
NUMBER	DS-6



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 G-14 FOR CONCRETE DRIVEWAYS.
4. SEE STANDARD DRAWING G-15 & G-16 FOR LOCATION & WIDTH REQUIREMENTS.

DRIVEWAY PAVING SCHEDULE

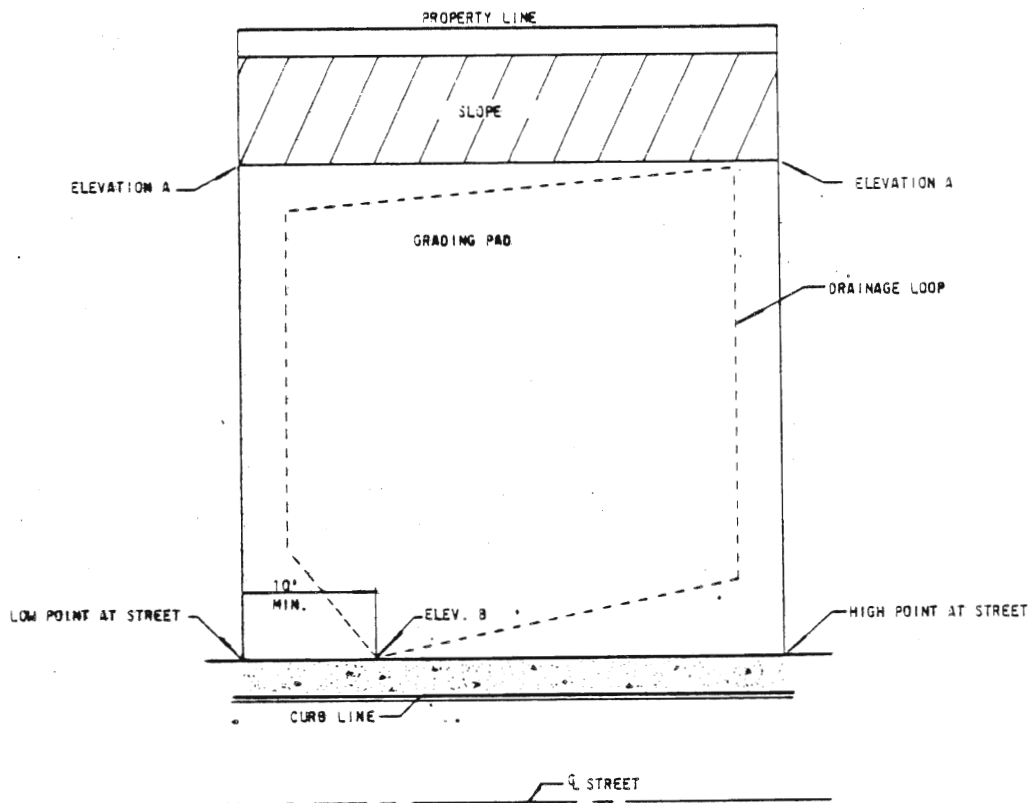
DEPTH OF AC	GRADE
0.17'	0-15%
0.25'	15-20%
0.33'	20-25%

DRAWN BY _____	CHECKED BY _____
RECOMMENDED BY <i>WCB</i>	
APPROVED BY COUNTY ENGINEER	
<i>WCB</i> R.C.E. 10358	
DATE <i>7/23/76</i>	

SAN DIEGO COUNTY DESIGN STANDARD

ASPHALT CONCRETE DRIVEWAY

TITLE <i>Rev. 10/1/76</i>			
BY <i>WCB</i> R.C.E. 10358			
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 22.7			
NUMBER		DS-7	



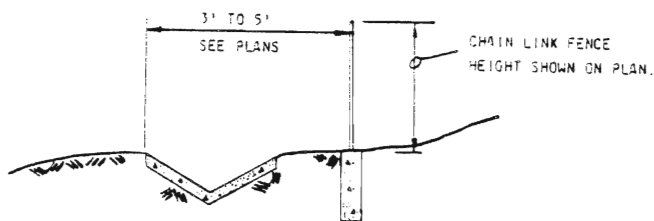
TYPICAL FINISHED GRADING

NOTES:

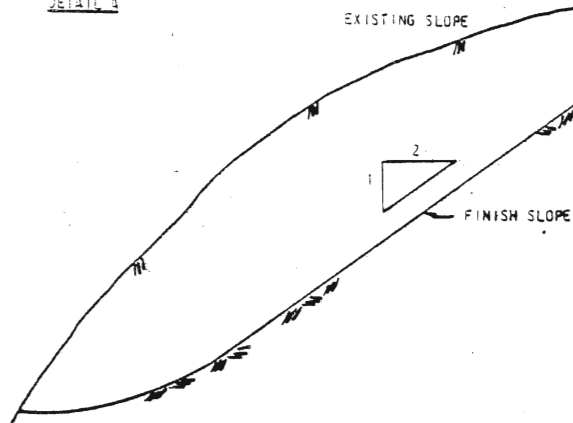
1. ELEV. A IS TO BE DETERMINED FOR THE MOST REMOTE CORNER OF THE LOT FROM THE DRAIN POINT. ELEV. A = ELEV. B PLUS 1% TIMES ONE-HALF THE PERIMETER OF THE LOT.
2. MIN. 1% SWALE TO STREET OR OTHER DISCHARGE POINT.
3. ALL SLOPE SURFACES TO BE PROTECTED BY APPROVED EROSION CONTROL.

DRAWN BY _____	CHECKED BY _____	SAN DIEGO COUNTY DESIGN STANDARD	TITLE <u>BLK 10</u> <u>6. Ketchum</u> <u>2/24/16</u>			
RECOMMENDED BY <u>WEB</u>			REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER <u>H. D. H.</u>			FORMERLY STANDARD DRAWING 231T			
DATE <u>2/24/16</u>			NUMBER DS-8			

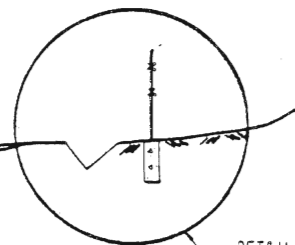
LOT GRADING



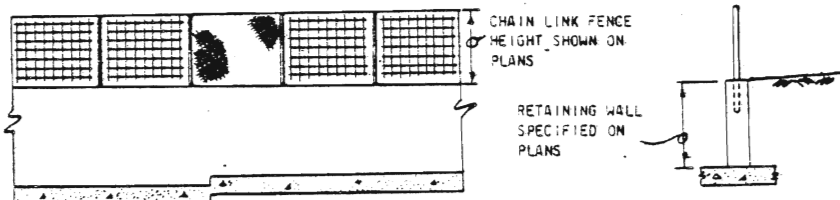
DETAIL A



FENCING CUT BANKS



DETAIL A



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.

DRAWN BY _____	CHECKED BY _____	SAN DIEGO COUNTY DESIGN STANDARD	TITLE _____	BY _____	APPROVED _____	DATE _____
RECOMMENDED BY <i>WEB</i>			REVISION _____	BY _____	APPROVED _____	DATE _____
APPROVED BY/COUNTY ENGINEER _____			FORMERLY STANDARD DRAWING 232T			
DATE <i>2/24/76</i>	R.C.E. 10358		NUMBER DS-9			

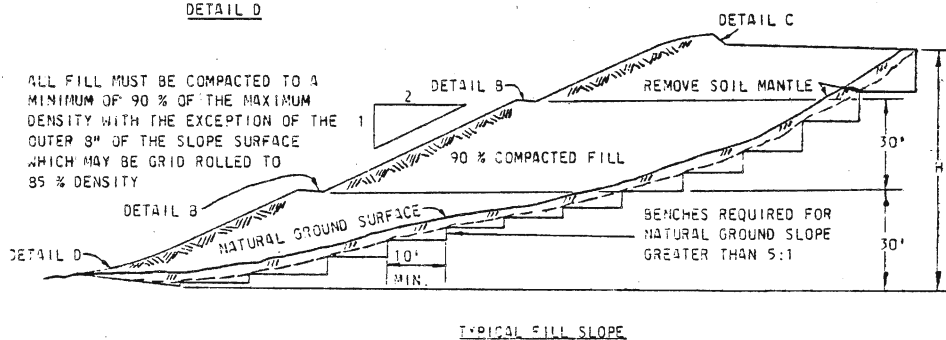
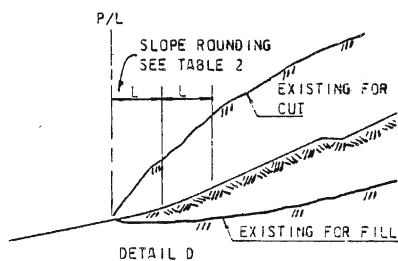
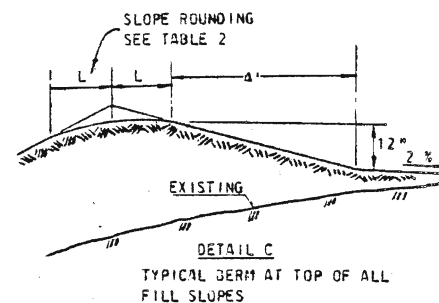
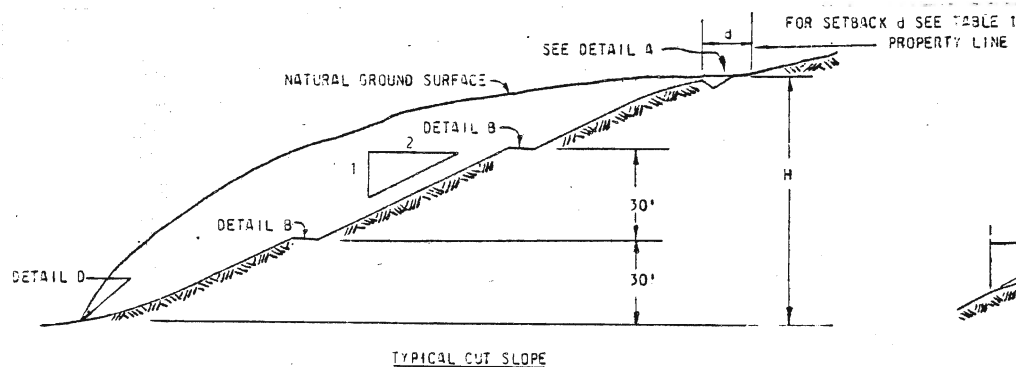


TABLE 1
REQUIRED SETBACK

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'

DRAWN BY _____ CHECKED BY _____

RECOMMENDED BY DEB

APPROVED BY COUNTY ENGINEER
[Signature] R.C.E. 10358

DATE 2/24/76

SAN DIEGO COUNTY DESIGN STANDARD

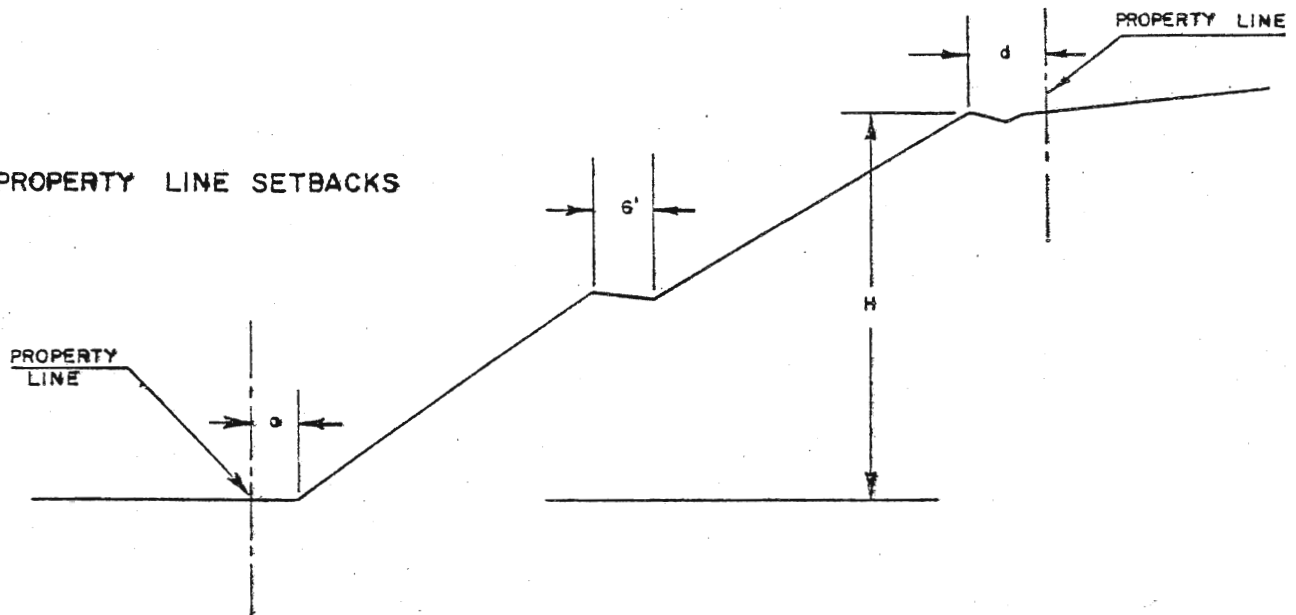
GRADING OF SLOPES

REVISION BY APPROVED DATE

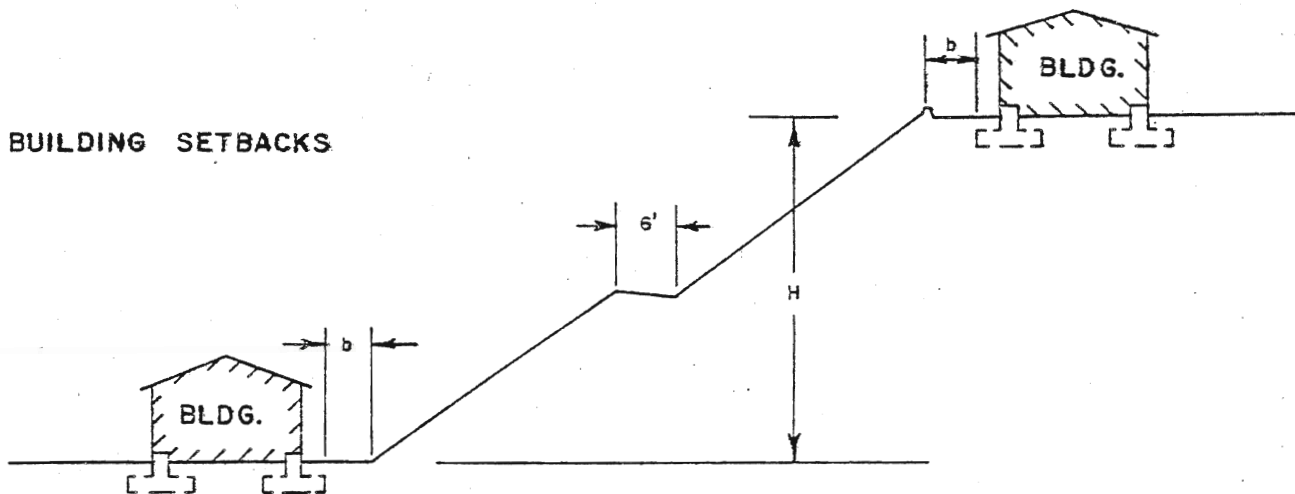
FORMERLY STANDARD DRAWING 208-17

NUMBER DS - 10

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'

UBC
 a
 1/2
 2' MIN
 b
 1/2
 2' MIN
 d
 1/5
 2' MIN
 10' MAX

- 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.

DRAWN BY	CHECKED BY
RECOMMENDED BY	APPROVED BY COUNTY ENGINEER
DATE	R.C.E. 10358

SAN DIEGO COUNTY DESIGN STANDARD

REQUIRED SETBACKS

REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 209			
NUMBER		DS - 11	

PROPOSED CONSTRUCTION

LINES

ULTIMATE CENTERLINE (CL) *

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

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

RS XXXX-X 35 2

1' 3' 35 2

2 PER INCH 2

4 PER INCH 0

8-10 PER INCH 5

VC 2% -1.8%

EXIST. PAVEMENT NAT. GROUND 0

5 PER INCH 10 PER INCH 5

5/32° 3/32° 5/32° 5/32°

5/32°

5/32°

POINTS

BC & EC

PI OR ANGLE PT.

CL MONUMENT

BENCH MARK

CONSTRUCTION

PAVEMENT EDGE & SHOULDERS

AC DIKE (LABEL TYPE)

CURB & GUTTER (LABEL TYPE)

CULVERT

DOWNDRAIN, AC SPILLWAY

DROP INLET

BOX CULVERT

HEADWALL, STANDARD

HEADWALL "L" TYPE

HEADWALL & WINGWALL

GUARD RAIL

DRIVEWAY APRONS AC

UTILITY DUCT (LABEL)

DRIVEWAY APRONS PCC

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

SIZE G

SIZE W

SIZE E

SIZE T

SIZE S

(LABEL) O

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

LABEL 1

LABEL 0

LABEL 2

LABEL 2

COUNTY 2

CITY 2

CITY 2

CITY 2

CITY 2

SECTION CORNER

2 1

11 12

SECTION CENTER

SEC

10

1/4 SECTION N-S

5

8

1/4 SECTION E-W

6 5

BASIS OF BEARING
CALIFORNIA COORDINATE SYSTEM ZONE VI

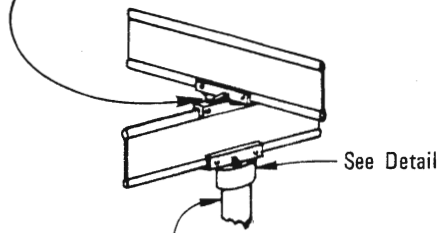
DRAWN BY	CHECKED BY
RECOMMENDED BY	WCB
APPROVED BY COUNTY ENGINEER	
R.C.E. 10358	
DATE	2/2/76

SAN DIEGO COUNTY DESIGN STANDARD

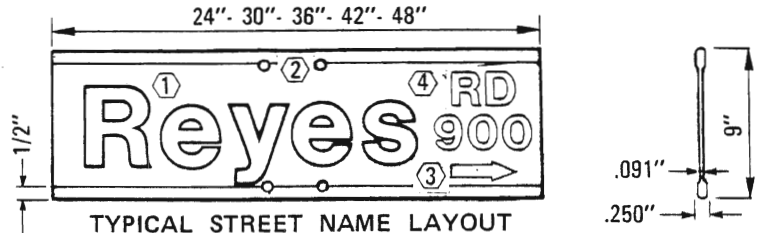
CONSTRUCTION PLAN SYMBOLS

TITLE	CONSTRUCTION PLAN SYMBOLS		
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING			
NUMBER	DS-12		

Sign to Sign Bracket, Dimension to be compatible with post cap.



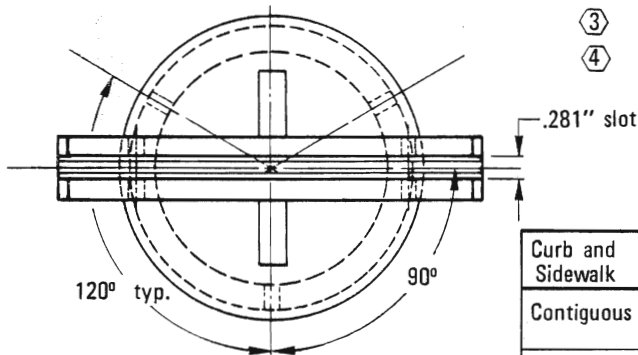
10'x 2 7/8" O.D. aluminum alloy 6063-T6, clear anodized pole.



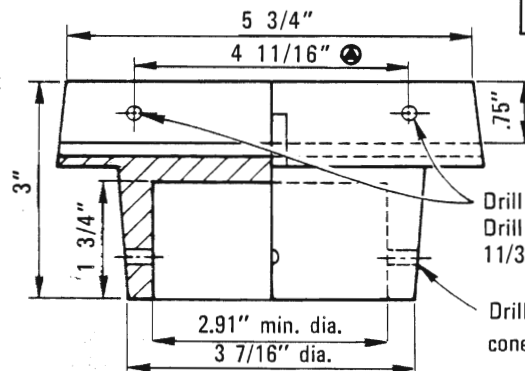
TYPICAL STREET NAME LAYOUT

Typical layout of legend and border on variable length sign blade of extruded aluminum with reverse screened reflective sheeting engineering grade. White letters and border on green background.

- ① 5"-U.C., 3 3/4"-L.C.
- ② 4 11/16" spacing of two 11/32" holes centered on both top and bottom edge of blade to match holes in sign bracket assemblies.
- ③ 2" x 2 3/4"-Arrow
- ④ 2"-U.C.



POST CAP DETAIL

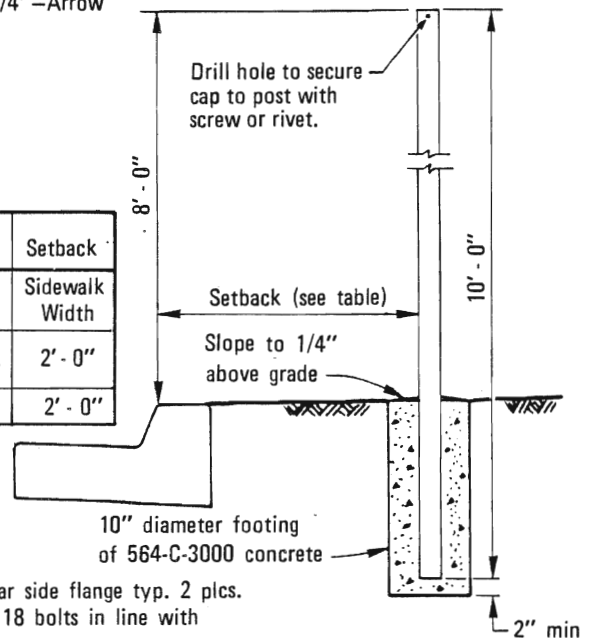


HALF-SECTION DETAIL

Curb and Sidewalk	Sidewalk Width	Setback
Contiguous	6' or less	Sidewalk Width
Contiguous	more than 6'	2' - 0"
Separate	-----	2' - 0"

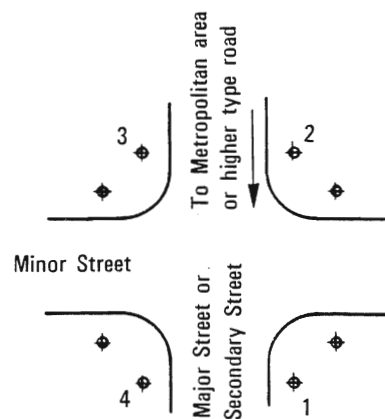
Drill 11/32" hole thru near side flange typ. 2 plcs. Drill and tap for 5/16"- 18 bolts in line with 11/32" diameter holes.

Drill and Tap for 5/16"-18 cone pointed screw (3 plcs.)



NOTES

- 1. ④ denotes 4 11/16" spacing shall match the holes in the extruded blades.
- 2. Bracket to be die cast aluminum.
- 3. All attaching screws shall be vandal proof type.



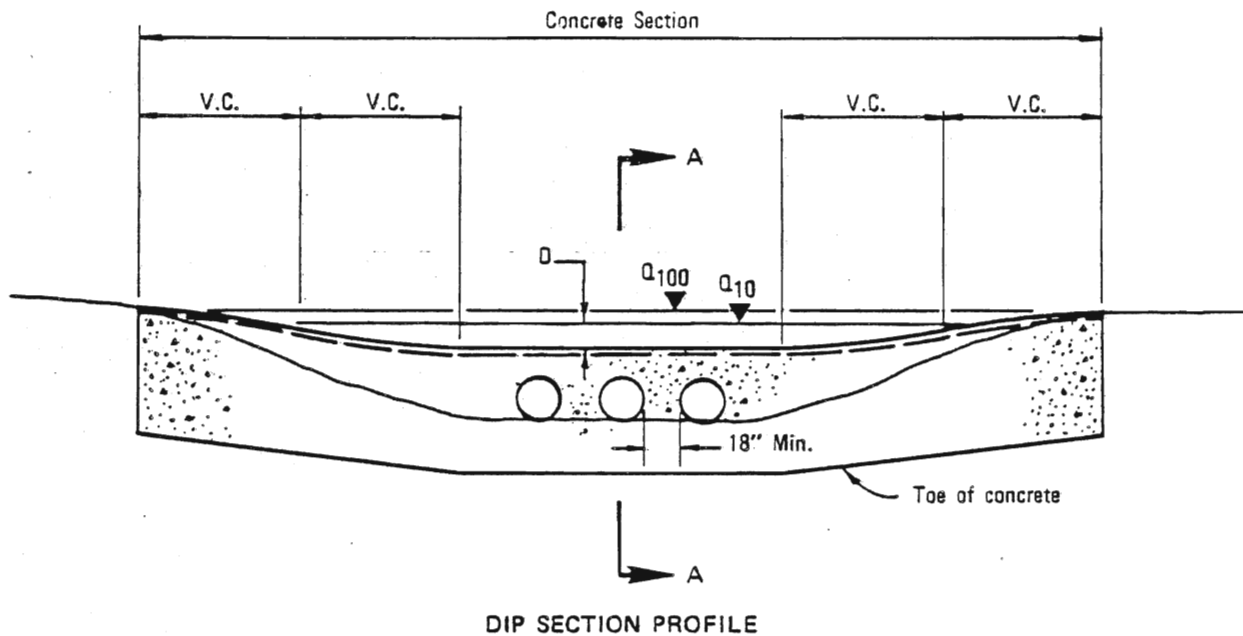
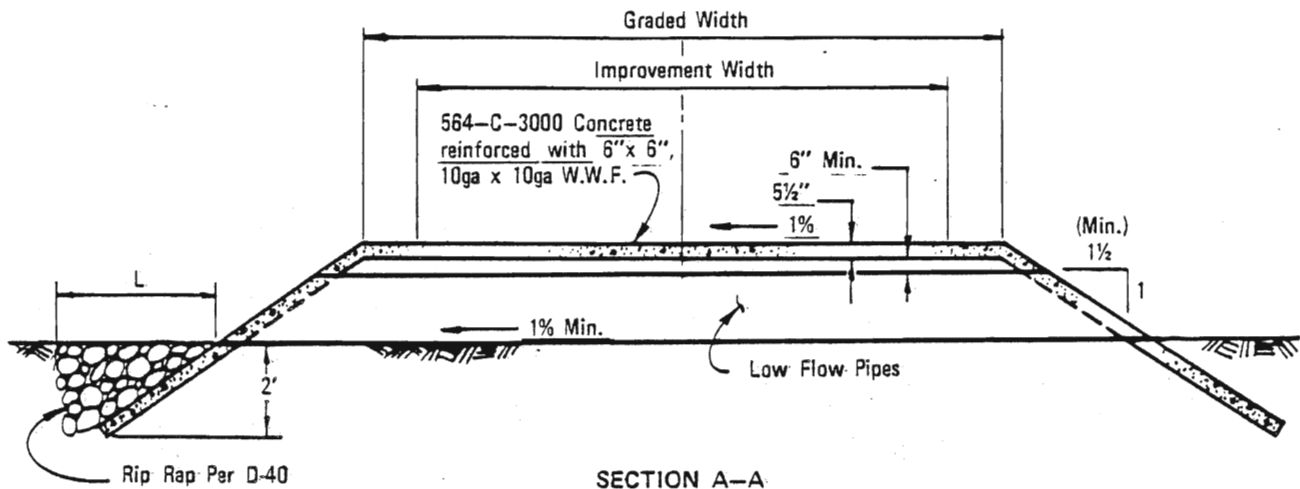
STREET NAME SIGN LOCATION
(numbers indicate priority of location selection)

DRAWN BY <i>GR</i>	CHECKED BY <i>RFW</i>
RECOMMENDED BY <i>RFW</i>	
APPROVED BY COUNTY ENGINEER	
<i>K. L. Erickson</i> R.C.E. 10358	
DATE <i>10/6/76</i>	

SAN DIEGO COUNTY DESIGN STANDARD

STANDARD STREET SIGN

CAP DIM.	C.D.	D.S.	10/6/76
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 301-2			
NUMBER		DS-13	



NOTES:

1. Dip sections shall conform to Section 5.7-10(d) of the San Diego County Standards.
2. The maximum water depth, based on a 10 year frequency storm, shall be 10". The depth (D) in feet multiplied by the velocity (V) in feet per second shall be equal to six or less. ($D \times V = 6$)
3. Vertical curves shall be designed based on road design speed and the percent change in longitudinal road grade.
4. Low Flow pipes may be omitted if the conditions of Note 2 can be met without their use.

DRAWN BY SG CHECKED BY MC
RECOMMENDED BY Mr. Baker

APPROVED BY COUNTY ENGINEER

B. F. Walsh P.E. 10358

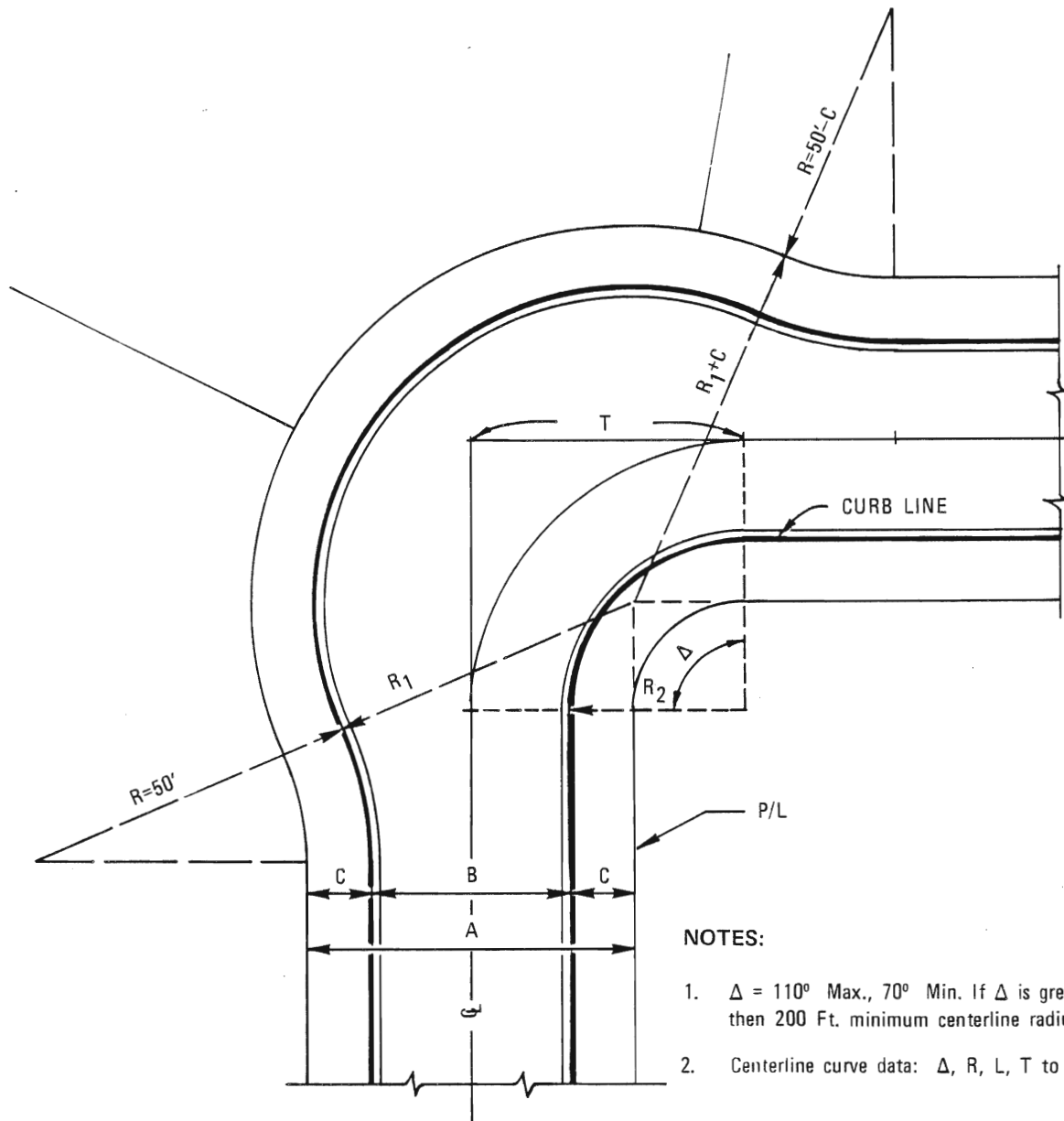
DATE 4-29-82

SAN DIEGO COUNTY DESIGN STANDARD

DIP SECTION (FOR PRIVATE STREETS)

REVISION	BY	APPROVED	DATE	

NUMBER DS-14



NOTES:

1. $\Delta = 110^\circ$ Max., 70° Min. If Δ is greater than 110° , then 200 Ft. minimum centerline radius required.
2. Centerline curve data: Δ , R, L, T to be shown on plans.

PLAN

A	B	R_1^*	R_2^*	C*
72'	52'	80'	40'	10'
60'	40'	68'	30'	10'
56'	36'	64'	30'	10'
52'	32'	60'	30'	10'
48'	28'	56'	30'	10'

* DIMENSIONS SHOWN ARE MINIMUMS

DRAWN BY *PH* CHECKED BY *m3*
 RECOMMENDED BY *P. Salas*
 APPROVED BY COUNTY ENGINEER
RF Ubbel for R.C.E. 10358
 DATE *11-6-84*

SAN DIEGO COUNTY DESIGN STANDARD

STREET KNUCKLE

R+C *RC M. Bahmar* *5-18-85*
 REVISION BY APPROVED DATE
 NUMBER DS-15

