



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

SEPTEMBER, 1988

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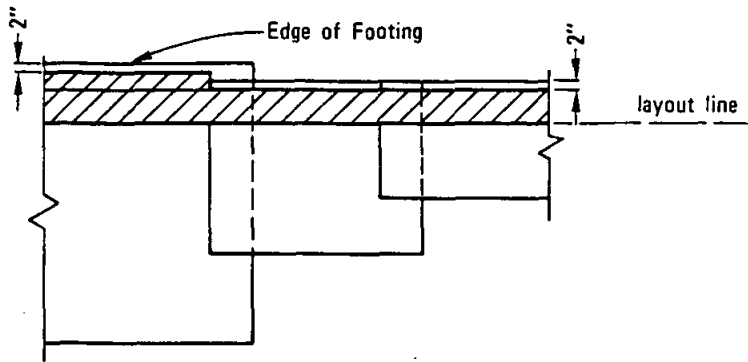
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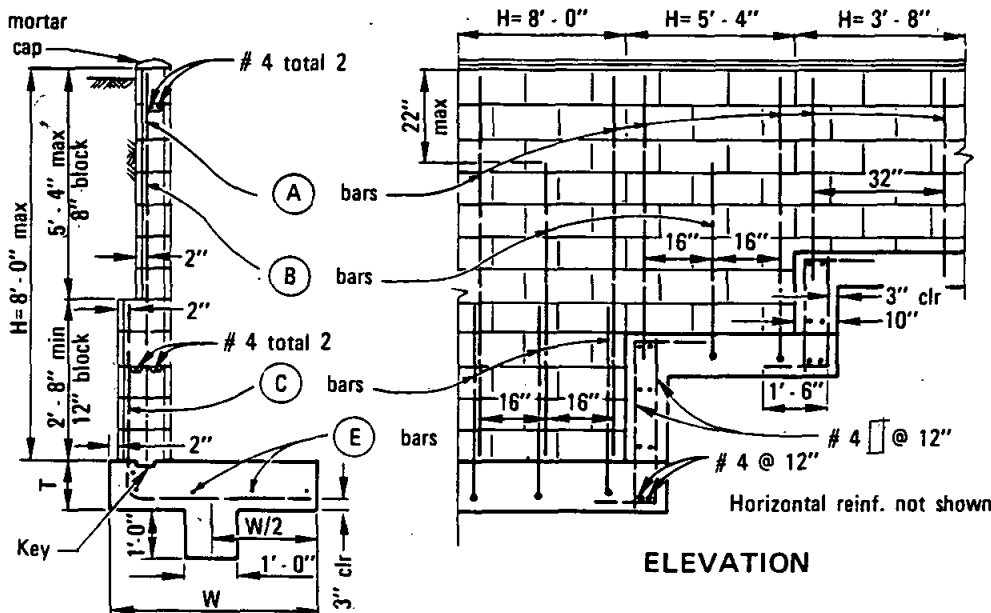
CONCRETE STRUCTURES

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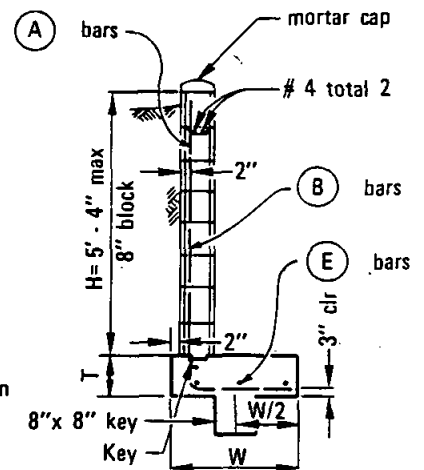
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PLAN



ELEVATION



TYPICAL SECTION
5' - 4" max

TYPICAL SECTION
over 5' - 4"

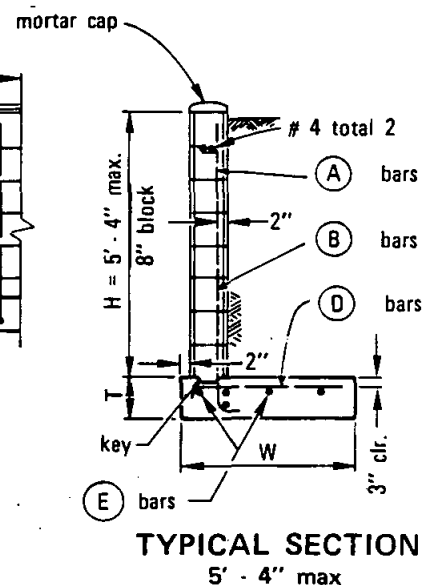
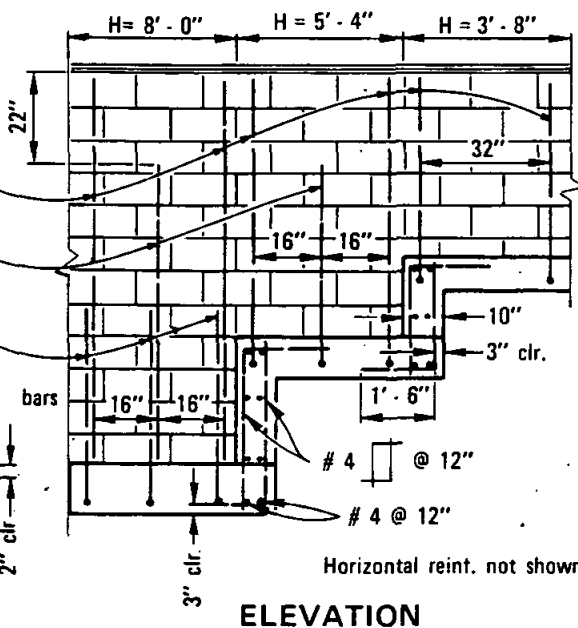
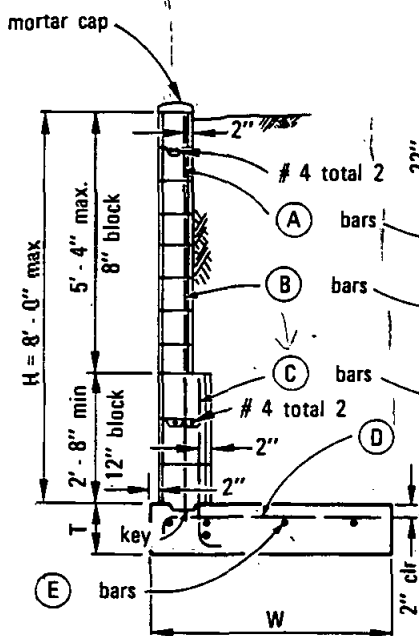
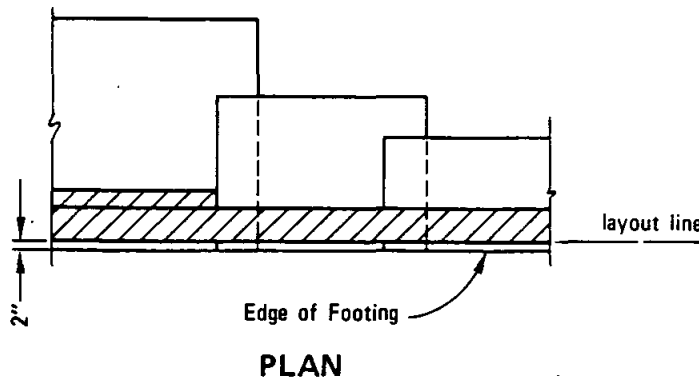
NOTES

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	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Title	MB	M.B.	5-86			Coordinator R.C.E. 19807 Date	
7/25/88	MB	M.B.	7-88	MASONRY RETAINING WALL TYPE 1 (LEVEL BACKFILL)		C-1	
						C-1	
						C-1	
						C-1	

Revision	By	Approved	Date
RE/INST	SC	A.H.	8-88



NOTES

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

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

Revision	By	Approved	Date
REINST.	30	9. H.	8-88

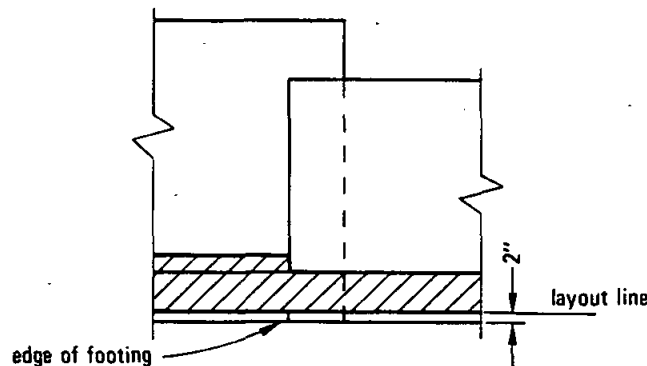
SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 3 (LEVEL BACKFILL)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

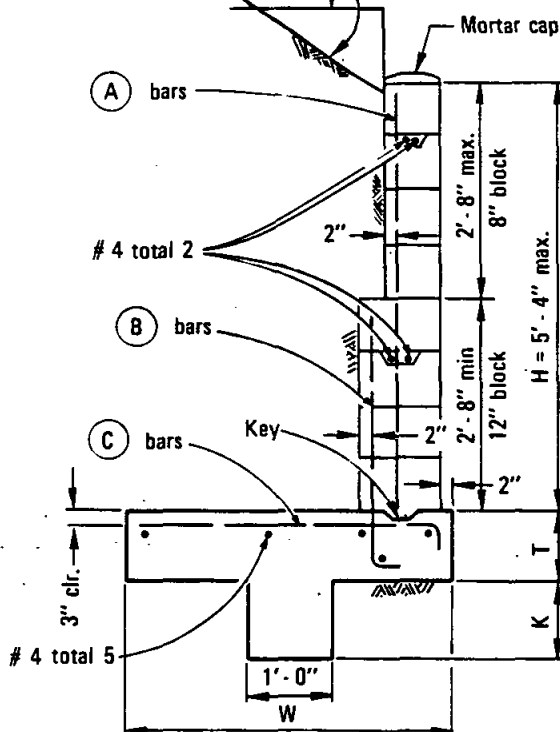
Allen J. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-3**

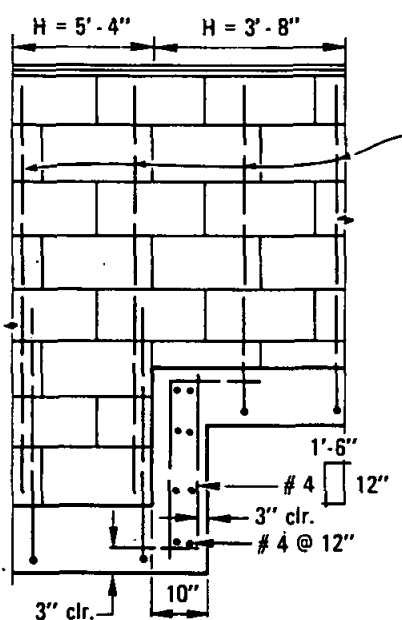


PLAN

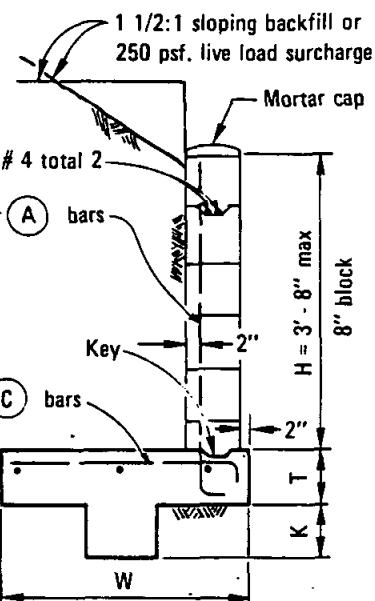
1 1/2:1 sloping backfill or
250 psf. live load surcharge



TYPICAL SECTION
over 3' - 8"



Horizontal reinf. not shown
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

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

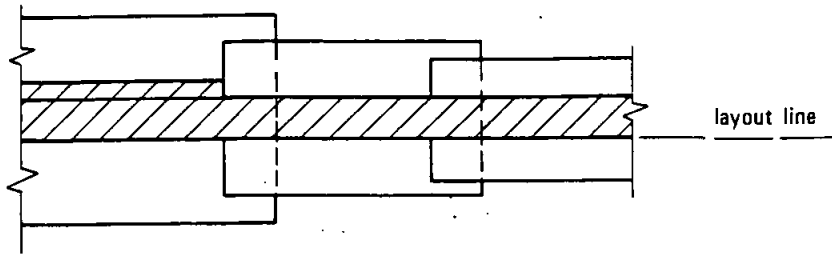
SAN DIEGO REGIONAL STANDARD DRAWING

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

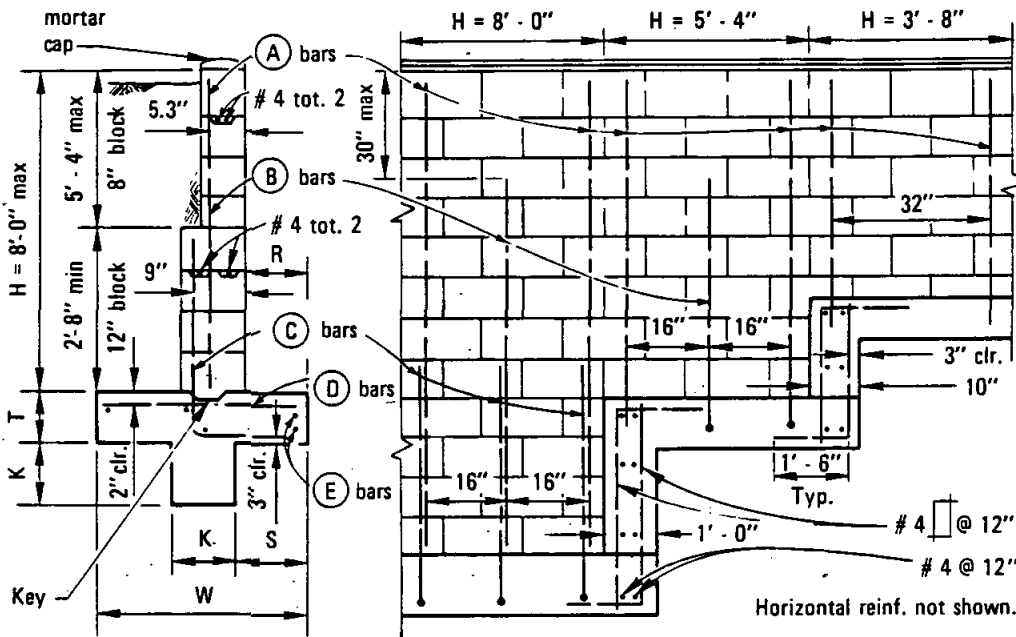
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NUMBER

C-4

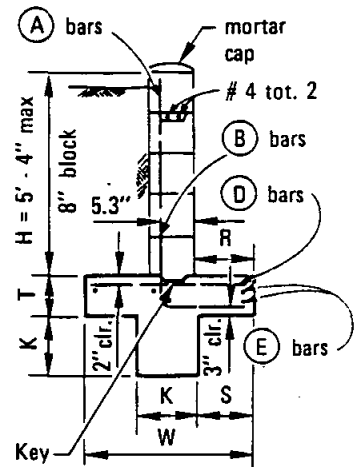
Revision	By	Approved	Date
Title	EC	TH.B.	5/86
TITLE	EC	A.H.	7/88



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 group.

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 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
Title	2	M.B.	5-86
TITLE	2	A.H.	7-88

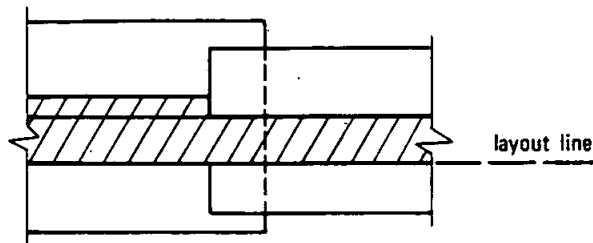
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MASONRY RETAINING WALL TYPE 5
(LEVEL BACKFILL)

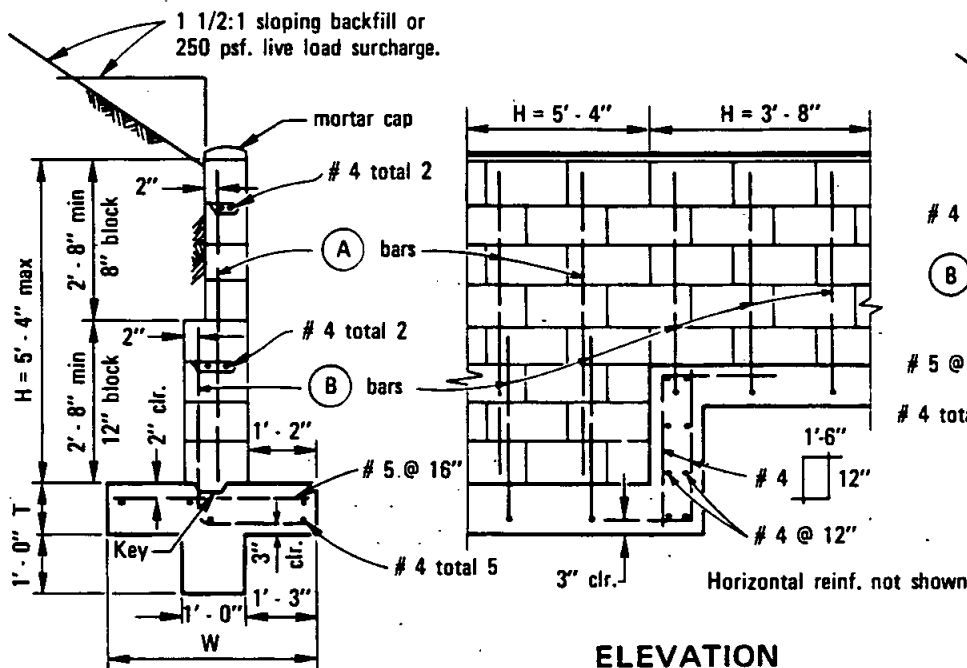
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Coordinator R.C.E. 19807 Date

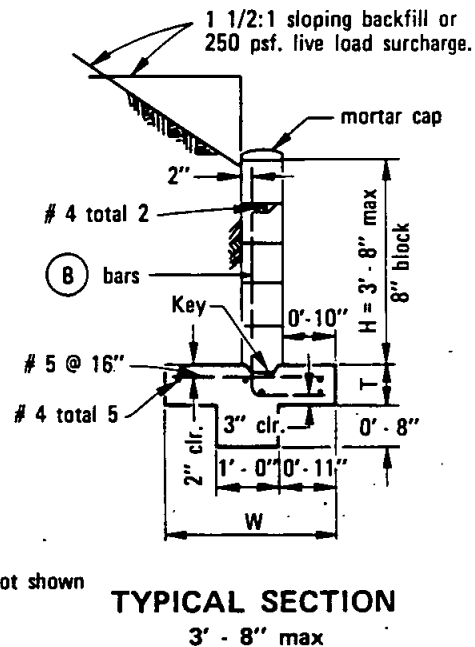
DRAWING
NUMBER C-5



PLAN



TYPICAL SECTION
over 3' - 8"



TYPICAL SECTION
3' - 8" max

ELEVATION

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 J. Kershner 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:

Reinforced Concrete:

$F_c = 1200$ psi $F'_c = 3000$ psi
 $F_s = 20,000$ psi $n = 10$

Reinforced Masonry:

$F'_m = 600$ psi $F_m = 200$ psi
 $F_s = 20,000$ psi $n = 50$
Earth = 120 pcf and Equivalent Fluid Pressure = 36 psf per foot of height. Walls shown for 1½:1 unlimited sloping surcharge are designed in accordance with Rankine's formula for unlimited sloping surcharge with 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 shall attain a minimum compressive strength of 2,000 psi in 28 days and mortar shall attain 1,800 psi in 28 days. 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.

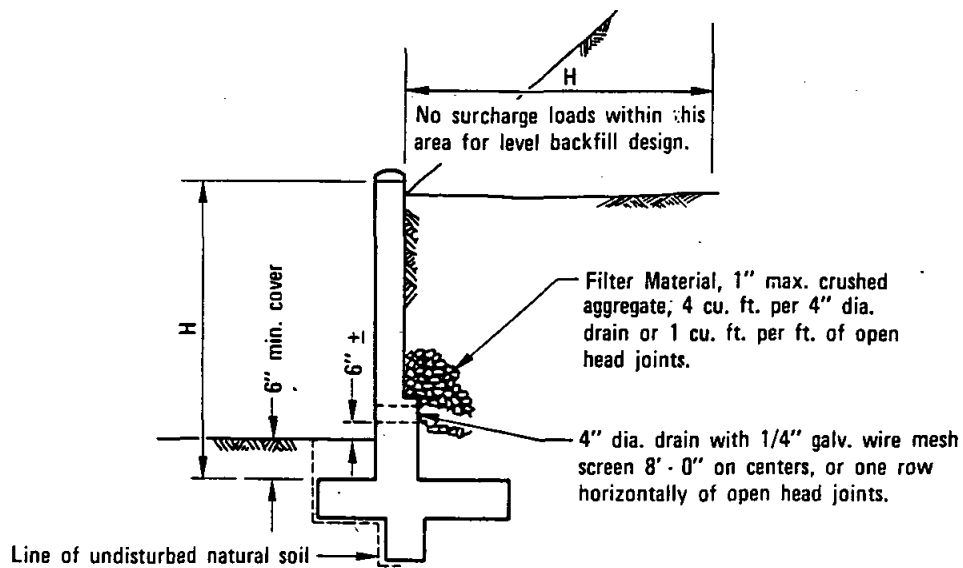
WALL DRAINS:

Wall drains shall be provided in accordance with Standard Drawing C-8.

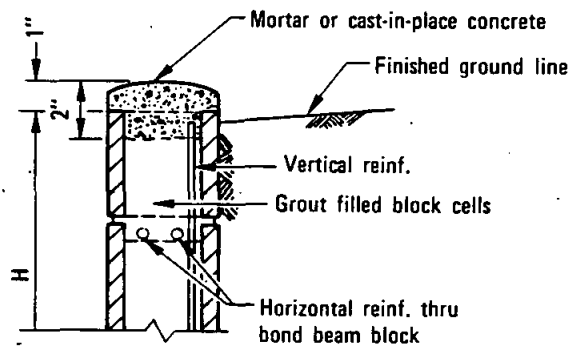
SOIL:

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.

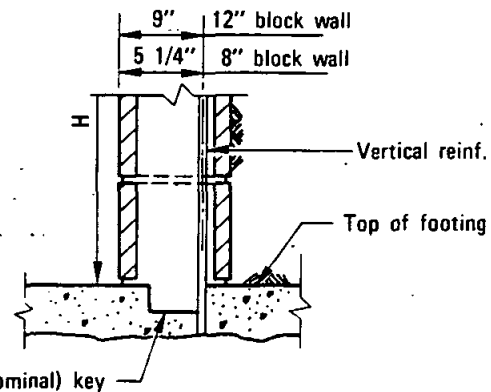
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
New Des.	RP	M.B.	10-82			GENERAL NOTES FOR MASONRY RETAINING WALLS
Notes		M.B.	5-86			
Notes	RC	A.H.	7-88			
						DRAWING NUMBER C-7



TYPICAL SECTION



CAP DETAIL



KEY DETAIL

NOTES:

1. All masonry retaining walls shall be constructed with cap, key and drainage details as shown hereon.
2. 4" diameter drain may be formed by placing a block on it's side.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

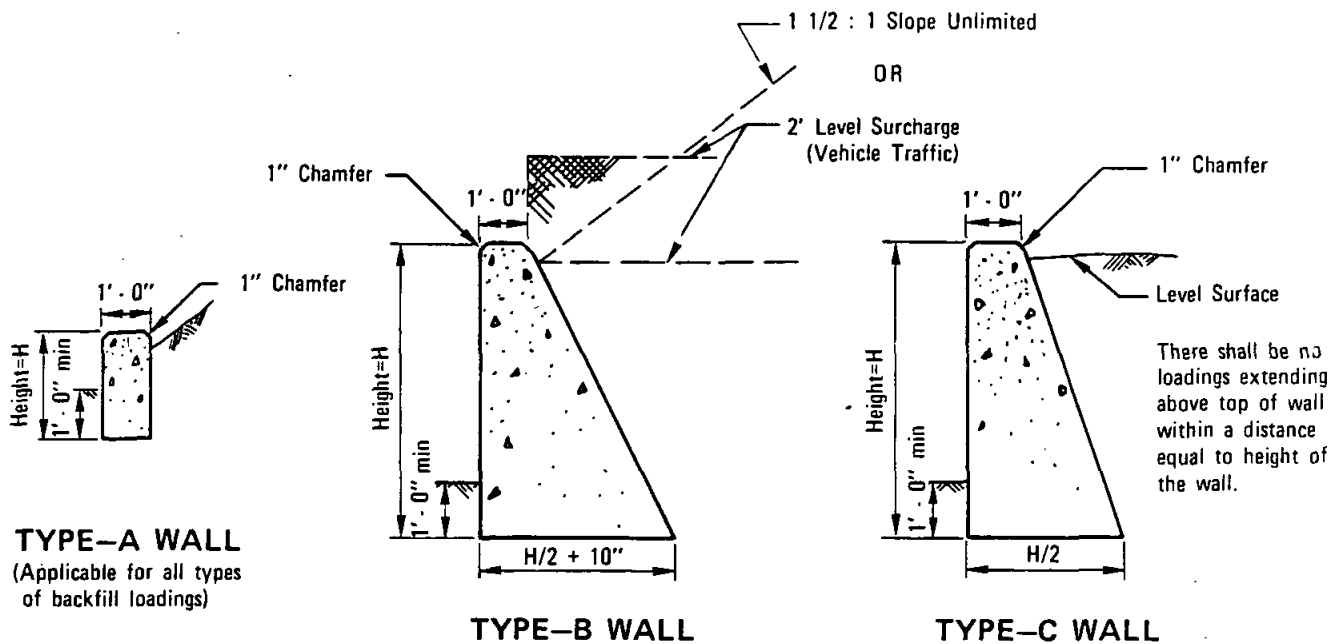
Allan S. Kishner Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-8**

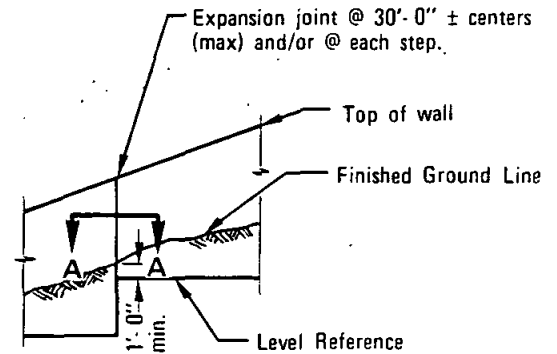
SAN DIEGO REGIONAL STANDARD DRAWING

DETAILS FOR MASONRY RETAINING WALL

Revision	By	Approved	Date
Note 2	sc	a.H.	7/88



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>Alfred G. Kerschbaum</i>	<i>Dec. 1975</i>	
						Coordinator	A.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

$F_c = 1200 \text{ psi}$ $F'_c = 3000 \text{ psi}$
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 $\phi = 33^\circ 42'$.

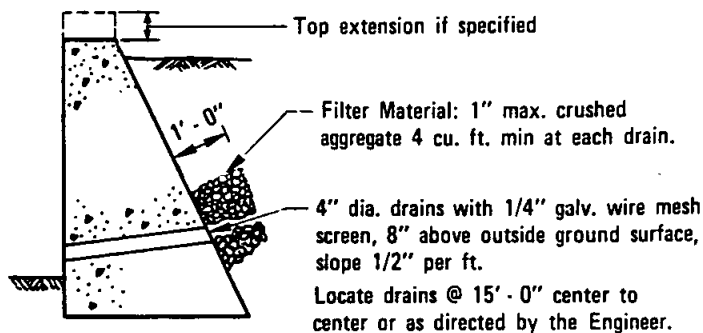
Note: Maximum toe pressure under wall footing = 1 1/2 tons. Special design required where footing material is incapable of supporting this pressure.

EXCAVATION AND BACKFILL

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

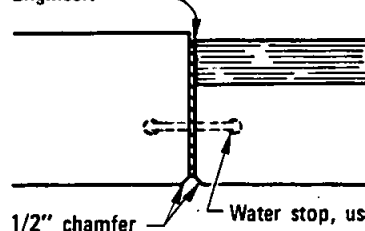
Each layer of backfill shall be moistened as directed by the Engineer and thoroughly tamped, rolled or otherwise compacted until the relative compaction is not less than 90 percent.

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.

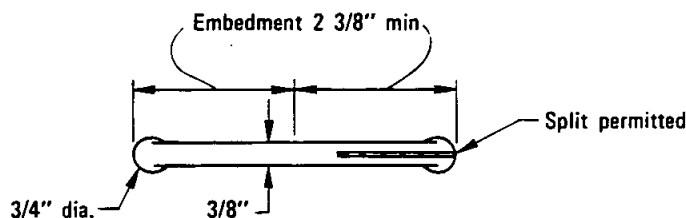


TYPICAL DRAINAGE WHEN H IS GREATER THAN 4' - 0"

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

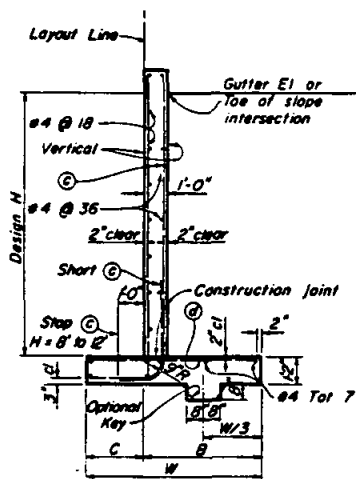
Robert A. Kuehner Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **C-10**

SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES AND DETAILS FOR GRAVITY RETAINING WALLS

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



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	4 - #7	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
Footings 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

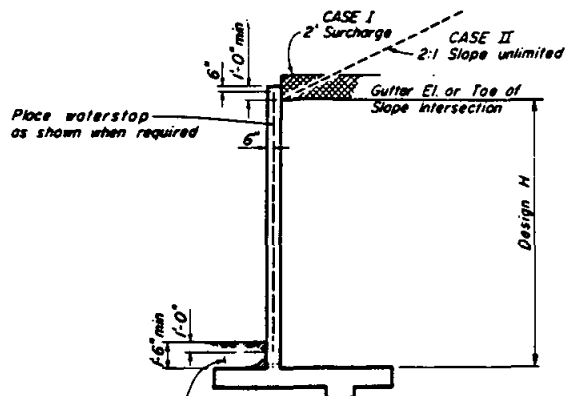
Design H may be exceeded by 6" before going to the next size. Footing key is required except when found unnecessary by the Engineer. Special footing design is required where foundation material is incapable of supporting toe pressure loads listed in table.

Design Data

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

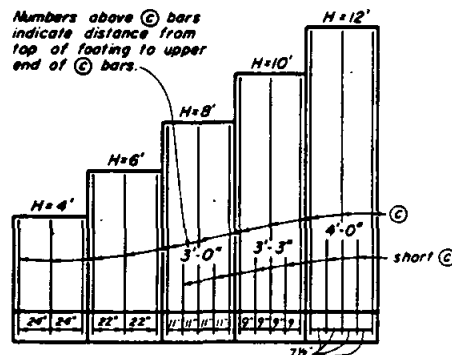
Case I Equivalent fluid pressure = 36 psf max for determination of toe pressure. 27 psf min for determination of heel pressure.

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

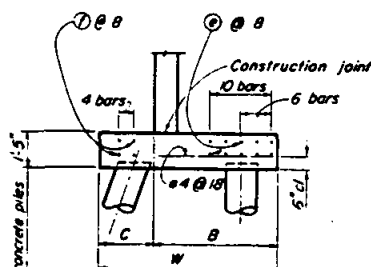


DESIGN

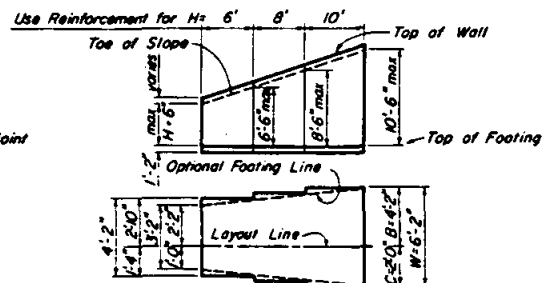
For drainage notes and other details, see "Retaining Wall Details No. 1," drawing C-13



ELEVATION



45° PILE FOOTING SECTION



TYPICAL LAYOUT EXAMPLE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

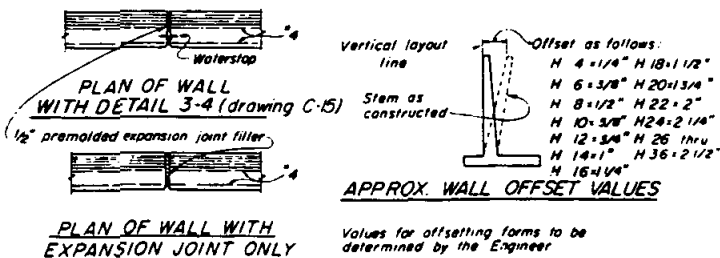
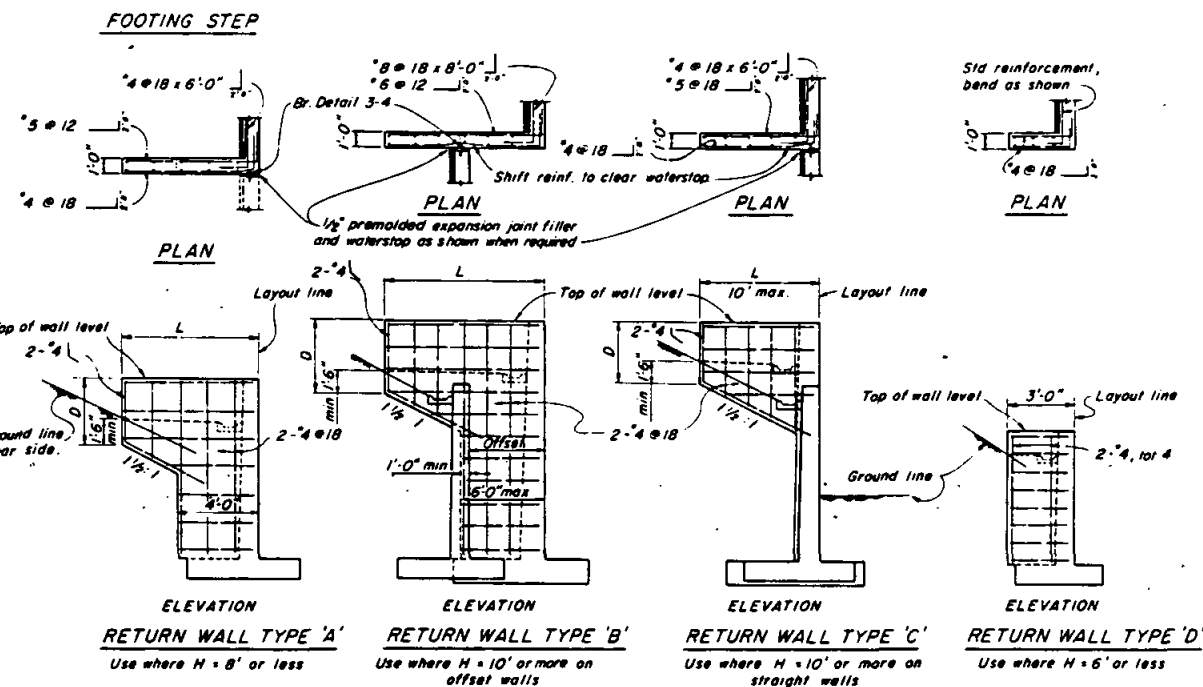
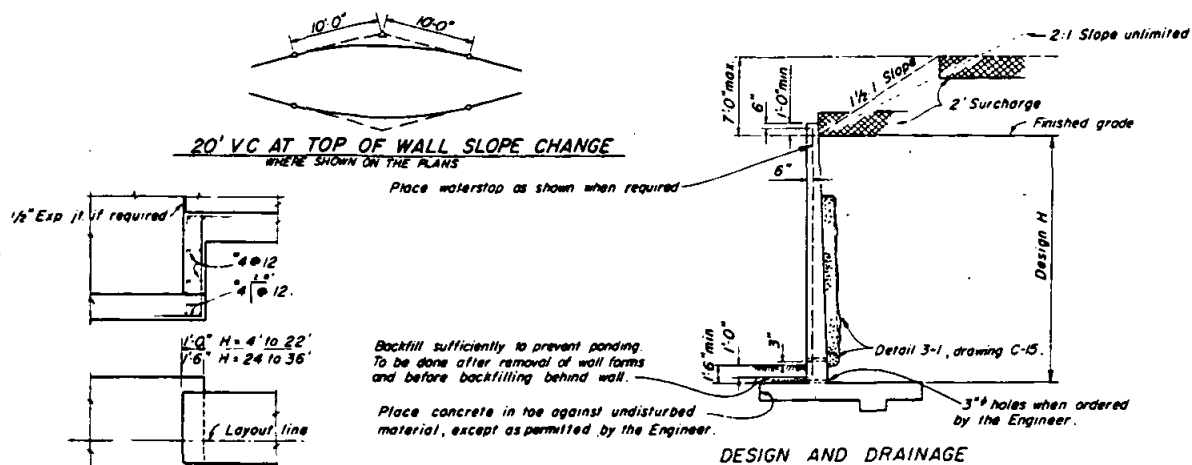
Allen A. Kuehn, Dec. 1975
 Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL
 TYPE 1A

DRAWING NUMBER C-12

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
Title	EC	M.B.	5-86

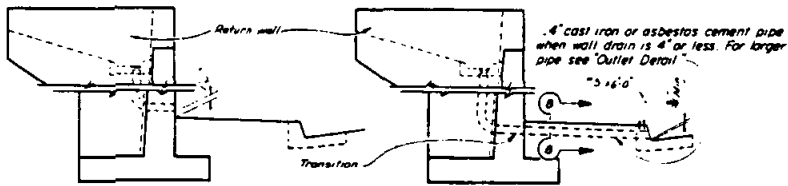
SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL DETAILS NO. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

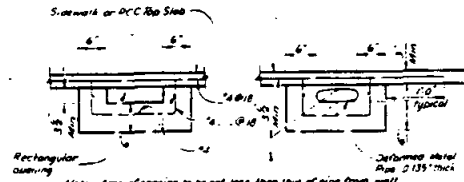
Allen A. Kuehnert Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER C-13

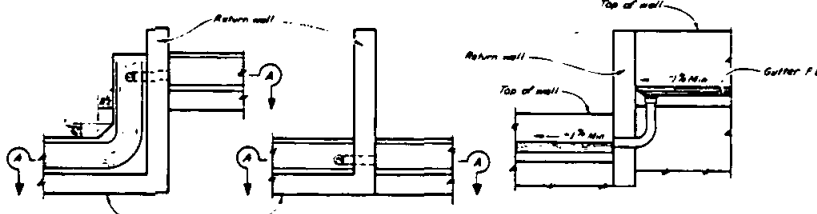


RETAINING WALL
FACE OF WALL OUTLET

RETAINING WALL
GUTTER OUTLET



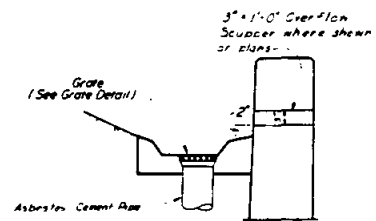
OUTLET DETAIL-SECTION B-B



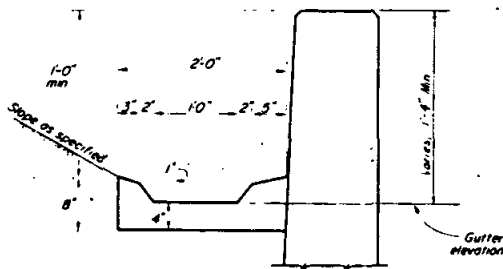
PLAN
OFFSET WALL
DRAIN THROUGH RETURN WALL

PLAN
CONTINUOUS WALL

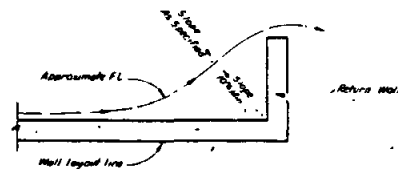
SECTION A-A



WALL DRAIN DETAIL



TYPICAL GUTTER DETAIL

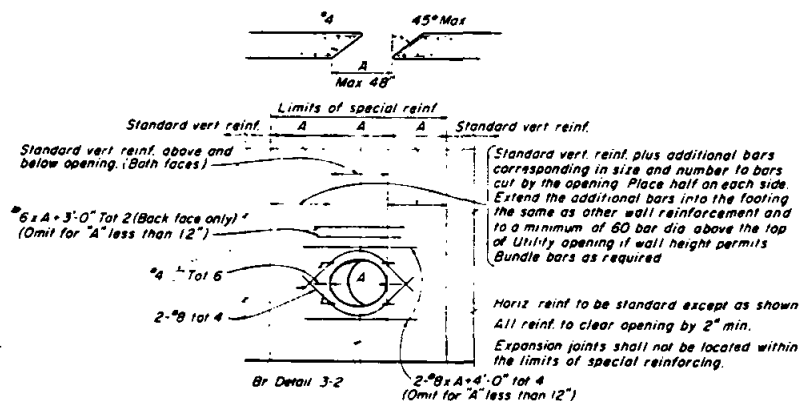


WALL DRAINAGE
WHERE GUTTER NOT REQUIRED



GRATE DETAIL

Sizes to fit Standard Hubs



RETAINING WALL-UTILITY OPENING
To be used in conjunction with the Retaining Wall Type 1\"/>

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

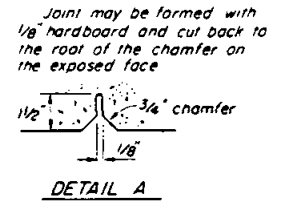
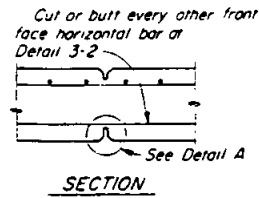
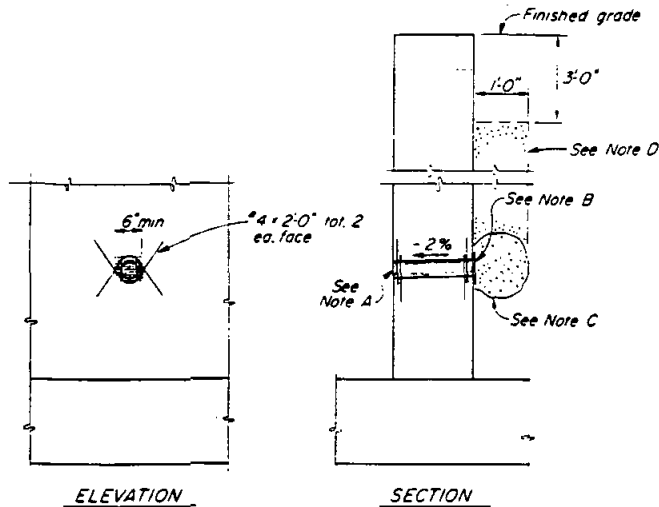
William J. Kuehner Dec. 1975
Coordinator R.C.E. 13807 Date

DRAWING
NUMBER C-14

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE
RETAINING WALL DETAILS NO. 2

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



WEAKENED PLANES

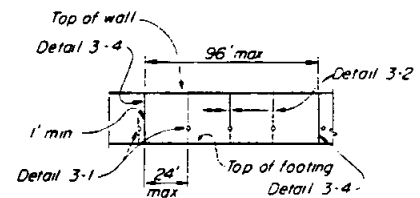
DETAIL 3-2

WEEP HOLE AND PERVIOUS BACKFILL

DETAIL 3-1

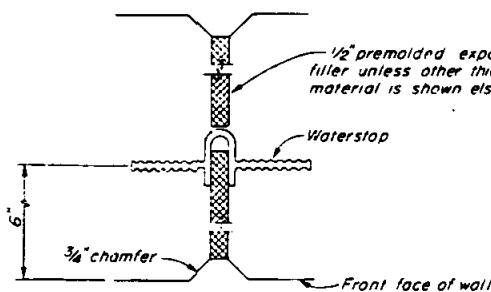
Notes:

- 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.



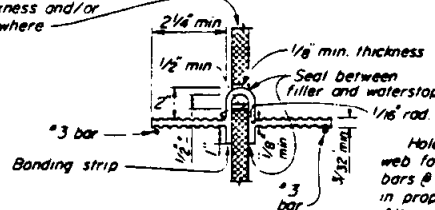
WALL EXPANSION JOINTS AND WEAKENED PLANES

DETAIL 3-3



WALL EXPANSION JOINT

DETAIL 3-4



WATERSTOP

DETAIL 3-6

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.

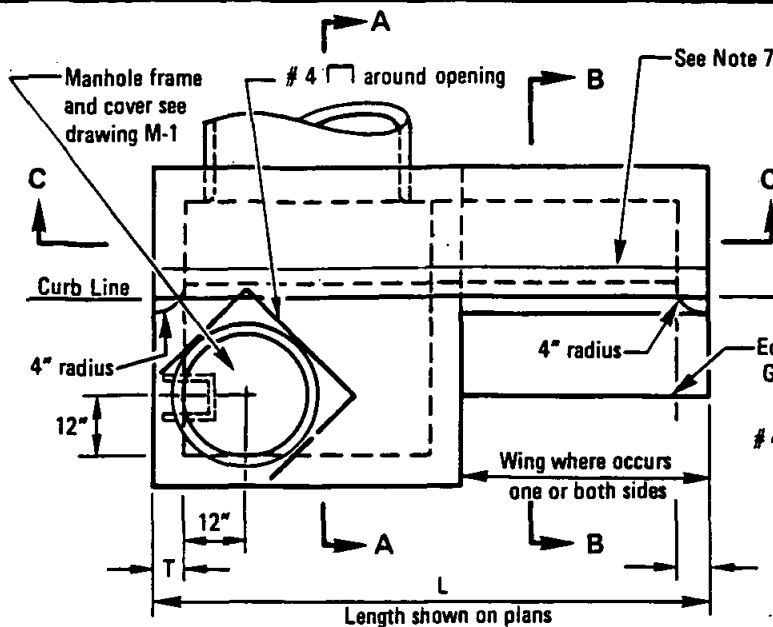
Holes will be permitted in the outer 1/2" of the web for wire, rings, etc. Tie web to #3 reinforcing bars @ 12" max. intervals to support the waterstop in proper position during concrete placement. Alternative detail may be submitted for approval of the Engineer.

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

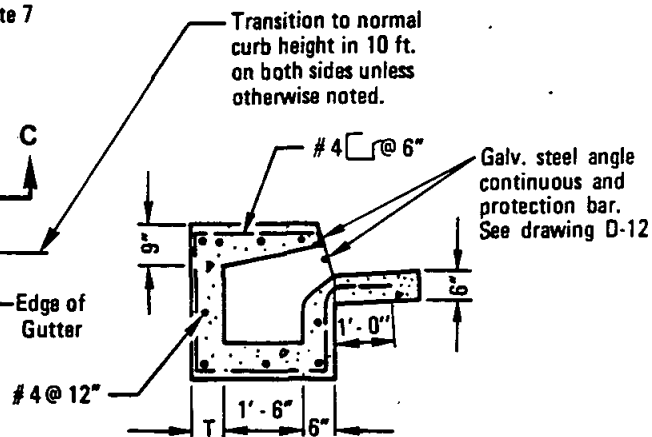
DRAINAGE SYSTEMS

DRAINAGE SYSTEMS

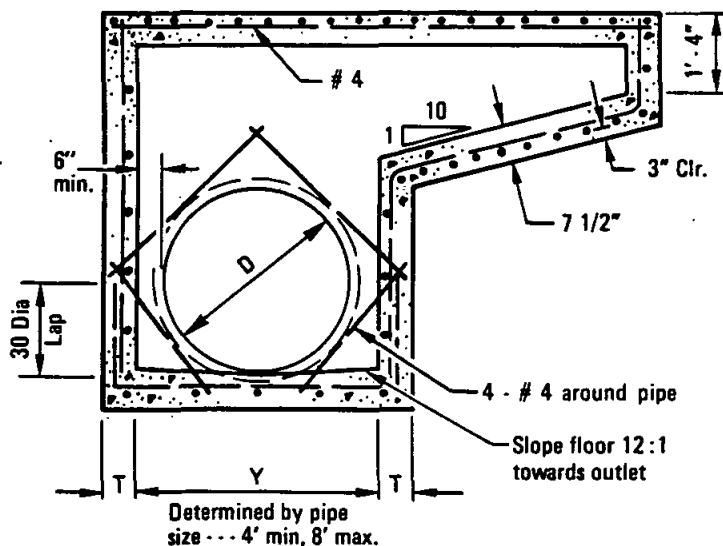
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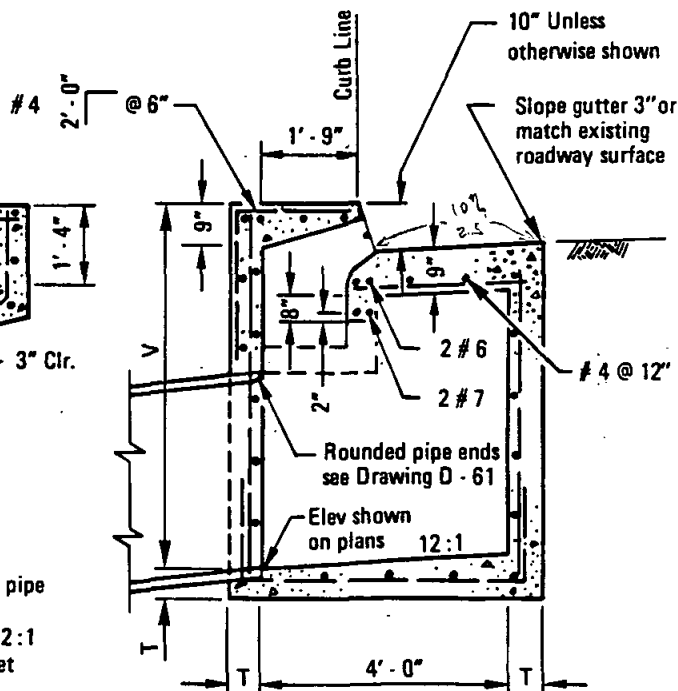
PLAN



SECTION B-B



SECTION C-C



SECTION A-A

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

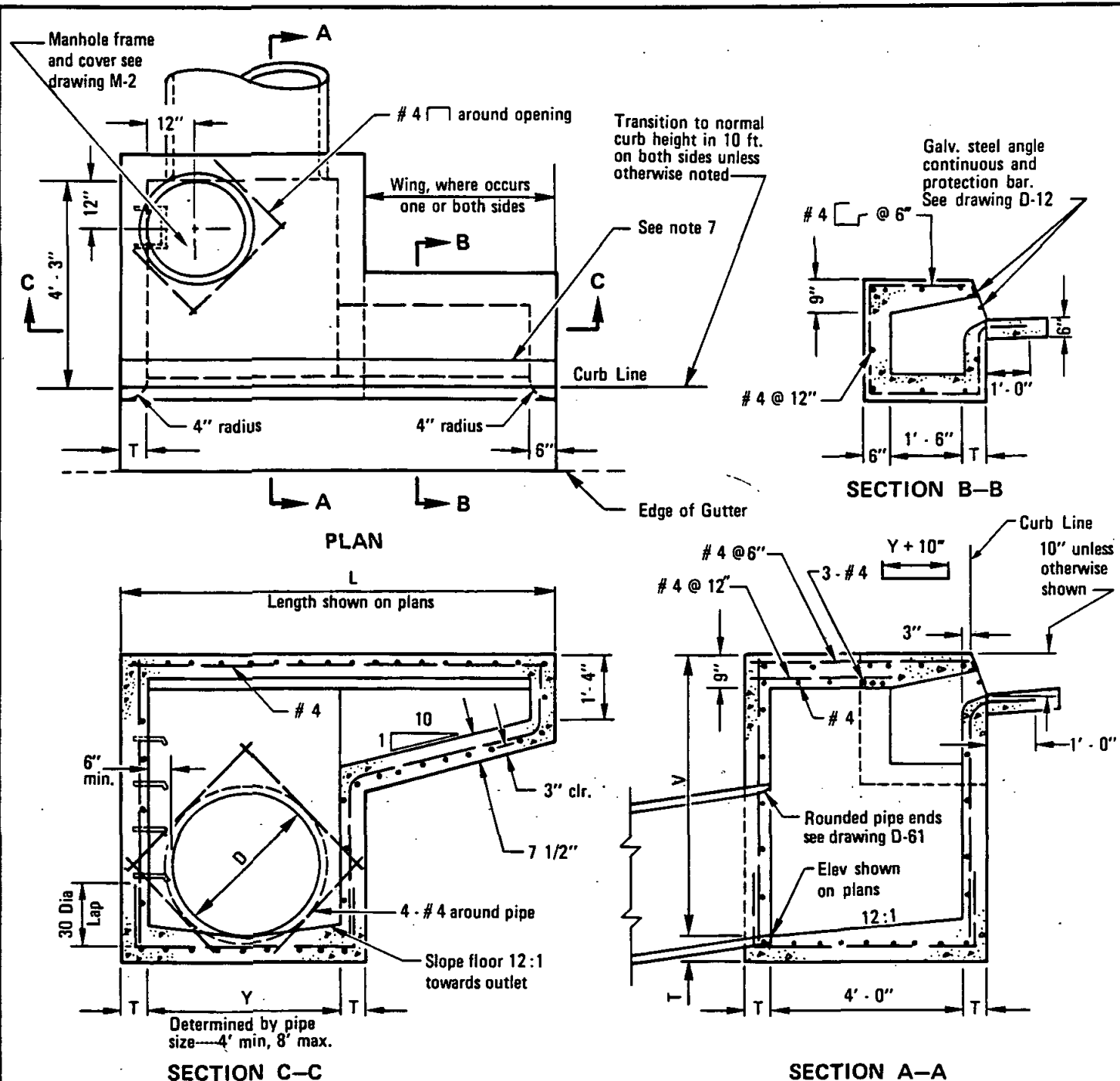
SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

DRAWING NUMBER **D-1**

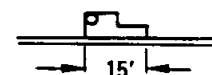


NOTES:

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

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

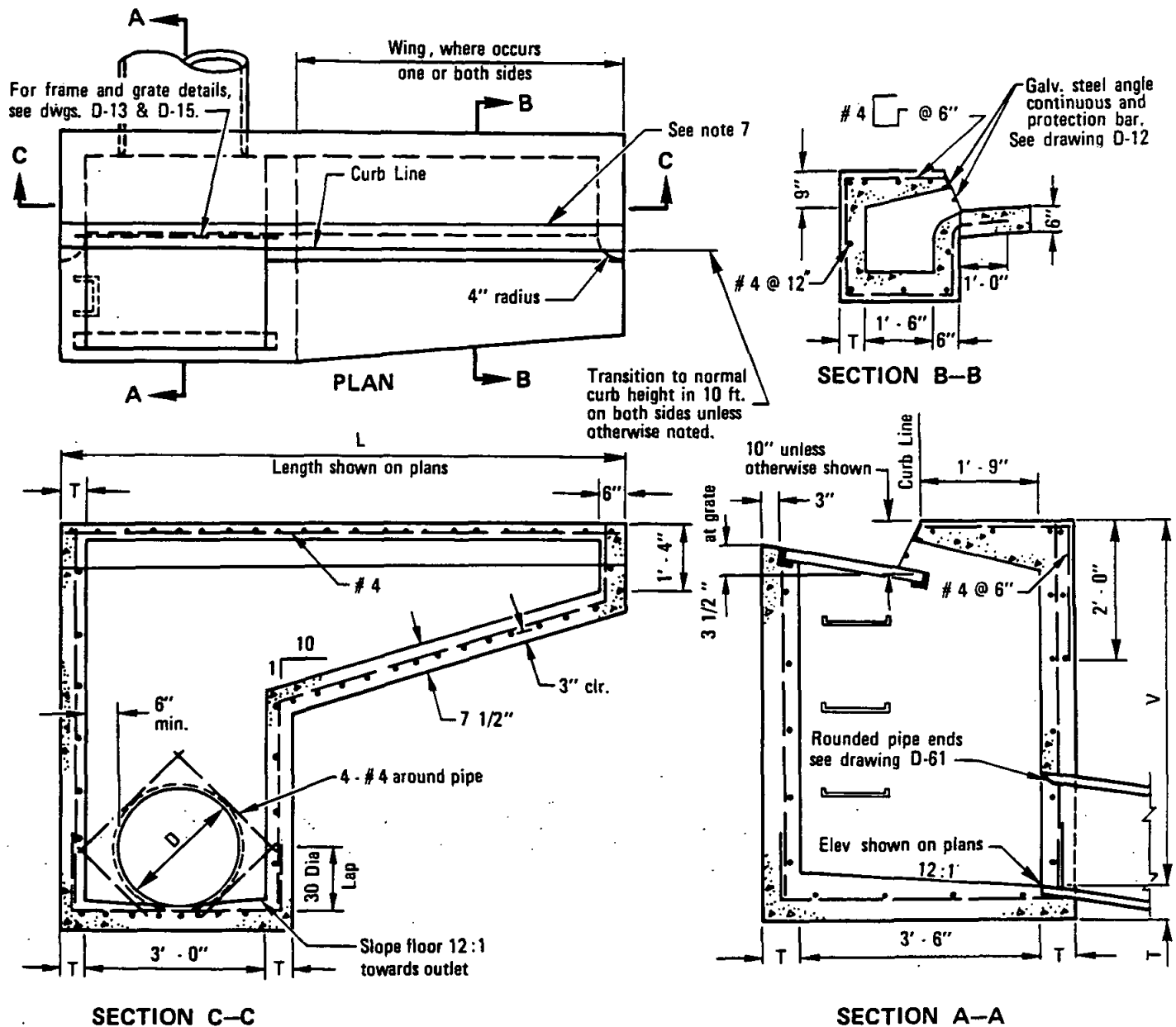
DRAWING
NUMBER

D-2

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE B

Revision	By	Approved	Date
Notes	<i>S.</i>	<i>D.S.</i>	7-79
Reference	<i>TRP</i>	<i>M.B.</i>	10-82
Rebar	<i>RC</i>	<i>M.B.</i>	5-86
Dash line	<i>RC</i>	<i>L.H.</i>	7-88

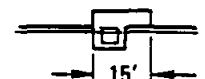


NOTES:

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	M.B.	10-82
Note 11	DC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE C

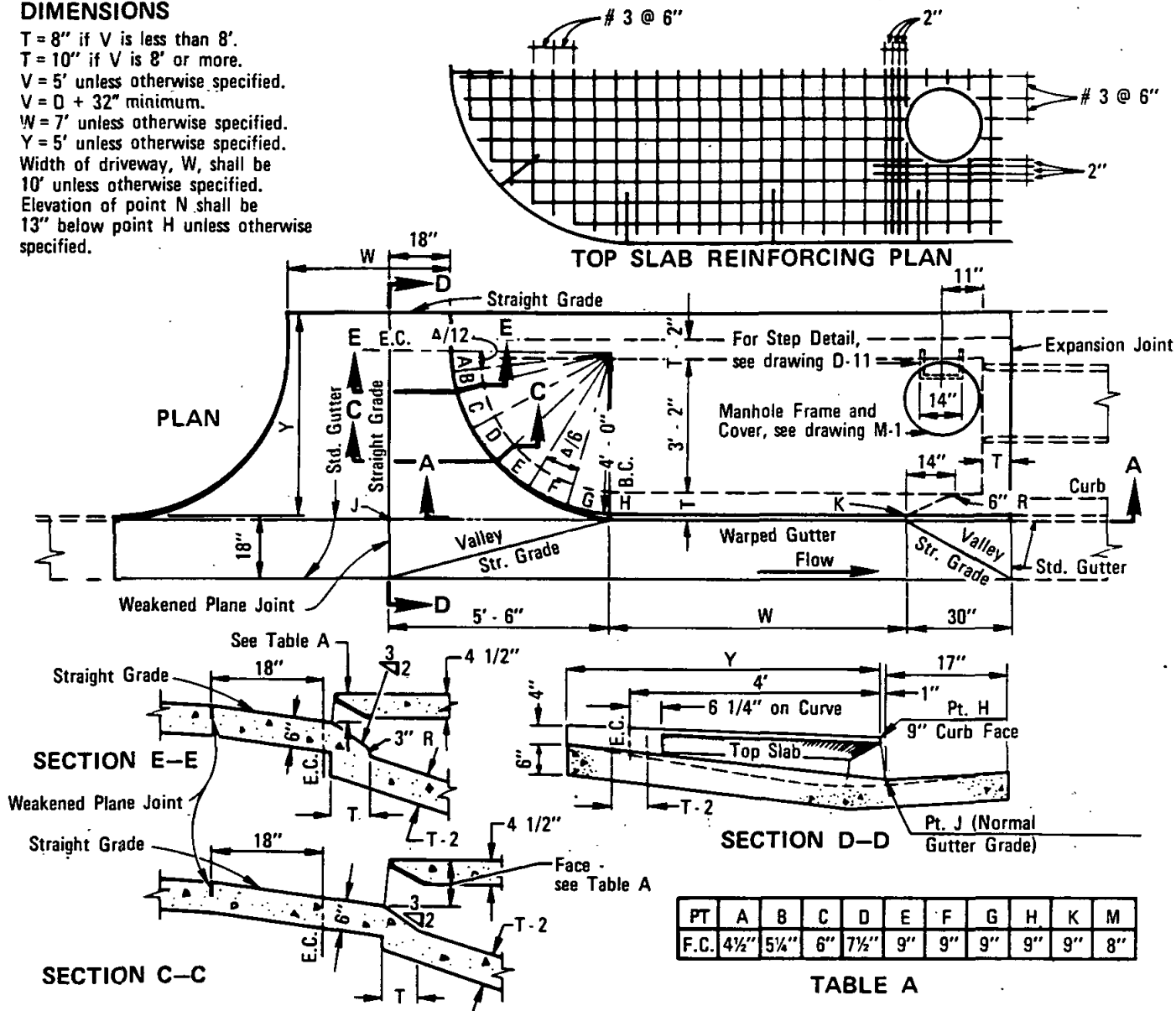
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allard A. Kerschbaum 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.

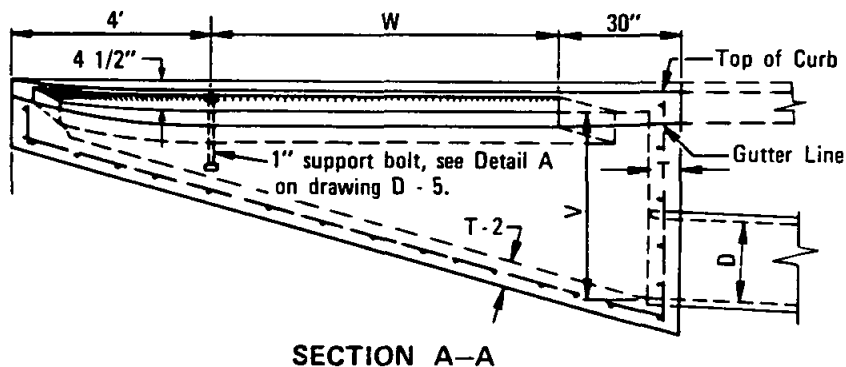


PT	A	B	C	D	E	F	G	H	K	M
F.C.	4 1/2"	5 1/4"	6"	7 1/2"	9"	9"	9"	9"	9"	8"

TABLE A

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.



SECTION A-A

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

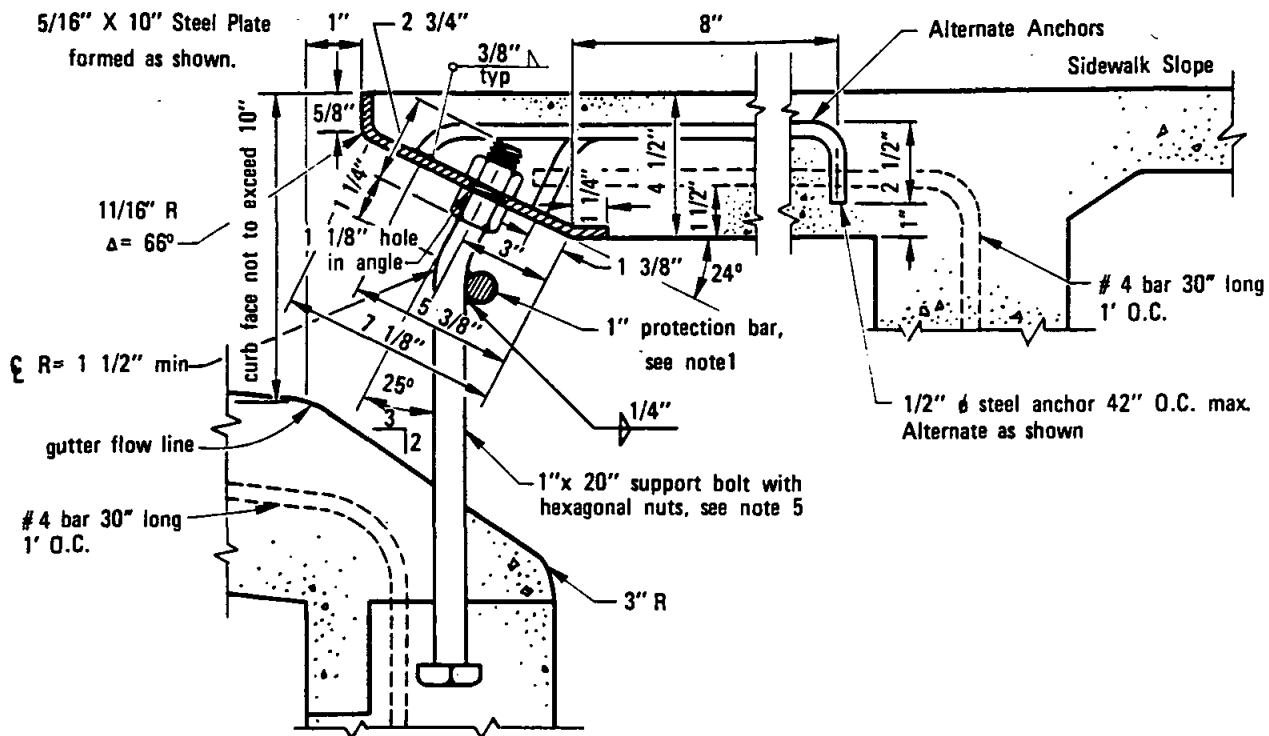
DRAWING
NUMBER

D-4

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE D

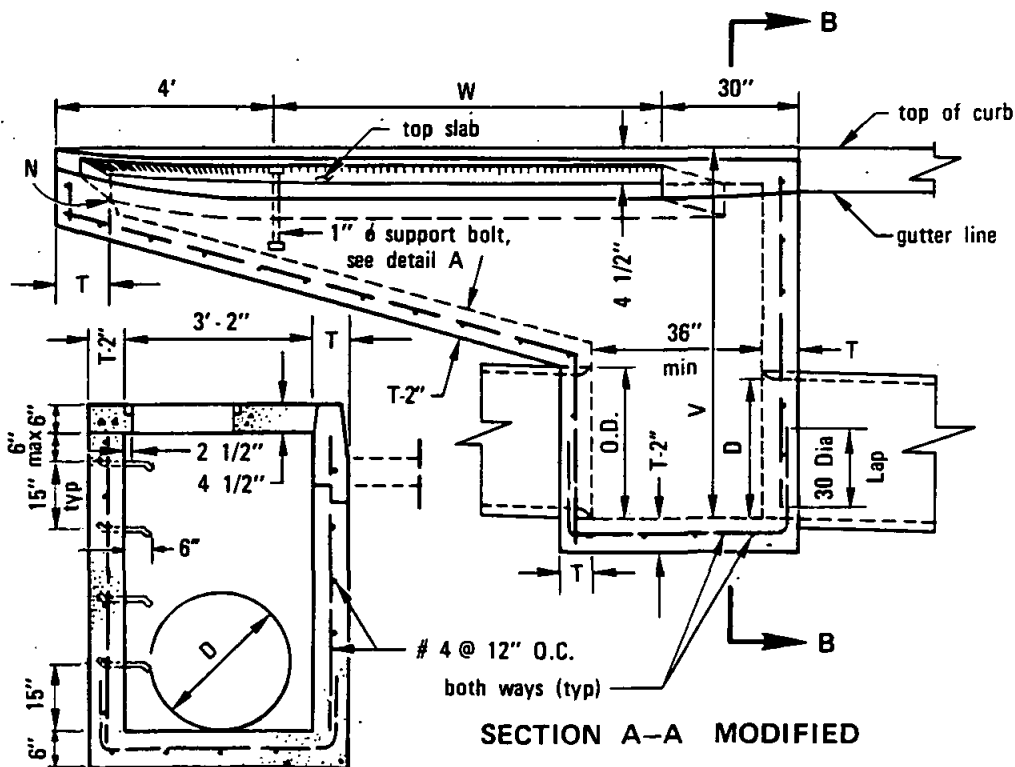
Revision	By	Approved	Date
Conc.	<i>R</i>	<i>M.B.</i>	5-86



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.



SECTION B-B

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

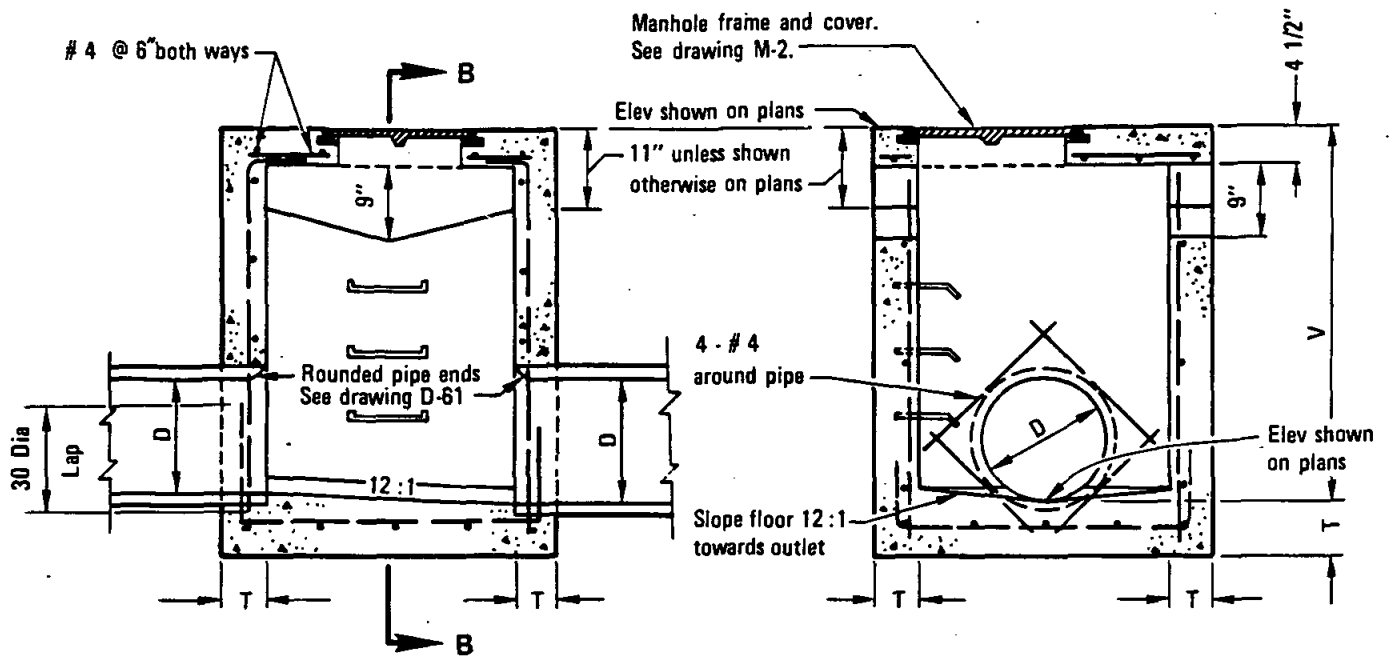
SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE D (DETAILS)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

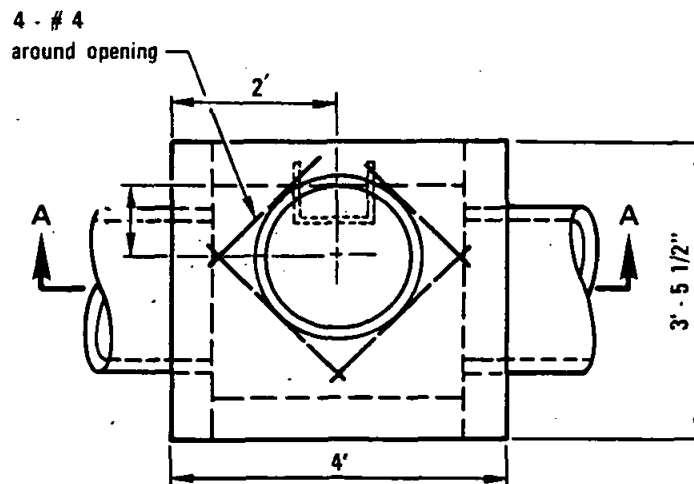
Allen G. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

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

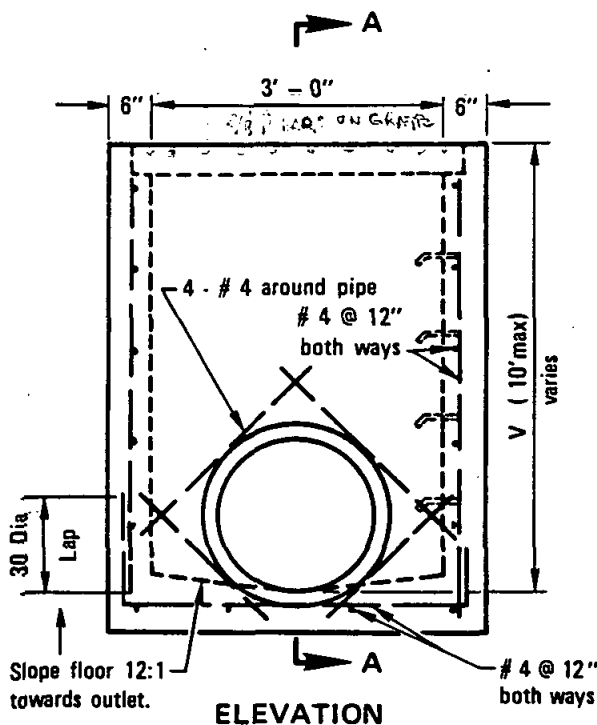
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE F

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

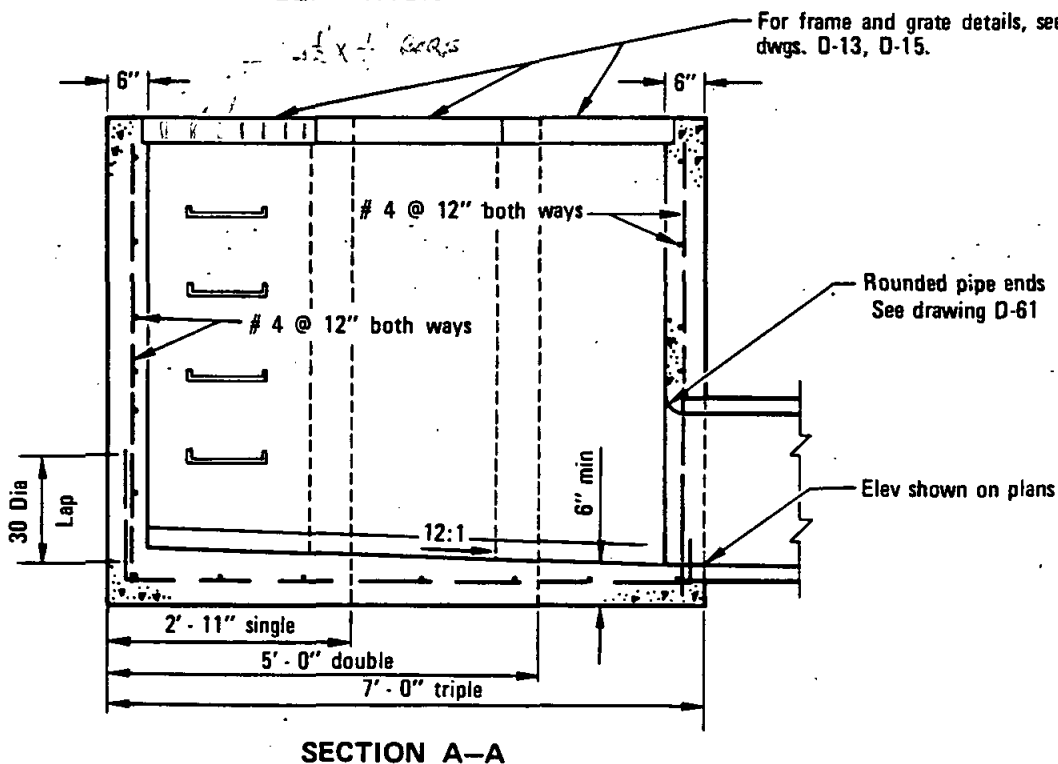
Allard O. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-7**

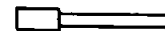


NOTES

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

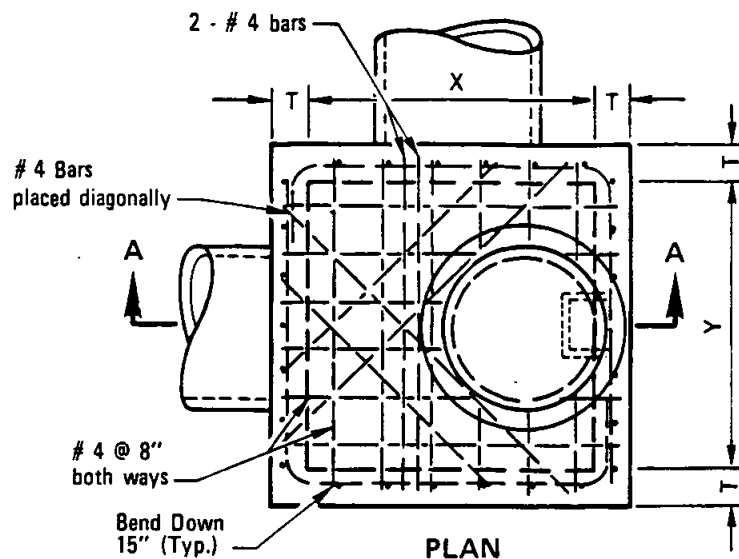
William G. Kneeland Dec. 1975
Coordinator R.C.E. 19807 Date

**DRAWING
NUMBER D-8**

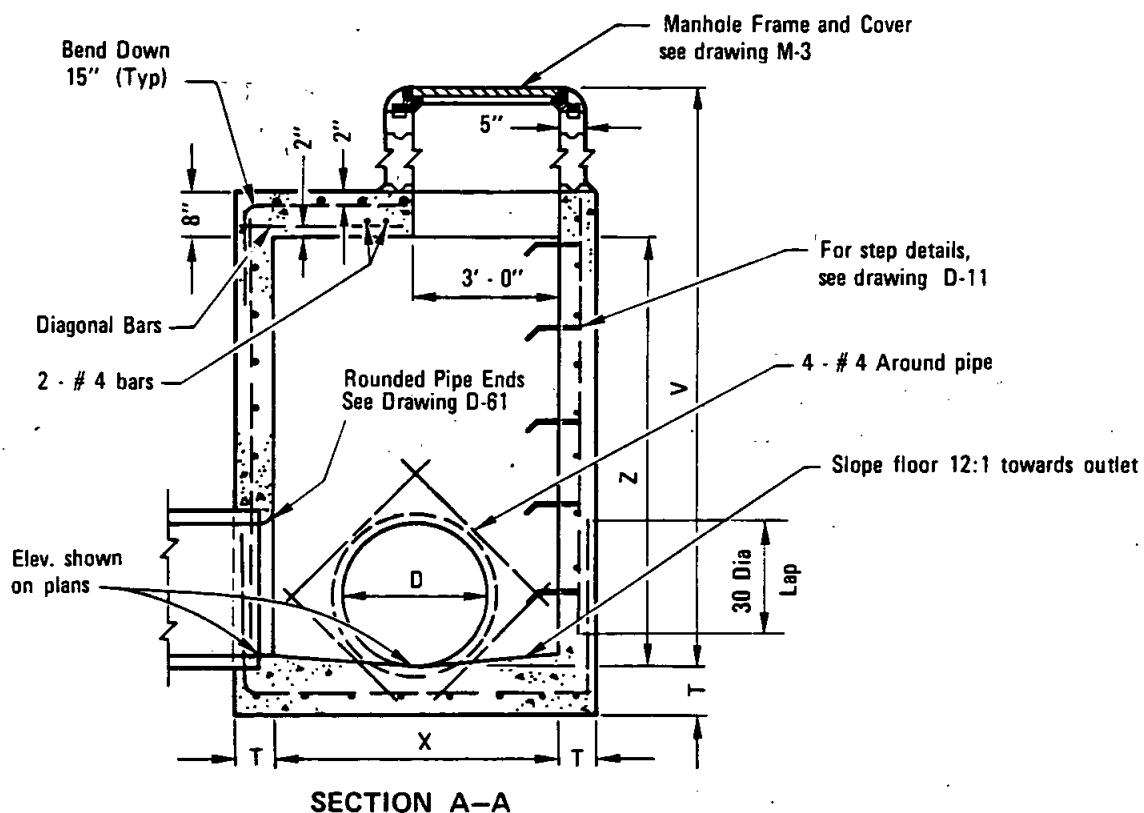
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE G

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



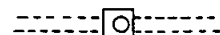
TYPE	PIPE DIA	X	Y	Z
A 4	up to 39"	4'	4'	6'
A 5	42" to 48"	5'	4'	6'
A 6	51" to 60"	6'	4'	6'
A 7	63" to 72"	7'	4'	7'
A 8	75" to 84"	8'	4'	8'



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



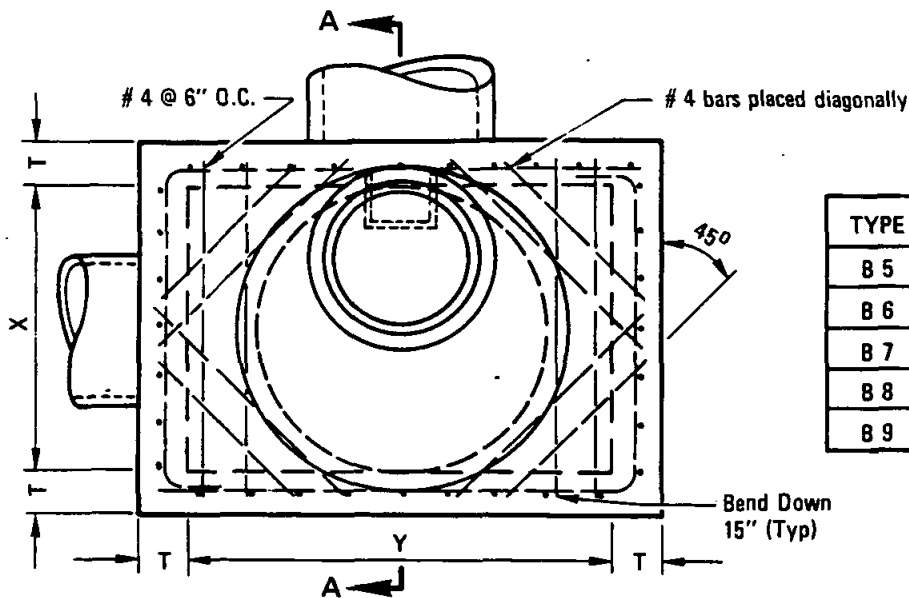
Revision	By	Approved	Date
Lap	SC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

STORM DRAIN CLEANOUT - TYPE A

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

DRAWING
NUMBER **D-9**

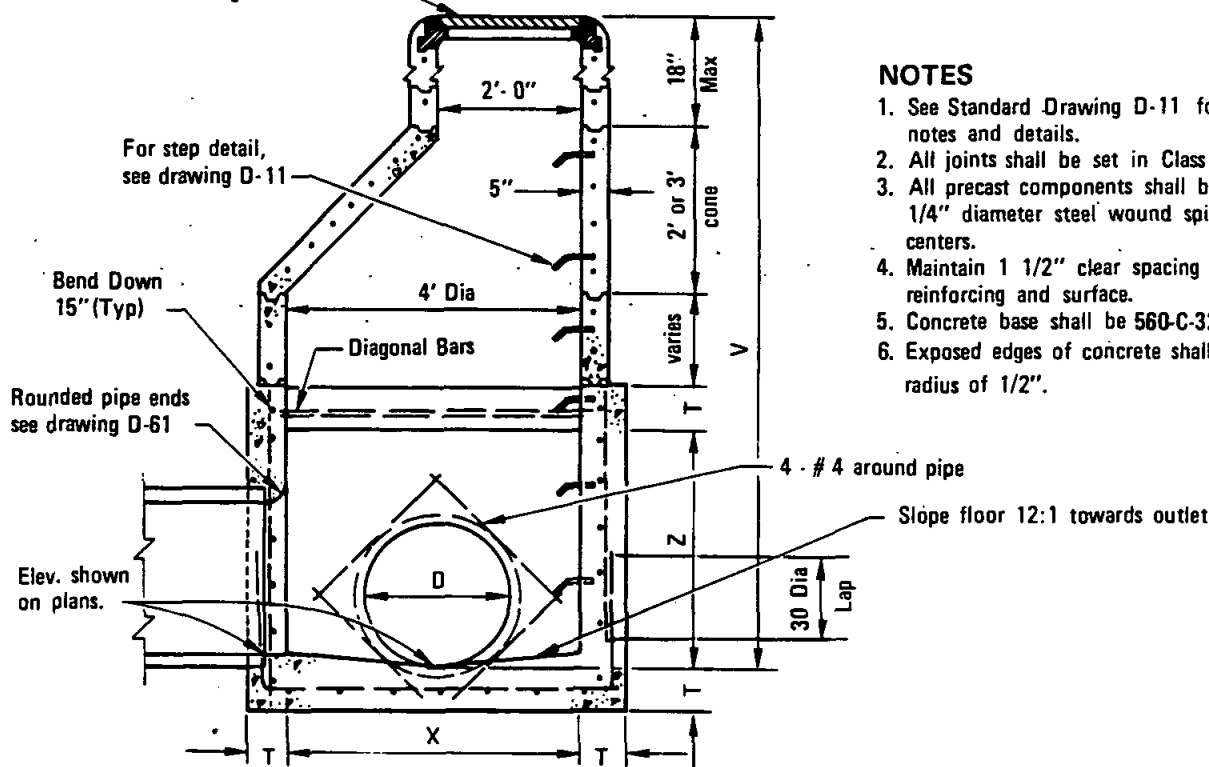


Manhole frame and cover
see drawing M-1 or M-2

PLAN

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'

Bend Down
15" (Typ)

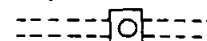


SECTION A-A

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

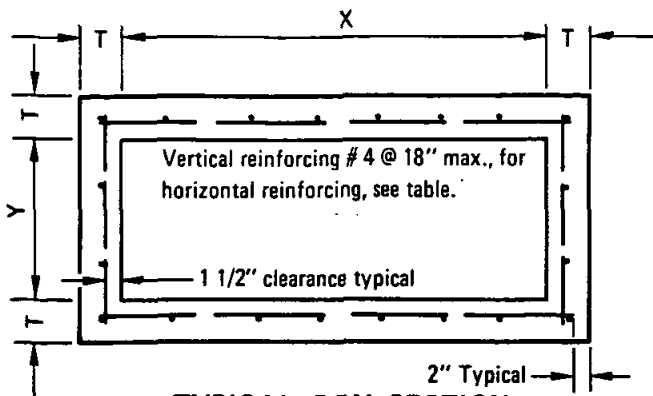
Clifford A. Kerschbaum Dec. 1975
Coordinator R.C.C. 19807 Date

DRAWING
NUMBER **D-10**

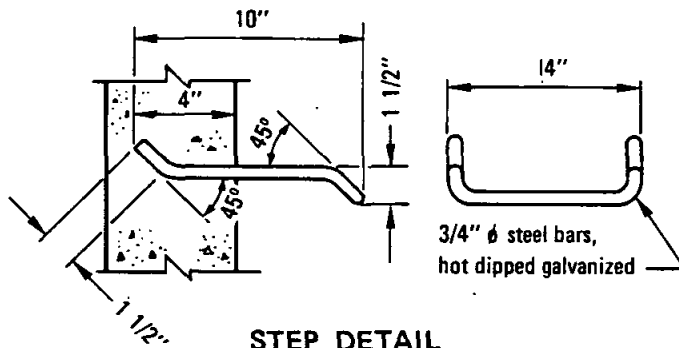
SAN DIEGO REGIONAL STANDARD DRAWING

STORM DRAIN CLEANOUT - TYPE B

Revision	By	Approved	Date
Lap	<i>SC</i>	<i>M.B.</i>	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' - 1" 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"	16' - 1" to 20' - 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"	20' - 1" to 24' - 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"	24' - 1" to 28' - 0"	10"	# 4 @ 8"
6' - 1" to 7' - 0"		10"	# 4 @ 6"
7' - 1" to 8' - 0"		10"	# 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
Notes	J. D. S.		7-79
Conc.	J. M. B.		5-86

SAN DIEGO REGIONAL STANDARD DRAWING

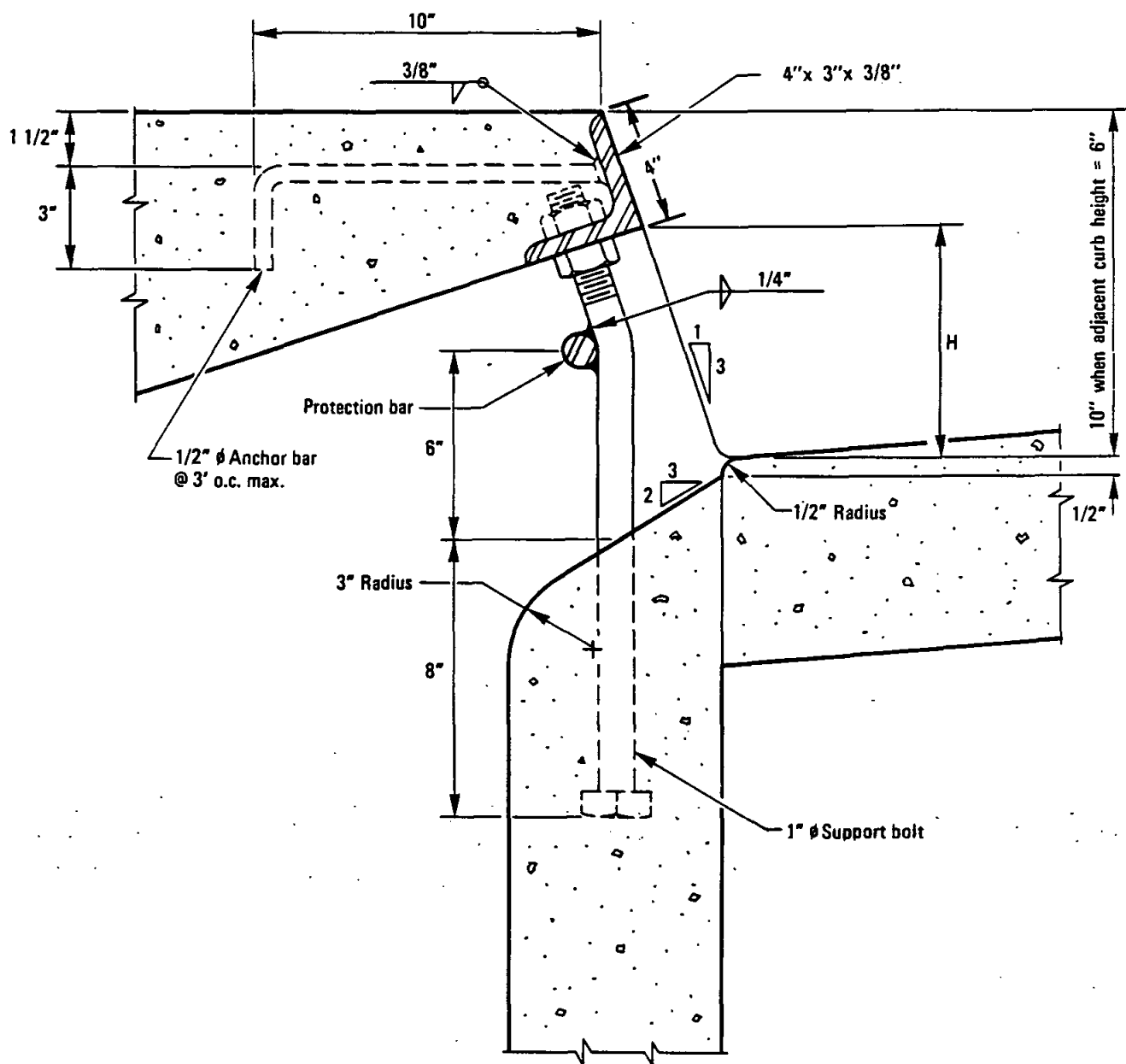
INLETS AND CLEANOUTS NOTES AND DETAILS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen G. Kerschbaum Dec. 1975
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

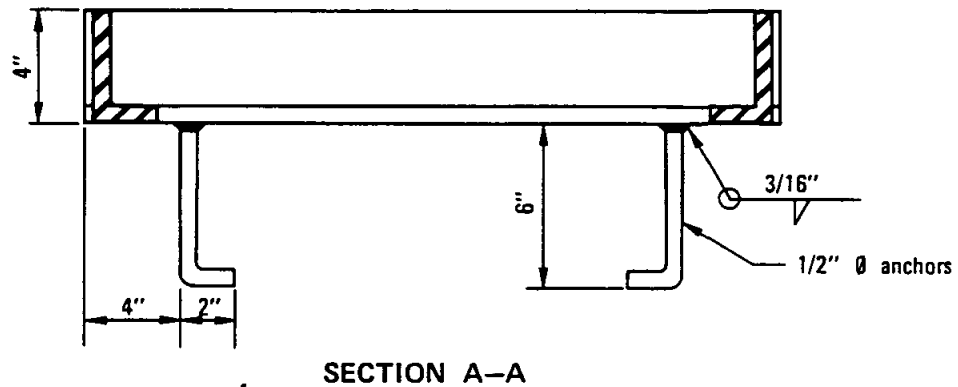
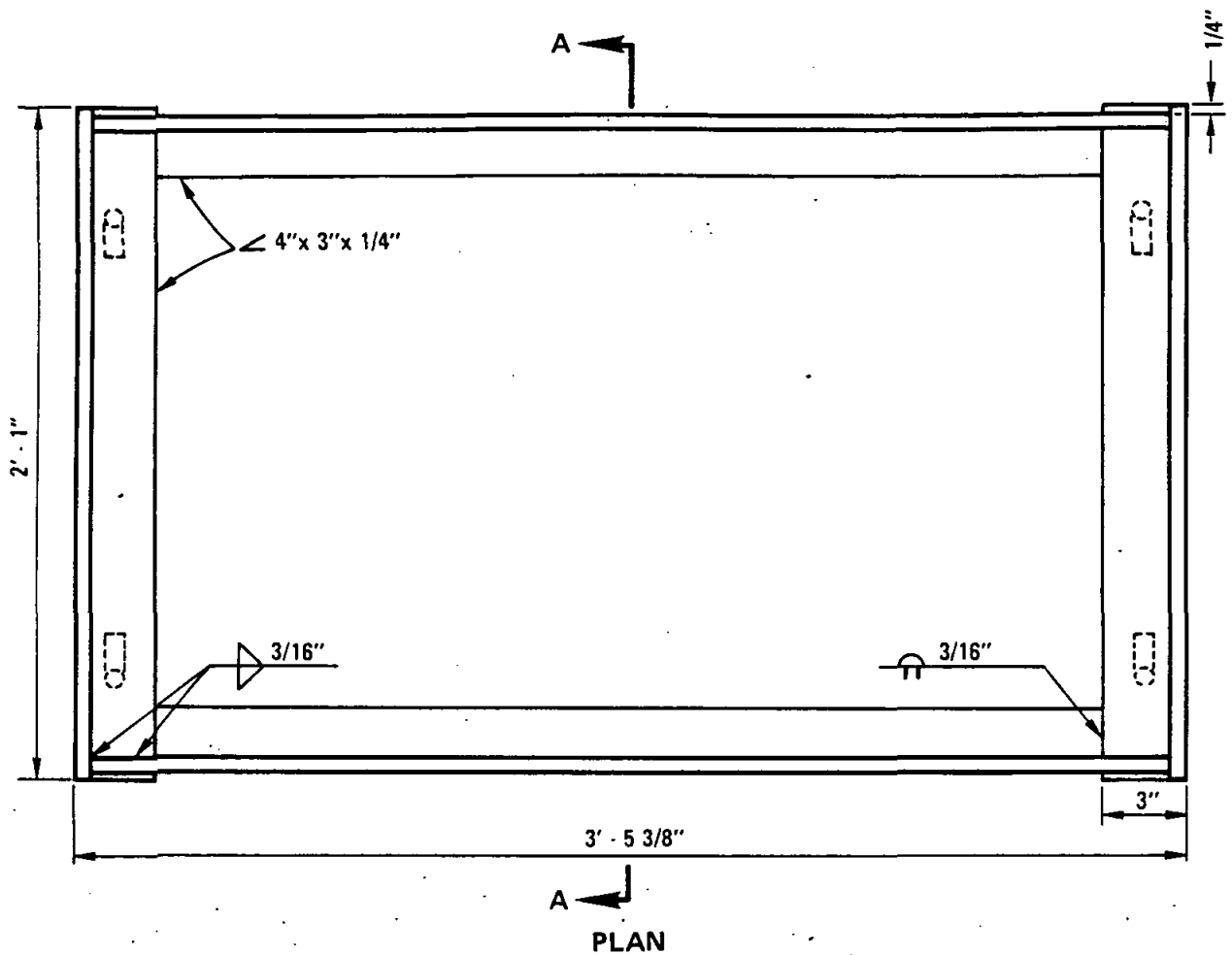
Robert S. Keshner Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET OPENING

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

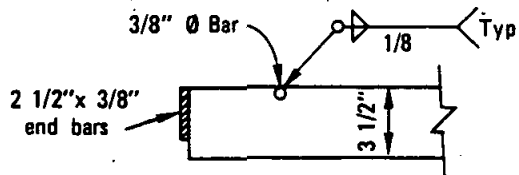
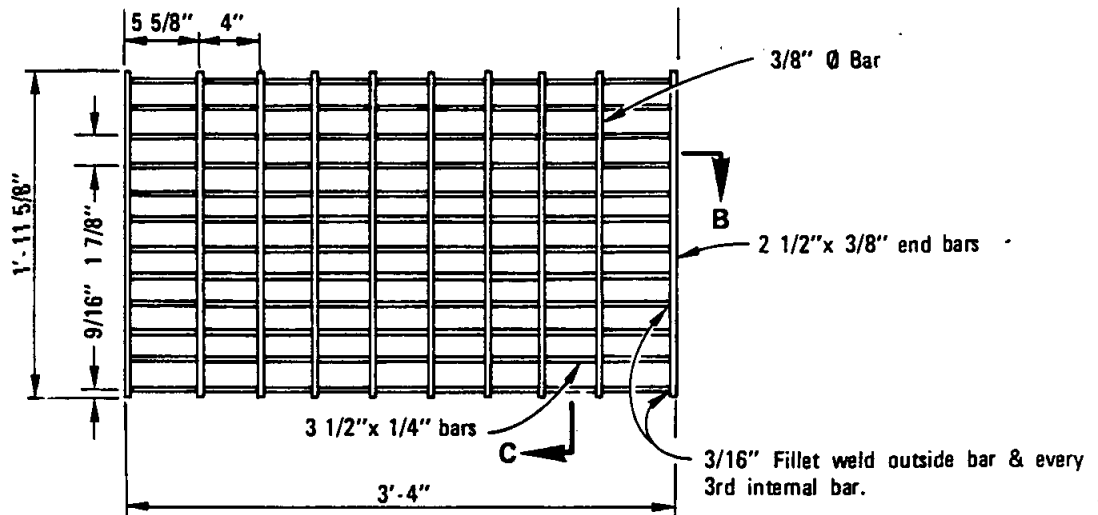
DRAWING
NUMBER **D-12**



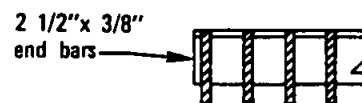
NOTES

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.E.	5-86			<i>Allan A. Kerschbaum</i>	<i>Dec. 1975</i>
				WELDED STEEL GRATE FRAME		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.

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

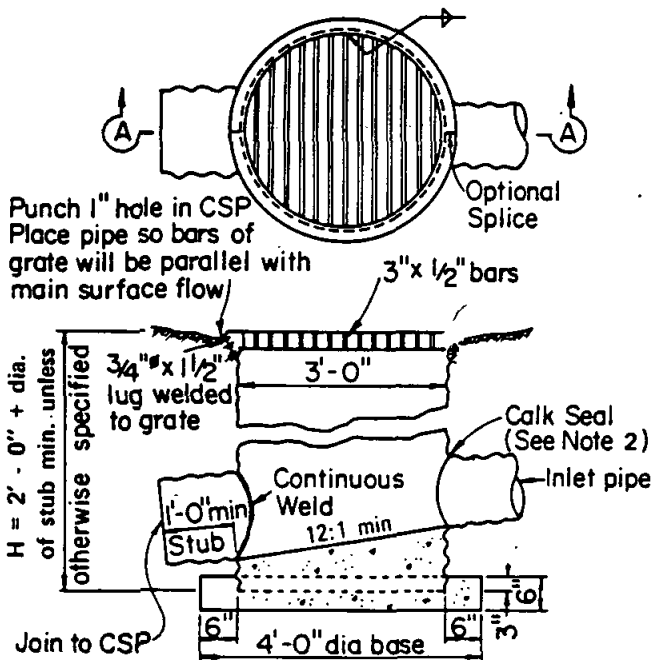
SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE STRUCTURE GRATE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

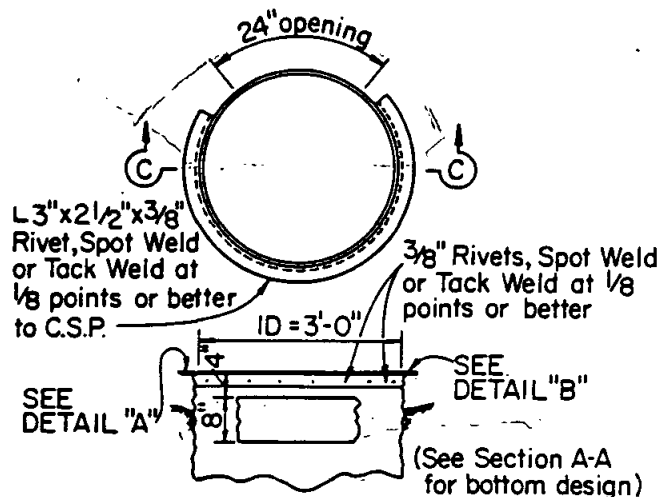
Allan A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER D-15



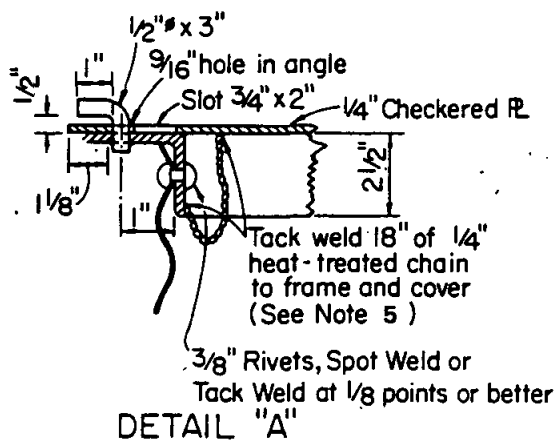
SECTION A-A

TYPE A

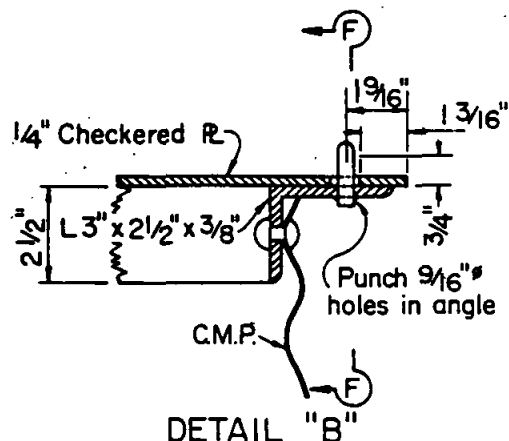


SECTION C-C

TYPE B



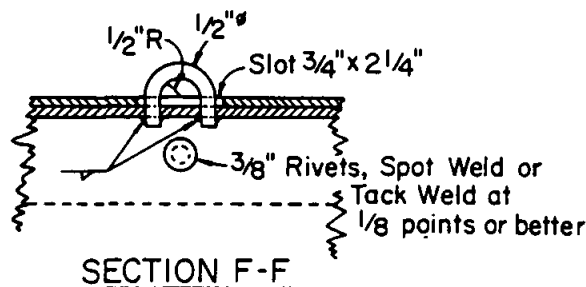
DETAIL "A"



DETAIL "B"

NOTES

1. All components shall be galvanized.
2. Inlet and outlet pipes shall be set at factory and positioned as shown on plans.
3. Ladders and Steps: None required where "H" is 3'-6" or less. Where "H" is between 3'-6" and 4'-11" place one step +16" above the floor. If "H" is 5'-0" or more install a ladder placing the lowest rung 16" above the floor and the highest rung not more than 14" below top of inlet. Place single step or ladder in wall without wall opening.
4. See Standard Drawing D-17 for additional details.
5. Grate to be provided when specified.
6. Grate detail shall be as shown on drawing D-17 unless otherwise approved by Agency.



SECTION F-F

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

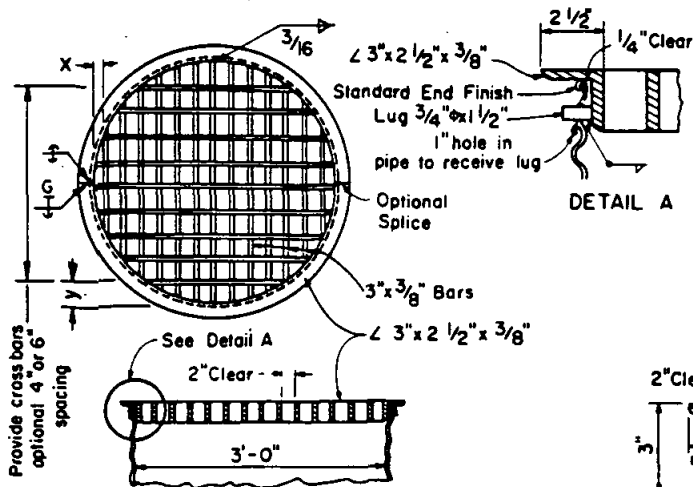
Oliver A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER D-16

SAN DIEGO REGIONAL STANDARD DRAWING

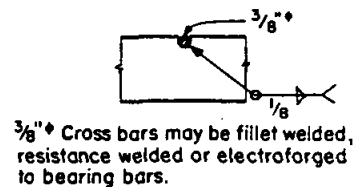
CORRUGATED STEEL PIPE INLETS
TYPES A AND B

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

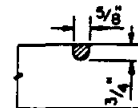


GRATE DETAILS

ALTERNATIVE CAST NODULAR
IRON GRATE OR CAST STEEL



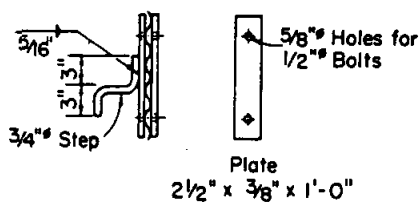
CROSS BAR DETAIL
GRATE (WELDED STEEL)



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

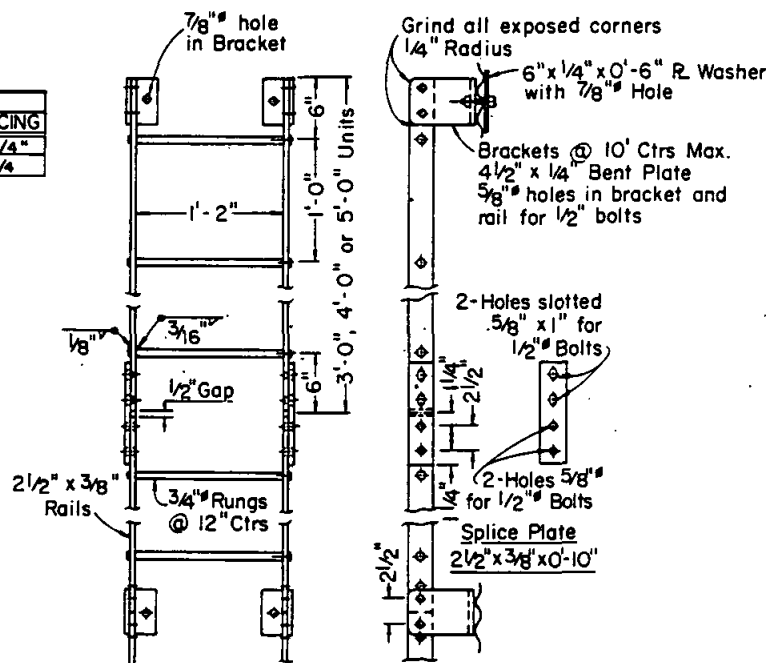
GRATE BAR SPACING TABLE

TYPE	NO BARS	CLEAR BAR SPACING	X	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

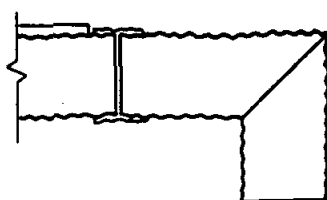
SAN DIEGO REGIONAL STANDARD DRAWING

CORRUGATED STEEL PIPE INLETS
DETAILS

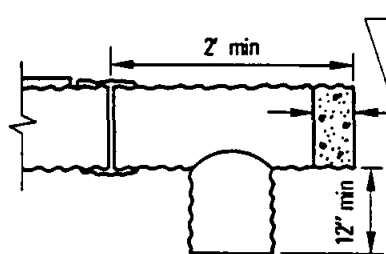
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

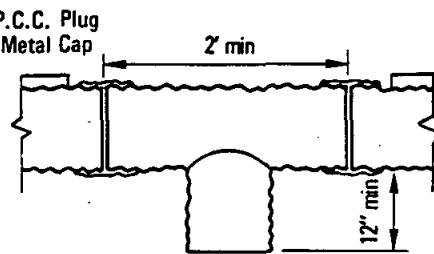
DRAWING
NUMBER **D-17**



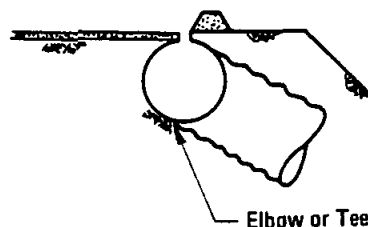
ELBOW



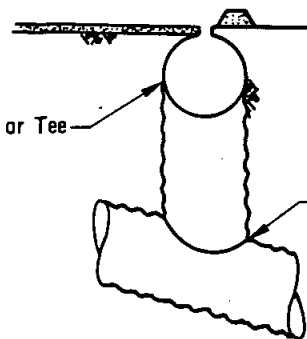
TEE



TEE-SAG CONDITION

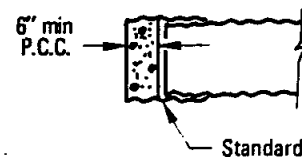


Elbow or Tee



Elbow or Tee

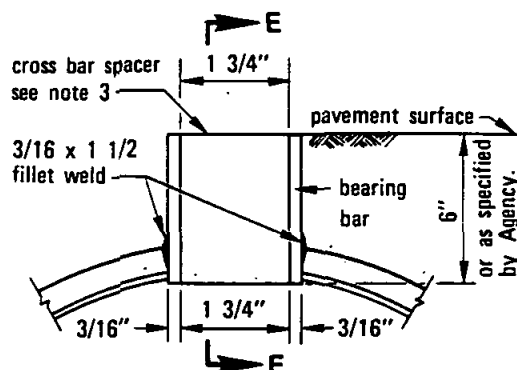
see note 8



Standard Band

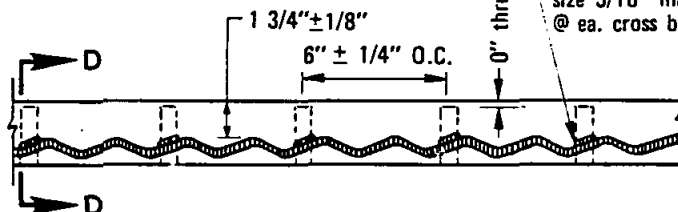
BAND PLUG

OVERSIDE DRAIN

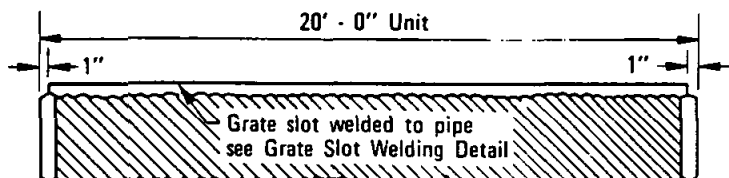


SECTION D-D

GRATE SLOT DETAIL

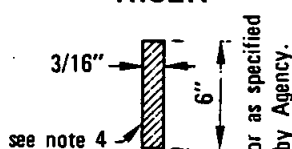


GRATE SLOT WELDING DETAIL



GRATE SLOT DRAIN

RISER



see note 4

or as specified by Agency.

SECTION E-E

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.

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

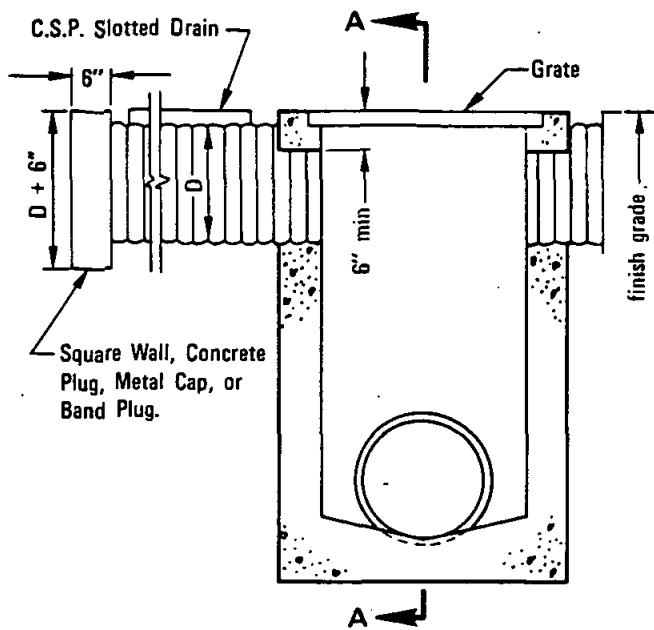
William J. Rasmussen Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER D-18

SAN DIEGO REGIONAL STANDARD DRAWING

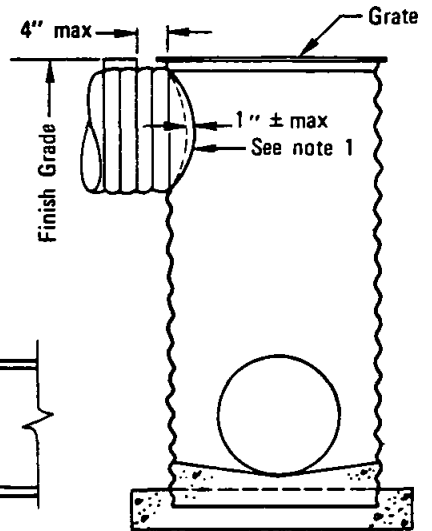
SLOTTED CORRUGATED STEEL PIPE DRAIN 12" THROUGH 24"

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

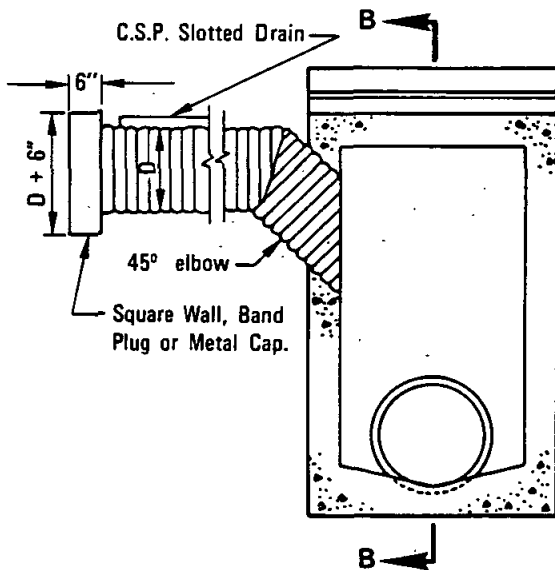


SECTION A-A

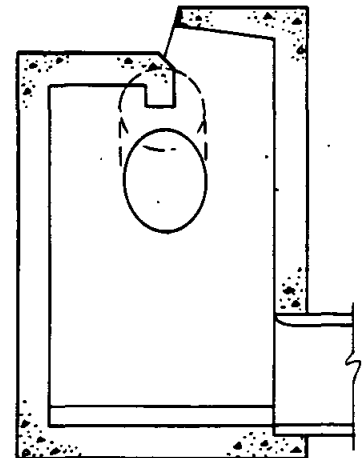
CATCH BASIN



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

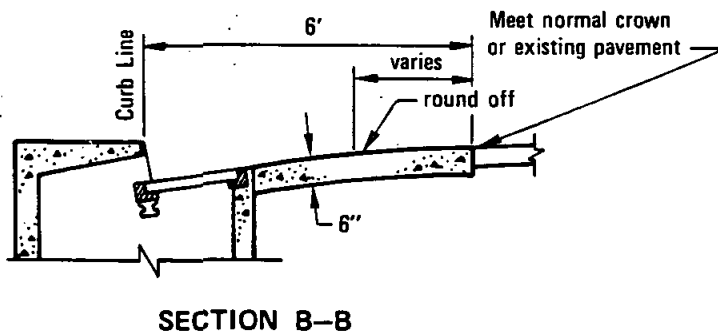
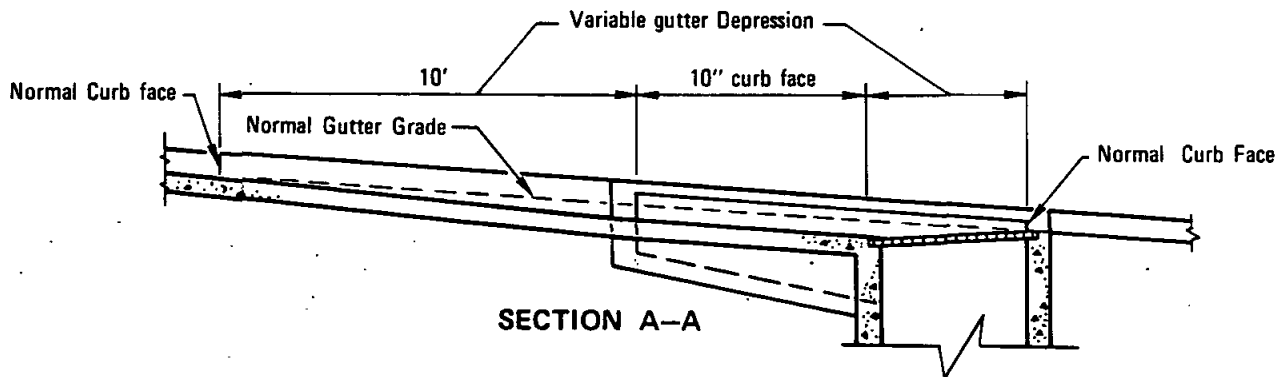
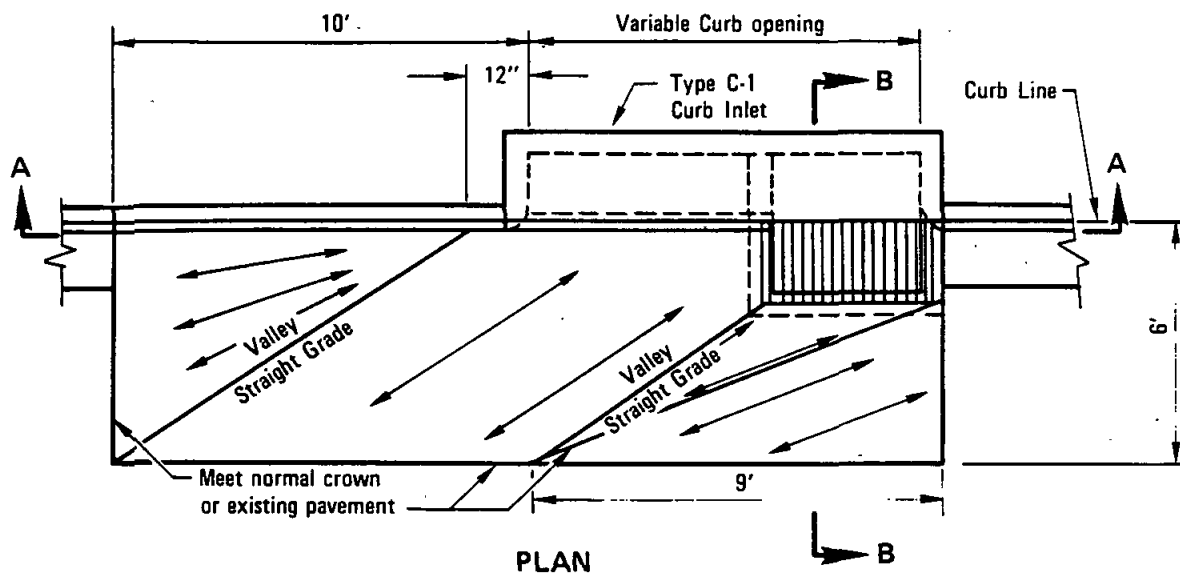
SAN DIEGO REGIONAL STANDARD DRAWING

SLOTTED DRAIN CONNECTIONS
TO STANDARD INLETS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

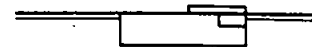
DRAWING
NUMBER **D-19**



NOTES:

1. Curb and apron to be placed monolithically.
2. Use of false header at valleys and slope break line is optional.
3. Extend vertical steel from inlet structure into concrete apron as required.
4. Screed Direction $\longleftrightarrow$
5. Concrete shall be 520-C-2500

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

William J. Karpman Dec. 1975
Coordinator R.C.C. 19807 Date

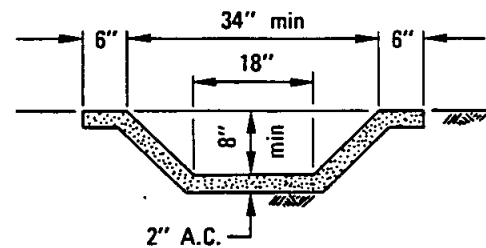
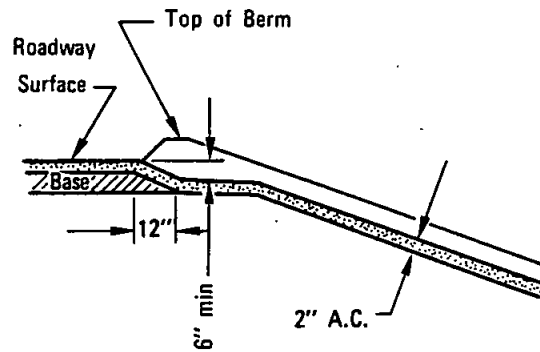
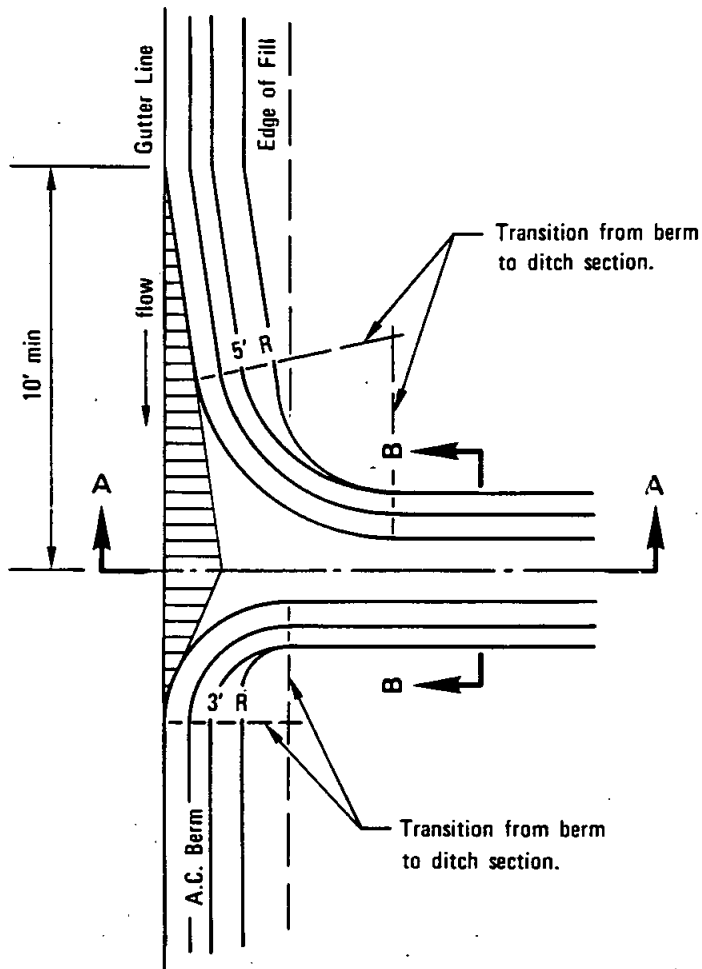
DRAWING
NUMBER **D-20**

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE APRON FOR CURB INLET

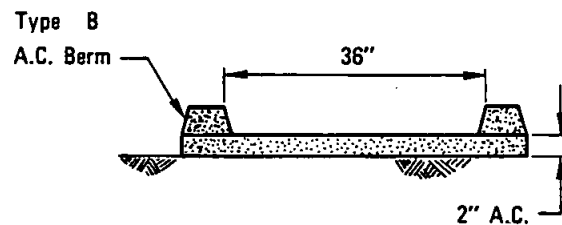
Revision	By	Approved	Date
Conc.	<i>MB</i>	<i>MB</i>	5-86

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

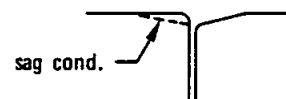
SECTION B-B



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

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

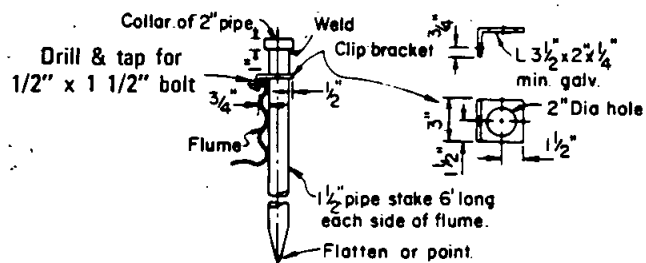
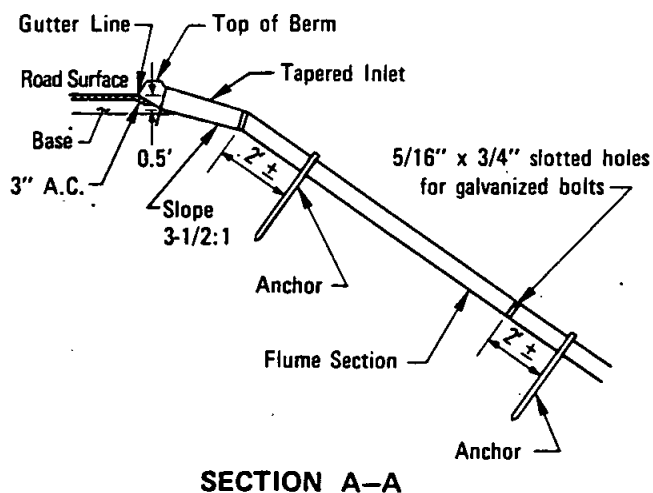
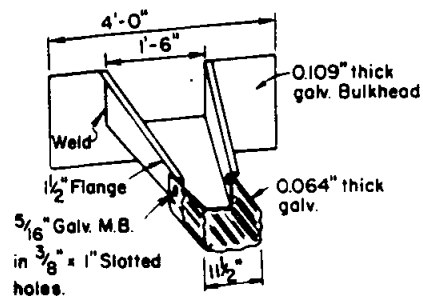
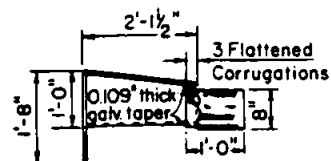
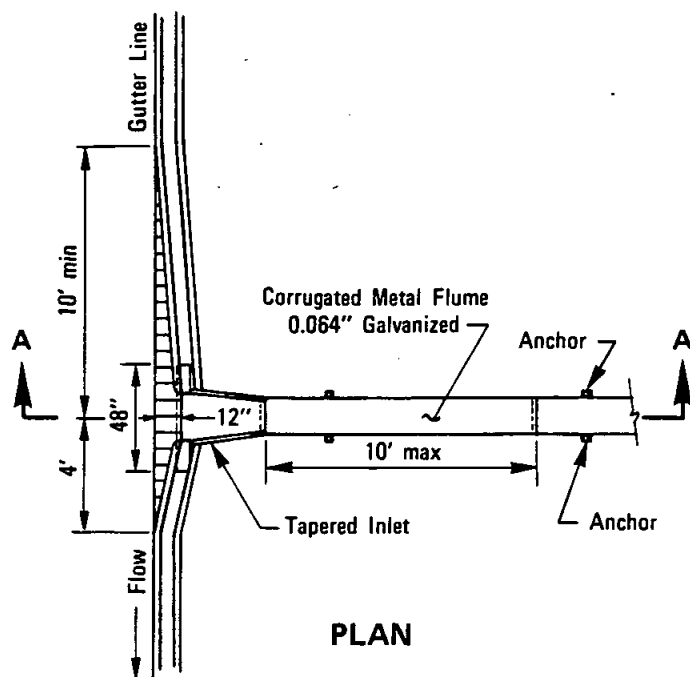
DRAWING
NUMBER

D-22

SAN DIEGO REGIONAL STANDARD DRAWING

ASPHALT CONCRETE SPILLWAY

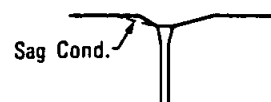
Revision	By	Approved	Date
Plan	<i>CS</i>	<i>D. S.</i>	<i>7.79</i>



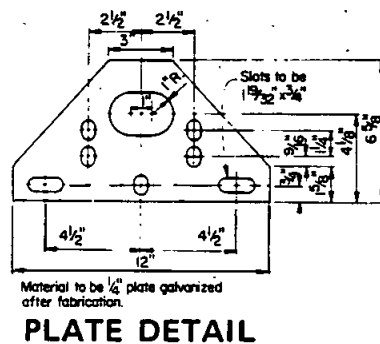
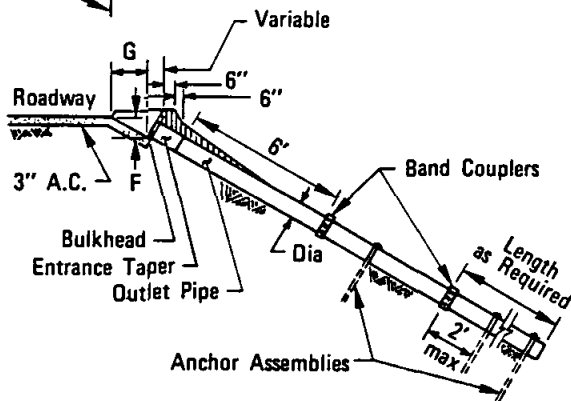
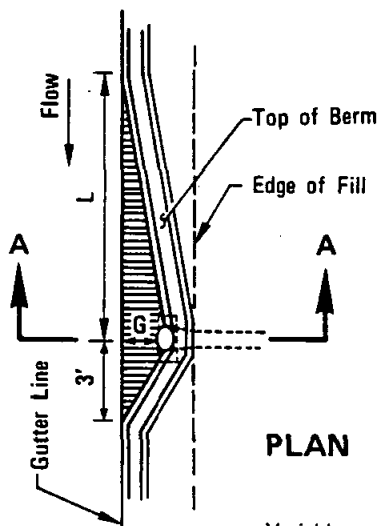
NOTES

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 TAPERED INLET AND DOWNDRAIN FLUME	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Alfred A. Kershner</i> <i>Dec. 1975</i> Coordinator R.C.E. 1980? Date
				DRAWING NUMBER	D-23

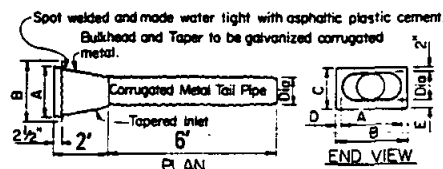


Dimensions to be as tabulated below for Assembly.

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'

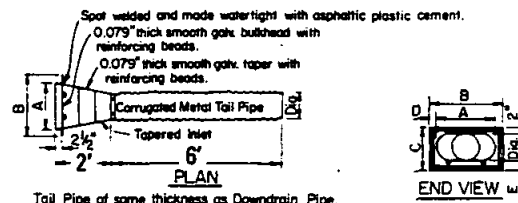
NOTES

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.



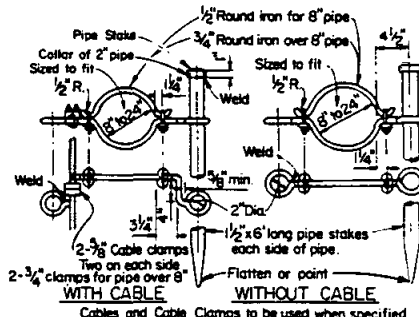
Bulkhead and Taper of same thickness as Tail Pipe with 0.079" Max. Tail Pipe of same thickness as Downdrain Pipe.

ENTRANCE TAPER—TYPE 1 ALTERNATIVE A

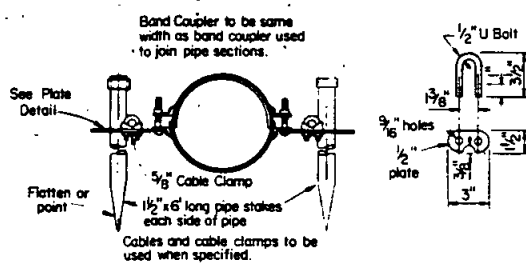


Tail Pipe of same thickness as Downdrain Pipe.

ENTRANCE TAPER—TYPE 1 ALTERNATIVE B



ANCHOR ASSEMBLY ALTERNATIVE-A



ANCHOR ASSEMBLY ALTERNATIVE-B

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen J. Kershner *Dec. 1975*
Coordinator R.C.E. 1980? Date

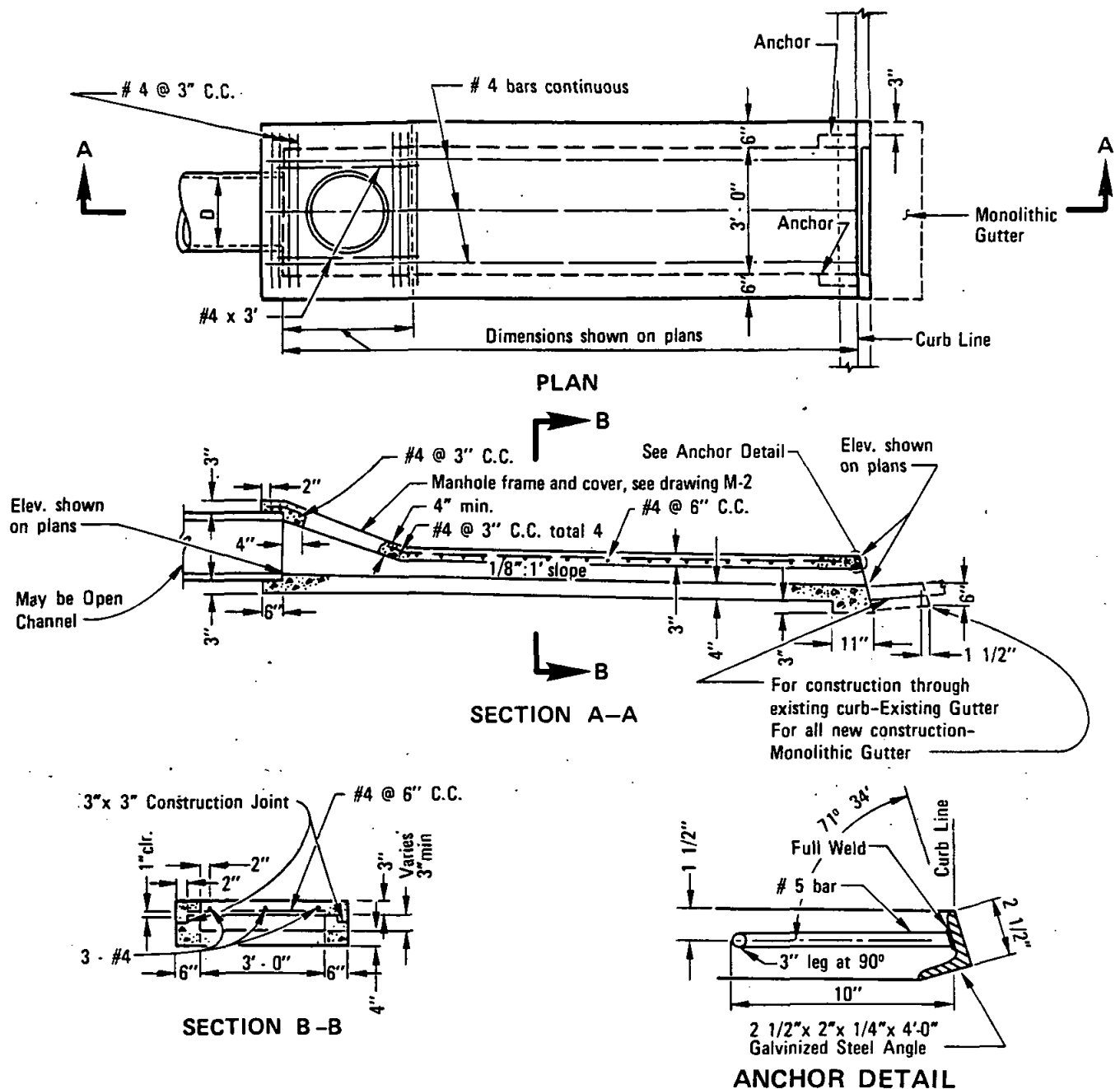
DRAWING NUMBER

D-24

SAN DIEGO REGIONAL STANDARD DRAWING

ENTRANCE TAPER AND DOWNDRAIN PIPE

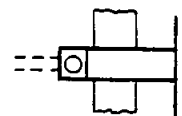
Revision	By	Approved	Date



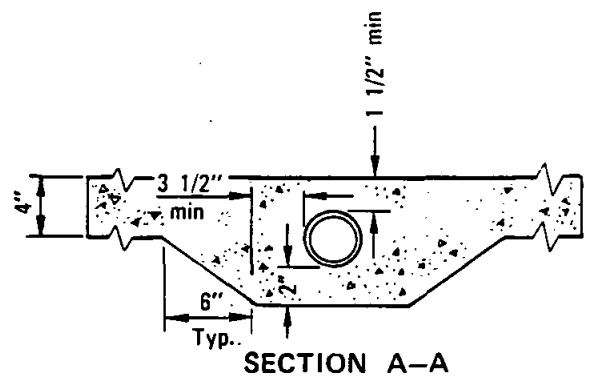
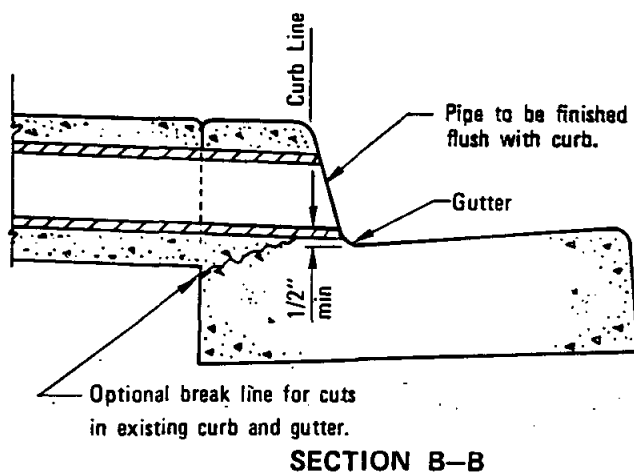
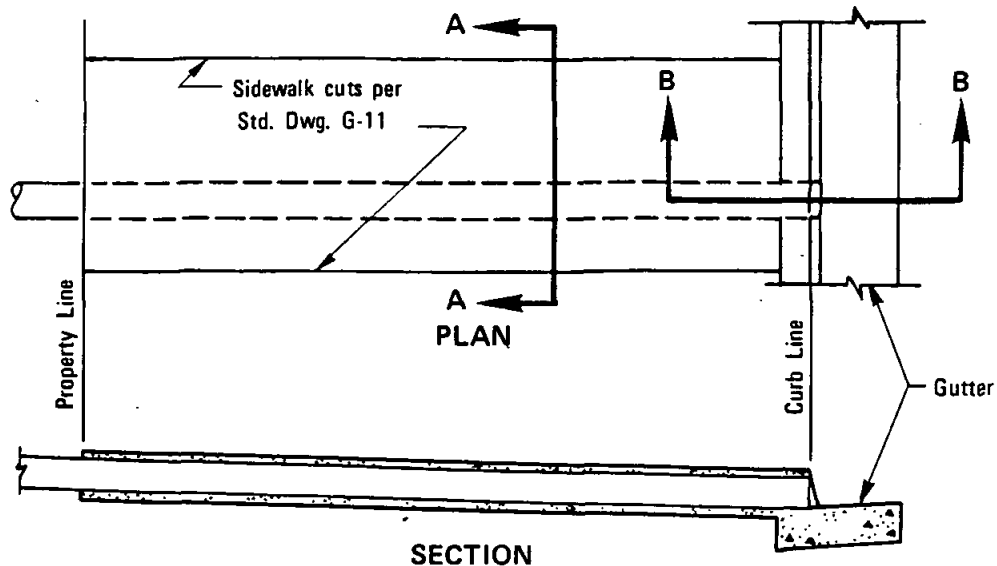
NOTES

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.

LEGEND ON PLANS



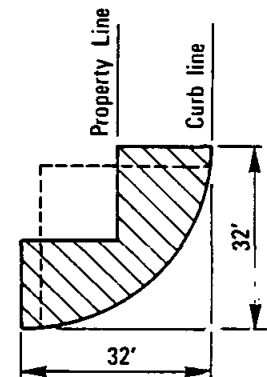
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Bar Size	SC	D.S.	7-79			Allen A. Kuehn	Dec. 1975
Conc.	SC	M.B.	5-86	CURB OUTLET - TYPE A		Coordinator R.C.E. 19807	Date
				DRAWING NUMBER		D-25	



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

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.



Drain shall not occupy
the hatched area

BLOCK CORNER

Revision	By	Approved	Date
Modif.	<i>MB</i>	<i>MB</i>	<i>5-86</i>

SAN DIEGO REGIONAL STANDARD DRAWING

SIDEWALK UNDERDRAIN PIPE

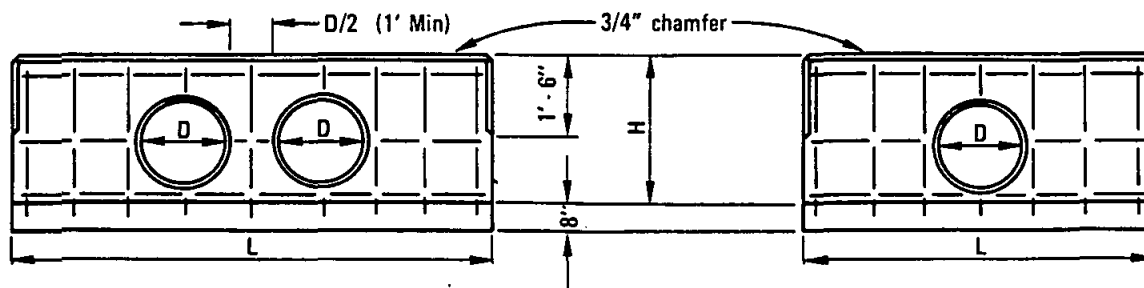
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

**DRAWING
NUMBER D-27**

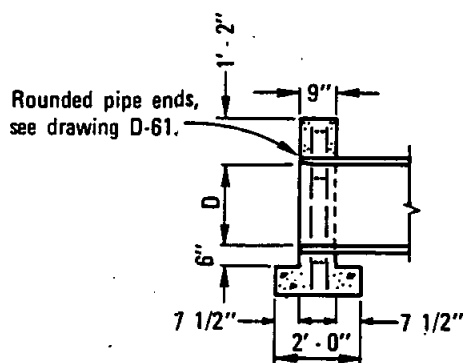


Revision		Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>David A. Solomon July 1979</i> Coordinator R.C.E. 25291 Date
Reference	TRP	M.B.	10-82		
Modif.	8	M.B.	5-86	CATCH BASIN-TYPE I	DRAWING NUMBER D-29



ELEVATION DOUBLE HEADWALL

ELEVATION SINGLE HEADWALL



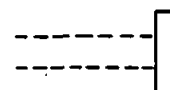
SECTION

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

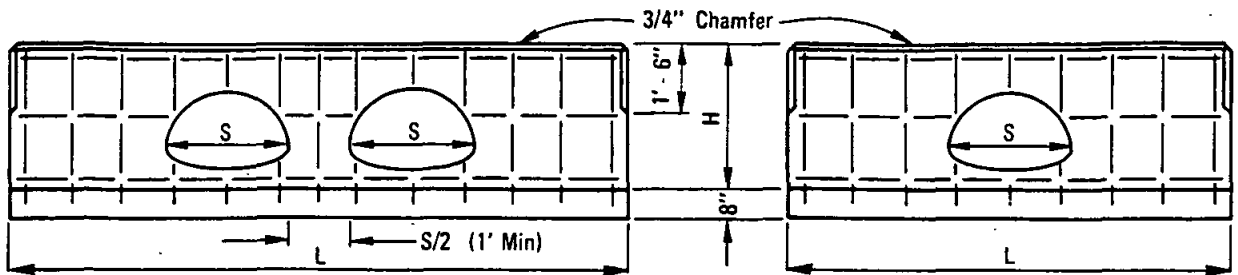
Alfred D. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-30**

SAN DIEGO REGIONAL STANDARD DRAWING

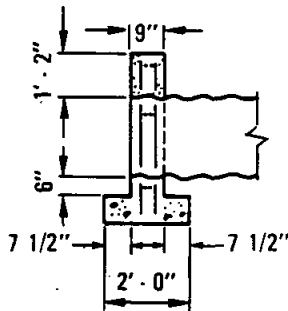
STRAIGHT HEADWALL - TYPE A
(CIRCULAR PIPE)

Revision	By	Approved	Date
Conc.	<i>MB</i>	<i>M.B.</i>	5-86
Dim. lines	<i>SC</i>	<i>A.H.</i>	7-88



ELEVATION DOUBLE HEADWALL

ELEVATION SINGLE HEADWALL



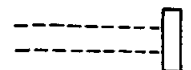
SECTION

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

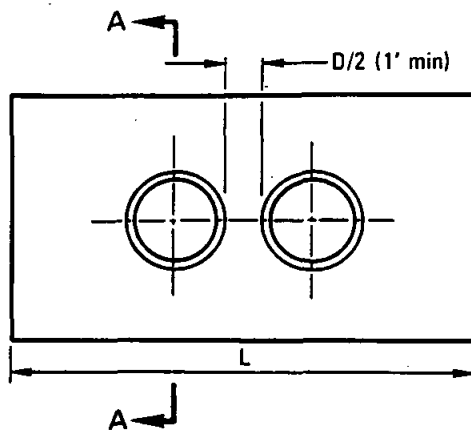
NOTES

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

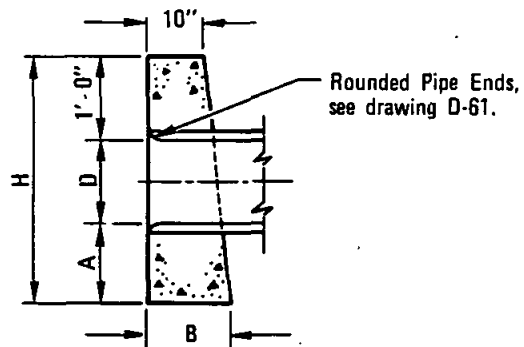
LEGEND ON PLANS



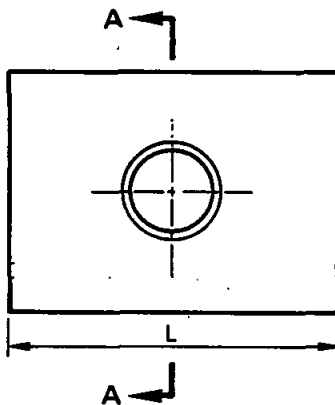
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Conc.	JD	M.B.	5-86				
				STRAIGHT HEADWALL - TYPE A (C.S.P.-ARCH)		<i>Edward A. Kuehnel</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER	
						D-31	



DOUBLE PIPE
ELEVATION



SECTION A-A



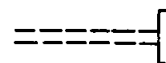
SINGLE PIPE
ELEVATION

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

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

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

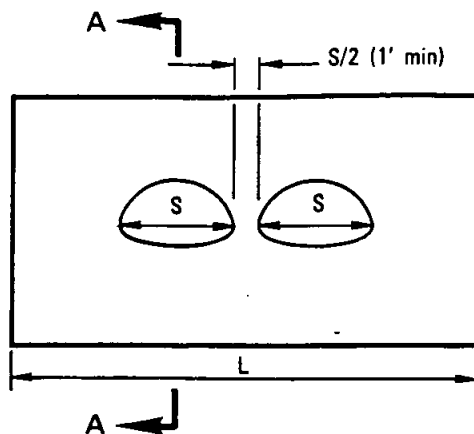
Chad G. Kuehn Dec. 1975
Coordinator R.C.E. 12807 Date

DRAWING
NUMBER **D-32**

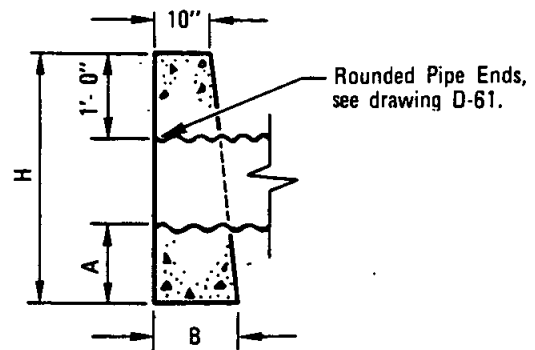
SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE B
(CIRCULAR PIPE)

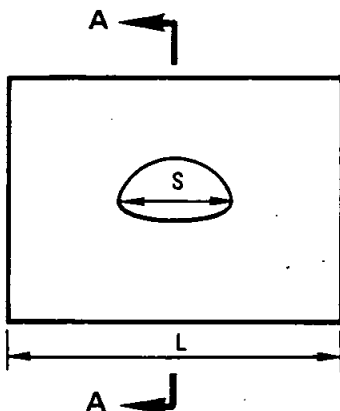
Revision	By	Approved	Date
Conc.	SC	M.B.	5-86



DOUBLE PIPE
ELEVATION



SECTION A-A



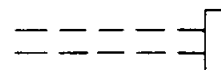
SINGLE PIPE
ELEVATION

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

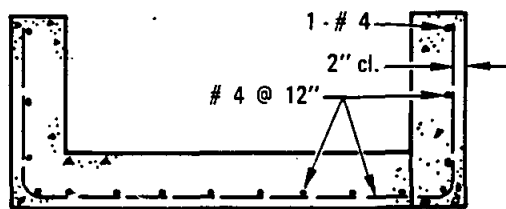
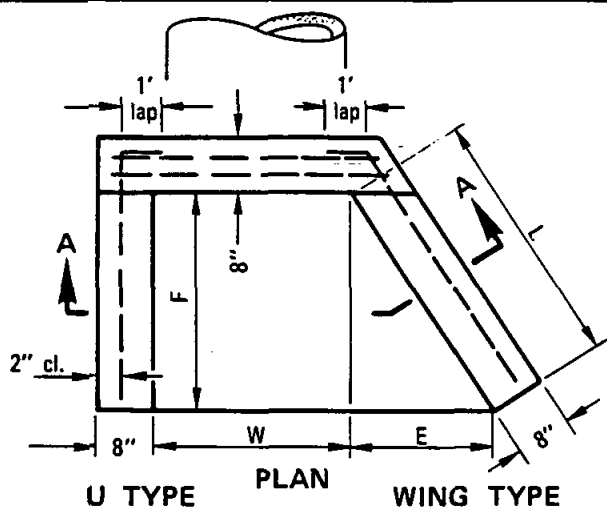
NOTES

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

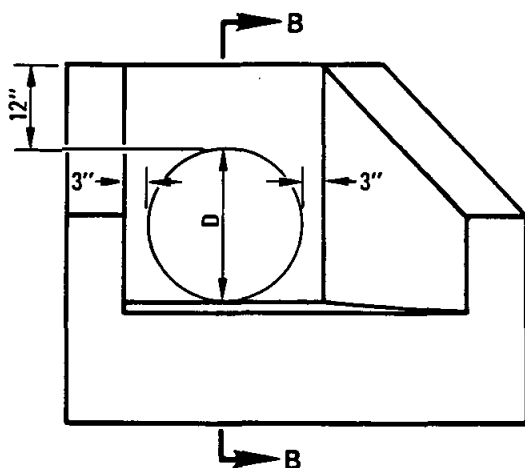
LEGEND ON PLANS



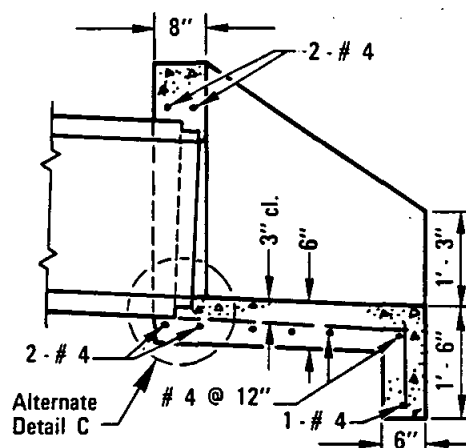
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING STRAIGHT HEADWALL - TYPE B (C.S.P. ARCH)	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allan A. Kershner</i> Dec. 1975 Coordinator R.C.E. 19807 Date
Conc.	<i>2</i>	<i>M.B.</i>	<i>5-86</i>		
DRAWING NUMBER				D-33	



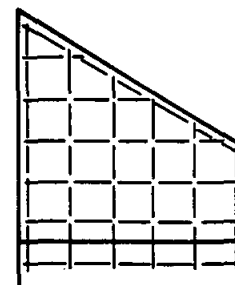
SECTION A-A



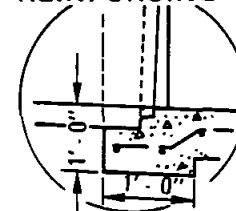
ELEVATION



SECTION B-B



WING WALL REINFORCING



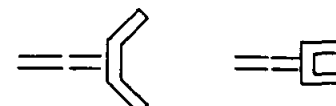
ALT. DETAIL C

DIA OF PIPE	DIMENSIONS			W	SINGLE PIPE				W	DOUBLE PIPE			
					U TYPE		WING TYPE			U TYPE		WING TYPE	
	L	E	F		CONC	STEEL	CONC	STEEL		CONC	STEEL	CONC	STEEL
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:

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

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Clifford B. Keshner Sec. 1975
Coordinator HCE 19807 Date

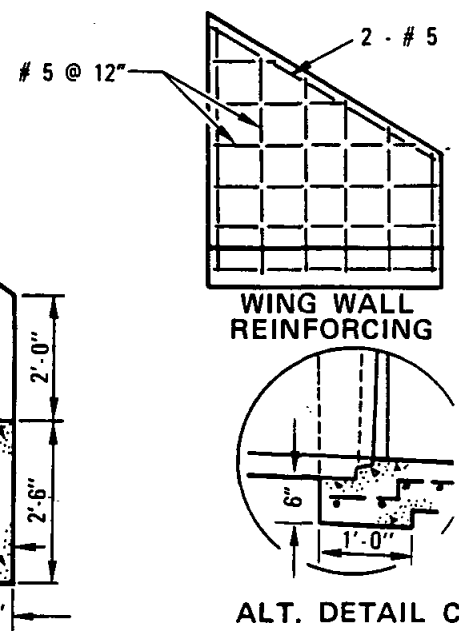
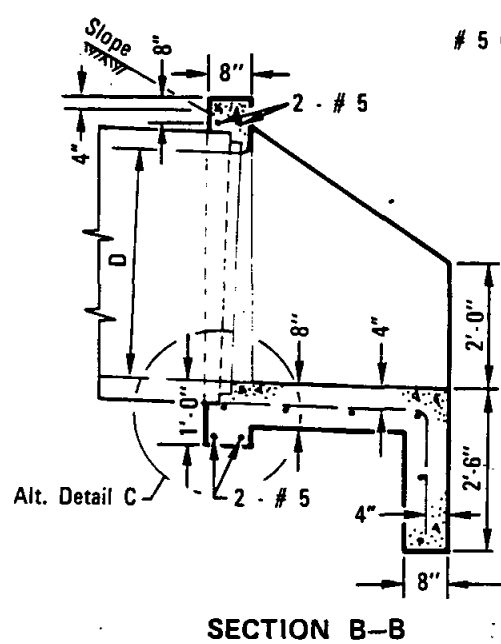
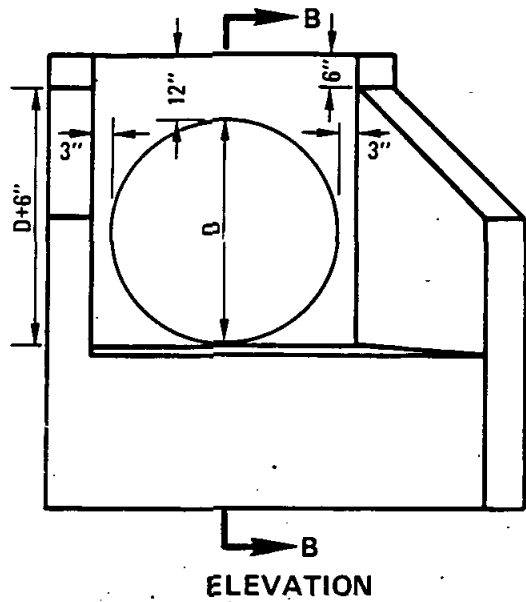
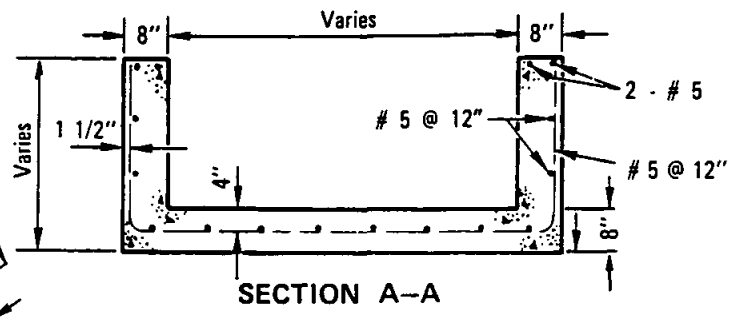
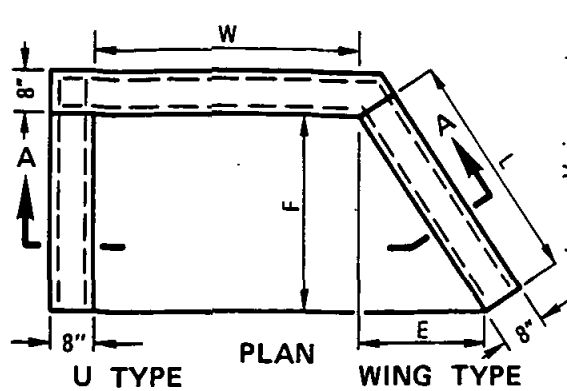
DRAWING NUMBER

D-34

SAN DIEGO REGIONAL STANDARD DRAWING

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

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



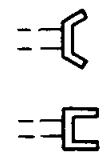
DIA. OF PIPE	DIMENSIONS			SINGLE PIPE				DOUBLE PIPE					
				W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
	L	E	F		CONC. STEEL		CONC. STEEL			CONC. STEEL		CONC. STEEL	
					C.Y.	LBS.	C.Y.	LBS.		C.Y.	LBS.	C.Y.	LBS.
42"	3'-7 1/4"	2'-0"	3'-0"	4'-0"	1.57	117	1.90	135	AS SHOWN ON PLANS	2.69	190	3.16	214
48"	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

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

LEGEND ON PLANS



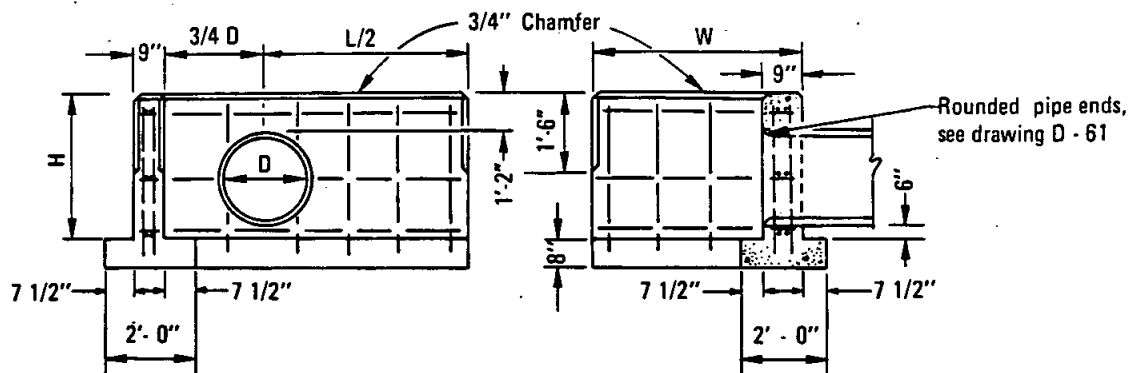
Revision	By	Approved	Date
Conc.	RC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

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

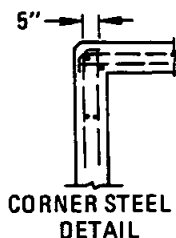
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Allan A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-35**



ELEVATION

SECTION

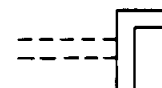


D	H	L/2	LENGTH OF W									
			3' - 4"		4' - 10"		6' - 4"		7' - 10"		9' - 4"	
			Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.	Steel lbs.	Conc C. Y.
12"	2' - 8"	2' - 6"	50	.79	60	.98						
15"	2' - 11"	3' - 0"	55	.91	65	1.11						
18"	3' - 2"	3' - 6"	65	1.04	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 S. Kunkel Dec. 1975
Committee H.C.C. 19807 Date

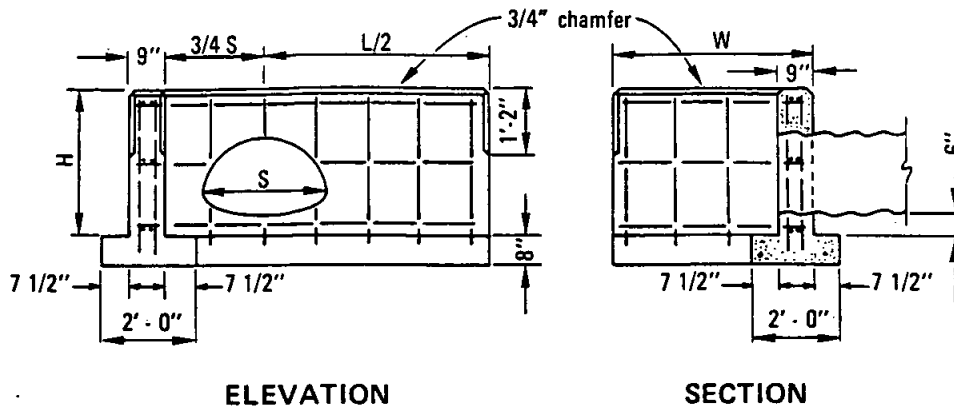
DRAWING
NUMBER

D-36

SAN DIEGO REGIONAL STANDARD DRAWING

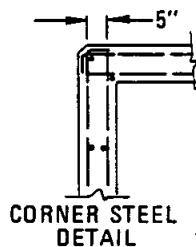
L TYPE HEADWALLS CIRCULAR PIPES

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



ELEVATION

SECTION



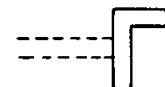
CORNER STEEL
DETAIL

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

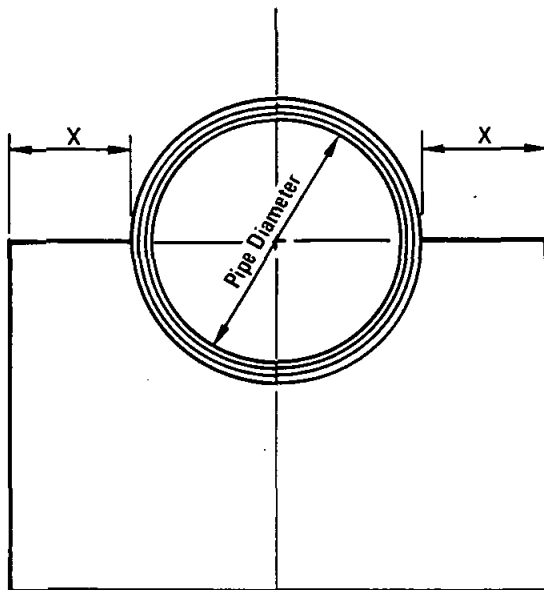
NOTES

1. Concrete shall be 560-C-3250
2. All reinforcing steel # 4 bars. All vertical and horizontal tie bars 18" maximum spacing.
3. 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.

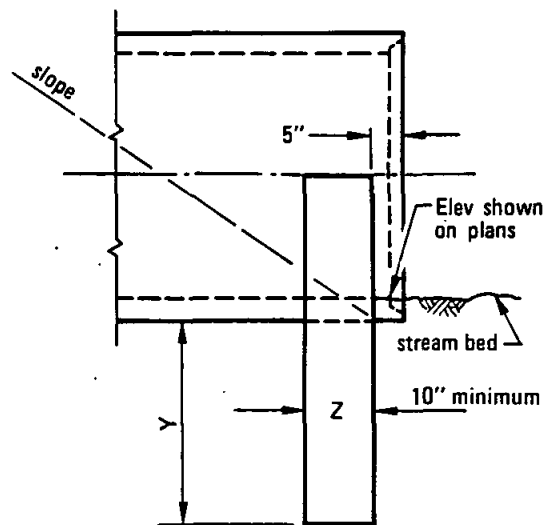
LEGEND ON PLANS



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



FACE ELEVATION



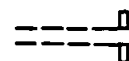
SIDE ELEVATION

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

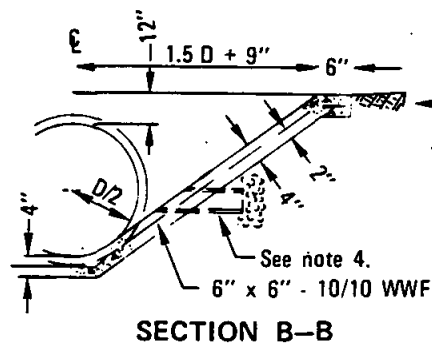
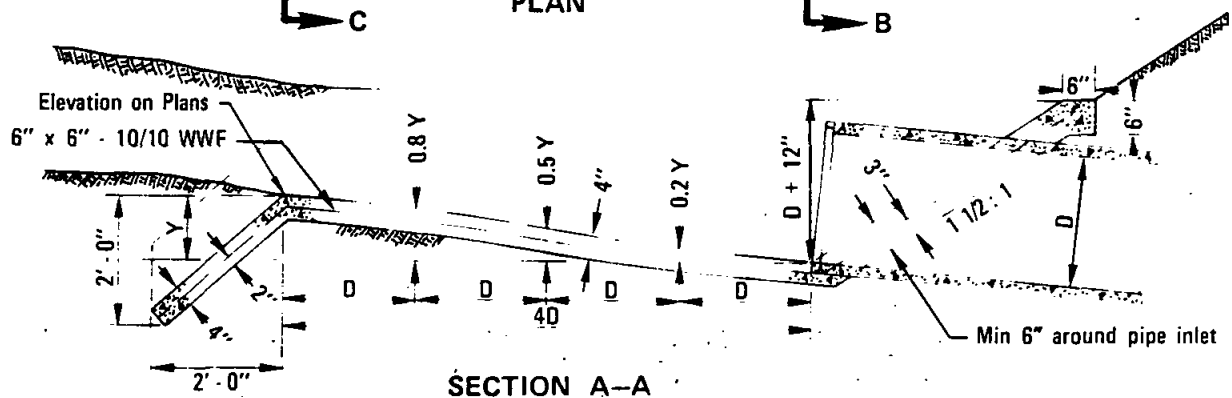
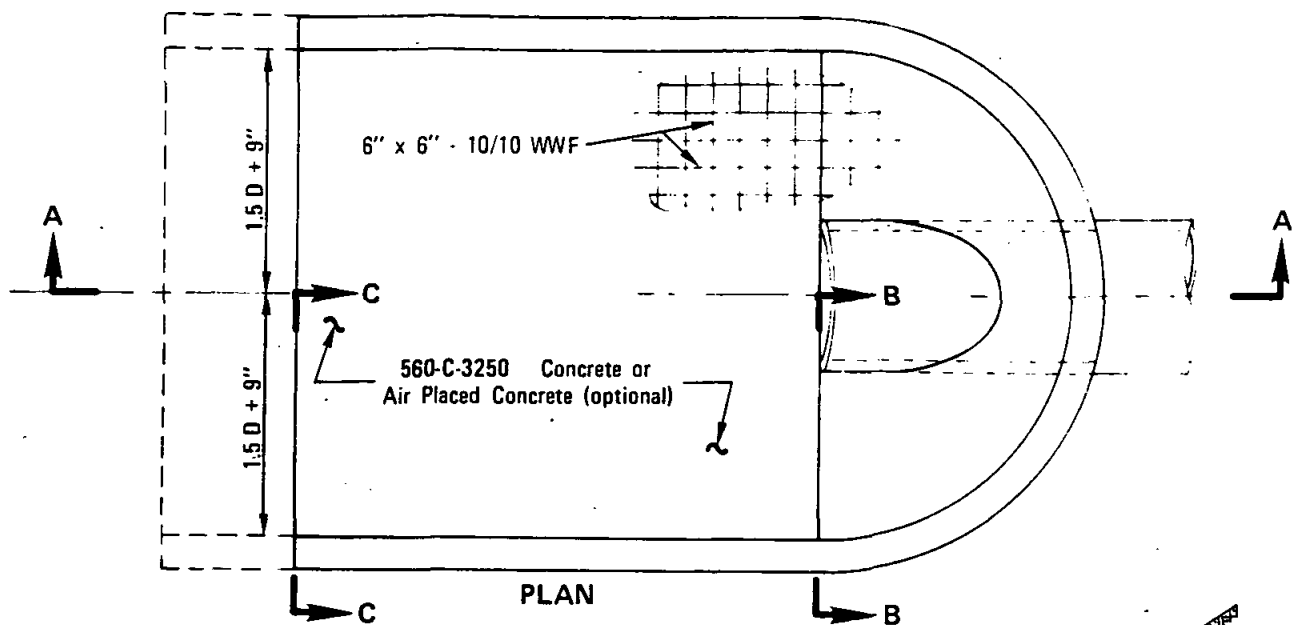
Clifford S. Kunkel *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

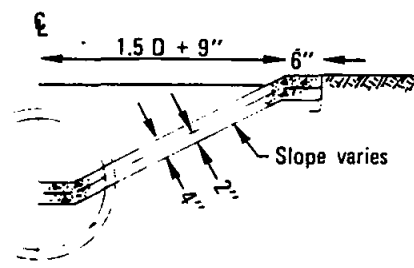
CURTAIN WALL

**DRAWING
NUMBER D-38**

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



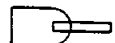
Inlet constr. sym. about Q except for multiple pipe installations (see note 1)



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
Sec. A-A	DS	7-79	
Sec. B-B	TRP	M.B.	10-82
Conc.	R	M.B.	5-96

SAN DIEGO REGIONAL STANDARD DRAWING

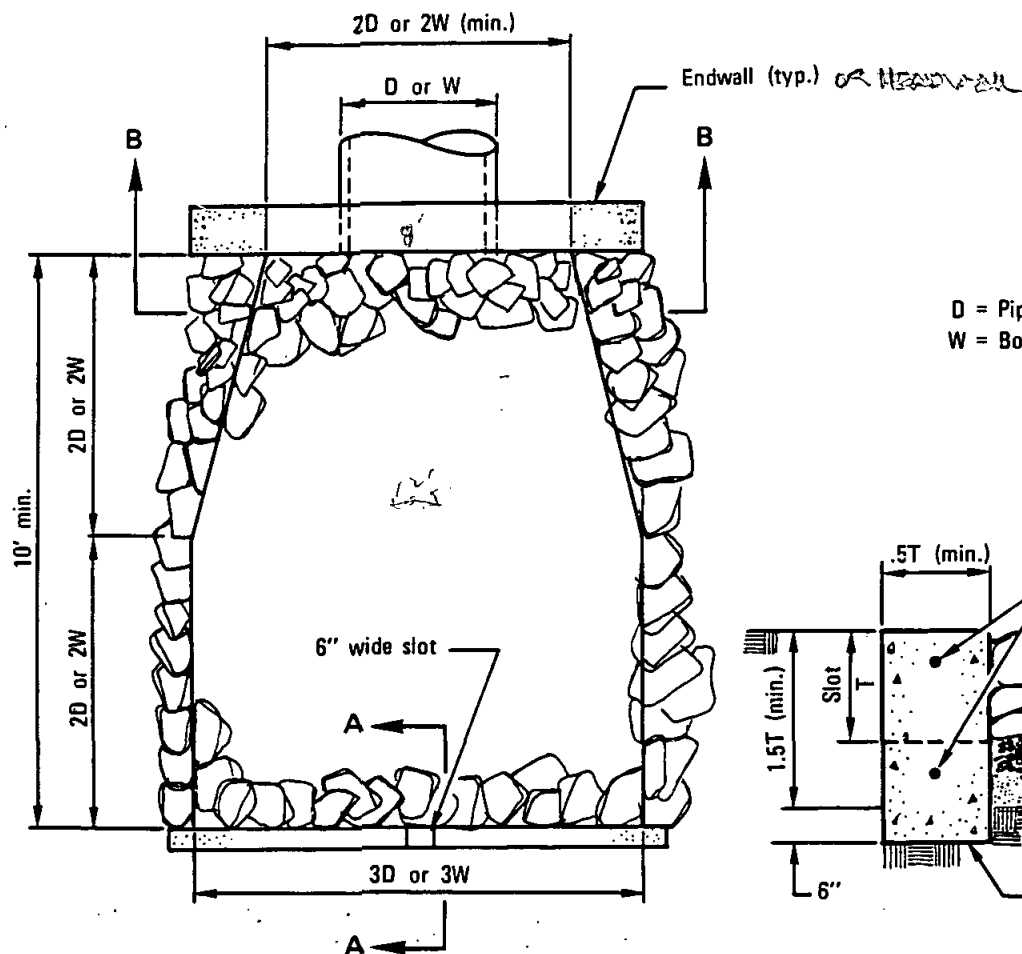
INLET APRON FOR CULVERTS UP TO 42" DIAMETER

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

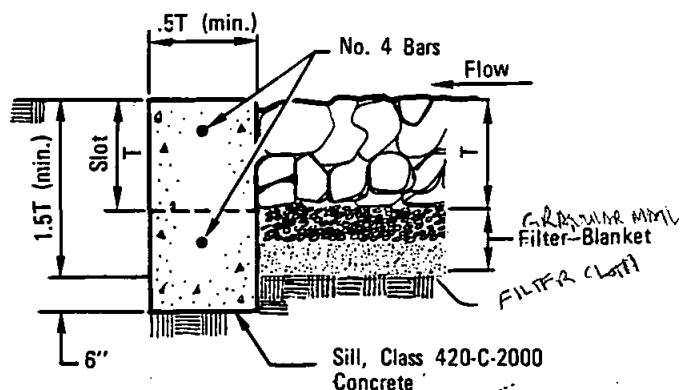
Oliver G. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER

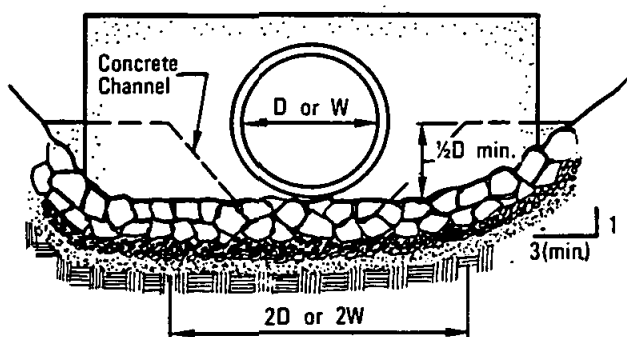
D-39



PLAN



SECTION A-A



SECTION B-B

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

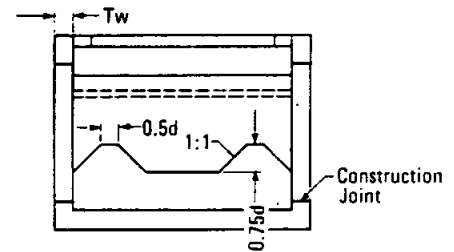
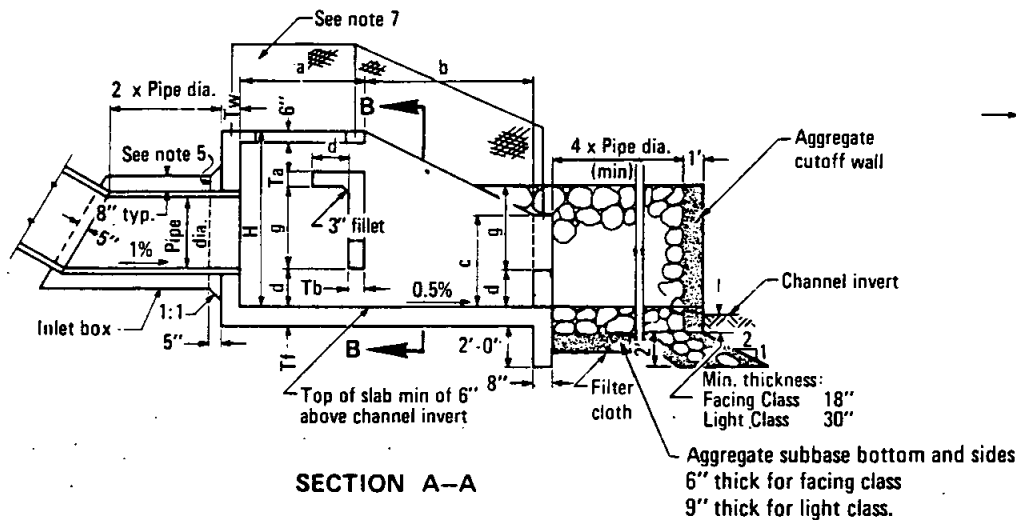
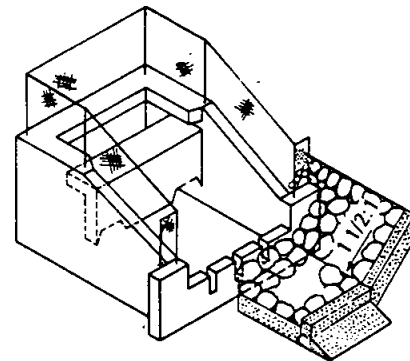
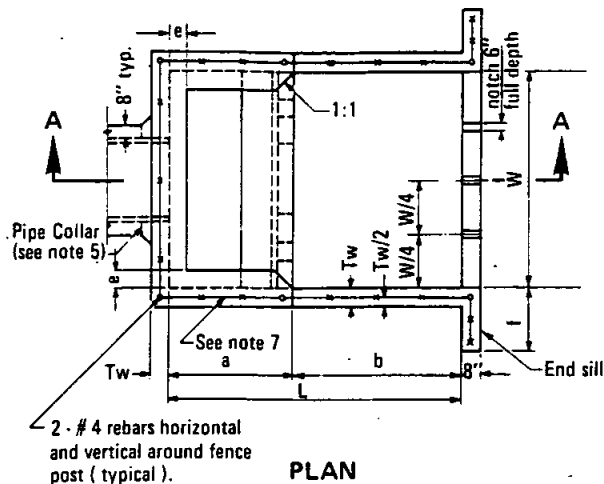
Clifford S. Kuehn Dec. 1975
Coordinator R.E.E. 19807 Date

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
Note 9	SC	D.S.	7-79
Conc.	SC	M.B.	5-80

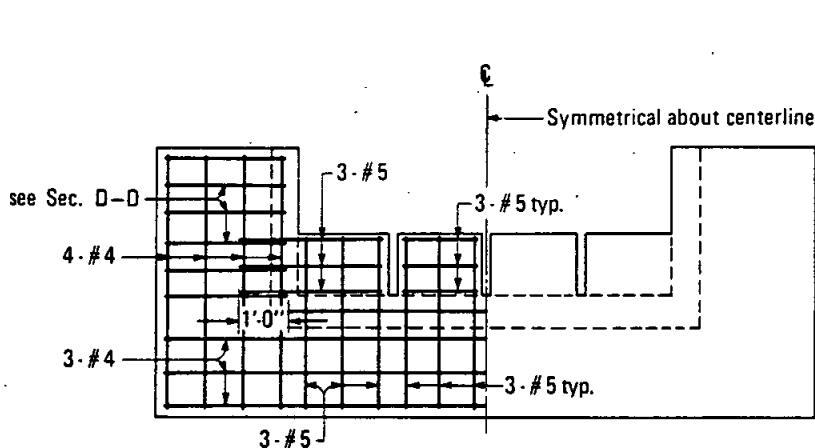
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ENERGY DISSIPATOR

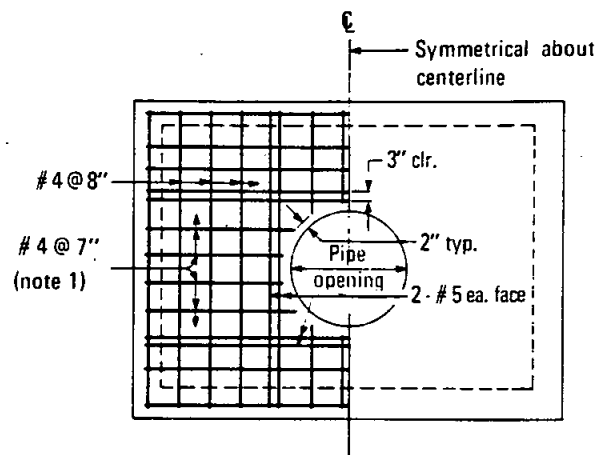
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

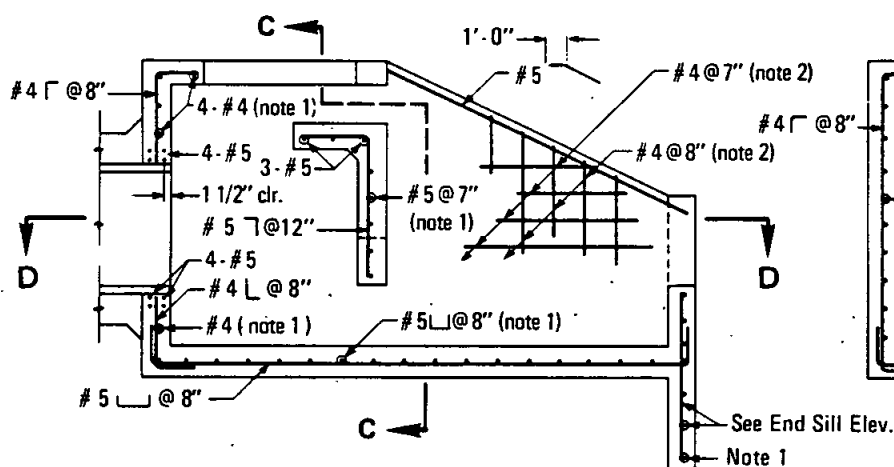
DRAWING NUMBER **D-41**



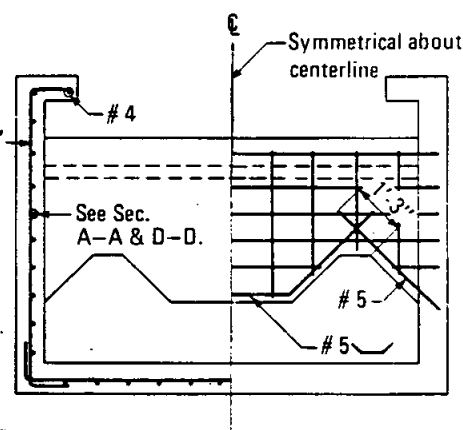
END SILL ELEVATION



HEADWALL ELEVATION



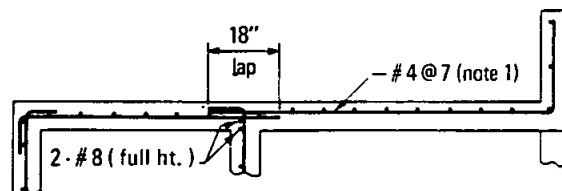
SECTION A-A



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

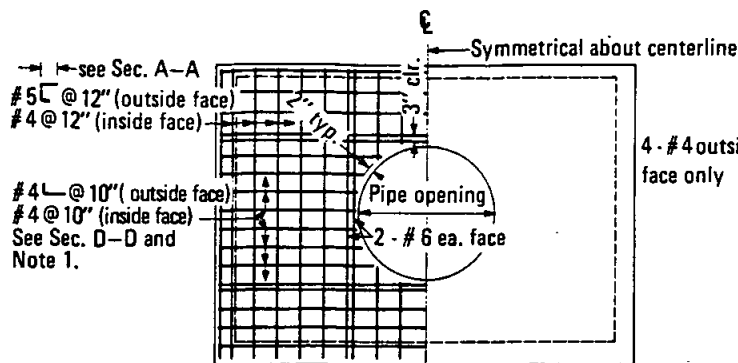
Allan A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-42**

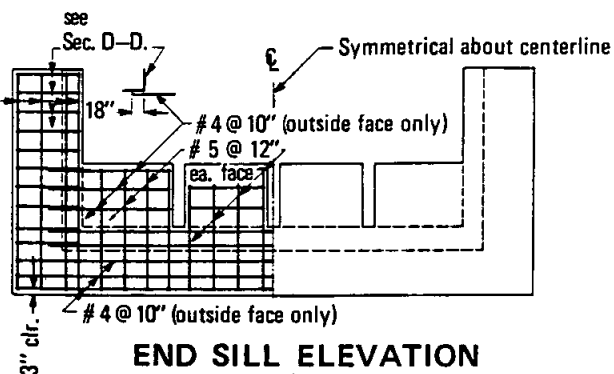
SAN DIEGO REGIONAL STANDARD DRAWING

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

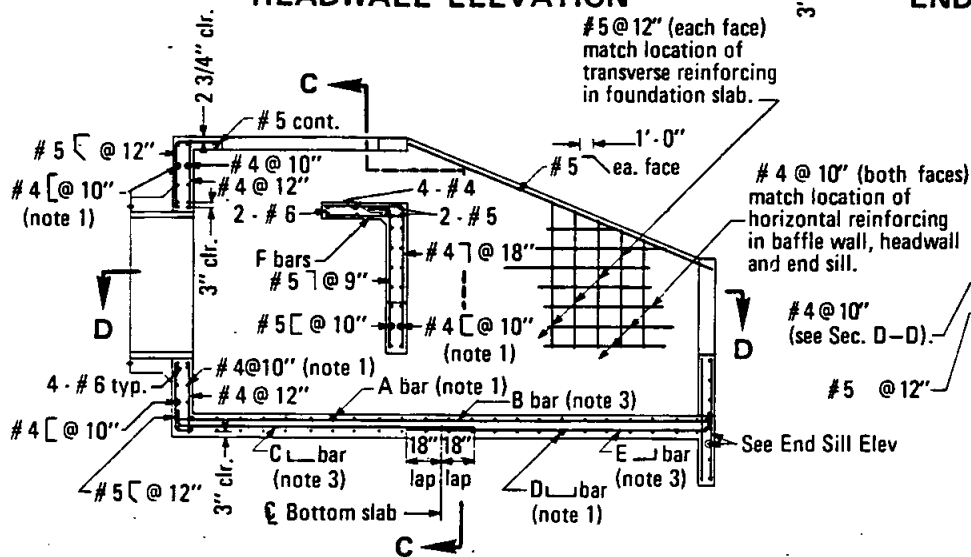
Revision	By	Approved	Date



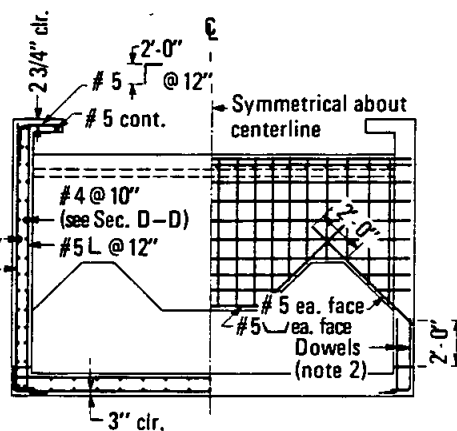
HEADWALL ELEVATION



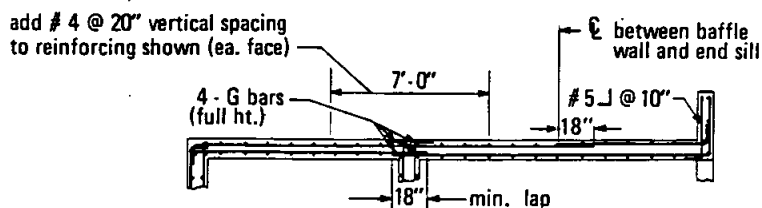
END SILL ELEVATION



SECTION A-A



SECTION C-C



SECTION D-D

NOTES

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

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

DRAWING
NUMBER **D-43**



If at upstream end, fillet is not shown

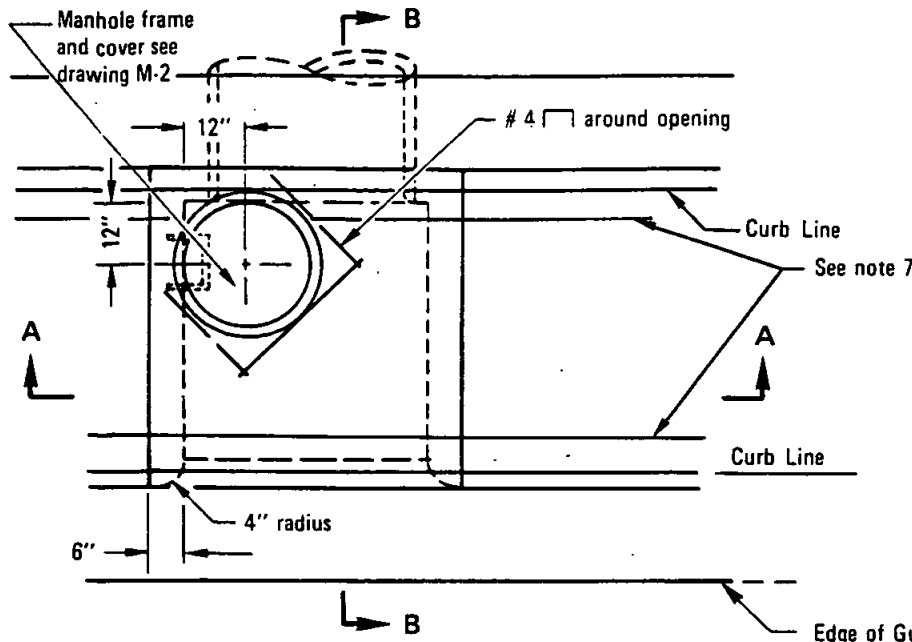


SECTION A-A

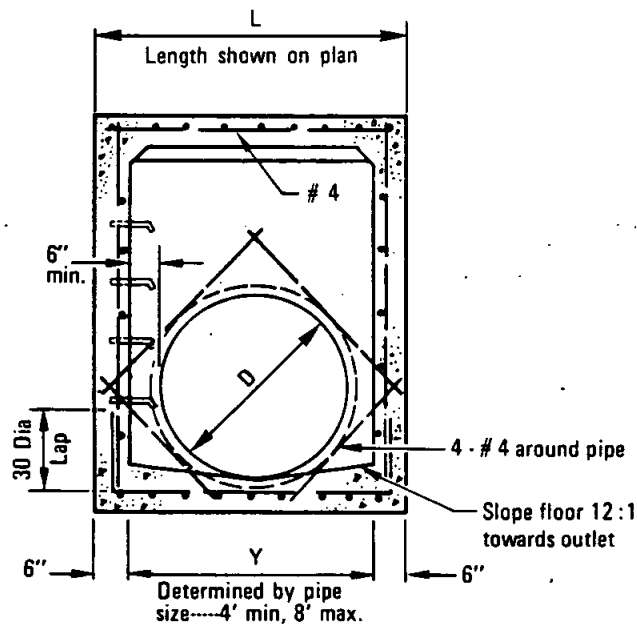


ALTERNATIVE WARPED WINGWALL

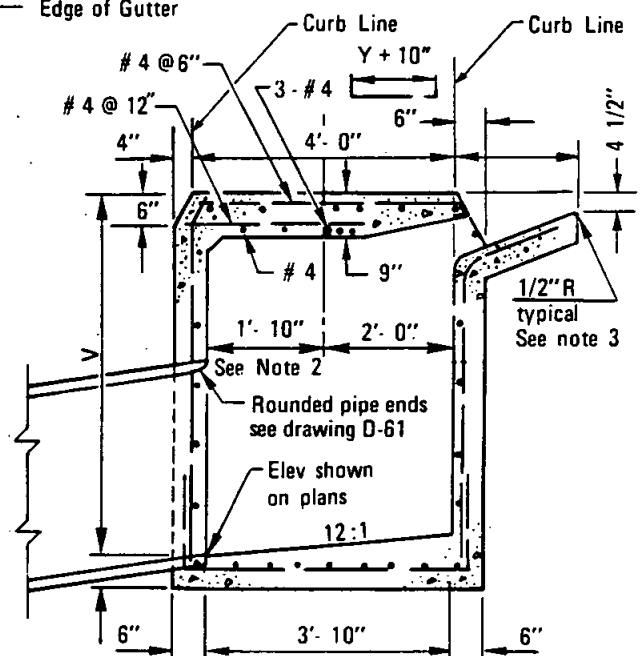
WARPED WINGWALLS																						
Element Shape	WALL DIMENSIONS AND REINFORCING								STIFFENING BEAM DIMENSIONS AND REINFORCING													
	"h"	8' or less	10'	12'	14'	16'	18'	20'	8"	12"	14"	16"	18"	20"	25"	30"	35"	40" or more				
16:1	Front face reinf.	"4 @ 12"	"4 @ 7"	"5 @ 7"	"5 @ 5"	"6 @ 6"	"7 @ 7"	"7 @ 6"	6	No beam. Place 2" in each face along top of wall												
	Rear face reinf.	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	6												
36:1	Front face reinf.	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 10"	"4 @ 8"	"4 @ 6"	10	"4" x 10" wall												
	Rear face reinf.	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 10"	"4 @ 7"	"4 @ 6"	"4 @ 8"	12													
146:1	Front face reinf.	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	"4 @ 12"	14	Tot 6'-6"												
	Rear face reinf.	"4 @ 8"	"4 @ 8"	"4 @ 5"	"4 @ 6"	"4 @ 7"	"4 @ 6"	"4 @ 6"	16"													
"D" at Cut-off Wall		6"	6"	6"	7 1/2"	8"	9 1/2"	11"	18"	Tot 6'-7"												
"D" at Headwall / Endwall		6"	6"	6"	8"	9 1/2"	11"	11'-1"	20"													
										Tot 6'-8"									"4" x 2'-0"			
																			"4" x 1'-6"			
																			"4" x 1'-0"			
																			"4" x 2'-0"			
																			"4" x 1'-6"			
																			"4" x 8'-9"			



PLAN



SECTION A-A



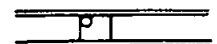
SECTION B-B

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
Rebar	RC	TH.B.
		5-86

SAN DIEGO REGIONAL STANDARD DRAWING

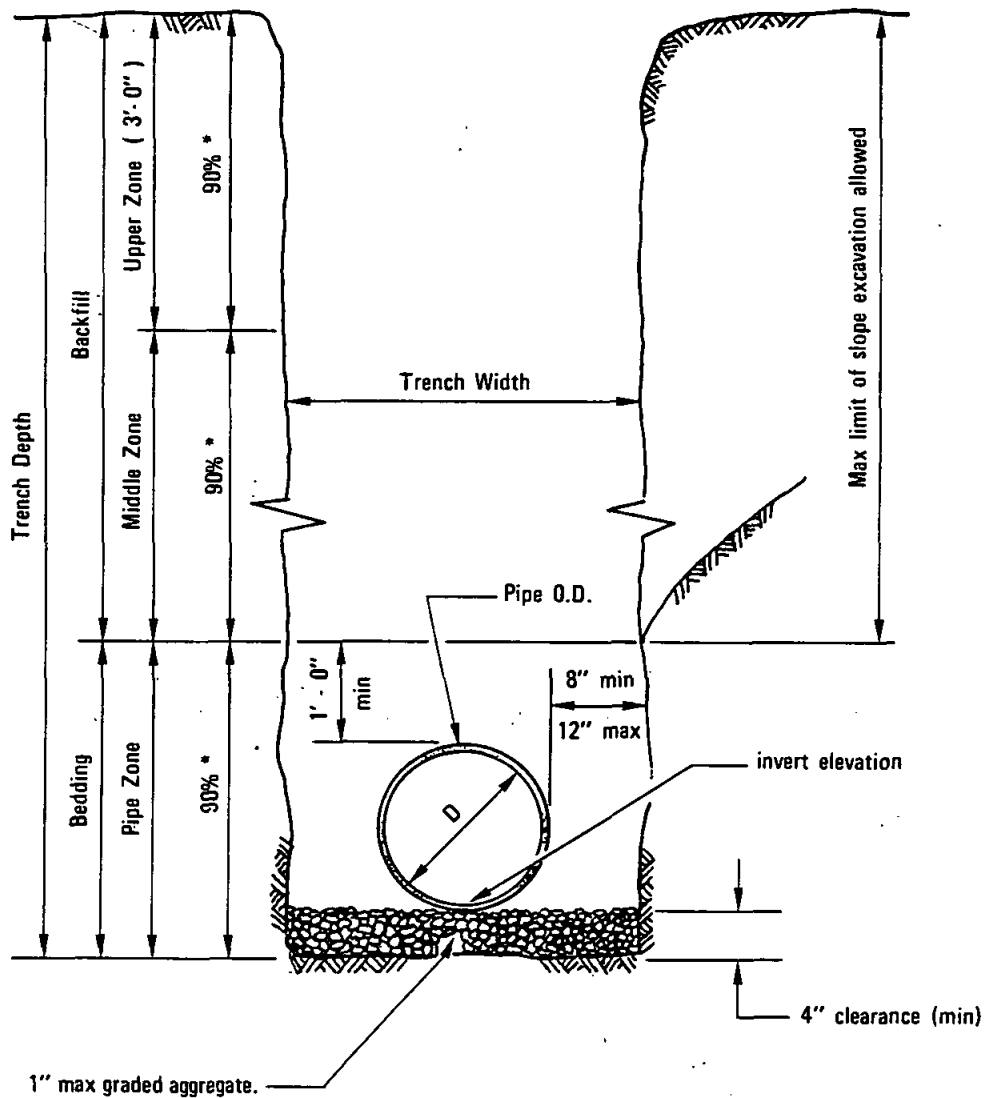
CURB INLET-TYPE J MEDIAN

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Harry R. Helt Oct 1982
Chairman A.C.E. C13768 Date

DRAWING
NUMBER

D-45



SECTION

NOTES

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

Clifford B. Kuehner Dec. 1975
Chairman H.C.E. 19807 Date

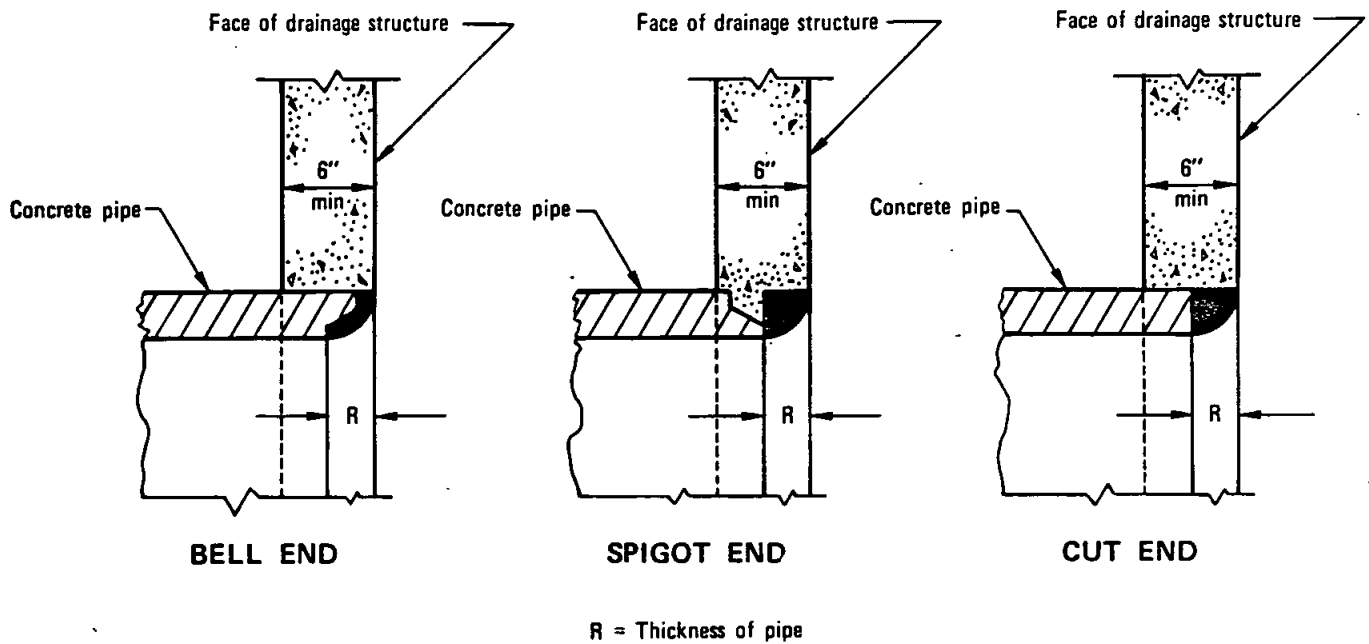
DRAWING
NUMBER

D-60

SAN DIEGO REGIONAL STANDARD DRAWING

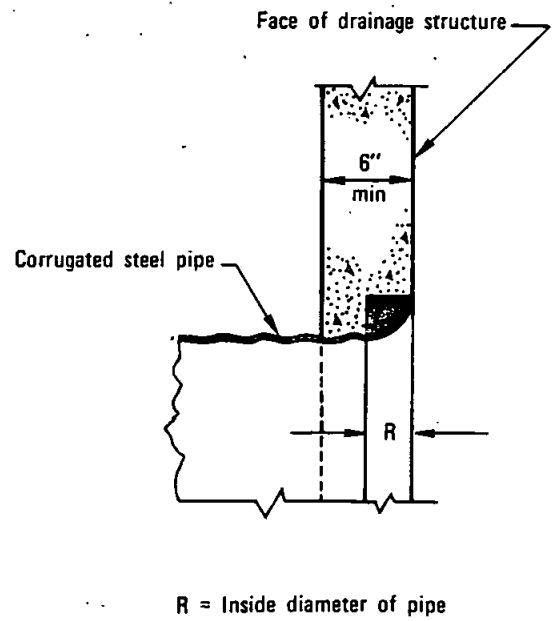
**PIPE BEDDING AND TRENCH BACKFILL
FOR STORM DRAINS**

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



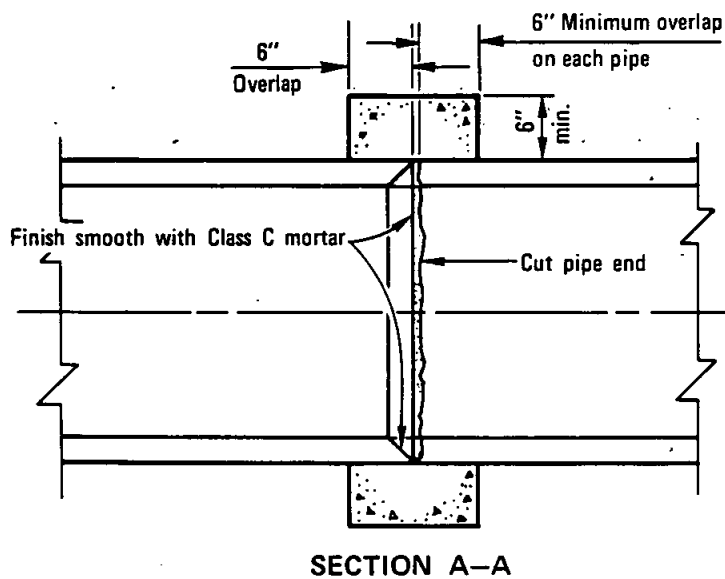
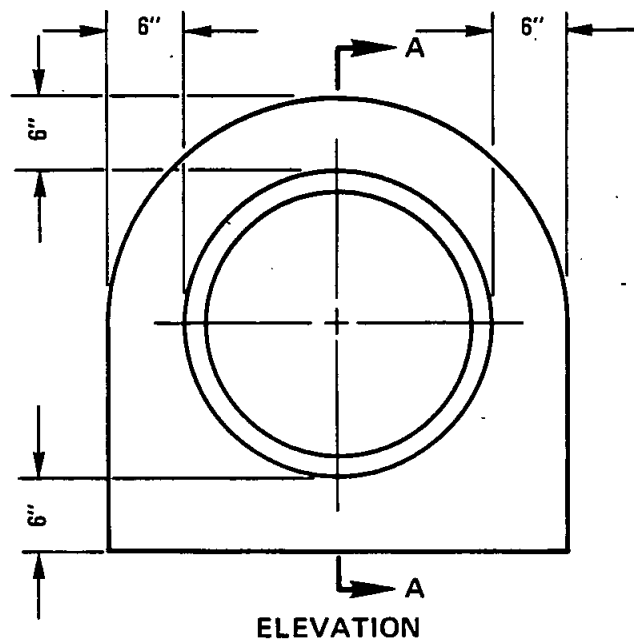
NOTE

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



10

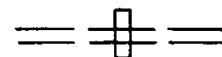
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
Note	JC	D.S.	7-79		
				ROUNDED PIPE ENDS IN DRAINAGE STRUCTURES	
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Alfred A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date	
				DRAWING NUMBER D-61	



NOTES:

1. Pipe collar does not have to be finished if covered.
2. Concrete shall be 560-C-3250.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

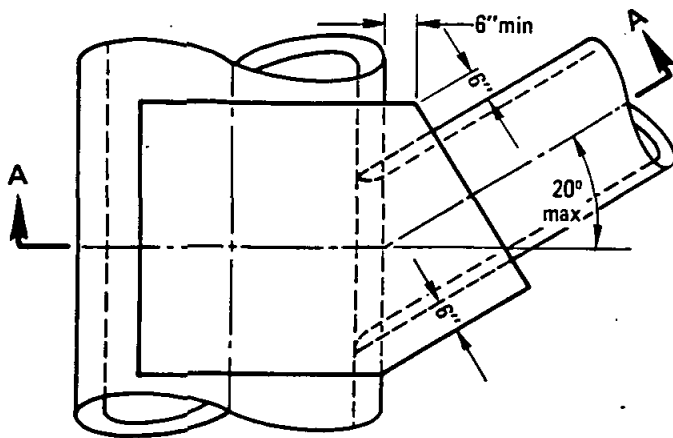
Allard G. Kershner *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

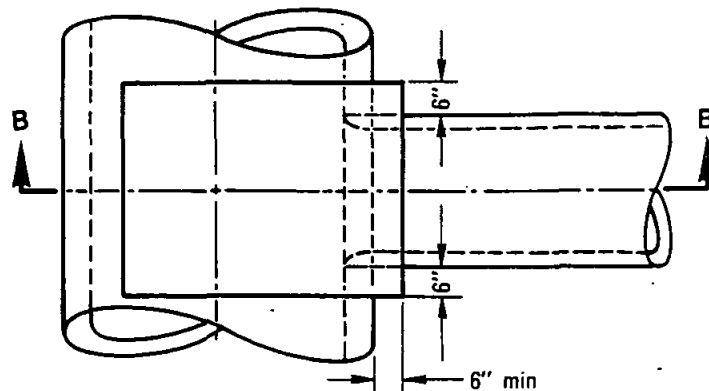
**DRAWING
NUMBER D-62**

PIPE COLLAR

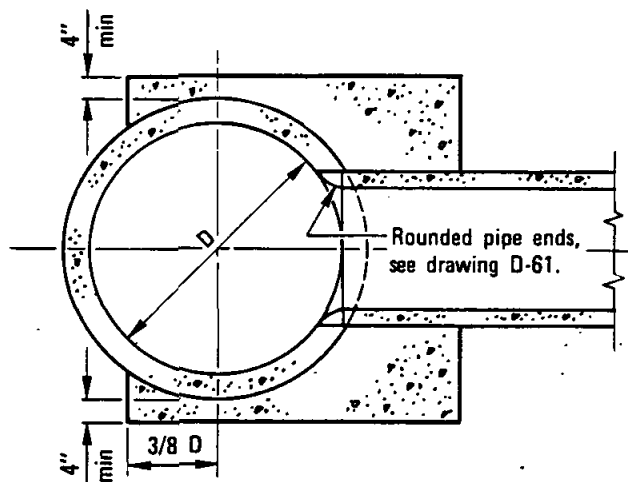
Revision	By	Approved	Date
Conc.	<i>SC</i>	<i>M.B.</i>	<i>5-86</i>
Overlap	<i>SC</i>	<i>A.H.</i>	<i>7-86</i>



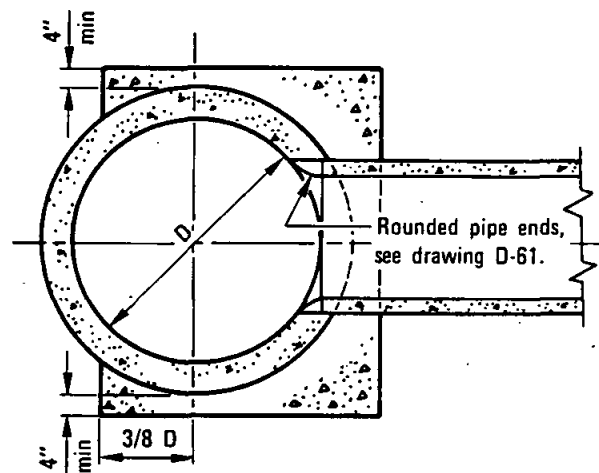
PLAN
SKEWED CONNECTION



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

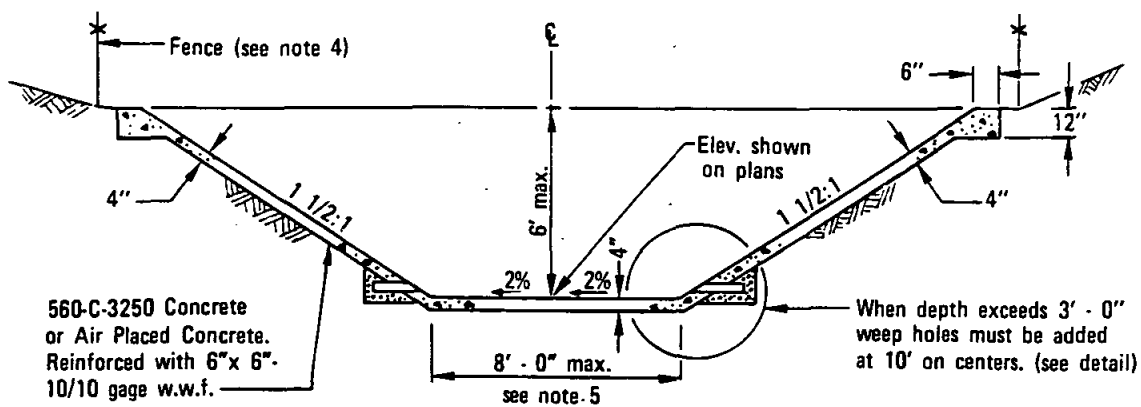
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE LUG

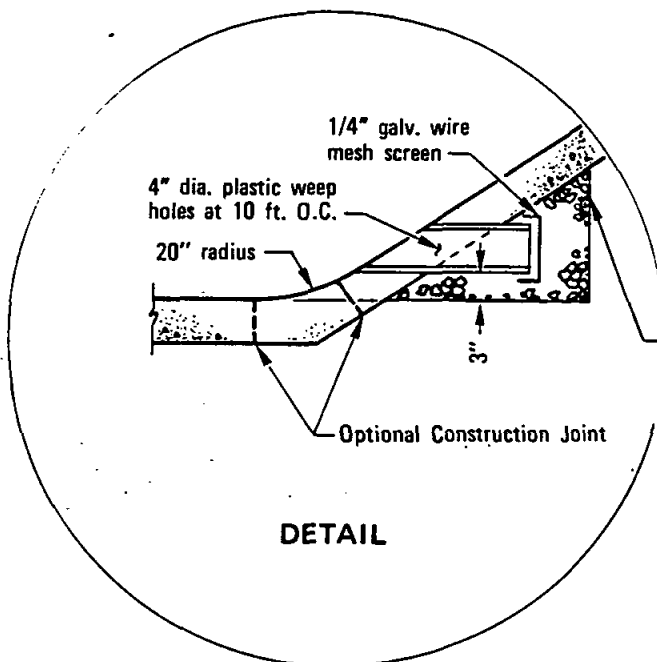
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER **D-63**

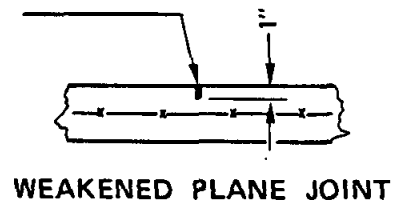


TYPICAL SECTION

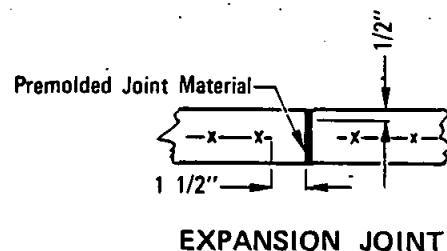


DETAIL

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



1" max. graded filter material placed a minimum of 18" each side of weep hole.



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

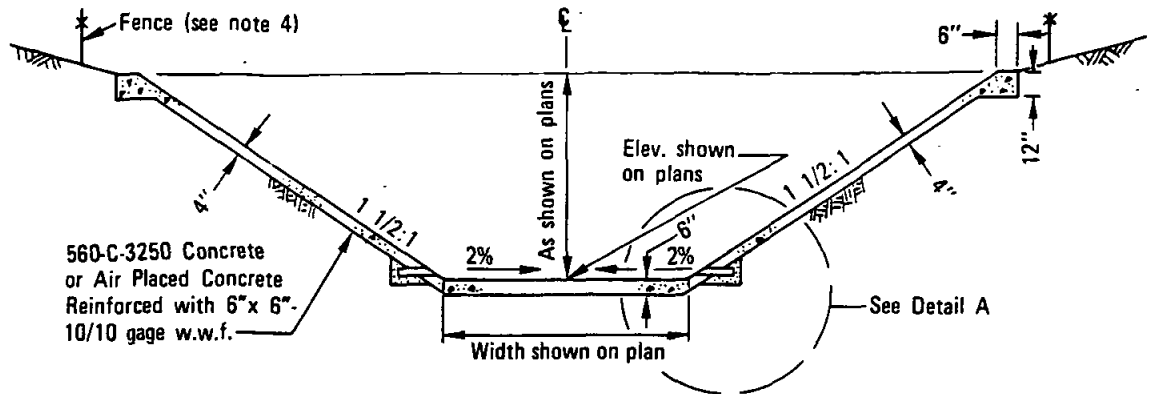
Clifford A. Kuehnel Dec. 1975
Coordinator R.C.C. 19807 Date

DRAWING NUMBER **D-70**

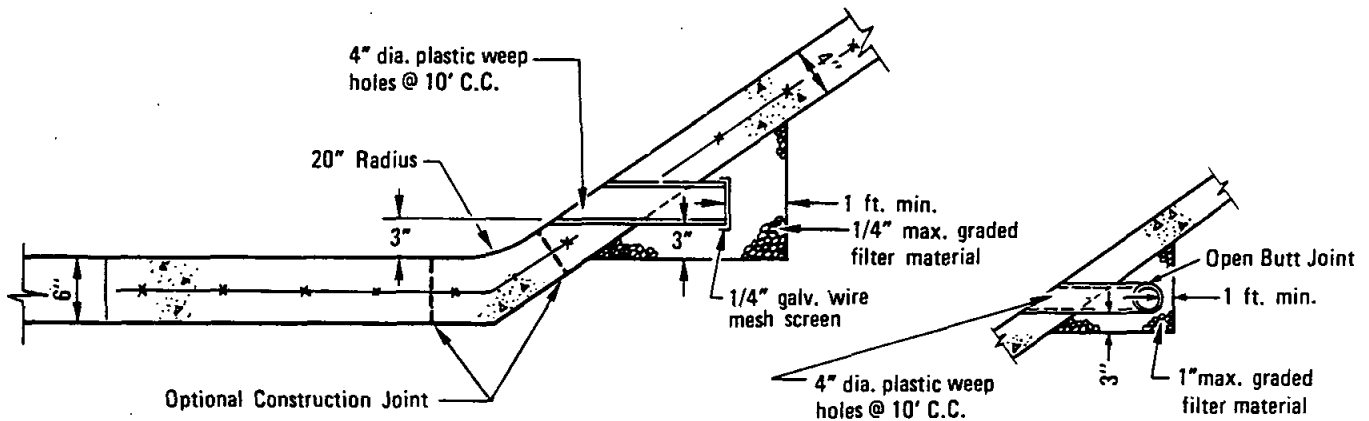
SAN DIEGO REGIONAL STANDARD DRAWING

MINOR DRAINAGE CHANNEL

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



TYPICAL SECTION

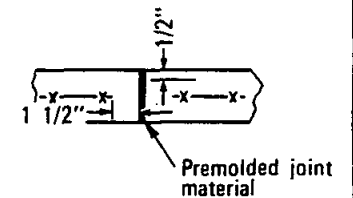


DETAIL A

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.

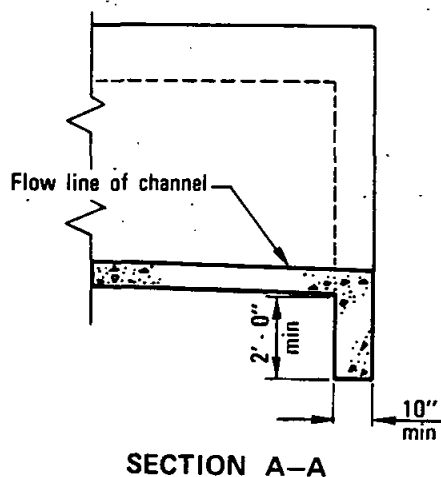
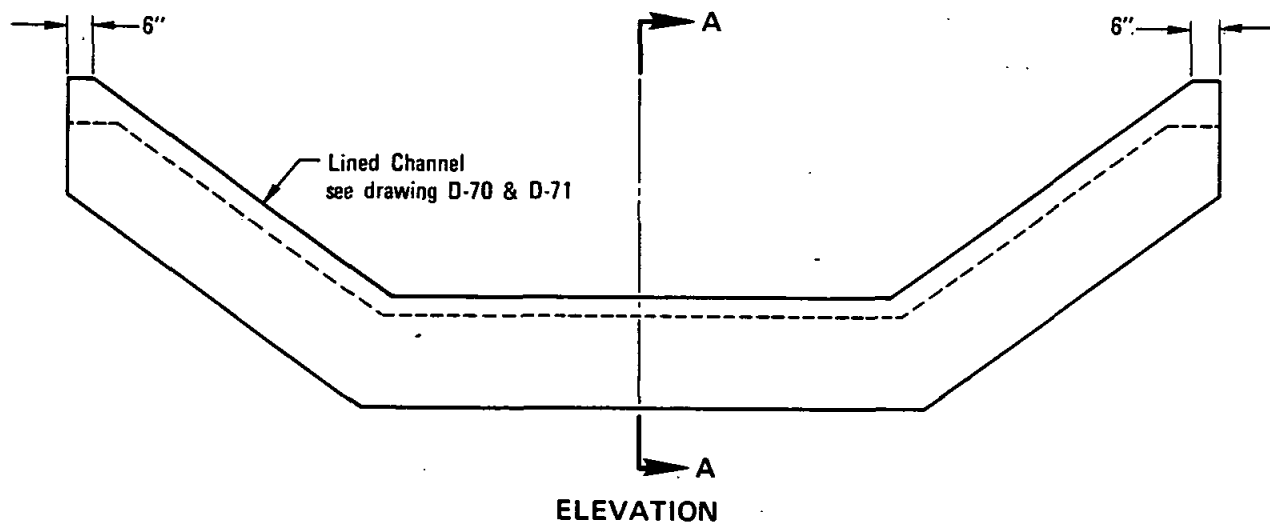
Revision	By	Approved	Date
Conc.	<i>MB</i>	<i>M.B.</i>	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

MAJOR DRAINAGE CHANNEL

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

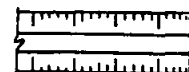
DRAWING
NUMBER **D-71**



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

Clifford S. Kunkel Dec. 1975
Coordinator H.C.E. 10807 Date

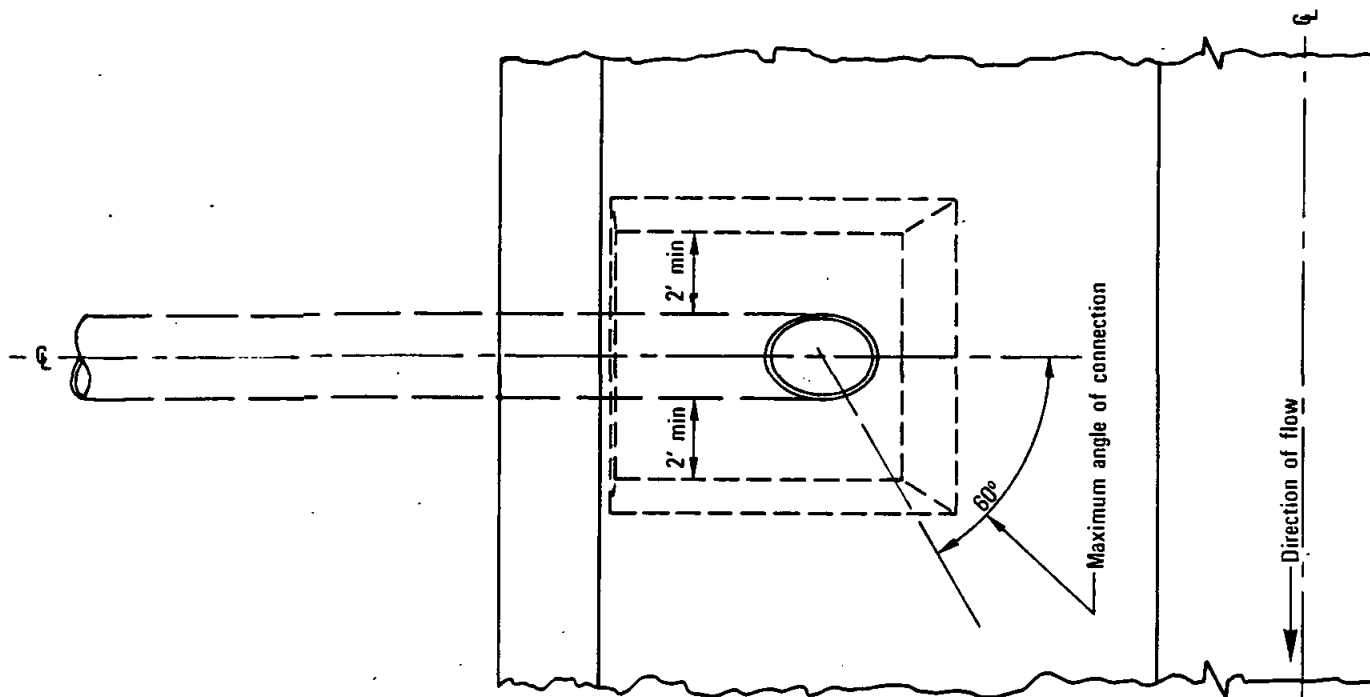
DRAWING
NUMBER

D-72

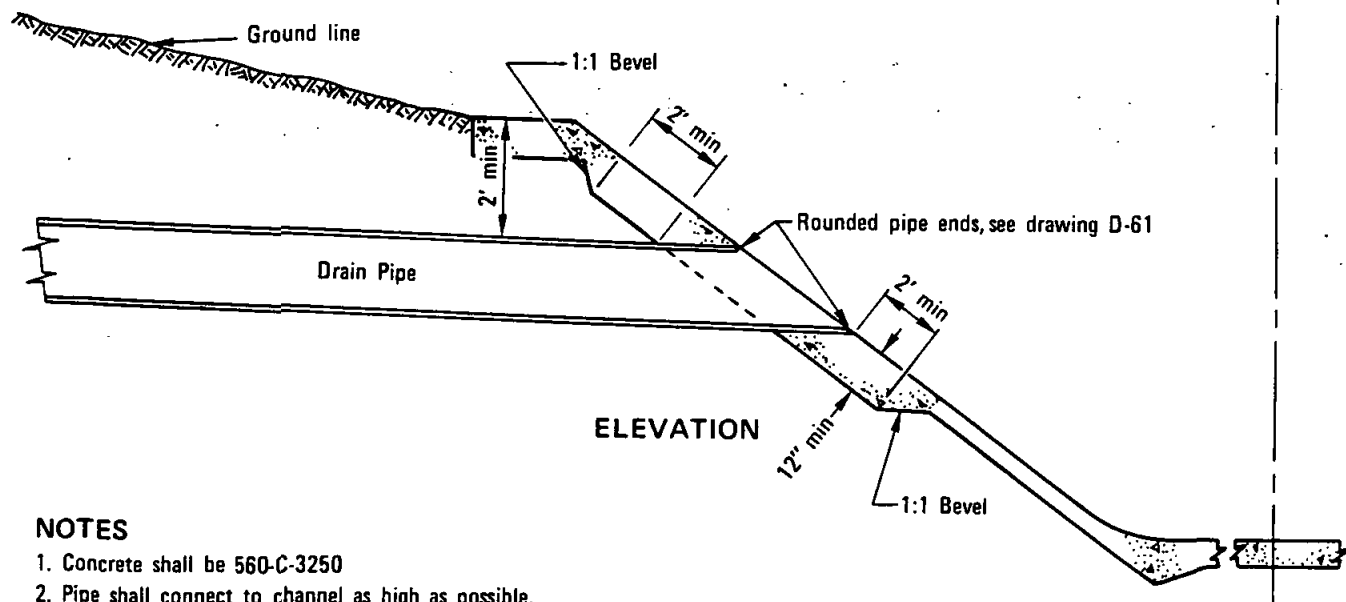
SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL FOR DRAINAGE CHANNEL

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



PLAN

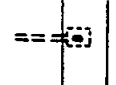


ELEVATION

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

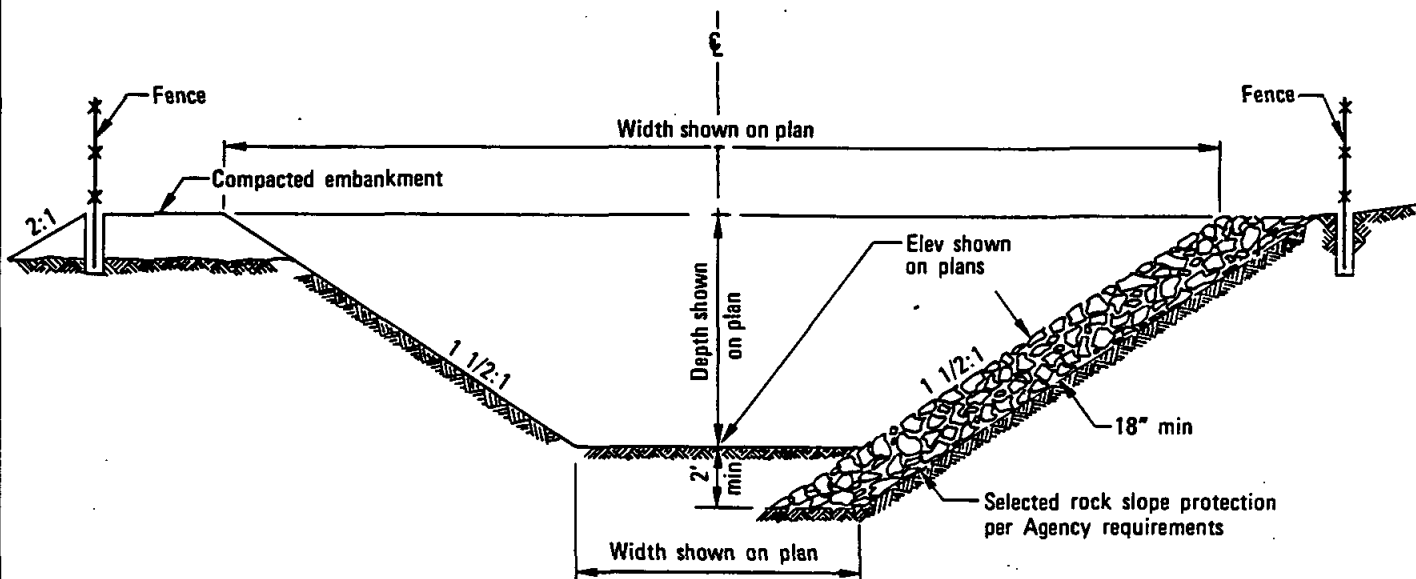
PIPE TO CHANNEL CONNECTION

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan D. 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

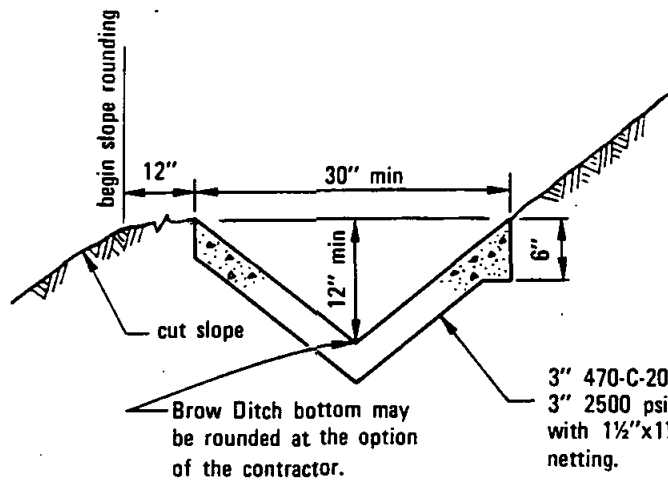
Allan A. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

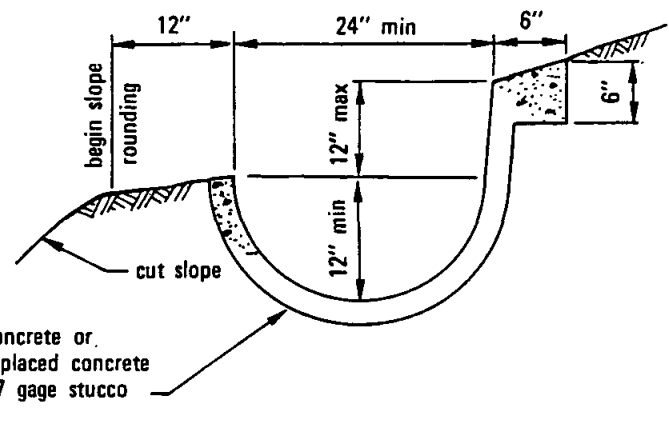
GRADED EARTH CHANNEL

DRAWING
NUMBER **D-74**

Revision	By	Approved	Date



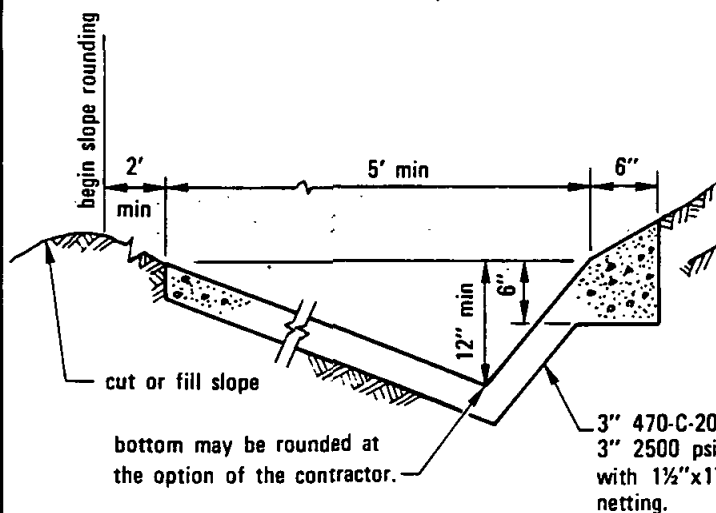
TYPE A



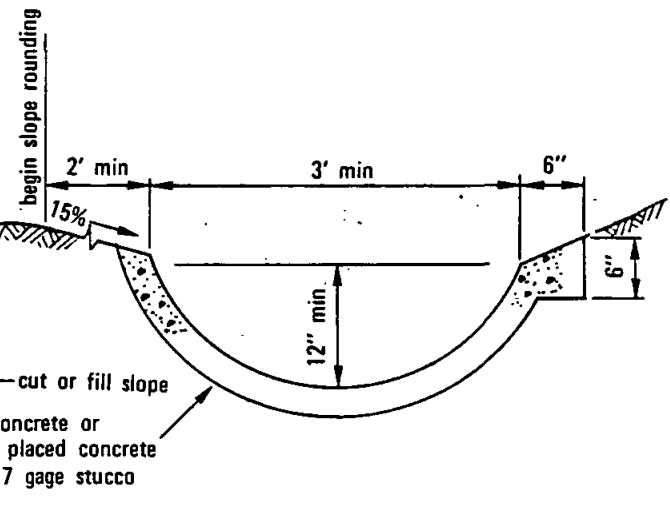
TYPE B

BROW DITCH

3" 470-C-2000 concrete or
3" 2500 psi, air placed concrete
with 1½"x1½" 17 gage stucco
netting.



TYPE C



TYPE D

TERRACE DITCH

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	EC	D.S.	7-77
A.P.C.	TR	M.B.	10-85
B height	EC	A.H.	7-88

SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE DITCHES

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER **D-75**

DRAWING
NUMBER D-76A

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Coordinator R.C.E. 1987 Date *Dec. 1975*

SPAN		2'		3'		4'		5'		6'		7'	
HEIGHT		2'	3'	2'	3'	2'	3'	2'	3'	2'	3'	2'	3'
STRENGTH CLASSIFICATION		A	A	A	A	B	A	B	A	B	A	B	A
MAX FILL OVER TOP		66	38	38	66	28	28	37	50	12	27	11	26
Top Slab	T ₁	6	6	6	6	6	6	6	6	6	6	6	6
Bottom Slab	T ₂	6	6	6	6	6	6	6	6	6	6	6	6
Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6
Size: Bar	"a"	4	4	4	4	4	4	4	4	4	4	4	4
Spacing	"a"	3-2	3-2	4-2	4-2	4-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3
Length	"a"	3-2	3-2	4-2	4-2	4-3	5-3	5-3	5-3	5-3	5-3	5-3	5-3
Top Slab - No of Bars	"d" Dist.	2	2	2	2	2	2	2	2	2	2	2	2
Bottom Slab - No of Bars	"d" Dist.	2	2	2	2	2	2	2	2	2	2	2	2
Bars Spacing	"e" Bars	18	18	18	18	18	18	18	18	18	18	18	18
Spacers Number	"e" Bars	12	12	12	12	12	12	12	12	12	12	12	12
Concrete: CY per lin ft	Reinf	17	18	23	27	31	33	36	40	43	46	50	58
Reinf lbs per lin ft	Reinf	27	29	34	36	44	45	47	52	54	57	61	70

SPAN		7'		8'		10'		12'	
HEIGHT		3'	4'	3'	4'	3'	4'	3'	4'
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B
MAX FILL OVER TOP		16	26	16	26	16	26	16	26
Top Slab	T ₁	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4
Bottom Slab	T ₂	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4
Sidewalls	T ₃	6	7	6	7	6	7	6	7
Size: Bar	"a"	6	5	5	5	5	5	5	5
Spacing	"a"	9	7	9	7	9	7	9	7
Length	"a"	6-8	6-9	6-9	6-9	6-9	6-9	6-9	6-9
Size: Bar	"b"	5	5	5	5	5	5	5	5
Spacing	"b"	9	7	9	7	9	7	9	7
Dimension "x"	"b"	1-3	1-4	1-3	1-4	1-3	1-4	1-3	1-4
Length	"b"	3-1	3-2	3-1	3-2	3-1	3-2	3-1	3-2
Size: Bar	"c"	5	5	5	5	5	5	5	5
Spacing	"c"	9	7	9	7	9	7	9	7
Dimension "y"	"c"	1-10	1-11	1-10	1-11	1-10	1-11	1-10	1-11
Length	"c"	5-2	5-4	5-2	5-4	5-2	5-4	5-2	5-4
Size: Bar	"d"	5	5	5	5	5	5	5	5
Spacing	"d"	9	7	9	7	9	7	9	7
Dimension "y"	"d"	1-10	1-11	1-10	1-11	1-10	1-11	1-10	1-11
Length	"d"	3-8	3-10	3-8	3-10	3-8	3-10	3-8	3-10
Top Slab - No of Bars	"e" Bars	7	4	7	4	7	4	7	4
Bottom Slab - No of Bars	"e" Bars	4	4	4	4	4	4	4	4
Bars Spacing	"e" Bars	18	18	18	18	18	18	18	18
Spacers Total Number	"e" Bars	24	28	24	28	24	28	24	28
Concrete: CY per lin ft	Reinf	47	56	51	60	55	64	58	68
Reinf lbs per lin ft	Reinf	107	130	114	138	118	143	125	150

SPAN		12'		12'	
HEIGHT		6'	7'	8'	9'
STRENGTH CLASSIFICATION		A	B	A	B
MAX FILL OVER TOP		5	16	5	16
Top Slab	T ₁	8 1/4	11 1/4	8 1/4	11 1/4
Bottom Slab	T ₂	8 1/4	11 1/4	8 1/4	11 1/4
Sidewalls	T ₃	7 1/4	10 1/4	7 1/4	10 1/4
Size: Bar	"a"	6	7	6	7
Spacing	"a"	11	10	11	10
Length	"a"	11-3	11-6	11-3	11-6
Size: Bar	"b"	6	7	6	7
Spacing	"b"	11	10	11	10
Dimension "x"	"b"	2-8	3-0	2-8	3-0
Length	"b"	4-10	5-7	4-10	5-7
Size: Bar	"c"	6	7	6	7
Spacing	"c"	11	10	11	10
Dimension "y"	"c"	3-9	3-9	3-9	3-9
Length	"c"	10-2	10-4	10-2	10-4
Size: Bar	"d"	6	7	6	7
Spacing	"d"	11	10	11	10
Dimension "y"	"d"	3-9	3-9	3-9	3-9
Length	"d"	5-11	6-3	5-11	6-3
Top Slab - No of Bars	"e" Bars	10	6	10	6
Bottom Slab - No of Bars	"e" Bars	6	6	6	6
Bars Spacing	"e" Bars	18	18	18	18
Spacers Total Number	"e" Bars	36	44	36	44
Concrete: CY per lin ft	Reinf	99	138	103	144
Reinf lbs per lin ft	Reinf	203	293	213	304

Note:

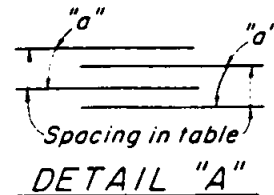
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.

SAN DIEGO REGIONAL STANDARD DRAWING

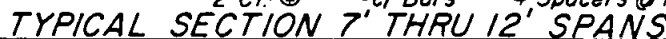
SINGLE BOX CULVERT

DETAILS NO. 1

Revision
Enlarged
By
Approved
Date



⊕ For reinforcement clearance, except at bottom, see "Miscellaneous Details."



FLAT INVERT

V INVERT

TRAPEZOIDAL INVERT

ALTERNATIVE INVERTS

(When shown)

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS NO. 2

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

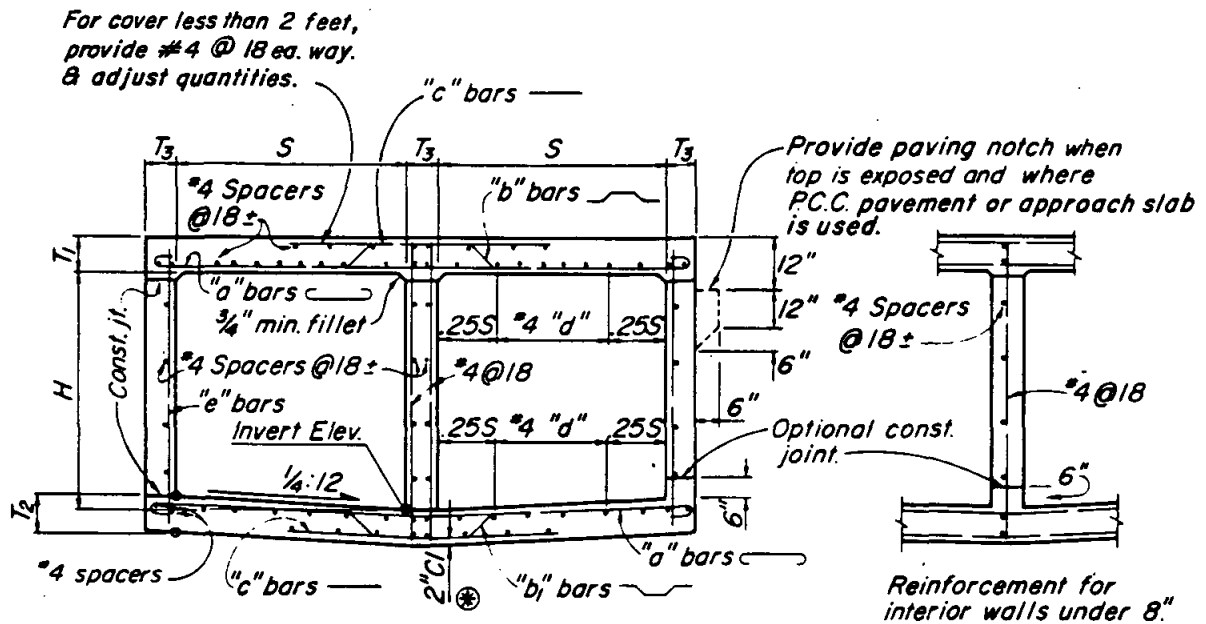
Allan G. Kucinski Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **D-76B**

SPAN		4'												5'												6'											
HEIGHT		2'				3'				4'				2'				3'				4'				5'				3'				4'			
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D				
MAX. FILL OVER TOP		11	21	32	43	11	23	34	46	11	23	34	46	6	24	36	6	24	36	6	24	36	6	23	34	46	6	23	34	46	4	20	34	4	20	34	
Conc.	Top Slab	T ₁	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/4		
	Bottom Slab	T ₂	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2	6	7 1/4	8 1/2		
	Side walls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
			5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	
Steel	a	Size Bar "	11	11	9	11	10 1/2	8 1/2	7 1/4	11	10 1/2	8 1/2	7 1/4	10	8 1/2	10	10	8 1/2	10	10	8 1/2	10	9	10	8 1/2	10	9	11	8 1/2	9	9 1/2	11	8 1/2	9	11	8 1/2	
		Spacing	10-3-10-2	10-2	10-3-10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	
		Length	10-3-10-2	10-2	10-3-10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	10-2	10-3-10-2	
	b	Size Bar "	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
		Spacing	11	11	9	11	10 1/2	8 1/2	7 1/4	11	10 1/2	8 1/2	7 1/4	10	8 1/2	10	10	8 1/2	10	10	8 1/2	10	9	10	8 1/2	10	9	10	8 1/2	10	9 1/2	11	8 1/2	9	11	8 1/2	
		Length	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4	9-6	9-4	9-4
	b ₁	Size Bar "	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5
		Spacing	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5
		Length	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5	9-6	9-4	9-5
	c	Size Bar "	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5	5	4	5
Spacing		11	11	9	11	10 1/2	8 1/2	7 1/4	11	10 1/2	8 1/2	7 1/4	10	8 1/2	10	10	8 1/2	10	10	8 1/2	10	9	10	8 1/2	10	9	10	8 1/2	10	9 1/2	11	8 1/2	9	11	8 1/2	9	11
Length		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	4-6	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	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	
Reinforcing Steel	d Dist	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6	10	6	6
	Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
	e	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Reinforcing Steel	Bars	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	
	Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
	Spacers Number	23				26				29				23				26				29				32				30				33			
Quan	Concrete C.Y. per lin ft	0.47	0.51	0.57	0.53	0.57	0.63	0.69	0.75	0.80	0.86	0.92	0.98	1.04	1.10	1.16	1.22	1.28	1.34	1.40	1.46	1.52	1.58	1.64	1.70	1.76	1.82	1.88	1.94	2.00	2.06	2.12	2.18	2.24	2.30		
	Reinf. Lbs per lin ft	81	74	84	79	91	101	87	85	99	111	99	100	109	103	104	112	106	109	119	133	109	116	126	148	121	119	147	125	124	155	124	125	144	155		

SPAN		6'								8'								10'							
HEIGHT		5'		6'		4'		5'		6'		7'		8'		5'		6'							
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP		4	19	33	43	4	19	33	43	3	14	25	3	14	25	3	14	25	37	3	14	25	37	2	17
Conc.	Top Slab	T ₁	7 1/4	8 1/4	10 1/4	7 1/4	8 1/4	10 1/4	12	8 1/4	9 1/4	12	8 1/4	9 1/4	12	8 1/4	9 1/4	12	14	8 1/4	9 1/4	12	14	8 1/4	9 1/4
	Bottom Slab	T ₂	7 1/4	9 1/4	11 1/4	7 1/4	9 1/4	11 1/4	12 1/4	7 1/4	10 1/4	12 1/4	7 1/4	10 1/4	12 1/4	7 1/4	10 1/4	12 1/4	13	7 1/4	10 1/4	12 1/4	13	7 1/4	10 1/4
Reinforcing Steel	Side walls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Size Bar "	a	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	4
Reinforcing Steel	Spacing	b	9 1/2	11	8 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2
	Length	b ₁	14-3-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14	2-14
Reinforcing Steel	Size Bar "	a	5	6	6	7	5	6	6	7	5	6	6	7	5	6	6	7	5	6	6	7	5	6	6
	Spacing	b	9 1/2	11	8 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2	9 1/2	11	8 1/2	10 1/2
Reinforcing Steel	Length	b ₁	13-6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13
	Length	b ₂	13-5-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13	6-13
Reinforcing Steel	Top Slab-Tot. No.	a	12	6	6	12	6	6	16	8	8	16	8	8	16	8	8	16	8	8	16	8	8	16	8
	Bottom Slab-Tot. No.	a	6	6	6	6	6	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Reinforcing Steel	Size Bar "	a	4	4	5	4	5	6	4	4	5	4	5	6	4	4	5	4	5	6	4	4	5	4	5
	Spacing	b	18	10	18	18	11	9	18	18	10	18	18	11	9	18	18	10	18	18	11	9	18	18	10
Reinforcing Steel	Spacers Number	a	36			36			41			44			44			47			56			60	
	Concrete C.Y. per lin. ft.	a	0.88	1.01	1.19	1.30	0.93	1.07	1.25	1.47	1.08	1.30	1.55	1.14	1.37	1.61	1.19	1.42	1.66	1.32	1.56	1.83	1.24	1.39	1.62
Reinforcing Steel	Reinf. Lbs. per lin. ft.	a	128	131	164	175	129	137	177	201	169	175	200	172	181	218	173	188	229	185	199	246	299	191	207

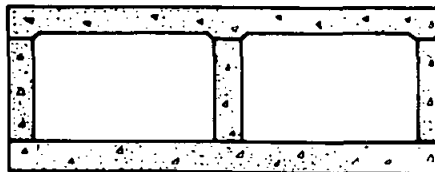
SPAN		10'												12'																							
HEIGHT		7'				8'				10'				6'				7'				8'				9'				10'				12'			
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D				
MAX FILL OVER TOP		2	17	30		2	16	29	36		2	16	29	36		2	14	26		2	14	26		2	14	26	36		2	14	26	36		2	14	26	36
Conc.	Top Slab	T ₁	8 1/2	12 1/2	16	8 1/2	12 1/2	16	17 1/4	8 1/2	12 1/2	16	17 1/4	10	14 1/4	10 1/4	14 1/2	17 1/4	10 1/4	14 1/2	17 1/4	10 1/4	14 1/2	17 1/4	20 1/4	10 1/4	14 1/2	17 1/4	20 1/4	10 1/4	14 1/2	18 1/4	21 1/4				
	Bottom Slab	T ₂	8 1/2	13 1/2	16 1/2	8 1/2	13 1/2	16 1/2	18 1/4	8 1/2	13 1/2	16 1/2	18 1/4	9 1/4	14 1/4	9 1/4	15 1/4	9 1/4	15 1/4	9 1/4	15 1/4	9 1/4	15 1/4	9 1/4	15 1/4	18 1/4	9 1/4	15 1/4	18 1/4	9 1/4	15 1/4	18 1/4	21 1/4				
	Side walls	T ₃	6	6 1/4	7	7	7 1/4	8 1/4	8	8 1/2	6	6 1/4	7	7 1/4	8 1/4	8	8 1/2	6	6 1/4	7	7 1/4	8 1/4	8	8 1/2	6	6 1/4	7	7 1/4	8 1/4	8	8 1/2	6	6 1/4	7	7 1/4		
Reinforcing Steel	a	Size Bar "	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	6	4	4		
		Spacing	11	9 1/2	10	11	10	10	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2		
		Length	22-4-22	4-22	5-22	22-5	22-7	10-22	10-22	8-22	11-23	26-4-26	26-4-26	26-5	26-5	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6		
	b	Size Bar "	6	7	8	6	7	8	6	7	8	6	7	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	
		Spacing	11	9 1/2	10	11	10	10	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2		
		Length	21-7-21	12-23	21-10	22-12	22-4-22	9-22	12-22	4-22	23-11	25-6-25	10-26	3-25	11-26	12-26	4-26	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	26-6	
	c	Size Bar "	6	7	8	6	7	8	6	7	8	6	7	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	
		Spacing	11	9 1/2	10	11	10	10	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2		
		Length	10-6-10	7-10	7-10	7-10	7-10	8-10	9-10	8-10	8-10	9-10	10-12	6-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12		
	d	Size Bar "	6	7	8	6	7	8	6	7	8	6	7	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	
		Spacing	11	9 1/2	10	11	10	10	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	9	11 1/2		
		Length	10-6-10	7-10	7-10	7-10	7-10	8-10	9-10	8-10	8-10	9-10	10-12	6-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12	7-12		
e	Size Bar "	4	4	4	4	5	5	5	5	6	6	7	4	6	7	4	6	7	4	6	7	4	6	7	4	6	7	4	6	7	4	6	7	4	6		
	Spacing	14	6	8	11	8 1/2	6	6	7 1/4	7	5 1/4	5	18	8	15	6	6 1/4	12	5 1/4	6	9	7 1/4	8 1/4	8	8 1/4	11	8 1/4	9	12	8	9	12	8	9			
	Spacers: Number	51			54		64			68			52		55		68			72			76														
Concrete: C.Y. per lin. ft.		21	2	18	264	1	68	27	274	5	04	1	92	5	1	305	3	41	1	84	25	13	16	197	27	3	26	2	48	3	23	3	684	2	48	3	23
	Reinf. : Lbs. per lin. ft.	243	280	339	252	278	335	430	279	327	400	476	309	317	401	316	330	415	336	363	460	345	374	485	578	351	394	519	582	371	442	567	673				



TYPICAL SECTION

(Showing reinforcement for interior walls 8" and over.)

⊗ For reinforcement clearance, except
at bottom, see "Miscellaneous Details."



"FLAT INVERT" ALTERNATIVE

(When shown)

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Enlarge	SC	Q.H.	9/88			
				DOUBLE BOX CULVERT DETAILS NO. 2		<i>Alfred A. Kerschbaum</i> Dec. 1975 Coordinator R.C.E. 19807 Date
						DRAWING NUMBER D-77B

SPAN		4'				5'				6'			
HEIGHT		2'		3'		4'		5'		6'		7'	
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP		10	24	38	10	24	38	10	24	38	10	24	38
Top Slab	T ₁	6 1/4	6 1/4	7 1/4	6 1/4	6 1/4	6 1/4	7 1/4	6 1/4	6 1/4	6 1/4	7 1/4	6 1/4
Bottom Slab	T ₂	6	7	8 1/4	6	7	8 1/4	6	7	8 1/4	6	7	8 1/4
Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6
Size Bar "		5	4	5	4	5	4	5	4	5	4	5	4
Spacing		11	11 1/2	13	11	11 1/2	13	11	11 1/2	13	11	11 1/2	13
Length		14-9	14-8	14-9	14-9	14-8	14-9	14-9	14-8	14-9	14-9	14-8	14-9
Size Bar "		5	5	5	5	5	5	5	5	5	5	5	5
Spacing		11	11 1/2	13	11	11 1/2	13	11	11 1/2	13	11	11 1/2	13
Length		14-2 1/4	14-3 1/4	14-2 1/4	14-2 1/4	14-3 1/4	14-2 1/4	14-2 1/4	14-3 1/4	14-2 1/4	14-2 1/4	14-3 1/4	14-2 1/4
Size Bar "		4	5	6	4	5	6	4	5	6	4	5	6
Spacing		11	11 1/2	13	11	11 1/2	13	11	11 1/2	13	11	11 1/2	13
Length		9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0
Top Slab-Tot No		15	9	9	15	9	9	15	9	9	15	9	9
Bottom Slab-Tot No		9	9	9	9	9	9	9	9	9	9	9	9
Size Bar "		4	4	4	4	4	4	4	4	4	4	4	4
Spacing		18	18	18	18	18	18	18	18	18	18	18	18
Spacers Number		34		38		42		46		50		54	
Concrete CY per lin ft		0.67	0.70	0.81	0.75	0.79	0.89	0.82	0.86	0.96	0.88	0.98	0.90
Reinf Lbs per lin ft		122	110	133	127	115	138	131	122	147	150	153	155

SPAN		6'				8'				10'			
HEIGHT		6'		7'		8'		9'		10'		11'	
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP		3	13	23	30	2	11	20	2	11	20	2	11
Top Slab	T ₁	7 1/4	7 1/4	8 1/4	9 1/4	8 1/4	8 1/4	9 1/4	10 1/4	9 1/4	9 1/4	10 1/4	11 1/4
Bottom Slab	T ₂	6	8	9 1/4	10 1/4	6	8	9 1/4	10 1/4	6	8	9 1/4	10 1/4
Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6
Size Bar "		6	5	5	6	5	5	6	5	5	6	5	5
Spacing		13	14	11 1/2	12	12	12 1/2	12	12 1/2	12	12 1/2	12	12 1/2
Length		20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0
Size Bar "		6	6	6	6	6	6	6	6	6	6	6	6
Spacing		13	14	11 1/2	12	12	12 1/2	12	12 1/2	12	12 1/2	12	12 1/2
Length		20-3	20-3	20-3	20-3	20-3	20-3	20-3	20-3	20-3	20-3	20-3	20-3
Size Bar "		4	6	6	4	6	7	4	6	7	4	6	7
Spacing		13	14	11 1/2	12	12	12 1/2	12	12 1/2	12	12 1/2	12	12 1/2
Length		13-0	13-0	13-0	13-0	13-0	13-0	13-0	13-0	13-0	13-0	13-0	13-0
Top Slab-Tot No		18	9	9	9	12	12	12	12	12	12	12	12
Bottom Slab-Tot No		9	9	9	9	12	12	12	12	12	12	12	12
Size Bar "		4	4	4	4	4	4	4	4	4	4	4	4
Spacing		18	18	18	18	18	18	18	18	18	18	18	18
Spacers Number		48		58		62		66		70		74	
Concrete CY per lin ft		1.27	1.39	1.52	1.64	1.47	1.67	1.99	1.54	1.76	2.06	1.62	1.84
Reinf Lbs per lin ft		192	187	221	249	261	250	301	266	257	310	267	264

SPAN		10'				12'				14'			
HEIGHT		10'		11'		12'		13'		14'		15'	
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D
MAX. FILL OVER TOP		2	11	20	28	2	11	20	28	2	11	20	28
Top Slab	T ₁	9	10	12	14 1/4	9	10	12	14 1/4	9	10	12	14 1/4
Bottom Slab	T ₂	7 1/4	11	13	15	8	11	13	15	8	11	13	15
Sidewalls	T ₃	7	7	7 1/2	8 1/2	8	8 1/2	9	10	6	6 1/2	6	6 1/2
Size Bar "		6	6	6	6	6	6	6	6	6	6	6	6
Spacing		10 1/2	13	10	11 1/2	13	10	11 1/2	13	10	11 1/2	13	10
Length		33-2	33-2	33-2	33-2	33-2	33-2	33-2	33-2	33-2	33-2	33-2	33-2
Size Bar "		6	7	7	8	6	7	7	8	6	7	7	8
Spacing		10 1/2	13	10	11 1/2	13	10	11 1/2	13	10	11 1/2	13	10
Length		32-0	32-1	33-4	33-1	33-1	33-4	33-1	33-4	33-1	33-4	33-1	33-4
Size Bar "		5	7	7	8	5	7	7	8	5	7	7	8
Spacing		10 1/2	13	10	11 1/2	13	10	11 1/2	13	10	11 1/2	13	10
Length		21-2	21-2	21-3	21-5	21-4	21-5	21-6	21-8	21-5	21-6	21-7	21-9
Top Slab-Tot No		27	15	15	15	27	15	15	15	36	15	15	15
Bottom Slab-Tot No		15	15	15	15	15	15	15	15	15	15	15	15
Size Bar "		4	6	7	8	4	6	7	8	4	6	7	8
Spacing		10 1/2	12	10	11 1/2	9	10	9	18	7	11 1/2	12	5 1/4
Spacers Number		76		94		102		76		80		84	
Concrete CY per lin ft		2.34	2.77	3.23	3.78	2.68	3.18	3.73	4.22	2.60	3.18	3.73	4.22
Reinf Lbs per lin ft		377	402	514	590	421	453	577	632	489	505	628	697

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.

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Alfred A. Kuehnle, Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **D-78A**

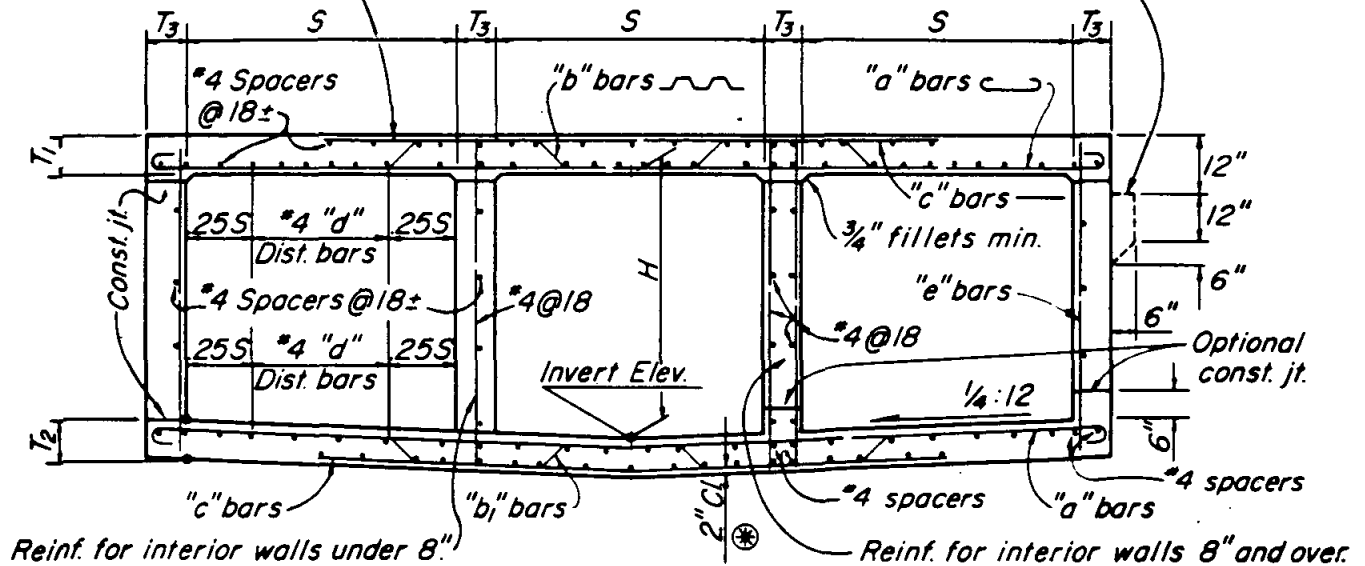
SAN DIEGO REGIONAL STANDARD DRAWING

**TRIPLE BOX CULVERT
DETAILS NO. 1**

Revision By Approved Date
Enlarge **CH** 9-88

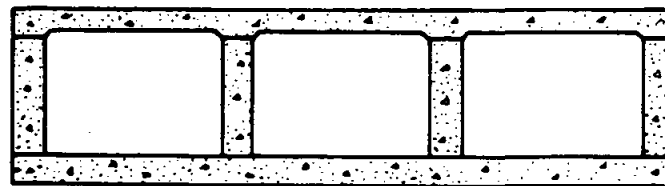
For cover less than 2 feet, extend "c" bars full length, top slab only. Provide additional #4 spacers @ 18"± and adjust quantities.

Provide paving notch when top is exposed and where P.C.C. pavement or approach slab is used.



TYPICAL SECTION

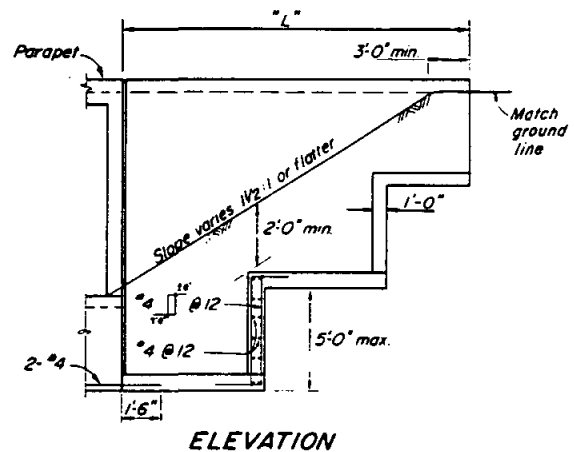
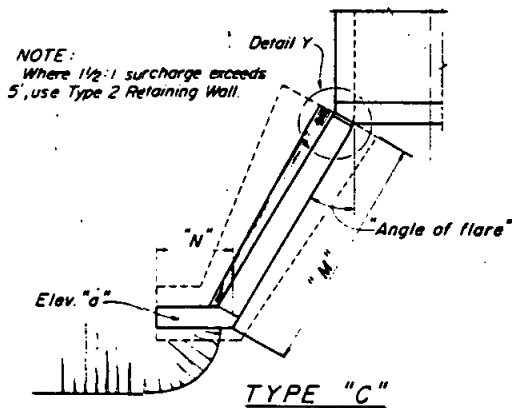
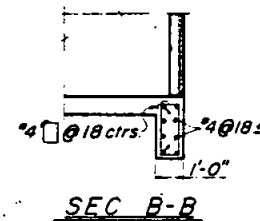
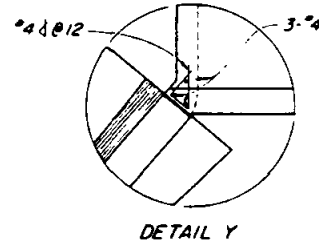
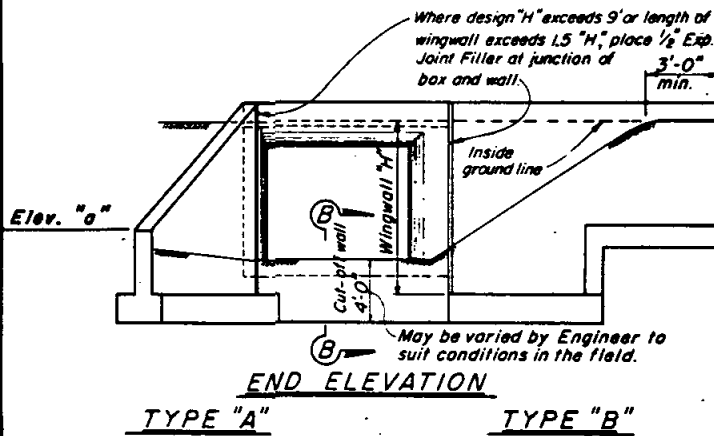
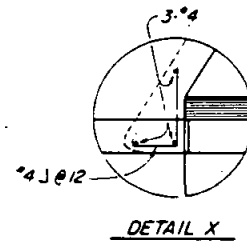
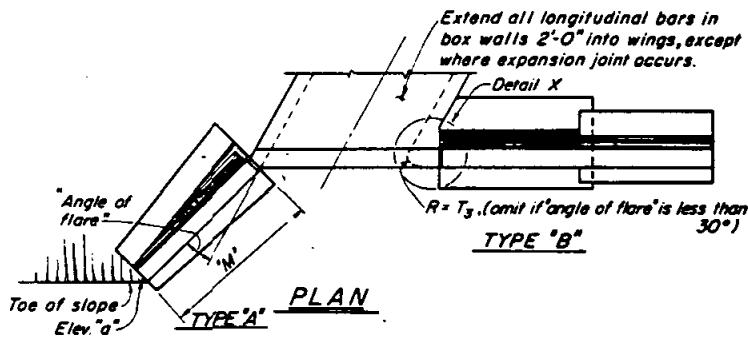
⊗ For reinforcement clearance, except at bottom, see "Miscellaneous Details."



"FLAT INVERT" ALTERNATIVE

(When shown)

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Enlarge	sc	U.H.	9-88			
				TRIPLE BOX CULVERT DETAILS NO. 2		<i>Allen A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
						DRAWING NUMBER D-78B



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

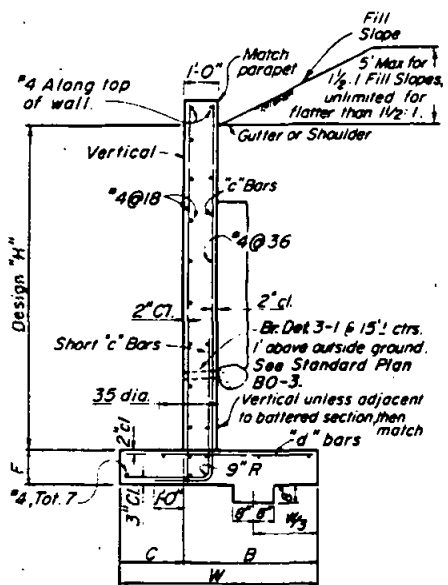
Allard A. Kuehnlel Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER D-79A

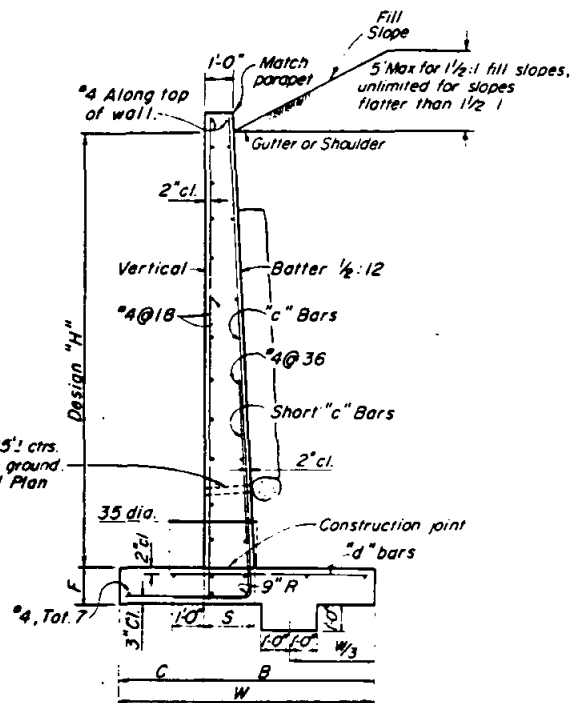
SAN DIEGO REGIONAL STANDARD DRAWING

BOX CULVERT WINGWALL
TYPES A, B & C
DETAILS NO. 1

Revision	By	Approved	Date
Enlarge	8	A.A.	7-88



TYPICAL SECTION
H=4' THRU 12'



TYPICAL SECTION
H=13' THRU 16'

Design Notes:

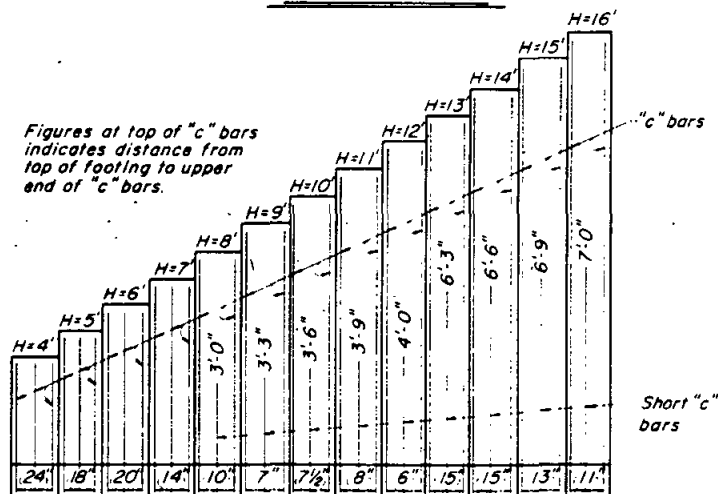
Unit Stresses: $f_s = 20,000 \text{ p.s.i.}$, $f_c = 1200 \text{ p.s.i.}$, $n = 10$

Maximum Toe Pressure = $1\frac{1}{2}$ Tons / sq. ft.

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

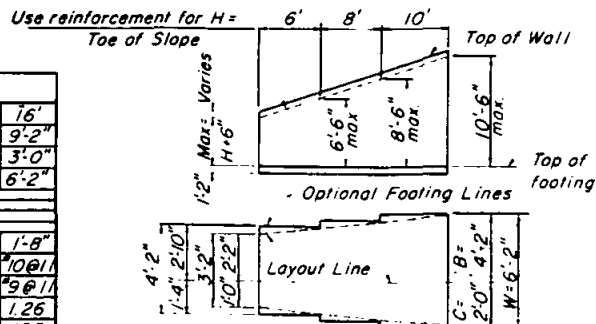
Dimensions "H", "L", "M", "N", Elev. "a" and "Angle of flare" (as apply) are shown on the plans.

Figures at top of "c" bars indicates distance from top of footing to upper end of "c" bars.



REINFORCED CONCRETE WINGWALLS													
"H"	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
W	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	7'-8"	8'-2"	8'-8"	9'-2"
C	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	2'-8"	2'-10"	3'-0"
B	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	4'-10"	5'-2"	5'-6"	5'-10"	6'-2"
F	1'-2"												
Batter	None												
S	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6 1/2"	1'-7"	1'-7 1/2"	1'-8"
"c" Bars	4@24	4@18	5@20	5@14	5@10	5@7	6@7 1/2	7@8	7@6	9@15	10@15	10@13	10@11
"d" Bars	4@24	4@18	5@20	5@14	5@10	5@14	7@15	8@16	7@12	8@15	9@15	9@13	9@11
Conc. %	0.32	0.38	0.44	0.49	0.55	0.61	0.67	0.73	0.79	1.02	1.10	1.18	1.26
Reinf. 100% r	13	16	19	25	30	37	49	62	76	73	90	104	125

Quantities do not include that portion above the design "H" limit



TYPICAL LAYOUT EXAMPLE

Revision	By	Approved	Date
Enlarge	SC	A.H.	9-88

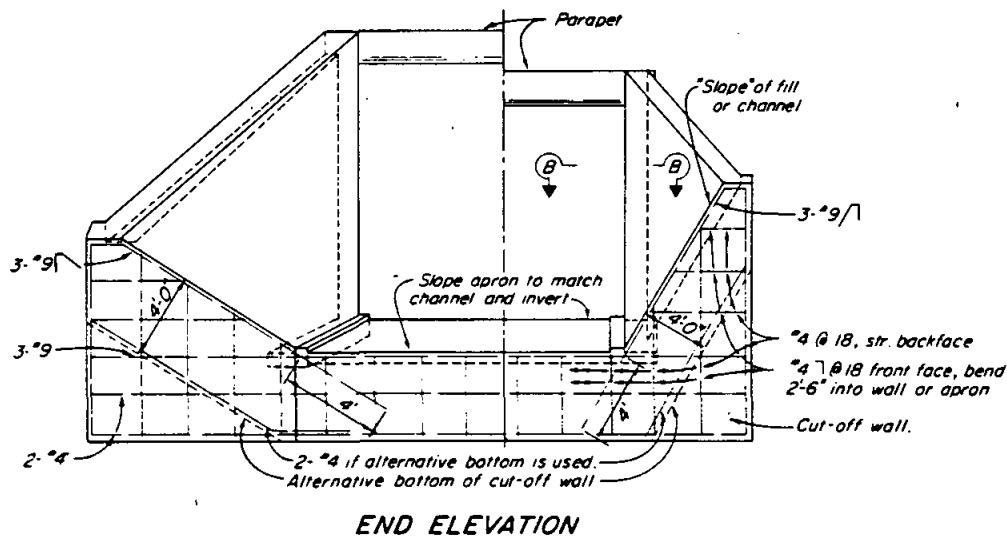
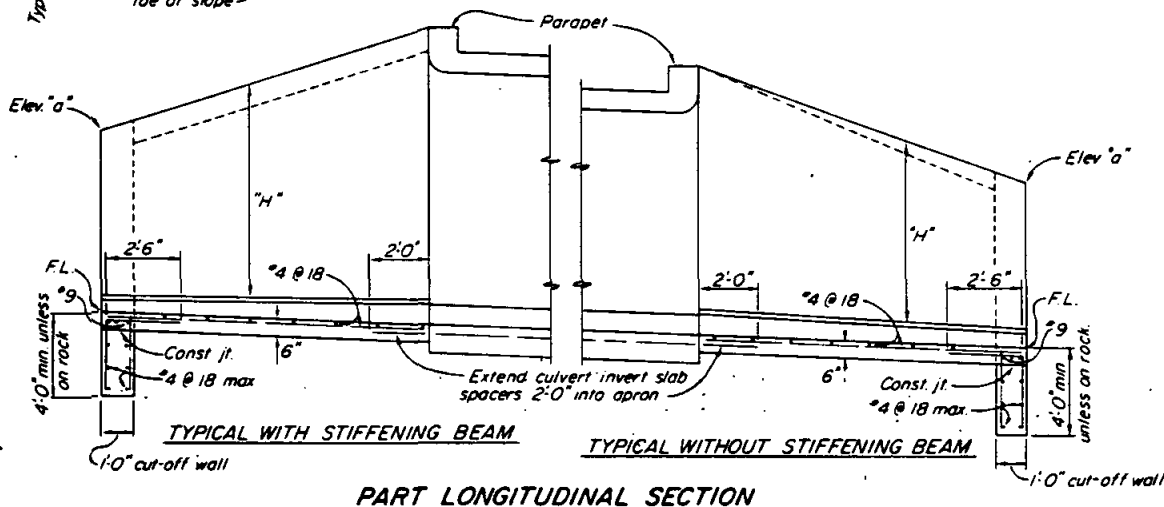
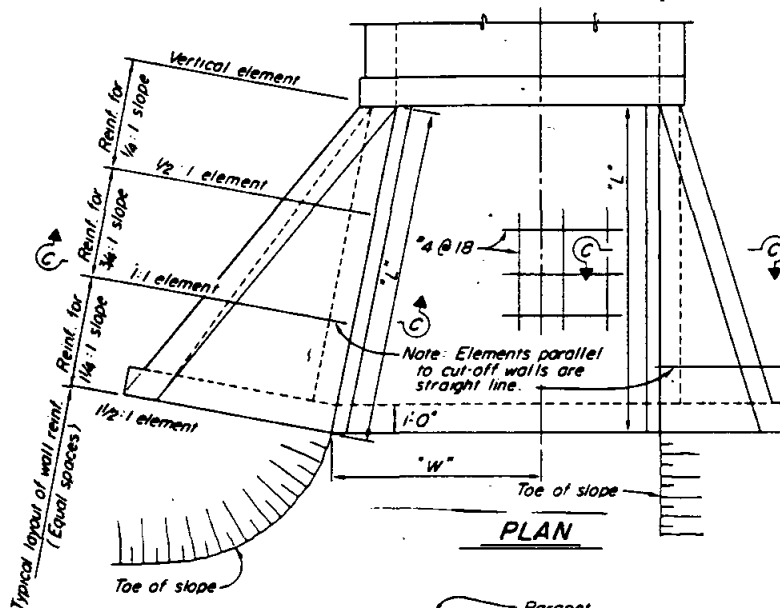
SAN DIEGO REGIONAL STANDARD DRAWING

BOX CULVERT WINGWALL
TYPES A, B & C
DETAILS NO. 2

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen G. Kuehnert Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER D-79B



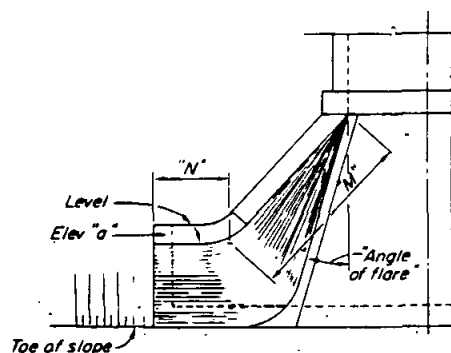
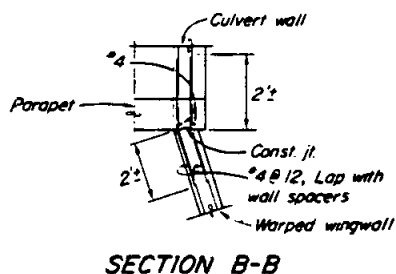
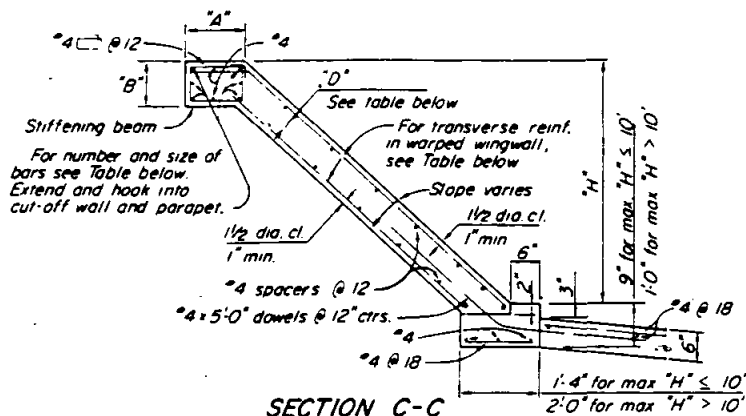
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Alfred A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **D-80A**

SAN DIEGO REGIONAL STANDARD DRAWING

**BOX CULVERT WARPED WINGWALL
DETAILS NO. 1**

Revision	By	Approved	Date
Enlarge	<i>SC</i>	<i>A.H.</i>	9-88



Use where additional protection to toe of embankment is required.

WARPED WINGWALLS																						
WALL DIMENSIONS AND REINFORCING										STIFFENING BEAM DIMENSIONS AND REINFORCING												
Element Slope	"H"	8' or less	10'	12'	14'	16'	18'	20'	$\frac{H}{max}$	12'	14'	16'	18'	20'	25'	30'	35'	40' or more				
$\frac{1}{4}:1$	Front face reinf.	#4 @ 12	#4 @ 7	#5 @ 7	#5 @ 5	#6 @ 6	#7 @ 7	#7 @ 6	6'	No beam Place 2" x 6" in each												
	Rear face reinf.	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	8'	face along top of												
$\frac{3}{8}:1$	Front face reinf.	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 10	#4 @ 8	#4 @ 6	10'	wall	$A^* = 1'-0"$											
	Rear face reinf.	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 10	#4 @ 7	#4 @ 6	#5 @ 8	12'		$B^* = 9"$											
$1\frac{1}{4}:1$	Front face reinf.	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	#4 @ 12	14'		Tot 6'-6"									$A^* = 1'-6"$		
	Rear face reinf.	#4 @ 8	#4 @ 8	#4 @ 5	#5 @ 6	#6 @ 7	#6 @ 6	#7 @ 6	16'		Tot 6'-7"									$B^* = 1'-0"$	$A^* = 1'-10"$	
"D" at Cut-off Wall		6"	6"	6"	7½"	8"	9½"	11"	18"		Tot 6'-8"									$B^* = 1'-0"$	$A^* = 1'-6"$	
"D" at Culvert		6"	6"	6"	8"	9½"	11"	11"	20"												Tot 8'-9"	

Notes : Walls designed for 2' surcharge; earth load = 120 #/cu. ft.; equivalent fluid pressure = 36 #/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 560-B-3250.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE			
Enlarge	2	A.H.	9-88								
				BOX CULVERT WARPED WINGWALL DETAILS NO. 2				<i>Attila A. Kerschbaum</i> Dec. 1975 Coordinator R.C.E. 19807 Date			
								DRAWING NUMBER D-80B			

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 x 4 :A x 60', FOLLOWED BY ALTERNATIVES

ALTERNATIVES: INVERT WILL BE SLOPED UNLESS "TRAPEZOIDAL INVERT", "FLAT INVERT" OR "V INVERT" IS INCLUDED IN DESIGNATION. ENDS OF CULVERT WILL BE ROUNDED UNLESS "SQUARE ENDS" ARE DESIGNATED. PARAPETS WILL BE AS SHOWN UNLESS "___ FT. PARAPET" IS DESIGNATED IN PLANS. SUCH DESIGNATIONS MAY BE DIFFERENT FOR INLET AND OUTLET ENDS.

REINF. PLACEMENT: MAIN REINFORCEMENT IS POSITIONED TRANSVERSE OR, FOR CURVED CULVERTS, RADIAL, WHEN RADIAL REINFORCING SPACING IS MEASURED ALONG THE ϵ

CONSTRUCTION NOTES

CONCRETE:

BOTTOM SLAB & WALLS SHALL BE CLASS 560-B-3250

TOP SLAB SHALL BE CLASS 560-C-3250

EXPANSION JOINTS:

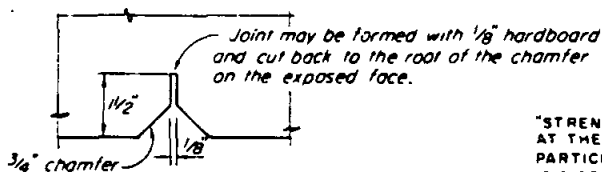
BOTTOM SLAB - NO EXPANSION JOINTS SHALL BE PLACED
TOP SLAB AND WALLS - WHEN COVER IS LESS THAN SPAN LENGTH, PLACE $\frac{1}{2}$ " EXPANSION JOINT FILLER AT 30' $\pm$ CENTERS OUTSIDE THE PAVED ROADWAY LANES AND PLACE BRIDGE DETAIL 3-2 AT 30' $\pm$ CENTERS UNDER PAVED ROADWAY LANES.
WHEN COVER IS MORE THAN SPAN LENGTH, PLACE $\frac{1}{2}$ " EXPANSION JOINT FILLER AT 30' $\pm$ 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 FALSEWORK PLANS HAVE BEEN SUBMITTED BY THE CONTRACTOR, TO THE ENGINEER, AND APPROVED.

CONSTRUCTION JOINTS:

TEMPORARY JOINTS MAY BE PERMITTED IF NORMAL (OR RADIAL) TO ϵ OF RCB. OTHERWISE, THE CONTRACTOR IS TO SUBMIT A PROPOSAL FOR CONSIDERATION



BRIDGE DETAIL 3-2
(Portion)

See Standard Drawing C-15

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 E 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 36 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 $\frac{1}{2}$ " 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 30% (UNLESS TRAFFIC LONGITUDINAL)

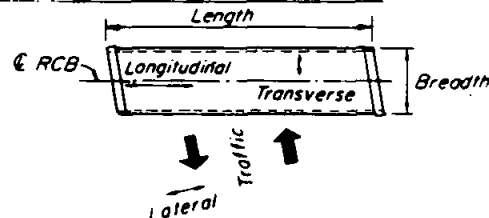
BOTTOM SLAB = "4 @ 18" MAX

CLASSIFICATION "B" TO "E": TOP AND BOTTOM SLABS "4 @ 18" MAX.

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



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

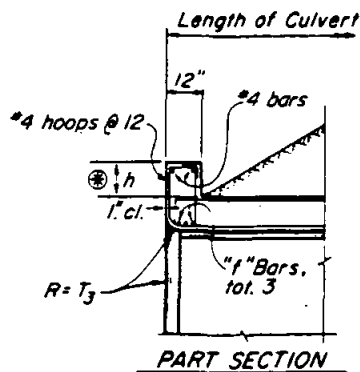
SAN DIEGO REGIONAL STANDARD DRAWING

BOX CULVERT

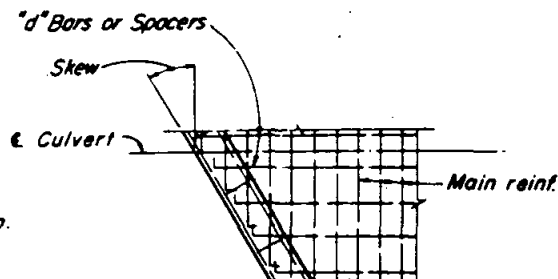
MISCELLANEOUS DETAILS NO. 1

Revision	By	Approved	Date
Enlarge	J	G. H.	10/88

DRAWING NUMBER **D-81A**



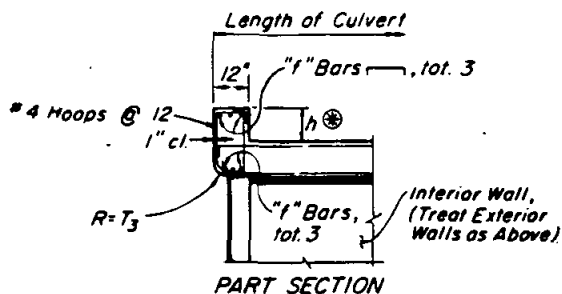
PART SECTION



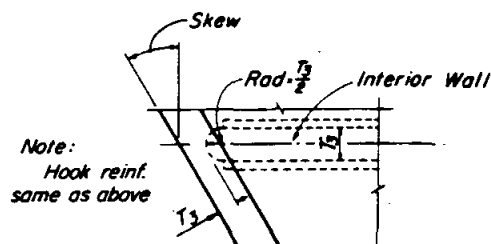
PART PLAN - SKEWED

PARAPET DETAILS FOR SINGLE SPAN CULVERTS

PARAPET "I" BAR NOS.			
SKEW ANGLE	0° TO 15°	16° TO 30°	31° TO 45°
SPAN			
4'	*4	*4	*4
6'	*4	*4	*5
8'	*4	*5	*6
10'	*5	*6	*7
12'	*6	*7	*8
14'	*7	*8	*9

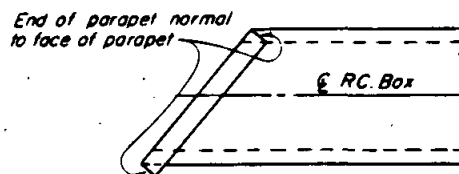


PART SECTION

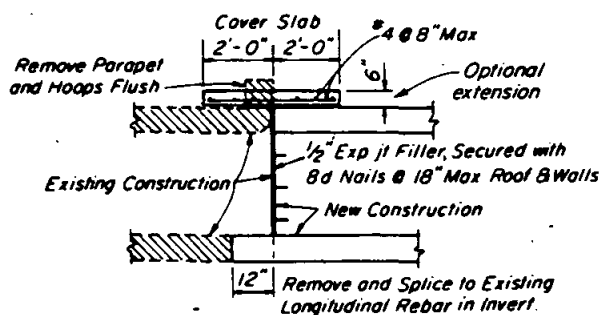


PART PLAN - SKEWED

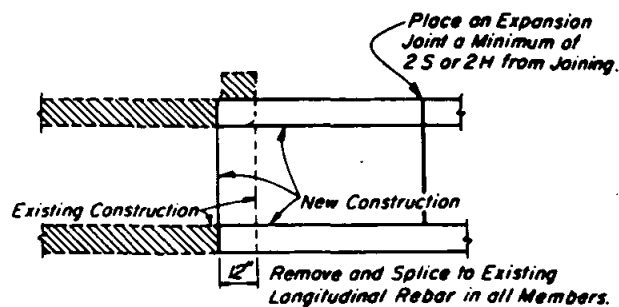
PARAPET DETAILS FOR MULTIPLE SPAN CULVERTS



PARAPET DETAIL FOR SKEWED CULVERTS W/O WINGWALLS



COVER: 1' AND GREATER



COVER: EXPOSED TOP AND GREATER

CULVERT EXTENSION

20° SKEW MAXIMUM

Revision	By	Approved	Date
Enlarge	EC	A.H.	10/88

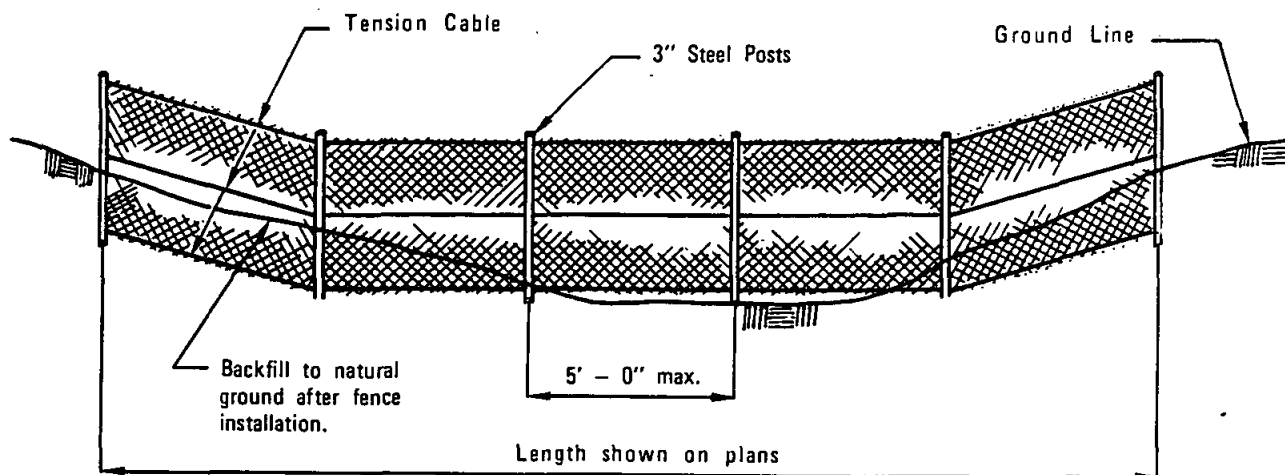
SAN DIEGO REGIONAL STANDARD DRAWING

**BOX CULVERT
MISCELLANEOUS DETAILS NO. 2**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen G. Kunkel Dec. 1975
Coordinator R.C.E. 19807 Date

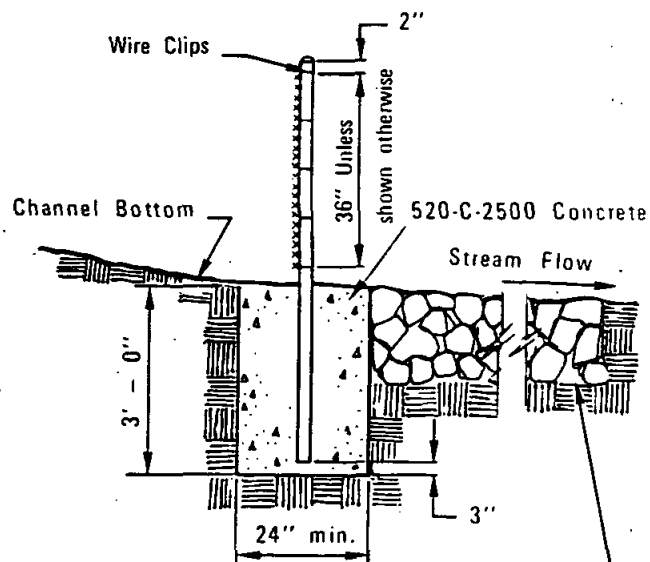
DRAWING
NUMBER **D-81B**



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.



Rip Rap size and length to be shown on plans. See Std. Dwg. D-40

SECTION

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER

D-82

SAN DIEGO REGIONAL STANDARD DRAWING

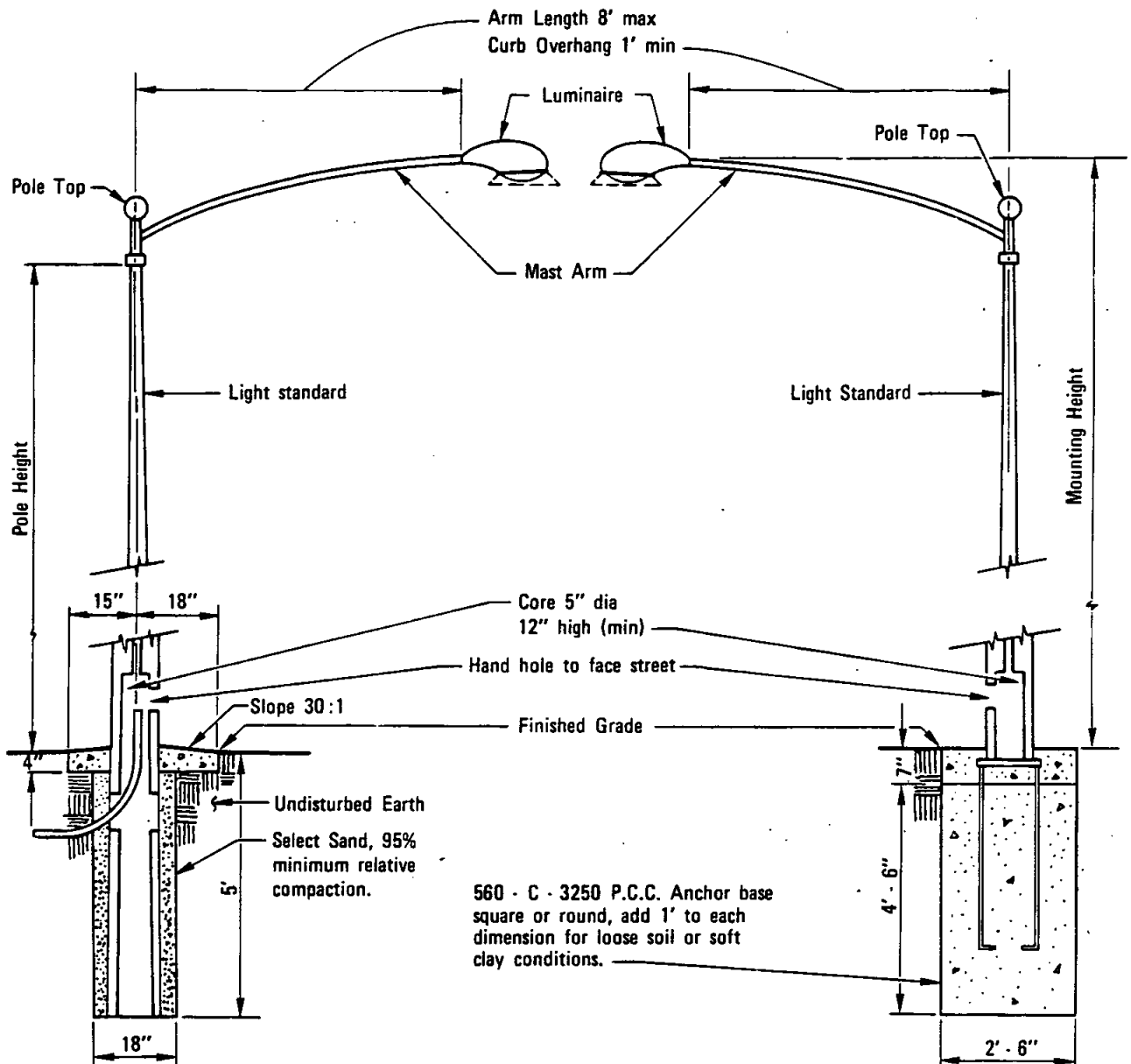
DEBRIS FENCE

Revision	By	Approved	Date

ELECTRICAL SYSTEMS

ELECTRICAL SYSTEMS

E

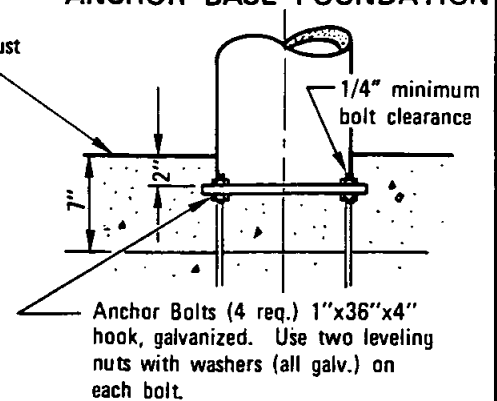


**DIRECT BURIAL
FOUNDATION**

ANCHOR BASE 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.

Finished Grade
Anchor bolts must
not protrude.



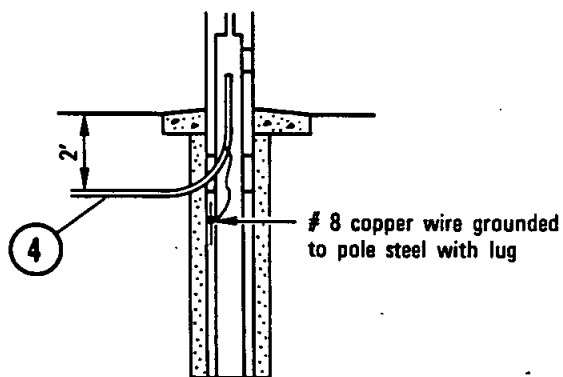
Revision	By	Approved	Date
Table	SC	M.B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

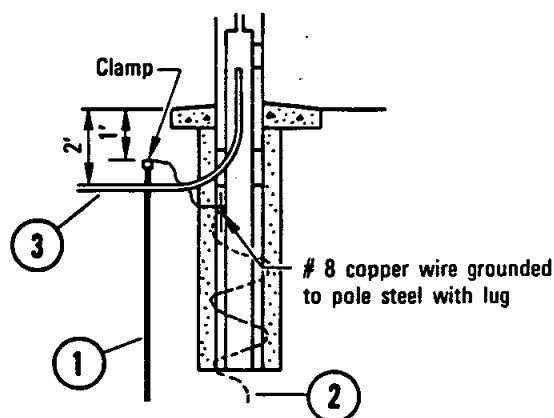
**STREET LIGHTING
STANDARD**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Allan A. Kuehn Dec. 1975
Coordinator R.C.E. 1980/ Date

**DRAWING
NUMBER E-1**

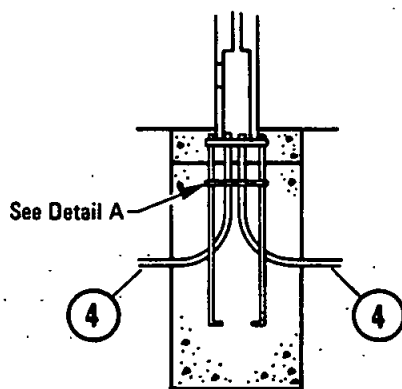


STEEL CONDUIT

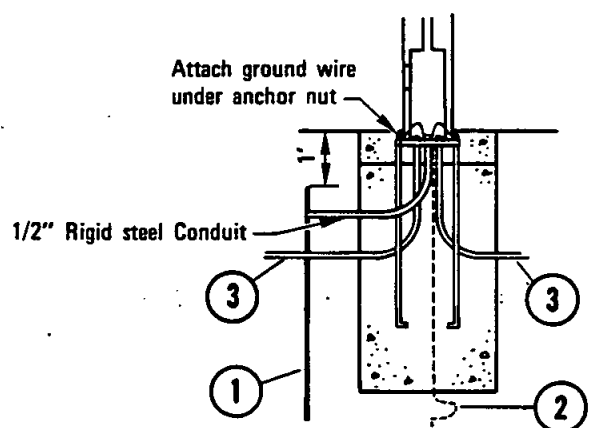


NON-METALLIC CONDUIT

DIRECT BURIAL FOUNDATION



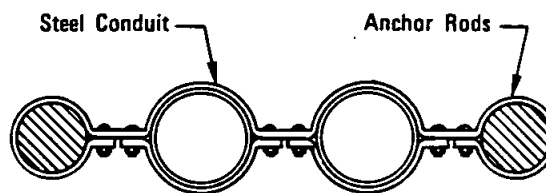
STEEL CONDUIT



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

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

DRAWING
NUMBER

E-2

SAN DIEGO REGIONAL STANDARD DRAWING

GROUNDING
OF CONCRETE LIGHTING STANDARDS

Revision	By	Approved	Date

1½" min. cover for bars and conduits.

Galvanized steel conduits.
Size and number as required.

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

NOTE:

Concrete shall be class 560-C-3250

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.

6"

16" dia.

Length as required

36"

36"

Grout cap protrusion to be sloped for drainage.

Ground Line

24" min.

6"

Panel Board

Meter

2" min.

4' - 6" min.
6' - 3" max.

3/4" x 8" copper covered steel ground rod.

SECTION A-A

STEEL & CONCRETE DIMENSIONS

SECTION B-B

CONDUIT & EQUIPMENT

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

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTAL FOR
ELECTRICAL EQUIPMENT

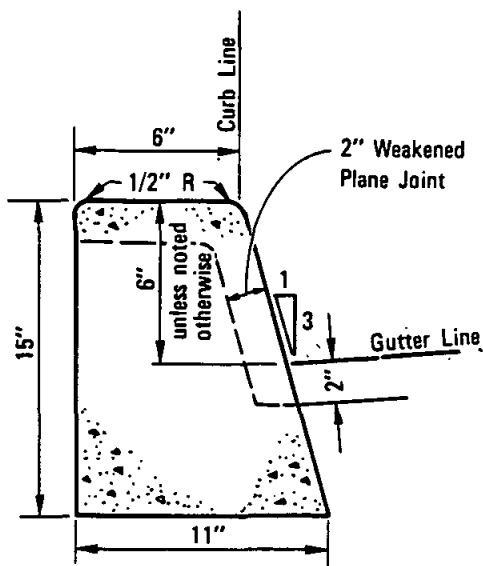
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Allen A. Kuehn *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER E-33

GENERAL SURFACE IMPROVEMENTS

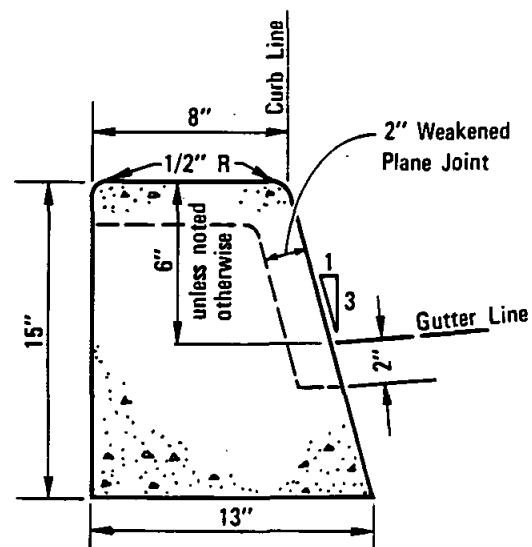
G

GENERAL SURFACE IMPROVEMENTS



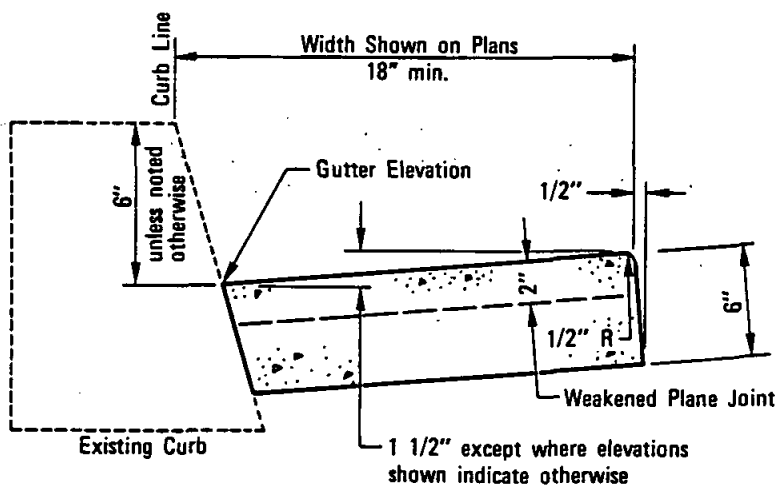
6" CURB

Area = 0.89 SQ. FT.



8" CURB

Area = 1.09 SQ. FT.



GUTTER

NOTES:

1. Concrete shall be 520-C-2500.
2. See Standard Drawing G-10 for joint details.
3. Slope top of curb 1/4" per foot toward street.

LEGEND ON PLANS

6" curb

Revision	By	Approved	Date
Conc.	MC	M.B.	5-86
Note 3	MC	A.H.	7-88

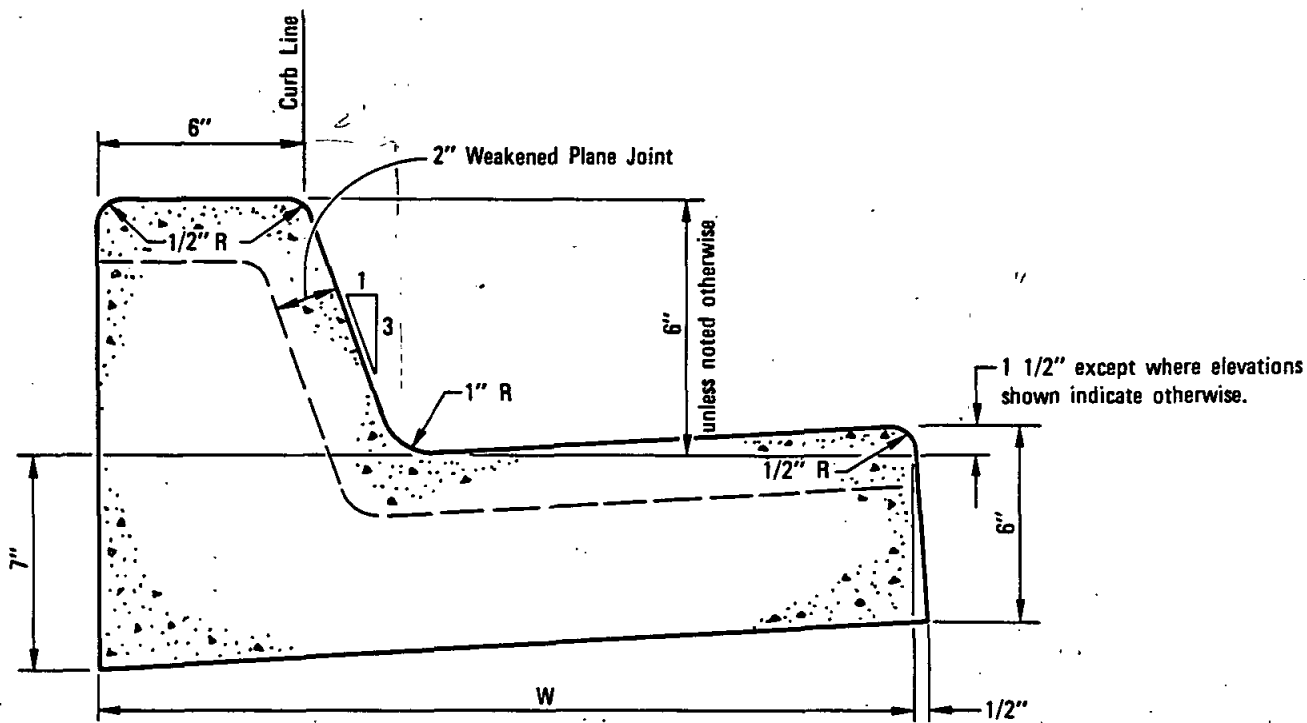
SAN DIEGO REGIONAL STANDARD DRAWING

CURBS AND GUTTER - SEPARATE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen A. Kerschbaum Dec. 1975
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.
3. Slope top of curb 1/4" per foot toward street.

LEGEND ON PLANS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

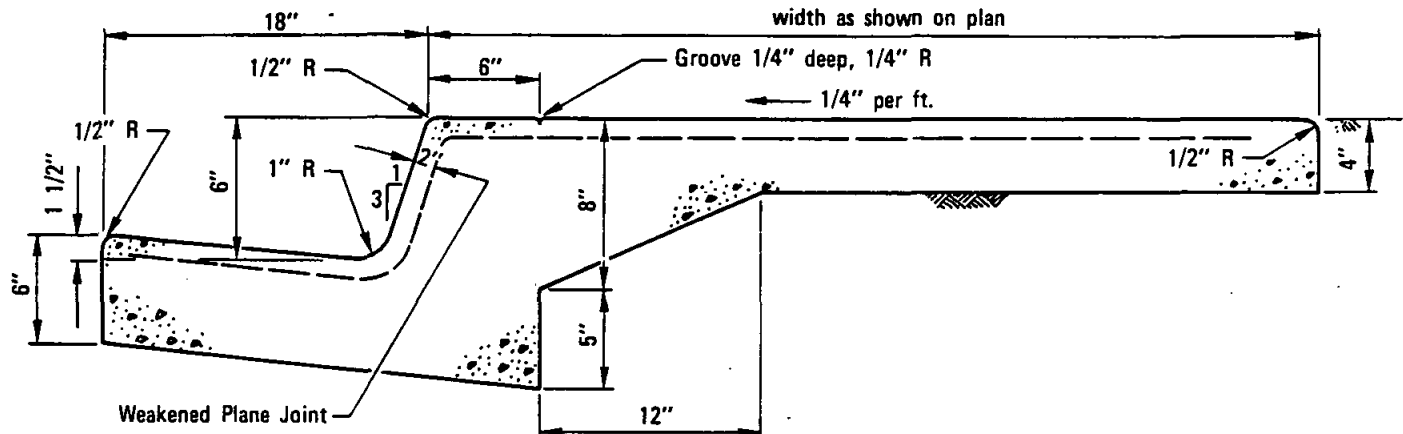
SAN DIEGO REGIONAL STANDARD DRAWING

CURB AND GUTTER - COMBINED

Revision	By	Approved	Date
Conc.	<i>MB</i>	<i>MB</i>	5-86
Note 3	<i>MB</i>	<i>MB</i>	7-88

DRAWING
NUMBER

G-2



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
Thickness	SC	D.S.	7-79
Thickness	HA	M.B.	6-82
Conc.	SC	M.B.	5-86

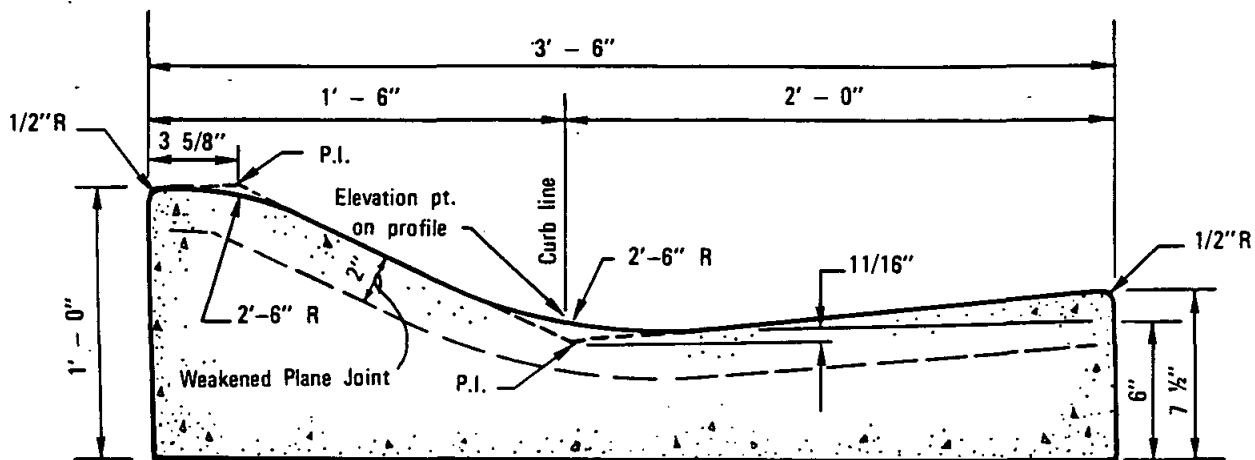
SAN DIEGO REGIONAL STANDARD DRAWING

MONOLITHIC CURB, GUTTER AND SIDEWALK

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred A. Kerschbaum Dec. 1975
Coordinator R.C.E. 1980? Date

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

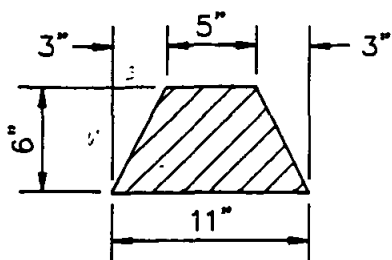
Clifford G. Kuehn Dec. 1975
Coordinator R.C.C. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

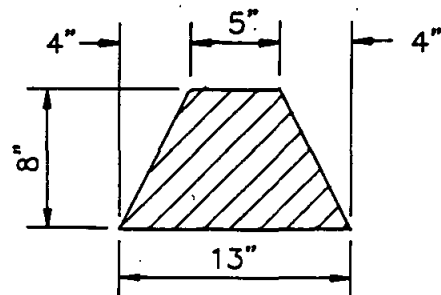
CURB AND GUTTER-ROLLED

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

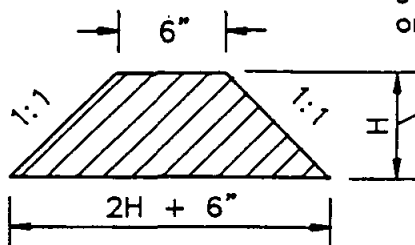
**DRAWING
NUMBER** **G-4**



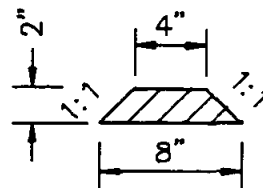
TYPE A-SECTION



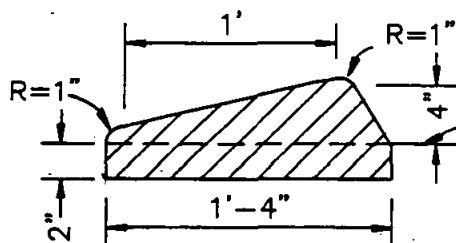
TYPE B-SECTION



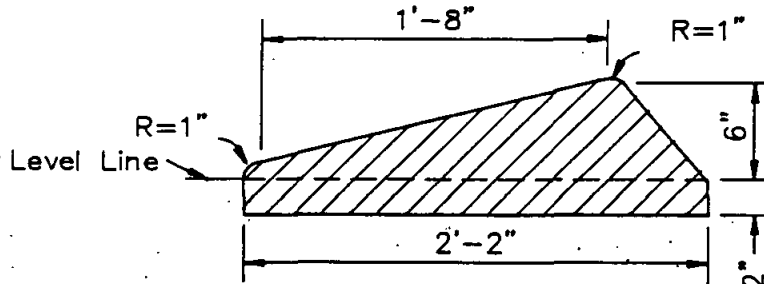
TYPE C-SECTION



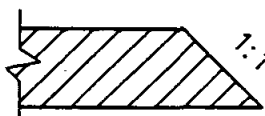
TYPE D-SECTION



TYPE E-SECTION



TYPE F-SECTION



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

ALL TYPES - SIDE VIEW

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.

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
E	0.0407
F	0.0623

LEGEND ON PLANS

Type A Dike

Revision	By	Approved	Date
Type E	SC	QH	10/88
Type F	SC	QH	10/88

SAN DIEGO REGIONAL STANDARD DRAWING

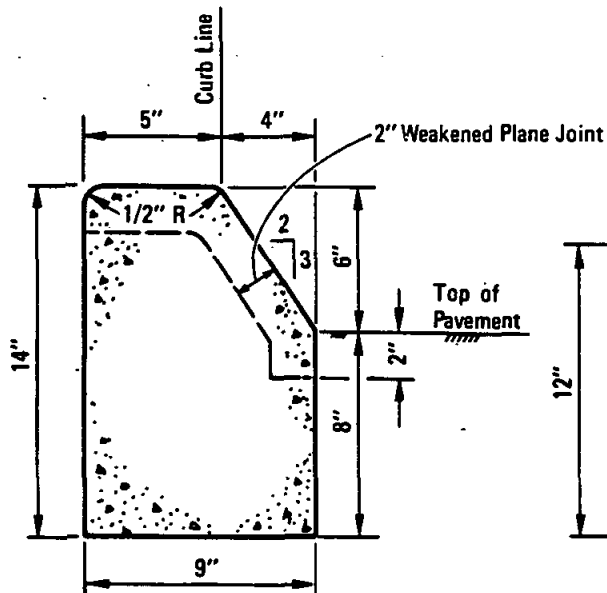
DIKES - ASPHALT CONCRETE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

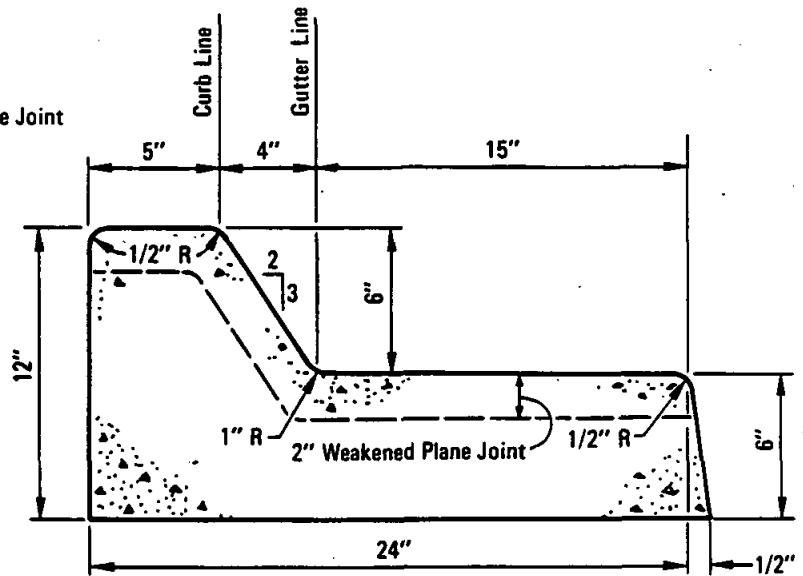
Alfred A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER

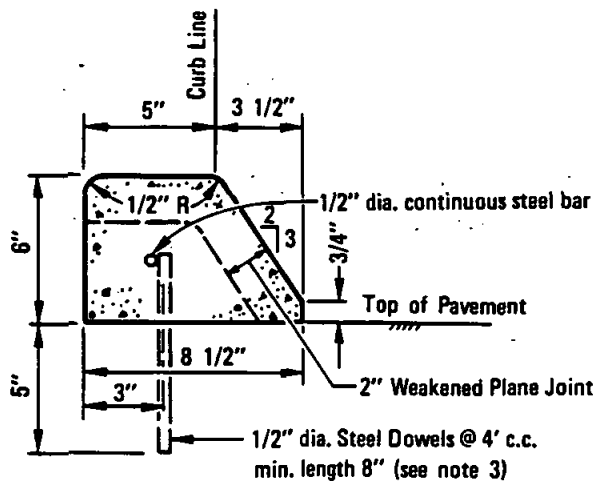
G-5



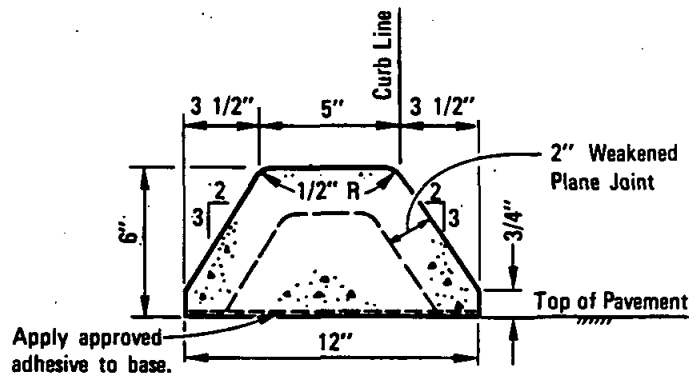
B-1
AREA = 0.79 SQ.FT.



B-2
AREA = 1.29 SQ.FT.



B-3
AREA = 0.29 SQ.FT.



B-4
AREA = 0.35 SQ.FT.

NOTES

- Concrete shall be 520-C-2500.
- See Standard Drawing G-10 for joint details.
- 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. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

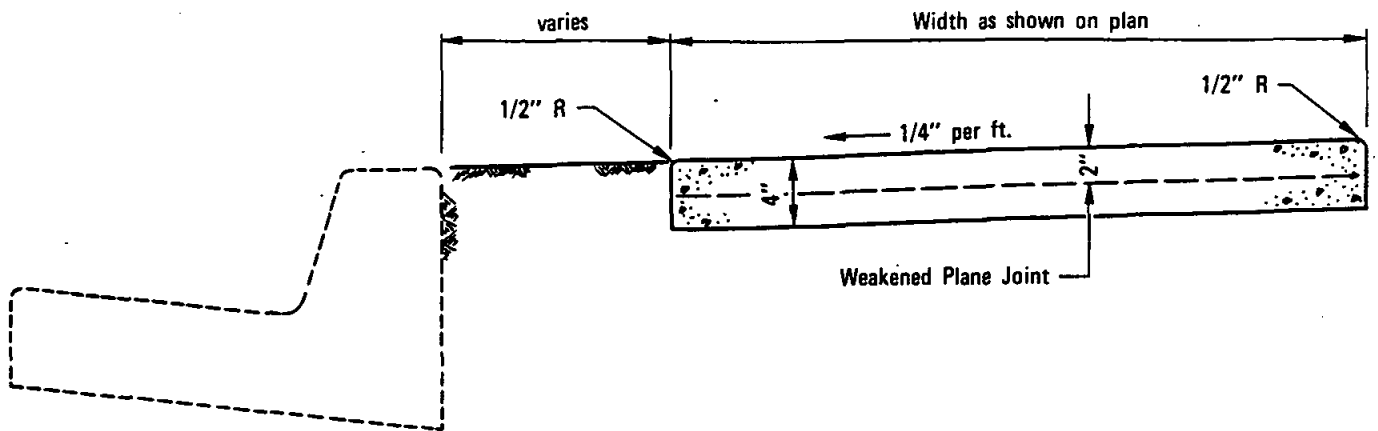
SAN DIEGO REGIONAL STANDARD DRAWING

**DRAWING
NUMBER**

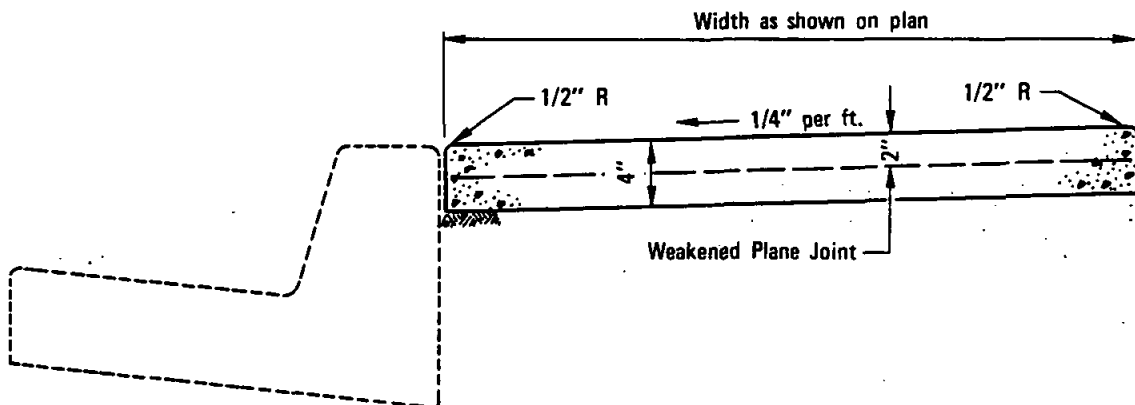
G-6

CURBS AND GUTTER - MEDIANS

Revision	By	Approved	Date
Note 1	<i>CS</i>	<i>P.S.</i>	<i>7-77</i>
Conc.	<i>CS</i>	<i>M.B.</i>	<i>5-86</i>



NON-CONTIGUOUS

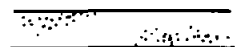


CONTIGUOUS

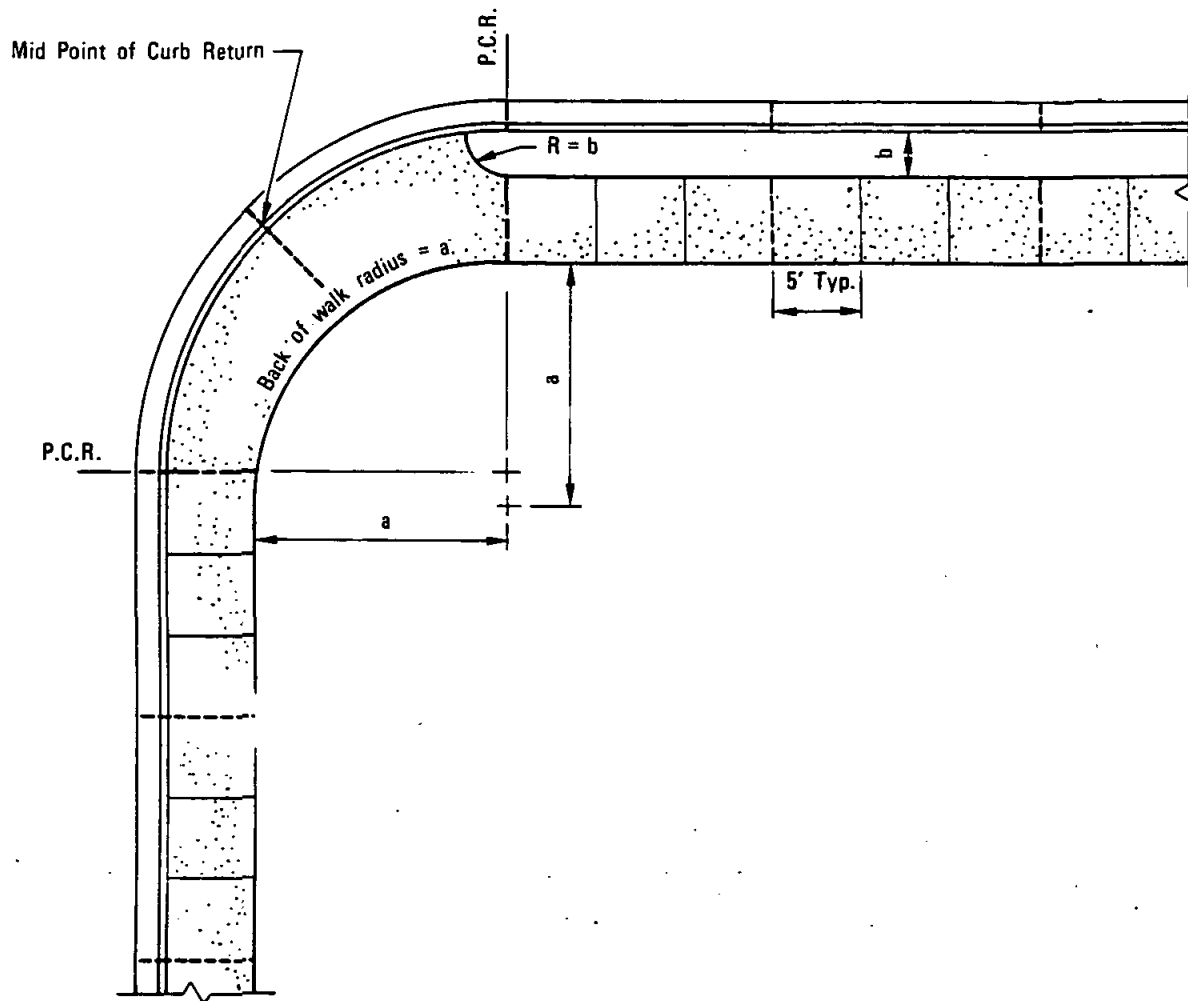
NOTES

- Concrete shall be 520-C-2500.
- See Standard Drawing G-9 and G-10 for joint details.

LEGEND ON PLANS



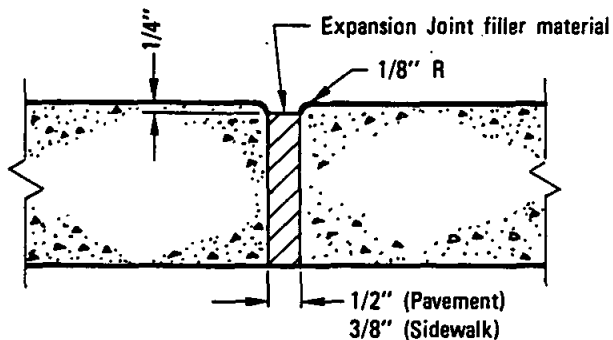
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Thickness	SC	D.S.	2-79	SIDEWALK - TYPICAL SECTIONS		<i>Allen A. Kuehn</i> Dec. 1975
Thickness	SC	M.B.	6-82			Coordinator R.C.E. 19807 Date
Conc.	SC	M.B.	5-86			
Note 2	SC	Q.H.	7-88			
						DRAWING NUMBER G-7



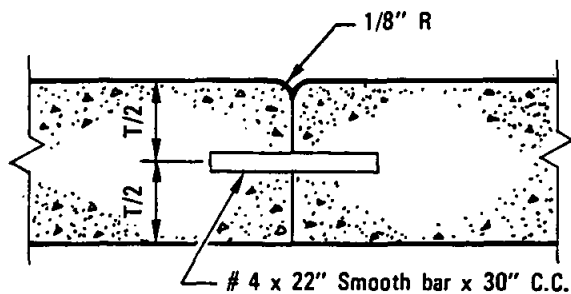
NOTES

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.

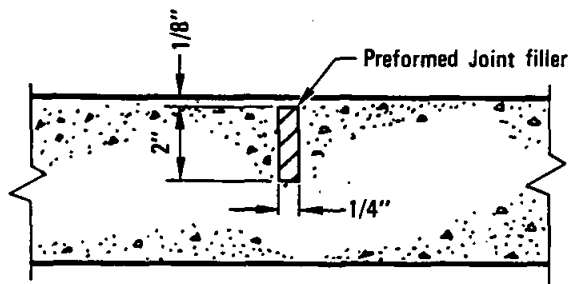
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Note 4	LC	M.B.	5-86			<i>Wendy S. ...</i>	<i>Dec. 1975</i>
				SIDEWALK JOINT LOCATIONS		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	G-9



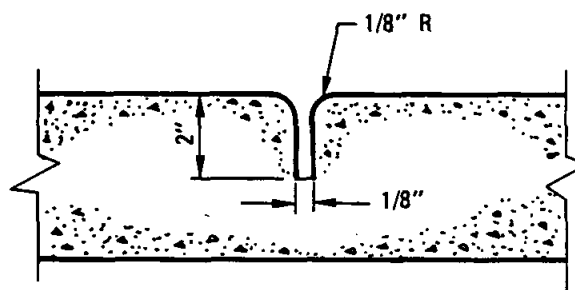
EXPANSION JOINT



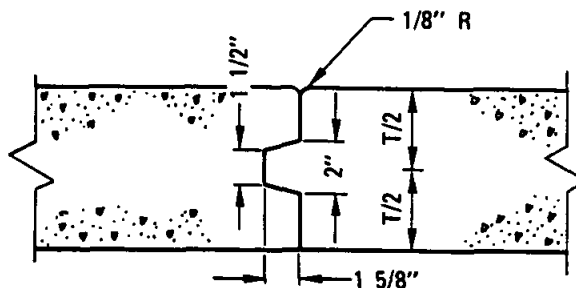
CONTACT JOINT



WEAKENED PLANE JOINT
GUTTER AND PAVEMENT



WEAKENED PLANE JOINT
CURB AND SIDEWALK



KEYED JOINT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

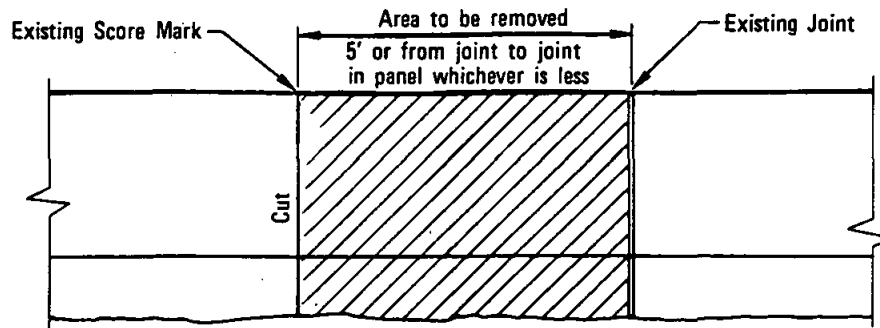
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE JOINT DETAILS

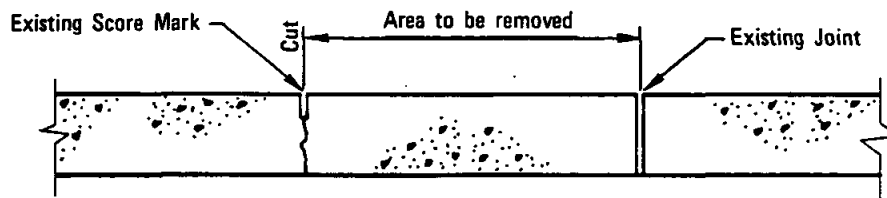
Revision	By	Approved	Date
Radius	SC	O. S.	2-79
Notations	SC	G. H.	7-88

DRAWING
NUMBER

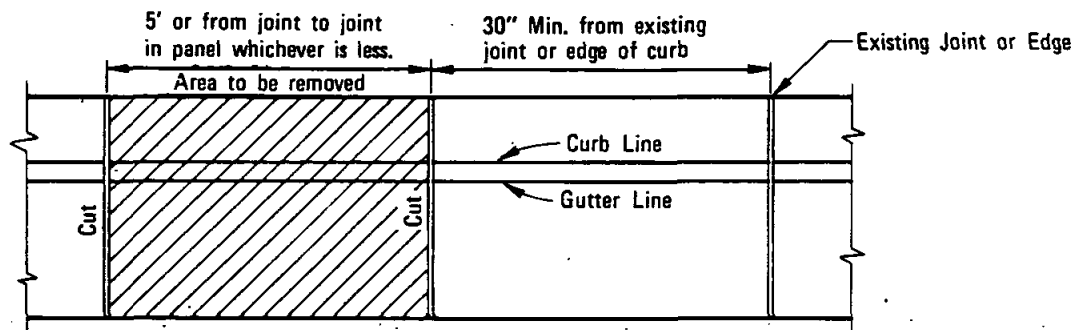
G-10



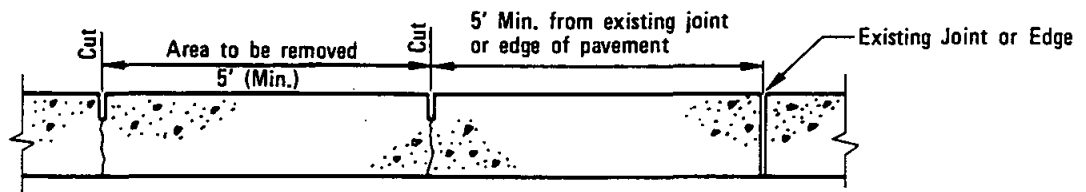
SIDEWALK PLAN



SIDEWALK SECTION



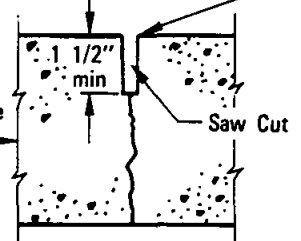
CURB PLAN



PAVEMENT SECTION

Remaining edge to be smooth and true with no shatter.

Portland cement concrete to be removed



**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
Pvmt. min.	78.3.	5-86	
Notes	9.4	9/88	

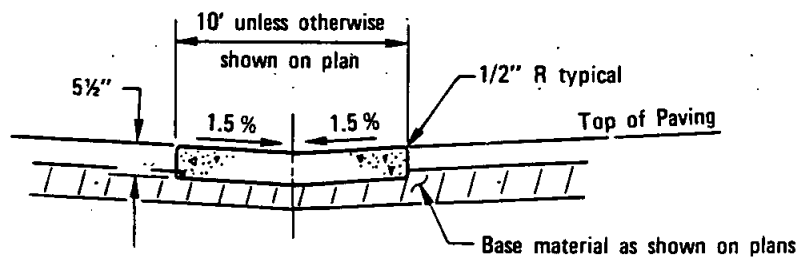
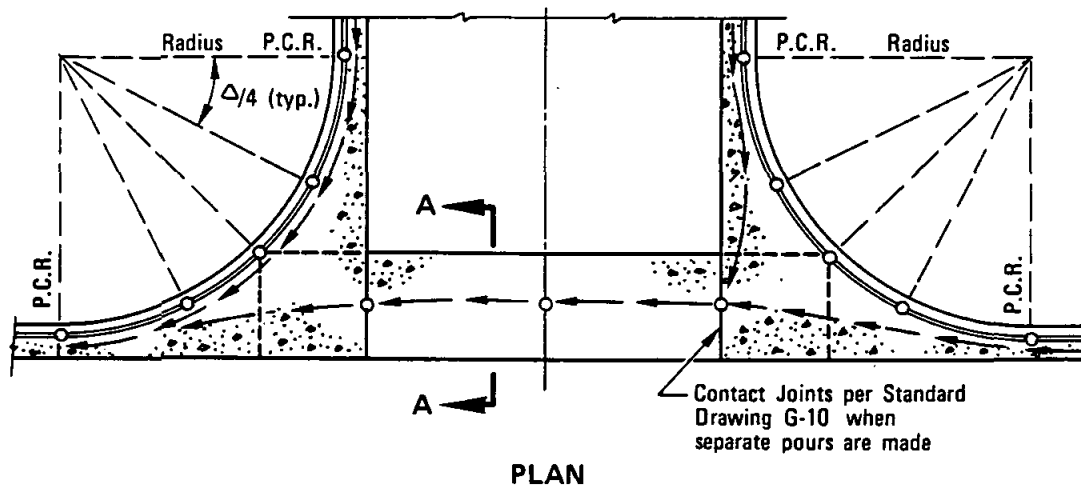
SAN DIEGO REGIONAL STANDARD DRAWING

**PORTLAND CEMENT CONCRETE CURB,
GUTTER, SIDEWALK AND PAVEMENT
REMOVAL AND REPLACEMENT**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen A. Kershner *Dec. 1975*
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 G. Kuehnel Dec. 1975
Coordinator H.C.E. 19807 Date

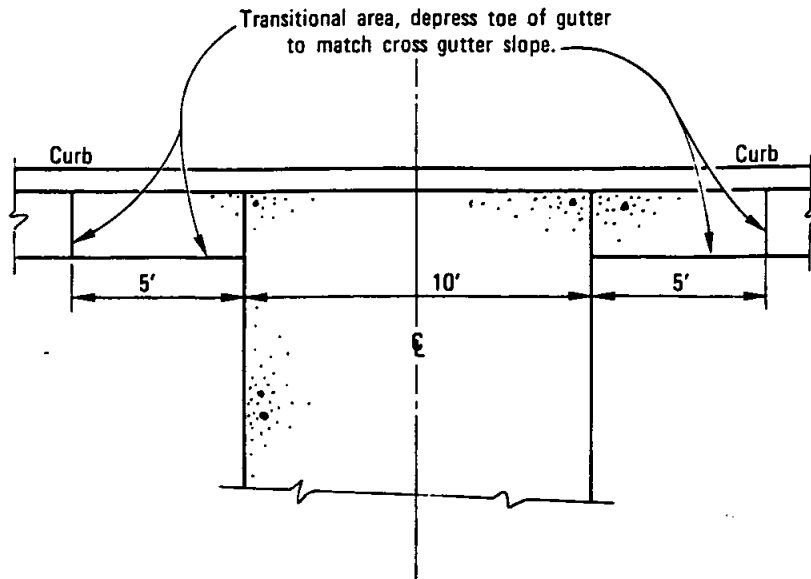
SAN DIEGO REGIONAL STANDARD DRAWING

CROSS GUTTER

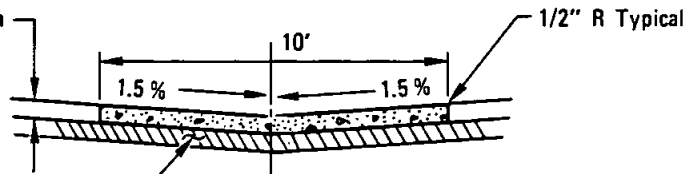
Revision	By	Approved	Date
Thickness	SC	D.S.	7-79
Note 1	TRF	M.B.	10-82
Note 6	SC	M.B.	5-86

DRAWING
NUMBER

G-12



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
Thickness	TR	M.B.	10-82
Conc.	TR	M.B.	10-82

SAN DIEGO REGIONAL STANDARD DRAWING

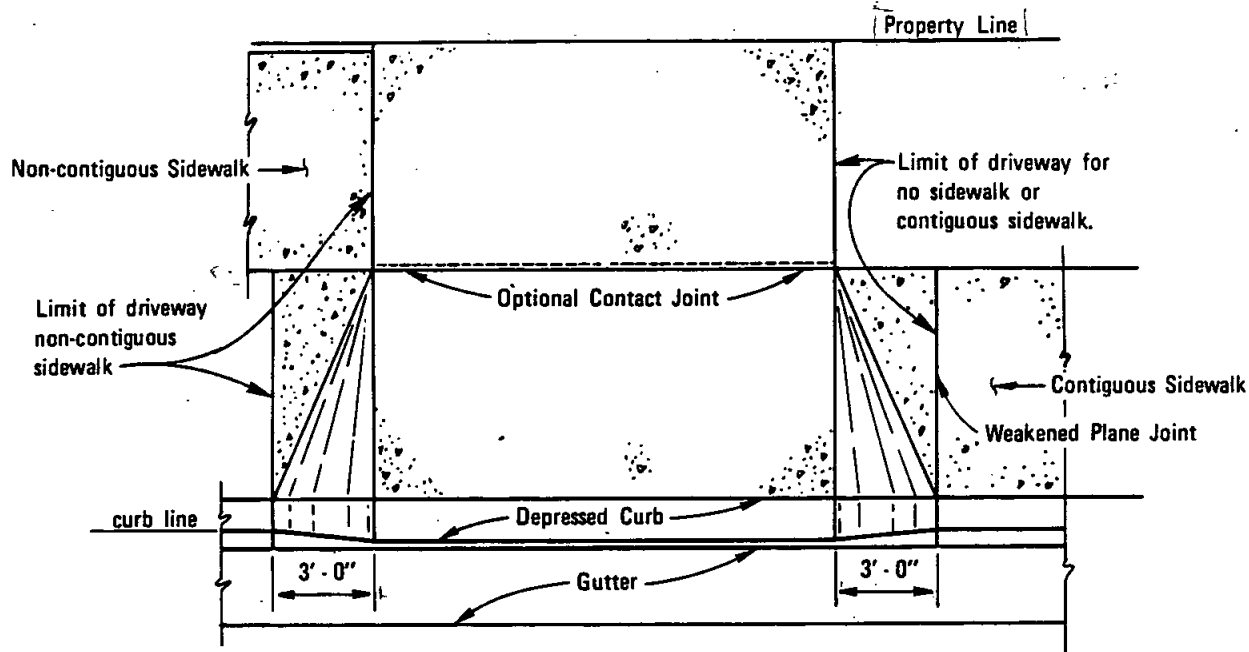
MID-BLOCK CROSS GUTTER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

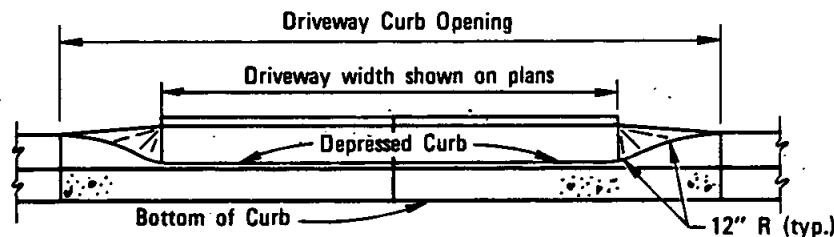
Alfred A. Knechtel Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER

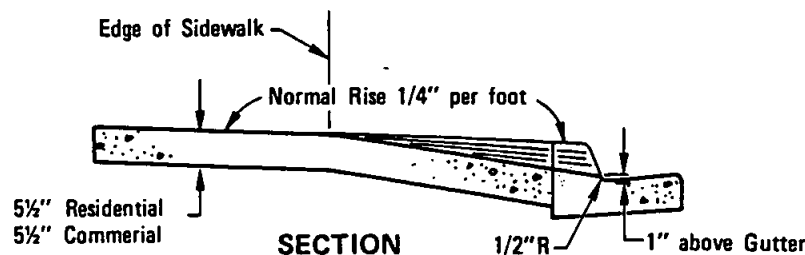
G-13



PLAN



ELEVATION

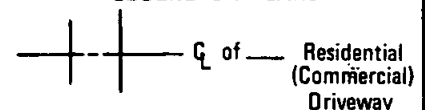


SECTION

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)
5. See Standard Drawings G-2 and G-10 for curb and joint details.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

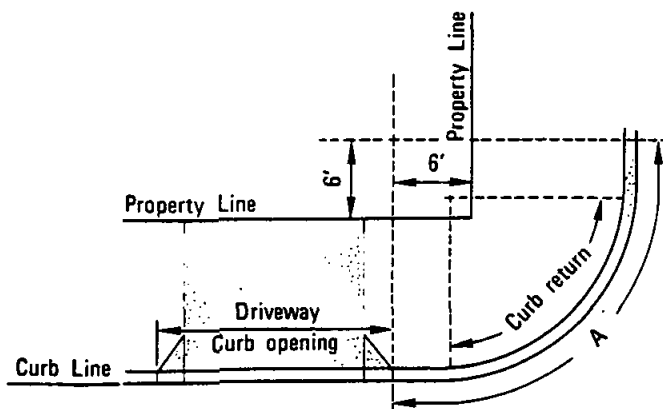
Alfred P. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **G-14**

SAN DIEGO REGIONAL STANDARD DRAWING

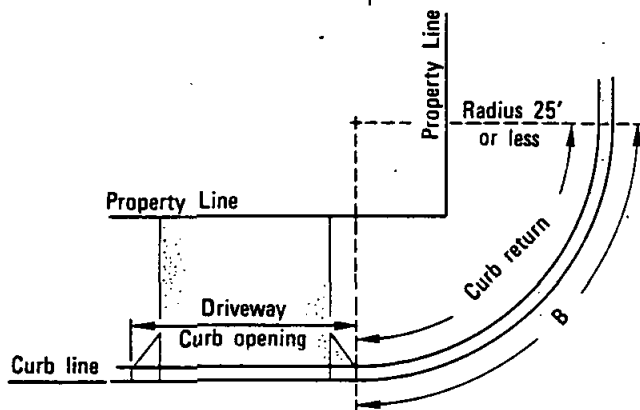
CONCRETE DRIVEWAYS

Revision	By	Approved	Date
Thickness	<i>SC</i>	<i>D.S.</i>	7-79
Thickness	<i>TR</i>	<i>M.B.</i>	6-82
Conc.	<i>TR</i>	<i>M.B.</i>	10-82
Limits	<i>SC</i>	<i>M.B.</i>	5-86
Notations	<i>SC</i>	<i>D.H.</i>	7-88



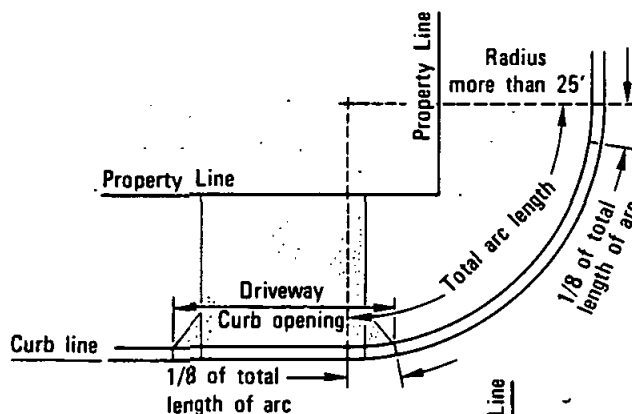
REQUIREMENT 1

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.



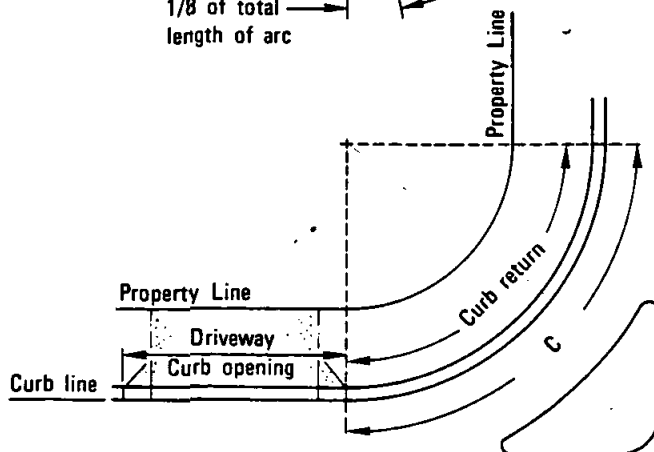
REQUIREMENT 2

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
Reqmt. 3	SC	M.B.	5-86

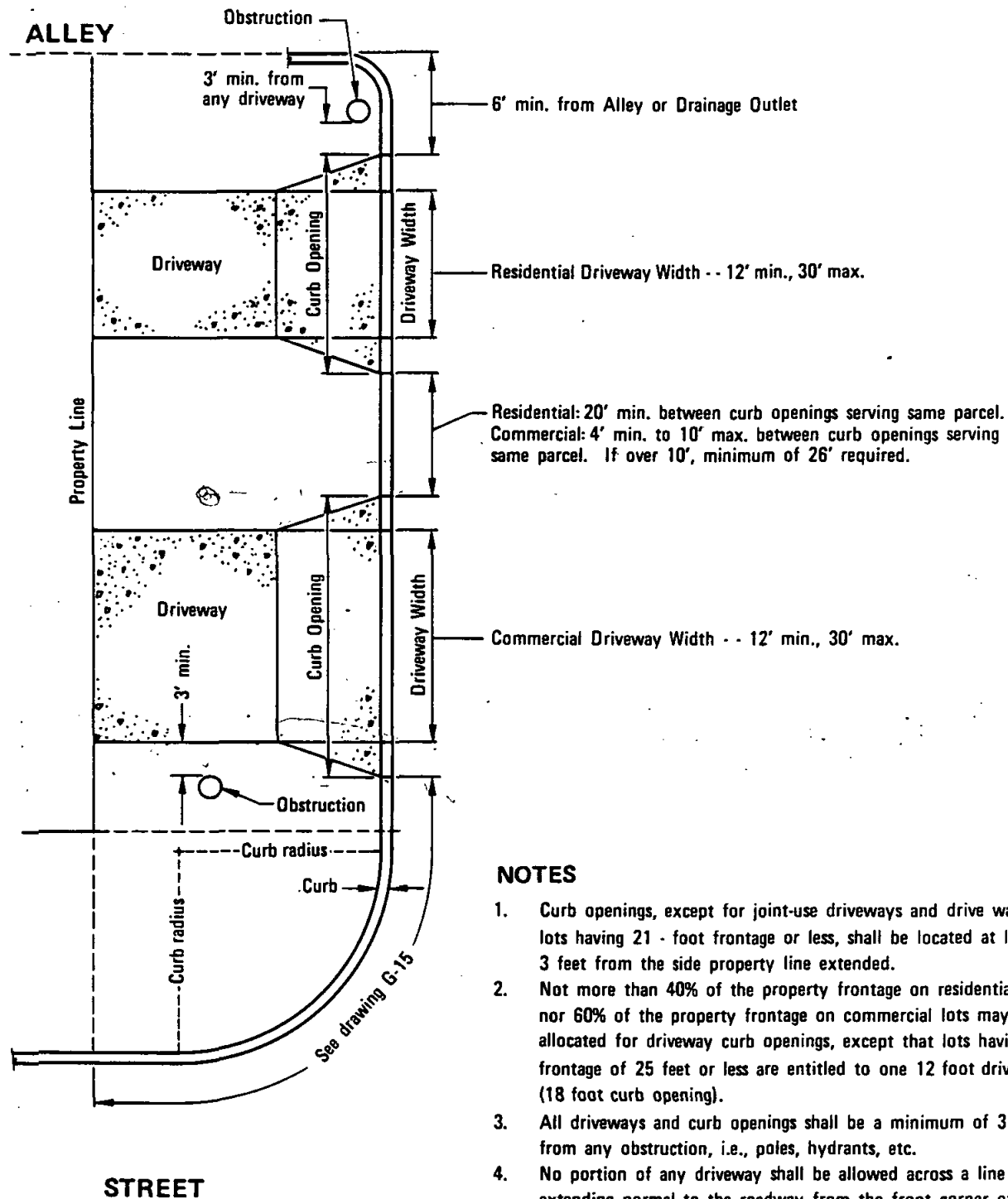
SAN DIEGO REGIONAL STANDARD DRAWING

DRIVEWAY LOCATION - ADJACENT TO CURB RETURNS AND STREET LINES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allen G. Kerschbaum *Dec. 1975*
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

Allan D. Kershner *Dec. 1975*
Coordinator R.C.E. 19807 Date

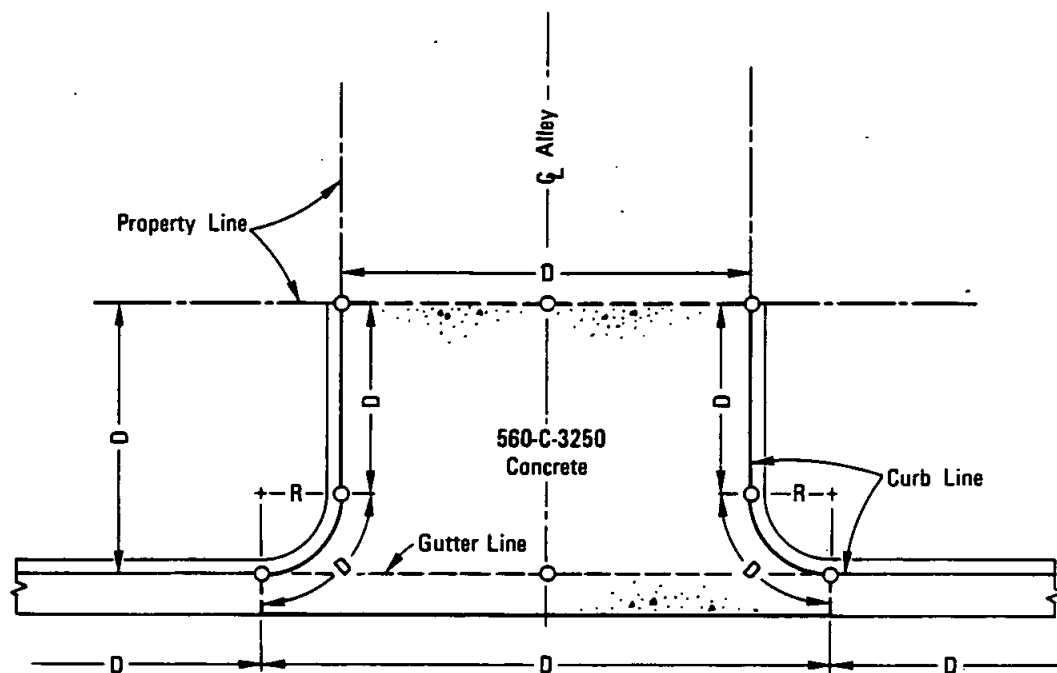
DRAWING
NUMBER

G-16

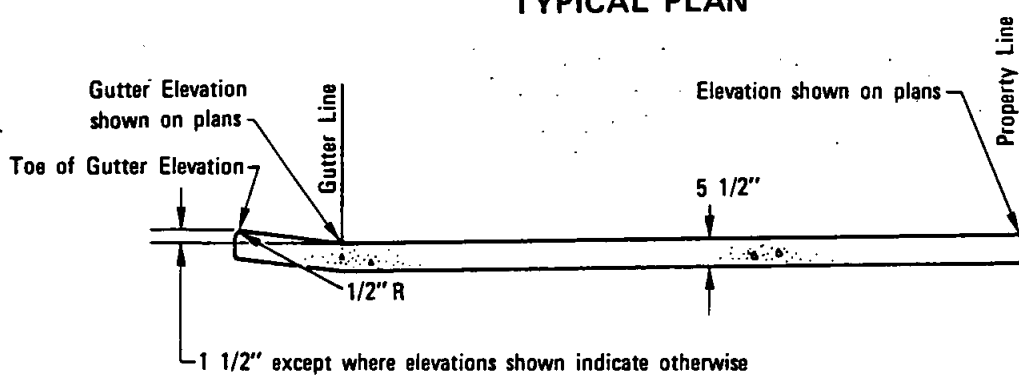
SAN DIEGO REGIONAL STANDARD DRAWING

**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).
5. --- = 1/2" expansion joints.

LEGEND ON PLANS



Revision	By	Approved	Date
Thickness	IC	D.S.	7-79
Conc.	SC	M.B.	5-86
Note 5	SC	G.H.	7-88

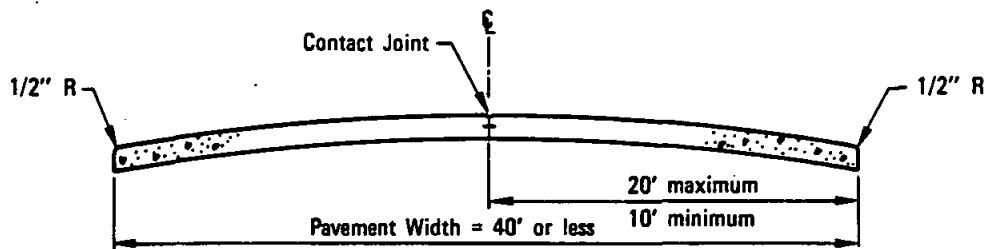
SAN DIEGO REGIONAL STANDARD DRAWING

ALLEY APRON

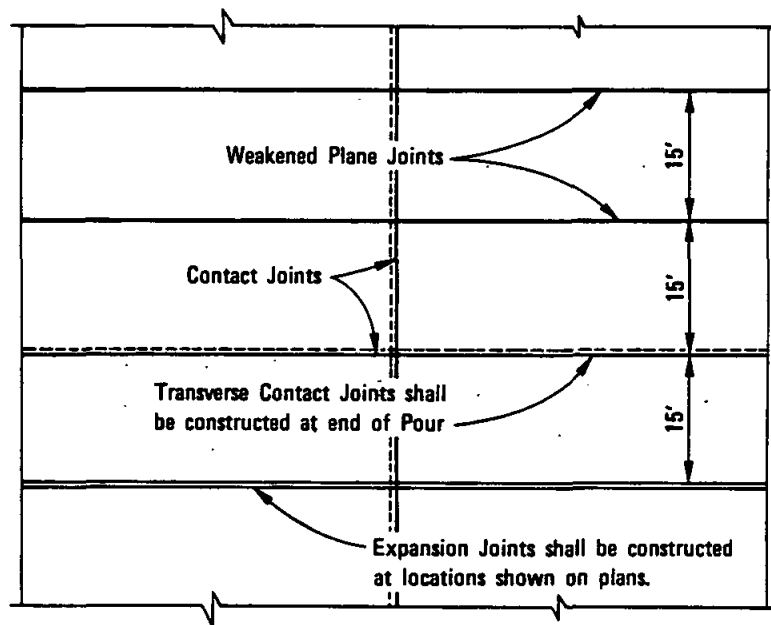
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allan A. Kerschbaum 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

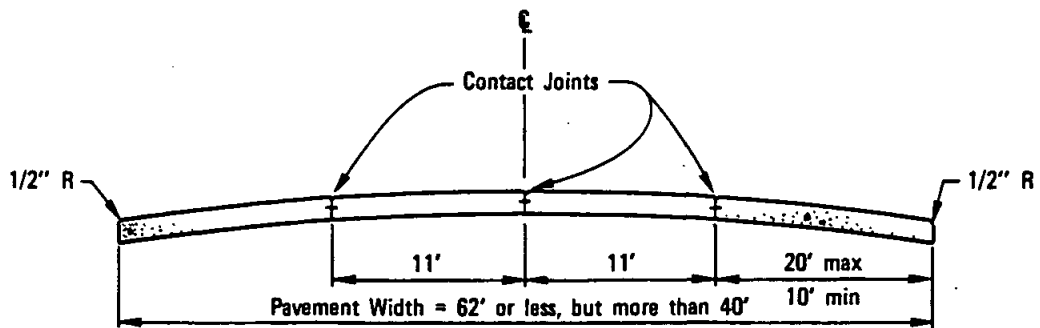
Allan A. Keshner *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **G-18**

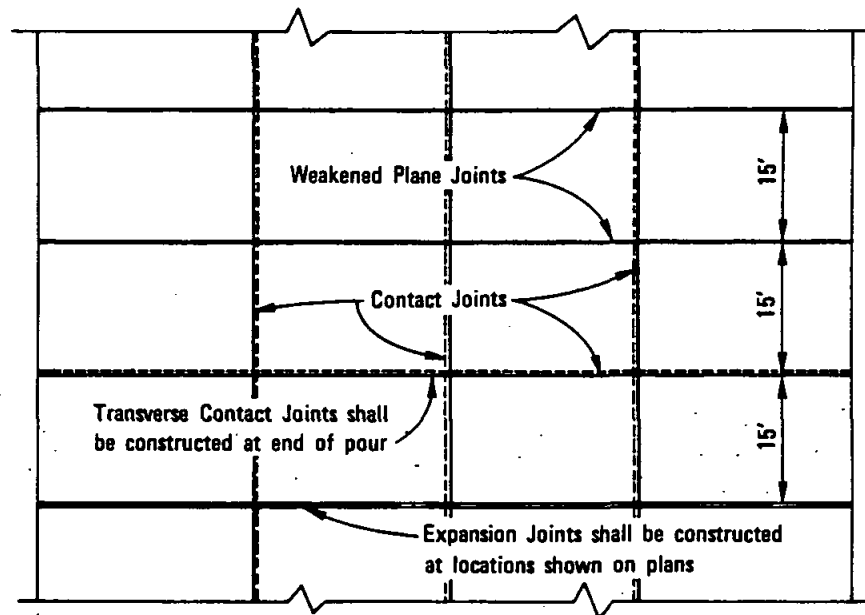
SAN DIEGO REGIONAL STANDARD DRAWING

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

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



TYPICAL SECTION

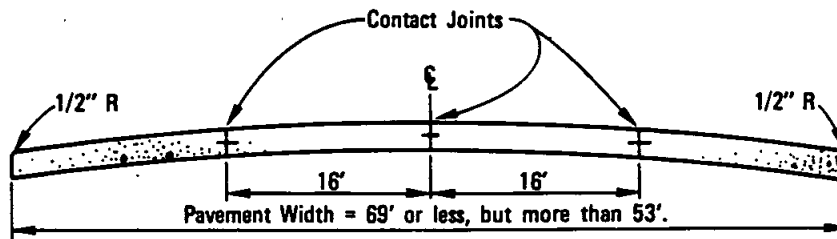


TYPICAL PLAN

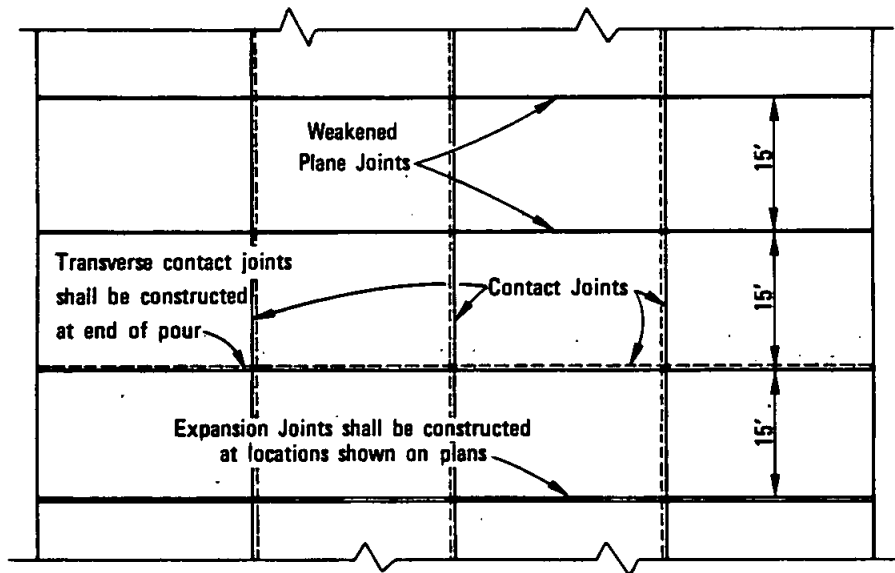
NOTES

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.	RE	MAA	5-84			<i>Allard 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

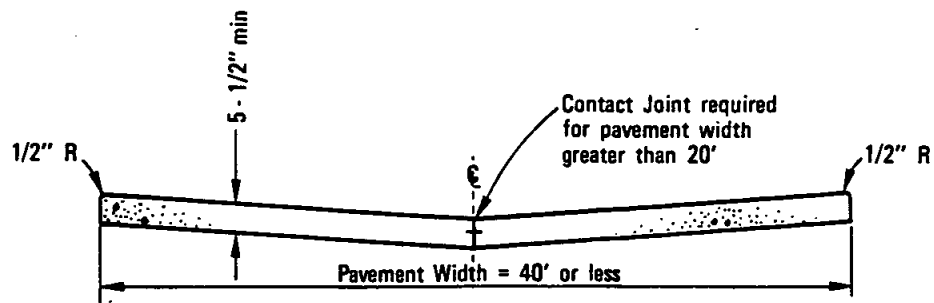
Allen D. Kuehnel *Dec. 1975*
Coordinator R.C.E. 19807 Date

**DRAWING
NUMBER G-20**

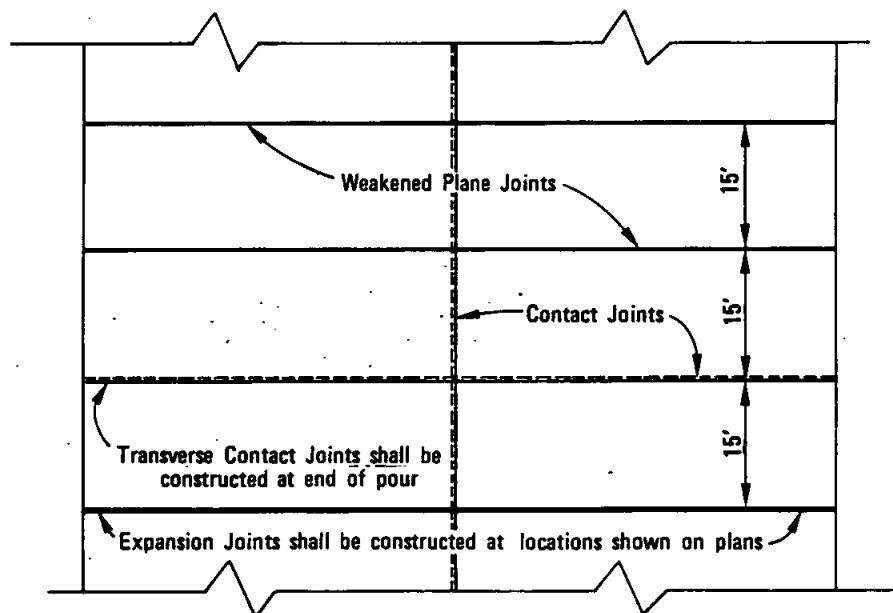
SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE PAVEMENT
WIDTH 53' TO 69'**

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



TYPICAL SECTION

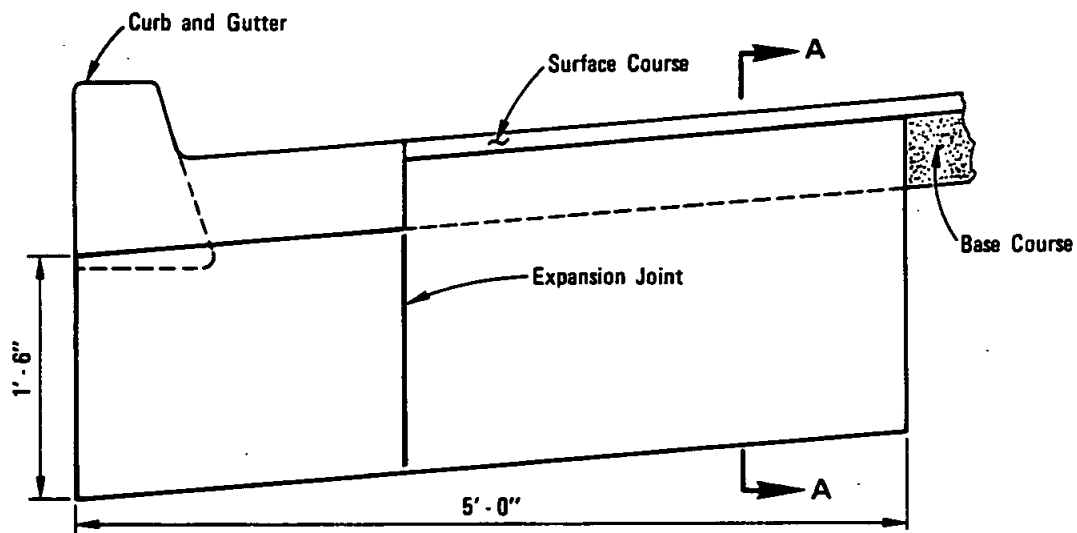


TYPICAL PLAN

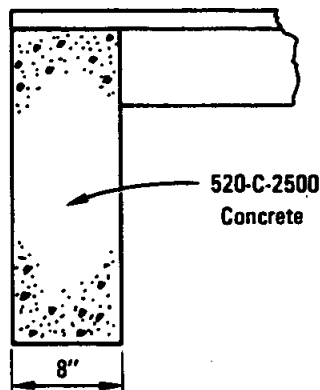
NOTES

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.	<i>R. M. B.</i>		<i>5-86</i>			<i>Allen A. Kershner</i>	<i>Dec. 1975</i>
				CONCRETE PAVEMENT, ALLEY SECTION, WIDTH 40' OR LESS		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	G-21

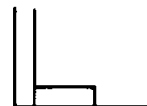


ELEVATION



SECTION A-A

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

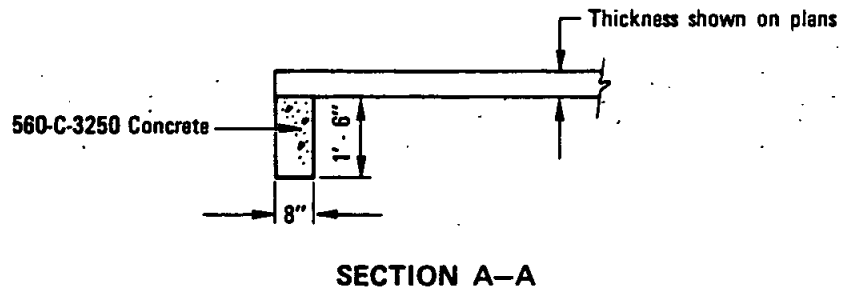
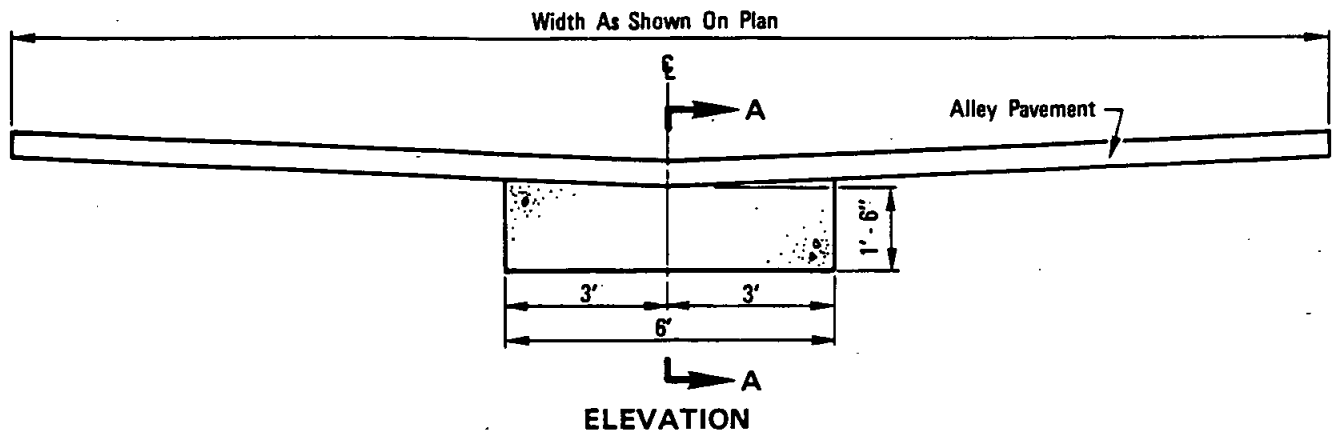
SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL AT END
OF PAVEMENT

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

DRAWING
NUMBER

G-22



LEGEND ON PLANS



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

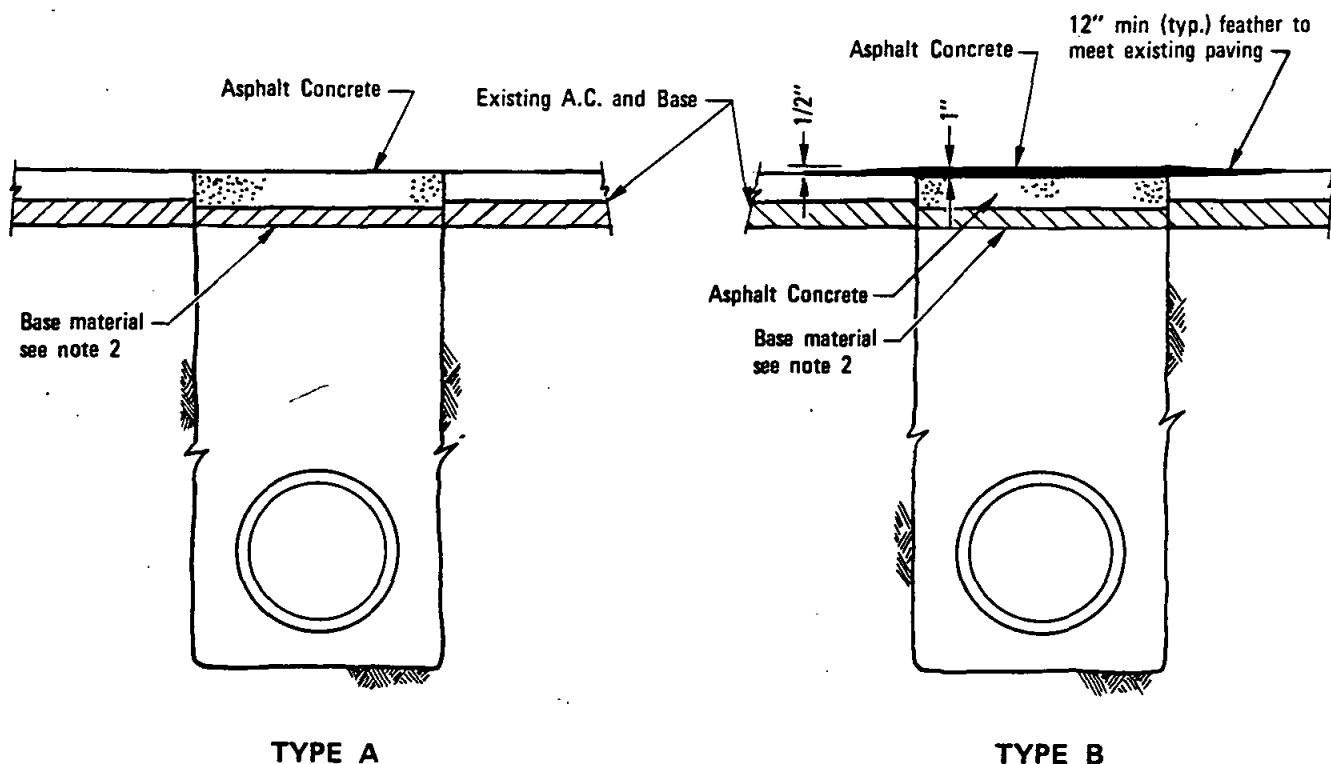
SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL AT END
OF ALLEY PAVEMENT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen G. Kershner *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 J. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date:

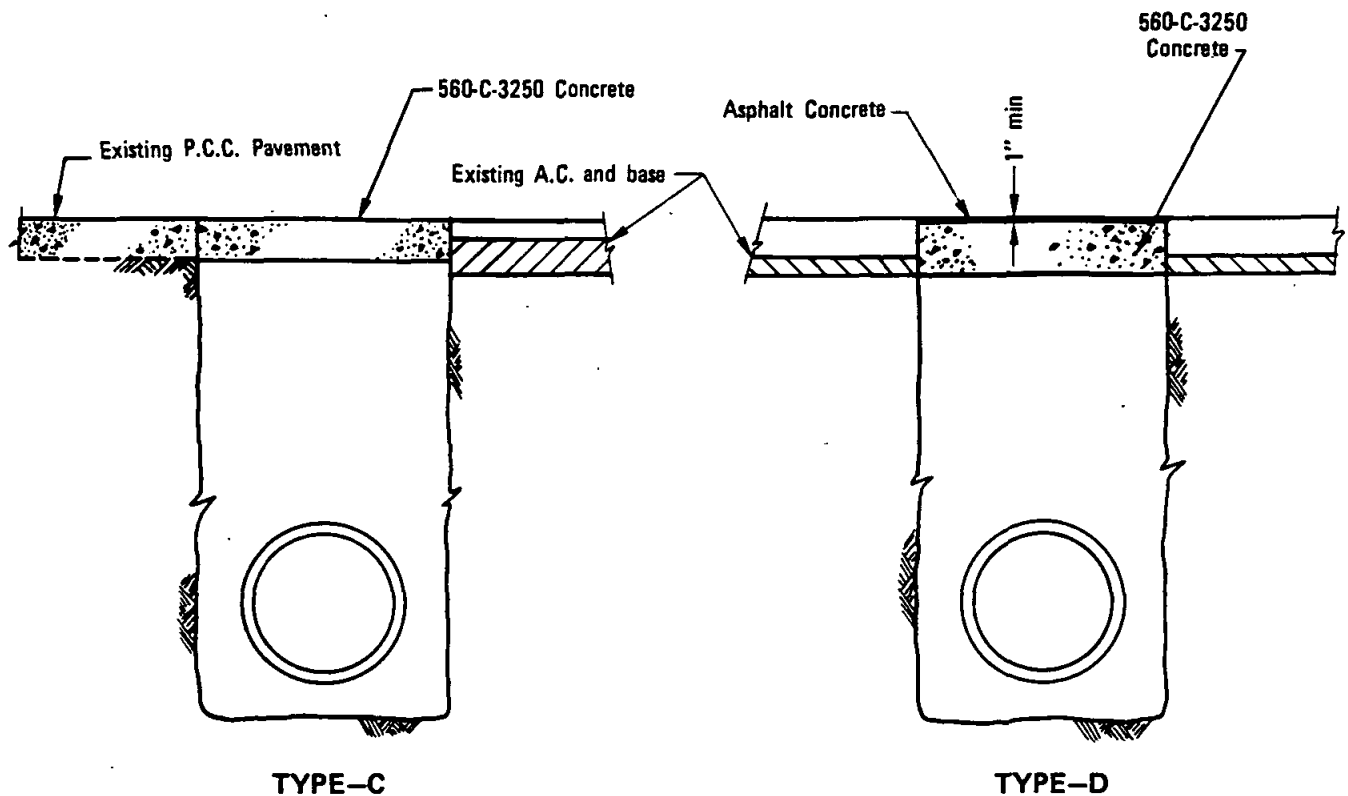
DRAWING
NUMBER

G-24

SAN DIEGO REGIONAL STANDARD DRAWING

TRENCH RESURFACING TYPES A & B

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



GENERAL 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. Sloughing of trench under pavement shall be cause for requiring additional pavement and base.

NOTES TYPE-C

1. Concrete shall be colored black where required to match existing pavement. Method to be specified by Agency.
2. 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

1. A.C. shall be hot plant mix.
2. 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.
3. 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
Overcut	TRP	M.B.	10-82
Conc.	SP	M.B.	5-86

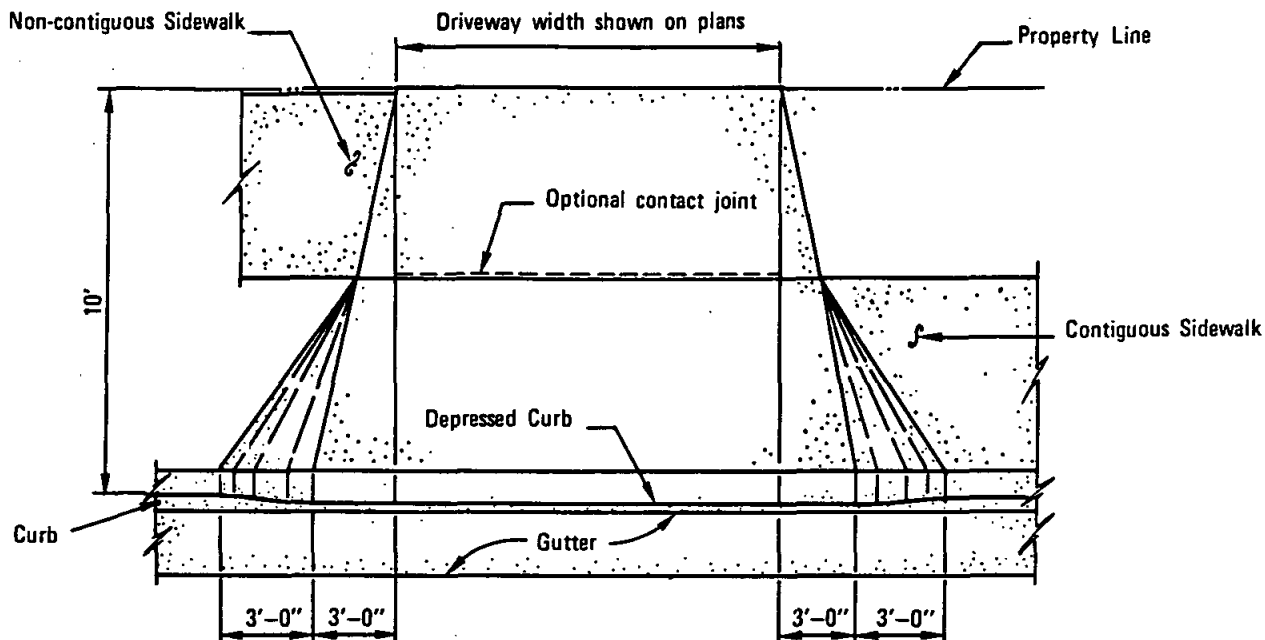
SAN DIEGO REGIONAL STANDARD DRAWING

TRENCH RESURFACING TYPES C & D

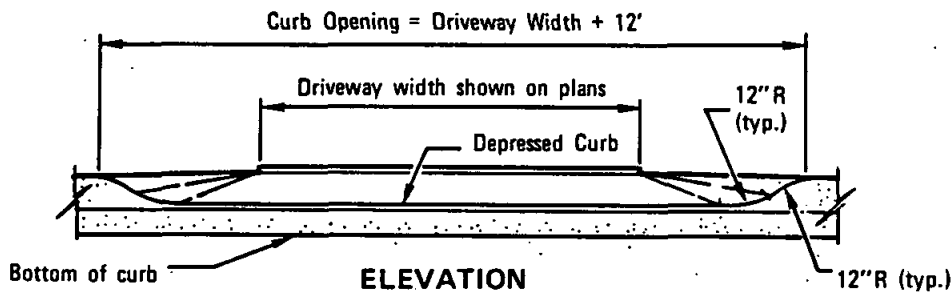
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

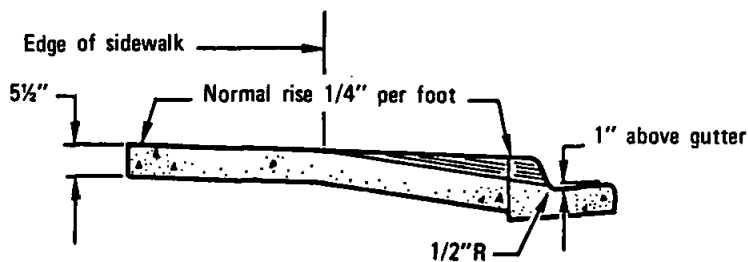
DRAWING
NUMBER G-25



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 Drawing G-15 and G-16 for width and location requirements.
4. See Standard Drawings G-2 and G-10 for curb and joint details.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

SAN DIEGO REGIONAL STANDARD DRAWING

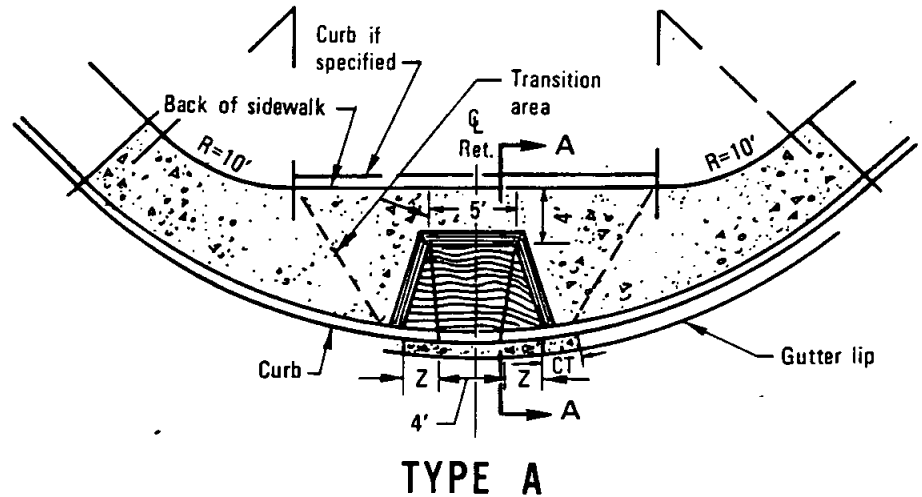
CONCRETE DRIVEWAY COMMERCIAL ALTERNATE

DRAWING
NUMBER

G-26

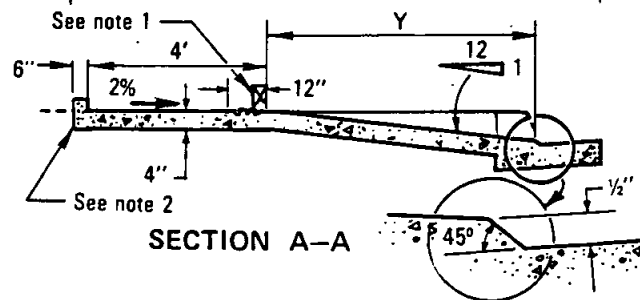
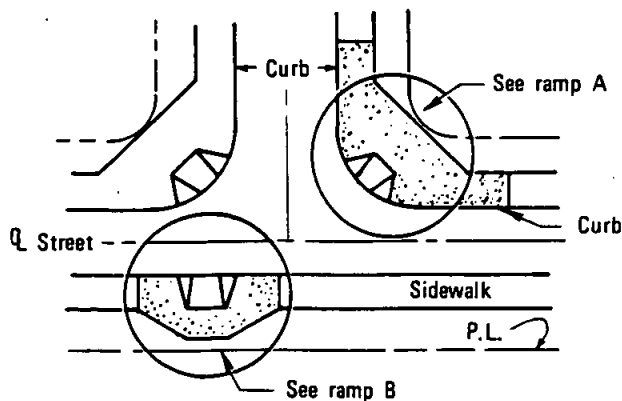
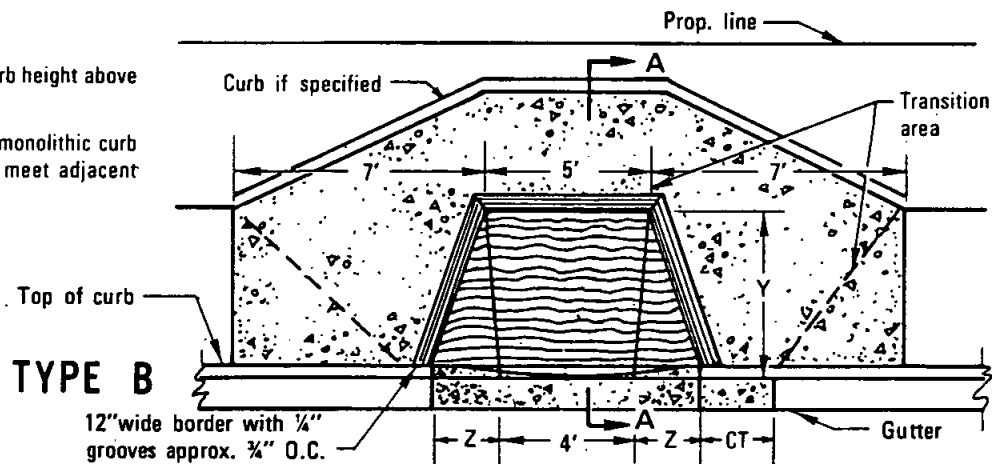
Revision	By	Approved	Date
Conc.	<i>SC</i>	<i>M.B.</i>	5-86
Note 4	<i>SC</i>	<i>A.H.</i>	7-88

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



CONSTRUCTION NOTES

1. Set false header for back of ramp at curb height above gutter grade to maximum 6".
2. Where shown on the plans, construct monolithic curb for retention of street drainage or to meet adjacent improvements.



NOTE

See Standard Drawing G-32 for general notes.

Revision	By	Approved	Date
Notes	<i>a.H.</i>		9/88

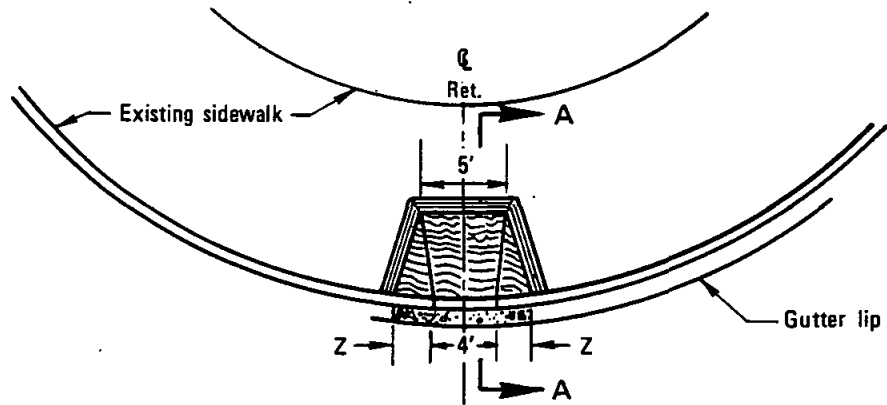
SAN DIEGO REGIONAL STANDARD DRAWING

**PEDESTRIAN RAMP
TYPES A AND B
(NEW CONSTRUCTION)**

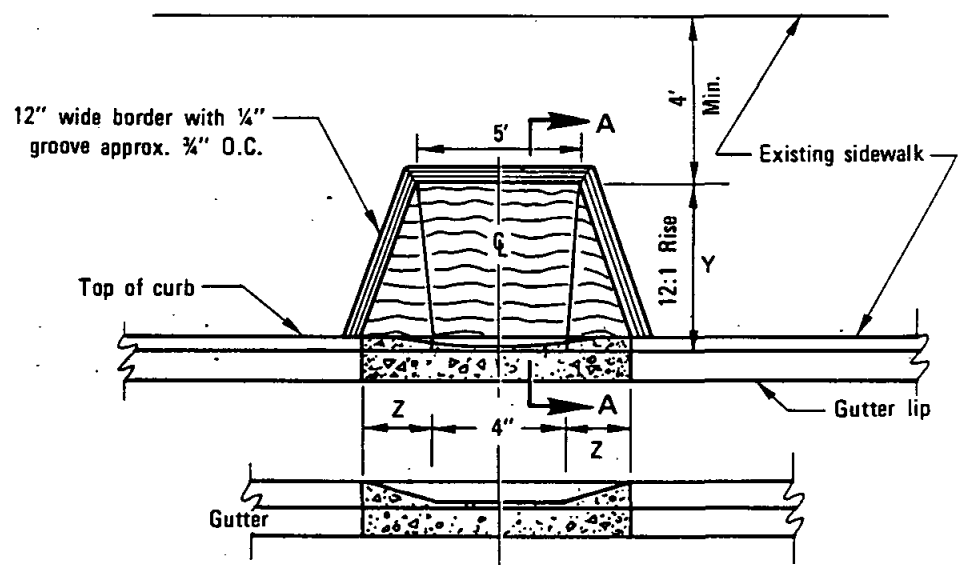
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
m.B. B... 4-25-86
Coordinator R.C.E. C21133 Date

**DRAWING
NUMBER G-27**

X	Y	Z
Curb Height	Ramp Length	Side Slope
1"	0' - 8"	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"



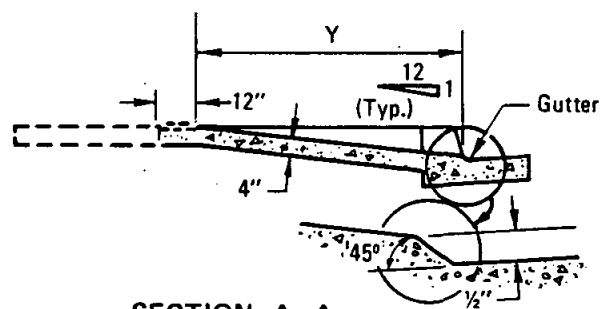
TYPE A-1



TYPE B-1

NOTES

1. See Standard Drawing G-32 for general notes.
2. If inadequate space exists in existing sidewalk to provide 4' minimum behind ramp use Standard Drawing G-30.



SECTION A-A

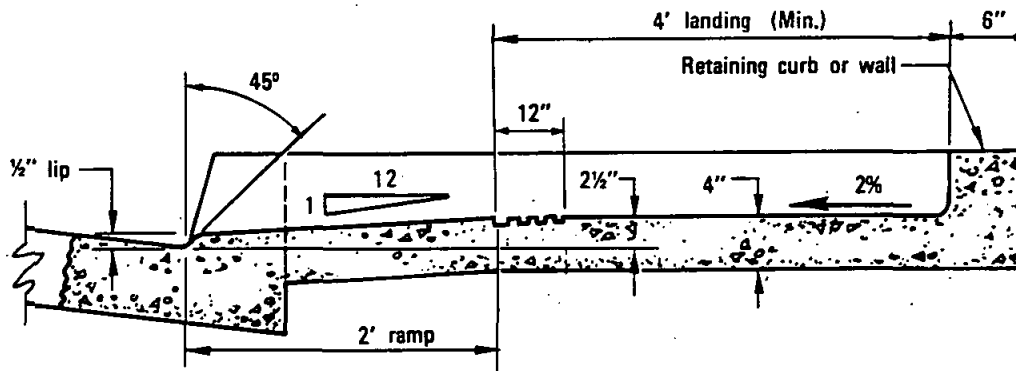
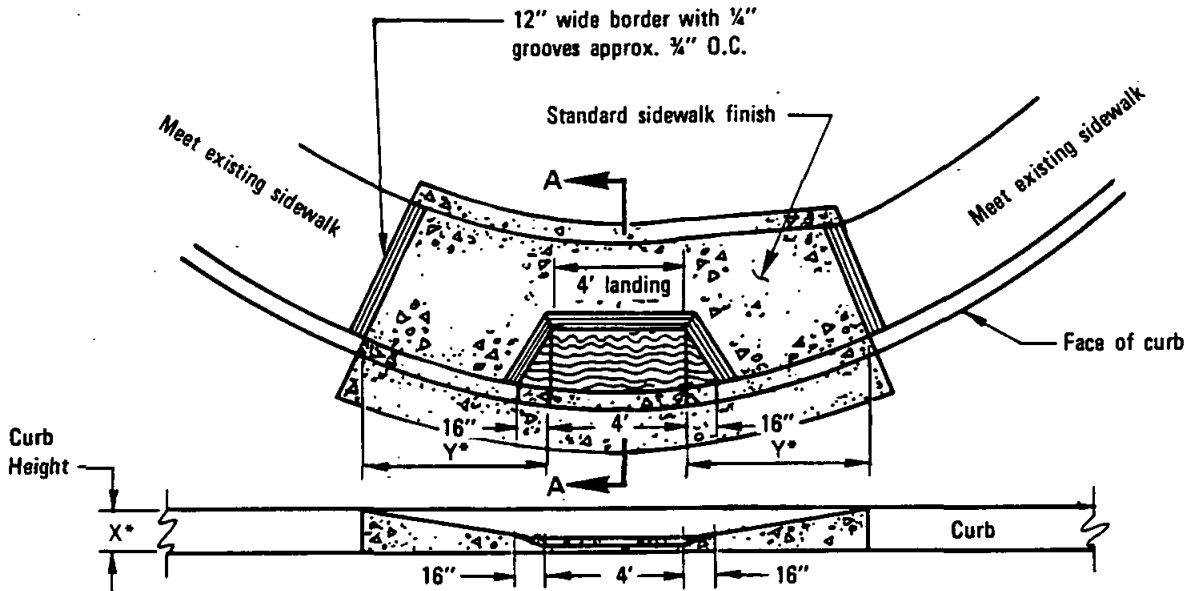
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
m B. J. D. 4-25-86
Coordinator R.C.E. C21133 Date

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTRIAN RAMP TYPES A-1 AND B-1 (IN EXISTING SIDEWALK)

Revision	By	Approved	Date
NOTES	3c	9.14	88

DRAWING
NUMBER G-28



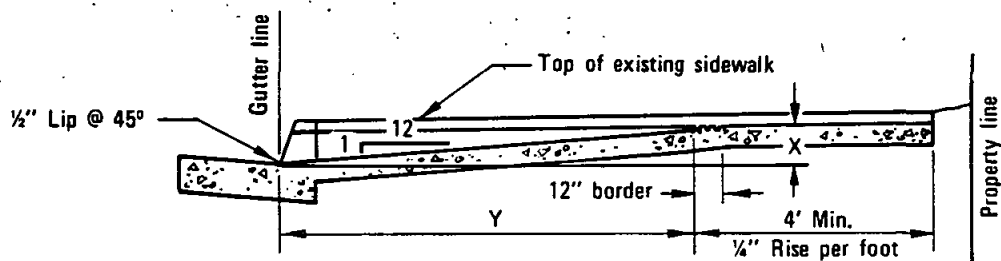
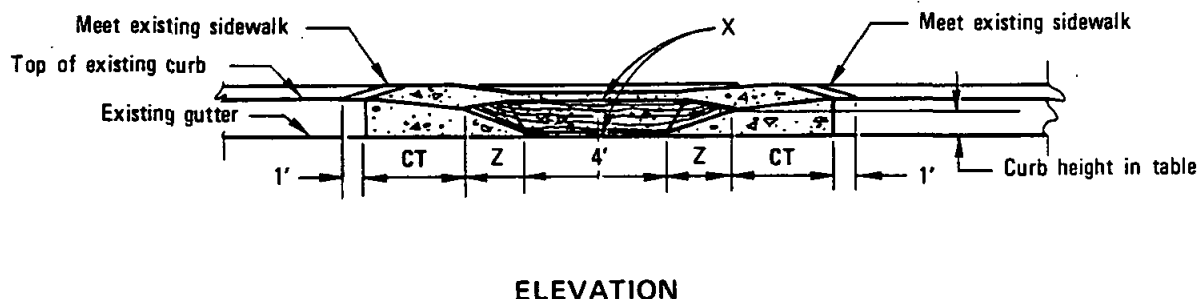
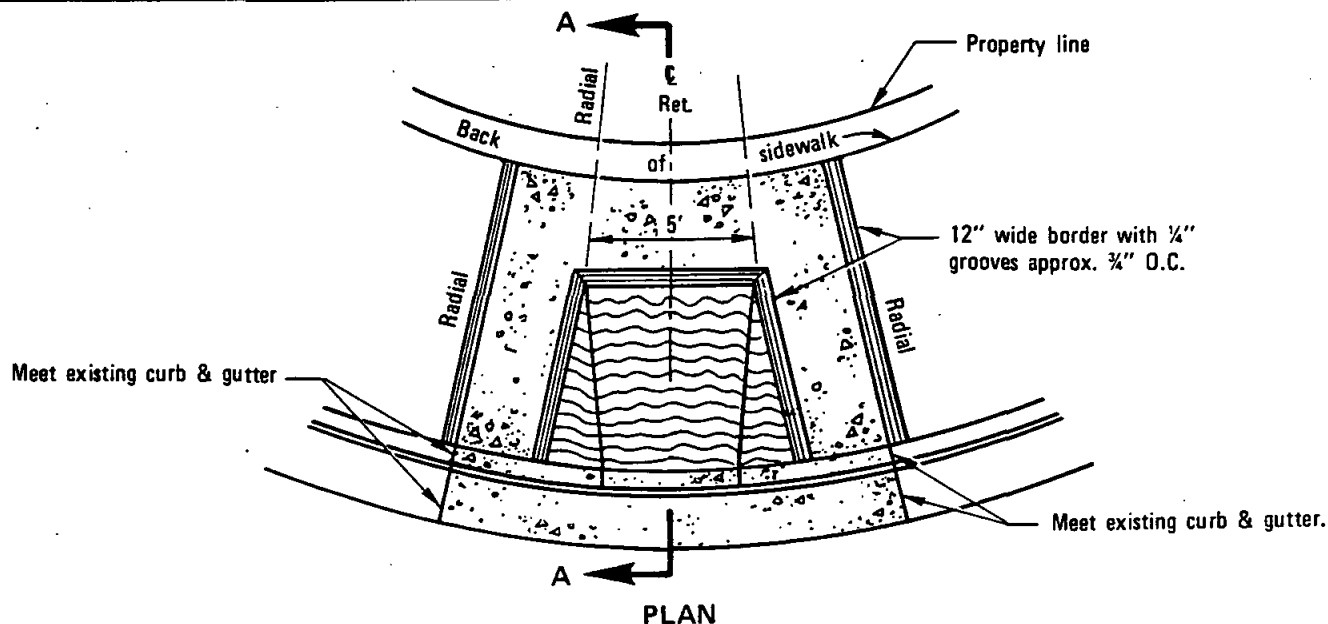
SECTION A-A

NOTES

1. Type C ramps are only to be used to mitigate existing conditions where inadequate right of way exists to use standard drawing G-27, G-28 or G-30 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 <u> </u>
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SECTION A-A

NOTES

1. See Standard Drawing G-32 for general notes.
2. See Standard Drawing G-27 for dimensions X, Y, Z, CT.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER **G-30**

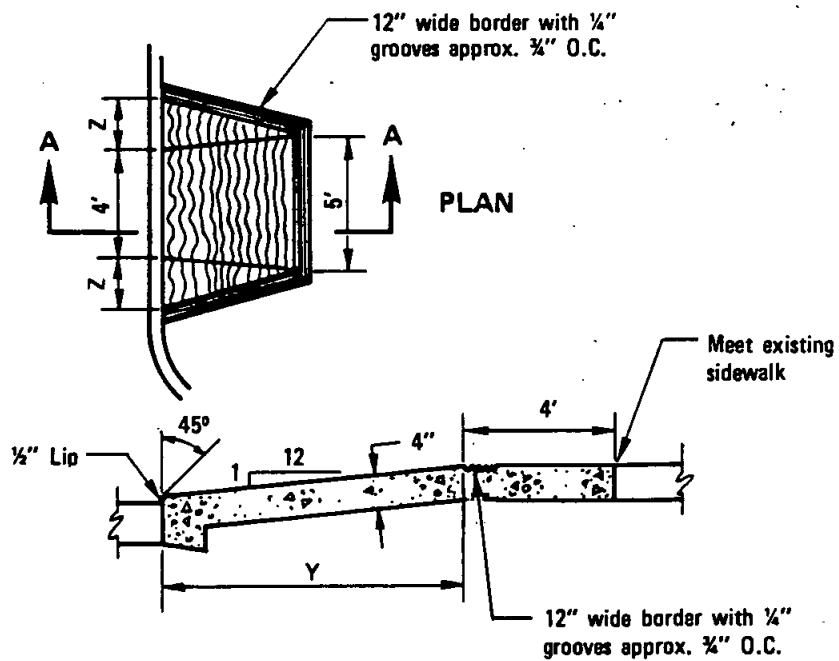
SAN DIEGO REGIONAL STANDARD DRAWING

**PEDESTRIAN RAMP
TYPE C-1
(IN EXISTING SIDEWALK)**

Revision	By	Approved	Date
NOTES	SC	CH	87



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"



SECTION A-A

NOTE

See Standard Drawing G-32 for general notes.

Revision	By	Approved	Date

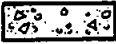
SAN DIEGO REGIONAL STANDARD DRAWING

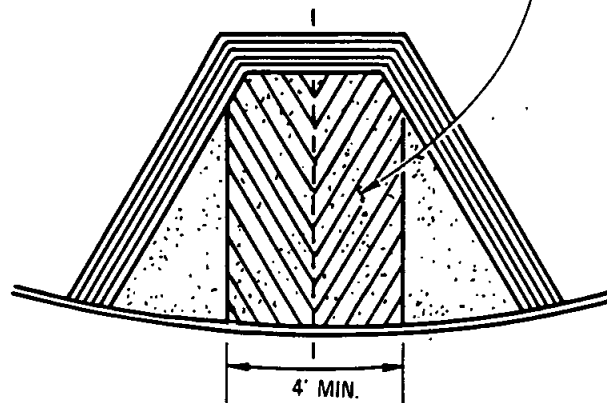
PEDESTRIAN RAMP TYPE D

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

M. Baham 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.
7. Where shown on plans, construct herringbone grooves 1/4" deep x 1/4" wide, 1-1/2" apart. Grooves shall be aligned parallel to crosswalk stripes to direct blind pedestrians into appropriate crosswalk.



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

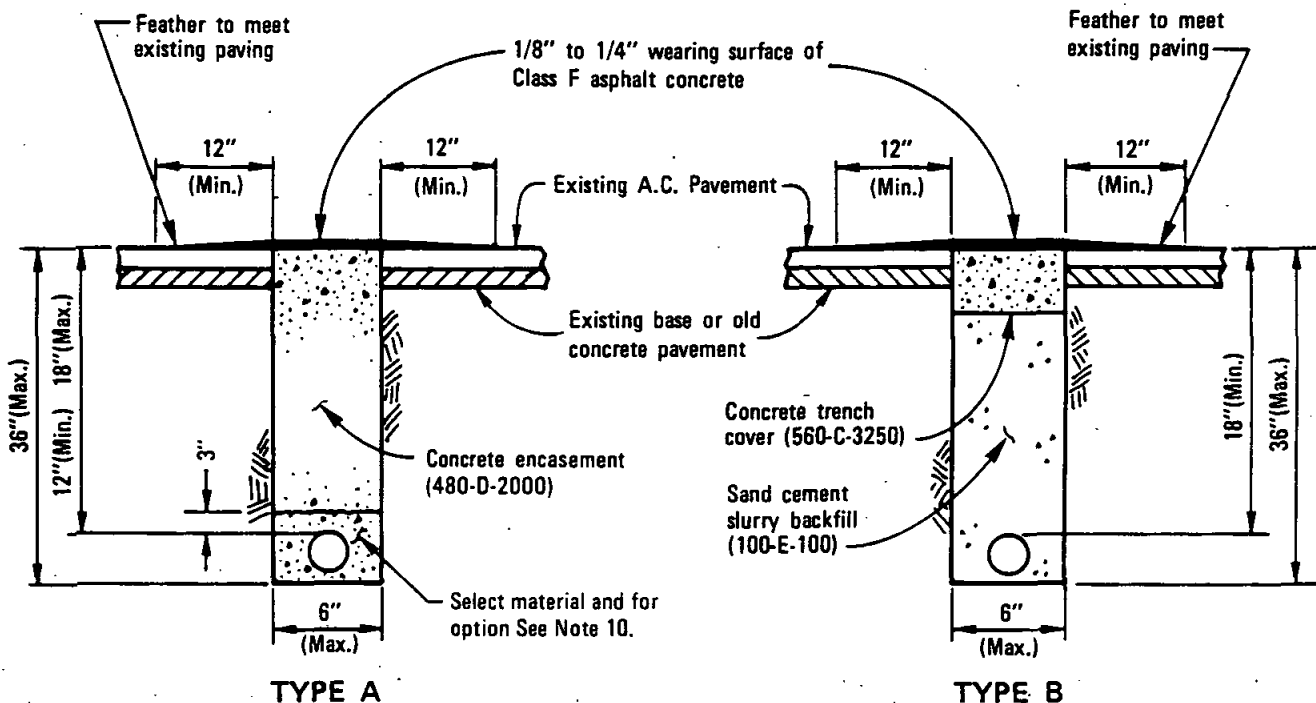
M. Behm 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **G-32**

SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES FOR PEDESTRIAN RAMP

Revision	By	Approved	Date
Note 7	<i>SC</i>	<i>94</i>	<i>9/88</i>



NOTES

1. Concrete encasement or sand cement slurry backfill shall have a maximum slump of 4 inches.
2. Concrete encasement 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 5 1/2 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) (b).
10. Select material with a minimum sand equivalent of 50 shall be backfilled to 3" above the conduit. Concrete encasement (480-D-2000) may be substituted for select material when a cold joint of 8 mil. plastic sheeting is installed 3" above conduit.

Revision	By	Approved	Date
Notes	CA	9/00	

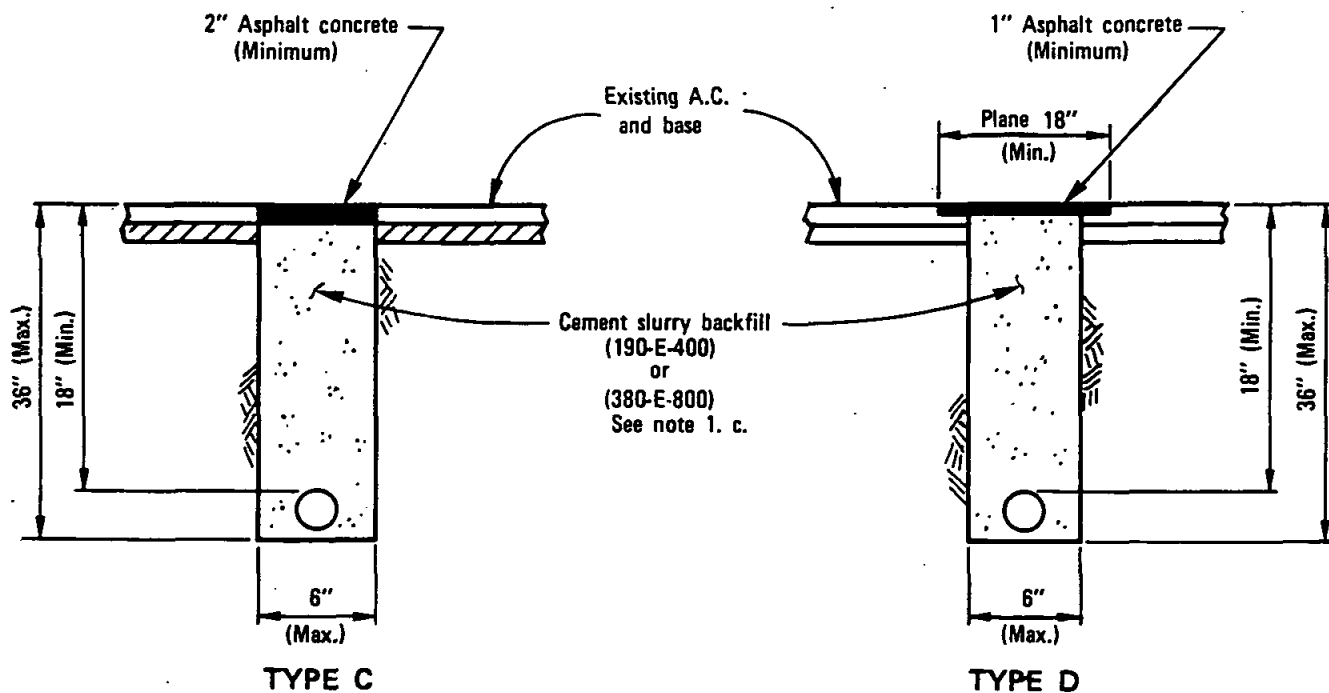
SAN DIEGO REGIONAL STANDARD DRAWING

NARROW TRENCHING TYPES A & B BACKFILL & RESURFACING

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

M. B. B. 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 (380-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

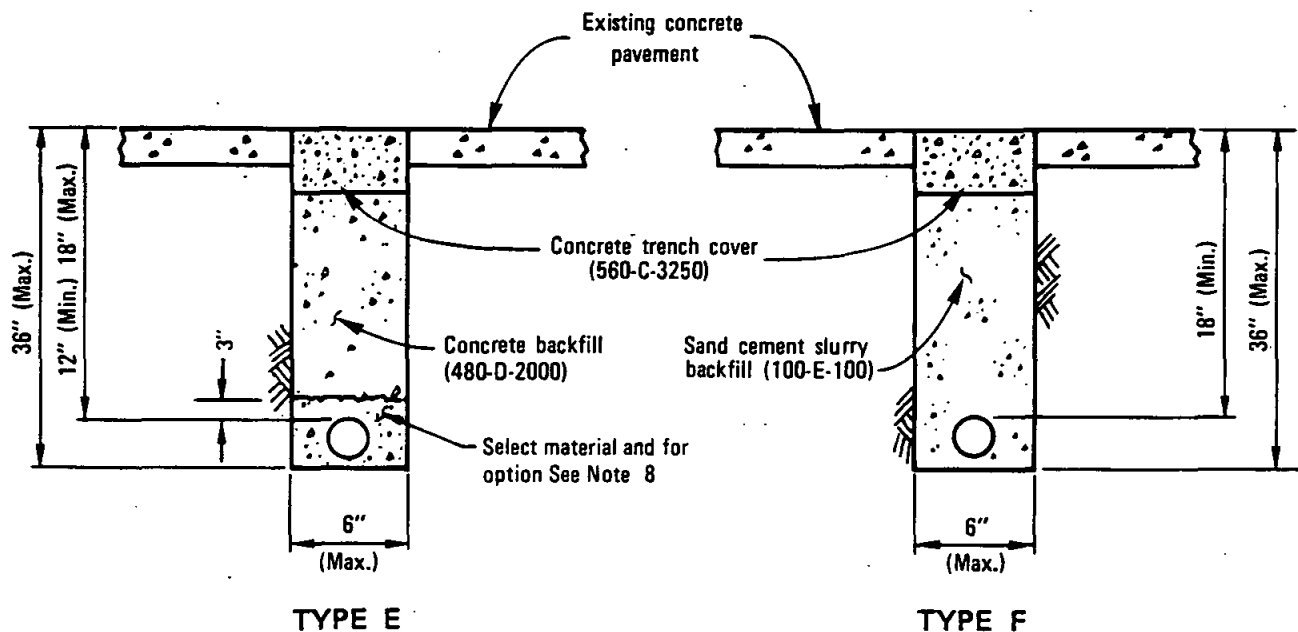
cm. B. D. 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **G-34**

SAN DIEGO REGIONAL STANDARD DRAWING

NARROW TRENCHING TYPES C & D BACKFILL & RESURFACING

Revision	By	Approved	Date
NOTES	SC	A.H.	8-88



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) (b).
8. Select material with a minimum sand equivalent of 50 shall be backfilled to 3" above the conduit. Concrete encasement (480-D-2000) may be substituted for select material when a cold joint of 8 mil. plastic sheeting is installed 3" above conduit.

Revision	By	Approved	Date
Notes 7, 8	Q.H.	Q.H.	7/88

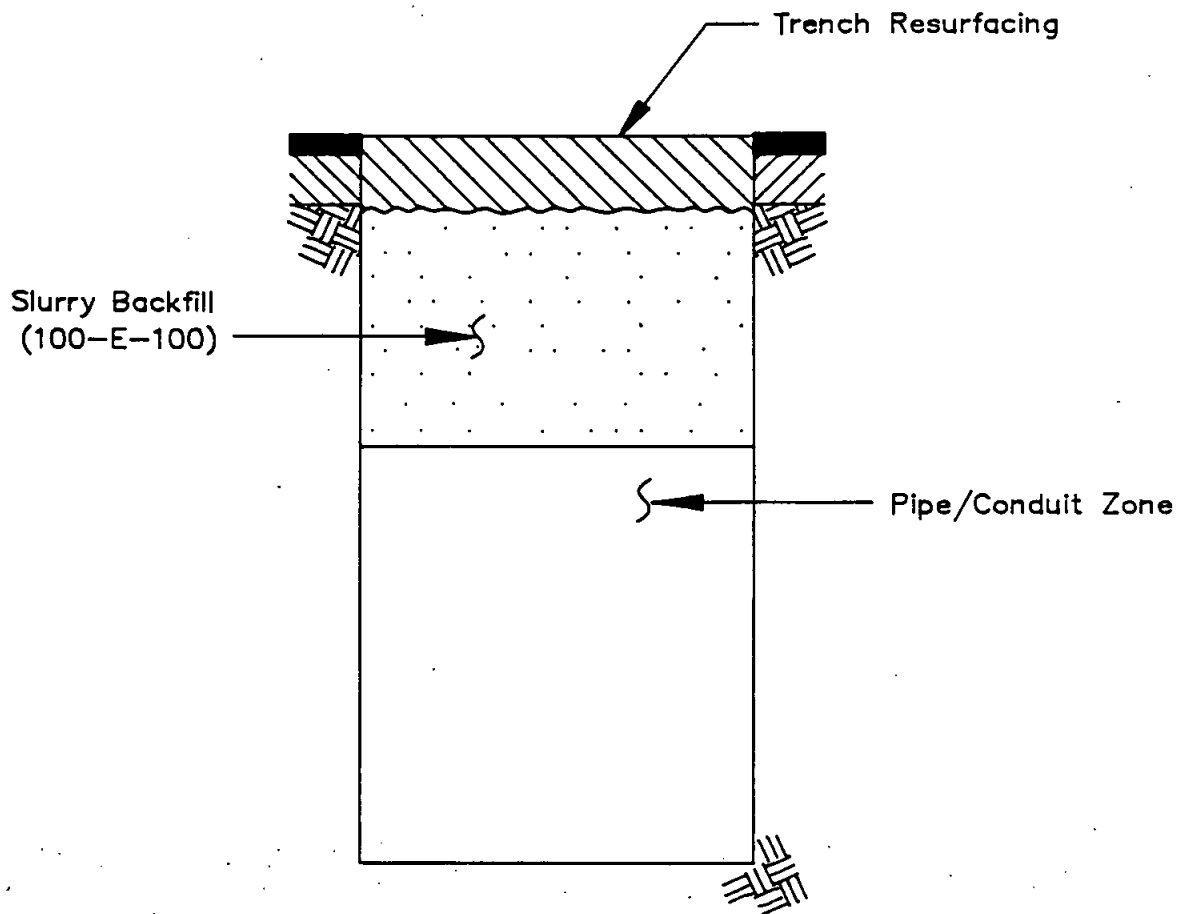
SAN DIEGO REGIONAL STANDARD DRAWING

NARROW TRENCHING TYPES E & F BACKFILL & RESURFACING

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER G-35



NOTES:

1. Trench resurfacing shall be done according to governmental (permitting) Agency's requirements.
2. The sand used for the slurry backfill shall meet the requirements for fine aggregate Subsection 400-1.3 listed in the Standard Specifications for Public Works Construction. Slurry must be firm prior to trench resurfacing.
3. Slurry backfill may be used in permeable soils and shall not be used where it will impede subsurface drainage.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Henry P. ... SEPT. 1988
Chairman Date

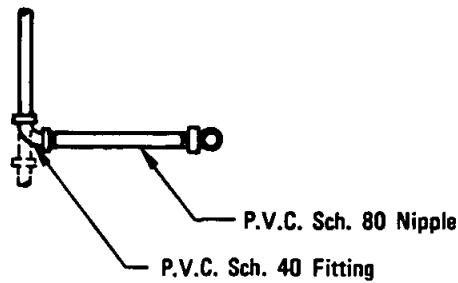
SAN DIEGO REGIONAL STANDARD DRAWING

SLURRY BACKFILL

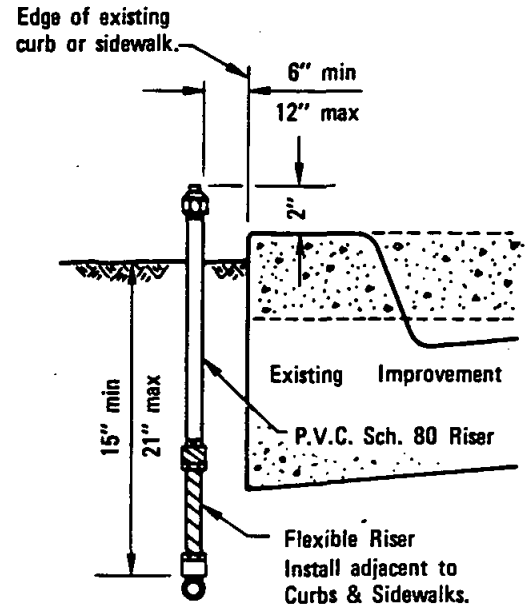
**DRAWING
NUMBER G-36**

Revision	By	Approved	Date

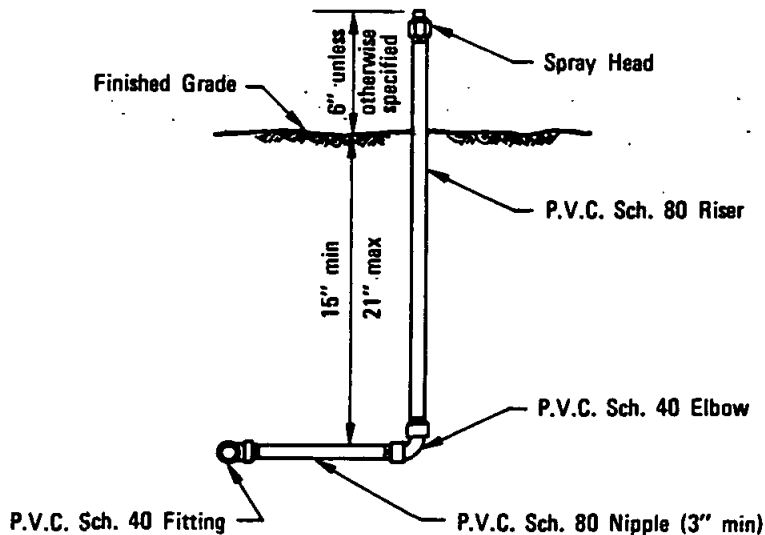
SPRINKLER IRRIGATION SYSTEMS



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

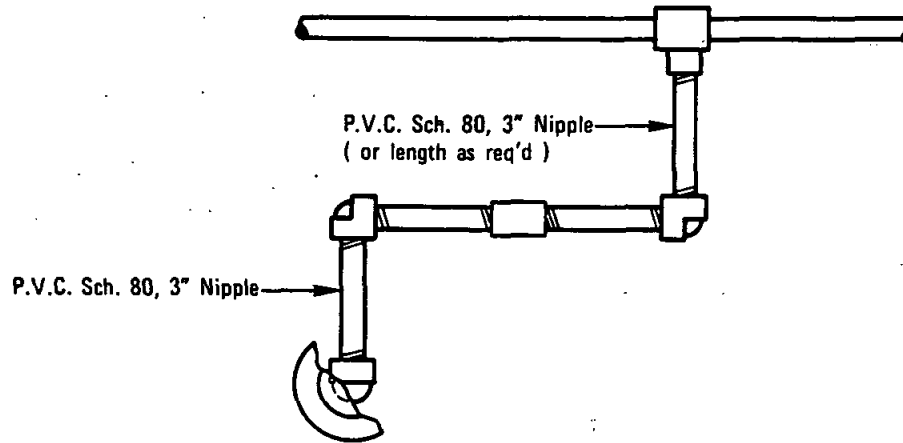
SAN DIEGO REGIONAL STANDARD DRAWING

SHRUBBERY SPRINKLER HEAD
FIXED SPRAY TYPE

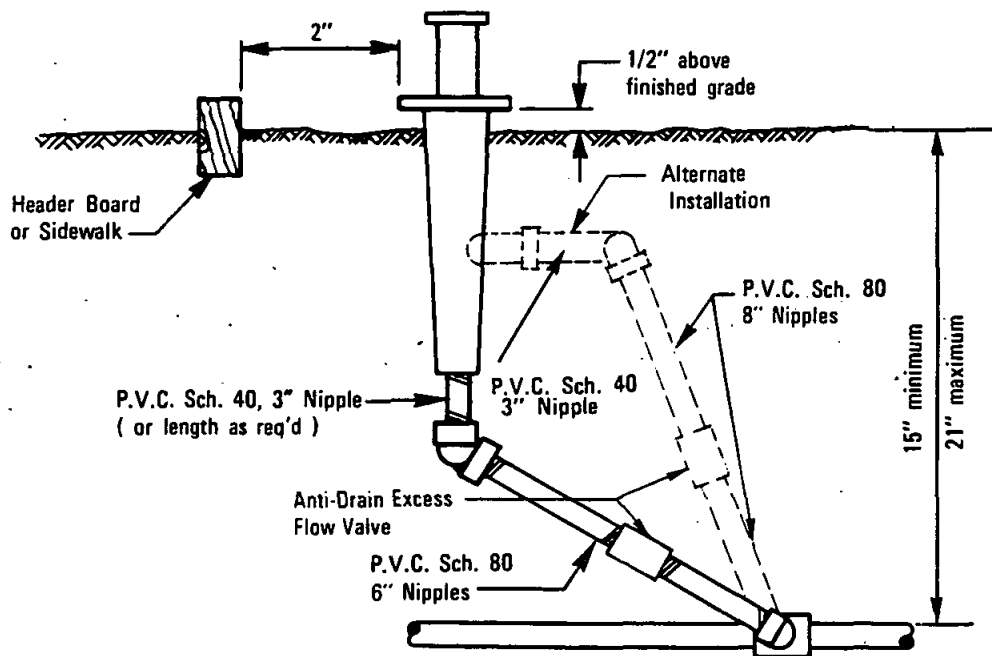
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allen D. Kneeland 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.
4. Anti-drain/Excess Flow Valve shall be installed under all heads unless heads have a "Built-in" Anti-drain or check valve.

LEGEND ON PLANS

Show a number to indicate type head 

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

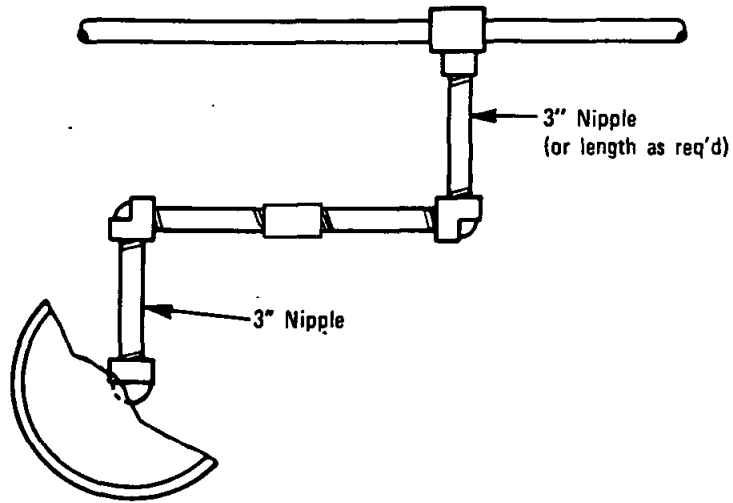
Allen O. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

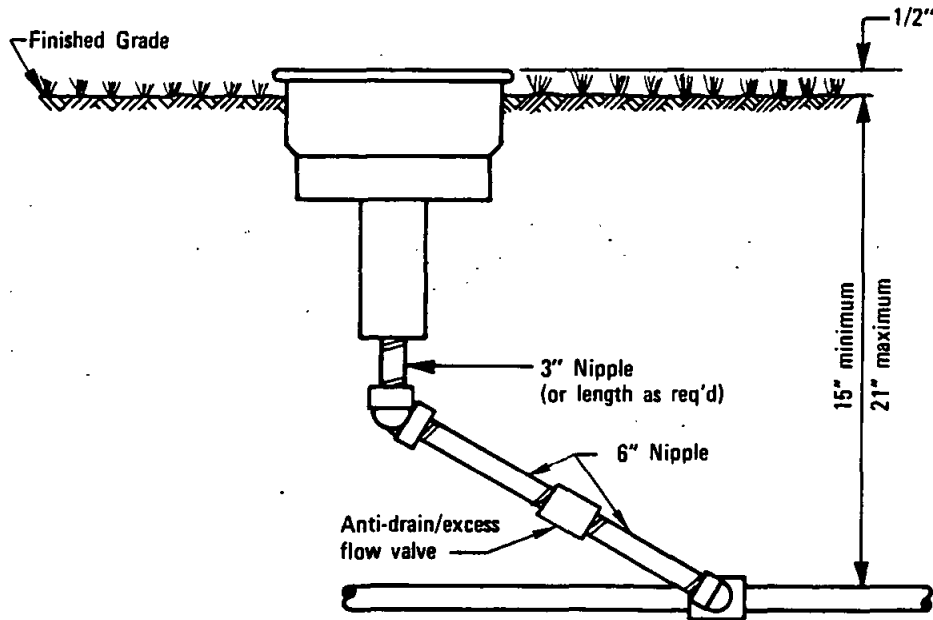
SPRINKLER HEAD
POP UP SPRAY TYPE

DRAWING
NUMBER 1-2

Revision	By	Approved	Date
Alt. Instl.	TRP	M.B.	10-82
VALVE	SC	D.H.	3-88



PLAN



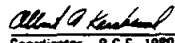
ELEVATION

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.
5. Anti-drain/Excess Flow Valve shall be installed under all heads unless heads have a "Built-in" Anti-drain or check valve.

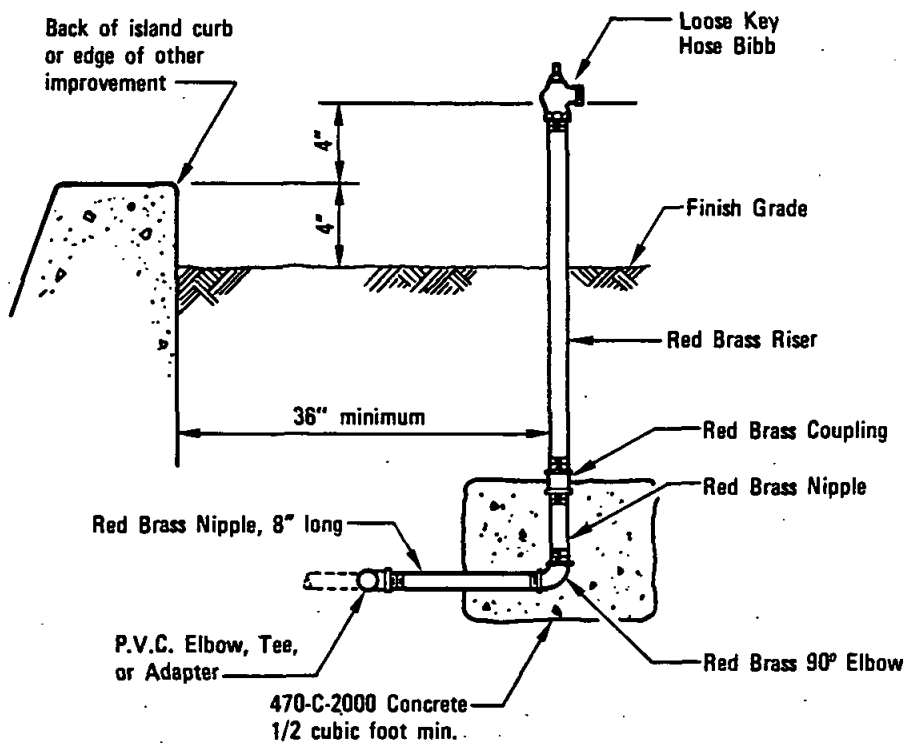
LEGEND ON PLANS

Show a number to indicate type head

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Valve	SC	AK	9/88	LAWN SPRINKLER HEAD POP UP ROTARY (WITH SWING JOINT)			
						Coordinator R.C.E. 19807 Date	
						Drawing Number	
						I-3	
						Date	



DRAWING NUMBER 1-5



NOTES

1. 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.
2. 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

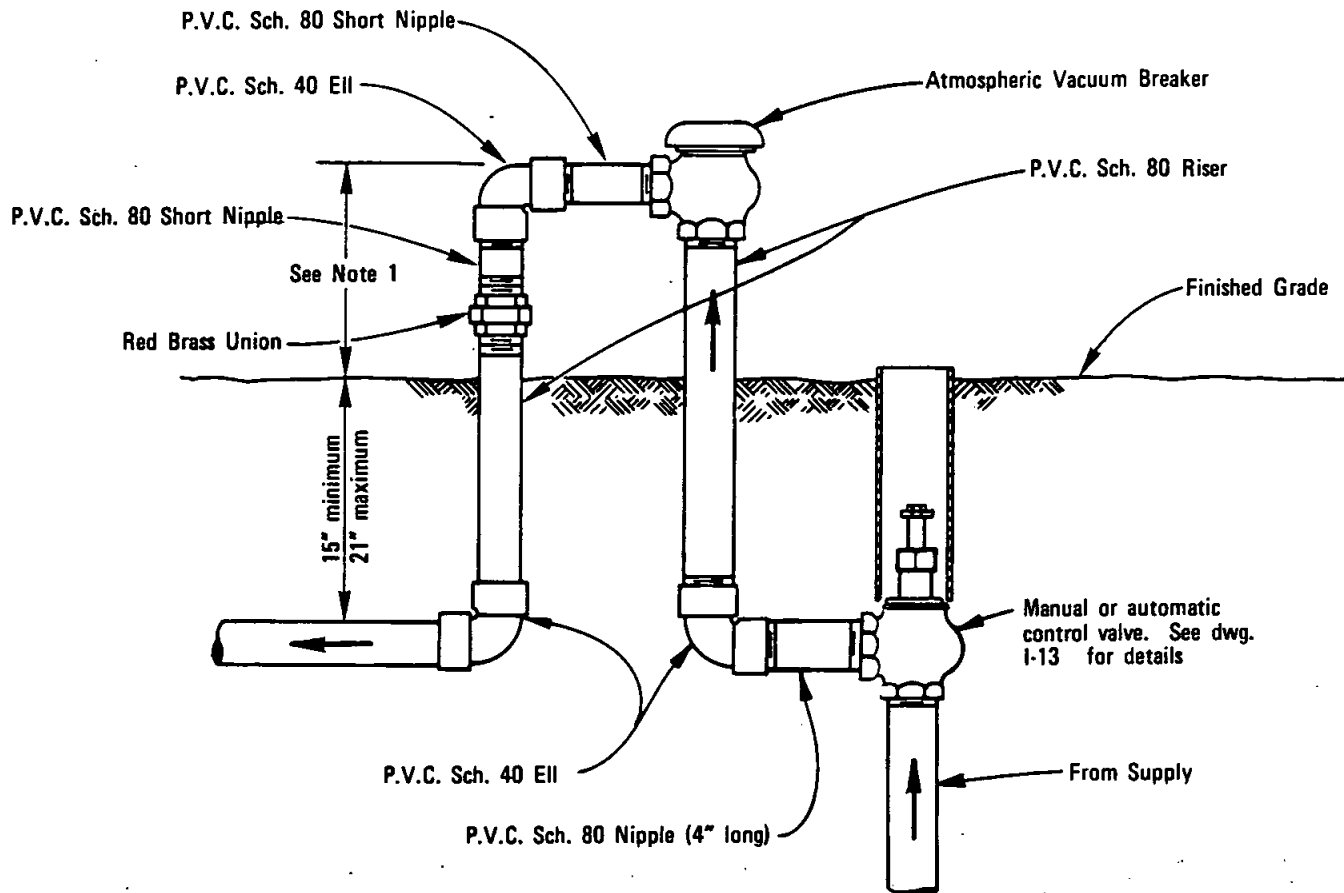
Allan S. Keshner *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **1-6**

SAN DIEGO REGIONAL STANDARD DRAWING

**HOSE BIBB
(GARDEN VALVE)**

Revision	By	Approved	Date
Set Back	<i>TR</i>	<i>M.B.</i>	<i>10-82</i>



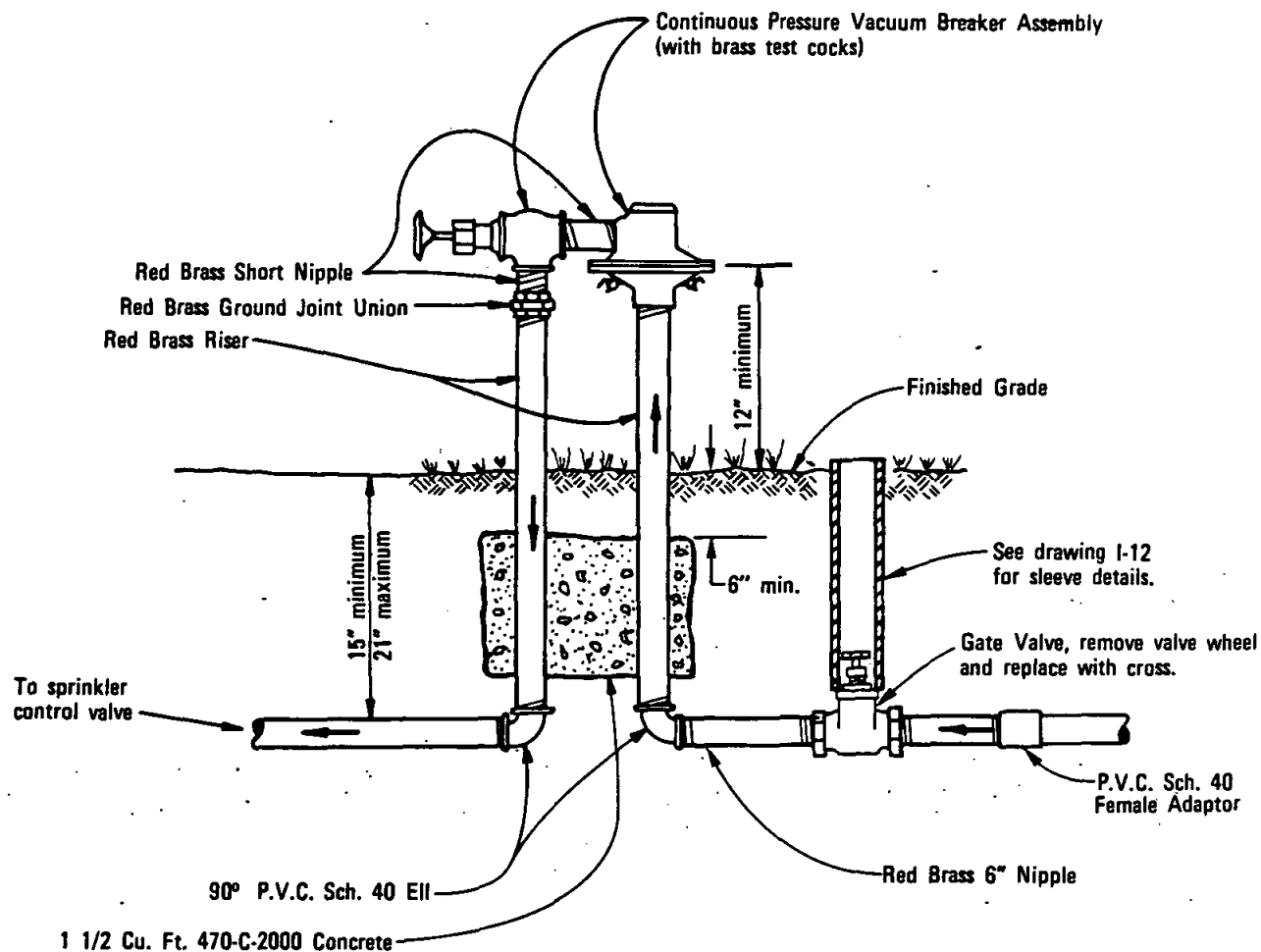
NOTES

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. Kershner</i>	<i>Dec. 1975</i>
				BACKFLOW PREVENTER ATMOSPHERIC VACUUM BREAKER (2" & SMALLER)		Coordinator R.C.E. 19807	Date
						DRAWING NUMBER 1-7	



NOTES

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

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

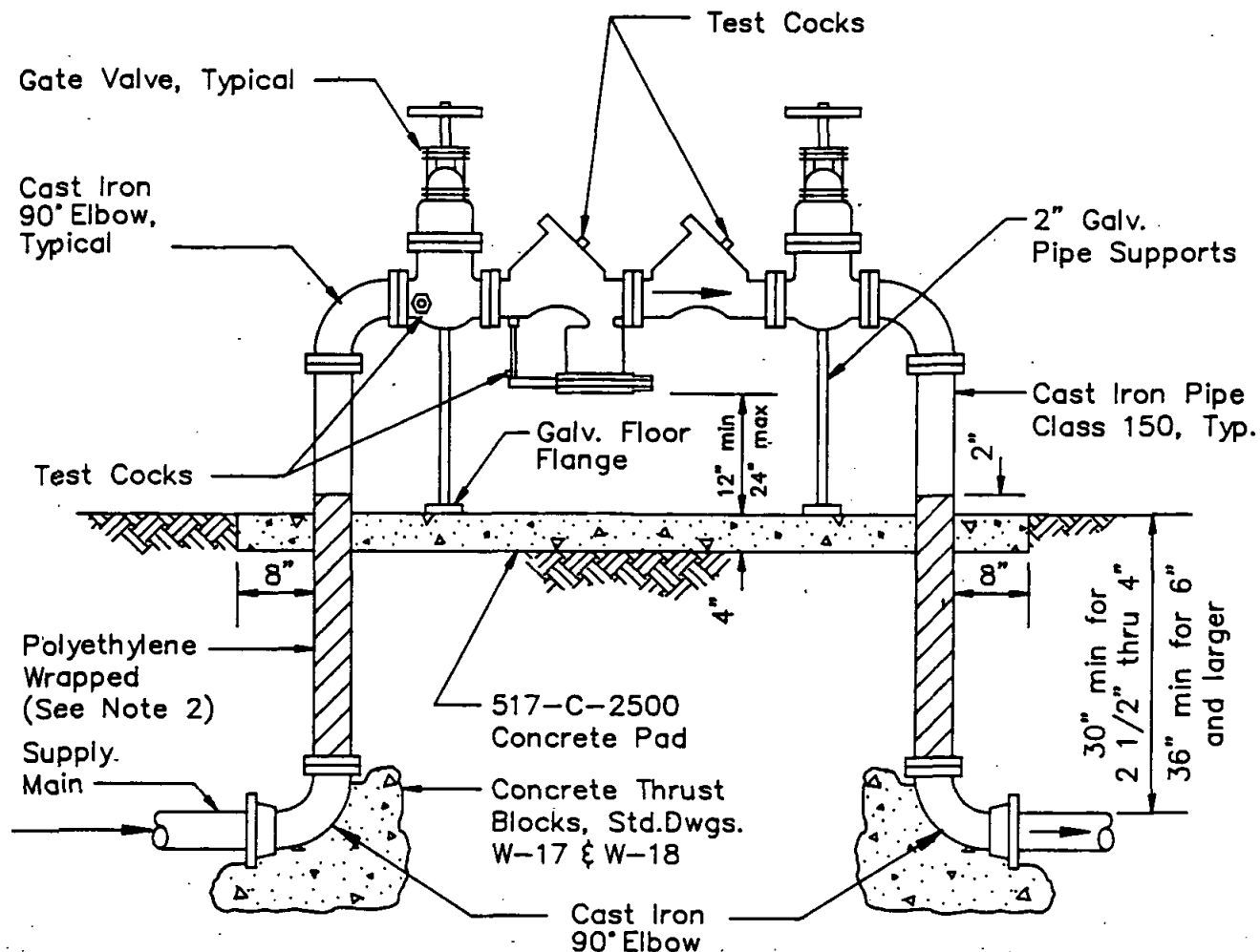
Allen A. Kershner *Dec. 1975*
Coordinator R.C.E. 19807 Date

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>RP</i>	<i>D.S.</i>	7-79
Reference	<i>RP</i>	<i>M.B.</i>	10-82



NOTES:

1. All fittings on assembly shall be flanged.
2. Buried cast iron pipe and fittings shall be polyethylene wrapped with 2 inch wide plastic backed adhesive tape (8 mil thickness). Use 1/2 inch overlap.
3. Cast iron pipe and fittings shall be cement mortar lined.
4. All exposed cast iron shall be painted with one coat of primer and two coats of exterior enamel.
5. Concrete pad shall be 24 inches wide.
6. 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 Engineer.
7. Adapt inlet and outlet fittings to main as required.

LEGEND ON PLANS



Revision	By	Approved	Date
New Dwg.	SC	J.H.	10/88

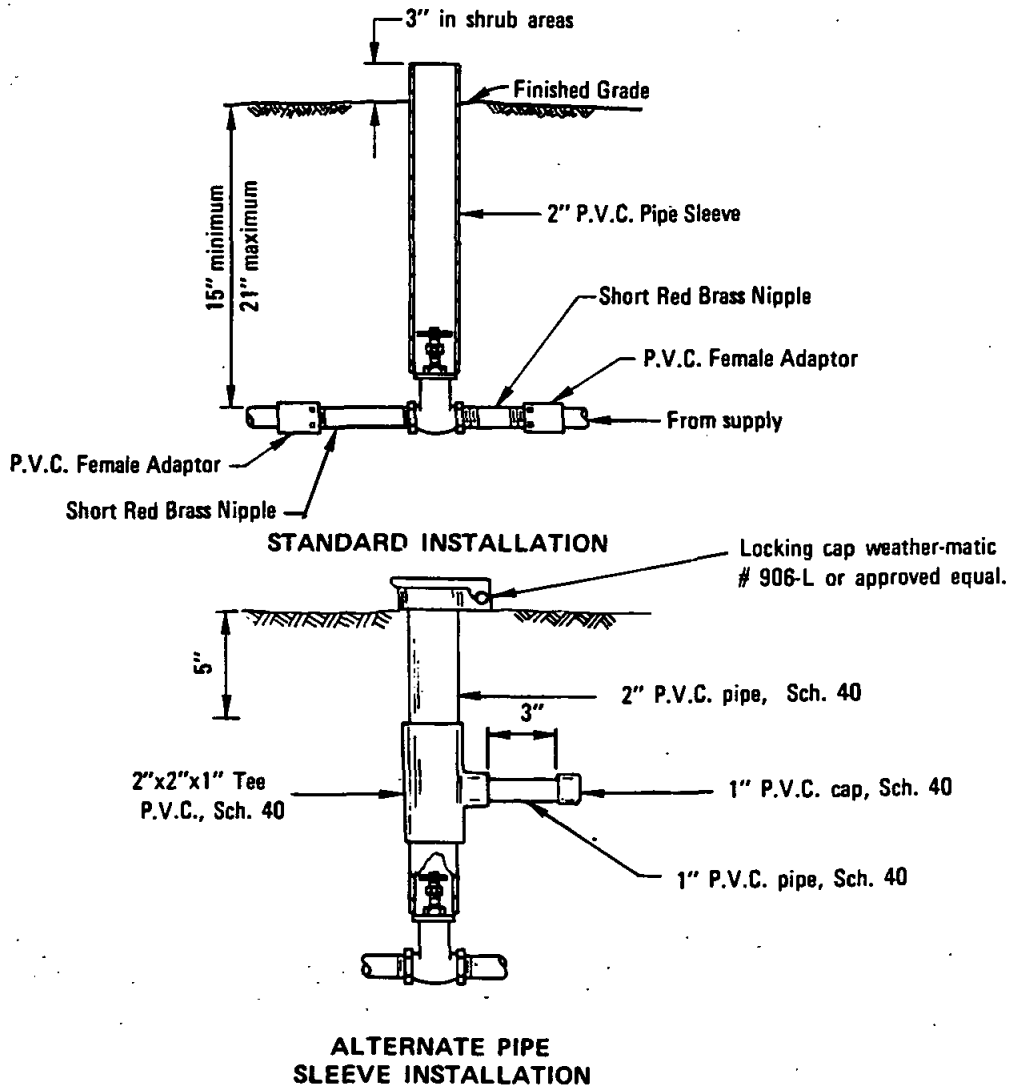
SAN DIEGO REGIONAL STANDARD DRAWING

**BACKFLOW PREVENTER
REDUCED PRESSURE PRINCIPLE
ASSEMBLY-LARGER THAN 2"**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Steve Pabon 5/9/88
Chairman Date

DRAWING
NUMBER **1-9**



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

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

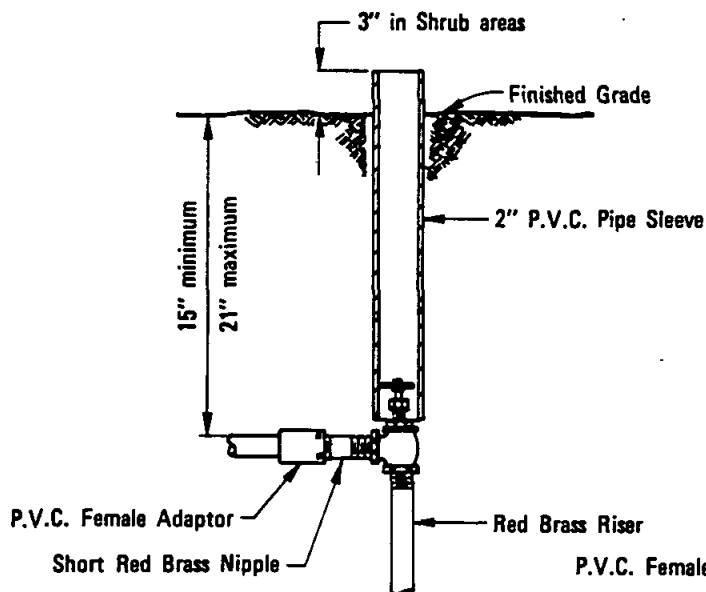
SAN DIEGO REGIONAL STANDARD DRAWING

**GATE VALVE
(2" AND SMALLER)**

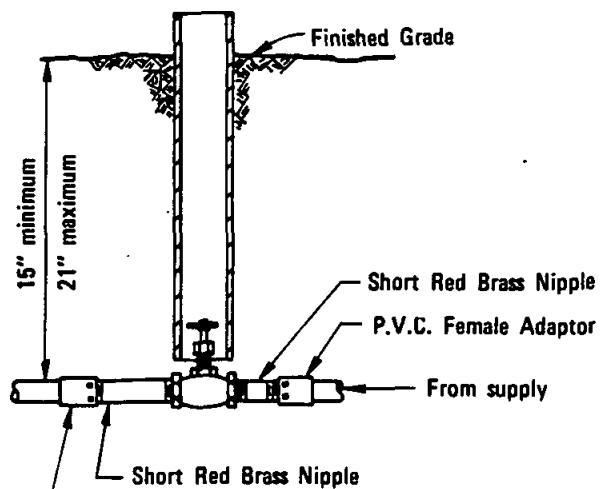
DRAWING
NUMBER

1-12

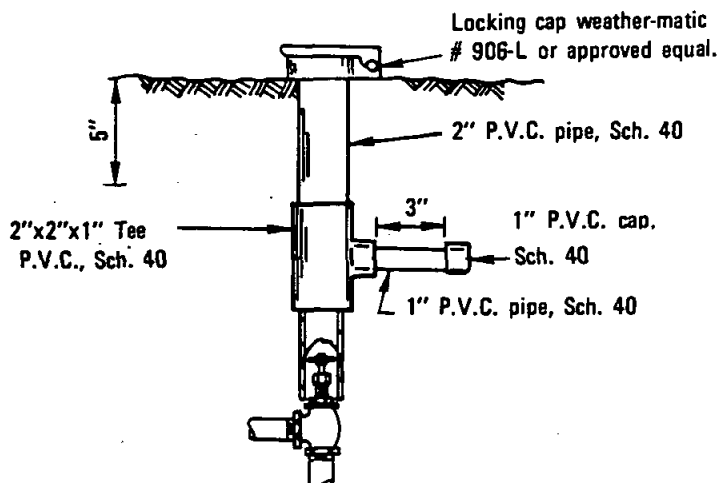
Revision	By	Approved	Date
Union	TRP	TH. B.	10-82



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



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

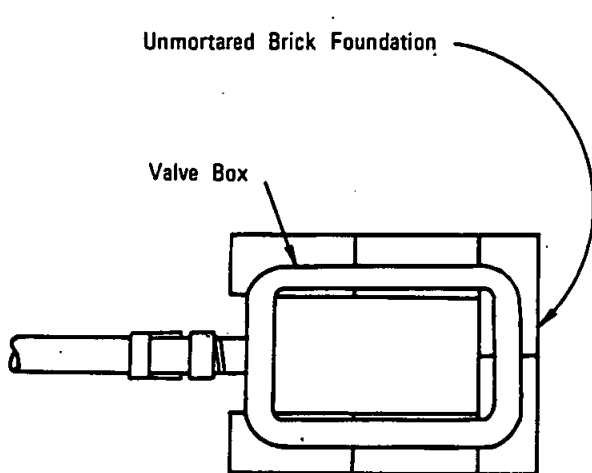
SAN DIEGO REGIONAL STANDARD DRAWING

MANUAL VALVES

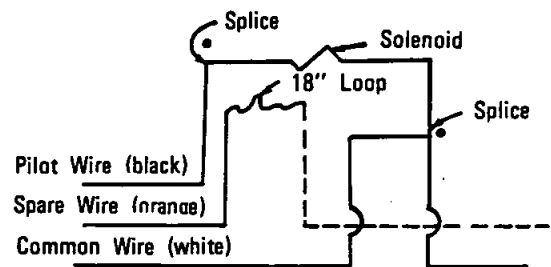
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

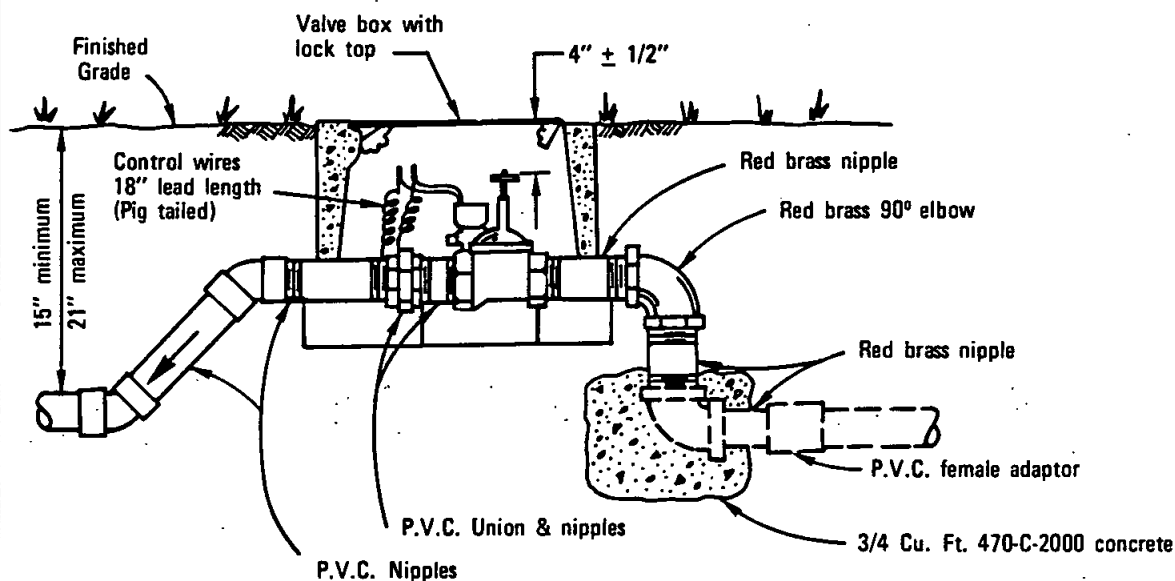
DRAWING NUMBER 1-13



PLAN



TYPICAL ELEMENTARY DIAGRAM FOR WIRING
ELECTRICAL REMOTE CONTROL VALVE



ELEVATION

NOTES

1. Splicing shall be made in valve boxes and pull boxes only. 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 globe valve installed at the start on 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.
6. Valve/controller identification shall be painted on valve box covers. Use only aluminum asphaltic base water-proof paint.

LEGEND ON PLANS
▼ R.C.V.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

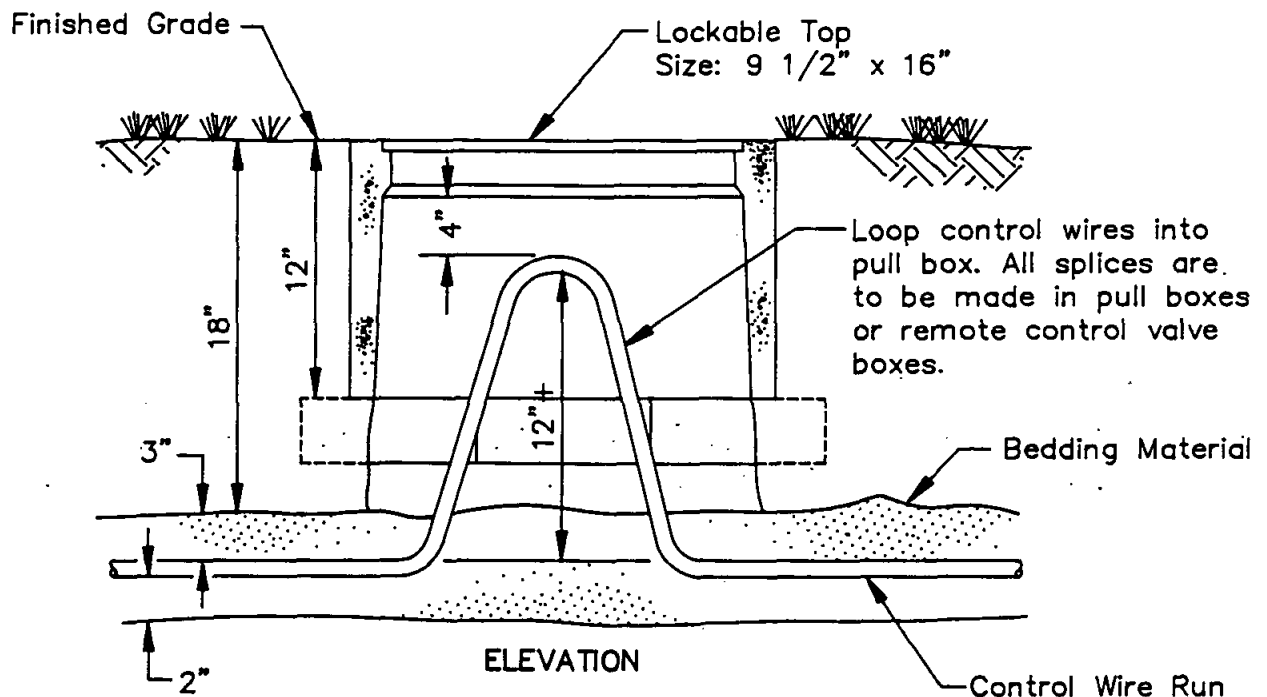
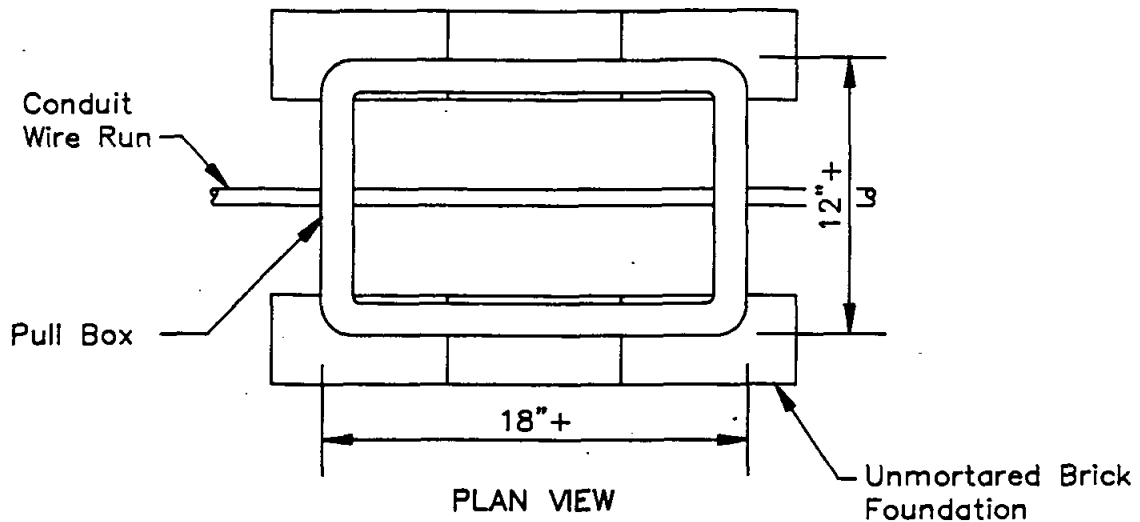
Allan G. Kershner *Dec. 1975*
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

REMOTE CONTROL VALVE

Revision	By	Approved	Date
Valve	TRP	M.B.	10-82
Notes 1,6	SP	QH	7-88

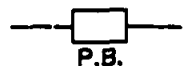
DRAWING
NUMBER I-14



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 resin and shall be completely water-proof.
6. All spare wire ends shall be insulated in the same manner as wire splices.
7. If specified, all splices shall be soldered with metallic alloy solder prior to installing connectors.
8. Wire bundles inside pull boxes shall be at least 4 inches from the under side of the box cover. Minimum size pull box shall be as shown above. Larger boxes may be necessary to meet 4 inch clearance requirement.

LEGEND



Revision	By	Approved	Date
Notes	RC	A.H.	10/68

SAN DIEGO REGIONAL STANDARD DRAWING

ELECTRICAL PULL BOX FOR DIRECT BURIAL CONTROL WIRES AND SPLICE DETAILS

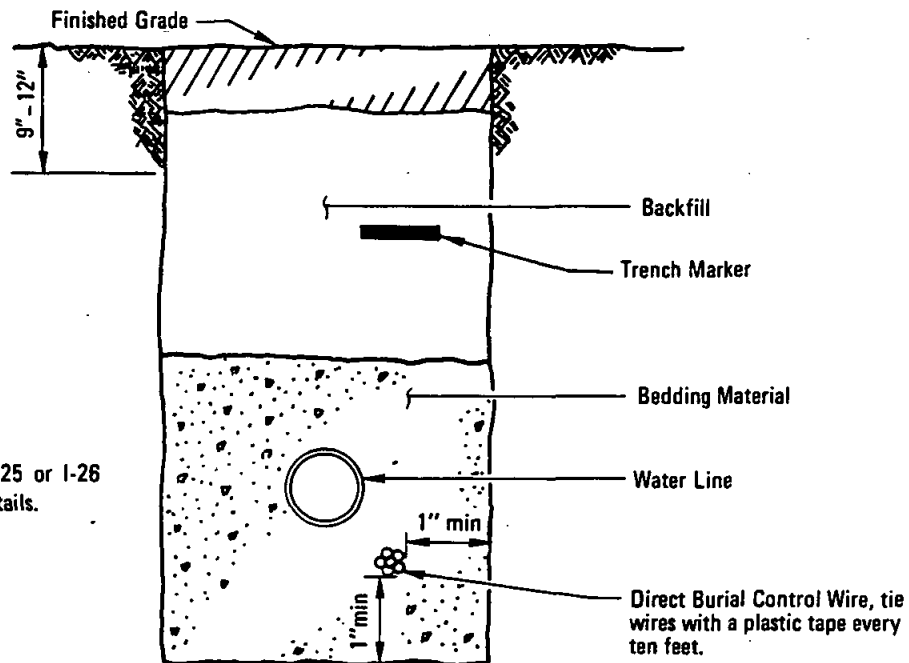
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

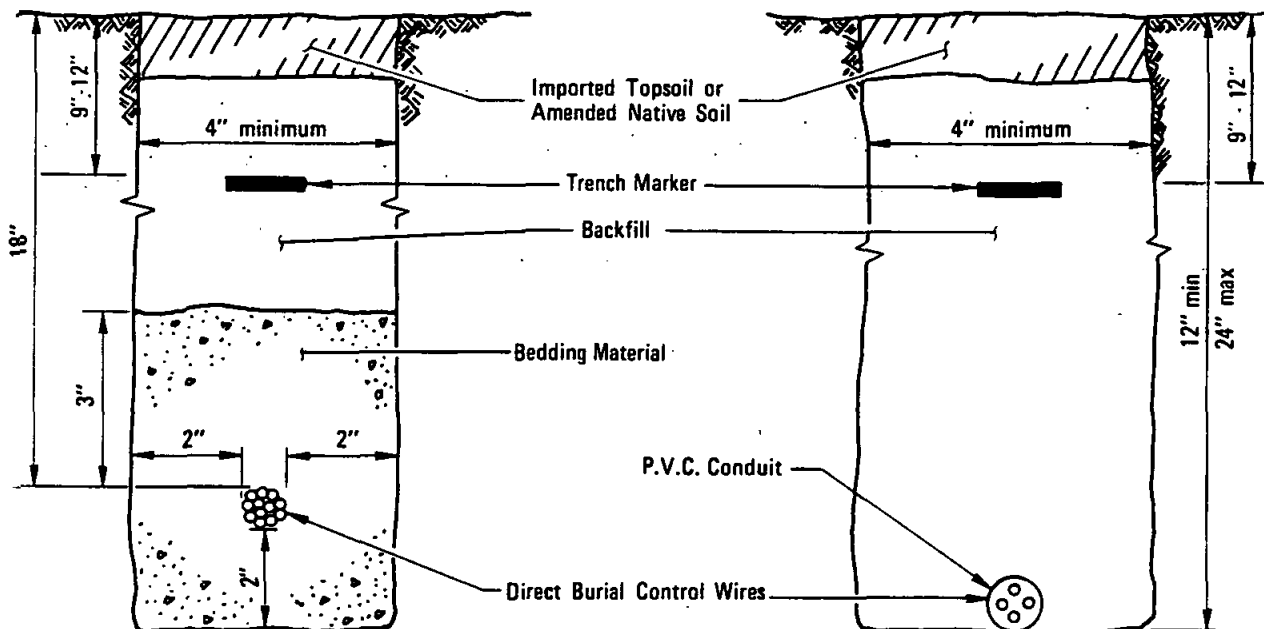
DRAWING
NUMBER **I-15**

NOTE

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



NORMAL LOCATIONS OF CONTROL WIRES



ALTERNATE LOCATION OF CONTROL WIRES

NOTES:

1. Bedding material shall have a sand equivalent of 50, minimum
2. Place a 3" wide red continuous plastic tape trench marker, 9" to 12" below finish grade, directly above the direct burial control wires.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

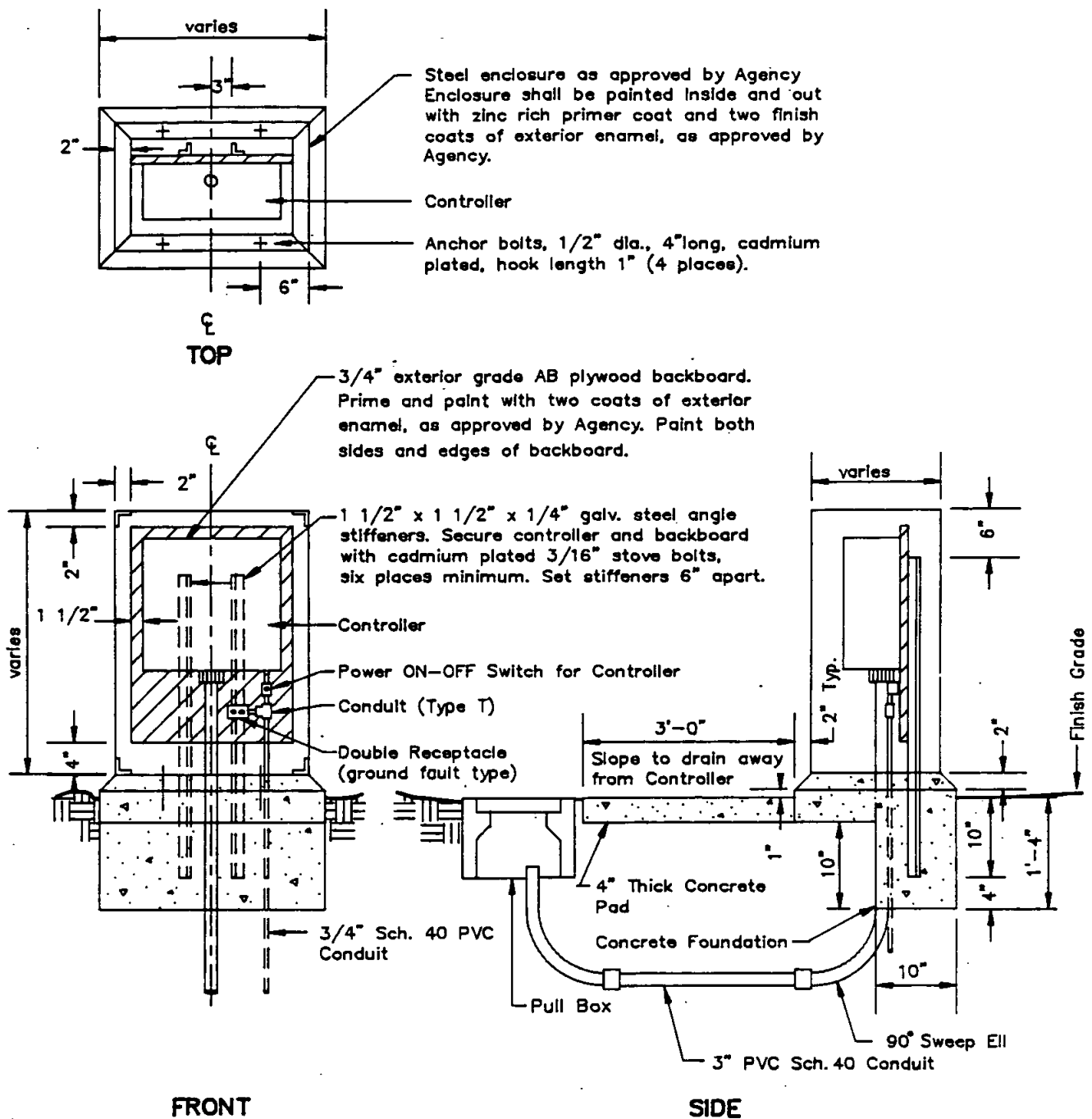
Allen J. Kuehnel Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **I-16**

SAN DIEGO REGIONAL STANDARD DRAWING

DIRECT BURIAL CONTROL WIRE

Revision	By	Approved	Date
Reference	TRP	M.B.	10-82
MARKER	3C	O.H.	3-88



NOTES:

1. Install in each enclosure, one 25 watt incandescent lamp in a two-prong plug in light socket. Install in receptacle.
2. A 15 amp (minimum) circuit is required at each double receptacle (120 V).

LEGEND ON PLANS



Revision	By	Approved	Date
New Dwg.	32	OK	10/88

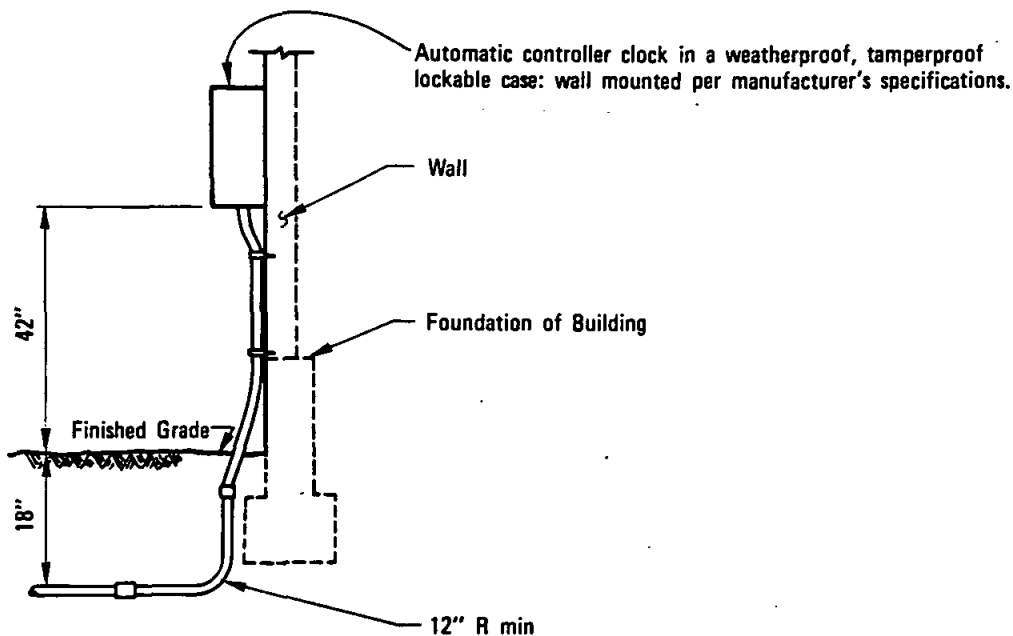
SAN DIEGO REGIONAL STANDARD DRAWING

IRRIGATION SYSTEMS ELECTRIC CONTROLLER CLOCK PEDESTAL MOUNTING

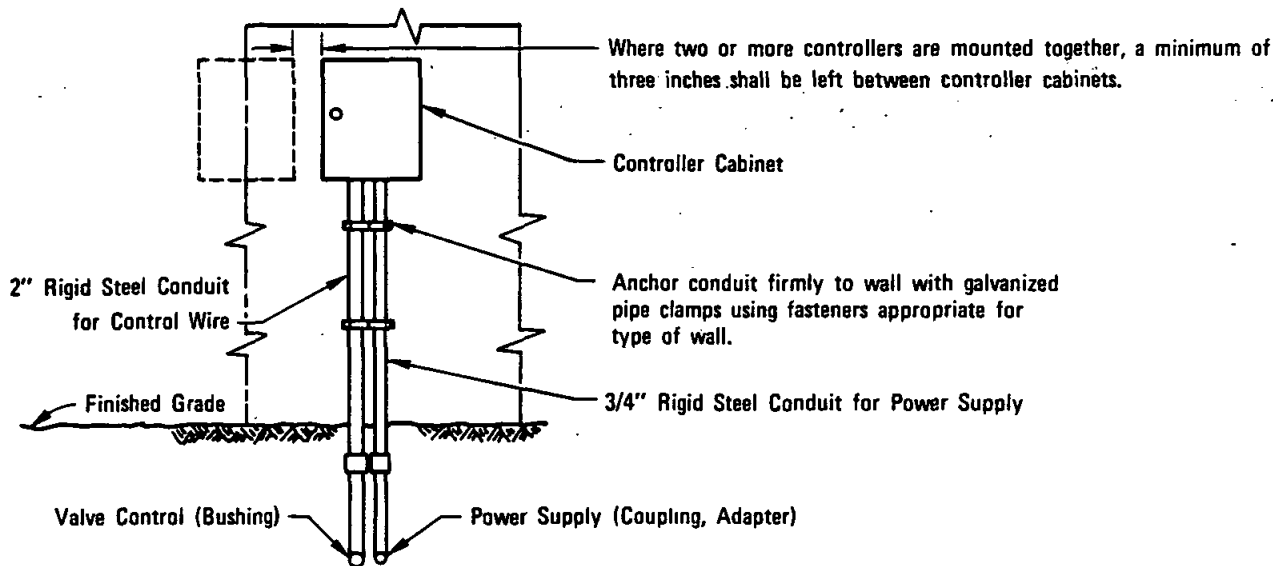
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Long Pabian SEPT 1988
Chairman Date

DRAWING
NUMBER I-17



SIDE VIEW



ELEVATION

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

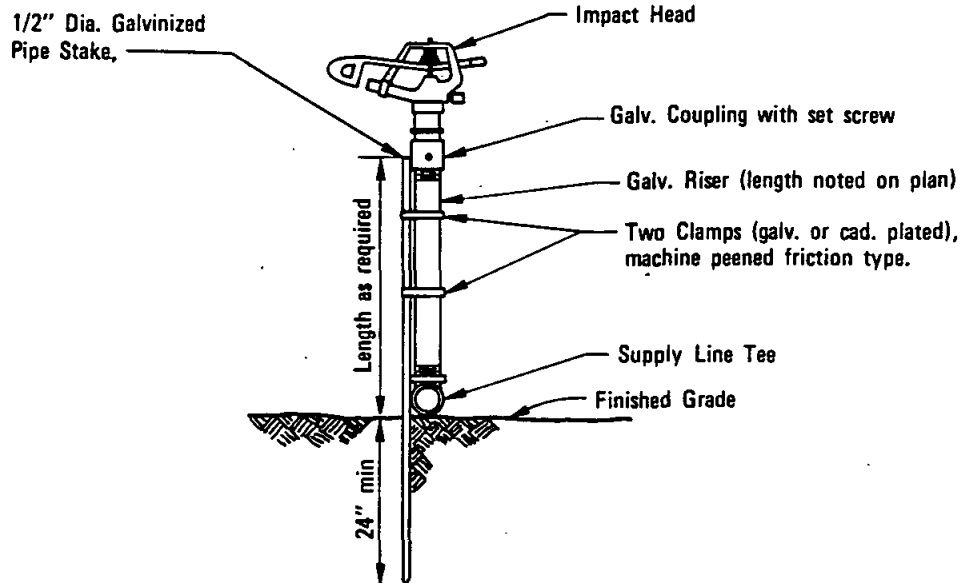
Allard A. Kuehn Dec. 1975
Coordinator R.C.E. 19807 Date

**DRAWING
NUMBER 1-18**

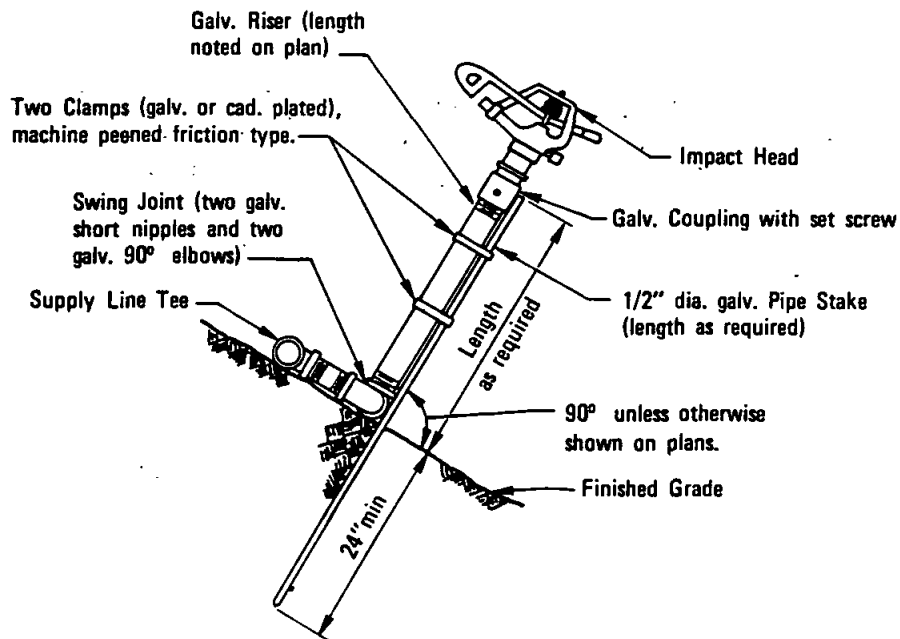
SAN DIEGO REGIONAL STANDARD DRAWING

**IRRIGATION SYSTEMS
ELECTRIC CONTROLLER CLOCK
WALL MOUNTING**

Revision	By	Approved	Date



LEVEL INSTALLATION

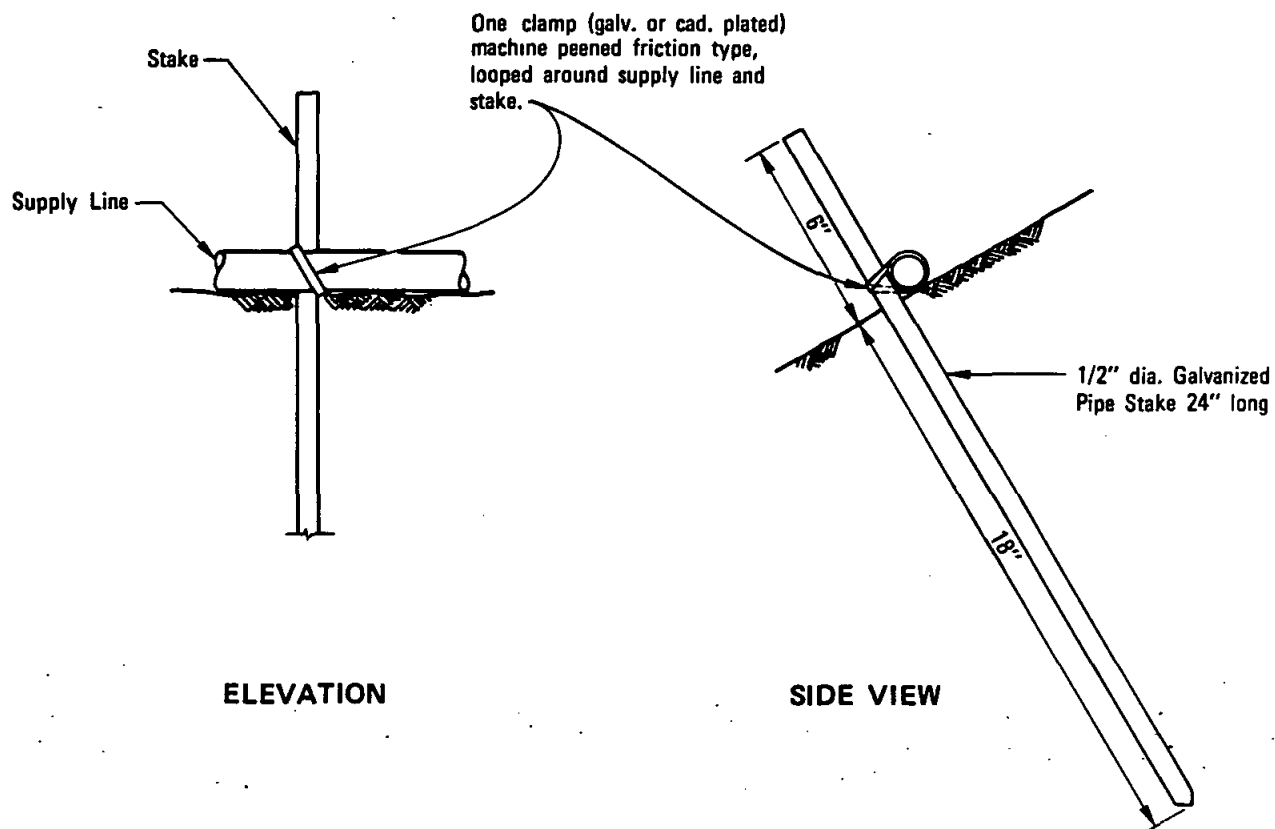


SLOPE INSTALLATION

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	TRF	M.B.	10-82				
				IMPACT HEAD ABOVE GROUND PIPE INSTALLATIONS		<i>Allan A. Kuehn</i> <i>Dec. 1975</i>	
						Coordinator R.C.E. 19807 Date	
						DRAWING NUMBER 1-19	



NOTE

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

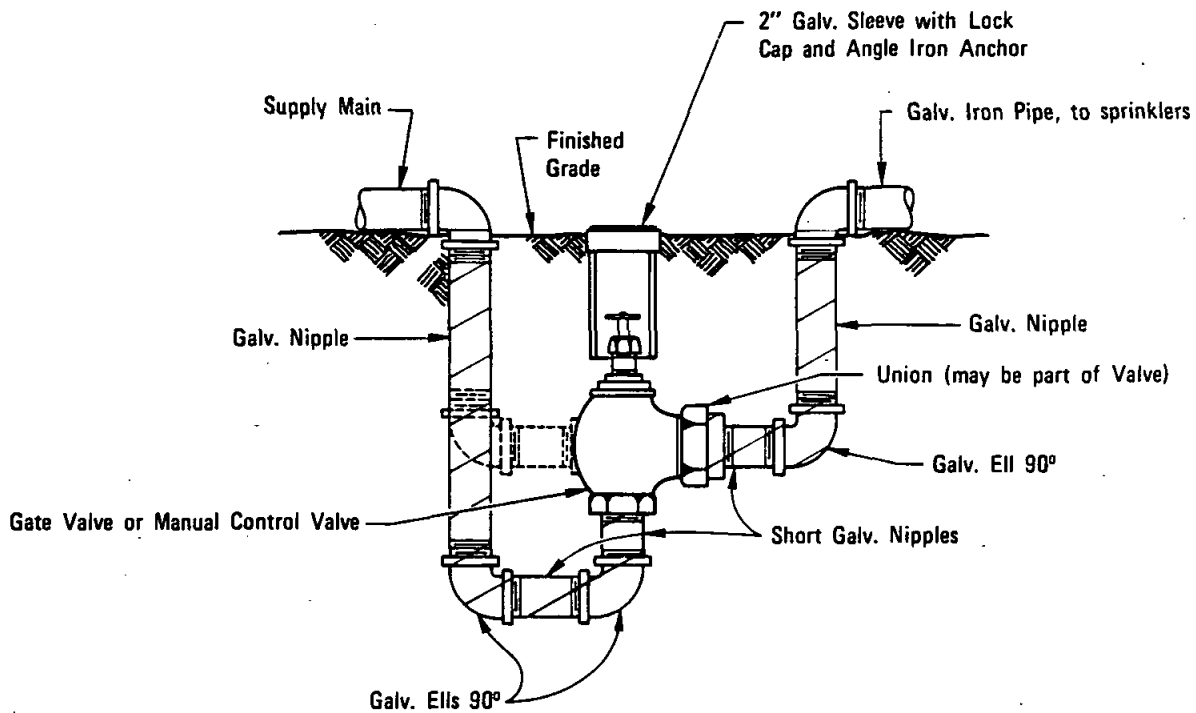
SAN DIEGO REGIONAL STANDARD DRAWING

PINNING OF PIPE ABOVE GROUND PIPE INSTALLATIONS

DRAWING
NUMBER

I-20

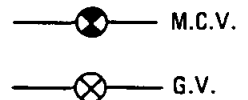
Revision	By	Approved	Date



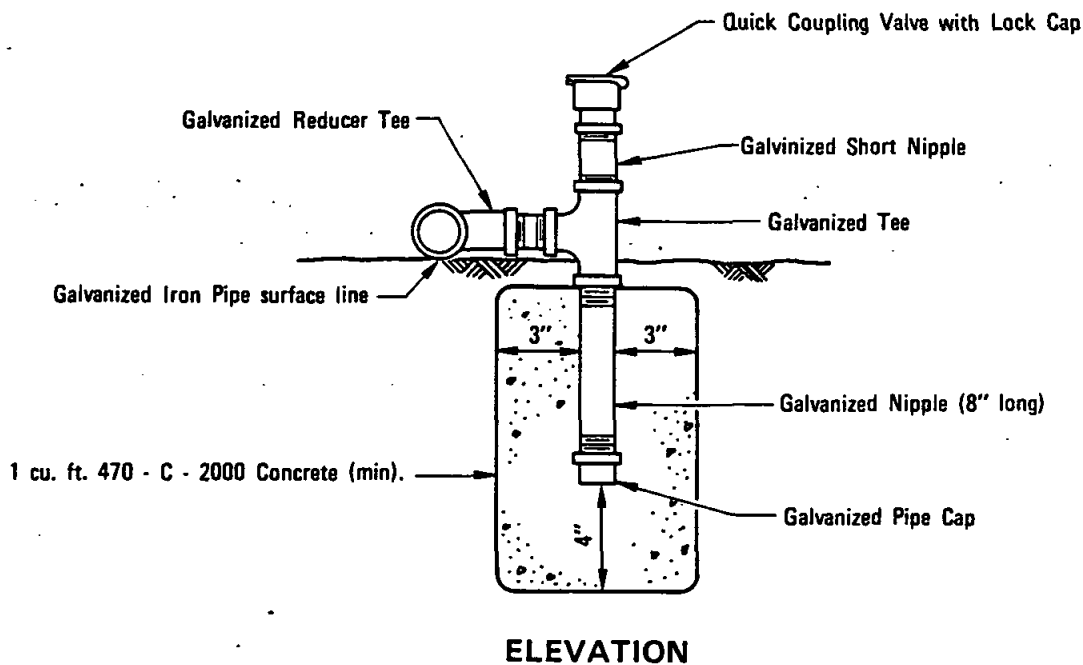
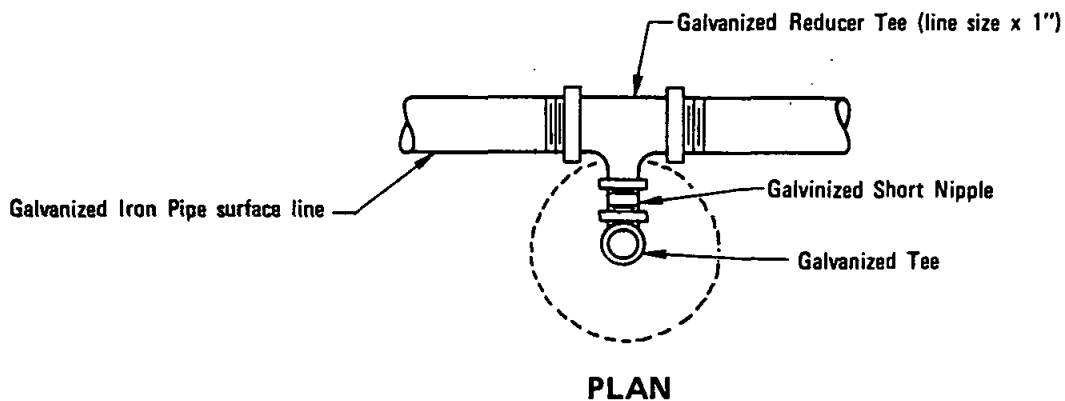
NOTE

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		
				MANUAL CONTROL VALVE AND GATE VALVE INSTALLATION FOR ABOVE GROUND PIPE INSTALLATIONS	<i>Alfred A. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date
					DRAWING NUMBER I-21



LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

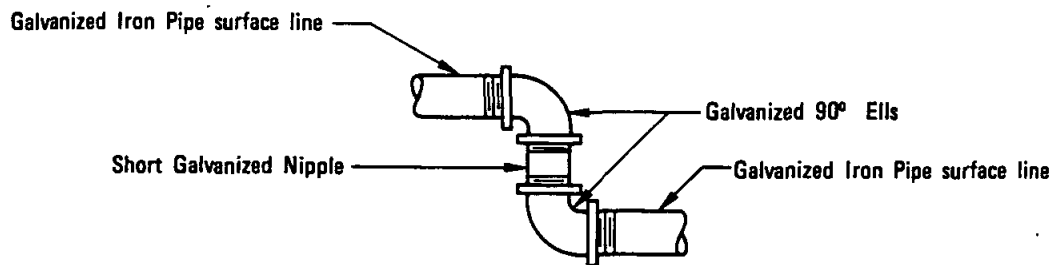
DRAWING
NUMBER

I-22

SAN DIEGO REGIONAL STANDARD DRAWING

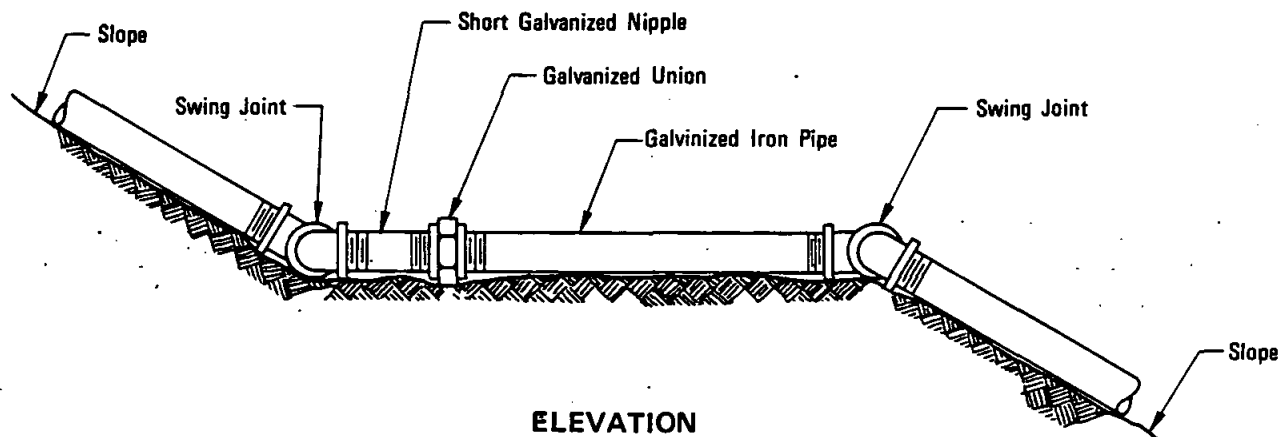
QUICK COUPLER ASSEMBLY
ABOVE GROUND PIPE INSTALLATIONS

Revision	By	Approved	Date



SWING JOINT DETAIL

PLAN

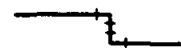


ELEVATION

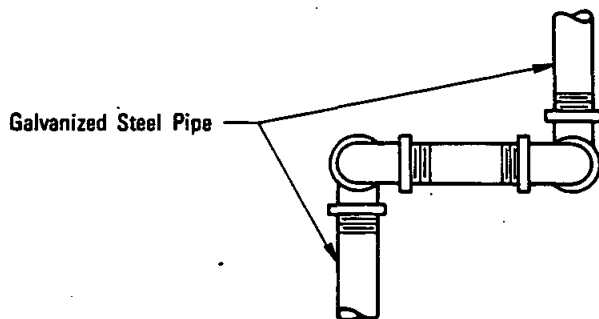
NOTE

Swing Joints shall be used at each change of grade.

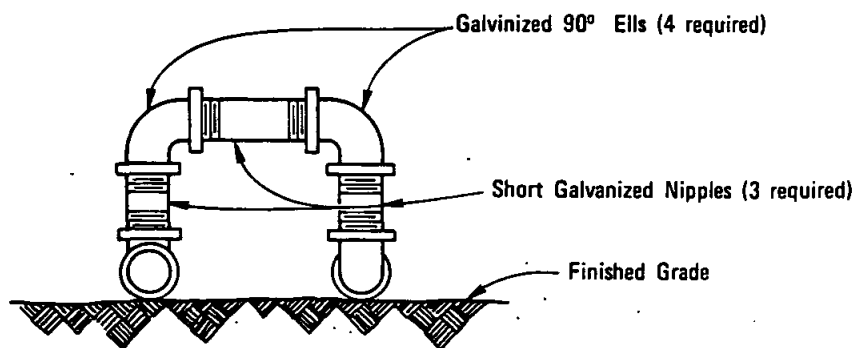
LEGEND ON PLANS



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



PLAN

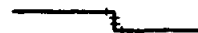


ELEVATION

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

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

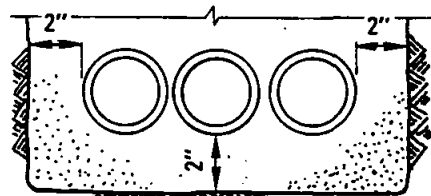
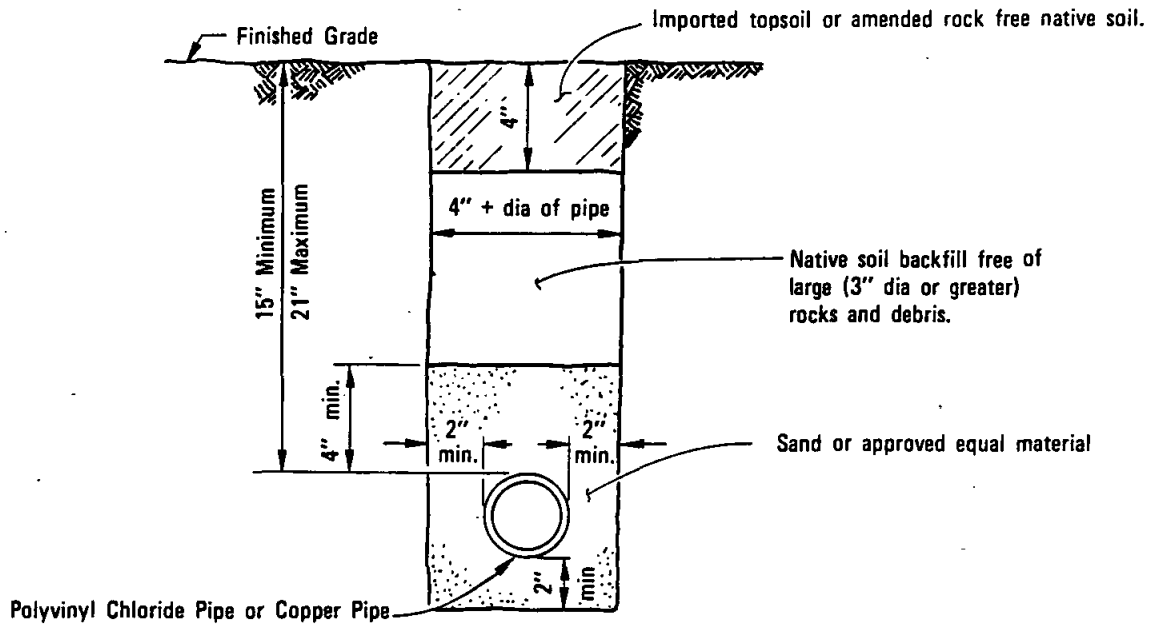
SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE SWING JOINT
ABOVE GROUND PIPE INSTALLATIONS**

DRAWING
NUMBER

1-24

Revision	By	Approved	Date



Details not shown
are same as above.

Multiple Pipe Installation Detail
(non-pressure pipe only, see Note 6
for pressure pipe)

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 pressure pipes shall be 2 inches.

Revision	By	Approved	Date
Title	MP	M.B.	10-82
Note 6	RC	M.B.	5-86
Title, 6	RC	A.N.	7-88

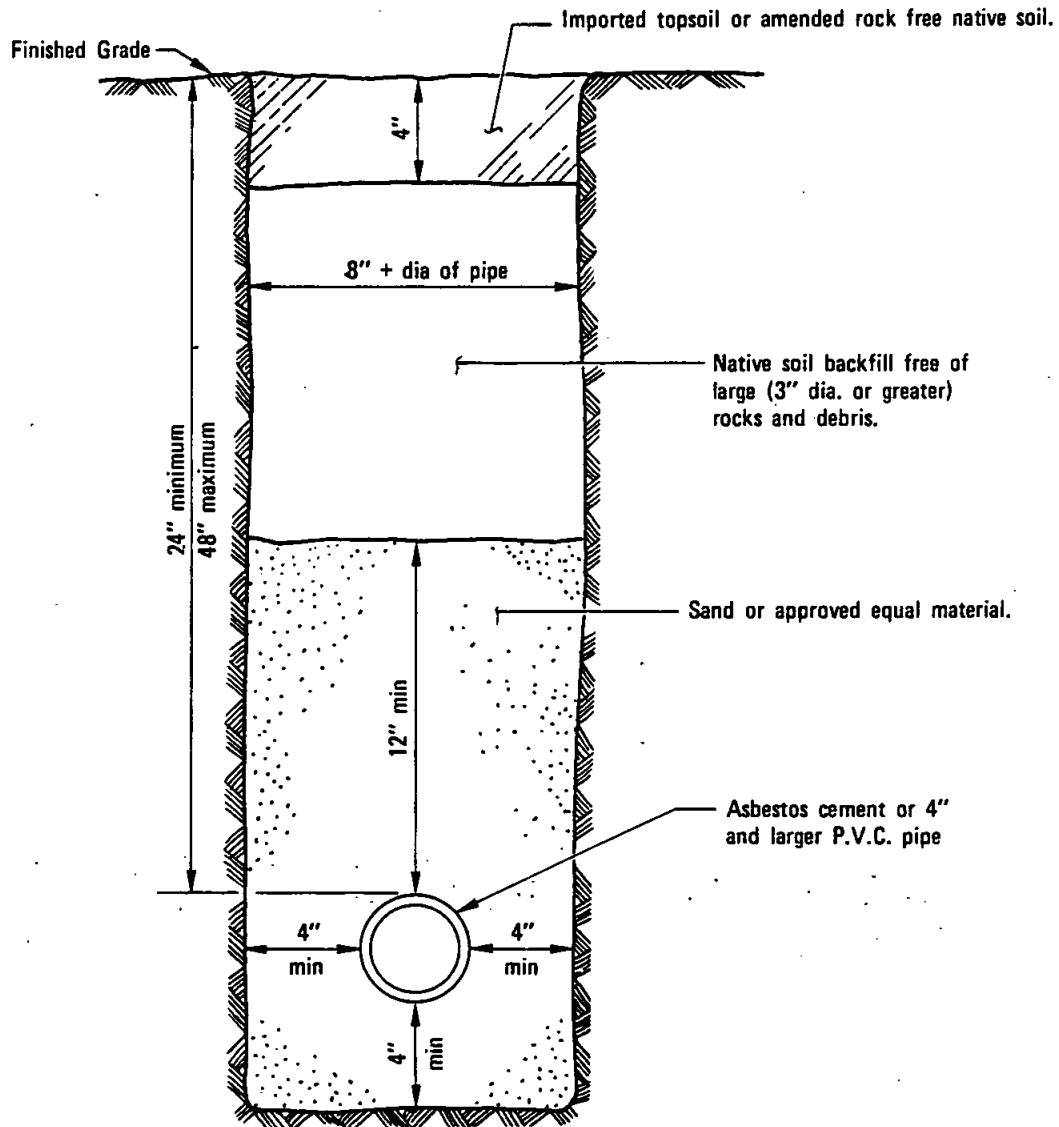
SAN DIEGO REGIONAL STANDARD DRAWING

**TRENCH DETAIL P.V.C. AND/OR
COPPER PIPE (3" AND SMALLER)**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

**DRAWING
NUMBER 1-25**



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

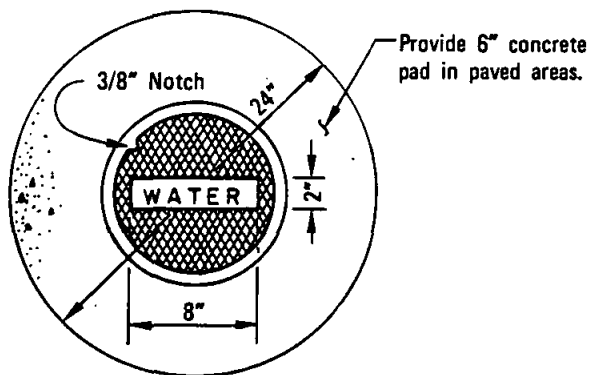
Allen A. Kershner *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER I-26

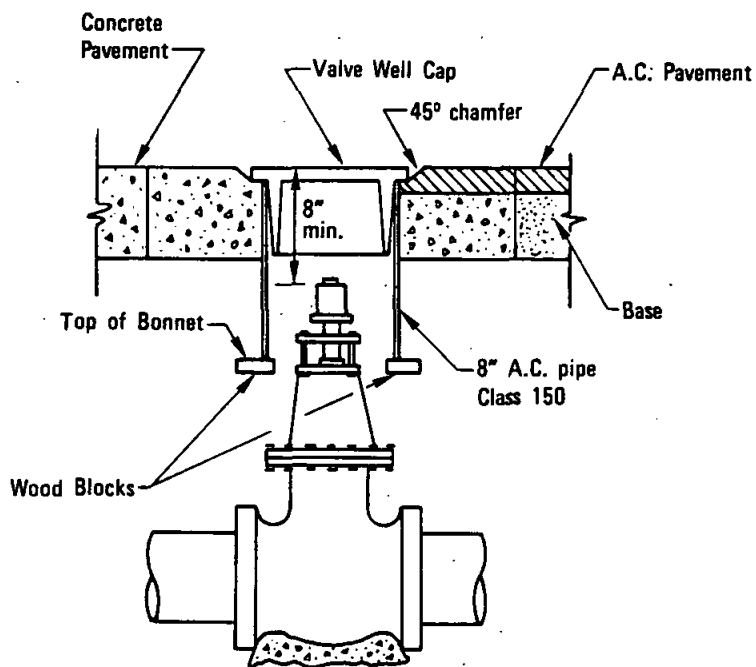
SAN DIEGO REGIONAL STANDARD DRAWING

TRENCH DETAIL — ASBESTOS CEMENT PIPE AND 4" AND LARGER P.V.C.

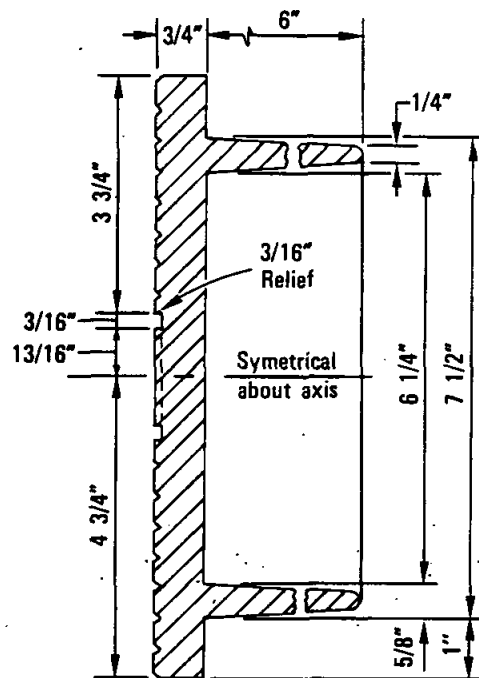
Revision	By	Approved	Date
Title	RP	M.B.	10-82
Title	RP	M.B.	7-88



PLAN



ELEVATION



CAST IRON
VALVE WELL CAP

LEGEND ON PLANS



Revision	By	Approved	Date
Dimension	<i>A.H.</i>		7-88

SAN DIEGO REGIONAL STANDARD DRAWING

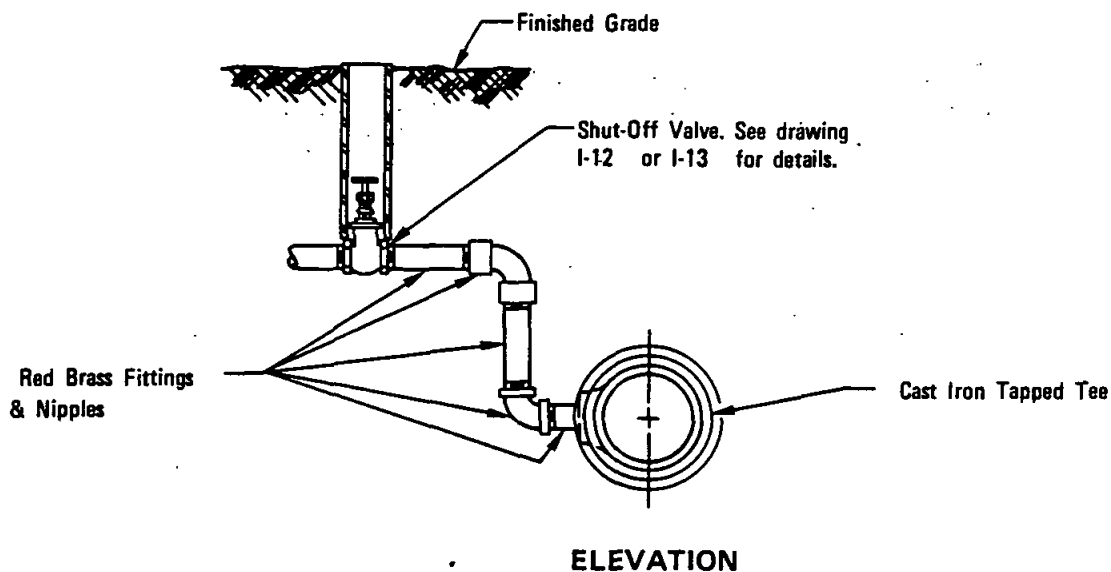
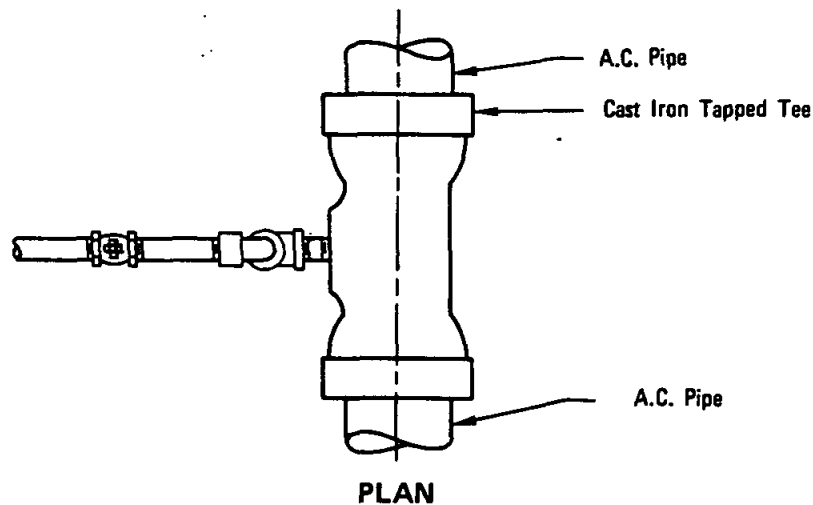
VALVE WELL AND COVER

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Alfred G. Kerschbaum *Dec. 1975*
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

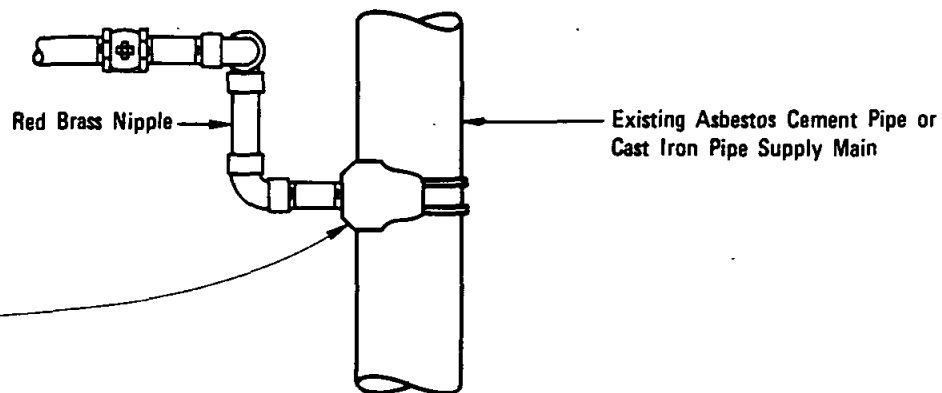
Alfred A. Kerschbaum *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **1-28**

SAN DIEGO REGIONAL STANDARD DRAWING

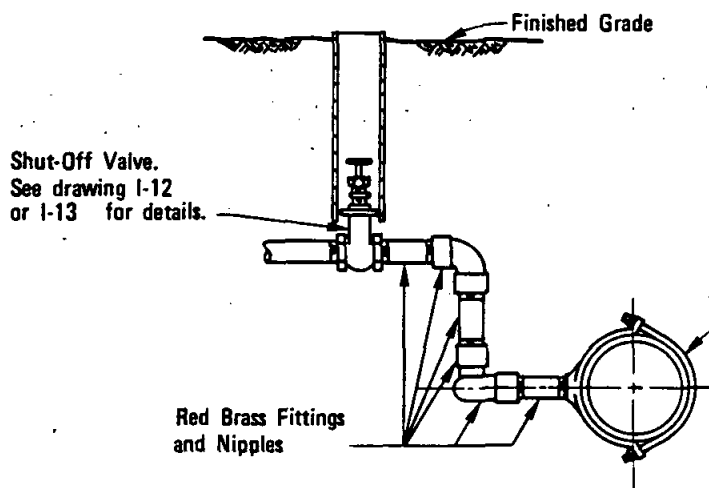
CONNECTION DETAIL FOR NEW ASBESTOS CEMENT SUPPLY MAINS

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

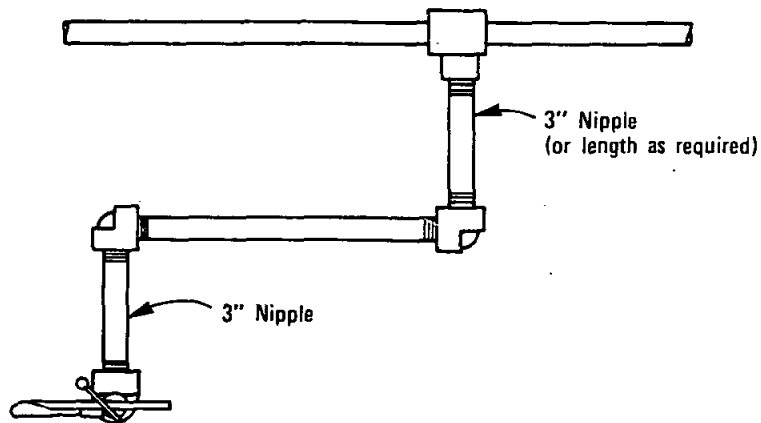
SAN DIEGO REGIONAL STANDARD DRAWING

**CONNECTION DETAIL
FOR EXISTING SUPPLY MAINS**

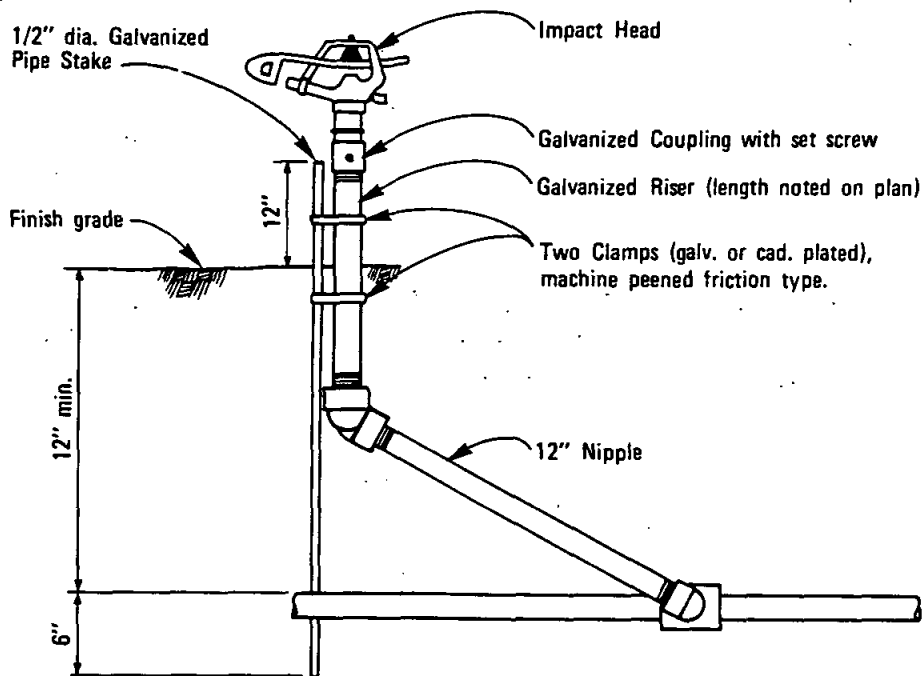
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

**DRAWING
NUMBER I-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

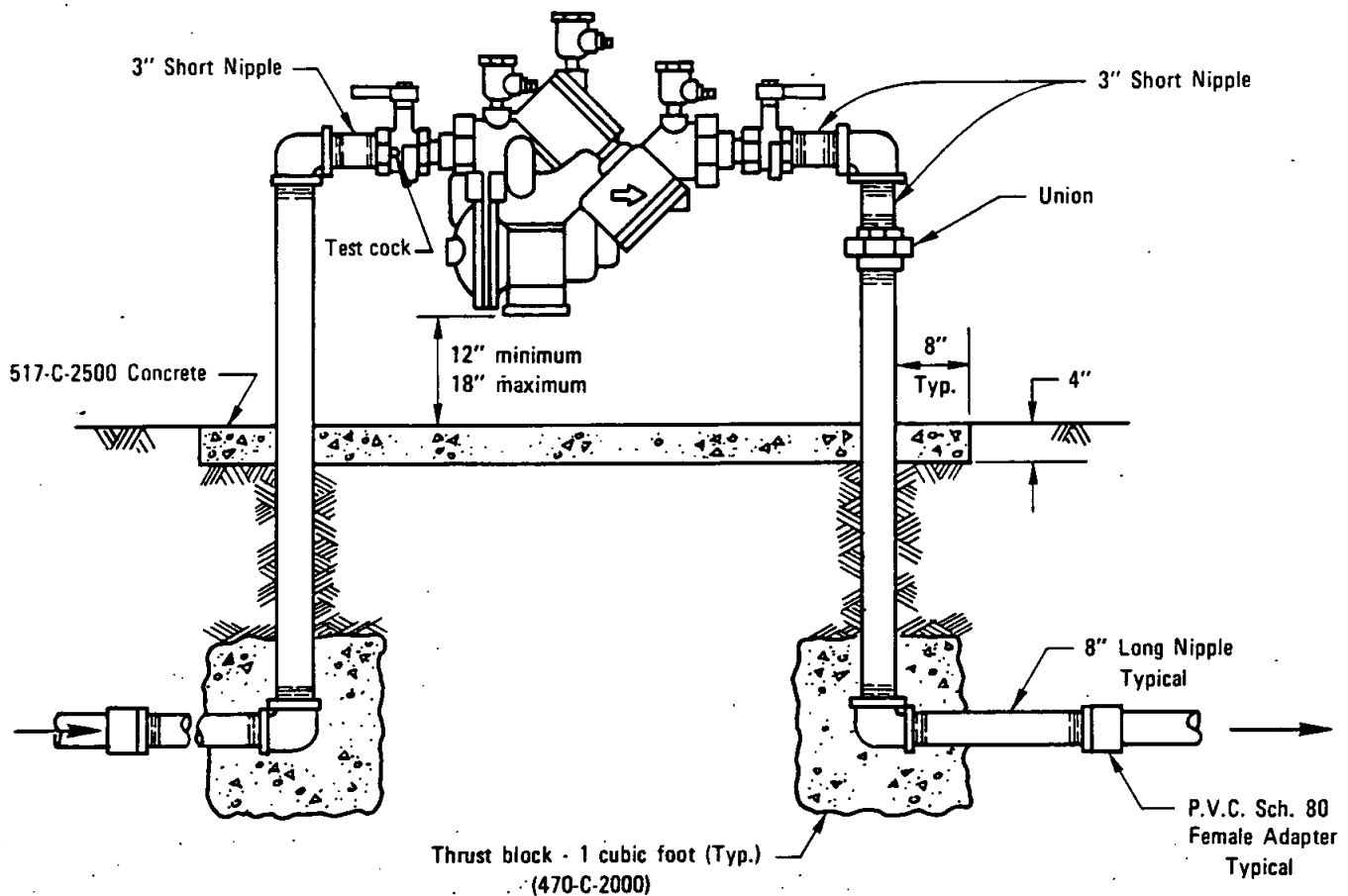
David J. Solomon - July 1979
Coordinator R.C.E. 25291 Date

SAN DIEGO REGIONAL STANDARD DRAWING

IMPACT HEAD
(WITH SWING JOINT)

DRAWING
NUMBER I-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. Teflon tape 3/4" wide shall be used on all threaded connections.
4. Concrete pad shall be 18" wide.
5. 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.

LEGEND ON PLANS



Revision	By	Approved	Date
Notes	<i>W</i>	<i>A.H.</i>	1-88

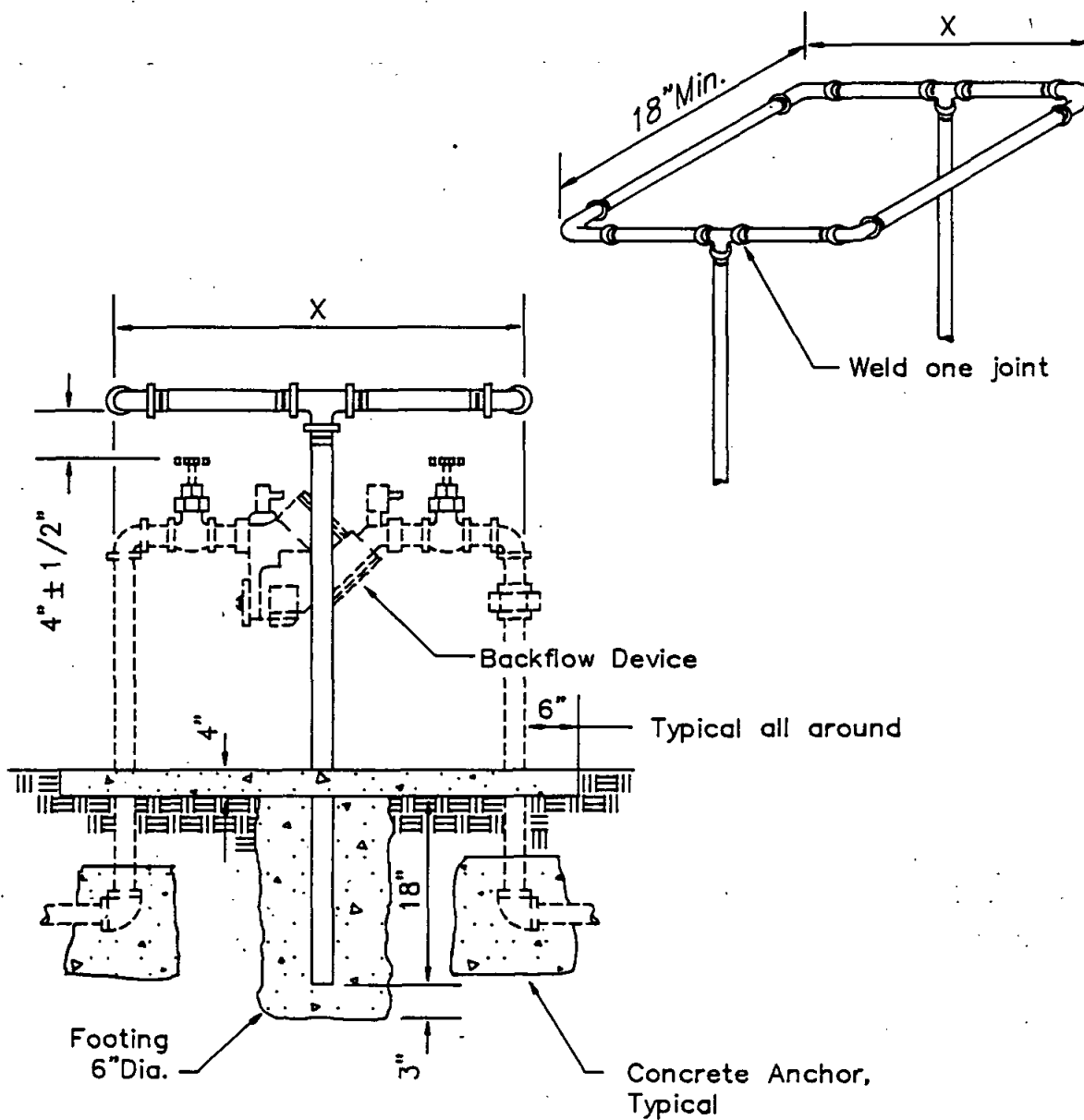
SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER REDUCED PRESSURE PRINCIPLE ASSEMBLY - 2" AND SMALLER

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER **I-31**



NOTES:

1. All pipes shall be 1 1/2-inch diameter galvanized schedule 40 steel.
2. X dimension shall be sized to accomodate type of backflow device being protected.
3. Paint entire fence with one coat metal primer and two coats of exterior yellow colored enamel.
4. Guard fence shall be centered on backflow device.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Henry P. Baker SEPT. 1988
Chairman Date

DRAWING
NUMBER 1-32

SAN DIEGO REGIONAL STANDARD DRAWING

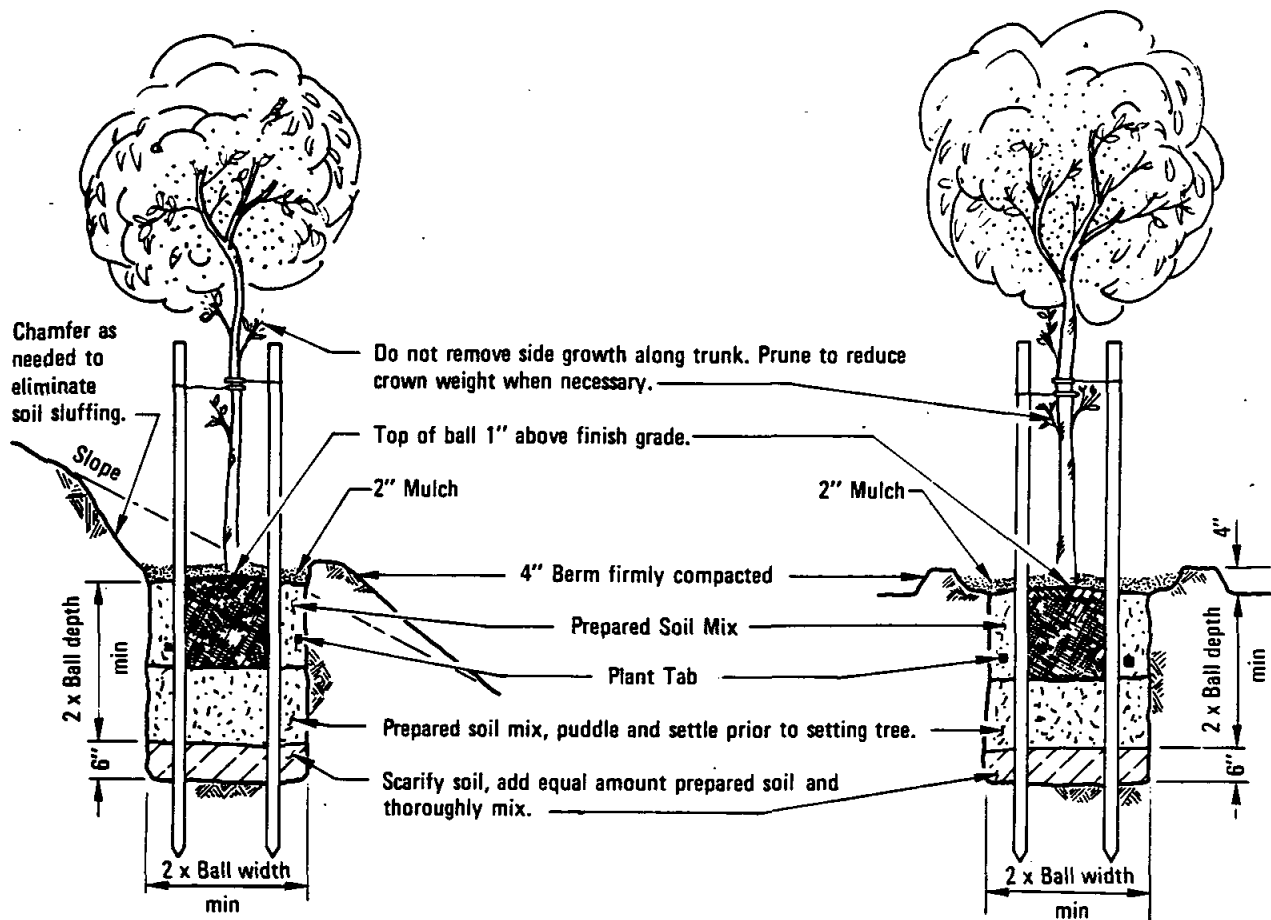
PROTECTIVE GUARD FENCE FOR BACKFLOW DEVICE

Revision	By	Approved	Date

LANDSCAPING

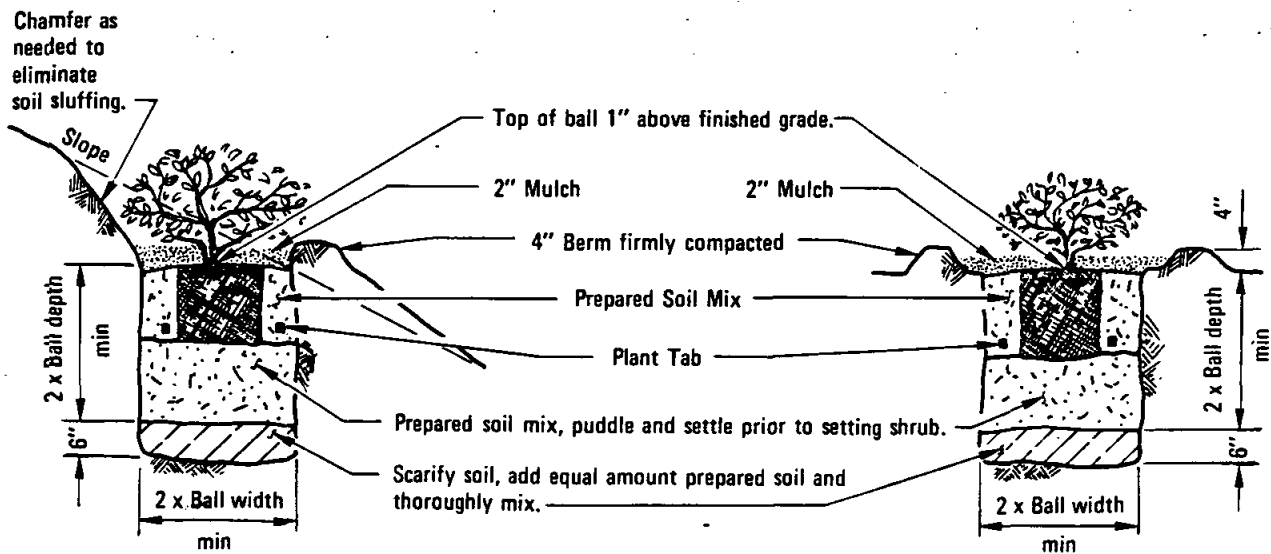
LANDSCAPING

L



TREE PLANTING - SLOPES

TREE PLANTING - LEVEL GROUND



SHRUB PLANTING - SLOPES

SHRUB PLANTING - LEVEL GROUND

Revision	By	Approved	Date

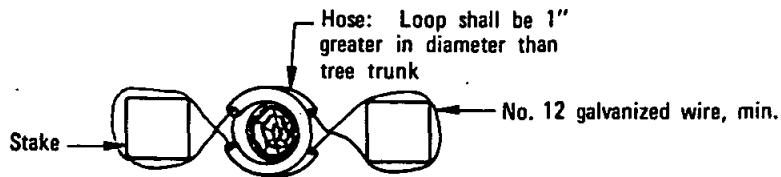
SAN DIEGO REGIONAL STANDARD DRAWING

TREE AND SHRUB PLANTING

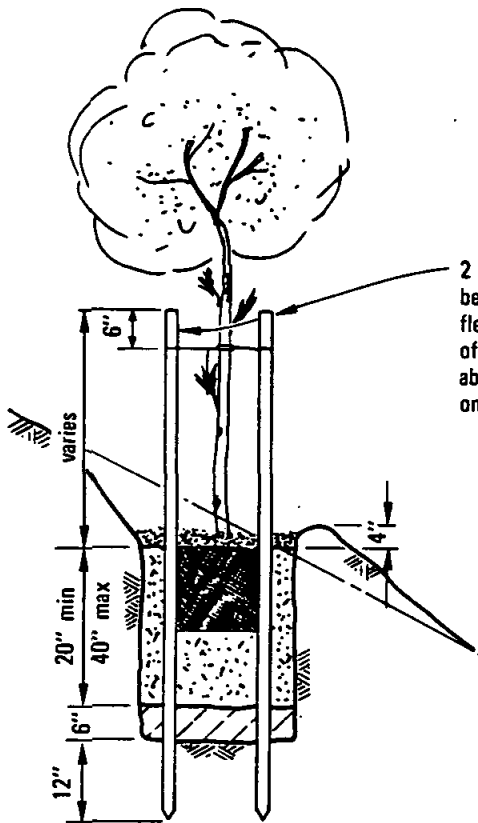
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

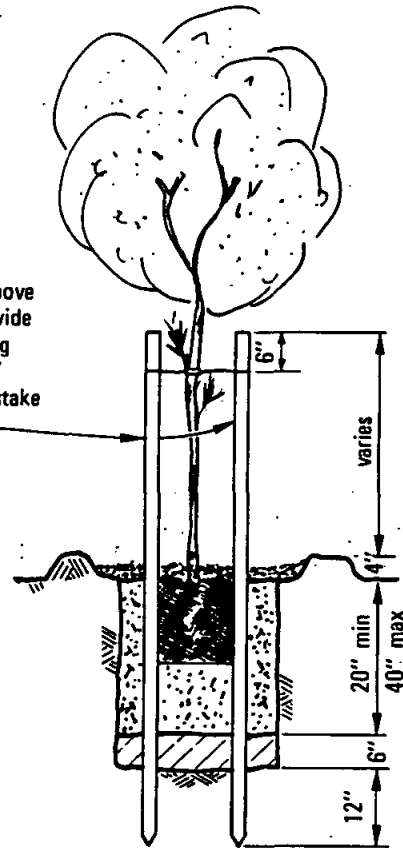
DRAWING
NUMBER L-1



PLAN



2 stakes and 2 ties. Tie tree trunk 6" above bending moment of tree. Tie should provide flexibility of trunk but not allow rubbing of trunk against stake. Cut stakes off 6" above ties. For single stake trees, place stake on windward side of tree.



TREE STAKING - SLOPES

TREE STAKING - LEVEL GROUND

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

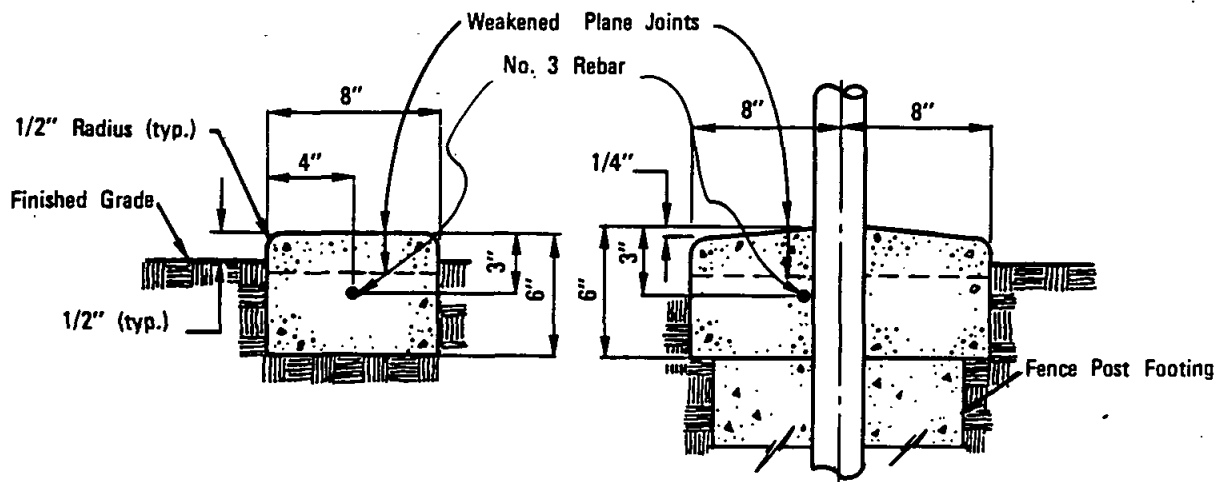
SAN DIEGO REGIONAL STANDARD DRAWING

TREE STAKING

Revision	By	Approved	Date
Plan	SC	D. S.	7.79

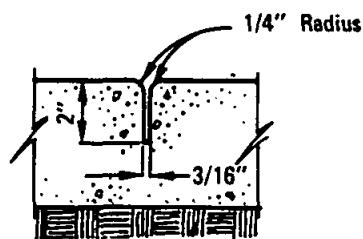
DRAWING
NUMBER

L-2

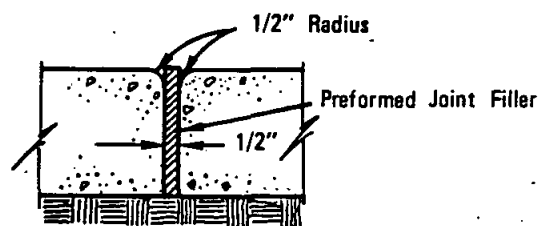


TYPE A
SHRUB AREAS

TYPE B
UNDER FENCES



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



EXPANSION JOINT
MAX. 120 FT. O. C.

NOTES:

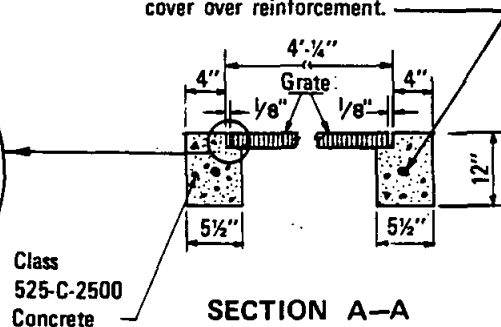
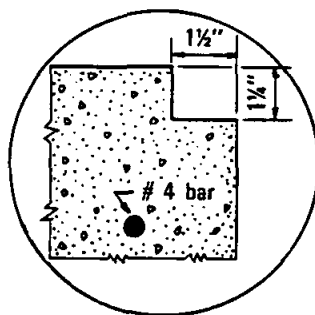
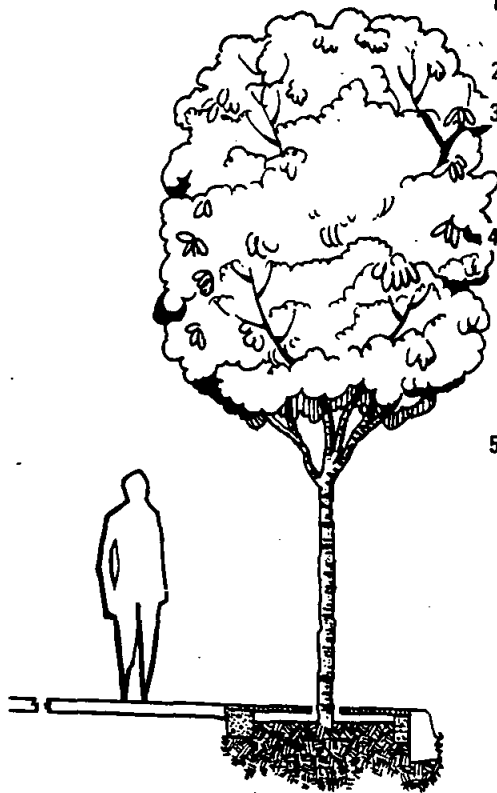
1. Rebar shall be continuous with 12 inch overlap at splices.
2. Concrete shall be class 520-C-2500 and same color as any adjacent concrete.
3. Install weakened plane joints at each fence post.
4. Install expansion joints where the mowing strip abuts any concrete improvement.

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 R.C.E. C13768 Date
					DRAWING NUMBER L-3

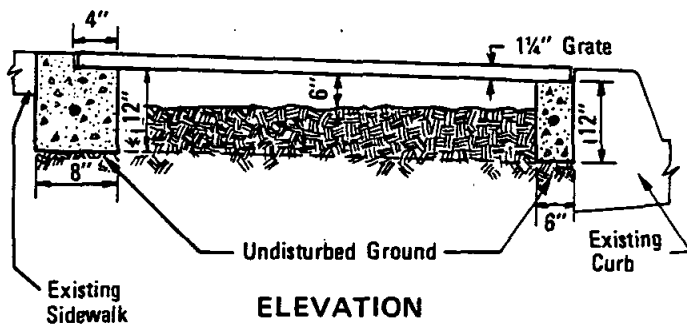
NOTES

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.

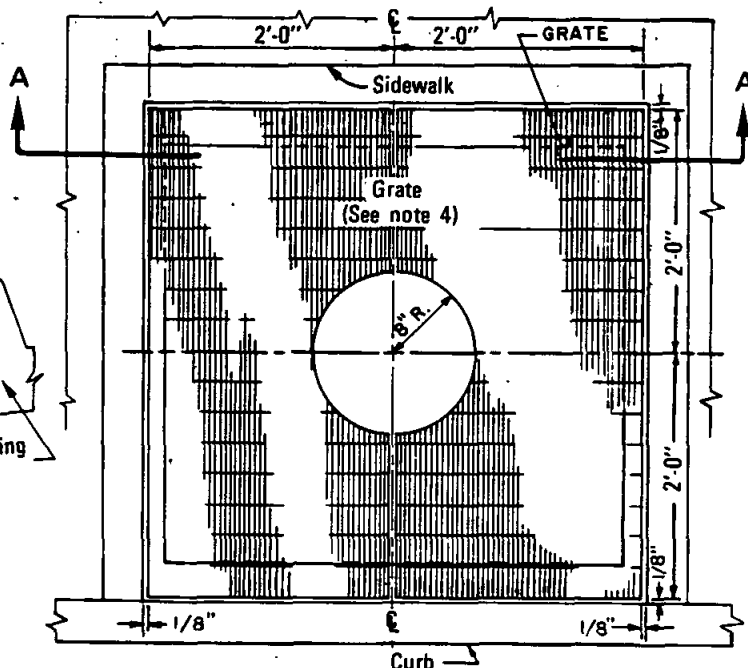
4 - Reinforcing bars on four sides, lap 15" at corners, 2 1/2" min. concrete cover over reinforcement.



SECTION A-A



ELEVATION



PLAN

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

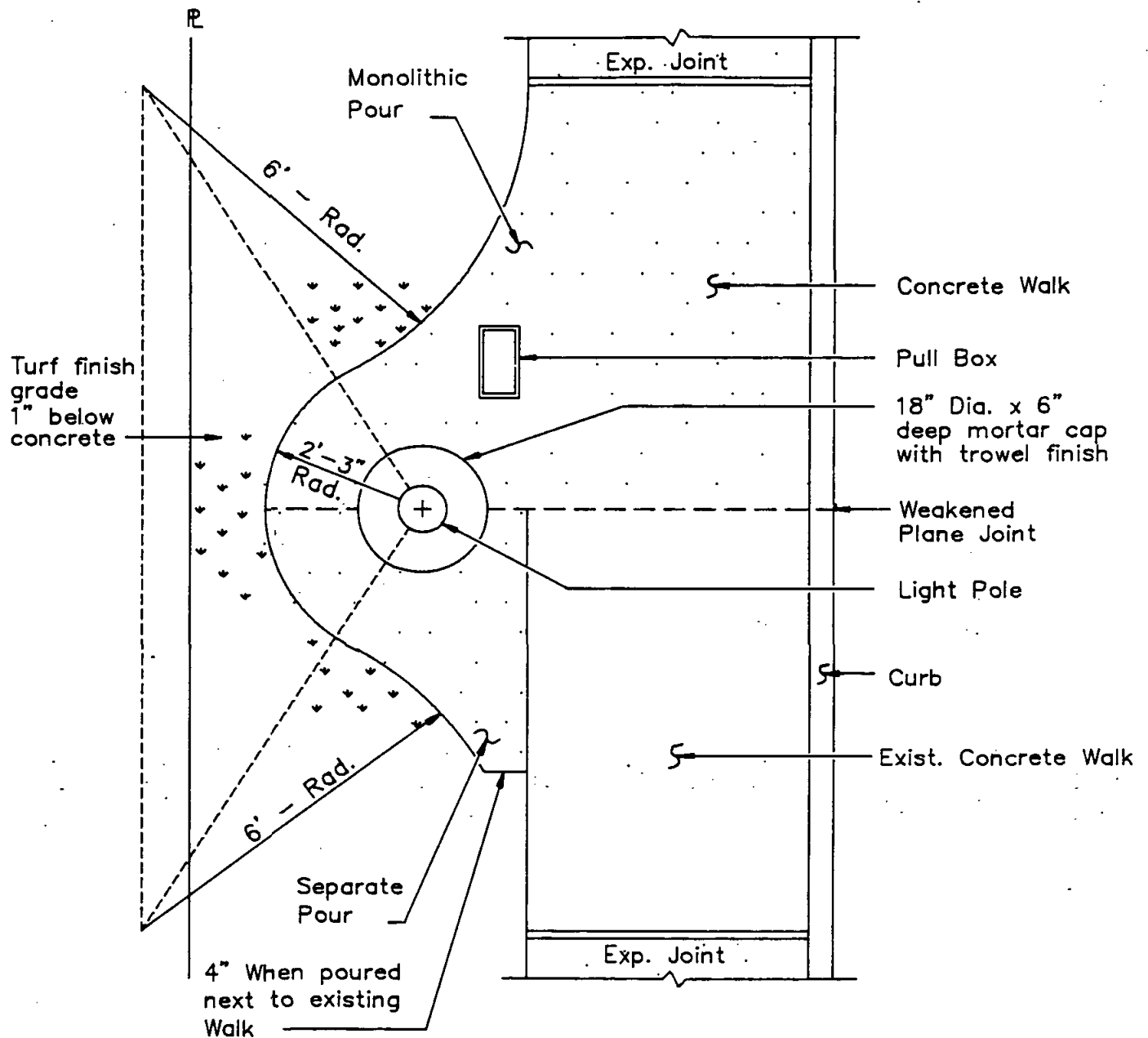
M. B. ... 4-2586
Coordinator R.C.E. C21133 Date

DRAWING NUMBER L-4

SAN DIEGO REGIONAL STANDARD DRAWING

STEEL GRATE
TREE WELL COVER

Revision	By	Approved	Date



NOTES:

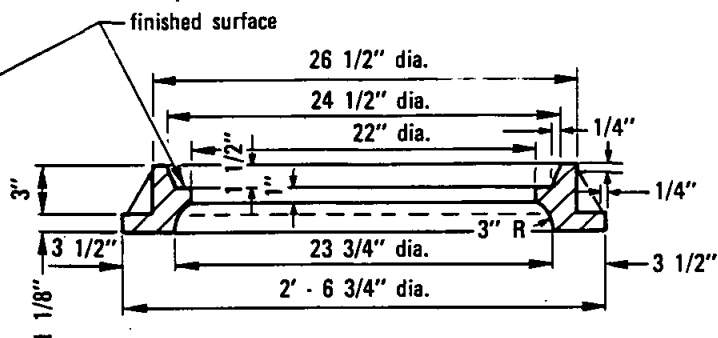
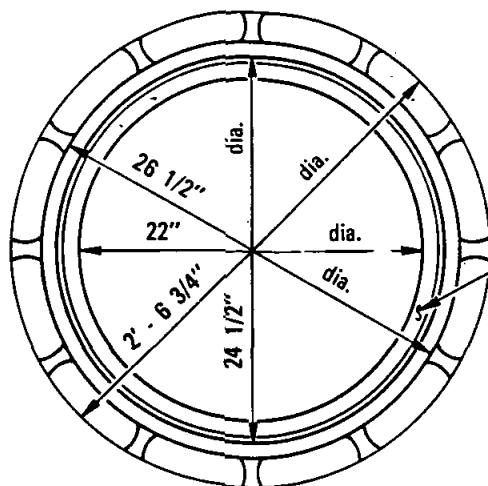
1. See Electric Plans for fixture/pole/footing details.
2. Use monolithic pour for new construction.
3. Poles shall be 6'-0" from face of curb, where applicable.
4. Pole pads shall drain at 2% minimum in same direction as sidewalk.
5. Concrete for pad shall be the same as specified for sidewalk.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>George Pabian</i> SEPT. 1988 Chairman Date
				LIGHT POLE PAD IN TURF AREAS	DRAWING NUMBER L-5

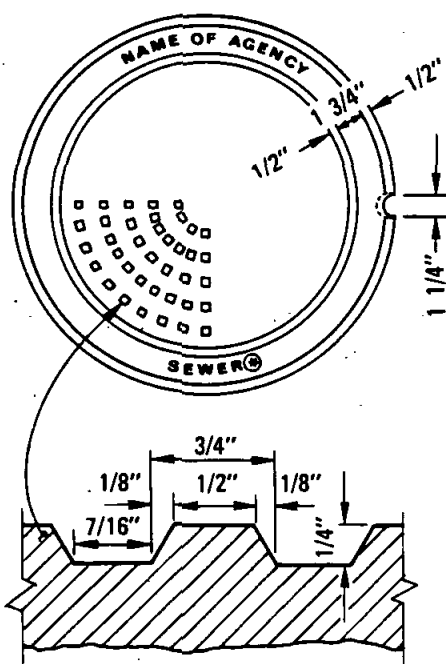
MISCELLANEOUS

MISCELLANEOUS

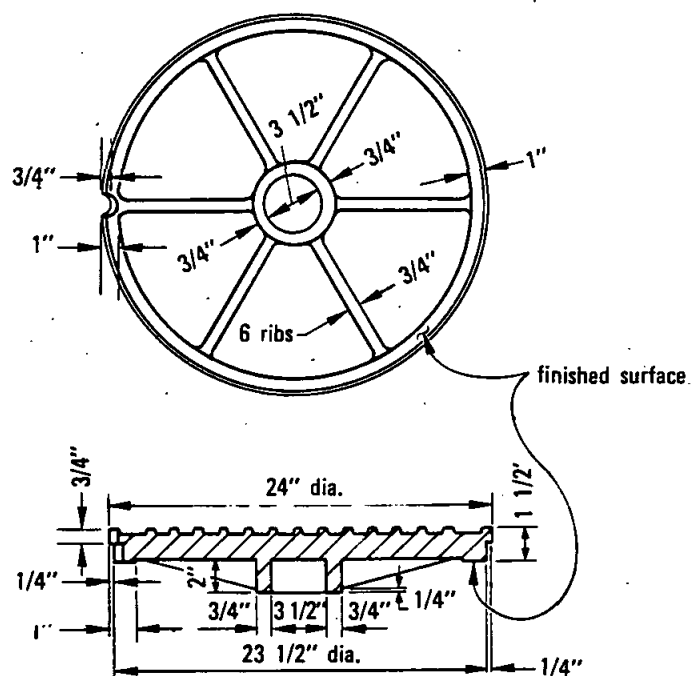
M



**MANHOLE COVER FRAME
CAST IRON WT. 175 LB.**



DETAIL



**MANHOLE COVER
CAST IRON WT. 155 LB.**

NOTES

1. Frame and cover shall be cast iron.
2. Weights: Frame 175 lbs.
Cover 155 lbs.
3. Imported covers and frames shall have the country of origin marking in compliance with federal regulations.

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

Revision	By	Approved	Date
Note 3	SE	A.A.	7-88

SAN DIEGO REGIONAL STANDARD DRAWING

**24" MANHOLE FRAME AND COVER
HEAVY DUTY**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

**DRAWING
NUMBER**

M-1



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
4. Imported covers and frames shall have the country of origin marking in compliance with federal regulations.

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

M-2

24" MANHOLE FRAME AND COVER LIGHT DUTY

Revision	By	Approved	Date
Note 4	22	A.H.	7/88



5. Imported covers and frames shall have the country of origin marking in compliance with federal regulations.



Revision	By	Approved	Date
Note 5	SC	G.H.	7-88

SAN DIEGO REGIONAL STANDARD DRAWING

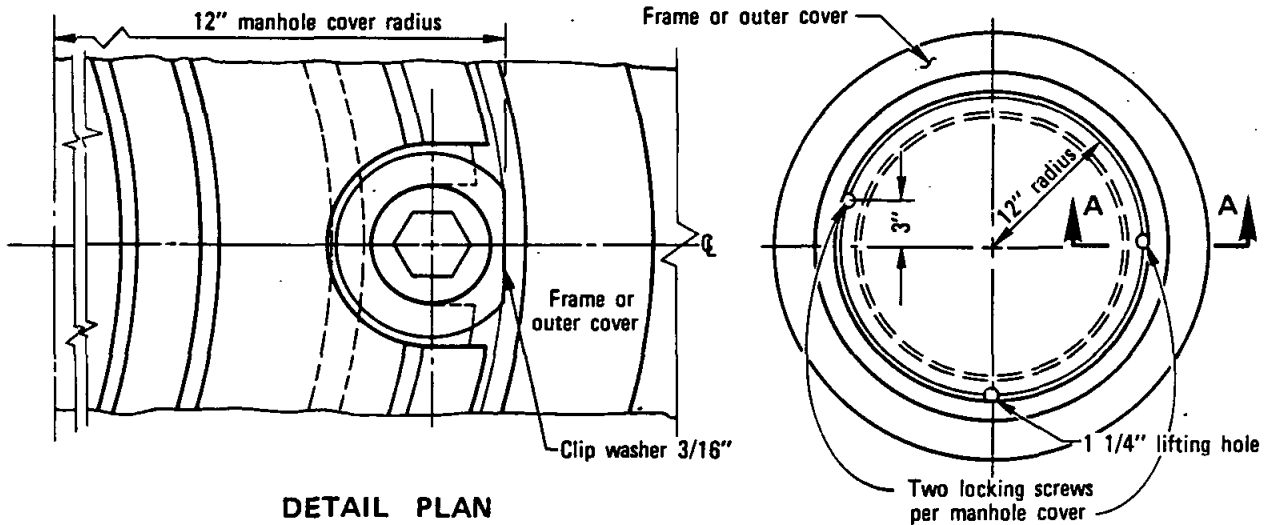
36" MANHOLE FRAME AND TWO CONCENTRIC COVERS HEAVY DUTY

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kerschbaum Dec. 1975
Coordinator R.C.E. 1980? Date

**DRAWING
NUMBER**

M-3

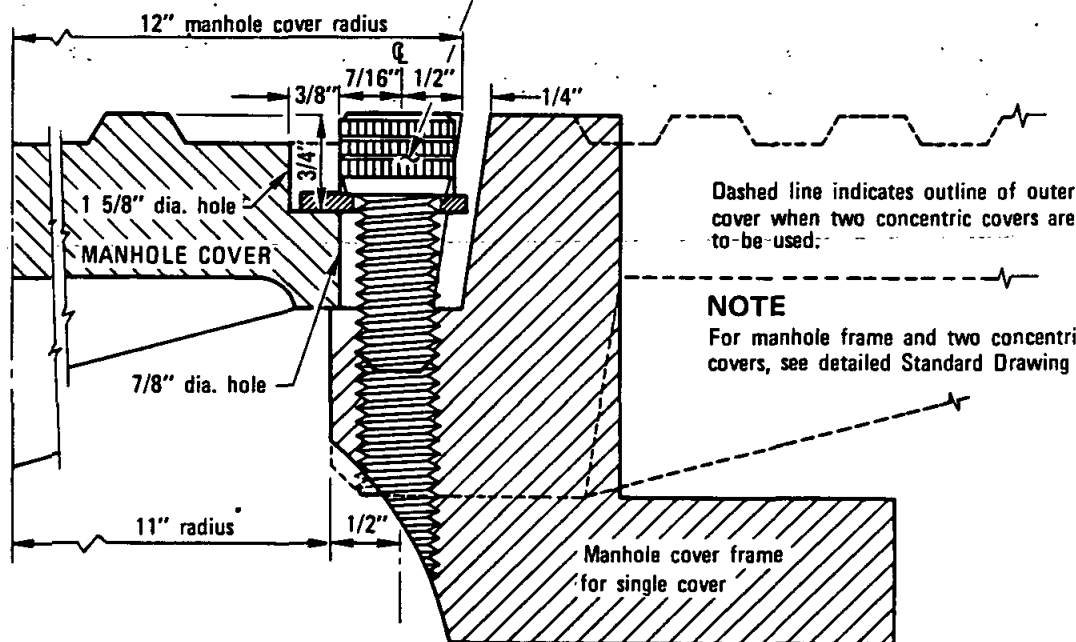


Drill and tap hole, install 5/8"x 1 1/2" stainless steel, hexagonal socket head cap screw (2 required), Unified National Coarse Thread - 11 per inch - with 1 1/2" O.D. x 11/16" I.D. x .078" thick stainless steel washer.

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

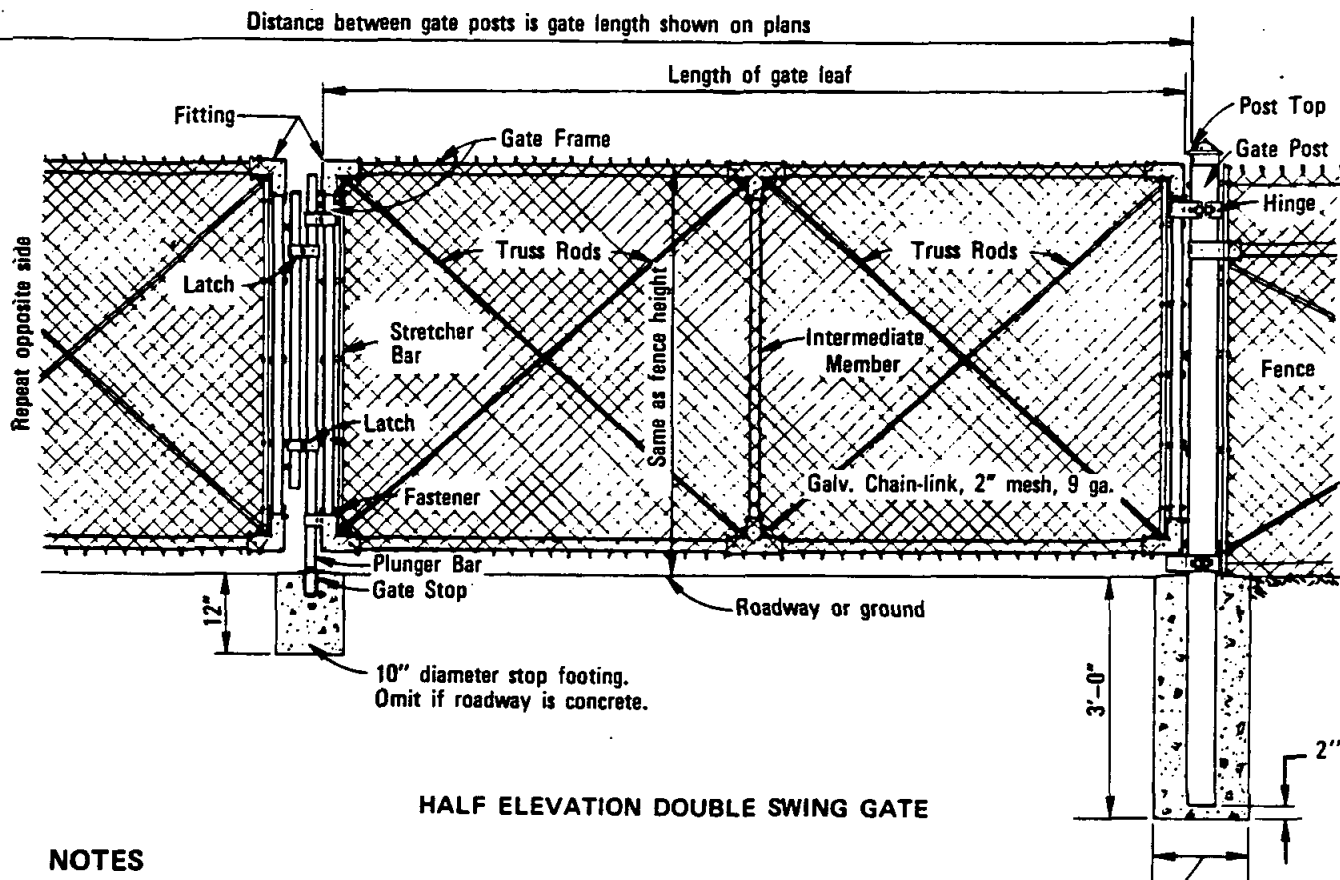
Allan O. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE COVER LOCKING DEVICE

DRAWING
NUMBER **M-4**

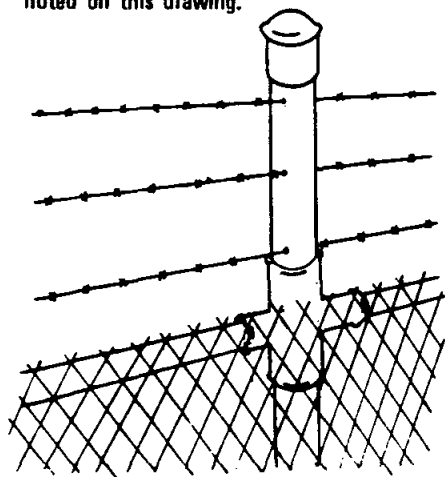
Revision	By	Approved	Date



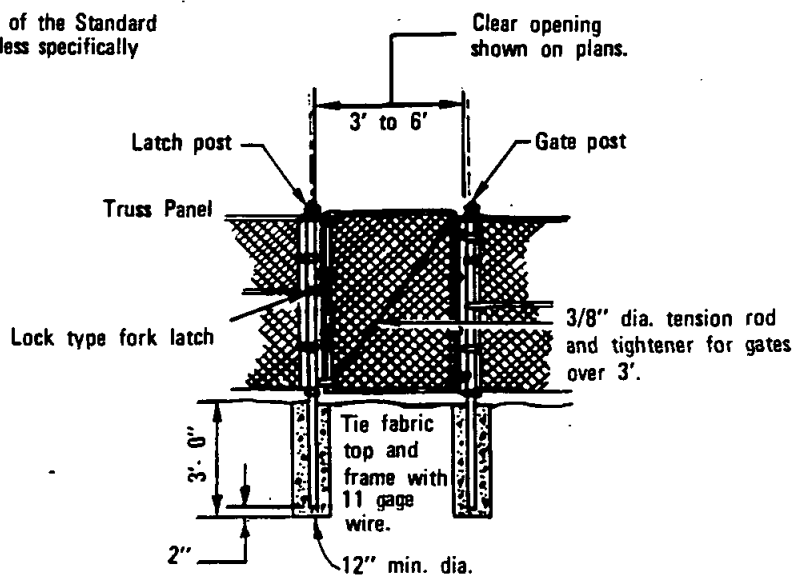
NOTES

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 post
3. 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	MA B.	10-82
Conc.	2	TRA B.	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

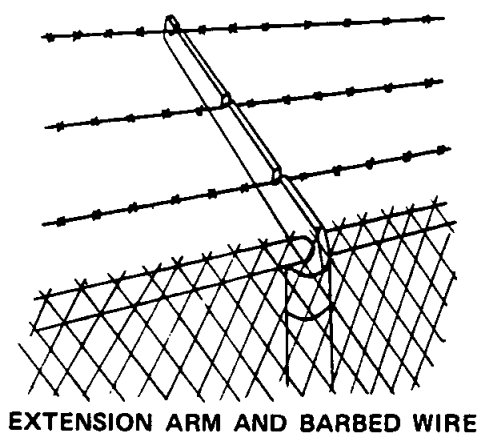
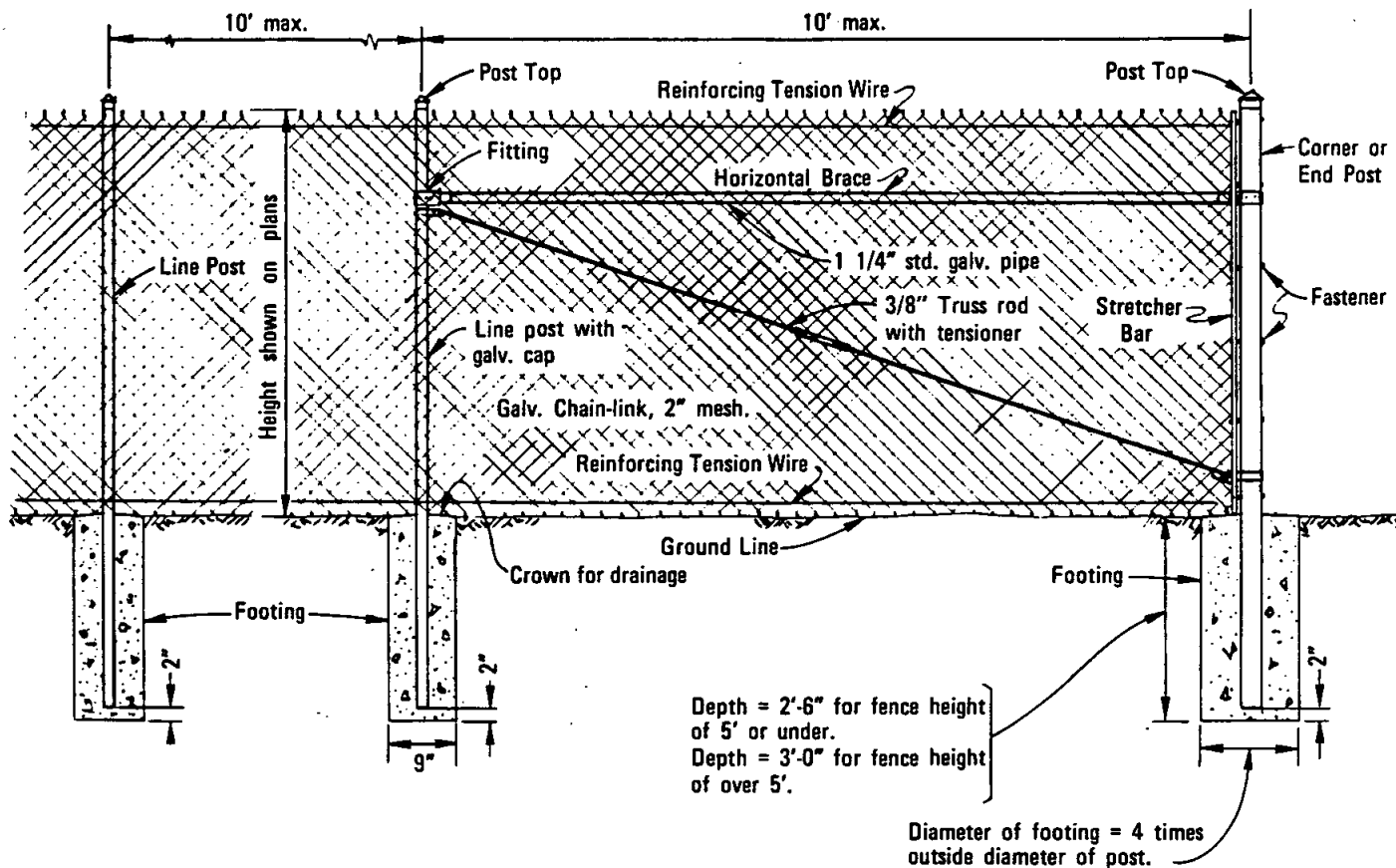
CHAIN LINK GATE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

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-20 for additional details.

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

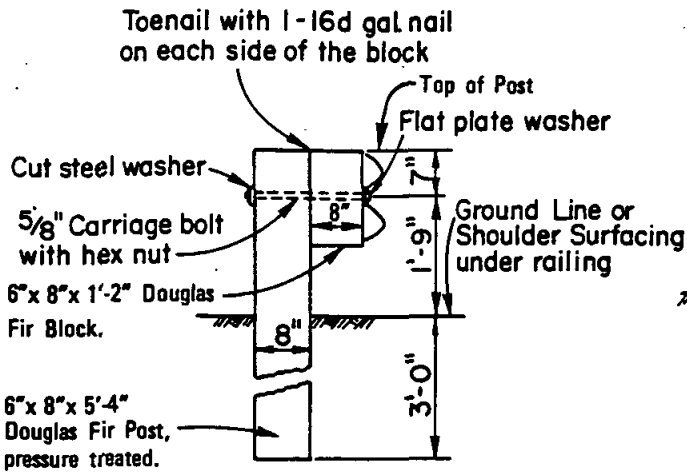
SAN DIEGO REGIONAL STANDARD DRAWING

CHAIN LINK FENCE

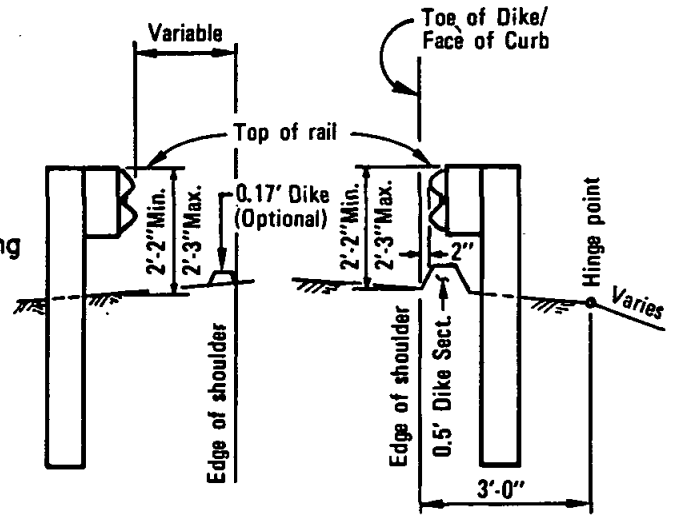
DRAWING
NUMBER

M-6

Revision	By	Approved	Date
Note 3	TRP	M.B.	10-82
Notes	SC	M.B.	5-86
Notes	SC	A.H.	7-88



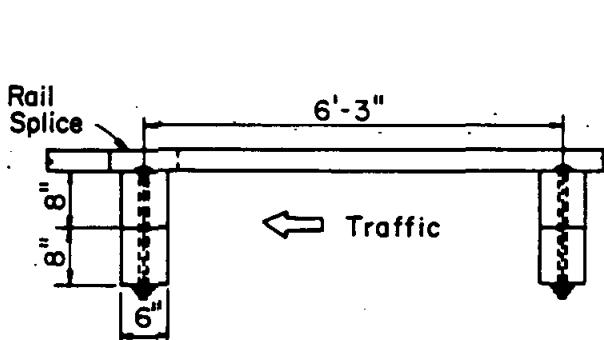
SECTION AT SUPPORT



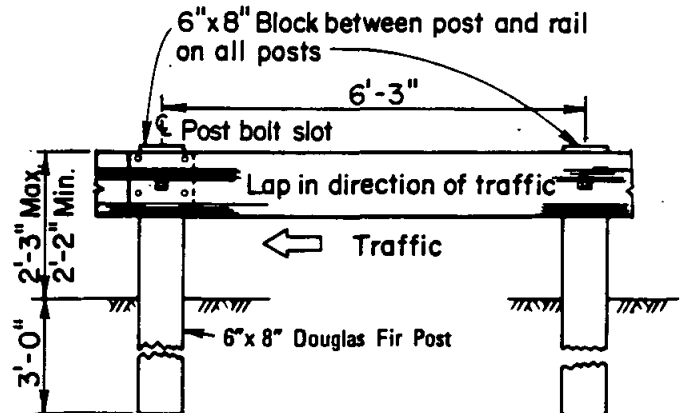
SECTION WITH / WITHOUT DIKE

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

LINE POSTS



PLAN

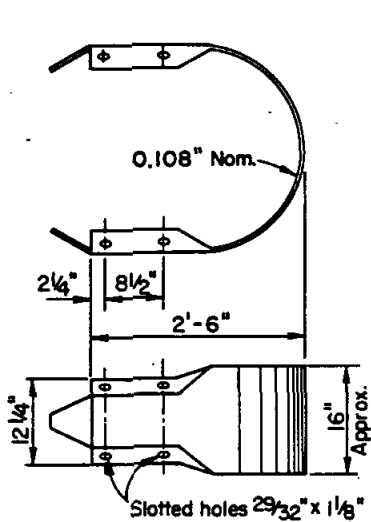


ELEVATION

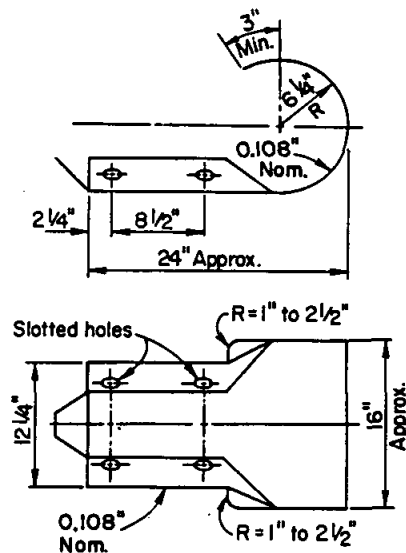
NOTE

See Standard Drawing M-8 for additional details.

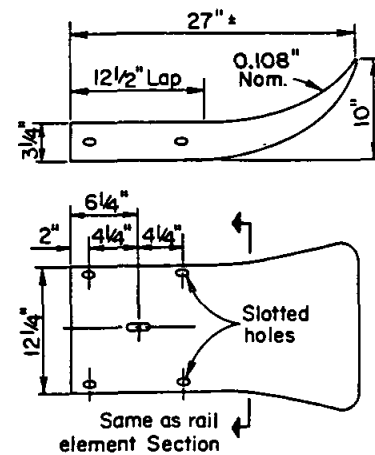
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY: THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Sections	R	M.B.	5-86			Allan O. Kuehn Dec. 1975 Coordinator R.C.E. 19807 Date	
				METAL BEAM GUARD RAIL INSTALLATION		DRAWING NUMBER	
						M-7	



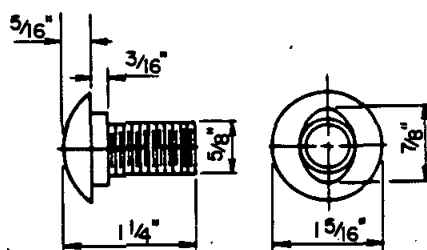
RETURN SECTION



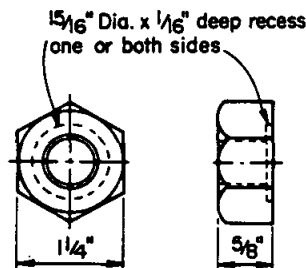
**TERMINAL SECTION
TYPE "A"**



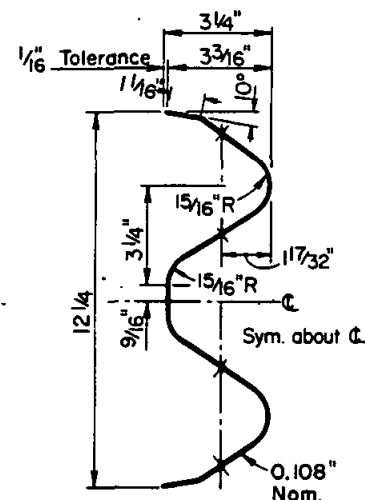
**TERMINAL SECTION
TYPE "B"**



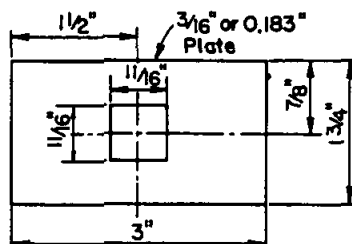
5/8" Ø BUTTON HEAD BOLT



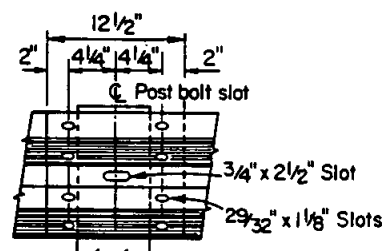
5/8" Ø RECESS NUT



**SECTION THRU
RAIL ELEMENT**



FLAT PLATE WASHER



5/8" x 1/4" Button head oval shoulder bolts with 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

Attilio A. Kuehnel Dec. 1975
Coordinator R.C.E. 15887 Date

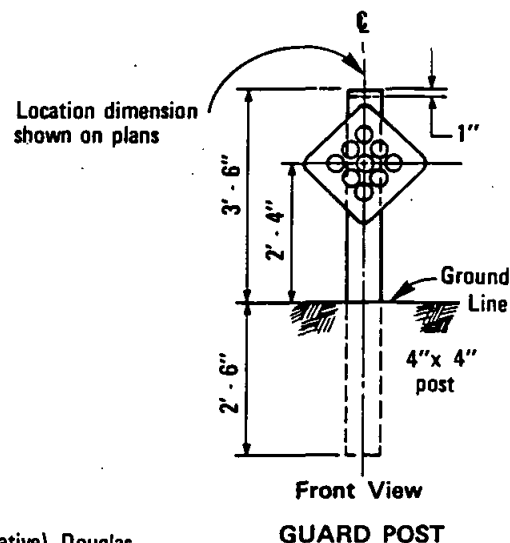
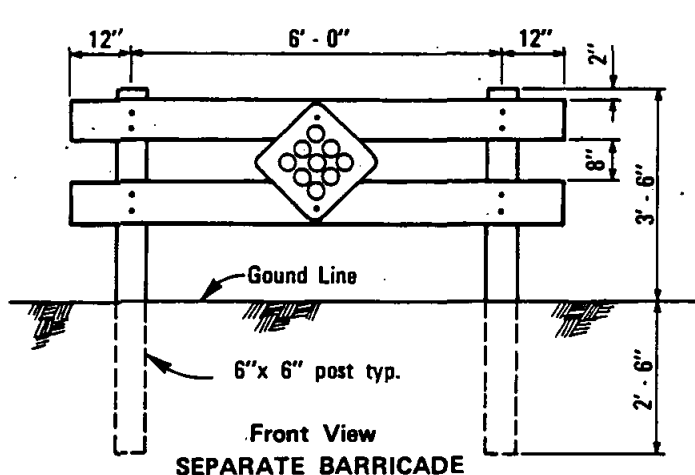
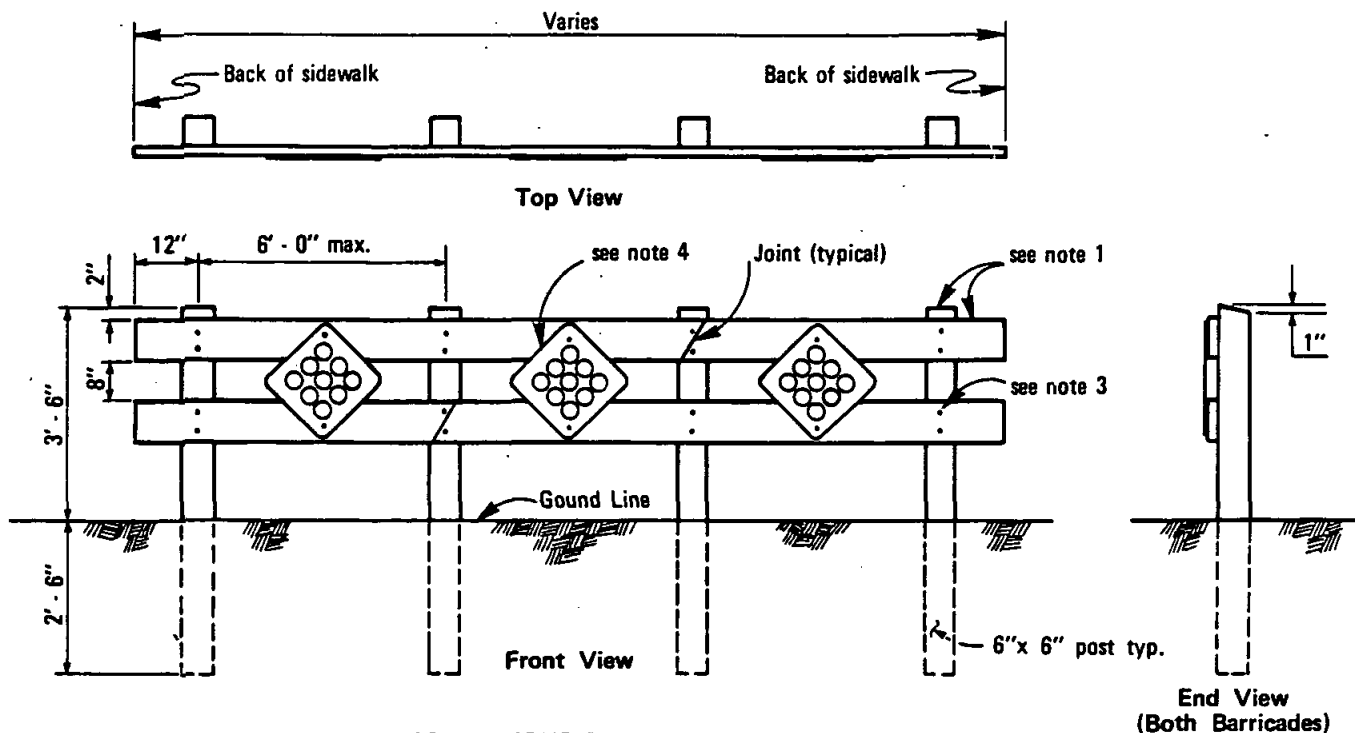
DRAWING
NUMBER

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
Cont. Barric.	TRP	D.S.	7-79
Post	TRP	M.B.	10-82

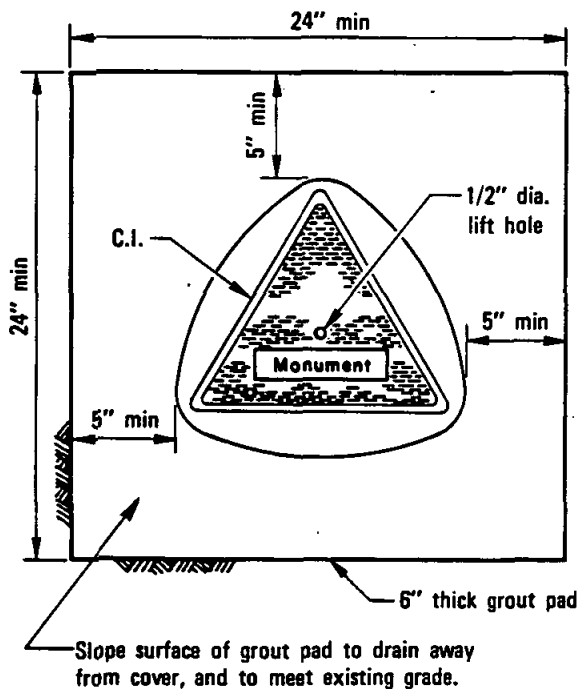
SAN DIEGO REGIONAL STANDARD DRAWING

GUARD POST AND BARRICADE

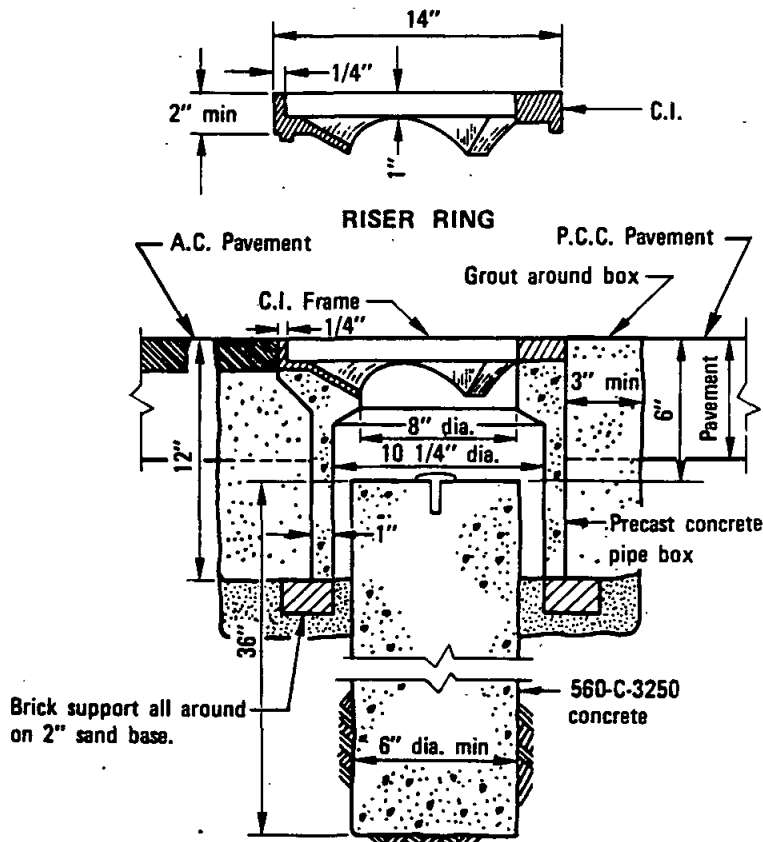
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

DRAWING NUMBER **M-9**



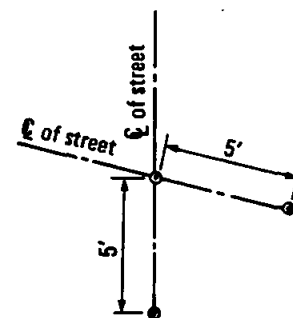
PLAN-IN UNPAVED AREA



TYPICAL MONUMENT SECTION IN PAVED AREA

NOTES

1. Cover and frame to be cast integrally with pipe box.
2. Monument base may be cast in place or precast.
3. Form and taper exposed upper 6" of cast in place base to a top diameter of 5". (Precast base shall be sand backfilled).
4. Monument marker shall be a domed brass, 3" in diameter.
5. Monument Location:
 - a) Set on all centerline intersections unless actual location is modified by the Agency and shown in modified location on map. When centerline intersection is impractical, offset 5 feet on centerline of major street, (see detail at right). If neither centerline can be occupied, two monuments will be set in line around the front on the perimeter of a 10-foot diameter circle, whose center is the point.
 - b) Set on centerline at intervals not exceeding 1000 feet on straight runs.
 - c) Set on centerline at points of curvature.
 - d) Set on center at center points of cul-de-sacs.
 - e) Set on centerline when center point of cul-de-sac is offset from centerline.
 - f) These standards may be modified at the discretion of the Agency in cases where strict compliance there-with results in more monuments than it considers necessary. The following technique for reducing the number of monuments will be routine.
 - g) Substitution of one monument on the "Point of Intersection" for monuments at the "Beginning of Curve" and the "Ending of Curve" when the "Point of Intersection" falls within the pavement area.
 - h) Deletion of any monument otherwise required by these standards when its position can be determined by turning one angle from a point on a straight line between two other monuments, providing such point is not more than 300 feet from the point on which the deleted monument would have been placed.



Alternate location of monument. Tie distances shown on final subdivision map if alternate location is used.

LOCATION OF STREET SURVEY MONUMENT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

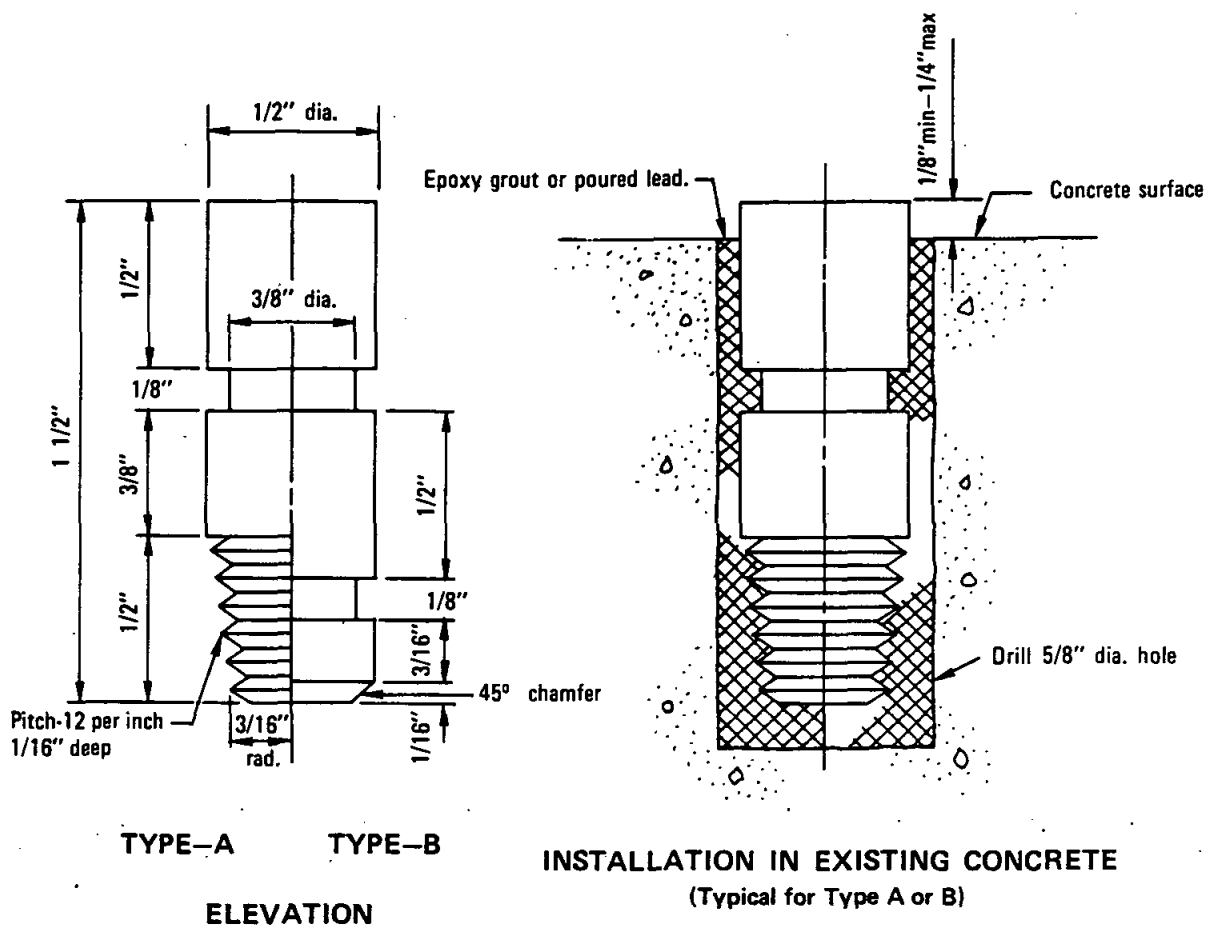
SAN DIEGO REGIONAL STANDARD DRAWING

STREET SURVEY MONUMENT

DRAWING
NUMBER

M-10

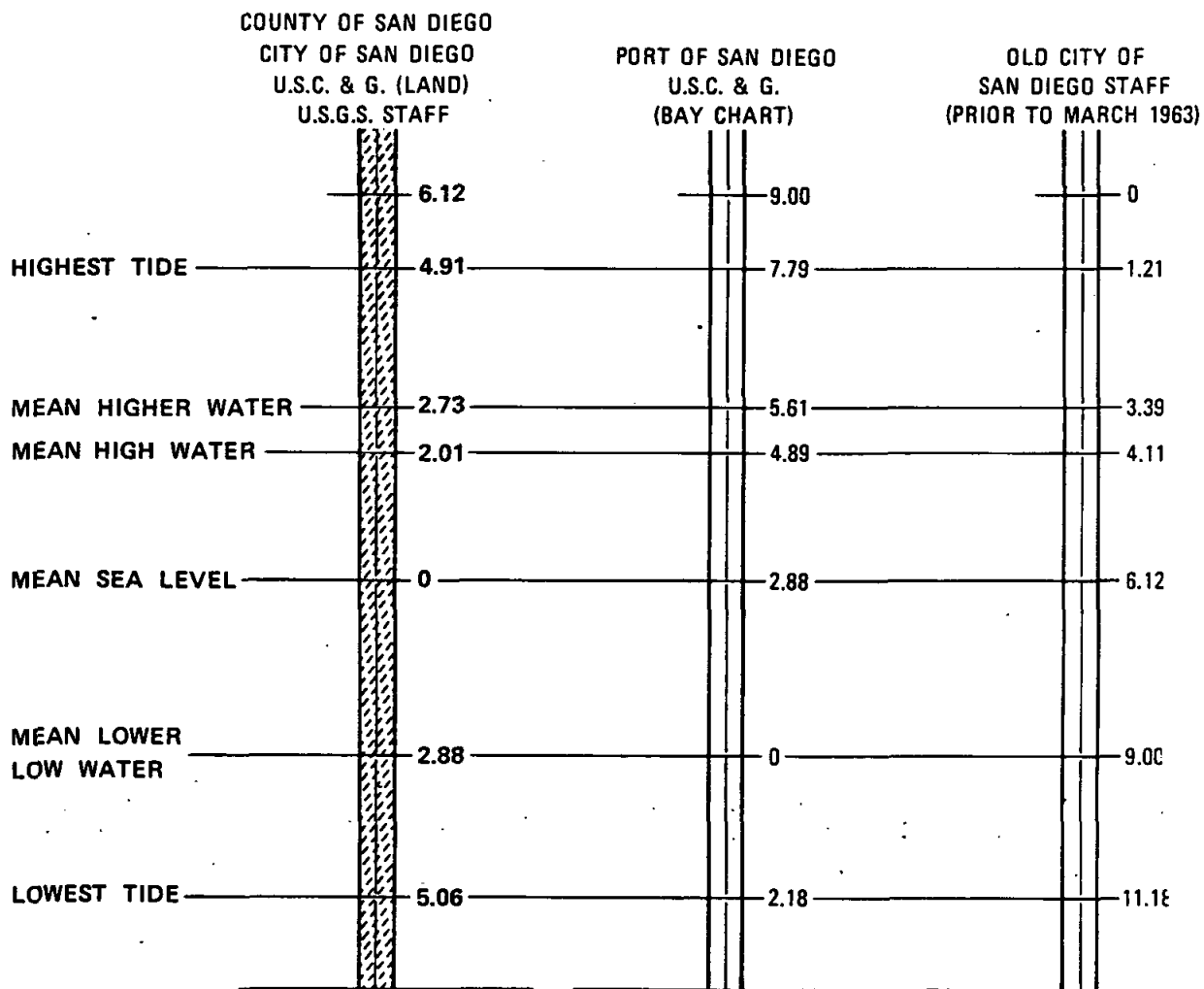
Revision	By	Approved	Date
Notes	3C	D.S.	7-79
Section	MC	M.B.	4-86



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		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
				BENCH MARK - BRASS PLUG		<i>Allan A. Kuehn</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

Alfred A. Kuehn 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 ½" 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.

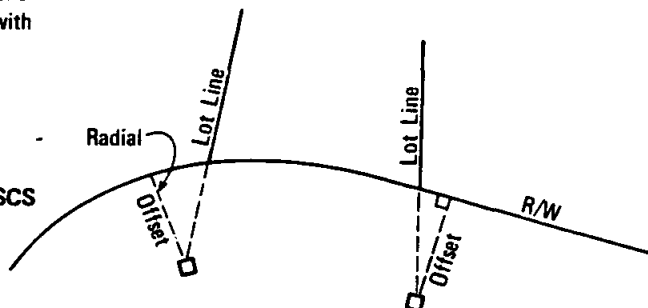
Unless otherwise shown on this map:

1. All lot corners except as described below will be monumented by a ½ 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
Notes	SC	Q.S.	7.79

SAN DIEGO REGIONAL STANDARD DRAWING

SURVEY MONUMENTS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

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 Celsius) + 32

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

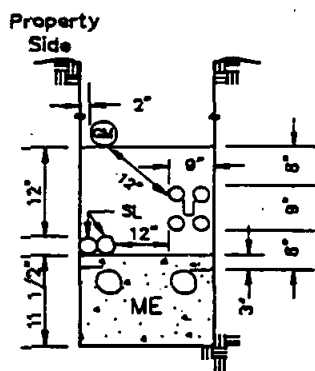
SAN DIEGO REGIONAL STANDARD DRAWING

METRIC EQUIVALENTS

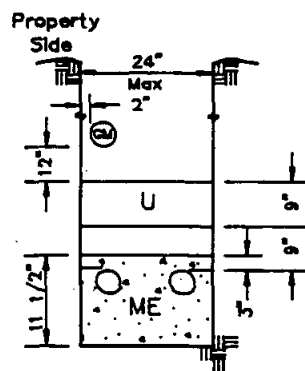
DRAWING
NUMBER

M-14

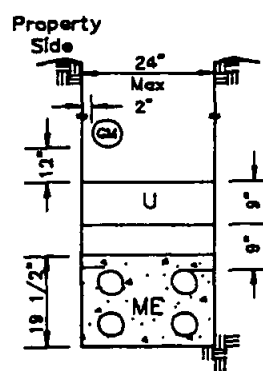
Revision	By	Approved	Date
Equation	30	D. J.	7-79



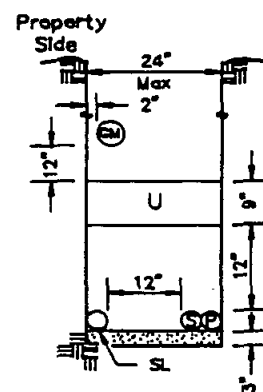
TYPE A



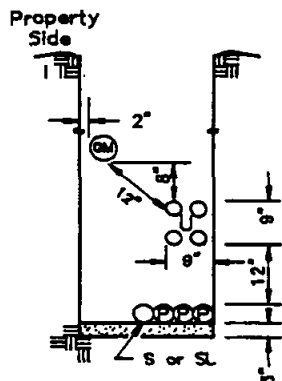
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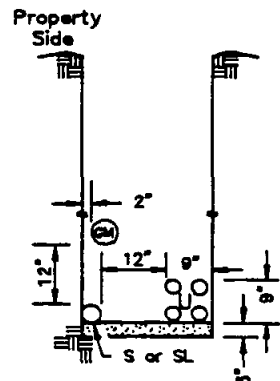
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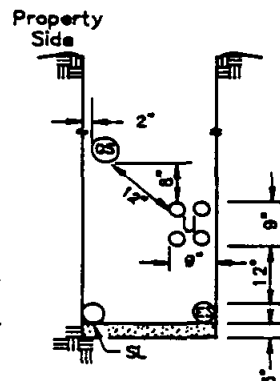
TYPE D



TYPE E



TYPE F



TYPE G

SERVICE TRENCH
ON
PUBLIC PROPERTY

LEGEND		MIN. COVER
GM	Gas Main	30"
GS	Gas Service	30"
P	Primary Electric	42"
S	Secondary Electric	30"
ES	Electric Service	30"
ME	Multiple Electric (P, S or ES In Spacers) Concrete Encased	24"
SL	Street Light (not series)	30"
U	CATV	24"
	TELCO	24"

NOTES:

1. All dimensions are typical unless otherwise noted.
2. Generally utilities are to be installed under the applicable specifications for the particular utility and the specifications of the owner Agency.
3. The location of utilities as shown by the Standard Drawing shall in no way violate existing codes or regulations applicable to individual utilities.
4. Installation of sewer and/or water utilities are not permitted in the joint trench shown above.
5. Minimum depth of gas pipe may, subject to gas company inspectors approval, be reduced to 24" where necessary to clear structure crossings.
6. Depth and width of trench varies.
7. CATV main or trunk line conduit required along all streets, except cul-de-sac streets less than 1000' in length which may be served by feeder lines only.
8. CATV 1 1/2" feeder conduit shall run across streets with each power service line and capped at edge of sidewalk.
9. 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 locations of the CATV system.
10. In no case shall CATV conduits be placed within 12" of gas lines. Also conduits are not to be placed directly over gas lines.
11. CATV conduit may be placed with the TELCO conduit provided the TELCO minimum depth is held.

Revision	By	Approved	Date
New Dwg	gc	A.H.	10/88

SAN DIEGO REGIONAL STANDARD DRAWING

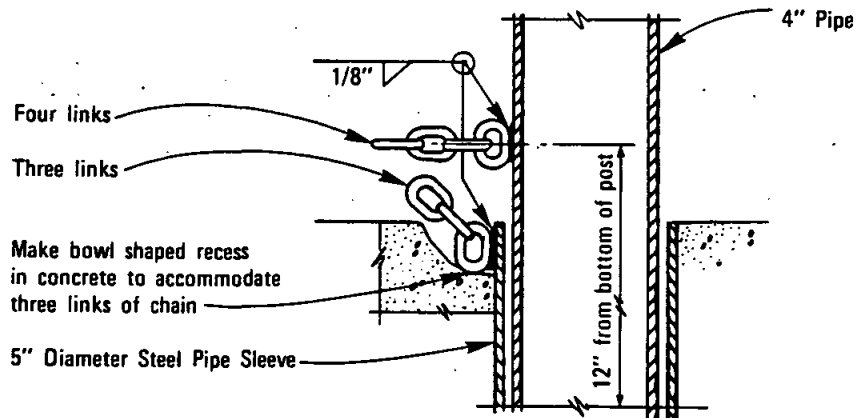
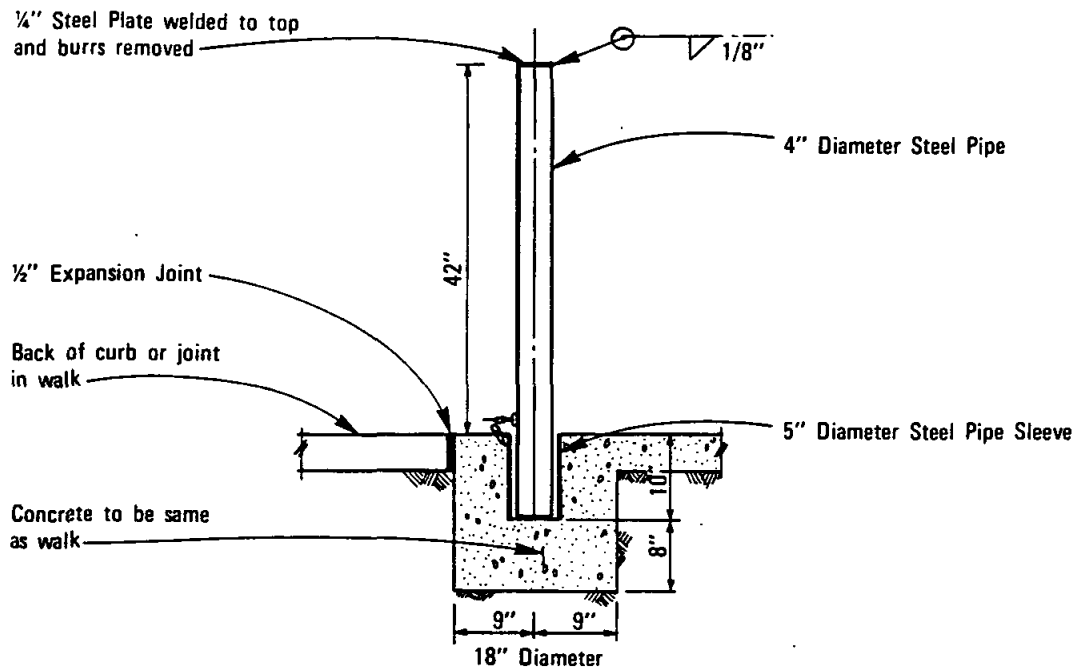
JOINT TRENCH UTILITIES LOCATION

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Long Palmer SET. 1788
Chairman 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

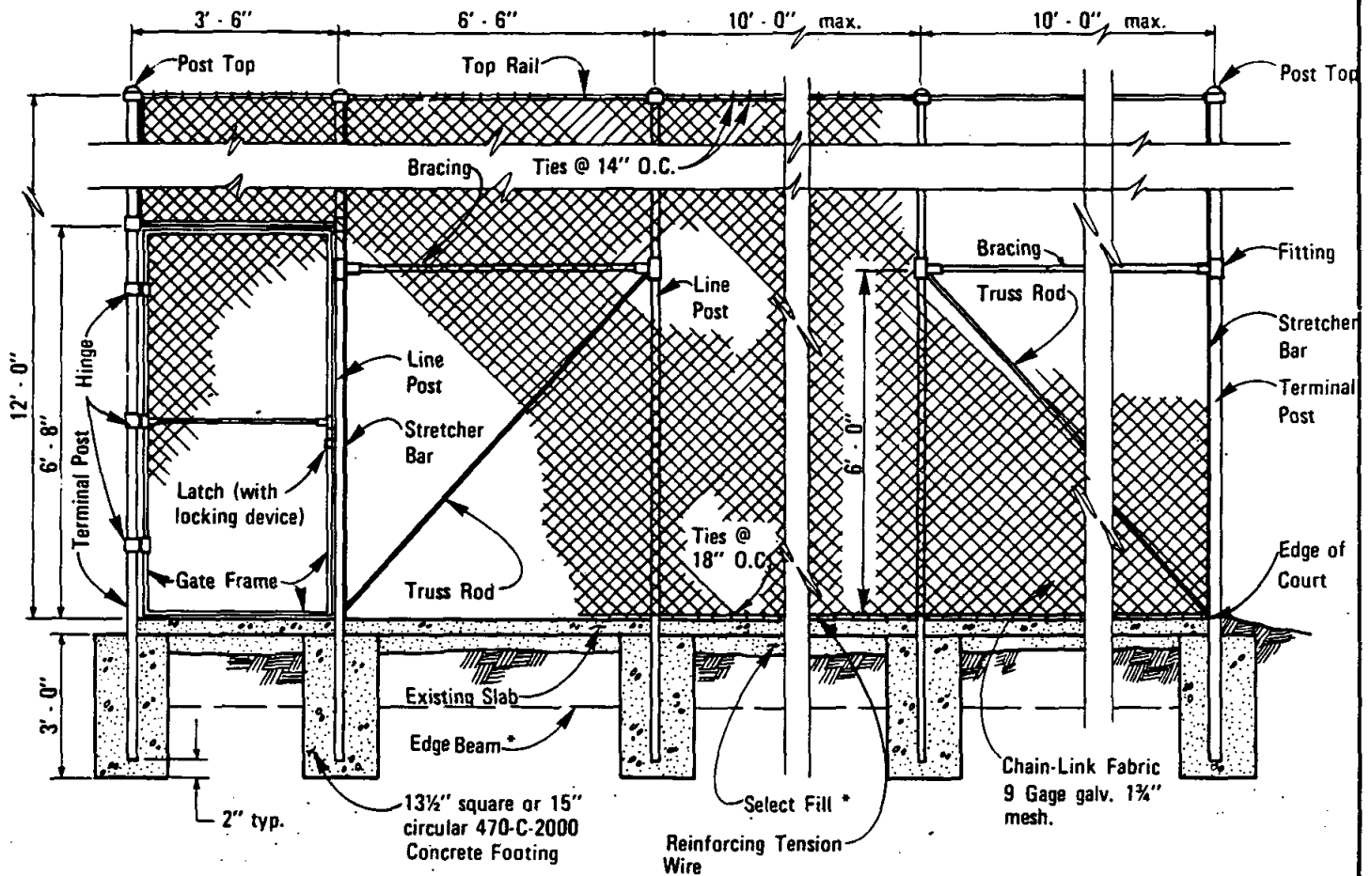
David L. Solomon July 1979
Coordinator R.C.E. 25291 Date

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 Drawing 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	M.B.	5-86
Caution	A.H.	7-88

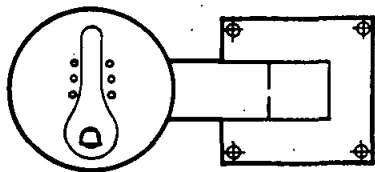
SAN DIEGO REGIONAL STANDARD DRAWING

TENNIS COURT FENCE CHAIN - LINK

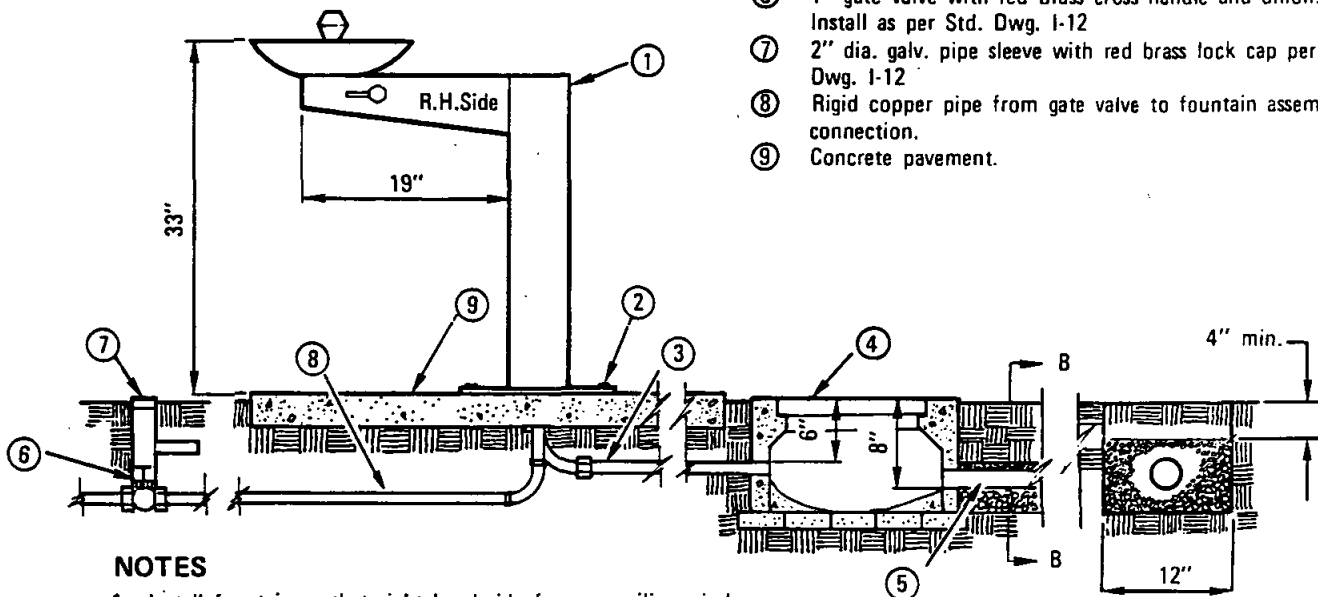
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER M-17



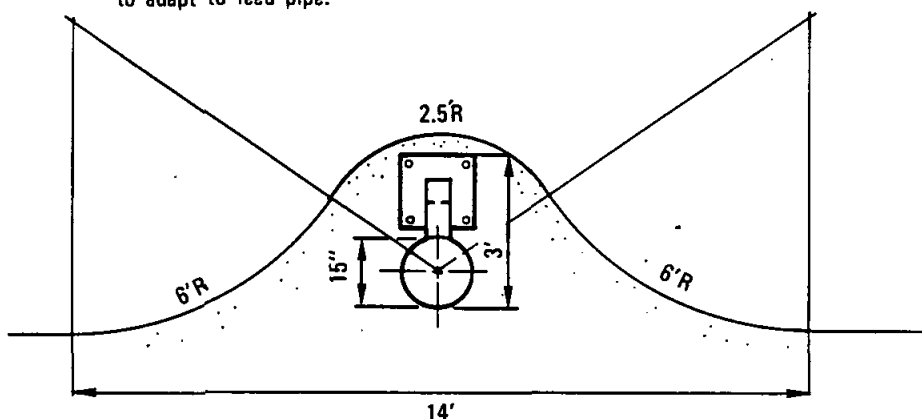
- ① Drinking Fountain - Haws model 3376 or approved equal.
- ② 3/8" dia. expansion anchors with flat (recessed heads) screws 4 places.
- ③ 1 1/2" P.V.C. pipe with sweep 90° ell connection to fountain drain.
- ④ 9 1/2" x 16" concrete yard box with hinged locking top (Brooks No. 3HL or equal) set on red 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

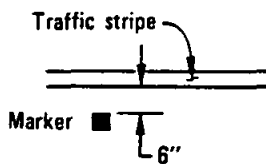
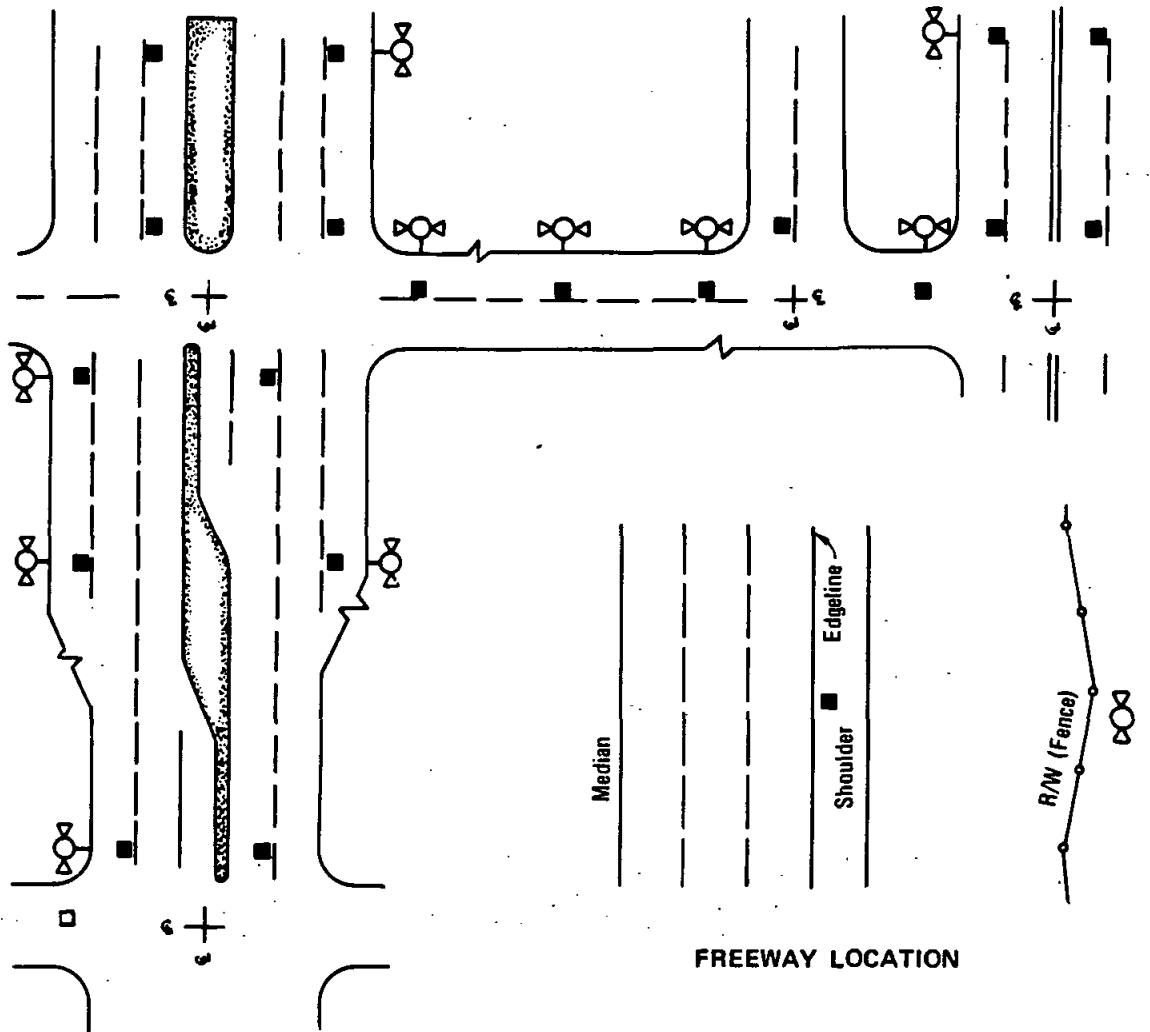
DRINKING FOUNTAIN

DRAWING
NUMBER

M-18

Revision	By	Approved	Date

STREET LOCATIONS



DETAIL

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

Marker 
Fire Hydrant 

Revision	Approved	Date
Frwy loc.	M.B.	5-86

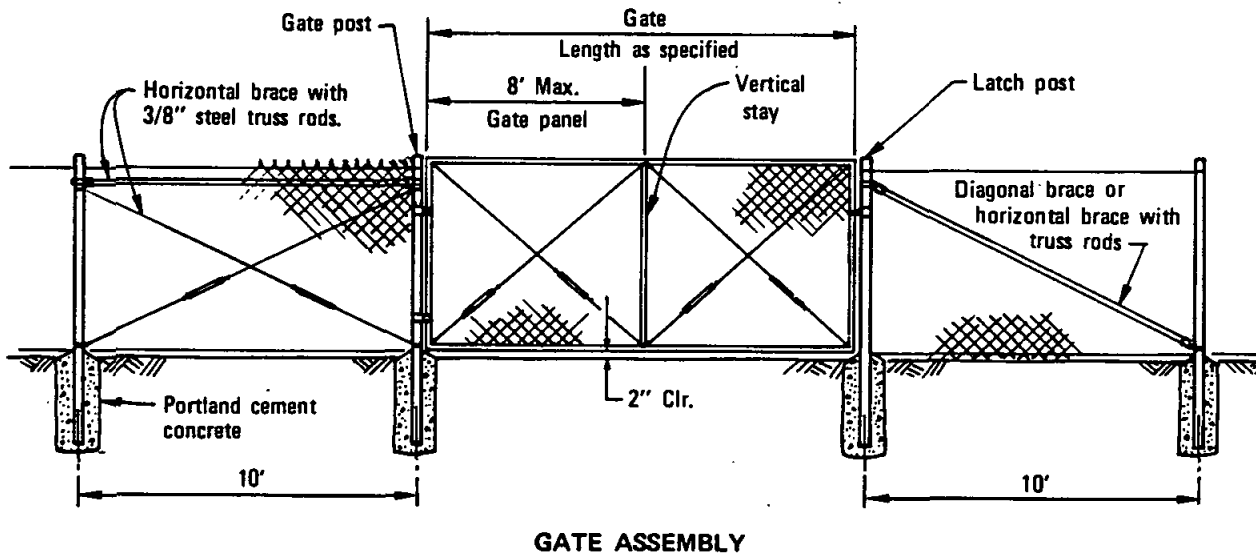
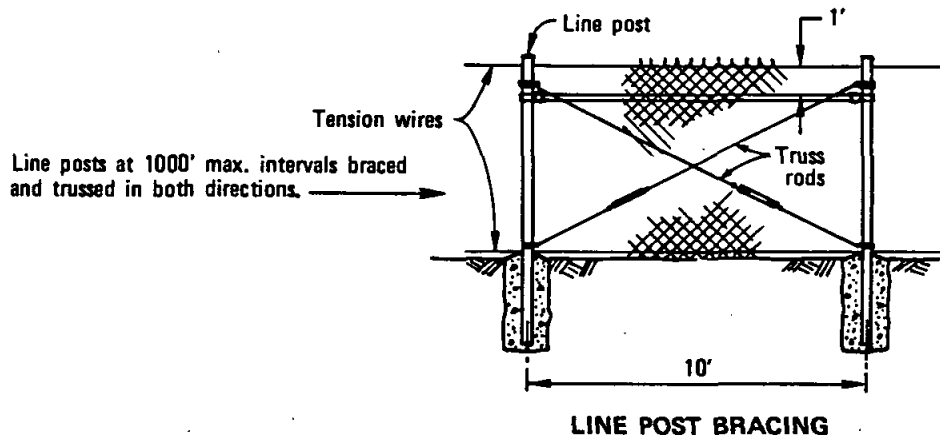
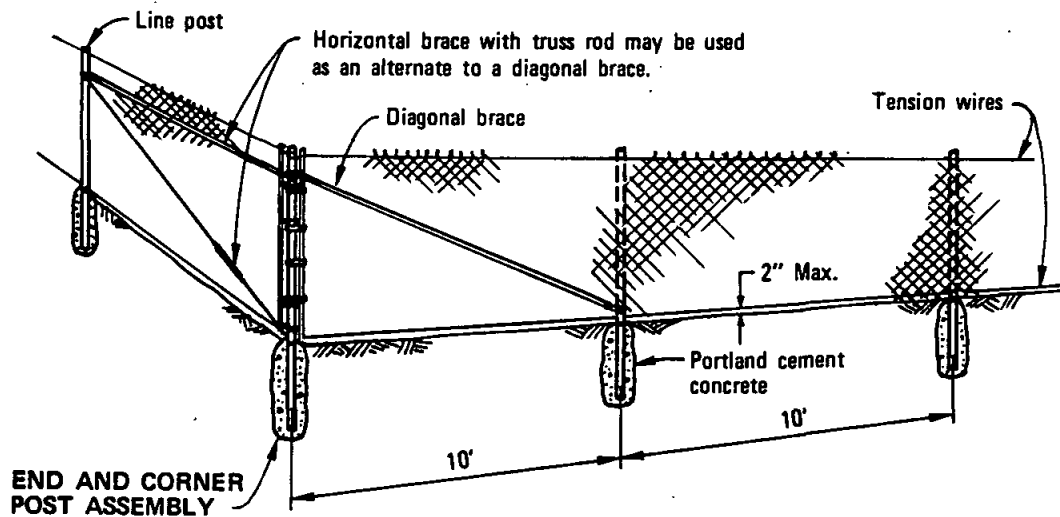
SAN DIEGO REGIONAL STANDARD DRAWING

FIRE HYDRANT MARKERS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER M-19



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

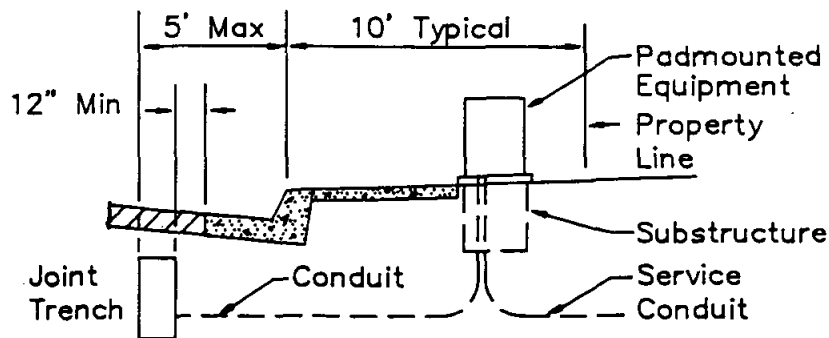
M. Belmont 4-25-86
Coordinator R.C.E. C21133 Date

DRAWING
NUMBER **M-20**

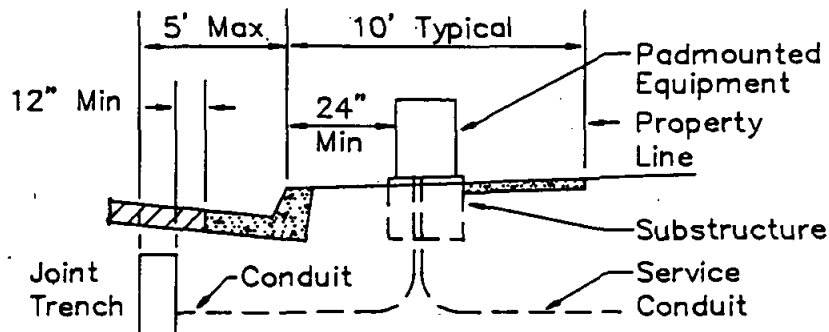
SAN DIEGO REGIONAL STANDARD DRAWING

**CHAIN LINK FENCE
DETAILS**

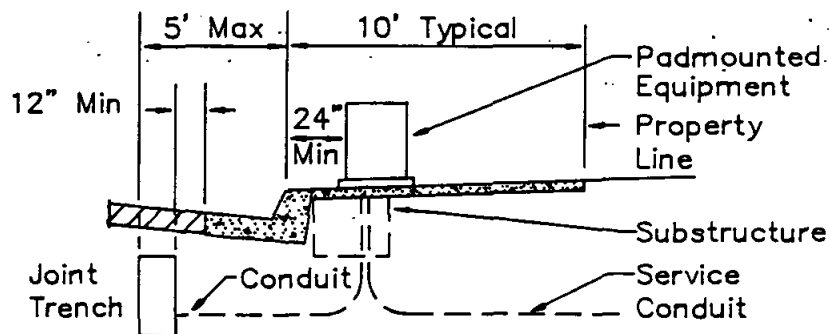
Revision	By	Approved	Date



SIDEWALK NEXT TO CURB



SIDEWALK NEXT TO PROPERTY LINE



SIDEWALK NEXT TO CURB AND PROPERTY LINE

NOTES:

1. Sidewalk shall have a minimum of four (4) foot clear area (path, not including curb) passing pedestals, pullboxes and other structures.
2. See Standard Drawing M-15 for joint trench.

Revision	By	Approved	Date

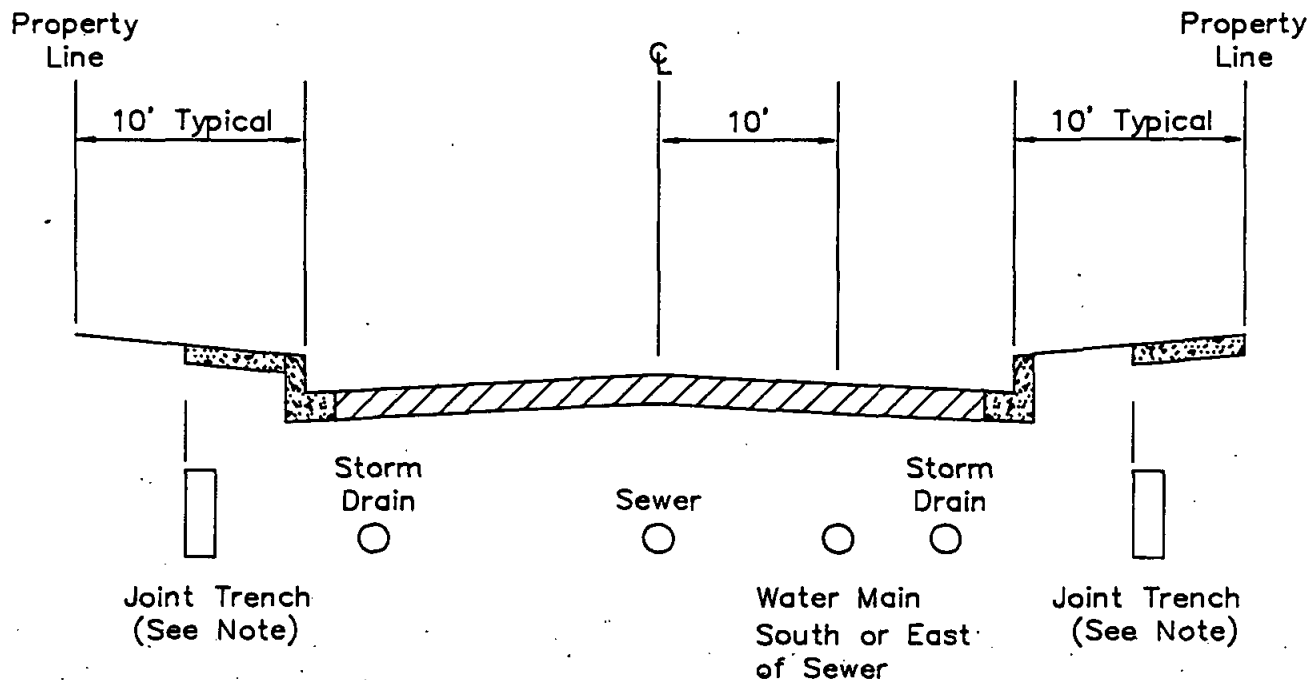
SAN DIEGO REGIONAL STANDARD DRAWING

**UNDERGROUND TYPICAL LOCATION
CONVERSION/REPLACEMENT/UPGRADE**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Henry Palmer 5 SEP 1988
Chairman Date

**DRAWING
NUMBER M-21**



**TYPICAL STREET
NEW CONSTRUCTION**

NOTE:

At catch basin locations, joint trench shall be 4 feet minimum from back of curb to inside wall of trench.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

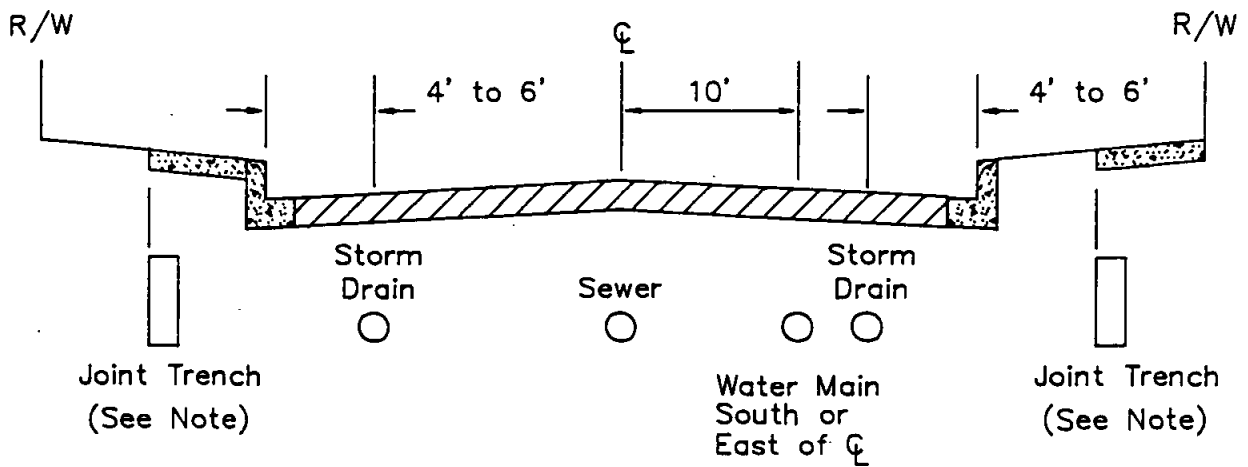
Ray B. Baker SEPT. 1988
Chairman Date

DRAWING
NUMBER **M-22**

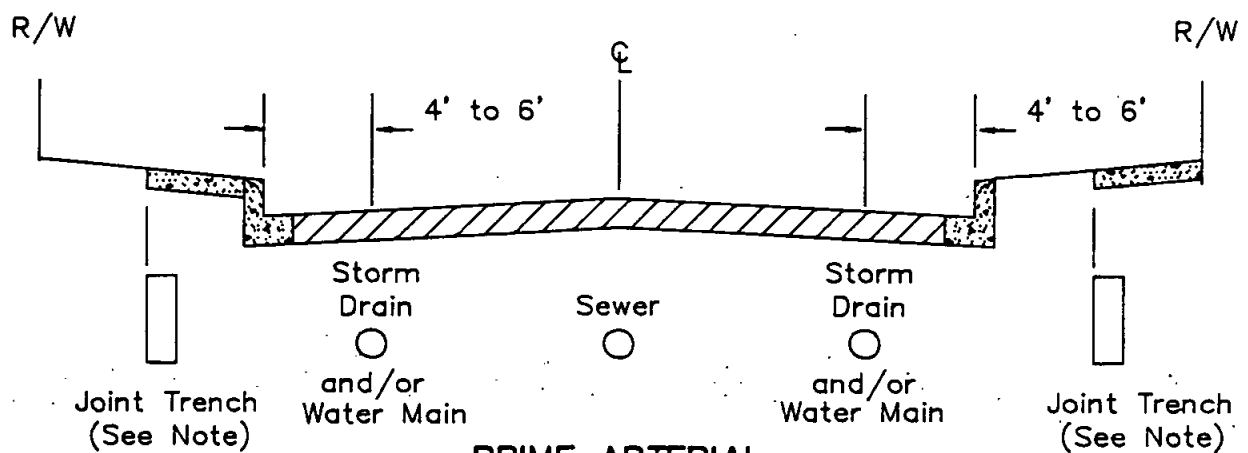
SAN DIEGO REGIONAL STANDARD DRAWING

**UTILITY LOCATIONS IN LOCAL
AND COLLECTOR STREETS**

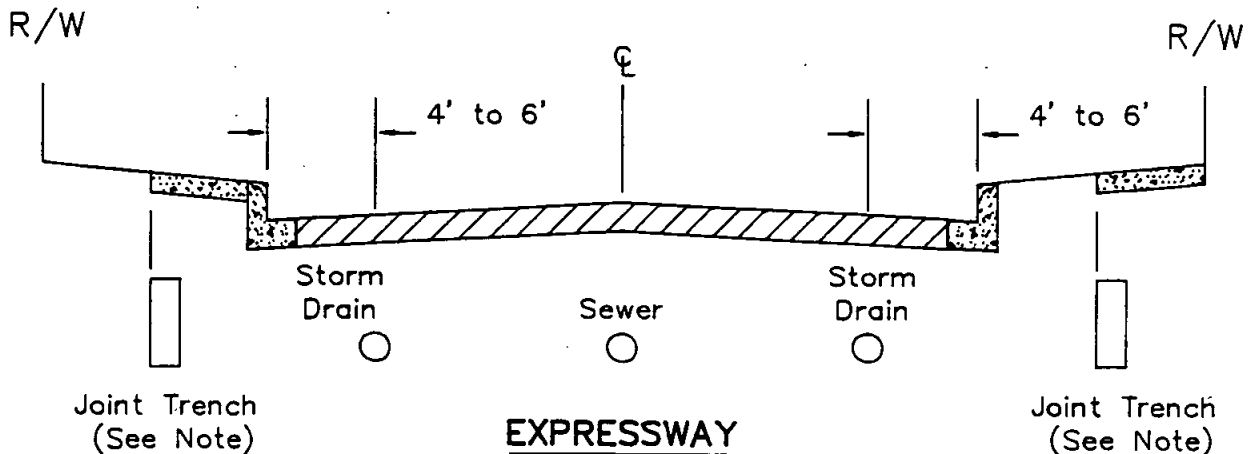
Revision	By	Approved	Date



MAJOR STREET



PRIME ARTERIAL



EXPRESSWAY

NOTE:

At catch basin locations, joint trench shall be 4 feet minimum from back of curb to inside wall of trench.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				UTILITY LOCATIONS IN MAJOR STREETS, PRIME ARTERIALS AND EXPRESSWAYS		<i>Greg Rubin</i> 5/17/88 Chairman Date	
				DRAWING NUMBER		M-23	

2-1/4" R AND FLUSH
WITH THE WALL.

PLAN AT END OF HANDRAIL

12" EXTENSION

1-1/2" STD. PIPE
7' MAX.

SURFACE OF RAMP OR
STEP NOSING LIMIT.

PIPE HANDRAIL WALL TYPE

7' MAX.

SURFACE OF
RAMP OR STEP
NOSING LIMIT.

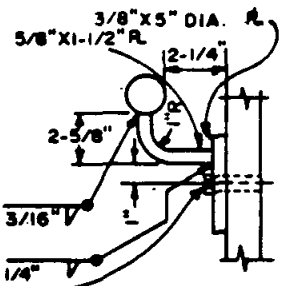
POST SHALL BE CENTERED
IN STAIR TREAD. SEE STD.
DRAWING M-26 FOR STAIRS.

12" EXTENSION

RAILING NOTES

1. 1/4" EXPANSION JTS. AT 16'± CTRS.
2. WELD AND GRIND SMOOTH ALL CONNECTIONS.
3. ALL RAILING TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. PIPE TO BE SEAMLESS STEEL ASTM A53, GRADE B

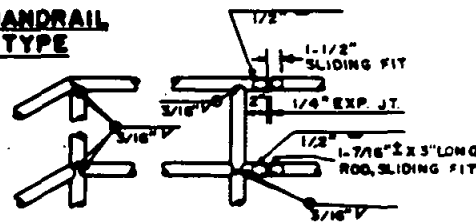
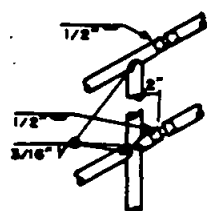
PIPE GUARDRAIL POST TYPE



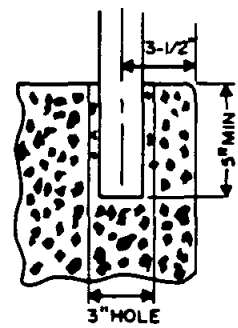
3/4" Ø BOLTS AND
ANCHORS APPROVED BY
THE ENGINEER.

HANDRAIL BRACKET

PIPE HANDRAIL POST TYPE



WELDING DETAILS



MOUNTING DETAIL

POST SHALL BE GROUTED
IN PLACE USING "POR-ROK"
GROUT, OR EQUAL.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

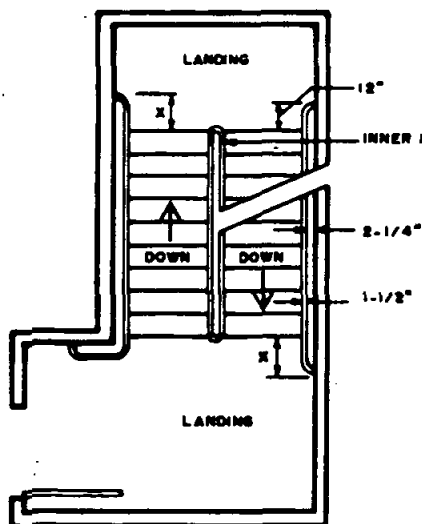
Henry Paulsen SEPT. 1968
Chairman Date

DRAWING
NUMBER M-24

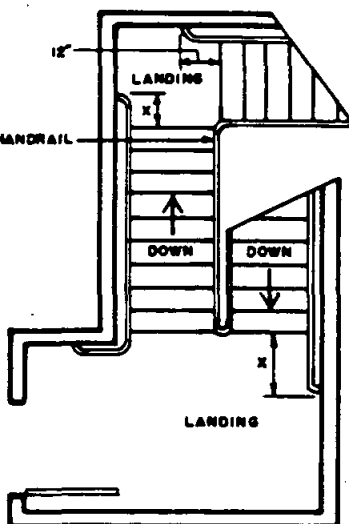
SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTRIAN PROTECTIVE RAILINGS DETAIL NO. 1

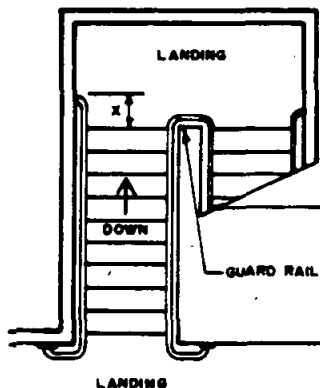
Revision	By	Approved	Date



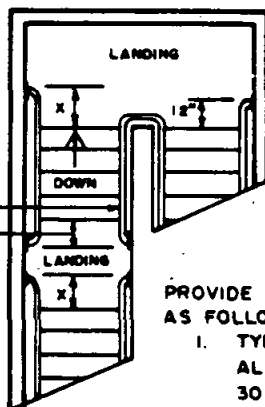
X: EXTENSION OF HANDRAIL SHALL BE EQUAL TO THE TREAD WIDTH PLUS 12 INCHES.



NOTE: INNER HANDRAIL AT LANDINGS OF STAIRS THAT DOUBLE BACK OR IMMEDIATELY TURN SHALL BE CONTINUOUS AND SHALL NOT EXTEND INTO LANDING OR PATH OF TRAVEL.

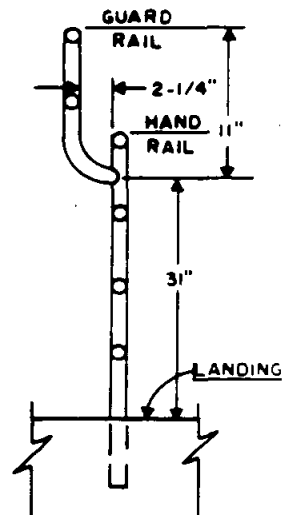


STAIR HANDRAILS

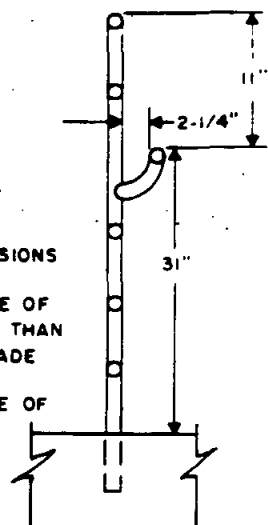


PROVIDE GUARDRAIL EXTENSIONS AS FOLLOWS:

1. TYPE A ON OPEN SIDE OF ALL LANDINGS MORE THAN 30 INCHES ABOVE GRADE OR FLOOR BELOW.
2. TYPE B ON OPEN SIDE OF STAIRS (INCLUDING LANDINGS) WHEN SPECIFIED.



TYPE A GUARDRAIL EXTENSION



TYPE B GUARDRAIL EXTENSION

GENERAL NOTES:

1. POST TYPE GUARDRAILS, AND HANDRAILS FOR STAIRS OR LANDINGS 30 INCHES OR LESS ABOVE GRADE OR FLOOR BELOW SHALL HAVE ONLY ONE INTERMEDIATE RAIL CENTERED BETWEEN THE STEP NOSING LIMIT (OR IF SPECIFIED THE TOP OF CURB) AND TOP OF RAILING.
2. POST TYPE GUARDRAILS, AND HANDRAILS FOR STAIRS OR LANDINGS MORE THAN 30 INCHES ABOVE GRADE OR FLOOR BELOW SHALL HAVE INTERMEDIATE RAILS EQUALLY SPACED SUCH THAT A SPHERE 6 INCHES IN DIAMETER CANNOT PASS THROUGH.
3. WHERE HANDRAIL EXTENSIONS INTERFERE WITH TRANSVERSE WALKWAYS THE HORIZONTAL PORTIONS SHALL NOT ENCROACH BUT BE TURNED AWAY FROM STAIRS AND PARALLEL TO WALKWAY.

Revision	By	Approved	Date

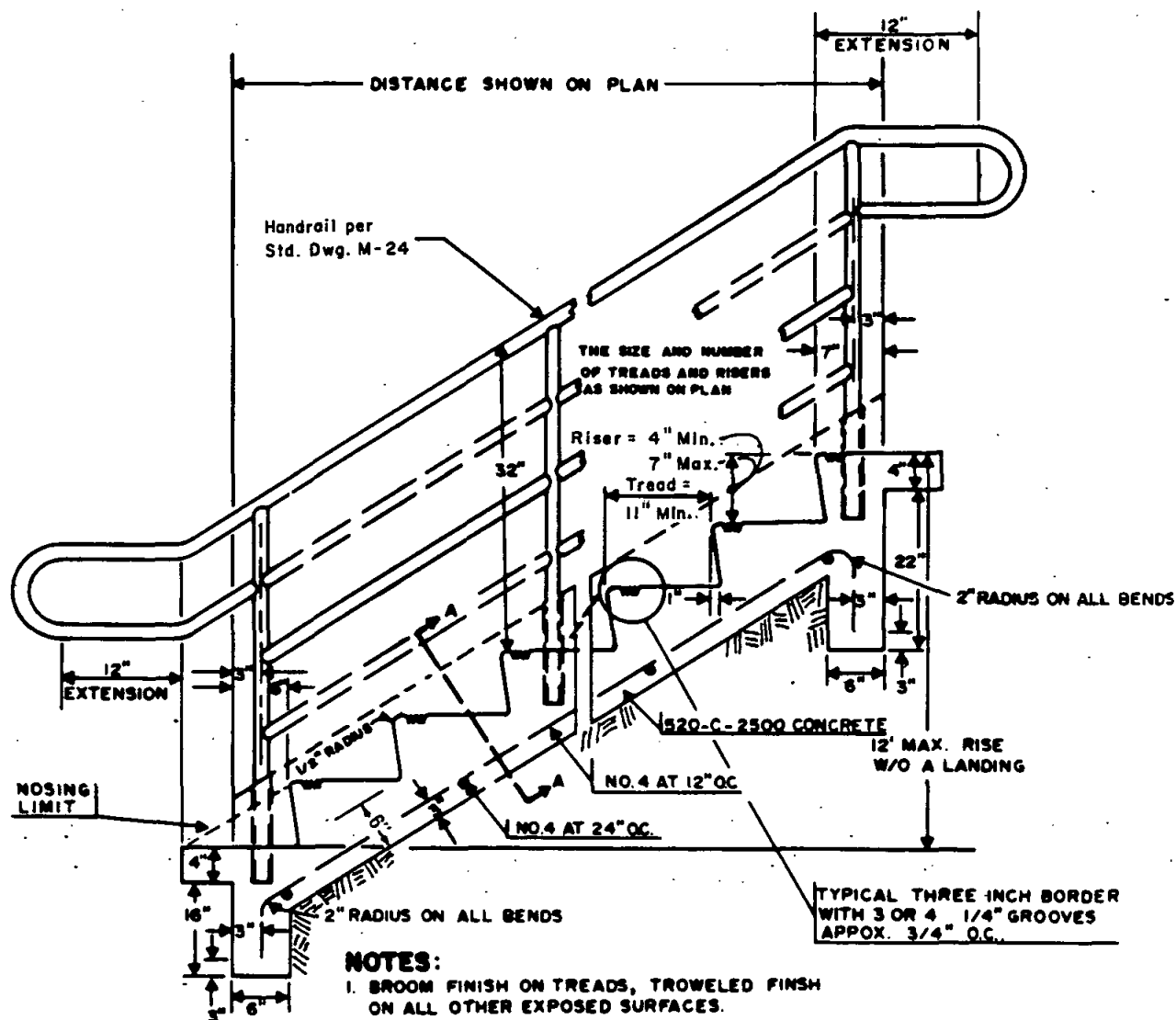
SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTRIAN PROTECTIVE RAILINGS DETAIL NO. 2

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

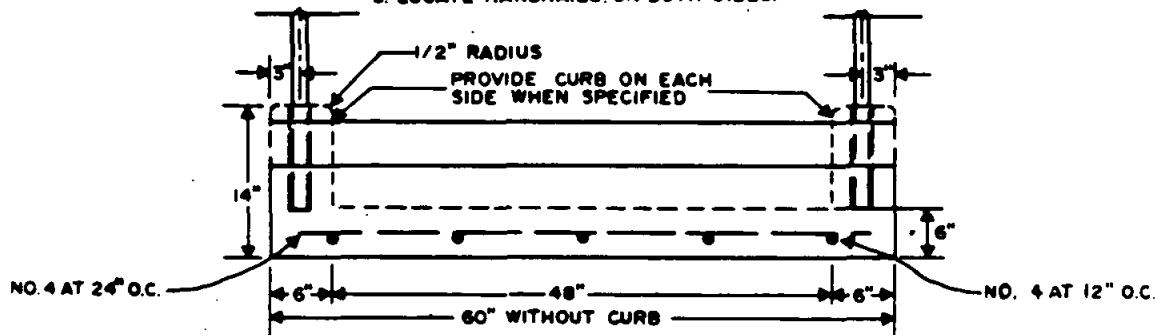
Henry Palmer 5 OCT. 1968
Chairman Date

DRAWING
NUMBER M-25



NOTES:

1. BROOM FINISH ON TREADS, TROWELED FINISH ON ALL OTHER EXPOSED SURFACES.
2. 1/4" SLOPE ON TREADS FOR DRAINAGE.
3. LOCATE HANDRAILS ON BOTH SIDES.



SECTION A-A

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

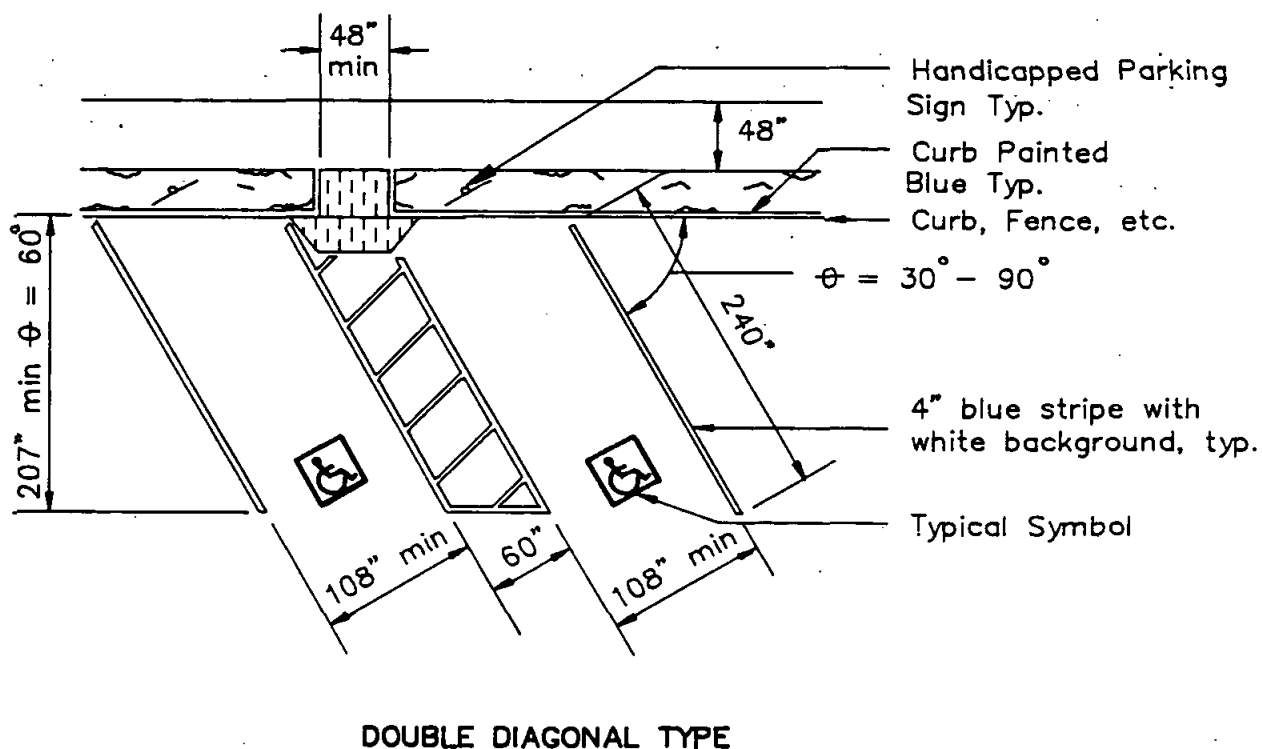
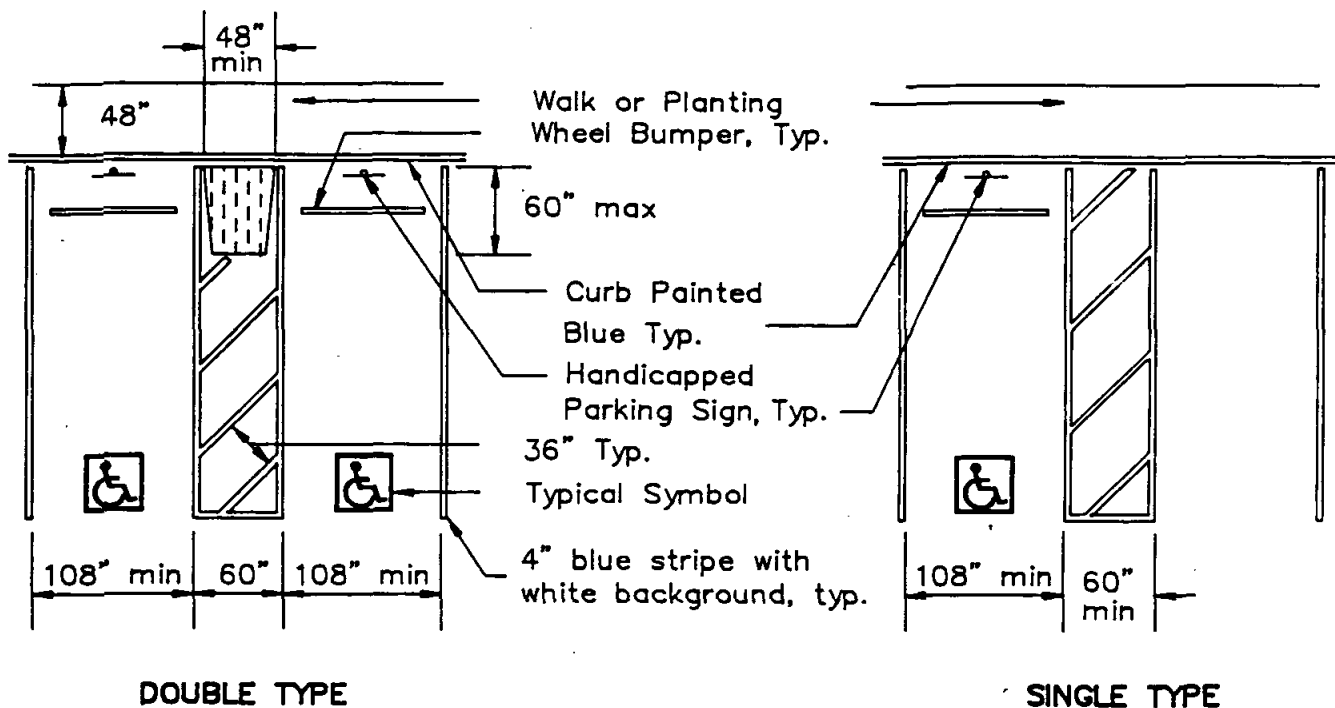
Harry B. Baker SEPT. 1900
Chairman Date

SAN DIEGO REGIONAL STANDARD DRAWING

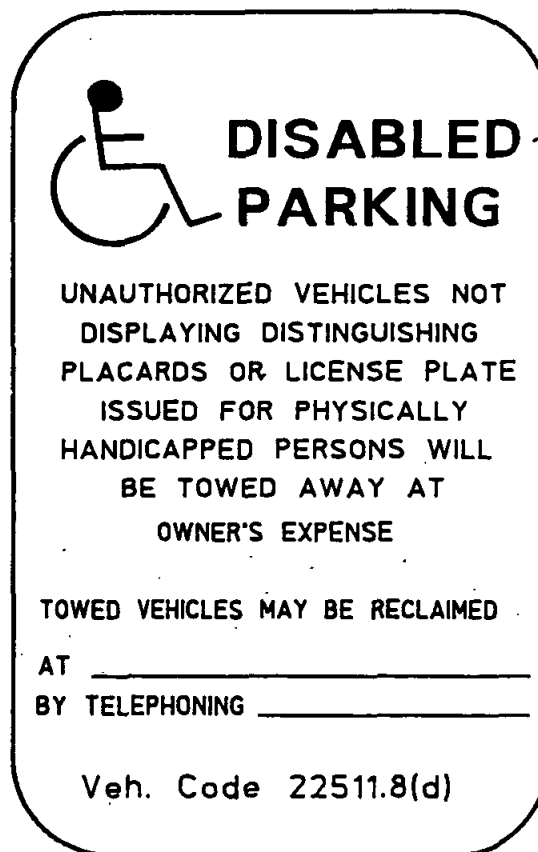
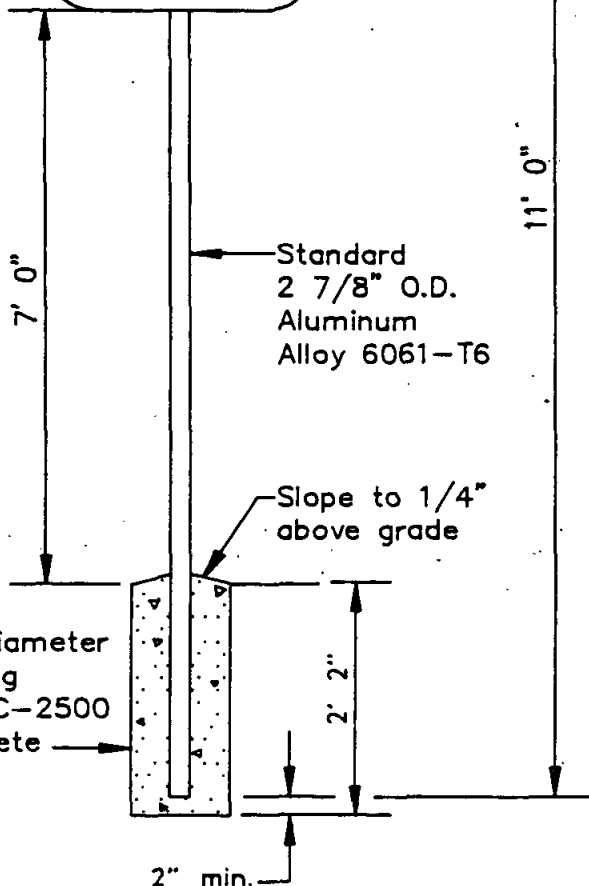
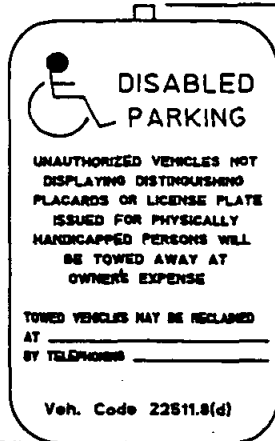
CONCRETE STEPS

**DRAWING
NUMBER M-26**

Revision	By	Approved	Date



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
						<i>Henry Pabian</i>	SEPT. 1988
				HANDICAPPED PARKING SPACES		Chairman	Date
						DRAWING NUMBER	M-27



Sign Detail

NOTES

1. Sign shall be 18"x 24" and constructed of 0.8" aluminum.
2. Lettering, symbol and border shall be reflectorized white, on a blue background.
3. Lettering shall be 1 inch and 2 inches high.
4. Attach sign with two piece SC-7 diecast aluminum sign clamps.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

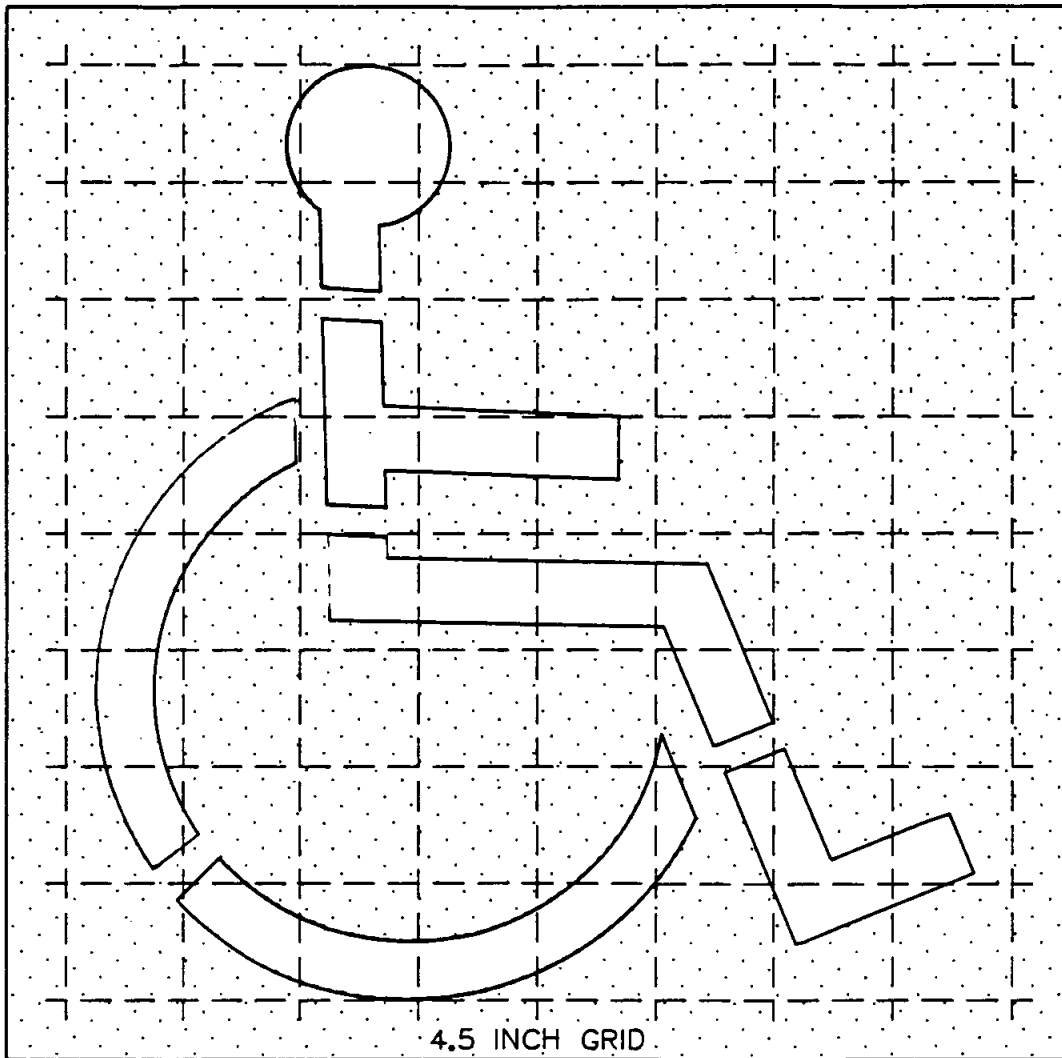
George Robinson SEPT. 1988
Chairman Date

DRAWING
NUMBER **M-28**

SAN DIEGO REGIONAL STANDARD DRAWING

DISABLED PARKING SIGN

Revision	By	Approved	Date



42"

42"

NOTE:

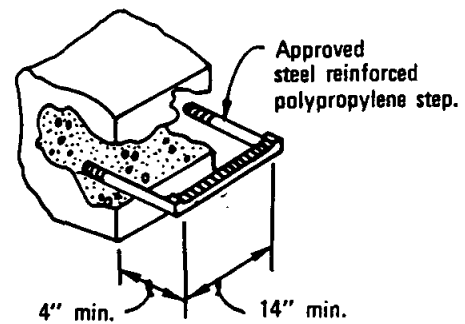
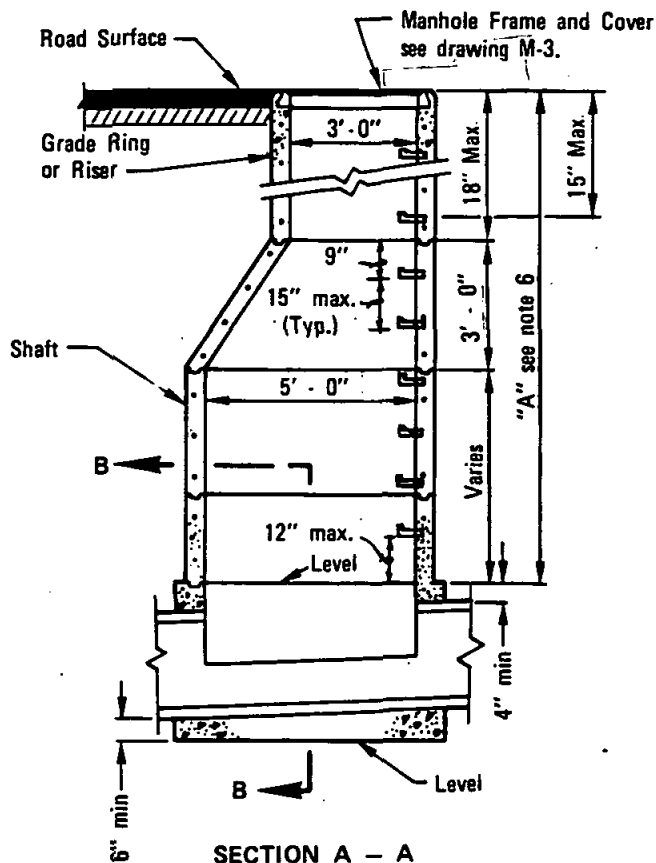
Pavement symbol shall be painted white on a blue background.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
				PAVEMENT SYMBOL DISABLED PARKING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Gary Rubin</i> <u>SEPT. 17 1988</u> Chairman Date
					DRAWING NUMBER M-29

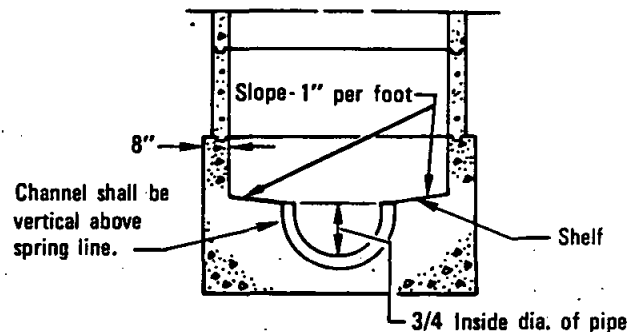
SEWERAGE SYSTEMS

SEWERAGE SYSTEMS

S



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 564-C-3000.
5. Approved water stop required for plastic pipe connectors.
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 18" of 3' diameter grade rings/and/or risers.
 - C. 5" diameter shaft variable height.
 - D. Top step to be 15" Max. from top of frame and cover.
7. Flexible pipe joints shall be required within 12" of inside face of manhole except for plastic pipe.
8. All patching within manhole base shall be epoxy mortar.
9. Prior approval of precast base is required by the Agency.

LEGEND ON PLANS

M.H. No. 2

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

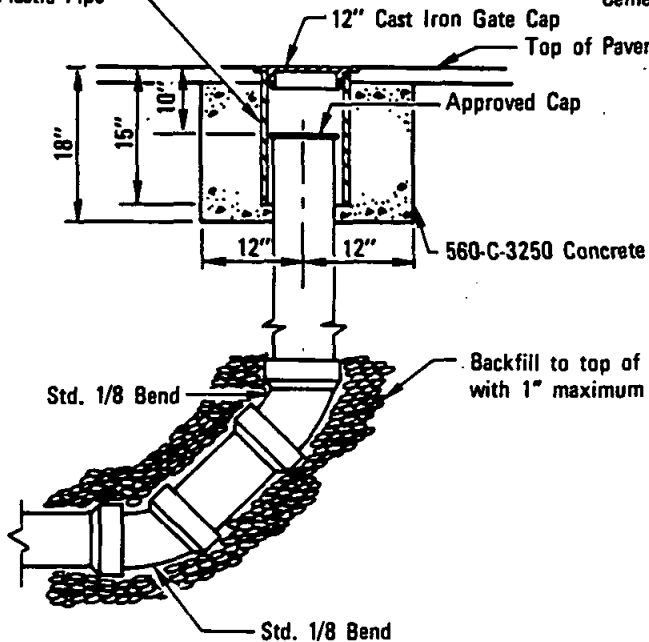
SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE 5'x 3' DIAMETER

**DRAWING
NUMBER S-2**

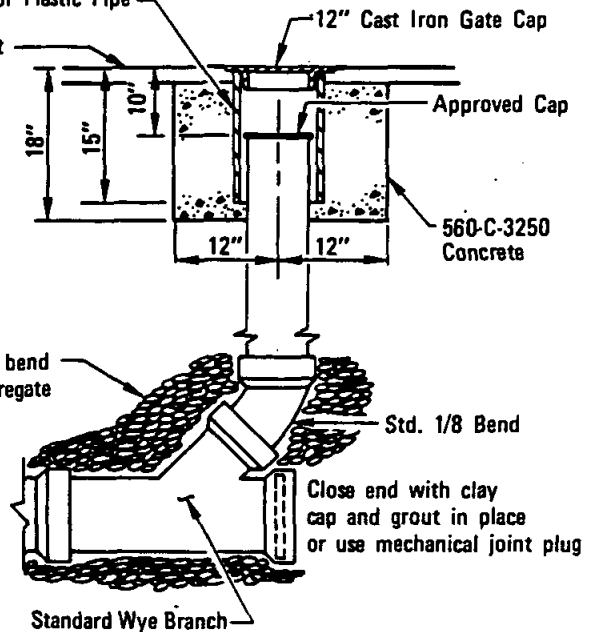
Revision	By	Approved	Date
Note 7	TRP	M.B.	10-82
Conc.	JK	M.B.	5-86
Notes	JB	J.H.	9-88

Section of 12" Metallic, Asbestos
Cement or Plastic Pipe



TYPE A

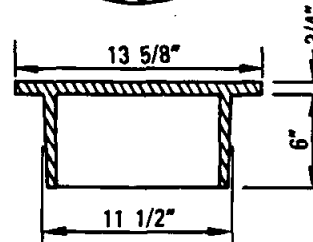
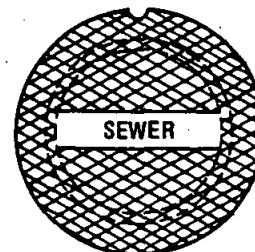
Section of 12" Metallic, Asbestos
Cement or Plastic Pipe



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.	MB	MB	5-86

SAN DIEGO REGIONAL STANDARD DRAWING

SEWER MAIN CLEANOUT

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

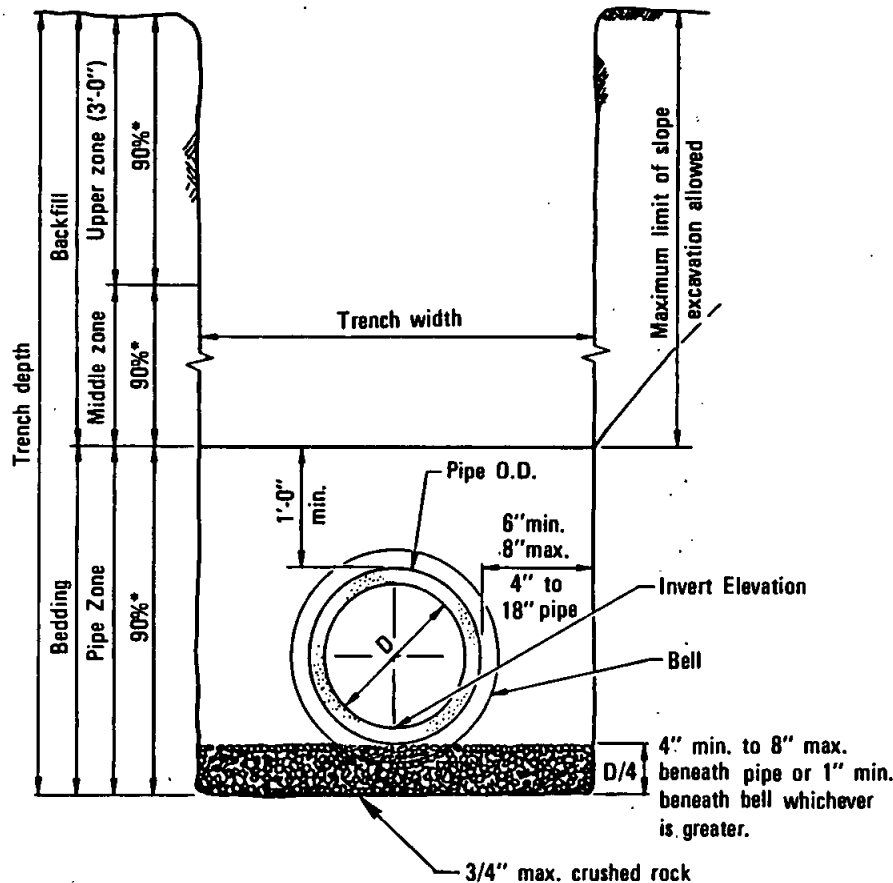
Alfred A. Kershner *Dec. 1975*
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER S-3

DRAWING
NUMBER S-4

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Oct. 1975
Coordinator R.C.E. 19807 Date

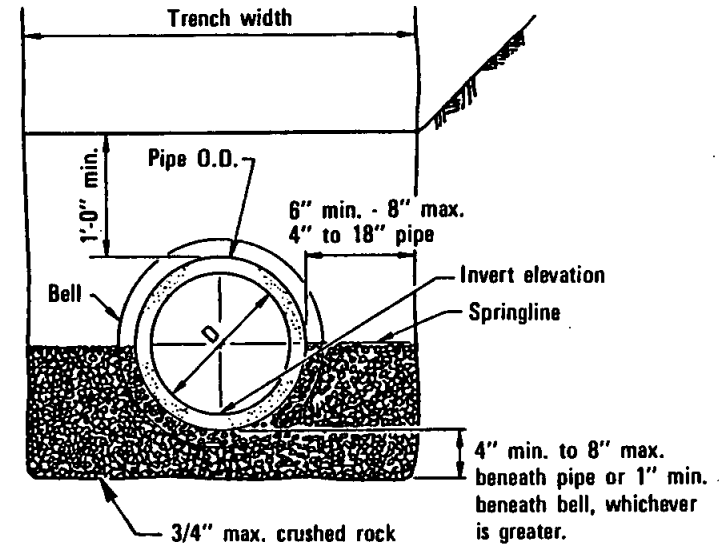
SAN DIEGO REGIONAL STANDARD DRAWING
PIPE BEDDING AND TRENCH BACKFILL
FOR SEWERS



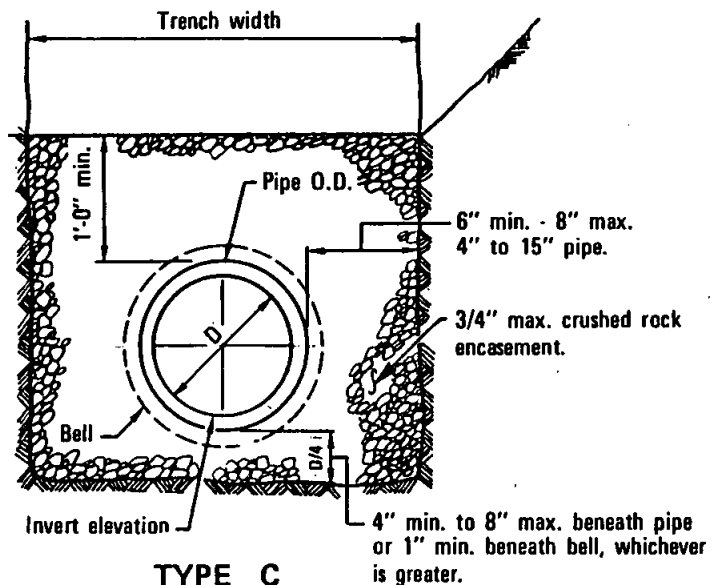
TYPE A
STANDARD INSTALLATION

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.

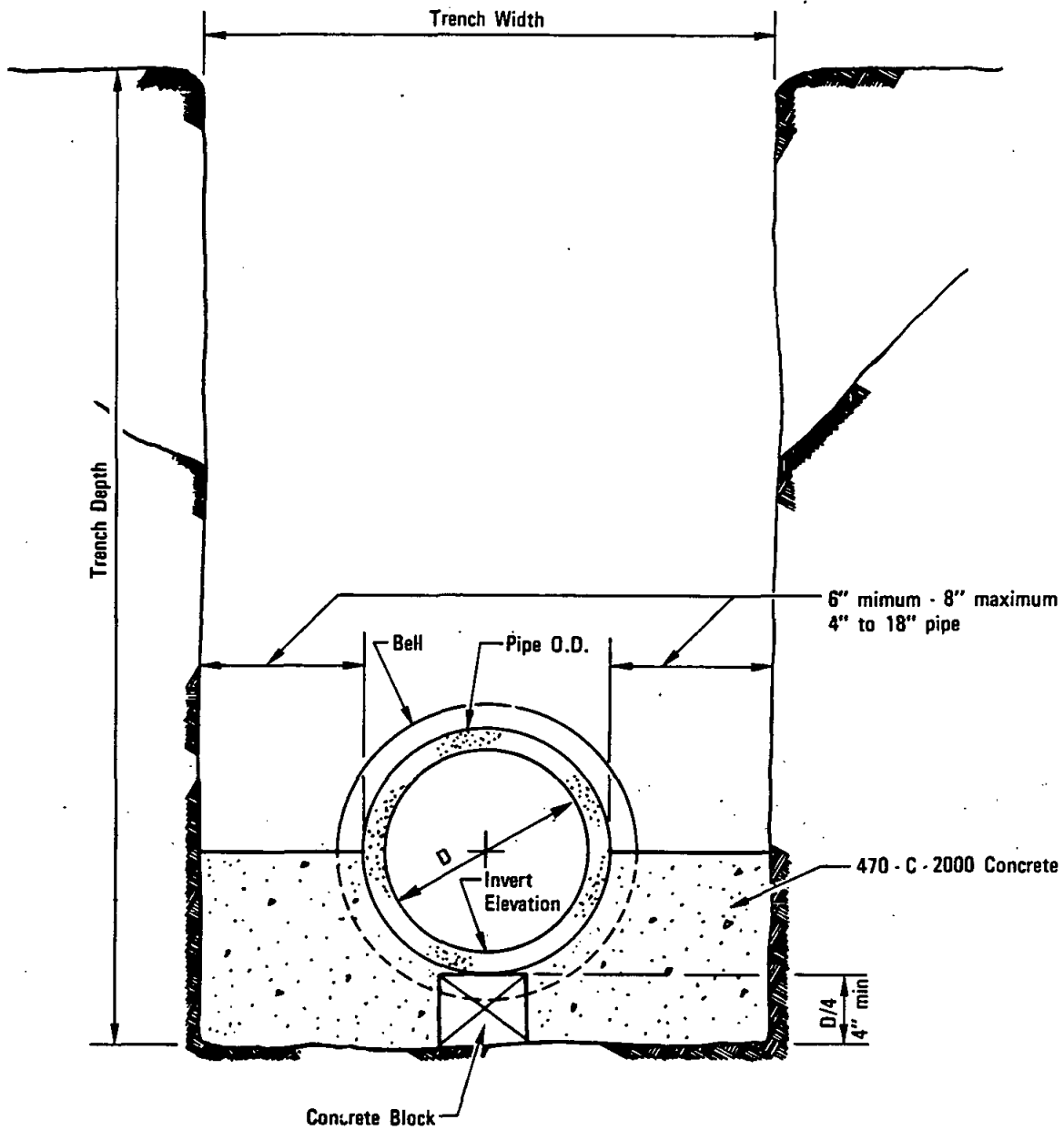


TYPE B
ROCK TO SPRINGLINE



TYPE C
ROCK ENVELOPE

Revision	By	Approved	Date
A, B, & C	RC	M.B.	5-82



SECTION

LEGEND ON PLANS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Allard A. Kuehn Dec. 1975
Coordinator R.C.E. 13807 Date

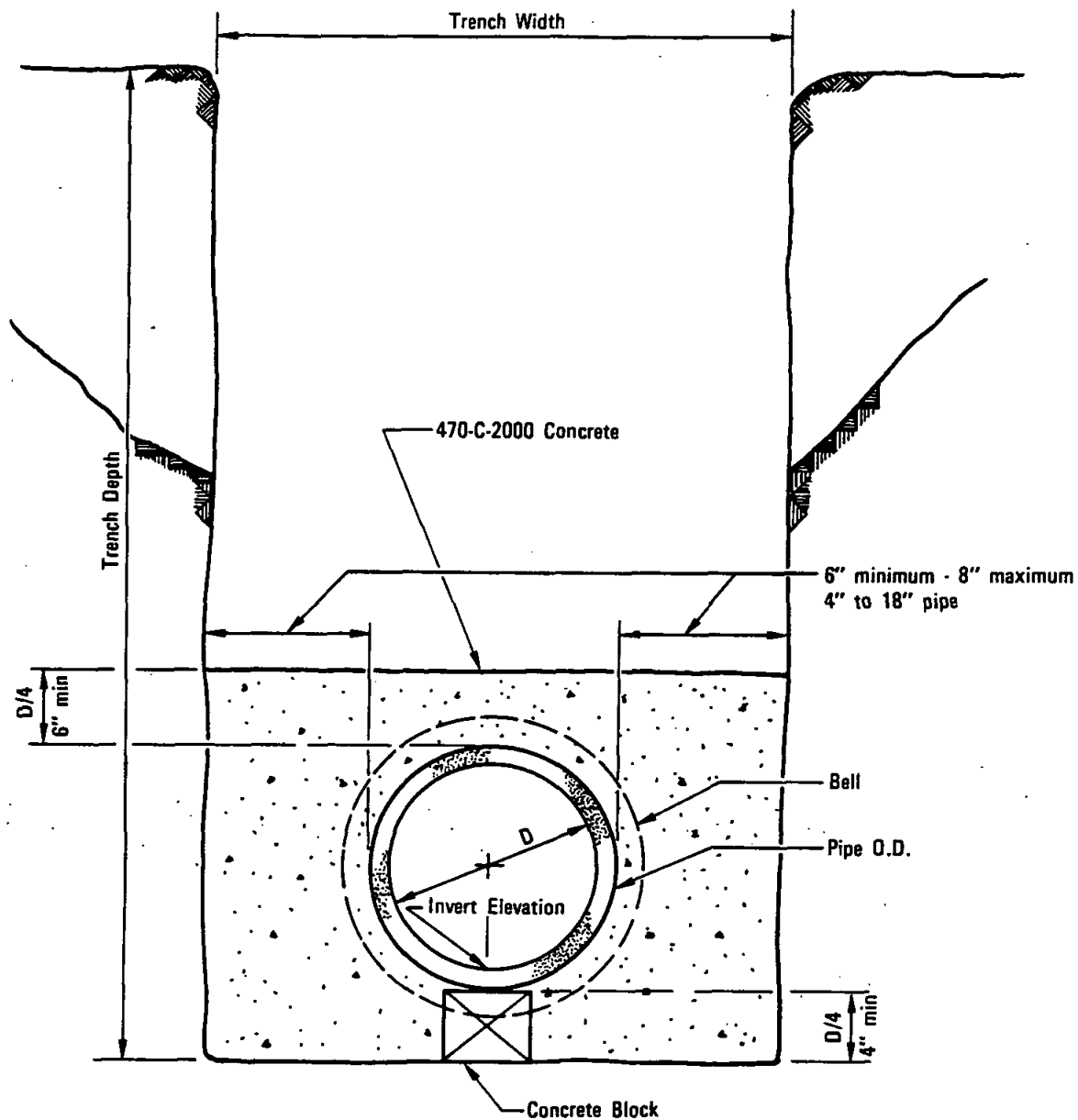
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE CRADLE

DRAWING
NUMBER

S-6

Revision	By	Approved	Date



SECTION

NOTE:

Encase pipe to the nearest flexible joint.

LEGEND ON PLANS

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

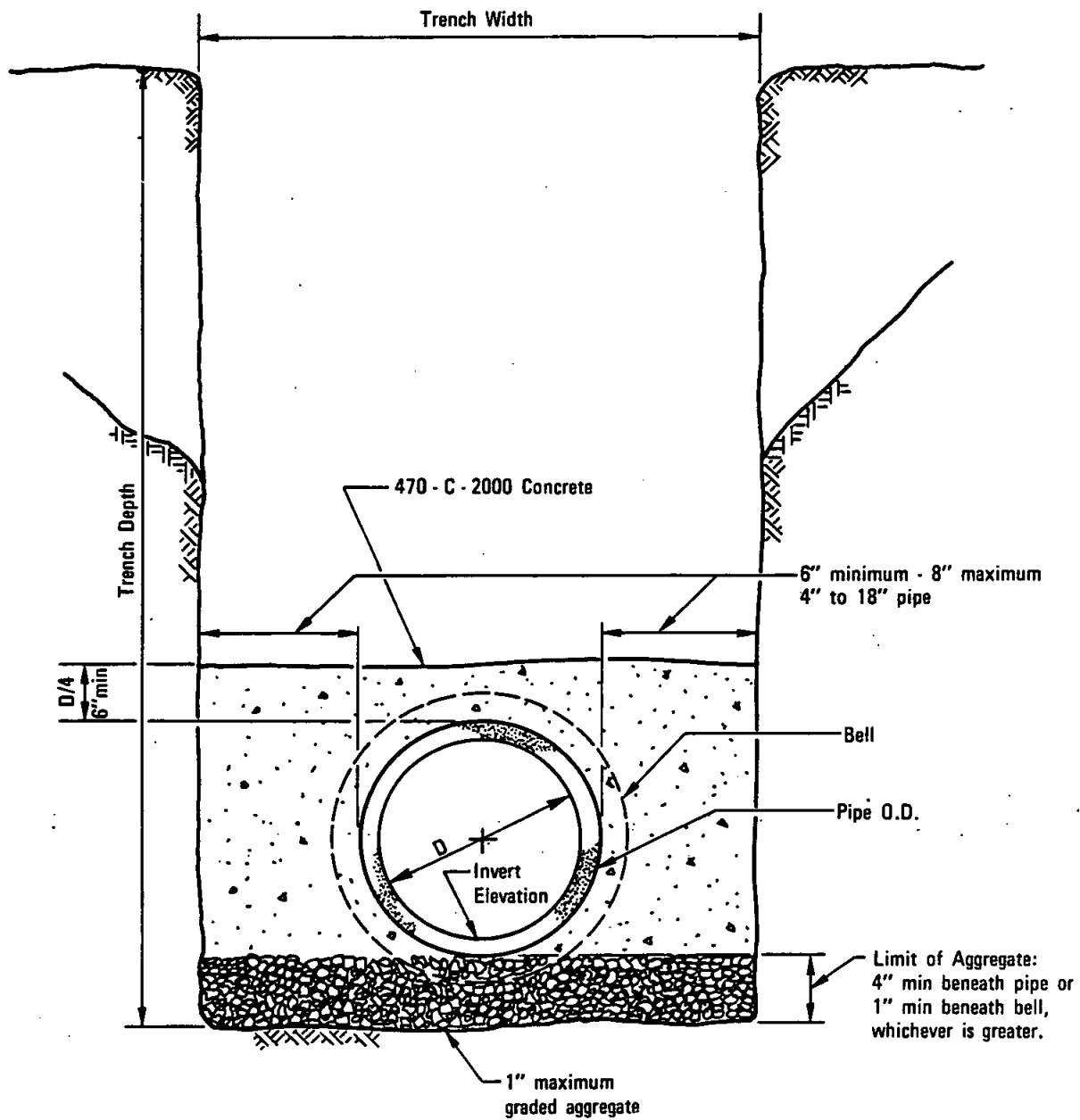
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ENCASEMENT

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

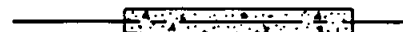
Allen A. Kershner Dec. 1975
Coordinator R.C.E. 19807 Date

DRAWING NUMBER **S-7**



SECTION

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

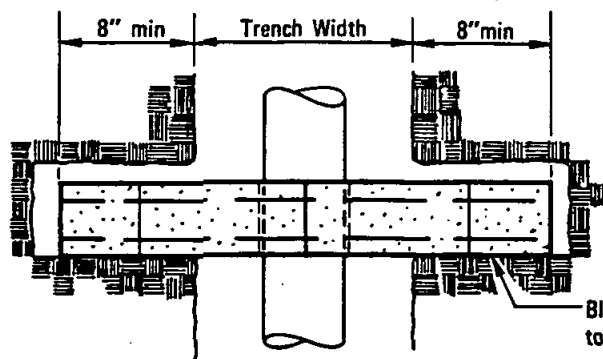
Allard A. Kerschbaum Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE BACKFILL

DRAWING
NUMBER S-8

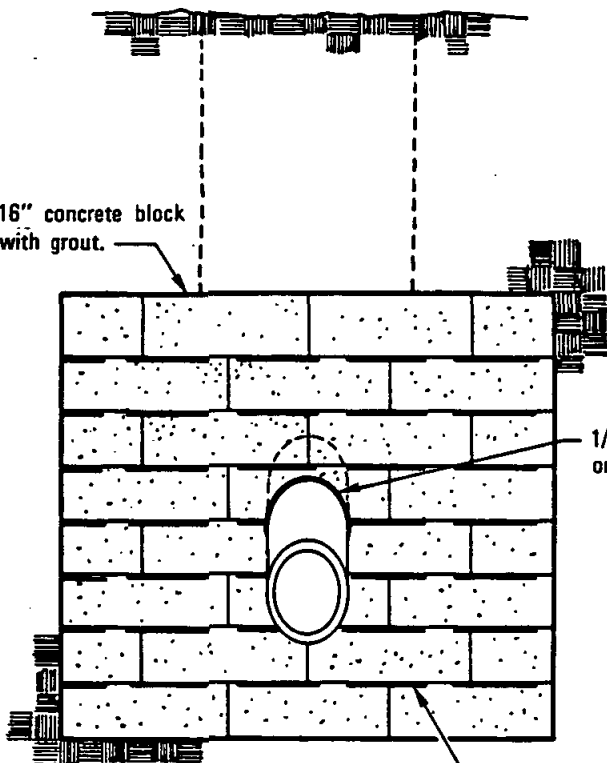
Revision	By	Approved	Date



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

PLAN

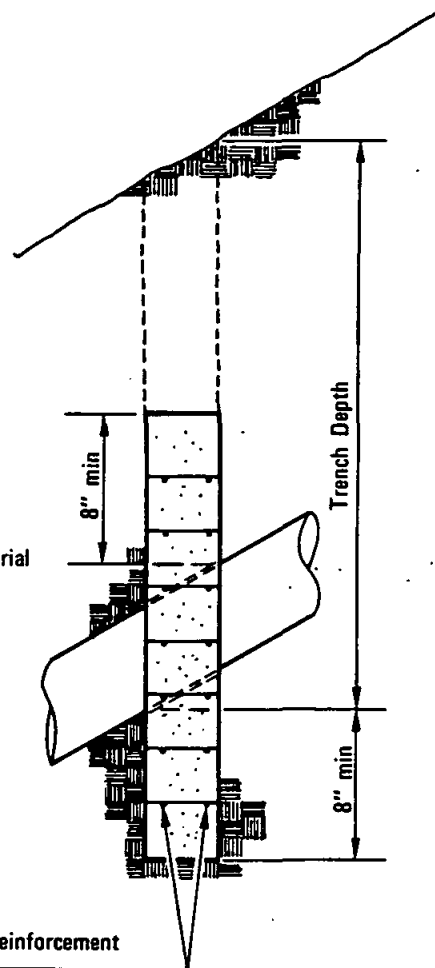
8"x 8"x 16" concrete block
Fill cores with grout.



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

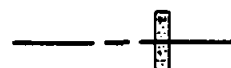
No. 9 wire ladder type reinforcement
in all horizontal joints.

FRONT ELEVATION



SIDE ELEVATION

LEGEND ON PLANS



Revision	By	Approved	Date
Expan. jt.	TRP	M.B.	10-82

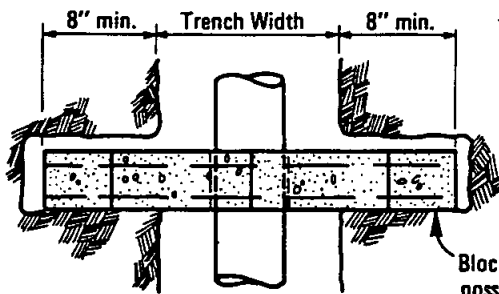
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ANCHOR

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER S-9



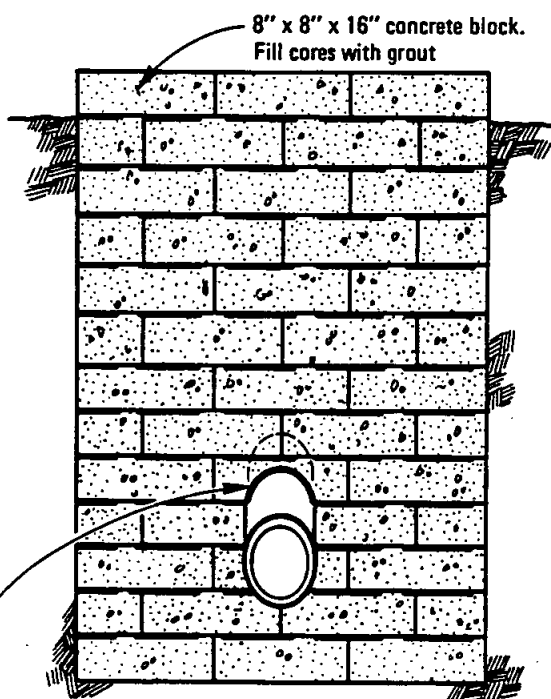
PLAN

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

NOTES

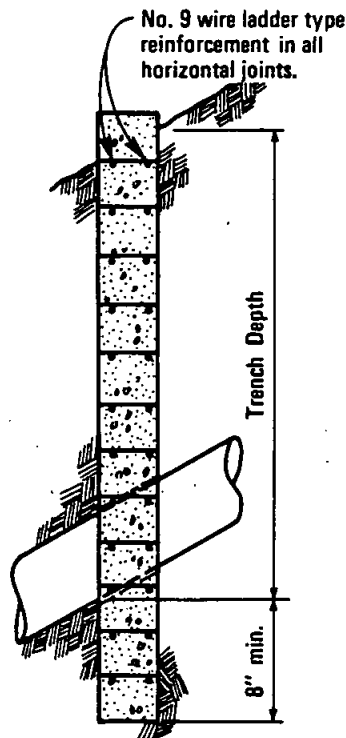
Type B:

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.



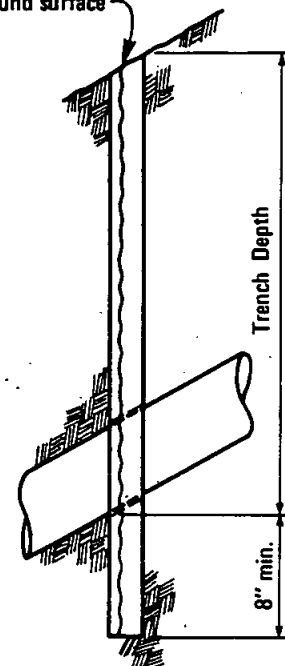
1/2" expansion joint material or jute around pipe.

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.

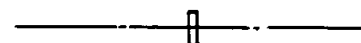


ELEVATION

TYPE A

TYPE B

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

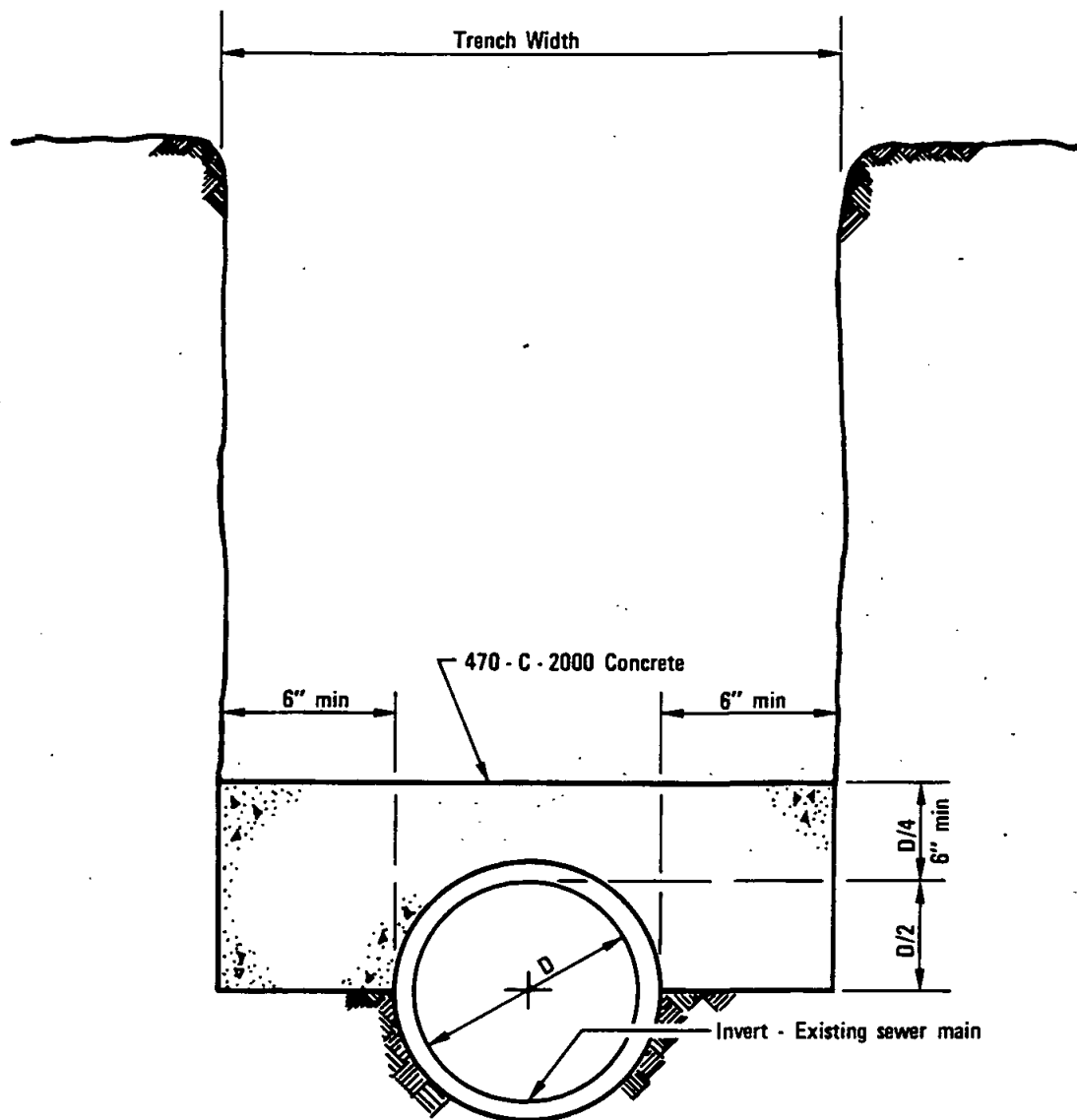
SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL

DRAWING
NUMBER

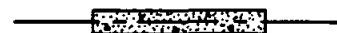
S-10

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

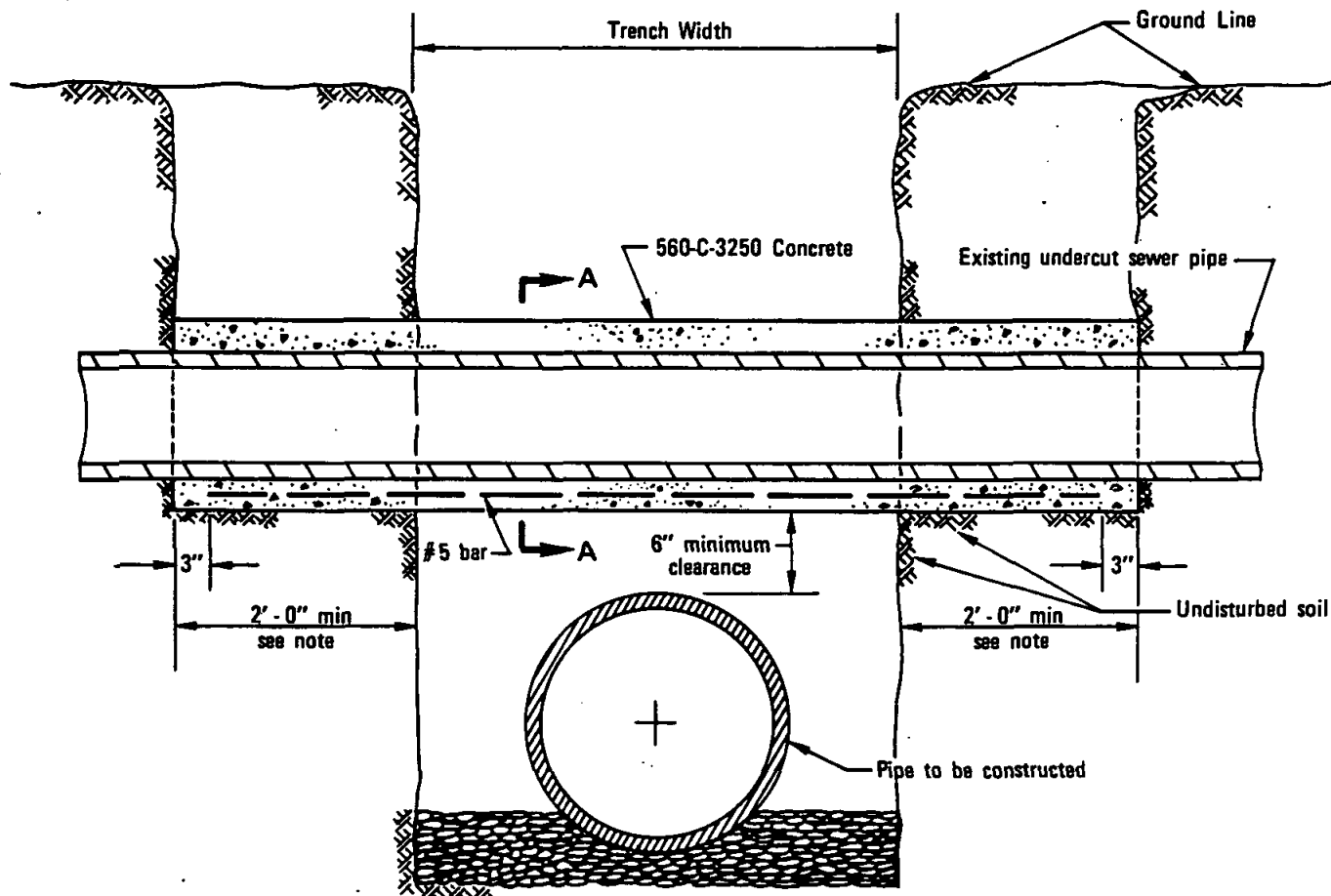


SECTION

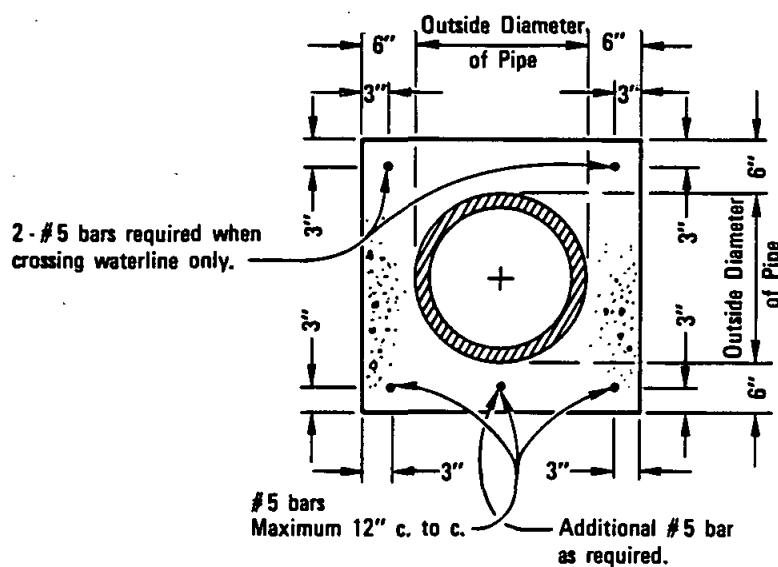
LEGEND ON PLANS



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



TYPICAL SECTION

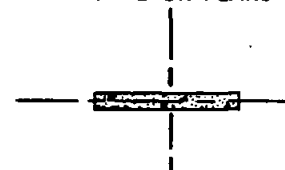


SECTION A-A

NOTE

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

LEGEND ON PLANS



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

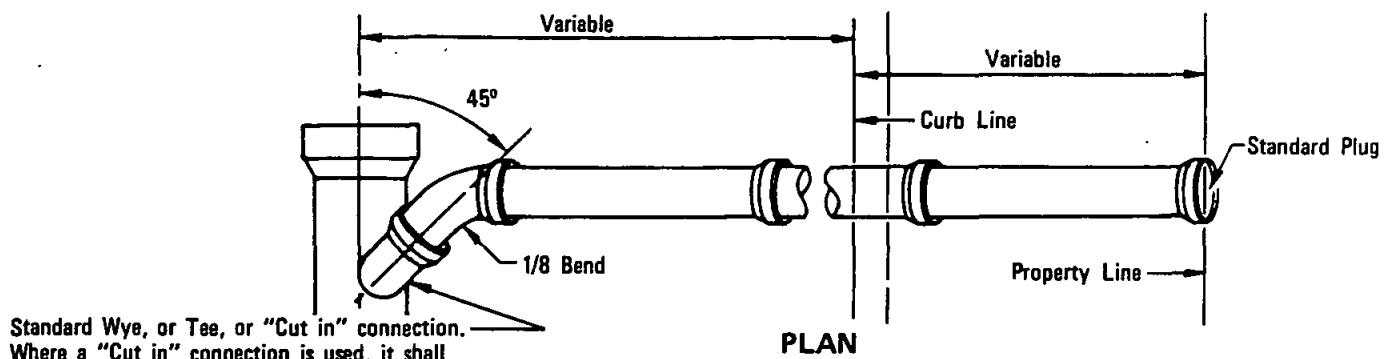
SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE SUPPORT
FOR UNDERCUT SEWER PIPE**

DRAWING
NUMBER

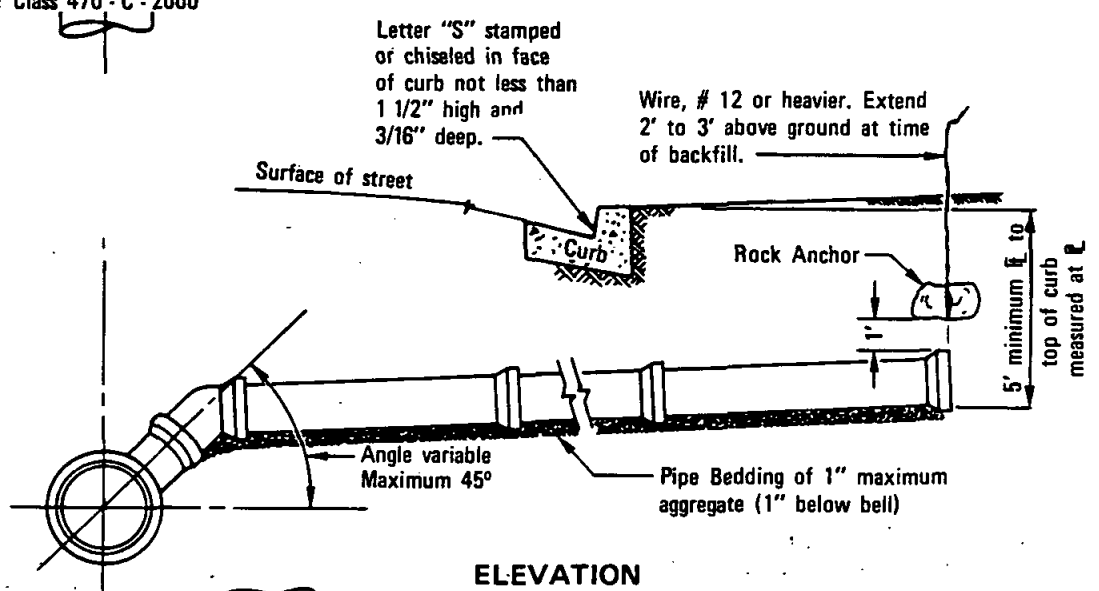
S-12

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



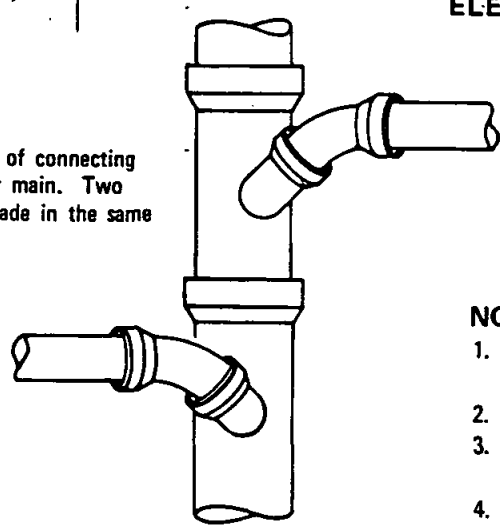
Standard Wye, or Tee, or "Cut in" connection. Where a "Cut in" connection is used, it shall be surrounded with 4" of Class 470 - C - 2000 Concrete.

PLAN



ELEVATION

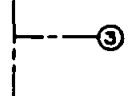
Detail showing the manner of connecting opposite laterals to a sewer main. Two connections shall not be made in the same length of pipe.



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

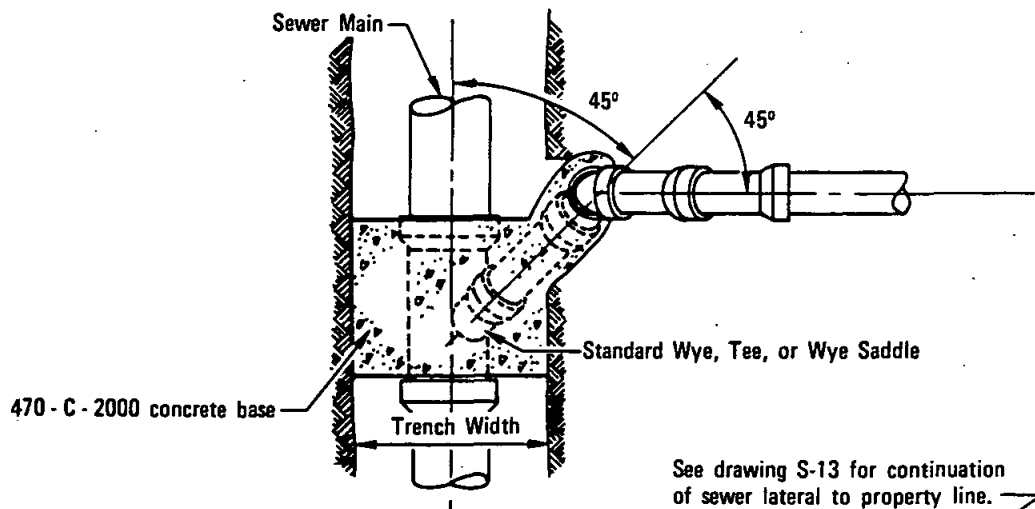
SAN DIEGO REGIONAL STANDARD DRAWING

HOUSE CONNECTION
(SEWER LATERAL)

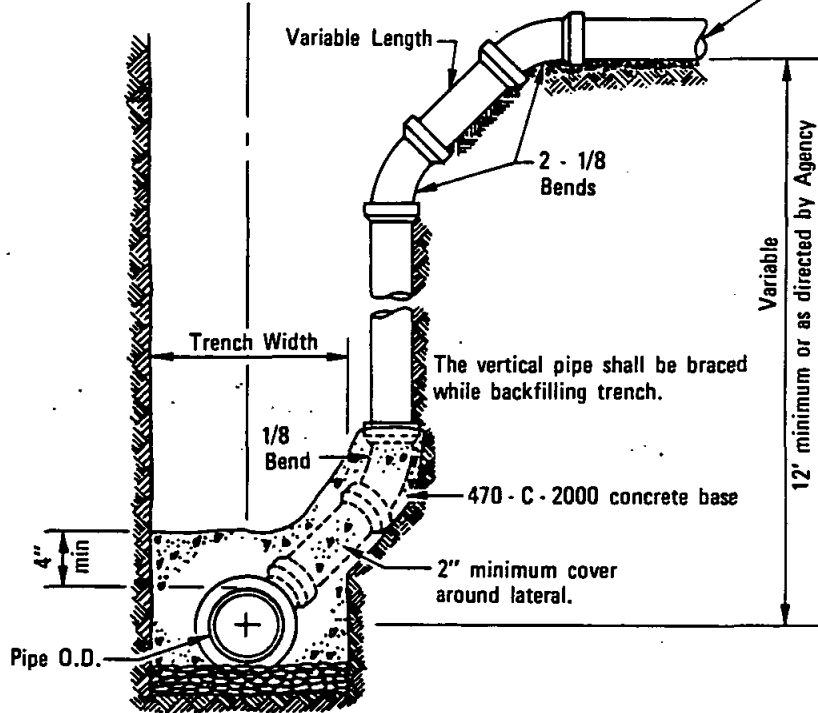
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

DRAWING NUMBER **S-13**



PLAN

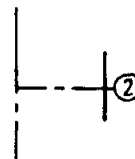


ELEVATION

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

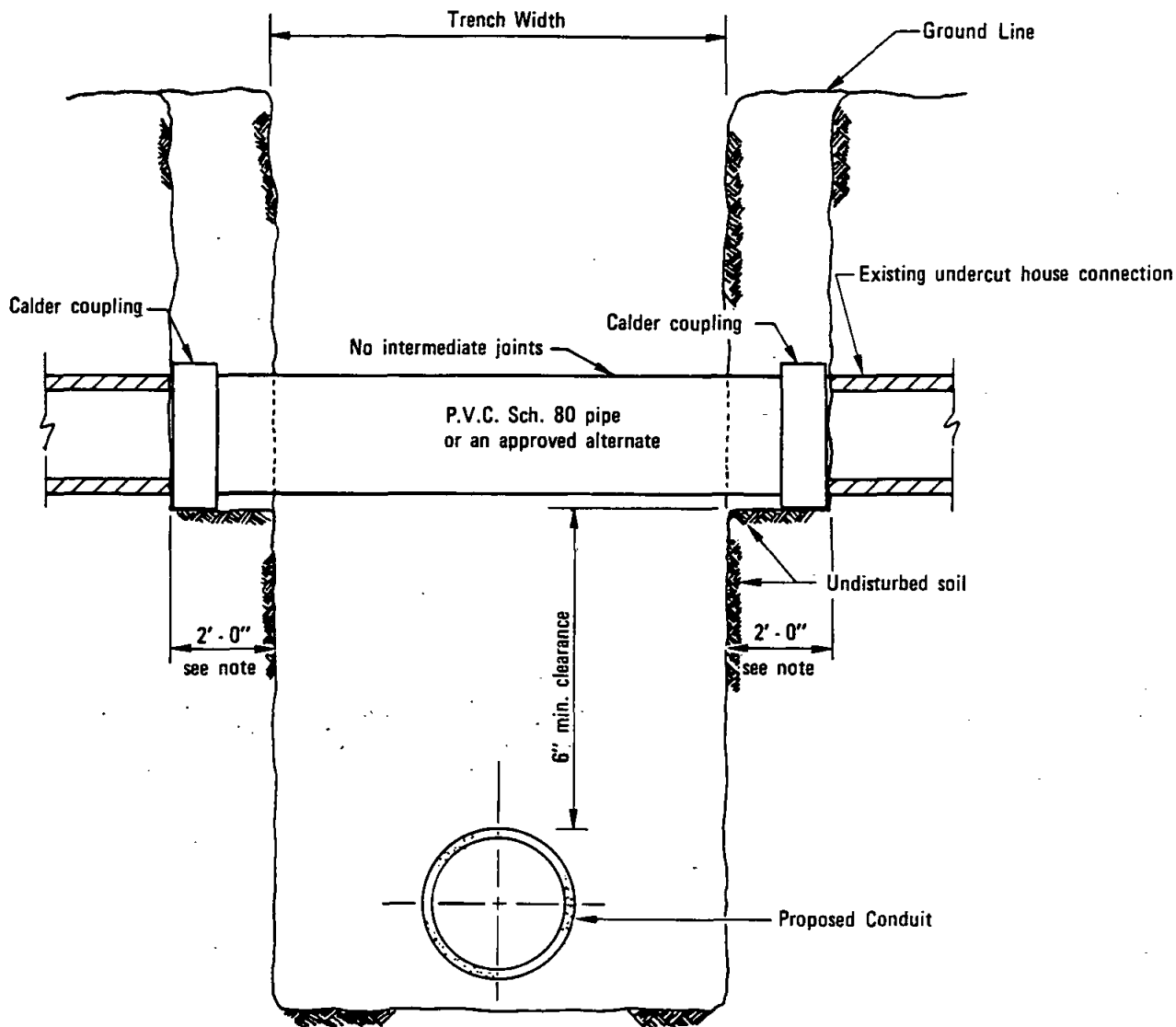
Allard G. Kaufman 5/20/1975
Coordinator R.C.E. 19807 Date

DRAWING
NUMBER **S-14**

SAN DIEGO REGIONAL STANDARD DRAWING

**DEEP CUT HOUSE CONNECTION
(SEWER LATERAL)**

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

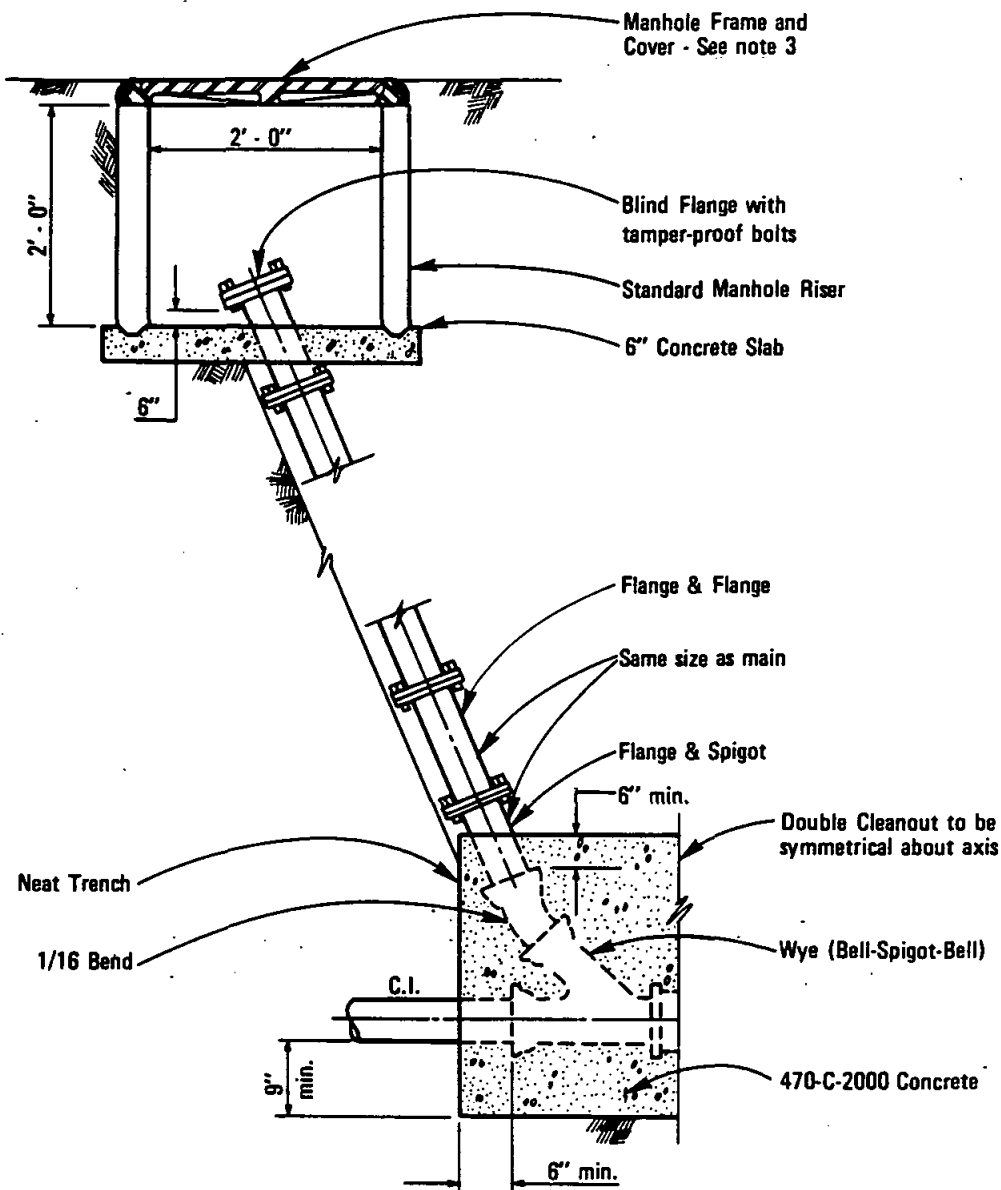
HOUSE CONNECTION SEWER REPAIR

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER

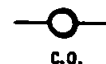
S-15



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



RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

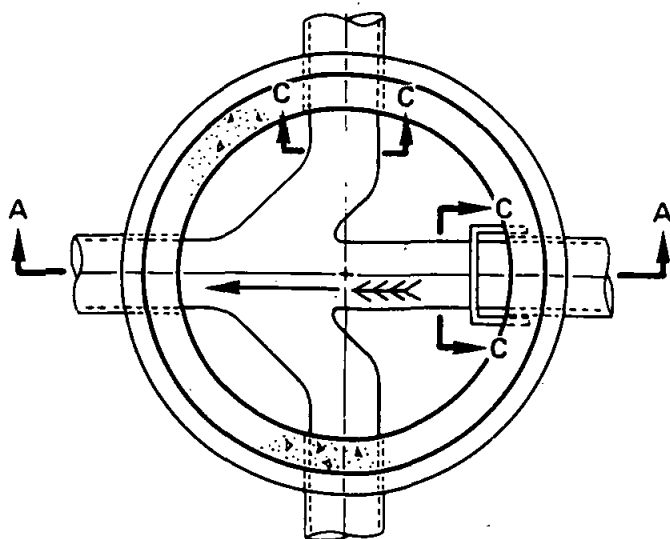
SAN DIEGO REGIONAL STANDARD DRAWING

CLEANOUT-SEWER FORCE MAIN

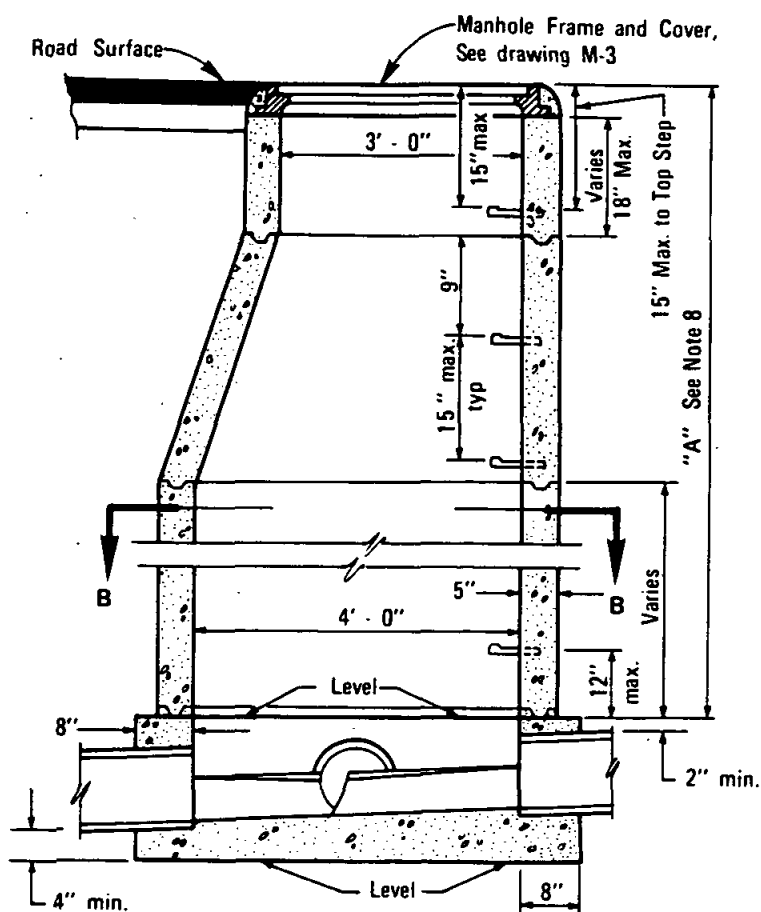
DRAWING
NUMBER

S-16

Revision	By	Approved	Date
Conc., slab	SC	M.E.	5-86

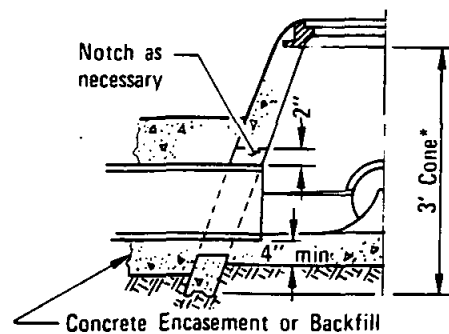
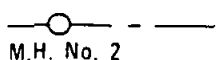


SECTION B-B



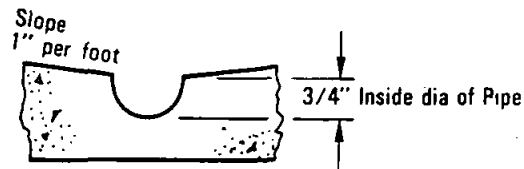
SECTION A-A

LEGEND ON PLANS

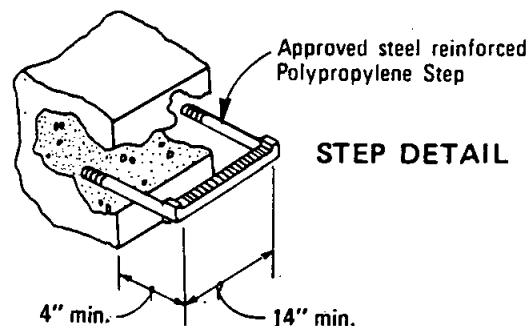


HALF SECTION SHALLOW MANHOLE

* 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. 3" to 18" of 3' diameter grade rings/and/or risers.
 - C. 4' diameter shaft variable height.
 - D. Top step to be 15' Max. from top of frame and cover.
9. All patching within manhole base shall be epoxy mortar.
10. Prior approval of precast base is required by the Agency.

Revision	Approved	Date
Notes	1RP	10/82
Conc., Step	M.B.	5-86
NOTES	Q.H.	8-88

SAN DIEGO REGIONAL STANDARD DRAWING

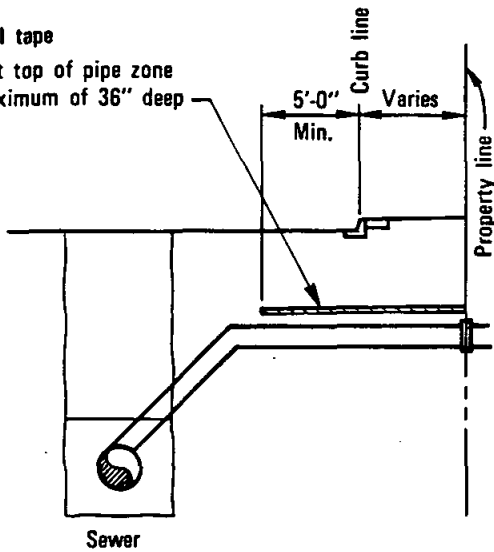
MANHOLE - 4' x 3' DIAMETER (FOR 15" MAX. DIA. PIPE)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

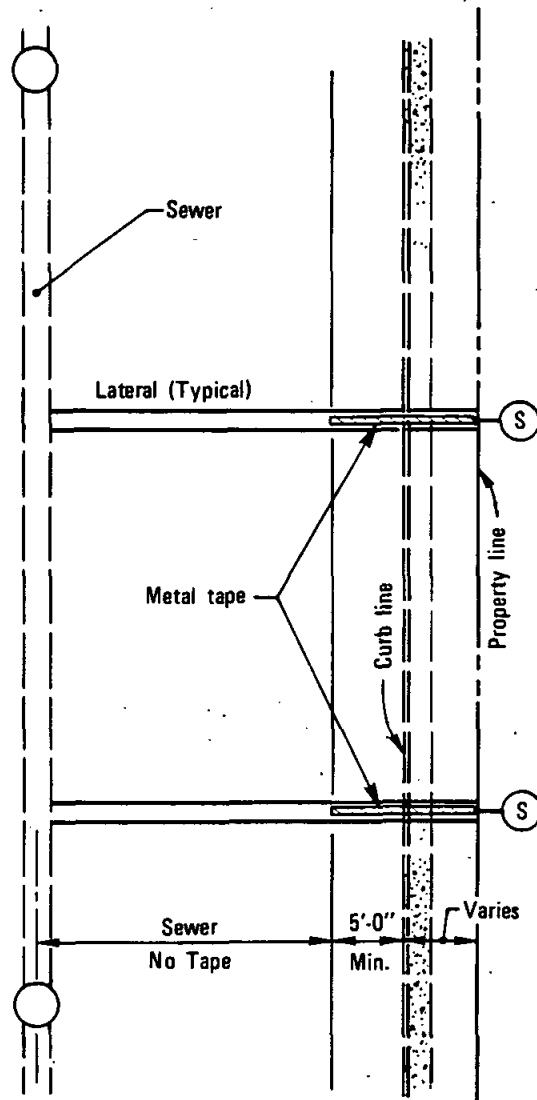
Coordinator R.C.E. 25291 Date

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

METALLIC TAPE LOCATOR
FOR NON-METALLIC SEWER PIPE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER S-19

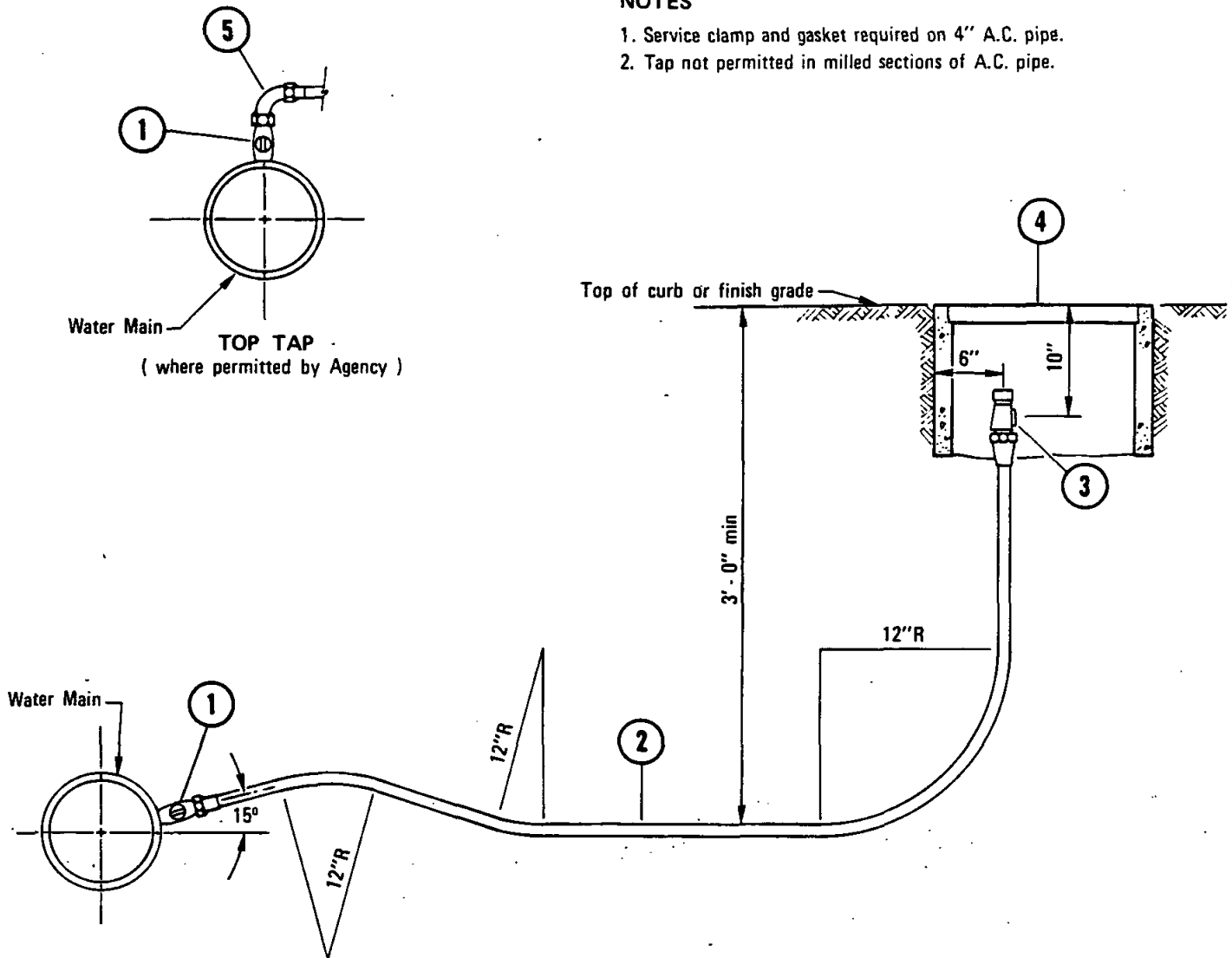
WATER SYSTEMS

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.

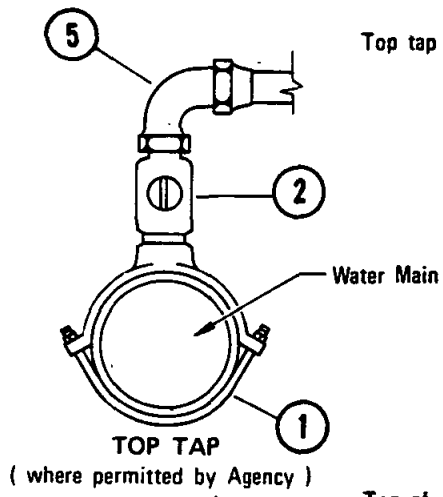


- 1 Bronze Corporation Stop (installed with key on side and open tap) and Adaptor as required by Agency.
Note: On steel mains use clamp or weld on coupling as required by Agency.
Install insulating bushing as required by Agency.
- 2 Copper Tubing or Plastic Pipe (no intermediate joints permitted without 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

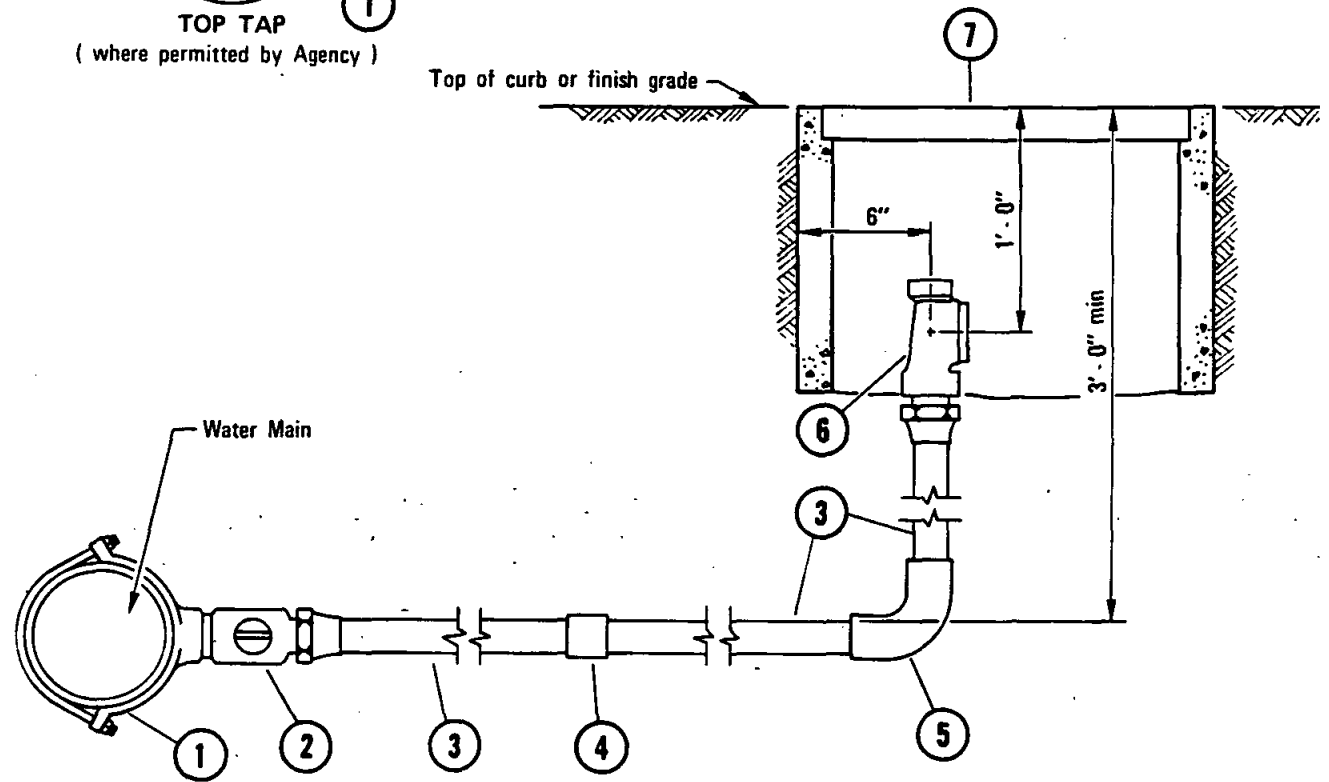
1" (W)

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Notes	SC	D.S.	7-79		
				1" WATER SERVICE	Coordinator R.C.E. 19807 Date Dec. 1975
					DRAWING NUMBER W-1



Top tap where permitted by Agency

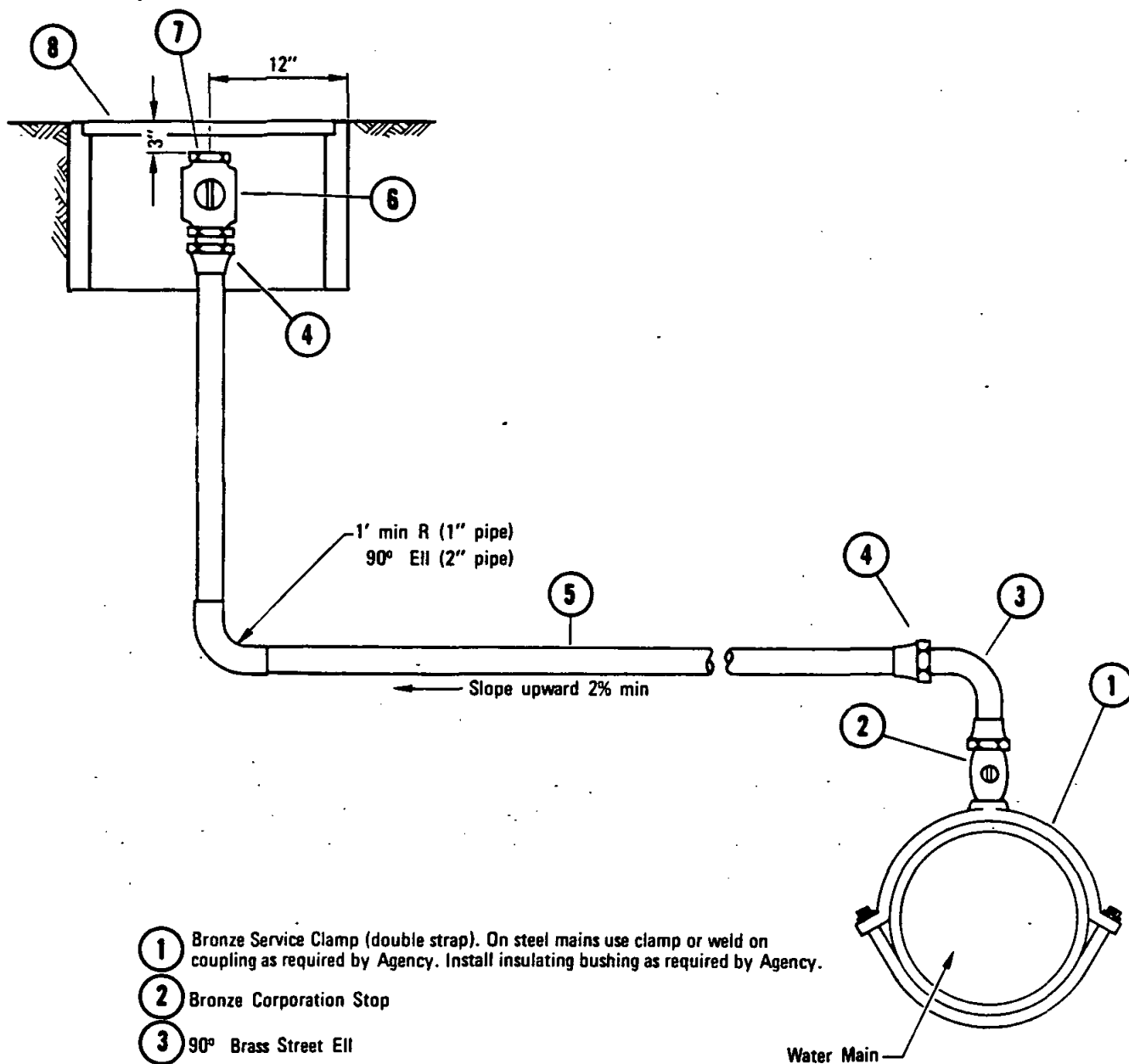
NOTE
Silver Soldered Joints may be used where approved by the Agency.



- 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).

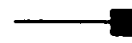
LEGEND ON PLANS
2" (W)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>William D. Kuehn</i> Dec. 1975 Coordinator R.C.E. 19807 Date	SAN DIEGO REGIONAL STANDARD DRAWING	Revision	By	Approved	Date
		Notes	SC	D.S.	7-79
DRAWING NUMBER W-2	1 1/2" AND 2" WATER SERVICES				



- 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.	7-71

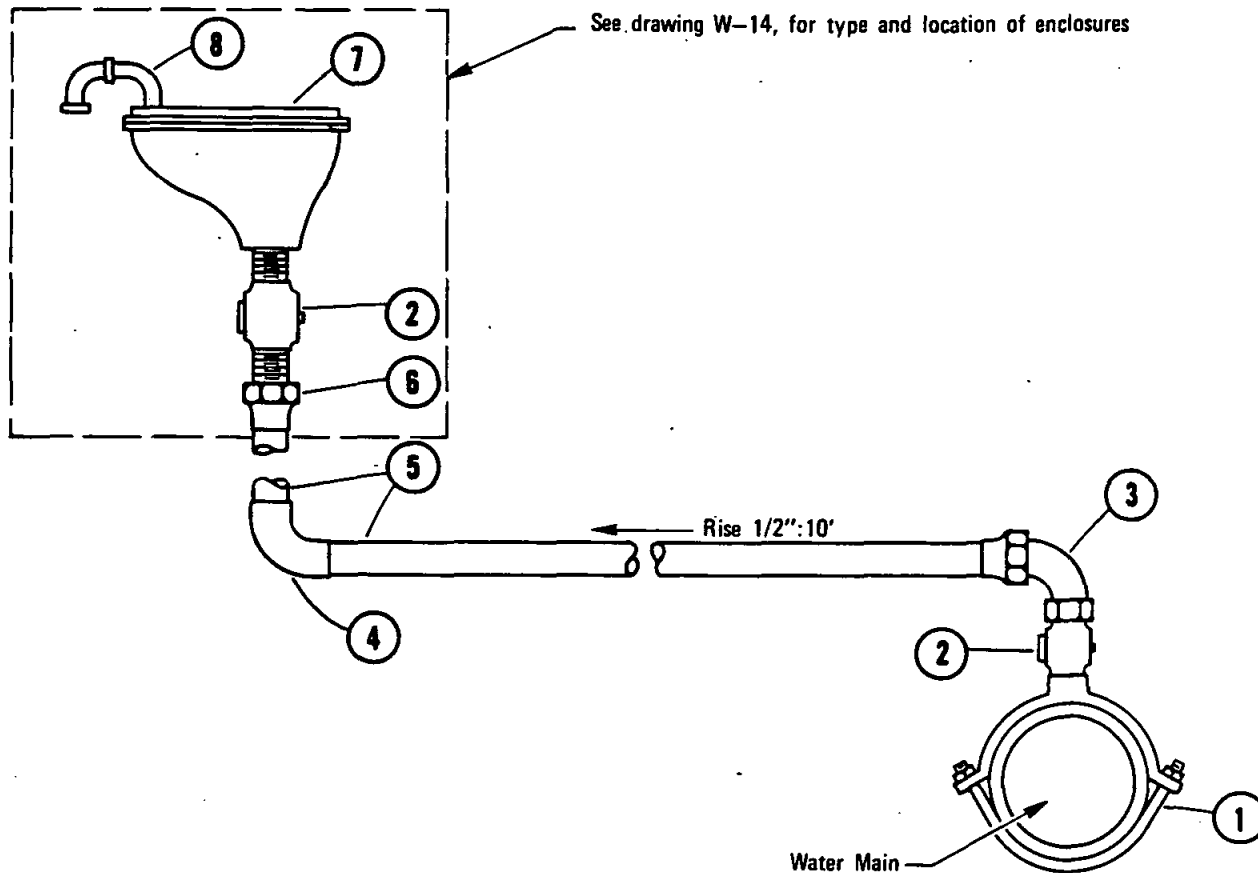
SAN DIEGO REGIONAL STANDARD DRAWING

1" AND 2" MANUAL AIR RELEASES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Allan A. Kershner *Dec. 1975*
Coordinator R.C.E. 19007 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

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

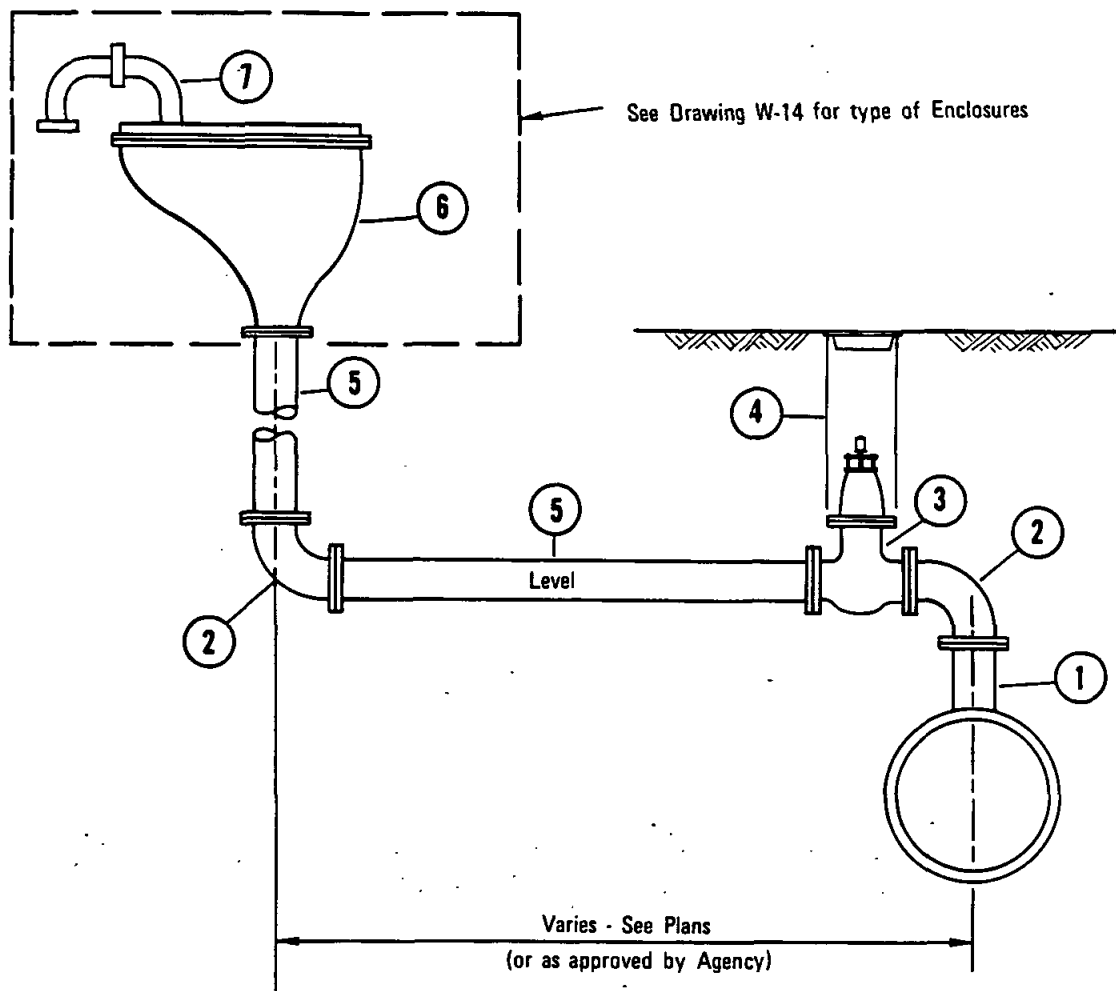
DRAWING
NUMBER

W-4

SAN DIEGO REGIONAL STANDARD DRAWING

1" AND 2" AIR AND VACUUM VALVES

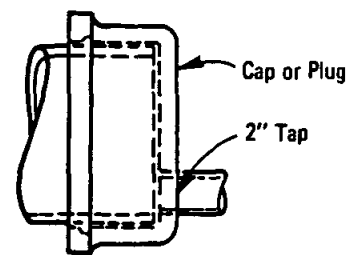
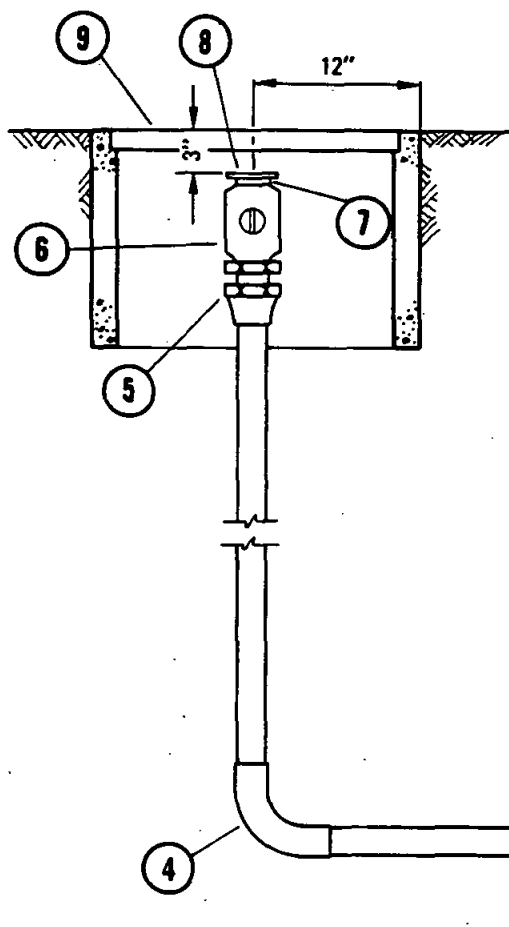
Revision	By	Approved	Date
Notes	<i>JS</i>	<i>O.S.</i>	<i>2-79</i>



- 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>Allan A. Kershner</i> <i>Dec. 1975</i>	
						Coordinator R.C.E. 19807 Date	
				4" AND 6" AIR AND VACUUM VALVES		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

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

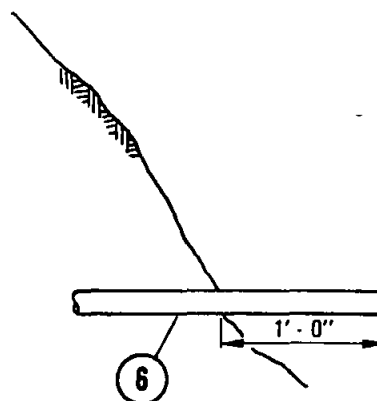
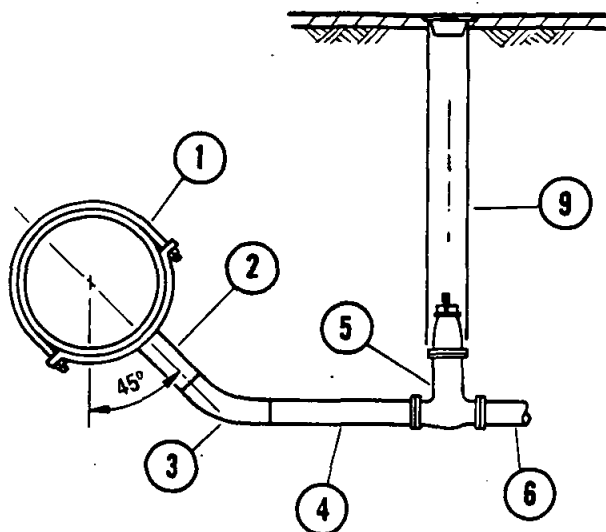
DRAWING
NUMBER

W-6

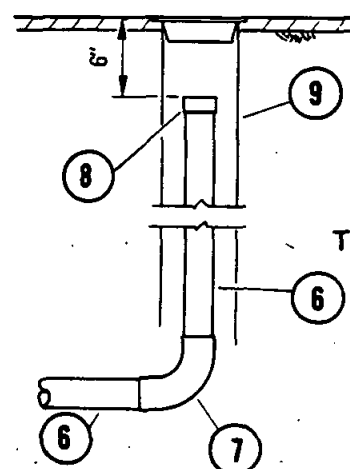
SAN DIEGO REGIONAL STANDARD DRAWING

2" BLOW-OFF ASSEMBLY - TYPE A

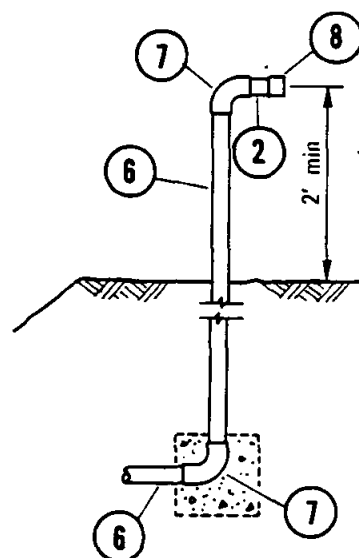
Revision	By	Approved	Date
Detail	<i>R.C.E.</i>	<i>O.S.</i>	7-79



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
Notes	SC	DS	7-79

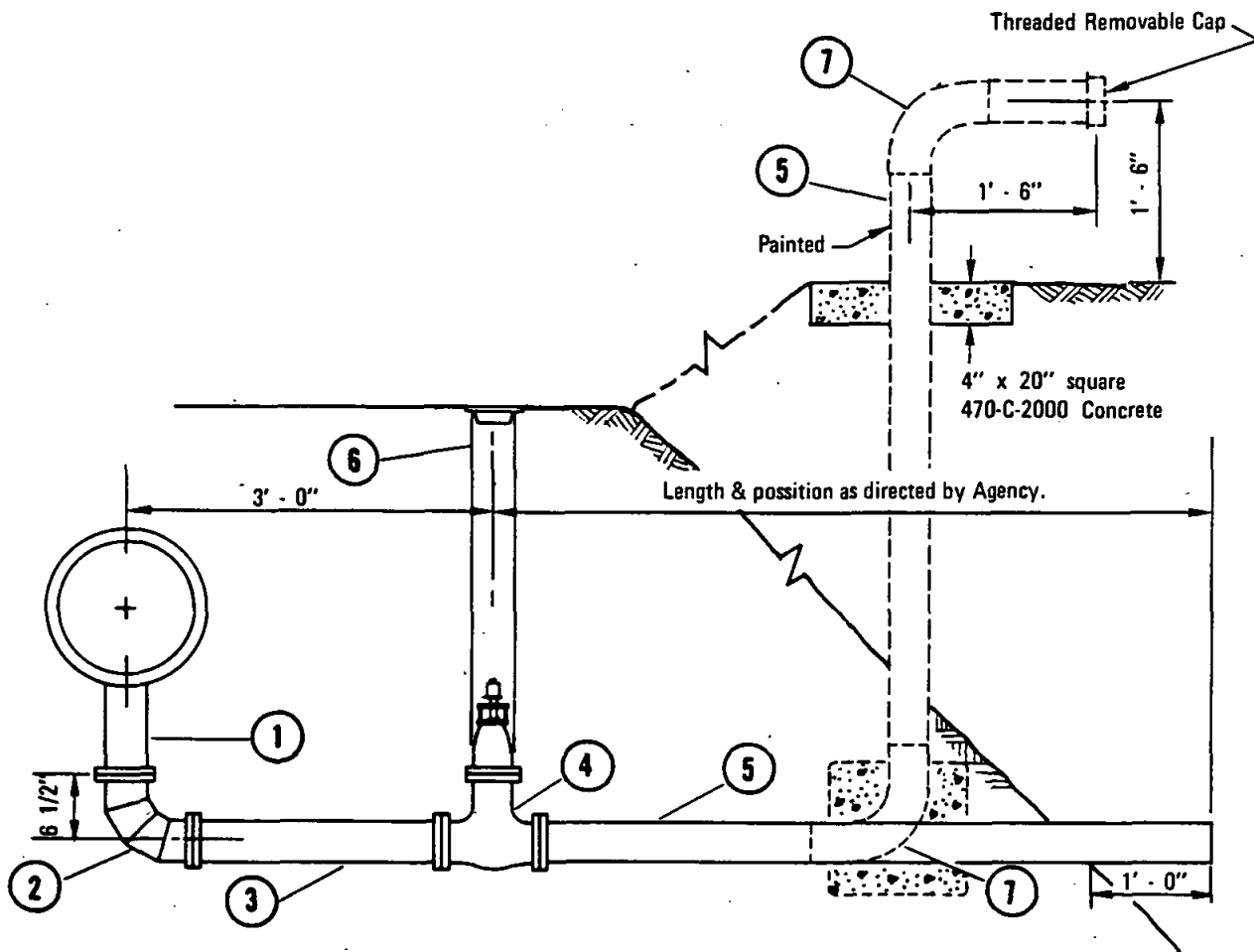
SAN DIEGO REGIONAL STANDARD DRAWING

2" BLOW-OFF ASSEMBLIES TYPES B, C AND D

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

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

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

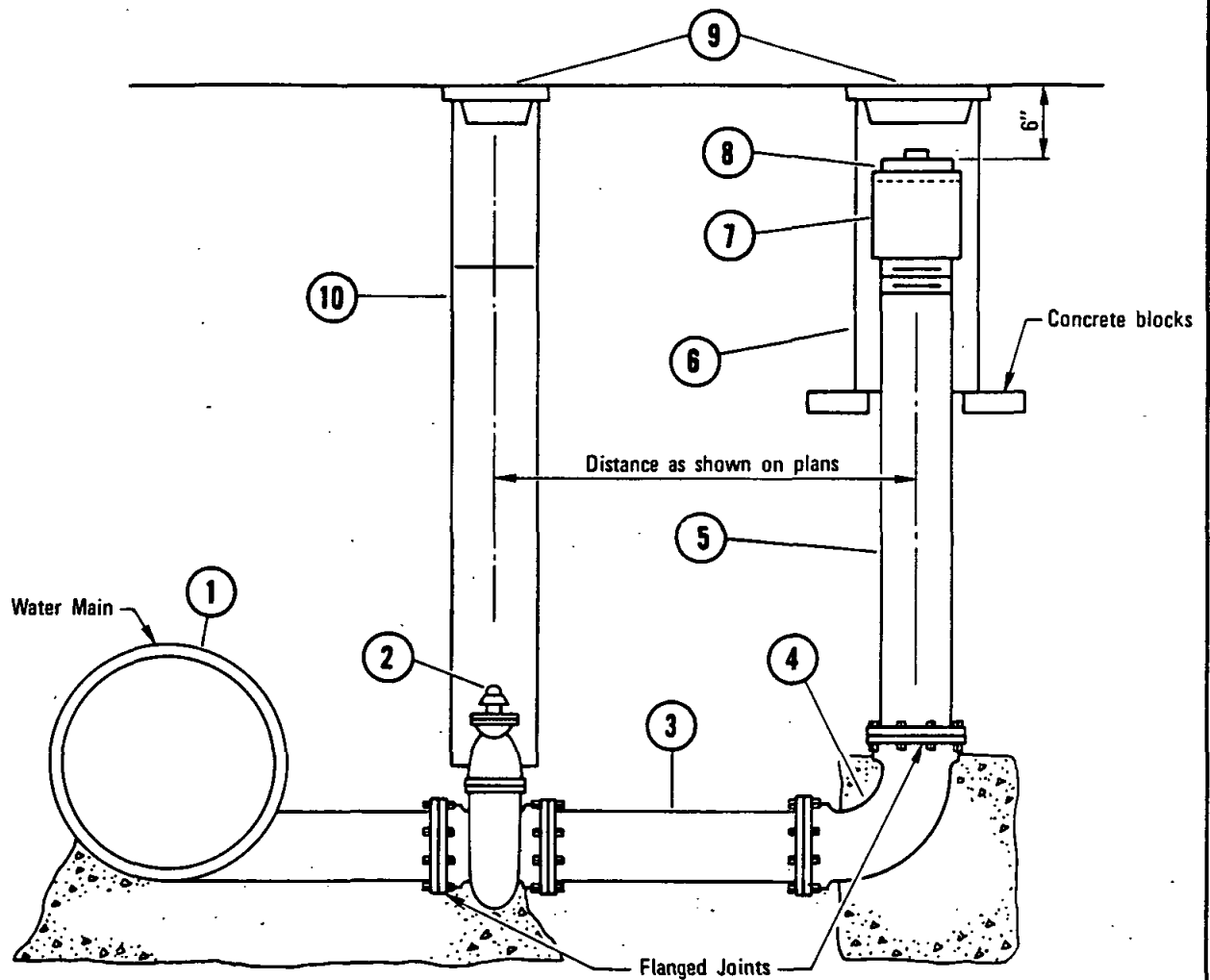
DRAWING
NUMBER

W-8

SAN DIEGO REGIONAL STANDARD DRAWING

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

Revision	By	Approved	Date

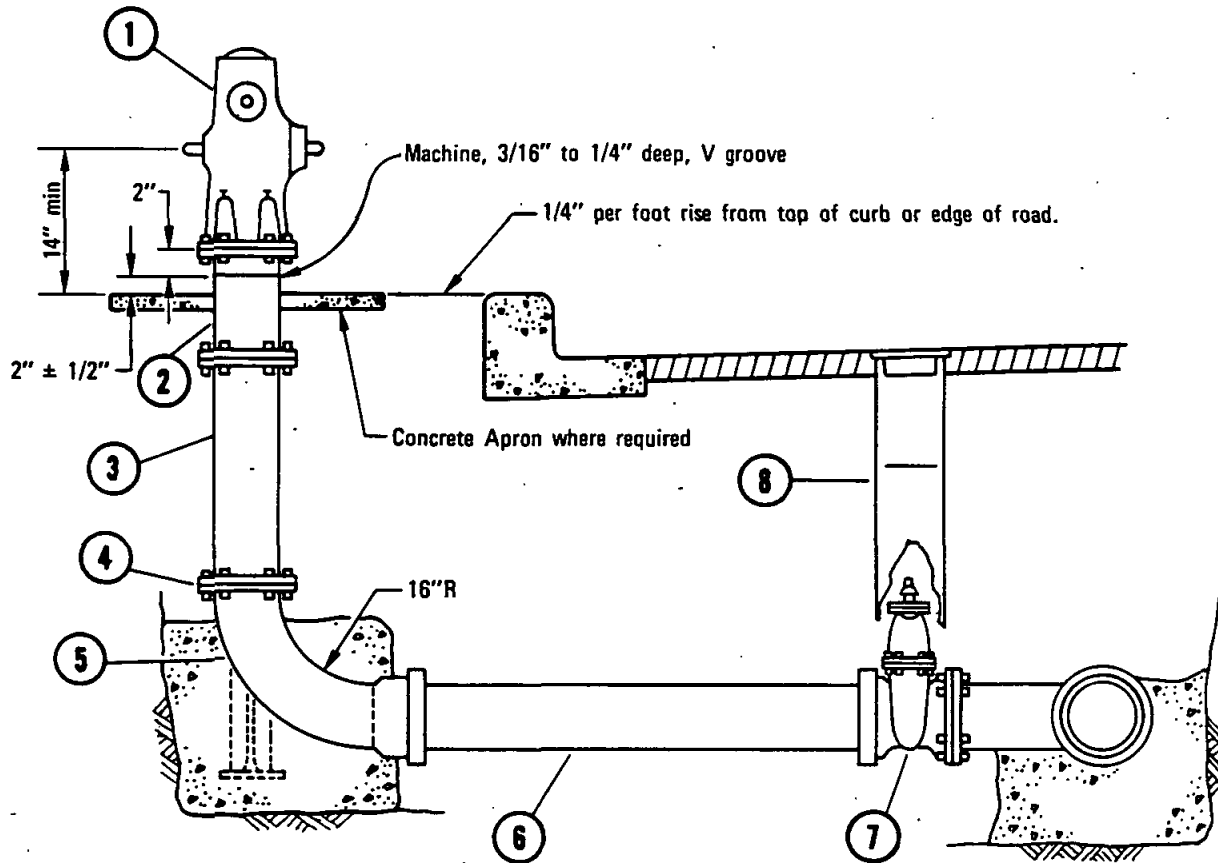


- ① Main Size x Flanged Outlet, cement lined and coated.
- ② Flanged Gate Valve (F x RT for A.C. Pipe).
- ③ Cast Iron Pipe or A.C. Pipe (6 1/2' min for A.C. Pipe).
- ④ F x F 90° Bend (F x RT for A.C. Pipe).
- ⑤ Galvanized Iron Pipe, threaded and flanged.
- ⑥ 10" Class 200 A.C. Pipe Gate Well.
- ⑦ Galvanized 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

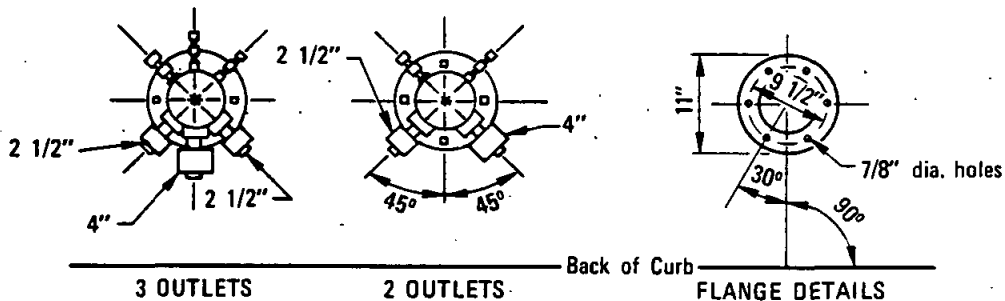


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				4" AND 6" BLOW-OFF ASSEMBLIES TYPE B		<i>Allan A. Kerschbaum</i>	<i>Dec. 1975</i>
						Coordinator R.C.E. 19807	Date
						DRAWING NUMBER	W-9



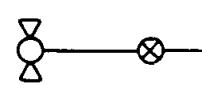
NOTE

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



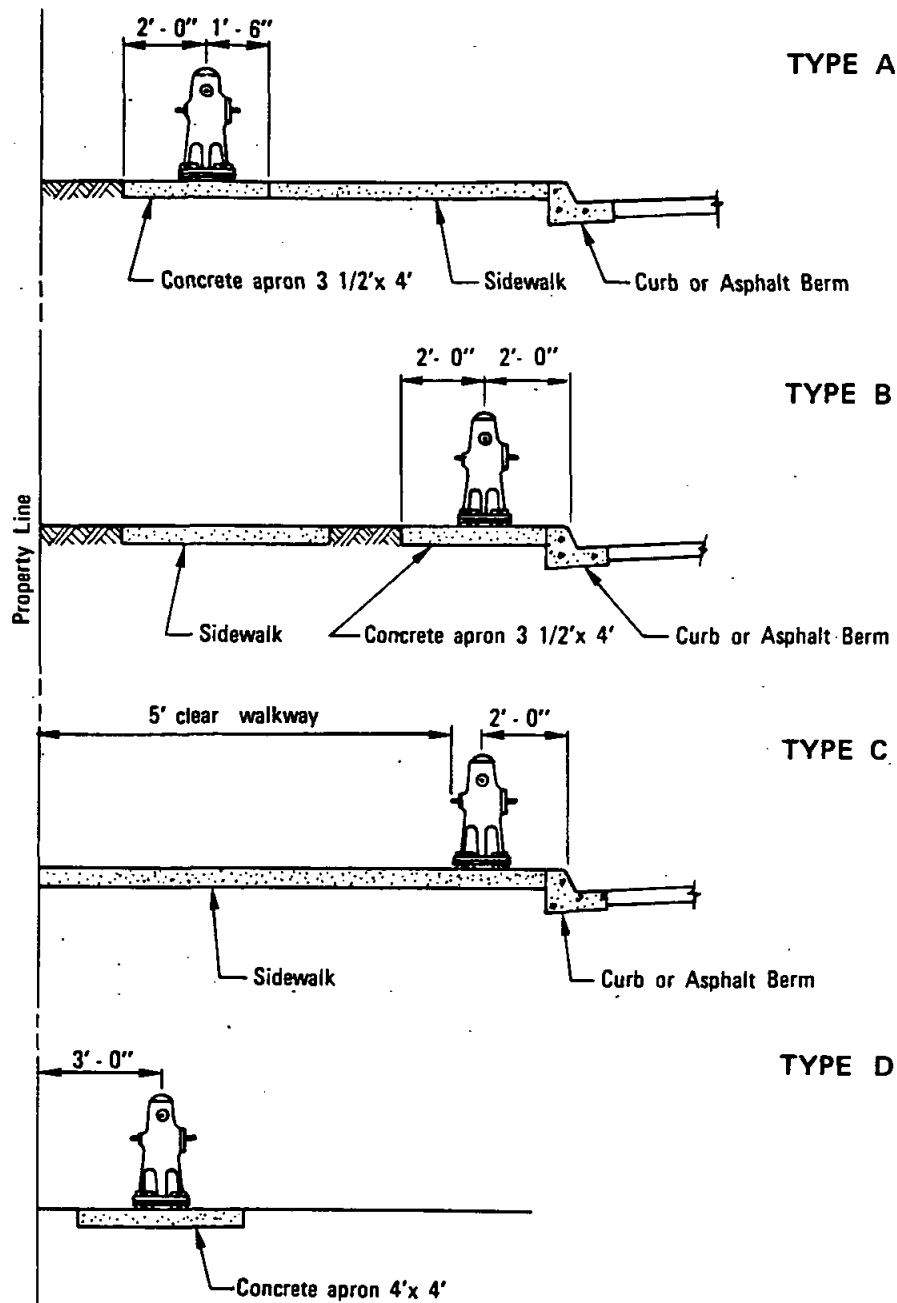
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
Allan A. Kershner Dec. 1975
Coordinator R.C.E. 15807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

DRAWING
NUMBER **W-10**

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. The centerline of the hydrant shall be located 5' minimum from curb return and minimum 3'-6" from driveway or any fixed obstruction.

Revision	By	Approved	Date
Notes	TRP	M.B.	10-82
Note 4	OK	OK	9-88

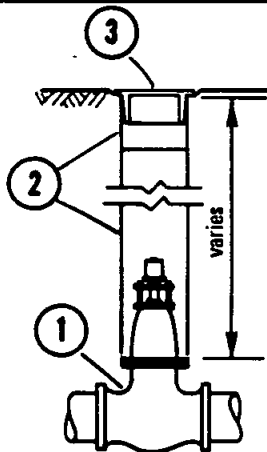
SAN DIEGO REGIONAL STANDARD DRAWING

FIRE HYDRANT LOCATIONS

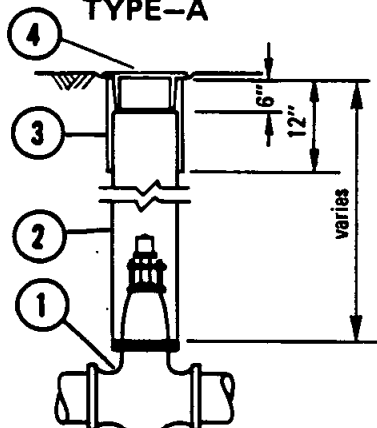
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

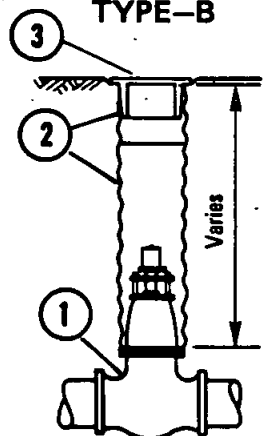
DRAWING
NUMBER **W-11**



TYPE-A



TYPE-B



TYPE-C

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

NOTES

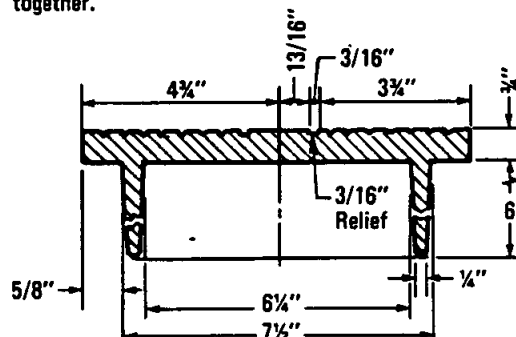
1. Provide clamp or felt to hold pipe sections (item 2) together during backfill.
2. Pipe shall be saw or machine cut on each end, no beveled sections will be permitted.
3. The final adjustment to finish grade may be made with an asbestos cement ring of 1" minimum height.

- 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.



CAST IRON
VALVE WELL CAP
DETAIL

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.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

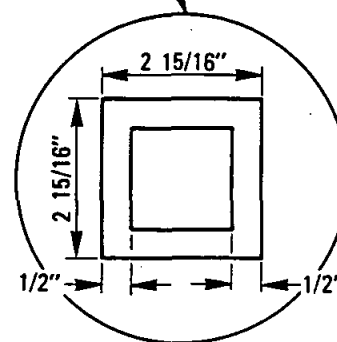
DRAWING
NUMBER

W-12

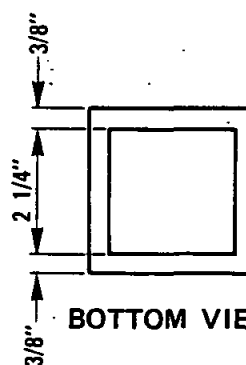
SAN DIEGO REGIONAL STANDARD DRAWING

VALVE WELL INSTALLATION

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

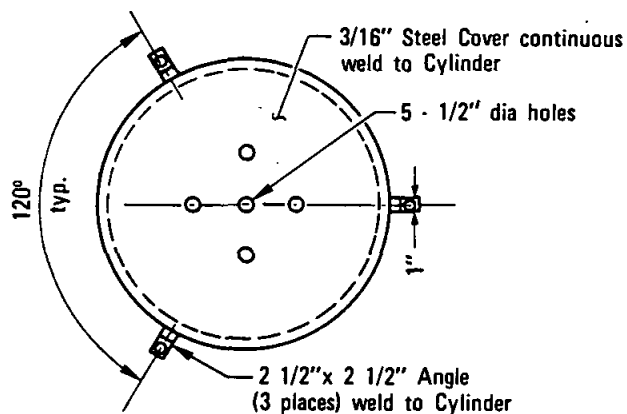


TOP VIEW



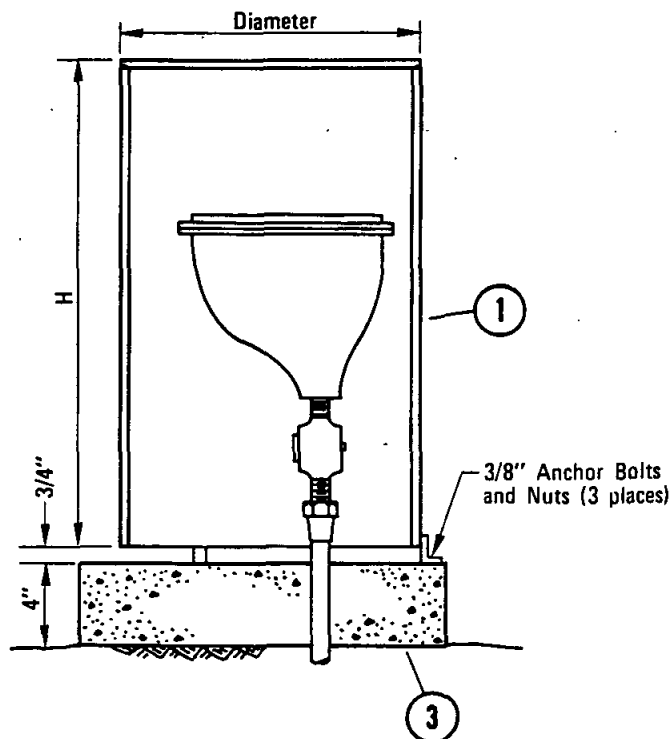
BOTTOM VIEW

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

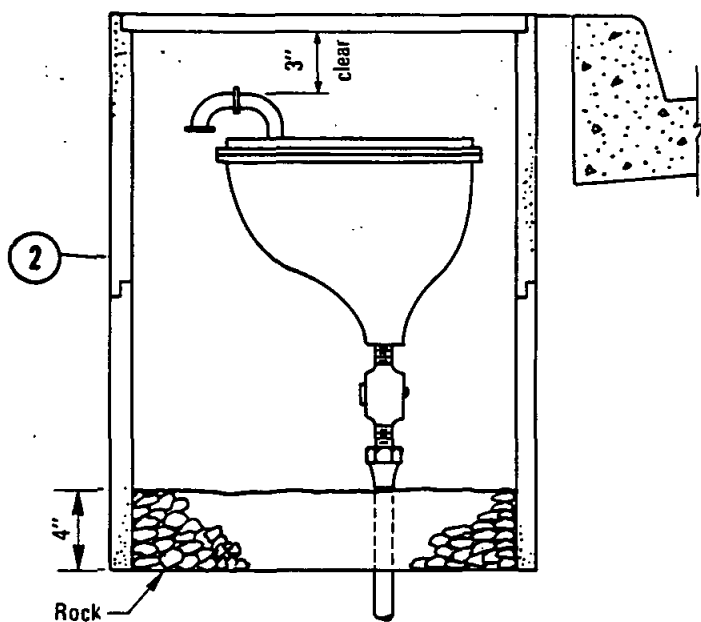


PLAN

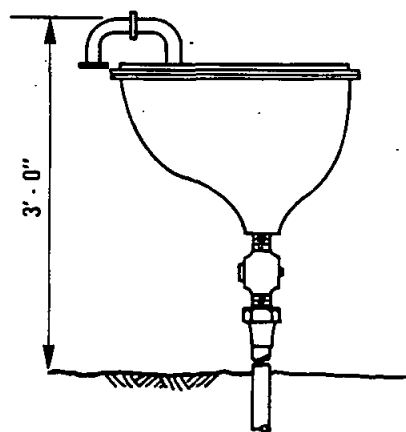
Valve Size	Dia	H
1" & 2"	14"	24"
4"	14"	30"
6"	16"	36"



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

Allard G. Kneeland Dec. 1975
Coordinator R.C.E. 19807 Date

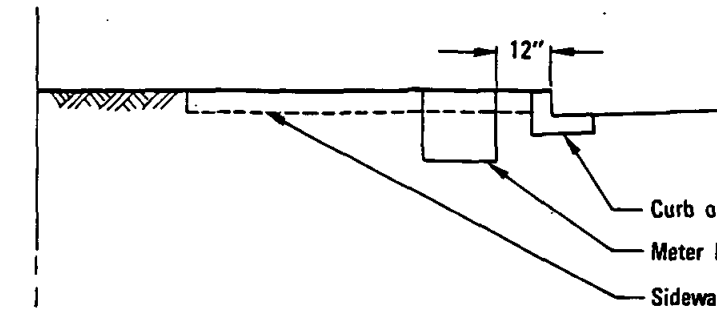
DRAWING
NUMBER

W-14

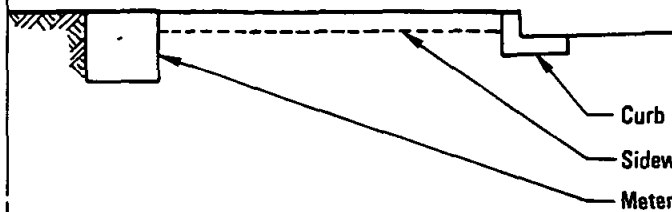
SAN DIEGO REGIONAL STANDARD DRAWING

AIR AND VACUUM VALVE ENCLOSURES

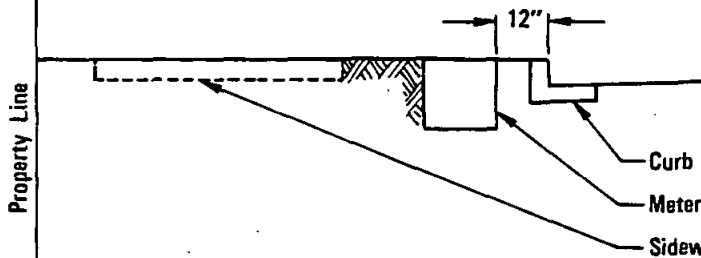
Revision	By	Approved	Date



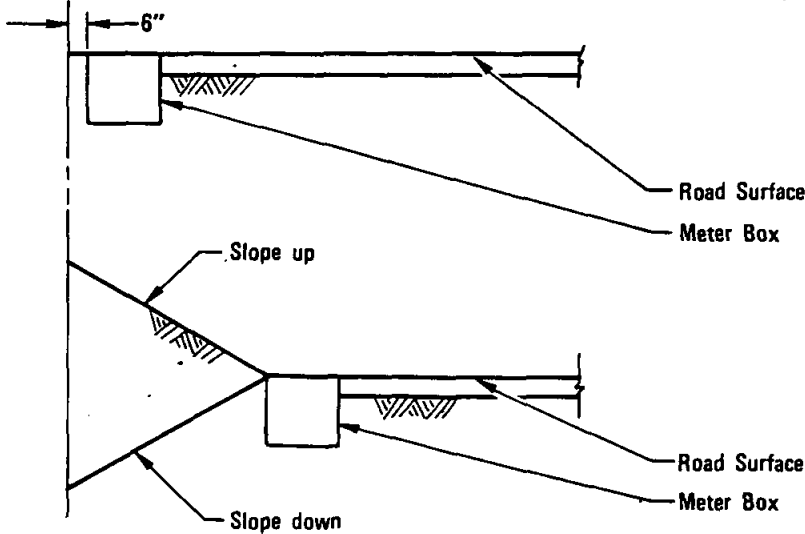
TYPE *A1
WITH OR WITHOUT COMMERCIAL
OR RESIDENTIAL SIDEWALK



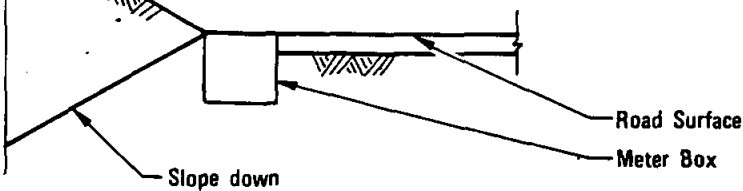
TYPE *A2
CONTIGUOUS SIDEWALK



TYPE B
NON-CONTIGUOUS SIDEWALK



TYPE C
NO CURB



TYPE D
NO CURB

* Agency to determine alternate

NOTE:

Meter boxes shall not be located within driveways.

Revision	By	Approved	Date
Note	SC	A.H.	7-88

SAN DIEGO REGIONAL STANDARD DRAWING

METER BOX LOCATIONS

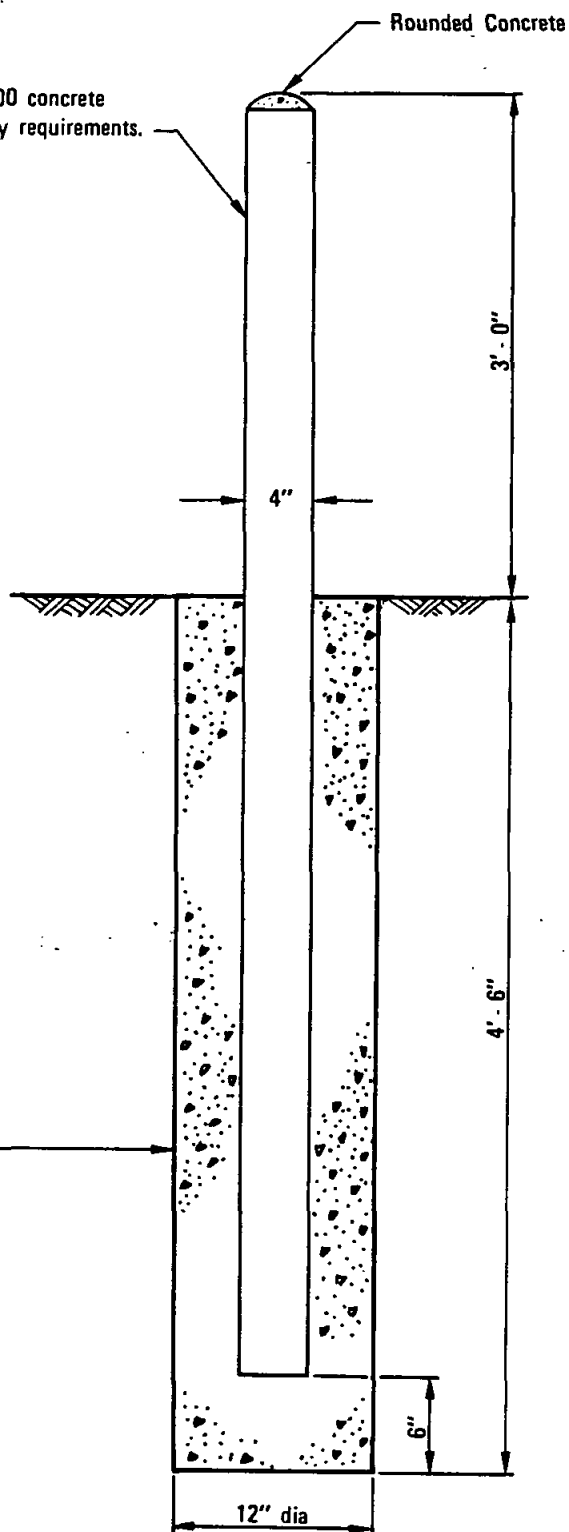
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Oliver S. 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.



470 - C - 2000 concrete

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

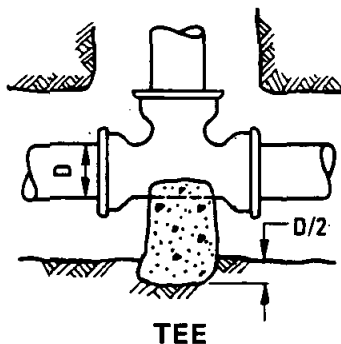
Allen G. Kneeland Dec. 1975
Coordinator R.C.E. 19807 Date

SAN DIEGO REGIONAL STANDARD DRAWING

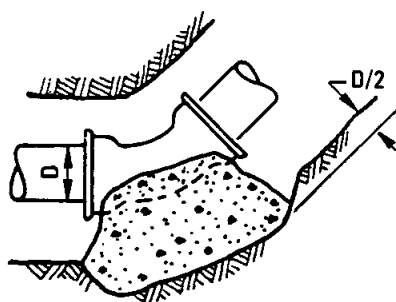
PROTECTION POST

DRAWING
NUMBER W-16

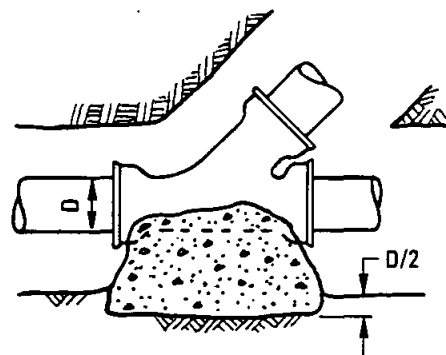
Revision	By	Approved	Date



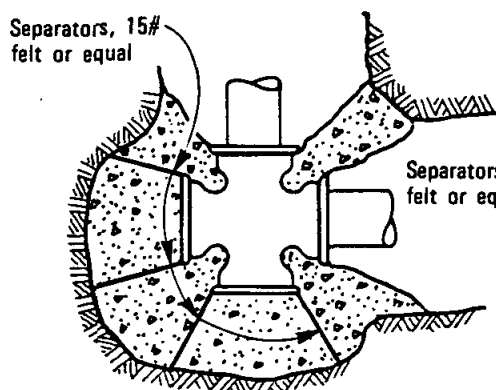
TEE



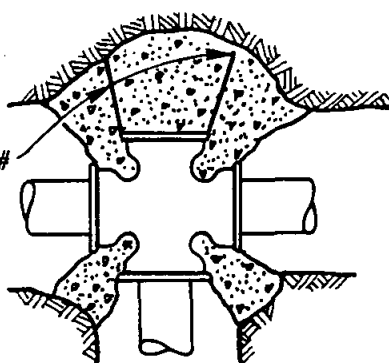
HORIZONTAL OR
VERTICAL BEND



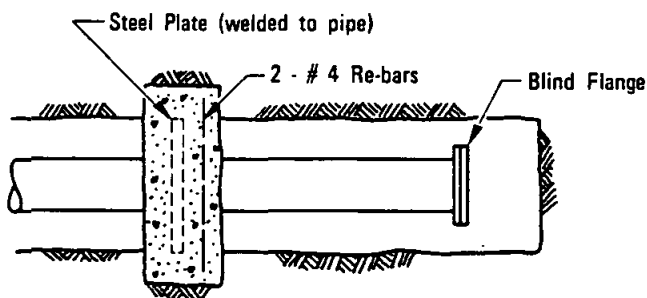
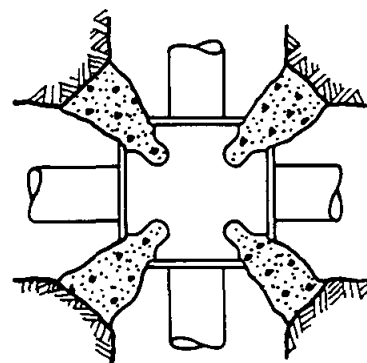
WYE



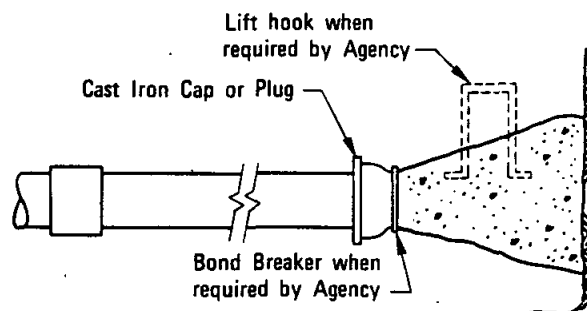
Separators, 15#
felt or equal



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

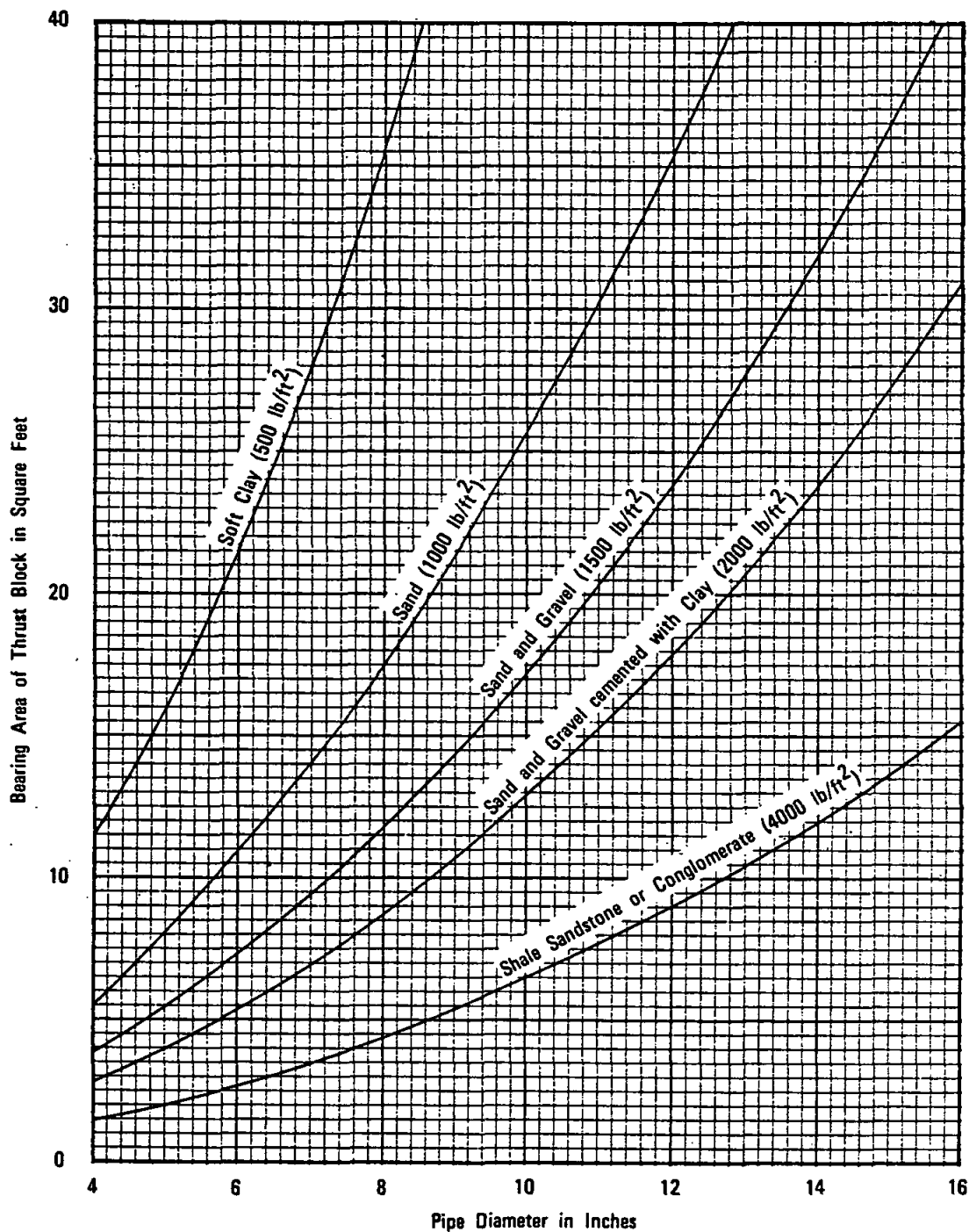
CONCRETE THRUST BLOCKS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER

W-17



NOTES

1. Based on 225 psi test pressure and bearing values of dry soils.
2. 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.
3. For conditions not covered by curves, special thrust blocks must be computed and approved.

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

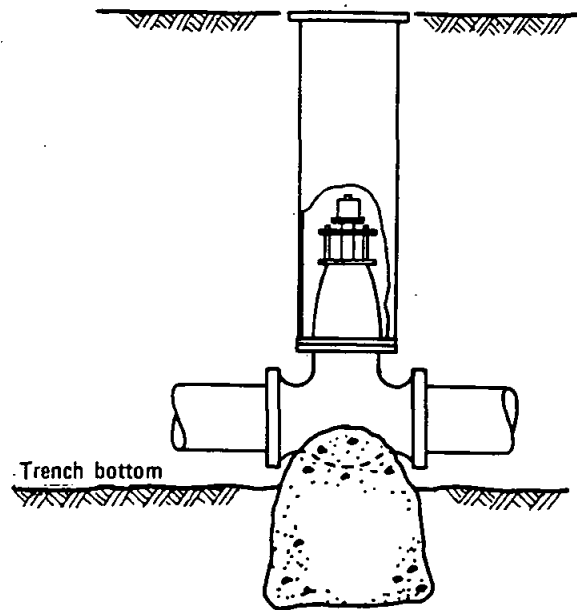
SAN DIEGO REGIONAL STANDARD DRAWING

THRUST BLOCK BEARING AREAS

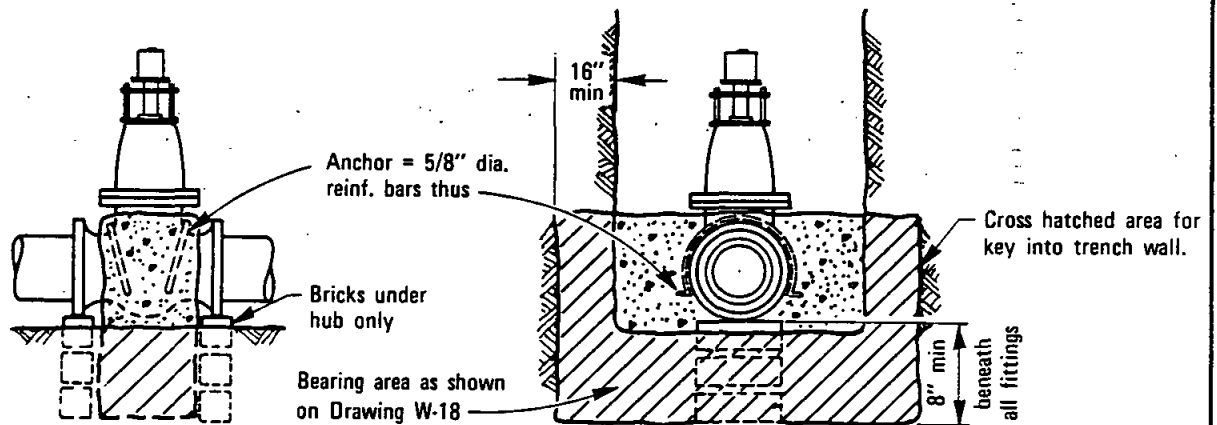
DRAWING
NUMBER

W-18

Revision	By	Approved	Date



TYPE-A SUPPORT BLOCK

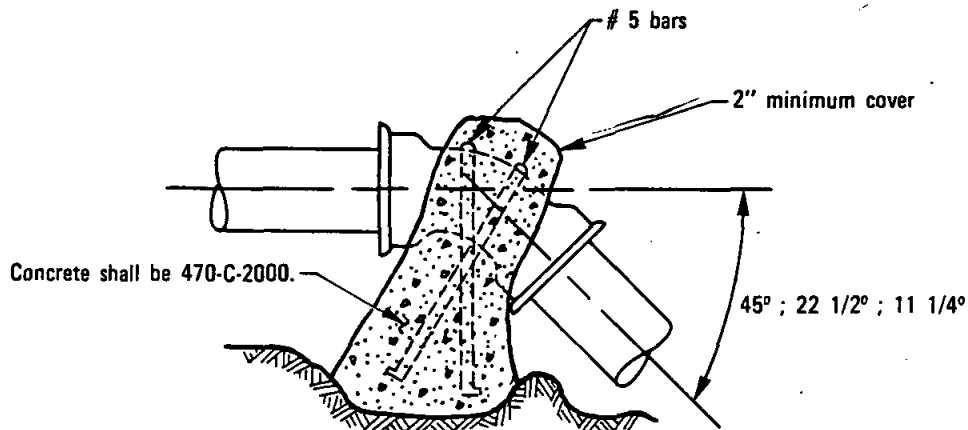


TYPE-B THRUST BLOCK

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>Alfred A. Kershner</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

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

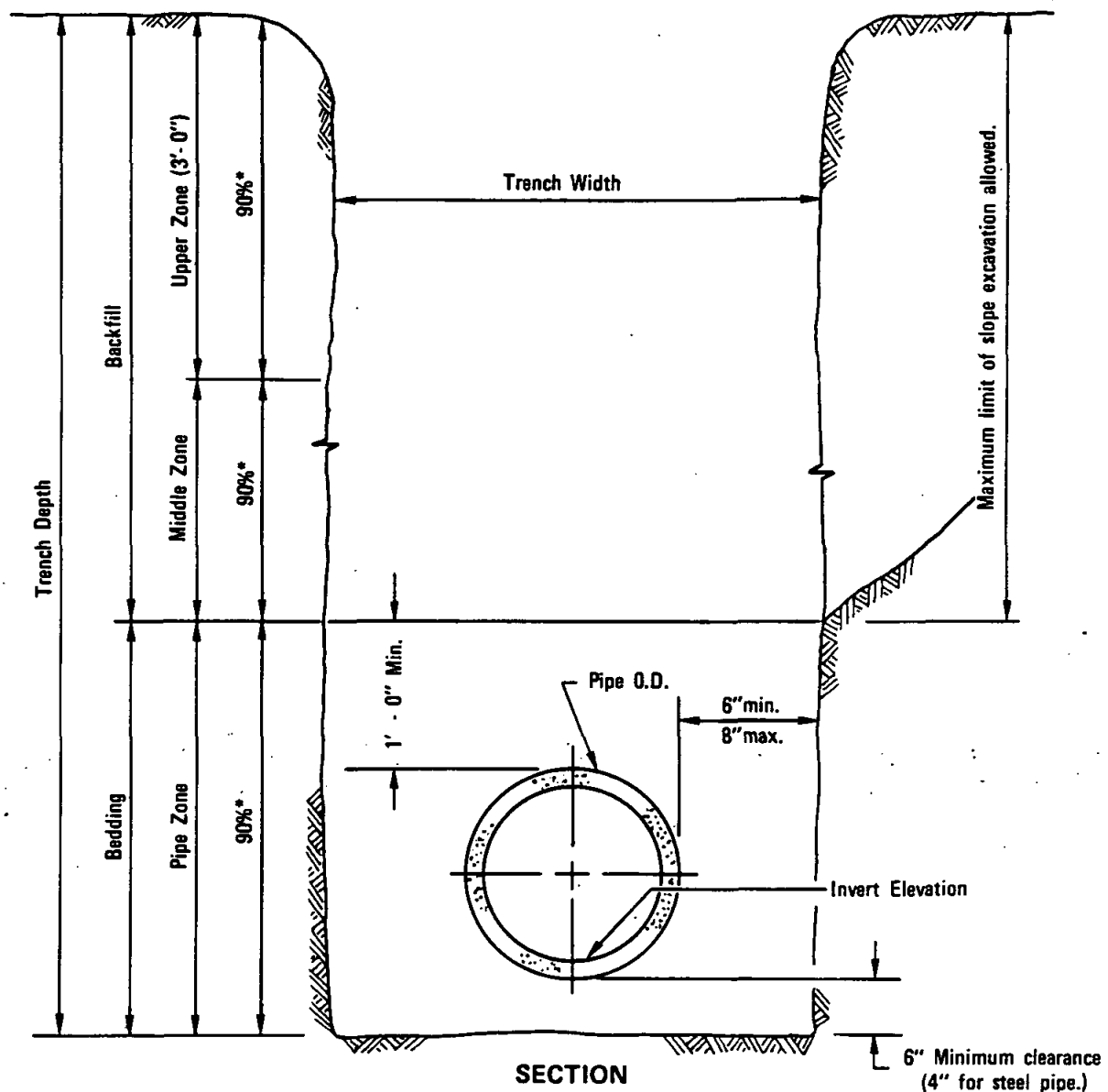
DRAWING
NUMBER

W-20

SAN DIEGO REGIONAL STANDARD DRAWING

**ANCHOR BLOCK
(VERTICAL BEND ONLY)**

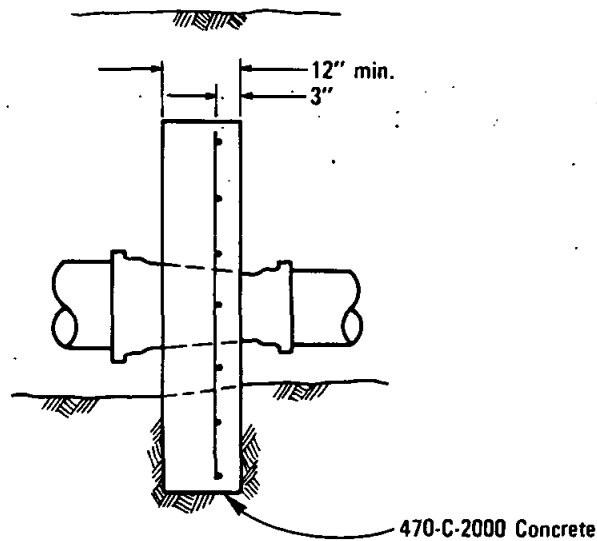
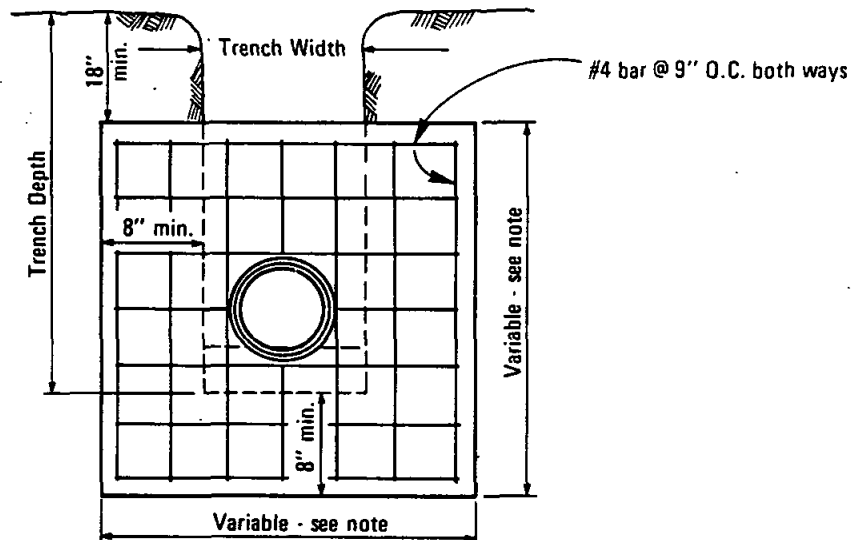
Revision	By	Approved	Date



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 PIPE BEDDING AND TRENCH BACKFILL FOR WATER MAINS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>Allen J. Kersch</i> <i>Dec. 1975</i> Coordinator R.C.E. 19807 Date
Section	<i>2</i>	<i>D.S.</i>	<i>7-77</i>		
Reference	<i>TR</i>	<i>M.B.</i>	<i>10-82</i>		
Compact	<i>2</i>	<i>M.B.</i>	<i>5-86</i>		
				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

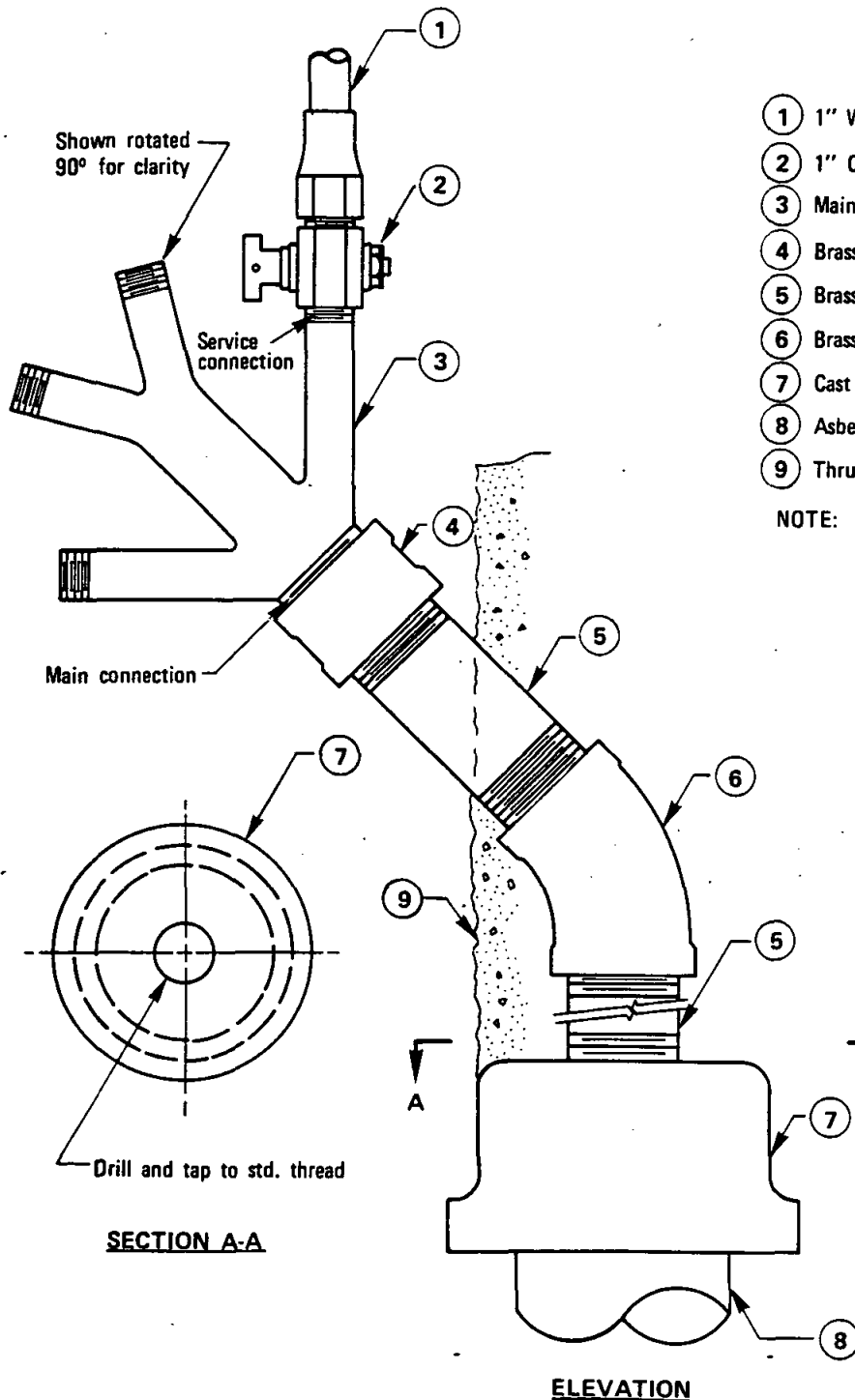
DRAWING
NUMBER

W-22

SAN DIEGO REGIONAL STANDARD DRAWING

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

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

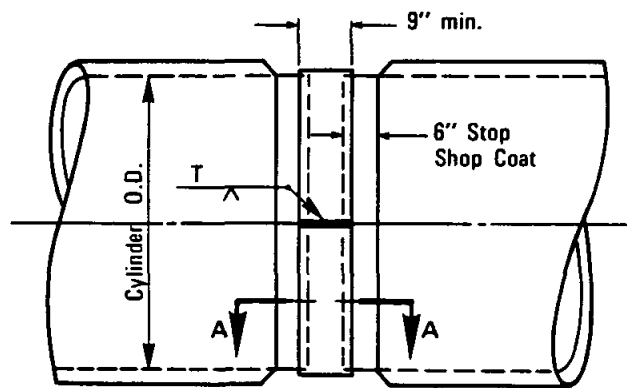
SAN DIEGO REGIONAL STANDARD DRAWING

**MULTIPLE SERVICE ASSEMBLY
DEAD END MAIN**

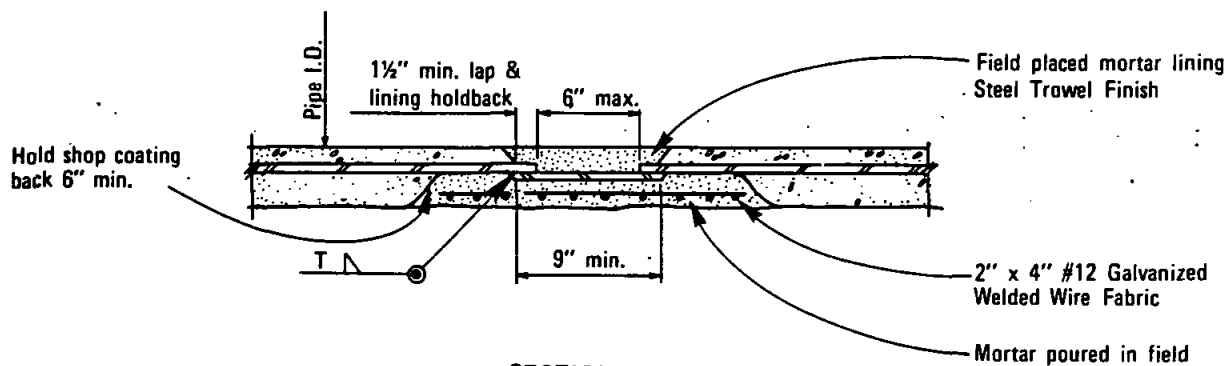
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

**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

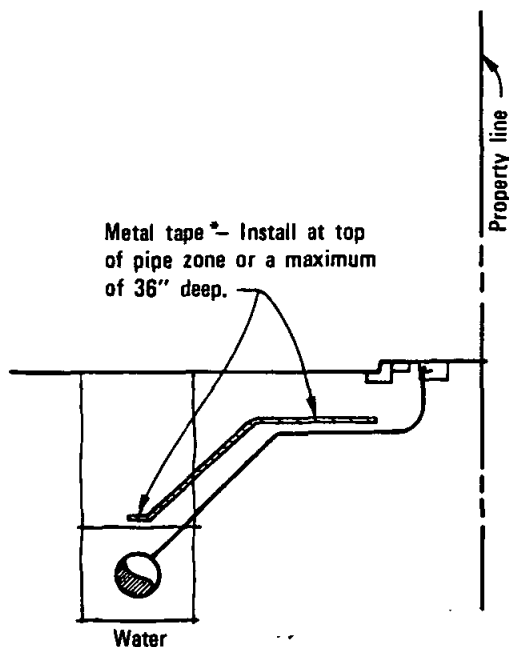
David J. Johnson July 1979
Coordinator R.C.E. 25291 Date

SAN DIEGO REGIONAL STANDARD DRAWING

SPLIT BUTT STRAP

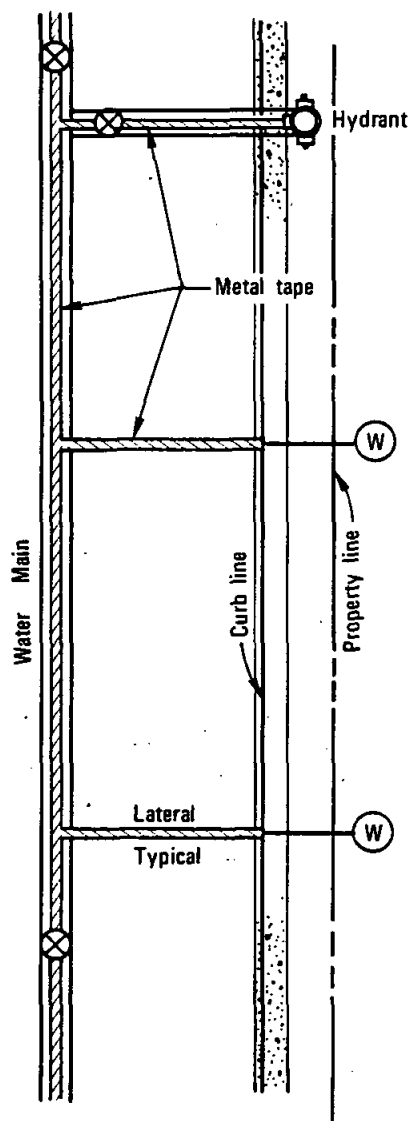
DRAWING
NUMBER **W-24**

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

METALLIC TAPE LOCATOR
FOR NON-METALLIC WATER PIPE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

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

DRAWING
NUMBER

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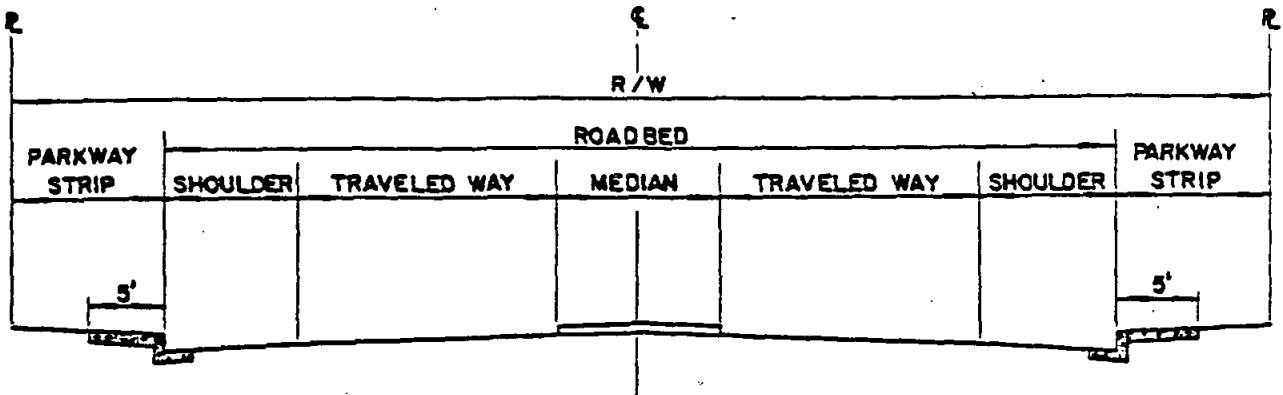
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TYPICAL ROADWAY SECTION **SYMMETRICAL ABOUT CENTERLINE**



TYPE OF ROAD OR STREET	R/W	ROADBED	TRAVELED WAY	SHOULDER	MEDIAN	PARKWAY STRIP
PRIME ARTERIAL TRAFFIC VOLUME OF 18,000 V.P.D. OR MORE	126'	106'	36'	8'	18'	10'
MAJOR ROAD TRAFFIC VOLUME 10,000 TO 18,000 V.P.D.	102'	82'	24'	8'	18'	10'
COLLECTOR ROAD TRAFFIC VOLUME 3,000 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 ADJUTING COMMERCIAL LOTS	72'	52'	16'	10'	0'	10'
* COMM. & IND. CUL-DE-SAC STREET TRAFFIC VOLUME FROM ADJUTING COMMERCIAL LOTS	72'	52'	16'	10'	0'	10'
FRONTAGE ROAD ADJACENT TO FREEWAY RIGHT OF WAY		SEE	NOTE	NA 4		

* COMM. & IND. = COMMERCIAL & INDUSTRIAL

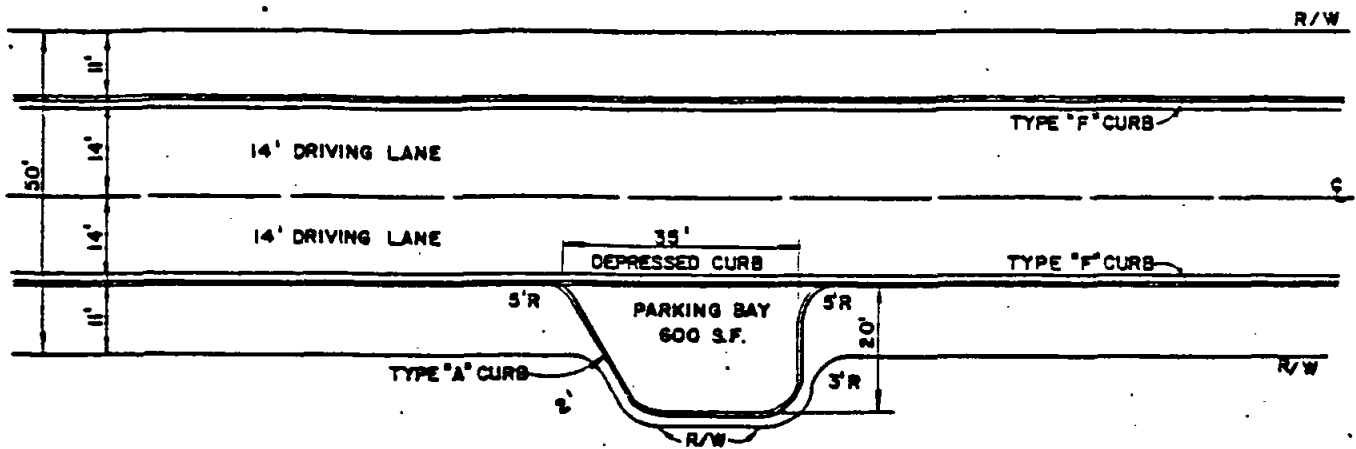
NOTE: 1. STREET CLASSIFICATIONS (EXCEPT PRIME ARTERIAL) AND TYPICAL ROADWAY SECTIONS FROM SAN DIEGO COUNTY TECHNICAL ROAD POLICY (JAN. 8, 1964).

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

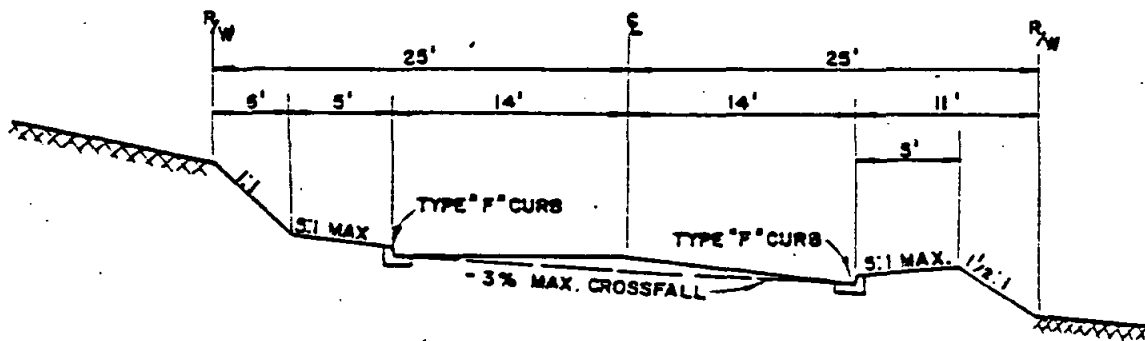
3. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR SIDEWALK, CURB, AND ROADWAY REQUIREMENTS.

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.

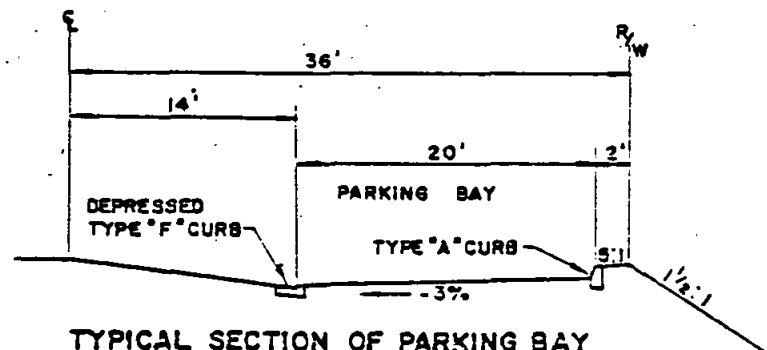
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RECOMMENDED BY <u>WBB</u>			REVISION	BY	APPROVED	DATE
APPROVED BY COUNTY ENGINEER			FORMERLY STANDARD DRAWING 310-3			
<u>H2A/10</u> R.C.E. 10358			NUMBER DS-1			
DATE <u>1-2-63</u>		TYPICAL ROADWAY SECTIONS				



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.

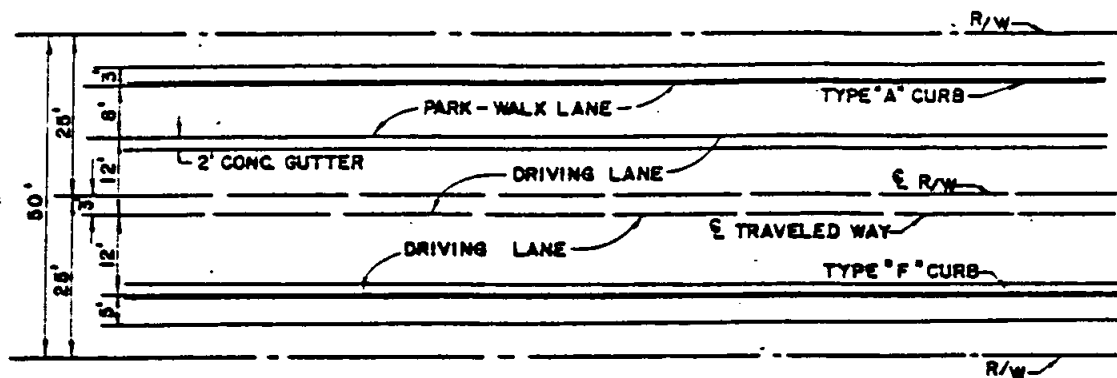
4. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA NOT LESS THAN 20,000 SQUARE FEET.

DRAWN BY	CHECKED BY
RECOMMENDED BY	
APPROVED BY COUNTY ENGINEER	
DATE	

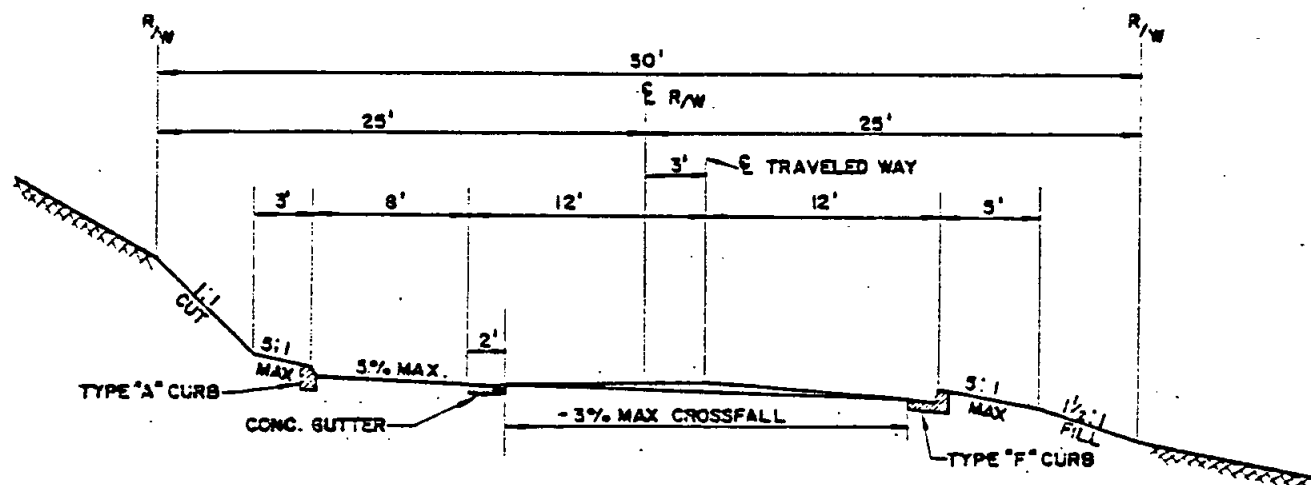
SAN DIEGO COUNTY DESIGN STANDARD

HILLSIDE RESIDENTIAL STREET
ALTERNATE No. 1

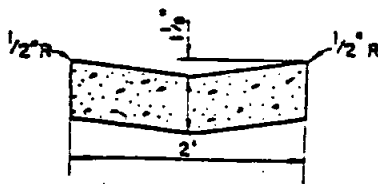
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 311-1			
NUMBER		DS-2	



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.

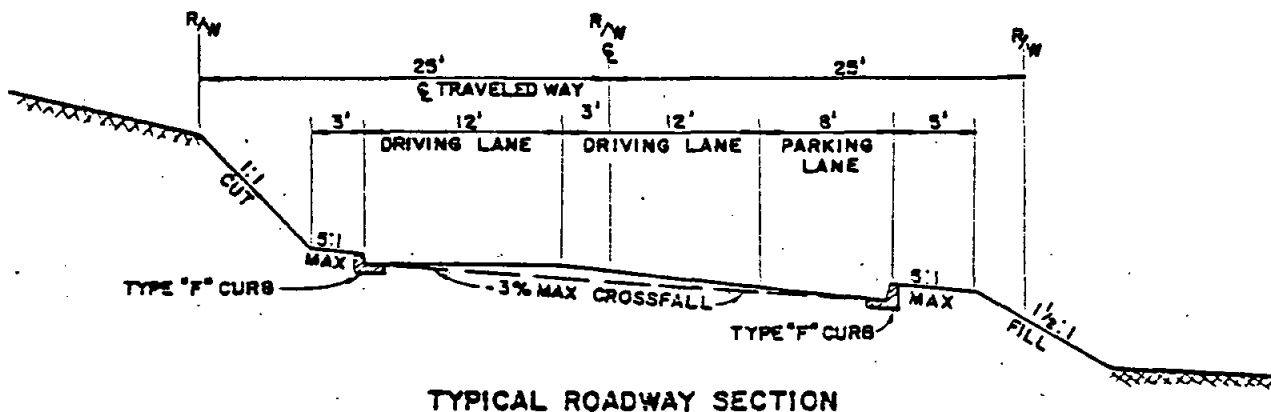
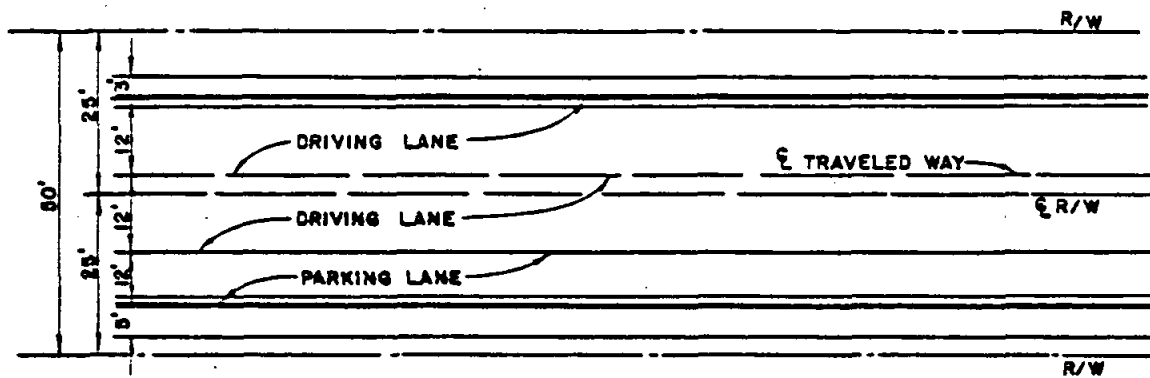
4. USE OF HILLSIDE RESIDENTIAL STREET STANDARDS ARE APPLICABLE ONLY TO STREETS CLASSIFIED AS, RESIDENTIAL, RESIDENTIAL CUL-DE-SAC, OR RESIDENTIAL LOOP STREETS AND ARE NOT APPLICABLE TO STREETS IN AREAS ZONED FOR COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL USE.

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	



NOTES:

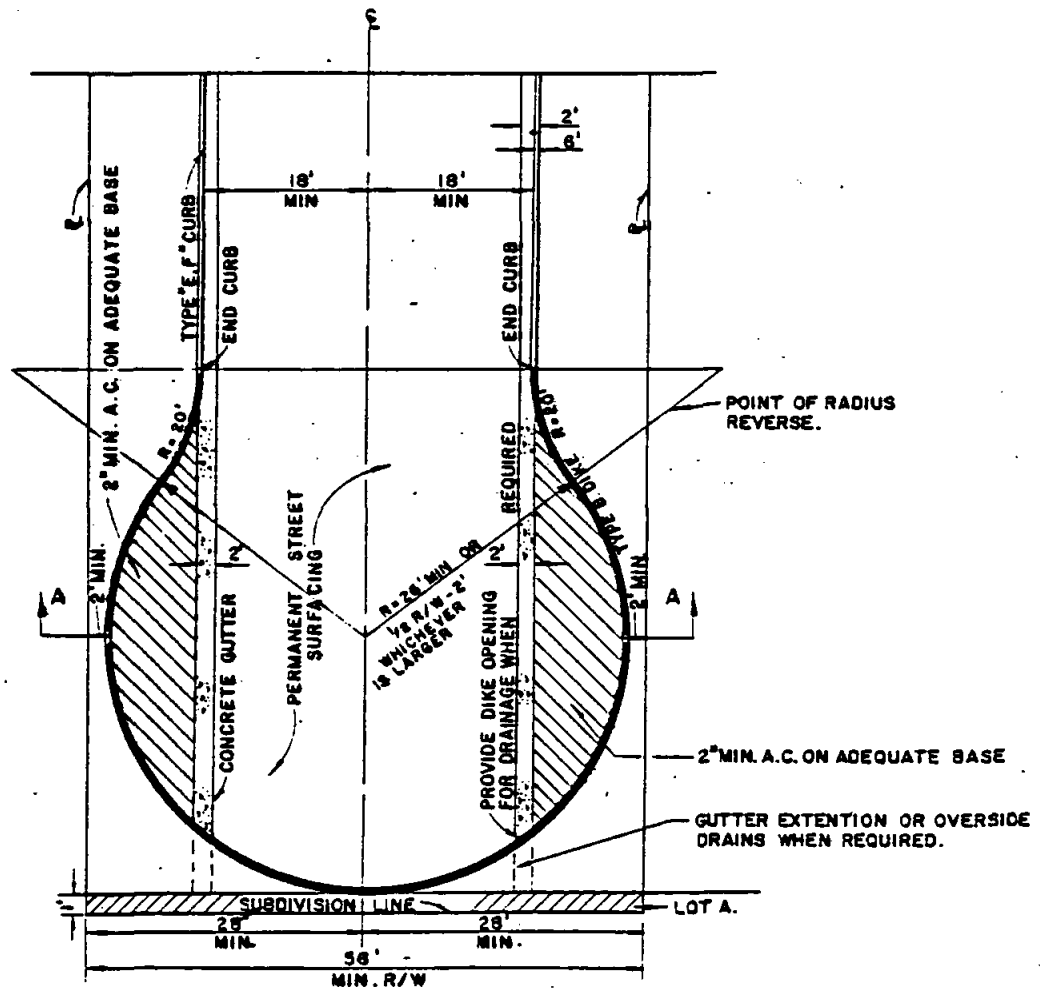
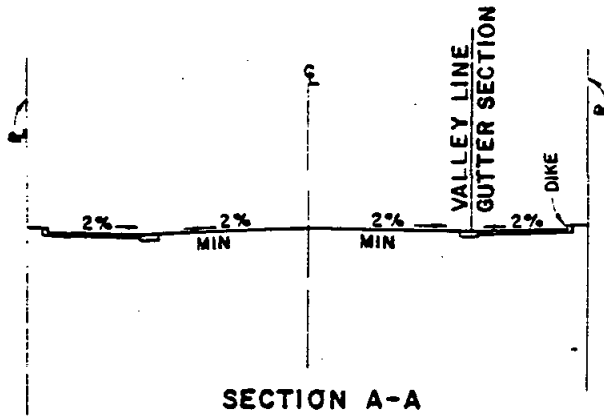
1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURBS, SIDEWALK & ROAD REQUIREMENTS.
2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22.
3. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE LOTS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

DRAWN BY	CHECKED BY
RECOMMENDED BY	<i>[Signature]</i>
APPROVED BY, COUNTY ENGINEER	
<i>[Signature]</i> S.D.C.E. 10358	
DATE	2/12/76

SAN DIEGO COUNTY DESIGN STANDARD

HILLSIDE RESIDENTIAL STREET
ALTERNATE No. 3

REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 313-1			
NUMBER		DS-4	



NOTE:

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

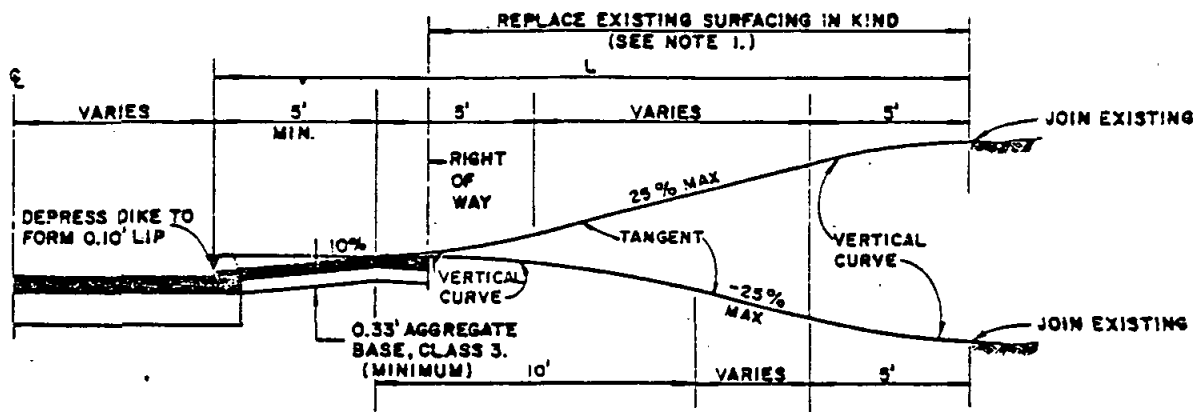
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DATE	

SAN DIEGO COUNTY DESIGN STANDARD

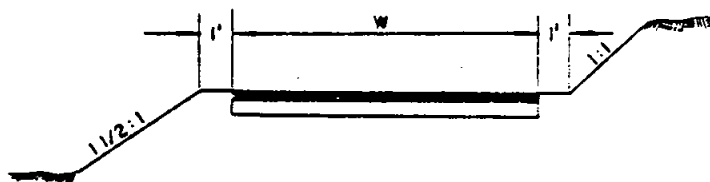
TEMPORARY TURN-AROUND AT
DEAD-END STREET

REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 314-1			
NUMBER		DS - 5	

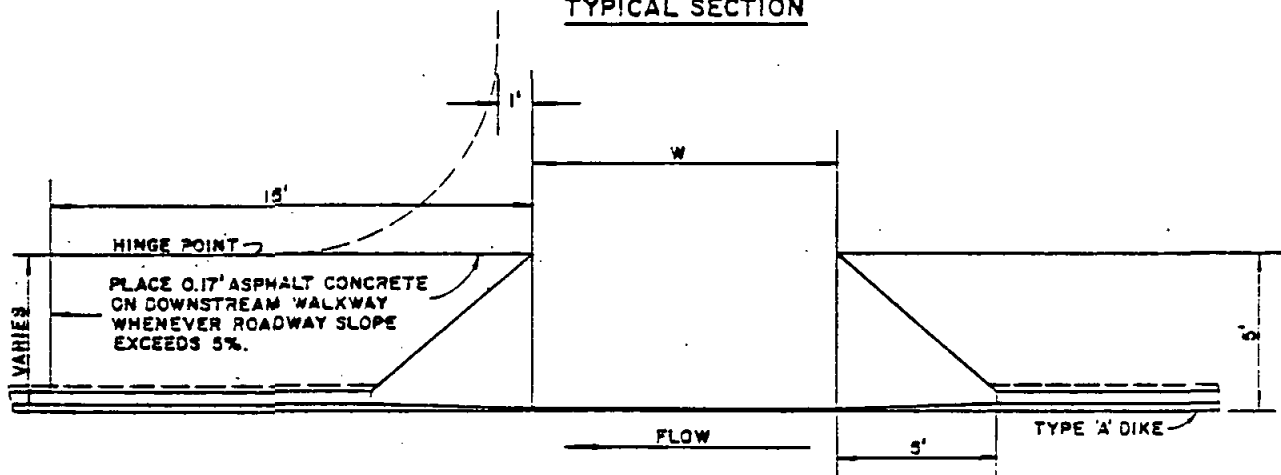
DIMENSIONS					CURVE 1.								CURVE 2							
R _W	A	B	C	D	Δ	CURB			PROP.			Δ	CURB			PROP.				
						R	T	L	R	T	L		R	T	L	R	T	L		
52'	26'	16'	10'	50.95	46°42' 30"	32'	26.09	13.82	22'	17.93	9.50	273°25' 00"	38'	18.34	48'	229.06				
56'	28'	18'	10'	50.99	42°50' 00"	37'	27.66	14.52	27'	20.18	10.59	265°40' 00"	38'	17.62	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'	15.63	48'	200.38				
72'	36'	26'	10'	81.39	32°31' 36"	100'	57.35	29.49	90'	51.62	26.54	245°43' 12"	50'	21.43	60'	257.32				



PROFILE



TYPICAL SECTION



PLAN

NOTES:

1. DRIVEWAYS WITH GRADES GREATER THAN 15% SHALL BE SURFACED WITH ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE.
2. MAXIMUM GRADE BREAK 14%.
3. SEE STANDARD DRAWING 3-14 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>WLB</i>	
APPROVED BY COUNTY ENGINEER	
<i>WLB</i> R.C.E. 10358	
DATE <i>9/22/71</i>	

SAN DIEGO COUNTY DESIGN STANDARD

ASPHALT CONCRETE DRIVEWAY

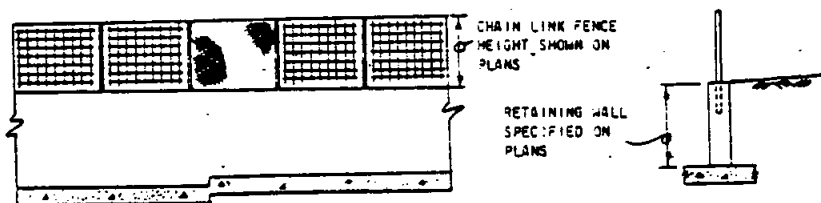
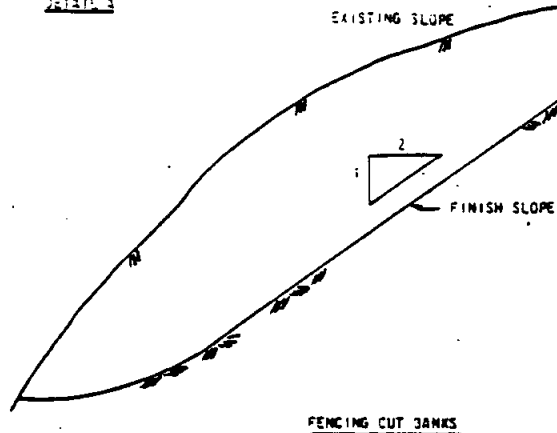
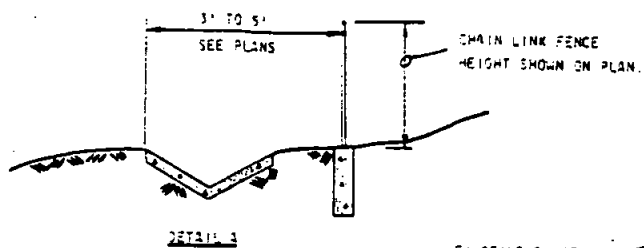
TITLE <i>Rev. 10/1/71</i>			
BY <i>WLB</i> R.C.E. 10358			
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 237			
NUMBER		DS-7	



NOTES:

1. ELEV. 4 IS TO BE DETERMINED FOR THE MOST REMOTE CORNER OF THE LOT FROM THE DRAIN POINT. $ELEV. 4 = ELEV. 3 \text{ PLUS } 1/3 \text{ TIMES ONE-HALF THE PERIMETER OF THE LOT.}$
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	T.T. = 3.0% W. Kuchner 2/26/76			
RECOMMENDED BY <u>WEB</u>						
APPROVED BY COUNTY ENGINEER <u>H. J. [Signature]</u> S.C.E. 10358		LOT GRADING	REVISION	BY	APPROVED	DATE
DATE <u>2/26/76</u>			FORMERLY STANDARD DRAWING Z3/T			
			NUMBER		DS - 8	



RETAINING WALL & CHAIN LINK FENCE
FOR WALL HEIGHTS GREATER THAN 3 FT.

NOTES:

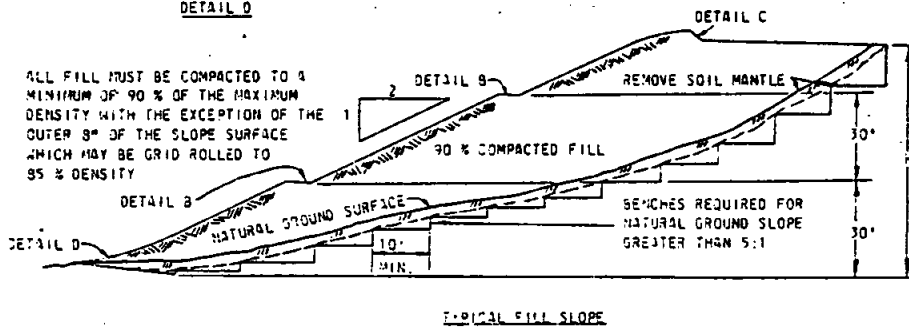
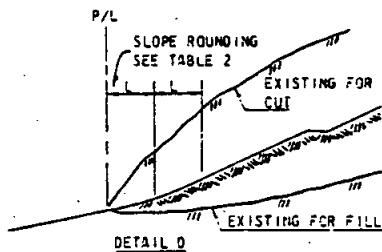
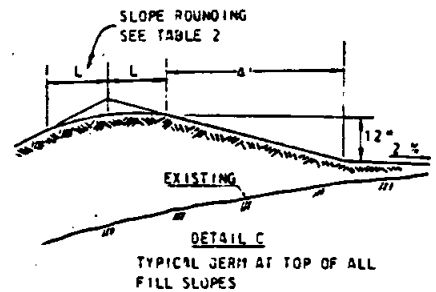
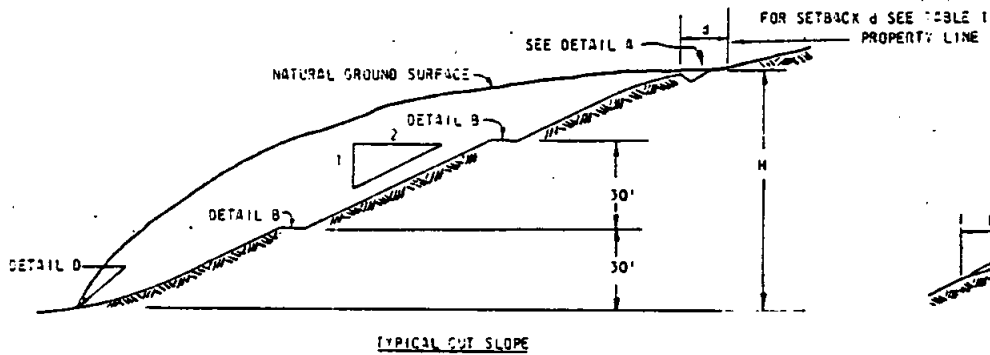
1. CHAIN LINK FENCE OR ALTERNATE ACCEPTABLE TO THE COUNTY ENGINEER SHALL BE INSTALLED ALONG THE TOP OF SLOPES EXCEEDING 15 FEET VERTICAL HEIGHT AND 3 TO 1 SLOPE RATIO, AND ALONG THE TOP OF WALLS EXCEEDING 4' VERTICAL HEIGHT.
2. RETAINING WALLS AND CHAIN LINK FENCE OR ALTERNATE SHALL BE CONSTRUCTED IN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

DRAWN BY	CHECKED BY
RECOMMENDED BY <i>LJB</i>	
APPROVED BY/COUNTY ENGINEER	
<i>[Signature]</i> R.C.E. 10358	
DATE <i>2/24/76</i>	

SAN DIEGO COUNTY DESIGN STANDARD

FENCING CUT BANKS

TITLE	30	<i>[Signature]</i>	<i>[Signature]</i>
REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING 232T			
NUMBER		DS - 9	



ALL FILL MUST BE COMPACTED TO A
MINIMUM OF 90% OF THE MAXIMUM
DENSITY WITH THE EXCEPTION OF THE 1'
OUTER 3" OF THE SLOPE SURFACE
WHICH MAY BE GRID ROLLED TO
95% DENSITY

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'

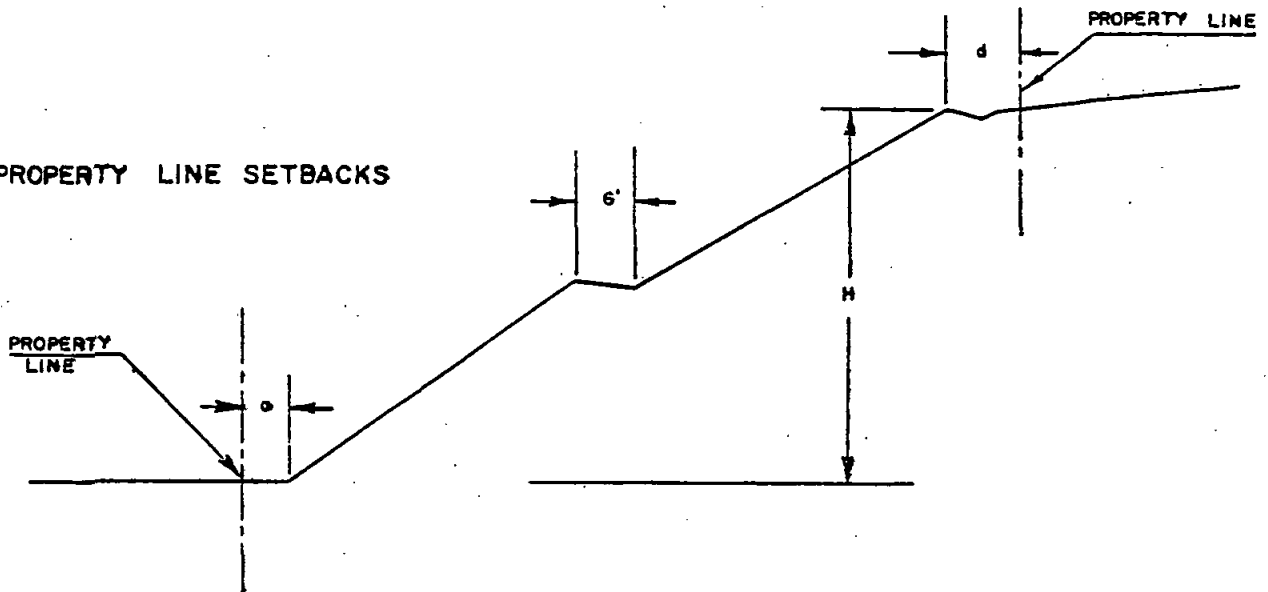
DRAWN BY	CHECKED BY
RECOMMENDED BY <i>DEB</i>	
APPROVED BY COUNTY ENGINEER	
<i>H. K. K. K.</i> R.C.E. 10358	
DATE <i>2/24/76</i>	

SAN DIEGO COUNTY DESIGN STANDARD

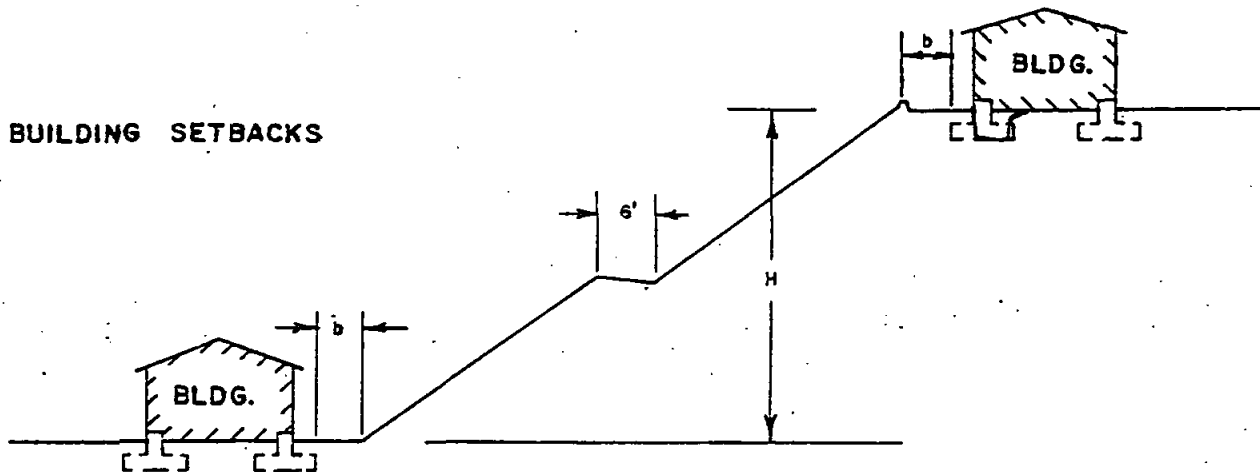
GRADING OF SLOPES

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'

- 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 <u>WJB</u>	
APPROVED BY COUNTY ENGINEER <u>[Signature]</u>	
DATE <u>7/17/76</u>	

SAN DIEGO COUNTY DESIGN STANDARD

REQUIRED SETBACKS

TITLE	SLK	RC	<u>A. Schubert</u>	<u>7/17/76</u>
REVISION	BY	APPROVED	DATE	
FORMERLY STANDARD DRAWING 209				
NUMBER		DS - 11		

PROPOSED CONSTRUCTION

LINES

ULTIMATE CENTERLINE (CL) ⁸

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

8- INDICATES CENTER LINE ESTABLISHED
IN ACCORDANCE WITH S.D. COUNTY CODE,
DIV. 3 OF TITLE 7,
RS XXXX-X 35

1' 3" 35

2 PER INCH

1 PER INCH

1 PER INCH

8-10 PER INCH

2% VC -1.8%

EXIST. PAVEMENT NAT. GROUND

5 PER INCH C/F 10 PER INCH

5/32"

5/32"

5/32"

5/32"

5/32"

5/32"

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5/32"

5/32"

DRIVEWAY APRONS P C C

CONCRETE CROSS GUTTER

SIDEWALK

RETAINING WALL

FENCE (LABEL TYPE)

DITCH, LINED

DITCH, UNLINED

BRIDGE

UTILITIES

GAS LINE

WATER LINE

ELECTRIC CABLE

TELEPHONE CABLE

SEWER LINE

UTILITY MANHOLE

UNDERGROUND ONLY

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

CONSTRUCTION

PAVEMENT EDGE & SHOULDERS

A C DIKE (LABEL TYPE)

CURB & GUTTER (LABEL TYPE)

CULVERT

DOWNDRAIN, A C SPILLWAY

DROP INLET

BOX CULVERT

HEADWALL, STANDARD

HEADWALL "L" TYPE

HEADWALL & WINGWALL

GUARD RAIL

DRIVEWAY APRONS A C

UTILITY DUCT (LABEL)

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 2

LABEL 3

LABEL 4

COUNTY 5

CITY 6

CITY 7

CITY 8

CITY 9

CITY 10

CITY 11

CITY 12

CITY 13

CITY 14

CITY 15

SECTION
CORNER

2 1

11 12

SECTION
CENTER

SEC

10

1/4 SECTION
N-S

5

8

1/4 SECTION
E-W

6 5

6 5

BASIS OF BEARING
CALIFORNIA COORDINATE SYSTEM ZONE 11

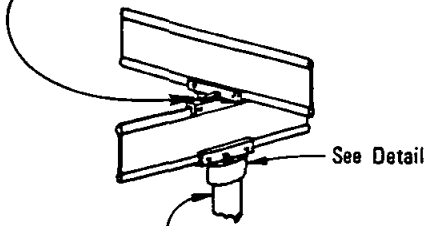
DRAWN BY	CHECKED BY
RECOMMENDED BY	WCB
APPROVED BY COUNTY ENGINEER	
	P.C.E. 10358
DATE	2/7/76

SAN DIEGO COUNTY DESIGN STANDARD

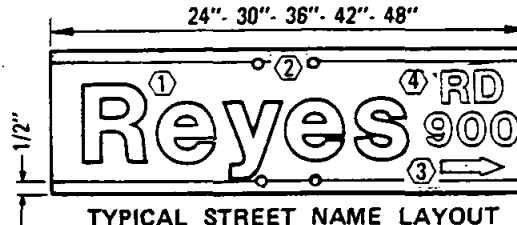
CONSTRUCTION PLAN SYMBOLS

REVISION	BY	APPROVED	DATE
FORMERLY STANDARD DRAWING			
NUMBER		DS-12	

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



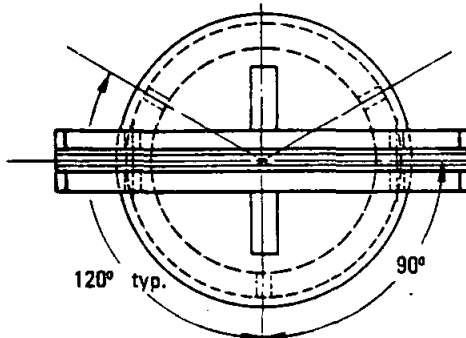
10"x 2 7/8" O.D. aluminum alloy 6063-T6, clear anodized pole.



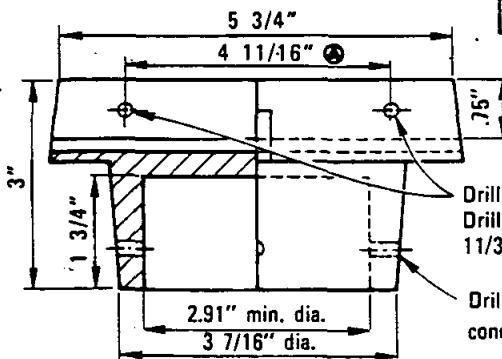
TYPICAL STREET NAME LAYOUT

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.

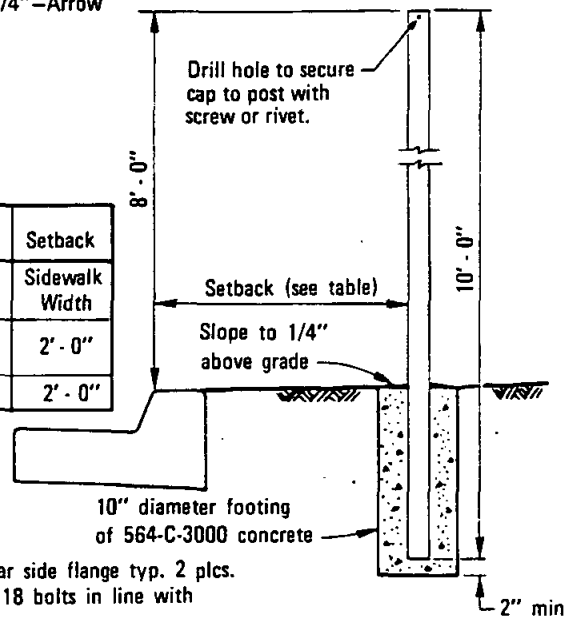


POST CAP DETAIL



HALF-SECTION DETAIL

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

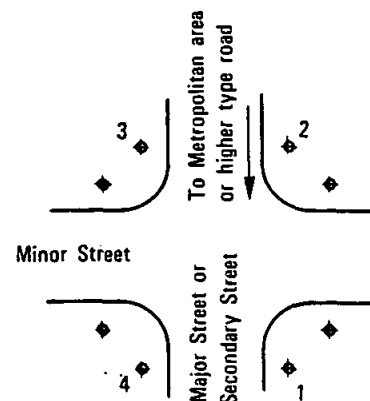


Drill 11/32" hole thru near side flange typ. 2 plcs. Drill and tap for 5/16"- 18 bolts in line with 11/32" diameter holes.

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

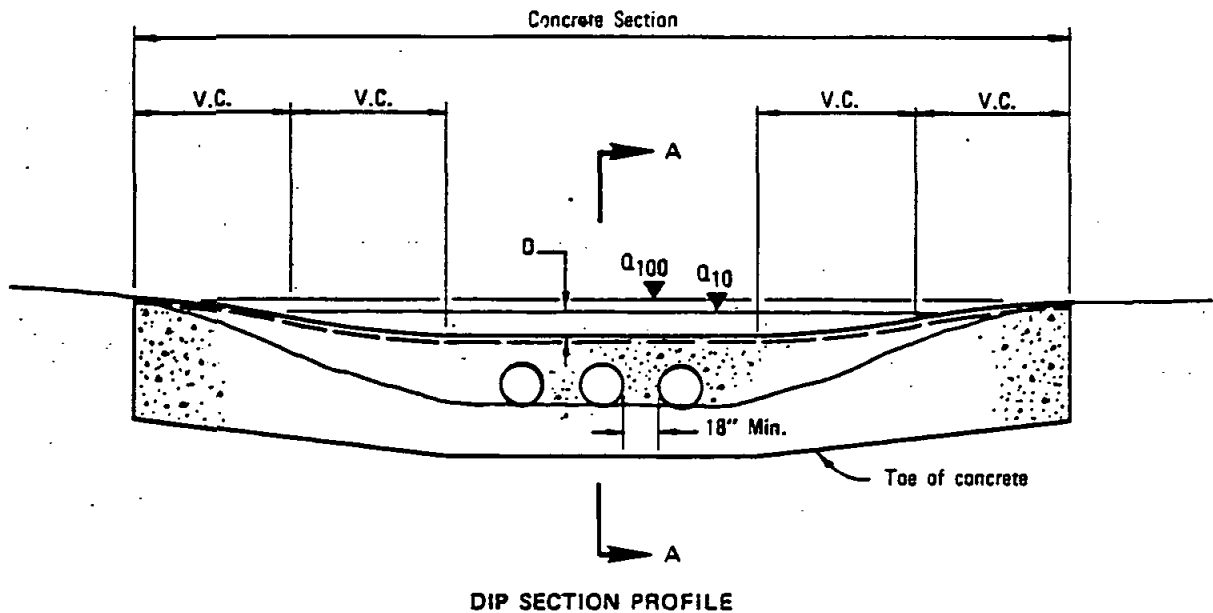
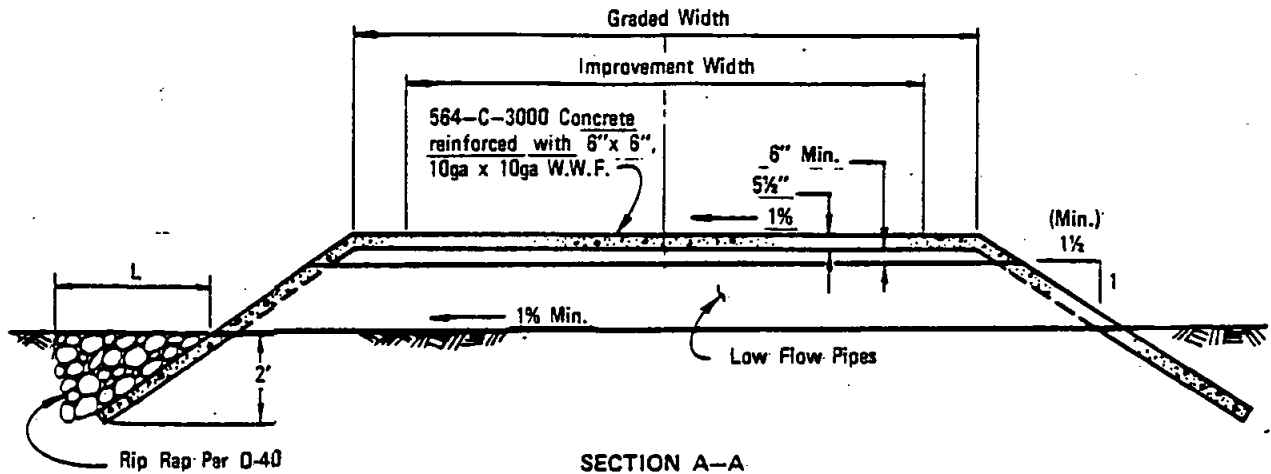
NOTES

- 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>JK</i>	CHECKED BY <i>JK</i>	SAN DIEGO COUNTY DESIGN STANDARD	CAP DIM.	C.S.	D.S.	12/2/76
RECOMMENDED BY <i>RFW</i>	APPROVED BY COUNTY ENGINEER		REVISION	BY	APPROVED	DATE
<i>R. L. Binkley</i> R.C.E. 10358 DATE <i>10/6/76</i>		STANDARD STREET SIGN	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 RG CHECKED BY RG

RECOMMENDED BY B. B. B.

APPROVED BY COUNTY ENGINEER

B. F. Walsh C.E. 10358

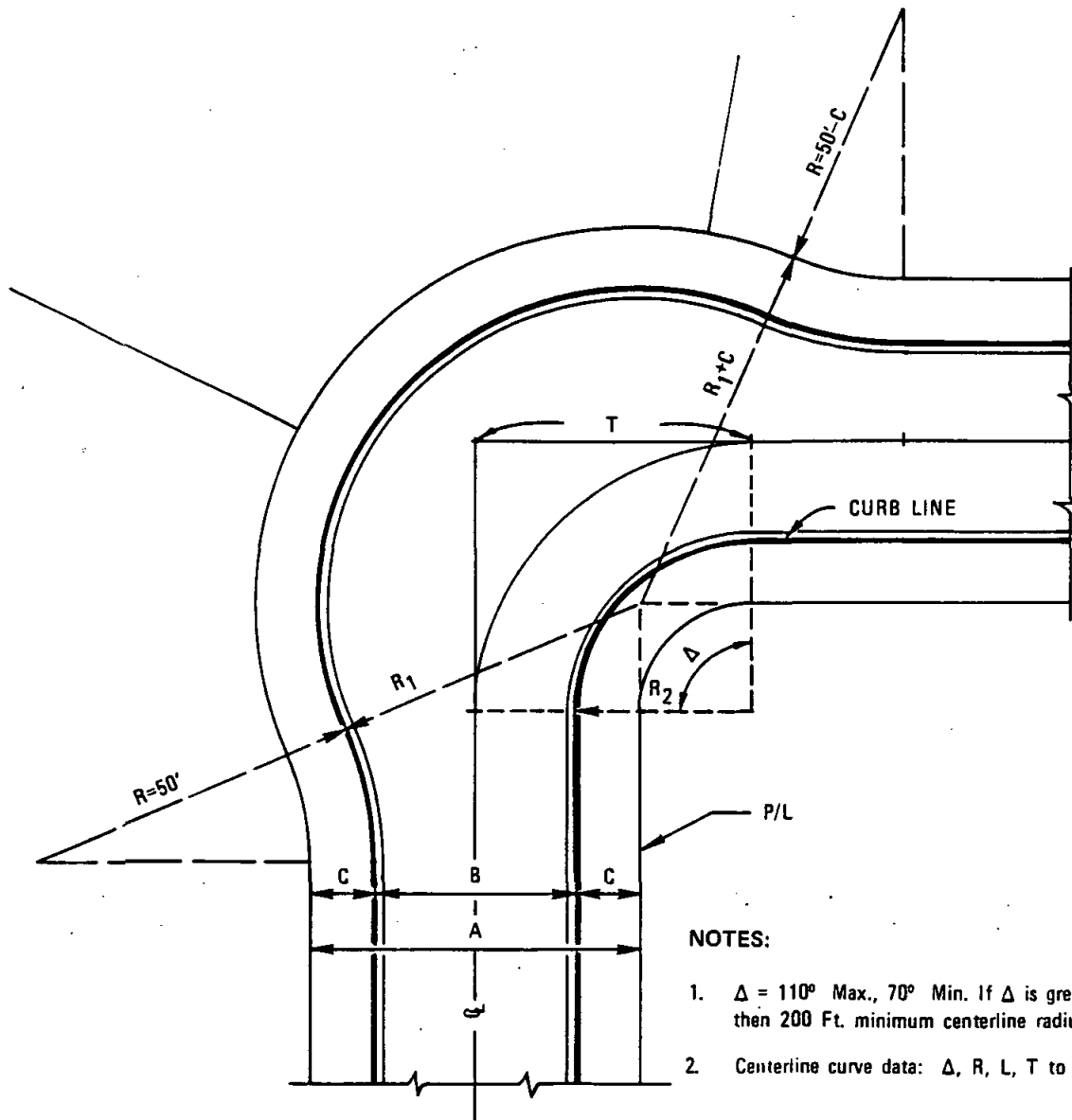
DATE 4-29-82

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 RA CHECKED BY WJ

RECOMMENDED BY J. Salas

APPROVED BY COUNTY ENGINEER
RF Ubbelohde
R.C.E. 10358

DATE 11-6-84

SAN DIEGO COUNTY DESIGN STANDARD

STREET KNUCKLE

R+C WJ WJ WJ WJ

REVISION BY APPROVED DATE

NUMBER DS-15