

CITY OF SAN DIEGO



STANDARD DRAWINGS

INCLUDES ALL SAN DIEGO REGIONAL STANDARD DRAWINGS DATED APRIL 2006

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INTRODUCTION

This volume includes all of the San Diego Regional Standard Drawings, as developed by the San Diego Regional Standards Committee, plus those additional standard drawings which are unique to public works construction in the City of San Diego. The additional drawings can easily be distinguished by their drawing numbers which contain the letters "SD" and are numbered beginning with 100, for example, SDW-100. These "SD" drawings take precedence over the San Diego Area Regional Standard Drawings. Also included in Appendix "A", for reference only, is a set of Traffic Control Plans for the city of San Diego and San Diego County; Appendix "B", for reference only, is a set of Fire and Hazard Prevention Services Policy for the City for San Diego; and Appendix "C", for reference only, is a set of Design Standard Drawings for the City of San Diego.

The City of San Diego Drawings take precedence over the drawings contained the San Diego Area Regional Standard Drawings. This order of precedence is to be used in all applicable cases unless modified by a higher precedence document.

COMMENTS

The City of San Diego is committed to the quality of this publication and desires to correct any errors, omissions or ambiguity. If you have any comments i.e., corrections or additions you would like to submit for consideration to be included in the next publication, you are encouraged to submit them to:

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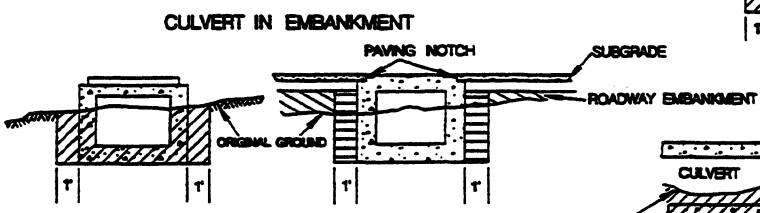
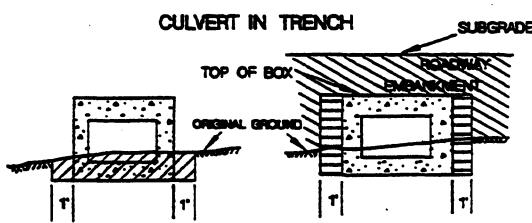
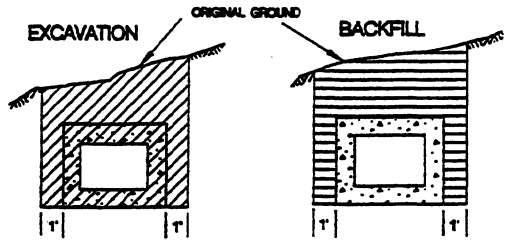
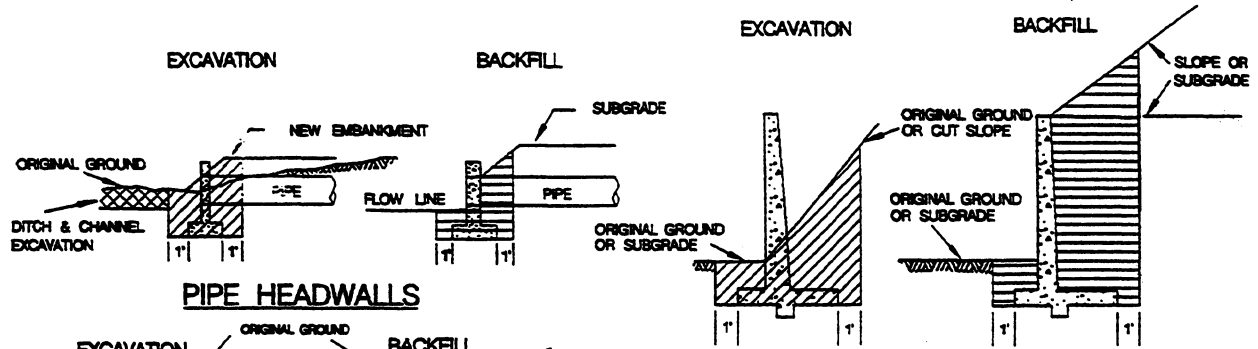
APPENDIX “B” – CITY OF SAN DIEGO FIRE HAZARD PREVENTION SERVICES POLICY – DESIGN STANDARDS

FHSP	Fire and Hazard Prevention Services Policy (Fire Access Roadways – Uniform Fire Code)
FHSP-101	Fire and Hazard Prevention Services Policy (Fire Access Roadways) (Sheet 1 thru Sheet 6)
FHSP-102	Fire and Hazard Prevention Services Policy (Access Roadways – Modified Roadway Surface – Uniform Fire Code) (Sheet 1 thru Sheet 4)
FHSP-103	Fire and Hazard Prevention Services Policy (Fire and Hazard Prevention Services Access Standards (Sheet 1 thru Sheet 2)

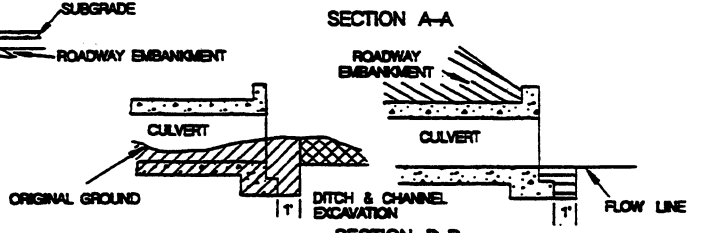
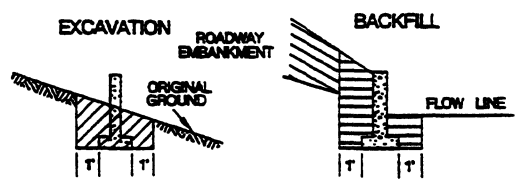
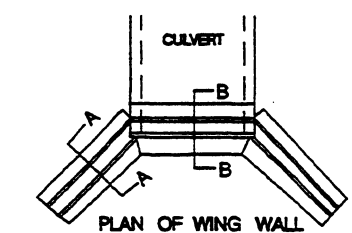
APPENDIX “C” – CITY OF SAN DIEGO DESIGN STANDARDS

SDDS	Design Standards
SDDS-102	Standard Street Section Residential Streets
SDDS-103	Standard Street Section Industrial, Commercial, Collector Streets
SDDS-104	Standard Street Section Major & Primary Arterial Streets
SDDS-105	Typical Street Section In Superelevation

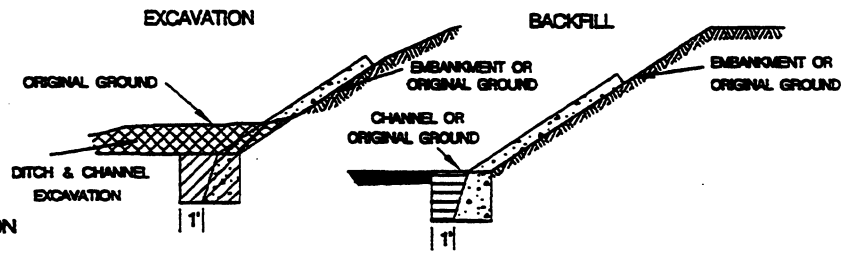
CONCRETE STRUCTURES



BOX CULVERTS



WING WALLS



TOP LIMIT OF STRUCTURE EXCAVATION AND BACKFILL IS ORIGINAL GROUND IF CHANNEL IS NOT EXCAVATED

LEGEND

- STRUCTURE EXCAVATION
- STRUCTURE BACKFILL
- DITCH & CHANNEL EXCAVATION
- ROADWAY EMBANKMENT
- ROADWAY EXCAVATION

NOTE: SUBGRADE SHALL BE LOWEST SUBGRADE AS DEFINED IN THE STANDARD SPECIFICATIONS

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	6-3-83

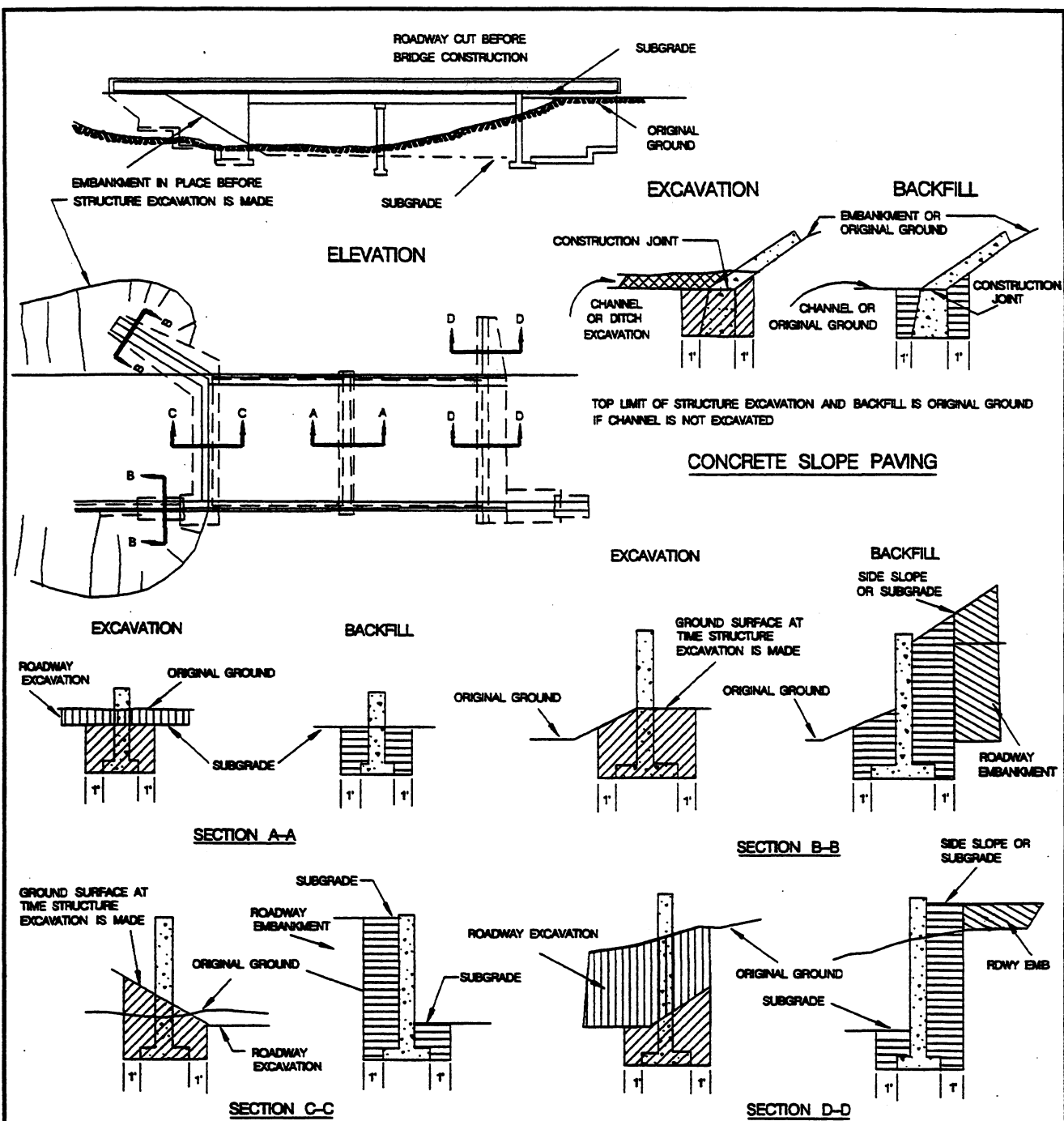
CITY OF SAN DIEGO - STANDARD DRAWING

STRUCTURE EXCAVATION & BACKFILL

CITY OF SAN DIEGO STANDARDS COMMITTEE

John J. Kelly 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDC-103**



BRIDGE ABUTMENTS & ADJOINING WING WALLS

LEGEND

- STRUCTURE EXCAVATION
- STRUCTURE BACKFILL
- DITCH & CHANNEL EXCAVATION
- ROADWAY EXCAVATION
- ROADWAY EMBANKMENT

NOTE: SUBGRADE SHALL BE LOWEST SUBGRADE AS DEFINED IN THE STANDARD SPECIFICATIONS

SEE ALSO STD. DWG. SDC-403

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	6-3-83

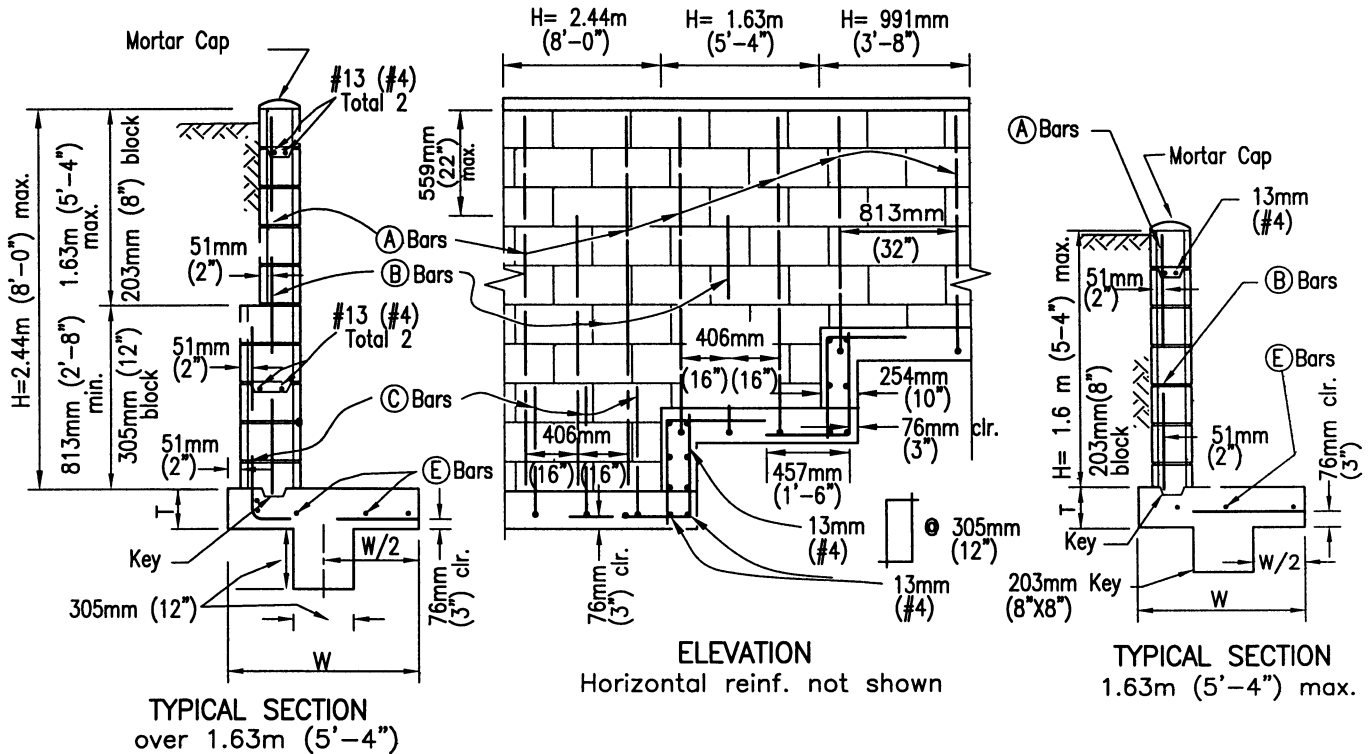
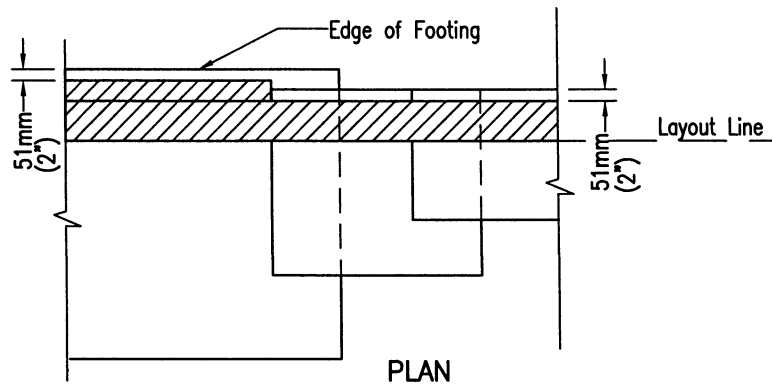
CITY OF SAN DIEGO - STANDARD DRAWING

STRUCTURE EXCAVATION & BACKFILL

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

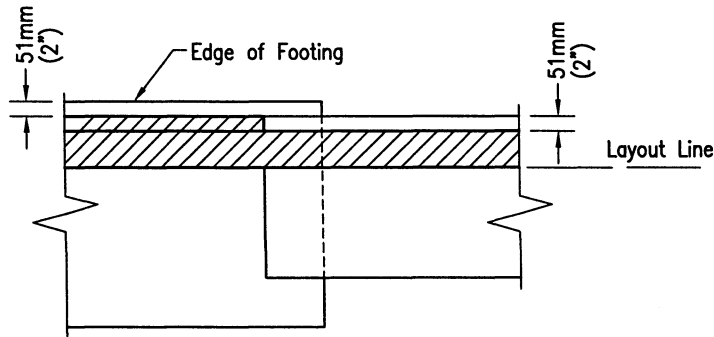
DRAWING NUMBER **SDC-104**



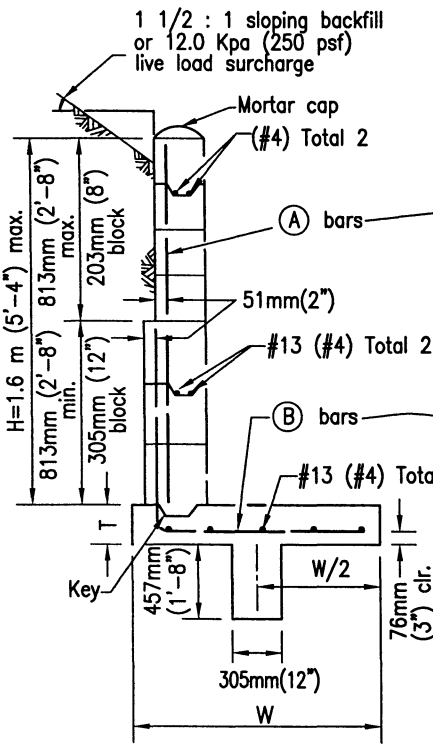
DIMENSIONS AND REINFORCING STEEL			
H (max.)	1.12m (3'-8")	1.63m (5'-4")	2.44m (8'-0")
T (min.)	203mm (0'-8")	254mm (0'-10")	305mm (1'-0")
W (min.)	762mm (2'-4")	1.12m (3'-6")	1.63m (5'-4")
(A) Bars	#13@813mm (#4@32")	#13@813mm (#4@32")	#13@813mm (#4@32")
(B) Bars	—	#13@813mm (#4@32")	#13@813mm (#4@32")
(C) Bars	—	—	406mm (#6@16")
(E) Bars	#13 (#4) Total 4	#13 (#4) Total 5	#13 (#4) Total 6
max soil press.	23.9 Kpa (500psf)	28.7 Kpa (600psf)	38.3 Kpa (800psf)

NOTES: 1. See Standard Drawings C-7 and C-8 for additional notes and details.
 2. Fill all block cells with grout.

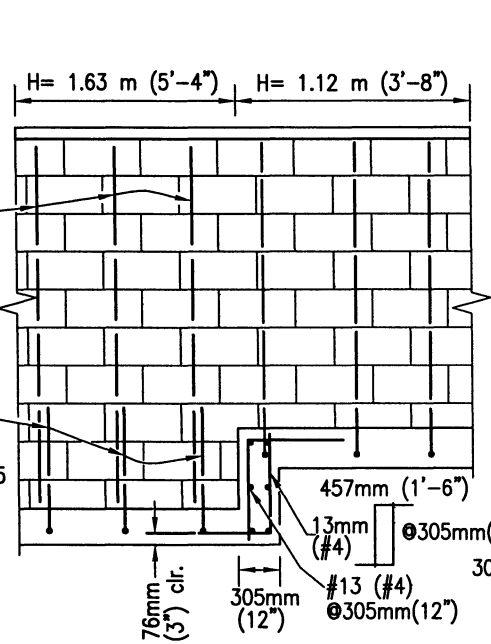
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING MASONRY RETAINING WALL TYPE 1 (LEVEL BACKFILL)	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>T. Stanton</i> 310112003 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		DRAWING NUMBER C-1



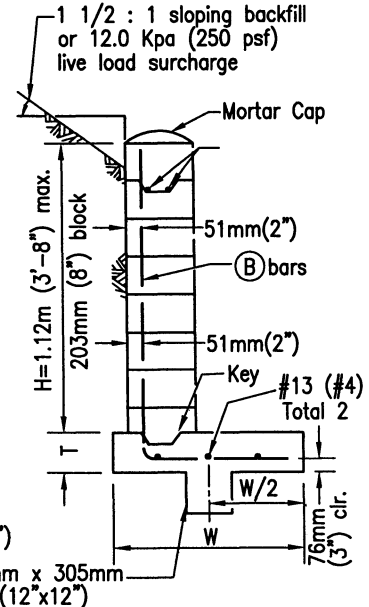
PLAN



TYPICAL SECTION
over 1.12m (3'-8")



ELEVATION
Horizontal reinf. not shown



TYPICAL SECTION
1.12 m (3'-8") max.

DIMENSIONS AND REINFORCING STEEL		
H (max.)	1.63m (5'-4")	1.12m (3'-8")
T (min.)	254mm (0'-10")	254mm (0'-10")
W (min.)	1.52m (5'-0")	1.14m (3'-9")
(A) Bars	#13@406mm (#4@16")	—
(B) Bars	#19@406mm (#6@16")	#13@406mm (#4@16")
max. soil press.	33.5 Kpa (700psf)	26.3 Kpa (550psf)

NOTES:

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

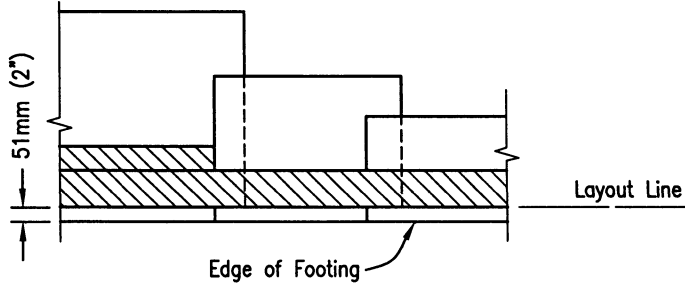
SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 2
(LIVE LOAD SURCHARGE OR SLOPING BACKFILL)

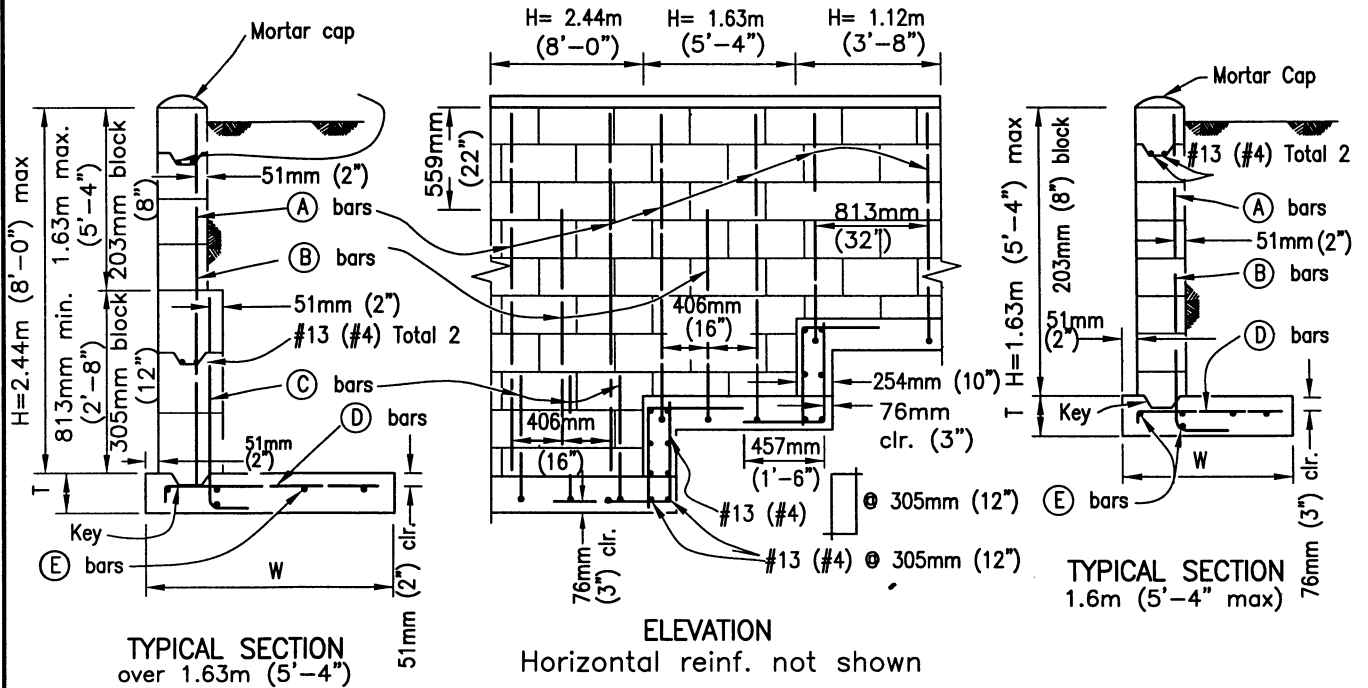
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **C-2**



PLAN



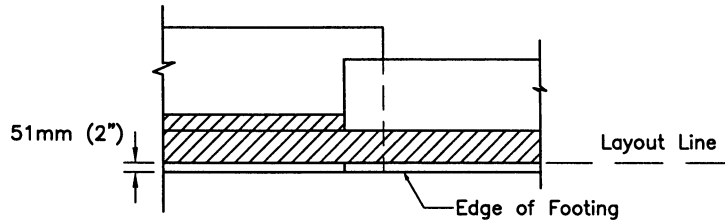
ELEVATION

Horizontal reinf. not shown

DIMENSIONS AND REINFORCING STEEL			
H (max)	1.12 m (3'-8")	1.63 m (5'-4")	2.44m (8'-0")
T (min)	203 mm (0'-8")	254 mm (0'-10")	305mm (1'-0")
W (min)	762 mm (2'-4")	965mm (3'-2")	1.45m (4'-9")
(A) Bars	#13@813mm (#4@32")	#13@813mm (#4@32")	13mm@813mm (#4@32")
(B) Bars	—	#13@813mm (#4@32")	13mm@813mm (#4@32")
(C) Bars	—	—	406mm (#6@16")
(D) Bars	#13@813mm (#4@32")	#13@406mm (#4@16")	406mm (#6@16")
(E) Bars	#13 (#4) total 4	#13 (#4) total 5	13mm (#4) total 6
max soil press. (psf)	7.6 MPa (1100psi)	11.0 MPa (1600psi)	15.2 MPa (2200psi)

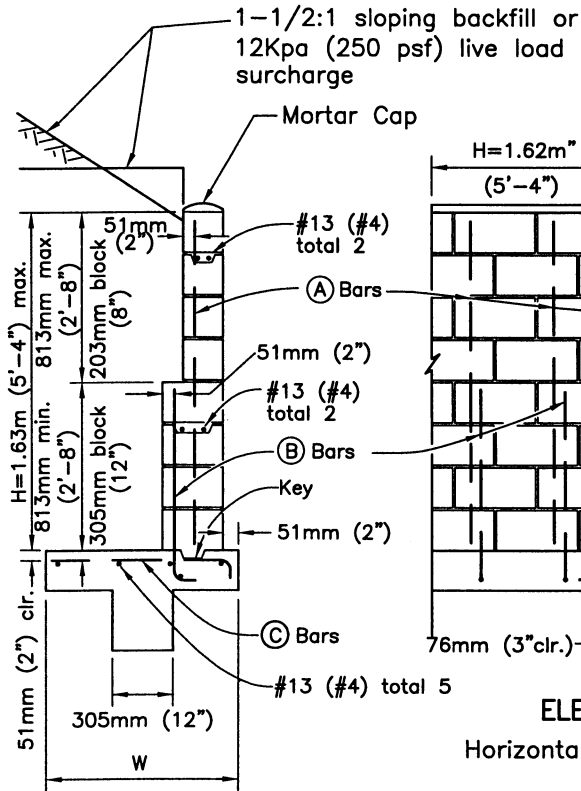
NOTES: 1. See Standard Drawings C-7 and C-8 for additional notes and details.
 2. Fill all block cells with grout.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	MASONRY RETAINING WALL TYPE 3 (LEVEL BACKFILL)	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 3/10/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
						DRAWING NUMBER C-3

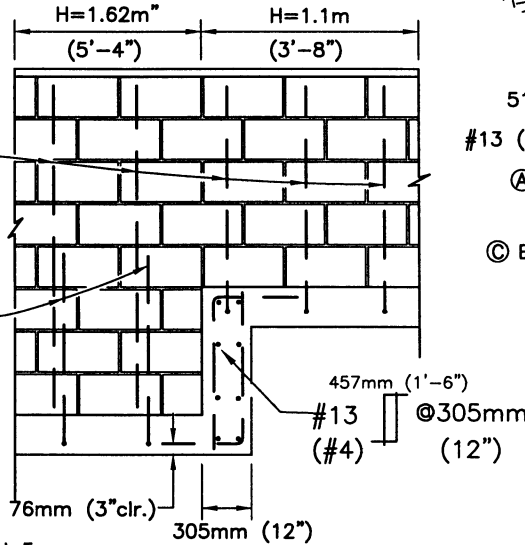


PLAN

1-1/2:1 sloping backfill or
12Kpa (250 psf) live load
surcharge

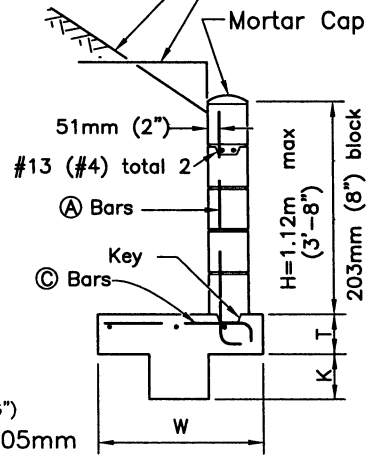


TYPICAL SECTION
over 1.12m (3'-8")



ELEVATION

Horizontal reinf. not shown



TYPICAL SECTION
1.12m (3'-8") max

DIMENSIONS AND REINFORCING STEEL				
H (max)	1.63m (5'-4")		1.12m (3'-8")	
T (min)	254mm (0'-10")		203mm (0'-8")	
W (min)	1.22m (4'-0")		914mm (3'-0")	
(A) Bars	#13(#4)@406mm(16")		#13 (#4)@406mm (16")	
(B) Bars	#19(#6)@406mm(16")		—	
Surcharge	sloping	live load	sloping	live load
(C) Bars	#19(#6)@203mm(8")	#19(#6)@406mm(16")	#19(#6)@406mm(16")	#19(#6)@403mm(16")
K (min)	305mm (1'-0")	203mm (0'-8")	305mm (1'-0")	203mm (0'-8")
Toe Press.	129.3 Kpa (2700 psf)	91 Kpa (1900 psf)	81.4 Kpa (1700 psf)	68.5 Kpa (1430 psf)

NOTES:

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

Revision	By	Approved	Date
ORIGINAL		Parkinson	02/95
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

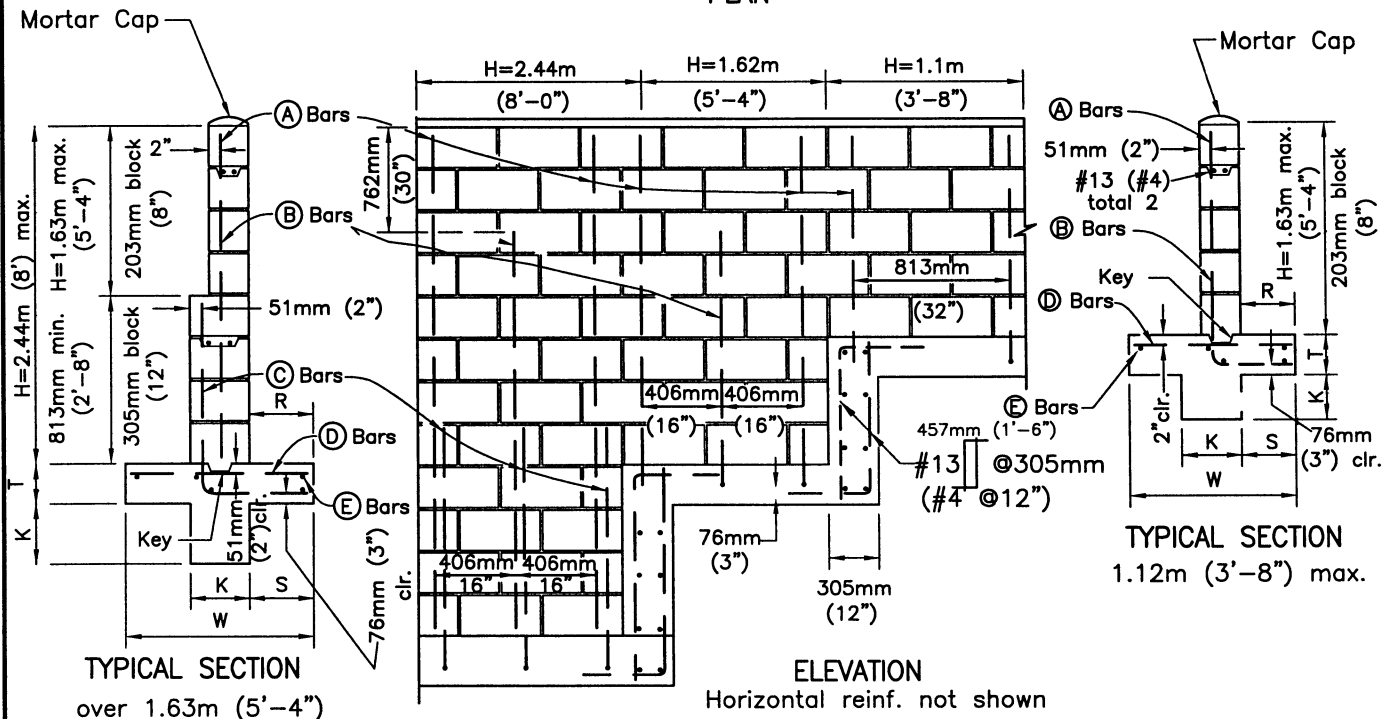
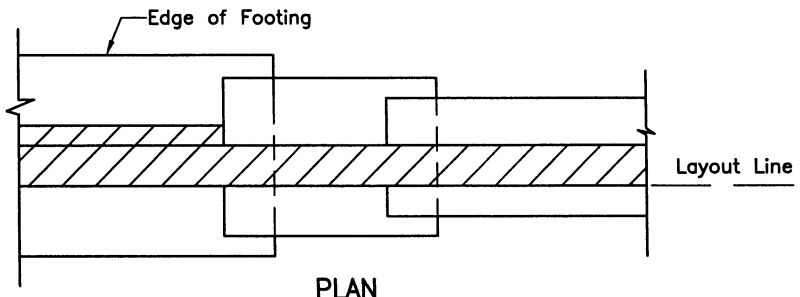
SAN DIEGO REGIONAL STANDARD DRAWING

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

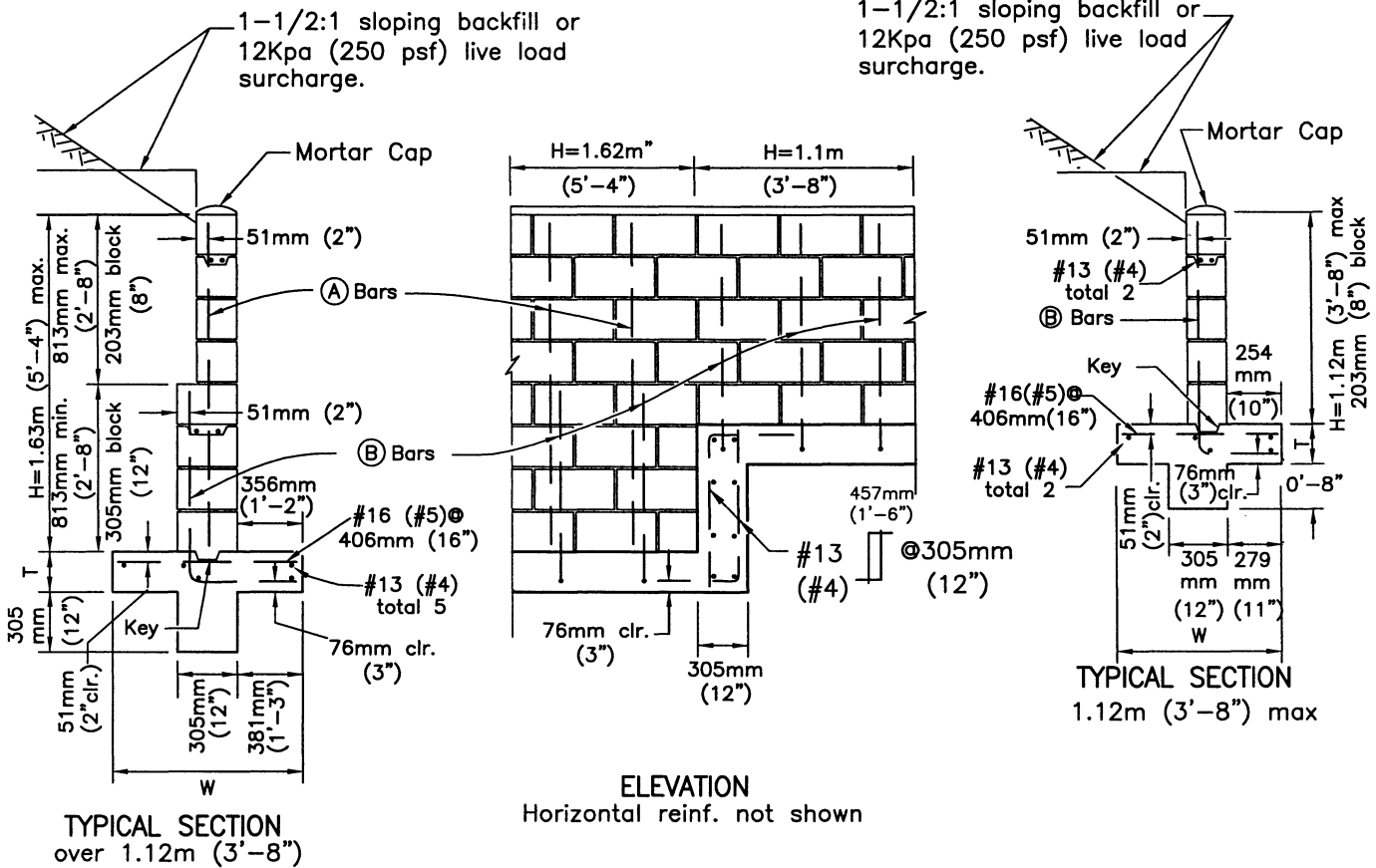
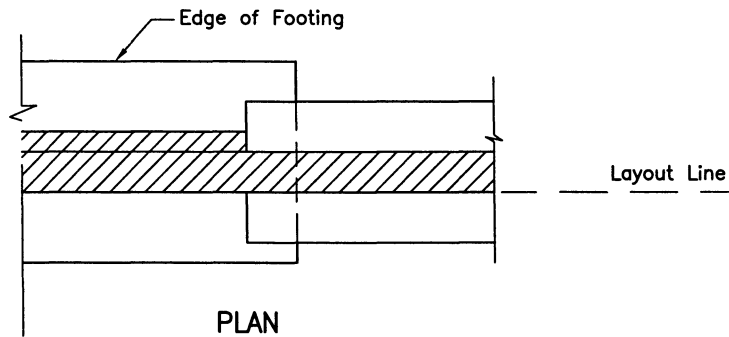
DRAWING
NUMBER **C-4**



DIMENSIONS AND REINFORCING STEEL			
H (max)	1.12m (3'-8")	1.63m (5'-4")	2.44m (8'-0")
T (min)	203mm (0'-8")	254mm (0'-10")	305mm (1'-0")
W (min)	635mm (2'-1")	940mm (3'-1")	1.25m (4'-3")
R	229mm (0'-9")	356mm (1'-2")	432mm (1'-5")
S	216mm (0'-8 1/2")	318mm (1'-1 1/2")	495mm (1'-7 1/2")
K	203mm (0'-8")	203mm (0'-8")	305mm (1'-0")
(A) Bars	#13(#4)@813mm(32")	#13(#4)@813mm(32")	#13(#4)@813mm(32")
(B) Bars	—	#13(#4)@813mm(32")	#13(#4)@813mm(32")
(C) Bars	—	—	#22(#7)@406mm(16")
(D) Bars	#13(#4)@813mm(32")	#13(#4)@406mm(16")	#13(#4)@406mm(16")
(E) Bars	#13(#4) total 5	#13(#4) total 5	#13(#4) total 6
Max. Toe Press.	37.1 Kpa (774 psf)	49.3 Kpa (1,030 psf)	79.5 Kpa (1,660psf)

- NOTES:
1. See Standard Drawings C-7 and C-8 for additional notes and details.
 2. Fill all block cells with grout.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	MASONRY RETAINING WALL TYPE 5 (LEVEL BACKFILL)	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Parkinson	2/95			<i>T. Stanton</i> 310112003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
				DRAWING NUMBER C-5		



DIMENSIONS AND REINFORCING STEEL		
H (max)	1.63m (5'-4")	1.12m (3'-8")
T (min)	254mm (0'-10")	203mm (0'-8")
W (min)	1.17m (3'-10")	838mm (2'-9")
(A) Bars	#13(#4)@406mm(16")	—
(B) Bars	#19(#6)@406mm(16")	#13(#4)@406mm(16")
Max. Toe Press.	95.8 Kpa (2,000 psf)	67.0 Kpa (1,400 psf)

NOTES:

- See Standard Drawings C-7 and C-8 for additional notes and details.
- Fill all block cells with grout.

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

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

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **C-6**

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=8.3 Mpa (1200 psi) F'_c=20.7 Mpa (3000 psi)
F_s=138 Mpa (20,000 psi) n=10

Reinforced Masonry:

F'_m=41.4 Mpa (600 psi) F_m=1.4 Mpa (200 psi)
F_s=138 Mpa (20,000 psi) n=50
Earth=1922 kg/cu m (120 pcf) and Equivalent Fluid Pressure=1.76 kg/sq m (36 psf) per 305mm (foot) of height.
Walls shown for 1 1/2:1 unlimited sloping surcharge are designed in accordance with Rankline's formula for unlimited sloping surcharge with a φ = 33° 13m(42').

REINFORCEMENT:

Intermediate grade, hard grade, or rail steel deformation shall conform 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 bars.

MASONRY:

All reinforced masonry retaining walls 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 9.75m (32') intervals maximum. Joints shall be designed to resist shear and other lateral forces while permitting longitudinal movement. Vertical expansion joints shall be placed at 29.3m (96') intervals maximum.

CONCRETE:

Footing concrete shall be 332 kg/M³-C-22Mpa (560-C-3250), using Type 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 compacting 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 1.22m (4') or full height for walls up to 1.52m (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 13.8 Mpa (2,000 psi) in 28 days and mortar shall attain 12.4 Mpa (1,800) psi in 28 days. All cells shall be filled with grout. Rod or vibrate consolidation. Bring grout within 10 minutes of pouring to insure grout to a point 51mm (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.

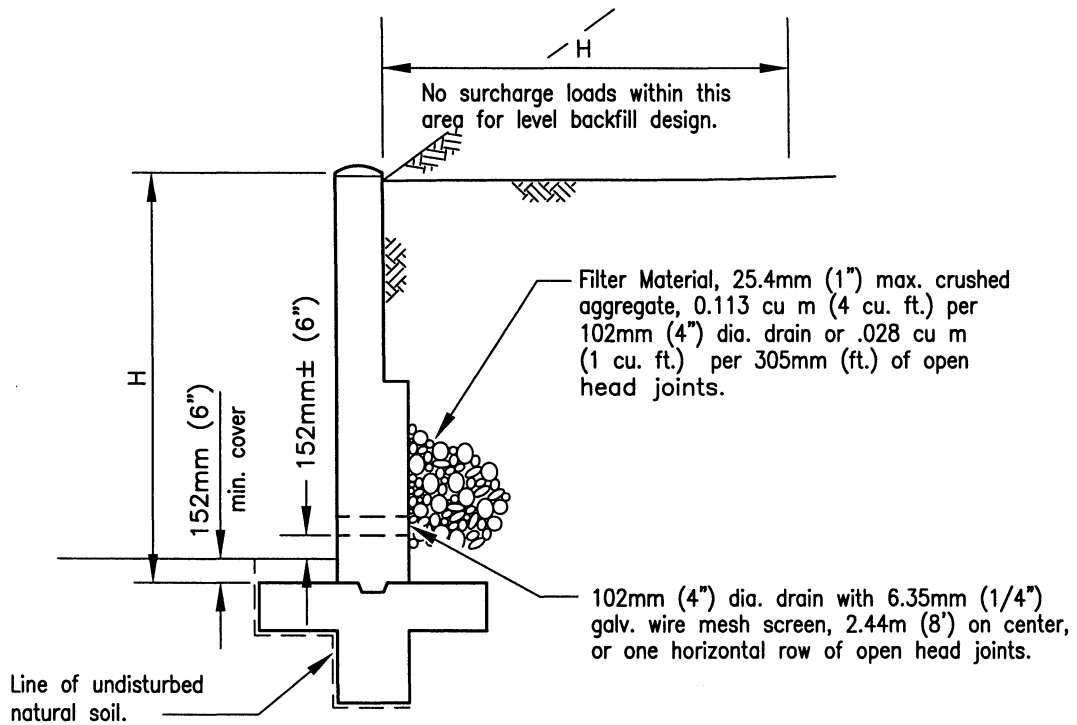
WALL DRAINS:

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

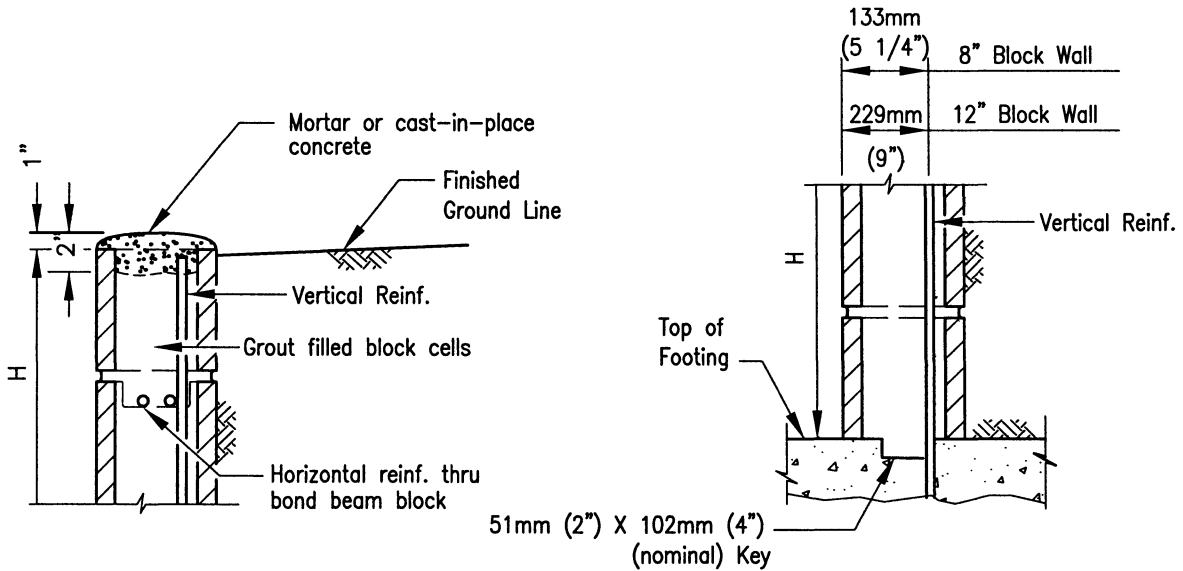
SOIL:

All footings shall extend at least 305mm (12") 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	
ORIGINAL		A. Kercheval	12/75		GENERAL NOTES FOR MASONRY RETAINING WALLS	 3/01/2003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
				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. 102mm (4") diameter drain may be formed by placing a block on it's side.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

DETAILS FOR MASONRY RETAINING WALL

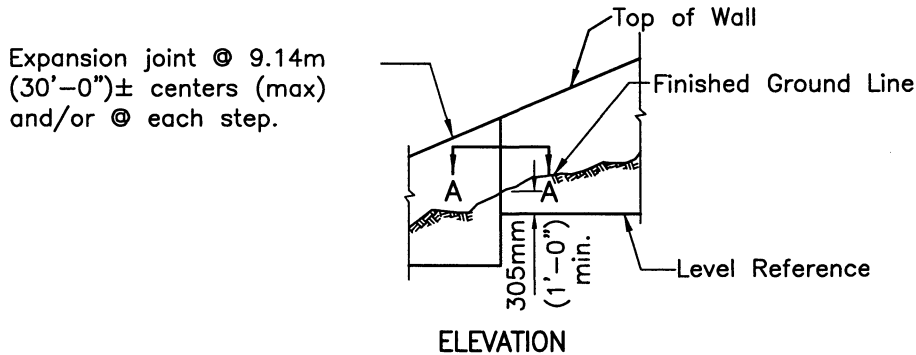
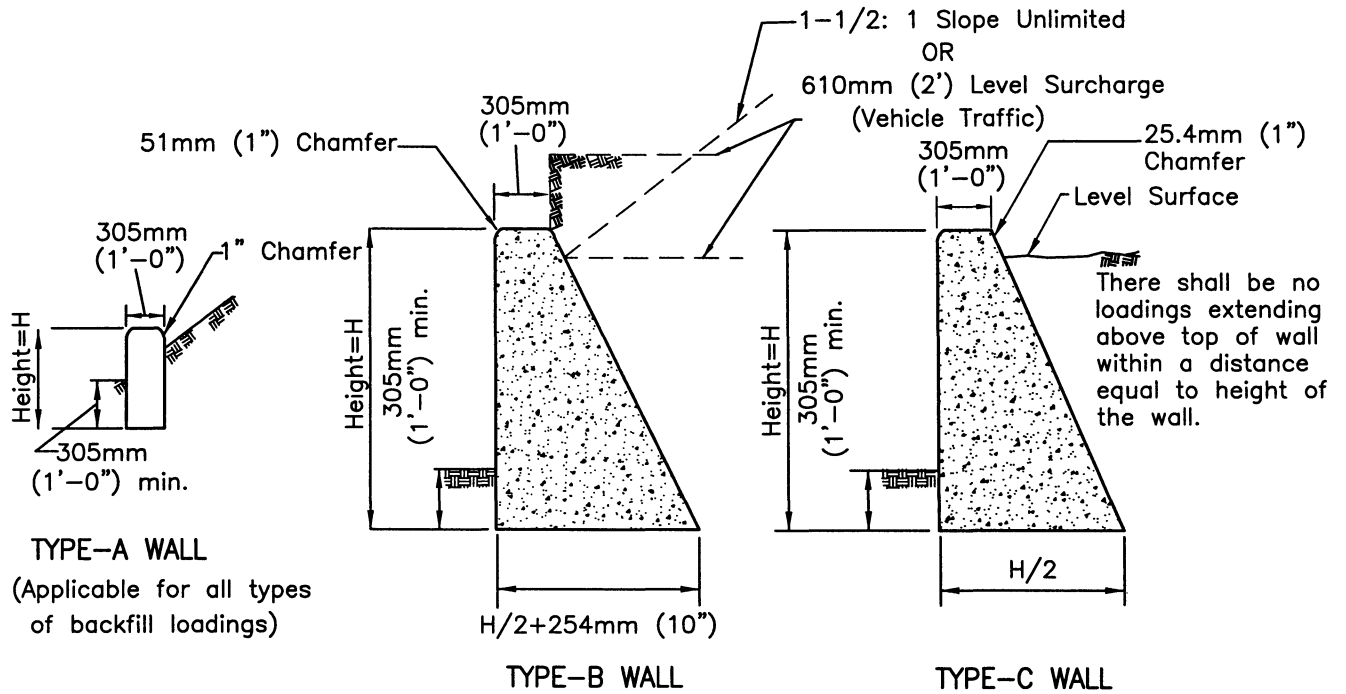
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER

C-8



WALL TYPE	HEIGHT	BASE	CONCRETE CU M - CF/FT
A	457mm (1'-6")	305mm (1'-0")	.042 cu m (1.50 cu ft.)
	610mm (2'-0")	305mm (1'-0")	.057 cu m (2.00 cu ft.)
B	914mm (3'-0")	711mm (2'-4")	1.41 cu m (4.99 cu ft.)
	1.22m (4'-0")	864mm (2'-10")	.217 cu m (7.66 cu ft.)
	1.52m (5'-0")	1.02m (3'-4")	.306 cu m (10.82 cu ft.)
C	1.83m (6'-0")	1.17m (3'-10")	.410 cu m (14.49 cu ft.)
	914mm (3'-0")	457mm (1'-6")	.106 cu m (3.75 cu ft.)
	1.22m (4'-0")	610mm (2'-0")	.170 cu m (6.00 cu ft.)
	1.52m (5'-0")	762mm (2'-6")	.248 cu m (8.75 cu ft.)
	1.83m (6'-0")	914mm (3'-0")	.340 cu m (12.00 cu ft.)

NOTE:
See Standard Drawings 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
ORIGINAL		Kercheval	12/75		GRAVITY RETAINING WALLS
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER	
				C-9	

CONCRETE

Concrete shall be 332 kg/M³ -C-22Mpa (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 = 8.3 Mpa (1200 psi)
 F'c = 20.7 Mpa (3000 psi)
 Earth = 1922 kg/cu m (120 pcf)
 and equivalent fluid pressure = 176 kg/sq m (36 psf) per 305mm (foot) of height

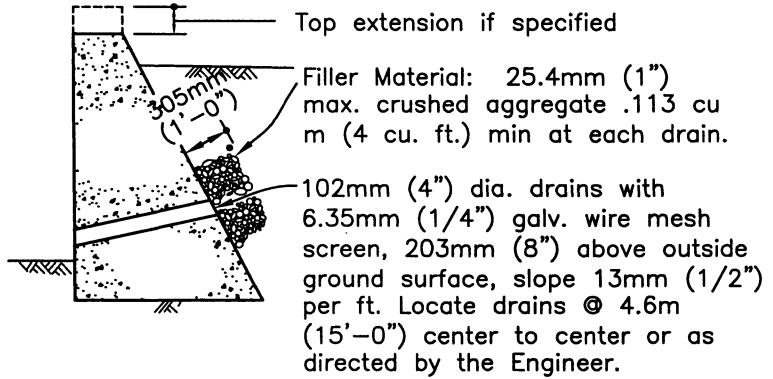
Walls shown for 1-1/2:1 unlimited sloping surcharge are designed in accordance with Rankine's Formula for unlimited sloping surcharge with $\phi = 33^\circ$ 13m (42').
 Note: Maximum toe pressure under wall footing = 143.6 Kpa (1-1/2 tons/sq. ft.). Special design required where footing material is incapable 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.

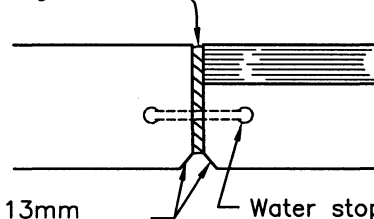
No backfill material shall be deposited against concrete retaining walls until the concrete has developed a strength of 17 Mpa (2,500 psi) in compression as determined by test cylinders, or until 28 days after wall has been placed.



TYPICAL DRAINAGE

WHEN H IS GREATER THAN 1.22m (4'-0")

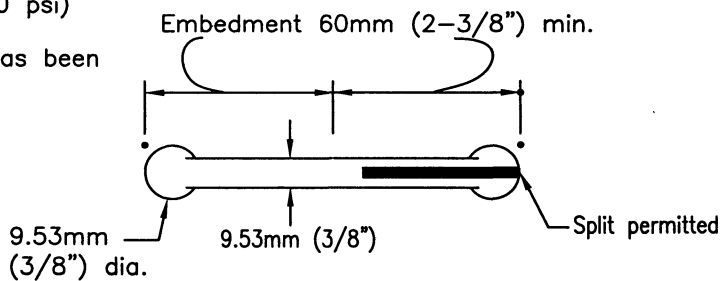
13mm (1/2") Expansion joint, fill with premolded expansion joint filler. Locate joints at approx. 9.14m (30'-0") centers or as directed by the Engineer.



13mm (1/2") chamfer

Water stop, use only when watertight joint is required, see water stop detail.

SECTION A-A



RUBBER WATERSTOP

Use only when watertight joint is required.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

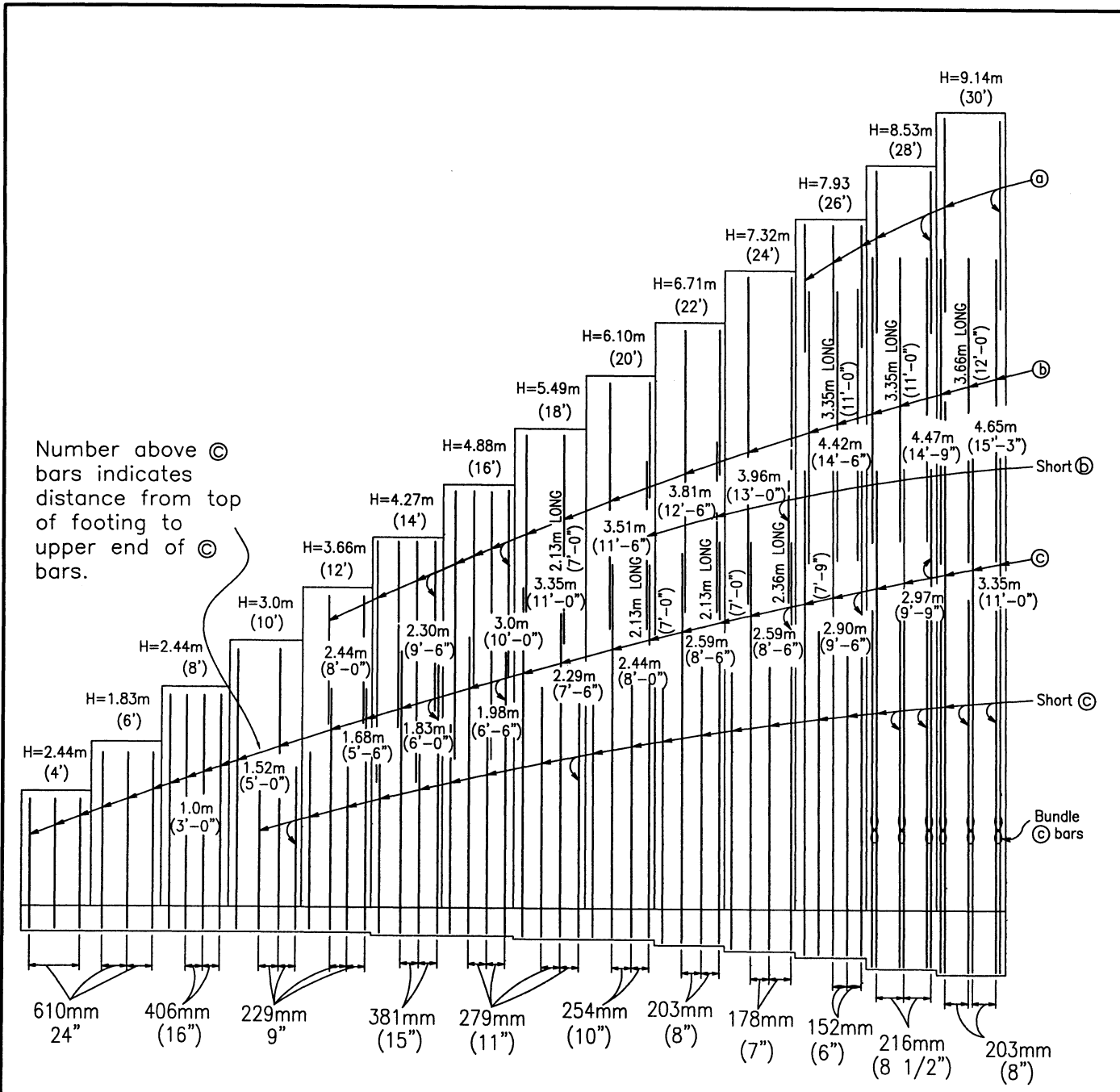
SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES AND DETAILS FOR GRAVITY RETAINING WALLS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
 Chairperson R.C.E. 19246 Date

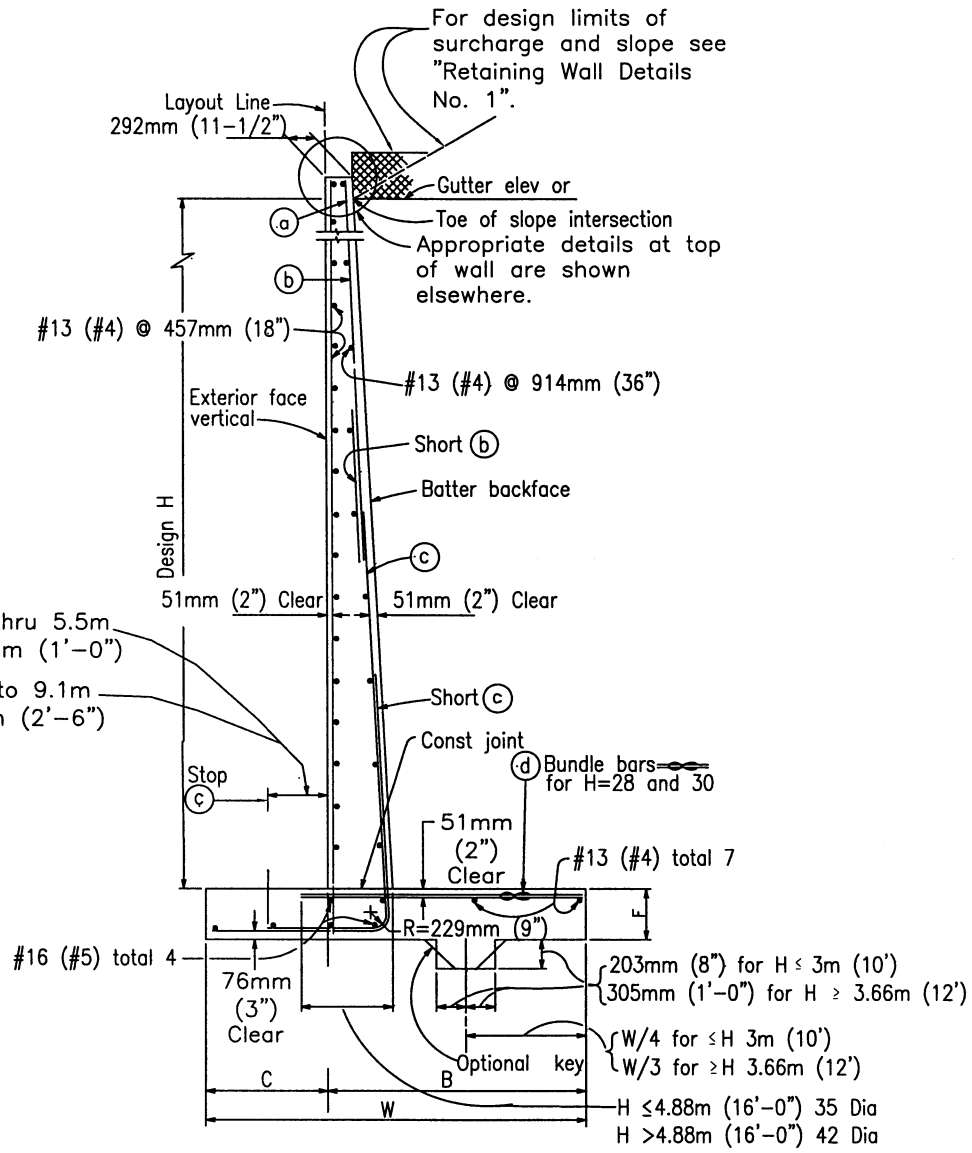
DRAWING NUMBER **C-10**



ELEVATION

- NOTES:
1. For SPREAD FOOTING SECTION see C-11B
 2. For TYPICAL LAYOUT EXAMPLE see C-11C
 3. For 45T PILE FOOTING SECTION see C-11C
 4. For TABLE OF REINFORCING STEEL DIMENSIONS AND DATA see C-11D

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
REINFORCED CONCRETE RETAINING WALL				<i>T. Stanton</i> 3/10/2003	
TYPE 1				Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER C-11A	

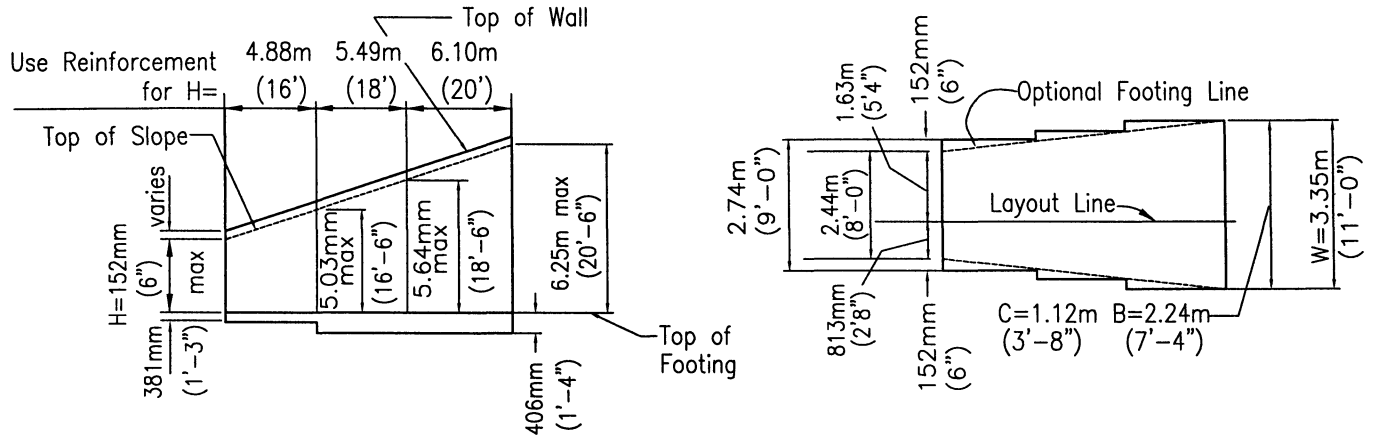


SPREAD FOOTING SECTION

NOTES:

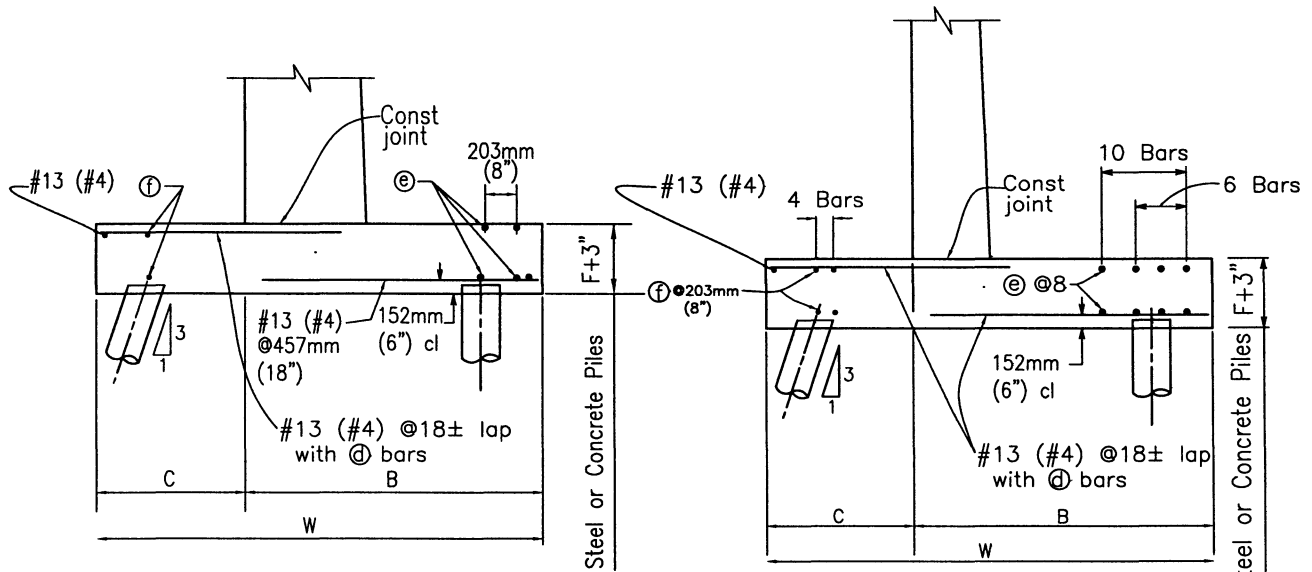
- For details not shown and drainage notes see "Retaining Wall Details No.1." Standard Drawing C-13.
- Quantities apply to Design H portion and exclude the added portion above "Gutter Elevation".

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		REINFORCED CONCRETE RETAINING WALL TYPE 1
Add Metric		T. Stanton	03/03	DRAWING NUMBER	
				C-11B	



TYPICAL LAYOUT EXAMPLE

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



45T PILE FOOTING SECTION

H=7.32m (24') Thru H=9.14m (30')

45T PILE FOOTING SECTION

H=1.22m (4') Thru H=6.71m (22')

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75	REINFORCED CONCRETE RETAINING WALL		<i>T. Stanton</i> 3/10/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
				TYPE 1		DRAWING NUMBER C-11C

Revision	By	Date
ORIGINAL	Approved Kercheval	12/75
Add Metric	T. Stanton	03/03

TABLE OF REINFORCING STEEL DIMENSIONS AND DATA			4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
Design H			4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
W	Metric U.S.	965mm 3'-2"	1.27m 4'-2"	1.58m 5'-2"	1.88m 6'-2"	2.18m 7'-2"	2.44m 8'-0"	2.74m 9'-0"	3.0 m 10'-0"	3.35m 11'-0"	3.66m 12'-0"	4.04m 13'-3"	4.34m 14'-3"	4.65m 15'-3"	5.10m 16'-9"	
C	Metric U.S.	305mm 1'-0"	406mm 1'-4"	508mm 1'-8"	610mm 2'-0"	711mm 2'-4"	813mm 2'-8"	1.0 m 3'-0"	1.02m 3'-4"	1.12m 3'-8"	1.22m 4'-0"	1.35m 4'-5"	1.45m 4'-9"	1.55m 5'-1"	1.65m 5'-5"	
B	Metric U.S.	660mm 2'-2"	864mm 2'-10"	1.07m 3'-6"	1.27m 4'-2"	1.47m 4'-10"	1.63m 5'-4"	1.83m 6'-0"	2.03m 6'-8"	2.24m 7'-4"	2.44m 8'-0"	2.69m 8'-10"	2.90m 9'-6"	3.10m 10'-2"	3.45m 11'-4"	
F Spread Ftg.	Metric U.S.	356mm 1'-2"	356mm 1'-2"	356mm 1'-2"	356mm 1'-2"	356mm 1'-2"	381mm 1'-3"	381mm 1'-3"	406mm 1'-4"	406mm 1'-4"	457mm 1'-6"	508mm 1'-8"	584mm 1'-11"	660mm 2'-2"	711mm 2'-4"	
Batter		1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	1/2:12	5/8:12	3/4:12	3/4:12	7/8:12	
ⓐ bars	Metric U.S.	—	—	—	—	—	—	—	—	—	—	—	—	#13@ 610mm #6@24	#19@ 432mm #6@17	#19@ 406mm #6@16
ⓑ bars	Metric U.S.	—	—	—	—	#13@ 457mm #4@18	#19@ 762mm #6@30	#19@ 559mm #6@22	#22@ 559mm #7@22	#25@ 508mm #8@20	#25@ 406mm #8@16	#25@ 356mm #8@14	#25@ 305mm #8@12	#25@ 13mm #8@8-1/2	#25@ 203mm #8@8	
ⓒ bars	Metric U.S.	#16@ 610mm #5@24	#16@ 610mm #5@24	#16@ 406mm #5@16	#16@ 229mm #5@9	#19@ 229mm #6@9	#29@ 381mm #9@15	#29@ 279mm #9@11	#32@ 279mm #10@11	#36@ 254mm #11@10	#36@ 203mm #11@8	#36@ 176mm #11@7	#36@ 152mm #11@6	#32@ 216mm δ #10@8-1/2	#32@ 203mm δ #10@8 δ	
ⓓ bars	Metric U.S.	#16@ 610mm #5@24	#16@ 610mm #5@24	#13@ 406mm #4@16	#13@ 229mm #4@9	#16@ 229mm #5@9	#25@ 381mm #8@15	#25@ 279mm #8@11	#32@ 279mm #10@11	#32@ 279mm #10@11	#32@ 203mm #10@8	#32@ 178mm #10@7	#32@ 152mm #10@6	#29@ 216mm δ #9@8-1/2	#29@ 203mm δ #9@8 δ	
Total ⓔ bars	Metric U.S.	6-#19 6-#6	6-#19 6-#6	10-#22 10-#7	10-#22 10-#7	10-#22 10-#7	10-#22 10-#7	6-#22 6-#7	6-#22 6-#7	6-#22 6-#7	6-#22 6-#7	6-#22 6-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7
Total ⓕ bars	Metric U.S.				4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	4-#22 4-#7	2-#22 2-#7	2-#22 2-#7	2-#22 2-#7	2-#22 2-#7
2' Level surcharge	Toe Pressure	Metric U.S.	77Kpa 1.6k/sf	91Kpa 1.9k/sf	105Kpa 2.2k/sf	110Kpa 2.3k/sf	134Kpa 2.8k/sf	158Kpa 3.3k/sf	168Kpa 3.5k/sf	191Kpa 4.0k/sf	206Kpa 4.3k/sf	220Kpa 4.6k/sf	235Kpa 4.9k/sf	254Kpa 5.3k/sf	273Kpa 5.7k/sf	297Kpa 6.2k/sf
2:1 unlimited slope	Toe Pressure	Metric U.S.	53Kpa 1.1k/sf	72Kpa 1.5k/sf	96Kpa 2.0k/sf	120Kpa 2.5k/sf	129Kpa 2.7k/sf	158Kpa 3.3k/sf	172Kpa 3.6k/sf	201Kpa 4.2k/sf	225Kpa 4.7k/sf	263Kpa 5.5k/sf	282Kpa 5.9k/sf	311Kpa 6.5k/sf	340Kpa 7.1k/sf	359Kpa 7.5k/sf
1-1/2:1 limited slope	Toe Pressure	Metric U.S.	62Kpa 1.3k/sf	81Kpa 1.7k/sf	101Kpa 2.1k/sf	120Kpa 2.5k/sf	139Kpa 2.9k/sf	163Kpa 3.4k/sf	182Kpa 3.8k/sf	206Kpa 4.3k/sf	230Kpa 4.8k/sf	259Kpa 5.4k/sf	278Kpa 5.8k/sf	311Kpa 6.5k/sf	345Kpa 7.2k/sf	359Kpa 7.5k/sf
Spread Footing	Steel kg/ft.	Metric	7.7kg	9.1kg	12.7kg	16.8kg	23kg	36.3kg	47.6kg	66.7kg	84.8kg	112kg	137kg	185kg	204kg	230kg
	Steel lbs/ft.	U.S.	17lb.	20lb.	28lb.	37lb.	51lb.	80lb.	105lb.	147lb.	187lb.	246lb.	303lb.	407lb.	449lb.	507lb.
Pile ftg.	Conc cu m	Metric	26cu m	36cu m	47cu m	58cu m	72cu m	86cu m	1.0cu m	1.2cu m	1.3cu m	1.5cu m	1.8cu m	2.9cu m	2.5cu m	3.0cu m
	Conc cf/ft	U.S.	8.9cu ft	12.5cu ft	16.3cu ft	20.2cu ft	25.4cu ft	30.1cu ft	34.6cu ft	40.1cu ft	45.0cu ft	52.1cu ft	63.3cu ft	77.0cu ft	88.1cu ft	104.8cu ft
Pile ftg.	Steel kg/ft.	Metric	13.2kg	14.5kg	18.6kg	31.8kg	38.1kg	51.3kg	63.5kg	78.0kg	96.2kg	122kg	146kg	194kg	213kg	240kg
	Steel lbs/ft.	U.S.	29lb.	32lb.	41lb.	70lb.	84lb.	113lb.	140lb.	172lb.	212lb.	270lb.	322lb.	427lb.	469lb.	528lb.
Pile ftg.	Conc cu m	Metric	30cu m	34cu m	48cu m	59cu m	72cu m	86cu m	99cu m	1.1cu m	1.3cu m	1.2cu m	1.8cu m	2.3cu m	2.6cu m	3.0cu m
	Conc cf/ft	U.S.	10.2cu ft	12.7cu ft	16.7cu ft	20.8cu ft	25.2cu ft	30.1cu ft	34.8cu ft	40.6cu ft	45.7cu ft	53.1cu ft	64.7cu ft	78.6cu ft	89.9cu ft	107.0cu ft

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' † Denotes a bundle of 2 bars

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL

TYPE 1

DRAWING NUMBER C-11D

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Christerson R.C.E. 19246 Date *3/01/2003*

Revision	By	Approved	Date
ORIGINAL			12/75
Add Metric	T. Stanton		03/03

SAN DIEGO REGIONAL STANDARD DRAWING

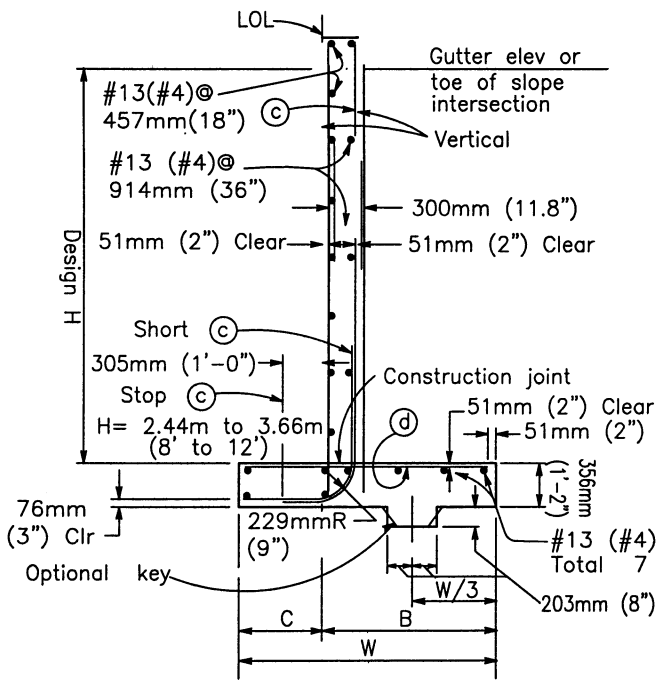
REINFORCED CONCRETE RETAINING WALL

TYPE 1A

DRAWING NUMBER C-12A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Christerson R.C.E. 19246 Date 3/01/2003



SPREAD FOOTING SECTION

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

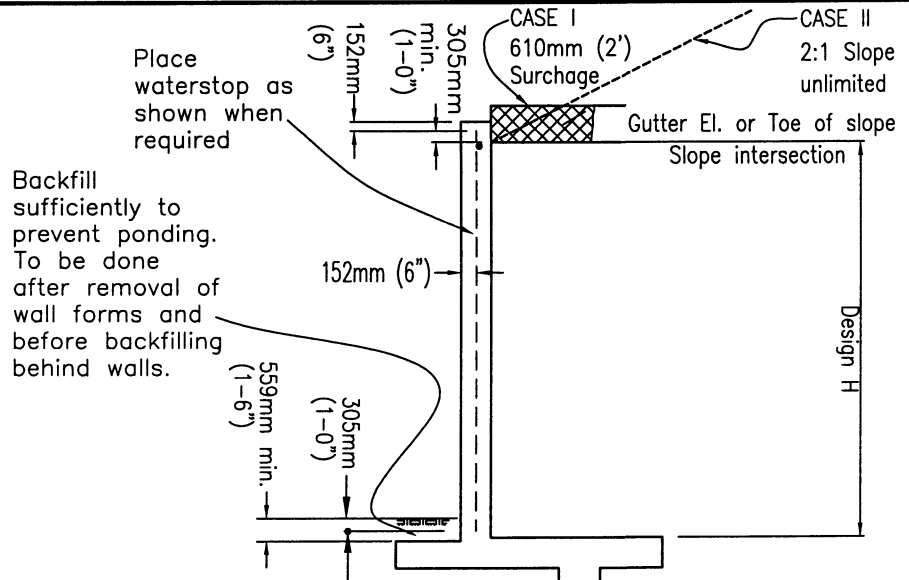
NOTES:
 Design H may be exceeded by 152mm (6") before going to the next size. Footing key is required except when found unnecessary by Engineer. Special footing design is required where foundation material is incapable of supporting toe pressure loads listed in table.

Design Data:
 $f_c = 8.96 \text{ Mpa (1300 psi)}$ $f'_c = 22.4 \text{ Mpa (3250 psi)}$ $f_s = 165 \text{ Mpa (24,000 psi)}$ $n = 10$ earth $5.75 \text{ Kpa (120 pcf)}$

Case I - Equivalent fluid pressure = 1.7 Kpa (36 psf) max for determination of toe pressure. 1.3 Kpa (27) psf min for determination of heel pressure.

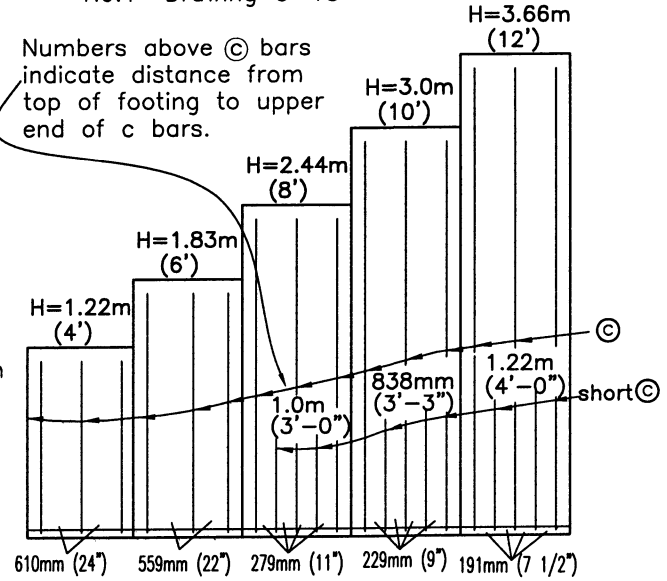
Case II - Earth pressure determined from Rankine's formula with $\theta = 33^\circ - 12.8\text{m (42')}$.

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=1.22m (4') use same footing dimensions as Design H=1.83m (6').



DESIGN

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



ELEVATION

Revision	By	Approved	Date
ORIGINAL	Kerchenski		12/75
Add Metric	T. Stanton		03/03

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL

TYPE 1A

DRAWING NUMBER C-12B

Checked by *T. Stanton* 3/01/2003
 Date
 RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

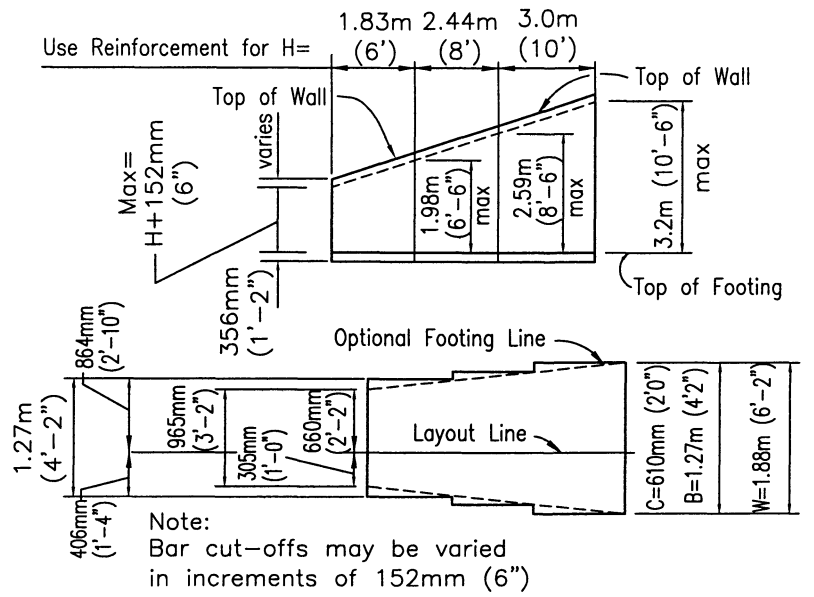
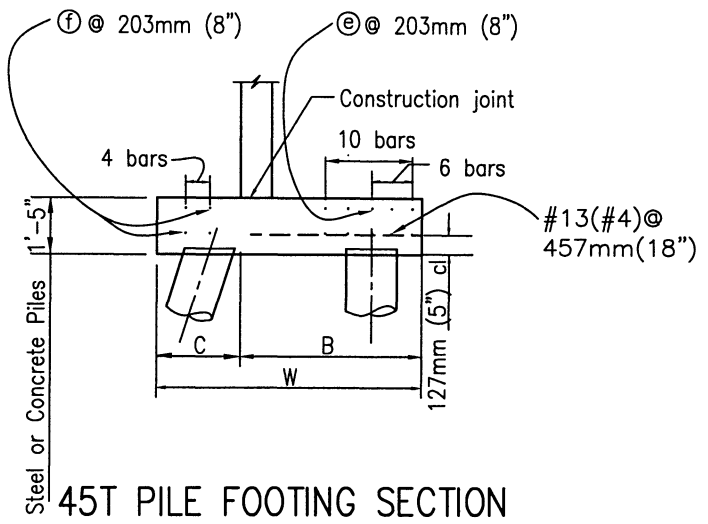
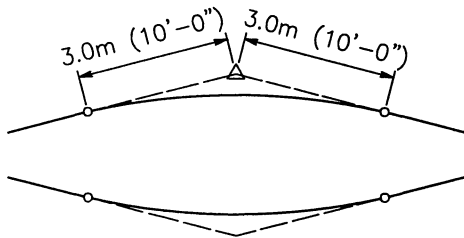
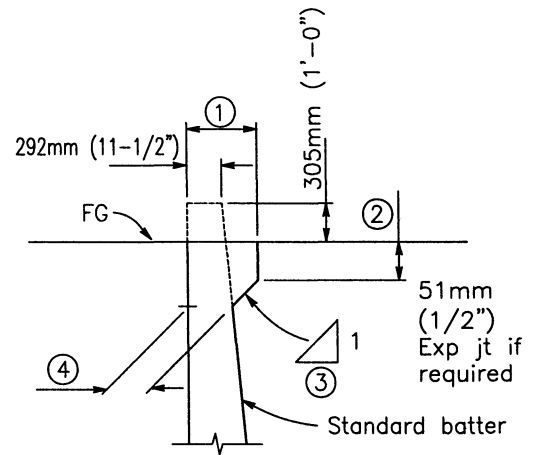
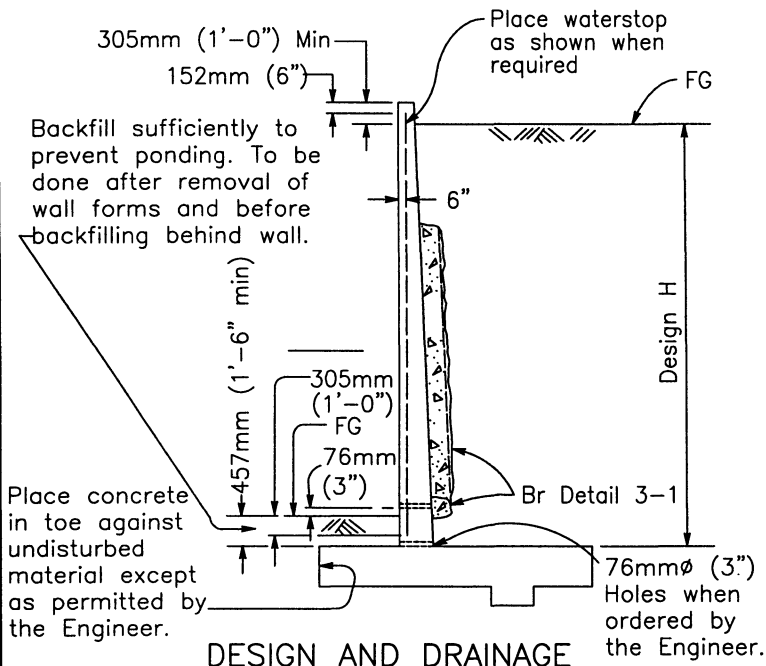


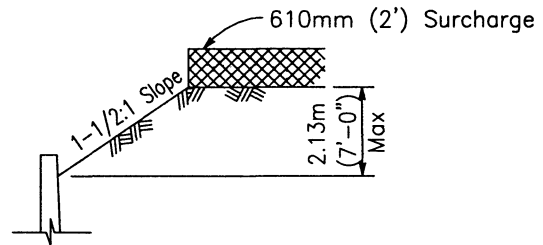
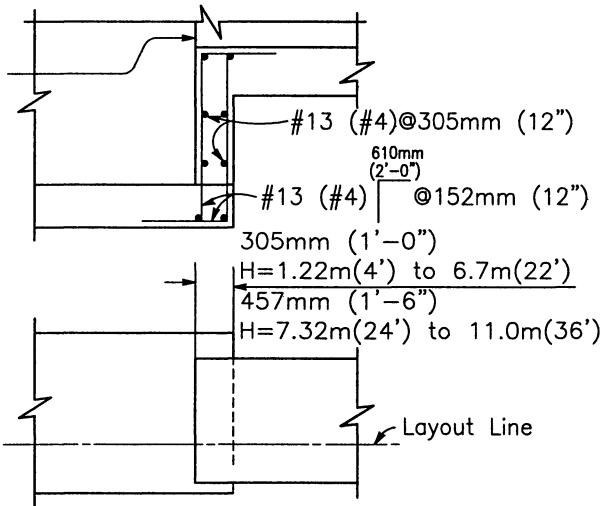
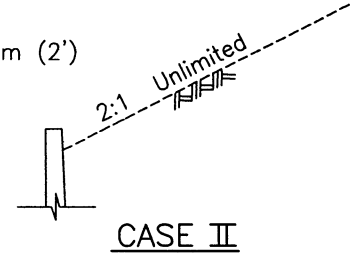
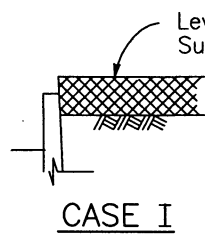
TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

Design H	1.22m (4')	1.83m (6')	2.44m (8')	3.0m (10')	3.66m (12')	
W	965mm (3'-2")	1.27m (4'-2")	1.57m (5'-2")	1.88m (6'-2")	2.18m (7'-2")	
C	305mm (1'-0")	406mm (1'-4")	508mm (1'-8")	610mm (2'-0")	711mm (2'-4")	
B	356mm (1'-2")	864mm (2'-10")	1.07m (3'-6")	1.27m (4'-2")	1.47m (4'-10")	
© bars	#16(#5)@610mm(24")	#16(#5)@559mm(22")	#16 (#5)@279mm (11")	#19(#6)@229mm(9")	#22(#7)@191mm(7-1/2")	
Ⓧ bars	#16(#5)@610mm(24")	#16(#5)@559mm(22")	#16 (#5)@559mm (22")	#22(#7)@457mm(18")	#25 (#8)@15	
Total © bars	6-#19 (#6)	6-#19 (#6)	6-#19 (#6)	10-#22 (#7)	10-#22 (#7)	
Total Ⓧ bars				4-#22 (#7)	4-#22 (#7)	
Case I - Toe Press.	76.1 kg/m ² (1590psf)	92.4kg/m ² (1930psf)	107kg/m ² (2240psf)	122kg/m ² (2550psf)	136kg/m ² (2840psf)	
Case II - Toe Press.	50.8 kg/m ² (1060psf)	69.9kg/m ² (1460psf)	89.1kg/m ² (1860psf)	109kg/m ² (2280psf)	129kg/m ² (2700psf)	
Spread	Steel lbs/ft	6.8kg (15lb)	9.52kg (21lb)	12.25kg (27lb)	21.3kg (46lb)	31.8kg (70lb)
	Conc CF/ft	3.9kg (8.6lb)	5.35kg (11.8lb)	6.76kg (14.9lb)	8.21kg (18.1lb)	9.66kg (21.3lb)
Pile Ftg	Steel lbs/ft	11.3kg (25lb)	14.51kg (32lb)	17.24kg (38lb)	34.0kg (75lb)	45.8kg (101lb)
	Conc CF/ft	4.5kg (9.9lb)	5.40kg (11.9lb)	6.94kg (15.3lb)	8.53kg (18.8lb)	10.1kg (22.2lb)

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



Where shown on the plans



DETAIL OF DESIGN LOADING CASES

- CASE I Level + 610mm (2') Surcharge
- CASE II 2:1 Unlimited Slope
- CASE III 1-1/2:1 Limited Slope (2.13m (7'-0") Max height) + 610mm (2') Surcharge

NOTE: Surcharge Limits Shown Apply To Retaining Walls Type 1 and 3.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

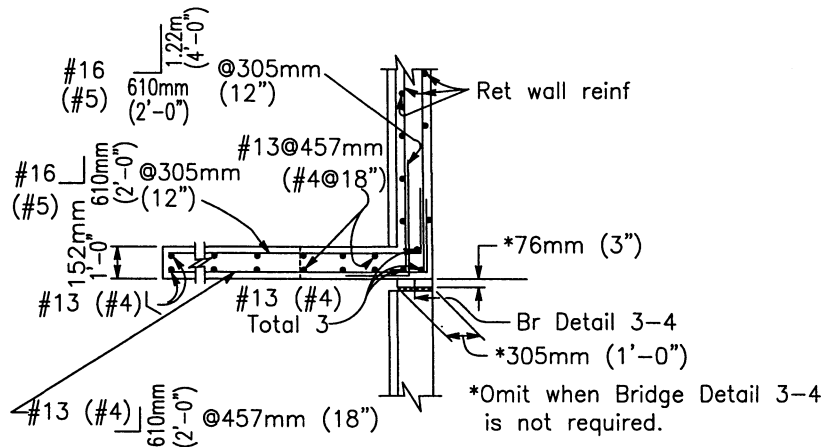
SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE
RETAINING WALL DETAILS No. 1

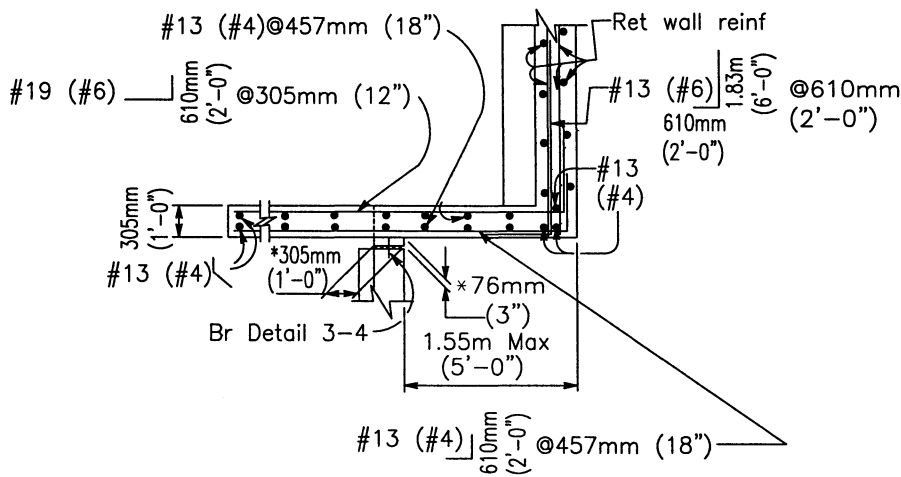
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

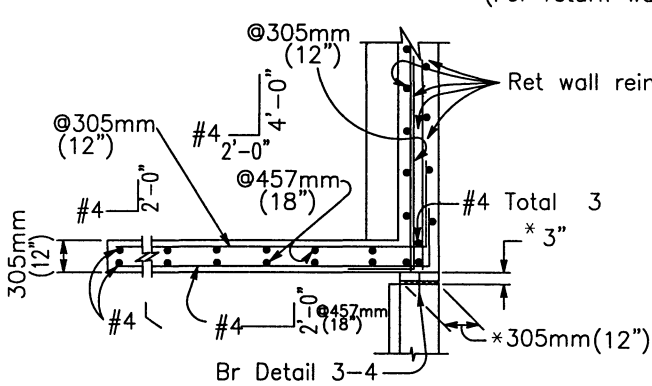
DRAWING NUMBER **C-13A**



PLAN
(For return wall Type "A")

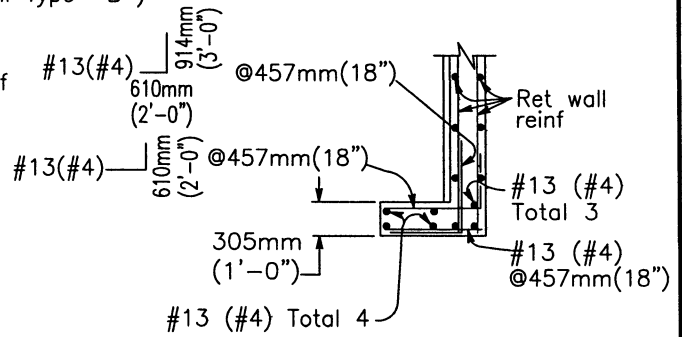


PLAN
(For return wall Type "B")



* Omit when Bridge Detail 3-4 is not required.

PLAN
(For return wall Type "C")



PLAN
(For return wall Type "D")

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

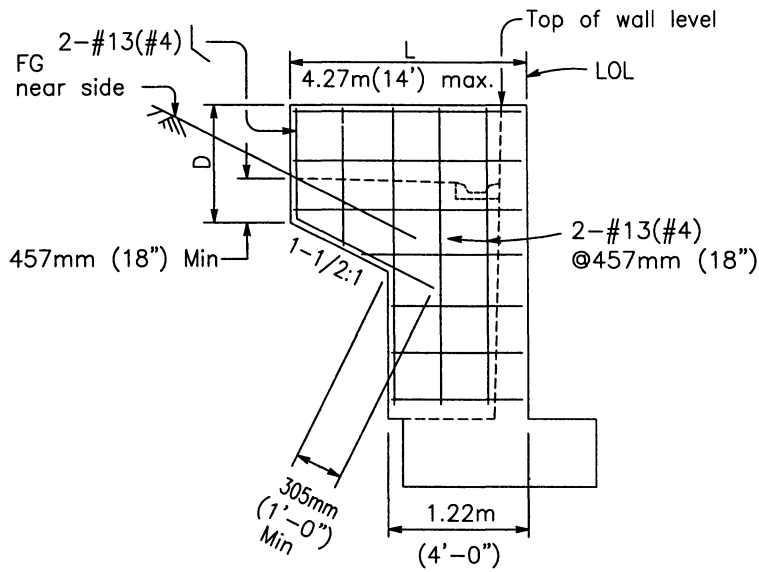
SAN DIEGO REGIONAL STANDARD DRAWING

**REINFORCED CONCRETE
RETAINING WALL DETAILS No. 1**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

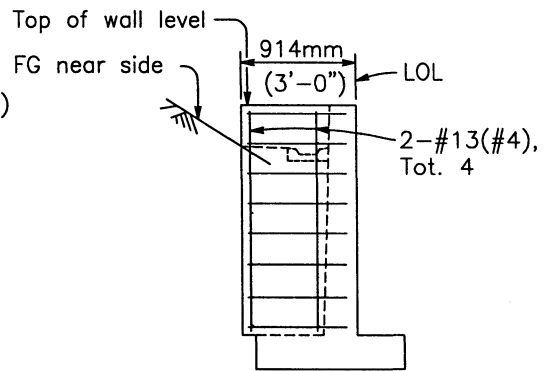
DRAWING NUMBER **C-13B**



ELEVATION

RETURN WALL TYPE A

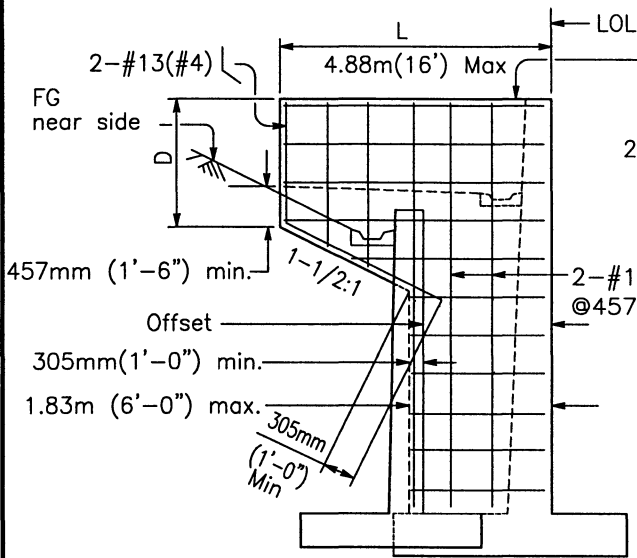
Use where H=2.44m (8') or less



ELEVATION

RETURN WALL TYPE D

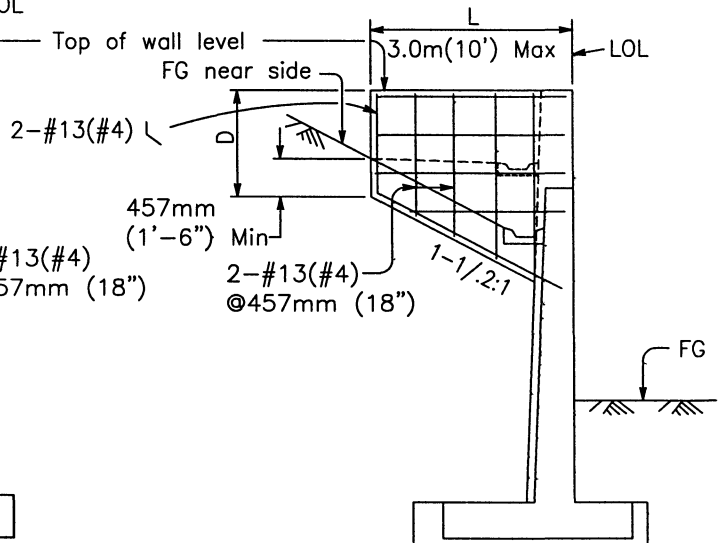
Use where H=1.83m (6') or less



ELEVATION

RETURN WALL TYPE B

Use where H=3.0m (10') or more on offset walls



ELEVATION

RETURN WALL TYPE C

Use where H=3.9m (10') or more on straight walls

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

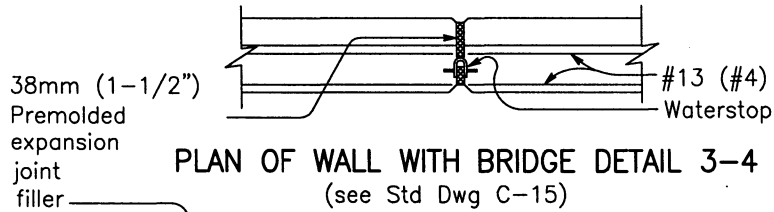
SAN DIEGO REGIONAL STANDARD DRAWING

**REINFORCED CONCRETE
RETAINING WALL DETAILS No. 1**

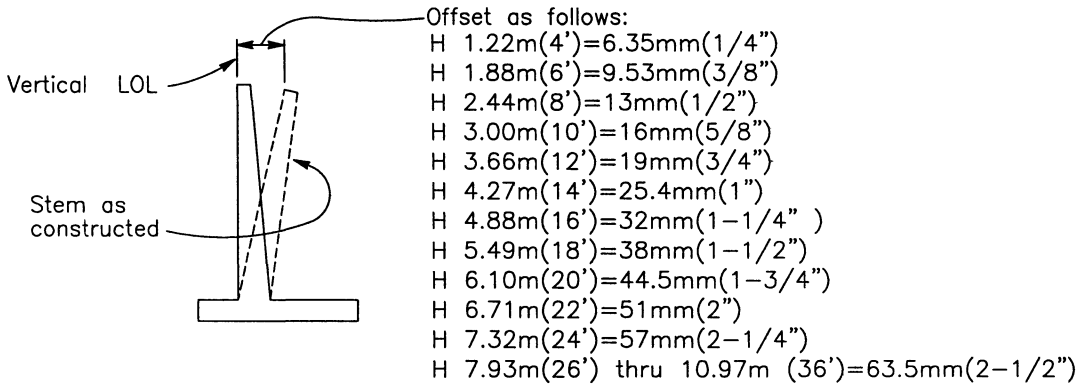
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **C-13C**



PLAN OF WALL WITH EXPANSION JOINT ONLY



APPROX. WALL OFFSET VALUES

Not required for wall Types 3 and 4.
 Values for offsetting forms to be determined by the Engineer.

NOTES

Design Conditions:

Design H may be exceeded by 152mm (6") before going to the next size. Special footing design is required where foundation material is incapable of supporting toe pressure listed in table. Return wall not required unless shown elsewhere.

Design Data:

$f_c = 8.96\text{Mpa}$ (1300 psi) $f'_c = 22.4\text{Mpa}$ (3250 psi) $f_s = 166\text{Mpa}$ (24,000 psi)
 $n = 10$ earth = 1922 kg/cu m (120 pcf)

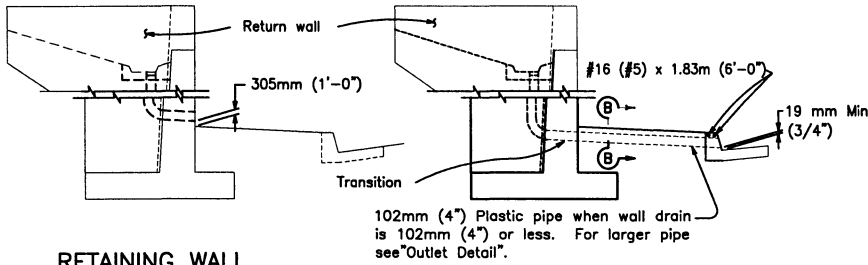
610mm (2') Surcharge:

Equivalent fluid pressure =

- 36 pcf maximum for determination of toe pressure.
- 27 pcf minimum for determination of heel pressure.

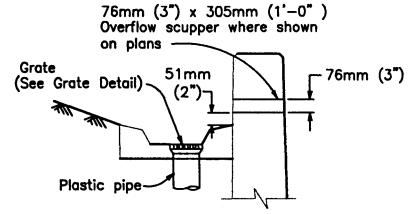
Earth pressures for 2:1 unlimited slope, 1-1/2:1 slope, and 1-1/2:1 unlimited slope, determined from Rankine's formula with $\phi=33^\circ-12.8\text{m}(42')$.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		REINFORCED CONCRETE RETAINING WALL DETAILS No. 1
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246	
					DRAWING NUMBER C-13D

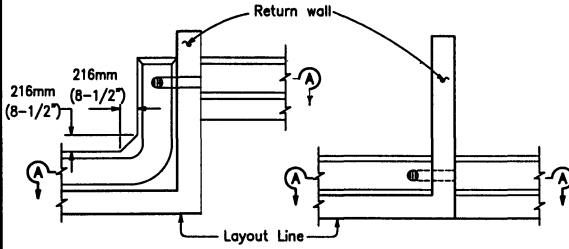


**RETAINING WALL,
FACE OF WALL OUTLET**

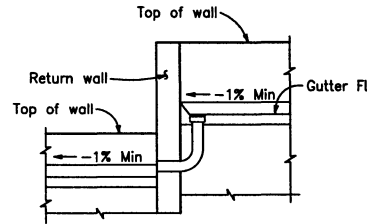
RETAINING WALL, GUTTER OUTLET



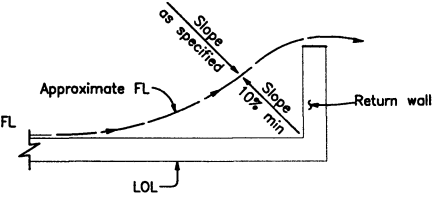
WALL DRAIN DETAIL



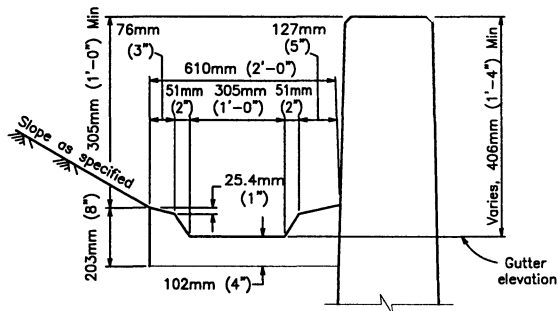
**PLAN-OFFSET WALL
DRAIN THROUGH RETURN WALL**



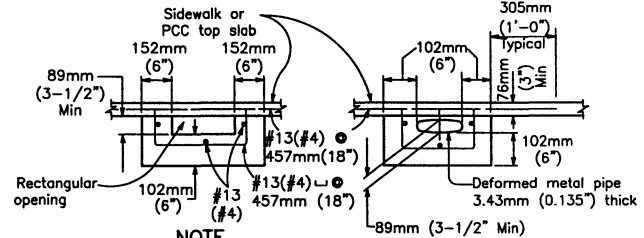
SECTION A-A



**WALL DRAINAGE
WHERE GUTTER NOT REQUIRED**



TYPICAL GUTTER DETAIL



NOTE

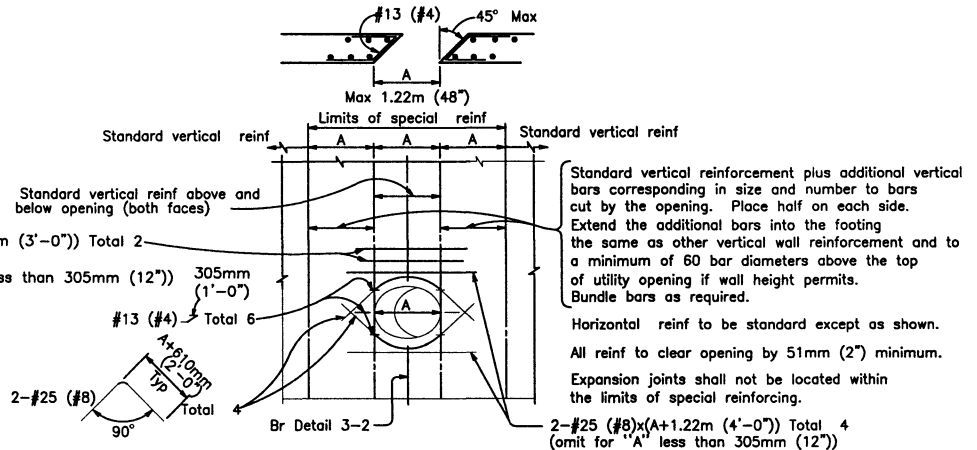
Area of opening to be not less than that of pipe from wall gutter. Make opening transition in wall. Edge opening in curb face to 19mm (3/4") minimum radius.

OUTLET DETAIL - SECTION B-B



GRATE DETAIL

Sizes to fit standard hubs



RETAINING WALL UTILITY OPENING

Max size of opening (A) = 1.22m (48") To be used in conjunction with Standard Drawing C-13.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

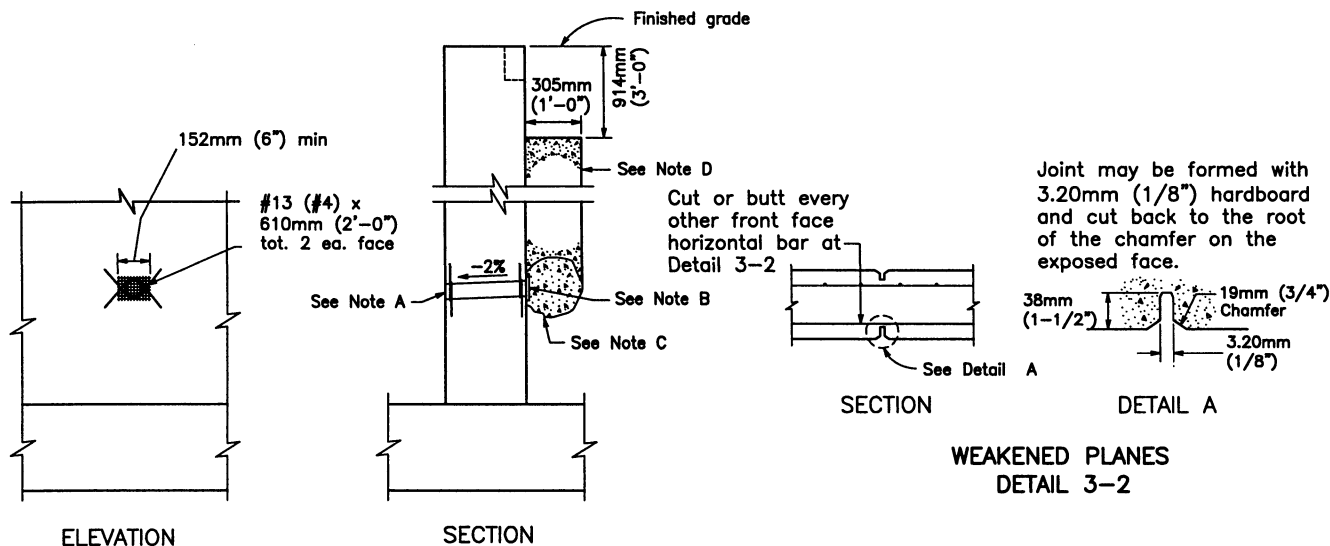
**REINFORCED CONCRETE
RETAINING WALL DETAILS No. 2**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

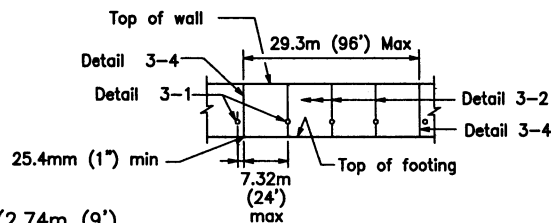
T. Stanton 310112003

Chairperson R.C.E. 19246 Date

**DRAWING
NUMBER C-14**



WEEP HOLE AND PERVIOUS BACKFILL
DETAIL 3-1

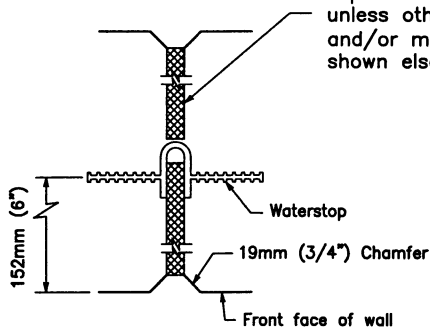


WALL EXPANSION JOINTS
AND WEAKENED PLANES
DETAIL 3-3

NOTES

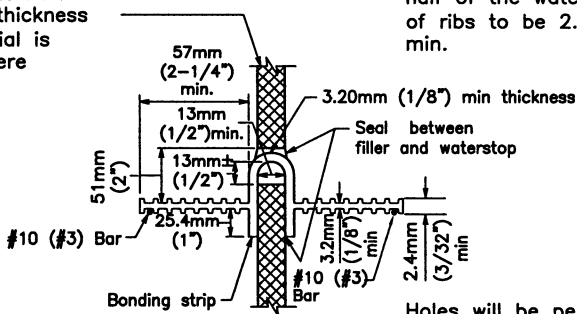
- A. 102mm (4") diameter drain @ 7.62m (25') max. center to center (2.74m (9') c-c for Type 3 and 2.82m (9'-3") c-c for Type 4 Retaining Walls). For walls adjacent to sidewalks or curbs, provide 102mm (4") cast iron or asbestos cement pipe under the sidewalk to discharge thru curb face. Exposed wall drains shall be located 76mm (3") ± above finished grade.
- B. 152mm (6") square aluminum or galvanized steel wire 4 mesh hardware cloth. (Min wire diameter .762mm (0.03")) Anchor firmly to backface.
- C. .028 Cubic Meter (One cubic foot) pervious backfill material in a burlap sack, securely tied.
- D. Pervious backfill material continuous behind retaining wall.

13mm (1/2") premolded expansion joint filler unless other thickness and/or material is shown elsewhere



WALL EXPANSION JOINT
DETAIL 3-4

Waterstop to have 5 or more pairs of raised ribs to provide 64.5 sq mm (0.1 sq in) min. rib cross-section area on each half of the water stop. Height of ribs to be 2.38mm (3/32") min.



WATERSTOP
DETAIL 3-6

Holes will be permitted in the outer 13mm (1/2") of the web for wire, rings etc. Tie web to #10 (#3) reinforcing bars @ 305mm (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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE
RETAINING WALL DETAILS No. 3

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER C-15

DRAINAGE SYSTEMS

SUPPLEMENTAL TO REGIONAL STANDARD DRAWING ("D" SERIES)
DRAWINGS D-1, D-2, D-3, AND D-4

REQUIRES the use of SDG-110

DRAWING D-12

NOTES Amend note 3 to read: "When curb inlet opening height (H) exceeds 8 inch, install 1 inch diameter steel protection bar."

 Amend note 4 to read: "Install additional bars at 3-12 inch clear spacing above first bar when opening exceeds 16 inch."

DRAWING D-19

NOTES Add 3. Slotted drain installations shall be encased with 6 inch PCC (520-C-2500) all around and shall be poured monolithically with the curb and gutter.

DRAWING D-40

SECTION B-B Amend 1/2D min. to read: "1D min." In addition, show riprap and concrete channel drawn even with top of pipe.

NOTES Amend note 1.B) to read: "Filter blanket material."

 Amend note 3 to read: "Riprap shall be placed over a geotextile filter fabric. Filter blanket material shall be placed under the fabric when specified."

DRAWING D-40, D-41A, and D-41B


Add the following:

Design Velocity (Ft./Sec)*	Rock Classification
6-10 10-12 12-14 14-16 16-18	No. 2 Backing 1/4 Ton 1/2 Ton 1 Ton 2 Ton

SECTION OF RIP RAP

* over 18 fps requires special design

SHT. 1 OF 2

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR R.C.E. 25902 2-7-95 DATE
ORIGINAL		M. V. Rollinger	5-20-92		
NOTES	SM	D. Clafre	2-9-03	SUPPLEMENTAL TO REGIONAL STANDARD DRAWING ("D" SERIES)	DRAWING NUMBER SDD-100

DRAWING D-63

NOTES

Amend note 3 to read: "The O.D. of smaller pipe shall not be more than two-thirds (2/3) the size of the larger pipe's I.D."

DRAWING D-70, D-71, D-74, D-79A, D-79B, D-80A, & 80B

NOTES

"Channel fencing is required. Unless otherwise shown on the plans a chain link fence (per Standard Drawings M-5 and M-6) six feet (6') in height, with a top rail set at six inches (6") inside easement boundary lines shall be constructed on both sides, including box culverts or any other structure at the end of the channel. Access points shall be provided on both sides at 500' maximum intervals. Two ten foot (10') gates or one twenty foot (20') gate for vehicular access are required at a maximum of 1000' intervals and may be placed on either side. The remaining access points shall be four-foot (4') gates."

DRAWING D-75

NOTES

Add: 3. Stucco netting shall be galvanized and shall have one and one-half inch (1-1/2") cover.

SHT. 2 OF 2

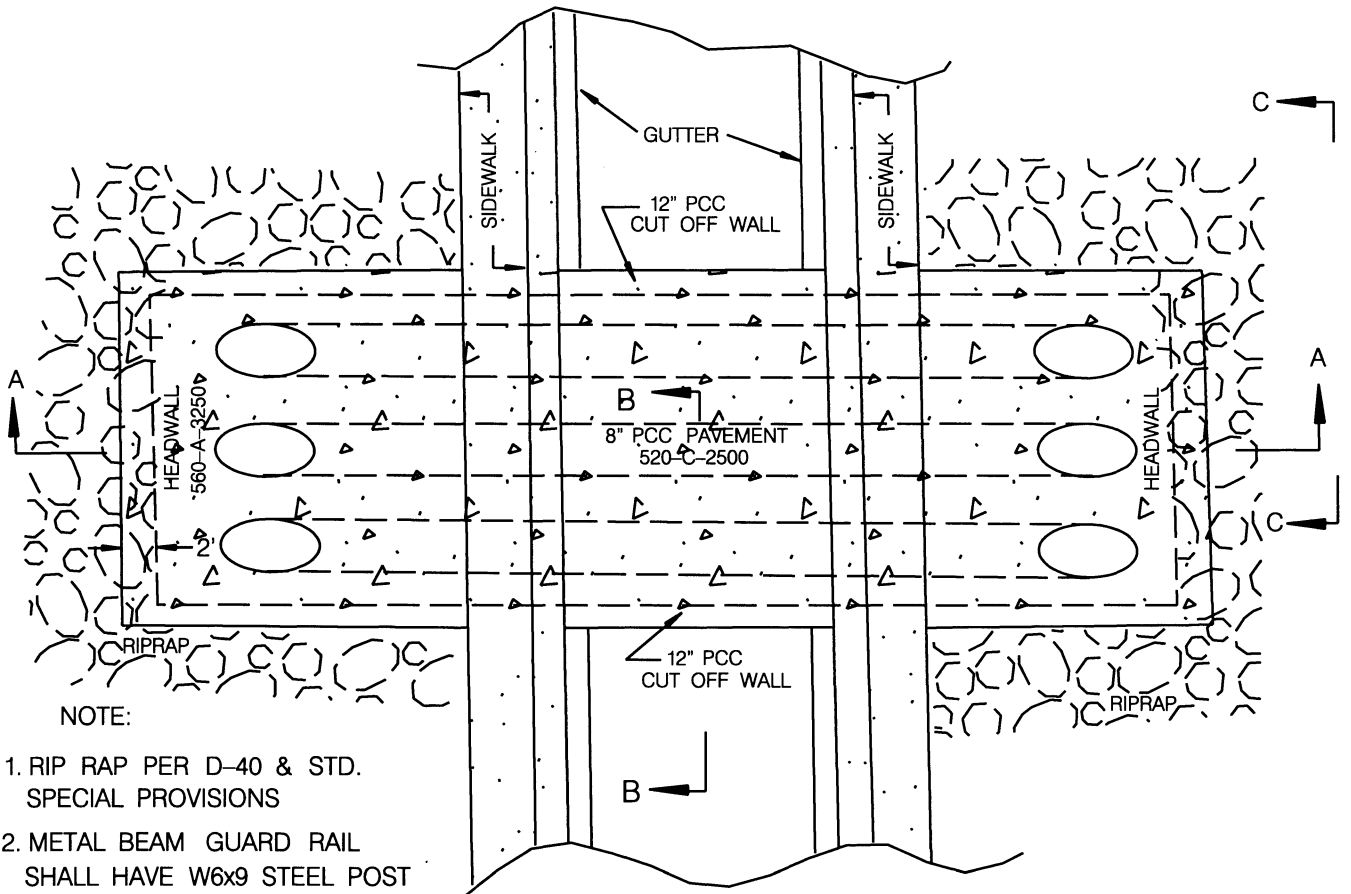
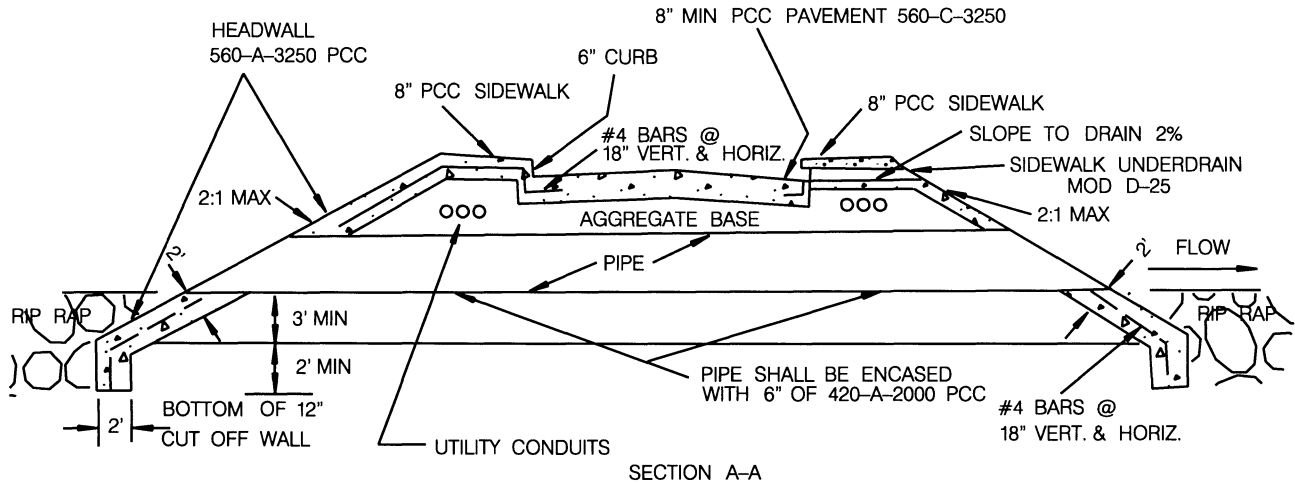
Revision	By	Approved	Date
ORIGINAL		M. V. Rollinger	5-20-92

CITY OF SAN DIEGO - STANDARD DRAWING

SUPPLEMENTAL TO REGIONAL
STANDARD DRAWING ("D" SERIES)

CITY OF SAN DIEGO
STANDARDS COMMITTEE
[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDD-100**



- NOTE:
1. RIP RAP PER D-40 & STD. SPECIAL PROVISIONS
 2. METAL BEAM GUARD RAIL SHALL HAVE W6x9 STEEL POST
 3. SIDEWALK, CURB, PAVEMENT AND HEADWALL'S SHALL BE TIED TOGETHER WITH #4 BARS 18" O.C. HORIZONTAL AND VERTICAL
 4. CONCRETE JOINTS PER G-9 AND G-10

SHT. 1 OF 2

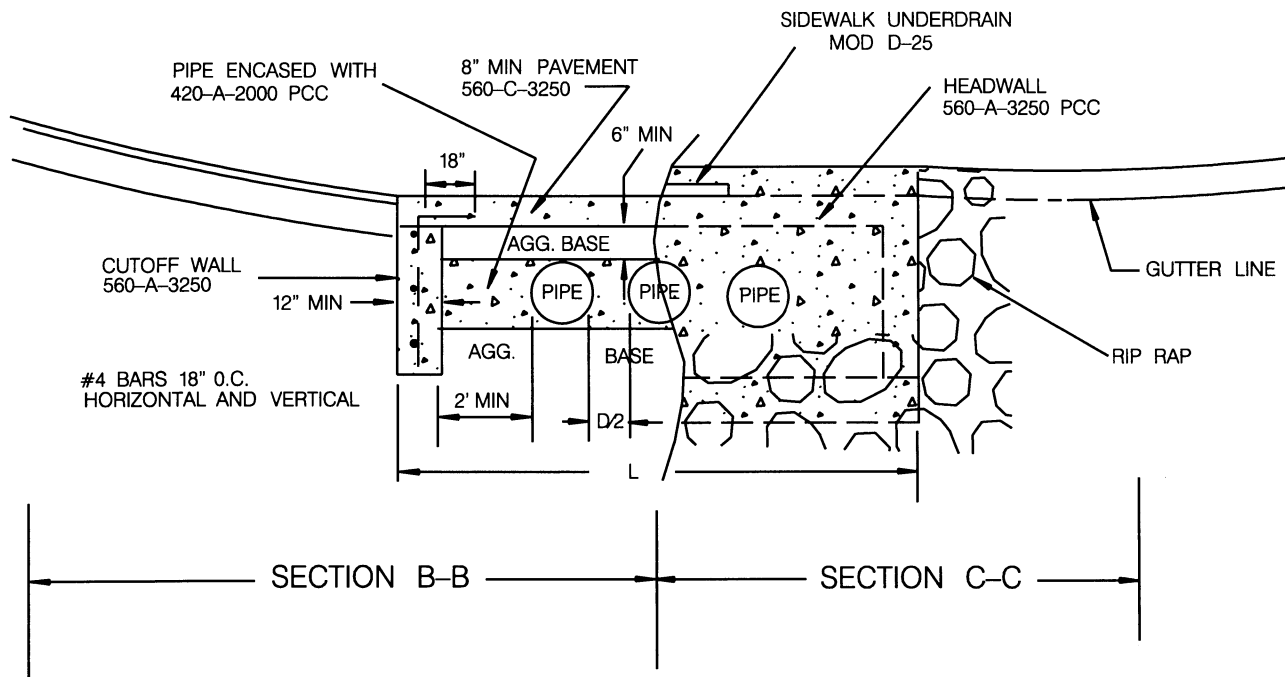
Revision	By	Approved	Date
ORIGINAL		J.P.Casey	6-3-83

CITY OF SAN DIEGO - STANDARD DRAWING

TYPICAL FORD

CITY OF SAN DIEGO
STANDARDS COMMITTEE
Thomas J. P. [Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDD-101**



NOTE:

1. HEADWALL LENGTH (L) PER D-30, D-31

SHT. 2 OF 2

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	6-3-83

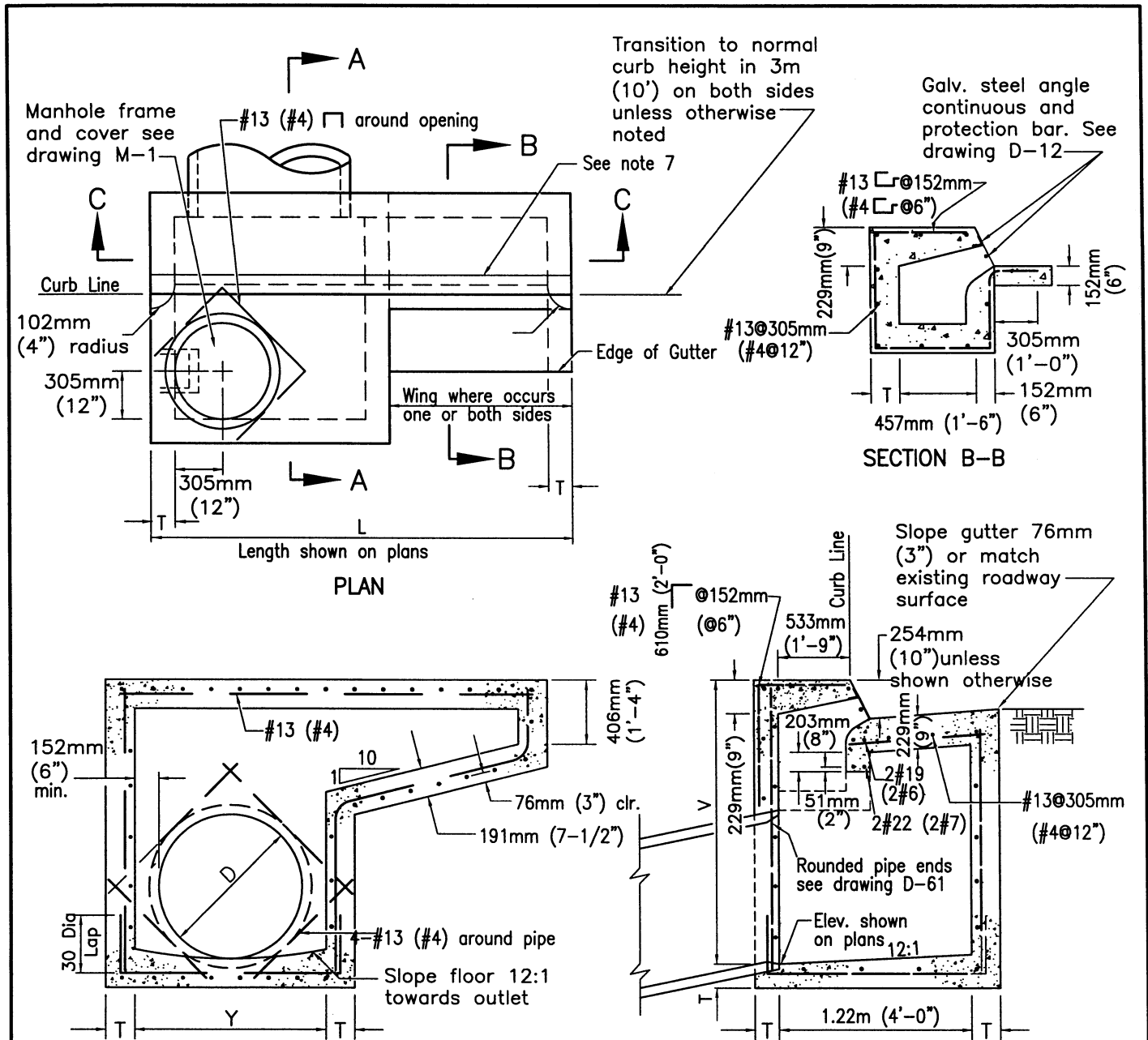
CITY OF SAN DIEGO - STANDARD DRAWING

TYPICAL FORD

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDD-101**



Determined by pipe size—1.22m (4') min., 2.44m (8') max.

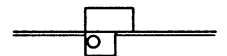
SECTION C-C

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 13mm (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 6.35mm (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 6.35mm (1/4") per foot.
9. Maintain 38mm (1-1/2") clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

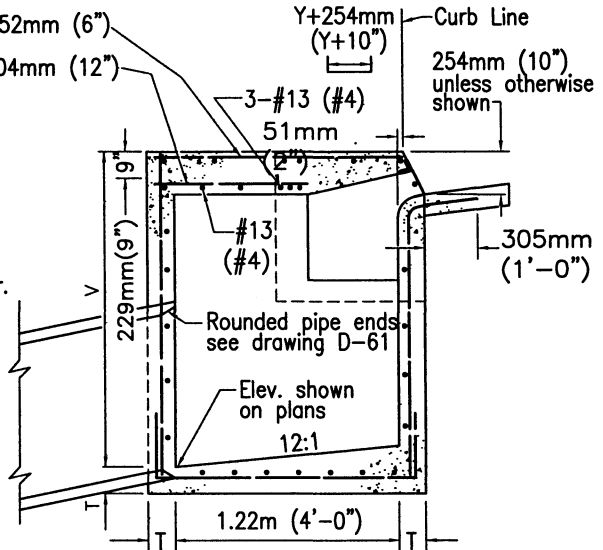
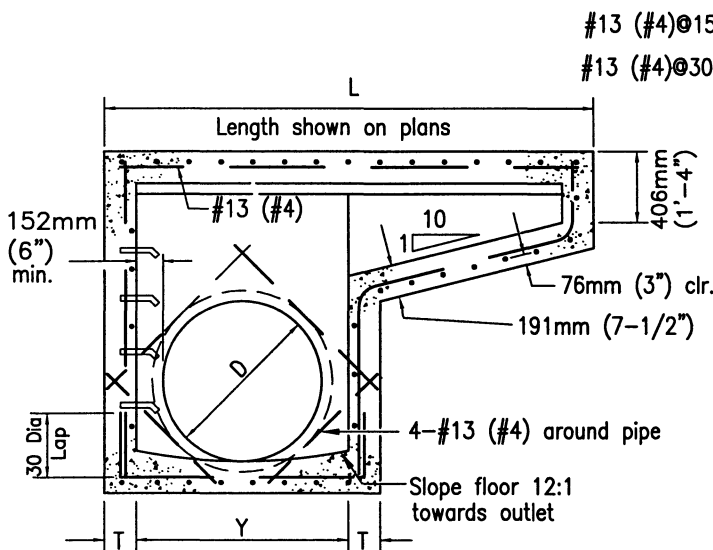
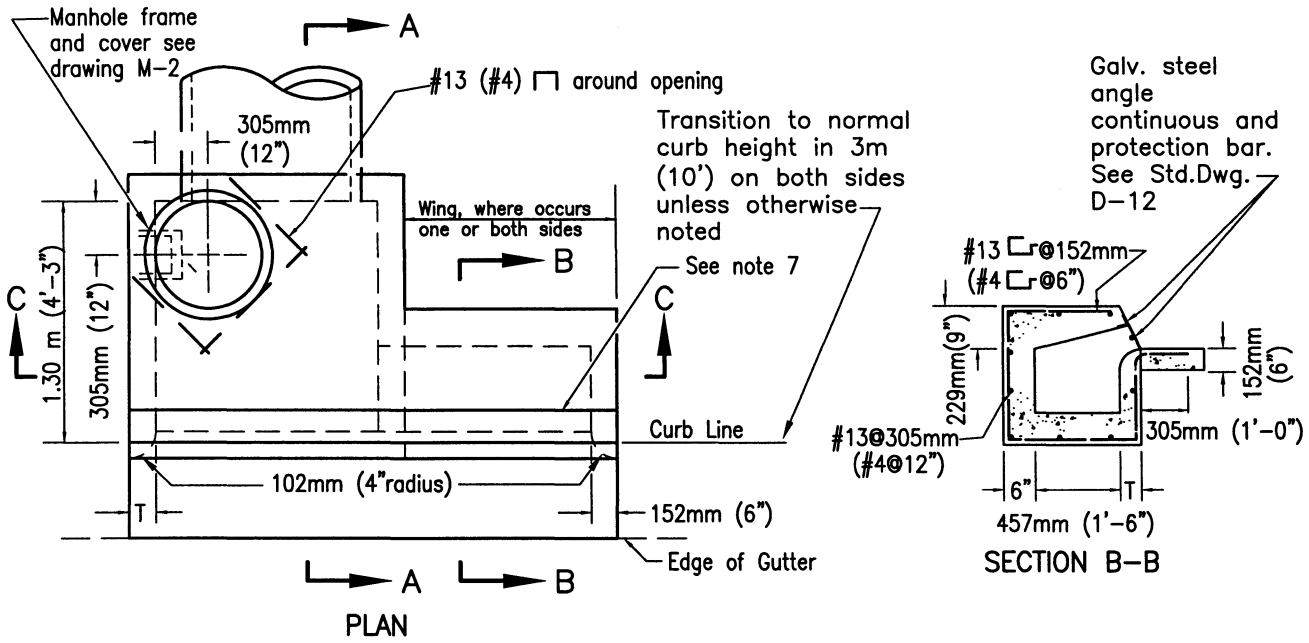
CURB INLET - TYPE A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-1**



Determined by pipe size—1.22m (4') min., 2.44m (8') max.

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)B, (one wing)B-1, (two wings)B-2.
3. Maintain 38mm (1-1/2") clear spacing between reinforcing and surface unless otherwise noted.
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 6.35mm (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 6.35mm (1/4") per foot.
9. Maintain 38mm (1-1/2") clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

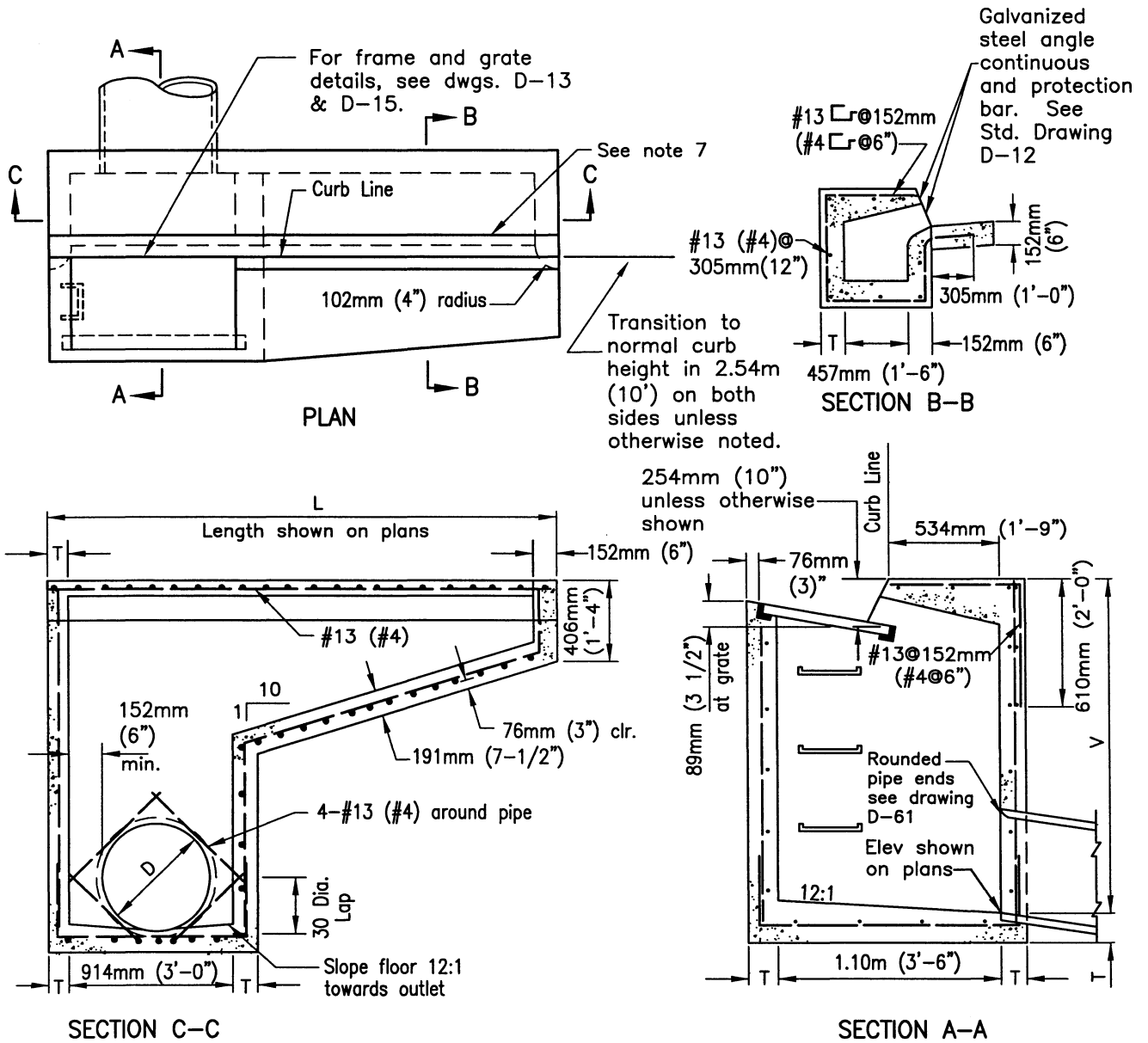
CURB INLET - TYPE B

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-2**

SEE SDD-100



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 13mm (1/2").
4. When V exceeds 1.22m (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 6.35mm (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 6.35mm (1/4") per foot.
9. Maintain 38mm (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.

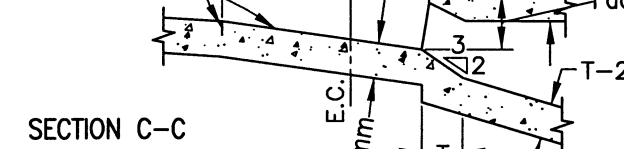
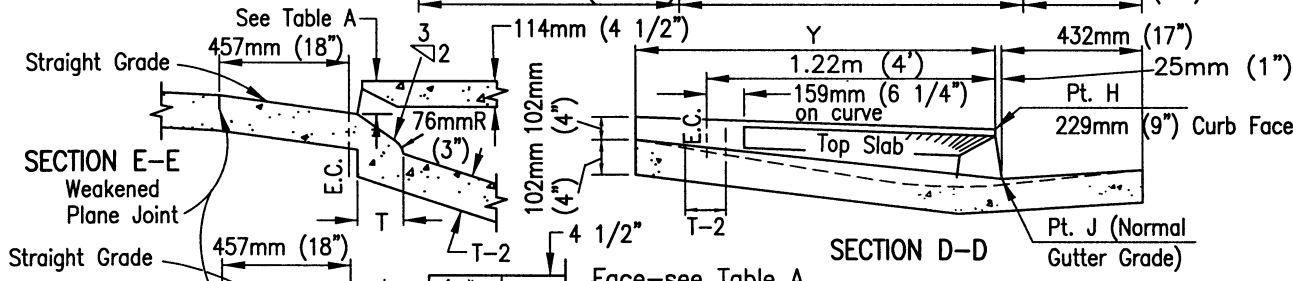
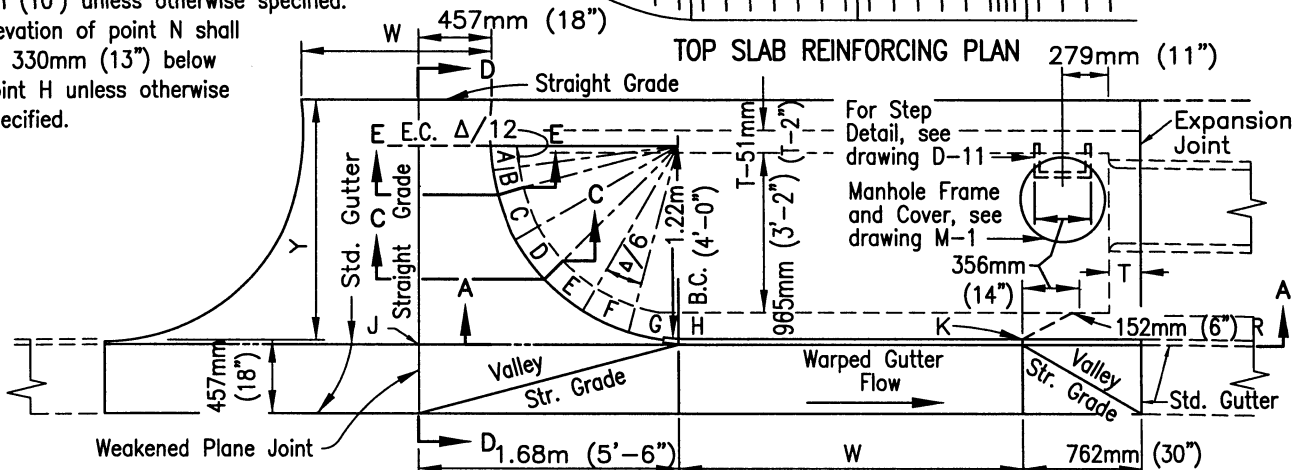
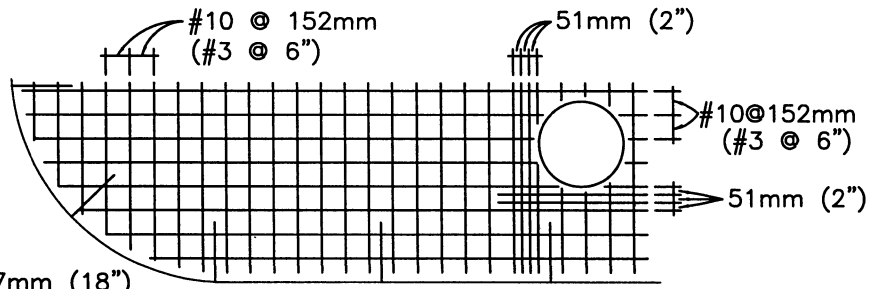
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75		CURB INLET - TYPE C	<i>T. Stanton</i> 3/10/2003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reformatted		T. Stanton	04/06			DRAWING NUMBER D-3
				SEE SDD-100		

DIMENSIONS

T=203mm (8") if V is less than 2.44m (8').
 T=254mm (10") if V is 2.44m (8') or more.
 V=1.52m (5') unless otherwise specified.
 V=D + 813mm (32") minimum.
 W=2.13m (7') unless otherwise specified.
 Y=1.52m (5') unless otherwise specified.
 Width of driveway, W, shall be 3m (10') unless otherwise specified.
 Elevation of point N shall be 330mm (13") below point H unless otherwise specified.

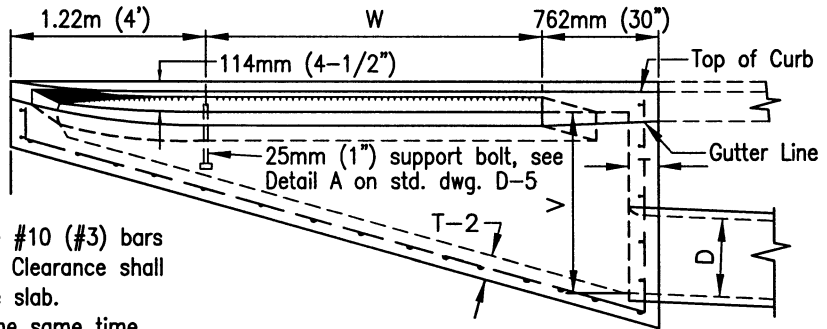


	PT	A	B	C	D	E	F	G	H	K	M
METRIC (mm)	F.C.	114	133	152	191	229	229	229	229	229	203
U.S. (inches)	F.C.	4 1/2	5 1/4	6	7 1/2	9	9	9	9	9	8

TABLE A

NOTES

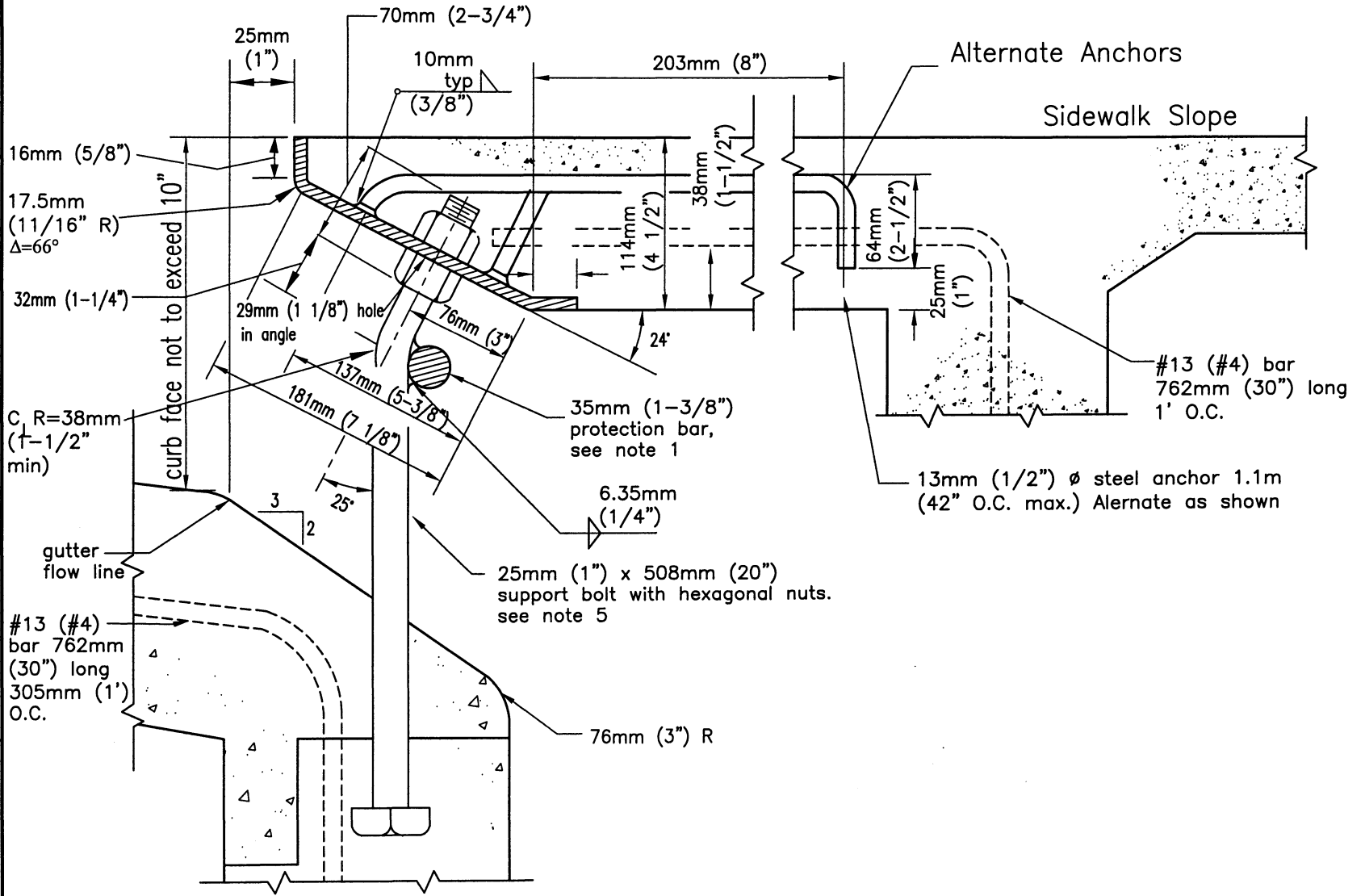
1. Steel Plate should be of one continuous piece with curve portion a circular arc.
Length = Width+457mm (18")+circular arc.
2. #13 (#4) rebar 762mm (30") long, 305mm (1') O.C. shall be installed in top of walls for ties to top and gutters.
3. The reinforcing steel in the top slab shall be #10 (#3) bars 152mm (6") O.C. unless otherwise specified. Clearance shall be 38mm (1-1/2") from the bottom of the slab.
4. Concrete for the inlet top to be placed at the same time as the s/w curb and gutter.
5. Concrete shall be 332kg/M³-C-22-Mpa (560-C-3250)
6. Exposed edges of concrete shall be rounded with a radius of 13mm (1/2").
7. Surface of top slab shall be sidewalk finished to drain toward street at a slope not to exceed 2%



SECTION A-A

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	CURB INLET - TYPE D	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 3/01/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reformatted		T. Stanton	04/06			
						DRAWING NUMBER D-4

8mm (5/16") x 254mm (10") Steel Plate formed as shown



DETAIL-A

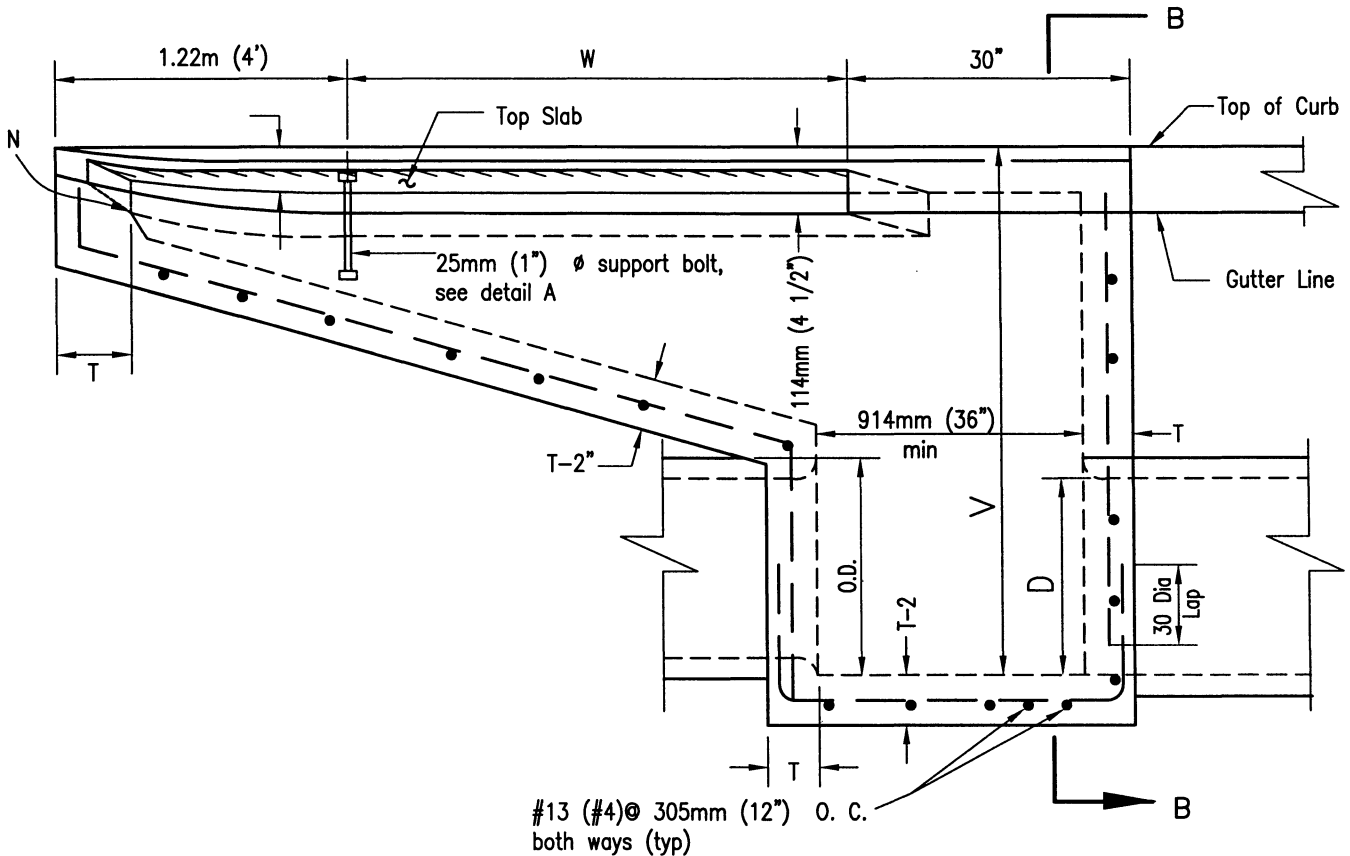
Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

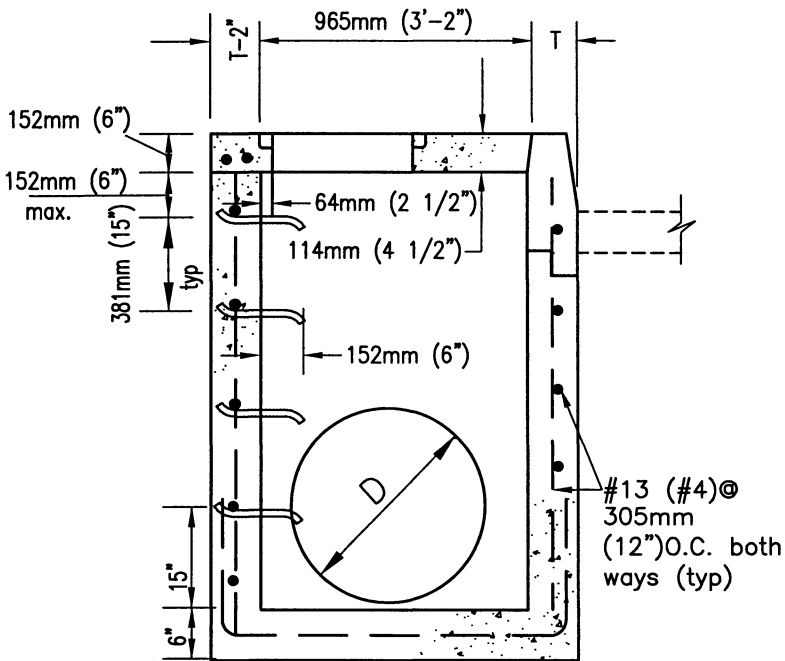
CURB INLET - TYPE D (DETAILS)

Chilpersen R.C.E. 19246 Date
[Signature] 5/01/2003
 DRAWING NUMBER **D-5A**



#13 (#4) @ 305mm (12") O.C. both ways (typ)

SECTION A-A MODIFIED



SECTION B-B

NOTES:

1. A plain, round steel protection bar 25mm (1") in dia. shall be installed. Bar shall be embedded 127mm (5") at each end.
2. Leave 203mm (8") hole blocked out in the bottom placing of concrete for bolts placed at the 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 1.52m (5'-0") O.C.
6. Adjusting nuts to be tightened and secured in placed when steel plate is in proper position.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE D (DETAILS)

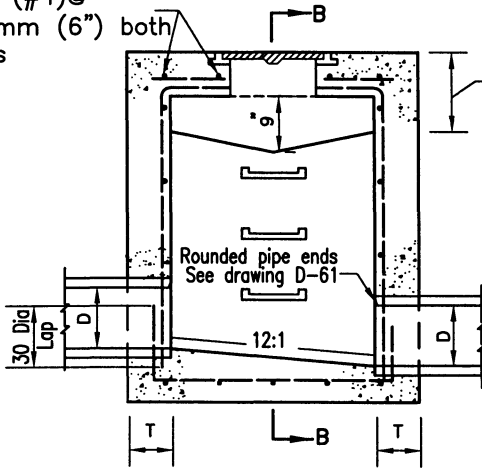
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-5B**

#13 (#4)@
152mm (6") both
ways



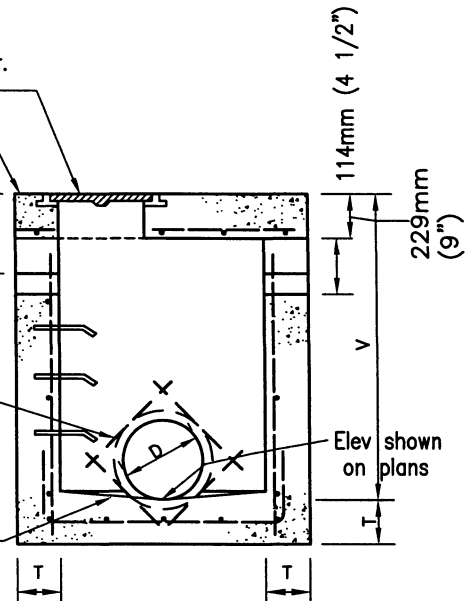
SECTION A-A

Manhole frame and cover.
See drawing M-2
Elev. shown on plans

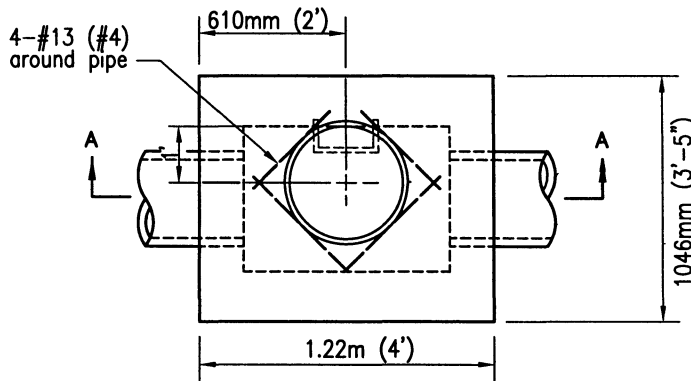
279mm (11")
unless shown
otherwise on
plans

4-#13 (#4)
around pipe

Slope floor 12:1
towards outlet



SECTION B-B



PLAN

NOTE:

1. See Standard Drawing D-11 for additional notes and details.
2. When V exceeds 1.22m (4') steps shall be installed. See Standard Drawing D-11 for details.
3. Exposed edges of concrete shall be rounded with a radius of 13mm (1/2").
4. Construct openings on both sides unless otherwise shown on plans.
5. Maintain 38mm (1-1/2") clear spacing between reinforcing and surface.
6. Install 25mm (1") steel protection bar.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

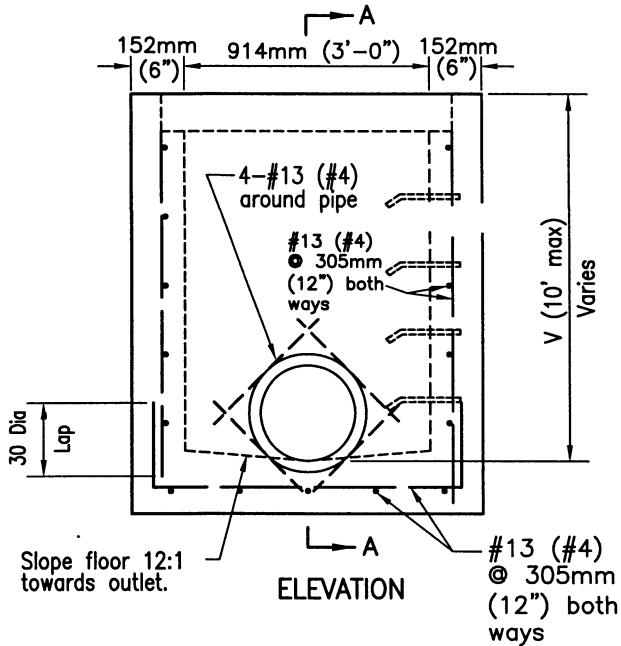
CATCH BASIN - TYPE F

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

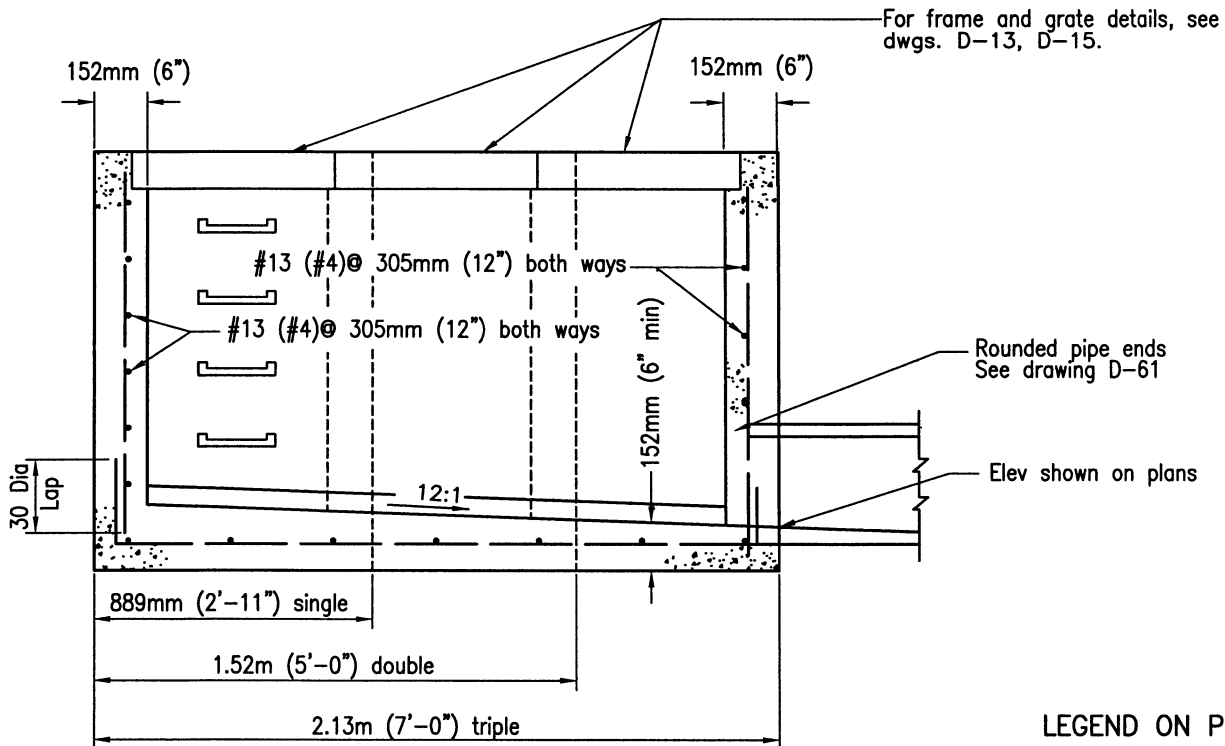
DRAWING
NUMBER

D-7



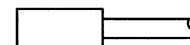
NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. When V exceeds 1.22m (4'), steps shall be installed. See Standard Drawing D-11 for details.
3. Maintain 38mm (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 radius of 13mm (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.



SECTION A-A

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

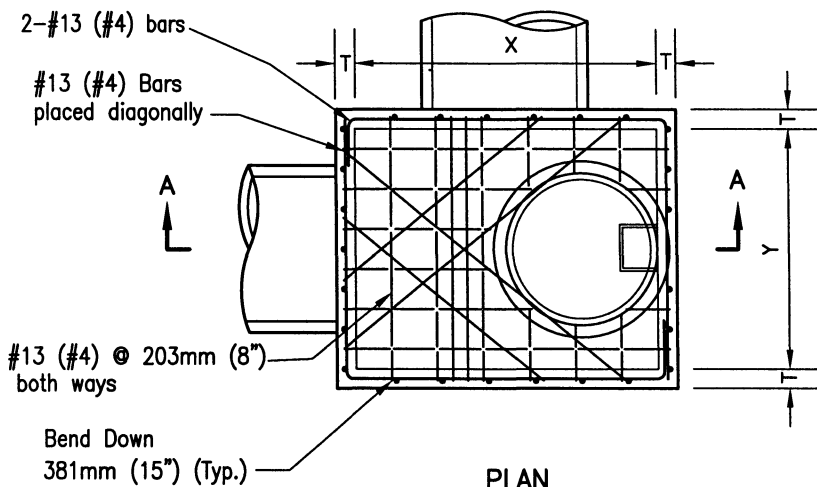
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE G

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

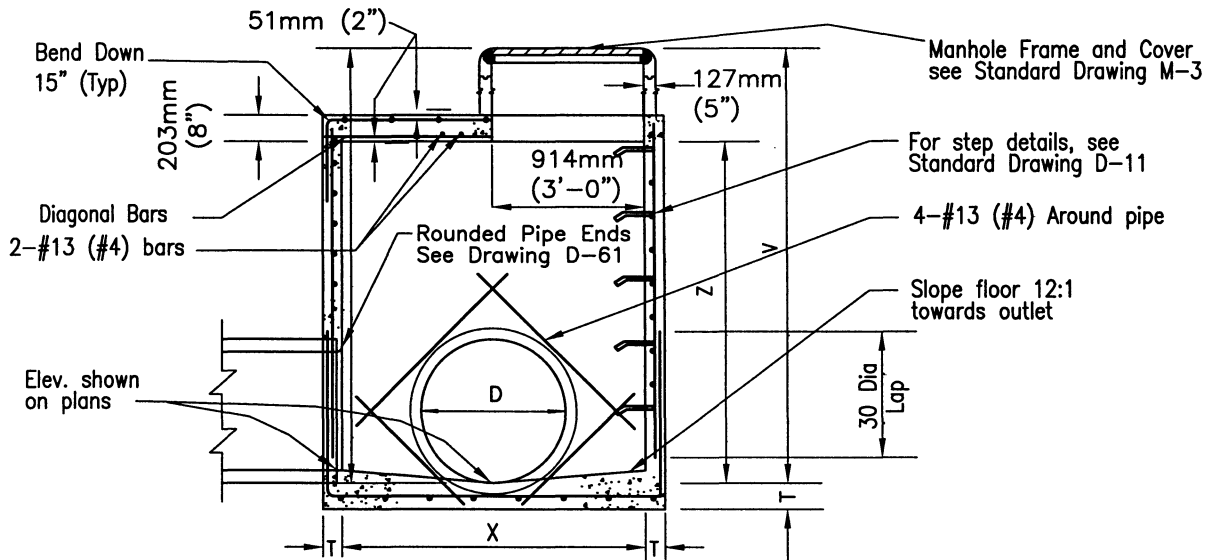
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-8



PLAN

TYPE	PIPE DIA.	X	Y	Z
A 4	up to 991mm (39")	1.22m (4')	1.22m (4')	1.83m (6')
A 5	1.1m (42") to 1.22m (48")	1.52m (5')	1.22m (4')	1.83m (6')
A 6	1.30m (51") to 1.50m (60")	1.83m (6')	1.22m (4')	1.83m (6')
A 7	1.60m (63") to 1.80m (72")	2.13m (7')	1.22m (4')	2.13m (7')
A 8	1.90m (75") to 2.13m (84")	2.44m (8')	1.22m (4')	2.44m (8')



SECTION A-A

NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. Concrete base shall be 332kg/M³-C-22Mpa (560-C-3250)
3. All precast components shall be reinforced with 6.35mm (1/4") diameter steel, wound spirally on 102mm (4") centers.
4. All joints shall be set in Class C mortar.
5. Maintain 38mm (1 1/2") clear spacing between reinforcing and surface unless otherwise noted.
6. Exposed edges of concrete shall be rounded with a radius of 13mm (1/2").
7. Manhole cover to be designated "Storm Drain".

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

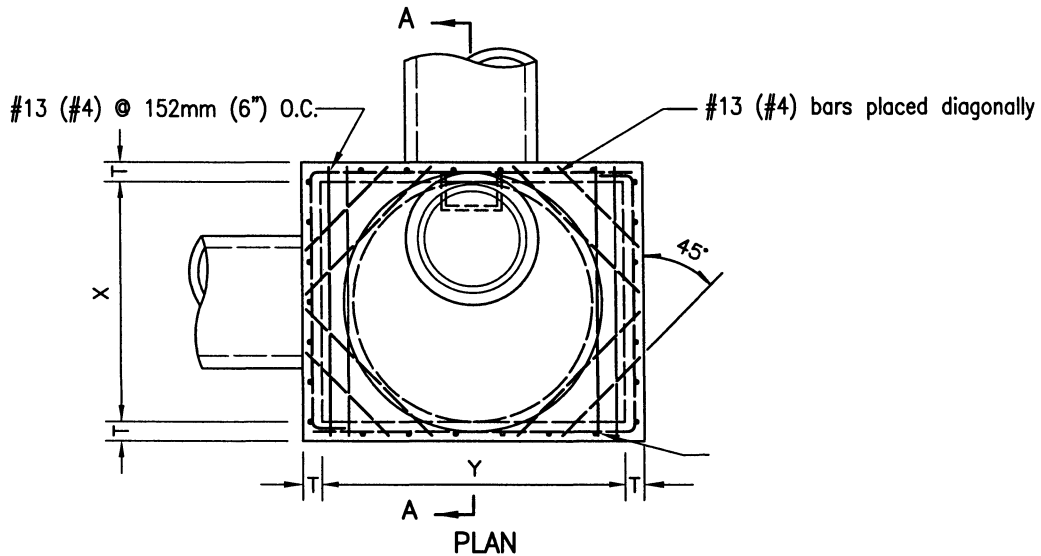
STORM DRAIN CLEANOUT - TYPE A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

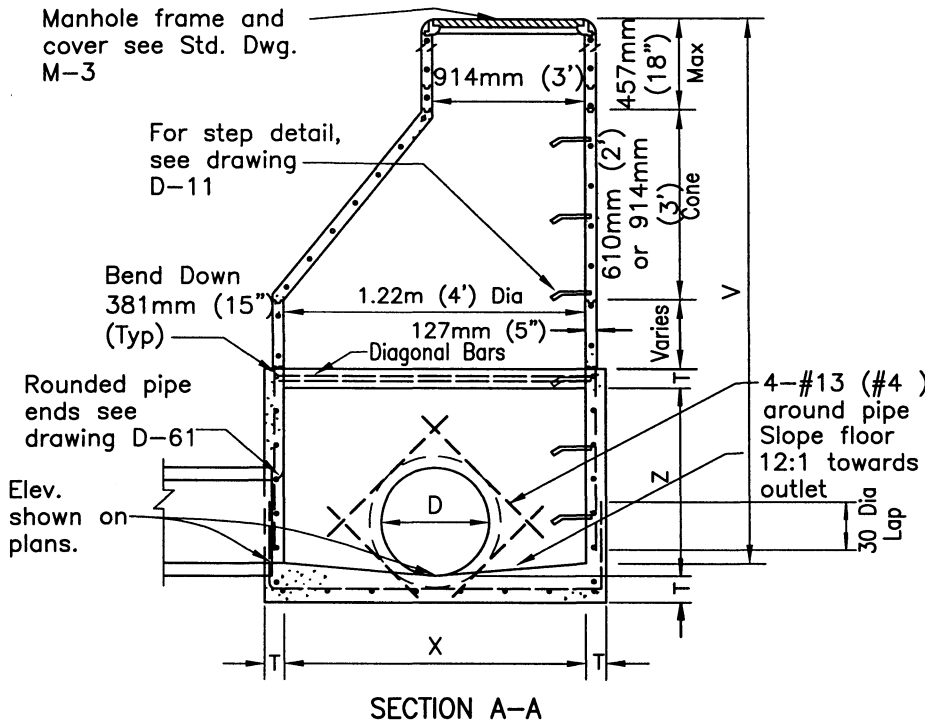
T. Stanton 310112003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER

D-9



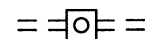
TYPE	PIPE DIAMETER	X	Y	Z
A 4	up to 1.30m (51")	1.22m (4')	1.53m (5')	1.53m (5')
A 5	1.37m (54") to 1.52m (60")	1.22m (4')	1.83m (6')	1.83m (6')
A 6	1.60m (63") to 1.80m (69")	1.22m (4')	2.13m (7')	2.13m (7')
A 7	1.83m (72") to 2.10m (81")	1.22m (4')	2.44m (8')	2.44m (8')
A 8	2.13m (84") to 2.30m (90")	1.22m (4')	2.74m (9')	2.74m (9')



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 6.35mm (1/4") diameter steel wound spirally on 102mm (4") centers.
4. Maintain 38mm (1-1/2") clear spacing between reinforcing and surface.
5. Concrete base shall be 332kg/M3-C-22-Mpa (560-C-3250).
6. Exposed edges of concrete shall be rounded with a radius of 13mm (1/2").
7. Manhole cover to be designated "Storm Drain".

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

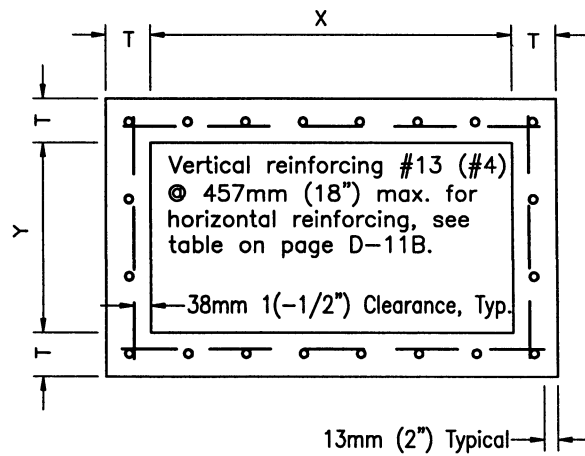
STORM DRAIN CLEANOUT - TYPE B

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

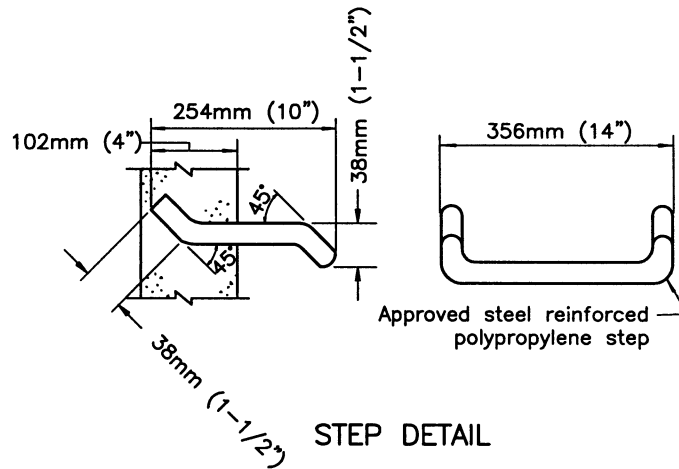
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER

D-10



TYPICAL BOX SECTION




NOTES

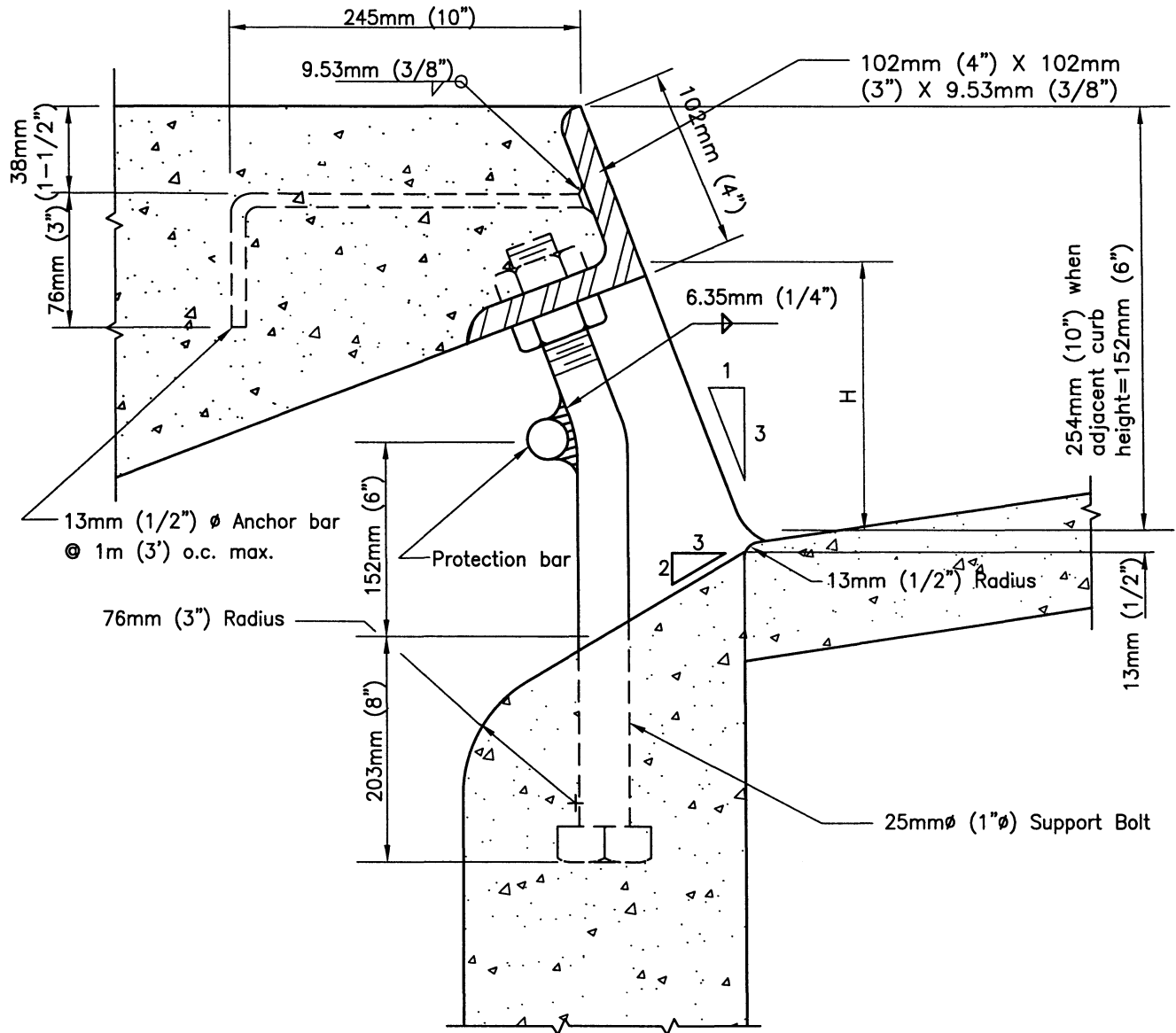
1. Concrete shall be 332kg/M³-C-22-Mpa (560-C-3250) unless otherwise noted.
2. Reinforcing steel shall comply with this drawing unless otherwise specified.
3. Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
4. Bends shall be in accordance with latest ACI code.
5. Minimum splice length for reinforcing shall be 30 diameters.
6. Floor shall have a wood trowel finish and, except where used as junction boxes, shall have a minimum slope of 1:12 toward the outlet.
7. Depth V is measured from the top of the structure to the flowline of the box.
8. Wall thickness and reinforcing steel required may be decreased in accordance with table above.
9. Wall thickness shall be stepped on the outside of the box.
10. When the structure depth V exceeds 1.21m (4'), steps shall be cast into the wall at 381mm (15") intervals from 381mm (15") above floor to within 305mm (12") of top of structure. Where possible place steps in wall without pipe opening, otherwise over opening of smallest diameter.
11. Alternate step may be an approved steel reinforced polypropylene step.
12. Upon approval of the Agency and the Engineer, as defined by Section 6703 of the Business and Professions Code, the use of precast storm structures is acceptable as an alternate to cast-in-place. Precast units shall conform to ASTM standards and be manufactured in a permanent facility designed for that purpose.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75		INLETS AND CLEANOUTS	<i>T. Stanton</i> 3/10/2003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reformatted		T. Stanton	04/06			DRAWING NUMBER
				D-11A		

BOX SECTION REINFORCEMENT			
MAXIMUM SPAN X or Y	DEPTH V	THICKNESS T	HOR. & FLR. REINF.
914mm (3'-0") to 1.22m (4'-0")	1.22m (4'-0")	152mm (6")	#13 (#4) @ 457mm (18")
1.24m (4'-1") to 2.13m (7'-0")		152mm (6")	#13 (#4) @ 305mm (12")
2.16m (7'-1") to 2.44m (8'-0")		152mm (6")	#13 (#4) @ 203mm (8")
914mm (3'-0") to 1.22m (4'-0")	1.24m to 2.44m (4'-1" to 8'-0")	152mm (6")	#13 (#4) @ 457mm (18")
1.24m (4'-1") to 1.52m (5'-0")		152mm (6")	#13 (#4) @ 305mm (12")
1.55m (5'-1") to 1.83m (6'-0")		152mm (6")	#13 (#4) @ 203mm (8")
1.85m (6'-1") to 2.44m (8'-0")		152mm (6")	#13 (#4) @ 152mm (6")
914mm (3'-0") to 1.22m (4'-0")	2.46m to 3.66m (8'-1" to 12'-0")	152mm (6")	#13 (#4) @ 381mm (15")
1.24m (4'-1") to 1.52m (5'-0")		203mm (8")	#13 (#4) @ 305mm (12")
1.55m (5'-1") to 1.83m (6'-0")		203mm (8")	#13 (#4) @ 203mm (8")
1.85m (6'-1") to 2.44m (8'-0")		203mm (8")	#13 (#4) @ 152mm (6")
914mm (3'-0") to 1.22m (4'-0")	3.68m to 4.88m (12'-1" to 16'-0")	203mm (8")	#13 (#4) @ 305mm (12")
1.24m (4'-1") to 1.52m (5'-0")		203mm (8")	#13 (#4) @ 305mm (12")
1.55m (5'-1") to 1.83m (6'-0")		203mm (8")	#13 (#4) @ 203mm (8")
1.85m (6'-1") to 2.13m (7'-0")		203mm (8")	#13 (#4) @ 152mm (6")
2.13m (7'-1") to 2.44m (8'-0")		203mm (8")	#13 (#5) @ 203mm (8")
914mm (3'-0") to 1.22m (4'-0")	4.90m to 6.10m (16'-1" to 20'-0")	203mm (8")	#13 (#4) @ 305mm (12")
1.24m (4'-1") to 1.52m (5'-0")		254mm (10")	#13 (#4) @ 305mm (12")
1.55m (5'-1") to 1.83m (6'-0")		254mm (10")	#13 (#4) @ 203mm (8")
1.85m (6'-1") to 2.13m (7'-0")		254mm (10")	#13 (#4) @ 152mm (6")
2.13m (7'-1") to 2.44m (8'-0")		254mm (10")	#13 (#5) @ 203mm (8")
914mm (3'-0") to 1.22m (4'-0")	6.12m to 7.32m (20'-1" to 24'-0")	203mm (8")	#13 (#4) @ 305mm (12")
1.24m (4'-1") to 1.52m (5'-0")		254mm (10")	#13 (#4) @ 305mm (12")
1.55m (5'-1") to 1.83m (6'-0")		254mm (10")	#13 (#4) @ 203mm (8")
1.85m (6'-1") to 2.13m (7'-0")		254mm (10")	#13 (#4) @ 152mm (6")
2.13m (7'-1") to 2.44m (8'-0")		305mm (12")	#13 (#5) @ 203mm (8")

HORIZONTAL REINFORCING

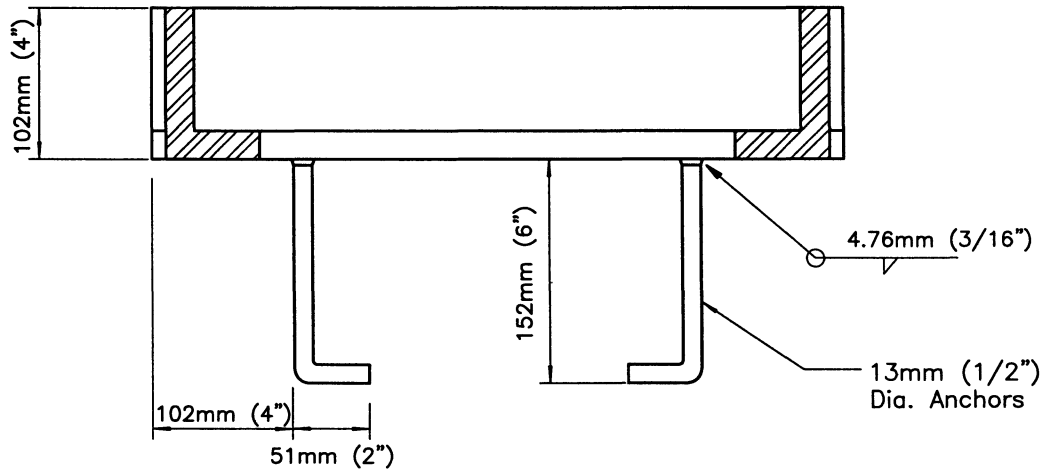
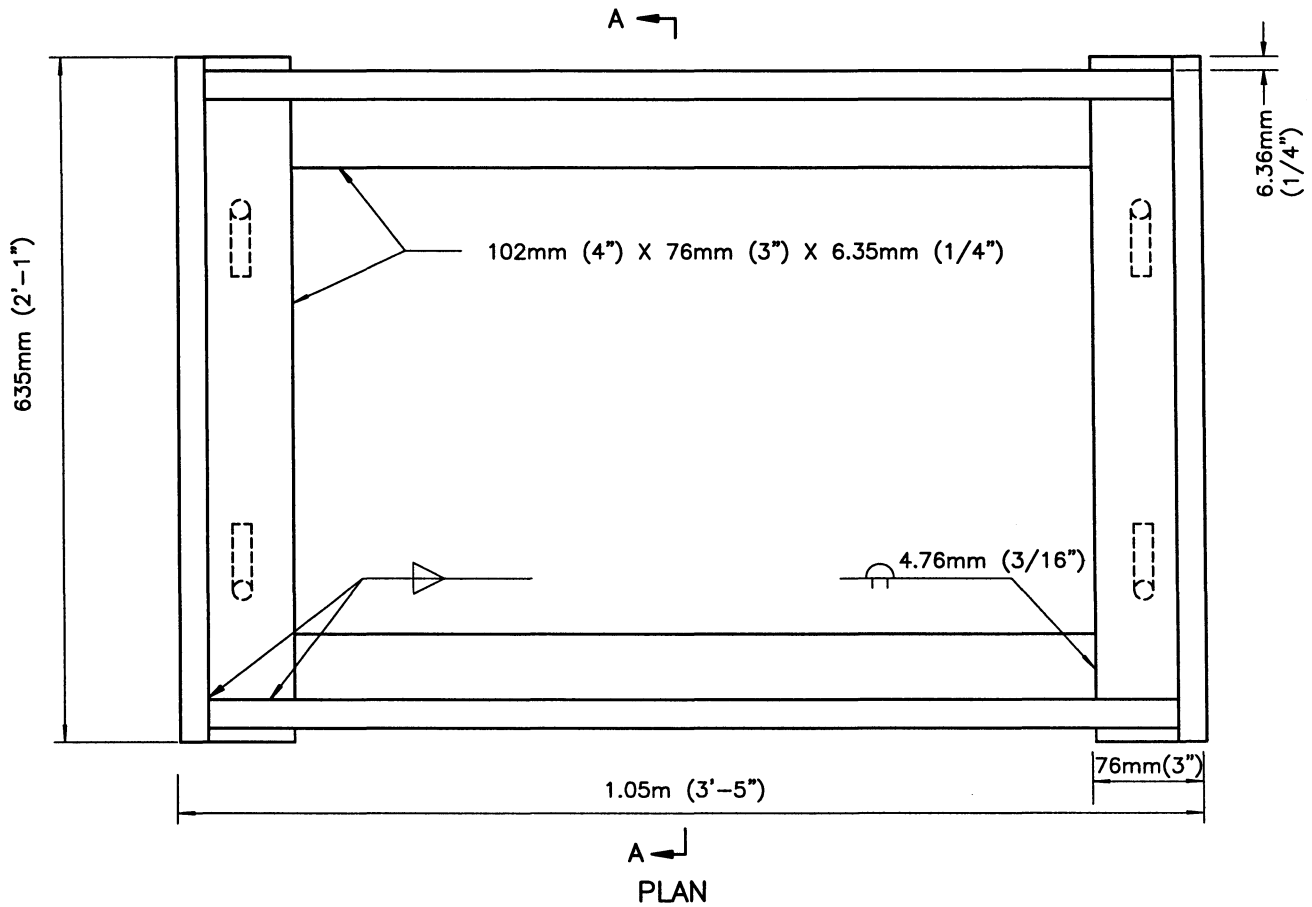
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING INLETS AND CLEANOUTS NOTES AND DETAILS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  3/10/2003 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Reformatted		T. Stanton	04/06		
				DRAWING NUMBER D-11B	



NOTES

1. Face angle shall be cast into structure continuous for the full length "L".
2. All exposed metal parts shall be hot-dipped galvanized after fabrication.
3. When curb inlet opening height (H) exceeds 152mm (6") install 25mm (1"Ø) steel protection bar.
4. Install additional bars at 89mm (3-1/2") clear spacing above first bar when opening exceeds 330mm (13").
5. When curb inlet opening length exceeds 2.44m (8') install 25mm (1"Ø) steel support bolts, spaced at not more than 1.52m (5') o.c.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		CURB INLET OPENING
Add Metric		T. Stanton	03/03		
Reformatted		T. Stanton	04/06		
				DRAWING NUMBER	D-12



NOTE
Hot dip galvanize all parts after fabrication.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

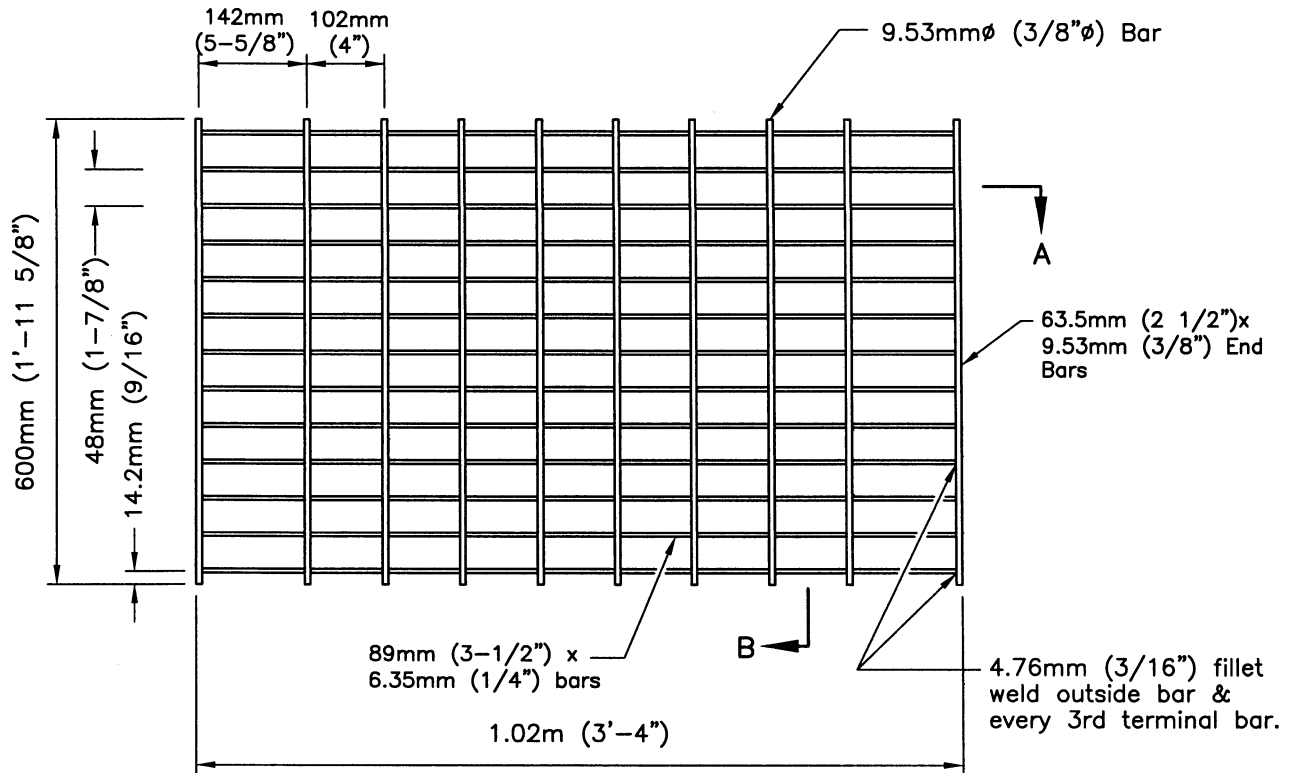
SAN DIEGO REGIONAL STANDARD DRAWING

WELDED STEEL GRATE FRAME

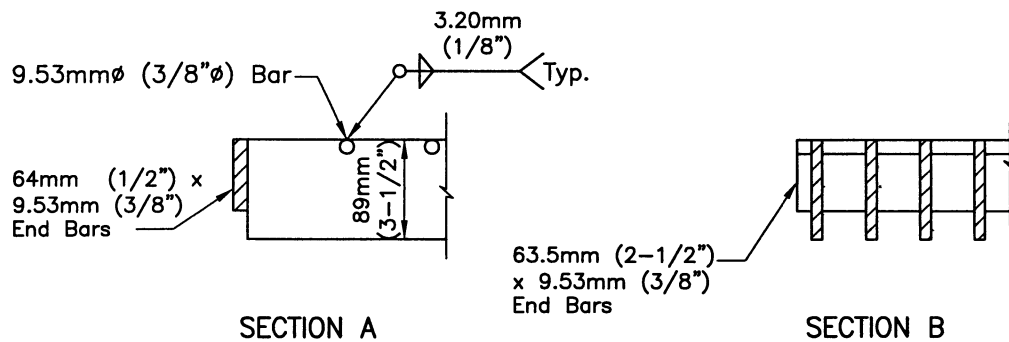
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-13**



PLAN



SECTION A

SECTION B

NOTES

1. Hot dip galvanize all parts after fabrication.
2. Dimensions to centerline of bars unless otherwise noted.
3. Weight: 64kg (143 pounds).
4. Not to be used in pedestrian areas.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE STRUCTURE GRATE

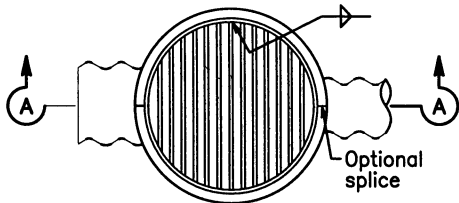
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

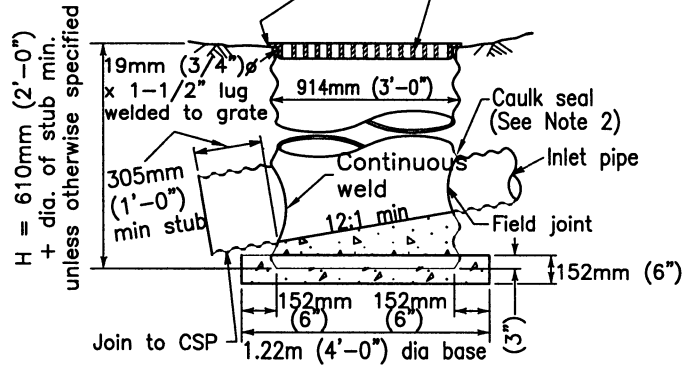
Chairperson R.C.E. 19246 Date

DRAWING NUMBER

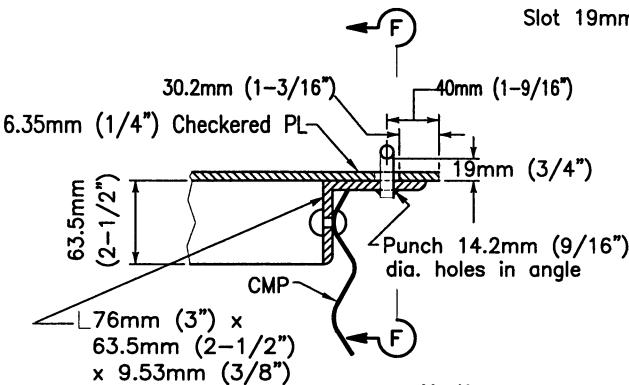
D-15



Punch 25mm (1") hole in CSP
Place pipe so bars of grate will be parallel with main surface flow.



SECTION A-A
TYPE A

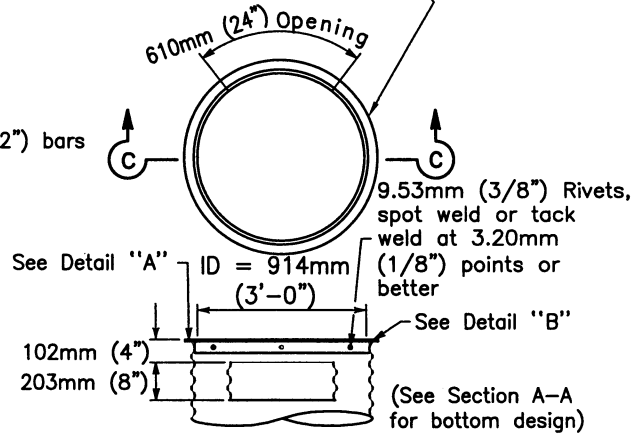


DETAIL "B"

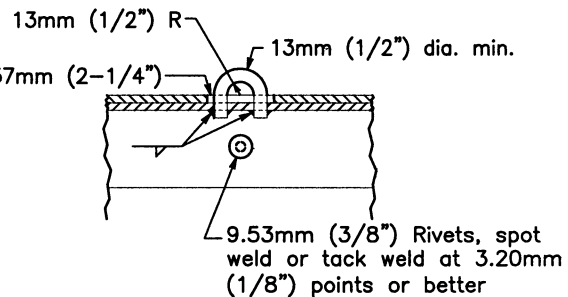
NOTES

- All components shall be galvanized.
- Inlet and outlet pipes shall be set at factory and positioned as shown on plans
- Ladders and Steps: None required where "H" is 1.10m (3'-6") or less. Where "H" is between 1.10m (3'-6") and 1.50m (4'-11") place one step + 406mm (16") above the floor. If "H" is 1.52m (5') or more install a ladder placing lowest rung 406mm (16") above the floor and the highest rung not more than 356mm (14") below top of inlet. Place single step or ladder in wall with wall opening.
- See Standard Drawing D-17 for additional details.
- Grate to be provided when specified.
- Grate detail shall be as shown on Standard Drawing D-17 unless otherwise approved by Agency.

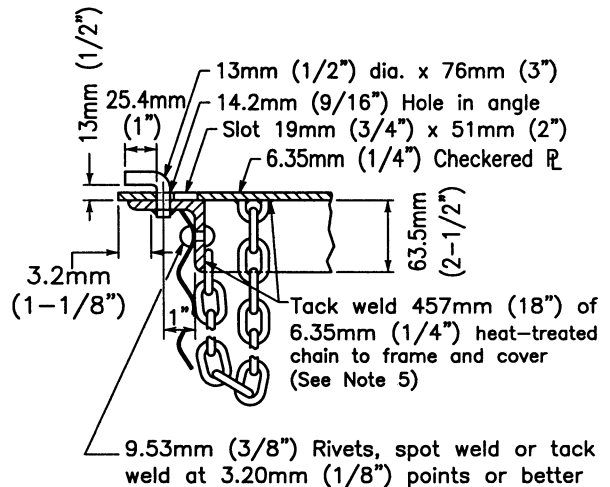
L 76mm (3") X 3.5mm
(2-1/2") X 9.53mm
(3/8") Rivet, Spot Weld or
Tack Weld at 1/8 points
or better to CSP



SECTION C-C
TYPE B



SECTION F-F



DETAIL "A"

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

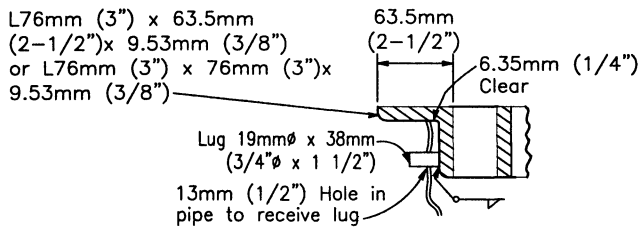
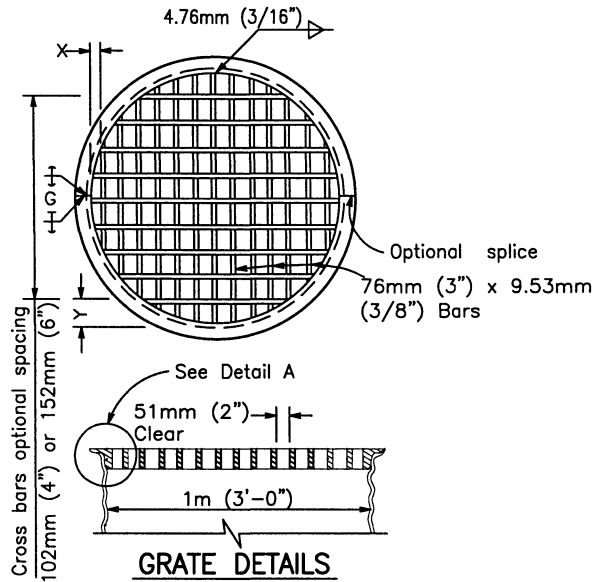
SAN DIEGO REGIONAL STANDARD DRAWING

CORRUGATED STEEL PIPE INLETS
TYPES A AND B

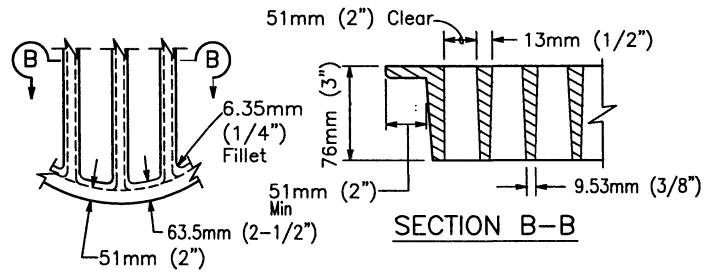
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER
D-16

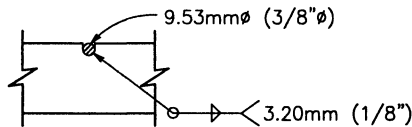


DETAIL A



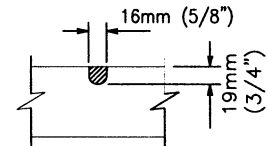
SECTION B-B

**ALTERNATIVE CAST NODULAR IRON GRATE
OR CAST STEEL GRATE**



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

**CROSS BAR DETAIL TYPE
WELDED STEEL GRATE**



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

GRATE BAR SPACING TABLE

TYPE	NO. OF BARS	CLEAR BAR SPACING	X	Y	
				102mm (4") SPACING	152mm (6") SPACING
Welded Steel	15	51mm (2")	14.2mm (9/16")	95mm (3-3/4")	146mm (5-3/4")
Cast	13	51mm (2")	54mm (2-1/8")	95mm (3-3/4")	146mm (5-3/4")

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

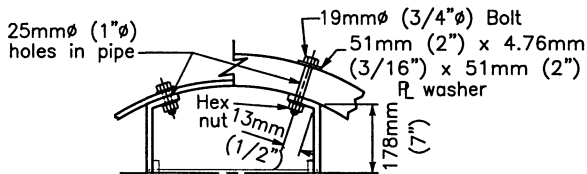
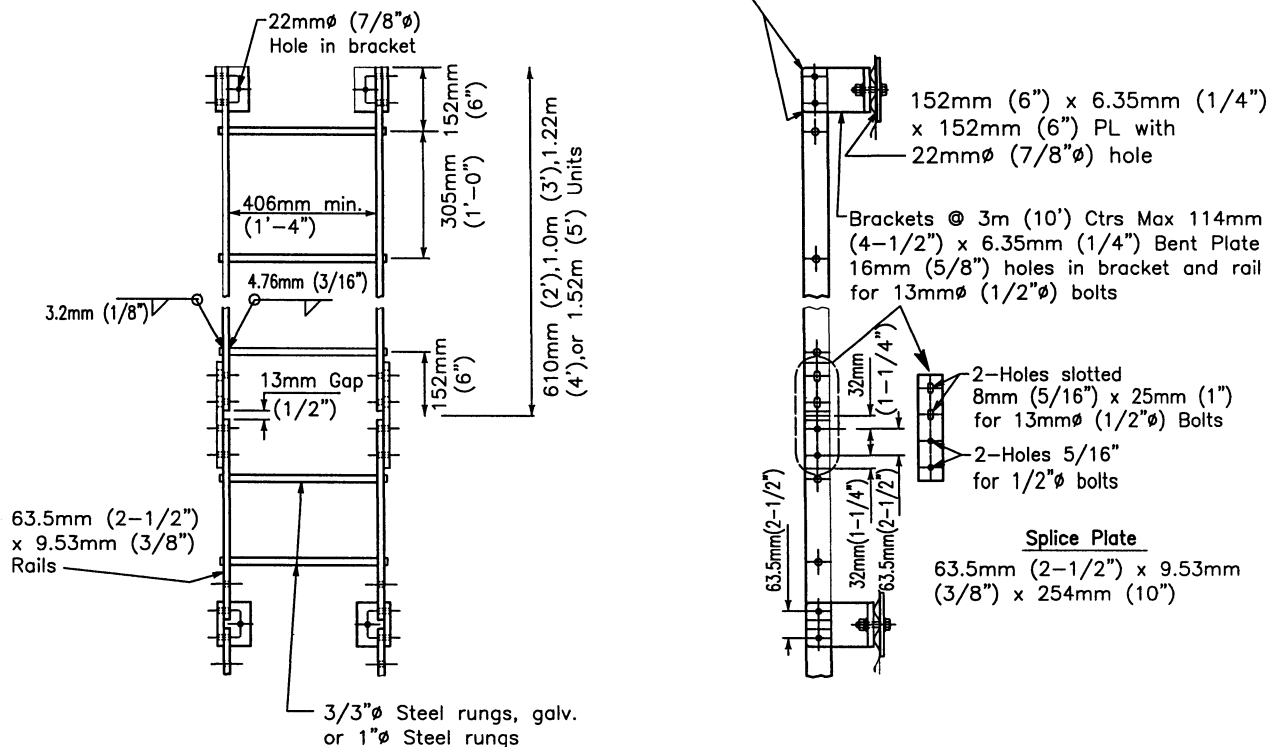
**CORRUGATED STEEL PIPE INLETS,
DETAILS**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

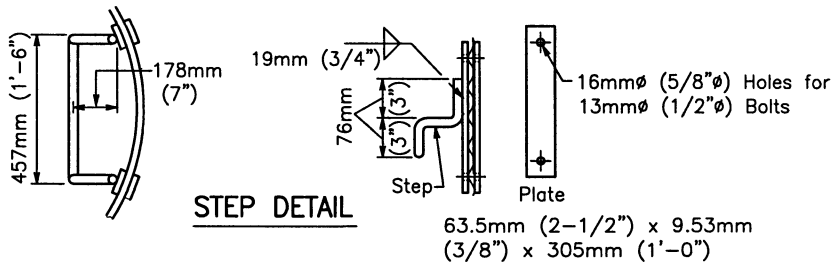
T. Stanton 310112003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-17A**

Grind all exposed corners
6.35mm (1/4") radius



LADDER DETAIL



STEP DETAIL

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

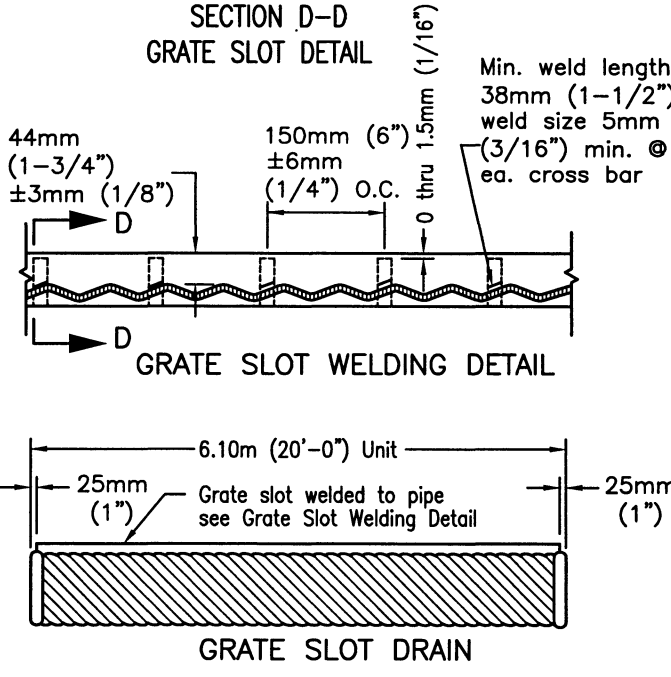
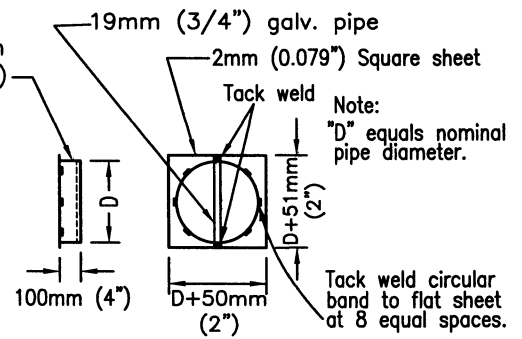
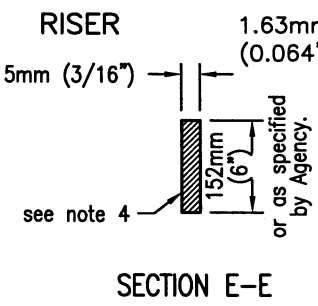
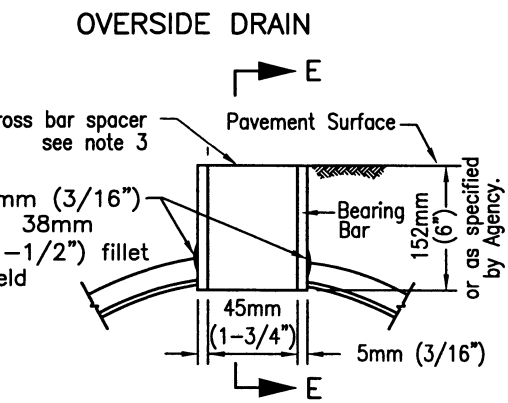
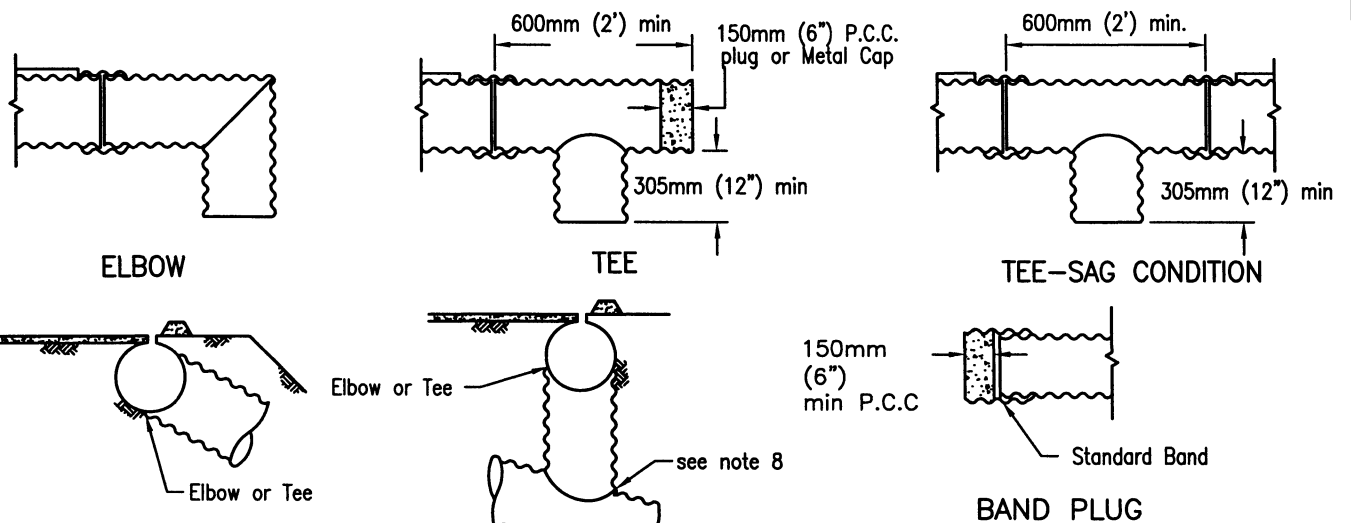
**CORRUGATED STEEL PIPE INLETS,
DETAILS**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE


T. Stanton 310112003

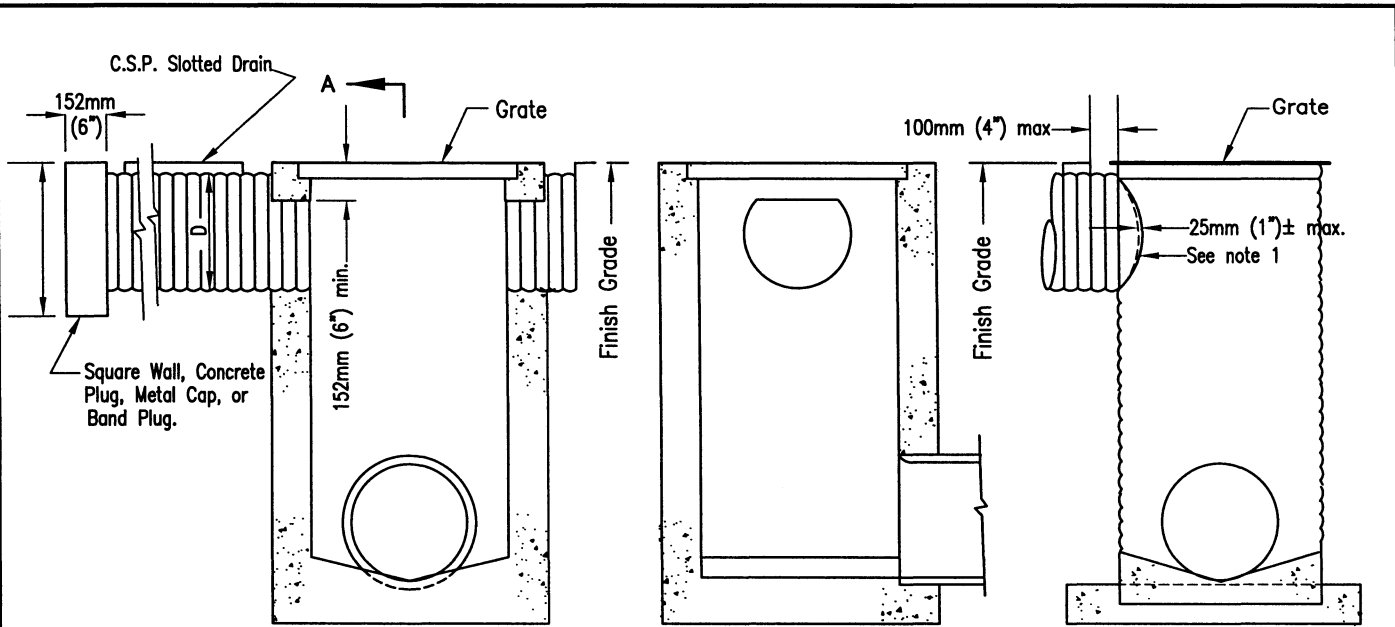
Chairperson R.C.E. 19246 Date

**DRAWING
NUMBER D-17B**



- NOTES**
1. Drain seams may be constructed by riveting or resistance spot-welding, continuous helical lock seam or helical welding seam at equal centers.
 2. Each drain section shall be assembled with standard coupling bands.
 3. Cross bar spacer of grate shall be pressure fused 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 13mm (1/2") in 6.1m (20').
 7. Installation lengths shall be 3m (10') 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.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75	SLOTTED CORRUGATED STEEL PIPE DRAINS 300mm (12") THROUGH 600mm (24")		 3101/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reformatted		T. Stanton	04/06			
						DRAWING NUMBER D-18

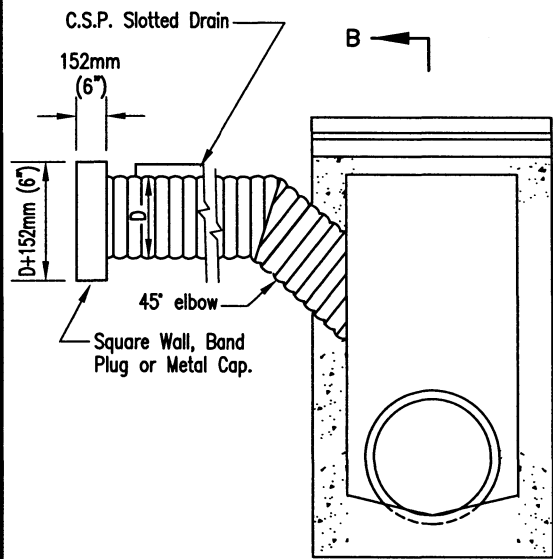


A ←

SECTION A-A

C.S.P. INLET

CATCH BASIN



B ←

SECTION B-B

ALTERNATE SECTION B-B

INLETS

NOTES

1. Either field joint with a pliable mixture of sand, portland cement 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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

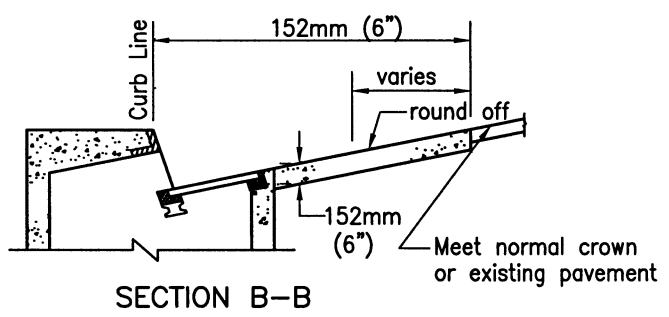
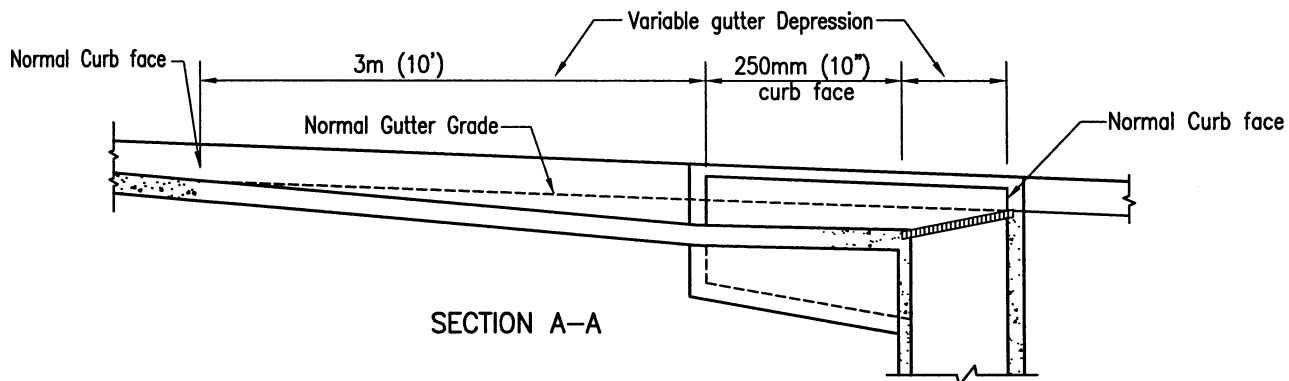
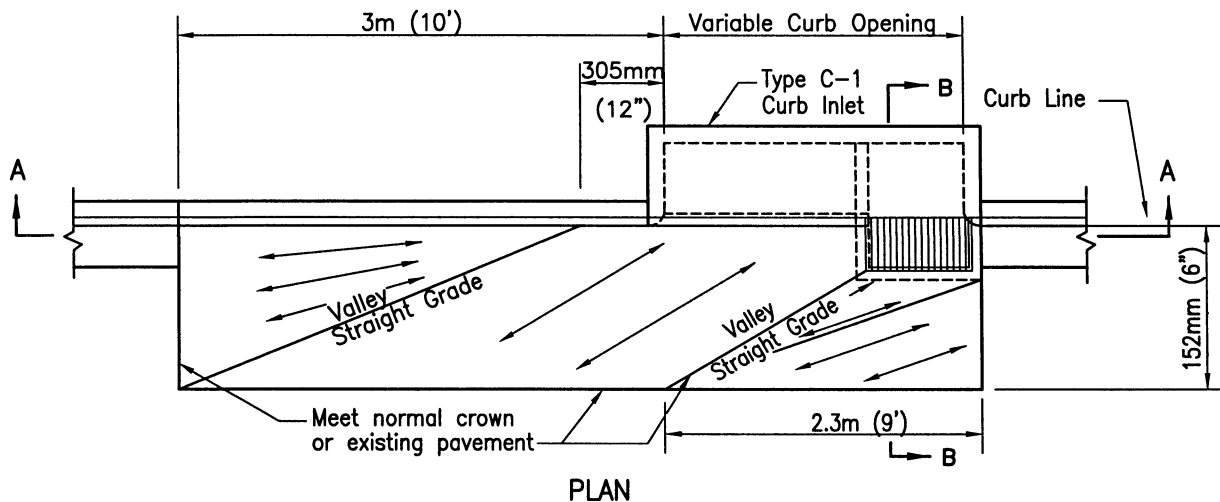
**SLOTTED DRAIN CONNECTIONS
TO STANDARD INLETS**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-19**

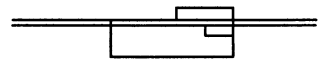
SEE SDD-100



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 308kg/M³C-17 Mpa (520-C-2500)

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

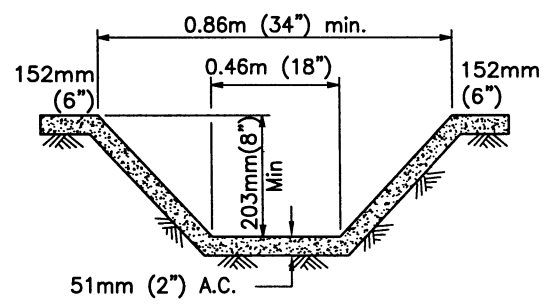
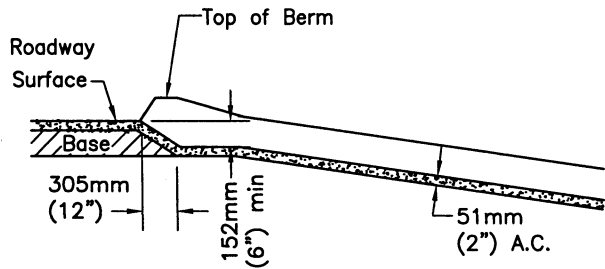
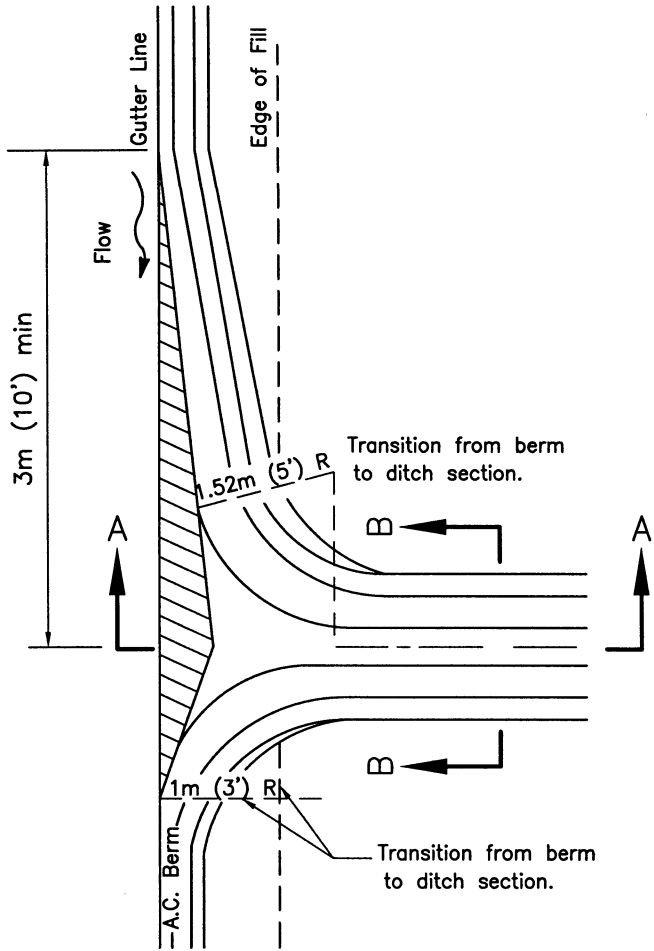
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE APRON FOR CURB INLET

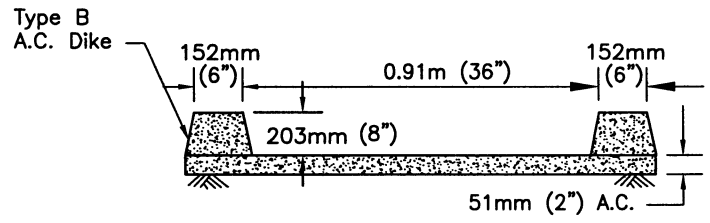
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-20**



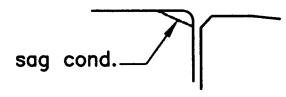
NOTE
1. Cross sectional area of ditch may be round or trapezoidal.



NOTE

1. A.C. spillway may be used when fill is 3m (10') or less, and where fill slope 1-1/2:1 or flatter.
2. Use 3m (10') min. length of gutter transition on each side of downdrain in sag condition.
3. A round sectional area of equal flow capacity may be used.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

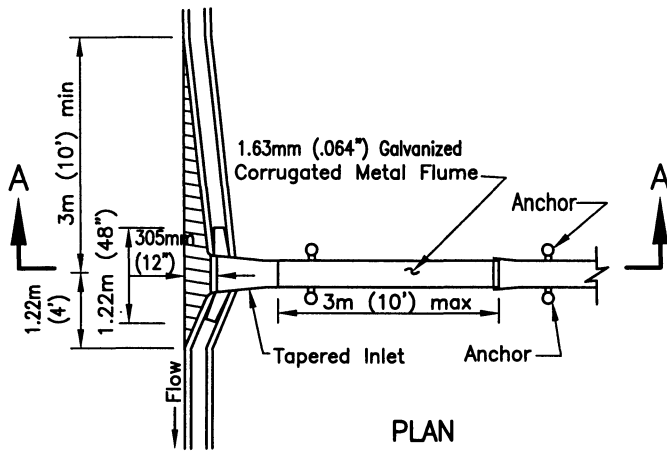
SAN DIEGO REGIONAL STANDARD DRAWING

ASPHALT CONCRETE SPILLWAY

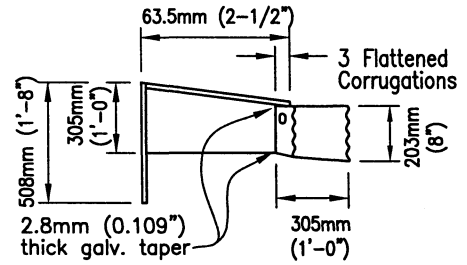
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 310112003
Chairperson R.C.E. 19246 Date

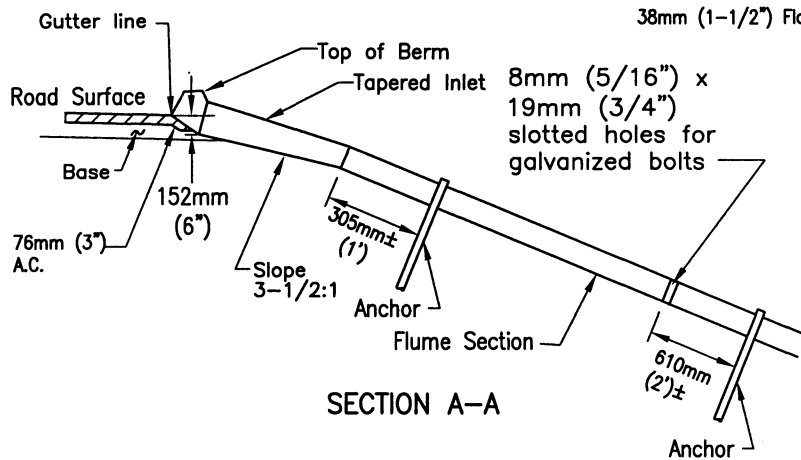
DRAWING NUMBER **D-22**



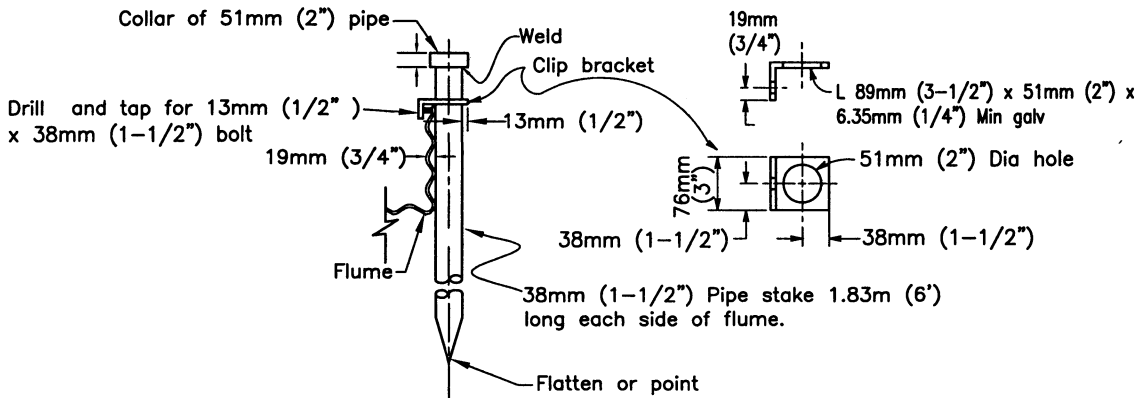
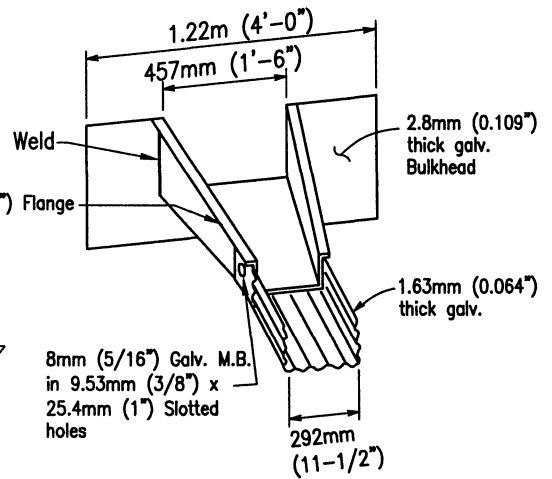
PLAN



TAPERED INLET



SECTION A-A

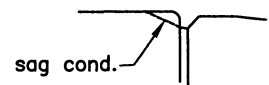


ANCHOR-DETAIL

NOTES

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

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

TAPERED INLET AND DOWNDRAIN FLUME

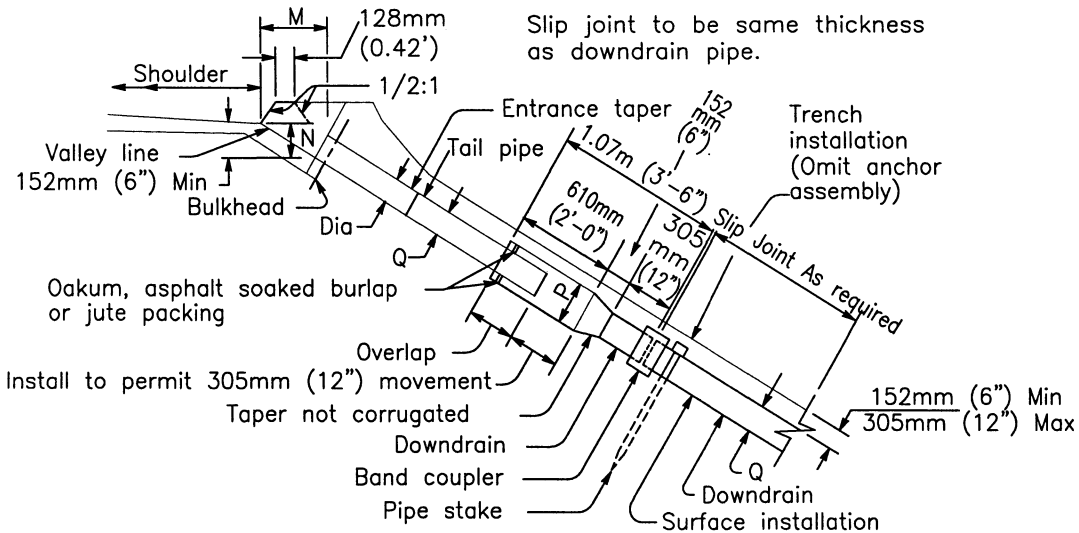
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER

D-23

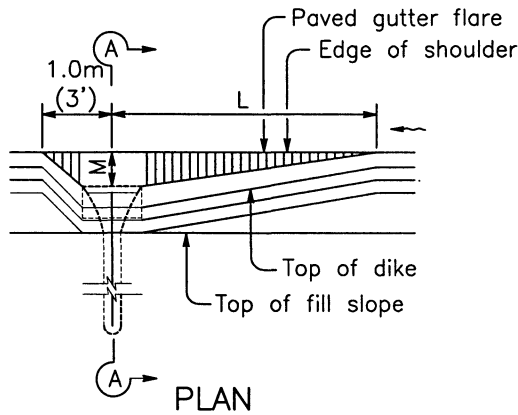


SECTION A-A

CMP dimensions as tabulated below

P	254mm (10")	381mm (15")	457mm (18")	533mm (21")	686mm (27")
Q	203mm (8")	305mm (12")	381mm (15")	457mm (18")	610mm (24")

DIAMETER	MINIMUM L	M	N
203mm (8")	3.0 m (10')	457mm (18")	203mm (8")
305mm (12")	4.57m (15')	508mm (20")	305mm (12")
381mm (15")	7.62m (25')	610mm (24")	381mm (15")
457mm (18")	9.14m (30')	762mm (30")	406mm (16")
610mm (24")	12.2m (40')	914mm (36")	457mm (18")



NOTES

1. Cable, slip joint or anchor assembly to be placed when specified.
2. Slip joint to be omitted when completely buried.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T.Stanton	03/03
Reformatted		T.Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

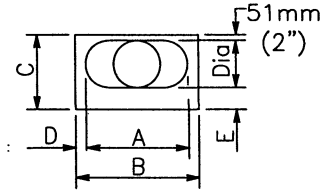
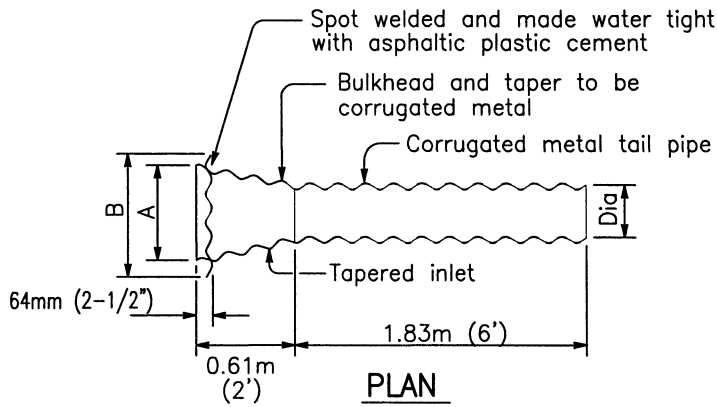
ENTRANCE TAPER AND DOWNDRAIN PIPE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

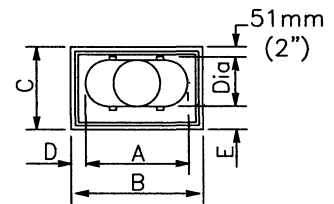
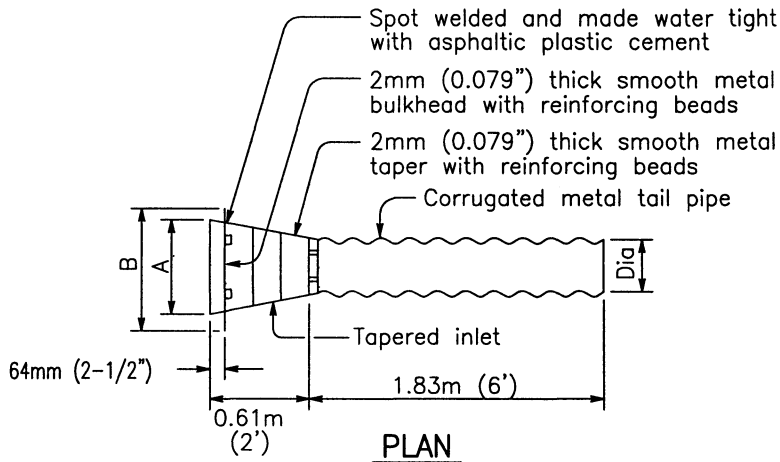
DRAWING NUMBER D-24A

Slip joint to be same thickness as downdrain pipe.



Bulkhead and taper of same thickness as tail pipe with 0.079" max.
Tail pipe of same thickness as downdrain pipe.

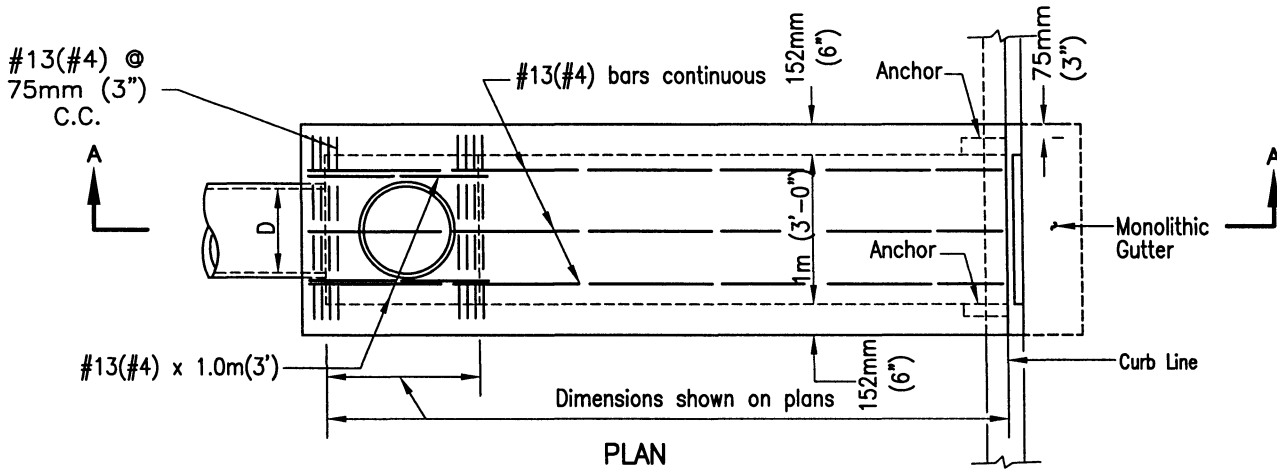
ENTRANCE TAPER
ALTERNATIVE A



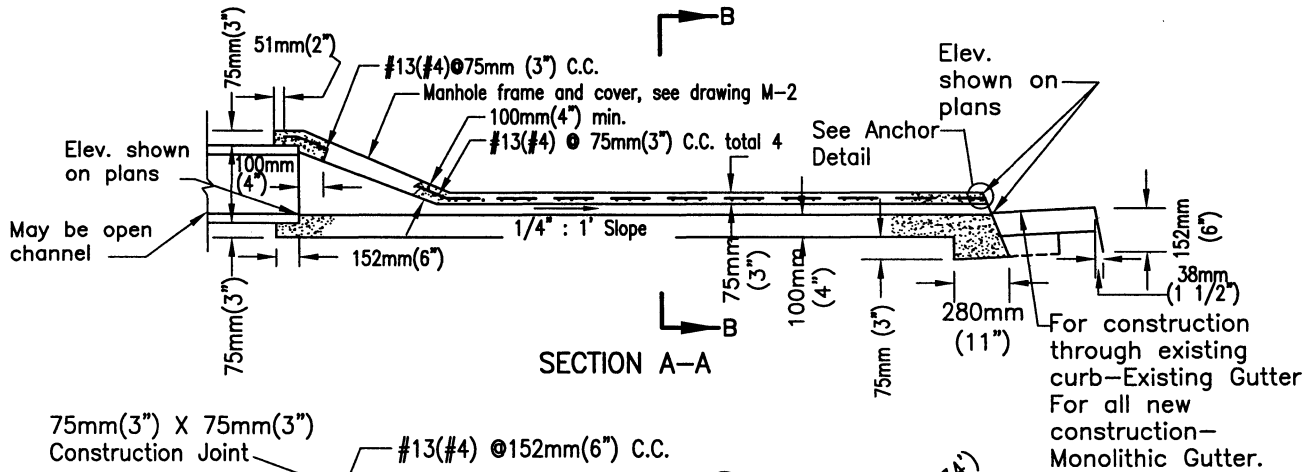
Tail pipe of same thickness as downdrain pipe.

ENTRANCE TAPER
ALTERNATIVE B

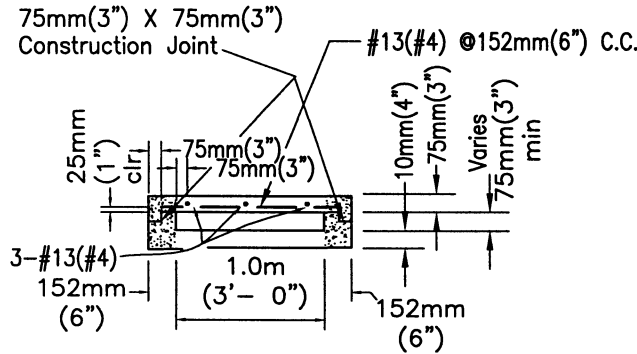
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75		ENTRANCE TAPER AND DOWNDRAIN PIPE	<i>T. Stanton</i> 3/10/2003
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246		Date
Reformatted		T. Stanton	04/06	DRAWING NUMBER		D-24B



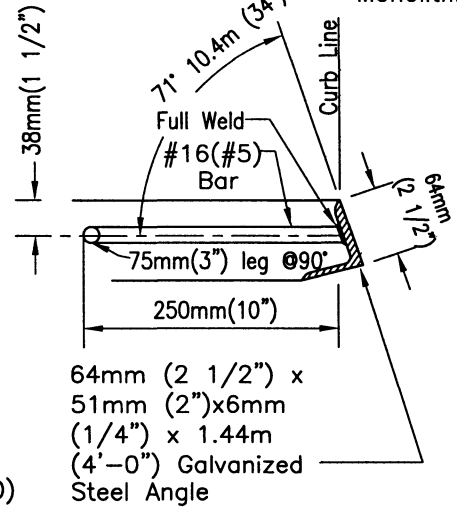
PLAN



SECTION A-A

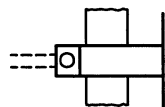


SECTION B-B



ANCHOR DETAIL

LEGEND ON PLANS



NOTES

1. Concrete shall be 332 kg/M³ -C-22Mpa (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.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T.Stanton	03/03
Reformatted		T.Stanton	04/06

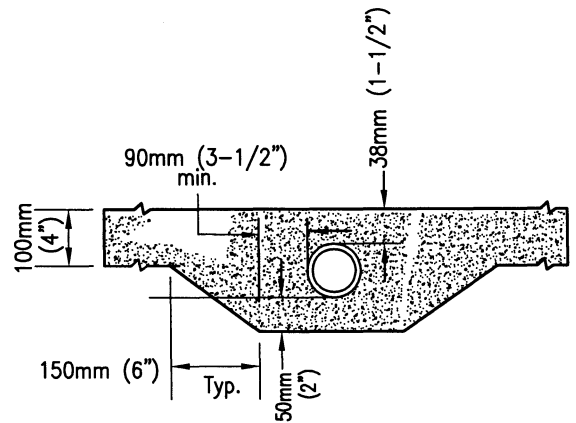
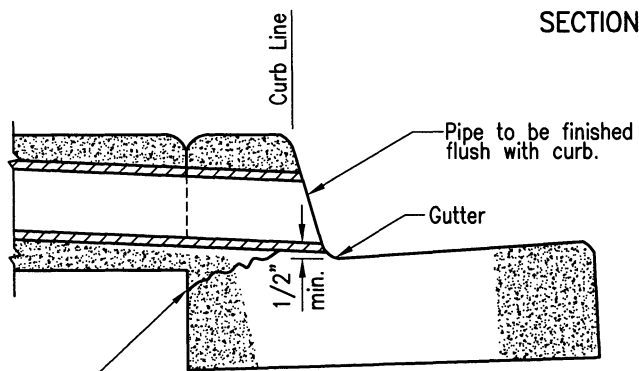
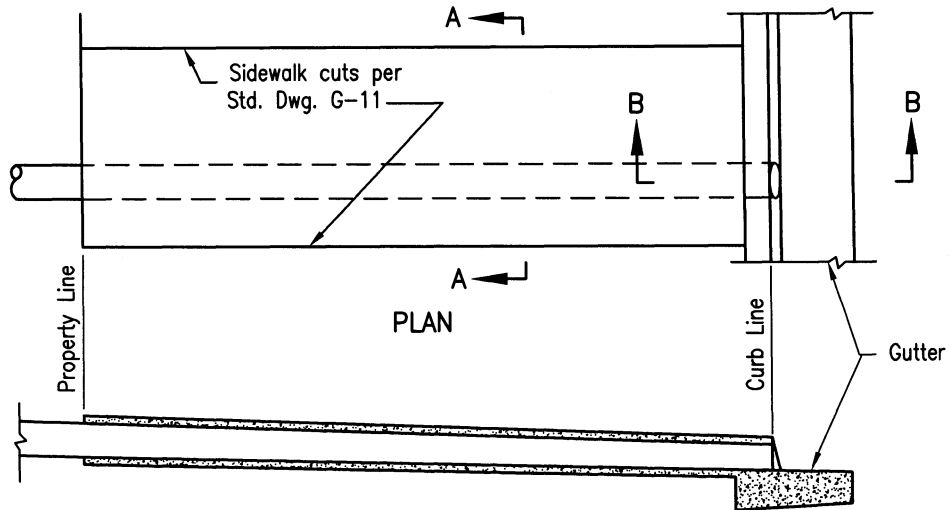
SAN DIEGO REGIONAL STANDARD DRAWING

CURB OUTLET - TYPE A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-25**

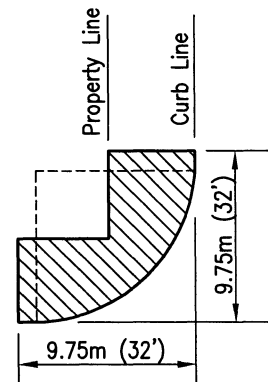


Optional break line for cuts in existing curb and gutter.

SECTION B-B

SECTION A-A

APPROVED DRAIN PIPE SIZES	
PIPE SIZE	CURB HEIGHT
75mm (3")	150mm (6") to 200mm (8") CURB FACE
100mm (4")	200mm (8") CURB FACE
150mm (6")	250mm (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 308kg/M³-C-17 Mpa (520-C-2500)
4. Pipe shall be circular rigid plastic, or approved equal.
5. Coring of existing curb may be used as an alternative.

Drain shall not occupy the hatched area

BLOCK CORNER

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T.Stanton	03/03
Reformatted		T.Stanton	04/06

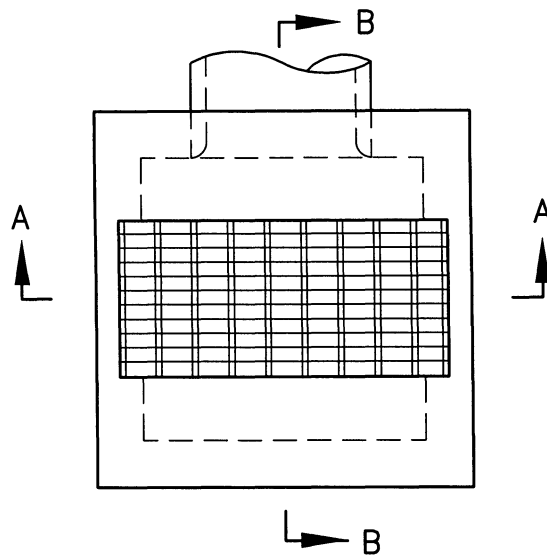
SAN DIEGO REGIONAL STANDARD DRAWING

SIDEWALK UNDERDRAIN PIPE

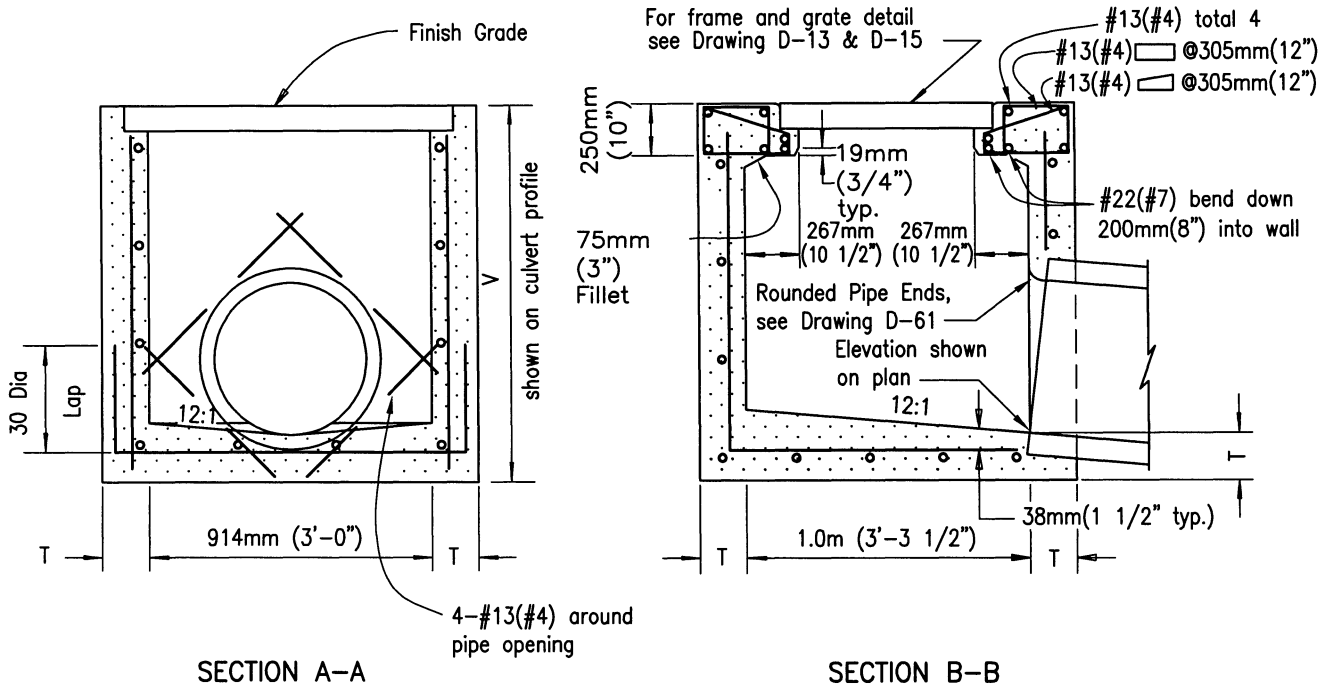
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-27**



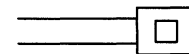
PLAN



NOTES

1. See Standard Drawing D-11 for additional notes and details.
2. When V exceeds 1.2m (4'), steps shall be installed

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Solomon	7/79
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

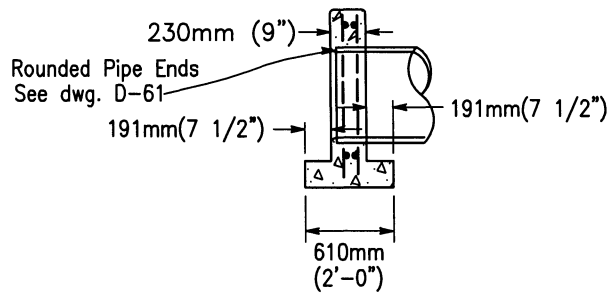
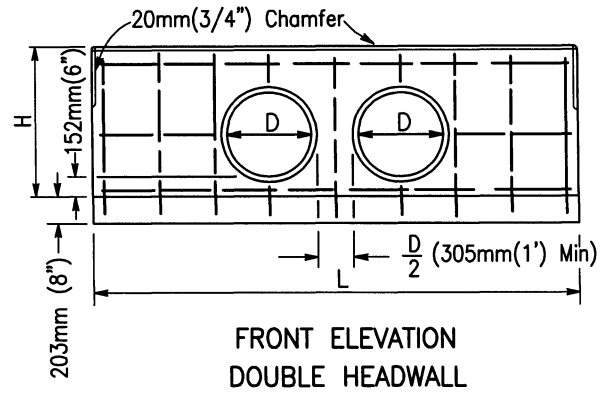
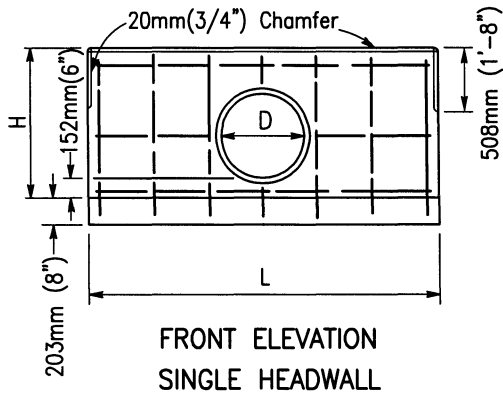
SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE I

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-29**

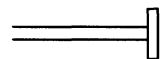


D	H	SINGLE				DOUBLE			
		L	Steel kg Lbs.	Concrete cu m C.Y.	L	Steel kg Lbs.	Concrete cu m C.Y.		
300mm(12")	813mm(2'-8")	1.52m (5'-0")	15.9 (35)	0.46 (0.60)	2.44m (8'-0")	22.7 (50)	0.72 (0.94)		
375mm(15")	889mm(2'-11")	1.83m (6'-0")	18.1 (40)	0.57 (0.75)	2.90m (9'-6")	27.2 (60)	0.89 (1.17)		
450mm(18")	965mm(3'-2")	2.13m (7'-0")	22.7 (50)	0.70 (0.91)	3.20m (10'-6")	34.0 (75)	1.03 (1.35)		
525mm(21")	1.04m (3'-5")	2.29m (7'-6")	27.2 (60)	0.78 (1.02)	3.51m (11'-6")	40.8 (90)	1.16 (1.52)		
600mm(24")	1.12m (3'-8")	2.59m (8'-6")	34.0 (75)	0.92 (1.20)	3.81m (12'-6")	45.4 (100)	1.32 (1.72)		
675mm(27")	1.19m (3'-11")	2.90m (9'-6")	38.6 (85)	1.06 (1.39)	4.27m (14'-0")	52.2 (115)	1.53 (2.00)		
750mm(30")	1.27m (4'-2")	3.05m (10'-0")	38.6 (85)	1.16 (1.52)	4.57m (15'-0")	57.2 (126)	1.69 (2.21)		
825mm(33")	1.35m (4'-5")	3.35m (11'-0")	45.4 (100)	1.32 (1.73)	4.88m (16'-0")	59.0 (130)	1.85 (2.42)		
900mm(36")	1.42m (4'-8")	3.65m (12'-0")	47.6 (105)	1.49 (1.95)	5.18m (17'-0")	65.8 (145)	2.03 (2.65)		
975mm(39")	1.50m (4'-11")	3.81m (12'-6")	59.0 (130)	1.60 (2.09)	5.49m (18'-0")	77.1 (170)	2.20 (2.88)		
1050mm (42")	1.57m (5'-2")	4.11m (13'-6")	63.5 (140)	1.79 (2.34)	5.79m (19'-0")	84.0 (185)	2.39 (3.13)		
1150mm (45")	1.65m (5'-5")	4.42m (14'-6")	68.0 (150)	1.99 (2.60)	6.10m (20'-0")	88.5 (195)	2.58 (3.38)		
1225mm (48")	1.73m (5'-8")	4.57m (15'-0")	72.6 (160)	2.10 (2.75)	6.40m (21'-0")	90.7 (200)	2.78 (3.64)		
1300mm (51")	1.80m (5'-11")	4.88m (16'-0")	81.6 (180)	2.32 (3.03)	6.86m (22'-6")	102 (225)	3.07 (4.02)		
1375mm (54")	1.88m (6'-2")	5.18m (17'-0")	86.2 (190)	2.53 (3.31)	7.16m (23'-6")	109 (240)	3.29 (4.30)		

NOTES

- Concrete shall be 332 kg/M³ -C-22Mpa (560-C-3250)
- All reinforcing shall be #13(#4) bars. All vertical and horizontal tie bars @ 457mm(18") maximum spacing.

LEGEND ON PLANS

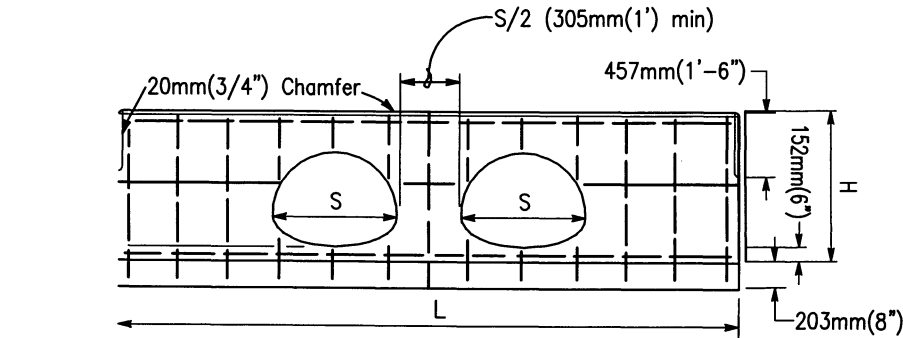


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	STRAIGHT HEADWALL - TYPE A (CIRCULAR PIPE)	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 3101/2003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reformatted		T. Stanton	04/06			DRAWING NUMBER D-30

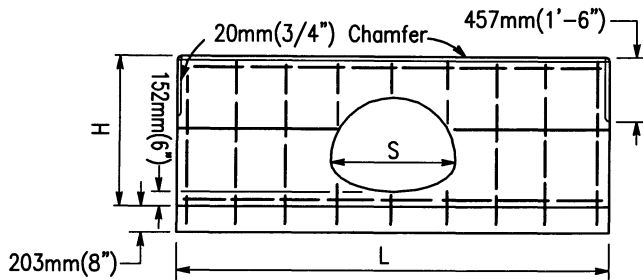
Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

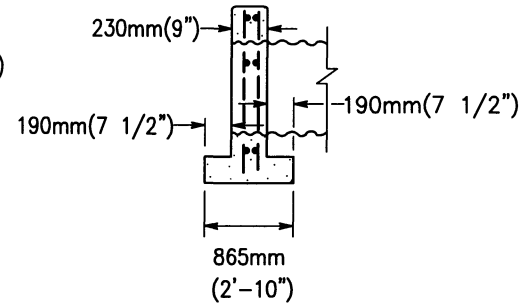
STRAIGHT HEADWALL - TYPE A
(C.S.P. - ARCH)



ELEVATION - DOUBLE HEADWALL



ELEVATION - SINGLE HEADWALL



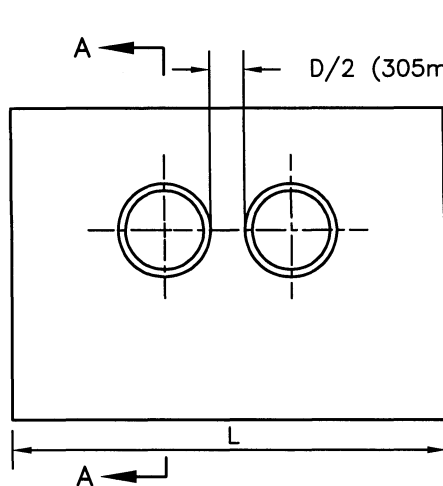
SECTION, SINGLE & DOUBLE HEADWALLS

C.S.P. ARCH SIZE Metric (inches)	SINGLE				DOUBLE		
	H Metric (ft/in)	L Metric (ft/in)	Steel	Concrete cu m C.Y.	L Metric (ft/in)	Steel kg Lbs.	Concrete cu m C.Y.
450mmx275mm (18x11)	787mm (2-7)	1.68m (5-6)	16.8 (37)	.490 (0.64)	2.44m (8'-0")	23.6 (52)	.700 (0.91)
525mmx375mm (21x15)	889mm (2-11)	1.98m (6-6)	20.4 (45)	.612 (0.80)	3.05m (10'-0")	27.2 (60)	.940 (1.22)
600mmx450mm (24x18)	965mm (3-2)	2.29m (7-6)	22.7 (50)	.734 (0.96)	3.51m (11'-6")	31.8 (70)	1.11 (1.45)
700mmx500mm (28x20)	1.02m (3-4)	2.59m (8-6)	27.3 (60)	.860 (1.12)	4.12m (13'-6")	40.9 (90)	1.35 (1.76)
875mmx600mm (35x24)	1.12m (3-8)	3.20m (10-6)	38.6 (85)	1.13 (1.47)	4.72m (15'-6")	54.5 (120)	1.66 (2.16)
1050mmx725mm (42x29)	1.24m (4-1)	3.81m (12-6)	50.0 (110)	1.34 (1.76)	5.49m (18'-0")	65.8 (145)	1.97 (2.57)
1225mmx825mm (49x33)	1.35m (4-5)	4.42m (14-6)	59.0 (130)	1.73 (2.26)	6.40m (21'-0")	77.2 (170)	2.40 (3.13)
1425mmx950mm (57x38)	1.47m (4-10)	5.18m (17-0)	70.4 (155)	2.15 (2.81)	7.47m (24'-6")	95.3 (210)	2.96 (3.86)
1550mmx1050mm (64x43)	1.60m (5-3)	5.79m (19-0)	79.4 (175)	2.54 (3.31)	8.23m (27'-0")	104.4 (230)	3.38 (4.42)
1775mmx1175mm (71x47)	1.70m (5-7)	6.40m (21-0)	88.5 (195)	2.92 (3.81)	9.14m (30'-0")	115.7 (255)	3.90 (5.09)

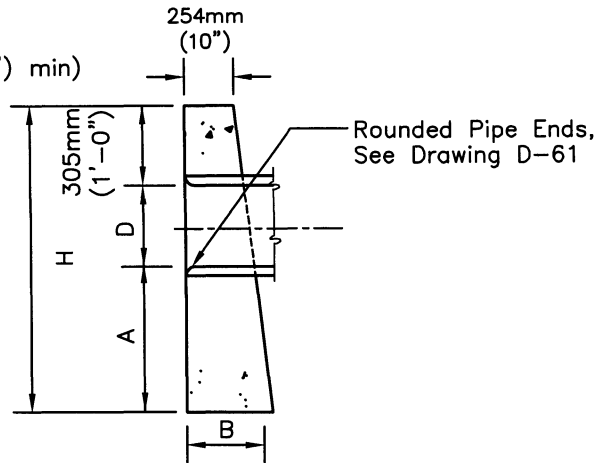
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Christerson R.C.E. 19246 Date

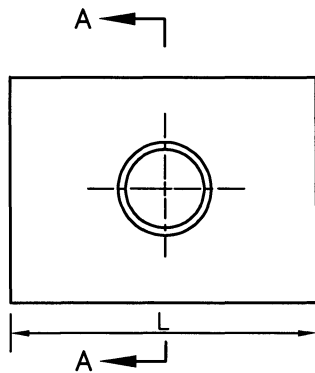
DRAWING NUMBER **D-31**



DOUBLE PIPE
ELEVATION



SECTION A-A



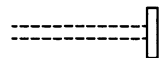
SINGLE PIPE
ELEVATION

D mm in.	A mm ft./in.	B mm ft./in.	H m ft./in.	SINGLE		DOUBLE	
				L m ft./in.	Concrete kg C.Y.	L m ft./in.	Concrete kg C.Y.
300 (12")	610 (2'-0")	305 (1'-0")	1.22 (4'-0")	1.22 (4'-0")	.345 (0.45)	1.73 (5'-8")	.475 (.62)
375 (15")	610 (2'-0")	330 (1'-1")	1.30 (4'-3")	1.52 (5'-0")	.482 (0.63)	2.16 (7'-1")	.650 (.85)
450 (18")	610 (2'-0")	356 (1'-2")	1.40 (4'-6")	1.83 (6'-0")	.635 (0.83)	2.59 (8'-6")	.860 (1.12)
600 (24")	762 (2'-6")	432 (1'-5")	1.68 (5'-6")	2.44 (8'-0")	1.18 (1.54)	3.45 (11'-4")	1.60 (2.09)
750 (30")	762 (2'-6")	533 (1'-9")	1.83 (6'-0")	3.05 (10'-0")	1.85 (2.41)	4.32 (14'-2")	2.50 (3.26)
900 (36")	914 (3'-0")	610 (2'-0")	2.13 (7'-0")	3.66 (12'-0")	2.86 (3.74)	5.18 (17'-0")	3.87 (5.05)

NOTES

- Concrete shall be 332 kg/M³-C-22Mpa (560-C-3250).
- Exposed corners shall be chamfered 19mm (3/4").

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

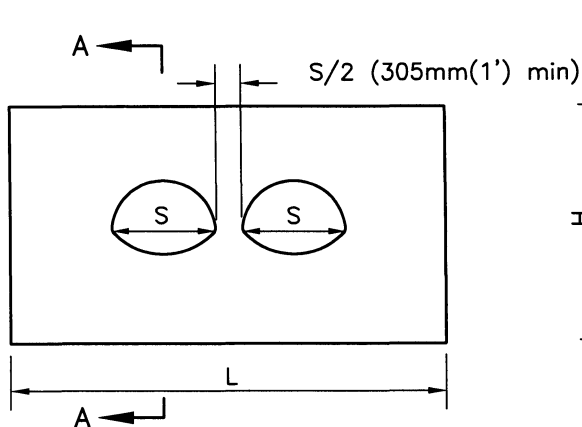
SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE B
(CIRCULAR PIPE)

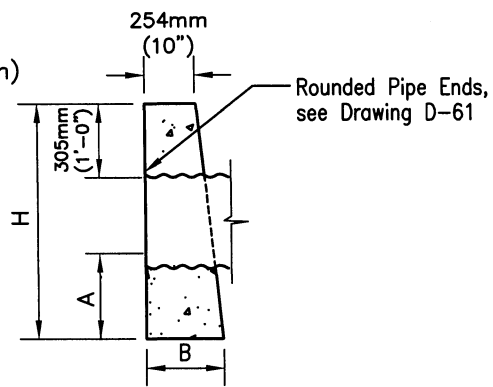
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

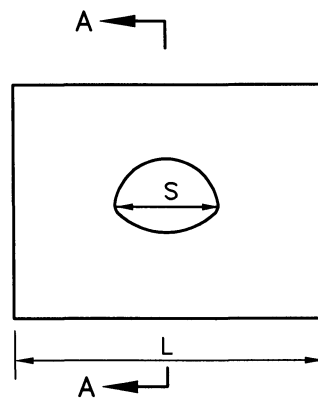
DRAWING
NUMBER **D-32**



DOUBLE PIPE
ELEVATION



SECTION A-A



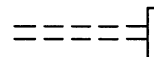
SINGLE PIPE
ELEVATION

C.S.P. ARCH SIZE Metric (inches)	A		B		H		SINGLE		DOUBLE					
	mm	ft./in.	mm	ft./in.	m	ft./in.	L m	Concrete cu m C.Y.	L m	Concrete cu m C.Y.				
450mmx275mm (18x11)	610	(2'-0")	356	(1'-2")	1.19	(3'-11")	1.83	(6')	0.64	(0.83)	2.21	(7'-3")	0.75	(0.97)
525mmx375mm (21x15)	610	(2'-0")	406	(1'-4")	1.24	(4'-1")	2.13	(7')	0.83	(1.08)	2.95	(9'-8")	1.12	(1.46)
600mmx450mm (24x18)	610	(2'-0")	457	(1'-6")	1.32	(4'-4")	2.44	(8')	1.08	(1.41)	3.51	(11'-6")	1.52	(1.98)
700mmx500mm (28x20)	762	(2'-6")	508	(1'-8")	1.52	(5'-0")	2.74	(9')	1.51	(1.97)	3.81	(12'-6")	2.04	(2.66)
875mmx600mm (35x24)	762	(2'-6")	610	(2'-0")	1.63	(5'-4")	3.05	(10')	1.96	(2.56)	4.37	(14'-5")	2.76	(3.60)

NOTES

- Concrete shall be 332 kg/M³ -C-22Mpa (560-C-3250)
- Exposed corners to be chamfered 19mm (3/4").

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

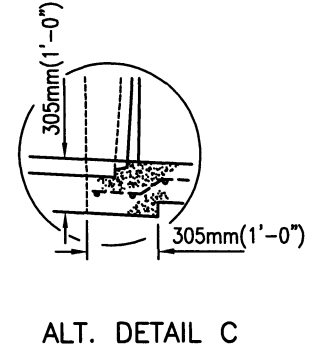
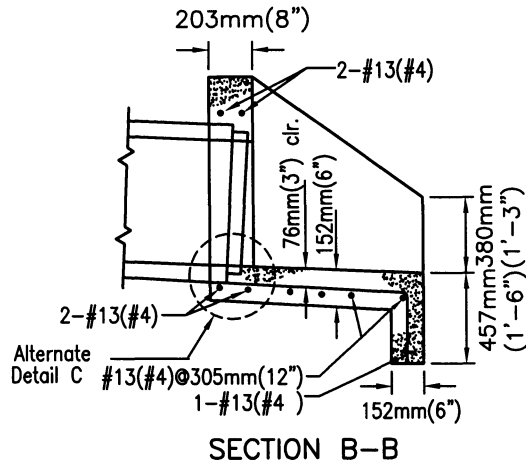
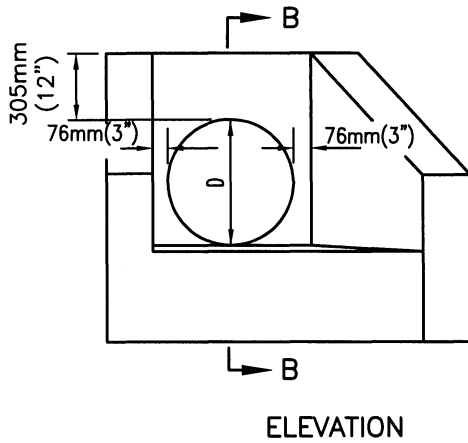
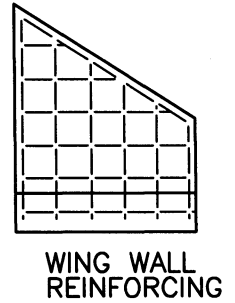
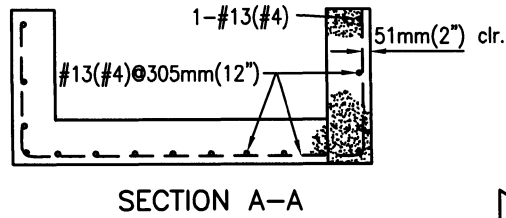
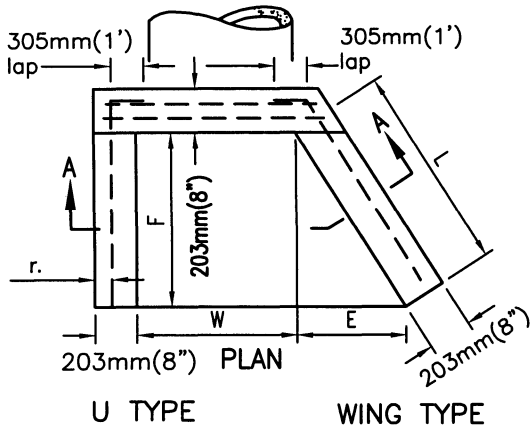
SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE B
(C.S.P. - ARCH PIPE)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-33**

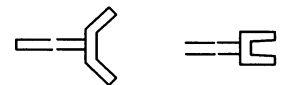


	DIA. OF PIPE	DIMENSIONS			DOUBLE PIPE				DOUBLE PIPE					
		L	E	F	W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
						CONC.	STEEL	CONC.	STEEL		CONC.	STEEL	CONC.	STEEL
Metric	450mm	689mm	381mm	571mm	610mm	0.43kg	16kg	0.49kg	20kg	AS SHOWN ON PLANS	0.63kg	24kg	0.69kg	28kg
US	18"	2'-3 1/8"	1'-3"	1'-10 1/2"	2'-0"	0.55yd	35lb	0.63yd	43lb		0.82yd	53lb	0.90yd	61lb
Metric	600mm	962mm	533mm	800mm	762mm	0.61kg	22kg	0.72kg	28kg	AS SHOWN ON PLANS	1.0kg	34kg	1.1kg	39kg
US	24"	3'-1 7/8"	1'-9"	2'-7 1/2"	2'-6"	0.79yd	47lb	0.93yd	60lb		1.22yd	73lb	1.36yd	86lb
Metric	750mm	1.24m	686mm	1.03m	914mm	.81kg	33kg	1.0kg	39kg	AS SHOWN ON PLANS	1.3kg	50kg	1.5kg	56kg
US	30"	4'-0 5/8"	2'-3"	3'-4 1/2"	3'-0"	1.05yd	71lb	1.29yd	85lb		1.66yd	109lb	1.92yd	123lb
Metric	900mm	1.51m	838mm	1.26m	1.07m	1.02kg	40kg	1.30kg	52kg	AS SHOWN ON PLANS	1.70kg	62kg	1.95kg	74kg
US	36"	4'-11 1/2"	2'-9"	4'-1 1/2"	3'-6"	1.33yd	88lb	1.69yd	114lb		2.19yd	136lb	2.55yd	162lb

NOTES:

- Concrete shall be 332kg/M³-C-22Mpa (560-C-3250)
- Exposed corners to be chamfered 3/4" (19mm).
- Multiple pipes to be set a distance of D/2, with a 305mm(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 76mm(3") use alternate Detail-C.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

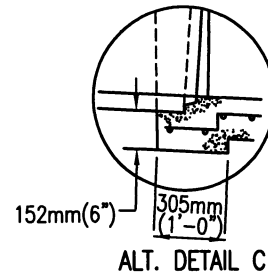
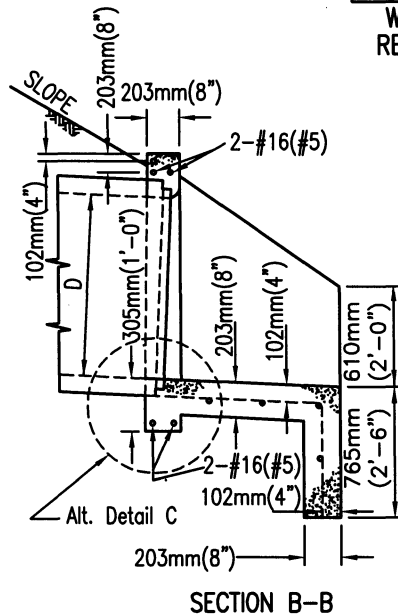
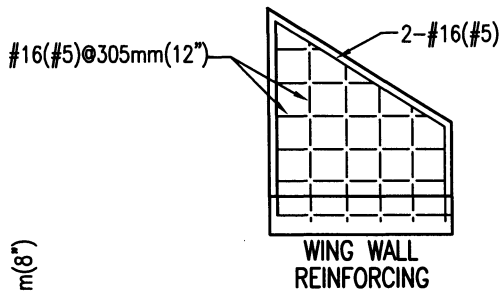
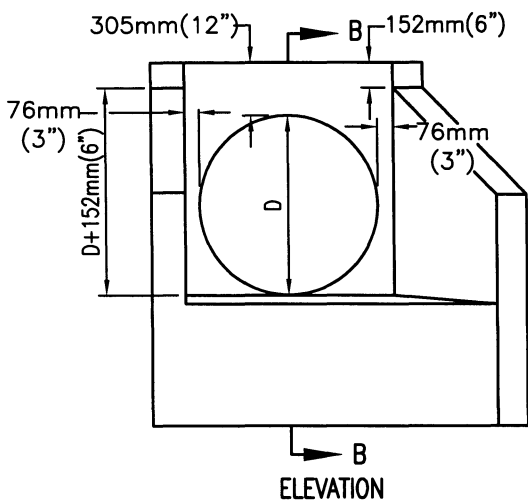
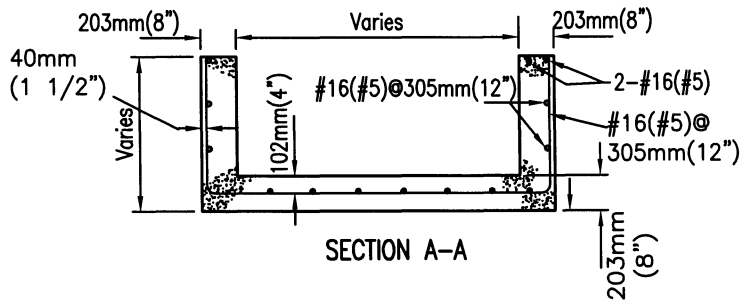
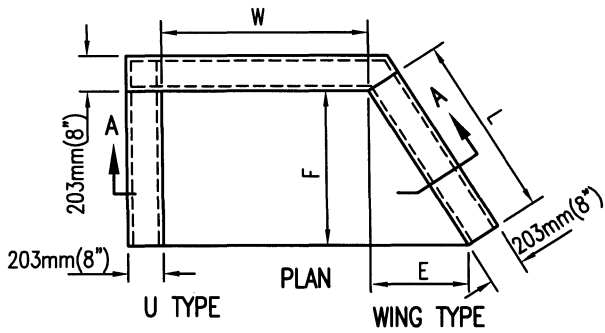
WING AND U TYPE HEADWALLS

FOR 450mm (18") TO 900mm (36") PIPES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/11/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-34



NOTE:

For Dimension Table and General Notes, see D-35B

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**WING AND U TYPE HEADWALLS
FOR 1.0m (42") TO 2.0m (84") PIPE**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-35A**

**TABLE OF DIMENSIONS AND QUANTITIES
FOR DRAWING D-35A**

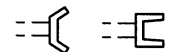
	DIA. OF PIPE	DIMENSIONS			SINGLE PIPE						DOUBLE PIPE			
		L	E	F	W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
						CONC.	STEEL	CONC.	STEEL		CONC.	STEEL	CONC.	STEEL
						C.Y.	LBS.	C.Y.	LBS.		C.Y.	LBS.	C.Y.	LBS.
Metric U.S.	1050mm 42"	1.10m 3'-7 1/4"	610mm 2'-0"	914mm 3'-0"	1.22m 4'-0"	1.20 cu m 1.57 C.Y.	53.1 kg 117lb	1.46 kg 1.90 C.Y.	61.3 kg 135 lb	AS SHOWN ON PLANS	2.1 cu m 2.69 C.Y.	86.2 kg 190 lb	2.5 cu m 3.16 C.Y.	97.1 kg 214 lb
Metric U.S.	1200mm 48"	1.37m 4'-6"	762mm 2'-6"	1.14m 3'-9"	1.37m 4'-6"	1.51 cu m 1.97 C.Y.	70.0 kg 153 lb	1.90 cu m 2.48 C.Y.	84.0 kg 184 lb		2.62 cu m 3.43 C.Y.	115 kg 252 lb	3.11 cu m 4.06 C.Y.	131 kg 288 lb
Metric U.S.	1350mm 54"	1.65m 5'-4 7/8"	914mm 3'-0"	1.37m 4'-6"	1.52m 5'-0"	1.85 cu m 2.41 C.Y.	86.2 kg 190 lb	2.35 cu m 3.07 C.Y.	112 kg 246 lb		3.25 cu m 4.24 C.Y.	145 kg 319 lb	3.87 cu m 5.06 C.Y.	176 kg 368 lb
Metric U.S.	1500mm 60"	1.92m 6'-3 3/4"	1.10m 3'-6"	1.60m 5'-3"	1.68m 5'-6"	2.21 cu m 2.88 C.Y.	109 kg 239 lb	2.87 cu m 3.75 C.Y.	134 kg 294 lb		3.40 cu m 5.13 C.Y.	175 kg 386 lb	4.72 cu m 6.17 C.Y.	201 kg 442 lb
Metric U.S.	1650mm 66"	2.20m 7'-2 1/2"	1.22m 4'-0"	1.83m 6'-0"	1.83m 6'-0"	2.59 cu m 3.38 C.Y.	134 kg 294 lb	3.46 cu m 4.52 C.Y.	162 kg 356 lb		4.65 cu m 6.08 C.Y.	206 kg 454 lb	5.51 cu m 7.20 C.Y.	234 kg 516 lb
Metric U.S.	1800mm 72"	2.47m 8'-1 3/8"	1.37m 4'-6"	1.80m 6'-9"	1.98m 6'-6"	3.0 cu m 3.93 C.Y.	167 kg 368 lb	4.22 cu m 5.52 C.Y.	190 kg 417 lb		5.44 cu m 7.11 C.Y.	237 kg 522 lb	6.35 cu m 8.30 C.Y.	267 kg 588 lb
Metric U.S.	1950mm 78"	2.74m 9'-0"	1.52m 5'-0"	2.29m 7'-6"	2.13m 7'-0"	3.45 cu m 4.50 C.Y.	202 kg 444 lb	5.13 cu m 6.70 C.Y.	229 kg 503 lb		6.27 cu m 8.20 C.Y.	270 kg 595 lb	7.27 cu m 9.50 lb	315 kg 693 lb
Metric U.S.	2100mm 84"	2.71m 9'-10 3/4"	1.68m 5'-6"	2.51m 8'-3"	2.29m 7'-6"	3.99 cu m 5.21 C.Y.	245 kg 540 lb	6.24 cu m 8.15 C.Y.	281 kg 619 lb		7.27 cu m 9.50 C.Y.	312 kg 687 lb	8.26 cu m 10.80 C.Y.	357 kg 786 lb

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

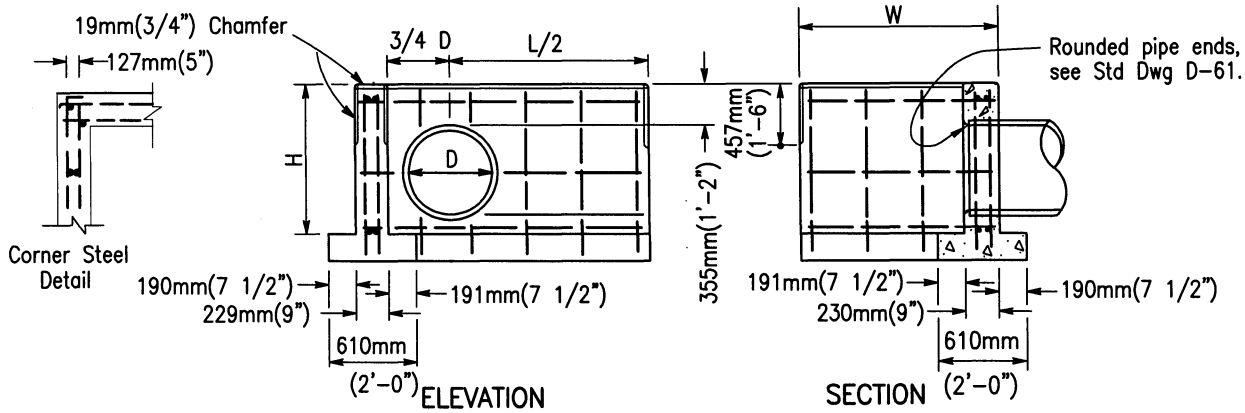
NOTES:

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 chamfered 20mm.
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 75mm use Alternate Detail-C.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	WING AND U TYPE HEADWALLS FOR 1.0 m (42") TO 2.0 m (84") PIPE	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 3/10/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reformatted		T. Stanton	04/06			
						DRAWING NUMBER D-35B

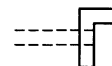


D	H	L/2	LENGTH OF W									
			965mm (3'-4")		1.47m (4'-10")		1.93m (6'-4")		2.39m (7'-10")		2.85m (9'-4")	
			Steel	Conc	Steel	Conc	Steel	Conc	Steel	Conc	Steel	Conc
300mm 12"	813mm 2'-8"	762mm 2'-6"	22.7kg 50lb	0.61cu m 0.79 C.Y.	27.3kg 60lb	.750cu m 0.98 C.Y.	—	—	—	—	—	—
375mm 15"	889mm 2'-11"	914mm 3'-0"	25.0kg 55lb	0.70cu m 0.91 C.Y.	30.0kg 65lb	.850cu m 1.11 C.Y.	—	—	—	—	—	—
450mm 18"	965mm 3'-2"	1.07m 3'-6"	30.0kg 65lb	.796cu m 1.04 C.Y.	34kg 75lb	.956cu m 1.25 C.Y.	—	—	—	—	—	—
525mm 21"	1.04m 3'-5"	1.14m 3'-9"	34.0kg 75lb	.880cu m 1.15 C.Y.	40.9kg 90lb	1.04cu m 1.36 C.Y.	—	—	—	—	—	—
600mm 24"	1.12m 3'-8"	1.30m 4'-3"	38.6kg 85lb	.990cu m 1.29 C.Y.	45.4kg 100lb	1.16cu m 1.51 C.Y.	50.0kg 110lb	1.33cu m 1.74 C.Y.	—	—	—	—
675mm 27"	1.14m 3'-11"	1.45m 4'-9"	40.9kg 90lb	1.10cu m 1.44 C.Y.	47.7kg 105lb	1.28cu m 1.67 C.Y.	52.2kg 115lb	1.91cu m 1.91 C.Y.	—	—	—	—
750mm 30"	1.27m 4'-2"	1.52m 5'-0"	43.0kg 95lb	1.19cu m 1.55 C.Y.	50.0kg 110lb	1.38cu m 1.80 C.Y.	54.5kg 120lb	2.05cu m 2.05 C.Y.	61.3kg 135lb	1.75cu m 2.29 C.Y.	—	—
825mm 33"	1.35m 4'-5"	1.68m 5'-6"	47.7kg 105lb	1.31cu m 1.71 C.Y.	54.5kg 120lb	1.51cu m 1.97 C.Y.	61.3kg 135lb	2.23cu m 2.23 C.Y.	68.0kg 150lb	1.90cu m 2.48 C.Y.	—	—
900mm 36"	1.42m 4'-8"	1.83m 6'-0"	50.0kg 110lb	1.44cu m 1.88 C.Y.	56.7kg 125lb	1.65cu m 2.15 C.Y.	63.5kg 140lb	2.41cu m 2.41 C.Y.	70.3kg 155lb	2.05cu m 2.68 C.Y.	77.2kg 170lb	2.26cu m 2.95 C.Y.
975mm 39"	1.25m 4'-11"	1.90m 6'-3"	—	—	68.0kg 150lb	1.75cu m 2.28 C.Y.	77.2kg 170lb	2.56cu m 2.56 C.Y.	84.0kg 185lb	2.18cu m 2.84 C.Y.	90.8kg 200lb	2.39cu m 3.12 C.Y.
1050mm 42"	1.58m 5'-2"	2.06m 6'-9"	—	—	70.3kg 155lb	1.85cu m 2.42 C.Y.	79.4kg 175lb	2.76cu m 2.76 C.Y.	86.2kg 190lb	2.34cu m 3.05 C.Y.	95.3kg 210lb	2.56cu m 3.34 C.Y.
1125mm 45"	1.65m 5'-5"	2.21m 7'-3"	—	—	—	—	81.7kg 180lb	2.97cu m 2.97 C.Y.	90.8kg 200lb	2.50cu m 3.27 C.Y.	97.6kg 215lb	2.73cu m 3.57 C.Y.
1200mm 48"	1.73m 5'-8"	2.29m 7'-6"	—	—	—	—	86.2kg 190lb	3.13cu m 3.13 C.Y.	98.0kg 216lb	2.63cu m 3.44 C.Y.	105kg 230lb	2.87cu m 3.75 C.Y.
1275mm 51"	1.80m 5'-11"	2.44m 8'-0"	—	—	—	—	—	—	99.8kg 220lb	2.81cu m 3.67 C.Y.	107kg 235lb	3.05cu m 3.99 C.Y.
1350mm 54"	1.88m 6'-2"	2.59m 8'-6"	—	—	—	—	—	—	107kg 235lb	2.99cu m 3.91 C.Y.	114kg 250lb	3.25cu m 4.24 C.Y.

NOTES

- Concrete shall be 332 kg/M³ -C-22Mpa (560-C-3250).
- All reinforcing steel #13 (#4) bars. All vertical and horizontal tie bars 460mm (18") maximum spacing.
- When multiple pipes are used, the distance between pipes shall be D/2 (300mm (1') min.). The dimension L/2 is from the center of the pipe to the end of the headwall as shown.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

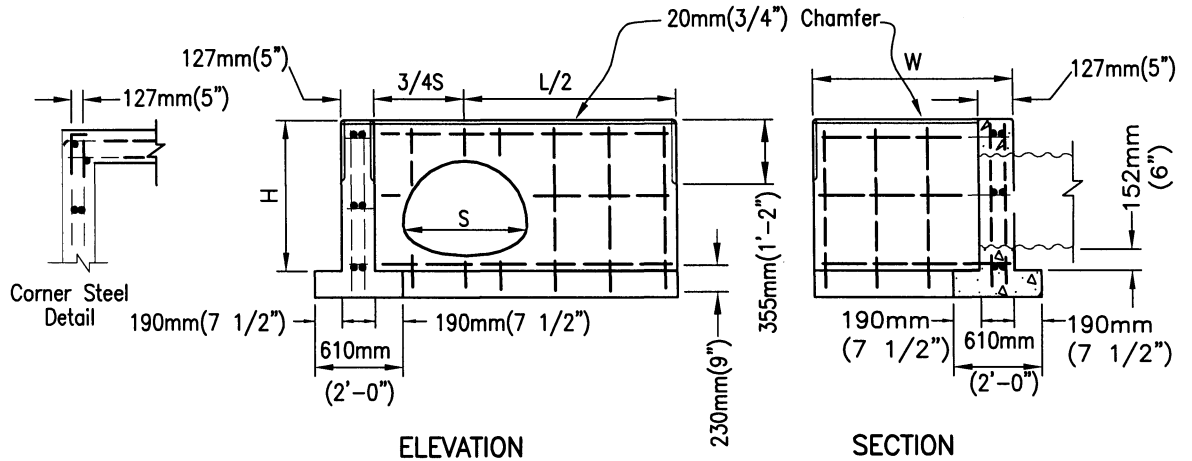
SAN DIEGO REGIONAL STANDARD DRAWING

**L TYPE HEADWALLS
CIRCULAR PIPES**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

**DRAWING
NUMBER D-36**

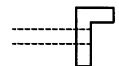


CSP ARCH SIZE		H	L/2	LENGTH OF W									
				1.02m (3'-4")		1.47m (4'-10")		1.93m (6'-4")		2.39m (7'-10")		2.84m (9'-4")	
				Steel	Conc	Steel	Conc	Steel	Conc	Steel	Conc	Steel	Conc
Metric	450mm x 275mm	787mm	838mm	22.7kg	.643cu m	27.3kg	.788cu m	31.8kg	.926cu m	36.3kg	1.07cu m	40.9kg	1.20cu m
U.S.	18"x11"	2'-7"	2'-9"	50lb	0.84 C.Y.	60lb	1.03 C.Y.	70lb	1.21 C.Y.	80lb	1.39 C.Y.	90lb	1.57 C.Y.
Metric	525mm x 375mm	889mm	991mm	27.3kg	.765cu m	29.5kg	.910cu m	34.0kg	1.06cu m	40.9kg	1.21cu m	54.4kg	1.36cu m
U.S.	21"x15"	2'-11"	3'-3"	60lb	1.00 C.Y.	65lb	1.18 C.Y.	75lb	1.38 C.Y.	90lb	1.58 C.Y.	100lb	1.77 C.Y.
Metric	600mm x 450mm	965mm	1.14m	27.3kg	.818cu m	31.8kg	1.00cu m	36.3kg	1.17cu m	43.1kg	1.33cu m	49.9kg	1.49cu m
U.S.	24"x18"	3'-2"	3'-9"	60lb	1.07 C.Y.	70lb	1.32 C.Y.	80lb	1.53 C.Y.	95lb	1.74 C.Y.	110lb	1.94 C.Y.
Metric	700mm x 500mm	1.02m	1.30m	31.8kg	.964cu m	36.3kg	1.13cu m	40.9kg	1.29cu m	45.4kg	1.45cu m	52.2kg	1.62cu m
U.S.	28"x20"	3'-4"	4'-3"	70lb	1.26 C.Y.	80lb	1.47 C.Y.	90lb	1.68 C.Y.	100lb	1.90 C.Y.	115lb	2.11 C.Y.
Metric	875mm x 600mm	1.07m	1.35m	45.36	1.16cu m	49.9kg	1.33cu m	54.5kg	1.51cu m	63.5kg	1.69cu m	70.3kg	1.85cu m
U.S.	35"x24"	3'-8"	5'-3"	100lb	1.51 C.Y.	110lb	1.74 C.Y.	120lb	1.97 C.Y.	140lb	2.20 C.Y.	155lb	2.42 C.Y.
Metric	1050mm x 725mm	1.25m	1.90m	52.2kg	1.40cu m	59.0kg	1.58cu m	63.5kg	1.77cu m	70.3kg	1.95cu m	77.2kg	2.17cu m
U.S.	42"x29"	4'-1"	6'-3"	115lb	1.82 C.Y.	130lb	2.06 C.Y.	140lb	2.31 C.Y.	155lb	2.55 C.Y.	170lb	2.83 C.Y.
Metric	1225mm x 825mm	1.35m	2.21m	59.0kg	1.62cu m	65.8kg	1.82cu m	70.3kg	2.02cu m	77.2kg	2.22cu m	84.0kg	2.41cu m
U.S.	49"x33"	4'-5"	7'-3"	130lb	2.12 C.Y.	145lb	2.37 C.Y.	155lb	2.64 C.Y.	170lb	2.90 C.Y.	185lb	3.15 C.Y.
Metric	1425mm x 950mm	1.47m	2.59m	65.8kg	1.93cu m	75.6kg	2.14cu m	79.4kg	2.35cu m	86.2kg	2.57cu m	93.0kg	2.76cu m
U.S.	57"x38"	4'-10"	8'-6"	145lb	2.52 C.Y.	160lb	2.79 C.Y.	175lb	3.07 C.Y.	190lb	3.35 C.Y.	205lb	3.61 C.Y.
Metric	1550mmx1050mm	1.35m	2.90m	84.0kg	2.21cu m	90.8kg	2.38cu m	97.6kg	2.66cu m	107kg	2.89cu m	114kg	3.11cu m
U.S.	64"x43"	5'-3"	9'-6"	185lb	2.89 C.Y.	200lb	3.11 C.Y.	215lb	3.48 C.Y.	235lb	3.77 C.Y.	250lb	4.06 C.Y.
Metric	1775mmx1175mm	1.45m	3.20m	90.8kg	2.49cu m	97.6kg	2.73cu m	107kg	2.96cu m	114kg	3.19cu m	123kg	3.43cu m
U.S.	71"x47"	5'-7"	10'-6"	200lb	3.25 C.Y.	215lb	3.56 C.Y.	235lb	3.86 C.Y.	250lb	4.17 C.Y.	270lb	4.48 C.Y.

NOTES

- Concrete shall be 332 kg/M³ -C-22Mpa (560-C-3250)
- All reinforcing steel #13 (#4) bars. All vertical and horizontal tie bars 460mm (18") maximum spacing.
- When multiple pipes are used, the distance between pipes shall be S/2 (305mm (1') min.). The dimension L/2 is from the center of the pipe to the end of the headwall as shown.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

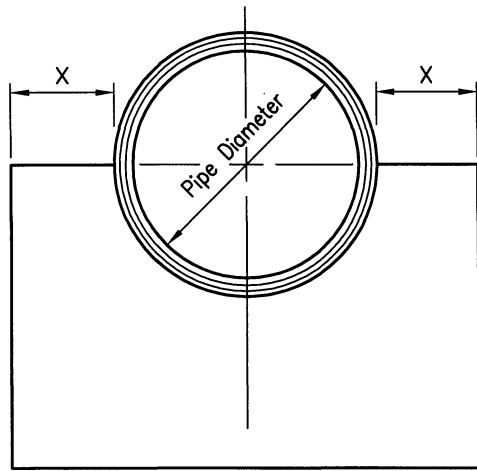
SAN DIEGO REGIONAL STANDARD DRAWING

**L TYPE HEADWALLS
C.S.P. ARCH PIPE**

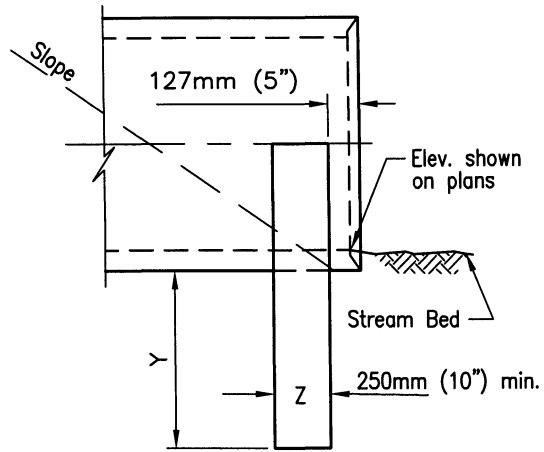
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-37**



FACE ELEVATION



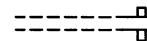
SIDE ELEVATION

PIPE DIAMETER	X	Y	Z
300mm (12") TO 600mm (24")	310mm (1"-0")	610mm (2"-0")	254mm (10")
525mm (21") TO 900mm (36")	457mm (1"-6")	762mm (2"-6")	305mm (12")
975mm (39") TO 1200mm (48")	610mm (2'-0")	914mm (3'-0")	305mm (12")
1275mm (51") TO 1500mm (60")	762mm (2'-6")	914mm (3'-0")	356mm (14")
1575mm (63") & Larger	914mm (3'-0")	914mm (3'-0")	356mm (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 332 kg/M³ -C-22Mpa (560-C-3250) .
3. Keep the pipe-end clear of obstructions to permit easy placing of culvert extension.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

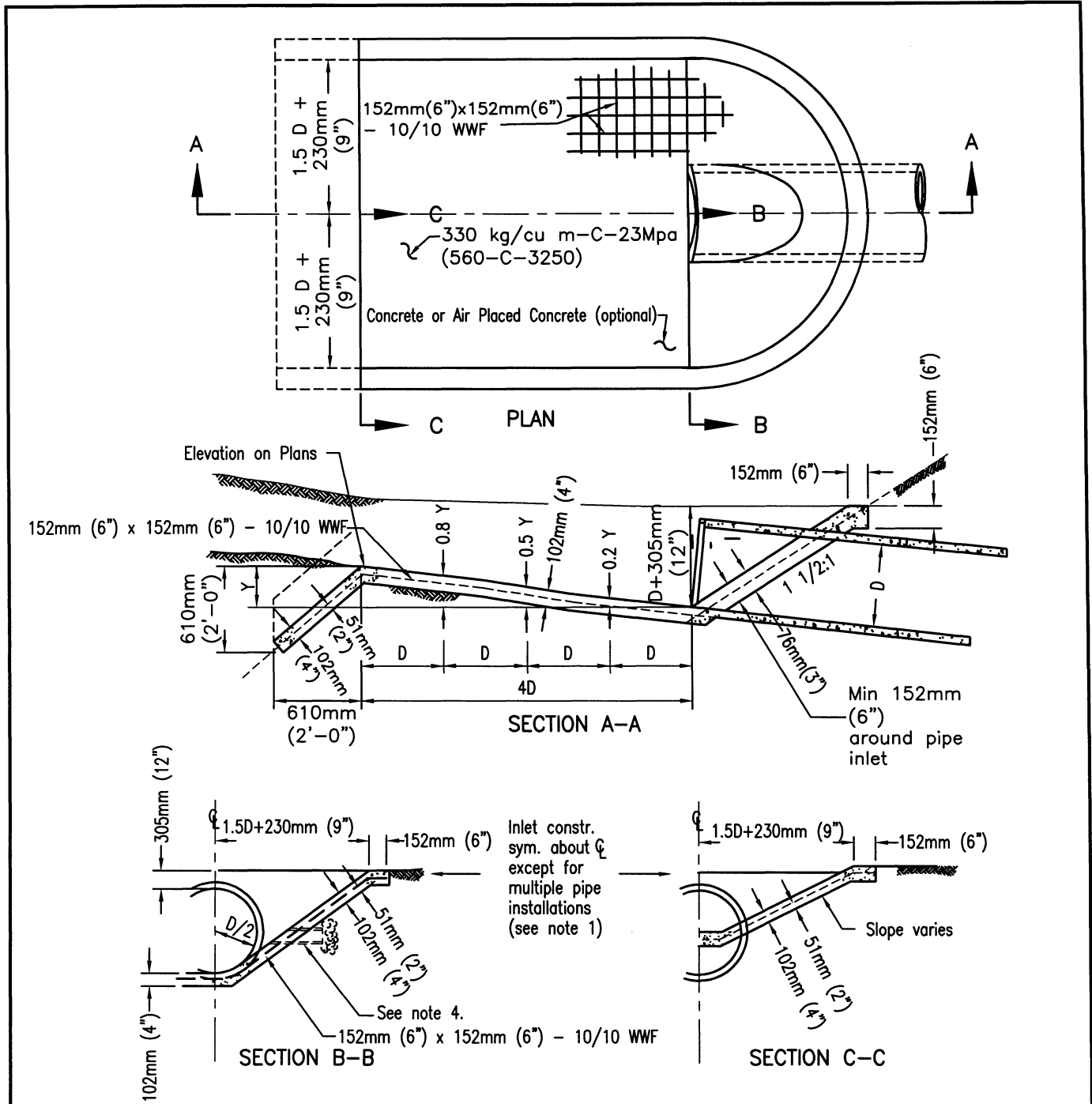
SAN DIEGO REGIONAL STANDARD DRAWING

CURTAIN WALL

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-38**



NOTES

1. When more than one pipe is used the profile view shown shall hold for the distance across across all pipe openings. Section A-A and B-B shall be from the outermost pipe. The distance between pipes shall be D/2 for round and Span/3 for arch pipe. (305mm (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 and section can not be utilized.
4. Place weep holes when required by the Agency.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

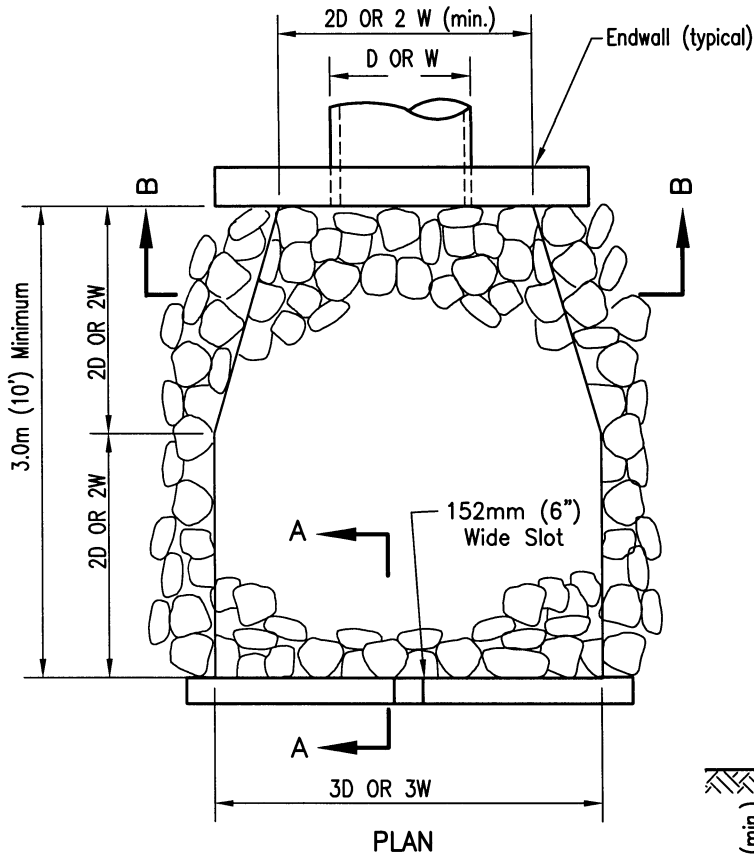
SAN DIEGO REGIONAL STANDARD DRAWING

**INLET APRON FOR CULVERTS
UP TO 1050mm (42") DIAMETER**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-39**

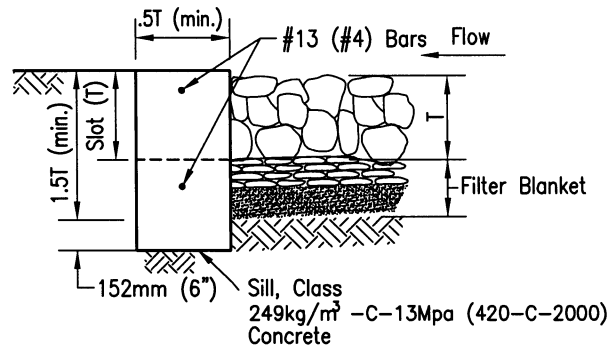


Design Velocity m/sec (ft/sec)*	Rock Classification	T (min)
1.8-3 (6-10)	No. 2 Backing	320mm (1.1ft)
3-3.7 (10-12)	220 kg (1/4 ton)	823mm (2.7ft)
3.7-4.3 (12-14)	450 kg (1/2 ton)	1.1m (3.5ft)
4.3-4.9 (14-16)	900 kg (1 ton)	1.3m (4.4ft)
4.9-5.5 (16-18)	1.8 tonne (2 ton)	1.6m (5.4ft)

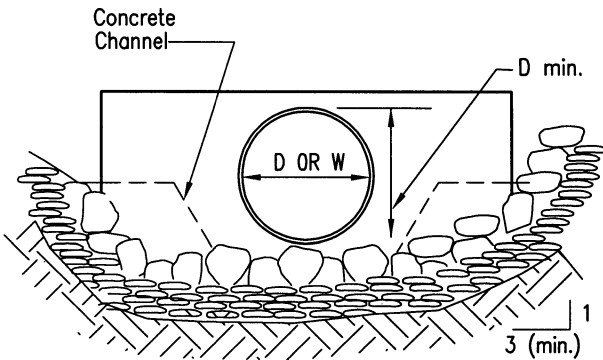
*over 5.5 mps (18 fps) requires special design

D = Pipe Diameter

W = Bottom Width of Channel



SECTION A-A



SECTION B-B

NOTES

- Plans shall specify:
A) Rock Class and thickness (T).
B) 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 filter blanket which may be either granular material or filter fabric (woven filter slit film fabric shall not be used).
- See Regional Supplement Amendments for selection of 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.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Add Rip Rap Table		S. Brady	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**RIP RAP
ENERGY DISSIPATOR**

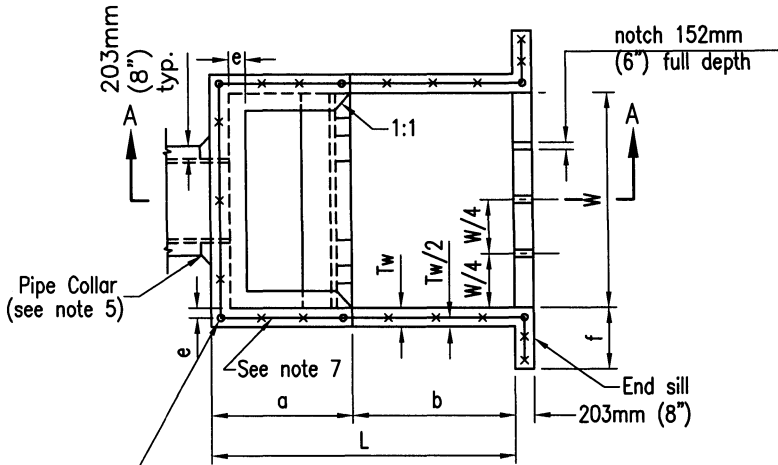
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 04/27/2006

Chairperson R.C.E. 19246 Date

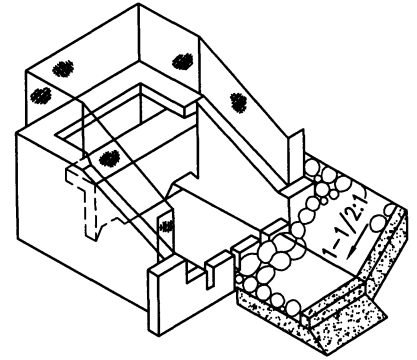
DRAWING NUMBER **D-40**

SEE SDD-100

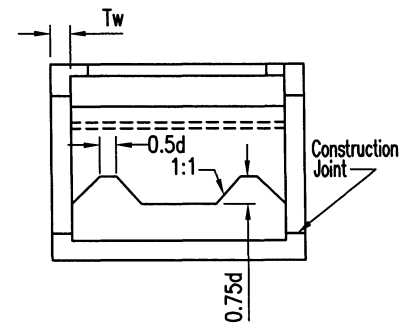


Note: Riprap not shown.
 2-#13 (#4) rebars horizontal and vertical around fence post (typical).

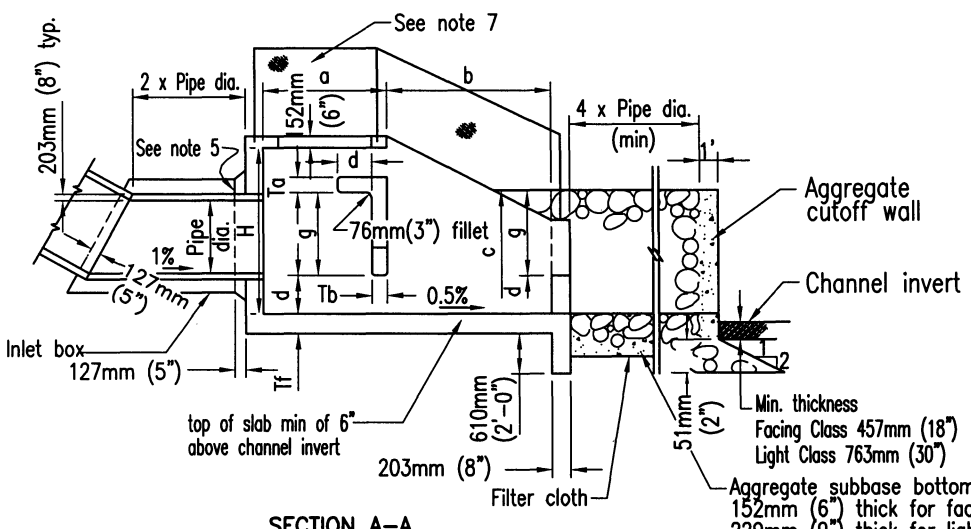
PLAN



PICTORIAL VIEW



SECTION B-B



SECTION A-A

NOTES

1. Design
 Equivalent Fluid Pressure (Earth Loading) = 961 kg/cu m (60 p.c.f.) Maximum Outlet velocity = 10.7m (35')/s
2. Concrete shall be 332 kg/M³-C-22Mpa (560-C-3250)
3. Reinforcing shall conform to ASTM designation A615 and may be grade 40 or 60. Reinforcing shall be placed with 51mm (2") clear concrete cover unless noted otherwise. Splices shall not be permitted except as indicated on the plans.
4. For pipe grades not exceeding 20%, inlet box may be omitted.
5. If inlet box is omitted, construct pipe collar as shown.
6. Unless noted otherwise, all reinforcing bar bends shall be fabricated with standard hooks.
7. Five foot high chain link fencing, embed post 18" deep in walls and encase with class B mortar.
8. In Sandy and Silty soil:
 - a) Riprap and aggregate base cutoff wall required at the end of rock apron.
 - b) Filter cloth (Polyfilter X or equivalent) shall be installed on native soil base, minimum of 305mm (1 ft.) overlaps at joints.
9. Rip rap and subbase classification shall be as shown on plans.

FOR DIMENSIONS, SEE D-41B.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ENERGY DISSIPATOR

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
T. Stanton 3/01/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-41A**

METRIC DIMENSIONS TABLE, FOR STRUCTURE DETAILS SEE D-41A.

Pipe Dia	457mm	610mm	9.14m	11.0m	12.80m	14.63m	16.46m	18.29m	21.95m
Area (sq. m)	.164	.292	.456	.657	.893	1.17	1.48	1.82	2.63
Max. Q (cu m/s)	.594	1.08	1.67	2.41	3.26	4.28	5.41	6.68	9.60
W	1.66m	1.80m	2.13m	2.82m	3.20m	3.58m	3.96	4.34	5.03m
H	1.30m	1.60m	1.90m	2.21m	2.44m	2.74m	2.87m	3.28m	3.73m
L	2.24m	2.74m	3.25m	3.76m	4.27m	4.78m	5.28m	5.79m	6.71m
a	991mm	1.19m	1.40m	1.60m	1.83m	1.80m	2.24m	2.44m	2.82m
b	1.24m	1.55m	1.85m	2.16m	2.44m	2.72m	3.05m	3.35m	3.87m
c	711mm	864mm	1.02m	1.17m	1.35m	1.50m	1.65m	1.80m	2.11m
d	279mm	356mm	406mm	482mm	533mm	610mm	660mm	737mm	838mm
e	152mm	152mm	203mm	203mm	254mm	254mm	305mm	305mm	381mm
f	457mm	610mm	762mm	914mm	914mm	914mm	914mm	914mm	914mm
g	635mm	762mm	914mm	1.07m	1.19m	1.35m	1.50m	1.63m	1.88m
Tf	203mm			254mm			305mm		
Tb	178mm			241mm			267mm		
Tw	178mm			241mm			267mm		
Ta	178mm			203mm					

IMPERIAL DIMENSIONS TABLE, FOR STRUCTURE DETAILS SEE D-41A.

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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

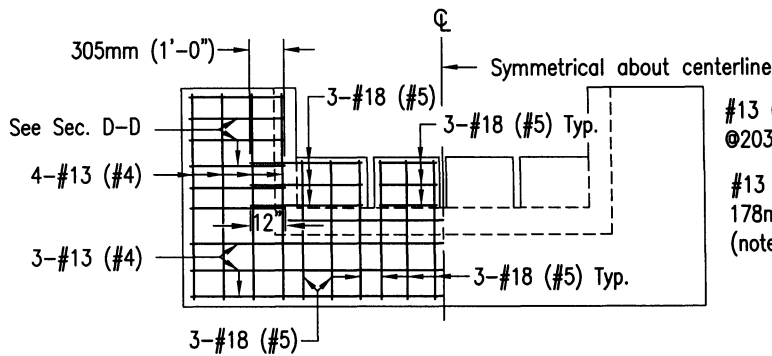
CONCRETE ENERGY DISSIPATOR

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

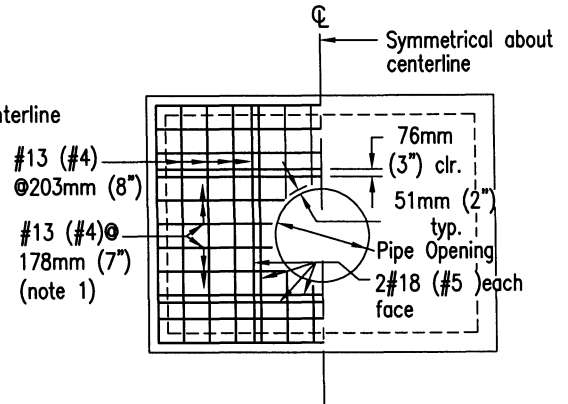
T. Stanton 3/10/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-41B**

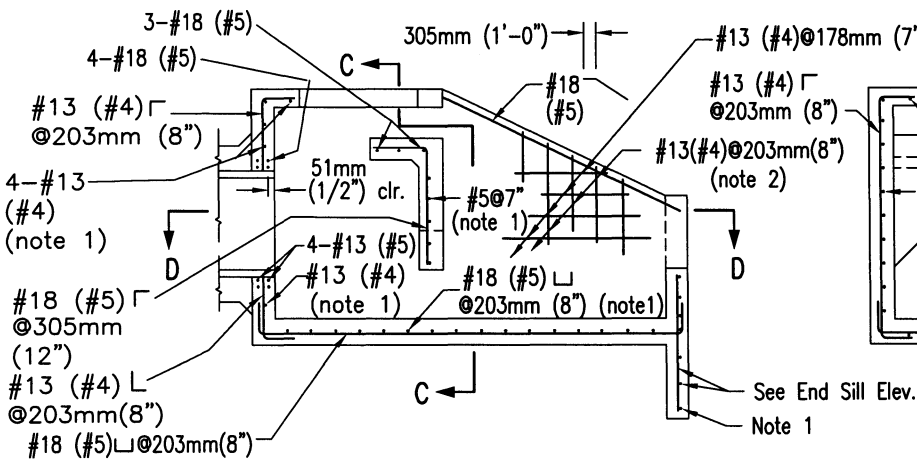
SEE SDD-100



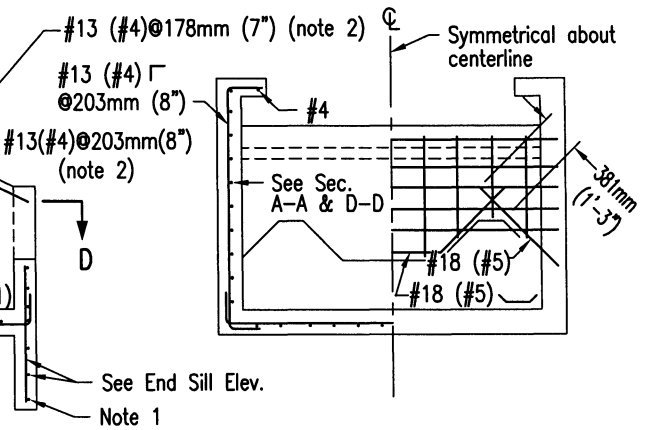
END SILL ELEVATION



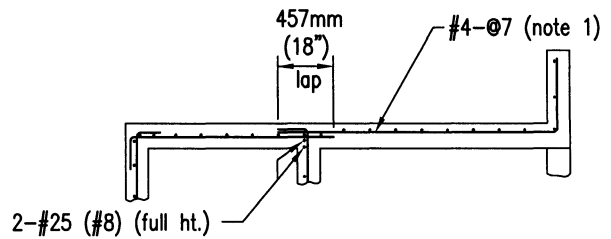
HEADWALL ELEVATION



SECTION A-A



SECTION C-C



SECTION D-D

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 51mm (2") concrete cover, unless noted otherwise.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

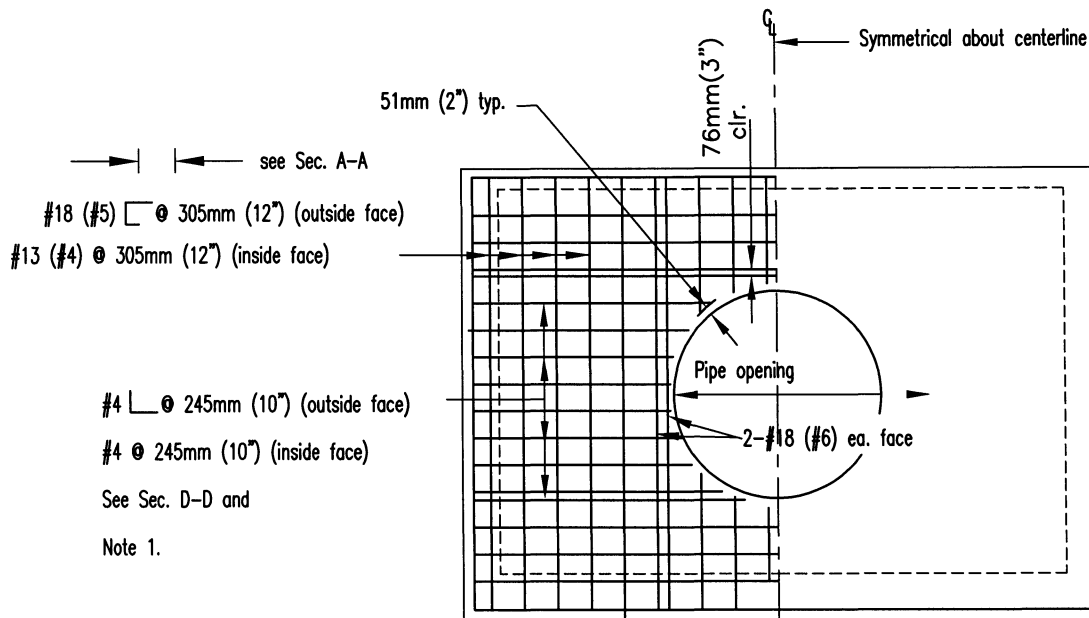
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ENERGY DISSIPATOR
 (REINFORCEMENT)
 450mm (18") TO 750mm (30") DIAMETER PIPE

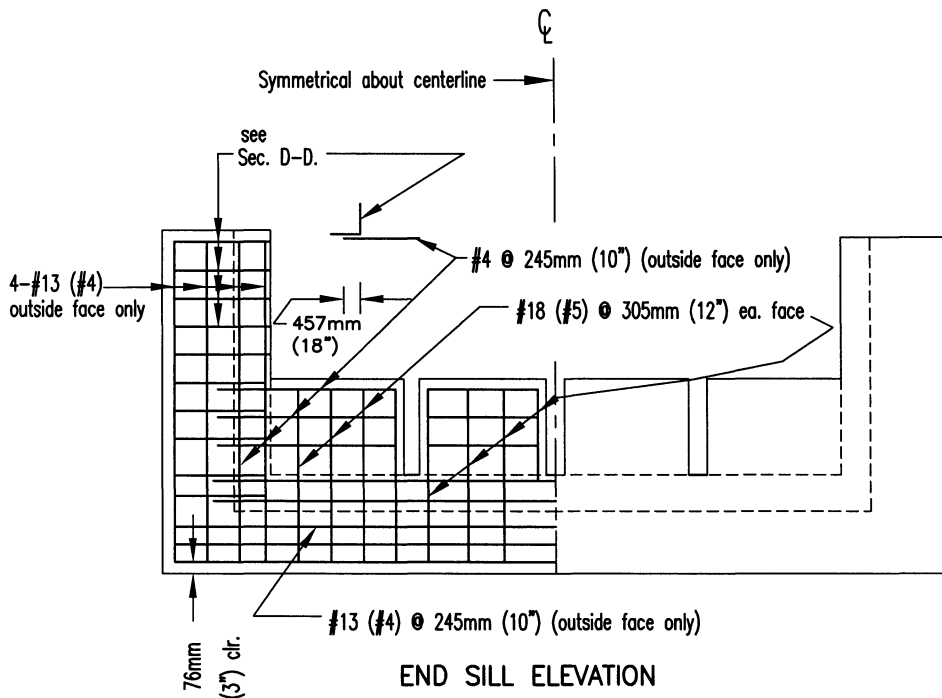
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-42**



HEADWALL ELEVATION



END SILL ELEVATION

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

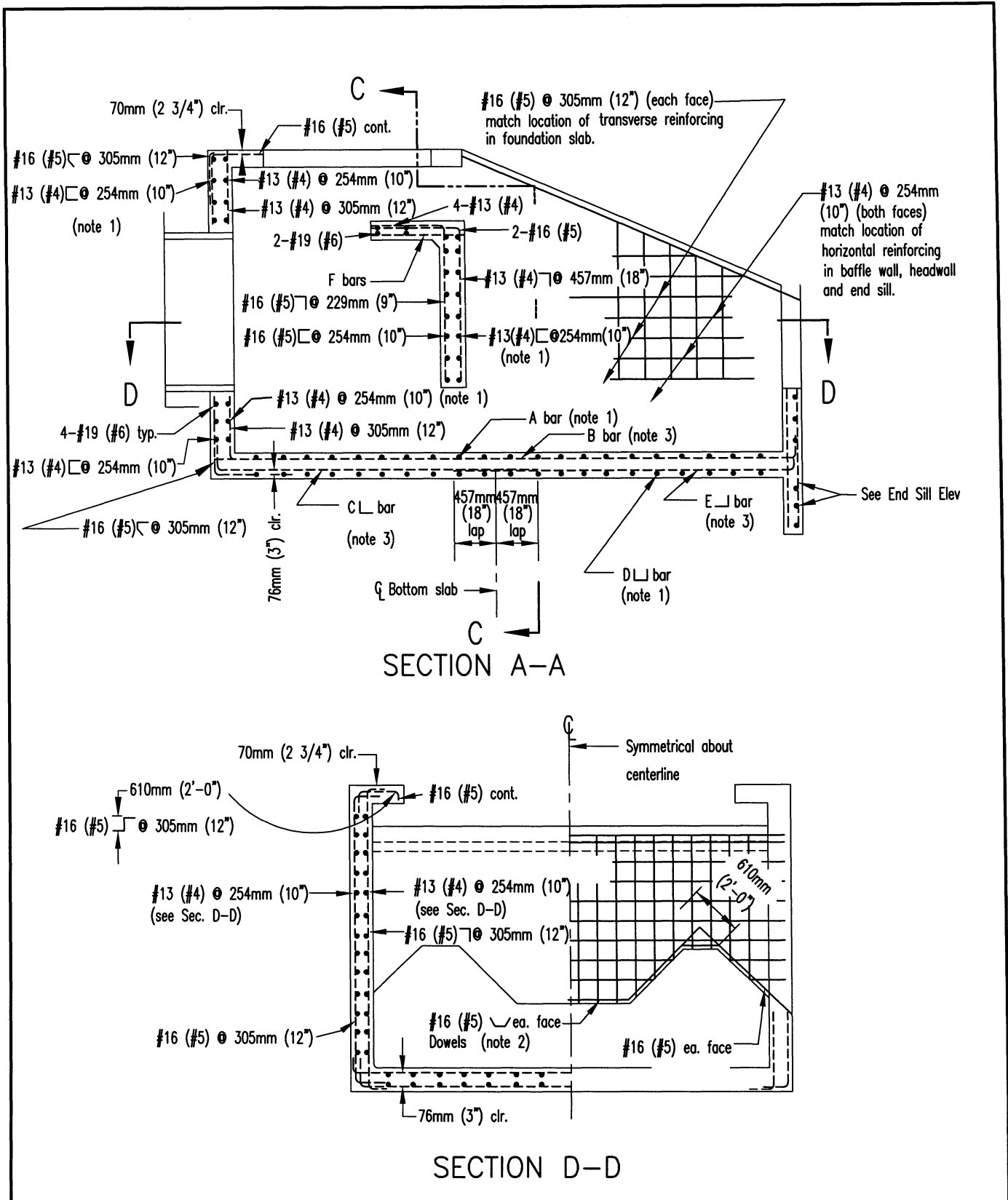
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ENERGY DISSIPATOR
(REINFORCEMENT)
900mm (36") TO 1800mm (72") DIAMETER PIPE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-43A**



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE ENERGY DISSIPATOR
(REINFORCEMENT)**

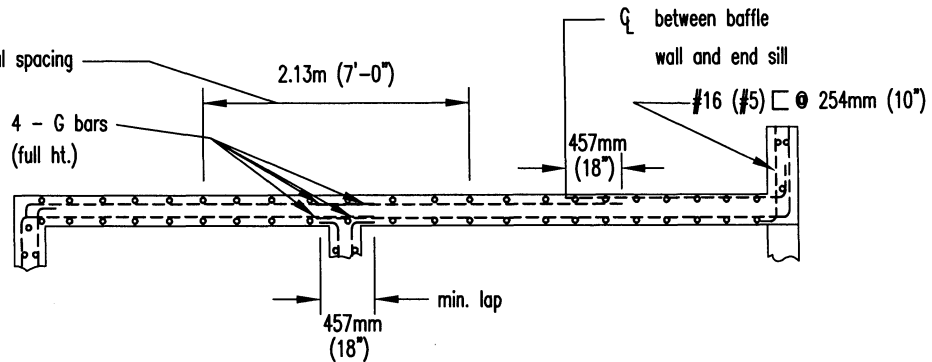
900mm (36") TO 1800mm (72") DIAMETER PIPE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

 3/11/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-43B

Add #13 (#4) @ 254mm (10") vertical spacing to reinforcing shown (ea. face)



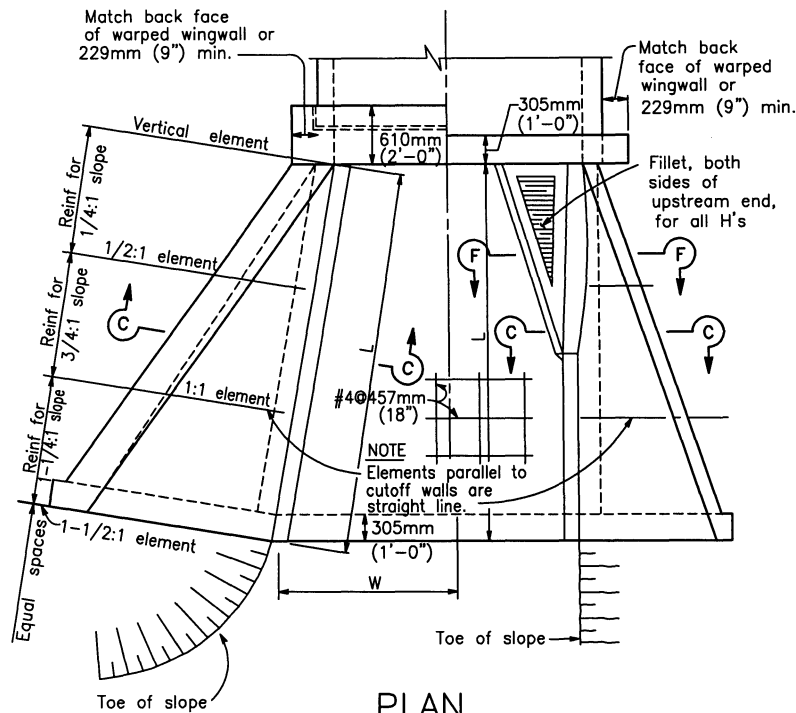
SECTION D-D

Pipe dia. (in.)	914mm (36")	1.07m (42")	1.22m (48")	1.37m (54")	1.52m (60")	1.83m (72")
A bar	#16 (#5) @ 305mm (12")		#19 (#6) @ 305mm (12")		#22 (#7) @ 305mm (12")	
B bar	#16 (#5) @ 305mm (12")		#19 (#6) @ 305mm (12")			
C bar	#13 (#4) @ 305mm (12")		#16 (#5) @ 305mm (12")			
D bar	#13 (#4) @ 305mm (12")		#16 (#5) @ 305mm (12")		#19 (#6) @ 305mm (12")	
E bar	#13 (#4) @ 305mm (12")		#16 (#5) @ 305mm (12")			
F bar	#13 (#4) @ 229mm (9")		#16 (#5) @ 229mm (9")			#19 (#6) @ 229mm (9")
G bar		#22 (#7)			#36 (#11)	

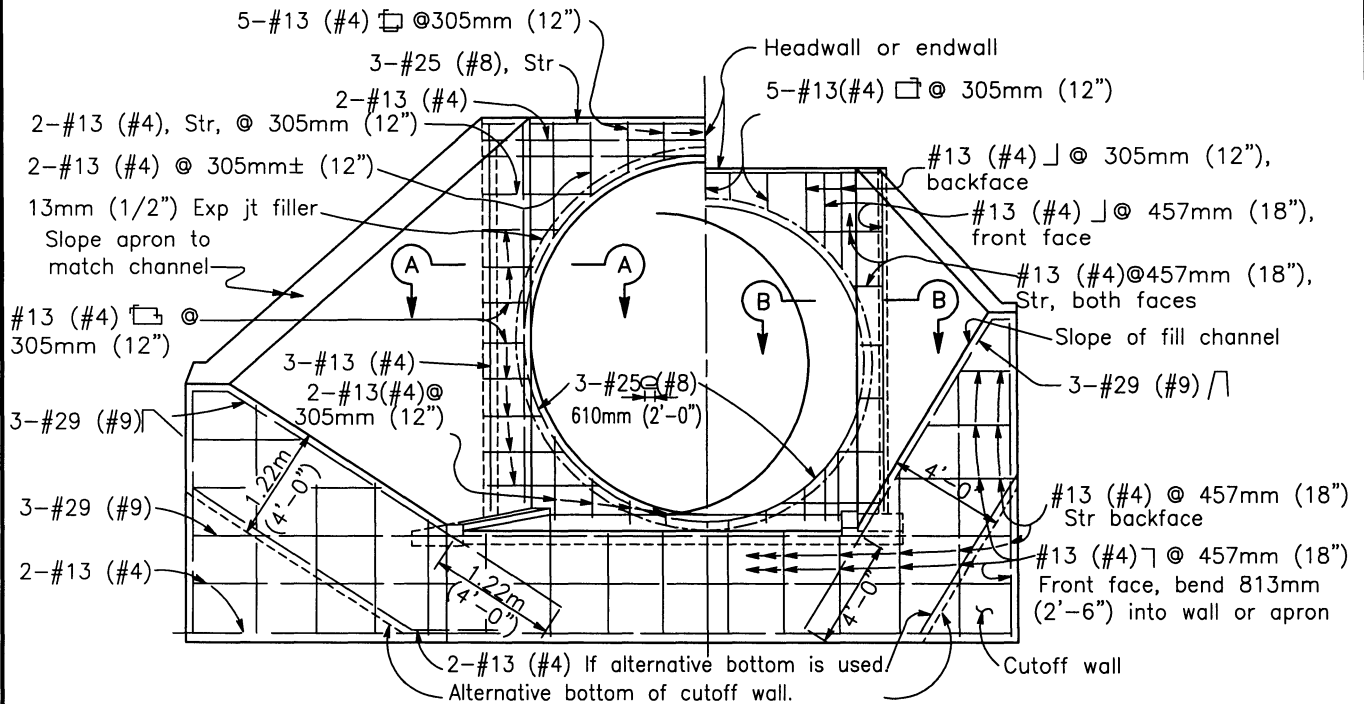
NOTES

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.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		CONCRETE ENERGY DISSIPATOR [REINFORCEMENT] 900mm (36") TO 1800mm (72") DIAMETER PIPE
Add Metric		T. Stanton	03/03	DRAWING NUMBER D-43C	
Reformatted		T. Stanton	04/06		



PLAN



TYPICAL FOR MAXIMUM H > 3.05m (10') TYPICAL FOR MAXIMUM H < 3.05m (10')

END ELEVATION

If at upstream end, fillet is not shown

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

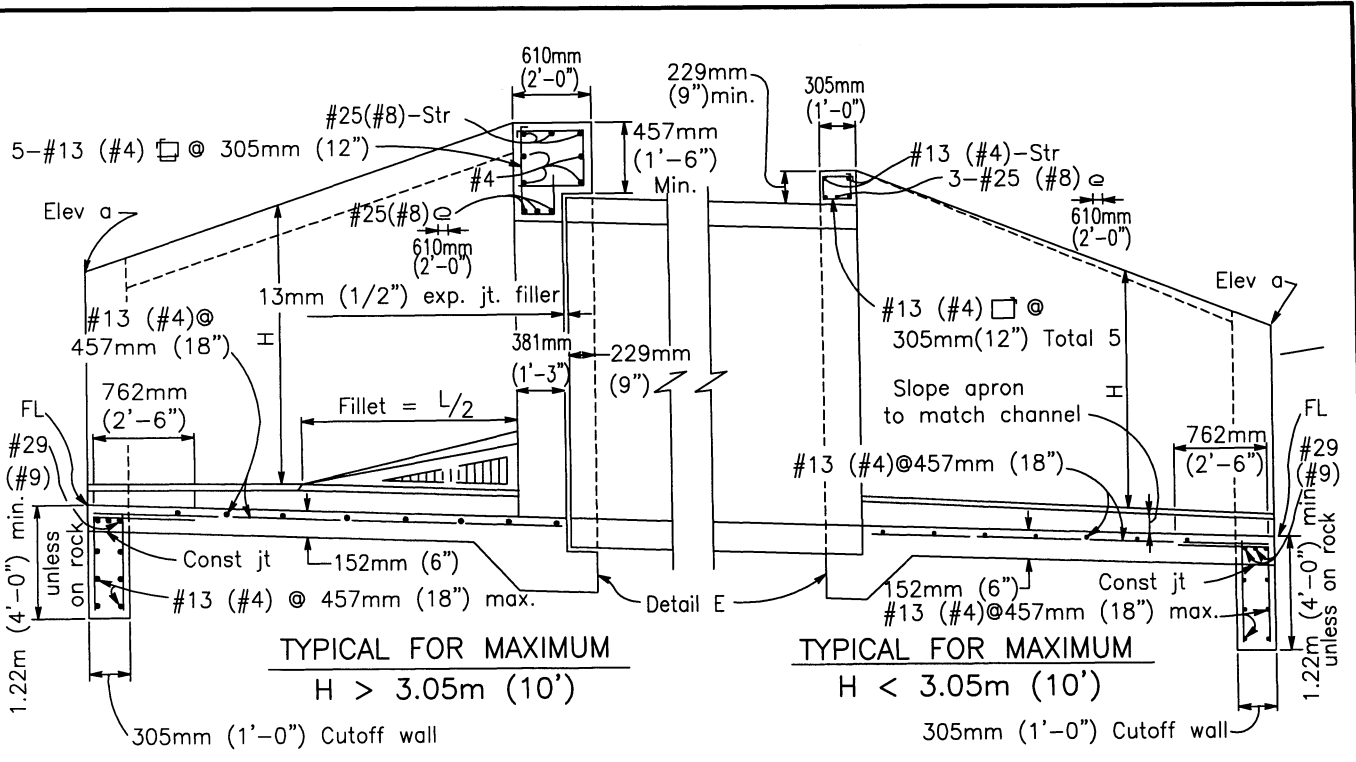
SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

PIPE CULVERT - HEADWALLS, ENDWALLS & WARPED WINGWALLS

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

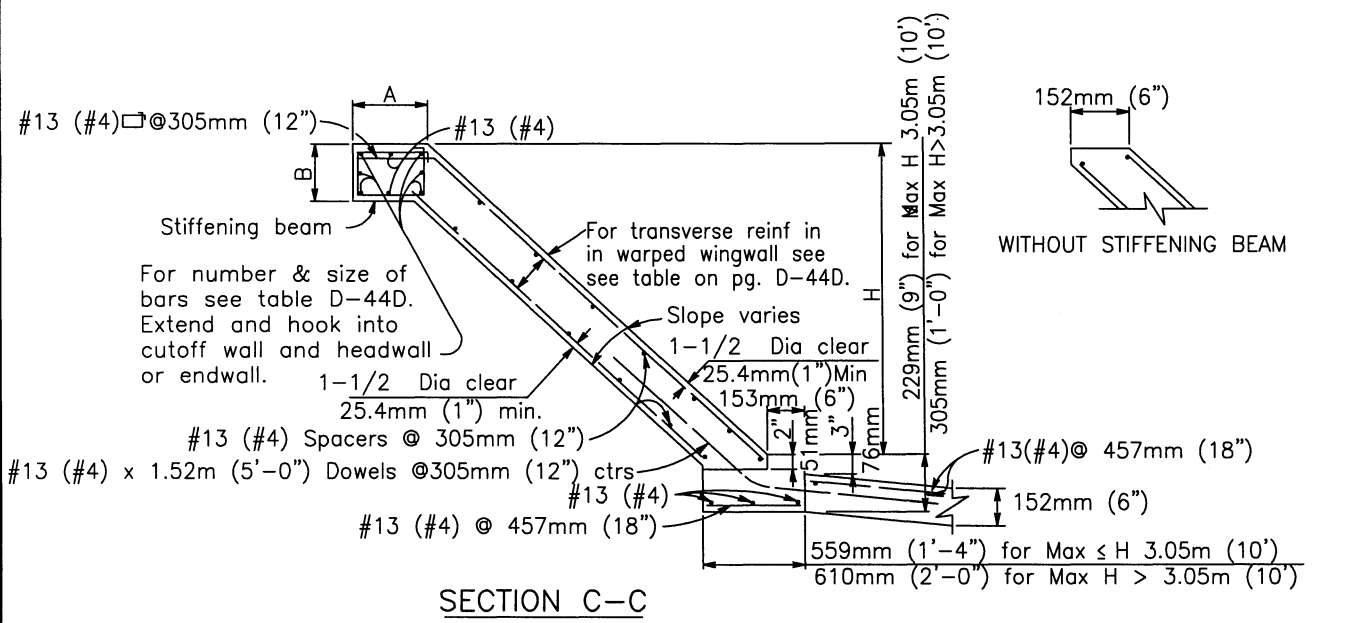
DRAWING NUMBER **D-44A**



PART LONGITUDINAL SECTION

NOTE

RCP shown. Metal pipe similar except eliminate the expansion joint and use hook bolts @ 483mm(19")± spacing. Size and length provided by manufacturer.



SECTION C-C

Where abrasion is anticipated, increase apron thickness to 178mm (7") minimum to provide 51mm (2") minimum reinforcement coverage.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

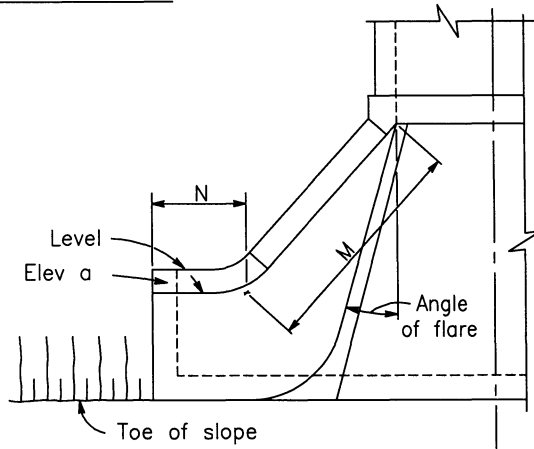
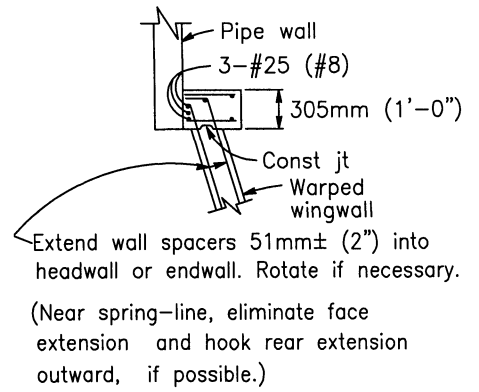
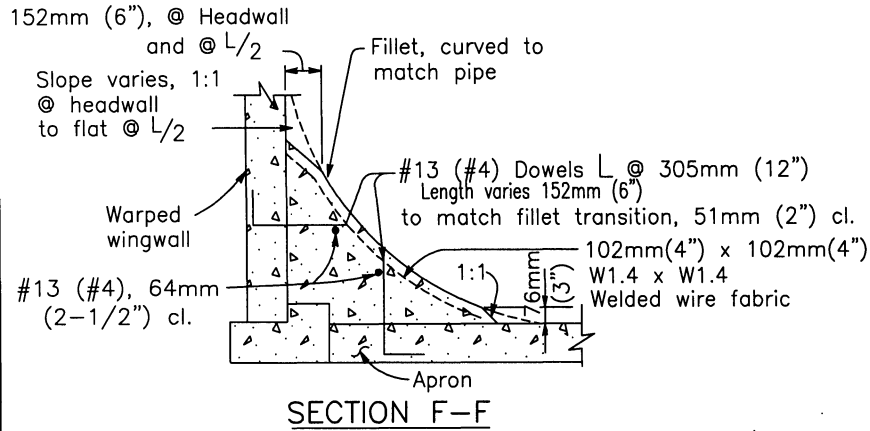
PIPE CULVERT - HEADWALLS, ENDWALLS & WARPED WINGWALLS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

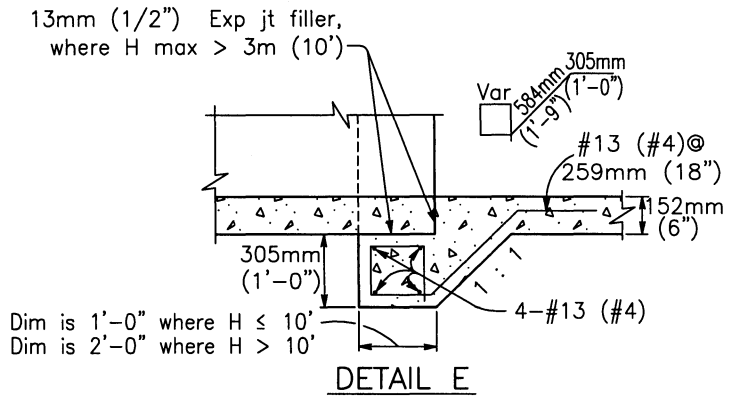
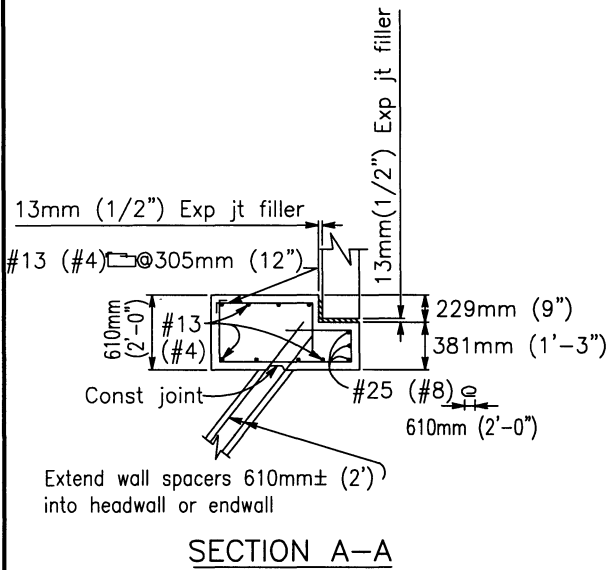
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-44B



ALTERNATIVE WARPED WINGWALL

Use where additional protection to toe of embankment is required. If at upstream end, fillet is not shown.



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**PIPE CULVERT - HEADWALLS,
ENDWALLS & WARPED WINGWALLS**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 31/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-44C**

WARPED WINGWALLS – IMPERIAL (All measurements in Feet and/or Inches unless otherwise noted)																			
WALL DIMENSIONS AND REINFORCING								STIFFENING BEAM DIMENSIONS AND REINFORCING											
Element Slope	H	8' or less	10'	12'	14'	16'	18'	20'	H max	L	12'	14'	16'	18'	20'	25'	30'	35'	40' or more
1/4:1	Front face reinf	#4@12	#4@7	#5@7	#5@5	#6@6	#7@7	#7@6	6'	No beam. Place 2-#6 in each face along top of wall.									
	Rear face reinf	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	8'										
3/4:1	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"								
1-1/4:1	Front face reinf	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	14'	Total 6-#6	A= 1'-6"								
	Rear face reinf	#4@8	#4@8	#4@5	#5@6	#6@7	#6@6	#7@6	16'		B= 1'-0"								
D at Cutoff Wall		6"	6"	6"	7-1/2"	8"	9-1/2"	11"	18'	Total 6-#7	A= 1'-10"								
D at Culvert		6"	6"	6"	8"	9-1/2"	11"	1'-1"	20'		B= 1'-0" A= 2'-0"								
											Total 6-#8 B= 1'-6"								
											Total 8-#9								

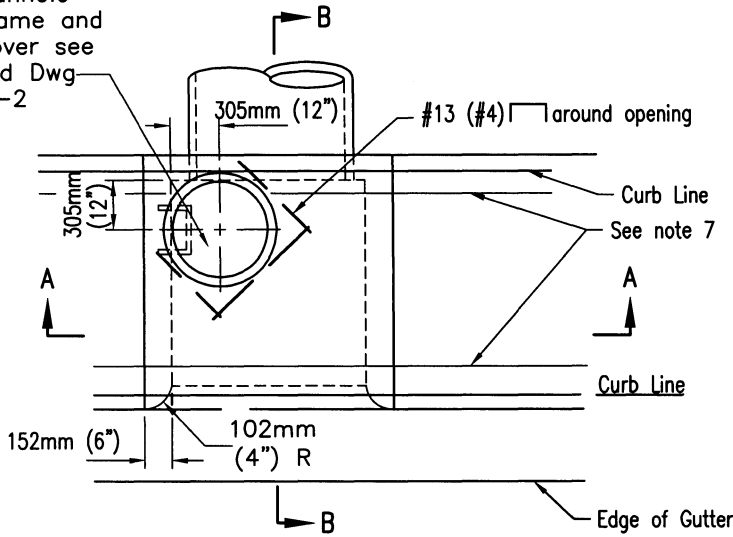
WARPED WINGWALLS – METRIC (All measurements in Millimeters unless otherwise noted)																			
WALL DIMENSIONS AND REINFORCING								STIFFENING BEAM DIMENSIONS AND REINFORCING											
Element Slope	H	2.44m or less	3.05m	3.66m	4.27	4.88m	5.59m	6.10m	H max	L	3.66m	3.27m	4.88m	5.49m	6.10m	7.62m	9.14m	10.7m	12m or more
1/4:1	Front face reinf	#13@305	#13@178	#16@178	#16@127	#19@152	#22@178	#22@152	1.83m	No beam. Place 2-#13 in each face along top of wall.									
	Rear face reinf	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	2.43m										
3/4:1	Front face reinf	#13@305	#13@305	#13@305	#13@305	#13@254	#13@203	#13@152	3.05m	wall.	A= 305								
	Rear face reinf	#13@305	#13@305	#13@305	#13@254	#13@178	#13@152	#16@203	3.66m		B= 229								
1-1/4:1	Front face reinf	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	4.27m	Total 6-#19	A= 457								
	Rear face reinf	#13@203	#13@203	#13@127	#16@152	#19@178	#19@152	#22@152	4.88m		B= 305								
D at Cutoff Wall		152	152	152	191	203	241	279mm	5.49m	Total 6-#22	A= 559								
D at Culvert		152	152	152	203	241	279	330	6.10m		B= 305 A= 610								
											Total 6-#25 B= 457								
											Total 8-#29								

NOTES:

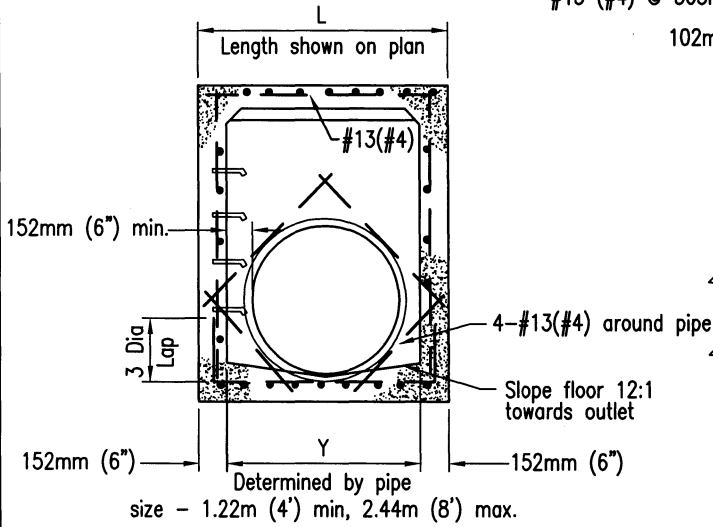
Walls designed for 610mm (2') surcharge; earth density = 55kg / 0.029 cu m (120 # / cu. ft.); equivalent fluid pressure = 16.4kg / cu m (36 #/cu. ft.) Vary D of warped wall uniformly from that at cutoff wall to that at culvert, for maximum H > 3.65m (12'). Dimensions L, W, H, M.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
PIPE CULVERT - HEADWALLS, ENDWALLS & WARPED WINGWALLS			
DRAWING NUMBER		D-44D	
Chairperson R.C.E. 19246		Date	
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE		3/10/2003	

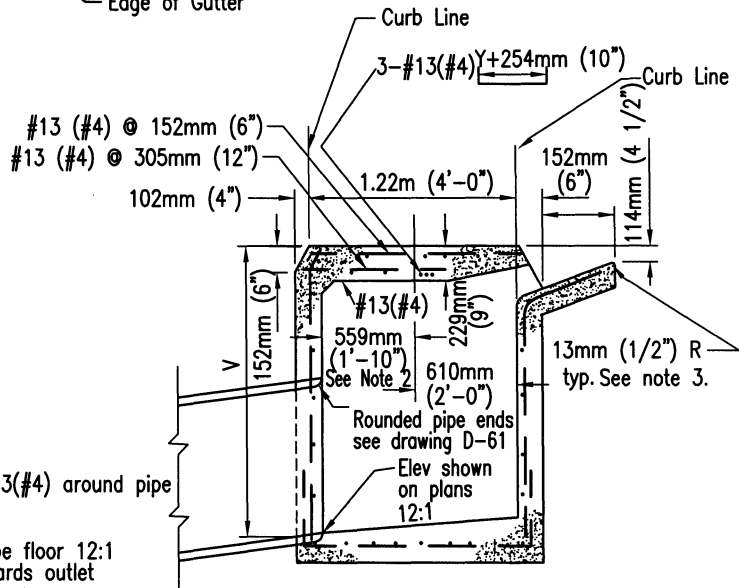
Manhole frame and cover see Std Dwg M-2



PLAN



SECTION A-A

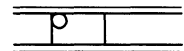


SECTION B-B

NOTES

1. See Standard Drawings D-11 & D-12 for additional notes and details.
2. Dimension shown becomes 610mm (2'-0") when opening on both sides. Adjust manhole as required.
3. Exposed edges of concrete shall be rounded with a radius of 13mm (1/2")
4. When V exceeds 1.22m (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 6.35mm (1/4") tooled groove in top slab in line with back of adjacent curb.
8. Maintain 38mm (1 1/2") clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		H. Hecht	10/82
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

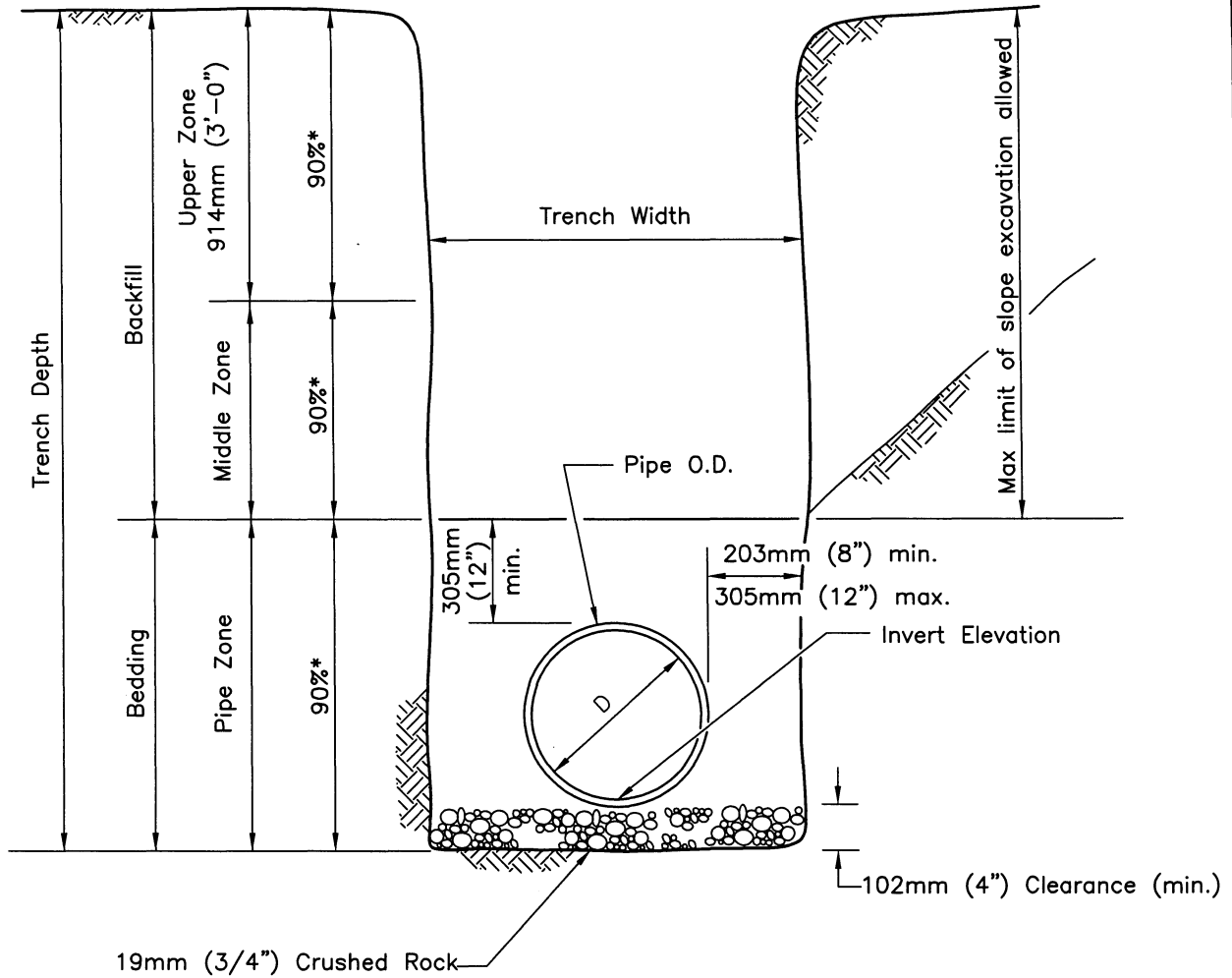
SAN DIEGO REGIONAL STANDARD DRAWING

MEDIAN CURB INLET - TYPE J

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 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.

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

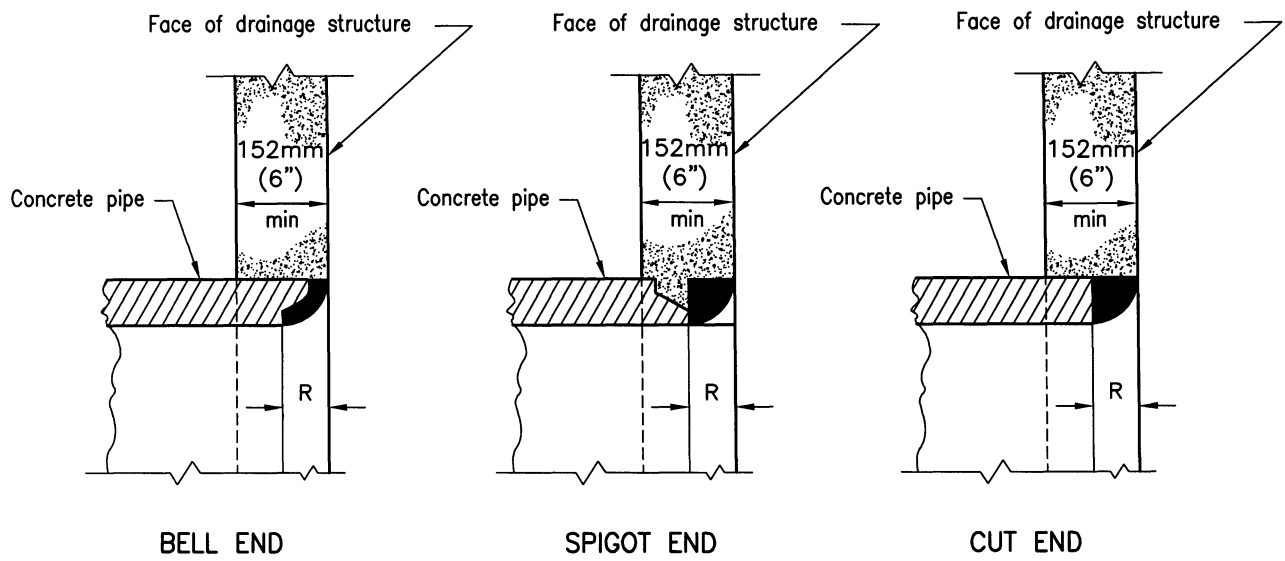
SAN DIEGO REGIONAL STANDARD DRAWING

PIPE BEDDING AND TRENCH BACKFILL
FOR STORM DRAINS

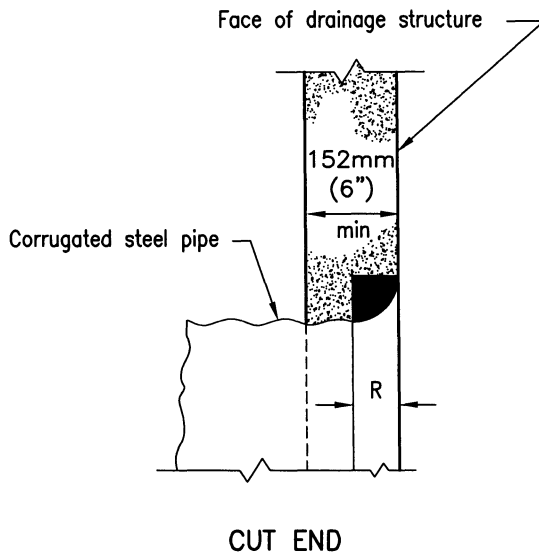
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-60**

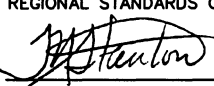


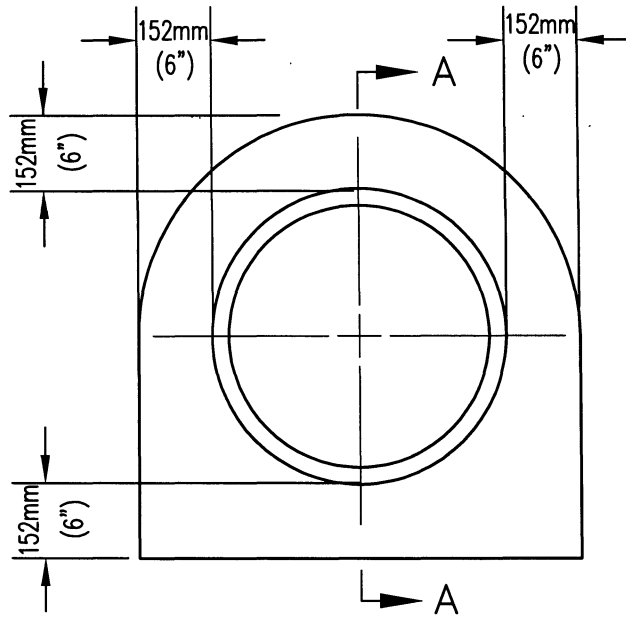
R = Thickness of pipe



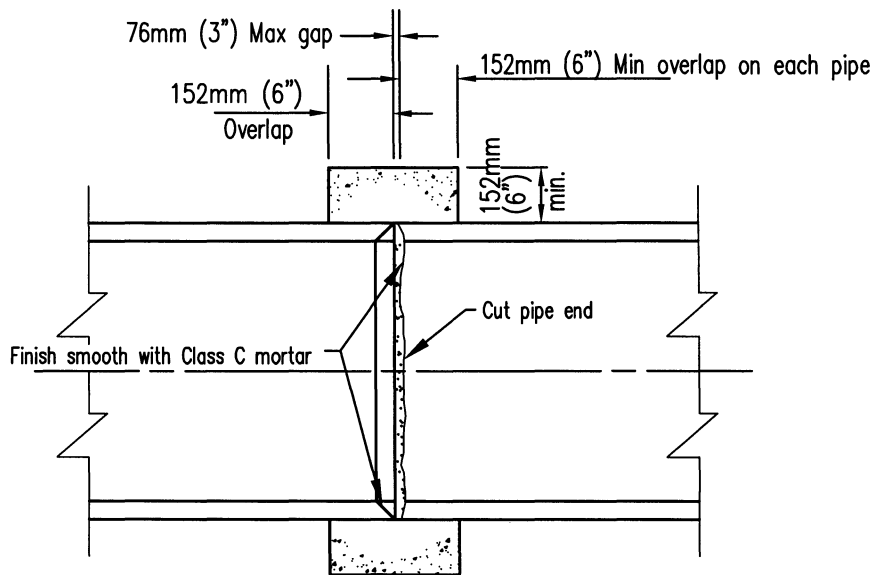
R = $\frac{\text{Inside diameter of pipe}}{10}$

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

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06		
ROUNDED PIPE ENDS IN DRAINAGE STRUCTURES				 3/01/2003 Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER D-61	



ELEVATION

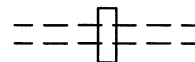


SECTION A-A

NOTES

1. Pipe collar does not have to be finished if covered.
2. Concrete shall be 332 kg/M³ - C-22Mpa (560-C-3250)
3. Where gap exceeds 76mm (3") but is not more than 152mm (6") an internal form shall be used.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

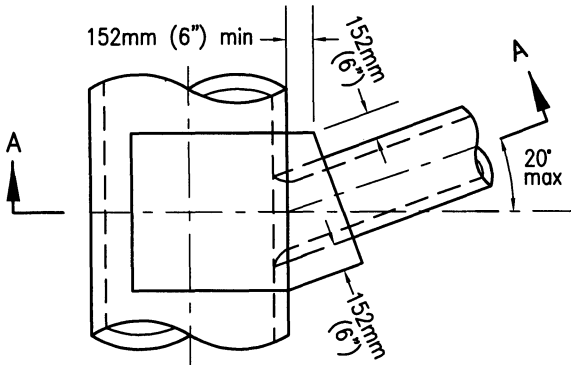
SAN DIEGO REGIONAL STANDARD DRAWING

PIPE COLLAR

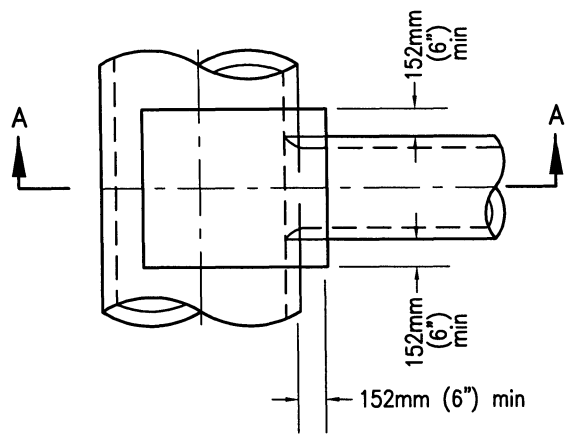
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

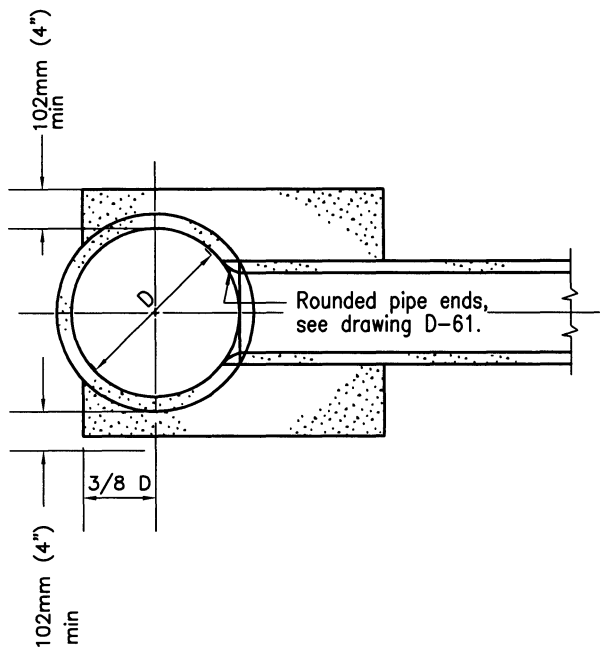
DRAWING NUMBER **D-62**



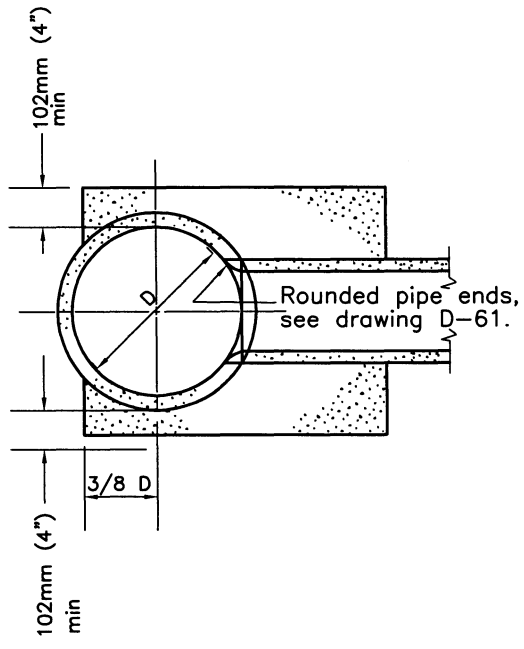
PLAN
SKEWED CONNECTION



PLAN



SECTION A-A

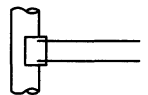


SECTION B-B

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 610mm (24") ID.
3. The smaller pipe shall not be more than 2/3 the size of the larger pipe.
4. Concrete shall be 279kg/M³ -C-14-Mpa (470-C-2000).

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

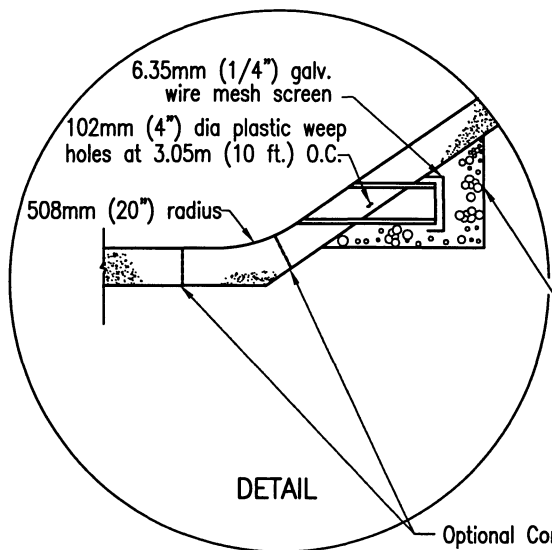
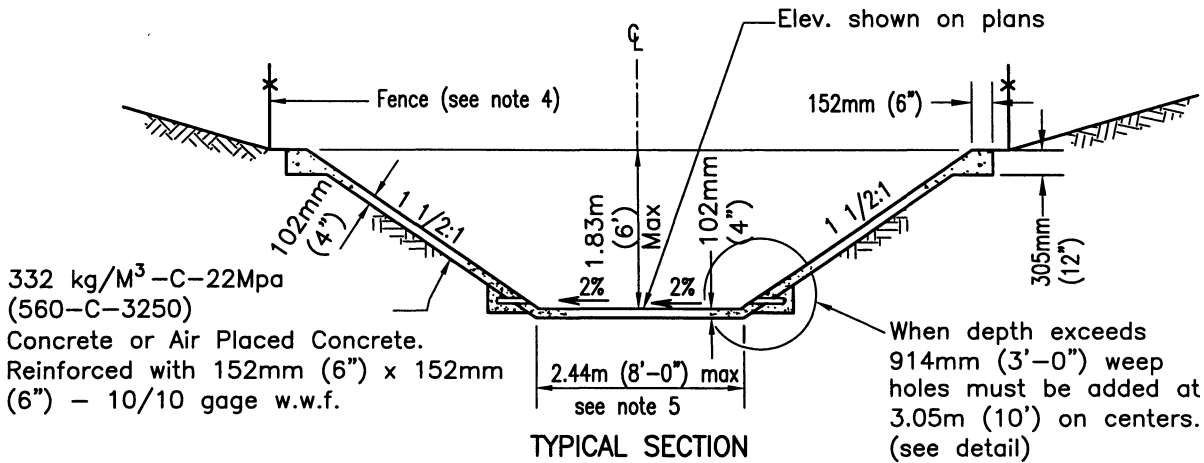
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE LUG

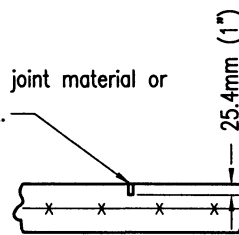
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-63**

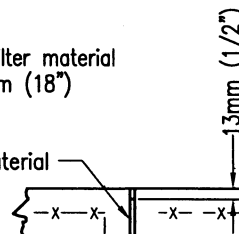


4.76mm (3/16") premolded joint material or
3.20mm (1/8") sawed joint.



25.4mm (1") max. graded filter material placed a minimum of 457mm (18") each side of weep hole.

Premolded Joint Material



38mm (1-1/2")

NOTES

1. A.C. or clay pipe may be substituted for plastic pipe at weep holes.
2. Weakened plane joints shall be placed every 3.66m (12') to 4.57m (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 2.44m (8 feet) see Standard Drawing D-71.
6. Reinforcement shown is minimum.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

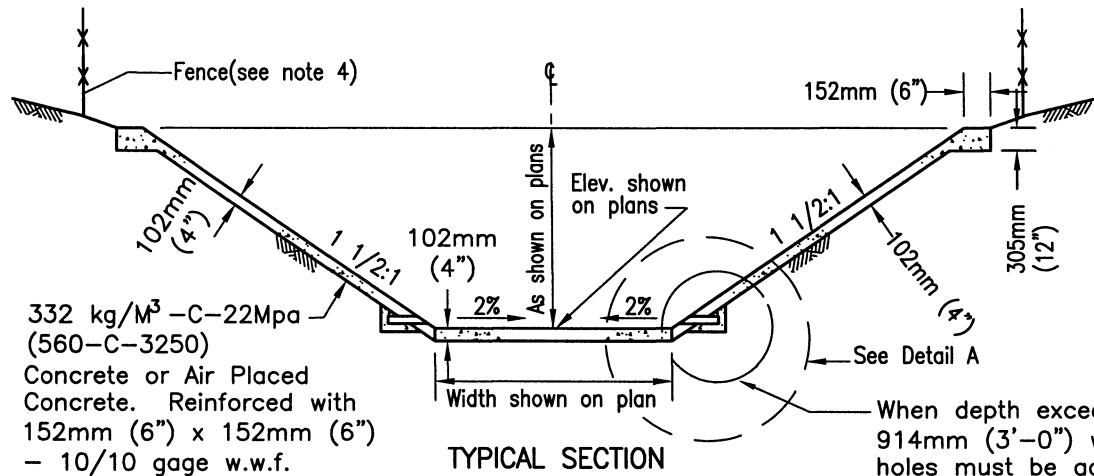
MINOR DRAINAGE CHANNEL

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-70**

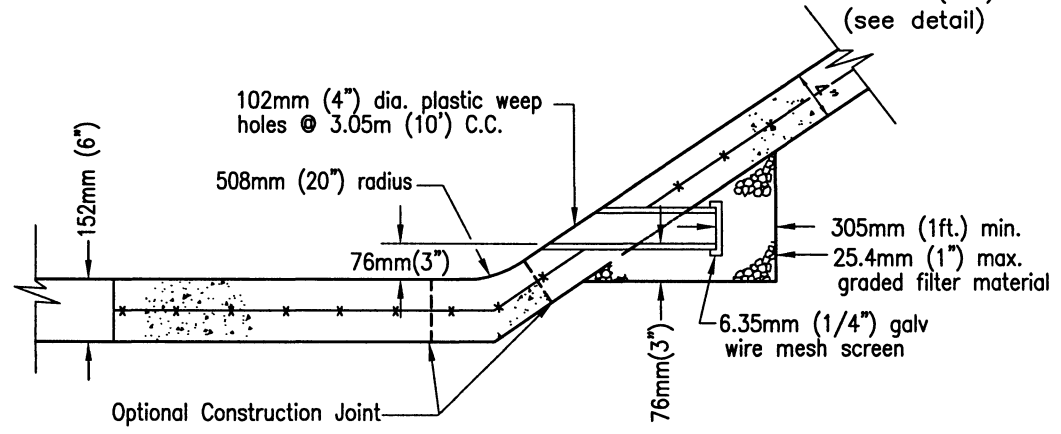
SEE SDD-100



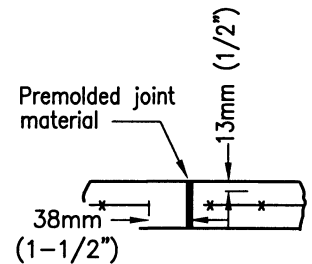
332 kg/M³ - C-22Mpa
(560-C-3250)
Concrete or Air Placed
Concrete. Reinforced with
152mm (6") x 152mm (6")
- 10/10 gage w.w.f.

TYPICAL SECTION

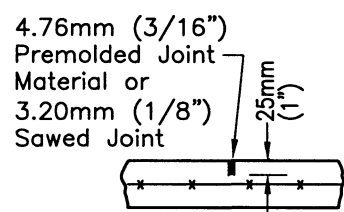
When depth exceeds
914mm (3'-0") weep
holes must be added at
3.05m (10') on centers.
(see detail)



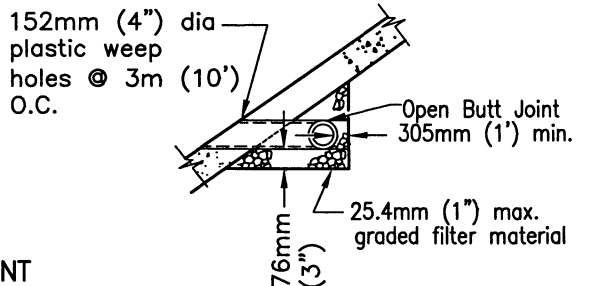
DETAIL A



EXPANSION JOINT



WEAKENED PLANE JOINT

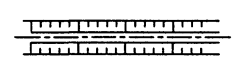


ALTERNATE CONTINUOUS DRAIN

NOTES

1. A.C. or clay pipe may be substituted for plastic pipe at weep holes.
2. Weakened plane joints shall be placed every 3.66m (12') to 4.57m (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.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

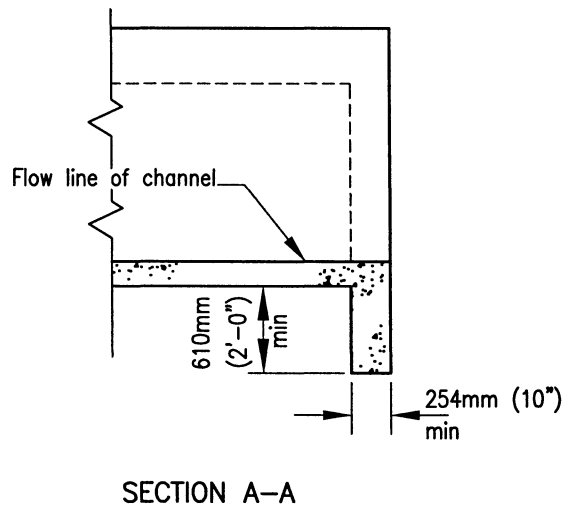
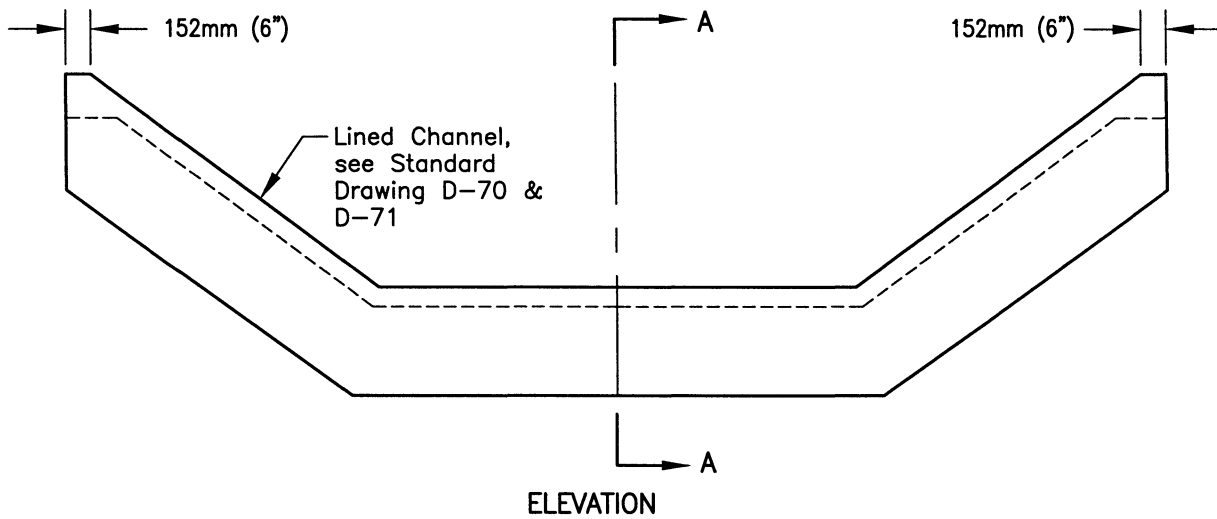
SAN DIEGO REGIONAL STANDARD DRAWING

MAJOR DRAINAGE CHANNEL

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

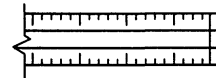
DRAWING NUMBER **D-71**



NOTES

1. Thickness and wall depth shall be as shown on plan.
2. Reinforcing in cut off wall shall be the same as that required in channel.
3. Concrete shall be 332 kg/M³-C-22Mpa (560-C-3250).

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL FOR DRAINAGE CHANNEL

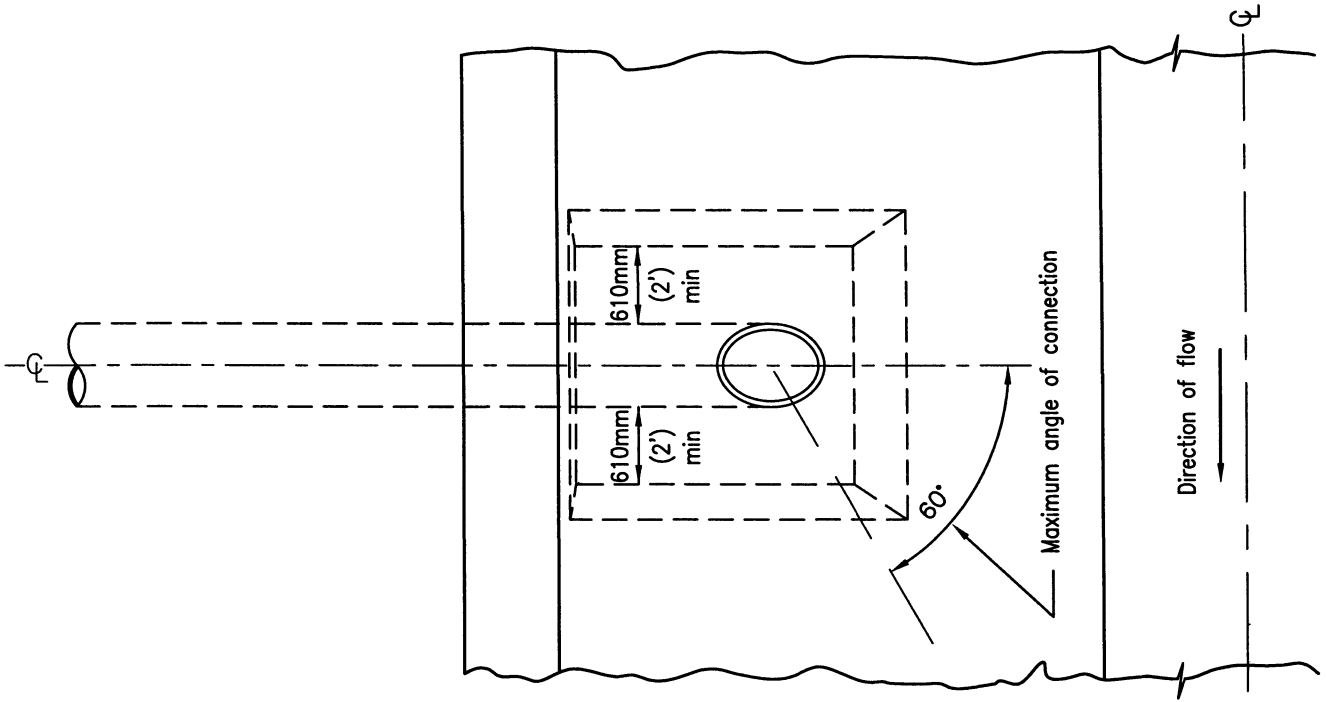
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

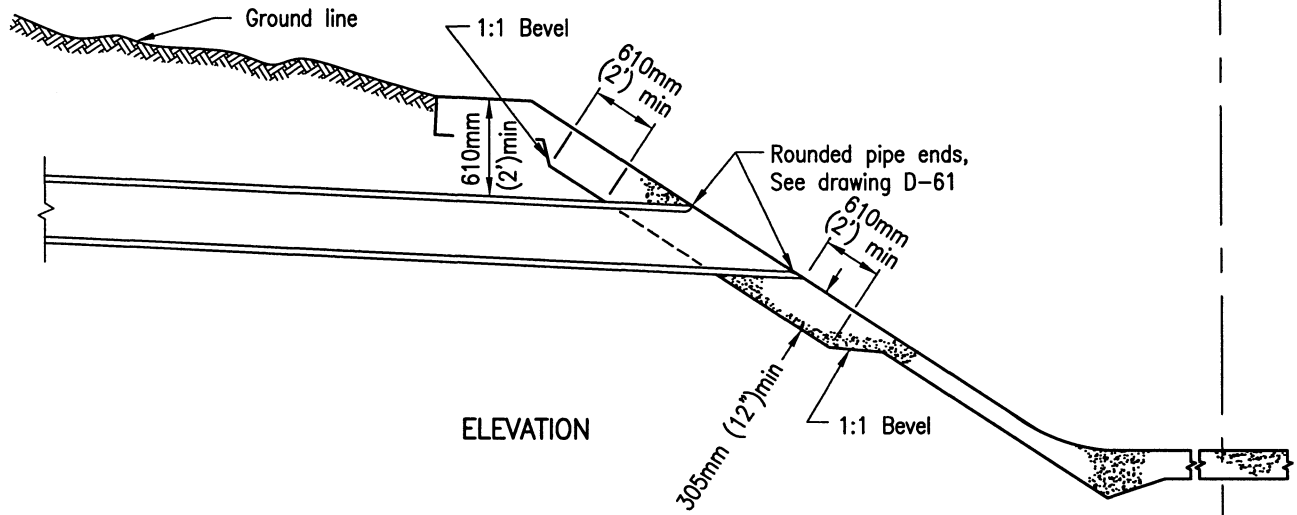
Chairperson R.C.E. 19246 Date

DRAWING NUMBER

D-72



PLAN

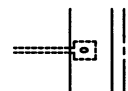


ELEVATION

NOTES:

1. Concrete shall be 332 kg/M³ -C-22Mpa (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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE TO CHANNEL CONNECTION

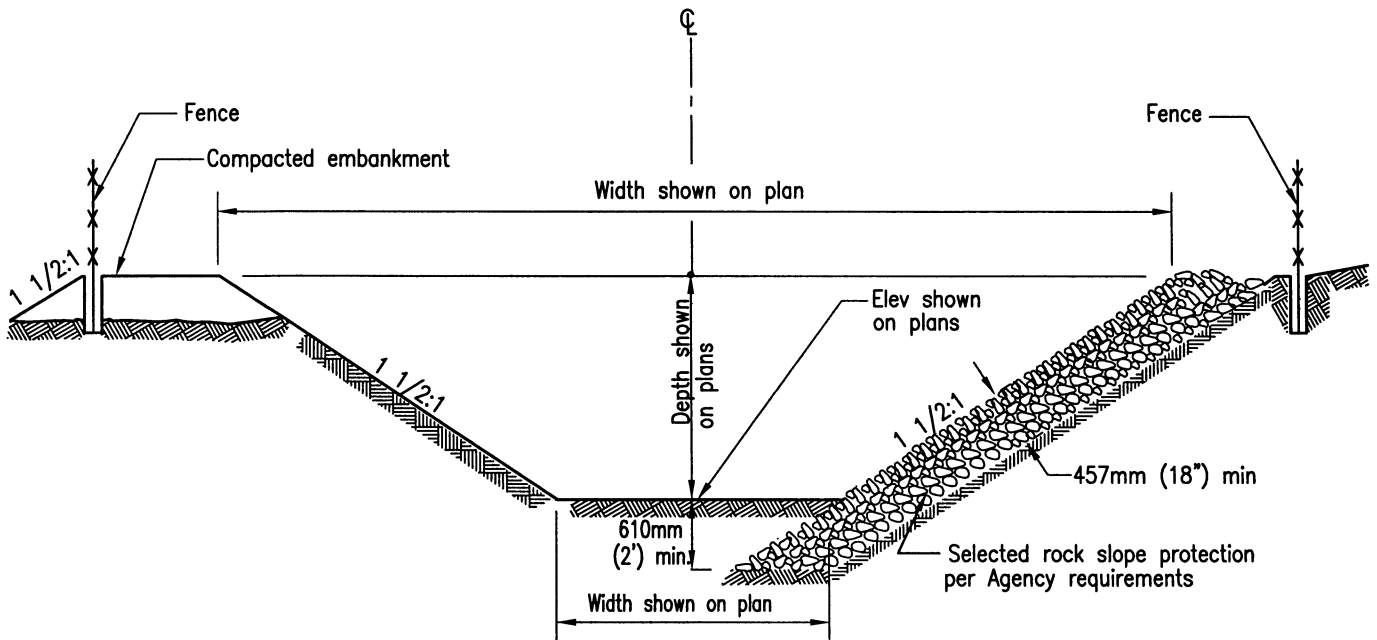
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 310112003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER

D-73



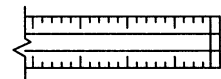
SECTION

NOTE:

The following shall be as required by Agency:

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

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

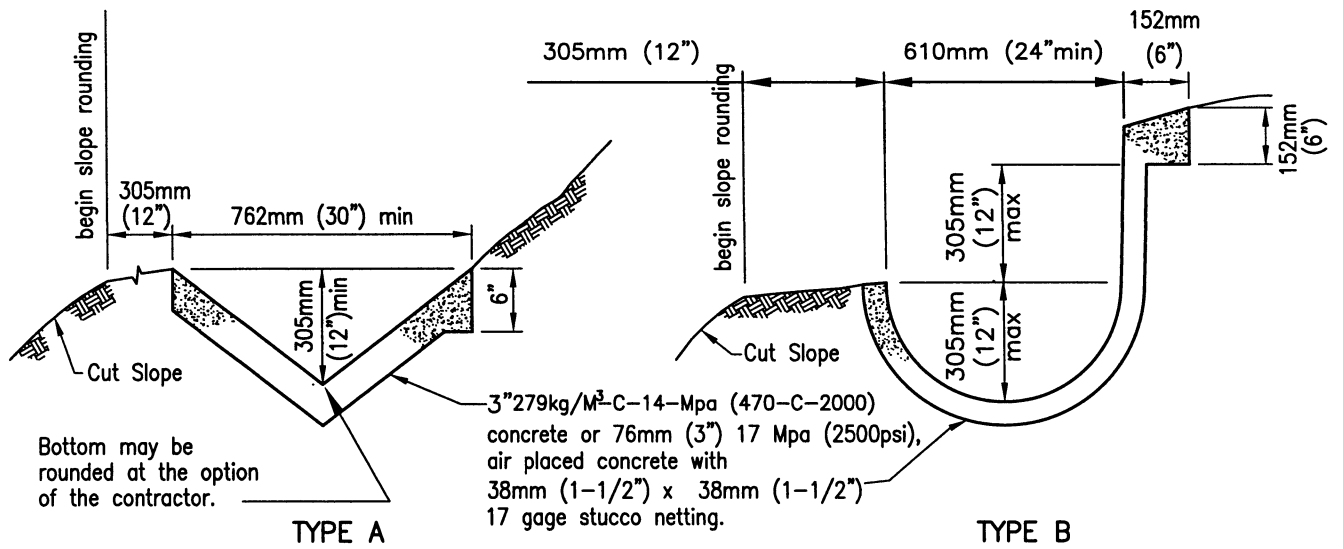
SAN DIEGO REGIONAL STANDARD DRAWING

GRADED EARTH CHANNEL

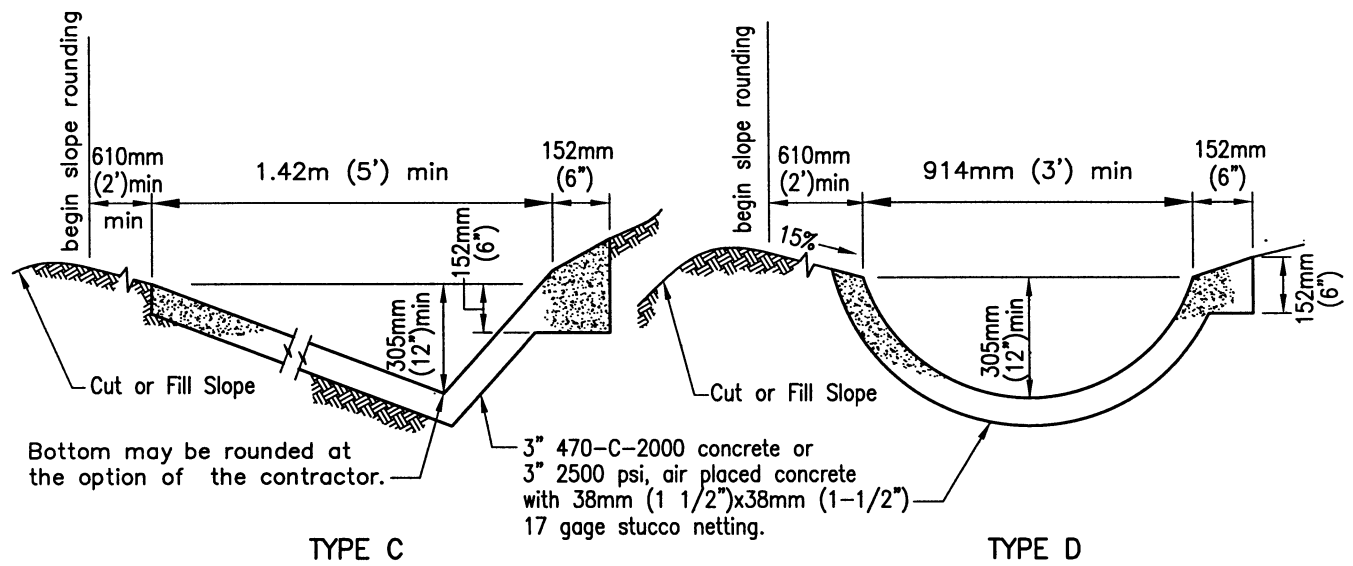
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-74**



BROW DITCH

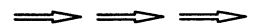


TERRACE DITCH

NOTES

1. Longitudinal slope of lined ditch shall be 2% minimum.
2. Over slope down ditches shall employ 152mm (6") thickened edge section at both sides of ditch.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE DITCHES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-75**

METRIC TABLE – SPANS UP TO 1.22M (all measurements in millimeters unless otherwise noted).

SPAN		610			914			1.22m					1.52m												
HEIGHT		457	610	610	914	610	914	1.22m	610	914	1.22m	610	914	1.22m	1.52m										
STRENGTH CLASSIFICATION		A	A	A	A	B	A	A	B	A	B	C	A	B	A	B	C	D	A	B	C	D			
MAX FILL OVER TOP		1.68m	965	965	1.68m	711	711	940	711	940	1.27m	305	686	305	686	279	660	889	1.17m	279	635	889	1.17m		
CONC.	Top Slab	T ₁	152	152	159	159	203	178	178	203	178	203	229	191	203	191	203	191	203	241	267	191	203	241	267
	Bottom Slab	T ₂	152	152	159	159	203	178	178	203	178	203	229	152	203	152	203	152	203	254	273	152	203	254	273
	Sidewalls	T ₃	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152
Reinforcing Steel	"a" Size Bar "	Spacing	89	89	89	89	102	127	127	114	127	114	127	102	102	102	102	102	102	127	114	102	102	127	114
		Length	965	965	1.27m	1.27m	1.3m	1.6m	1.6m	1.6m	1.6m	1.6m	1.57m	1.9m	1.9m	1.9m	1.9m	1.9m	1.9m	1.88m	1.88m	1.9m	1.9m	1.88m	1.88m
		"d" Dist. Bars	Top Slab–No. of	2	2	3	3	2	3	5	3	3	3	3	7	3	7	3	7	3	3	7	3	3	3
Reinforcing Steel	"e" Bars	Spacing	457	457	457	457	311	457	457	457	432	330	241	457	457	457	457	457	432	330	279	457	305	216	165
		Spacers	Number	12	12	12	12	12	12	12	12	14	14	14	14	14	14	14	14	14	14	14	16	16	16
		QUAN: Concrete: cubic meter per lin. ft.	13	13.8	17.6	20.7	23.7	22.2	25.3	27.6	27.6	30.6	32.9	24.5	28.3	27.6	31.2	30.6	33.7	39.0	41.3	32.9	34.5	42.1	43.6
QUAN: Reinf. kg per lin. ft.	12.3	13.2	15.5	16.4	20.9	20.0	20.5	21.4	21.8	23.6	29.0	25.9	25.5	26.8	25.9	27.7	27.3	30.9	34.0	28.6	29.5	35.0	39.5		

IMPERIAL TABLE – SPANS UP TO 5' (all measurements in feet and/or inches).

SPAN		2'		3'		4'					5'														
HEIGHT		1'-6"	2'	2'	3'	2'	3'	4'	4'	4'	4'	2'	3'	4'	4'	5'									
STRENGTH CLASSIFICATION		A	A	A	A	B	A	A	B	A	B	C	A	B	A	B	C	D	A	B	C	D			
MAX FILL OVER TOP		66	38	38	66	28	28	37	28	37	50	12	27	12	27	11	26	35	46	11	25	35	46		
CONC.	Top Slab	T ₁	6	6	6 1/4	6 1/4	8	7	7	8	7	8	9	7 1/2	8	7 1/2	8	7 1/2	8	9 1/2	10 1/2	7 1/2	8	9 1/2	10 1/2
	Bottom Slab	T ₂	6	6	6 1/4	6 1/4	8	7	7	8	7	8	9	6	8	6	8	10	10 3/4	6	8	10	10 3/4		
	Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Reinforcing Steel	"a" Size Bar "	Spacing	3 1/2	3 1/2	3 1/2	3 1/2	4	5	5	4 1/2	5	4 1/2	5	4	4	4	4	5	4 1/2	4	4	5	4 1/2		
		Length	3-2	3-2	4-2	4-2	4-3	5-3	5-3	5-3	5-3	5-2	6-3	6-3	6-3	6-3	6-3	6-2	6-2	6-3	6-3	6-2	6-2		
		"d" Dist. Bars	Top Slab–No. of	2	2	3	3	2	3	5	3	3	3	3	7	3	7	3	7	3	3	7	3	3	
Reinforcing Steel	"e" Bars	Bottom Slab–No. of	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
		Spacing	18	18	18	18	12 1/4	18	18	18	17	13	9 1/2	18	18	18	18	18	17	13	11	18	12	8 1/2	6 1/2
		Spacers	Number	12	12	12	12	12	12	12	14	14	14	14	14	14	14	14	14	16	16	16	16		
QUAN: Concrete: C.Y. per lin. ft.	17	18	23	27	31	29	33	36	36	40	43	32	37	36	41	40	44	51	54	43	48	55	57		
QUAN: Reinf. lbs per lin. ft.	27	29	34	36	46	44	45	47	48	52	64	57	56	59	57	61	60	68	75	63	65	77	87		

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

DRAWING NUMBER D-76A
 Recommended by THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
 Christensen R.C.E. 19246 Date 3/10/2003

Revision	By	Approved	Date
ORIGINAL	A.Kercheval		12/75
Add Metric	T. Stanton		03/03
Reviewed	T. Stanton		04/06

METRIC TABLE – SPAN 1.88m (all measurements in millimeters unless otherwise noted).

SPAN		1.88m																					
HEIGHT		2'		3'		4'			5'				6'				7'						
STRENGTH CLASSIFICATION		A	B	A	B	A	B	C	A	B	C	D	A	B	C	D	E	A	B	C	D	E	
MAX FILL OVER TOP		254	457	254	457	254	457	635	229	457	635	914	229	432	635	914	1.14m	229	432	635	914	1.14m	
CONC.	Top Slab T ₁	210	210	210	210	210	210	235	210	210	235	279	210	210	235	279	305	210	210	235	279	305	
	Bottom Slab T ₂	172	203	172	203	172	203	248	184	210	305	286	184	210	267	286	311	184	210	267	286	311	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	152	152	152	159	178	152	152	159	178	197	
Reinforcing Steel	"a" ┌───┐ └───┘	Size Bar "	16	16	16	16	16	16	19	16	16	19	19	16	16	19	22	22	16	16	19	22	22
		Spacing	102	102	102	102	102	102	127	102	102	127	4 1/2	102	102	127	5 1/2	5	102	102	127	140	127
		Length	2.21m	2.21m	2.21m	2.21m	2.21m	2.21m	2.18m	2.21m	2.21m	2.18m	2.18m	2.21m	2.21m	2.18m	2.21m	2.26m	2.21m	2.21m	2.18m	2.26m	2.29m
	"d" Dist.	Top Slab–No. of	7	4	7	4	7	4	7	4	7	4	7	4	7	4	4	4	7	4	4	4	4
	Bars	Bottom Slab–No. of	4		4		4			4				4				4					
	"e" Bars	Spacing	457	457	457	457	457	457	432	457	394	292	216	432	267	191	152	127	305	191	178	127	114
QUAN.	Concrete: Cubic Meter per lin. ft.	30.6	32.2	32.9	35.2	36.0	38.3	44.4	44.4	41.3	45.9	50.5	42.9	44.4	49.7	54.3	59.7	45.1	46.7	53.6	59.7	67.3	
	Reinf. kg per lin. ft.	29.0	28.6	30.0	29.5	31.3	30.4	33.6	31.8	31.8	36.3	41.3	33.2	35.4	41.8	50.8	57.6	36.8	40.9	44.9	57.2	63.1	

IMPERIAL TABLE – SPANS 6' (all measurements in feet and/or inches).

SPAN		6'																					
HEIGHT		2'		3'		4'			5'				6'				7'						
STRENGTH CLASSIFICATION		A	B	A	B	A	B	C	A	B	C	D	A	B	C	D	E	A	B	C	D	E	
MAX FILL OVER TOP		10	18	10	18	10	18	25	9	18	25	36	9	17	25	36	45	9	17	25	36	45	
CONC.	Top Slab T ₁	8 1/4	8 1/4	8 1/4	8 1/4	8 1/4	8 1/4	9 1/4	8 1/4	8 1/4	9 1/4	11	8 1/4	8 1/4	9 1/4	11	12	8 1/4	8 1/4	9 1/4	11	12	
	Bottom Slab T ₂	6 3/4	8	6 3/4	8	6 3/4	8	9 3/4	7 1/4	8 1/4	10	11 1/4	7 1/4	8 1/4	10 1/2	11 1/4	12 1/4	7 1/4	8 1/4	10 1/2	11 1/4	12 1/4	
	Sidewalls T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6 1/4	7	6	6	6 1/4	7	7 3/4	
Reinforcing Steel	"a" ┌───┐ └───┘	Size Bar "	5	5	5	5	5	6	5	5	6	6	5	5	6	7	7	5	5	6	7	7	
		Spacing	4	4	4	4	4	4	5	4	4	5	4 1/2	4	4	5	5 1/2	5	4	4	5	5 1/2	5
		Length	7-3	7-3	7-3	7-3	7-3	7-3	7-2	7-3	7-3	7-2	7-2	7-3	7-3	7-2	7-3	7-5	7-3	7-3	7-2	7-5	7-6
	"d" Dist.	Top Slab–No. of	7	4	7	4	7	4	7	4	7	4	4	7	4	4	4	7	4	4	4	4	4
	Bars	Bottom Slab–No. of	4		4		4			4				4				4					
	"e" Bars	Spacing	18	18	18	18	18	18	17	18	15 1/2	11 1/2	8 1/2	17	10 1/2	7 1/2	6	5	12	7 1/2	7	5	4 1/2
QUAN.	Concrete: C.Y. per lin. ft.	40	42	43	46	47	50	58	52	54	60	66	56	58	65	71	78	59	61	70	78	88	
	Reinf. lbs per lin. ft.	64	63	66	65	69	67	74	70	70	80	91	73	78	92	112	127	81	90	99	126	139	

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.

Revision	By	Approved	Date
ORIGINAL		A. Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT

DETAILS No. 1

DRAWING NUMBER **D-76B**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE


Chris Peterson R.C.E. 19246 Date *3/10/2003*

METRIC TABLE - SPAN 2.13m (all measurements in millimeters unless otherwise noted).
For Imperial table (7' Span) - see drawing D76D

SPAN		2.13m													
HEIGHT		914		1.22m		1.52m			1.83m			2.14			
STRENGTH CLASSIFICATION		A	B	A	B	A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		406	660	406	660	406	660	889	406	660	889	406	660	889	
CONC.	Top Slab T ₁	184	210	184	210	184	210	248	184	210	248	184	210	248	
	Bottom Slab T ₂	191	222	191	222	191	222	267	191	222	267	191	222	267	
	Sidewalls T ₃	152	178	152	178	152	178	216	152	178	216	152	178	216	
Reinforcing Steel	"a"	Size Bar "	16	16	16	16	16	16	19	16	16	19	16	16	19
		Spacing	229	178	229	178	229	178	229	229	178	229	229	178	229
		Length	2.03m	2.06m	2.03m	2.06m	2.03m	2.06m	2.08m	2.03m	2.06m	2.08m	2.03m	2.06m	2.08m
	"b"	Size Bar "	16	16	16	16	16	16	19	16	16	19	16	16	19
		Spacing	229	178	229	178	229	178	229	229	178	229	229	178	229
		Dimension "X"	381	406	381	406	381	406	508	381	406	508	381	406	508
	"c"	Size Bar "	16	16	16	16	16	16	19	16	16	19	16	16	19
		Spacing	229	178	229	178	229	178	229	229	178	229	229	178	229
		Dimension "Y"	559	584	559	584	559	584	686	559	584	686	559	584	686
	"c _i "	Size Bar "	16	16	16	16	16	16	19	16	16	19	16	16	19
		Spacing	229	178	229	178	229	178	229	229	178	229	229	178	229
		Dimension "Y"	559	584	559	584	559	584	686	559	584	686	559	584	686
	"d"	Length	940	965	940	965	940	965	1.17m	940	965	1.17m	940	965	1.17m
		Top Slab-No. of Bars	7	4	7	4	7	4	4	7	4	4	7	4	4
		Bottom Slab-No. of Bars	4	4	4	4	4	4	4	4	4	4	4	4	4
	"e" Bars	Spacing	457	457	457	457	457	457	457	457	457	457	457	457	457
		Spacers Total Number	24		28		28			32			36		
	QUAN.	Concrete: cu meters per lin. ft.	36.0	42.9	39.0	45.9	42.1	49.0	59.7	44.4	52.0	64.3	47.4	55.9	68.0
		Reinf kg per lin. ft.	48.6	59.0	51.8	62.6	53.6	64.9	76.3	56.7	68.0	80.0	59.9	71.7	83.5

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.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	SINGLE BOX CULVERT	DETAILS No.1	DRAWING NUMBER D-76C
ORIGINAL		A.Kercheval	12/75				
Add Metric		T. Stanton	03/03				
Reviewed		T. Stanton	04/06				
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE				 Chairperson R.C.E. 19246 Date 3/01/2003			

Revision	By	Approved	Date
ORIGINAL	A. Kercheval		12/75
Add Metric	T. Stanton		03/03
Reviewed	T. Stanton		04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**SINGLE BOX CULVERT
DETAILS No.1**

DRAWING NUMBER **D-76D**

Chairperson R.C.E. 19246 Date *3/01/2003*

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

IMPERIAL TABLE - SPAN 7' (all measurements in feet and/or inches unless otherwise noted).
For Metric Table (2.13m Span) - see drawing D76C

SPAN		7'														
HEIGHT		3'		4'		5'			6'			7'				
STRENGTH CLASSIFICATION		A	B	A	B	A	B	C	A	B	C	A	B	C		
MAX FILL OVER TOP		16	26	16	26	16	26	35	16	26	35	16	26	35		
CONC.	Top Slab T ₁	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4	9 3/4	7 1/4	8 1/4	9 3/4	7 1/4	8 1/4	9 3/4		
	Bottom Slab T ₂	7 1/2	8 3/4	7 1/2	8 3/4	7 1/2	8 3/4	10 1/2	7 1/2	8 3/4	10 1/2	7 1/2	8 3/4	10 1/2		
	Sidewalls T ₃	6	7	6	7	6	7	8 1/2	6	7	8 1/2	6	7	8 1/2		
Reinforcing Steel	"a" ┌───┐ 	Size Bar "	5	5	5	5	5	6	5	5	6	5	5	6		
		Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9	
		Length	6-8	6-9	6-8	6-9	6-8	6-9	6-10	6-8	6-9	6-10	6-8	6-9	6-10	
	"b" ┌──┐ 	Size Bar "	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9	
		Dimension "X"	1-3	1-4	1-3	1-4	1-3	1-4	1-8	1-3	1-4	1-8	1-3	1-4	1-8	
		Length	3-1	3-2	3-1	3-2	3-1	3-2	3-10	3-1	3-2	3-10	3-1	3-2	3-10	
	"c" ┌──┐ 	Size Bar "	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9	
		Dimension "Y"	1-10	1-11	1-10	1-11	1-10	1-11	2-3	1-10	1-11	2-3	1-10	1-11	2-3	
	"c" ┌──┐ 	Size Bar "	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	9	7	9	9	7	9	
		Dimension "Y"	1-10	1-11	1-10	1-11	1-10	1-11	2-3	1-10	1-11	2-3	1-10	1-11	2-3	
	"d"	Top Slab-No. of Bars	7	4	7	4	7	4	4	7	4	4	7	4	4	
		Bottom Slab-No. of Bars	4	4	4	4	4	4	4	4	4	4	4	4	4	
	"e" Bars	Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	
		Spacers Total Number	24			28			28			32			36	
	QUAN.	Concrete: C.Y. per lin. ft.	47	56	51	60	55	64	78	58	68	84	62	73	89	
		Reinf lbs per lin. ft.	107	130	114	138	118	143	168	125	150	176	132	158	184	

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.

METRIC TABLE – SPAN 2.44m (all measurements in millimeters unless otherwise noted).
 For Imperial table (8' Span) – see drawing D76F

SPAN		2.44m															
HEIGHT		910mm		1.22m		1.52m		1.83m			2.13m			2.44m			
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		4m	6.4m	4m	6.4m	4m	6.4m	4m	6.4m	9.4m	4m	6.4m	9.4m	4m	6.4m	9.4m	
CONC.	Top Slab T ₁	184	216	184	216	184	216	184	216	260	184	216	260	184	216	260	
	Bottom Slab T ₂	184	241	184	241	184	241	184	241	292	184	241	292	184	241	292	
	Sidewalls T ₃	165	184	165	184	165	184	165	184	248	165	184	248	165	184	248	
Reinforcing Steel	"a" ┌───┐	Size Bar "	16	16	16	16	16	16	16	19	16	16	19	16	16	19	
		Spacing	229	178	229	178	229	178	229	178	203	229	178	203	229	178	203
		Length	2.31m	2.34m	2.31m	2.34m	2.31m	2.34m	2.31m	2.34m	2.40m	2.31m	2.34m	2.40m	2.31m	2.34m	2.40m
	"b" ┌──┐	Size Bar "	16	16	16	16	16	16	16	19	16	16	19	16	16	19	
		Spacing	229	178	229	178	229	178	229	178	203	229	178	203	229	178	203
		Dimension "X"	457	483	457	483	457	483	457	483	508	457	483	508	457	483	508
		Length	1.02m	1.04m	1.02m	1.04m	1.02m	1.04m	1.02m	1.04m	1.17m	1.02m	1.04m	1.17m	1.02m	1.04m	1.17m
	"c" ┌──┐	Size Bar "	16	16	16	16	16	16	16	19	16	16	19	16	16	19	
		Spacing	229	178	229	178	229	178	229	178	203	229	178	203	229	178	203
		Dimension "Y"	610	737	610	737	610	737	610	737	813	610	737	813	610	737	813
		Length	1.02m	1.17m	1.02m	1.17m	1.02m	1.17m	1.02m	1.17m	1.29m	1.02m	1.17m	1.29m	1.02m	1.17m	1.29m
	"c" ┌──┐	Size Bar "	16	16	16	16	16	16	16	19	16	16	19	16	16	19	
		Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
		Dimension "Y"	610	737	610	737	610	737	610	737	813	610	686	813	610	737	813
		Length	1.14m	1.35m	1.14m	1.35m	1.14m	1.35m	3-9	1.35m	1.52m	1.14m	1.35m	1.52m	1.14m	1.35m	1.52m
	"d" ┌──┐	Top Slab–No. of Bars	7	5	7	5	7	5	7	5	5	7	5	5	7	5	5
		Bottom Slab–No. of Bars	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	"e" ┌──┐	Spacing	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457
		Total Number	28		32		32		36		40		40		40		40
	QUAN.	Concrete: Cubic Meter per lin. ft.	39.8	50.0	42.9	53.6	46.9	56.6	50.0	60.4	76.5	52.8	63.5	81.1	55.9	67.3	85.7
		Reinf kg per lin. ft.	53.6	65.8	56.7	69.9	58.6	73.1	61.7	75.8	95.8	64.9	79.0	99.8	66.7	81.2	102.1

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.

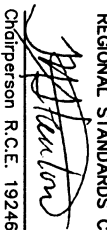
Revision	By	Approved	Date
ORIGINAL		A.Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
SINGLE BOX CULVERT			
DETAILS No.1			
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chairperson R.C.E. 19246 Date <i>3/01/2003</i>			
DRAWING NUMBER D-76E			

IMPERIAL TABLE - SPAN 8' (all measurements in feet and/or inches unless otherwise noted).
 For Metric table (2.44m Span) - see drawing D76E

SPAN		8'															
HEIGHT		3'		4'		5'		6'			7'			8'			
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		13	21	13	21	13	21	13	21	31	13	21	31	13	21	31	
CONC.	Top Slab T ₁	7 1/4	8 1/2	7 1/4	8 1/2	7 1/4	8 1/2	7 1/4	8 1/2	10 1/4	7 1/4	8 1/2	10 1/4	7 1/4	8 1/2	10 1/4	
	Bottom Slab T ₂	7 1/4	9 1/2	7 1/4	9 1/2	7 1/4	9 1/2	7 1/4	9 1/2	11 1/2	7 1/4	9 1/2	11 1/2	7 1/4	9 1/2	11 1/2	
	Sidewalls T ₃	6 1/2	7 1/2	6 1/2	7 1/2	6 1/2	7 1/2	6 1/2	7 1/2	9 3/4	6 1/2	7 1/2	9 3/4	6 1/2	7 1/2	9 3/4	
Reinforcing Steel	"a"	Size Bar "	5	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
		Length	7-7	7-8	7-7	7-8	7-7	7-8	7-7	7-8	7-10	7-7	7-8	7-10	7-7	7-8	7-10
	"b"	Size Bar "	5	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
		Dimension "X"	1-6	1-7	1-6	1-7	1-6	1-7	1-6	1-7	1-8	1-6	1-7	1-8	1-6	1-7	1-8
	"c"	Size Bar "	5	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
		Dimension "Y"	2-0	2-5	2-0	2-5	2-0	2-5	2-0	2-5	2-8	2-0	2-5	2-8	2-0	2-5	2-8
	"c ₁ "	Size Bar "	5	5	5	5	5	5	5	6	5	5	6	5	5	6	
		Spacing	9	7	9	7	9	7	9	7	8	9	7	8	9	7	8
		Dimension "Y"	2-0	2-5	2-0	2-5	2-0	2-5	2-0	2-5	2-8	2-0	2-3	2-8	2-0	2-5	2-8
	"d"	Top Slab-No. of Bars	7	5	7	5	7	5	7	5	5	7	5	5	7	5	5
		Bottom Slab-No. of Bars	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	"e" Bars	Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Spacers	Total Number	28		32		32		36			40			40		
	QUAN.	Concrete: C.Y. per lin. ft.	52	65	56	70	60	74	65	79	100	69	83	106	73	88	112
		Reinf lbs per lin. ft.	118	146	125	154	129	139	136	167	211	143	174	220	147	179	225

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.

Revision	By	Approved	Date
ORIGINAL	A. Kercheval	T. Stanton	12/75
Add Metric	T. Stanton		03/03
Reviewed	T. Stanton		04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
SINGLE BOX CULVERT			
DETAILS No.1			
DRAWING NUMBER		D-76F	
 R. Stanton Chiefperson R.C.E. 19246 Date 3/01/2003		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	

METRIC TABLE – SPAN 3.05m (all measurements in millimeters unless otherwise noted).
 For Imperial table (10' Span) – see drawing D76H

SPAN		3.05m																		
HEIGHT		1.22m		1.52m		1.83m		2.13m		2.44m			2.74m			3.05m				
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	A	B	C	A	B	C	A	B	C		
MAX FILL OVER TOP		2.7m	5.5m	2.7m	5.5m	2.7m	5.5m	2.7m	5.5m	2.4m	5.5m	8.5m	2.4m	5.5m	8.5m	2.4m	5.5m	8.5m		
CONC.	Top Slab T ₁	203	241	210	248	210	248	216	248	216	248	311	216	248	311	216	248	311		
	Bottom Slab T ₂	222	267	229	272	229	272	235	279	235	279	337	235	279	337	235	279	337		
	Sidewalls T ₃	184	241	184	241	184	241	184	241	184	241	292	8	241	292	229	241	292		
Reinforcing Steel	"a" ┌───┐	Size Bar "	19	19	19	19	19	19	19	19	19	22	19	19	22	19	19	22		
		Spacing	279	203	279	203	279	203	279	203	279	203	229	279	203	229	279	203	229	
		Length	2.87m	2.95m	2.87m	2.95m	2.87m	2.95m	2.87m	2.95m	2.87m	2.95m	2.97m	9-6	2.95m	2.97m	2.87m	2.95m	2.97m	
	"b" ┌──┐	Size Bar "	16	19	16	19	16	19	16	19	16	19	19	16	19	19	16	19	19	
		Spacing	279	203	279	203	279	203	279	203	279	203	229	279	203	229	279	203	229	
		Dimension "X"	610	610	610	610	610	610	610	610	610	610	782	610	610	782	610	610	782	
	"c" ┌──┐	Size Bar "	16	19	16	19	16	19	16	19	16	19	19	16	19	19	16	19	19	
		Spacing	279	203	279	203	279	203	279	203	279	203	229	279	203	229	279	203	229	
		Dimension "Y"	813	1.02m	813	1.02m	813	1.02m	813	1.02m	813	1.02m	1.07m	813	1.02m	1.07m	813	1.02m	1.07m	
	"c" ┌──┐	Size Bar "	16	19	16	19	16	19	16	19	16	19	19	16	19	19	16	19	19	
		Spacing	279	203	279	203	279	203	279	203	279	203	229	279	203	229	279	203	229	
		Dimension "Y"	813	1.02m	813	1.02m	813	1.02m	813	1.02m	813	1.02m	1.07m	813	1.02m	1.07m	813	1.02m	1.07m	
	"d" ┌──┐	Length	1.40m	1.73m	1.40m	1.73m	1.40m	1.73m	1.40m	1.73m	1.40m	1.73m	1.40m	1.73m	1.88m	1.40m	1.73m	1.88m	1.40m	
		"d" Bars	Top Slab–No. of	9	5	9	5	9	5	9	5	9	5	9	5	5	9	5	5	
		Bottom Slab–No. of	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
	"e" Bars	Spacing	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	
		Spacers	Total Number	32		34		36		40			40			44			48	
	QUAN.	Concrete: Cu Meter per lin. ft.	57.4	71.9	62.7	85.6	65.8	85.6	70.4	88.0	74.2	92.6	114.7	81.1	96.4	120.1	90.3	101.0	126.2	
		Reinf kg per lin. ft.	64.9	100	67.2	103.5	69.9	106.6	72.6	110.7	74.4	113.4	120.3	77.2	117.5	123.9	80.8	121.2	127.5	

NOTE:

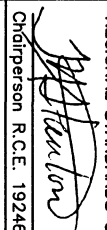
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.

Revision	By	Approved	Date
ORIGINAL		A. Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
SINGLE BOX CULVERT			
DETAILS No.1			
DRAWING NUMBER		D-76G	
Chipperon R.C.E. 19246		Date	
3/01/2003			
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE			

IMPERIAL TABLE - SPAN 10' (all measurements in feet and/or inches unless otherwise noted).
 For Metric table (3.05m Span) - see drawing D76G

SPAN		10'																				
HEIGHT		4'			5'			6'			7'			8'			9'			10'		
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	A	B	C	A	B	C	A	B	C				
MAX FILL OVER TOP		9	18	9	18	9	18	9	18	8	18	28	8	18	28	8	18	28				
CONC.	Top Slab T ₁	8	9 1/2	8 1/4	9 3/4	8 1/4	9 3/4	8 1/2	9 3/4	8 1/2	9 3/4	12 1/4	8 1/2	9 3/4	12 1/4	8 1/2	9 3/4	12 1/4				
	Bottom Slab T ₂	8 3/4	10 1/2	9	10 3/4	9	10 3/4	9 1/4	11	9 1/4	11	13 1/4	9 1/4	11	13 1/4	9 1/4	11	13 1/4				
	Sidewalls T ₃	7 1/4	9 1/2	7 1/4	9 1/2	7 1/4	9 1/2	7 1/4	9 1/2	7 1/4	9 1/2	11 1/2	8	9 1/2	11 1/2	9	9 1/2	11 1/2				
Reinforcing Steel	"a"	Size Bar "	6	6	6	6	6	6	6	6	6	7	6	6	7	6	6	7				
		Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9			
		Length	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-9	9-6	9-8	9-9	9-5	9-8	9-9			
	"b"	Size Bar "	5	6	5	6	5	6	5	6	5	6	6	5	6	6	5	6	6			
		Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9			
		Dimension "X"	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-0	2-6	2-0	2-0	2-6	2-0	2-0	2-6			
	"c"	Length	3-10	4-2	3-10	4-2	3-10	4-2	3-10	4-2	3-10	4-2	4-8	3-10	4-2	4-8	3-10	4-2	4-8			
		Size Bar "	5	6	5	6	5	6	5	6	5	6	6	5	6	6	5	6	6			
		Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9			
	"c ₁ "	Dimension "Y"	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	3-6	2-8	3-4	3-6	2-8	3-4	3-6			
		Length	6-11	7-10	8-1	8-10	9-1	9-10	10-1	10-10	11-1	11-10	12-3	12-1	12-10	13-3	13-1	13-10	14-3			
		Size Bar "	5	6	5	6	5	6	5	6	5	6	6	5	6	6	5	6	6			
	"d"	Spacing	11	8	11	8	11	8	11	8	11	8	9	11	8	9	11	8	9			
		Dimension "Y"	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	3-6	2-8	3-4	3-6	2-8	3-4	3-6			
		Length	4-7	5-8	4-7	5-8	4-7	5-8	4-7	5-8	4-7	5-8	6-0	4-7	5-8	6-0	4-7	5-8	6-2			
	"e"	Top Slab-No. of Bars	9	5	9	5	9	5	9	5	9	5	5	9	5	5	9	5	5			
		Bottom Slab-No. of Bars	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5			
	"e"	Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18			
		Spacers Total Number	32			34			36			40			40			44			48	
	QUAN.	Concrete: C.Y. per lin. ft.	75	94	82	108	86	108	92	115	97	121	150	106	126	157	118	132	165			
Reinf lbs per lin. ft.		143	221	148	228	154	235	160	244	164	250	265	170	259	273	178	267	281				

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.

Revision	By	Approved	Date
ORIGINAL	A Kercheval	12/75	
Add Metric	T. Stanton	03/03	
Reviewed	T. Stanton	04/06	
SAN DIEGO REGIONAL STANDARD DRAWING			
SINGLE BOX CULVERT			
DETAILS No.1			
DRAWING NUMBER		D-76H	
 J. H. Anderson Chief Engineer R.C.E. 19246		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE 3/01/2003 Date	

METRIC TABLE – SPAN 3.66m (all measurements in millimeters unless otherwise noted).
 For Imperial table (12' Span) – see drawing D76J

SPAN		3.66m															
HEIGHT		1.83m		2.13m		2.44m		2.74m			3.05m			3.66m			
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		1.5m	4.9m	1.5m	4.9m	1.5m	4.9m	1.5m	4.9m	7.3m	1.5m	4.9m	7.3m	1.5m	4.9m	7.3m	
CONC.	Top Slab T ₁	222	286	222	286	222	286	229	286	337	229	286	337	229	286	337	
	Bottom Slab T ₂	222	311	222	311	222	311	229	311	375	229	311	375	229	311	375	
	Sidewalls T ₃	191	267	191	267	191	267	203	267	318	229	267	318	229	267	318	
Reinforcing Steel	"a"	Size Bar "	19	22	19	22	19	22	19	22	22	19	22	22	19	22	22
		Spacing	279	254	279	254	279	254	279	254	203	279	254	203	279	254	203
		Length	3.38m	4.27m	3.38m	4.27m	3.38m	4.27m	3.45m	4.27m	3.56m	3.48m	4.27m	3.56m	3.48m	4.27m	3.56m
	"b"	Size Bar "	19	22	19	22	19	22	19	22	22	19	22	22	19	22	22
		Spacing	279	254	279	254	279	254	279	254	203	279	254	203	279	254	203
		Dimension "X"	813	914	813	914	813	914	813	914	914	813	914	914	813	914	914
	"c"	Length	1.47m	1.70m	1.47m	1.70m	1.47m	1.70m	1.47m	1.70m	1.70m	1.47m	1.70m	1.70m	1.47m	1.70m	1.70m
		Size Bar "	19	22	19	22	19	22	19	22	22	19	22	22	19	22	22
		Spacing	279	254	279	254	279	254	279	254	203	279	254	203	279	254	203
	"c _i "	Dimension "Y"	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m
		Length	3.10m	3.15m	3.40m	3.45m	3.71m	3.76m	4.01m	4.06m	4.11m	4.32m	4.37m	4.42m	4.93m	4.98m	5.03m
		Size Bar "	19	22	19	22	19	22	19	22	22	19	22	22	19	22	22
	"d"	Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
		Dimension "Y"	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m	1.14m
		Length	1.80m	1.96m	1.80m	1.96m	1.80m	1.98m	1.80m	1.98m	2.03m	1.80m	1.98m	2.03m	1.80m	1.98m	2.03m
	"e"	Top Slab–No. of Bars	10	6	10	6	10	6	10	6	6	10	6	6	10	6	6
		Bottom Slab–No. of Bars	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	"e"	Bars Spacing	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457
		Spacers Total Number	36		44		44		44			48			52		
	QUAN.	Concrete: cu m per lin. ft.	76.7	105.5	78.8	110.1	82.6	116.3	90.3	120.6	145.3	99.4	126.2	151.4	107.9	136.1	162.9
		Reinf kg per lin. ft.	92.1	133.0	96.7	137.9	98.9	141.1	101.2	143.8	175.6	104.8	147.9	180.1	110.3	154.7	188.3

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.

Revision	By	Approved	Date
ORIGINAL		A.Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**SINGLE BOX CULVERT
DETAILS No.1**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

[Signature]
 Chairperson R.C.E. 19246 Date 3/01/2003

DRAWING NUMBER **D-761**

Revision	By	Approved	Date
ORIGINAL		A.Kerchevdl	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**SINGLE BOX CULVERT
DETAILS No.1**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

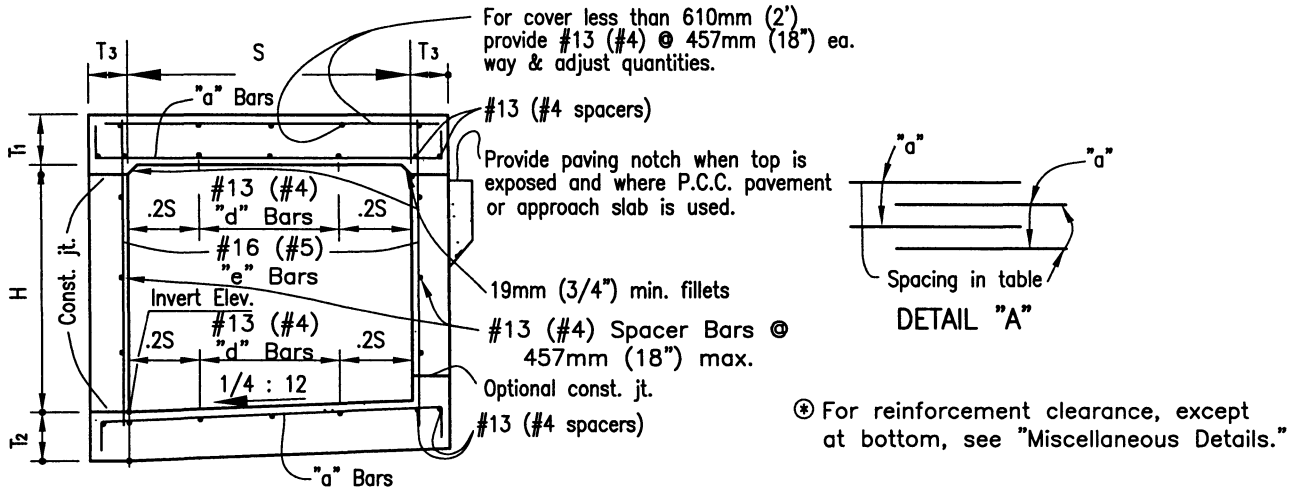
Chairperson R.C.E. 19246 Date *T. Stanton* 3/01/2003

DRAWING NUMBER **D-76J**

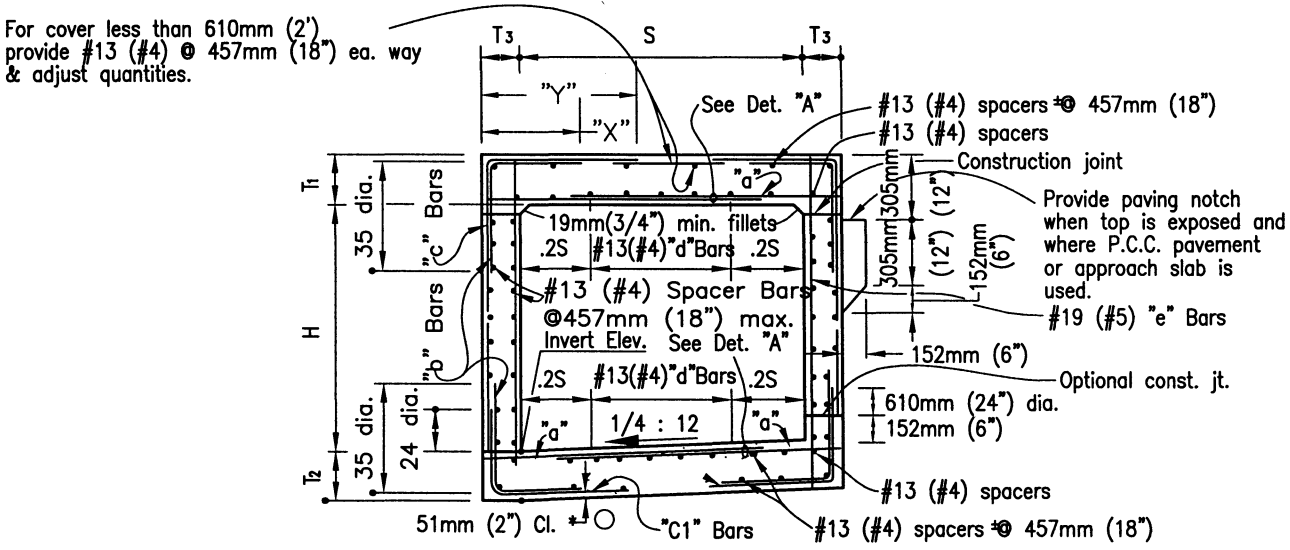
IMPERIAL TABLE - SPAN 12' (all measurements in feet and/or inches unless otherwise noted).
For Metric table (3.66m Span) - see drawing D76I

SPAN		12'															
		6'		7'		8'		9'			10'			12'			
HEIGHT		A	B	A	B	A	B	A	B	C	A	B	C	A	B	C	
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		5	16	5	16	5	16	5	16	24	5	16	24	5	16	24	
CONC.	Top Slab T ₁	8 3/4	11 1/4	8 3/4	11 1/4	8 3/4	11 1/4	9	11 1/4	13 1/4	9	11 1/4	13 1/4	9	11 1/4	13 1/4	
	Bottom Slab T ₂	8 3/4	12 1/4	8 3/4	12 1/4	8 3/4	12 1/4	9	12 1/4	14 3/4	9	12 1/4	14 3/4	9	12 1/4	14 3/4	
	Sidewalls T ₃	7 1/2	10 1/2	7 1/2	10 1/2	7 1/2	10 1/2	8	10 1/2	12 1/2	9	10 1/2	12 1/2	9	10 1/2	12 1/2	
Reinforcing Steel	"a"	Size Bar "	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
		Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
		Length	11-3	11-6	11-3	11-6	11-3	11-6	11-4	11-6	11-8	11-5	11-6	11-8	11-5	11-6	11-8
	"b"	Size Bar "	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
		Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
		Dimension "X"	2-8	3-0	2-8	3-0	2-8	3-0	2-8	3-0	3-0	2-8	3-0	3-0	2-8	3-0	3-0
		Length	4-10	5-7	4-10	5-7	4-10	5-7	4-10	5-7	5-7	4-10	5-7	5-7	4-10	5-7	5-7
	"c"	Size Bar "	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
		Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
		Dimension "Y"	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9
	"c _i "	Length	10-2	10-4	11-2	11-4	12-2	12-4	13-2	13-4	13-6	14-2	14-4	14-6	16-2	16-4	16-6
		Size Bar "	6	7	6	7	6	7	6	7	7	6	7	7	6	7	7
		Spacing	11	10	11	10	11	10	11	10	8	11	10	8	11	10	8
		Dimension "Y"	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9	3-9
	"d"	Length	5-11	6-5	5-11	6-5	5-11	6-6	5-11	6-6	6-8	5-11	6-6	6-8	5-11	6-6	6-8
		Top Slab-No. of Bars	10	6	10	6	10	6	10	6	6	10	6	6	10	6	6
	"e"	Bottom Slab-No. of Bars	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Spacing	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	QUAN.	Spacers Total Number	36		44		44		44			48			52		
		Concrete: C.Y. per lin. ft.	99	138	103	144	108	152	118	158	190	130	165	198	141	178	213
		Reinf lbs per lin. ft.	203	293	213	304	218	311	223	317	387	231	326	397	243	341	415

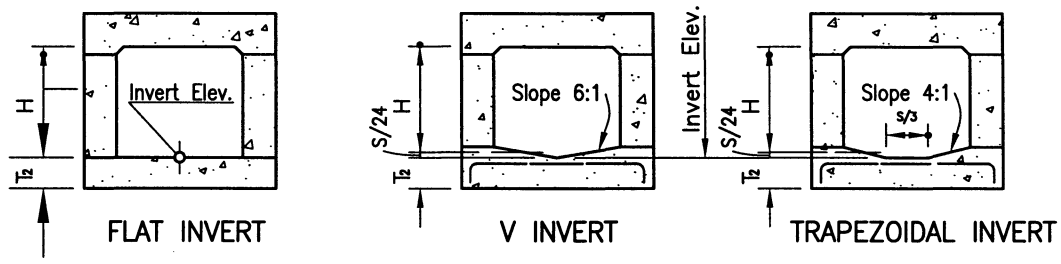
NOTES:
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.



TYPICAL SECTIONS 610mm (2') THRU 1.83m (6') SPANS



TYPICAL SECTIONS 2.13m (7') THRU 3.66m (12') SPANS



ALTERNATIVE INVERTS
(When shown)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**SINGLE BOX CULVERT
DETAILS NO.2**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-76K

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE BOX CULVERT
DETAILS NO. 1**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Chairperson R.C.E. 19246 Date 3/01/2003

DRAWING NUMBER **D-77A**

METRIC TABLE – SPAN 1.22m (all measurements in millimeters unless otherwise noted).
For Imperial table (4' Span) – see drawing D77B

SPAN		1.22m											
		610mm			914mm				1.22m				
HEIGHT		A	B	C	A	B	C	D	A	B	C	D	
STRENGTH CLASSIFICATION		A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		3.35m	6.4m	9.75m	3.35m	7.0m	10.4m	14.0m	3.35m	7.0m	10.4m	14.0m	
Conc.	Top Slab T ₁	165	165	184	165	165	191	216	165	165	191	216	
	Bottom Slab T ₂	152	184	216	152	191	216	241	152	191	216	241	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	
Reinforcing Steel	"a"	Size Bar #	16	13	13	16	13	13	13	16	13	13	13
		Spacing	279	279	229	279	267	216	191	279	267	216	191
		Length	3.12m	3.10m	3.10m	3.12m	3.10m	3.10m	3.10m	3.12m	3.10m	3.10m	3.10m
	"b" or "b ₁ "	Size Bar #	16	16	16	16	16	16	16	16	16	16	16
		Spacing	279	279	229	279	267	216	191	279	267	216	191
		Length "b"	2.84m	2.84m	2.90m	2.84m	2.84m	2.90m	2.92	2.84m	2.84m	2.90m	2.92
		Length "b ₁ "	2.84m	9-5	2.90m	2.84m	2.84m	2.90m	2.92	2.84m	2.84m	2.90m	2.92
	"c"	Size Bar #	13	16	16	13	16	16	16	13	16	16	16
		Spacing	279	279	229	279	267	216	191	279	267	216	191
		Length	1.37m	1.37m	1.37m	1.37m	1.37m	1.37m	1.37m	1.37m	1.37m	1.37m	1.37m
	"d" Dist Bars	Top Slab–Tot. No.	10	6	6	10	6	6	6	10	6	6	6
		Bottom Slab–Tot. No.	6	6	6	6	6	6	6	6	6	6	6
"e" Bars	Size Bar #	13	13	13	13	13	13	13	13	13	13	16	
	Spacing	457	457	457	457	457	406	305	457	305	229	254	
Spacers Number		23			26				29				
Quan.	Concrete: C.Y. per lin. ft.	0.36	0.39	0.44	0.41	0.44	0.48	0.53	0.45	0.48	0.53	0.57	
	Reinf .lbs per lin. ft.	37	34	38	38	36	41	46	40	39	45	50	

NOTE:

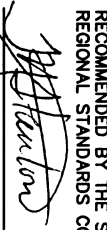
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities. Number of "d" bars in table is slab total for both cells.

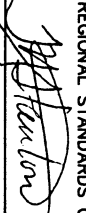
IMPERIAL TABLE – SPAN 4' (all measurements in feet and/or inches unless otherwise noted).
 For Metric Table (1.22m Span) – see drawing D77A

SPAN		4'											
HEIGHT		2'				3'				4'			
STRENGTH CLASSIFICATION		A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		11	21	32	11	23	34	46	11	23	34	46	
Conc.	Top Slab T ₁	6 1/2	6 1/2	7 1/4	6 1/2	6 1/2	7 1/2	8 1/2	6 1/2	6 1/2	7 1/2	8 1/2	
	Bottom Slab T ₂	6	7 1/4	8 1/2	6	7 1/2	8 1/2	9 1/2	6	7 1/2	8 1/2	9 1/2	
	Sidewalls T ₃	6	6	6	6	6	6	6	6	6	6	6	
Reinforcing Steel	"a" ⎵ Length	Size Bar #	5	4	4	5	4	4	4	5	4	4	4
		Spacing	11	11	9	11	10 1/2	8 1/2	7 1/2	11	10 1/2	8 1/2	7 1/2
		Length	10-3	10-2	10-2	10-3	10-2	10-2	10-2	10-3	10-2	10-2	10-2
	"b" ⎵ or "b" ⎵ Length "b" ⎵ Length "b" ₁	Size Bar #	5	5	5	5	5	5	5	5	5	5	5
		Spacing	11	11	9	11	10 1/2	8 1/2	7 1/2	11	10 1/2	8 1/2	7 1/2
		Length "b"	9-4	9-4	9-6	9-4	9-4	9-6	9-7	9-4	9-4	9-6	9-7
		Length "b" ₁	9-4	9-5	9-6	9-4	9-4	9-6	9-7	9-4	9-4	9-6	9-7
	"c" ⎵ Length	Size Bar #	4	5	5	4	5	5	5	4	5	5	5
		Spacing	11	11	9	11	10 1/2	8 1/2	7 1/2	11	10 1/2	8 1/2	7 1/2
		Length	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6	4-6
	"d" Dist Bars	Top Slab-Tot. No.	10	6	6	10	6	6	6	10	6	6	6
		Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6
	"e" Bars	Size Bar #	4	4	4	4	4	4	4	4	4	4	5
		Spacing	18	18	18	18	18	16	12	18	12	9	10
	Spacers	Number	23				26				29		
Quan.	Concrete: C.Y. per lin. ft.	0.47	0.51	0.57	0.53	0.57	0.63	0.69	0.59	0.63	0.69	0.75	
	Reinf :lbs per lin. ft.	81	74	84	84	79	91	101	87	85	99	111	

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 both cells.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING
ORIGINAL		Kercheval	12/75	
Add Metric		T. Stanton	03/03	
Reviewed		T. Stanton	04/06	
DOUBLE BOX CULVERT DETAILS No. 1				DRAWING NUMBER D-77B
 RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chris Peterson R.C.E. 19246 Date 3/01/2003				

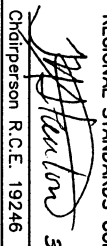
Revision	By Approved	Date
ORIGINAL	Kercheval	12/75
Add Metric	T. Stanton	03/03
Reviewed	T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING		
DOUBLE BOX CULVERT		
DETAILS No. 1		
 RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chairperson R.C.E. 19246 Date 3/01/2003		
DRAWING NUMBER	D-77C	

METRIC TABLE - SPAN 1.52m (all measurements in millimeters unless otherwise noted).
For Imperial table (5' Span) - see drawing D77D

SPAN		1.52m																
HEIGHT		610mm				914mm				1.22m				1.62m				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D			
MAX FILL OVER TOP		1.83m	11.0m	11.0m	1.83m	7.3m	11.0m	1.83m	7.0m	10.4m	14m	1.83m	7.0m	10.4m	14m			
Conc.	Top Slab T ₁	171	197	235	171	197	235	171	197	235	260	171	197	235	260			
	Bottom Slab T ₂	165	222	260	165	222	260	165	222	260	286	165	222	260	286			
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	152	152	152			
Reinforcing Steel	"a" } Size Bar # } Spacing } Length	16	13	13	16	13	13	16	13	13	13	16	13	13	13			
		254	216	254	254	216	254	254	216	254	229	254	216	267	229			
		3.73m	3.71m	3.71m	3.73m	3.71m	3.71m	3.73m	3.71m	3.71m	3.71m	3.73m	3.71m	3.71m	3.71m			
	"b" } or "b" } "b" } Length "b" } Length "b" ₁	16	16	19	16	16	19	16	16	19	19	16	16	19	19			
		254	216	254	254	216	254	254	216	254	229	254	216	267	229			
		3.48m	3.51m	3.53m	3.48m	3.51m	3.53m	3.48m	3.51m	3.53m	3.54m	3.48m	3.51m	3.53m	3.54m			
	"c" } Size Bar # } Spacing } Length	13	16	19	13	16	19	13	16	19	19	13	16	19	19			
		254	216	254	254	216	254	254	216	254	229	254	216	267	229			
		1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m	1.68m			
	"d" Dist Bars	Top Slab-Tot. No.	12	6	6	12	6	6	12	6	6	6	12	6	6	6		
		Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
	"e" Bars	Size Bar #	13	13	13	13	13	13	13	13	13	16	13	13	16	19		
		Spacing	457	457	457	457	457	406	457	305	254	267	457	216	229	229		
	Spacers	Number	23				26				29				32			
	Quan.	Concrete: C.Y. per lin. ft.	0.44	0.53	0.61	0.48	0.57	0.66	0.53	0.61	0.68	0.75	0.57	0.66	0.74	0.80		
	Reinf :lbs per lin. ft.	45	45	49	47	47	51	48	49	54	60	49	53	57	67			

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 both cells.

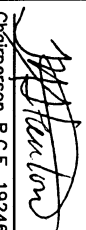
Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
DOUBLE BOX CULVERT			
DETAILS No. 1			
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  Chairperson R.C.E. 19246 Date 3/01/2003			
DRAWING NUMBER D-77D			

IMPERIAL TABLE – SPAN 5' (all measurements in feet and/or inches unless otherwise noted).
 For Metric Table (1.52m Span) – see drawing D77C

SPAN		5'														
HEIGHT		2'			3'			4'			5'					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		6	36	36	6	24	36	6	23	34	46	6	23	34	46	
Conc.	Top Slab	T ₁	6 3/4	7 3/4	9 1/4	6 3/4	7 3/4	9 1/4	6 3/4	7 3/4	9 1/4	10 1/4	6 3/4	7 3/4	9 1/4	10 1/4
	Bottom Slab	T ₂	6 1/2	8 3/4	10 1/4	6 1/2	8 3/4	10 1/4	6 1/2	8 3/4	10 1/4	11 1/4	6 1/2	8 3/4	10 1/4	11 1/4
	Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Reinforcing Steel	"a"	Size Bar #	5	4	4	5	4	4	5	4	4	4	5	4	4	4
		Spacing	10	8 1/2	10	10	8 1/2	10	10	8 1/2	10	9	10	8 1/2	10 1/2	9
		Length	12-3	12-2	12-2	12-3	12-2	12-2	12-3	12-2	12-2	12-2	12-3	12-2	12-2	12-2
	"b" or "b ₁ "	Size Bar #	5	5	6	5	5	6	5	5	6	6	5	5	6	6
		Spacing	10	8 1/2	10	10	8 1/2	10	10	8 1/2	10	9	10	8 1/2	10 1/2	9
		Length "b"	11-5	11-6	11-7	11-5	11-6	11-7	11-5	11-6	11-7	11-8	11-5	11-6	11-7	11-8
	Length "b ₁ "	11-4	11-6	11-7	11-4	11-6	11-7	11-4	11-6	11-7	11-8	11-4	11-6	11-7	11-8	
	"c"	Size Bar #	4	5	6	4	5	6	4	5	6	6	4	5	6	6
		Spacing	10	8 1/2	10	10	8 1/2	10	10	8 1/2	10	9	10	8 1/2	10 1/2	9
		Length	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6	5-6
	"d" Dist Bars	Top Slab-Tot. No.	12	6	6	12	6	6	12	6	6	6	12	6	6	6
		Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6	6	6	6
"e" Bars	Size Bar #	4	4	4	4	4	4	4	4	4	5	4	4	5	6	
	Spacing	18	18	18	18	18	16	18	12	10	10 1/2	18	8 1/2	9	9	
Spacers	Number	23			26			29			32					
Quan.	Concrete: C.Y. per lin. ft.	0.58	0.69	0.80	0.63	0.75	0.86	0.69	0.80	0.89	0.98	0.74	0.86	0.97	1.04	
	Reinf :lbs per lin. ft.	99	100	109	103	104	112	106	109	119	133	109	116	126	148	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
DOUBLE BOX CULVERT			
DETAILS No. 1			
 RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chairperson R.C.E. 19246 Date 3/01/2003			
DRAWING NUMBER D-77E			

METRIC TABLE – SPAN 1.83m (all measurements in millimeters unless otherwise noted).
 For Imperial table (6' Span) – see drawing D77F

SPAN		1.83m														
HEIGHT		914mm			1.22m			1.52m			1.83m					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		1.22m	6.1m	10.4m	1.22m	6.1m	10.4m	1.22m	5.79m	10m	13.1m	1.22m	5.8m	10m	13.1m	
Conc.	Top Slab T ₁	184	210	267	184	210	267	184	210	267	305	184	210	267	305	
	Bottom Slab T ₂	184	241	292	184	241	292	184	241	292	324	184	241	292	324	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	152	152	191	
Reinforcing Steel	"a"	Size Bar #	16	13	13	16	13	13	16	13	13	13	16	13	13	13
		Spacing	241	279	216	241	279	216	241	279	216	267	241	279	216	267
		Length	4.34m	4.32m	4.32m	4.34m	4.32m	4.32m	4.34m	4.32m	4.32m	4.32m	4.34m	4.32m	4.32m	4.47m
	"b" or "b ₁ "	Size Bar #	16	19	19	16	19	19	16	19	19	22	16	19	19	22
		Spacing	241	279	216	241	279	216	241	279	216	267	241	279	216	267
		Length "b"	4.11m	4.11m	4.17m	4.11m	4.11m	4.17m	4.11m	4.11m	4.17m	4.19m	4.11m	4.11m	4.17m	4.32m
	Length "b ₁ "	4.09m	4.14m	4.17m	4.09m	4.14m	4.17m	4.09m	4.11m	4.17m	4.19m	4.11m	4.11m	4.17m	4.32m	
	"c"	Size Bar #	13	19	19	13	19	19	13	19	19	22	13	19	19	22
		Spacing	241	279	216	241	279	216	241	279	216	267	241	279	216	267
		Length	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	2.03m
	"d" Dist Bars	Top Slab-Tot. No.	12	6	6	12	6	6	12	6	6	6	12	6	6	6
		Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	"e" Bars	Size Bar #	13	13	13	13	13	13	13	13	16	16	13	16	19	19
		Spacing	457	457	406	457	356	216	457	254	241	178	457	279	229	152
	Spacers	Number	30			33			36			36				
Quan.	Concrete: cu m per lin. ft.	0.59	0.69	0.83	0.63	0.73	0.86	.67	.77	.91	.99	0.71	.82	.96	1.12	
	Reinf: kqs per lin. ft.	55	54	67	57	56	70	58	59	74	79	59	62	80	91	

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 both cells.

IMPERIAL TABLE - SPAN 6' (all measurements in feet and/or inches unless otherwise noted).
 For Metric Table (1.83m Span) - see drawing D77E

SPAN		6'														
HEIGHT		3'			4'			5'			6'					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		4	20	34	4	20	34	4	19	33	43	4	19	33	43	
Conc.	Top Slab	T ₁	7 1/4	8 1/4	10 1/2	7 1/4	8 1/4	10 1/2	7 1/4	8 1/4	10 1/2	12	7 1/4	8 1/4	10 1/2	12
	Bottom Slab	T ₂	7 1/4	9 1/2	11 1/2	7 1/4	9 1/2	11 1/2	7 1/4	9 1/2	11 1/2	12 3/4	7 1/4	9 1/2	11 1/2	12 3/4
	Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	7 1/2
Reinforcing Steel	"a"	Size Bar #	5	4	4	5	4	4	5	4	4	4	5	4	4	4
		Spacing	9 1/2	11	8 1/2	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
		Length	14-3	14-2	14-2	14-3	14-2	14-2	14-3	14-2	14-2	14-2	14-3	14-2	14-2	14-8
	"b" or "b ₁ "	Size Bar #	5	6	6	5	6	6	5	6	6	7	5	6	6	7
		Spacing	9 1/2	11	8 1/2	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
		Length "b" Length "b ₁ "	13-6	13-6	13-8	13-6	13-6	13-8	13-6	13-6	13-8	13-9	13-6	13-6	13-8	14-2
	"c"	Size Bar #	4	6	6	4	6	6	4	6	6	7	4	6	6	7
		Spacing	9 1/2	11	8 1/2	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
		Length	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	6-8
	"d" Dist Bars	Top Slab-Tot. No.	12	6	6	12	6	6	12	6	6	6	12	6	6	6
		Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	"e" Bars	Size Bar #	4	4	4	4	4	4	4	4	5	5	4	5	6	6
Spacing		18	18	16	18	14	8 1/2	18	10	9 1/2	7	18	11	9	6	
Spacers Number		30			33			36			36					
Quan.	Concrete: C.Y. per lin. ft.	0.77	0.90	1.08	0.82	0.96	1.13	0.88	1.01	1.19	1.30	0.93	1.07	1.25	1.47	
	Reinf :lbs per lin. ft.	121	119	147	125	124	155	128	131	164	175	129	137	177	201	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT

DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Chairperson R.C.E. 19246 Date *3/01/2003*

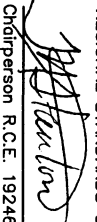
DRAWING NUMBER **D-77F**

Revision	By	Approved	Date
ORIGINAL		Kercheyal	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE BOX CULVERT
DETAILS NO. 1**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE


 Chris Peterson R.C.E. 19246 Date 3/01/2003

DRAWING NUMBER **D-77G**

METRIC TABLE – SPAN 2.44m (all measurements in millimeters unless otherwise noted).
For Imperial table (8' Span) – see drawing D77H

SPAN		2.44m																	
HEIGHT		1.22m				1.52m			1.83m			2.13m				2.44m			
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		914mm	4.27m	7.62m	914mm	4.27m	7.62m	914mm	4.27m	7.62m	914mm	4.27m	7.62m	11.3m	914mm	4.27m	7.62m	11.3m	
Conc.	Top Slab	T	216	241	305	216	241	305	216	241	305	216	241	311	362	216	241	311	362
	Bottom Slab	T ₂	191	267	324	191	267	324	191	267	324	191	273	13	15	191	273	13	15
	Sidewalls	T ₃	152	152	152	152	152	152	152	152	152	178	178	178	203	178	178	203	216
Reinforcing Steel	"a"	Size Bar #	19	13	13	19	13	13	19	13	13	19	13	13	13	19	13	13	13
		Spacing	305	241	267	305	241	254	305	241	254	292	241	254	216	292	241	254	216
		Length	5.59m	5.54m	5.54m	5.59m	5.54m	5.54m	5.59m	5.54m	5.54m	5.66m	5.61m	5.61m	5.69m	5.66m	5.61m	5.69m	5.74m
	"b" or "b ₁ "	Size Bar #	19	19	22	19	19	22	19	19	22	19	19	22	22	19	19	22	22
		Spacing	305	241	267	305	241	254	305	241	254	292	241	254	216	292	241	254	216
		Length "b"	5.36m	5.38m	5.41m	5.36m	5.38m	5.41m	5.36m	5.38m	5.41m	5.44m	5.44m	5.49m	5.61m	5.44m	5.44m	5.56m	5.64m
	Length "b ₁ "	5.31m	5.38m	5.41m	5.31m	5.38m	5.41m	5.31m	5.38m	5.41m	5.44m	5.44m	5.49m	5.61m	5.38m	5.46m	5.49m	5.66m	
	"c"	Size Bar #	13	19	22	13	19	22	13	19	22	13	19	22	22	13	19	22	22
		Spacing	305	241	267	305	241	254	305	241	254	292	241	254	216	292	241	254	216
		Length	2.59m	2.59m	2.59m	2.59m	2.59m	2.59m	2.59m	2.59m	2.59m	2.62m	2.62m	2.62m	2.64m	2.62m	2.62m	2.64m	2.67m
	"d" Dist Bars	Top Slab–Tot. No.	16	8	8	16	8	8	16	8	8	16	8	8	8	16	8	8	8
		Bottom Slab–Tot. No.	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	"e" Bars	Size Bar #	13	13	16	13	13	16	13	16	19	13	16	19	22	13	16	22	22
		Spacing	457	457	267	457	305	254	457	292	254	356	241	191	216	292	216	191	229
	Spacers	Number	41			44			44			47				56	50		60
Quan.	Concrete: cu m per lin. ft.	.83	.99	1.19	0.87	1.05	1.23	0.91	1.09	1.27	1.00	1.19	1.40	1.64	1.06	1.24	1.52	1.73	
	Reinf: kg per lin. ft.	77	79	91	78	82	99	79	85	104	84	90	113	136	87	94	129	142	

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 both cells.

IMPERIAL TABLE - SPAN 8' (all measurements in feet and/or inches unless otherwise noted).
 For Metric Table (2.44m Span) - see drawing D77G

SPAN		8'																	
HEIGHT		4'				5'			6'			7'				8'			
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		3	14	25	3	14	25	3	14	25	3	14	25	37	3	14	25	37	
Conc.	Top Slab	T ₁	8 1/2	9 1/2	12	8 1/2	9 1/2	12	8 1/2	9 1/2	12	8 1/2	9 1/2	12 1/4	14 1/4	8 1/2	9 1/2	12 1/4	14 1/4
	Bottom Slab	T ₂	7 1/2	10 1/2	12 3/4	7 1/2	10 1/2	12 3/4	7 1/2	10 1/2	12 3/4	7 1/2	10 3/4	13	15	7 1/2	10 3/4	13	15
	Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	7	7	7	8	7	7	8	8 1/2
Reinforcing Steel	"a"	Size Bar #	6	4	4	6	4	4	6	4	4	6	4	4	4	6	4	4	4
		Spacing	12	9 1/2	10 1/2	12	9 1/2	10	12	9 1/2	10	11 1/2	9 1/2	10	8 1/2	11 1/2	9 1/2	10	8 1/2
		Length	18-4	18-2	18-2	18-4	18-2	18-2	18-4	18-2	18-2	18-7	18-5	18-5	18-8	18-7	18-5	18-8	18-10
	"b" or "b ₁ "	Size Bar #	6	6	7	6	6	7	6	6	7	6	6	7	7	6	6	7	7
		Spacing	12	9 1/2	10 1/2	12	9 1/2	10	12	9 1/2	10	11 1/2	9 1/2	10	8 1/2	11 1/2	9 1/2	10	8 1/2
		Length "b"	17-7	17-8	17-9	17-7	17-8	17-9	17-7	17-8	17-9	17-10	17-10	18-0	18-5	17-10	17-10	18-3	18-6
	Length "b ₁ "	17-5	17-8	17-9	17-5	17-8	17-9	17-5	17-8	17-9	17-10	17-10	18-0	18-5	17-8	17-11	18-0	18-7	
	"c"	Size Bar #	4	6	7	4	6	7	4	6	7	4	6	7	7	4	6	7	7
		Spacing	12	9 1/2	10 1/2	12	9 1/2	10	12	9 1/2	10	11 1/2	9 1/2	10	8 1/2	11 1/2	9 1/2	10	8 1/2
		Length	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-7	8-7	8-7	8-8	8-7	8-7	8-8	8-9
	"d" Dist Bars	Top Slab-Tot. No.	16	8	8	16	8	8	16	8	8	16	8	8	8	16	8	8	8
		Bottom Slab-Tot. No.	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
"e" Bars	Size Bar #	4	4	5	4	4	5	4	5	6	4	5	6	7	4	5	7	7	
	Spacing	18	18	10 1/2	18	12	10	18	11 1/2	10	14	9 1/2	7 1/2	8 1/2	11 1/2	8 1/2	7 1/2	9	
Spacers	Number	41			44			44			47		56	50		60			
Quan.	Concrete: C.Y. per lin. ft.	1.08	1.30	1.55	1.14	1.37	1.61	1.19	1.42	1.66	1.32	1.56	1.83	2.14	1.39	1.62	1.99	2.27	
	Reinf :lbs per lin. ft.	169	175	200	172	181	218	173	188	229	185	199	248	299	191	207	284	314	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
SAN DIEGO REGIONAL STANDARD DRAWING			
DOUBLE BOX CULVERT			
DETAILS No. 1			
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE			
Chiefperson	R.C.E.	19246	Date
DRAWING NUMBER	D-77H		

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE BOX CULVERT
DETAILS No. 1**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

Chrisperson R.C.E. 19246 Date *3/01/2003*

DRAWING NUMBER **D-771**

METRIC TABLE - SPAN 3.05m (all measurements in millimeters unless otherwise noted).
For Imperial table (10' Span) - see drawing D77J

SPAN		3.05m																	
HEIGHT		1.52m			1.83m			2.13m			2.44m				3.05m				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		610mm	5.18m	9.14m	610mm	5.18m	9.14m	610mm	5.18m	9.14m	610mm	4.88m	8.84m	11m	610mm	4.88m	8.84m	11m	
Conc.	Top Slab	T	222	324	406	222	324	406	222	324	406	222	324	406	438	222	324	406	445
	Bottom Slab	T ₂	210	343	419	210	343	419	210	349	425	222	343	419	464	222	343	419	470
	Sidewalls	T ₃	152	152	152	152	152	152	152	165	179	179	179	191	191	203	203	229	254
Reinforcing Steel	"a"	Size Bar #	19	13	13	19	13	13	19	13	13	19	13	13	19	19	13	13	13
		Spacing	279	254	254	279	241	254	279	241	254	279	254	254	229	279	254	254	229
		Length	6.81m	6.76m	6.76m	6.81m	6.76m	6.76m	6.81m	6.81m	6.83m	6.88m	6.83m	6.88m	6.96m	6.96m	6.91m	6.99m	7.06m
	"b" or "b ₁ "	Size Bar #	19	22	25	19	22	25	19	22	25	19	22	25	25	19	22	25	25
		Spacing	279	254	254	279	241	254	279	241	254	279	254	254	229	279	254	254	229
		Length "b"	6.58m	6.65m	6.71m	6.58m	6.65m	6.71m	6.58m	6.68m	6.78m	6.65m	6.73m	6.81m	6.93m	6.73m	6.81m	6.93m	7.04m
		Length "b ₁ "	6.53m	6.65m	6.71m	6.53m	6.65m	6.71m	6.53m	6.68m	6.78m	6.63m	6.71m	6.81m	6.93m	6.71m	6.78m	6.91m	7.06m
	"c"	Size Bar #	19	22	25	19	22	25	19	22	25	19	22	25	25	19	22	25	25
		Spacing	279	254	254	279	241	254	279	241	254	279	254	254	229	279	254	254	229
		Length	3.20m	3.20m	3.20m	3.20m	3.20m	3.20m	3.20m	3.23m	3.23m	3.23m	3.23m	3.25m	3.28m	3.25m	3.25m	3.28m	3.30m
	"d" Dist Bars	Top Slab-Tot. No.	10	10	10	10	10	10	18	10	10	18	10	10	10	18	10	10	10
		Bottom Slab-Tot. No.	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
"e" Bars	Size Bar #	13	13	16	13	13	16	13	13	19	13	16	19	22	13	19	19	22	
	Spacing	457	254	254	457	152	165	356	152	203	279	216	152	152	191	178	140	127	
Spacers	Number	48			48			51			54				64				
Quan.	Concrete: cu m per lin. ft.	1.07	1.57	1.88	1.10	1.58	1.90	1.15	1.67	2.02	1.28	1.74	2.09	2.32	1.47	1.92	2.33	2.61	
	Reinf: kg per lin. ft.	107	115	141	108	124	147	110	127	154	114	126	161	195	127	148	181	216	

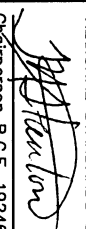
NOTE:
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities. Number of "d" bars in table is slab total for both cells.

IMPERIAL TABLE - SPAN 10' (all measurements in feet and/or inches unless otherwise noted).
 For Metric Table (3.05m Span) - see drawing D771

SPAN		10'																	
HEIGHT		5'			6'			7'			8'				10'				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		2	17	30	2	17	30	2	17	30	2	16	29	36	2	16	29	36	
Conc.	Top Slab	T ₁	8 3/4	12 3/4	16	8 3/4	12 3/4	16	8 3/4	12 3/4	16	8 3/4	12 3/4	16	17 1/4	8 3/4	12 3/4	16	17 1/2
	Bottom Slab	T ₂	8 1/4	13 1/2	16 1/2	8 1/4	13 1/2	16 1/2	8 1/4	13 3/4	16 3/4	8 3/4	13 1/2	16 1/2	18 1/4	8 3/4	13 1/2	16 1/2	18 1/2
	Sidewalls	T ₃	6	6	6	6	6	6	6	6 1/2	7	7	7	7 1/2	7 1/2	8	8	9	10
Reinforcing Steel	"a"	Size Bar #	6	4	4	6	4	4	6	4	4	6	4	4	4	6	4	4	4
		Spacing	11	10	10	11	9 1/2	10	11	9 1/2	10	11	10	10	9	11	10	10	9
		Length	22-4	22-2	22-2	22-4	22-2	22-2	22-4	22-4	22-5	22-7	22-5	22-7	22-10	22-10	22-8	22-11	23-2
	"b" or "b ₁ "	Size Bar #	6	7	8	6	7	8	6	7	8	6	7	8	8	6	7	8	8
		Spacing	11	10	10	11	9 1/2	10	11	9 1/2	10	11	10	10	9	11	10	10	9
		Length "b"	21-7	21-10	22-0	21-7	21-10	22-0	21-7	21-11	22-3	21-10	22-1	22-4	22-9	22-1	22-4	22-9	23-1
	Length "b ₁ "	21-5	21-10	22-0	21-5	21-10	22-0	21-5	21-11	22-3	21-9	22-0	22-4	22-9	22-0	22-3	22-8	23-2	
	"c"	Size Bar #	6	7	8	6	7	8	6	7	8	6	7	8	8	6	7	8	8
		Spacing	11	10	10	11	9 1/2	10	11	9 1/2	10	11	10	10	9	11	10	10	9
		Length	10-6	10-6	10-6	10-6	10-6	10-6	10-6	10-7	10-7	10-7	10-7	10-8	10-9	10-8	10-8	10-9	10-10
	"d" Dist Bars	Top Slab-Tot. No.	18	10	10	18	10	10	18	10	10	18	10	10	10	18	10	10	10
		Bottom Slab-Tot. No.	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	"e" Bars	Size Bar #	4	4	5	4	4	5	4	4	6	4	5	6	7	4	6	6	7
		Spacing	18	10	10	18	6	6 1/2	14	6	8	11	8 1/2	6	6	7 1/2	7	5 1/2	5
Spacers	Number	48			48			51			54			64			68		
Quan.	Concrete: C.Y. per lin. ft.	1.40	2.05	2.46	1.45	2.07	2.48	1.51	2.18	2.64	1.68	2.27	2.74	3.04	1.92	2.51	3.05	3.41	
	Reinf :lbs per lin. ft.	236	254	310	238	274	324	243	280	339	252	278	355	430	279	327	400	476	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	03/03
SAN DIEGO REGIONAL STANDARD DRAWING			
DOUBLE BOX CULVERT			
DETAILS No. 1			
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE			
 Chairperson R.C.E. 19246 Date 3/01/2003			
DRAWING NUMBER D-77J			

METRIC TABLE – SPAN 3.66M (all measurements in millimeters unless otherwise noted).
For Imperial Table (12' Span) – See Drawing D-77L

SPAN		3.66m																					
HEIGHT		1.83m			2.13m			2.44m			2.74m				3.05m				3.66m				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		610mm	4.27m	7.9m	610mm	4.27m	7.9m	610mm	4.27m	7.9m	610mm	4.27m	7.9m	11m	610mm	4.27m	7.9m	11m	610mm	4.27m	7.9m	11m	
Conc.	Top Slab	T ₁	254	356	445	254	362	445	260	362	451	260	368	451	527	260	368	451	527	260	368	464	540
	Bottom Slab	T ₂	235	375	457	235	381	464	248	381	470	254	387	476	540	260	387	476	546	267	387	489	559
	Sidewalls	T ₃	152	152	165	178	178	178	203	203	216	229	229	229	254	229	229	241	279	229	254	279	305
Reinforcing Steel	"a"	Size Bar #	19	13	13	19	13	13	19	13	13	19	13	13	13	19	13	13	13	19	13	13	13
		Spacing	229	292	229	229	292	229	229	279	216	229	279	216	229	229	279	216	229	229	279	216	229
		Length	8.03m	7.98m	8.03m	8.10m	8.05m	8.05m	8.18m	8.13m	8.18m	8.26m	8.20	8.20	8.26m	8.26m	8.20	8.31m	8.36m	8.26m	8.28m	8.36m	8.43m
	"b" or "b ₁ "	Size Bar #	19	25	25	19	25	25	19	25	25	19	25	25	29	19	25	25	29	19	25	25	29
		Spacing	229	292	229	229	292	229	229	279	216	229	279	216	229	229	279	216	229	229	279	216	229
		Length "b"	7.82m	7.87m	8.00m	7.90m	7.95m	8.03m	7.98m	8.03m	8.15m	8.05m	8.13m	8.18m	8.33m	8.05m	8.13m	8.28m	8.38m	8.05m	8.20	8.36m	8.48m
	Length "b ₁ "	7.77m	7.87m	8.00m	7.85m	7.98m	8.03m	7.95m	8.05m	8.15m	8.03m	8.13m	8.20	8.33m	8.03m	8.13m	8.28m	8.41m	8.03m	8.20	8.36m	8.51m	
	"c"	Size Bar #	16	25	25	16	25	25	16	25	25	16	25	25	29	16	25	25	29	16	25	25	29
		Spacing	229	292	229	229	292	229	229	279	216	229	279	216	229	229	279	216	229	229	279	216	229
		Length	3.81m	3.81m	3.84m	3.84m	3.84m	3.84m	3.86m	3.86m	3.89m	3.89m	3.89m	3.89m	3.91m	3.89m	3.89m	3.91m	3.94m	3.89m	3.91m	3.94m	3.96m
	"d" Dist Bars	Top Slab-Tot. No.	24	10	10	24	10	10	24	10	10	24	10	10	10	24	10	10	10	24	10	10	10
		Bottom Slab-Tot. No.	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	"e" Bars	Size Bar #	13	13	16	13	13	16	13	13	16	13	16	22	25	13	22	25	25	19	22	25	29
		Spacing	457	203	203	381	152	165	305	140	152	229	191	216	203	216	11	216	229	305	203	178	178
	Spacers	Number	52			55			68			68				72				76			
Quan.	Concrete: cu m per lin. ft.	1.41	1.98	2.42	1.51	2.12	2.51	1.67	2.24	2.74	1.82	.57	2.82	3.25	1.90	2.47	2.95	3.43	2.04	2.70	3.29	3.76	
	Reinf: kg per lin. ft.	140	144	182	142	150	188	152	165	209	156	170	211	262	159	179	235	264	168	194	257	305	

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 both cells.

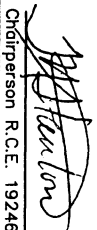
Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT

DETAILS NO. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE


 Chairperson R.C.E. 19246 Date 3/01/2003

DRAWING NUMBER **D-77K**

IMPERIAL TABLE - SPAN 12' (all measurements in feet and/or inches unless otherwise noted).
 For Metric Table (3.66m Span) - see drawing D77K

SPAN		12'																						
HEIGHT		6'			7'			8'			9'				10'				12'					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D		
MAX FILL OVER TOP		2	14	26	2	14	26	2	14	26	2	14	26	36	2	14	26	36	2	14	26	36		
Conc.	Top Slab	T ₁	10	14	17 1/2	10	14 1/4	17 1/2	10 1/4	14 1/4	17 3/4	10 1/4	14 1/2	17 3/4	20 3/4	10 1/4	14 1/2	17 3/4	20 3/4	10 1/4	14 1/2	18 1/4	21 1/4	
	Bottom Slab	T ₂	9 1/4	14 3/4	18	9 1/4	15	18 1/4	9 3/4	15	18 1/2	10	15 1/4	18 3/4	21 1/4	10 1/4	15 1/4	18 3/4	21 1/2	10 1/2	15 1/4	19 1/4	22	
	Sidewalls	T ₃	6	6	6 1/2	7	7	7	8	8	8 1/2	9	9	9	10	9	9	9 1/2	11	9	10	11	12	
Reinforcing Steel	"a"	Size Bar #	6	4	4	6	4	4	6	4	4	6	4	4	4	6	4	4	4	6	4	4	4	
		Spacing	9	11 1/2	9	9	11 1/2	9	9	11	8 1/2	9	11	8 1/2	9	9	11	8 1/2	9	9	11	8 1/2	9	
		Length	26-4	26-2	26-4	26-7	26-5	26-5	26-10	26-8	26-10	27-1	26-11	26-11	27-1	27-1	26-11	27-3	27-5	27-1	27-2	27-5	27-8	
	"b" or "b ₁ "	Size Bar #	6	8	8	6	8	8	6	8	8	6	8	8	9	6	8	8	8	9	6	8	8	9
		Spacing	9	11 1/2	9	9	11 1/2	9	9	11	8 1/2	9	11	8 1/2	9	9	11	8 1/2	9	9	11	8 1/2	9	
		Length "b"	25-8	25-10	26-3	25-11	26-1	26-4	26-2	26-4	26-9	26-5	26-8	26-10	27-4	26-5	26-8	27-2	27-6	26-5	26-11	27-5	27-10	
	Length "b ₁ "	25-6	25-10	26-3	25-9	26-2	26-4	26-1	26-5	26-9	26-4	26-8	26-11	27-4	26-4	26-8	27-2	27-7	26-4	26-11	27-5	27-11		
	"c"	Size Bar #	5	8	8	5	8	8	5	8	8	5	8	8	9	5	8	8	9	5	8	8	9	
		Spacing	9	11 1/2	9	9	11 1/2	9	9	11	8 1/2	9	11	8 1/2	9	9	11	8 1/2	9	9	11	8 1/2	9	
		Length	12-6	12-6	12-7	12-7	12-7	12-7	12-8	12-8	12-9	12-9	12-9	12-9	12-10	12-9	12-9	12-10	12-11	12-9	12-10	12-11	13-0	
	"d" Dist Bars	Top Slab-Tot. No.	24	10	10	24	10	10	24	10	10	24	10	10	10	24	10	10	10	24	10	10	10	
		Bottom Slab-Tot. No.	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	"e" Bars	Size Bar #	4	4	5	4	4	5	4	4	5	4	5	7	8	4	7	8	8	6	7	8	9	
		Spacing	18	8	8	15	6	6 1/2	12	5 1/2	6	9	7 1/2	8 1/2	8	8 1/2	11	8 1/2	9	12	8	7	7	
	Spacers	Number	52			55			68			68				72				76				
Quan.	Concrete: C.Y. per lin. ft.	1.84	2.59	3.16	1.97	2.77	3.28	2.19	2.93	3.59	2.38	0.74	3.69	4.25	2.48	3.23	3.86	4.49	2.67	3.53	4.30	4.92		
	Reinf :lbs per lin. ft.	309	317	401	316	330	415	336	363	460	345	374	485	578	351	394	519	582	371	427	567	673		

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 both cells.


Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT

DETAILS No. 1

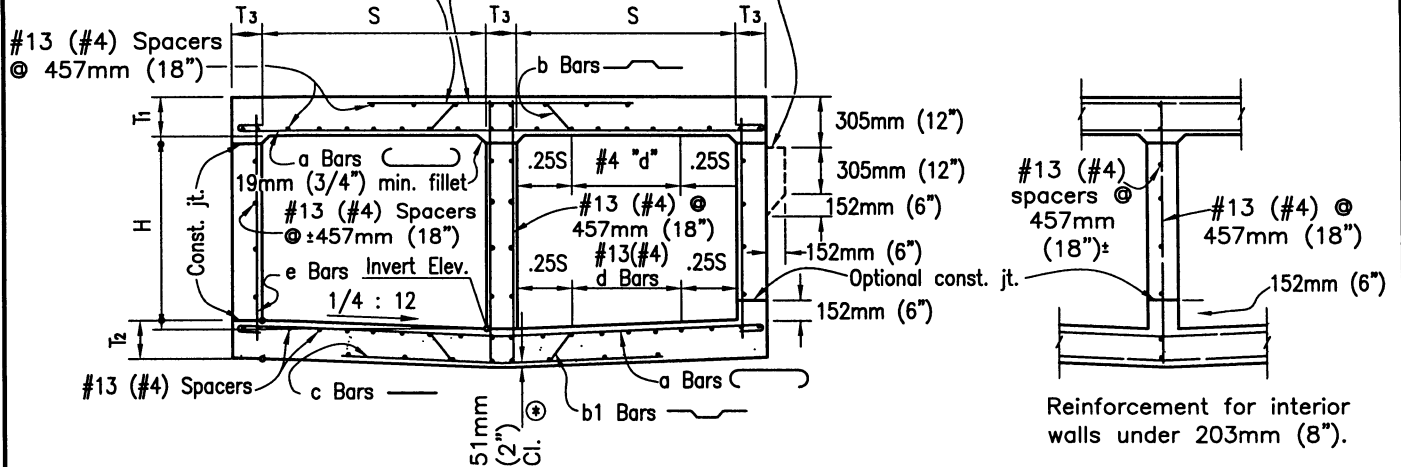
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE


 J. Faulkner
 Chairperson R.C.E. 19246 Date 3/01/2005

DRAWING NUMBER **D-77L**

For cover less than 610mm (2') provide #13 (#4) @ 457mm (18") ea. way & adjust quantities.

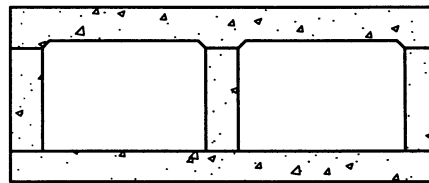
Provide paving notch when top is exposed and where P.C.C. pavement or approach slab is used.



TYPICAL SECTION

(Showing reinforcement for interior walls 203mm (8") and over.)

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



"FLAT INVERT" ALTERNATIVE
(When shown)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE BOX CULVERT
DETAILS NO. 2**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-77M**

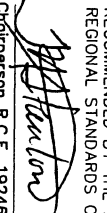
This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

METRIC TABLE – SPAN 1.22m (all measurements in millimeters unless otherwise noted).
 For Imperial table (4' Span) – see drawing D78B

SPAN		1.22m									
HEIGHT		610mm			914mm			1.22m			
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		3m	7.3m	11.6m	3m	7.3m	11.6m	3m	7.3m	11.6m	
Conc.	Top Slab T ₁	159	159	184	159	159	184	159	159	184	
	Bottom Slab T ₂	152	178	210	152	178	210	152	178	210	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	
Reinforcing Steel	"a"	Size Bar#	16	13	16	16	13	16	16	13	16
		Spacing	279	286	330	279	286	330	279	286	330
		Length	4.50m	4.47m	4.50m	4.50m	4.47m	4.50m	4.50m	4.47m	4.50m
	"b" or "b ₁ "	Size Bar#	16	16	19	16	16	19	16	16	19
		Spacing	279	286	330	279	286	330	279	286	330
		Length "b"	4.32m	4.32m	4.34m	4.32m	4.32m	4.34m	4.32m	4.32m	4.34m
	"c"	Size Bar#	13	16	19	13	16	19	13	16	19
		Spacing	279	286	330	279	286	330	279	286	330
		Length	2.74m	2.74m	2.74m	2.74m	2.74m	2.74m	2.74m	2.74m	2.74m
	"d" Dist Bars	Top Slab–Tot. No.	15	9	9	15	9	9	15	9	9
		Bottom Slab–Tot. No.	9	9	9	9	9	9	9	9	9
	"e" Bars	Size Bar#	13	13	13	13	13	13	13	13	16
Spacing		457	457	457	457	457	330	457	286	330	
Spacers	Number	34			38			42			
Quan.	Concrete: cu m per lin. ft.	0.51	0.54	0.62	0.57	0.60	0.68	0.63	0.66	0.73	
	Reinf: kg per lin. ft.	55	50	60	58	52	63	59	55	67	

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 both cells.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING TRIPLE BOX CULVERT DETAILS No. 1
ORIGINAL		Kercheval	12/75	
Add Metric		T. Stanton	03/03	
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  Christopher R.C.E. 19246 Date 5/01/2003				DRAWING NUMBER D-78A

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

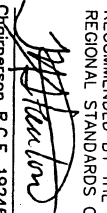
IMPERIAL TABLE - SPAN 4' (all measurements in feet and/or inches).

For Metric table (1.22m Span) - see drawing D78A

SPAN		4'									
		2'			3'			4'			
HEIGHT		A	B	C	A	B	C	A	B	C	
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	
MAX FILL OVER TOP		10	24	38	10	24	38	10	24	38	
Conc.	Top Slab	T ₁	6 1/4	6 1/4	7 1/4	6 1/4	6 1/4	7 1/4	6 1/4	6 1/4	7 1/4
	Bottom Slab	T ₂	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
Reinforcing Steel	"a"	Size Bar#	5	4	5	5	4	5	5	4	5
		Spacing	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
	"b" or "b ₁ "	Size Bar#	5	5	6	5	5	6	5	5	6
		Spacing	11	11 1/2	13	11	11 1/2	13	11	11 1/2	13
		Length "b"	14-2	14-2	14-3	14-2	14-2	14-3	14-2	14-2	14-3
	Length "b ₁ "	14-0	14-2	14-3	14-0	14-2	14-3	14-0	14-2	14-3	
	"c"	Size Bar#	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
		Length	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0	9-0
	"d" Dist Bars	Top Slab-Tot. No.	15	9	9	15	9	9	15	9	9
		Bottom Slab-Tot. No.	9	9	9	9	9	9	9	9	9
"e" Bars	Size Bar#	4	4	4	4	4	4	4	4	5	
	Spacing	18	18	18	18	18	13	18	11 1/2	13	
Spacers	Number	34			38			42			
Quan.	Concrete: C.Y. per lin. ft.	0.67	0.71	0.81	0.75	0.79	0.89	0.82	0.86	0.96	
	Reinf :lbs per lin. ft.	122	110	133	127	115	138	131	122	147	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kereheval	12/75
Add Metric		T. Stanton	03/03
SAN DIEGO REGIONAL STANDARD DRAWING			
TRIPLE BOX CULVERT			
DETAILS No. 1			
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE			
 Chairperson R.C.E. 19246 Date 3/01/2003			
DRAWING NUMBER		D-78B	

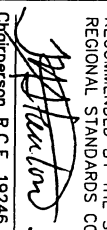
This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

METRIC TABLE - SPAN 1.52m (all measurements in millimeters unless otherwise noted).
 For Imperial table (5' Span) - see drawing D78B

SPAN		1.52m															
HEIGHT		610mm			914mm			1.22m				1.52m					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D		
MAX FILL OVER TOP		2.4m	5.2m	7.9m	2.4m	5.2m	7.9m	2.4m	5.2m	7.9m	10.7m	2.4m	5.2m	7.9m	10.7m		
Conc.	Top Slab T ₁	171	171	191	171	171	191	171	171	191	216	171	171	191	216		
	Bottom Slab T ₂	159	184	216	159	184	216	159	184	216	241	159	191	216	241		
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	152	152	152		
Reinforcing Steel	"a"	Size Bar #	16	13	16	16	13	16	5	4	5	5	5	4	5	5	
		Spacing	254	286	330	254	286	330	254	279	330	286	254	279	330	286	
		Length	5.41m	5.38m	5.41m	5.41m	5.38m	5.41m	5.41m	5.38m	5.41m	5.41m	5.38m	5.41m	5.41m		
	"b"	Size Bar #	16	16	19	16	16	19	16	16	19	19	16	16	19	19	
		Spacing	254	286	13	254	286	330	254	279	330	286	254	279	330	286	
		Length "b"	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.26m	5.31m	
	"b ₁ "	Length "b ₁ "	5.18m	5.23m	5.28m	5.18m	5.23m	5.28m	5.18m	5.23m	5.28m	5.31m	5.18m	5.23m	5.28m	5.31m	
		Length "b ₁ "	5.18m	5.23m	5.28m	5.18m	5.23m	5.28m	5.18m	5.23m	5.28m	5.31m	5.18m	5.23m	5.28m	5.31m	
	"c"	Size Bar #	13	16	19	13	16	19	13	16	19	19	13	16	19	19	
		Spacing	254	286	330	254	286	330	254	279	330	286	254	279	330	286	
		Length	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	3.35m	
	"d" Dist Bars	Top Slab-Tot. No.	18	9	9	18	9	9	18	9	9	9	18	9	9	9	
		Bottom Slab-Tot. No.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	
	"e" Bars	Size Bar #	13	13	13	13	13	13	13	13	13	16	13	13	13	19	
		Spacing	457	457	457	457	457	457	457	432	286	286	457	279	102	286	
Spacers	Number	34			38			38				42					
Quan.	Concrete: cu m per lin. ft.	0.63	0.66	0.75	0.69	0.73	0.80	0.74	0.78	0.86	0.94	0.80	0.85	0.92	1.00		
	Reinf: kg per lin. ft.	68	57	69	70	59	71	71	62	73	82	73	65	78	87		

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 both cells.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING
ORIGINAL		Kercheval	12/75	
Add Metric		T. Stanton	03/03	
TRIPLE BOX CULVERT DETAILS No. 1				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
DRAWING NUMBER D-78C				
 Chairperson R.C.E. 19246 Date 3/01/2003				

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

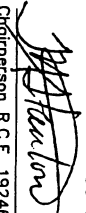
IMPERIAL TABLE - SPAN 5' (all measurements in feet and/or inches).

For Metric table (1.52m Span) - see drawing D78C

SPAN		5'														
HEIGHT		2'			3'			4'			5'					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		8	17	26	8	17	26	8	17	26	35	8	17	26	35	
Canc.	Top Slab T ₁	6 3/4	6 3/4	7 1/2	6 3/4	6 3/4	7 1/2	6 3/4	6 3/4	7 1/2	8 1/2	6 3/4	6 3/4	7 1/2	8 1/2	
	Bottom Slab T ₂	6 1/4	7 1/4	8 1/2	6 1/4	7 1/4	8 1/2	6 1/4	7 1/4	8 1/2	9 1/2	6 1/4	7 1/2	8 1/2	9 1/2	
	Sidewalls T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Reinforcing Steel	"a" Length	Size Bar#	5	4	5	5	4	5	5	4	5	5	5	4	5	5
		Spacing	10	11 1/2	13	10	11 1/2	13	10	11	13	11 1/2	10	11	13	11 1/2
	"b" or "b ₁ " Length "b"	Size Bar#	5	5	6	5	5	6	5	5	6	6	5	5	6	6
		Spacing	10	11 1/2	13	10	11 1/2	13	10	11	13	11 1/2	10	11	13	11 1/2
	"c" Length "b ₁ "	Size Bar#	4	5	6	4	5	6	4	5	6	6	4	5	6	6
		Spacing	10	11 1/2	13	10	11 1/2	13	10	11	13	11 1/2	10	11	13	11 1/2
	"d" Dist Bars	Top Slab-Tot. No.	18	9	9	18	9	9	18	9	9	9	18	9	9	9
		Bottom Slab-Tot. No.	9	9	9	9	9	9	9	9	9	9	9	9	9	9
	"e" Bars	Size Bar#	4	4	4	4	4	4	4	4	4	5	4	4	4	6
		Spacing	18	18	18	18	18	18	18	17	11 1/2	11 1/2	18	11	4	11 1/2
	Spacers	Number	34			38			38			42				
	Quan.	Concrete: C.Y. per lin. ft.	0.82	0.87	0.98	0.90	0.95	1.05	0.97	1.02	1.13	1.23	1.04	1.11	1.20	1.31
Reinf :lbs per lin. ft.		150	126	153	155	130	157	157	136	161	181	161	143	171	192	

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 both cells.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING TRIPLE BOX CULVERT DETAILS No. 1
ORIGINAL		Kereheval	12/75	
Add Metric		T. Stanton	03/03	
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  Chairperson R.C.E. 19246 Date 3/01/2003				DRAWING NUMBER D-78D

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

METRIC TABLE – SPAN 1.83m (all measurements in millimeters unless otherwise noted).
 For Imperial table (6' Span) – see drawing D78F

SPAN		1.83m														
HEIGHT		914mm			1.22m			1.52m			1.83m					
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		1.2m	6.1m	10.4m	1.2m	6.1m	10.4m	1.2m	5.8m	10m	13.1m	1.2m	5.8m	10m	13.1m	
Conc.	Top Slab T ₁	184	210	267	184	210	267	184	210	267	305	184	210	267	305	
	Bottom Slab T ₂	184	241	292	184	241	292	184	241	292	324	184	241	292	324	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	152	152	191	
Reinforcing Steel	"a"	Size Bar #	16	13	13	16	13	13	16	13	13	13	16	13	13	13
		Spacing	241	279	216	241	279	216	241	279	216	267	241	279	216	267
		Length	4.34m	4.32m	4.32m	4.34m	4.32m	4.32m	4.34m	4.32m	4.32m	4.32m	4.34m	4.32m	4.32m	4.47m
	"b" or "b ₁ "	Size Bar #	16	19	19	16	19	19	16	19	19	22	16	19	19	22
		Spacing	241	279	216	241	279	216	241	279	216	267	241	279	216	267
		Length "b"	4.11m	4.11m	4.17m	4.11m	4.11m	4.17m	4.11m	4.11m	4.17m	4.19m	4.11m	4.11m	4.17m	4.32m
	Length "b ₁ "	4.09m	4.14m	4.17m	4.09m	4.14m	4.17m	4.09m	4.11m	4.17m	4.19m	4.11m	4.11m	4.17m	4.32m	
	"c"	Size Bar #	13	19	19	13	19	19	13	19	19	22	13	19	19	22
		Spacing	241	279	216	241	279	216	241	279	216	267	241	279	216	267
		Length	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	1.98m	2.03m
	"d" Dist Bars	Top Slab-Tot. No.	12	6	6	12	6	6	12	6	6	6	12	6	6	6
		Bottom Slab-Tot. No.	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	"e" Bars	Size Bar #	13	13	13	13	13	13	13	13	16	16	13	16	19	19
		Spacing	457	457	406	457	356	216	457	254	241	178	457	279	229	152
Spacers	Number	30			33			36			36					
Quan.	Concrete: cu m per lin. ft.	0.59	0.69	0.83	0.63	0.73	0.86	.67	.77	.91	.99	0.71	.82	.96	1.12	
	Reinf: kgs per lin. ft.	55	54	67	57	56	70	58	59	74	79	59	62	80	91	

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 both cells.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING DOUBLE BOX CULVERT DETAILS No. 1	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chairperson R.C.E. 19246 Date 5/10/2003
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
				DRAWING NUMBER D-78F	

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

IMPERIAL TABLE - SPAN 6' (all measurements in feet and/or inches).

For Metric table (1.83m Span) - see drawing D78E

SPAN		6'													
HEIGHT		3'			4'			5'			6'				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	D	A	B	C	D
MAX FILL OVER TOP		3	13	23	3	13	23	3	13	23	30	3	13	23	30
Conc.	Top Slab T ₁	7 1/2	7 1/2	8 1/4	7 1/2	7 1/2	8 1/4	7 1/2	7 1/2	8 1/4	9 1/4	7 1/2	7 1/2	8 1/4	9 1/4
	Bottom Slab T ₂	6	7 3/4	9 1/4	6	7 3/4	9 1/4	6	8	9 1/4	10	6	8	9 1/4	10 1/4
	Sidewalls T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Reinforcing Steel	"a" Size Bar #	6	5	5	6	5	5	6	5	5	5	6	5	5	5
	"a" Spacing	13	14	11 1/2	13	14	11 1/2	13	14	11 1/2	10	13	14	11 1/2	10
	"a" Length	20-10	20-9	20-9	20-10	20-9	20-9	20-10	20-9	20-9	20-9	20-10	20-9	20-9	20-9
	"b" Size Bar #	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	"b" Spacing	13	14	11 1/2	13	14	11 1/2	13	14	11 1/2	10	13	14	11 1/2	10
	"b" Length "b"	20-3	20-3	20-5	20-3	20-3	20-5	20-3	20-3	20-5	20-6	20-3	20-3	20-5	20-6
	"b" Length "b ₁ "	20-0	20-2	20-5	20-0	20-2	20-5	20-0	20-2	20-5	20-6	20-0	20-0	20-5	20-7
	"c" Size Bar #	4	6	6	4	6	6	4	6	6	6	4	6	6	6
	"c" Spacing	13	14	11 1/2	13	14	11 1/2	13	14	11 1/2	10	13	14	11 1/2	10
	"c" 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	13-0	13-0
	"d" Dist Top Slab-Tot. No.	18	9	9	18	9	9	18	9	9	9	18	9	9	9
	"d" Dist Bottom Slab-Tot. No.	9	9	9	9	9	9	9	9	9	9	9	9	9	9
"e" Size Bar #	4	4	4	4	4	4	4	4	5	5	4	4	6	6	
"e" Spacing	18	18	18	18	18	11 1/2	18	11 1/2	12	10	18	8	12	10	
Spacers Number	40			40			52			48					
Quan. Concrete: C.Y. per lin. ft.	1.05	1.15	1.29	1.12	1.23	1.37	1.19	1.32	1.44	1.55	1.27	1.39	1.52	1.64	
Reinf :lbs per lin. ft.	181	168	196	183	170	200	187	177	209	235	192	187	221	249	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT
DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

John Low
Chiefperson R.C.E. 19246 Date *5/10/2003*

DRAWING NUMBER D-78F

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

METRIC TABLE – SPAN 2.44m (all measurements in millimeters unless otherwise noted).
 For Imperial table (8' Span) – see drawing D78BH

SPAN		2.44m																	
HEIGHT		1.22m			1.52m			1.83m			2.13m				2.44m				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		610	3.4m	6.1m	610	3.4m	6.1m	610	3.4m	6.1m	610	3.4m	6.1m	8.5m	610	3.4m	6.1m	8.5m	
Conc.	Top Slab T ₁	210	210	280	210	210	280	210	210	280	210	210	280	286	210	210	280	286	
	Bottom Slab T ₂	165	229	279	165	235	279	165	235	279	171	235	11	311	171	235	279	311	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	152	152	152	165	165	178	178	191	216	
Reinforcing Steel	"a"	Size Bar #	19	16	16	19	16	16	19	16	16	19	16	16	19	19	16	16	19
		Spacing	286	305	305	286	305	305	286	305	305	286	305	305	267	286	286	305	267
		Length	8.18m	8.15m	8.15m	8.18m	8.15m	8.15m	8.18m	8.15m	8.15m	8.18m	8.15m	8.20m	8.33m	8.28m	8.26m	8.31m	8.43m
	"b"	Size Bar #	19	19	22	19	19	22	19	19	22	19	19	22	19	22	19	22	22
		Spacing	286	305	305	286	305	305	286	305	305	286	305	305	267	286	286	305	267
		Length "b"	8.05m	8.05m	8.10m	8.05m	8.05m	8.10m	8.05m	8.05m	8.10m	8.05m	8.05m	8.15m	8.31m	8.15m	8.15m	8.26m	8.41m
	"or "b ₁ "	Length "b ₁ "	12.19m	8.03m	8.10m	12.19m	8.05m	8.10m	12.19m	8.05m	8.10m	7.95m	8.05m	8.15m	8.31m	8.05m	8.15m	8.26m	8.41m
		Length "c"	13	19	22	13	19	22	13	19	22	143	19	22	22	143	19	22	22
	"j" Dist Bars	Top Slab-Tot. No.	24	12	12	24	12	12	24	12	12	24	12	12	24	24	12	12	12
		Bottom Slab-Tot. No.	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	"e" Bars	Size Bar #	13	13	13	13	13	16	13	16	19	13	19	22	22	13	19	22	22
		Spacing	457	457	305	457	305	305	457	305	305	286	305	305	267	286	286	305	267
Spacers	Number	58			62			62			66				70				88
Quan.	Concrete: cu m per lin. ft.	1.12	1.28	1.52	1.18	1.35	1.57	1.24	1.41	1.64	1.31	1.46	1.73	1.96	1.45	1.61	1.88	2.13	
	Reinf: kg per lin. ft.	118	113	137	121	117	141	121	120	145	125	126	152	186	128	134	157	200	

Note

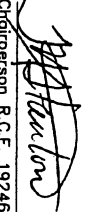
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities. Number of "d" bars in table is slab total for both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT
DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE


 Chairperson R.C.E. 19246 Date 3/10/2003

DRAWING NUMBER D-78C

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

IMPERIAL TABLE - SPAN 8' (all measurements in feet and/or inches).

For Metric table (2.44m Span) - see drawing D78G

		SPAN 8'																
		HEIGHT 4'			5'			6'			7'			8'				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D
MAX FILL OVER TOP		2	11	20	2	11	20	2	11	20	2	11	20	28	2	11	20	28
Conc.	Top Slab	T ₁	8 1/4	8 1/4	10 1/4	8 1/4	8 1/4	10 1/4	8 1/4	8 1/4	10 1/4	8 1/4	8 1/4	10 1/4	11 1/2	8 1/4	8 1/4	10 1/4
	Bottom Slab	T ₂	6 1/2	9	11	6 1/2	9 1/4	11	6 1/2	9 1/4	11	6 3/4	9 1/4	11	12 1/4	6 3/4	9 1/4	11
	Sidewalls	T ₃	6	6	6	6	6	6	6	6	6	6	6	6	6 1/2	6 1/2	7	7
Reinforcing Steel	"a"	Size Bar #	6	5	5	6	5	5	6	5	5	6	5	5	6	6	5	5
		Spacing	11 1/2	12	12	11 1/2	12	12	11 1/2	12	12	11 1/2	12	12	10 1/2	11 1/2	11 1/2	12
		Length	26-10	26-9	26-9	26-10	26-9	26-9	26-10	26-9	26-9	26-10	26-9	26-11	27-4	27-2	27-1	27-3
	"b" or "b ₁ "	Size Bar #	6	6	7	6	6	7	6	6	7	6	6	7	7	6	6	7
		Spacing	11 1/2	12	12	11 1/2	12	12	11 1/2	12	12	11 1/2	12	12	10 1/2	11 1/2	11 1/2	12
		Length "b"	26-5	26-5	26-7	26-5	26-5	26-7	26-5	26-5	26-7	26-5	26-5	26-9	27-3	26-9	26-9	27-1
	Length "b ₁ "	26-0	26-4	26-7	26-0	26-5	26-7	26-0	26-5	26-7	26-1	26-5	26-9	27-3	26-5	26-9	27-1	
	"c"	Size Bar #	4	6	7	4	6	7	4	6	7	4	6	7	7	4	6	7
		Spacing	11 1/2	12	12	11 1/2	12	12	11 1/2	12	12	11 1/2	12	12	10 1/2	11 1/2	11 1/2	12
		Length	17-0	17-0	17-0	17-0	17-0	17-0	17-0	17-0	17-0	17-0	17-0	17-1	17-3	17-2	17-2	17-3
	"d" Dist Bars	Top Slab-Tot. No.	24	12	12	24	12	12	24	12	12	24	12	12	12	24	12	12
		Bottom Slab-Tot. No.	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
"e" Bars	Size Bar #	4	4	4	4	4	5	4	5	6	4	6	7	7	4	6	7	
	Spacing	18	18	12	18	12	12	18	12	12	11 1/2	12	12	10 1/2	11 1/2	11 1/2	12	
Spacers	Number	58			62			62			66			70				
Quan.	Concrete: C.Y. per lin. ft.	1.47	1.67	1.99	1.54	1.76	2.06	1.62	1.84	2.14	1.71	1.91	2.26	2.57	1.90	2.10	2.46	
	Reinf .lbs per lin. ft.	261	250	301	266	257	310	267	264	320	276	277	336	409	283	295	347	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT
DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Christopher R.C.E. 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-78H

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

METRIC TABLE - SPAN 3.05m (all measurements in millimeters unless otherwise noted).
 For Imperial table (10' Span) - see drawing D78BJ

SPAN		3.05m																	
HEIGHT		1.52m			1.83m			2.13m			2.44m				3.05m				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	
MAX FILL OVER TOP		610	3.4m	6.1m	610	3.4m	6.1m	610	3.4m	6.1m	610	3.4m	6.1m	28	610	3.4m	6.1m	28	
Conc.	Top Slab T ₁	229	254	305	229	254	305	229	254	305	229	254	305	362	229	260	318	368	
	Bottom Slab T ₂	191	273	330	191	273	13	191	273	330	197	279	330	381	203	279	343	381	
	Sidewalls T ₃	152	152	152	152	152	152	152	152	165	178	178	191	216	203	216	229	254	
Reinforcing Steel	"a"	Size Bar #	19	19	19	19	19	19	19	19	19	19	19	19	22	19	19	19	22
		Spacing	267	330	254	254 1/2	330	254	267	330	254	267	330	254	279	267	330	254	279
		Length	10.01m	10.01m	10.01m	10.01m	10.01m	10.01m	10.01m	10.01m	10.01m	10.11m	10.11m	10.16m	10.26m	10.21m	10.26m	10.31m	10.41m
	"b" or "b ₁ "	Size Bar #	19	22	22	19	22	22	19	22	22	19	22	22	25	19	22	22	25
		Spacing	267	330	254	254 1/2	330	254	267	330	254	267	330	254	279	267	330	254	279
		Length "b"	9.91m	9.93m	10.01m	9.91m	9.93m	10.01m	9.91m	9.93m	10.06m	10.01m	10.03m	10.16m	10.31m	9.80m	10.19m	10.31m	10.49m
		Length "b ₁ "	9.80m	9.93m	10.03m	9.80m	9.93m	10.03m	9.80m	9.93m	10.31m	9.91m	10.03m	10.19m	10.31m	10.03m	10.19m	10.31m	10.49m
	"c"	Size Bar #	16	22	22	16	22	22	16	22	22	16	22	22	25	16	22	22	25
		Spacing	267	330	254	267	330	254	267	13	254	267	330	254	279	267	330	254	279
		Length	6.40m	6.40m	6.40m	6.40m	6.40m	6.40m	6.40m	6.40m	6.43m	6.45m	6.45m	6.48m	6.53m	6.50m	6.53m	6.55m	6.60m
	"d" Dist Bars	Top Slab-Tot. No.	27	15	15	27	15	15	27	15	15	27	15	15	15	27	15	15	15
		Bottom Slab-Tot. No.	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
"e" Bars	Size Bar #	13	13	16	13	16	19	13	19	22	13	19	22	25	16	19	25	25	
	Spacing	457	330	254	457	330	254	330	330	254	267	305	10	279	267	229	254	229	
Spacers	Number	68			68			72			76			94		102			
Quan.	Concrete: cu m per lin. ft.	1.51	1.83	2.16	1.57	1.90	2.22	1.63	1.95	2.32	1.79	2.12	2.47	2.90	2.05	2.43	2.85	3.23	
	Reinf kg per lin. ft.	162	169	213	163	172	219	166	177	228	171	182	233	268	191	205	262	287	

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 both cells.

Revision	By	Approved	Date
ORIGINAL	Kercheval		12/75
Add Metric	T. Stanton		03/03

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT
 DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 5/01/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-781

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

IMPERIAL TABLE - SPAN 10' (all measurements in feet and/or inches).

For Metric table (3.05m Span) - see drawing D781

SPAN		10'																							
HEIGHT		5'				6'				7'				8'				10'							
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D							
MAX FILL OVER TOP		2	11	20	2	11	20	2	11	20	2	11	20	28	2	11	20	28							
Conc.	Top Slab T ₁	9	10	12	9	10	12	9	10	12	9	10	12	14 1/4	9	10 1/4	12 1/2	14 1/2							
	Bottom Slab T ₂	7 1/2	10 3/4	13	7 1/2	10 3/4	13	7 1/2	10 3/4	13	7 3/4	11	13	15	8	11	13 1/2	15							
	Sidewalls T ₃	6	6	6	6	6	6	6	6	6 1/2	7	7	7 1/2	8 1/2	8	8 1/2	9	10							
Reinforcing Steel	"a"	Size Bar#	6	6	6	6	6	6	6	6	6	6	6	7	6	6	6	7							
		Spacing	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	11	10 1/2	13	10	11						
		Length	32-10	32-10	32-10	32-10	32-10	32-10	32-10	32-10	32-10	33-2	33-2	33-4	33-8	33-6	33-8	33-10	34-2						
	"b"	Size Bar#	6	7	7	6	7	7	6	7	7	6	7	7	8	6	7	7	8						
		Spacing	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	11	10 1/2	13	10	11						
		Length "b"	32-6	32-7	32-10	32-6	32-7	32-10	32-6	32-7	33-0	32-10	32-11	33-4	33-11	32-2	33-5	33-11	34-5						
	"or "b ₁ "	Length "b ₁ "	32-2	32-7	32-11	32-2	32-7	32-11	32-2	32-7	33-1	32-6	32-11	33-5	33-11	32-11	33-5	33-11	34-5						
		Size Bar#	5	7	7	5	7	7	5	7	7	5	7	7	8	5	7	7	8						
	"c"	Spacing	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	11	10 1/2	13	10	11						
		Length	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-0	21-1	21-2	21-2	21-3	21-5	21-4	21-5	21-6	21-8						
		"d" Dist Bars	27	15	15	27	15	15	27	15	15	27	15	15	27	15	15	15	15						
	"e" Bars	Top Slab-Tot. No.	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15						
Bottom Slab-Tot. No.		15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15							
"e" Bars	Size Bar#	4	4	5	4	5	6	4	6	7	4	6	7	8	5	6	8	8							
	Spacing	18	13	10	18	13	10	13	13	10	10 1/2	12	10	11	10 1/2	9	10	9							
Spacers	Number	68				68				72				76				94				102			
	Concrete: C.Y. per lin. ft.	1.98	2.40	2.82	2.06	2.48	2.90	2.13	2.55	3.03	2.34	2.77	3.23	3.78	2.68	3.18	3.73	4.22							
Quar.	Reinf :lbs per lin. ft.	358	372	470	359	379	482	367	391	502	377	402	514	590	421	453	577	632							

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT
DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Christopher R.C.E. 3/10/2003

Christopher R.C.E. 19246 Date

DRAWING NUMBER D-78J

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

METRIC TABLE - SPAN 3.66m (all measurements in millimeters unless otherwise noted).
For Imperial table (12' Span) - see drawing D78BJ

SPAN		3.66m																													
HEIGHT		1.83m			2.13m			2.44m			2.74m				3.05m				3.66m												
STRENGTH CLASSIFICATION		A		B		C		A		B		C		A		B		C		D		A		B		C		D			
MAX FILL OVER TOP		610	3m	5.5m	610	3m	5.5m	610	3m	5.5m	2	3.4m	20	9.1m	610	3.4m	20	9.1m	610	3.4m	20	9.1m	610	3.4m	20	9.1m	610	3.4m	20	9.1m	
Conc.	Top Slab	T ₁	280	286	356	280	286	356	280	286	356	280	305	375	451	280	305	375	451	280	305	375	451	280	305	375	451	280	305	375	451
	Bottom Slab	T ₂	210	305	368	216	305	375	216	305	375	222	318	394	464	222	318	394	464	229	324	400	464	229	324	400	464	229	324	400	464
	Sidewalls	T ₃	152	152	165	152	152	178	178	178	191	203	203	229	254	203	203	229	267	229	229	229	267	229	229	229	267	305	305	305	305
Reinforcing Steel	"a"	Size Bar #	22	19	22	22	19	22	22	19	22	22	19	22	25	22	19	22	25	22	19	22	25	22	19	22	25	22	19	22	25
		Spacing	305	11	286	305	279	286	305	279	286	305	267	279	286	305	267	279	286	305	267	279	286	305	267	279	286	305	267	279	286
		Length	11.91m	11.84m	11.96m	11.91m	11.84m	12.01m	12.01m	11.94m	12.07m	12.12m	12.04m	12.22m	12.45m	12.12m	12.04m	12.22m	12.50m	12.22m	12.50m	12.22m	12.50m	11.91m	12.37m	12.65m	12.65m	12.65m	12.65m	12.65m	
	"b"	Size Bar #	22	22	25	22	22	25	22	22	25	22	22	25	29	22	22	25	29	22	22	25	29	22	22	25	29	22	22	25	29
		Spacing	305	279	286	305	279	286	305	279	286	305	267	279	286	305	267	279	286	305	267	279	286	305	267	279	286	305	267	279	286
		Length "b"	11.76m	11.81m	11.96m	11.76m	11.81m	12.01m	11.86m	11.91m	12.07m	11.96m	12.04m	12.24m	12.45m	11.96m	12.04m	12.24m	12.50m	12.07m	12.50m	12.07m	12.50m	11.91m	12.40m	12.65m	12.65m	12.65m	12.65m	12.65m	
	"b ₁ "	Length "b ₁ "	11.66m	11.76m	11.94m	11.66m	11.81m	12.01m	11.76m	11.91m	12.07m	11.89m	12.04m	12.24m	12.45m	11.89m	12.04m	12.24m	12.50m	11.99m	12.50m	11.99m	12.50m	11.91m	12.42m	12.65m	12.65m	12.65m	12.65m	12.65m	
		Size Bar #	19	22	25	19	22	25	19	22	25	19	22	25	29	19	22	25	29	19	22	25	29	19	22	25	29	19	22	25	29
		Spacing	305	279	286	305	279	286	305	279	286	305	267	279	286	305	267	279	286	305	267	279	286	305	267	279	286	305	267	279	286
	"d" Dist Bars	Length	7.62m	7.62m	7.65m	7.62m	7.62m	7.67m	7.67m	7.67m	7.70m	7.72m	7.72m	7.77m	7.82m	7.72m	7.72m	7.77m	7.85m	7.77m	7.85m	7.77m	7.85m	7.77m	7.85m	7.77m	7.85m	7.92m	7.92m	7.92m	7.92m
		Top Slab-Tot. No.	36	15	15	36	15	15	36	15	15	36	15	15	15	36	15	15	15	36	15	15	15	36	15	15	15	36	15	15	15
		Bottom Slab-Tot. No.	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
"e" Bars	Size Bar #	13	13	19	13	13	19	13	13	19	13	19	22	25	16	22	25	25	19	22	25	25	19	22	29	29	19	22	29	29	
	Spacing	457	178	286	305	146	286	305	140	229	254	267	279	286	305	267	279	165	305	229	279	165	305	229	279	165	305	229	279	165	
Spacers	Number	76			80			84			104				110				116												
Quan.	Concrete: cu m per lin. ft.	1.99	2.43	2.92	2.06	2.49	3.04	2.20	2.64	3.16	2.39	2.90	3.52	4.17	2.47	2.97	3.61	4.32	2.77	3.27	4.01	4.72	2.77	3.27	4.01	4.72	2.77	3.27	4.01	4.72	
	Reinf kg per lin. ft.	222	229	285	225	234	289	229	239	297	243	264	326	396	249	275	338	426	261	288	360	440	261	288	360	440	261	288	360	440	

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 both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT
DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
Chairperson R.C.E. 19246	Date 5/10/2003
DRAWING NUMBER D-78K	

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

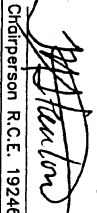
IMPERIAL TABLE - SPAN 12' (all measurements in feet and/or inches).

For Metric table (3.66m Span) - see drawing D78I

SPAN		12'																							
HEIGHT		6'			7'			8'			9'				10'				12'						
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D			
MAX FILL OVER TOP		2	10	18	2	10	18	2	10	18	2	11	20	30	2	11	20	30	2	11	20	30			
Conc.	Top Slab T ₁	10 1/4	11 1/2	14	10 1/4	11 1/2	14	10 1/4	11 1/2	14	10 1/4	12	14 3/4	17 3/4	10 1/4	12	14 3/4	17 3/4	10 1/4	12	14 3/4	17 3/4			
	Bottom Slab T ₂	8 1/4	12	14 1/2	8 1/2	12	14 3/4	8 1/2	12	14 3/4	8 3/4	12 1/2	15 1/2	18 1/4	8 3/4	12 1/2	15 1/2	18 1/4	9	12 3/4	15 3/4	18 1/4			
	Sidewalls T ₃	6	6	6 1/2	6	6	7	7	7	7 1/2	8	8	9	10	8	8	9	10 1/2	9	9	10 1/2	12			
Reinforcing Steel	"a"	Size Bar#	7	6	7	7	6	7	7	6	7	7	6	7	8	7	8	7	8	7	8	7	6	7	8
		Spacing	12	11	11 1/2	12	11	11 1/2	12	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2
		Length	39-1	38-10	39-3	39-1	38-10	39-5	39-5	39-2	39-7	39-9	39-6	40-1	40-10	39-9	39-6	40-1	41-0	40-1	39-10	40-7	41-6	41-6	41-6
	"b" or "b ₁ "	Size Bar#	7	7	8	7	7	8	7	7	8	7	7	8	9	7	7	8	9	7	7	8	9	8	9
		Spacing	12	11	11 1/2	12	11	11 1/2	12	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2
		Length "b"	38-7	38-9	39-3	38-7	38-9	39-5	38-11	39-1	39-7	39-3	39-6	40-2	40-10	39-3	39-6	40-2	41-0	39-7	39-10	40-8	41-6	41-6	41-6
	Length "b ₁ "	38-3	38-7	39-2	38-3	38-9	39-5	38-7	39-1	39-7	39-0	39-6	40-2	40-10	39-0	39-6	40-2	41-0	39-4	39-10	40-9	41-6	41-6	41-6	
	"c"	Size Bar#	6	7	8	6	7	8	6	7	8	6	7	8	9	6	7	8	9	6	7	8	9	8	9
		Spacing	12	11	11 1/2	12	11	11 1/2	12	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2	11	11 1/2	12	10 1/2
		Length	25-0	25-0	25-1	25-0	25-0	25-2	25-2	25-3	25-4	25-4	25-6	25-8	25-8	25-4	25-6	25-9	25-6	25-6	25-6	25-9	26-0	26-0	26-0
	"d" Dist Bars	Top Slab-Tot. No.	36	15	15	36	15	15	36	15	15	36	15	15	36	15	15	36	15	15	15	36	15	15	15
		Bottom Slab-Tot. No.	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
"e" Bars	Size Bar#	4	4	6	4	4	6	4	4	6	4	6	7	8	5	7	8	8	6	7	9	9	9	9	
	Spacing	18	7	11 1/2	12	5 3/4	11 1/2	12	5 1/2	9	10	10 1/2	11	11 1/2	12	10 1/2	11	6 1/2	12	9	11	9	9	9	
Spacers	Number	76			80			84			104				110				116						
	Concrete: C.Y. per lin. ft.	2.60	3.18	3.82	2.70	3.26	3.98	2.88	3.45	4.13	3.13	3.79	4.61	5.45	3.23	3.89	4.72	5.65	3.62	4.28	5.24	6.18	6.18	6.18	
Reinf	:lbs per lin. ft.	489	505	628	497	516	637	505	527	654	536	582	719	872	548	606	745	939	575	636	793	963	963	963	

Note

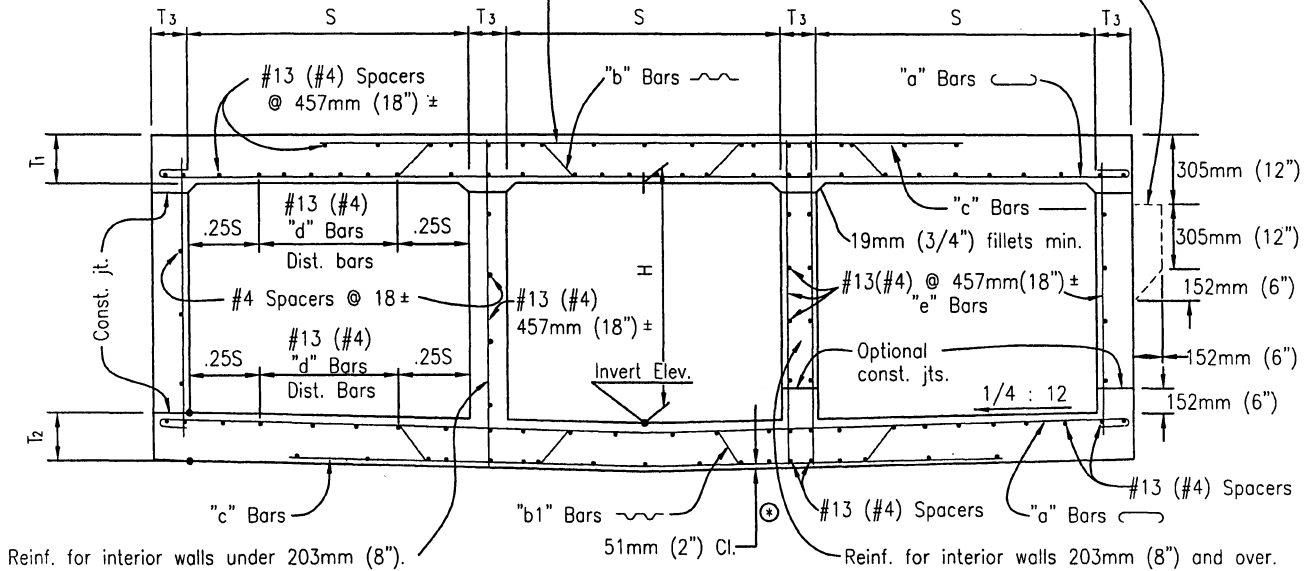
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities. Number of "d" bars in table is slab total for both cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
SAN DIEGO REGIONAL STANDARD DRAWING			
TRIPLE BOX CULVERT			
DETAILS No. 1			
DRAWING NUMBER D-78L			
 RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chairperson R.C.E. 19246 Date 5/01/2005			

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

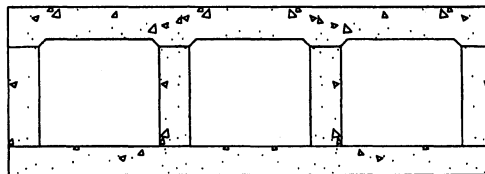
For cover less than 610mm (2 feet), extend "c" bars full length, top slab only. Provide additional #13 (#4) @ 305mm (18") ± and adjust quantities.

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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

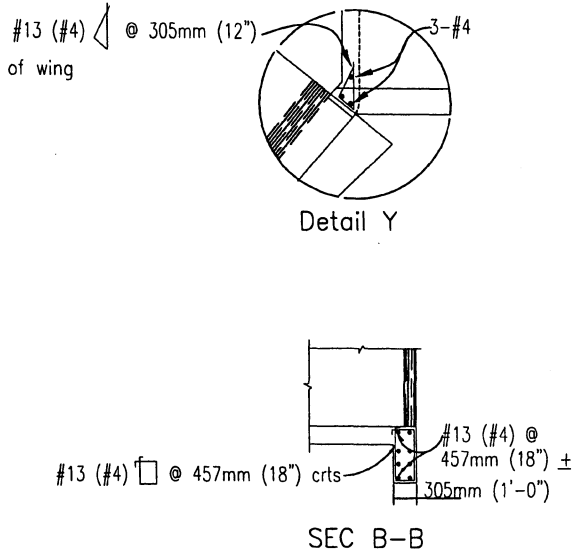
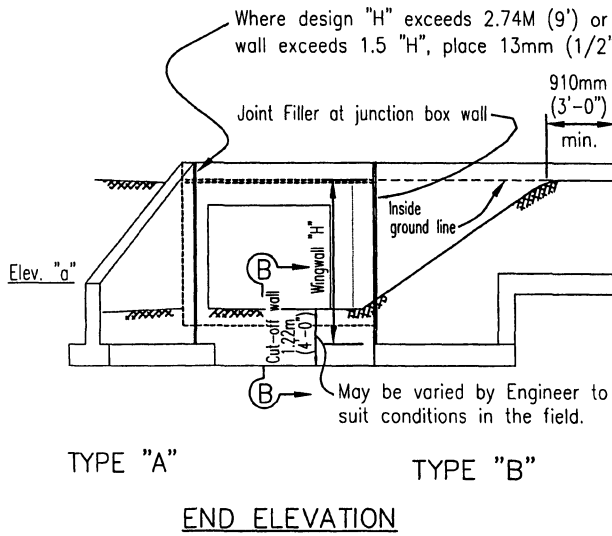
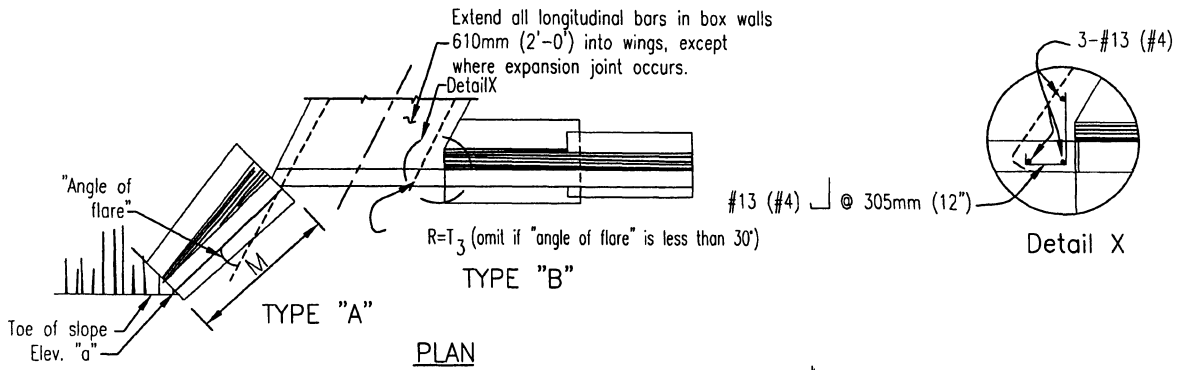
TRIPLE BOX CULVERT
DETAILS NO.2

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

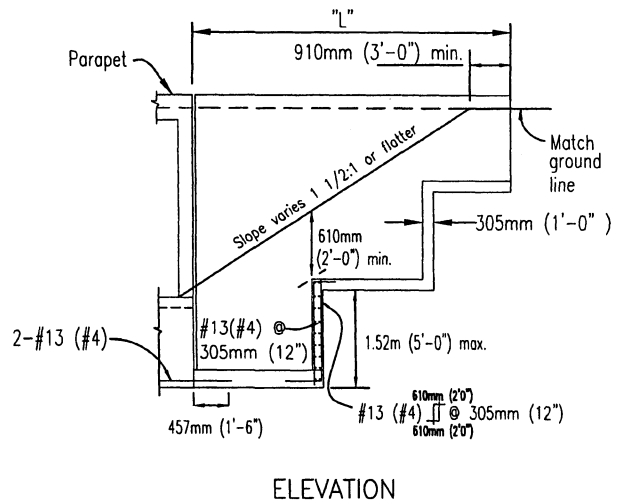
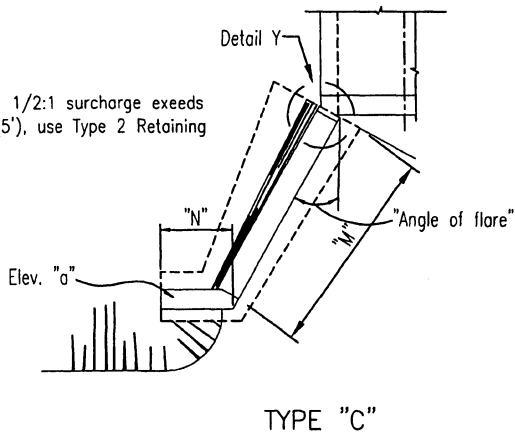
T. Stanton 310112003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-78M

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



NOTE
Where 1 1/2:1 surcharge exceeds 1.52m (5'), use Type 2 Retaining Wall.



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

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

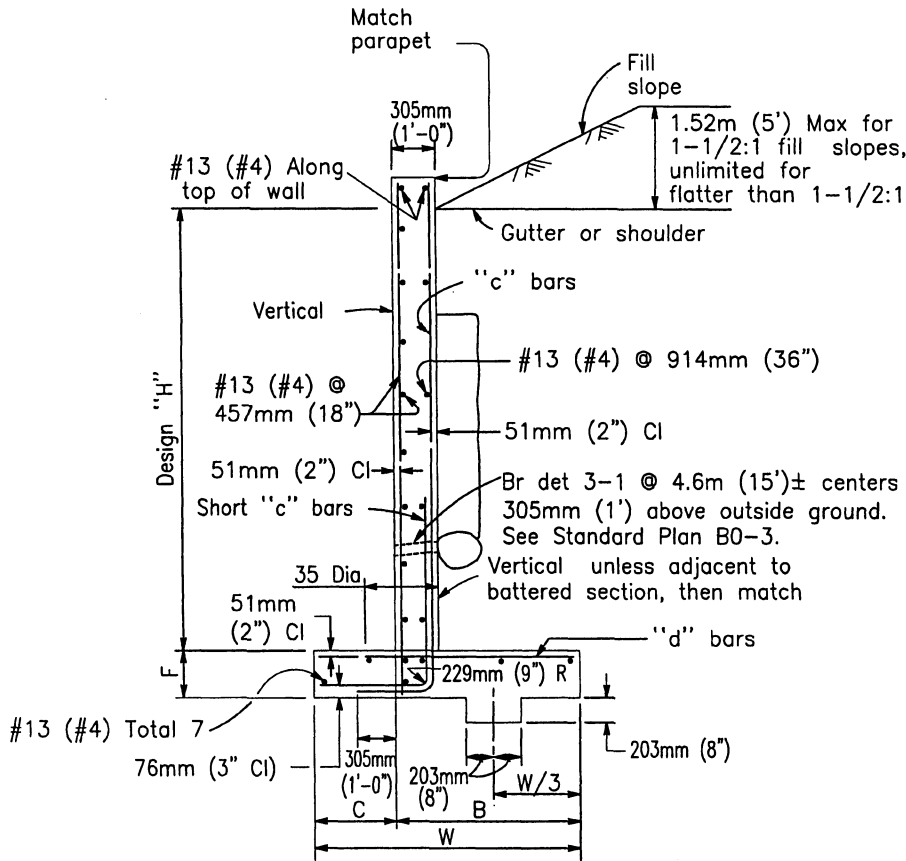
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-79A

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



TYPICAL SECTION

H=1.22m (4') Thru 3.66m (12')

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

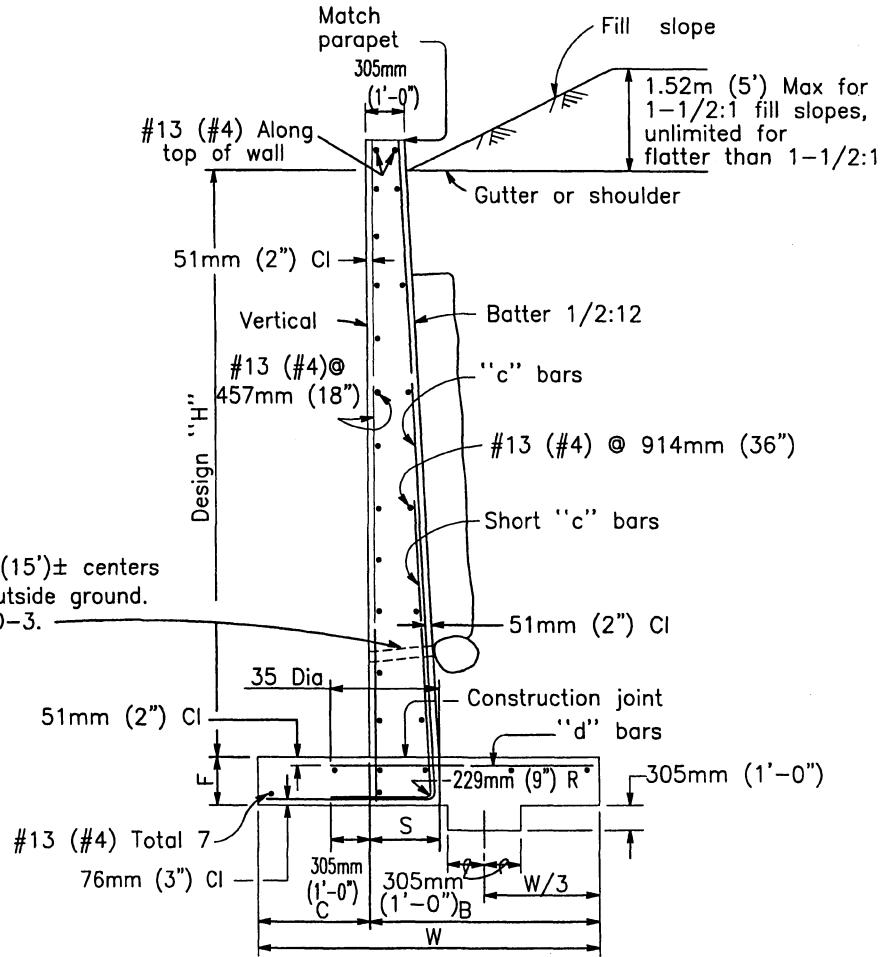
BOX CULVERT WINGWALL
TYPES A, B & C
DETAILS NO. 2

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER D-79B


This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



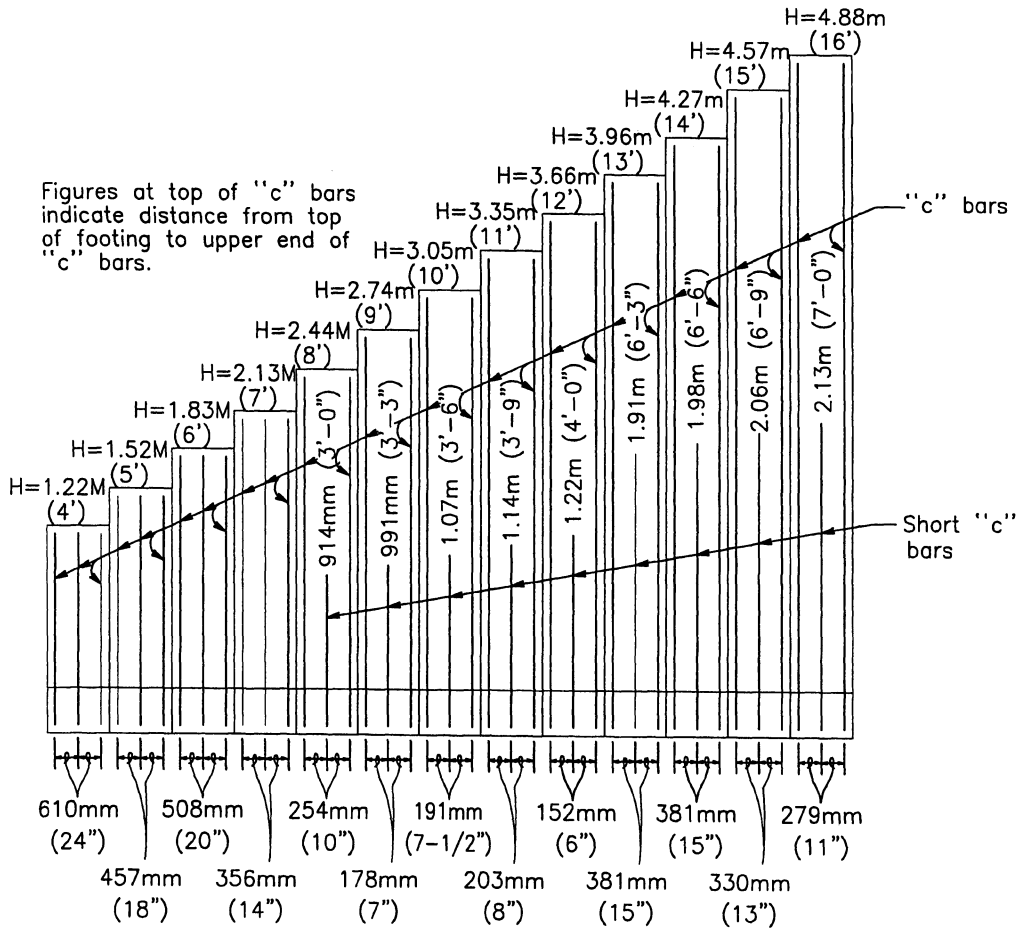
Br det 3-1 @ 4.6m (15') ± centers
305mm (1') above outside ground.
See Standard Plan B0-3.

TYPICAL SECTION

H=4.0m (13') Thru 4.9m (16')

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	BOX CULVERT WINGWALL TYPES A, B & C DETAILS NO. 2	 310112003 Chairperson R.C.E. 19246 Date
				DRAWING NUMBER	D-79C

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



TYPICAL LAYOUT EXAMPLE 1

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

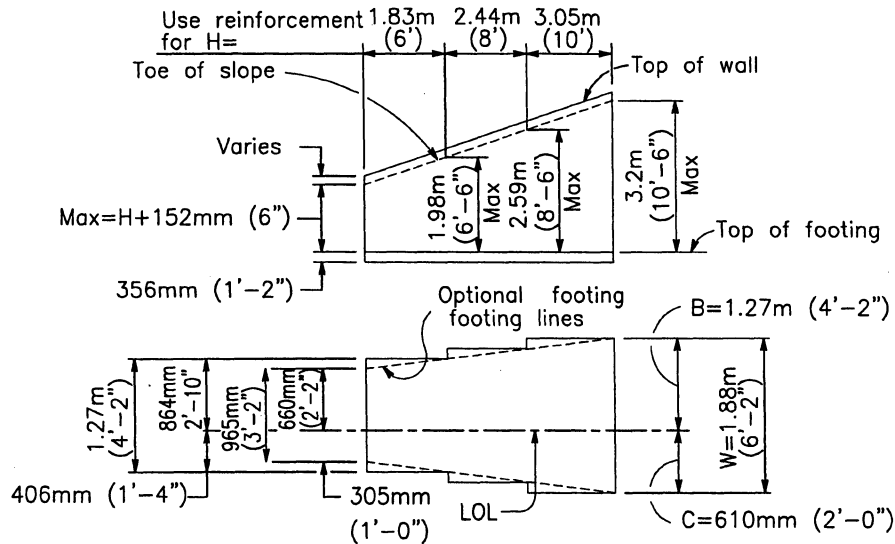
BOX CULVERT WINGWALL
TYPES A, B & C
DETAILS NO. 2

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-79D

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



TYPICAL LAYOUT EXAMPLE 2

NOTES

Unit Stresses: $f_s = 138 \text{ Mpa}$ (20,000 psi), $f_c = 8.3 \text{ Mpa}$ (1,200 psi), $n = 10$

Maximum Toe Pressure = 144Kpa (1-1/2 Tons/sq. ft).

Elevations, length and angle of flare of wings may be varied by the Engineer to suit conditions encountered in the field.

Walls designed for 610mm (2') liveload surcharge, 1-1/2:1 sloping surcharge not to exceed 1.52m (5') in elevation plus 610mm (2') liveload surcharge, or unlimited 2:1 surcharge. Dimensions "H", "L", "M", "N", Elevation "a" and "Angle of flare" (as apply) are shown on the plans.

Wall height may be exceeded by 152mm (6") before going to next greater "H". Eliminate cutoff wall if adjacent channel is paved and skew is 20' maximum.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		BOX CULVERT WINGWALL TYPES A, B & C DETAILS NO. 2
Add Metric		T. Stanton	03/03		
					DRAWING NUMBER D-79E

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

REINFORCED CONCRETE WINGWALLS - METRIC

"H"	1.22m	1.52m	1.83m	2.13m	2.44m	2.74m	3.05m	3.35m	3.66m	3.96m	4.27m	4.57m	4.88m	
W	965mm	1.12m	1.27m	1.42m	1.57m	1.73m	1.88m	2.03m	2.18m	2.34m	2.49m	2.64m	2.79m	
C	305mm	356mm	406mm	457mm	508mm	559mm	610mm	660mm	711mm	762mm	813mm	864mm	914mm	
B	660mm	762mm	864mm	965mm	1.07m	1.17m	1.27m	1.37m	1.47m	1.57m	1.68m	1.78m	1.88m	
F	1'-2"													
Batter	None										1/2 : 12			
S	305mm	305mm	305mm	305mm	305mm	305mm	305mm	305mm	305mm	305mm	1'-6 1/2"	1'-7"	1'-7 1/2"	1'-8"
"c" Bars (mm)	#13@625	#13@457	#16@508	#16@356	#16@254	#16@178	#19@191	#22@203	#22@152	#29@381	#32@381	#32@330	#32@279	
"d" Bars (mm)	#13@625	#13@457	#16@508	#16@356	#16@254	#19@356	#22@381	#25@16	#22@305	#25@381	#29@381	#32@330	#29@279	
Conc cu m/lf	0.25	0.30	0.34	0.38	0.43	0.47	0.52	0.56	0.61	0.78	0.85	0.91	0.97	
Reinf #/lf	13	16	19	25	30	37	49	62	76	73	90	104	125	

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

REINFORCED CONCRETE WINGWALLS - IMPERIAL

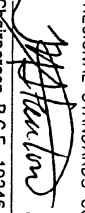
"H"	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	
W	3'-2"	3'-8"	4'-2"	4'-8"	5'-2"	5'-8"	6'-2"	6'-8"	7'-2"	7'-8"	8'-2"	8'-8"	9'-2"	
C	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-2"	2'-4"	2'-6"	2'-8"	2'-10"	3'-0"	
B	2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	4'-10"	5'-2"	5'-6"	5'-10"	6'-2"	
F	1'-2"													
Batter	None										1/2 : 12			
S	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6 1/2"	1'-7"	1'-7 1/2"	1'-8"
"c" Bars	#4@24	#4@18	#5@20	#5@14	#5@10	#5@7	#6@7 1/2	#7@8	#7@6	#9@15	#10@15	#10@13	#10@11	
"d" Bars	#4@24	#4@18	#5@20	#5@14	#5@10	#6@14	#7@15	#8@16	#7@12	#8@15	#9@15	#10@13	#9@11	
Conc cu yd/lf	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 #/lf	13	16	19	25	30	37	49	62	76	73	90	104	125	

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

SAN DIEGO REGIONAL STANDARD DRAWING

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

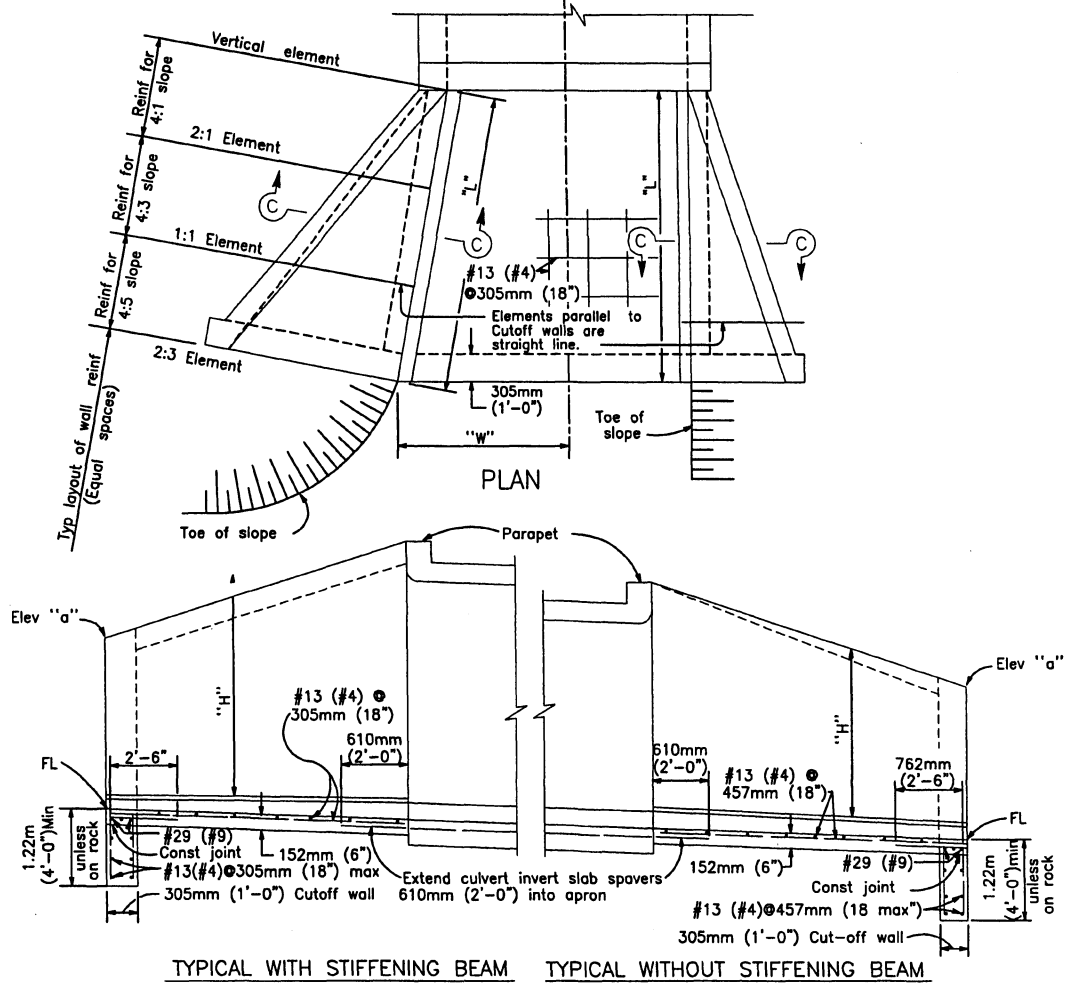


 Christopher R.C.E. 19246 Date
 5/11/2003

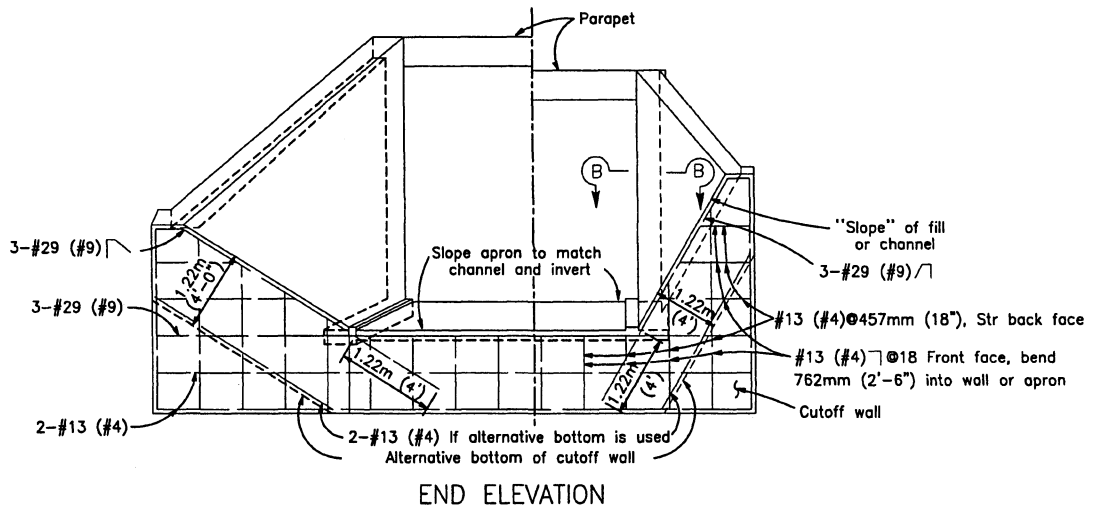
DRAWING
NUMBER D-79F

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



TYPICAL WITH STIFFENING BEAM TYPICAL WITHOUT STIFFENING BEAM
PART LONGITUDINAL SECTION



END ELEVATION

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

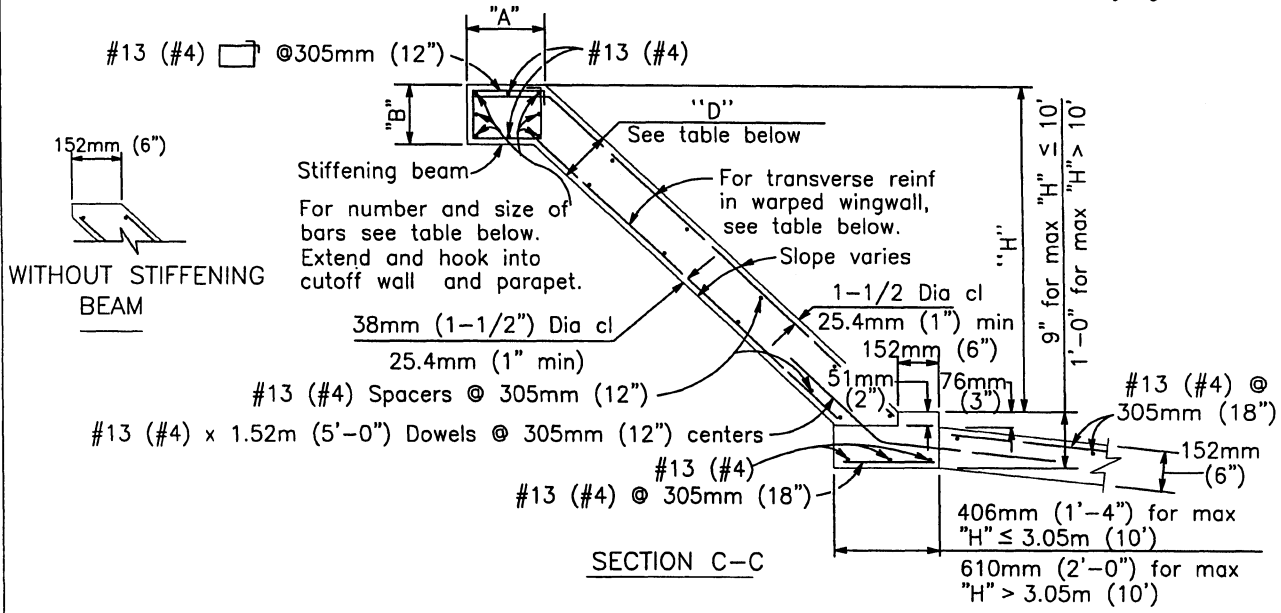
BOX CULVERT WARPED WINGWALL
DETAILS NO. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

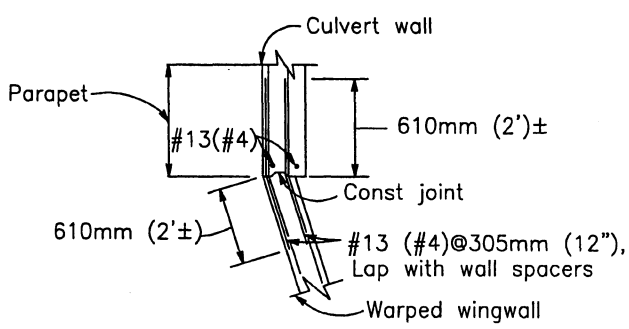
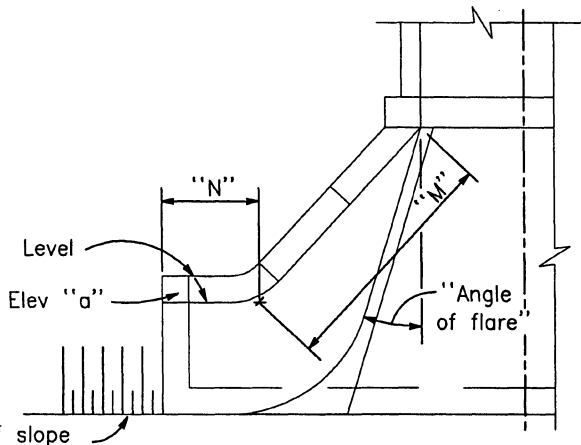
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-80A

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



WITHOUT STIFFENING BEAM




ALTERNATIVE WARPED WINGWALL

Use where additional protection to toe of embankment is required.

NOTES

- Walls designed for 610mm (2') surcharge; earth density = 3.40 cu m (120 #/cu. ft.); equivalent fluid pressure = 1.0 cu m (36 #/cu. ft.)
- Vary "D" of warped wall uniformly from that at cutoff wall to that at culvert, for maximum "H" > 3.66m (12').
- Where abrasion is anticipated increase apron thickness to 178mm (7") minimum to provide 51mm (2") minimum reinforcement coverage.
- Dimensions "L", "W", "H", "M", "N", Elevation "a", "Angle of flare", and end "Slope" (as apply) are shown on the plans.
- Concrete shall be 332 kg/M³ -C-22Mpa (560-C-3250).

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		A.Kercheval	12/75		
Add Metric		T. Stanton	03/03	BOX CULVERT WARPED WINGWALL DETAILS No. 2	 3/11/2003 T. Stanton Chairperson R.C.E. 19246 Date

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

WARPED WINGWALLS - METRIC MEASUREMENT TABLE ONLY																			
WALL DIMENSIONS AND REINFORCING					STIFFENING BEAM DIMENSIONS AND REINFORCING														
Element Slope	"H"	2.44 or less bar mm	3.05 bar mm	12' bar mm	14' bar mm	16' bar mm	18' bar mm	20' bar mm	"H" max	"L"	3.66m	4.27m	4.88m	5.49m	6.10m	7.62m	9.14m	10.7m	12.2m or more
1/4:1	Front face reinf	#13@305	#13@178	#16@178	#16@127	#19@152	#22@178	#22@152	1.83m	No beam. Place 2-#6 in each face along top of wall.	"A" = 305mm								
	Rear face reinf	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	2.44m		"B" = 229mm								
3/4:1	Front face reinf	#13@305	#13@305	#13@305	#13@305	#13@254	#13@203	#13@152	3.05m	Total 6-#19	"A" = 457mm			"B" = 305mm			"A" = 559mm		
	Rear face reinf	#13@305	#13@305	#13@305	#13@254	#13@178	#13@152	#16@203	3.66m		"B" = 305mm			"A" = 610mm					
1-1/4:1	Front face reinf	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	#13@305	4.27m	Total 6-#22	"B" = 305mm			"A" = 559mm					
	Rear face reinf	#13@203	#13@203	#13@127	#16@152	#19@178	#19@152	#22@152	4.88m		"B" = 305mm			"A" = 610mm					
"D" at Cutoff Wall		152	152	152	191	203	241	279	5.49m	Total 6-#8			"B" = 457MM						
"D" at Culvert		152	152	152	203	241	279	330	6.10m	Total 8-#29									

WARPED WINGWALLS - U.S. MEASUREMENT TABLE ONLY																			
WALL DIMENSIONS AND REINFORCING					STIFFENING BEAM DIMENSIONS AND REINFORCING														
Element Slope	"H"	8' or less	10'	12'	14'	16'	18'	20'	"H" max	"L"	12'	14'	16'	18'	20'	25'	30'	35'	40' or more
1/4:1	Front face reinf	#4@12	#4@ 7	#5@ 7	#5@ 5	#6@ 6	#7@ 7	#7@ 6	6'	No beam. Place 2-#6 in each face along top of wall.	"A" = 1'-0"								
	Rear face reinf	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	8'		"B" = 9"								
3/4:1	Front face reinf	#4@12	#4@12	#4@12	#4@12	#4@10	#4@ 8	#4@ 6	10'	Total 6-#6	"A" = 1'-6"			"B" = 1'-0"			"A" = 1'-10"		
	Rear face reinf	#4@12	#4@12	#4@12	#4@10	#4@ 7	#4@ 6	#5@ 8	12'		"B" = 1'-0"			"A" = 2'-0"					
1-1/4:1	Front face reinf	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	14'	Total 6-#7	"B" = 1'-0"			"A" = 1'-6"					
	Rear face reinf	#4@ 8	#4@ 8	#4@ 5	#5@ 6	#6@ 7	#6@ 6	#7@ 6	16'		Total 6-#8			"B" = 1'-6"					
"D" at Cutoff Wall		6"	6"	6"	7-1/2"	8"	9-1/2"	11"	18'	Total 8-#9									
"D" at Culvert		6"	6"	6"	8"	9-1/2"	11"	1'-1"	20'	Total 8-#9									

SAN DIEGO REGIONAL STANDARD DRAWING

BOX CULVERT WARPED WINGWALL
DETAILS No. 2

Revision	By	Approved	Date
ORIGINAL		A. Kercheval	12/75
Add Metric		T. Stanton	03/03

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton
3/01/2003
Date

DRAWING NUMBER D-80C

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.

GENERAL NOTES

QUANTITIES: Quantities are for the sloped invert slab and do not include splices in the 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 1.22m x 1.22m-A x 18.3m (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 C.

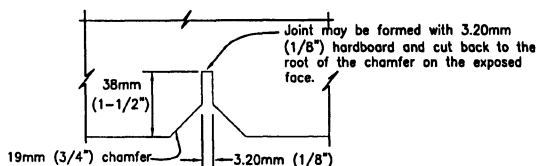
CONSTRUCTION NOTES

CONCRETE: Bottom slab & walls shall be class 332 kg/M³ -B-22Mpa (560-B-3250). Top slab shall be class 332 kg/M³ -C-22Mpa (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 13mm (1/2") expansion joint filler at 15.2m (50')± centers outside the paved roadway lanes and place bridge detail 3-2 at 9.14m (30')± centers under paved roadway lanes.
When cover is more than span

CONSTRUCTION LOADS: Not permitted until concrete has reached a strength of 20.7Mpa (3,000p.s.i.) 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 C of R.C.B. otherwise, the Contractor is to submit a proposal for consideration.



BRIDGE DETAIL 3-2
(Portion)

See Standard Drawing C-15

DESIGN NOTES

SPECIFICATIONS

DESIGN: AASHO, dated 1973, with revisions 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 610mm (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 2.29m (7.5') longitudinally and uniformly over the breadth of the culvert.

COVER 610mm (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 2.29m (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 2.44m (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: $F_s = 138\text{Mpa}$ (20,000 psi), $N = 10$
 $F_c = 8.27\text{Mpa}$ (1,200 psi)

Reinforcement embedment is 38mm (1-1/2) dia. clear, min 25.4mm (1") and in 6.35mm (1/4") increments, except as noted.

Distribution "d" bars expressed as a percent of main positive reinforcement.

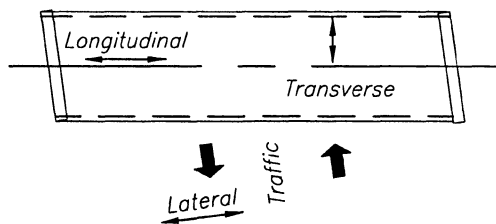
Classification "A" top slab = $\frac{100}{\text{SPAN}}$, max 50% (unless traffic longitudinal)

Classification "B" to "E": Top and bottom slabs
#13 (#4) @ 457mm (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 the top slab.

LIVE LOAD & R.C.B. TERMINOLOGY



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

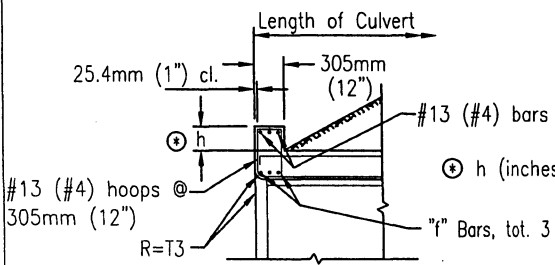
BOX CULVERT
MISCELLANEOUS DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

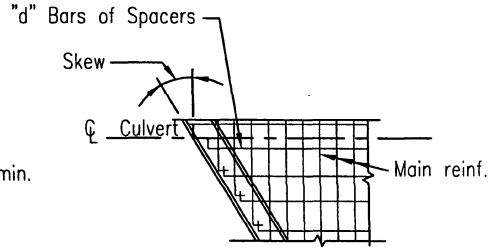
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-81A

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



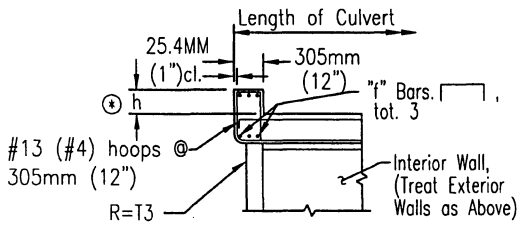
PART SECTION



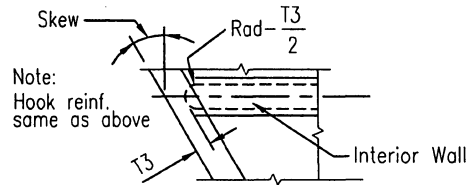
PART PLAN-SKEWED

SPAN	PARAPET "f" BAR Nos.		
	SKEW ANGLE		
	0' TO 15'	16' TO 30'	31' TO 45'
1.22M (4')	#13 (#4)	#13 (#4)	#13 (#4)
1.83M (6')	#13 (#4)	#13 (#4)	#16 (#5)
2.44M (8')	#13 (#4)	#16 (#5)	#19 (#6)
3.05M (10')	#16 (#5)	#19 (#6)	#22 (#7)
3.66M (12')	#19 (#6)	#22 (#7)	#25 (#8)
4.27M (14')	#22 (#7)	#25 (#8)	#29 (#9)

PARAPET DETAILS FOR SINGLE SPAN CULVERTS

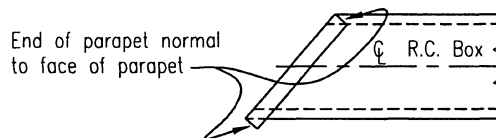


PART SECTION

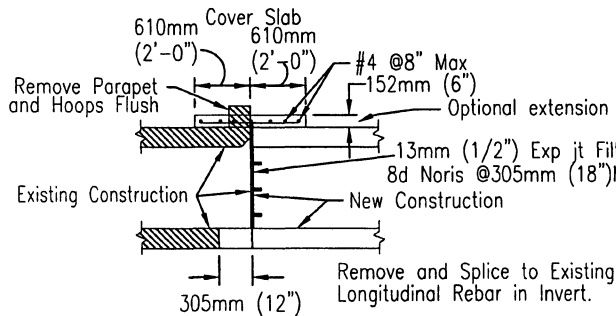


PART PLAN-SKEWED

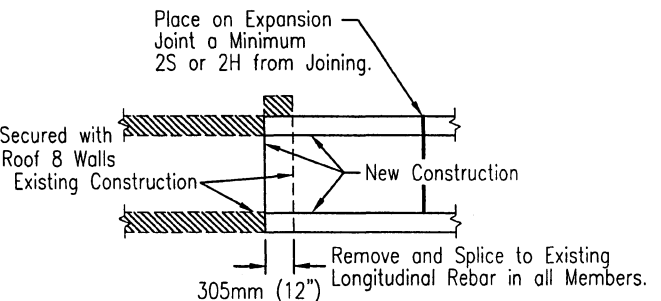
PARAPET DETAILS FOR MULTIPLE SPAN CULVERTS



PARAPET DETAIL FOR SKEWED CULVERTS W/O WINGWALLS



COVER: 305mm (1') AND GREATER



COVER: EXPOSED TOP AND GREATER

CULVERT EXTENSION
20' SKEW MAXIMUM

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

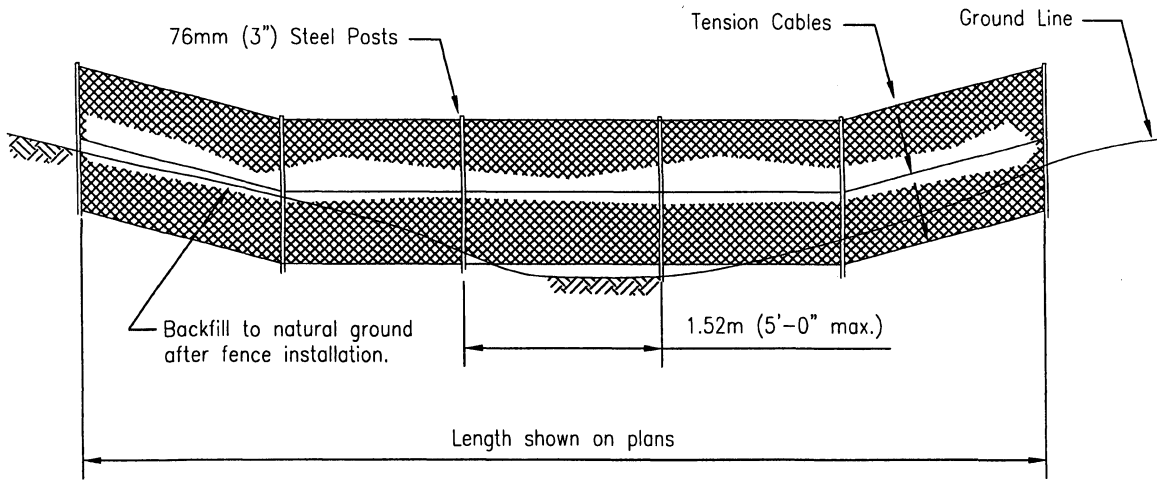
BOX CULVERT
MISCELLANEOUS DETAILS NO. 2

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

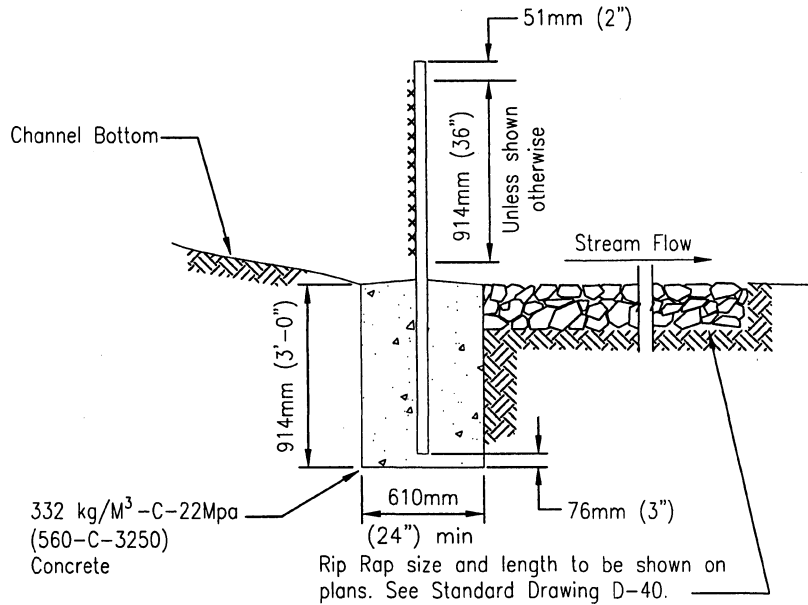
T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-81B

This drawing is NOT in conformance with latest UBC and should be used with care and judgment.



ELEVATION

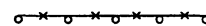


SECTION

NOTES:

1. Fence fabric shall be 51mm (2") mesh, 9 gage galvanized wire, chain link placed on the upstream side of the posts and tension cables.
2. Tension cable shall be 8mm ϕ (5/16") steel at 457mm (18") c/c, secured at ends with cable clamps. Secure fence to cable with No. 12 galvanized steel wire looped at 152mm (6") c/c.
3. Posts shall be 76mm ϕ (3") steel pipe, 2.63kg (5.79) lb/ft. Fill with mortar after placing.
4. Fence fabric shall be secured to posts with 9 gage wire clips at 229mm (9") c/c.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		H. Hecht	10/82
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

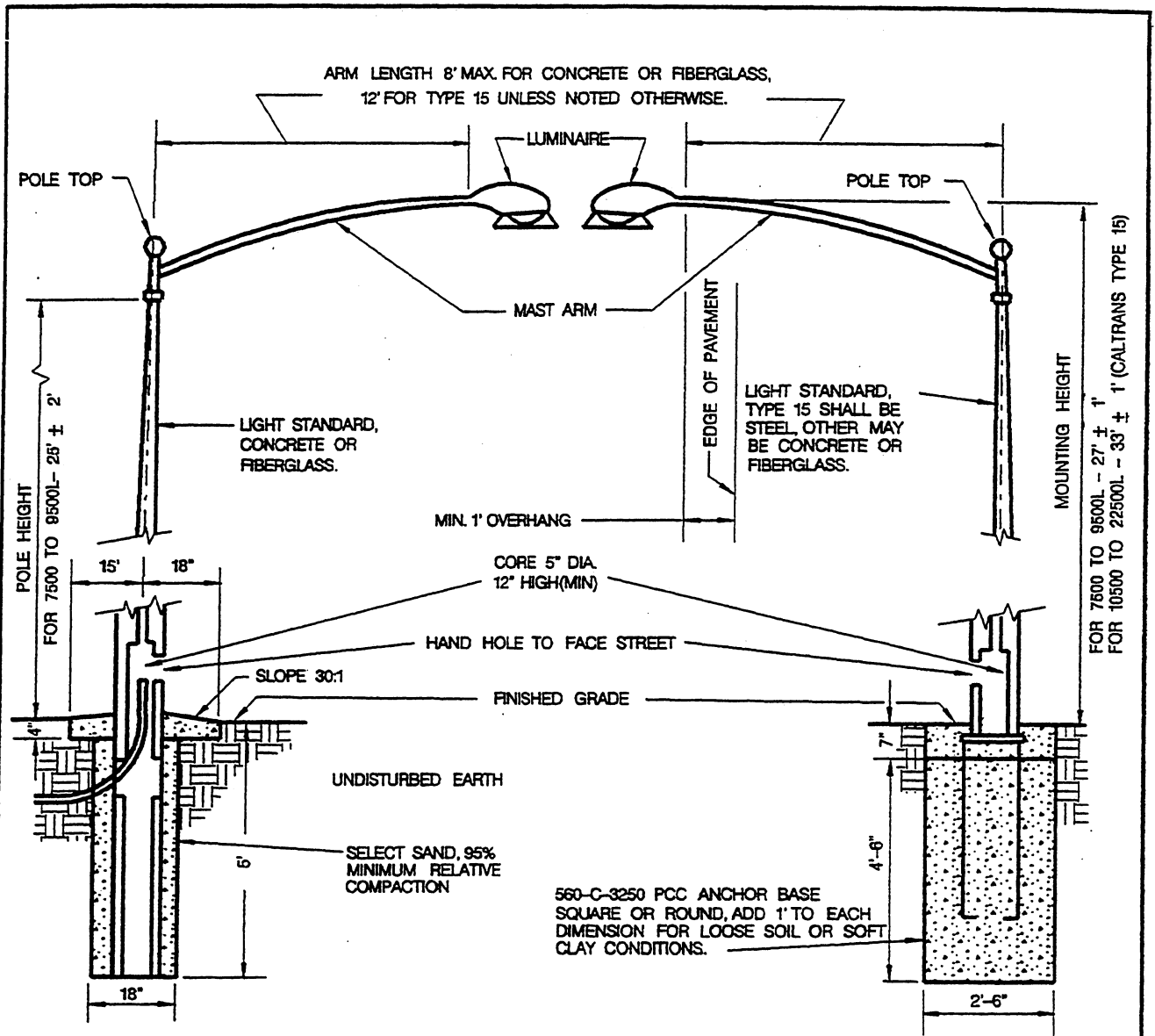
DEBRIS FENCE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER D-82

ELECTRICAL SYSTEMS



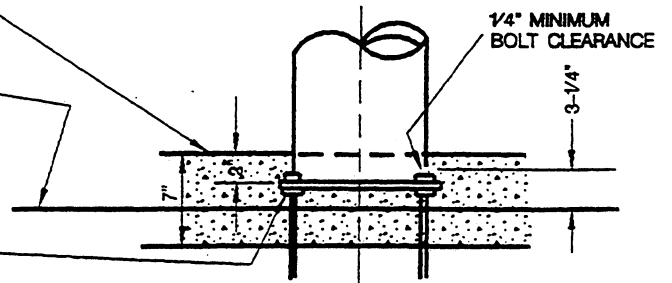
DIRECT BURIAL FOUNDATION

ANCHOR BASE FOUNDATION

FINISHED GRADE FOR CONCRETE STANDARDS.
ANCHOR BOLTS MUST NOT PROTRUDE.

FINISHED GRADE FOR STEEL AND
FIBERGLASS STANDARDS.
PROVIDE ANCHOR BOLT NUT COVERS.

ANCHOR BOLTS (4 REQ.) 1"x 36"x 4" HOOK,
GALV. USE TWO LEVELING NUTS WITH
WASHERS (ALL GALV.) ON EACH BOLT.



Revision	By	Approved	Date
ORIGINAL		J.P. Casey	6-3-83

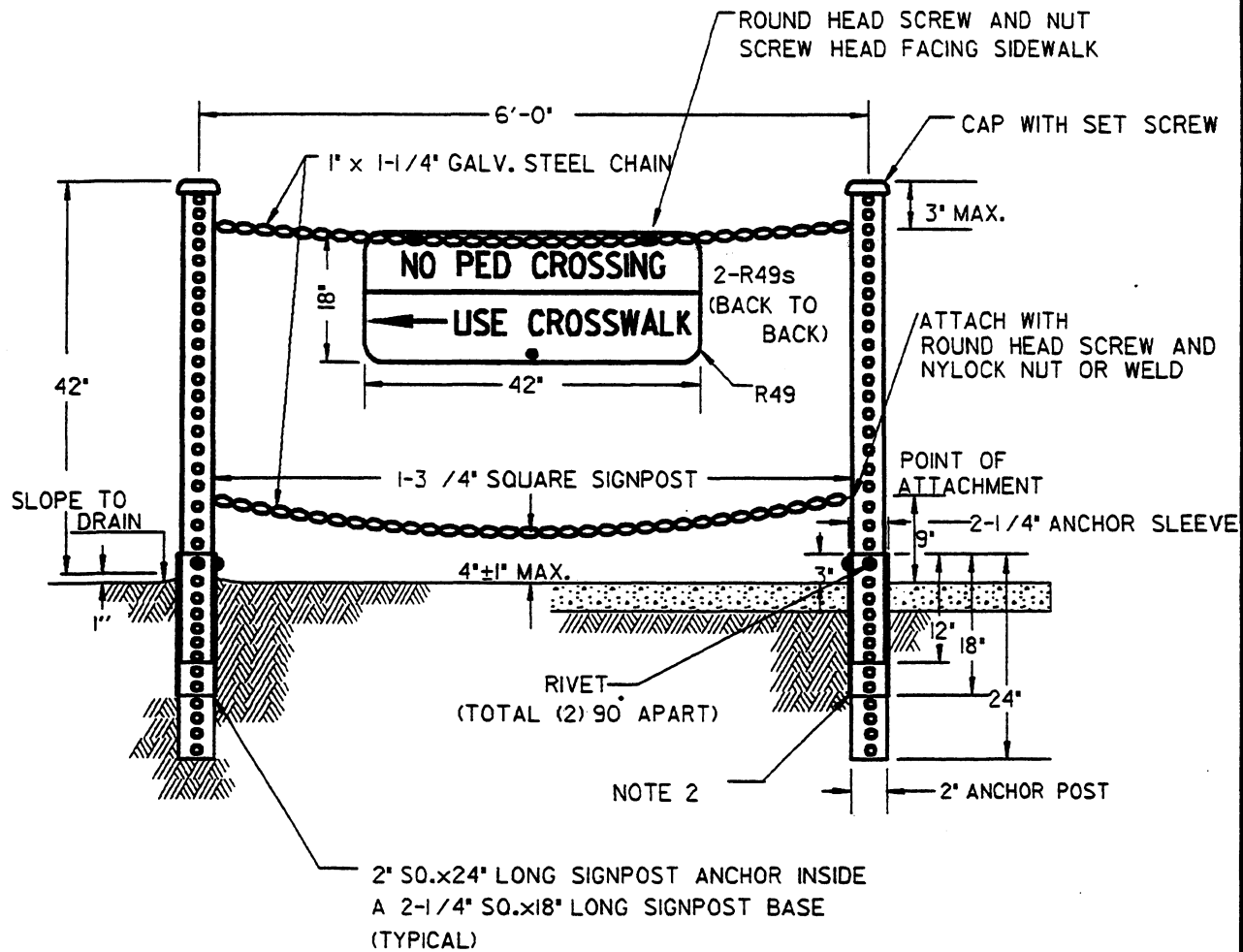
CITY OF SAN DIEGO - STANDARD DRAWING

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

STREET LIGHTING STANDARD

DRAWING NUMBER **SDE-101**



NOTES:

1. POSTS TO BE SET 1'-6" BEHIND FACE OF CURB UNLESS OTHERWISE SPECIFIED.
2. IN EXISTING SIDEWALK AREA SET POSTS INTO 4" CORE BORING, PACK WITH GROUT.
3. R49 SIGNS ON ALUMINUM SHEETING CENTERED BETWEEN POSTS.

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	8-23-88

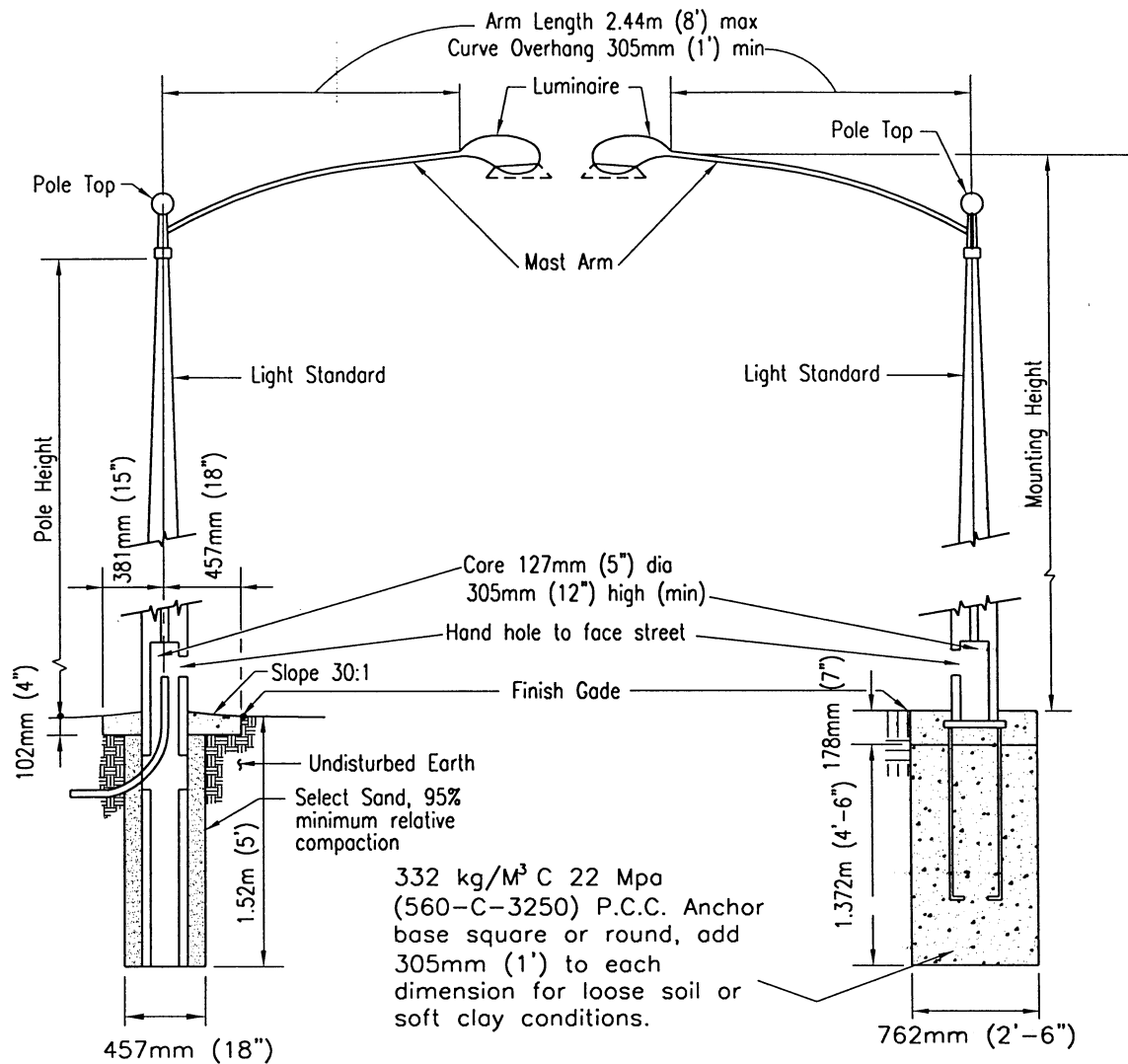
CITY OF SAN DIEGO - STANDARD DRAWING

PEDESTRIAN BARRICADE

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

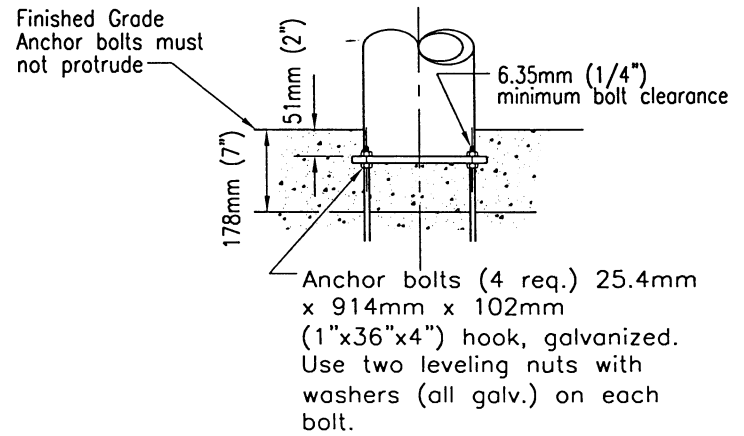
DRAWING NUMBER **SDE-103**



DIRECT BURIAL FOUNDATION

ANCHOR BASE FOUNDATION

POLE HEIGHT	MOUNTING HEIGHT	LAMP SIZE (WATTS)
7.62m ±610mm 25' ±2'	8.23m ±305mm 27' ±1'	170 M.V. 100 H.P.S. 90 L.P.S.
8.53m ±610mm 28' ±2'	9.14m ±305mm 30' ±1'	400 M.V. 250 H.P.S. 180 L.P.S.
7m 23' -0"	8.15m 26' -9"	70 H.P.S.
8.1m 26' -6"	9.14m 30' -0"	150 H.P.S.



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Table		M. Bahmanian	05/86
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

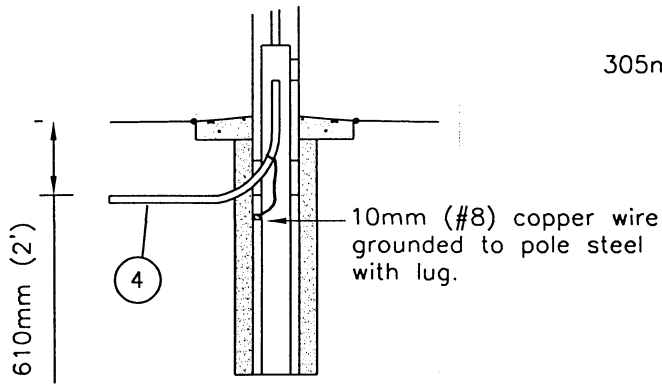
SAN DIEGO REGIONAL STANDARD DRAWING

STREET LIGHTING STANDARD

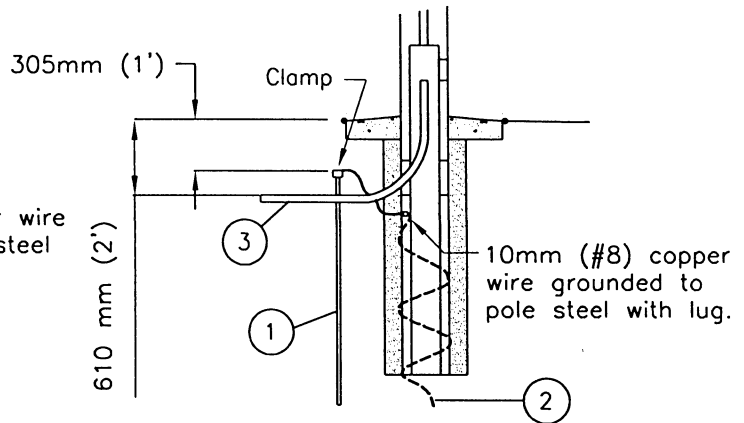
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER E-1

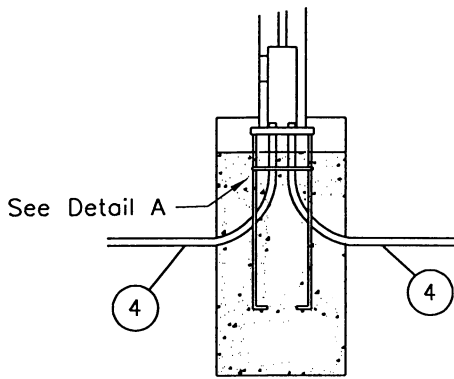


STEEL CONDUIT

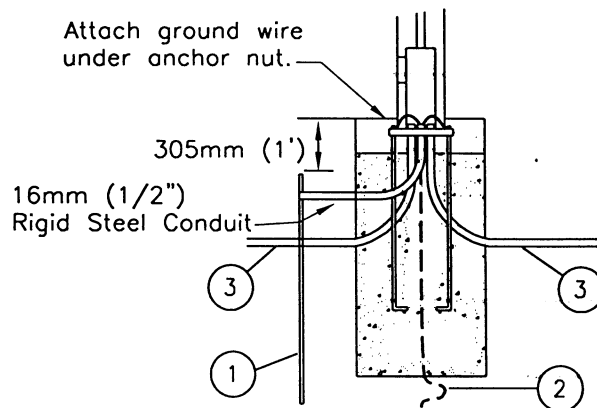


NON-METALLIC CONDUIT

DIRECT BURIAL FOUNDATION



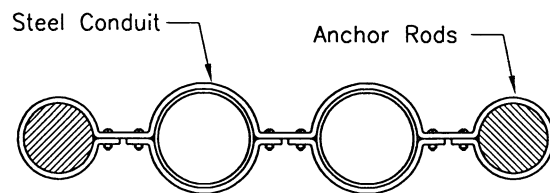
STEEL CONDUIT



NON-METALLIC CONDUIT

ANCHOR BASE FOUNDATION

- ① 19mm x 2.4m (3/4" x 8') copper covered steel ground rod.
- ② Alternate Ground: 4.57m (15') 35mm (no. 4) stranded copper wire, coiled.
- ③ Approved non-metallic conduit.
- ④ Steel conduit.



DETAIL A

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**GROUNDING
OF CONCRETE LIGHTING STANDARDS**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

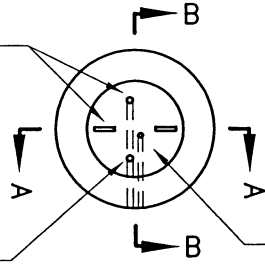
T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

E-2

38mm (1 1/2") min. cover for bars and conduits



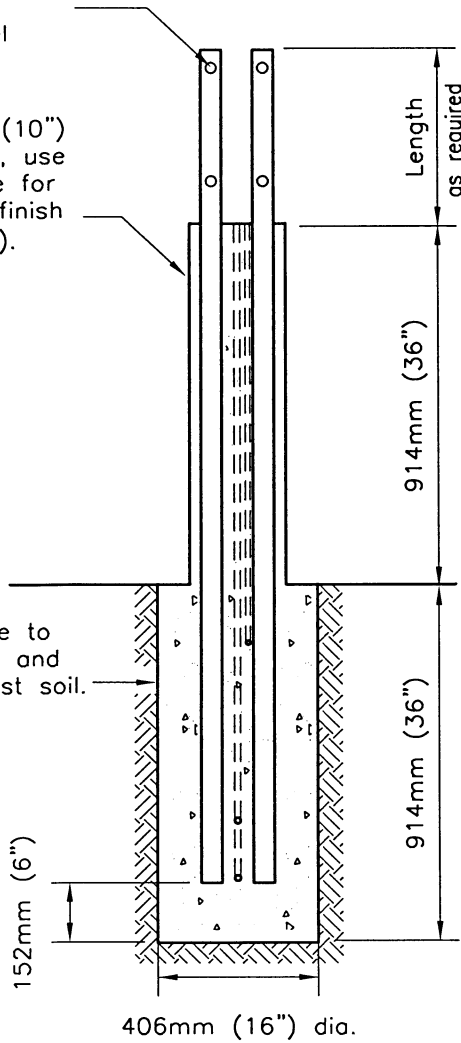
Galvanized steel conduits. Size and number as required.

25.4mm (1") galvanized steel conduit for service ground (where required).

PLAN

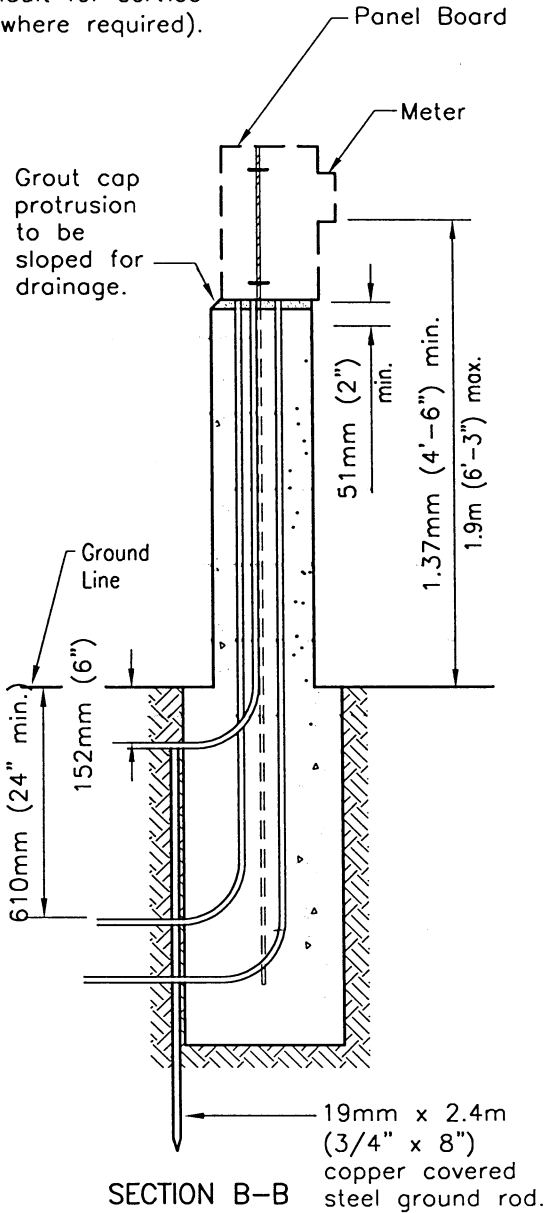
6.35mm x 51mm (1/4" x 2") galvanized steel bars.

254mm (10") Diameter, use Sonotube for smooth finish (Class 1).



Permissible to auger hole and pour against soil.

SECTION A-A
STEEL & CONCRETE
DIMENSIONS



SECTION B-B
CONDUIT & EQUIPMENT

NOTE: Concrete shall be class 332 kg/M³ C 22 Mpa (560-C-3250)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTAL FOR
ELECTRICAL EQUIPMENT

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 310112003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **E-33**

GENERAL SURFACE IMPROVEMENTS

SUPPLEMENT TO REGIONAL STANDARD DRAWING ("G" SERIES)

DRAWINGS G-1, G-2, G-3, G-4, G-6, G-7, G-11,
G-12, G-13, G-14A, G-14B, G-14C, G-14D, G-28, G-29, G-30, & G-31

NOTES All Historical Stamps/Impressions (Street name, Contractor name, and/or date) shall be preserved per Standard Drawing SDG-115.

DRAWINGS G-3, G-7, G-11, G-14A, G-14B,
G-14C, G-14D, G-26, G-27, G-28, G-29, G-30, & G-31

NOTES For designated urbanized communities, sidewalk design (scoring pattern, color, texture) to be in conformance with historic design on adjacent properties.

DRAWINGS G-3, G-7, G-11, G-14A, G-14B,
G-14C, G-14D, G-27, G-28, G-29, G-30, & G-31

NOTES Sidewalk cross slope shall be 1.5%

DRAWING G-1

NOTES Amend Note 3 to read: "Sidewalk cross slope shall be 1.5%"

DRAWING G-2

NOTES Amend Note 3 to read: "Cross slope shall be 1.5%"

Add: 4. On the high side of superelevated curves the gutter shall be sloped to match cross-section grade of the roadway (see SDDS-105).

Add: 5. Place expansion joints at curb returns, adjacent to structures and at no greater than forty-five foot (45') intervals.

Add: 6. Place weakened plane joints at driveways and at fifteen (15') foot intervals from P. C. R. 's.

SHT. 1 OF 3

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>RL</i> 12-9-03 Chairperson RCE 64572 Date
ORIGINAL		M. V. Rollinger	5-20-92		
NOTES		G. Parkinson	2-07-95		
NOTES	SM	Oskoui	12-09-03		

SUPPLEMENT TO REGIONAL STANDARD DRAWING ("G" SERIES) cont.

DRAWING G-4

NOTES Add: 4. Sidewalk under drains shall not be allowed.

DRAWING G-7

NOTES Add: 3. Sidewalk shall have a minimum clear width of four feet (4') from any obstruction.

DRAWING G-9

NOTES For designated urbanized communities, sidewalk scoring (grooves) pattern to be in conformance with historic design on adjacent properties.

DRAWING G-12

SECTION A-A Delete notation, "Base material as shown on plans."

DRAWING G-13

CROSS SECTION Delete notation, "Base material as shown on plans."

DRAWINGS G-14A, G-14B

PLAN Add notation at property line, "Place one-quarter inch (1/4") Expansion Joint Filler Material."

NOTES Amend note 4 to read: "Driveway shall be a continuous pour from back of Curb to Property Line."
 Add: 6 Meter boxes shall not be located within driveway - see W-15.
 Add: 7 Driveway in excess of 150 feet in length from curb face shall require minimum of 7 inch P.C.C.

SHT. 2 OF 3

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	SUPPLEMENTAL TO REGIONAL STANDARD DRAWING ("G" SERIES)	CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL		M. V. Rollinger	5-20-92			<i>B. L. C.</i> 12-9-03	
NOTES		G. Parkinson	2-07-95			Chairperson RCE 64572 Date	
NOTES	SM	Oskoui	12-09-03			DRAWING NUMBER	SDG-100

SUPPLEMENT TO REGIONAL STANDARD DRAWING ("G" SERIES) cont.

DRAWINGS G-14C, G-14D

NOTES Add: 6 Meter boxes shall not be located within driveway – see W-15.

DRAWING G-17

NOTES Add: 6. Construction of Alley Apron includes the adjacent six-inch (6") curb.
 Add: 7. Refer to G-31 for pedestrian ramps.

DRAWING G-31

NOTES Add: 3. Where curb height affected by construction varies, the ramp length (Y) shall be governed by the highest curb height (X). The side slope (Z) shall be governed by the curb height on the respective side.

DRAWING G-32

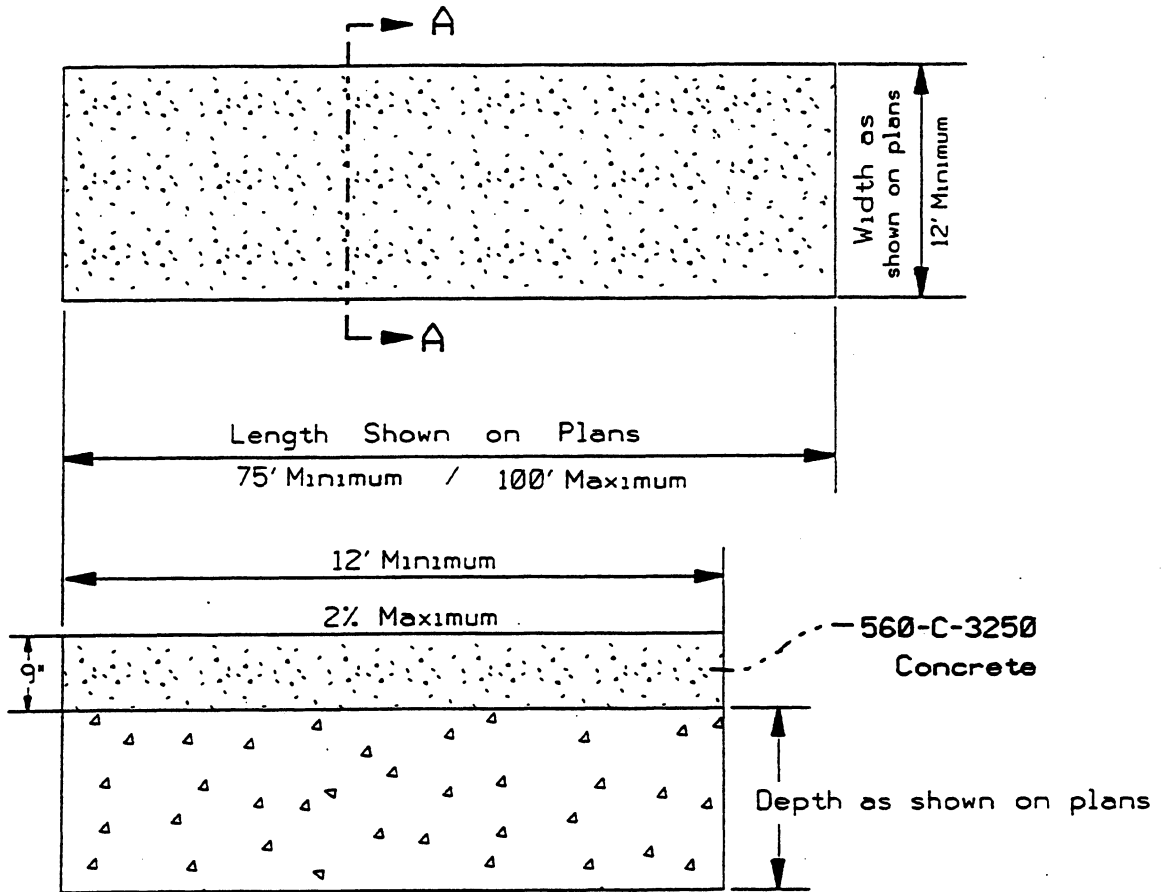
NOTES Add: 7. For Federally funded projects (new constructions and alterations), the lower end of the 48-inch width of the ramp shall be flush and free of abrupt changes between the bottom of the ramp and the street pavement.

DRAWINGS G-27, G-28, G-29, G-30, & G-31

NOTES Do NOT use tables.

SHT. 3 OF 3

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		M. V. Rollinger	5-20-92		
NOTES		G. Parkinson	2-07-95		
NOTES	SM	Oskoui	12-09-03		
				SUPPLEMENTAL TO REGIONAL STANDARD DRAWING ("G" SERIES)	Chairperson RCE 64512 Date 12-9-03 DRAWING NUMBER SDG-100

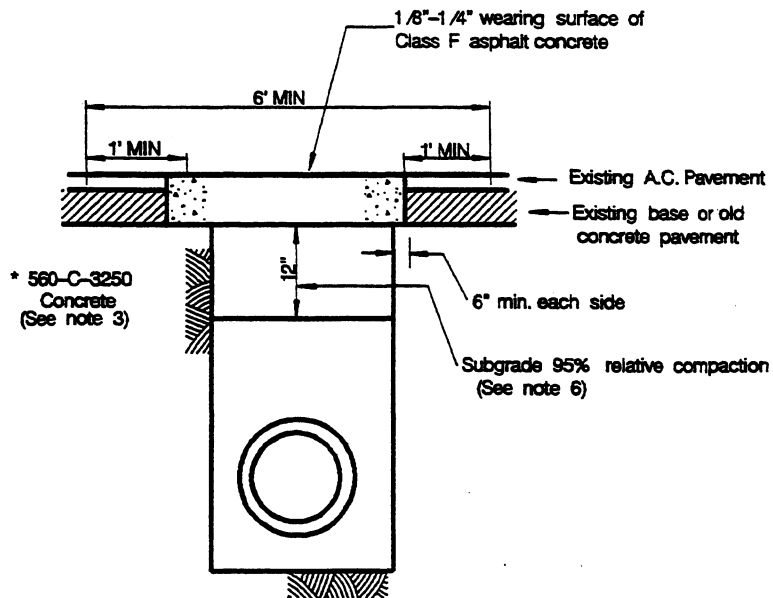


SECTION A-A

NOTES

1. Broom finish parallel with traffic.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		PARKINSON	5-6-80		
REVISION		J.C.CASEY	6-3-83	BUS STOP SLAB	DRAWING NUMBER
DRAWING	LEC		6-95		SDG-102
MAX	G.P.	F.BELOCK	4-96		



NOTES:

1. Existing A.C. pavement shall be sawcut to a minimum depth of 1-1/2 inches or 25% of its thickness, whichever is greater, except lateral trenches in 2-lane residential streets may be jack-hammered if approved by the Engineer. In case of an emergency endangering public safety or property, sawcutting is not required.
 2. Prior to placing concrete, paving and base edges shall be trimmed to neat horizontal and vertical lines.
 3. Unless otherwise specified, concrete trench cover shall be a minimum of 5-1/2 inches thick for alleys, 7 inches for local through four lane collector streets and 9 inches thick for all major or greater street classifications.
 4. Only asphaltic type curing compound shall be used on the concrete trench cover. Pigmentation is not required.
 5. A tack coat shall be applied to the existing A.C. pavement and concrete trench cover prior to placing the new A.C.
 6. Subgrade preparation shall be done in accordance with Section 301-1 of the Standard Specifications for Public Works Construction; latest edition.
 7. Any street trench 7 feet in width or greater and longer than 100 feet in overall length shall be reconstructed with the pavement section for the street classification per Schedule "J" (SDG-113). Street trench sections 7 feet in width or greater but less than 100 feet in overall length shall be resurfaced to a thickness of one inch (1") greater than required by note 3 above.
- * In four-lane major or greater streets, an approved set accelerating admixture such as calcium chloride, shall be used in the concrete.

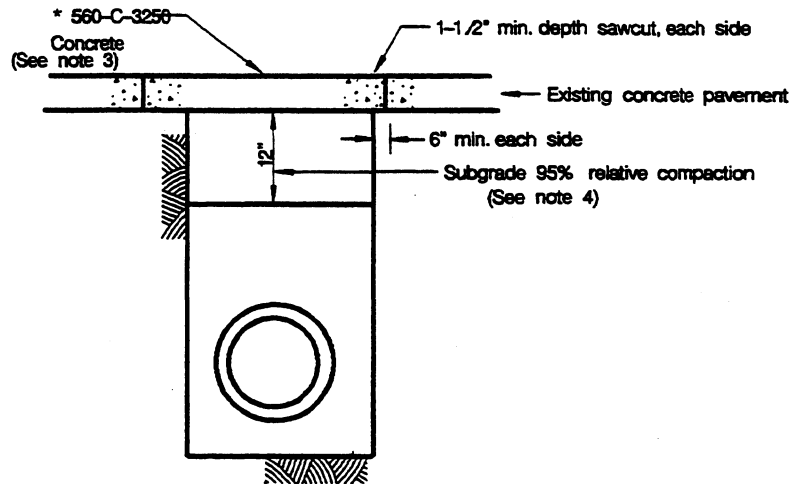
Revision	By	Approved	Date
ORIGINAL		J.P. Casey	1-24-89

CITY OF SAN DIEGO - STANDARD DRAWING

**TRENCH RESURFACING FOR ASPHALT
CONCRETE SURFACED STREETS**

CITY OF SAN DIEGO
STANDARDS COMMITTEE
Thomas J. Kelly 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDG-107**



NOTES:

1. Removal of the existing concrete pavement for trench excavation shall be done in accordance with Section 300-1.3 of the Standard Specifications for Public Works Construction, latest edition.
 2. Prior to placing concrete, pavement edges shall be trimmed to neat horizontal and vertical lines.
 3. Unless otherwise specified, concrete trench cover shall be a minimum of 5-1/2 inches thick for alleys, 7 inches for local through four lane collector streets and 9 inches thick for all major or greater street classifications.
 4. Subgrade preparation shall be done in accordance with Section 301-1 of the Standard Specifications for Public Works Construction, latest edition.
 5. Any street trench 7 feet in width or greater and longer than 100 feet in length shall be reconstructed with the pavement section for the street classification per Schedule "J" (SDG-113). Street trench sections 7 feet in width or greater but less than 100 feet in overall length shall be resurfaced to a thickness of one inch (1") greater than required by note 3 above.
- * In four-lane major or greater streets, an approved set accelerating admixture such as calcium chloride, shall be used in the concrete.

FOR A STREET SURFACED WITH ASPHALT CONCRETE, SEE STANDARD DRAWING SDG-107.

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	1-24-89

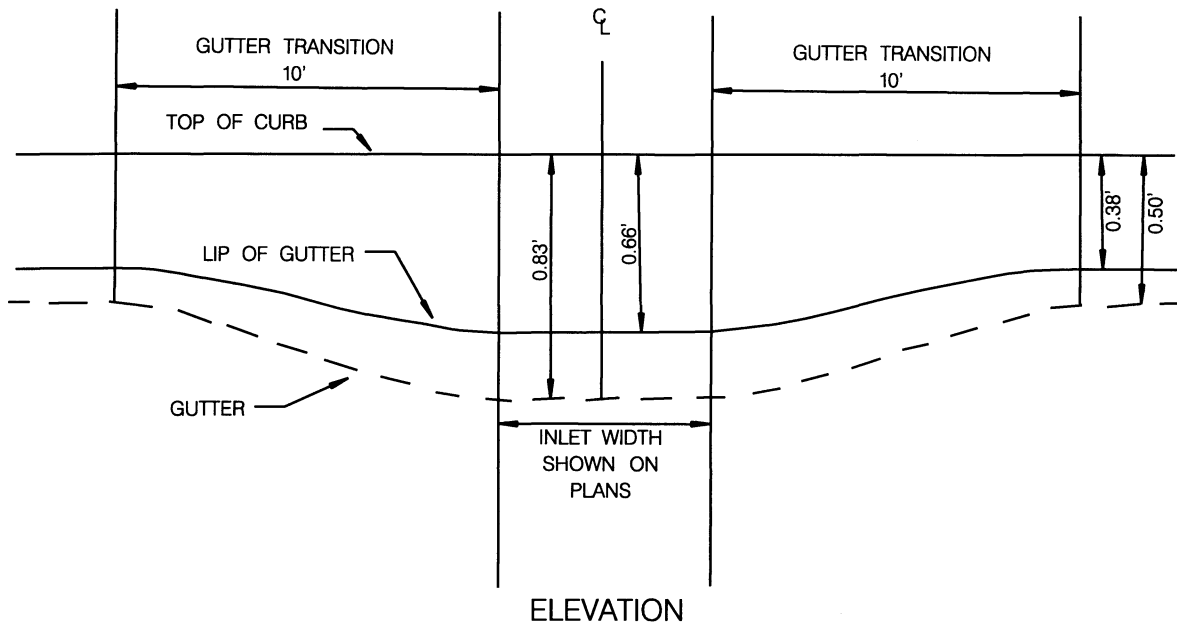
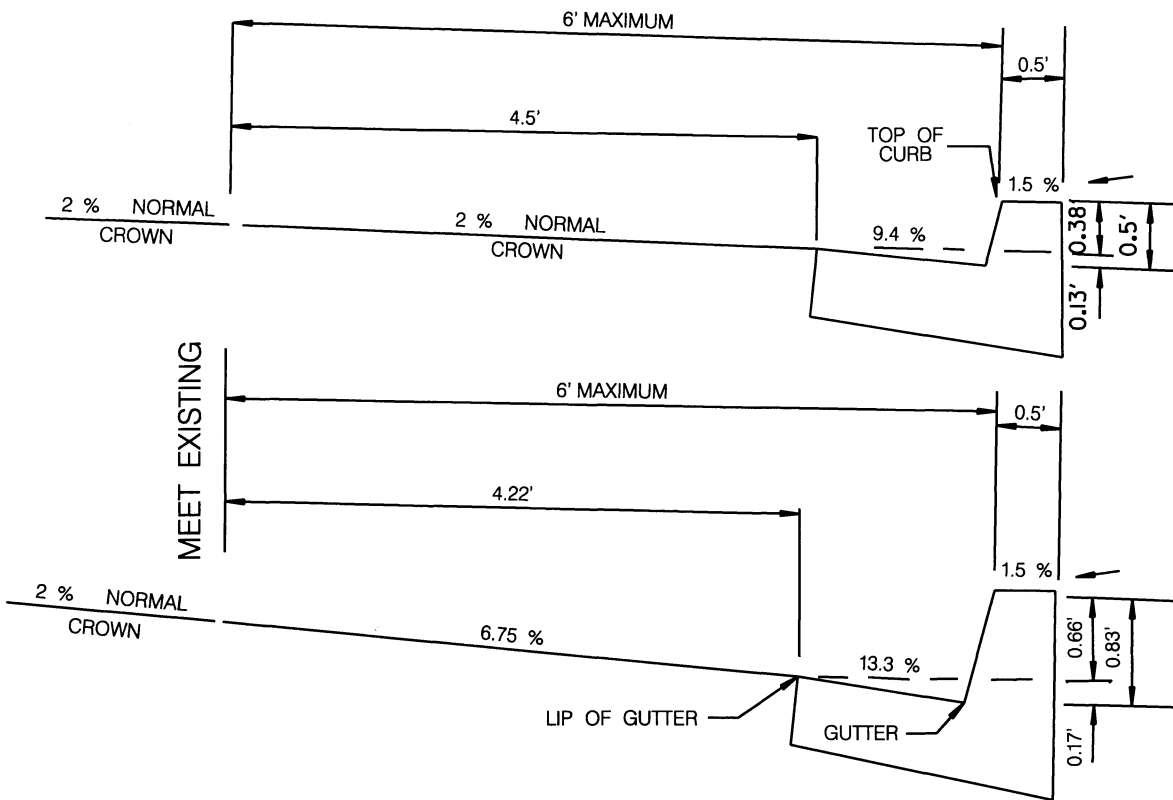
CITY OF SAN DIEGO - STANDARD DRAWING

**TRENCH RESURFACING FOR PCC
SURFACED STREETS**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

James J. [Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING
NUMBER **SDG-108**



CURB PROFILE – INLET TRANSITION
NOT TO SCALE

SHT. 1 OF 2

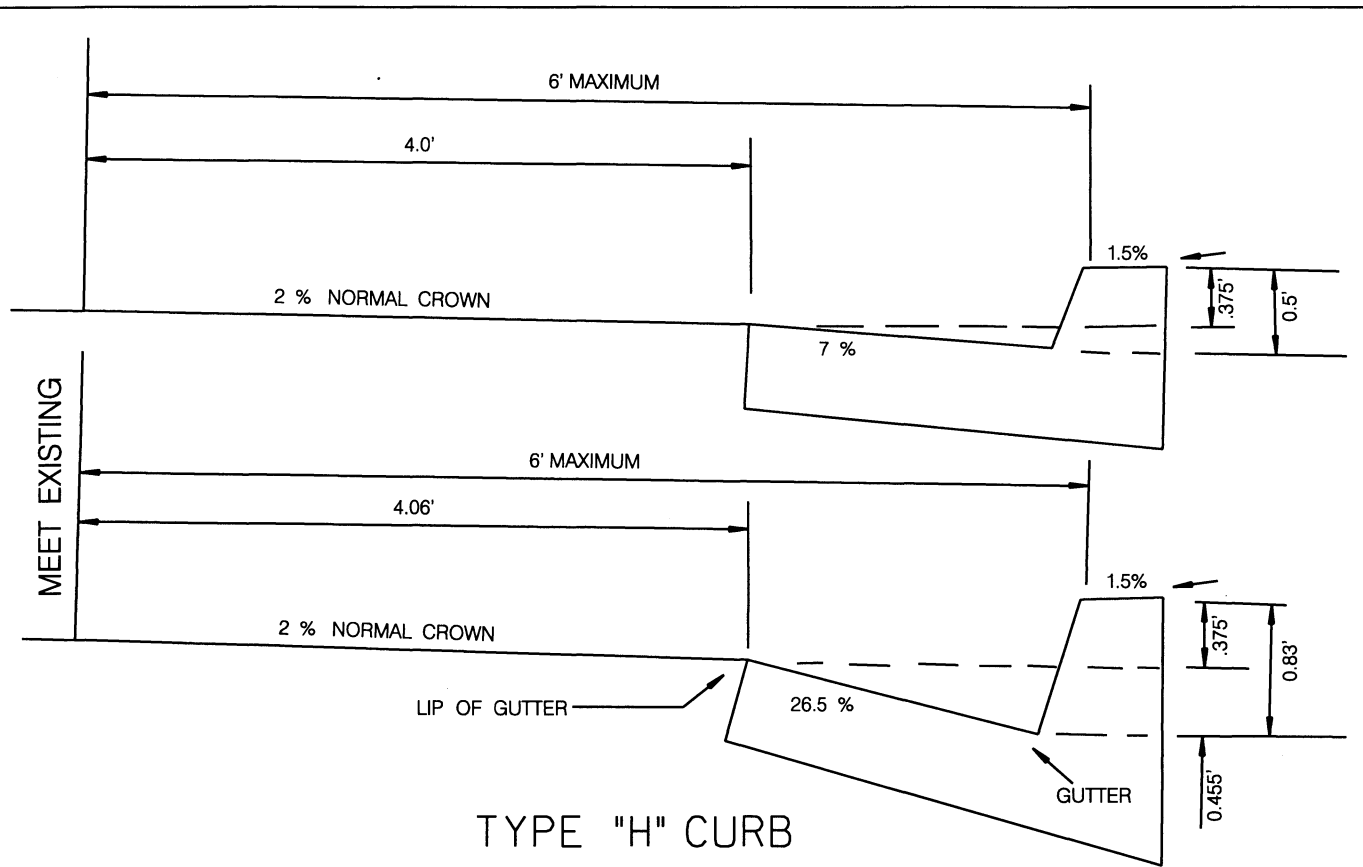
Revision	By	Approved	Date
ORIGINAL		J.P. Casey	11-8-88

CITY OF SAN DIEGO - STANDARD DRAWING

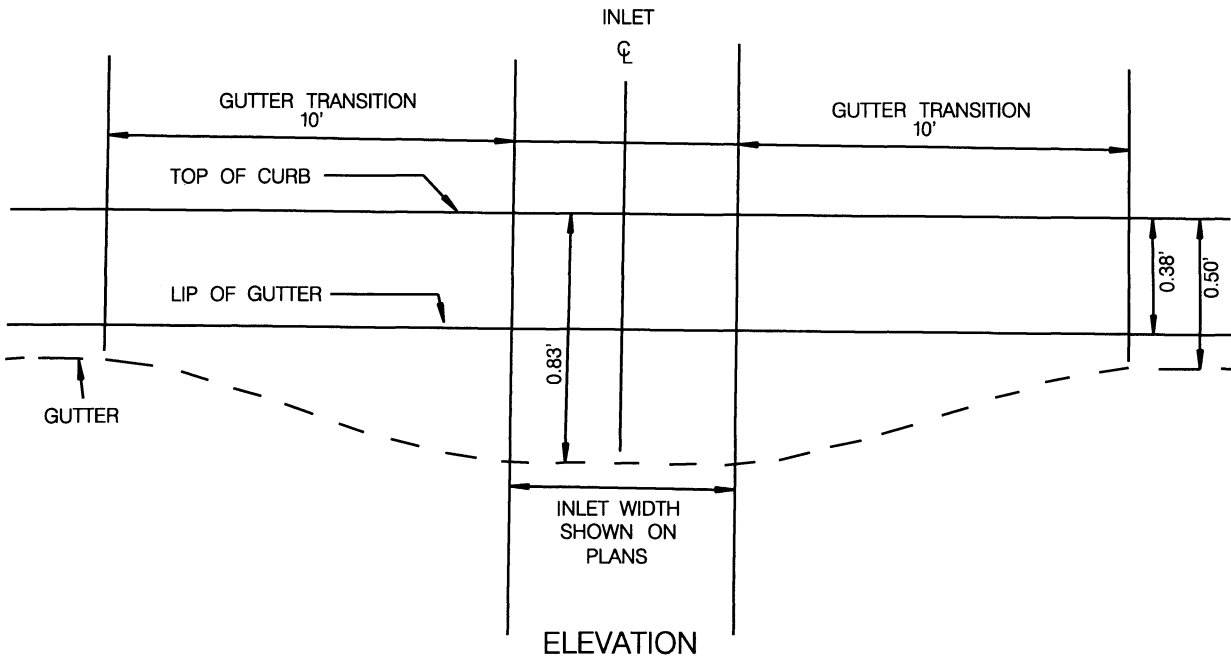
**G CURB PROFILE
INLET TRANSITION**

CITY OF SAN DIEGO
STANDARDS COMMITTEE
James J. [Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDG-110**



TYPE "H" CURB



CURB PROFILE - INLET TRANSITION

NOT TO SCALE

SHT. 2 OF 2

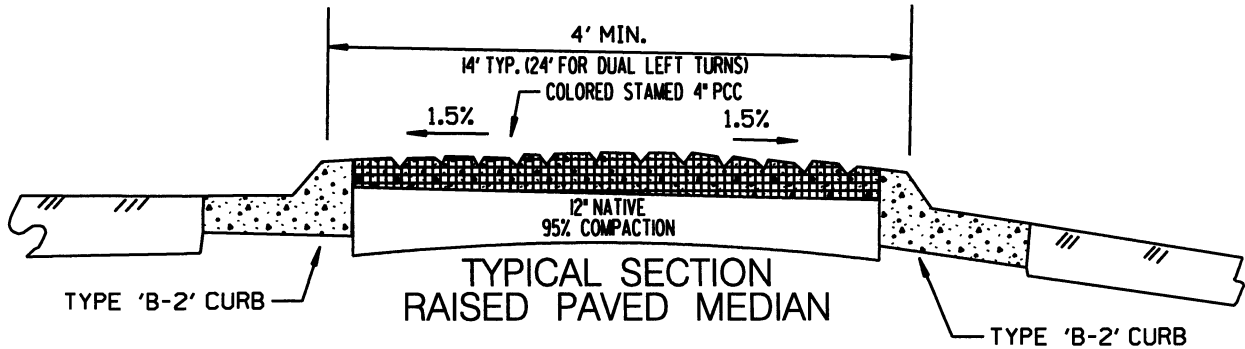
Revision	By	Approved	Date
ORIGINAL		J.P. Casey	11-18-88

CITY OF SAN DIEGO - STANDARD DRAWING

H CURB PROFILE
INLET TRANSITION

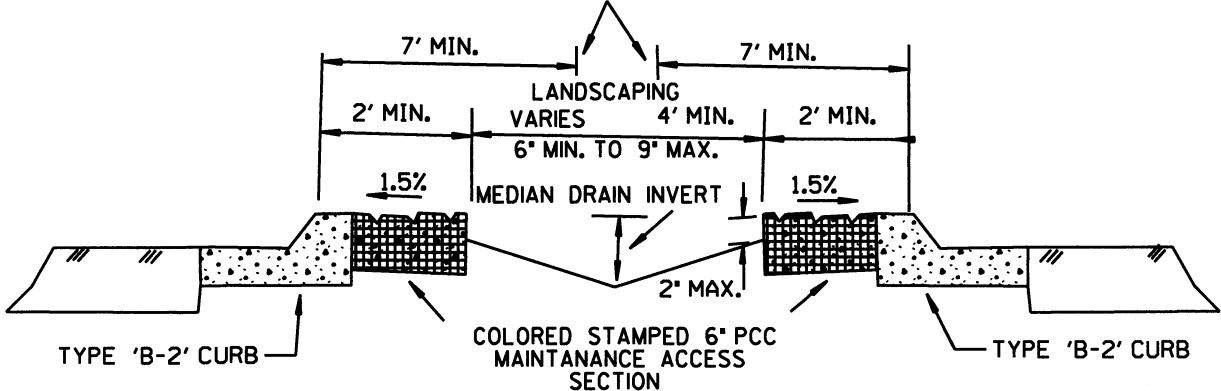
CITY OF SAN DIEGO
STANDARDS COMMITTEE
[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDG-110**

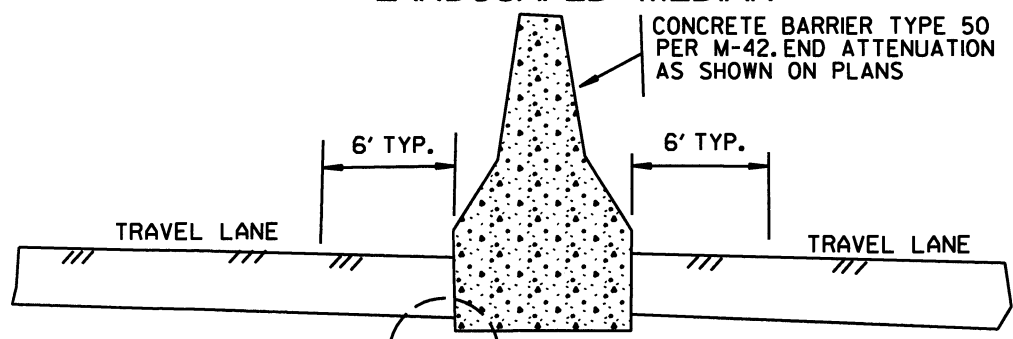


TYPICAL SECTION
RAISED PAVED MEDIAN

LOCATION OF STREET TREES WHEN PERMITTED



TYPICAL SECTION
LANDSCAPED MEDIAN



TYPICAL SECTION
CONCRETE BARRIER

18" SLOTTED CMPC WITH 6" HIGH SLOT WHERE REQUIRED FOR DRAINAGE, SEE SHEET 2 OF 2

NOTES:

1. CONCRETE SHALL BE 520-C-2500.
2. SEE STANDARD DRAWINGS G-9 & G-10 FOR JOINT DETAILS.
3. COLOR & PATTERN OF COLORED STAMPED CONCRETE SHALL BE SHOWN ON PLANS.
4. CONCRETE COLOR SHALL BE INTERGRATED THROUGHOUT.

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	11-10-88

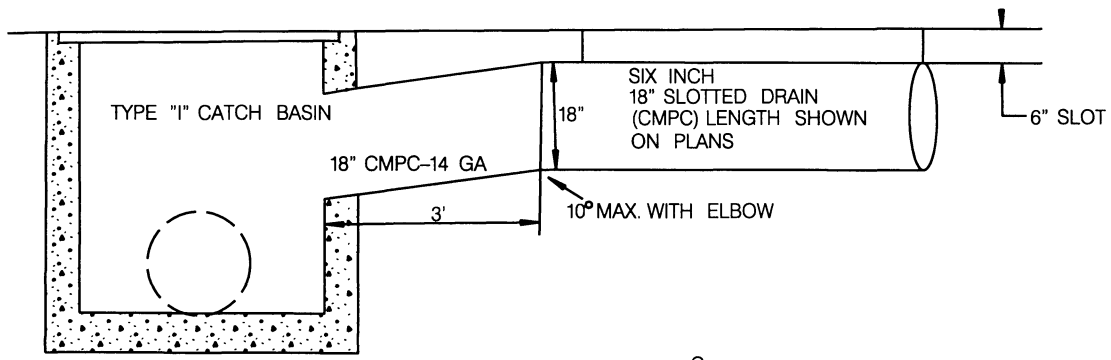
CITY OF SAN DIEGO - STANDARD DRAWING

RAISED CENTER MEDIAN

CITY OF SAN DIEGO
STANDARDS COMMITTEE

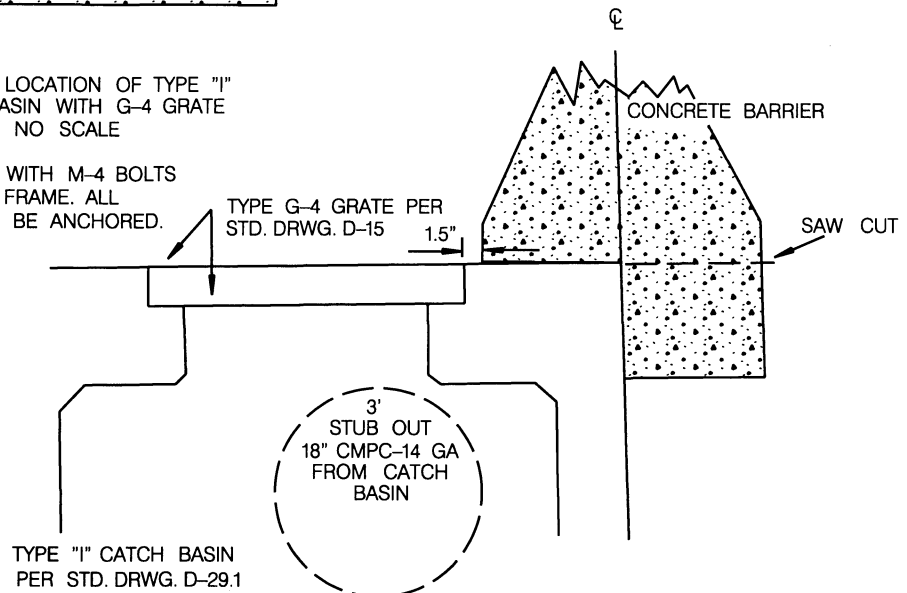
[Signature] 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDG-112**



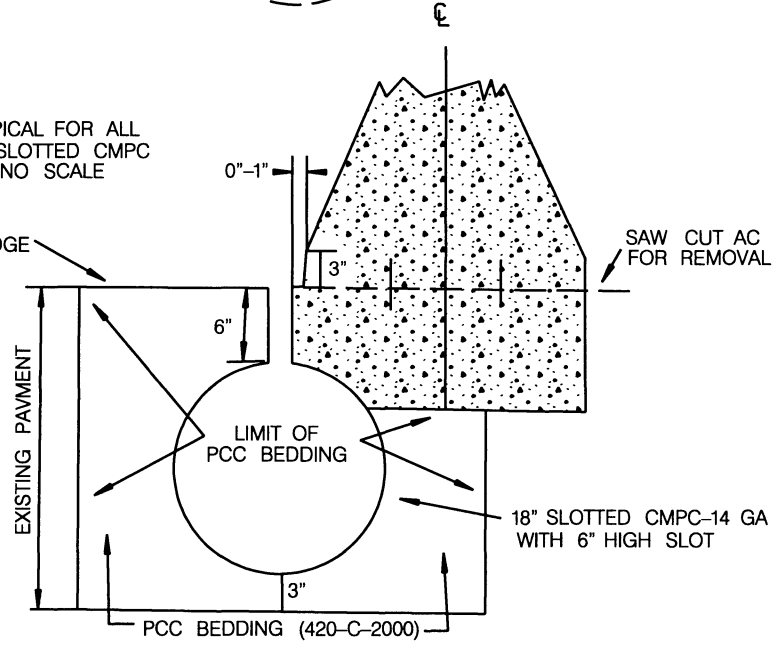
DETAILED LOCATION OF TYPE "I"
CATCH BASIN WITH G-4 GRATE
NO SCALE

ANCHOR GRATE WITH M-4 BOLTS
TO D-13 GRATE FRAME. ALL
GRATES ARE TO BE ANCHORED.



TYPICAL FOR ALL
18" SLOTTED CMPC
NO SCALE

SAW CUT AC
FOR TRENCH EDGE



SHT. 2 OF 2

Revision	By	Approved	Date
ORIGINAL		M. V. Rollinger	5-20-92

CITY OF SAN DIEGO - STANDARD DRAWING

CITY OF SAN DIEGO
STANDARDS COMMITTEE
Thomas J. Rollinger 2-7-95
COORDINATOR R.C.E. 25902 DATE

RAISED CENTER MEDIAN


DRAWING
NUMBER **SDG-112**

SCHEDULE "J" PAVEMENT

The following tables are to be used to determine the Schedule "J" pavement design sections for streets, alleys, parking lots for public facilities, driveways, and easements, including public access easements. These designs shall be used in the public right-of-way, or private property in the areas where public easements are granted.

1. Resistance values (R-values) will be determined from samples taken in the 12 inches of material located immediately below the first layer of subbase, base or pavement. This 12 inch section shall represent the top 36 inches of uniform soils below the subbase, or pavement. If a lower bearing soil is encountered in this 36-inch section, the R-value will be determined from the lowest bearing soil. Determination of the R-value shall be in accordance with CalTrans test methods 301-F and 301-G.
2. Average daily traffic (ADT) is the maximum average annual ADT expected at buildout. Function shall also be considered when determining the minimum Schedule "J" pavement section per the Engineer.
3. Rigid Pavements: The design thickness shown in the tables are based on a modified Portland Cement Association (PCA) design. Projects requiring CalTrans review should utilize the design methods prescribed in the CalTrans Highway Design Manual.
4. Portland Cement Concrete (PCC) pavement shall be constructed in streets on grades greater than 12.0 percent and in alleys and in alley intersections. The pavement shall be Class 560-B-3250 concrete with a minimum modulus of rupture (MOR) of 600.
5. New pavement, less than six feet (6') in width, shall be paved with Portland Cement Concrete pavement section noted in Schedule "J" for the street classification plus a 1/8" to 1/4" Class F asphalt concrete cap. An equivalent section of lean concrete shall be substituted for any required CTB subbase.
6. Personnel from the City's Engineering Laboratory will designate where a Private Laboratory shall sample for R-values.

SHEET 1 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	CITY OF SAN DIEGO STANDARDS COMMITTEE  5-29 COORDINATOR DATE
ORIGINAL		M.ROLLINGER	5-20-92		PAVEMENT DESIGN STANDARDS SCHEDULE "J"
NOTES		G.PARKINSON	2-7-95		

STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	'R' VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH A.C. (IN)
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	
CUL-DE-SAC	200	5.0	50.0 OR GREATER	3.0	5.0	6.0	---	4.5
LOCAL (L.V.R.)	700	5.5		3.0	5.0	6.5	---	5.0
LOCAL (RES.)	1200	6.0		3.0	5.0	6.5	---	5.5
LOCAL (RES.)	2200	6.5		3.0	5.0	6.5	---	6.0
LOCAL (IND.)	2000	8.5		3.0	7.5	7.5	---	8.5
COLLECTOR (RES.)	3500	7.0		3.0	5.0	7.0	---	6.5
COLLECTOR (RES.)	5000	7.5		3.0	5.5	7.0	---	7.5
COLLECTOR (COMM./IND)	5000	9.5		3.0	8.5	7.5	---	9.0
COLLECTOR (NO FRT.)	7500	8.0		3.0	6.5	7.0	---	8.0
COLLECTOR	15000	9.0		3.0	7.5	7.5	---	8.5
MAJOR (4-LANE)	30000	10.5		3.0	10.0	8.0	---	10.5
MAJOR (6-LANE)	40000	11.0		3.5	10.5	8.0	---	11.0
PRIMARY ARTERIAL	50000	11.5		3.5	11.5	8.0	---	11.5
EXPRESSWAY	60000	12.0		3.5	11.5	8.5	---	12.0
EXPRESSWAY	80000	12.5		4.0	12.0	8.5	---	12.5
EXPRESSWAY	100000	13.0		4.0	12.5	9.0	---	13.0

STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	'R' VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH A.C. (IN)
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	
CUL-DE-SAC	200	5.0	40 TO 49.9	3.0	5.0	6.5	---	5.0
LOCAL (L.V.R.)	700	5.5		3.0	5.0	6.5	---	6.0
LOCAL (RES.)	1200	6.0		3.0	5.5	7.0	---	6.5
LOCAL (RES.)	2200	6.5		3.0	6.0	7.0	---	7.0
LOCAL (IND.)	2000	8.5		3.0	9.5	7.5	---	9.5
COLLECTOR (RES.)	3500	7.0		3.0	6.5	7.0	---	8.0
COLLECTOR (RES.)	5000	7.5		3.0	7.5	7.5	---	8.5
COLLECTOR (COMM./IND)	5000	9.5		3.0	11.0	8.0	---	11.0
COLLECTOR (NO FRT.)	7500	8.0		3.0	8.5	7.5	---	9.0
COLLECTOR	15000	9.0		3.0	10.5	8.0	---	10.0
MAJOR (4-LANE)	30000	10.5		3.5	12.5	8.5	---	12.0
MAJOR (6-LANE)	40000	11.0		4.0	12.5	8.5	---	12.5
PRIMARY ARTERIAL	50000	11.5		4.0	13.5	9.0	---	13.0
EXPRESSWAY	60000	12.0		4.5	13.5	9.0	---	13.5
EXPRESSWAY	80000	12.5		4.5	14.5	9.5	---	14.0
EXPRESSWAY	100000	13.0		5.0	15.0	10.0	---	15.0

SHEET 2 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>[Signature]</i> 5-2-94 COORDINATOR DATE
ORIGINAL		J.P.CASEY	1-12-84		
REVISED		G.PARKINSON	2-7-95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	DRAWING NUMBER SDG-113

STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	'R' VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	A.C. (IN)
CUL-DE-SAC	200	5.0		3.0	5.0	6.5	---	6.0
LOCAL (L.V.R.)	700	5.5		3.0	5.5	7.0	---	6.5
LOCAL (RES.)	1200	6.0		3.0	6.5	7.0	---	7.0
LOCAL (RES.)	2200	6.5		3.0	7.5	7.0	---	8.0
LOCAL (IND.)	2000	8.5		3.0	11.5	8.0	---	10.5
COLLECTOR (RES.)	3500	7.0		3.0	8.5	7.5	---	8.5
COLLECTOR (RES.)	5000	7.5	30 TO	3.0	9.5	7.5	---	9.0
COLLECTOR (COMM./IND)	5000	9.5	39.9	3.5	13.0	8.5	---	12.0
COLLECTOR (NO FRT.)	7500	8.0		3.0	10.5	7.5	---	10.0
COLLECTOR	15000	9.0		3.5	12.0	8.0	---	11.0
MAJOR (4-LANE)	30000	10.5		4.0	14.5	8.5	---	13.5
MAJOR (6-LANE)	40000	11.0		4.5	15.0	9.0	---	14.0
PRIMARY ARTERIAL	50000	11.5		5.0	15.5	9.0	---	14.5
EXPRESSWAY	60000	12.0		5.0	16.5	9.5	---	15.0
EXPRESSWAY	80000	12.5		5.5	17.0	9.5	---	16.0
EXPRESSWAY	100000	13.0		6.0	17.0	10.0	---	17.0

STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	'R' VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	A.C. (IN)
CUL-DE-SAC	200	5.0		3.0	5.5	7.0	---	6.5
LOCAL (L.V.R.)	700	5.5		3.0	7.0	7.0	---	7.5
LOCAL (RES.)	1200	6.0		3.0	8.0	7.0	---	8.0
LOCAL (RES.)	2200	6.5		3.0	9.0	7.5	---	8.5
LOCAL (IND.)	2000	8.5		3.5	13.0	8.0	---	11.5
COLLECTOR (RES.)	3500	7.0		3.0	10.0	7.5	---	9.0
COLLECTOR (RES.)	5000	7.5	20 TO	3.0	11.5	7.5	---	10.0
COLLECTOR (COMM./IND)	5000	9.5	29.9	4.0	15.0	8.5	---	13.0
COLLECTOR (NO FRT.)	7500	8.0		3.5	12.0	8.0	---	11.0
COLLECTOR	15000	9.0		4.0	13.5	8.5	---	12.0
MAJOR (4-LANE)	30000	10.5		5.0	16.0	8.5	5.0	14.5
MAJOR (6-LANE)	40000	11.0		5.0	17.0	8.5	5.0	15.5
PRIMARY ARTERIAL	50000	11.5		5.5	17.5	9.0	5.0	16.0
EXPRESSWAY	60000	12.0		6.0	18.0	9.0	5.0	17.0
EXPRESSWAY	80000	12.5		6.0	19.5	9.5	5.0	17.5
EXPRESSWAY	100000	13.0		6.5	20.0	10.0	5.0	18.5


SHEET 3 OF 4

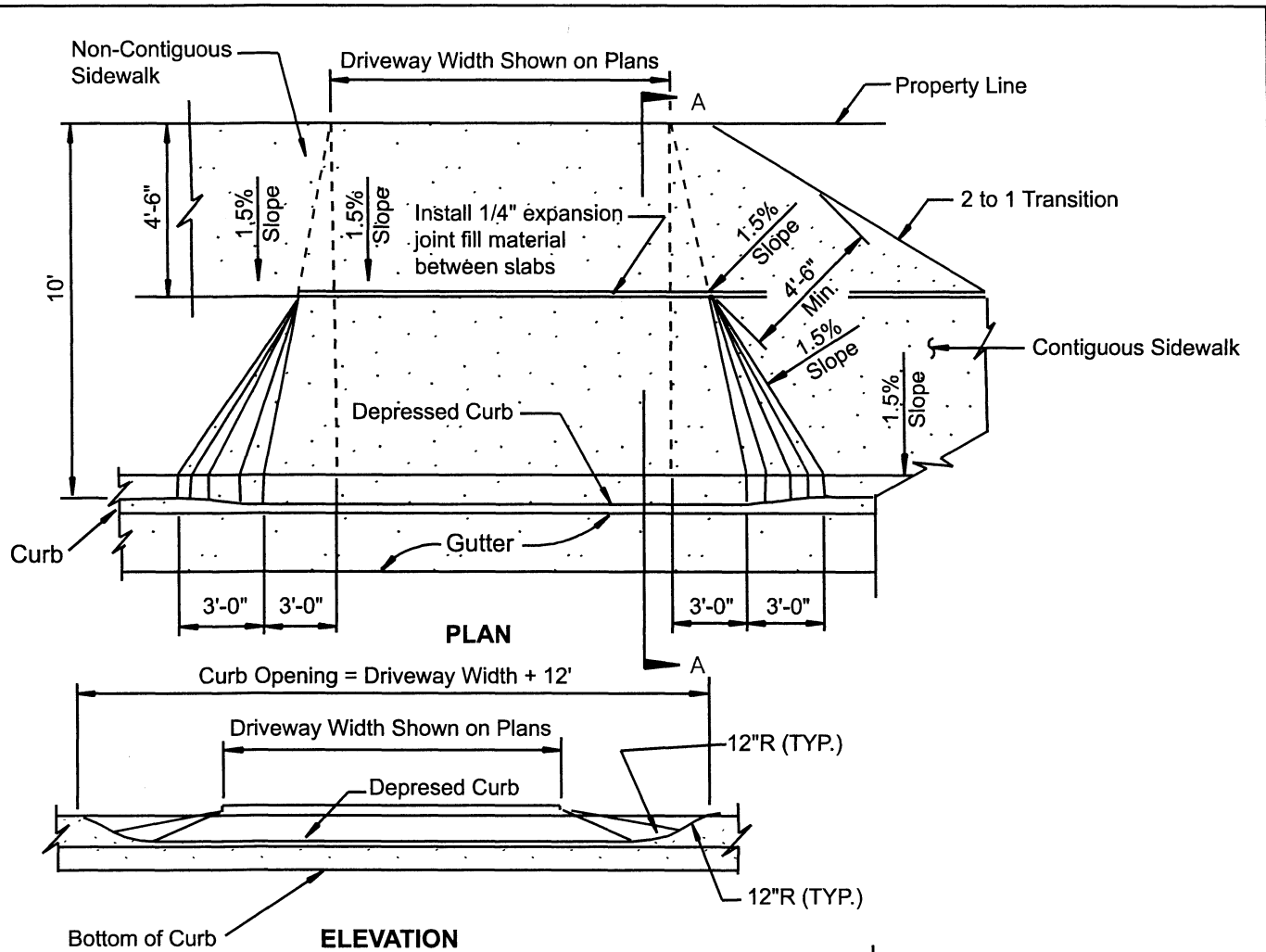
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>[Signature]</i> 5-2-97 COORDINATOR DATE
ORIGINAL		J.P.CASEY	1-12-84		
REVISED		G.PARKINSON	2-7-95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	DRAWING NUMBER SDG-113

STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	"R" VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH A.C. (IN)
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	
CUL-DE-SAC	200	5.0		3.0	7.0	7.0	---	7.5
LOCAL (L.V.R.)	700	5.5		3.0	8.0	7.0	---	8.0
LOCAL (RES.)	1200	6.0		3.0	9.0	7.5	---	8.5
LOCAL (RES.)	2200	6.5		3.0	10.5	7.5	---	9.0
LOCAL (IND.)	2000	8.5		4.0	14.5	8.0	5.0	12.5
COLLECTOR (RES.)	3500	7.0		3.0	12.0	7.5	---	10.0
COLLECTOR (RES.)	5000	7.5	10 TO	3.5	12.5	8.0	---	11.0
COLLECTOR (COMM./IND)	5000	9.5	19.9	4.5	16.5	8.5	5.0	14.0
COLLECTOR (NO FRT.)	7500	8.0		3.5	14.0	8.0	---	11.5
COLLECTOR	15000	9.0		4.5	15.0	8.0	5.0	13.0
MAJOR (4-LANE)	30000	10.5		5.5	18.0	8.5	6.0	15.5
MAJOR (6-LANE)	40000	11.0		6.0	18.5	9.0	6.0	16.5
PRIMARY ARTERIAL	50000	11.5		6.0	20.0	9.0	6.0	17.5
EXPRESSWAY	60000	12.0		6.5	20.5	9.0	6.0	18.5
EXPRESSWAY	80000	12.5		7.0	21.5	9.5	6.0	19.0
EXPRESSWAY	100000	13.0		7.5	22.5	10.0	6.0	20.0

STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	"R" VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH A.C. (IN)
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	
CUL-DE-SAC	200	5.0		3.0	8.0	7.0	---	8.5
LOCAL (L.V.R.)	700	5.5		3.0	9.5	7.5	---	9.0
LOCAL (RES.)	1200	6.0		3.0	10.5	7.5	---	9.5
LOCAL (RES.)	2200	6.5		3.0	12.5	7.5	---	10.5
LOCAL (IND.)	2000	8.5		4.5	16.0	8.0	5.0	14.0
COLLECTOR (RES.)	3500	7.0		3.5	13.0	7.5	---	11.5
COLLECTOR (RES.)	5000	7.5	0 TO	3.5	14.5	8.0	---	12.5
COLLECTOR (COMM./IND)	5000	9.5	9.9	5.0	18.5	8.5	6.0	15.5
COLLECTOR (NO FRT.)	7500	8.0		4.0	15.5	8.0	5.0	13.0
COLLECTOR	15000	9.0		5.0	17.0	8.5	5.0	14.5
MAJOR (4-LANE)	30000	10.5		6.0	20.0	9.0	6.0	17.5
MAJOR (6-LANE)	40000	11.0		6.5	21.0	9.0	6.0	18.5
PRIMARY ARTERIAL	50000	11.5		7.0	22.0	9.0	6.0	19.5
EXPRESSWAY	60000	12.0		7.0	23.0	9.5	6.0	20.5
EXPRESSWAY	80000	12.5		7.5	24.0	10.0	6.0	21.5
EXPRESSWAY	100000	13.0		8.0	25.0	10.5	6.0	22.0

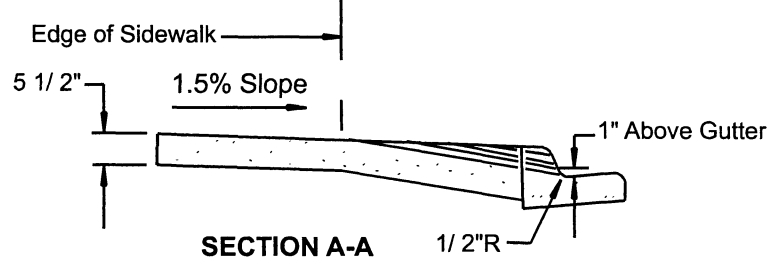
SHEET 4 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR DATE
ORIGINAL		J.P.CASEY	1-12-84		
REVISED		G.PARKINSON	2-7-95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	DRAWING NUMBER SDG-113

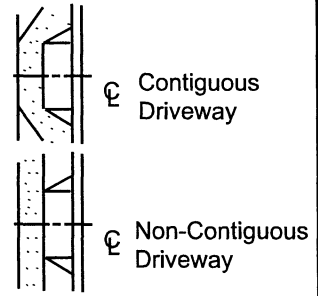


NOTES:

1. Concrete shall not be placed until forms and subgrade are inspected and approved by the Resident Engineer.
2. Concrete shall be 520-C-2500
3. See Standard Drawing G-15 and G-16 for width and location requirements.
4. See Standard Drawing G-2 and G-10 for curb and joint details
5. Meter Boxes shall not be located within driveway. See W-15.
6. Driveway in excess of 150' in length from curb face shall require a minimum of 7" P.C.C.
7. Driveway shall be a continuous pour from back of curb to property line.
8. All Historical Stamps/Impressions (Street Name, Contractor Name, and/or date) shall be preserved per standard drawing SDG-115.
9. For designated urbanized communities, sidewalk design (scoring pattern, color, texture) to be in conformance with historic design on adjacent properties.



LEGEND ON PLANS

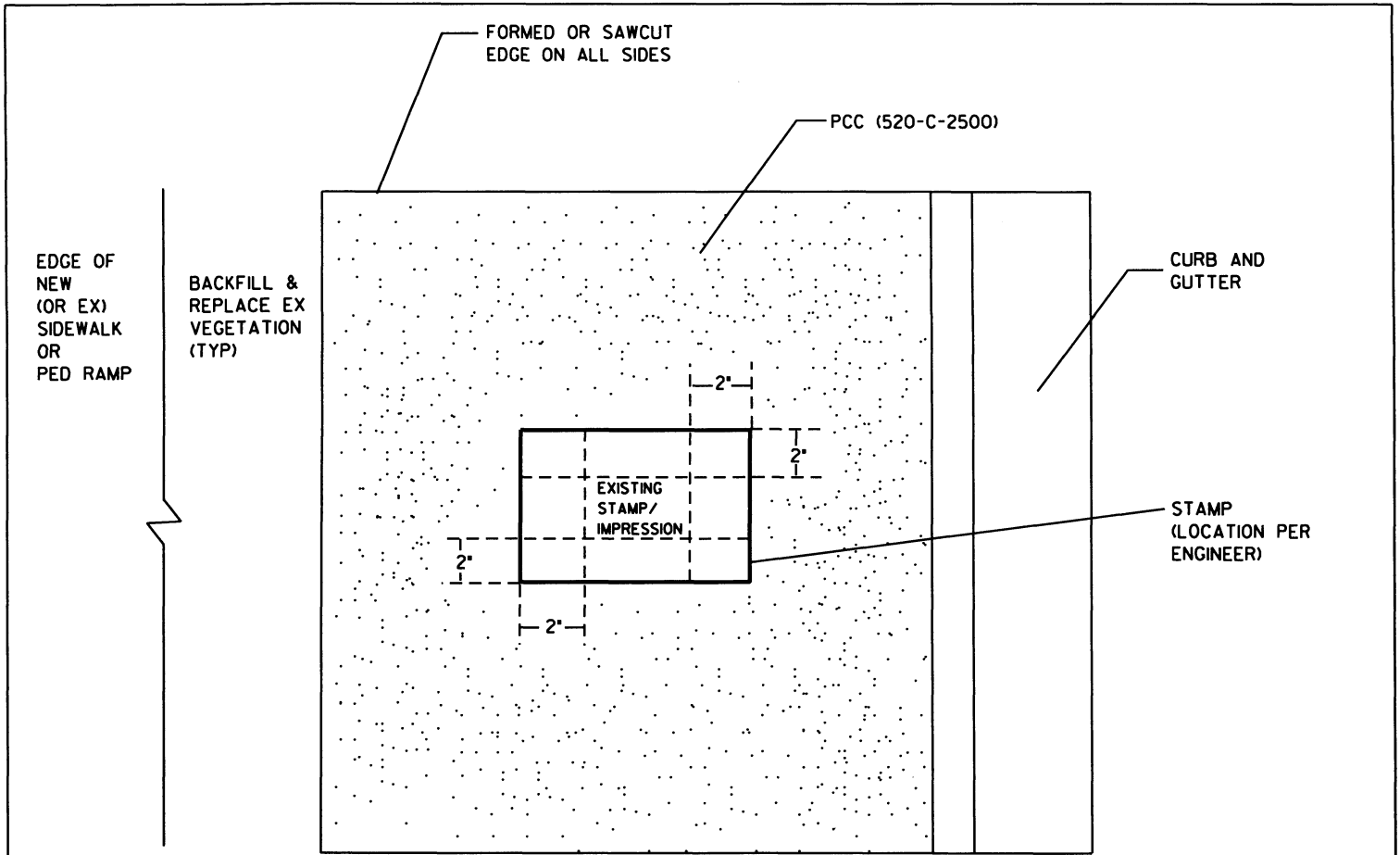


Revision	By	Approved	Date
Original		M.V.R.	5-92
Notes		G. P.	2-95
Notes	SM	A. Oskoui	12-03
Notes	SM	A. Oskoui	8-06
Update	FC	A. Oskoui	12-06

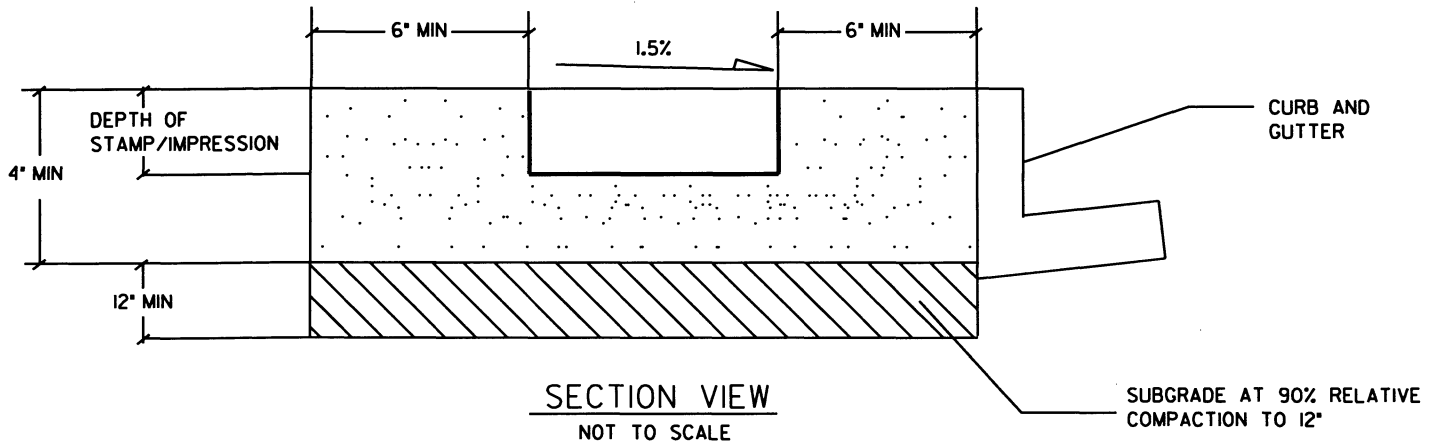
CITY OF SAN DIEGO - STANDARD DRAWING

COMMERCIAL CONCRETE DRIVEWAY

CITY OF SAN DIEGO
STANDARDS COMMITTEE
W. Daniel 12/19/6
COORDINATOR R.C.E 65271 - Date
DRAWING NUMBER SDG-114



PLAN VIEW
NOT TO SCALE



SECTION VIEW
NOT TO SCALE

NOTES:

1. ALL STAMP/IMPRESSION LOCATIONS AND ORIENTATIONS SHALL BE PRE-APPROVED BY THE ENGINEER.
2. SINGLE STAMP/IMPRESSION SHALL BE PLACED AS CLOSE TO ITS ORIGINAL LOCATION AS CONSTRUCTION ALLOWS.
3. MULTIPLE STAMPS/IMPRESSIONS (EXISTING AND/OR NEW) SHALL BE EVENLY SPACED ALONG THE NEWLY CONSTRUCTED SIDEWALK
4. EXISTING STAMP/IMPRESSION SHALL BE SAWCUT TO NO LESS THAN 2" FROM STAMP LETTERING AND/OR SYMBOL
5. INSTALLATION OF ALL NEW STAMPS/IMPRESSIONS SHALL BE PER GREENBOOK SPECIFICATION SECTION 303-5.5

Revision	By	Approved	Date
ORIGINAL	NBZ	J. SHOAF	8/00
DETAIL	SM	A. OSKOU	12/03

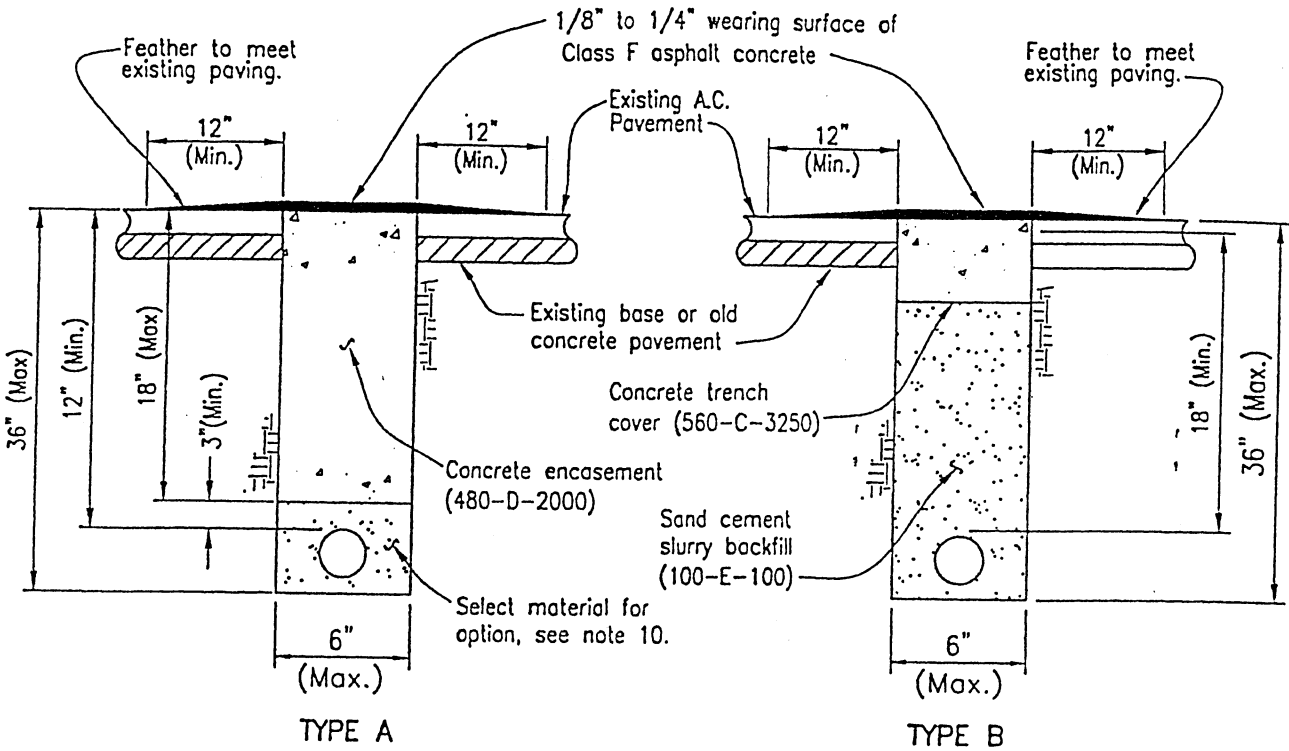
CITY OF SAN DIEGO - STANDARD DRAWING

EXISTING STAMP/IMPRESSION PLACEMENT

CITY OF SAN DIEGO
STANDARDS COMMITTEE

B. L. H. 6-14-04
Chairperson RCE 64372 Date

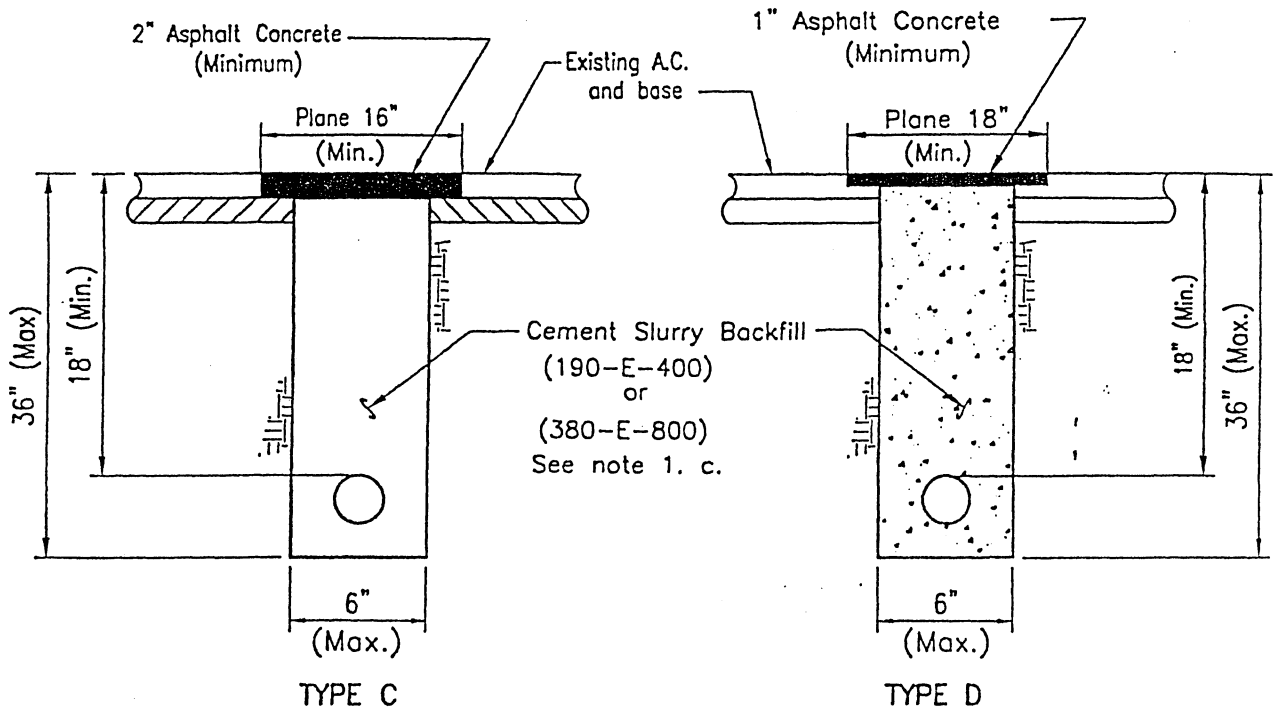
DRAWING NUMBER SDG-115



NOTES

1. Concrete encasement or sand cement slurry backfill shall have a minimum 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 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 saw cutting 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 7 calendar days minimum, but no longer than 30 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 agency's 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. Selected material with minimum sand equivalent of 50 shall be backfilled to 3 inches minimum above the conduit. Sand cement slurry backfill (100-E-100) may be substituted for select material.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original		Bahmanian	04/86		
		A.Oskoui	12/03	NARROW TRENCHING TYPES A & B BACKFILL & RESURFACING	<i>Ch. W. Hall</i> 12/16/16
Title Block		A.Oskoui	12/06		COORDINATOR R.C.E 65271 Date
					DRAWING NUMBER



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

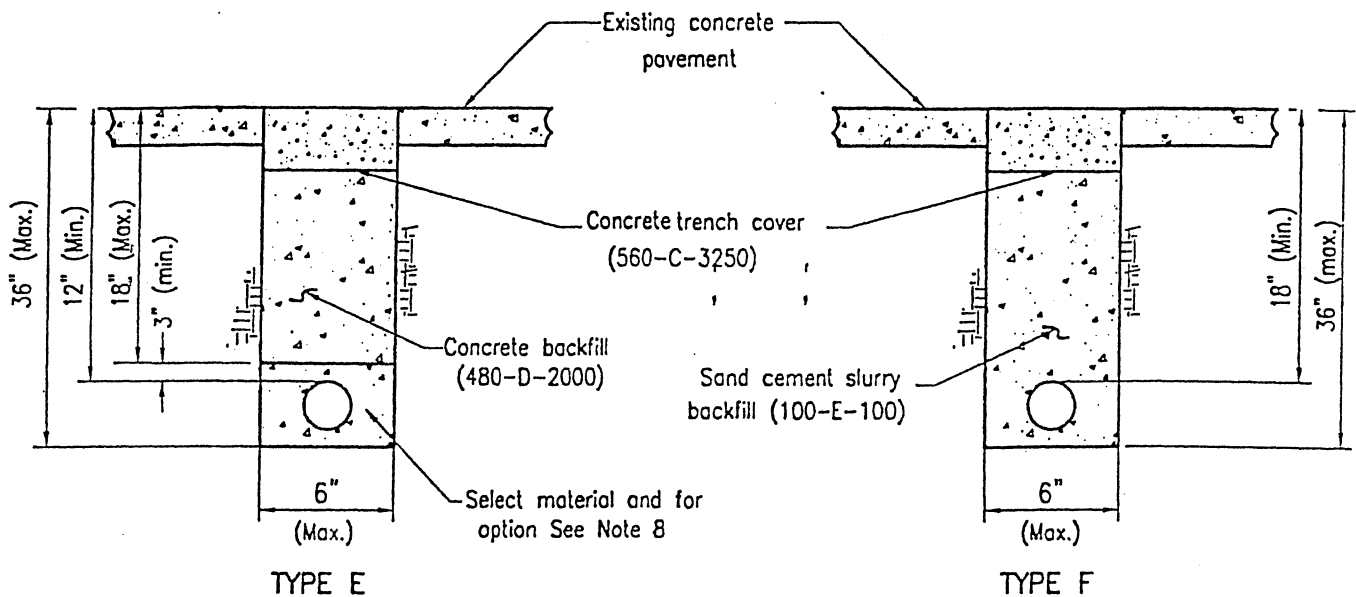
- a. Allow cement slurry backfill 48 hours minimum to cure before resurfacing, unless approved by the Engineer.
- b. Thickness shall match the existing A.C. with a minimum of 2 inches.
- c. A.C. shall be hot mix.

Type D

- a. Allow cement slurry backfill seven days minimum to cure before planing.
- b. Plane existing asphalt pavement and slurry backfill, one half thickness of existing A.C., (1 inch minimum 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 agency's Engineer.
- 5. Existing A.C. pavement will not require sawcutting when using rockwheel for excavation.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original		Bahmanian	04/86		
		A.Oskoui	12/03	NARROW TRENCHING TYPES C & D BACKFILL & RESURFACING	<i>Ch. W. Welch</i> 12/16/06 COORDINATOR R.C.E 65271 Date
Title Block		A.Oskoui	12/06		
				DRAWING NUMBER	SDG-117

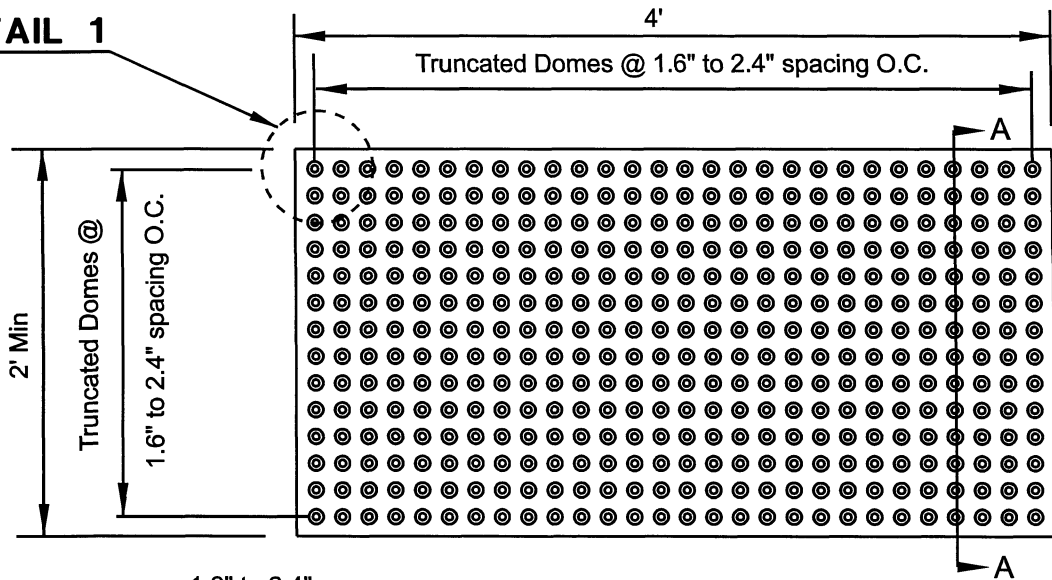


NOTES

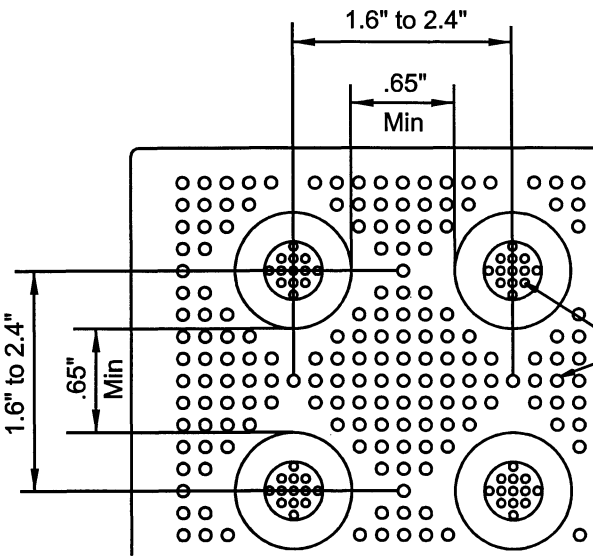
1. Concrete slurry backfill shall have a maximum slump of 4 inches.
2. Cement slurry backfill shall be thoroughly consolidated to encase conduits. Tampers or vibrators shall be used.
3. Concrete shall be screeded off to match existing pavement grade and floated to assure proper edge match.
4. Concrete trench cover shall be a minimum of 5 1/2 inches thick in alley or local residential streets and 7 inches thick in all other streets.
5. Existing concrete pavement will 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 agency's 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 (1)(b).
8. Select material with a minimum sand equivalent of 50 shall be backfilled to 3" min. above the conduit. Sand cement slurry backfill (100-E-100) may be substituted for select material.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>Ch. W. Neal: 12/16/16</i> COORDINATOR R.C.E 65271 Date
Original		Bahmanian	04/86		
		A.Oskoui	12/03		
Title Block		A.Oskoui	12/06		

DETAIL 1



PLAN - TILE

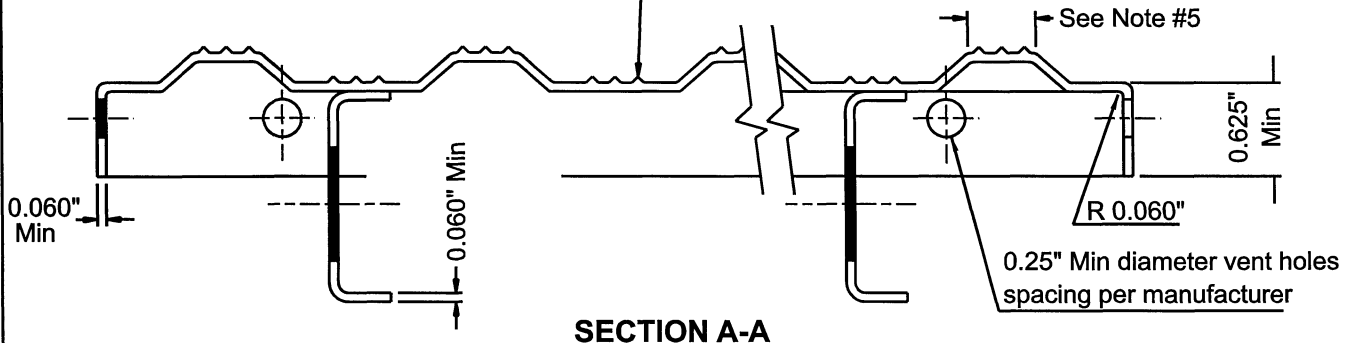


DETAIL 1

See Note 2

NOTES:

1. The detectable/tactile warning tiles shall be stainless steel cast in place and shall comply with the City of San Diego Supplement Amendments Sections 216 and 303.
2. Pattern, size & orientation are per manufacturer's recommendation.



SECTION A-A

Revision	By	Approved	Date
Original	FC	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

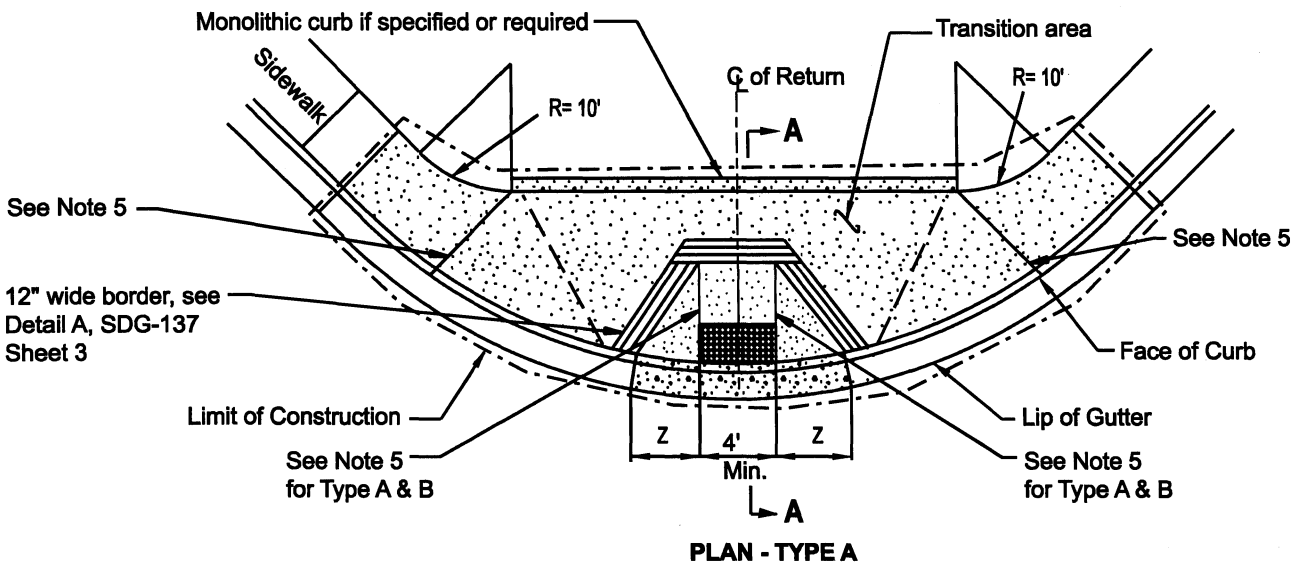
CITY OF SAN DIEGO - STANDARD DRAWING

**DETECTABLE/TACTILE WARNING
TILE (TRUNCATED DOMES)**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

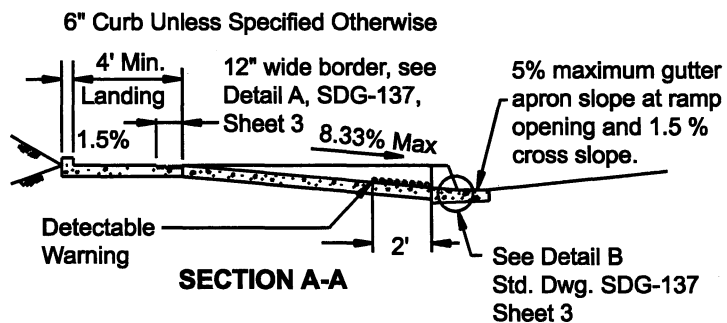
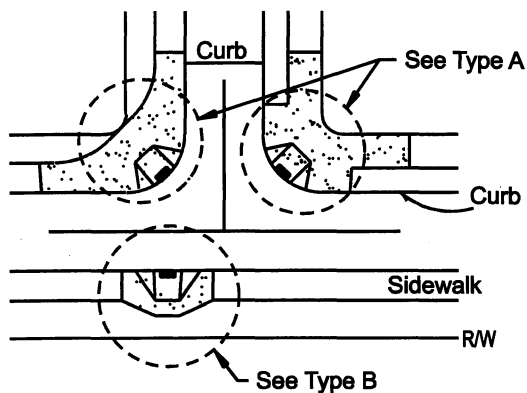
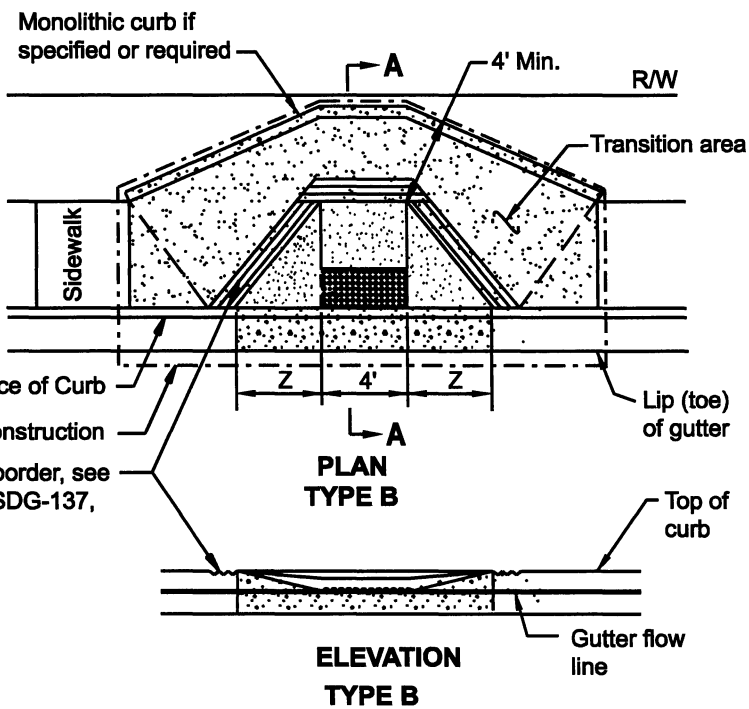
H. Daniel 12/19/6
COORDINATOR R.C.E 65271 - Date

**DRAWING
NUMBER SDG-130**



NOTES:

1. See SDG-130 for Detectable/Tactile Warning Tile (Truncated Domes) details.
2. See Drawing SDG-137 for additional Curb Ramp Details and Information.
3. The landing cross slope shall be 1.5%
4. Z = side slope or flares cannot exceed 10.0%
5. Tooled Joint - 1/4" deep groove with 1/4" radius edges.

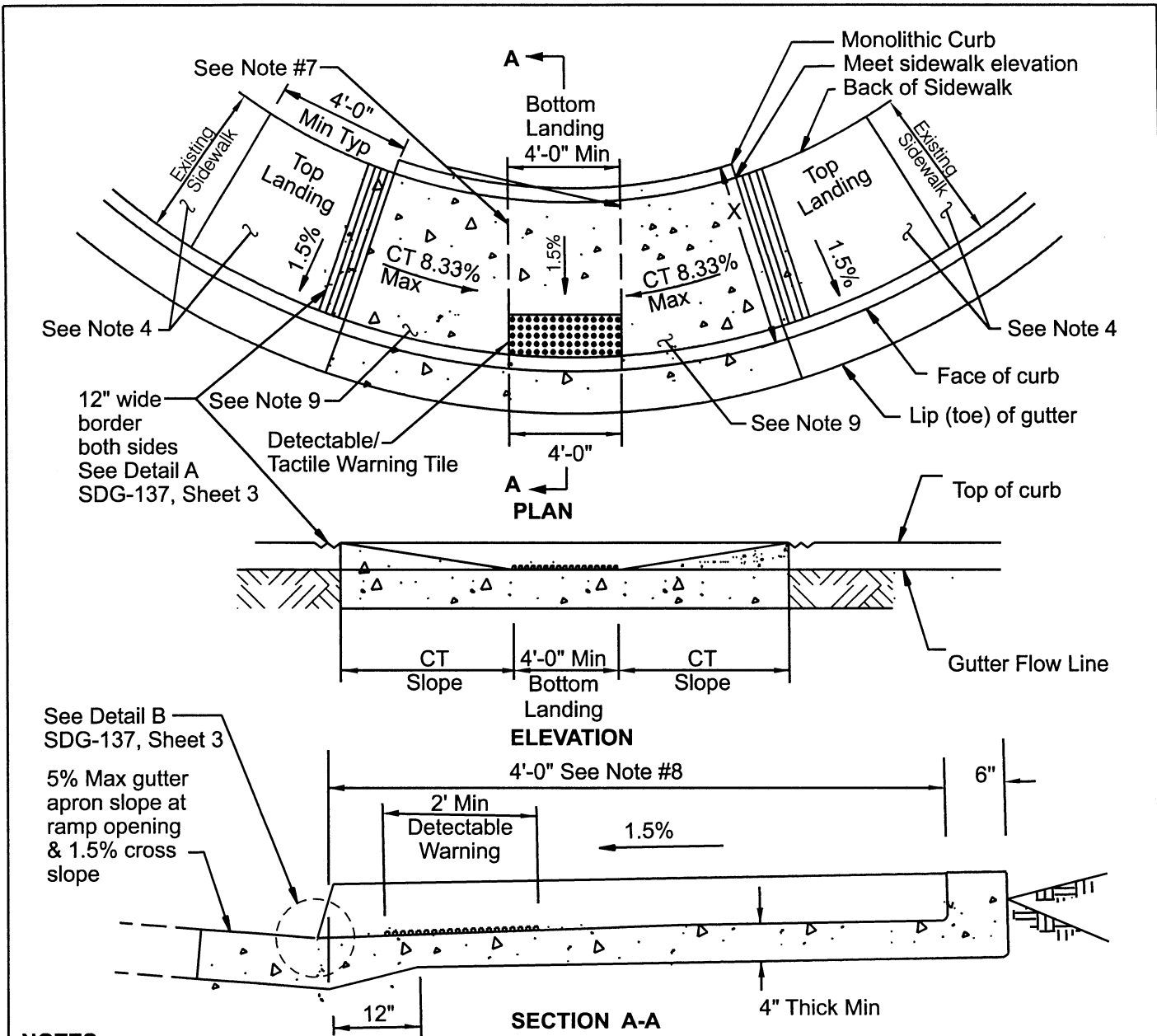


Revision	By	Approved	Date
Original	FC	A. Oskoui	12/03
Update	FC	A. Oskoui	

CITY OF SAN DIEGO - STANDARD DRAWING

CURB RAMP - TYPES A AND B

CITY OF SAN DIEGO
STANDARDS COMMITTEE
Ad. Havel 12/10/6
COORDINATOR R.C.E 65271 - Date
DRAWING NUMBER SDG-132



NOTES:

1. Type C1 curb ramp shall only be used to mitigate existing conditions where inadequate right of way exists to use Standard Drawing SDG-132. **Type C1 shall be used when $X < 7'$** . X = distance from face of curb to property line.
2. See SDG-130 for Detectable/Tactile Warning Tile (Truncated Domes) details.
3. See SDG-137 for additional curb ramp details and information.
4. The top landing of the curb ramp shall be 4'-0" min. in length and the cross & running slope shall be 1.5%. Remove and replace existing sidewalk as necessary to achieve the required top landing size & slope requirements.
5. CT - Curb Transition slope shall not exceed 8.33% running slope and 1.5% cross slope.
6. The bottom landing cross slope shall be 1.5%.
7. Tooled Joint - 1/4" deep groove with 1/4" radius edges.
8. The depth of the bottom landing shall be a minimum of 4'-0" or up to the property line whichever is greater.
9. If the condition of the street and sidewalk is such that the existing slopes do not allow the installation of the required curb ramp slope then the Contractor shall extend the construction of the slope up to a maximum length of 15'-0" (linear feet) to catch the required slope even if the required slope is not achieved. Coordination with Resident Engineer is required at these conditions prior to any demolition or construction.

Revision	By	Approved	Date
Original	SS	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

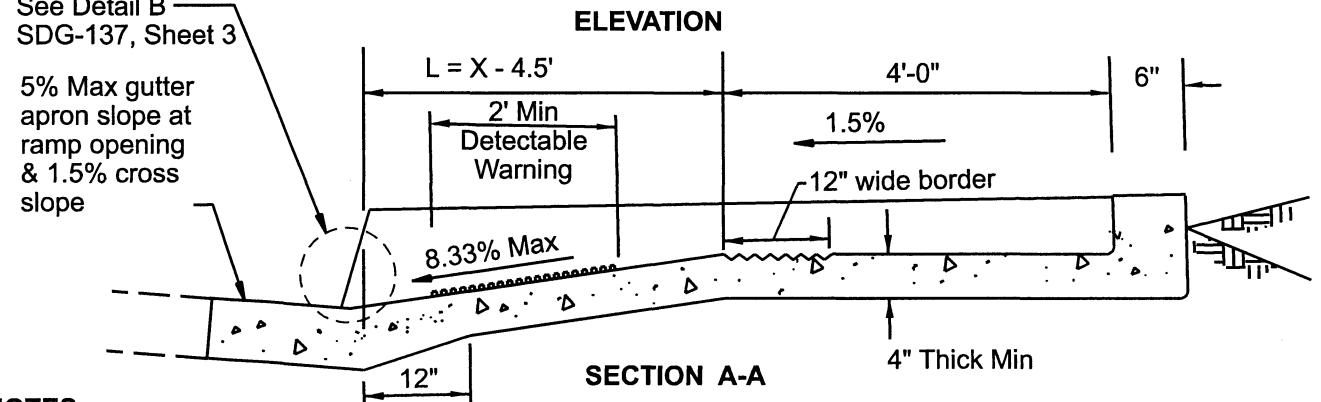
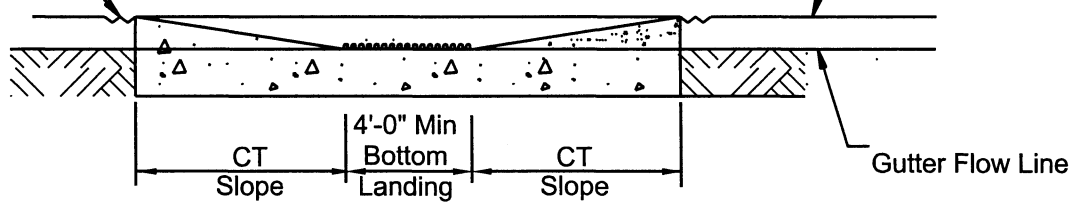
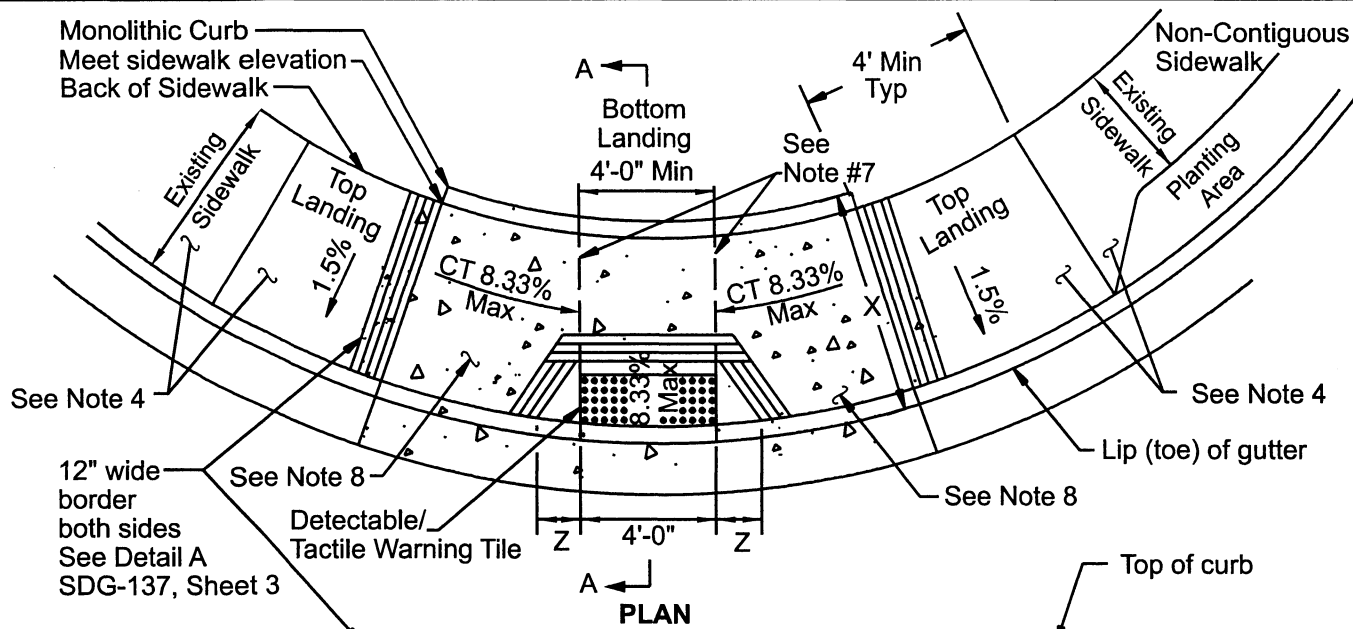
CITY OF SAN DIEGO - STANDARD DRAWING

**CURB RAMP - TYPE C1
(For Existing Sidewalk)**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

A. Oskoui 12/16/6
COORDINATOR R.C.E 65271 - Date

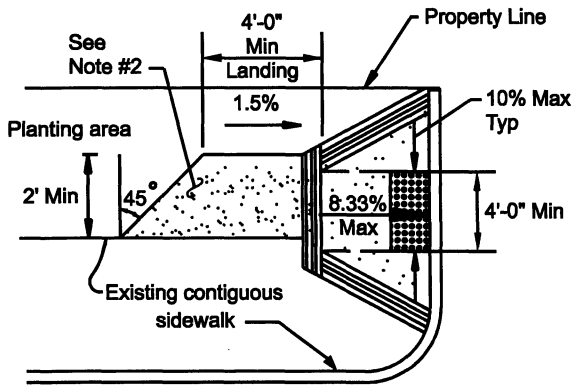
**DRAWING
NUMBER SDG-134**



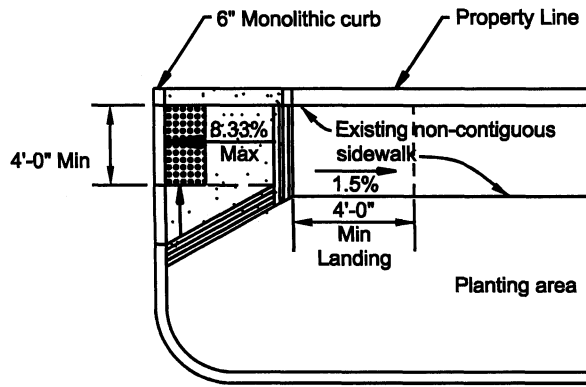
NOTES:

1. Type C2 curb ramp shall only be used to mitigate existing conditions where inadequate right of way exists to use Standard Drawing SDG-132. **Type C2 shall be used when $X=7'$ or $7' < X < 10'$.**
 X = distance from face of curb to property line.
2. See SDG-130 for Detectable/Tactile Warning Tile (Truncated Domes) details.
3. See SDG-137 for additional curb ramp details and information.
4. The top landing of the curb ramp shall be 4'-0" min. in length and the cross & running slope shall be 1.5%. Remove and replace existing sidewalk as necessary to achieve the required top landing size and slope requirements.
5. CT - Curb Transition slope shall not exceed 8.33% running slope and 1.5% cross slope.
6. The bottom landing cross slope shall be 1.5%.
7. Tooled Joint - 1/4" deep groove with 1/4" radius edges.
8. If the condition of the street and sidewalk is such that the existing slopes do not allow the installation of the required curb ramp and side/flare slopes then the Contractor shall extend the construction of the slope up to a maximum length of 15'-0" (linear feet) to catch the required slope even if the required slope is not achieved. Coordination with Resident Engineer is required at these conditions prior to any demolition or construction.
9. Z - Flare Slopes shall not exceed 10%.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original	SS	A. Oskoui	12/03		
Update	FC	A. Oskoui	12/06		
CURB RAMP - TYPE C2 (For Existing Sidewalk)				<i>M. H. H. H.</i> 12/16/16 COORDINATOR R.C.E 65271 - Date	
				DRAWING NUMBER SDG-135	

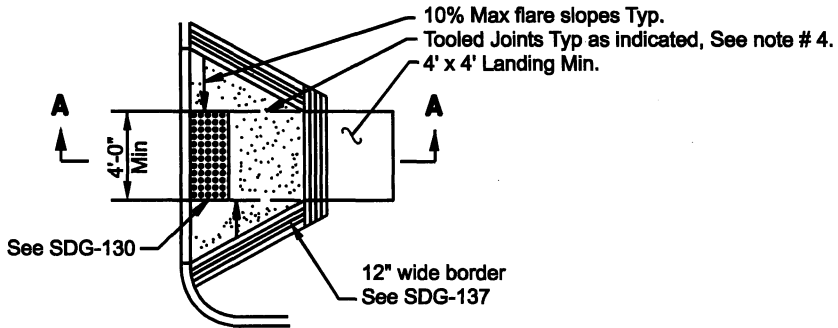


ALLEY

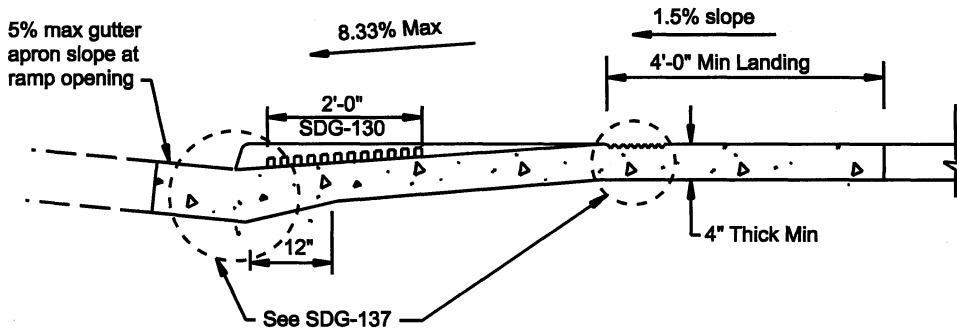


TYPICAL PLAN

STREET



PLAN VIEW



SECTION A - A

NOTES:

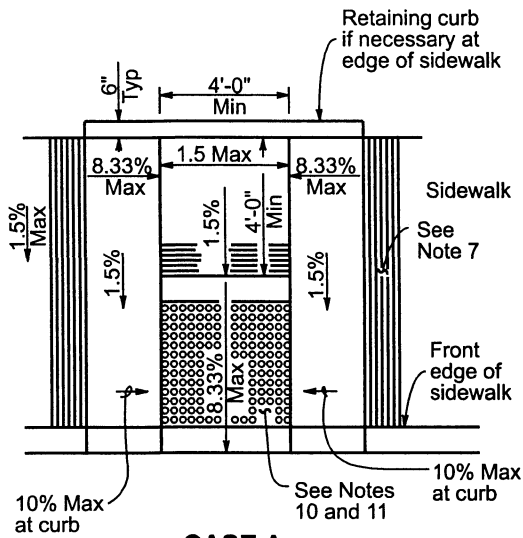
1. See Drawing SDG-137 for additional curb ramp details and information.
2. Landing cross slope shall be 1.5%.
3. See SDG-130 For Detectable Warning details.
4. Tooled Joint - 1/4" Deep Groove with 1/4" Radius Edges.

Revision	By	Approved	Date
Original	SM	A. Oskoui	12/03
Up-Date	FC	A. Oskoui	12/06

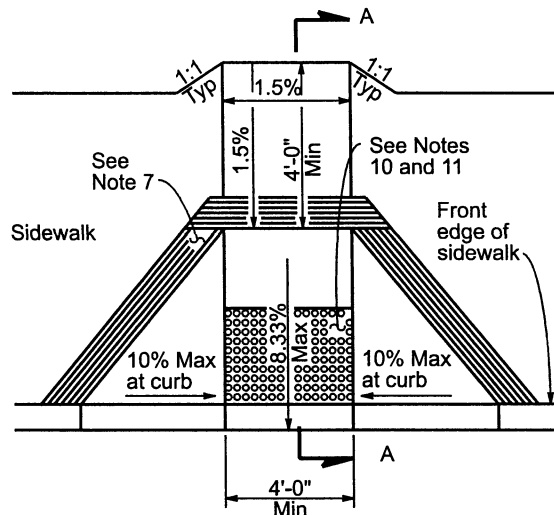
CITY OF SAN DIEGO - STANDARD DRAWING

CURB RAMP - TYPE D

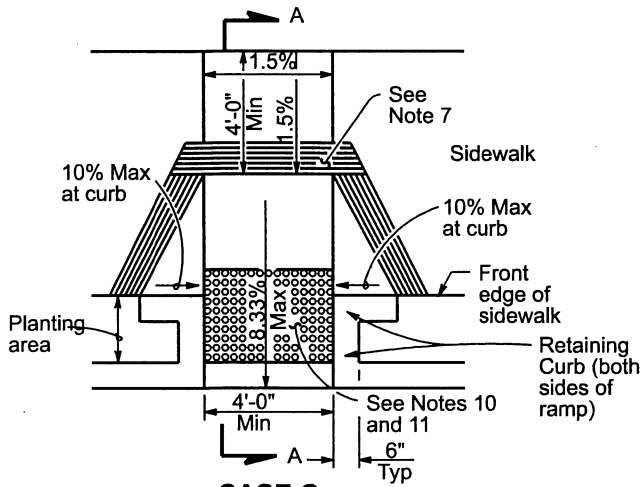
CITY OF SAN DIEGO STANDARDS COMMITTEE
<i>W. H. ...</i> 12/16/06
COORDINATOR R.C.E 65271 - Date
DRAWING NUMBER SDG-136



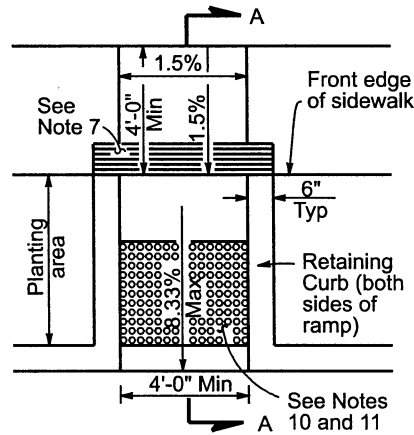
CASE A



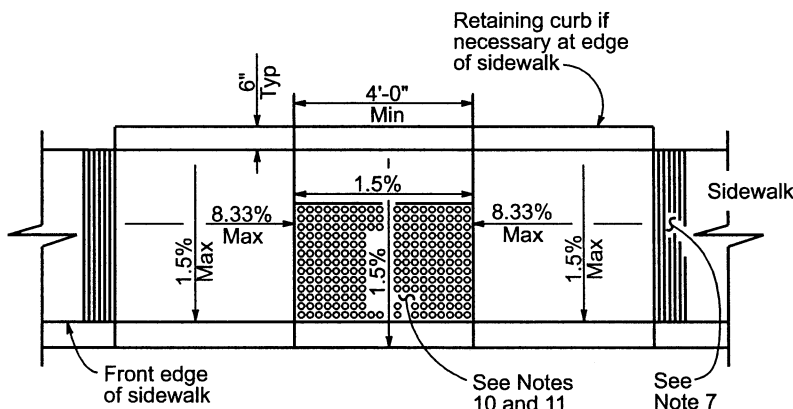
CASE B



CASE C



CASE D



CASE E

Revision	By	Approved	Date
Original	SS	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

**SUPPLEMENTAL CURB RAMP
DETAILS**

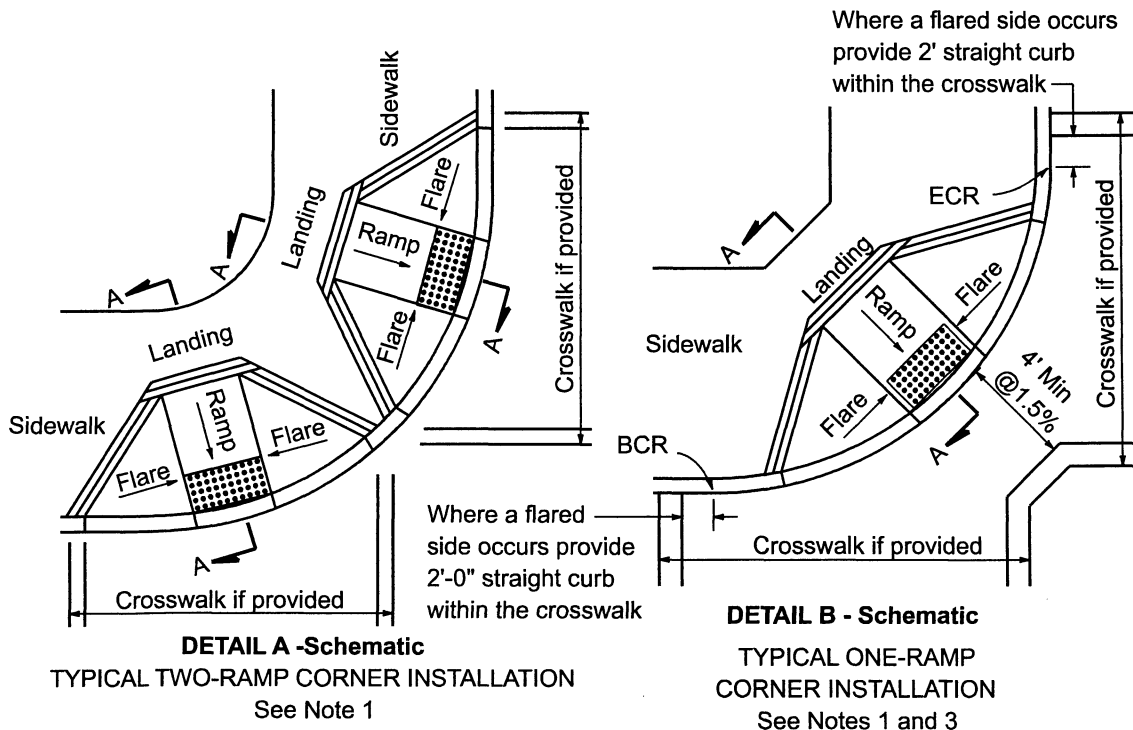
CITY OF SAN DIEGO
STANDARDS COMMITTEE

A. Oskoui 12/16/06
COORDINATOR R.C.E 65271 - Date

**DRAWING
NUMBER SDG-137**

SUPPLEMENTAL NOTES TO SDG-137, SHEET 1 OF 3:

1. As site conditions dictate, Case A through Case E (including SDG-134 and SDG-135) curb ramps may be used for corner installations similar to those shown in Detail A and Detail B below. The Contractor must obtain approval from the designated Resident Engineer prior to the application of any of these cases.
2. If distance from curb to back of sidewalk is too short to accommodate a Type A or B curb ramp and a 4'-0" landing as shown in SDG-132, the sidewalk may be depressed longitudinally as shown in Case A, Case E, SDG-134, and SDG-135 or, may be widened as shown in Case B if within right-of-way.
3. When a curb ramp is located in the center of a curb return, crosswalk configuration must be similar to that shown for Detail B as shown below.
4. Side slope or flare slopes may vary uniformly up to a maximum of 10.0% at curb to conform with the longitudinal sidewalk slope adjacent to top of the ramp, except for Case A, D, E, SDG-134, and SDG-135.
5. The curb ramp shall be outlined with a 12" wide border, with 1/4" grooves approximately 3/4" on center. See Detail A, Sheet 3 of 3.
6. Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. On existing street conditions, the built-up asphalt at the bottom of the curb ramp between the gutter and the street must be milled away to achieve the required flush transition.
7. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp, and continuous passage to the curb ramp shall not exceed 5.0% within 4'-0" of the bottom of the curb ramp.
8. Curb ramps shall have a detectable warning surface (truncated domes) that extends the full width and min 2'-0" depth of the ramp. Detectable/Tactile warning tile design, color, and materials must conform with the City of San Diego Supplement Amendments Sections 216 and 303 and SDG-130.
9. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
10. If the condition of the street and sidewalk is such that the existing slopes do not allow the installation of the required curb ramp and side/flare slopes then the Contractor may extend the construction of the slope up to a maximum length of 15'-0" (linear feet) to catch the required slope even if the required slope is not achieved. Close coordination with the designated Resident Engineer is required at these conditions prior to any demolition of the street and sidewalk and prior to the installation of the curb ramp(s).



SHEET 2 OF 3

Revision	By	Approved	Date
Original	SS	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

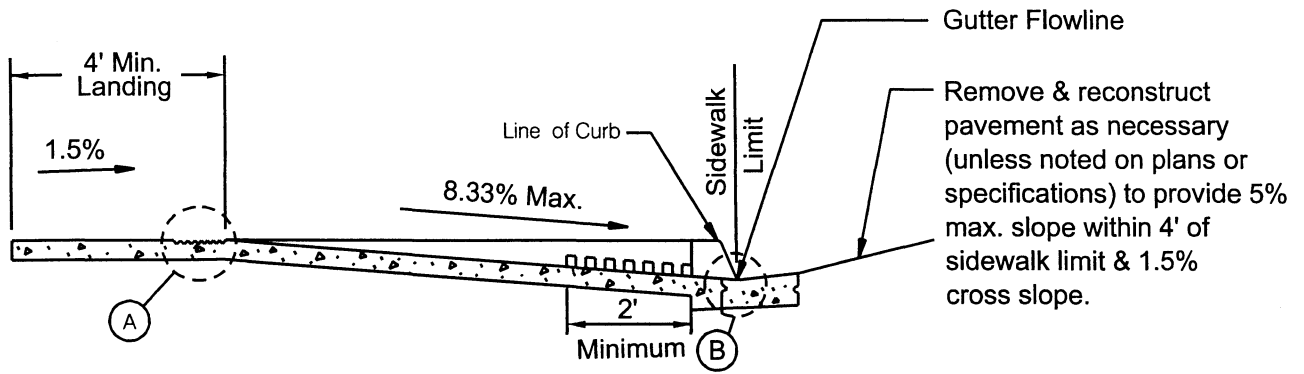
CURB RAMP DETAILS

CITY OF SAN DIEGO
STANDARDS COMMITTEE

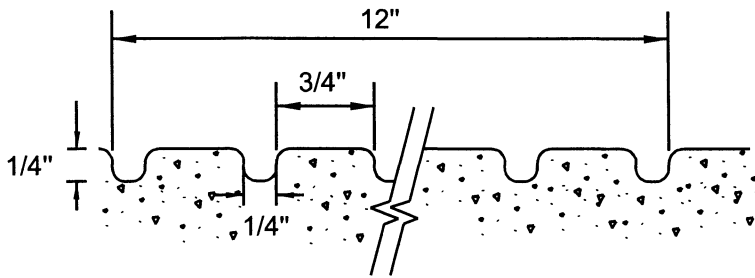
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COORDINATOR R.C.E 65271 - Date

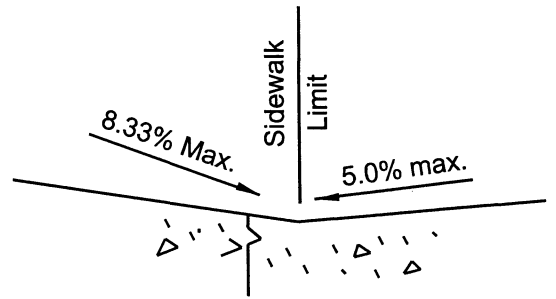
DRAWING NUMBER SDG-137



SECTION A-A



DETAIL A
12" wide border

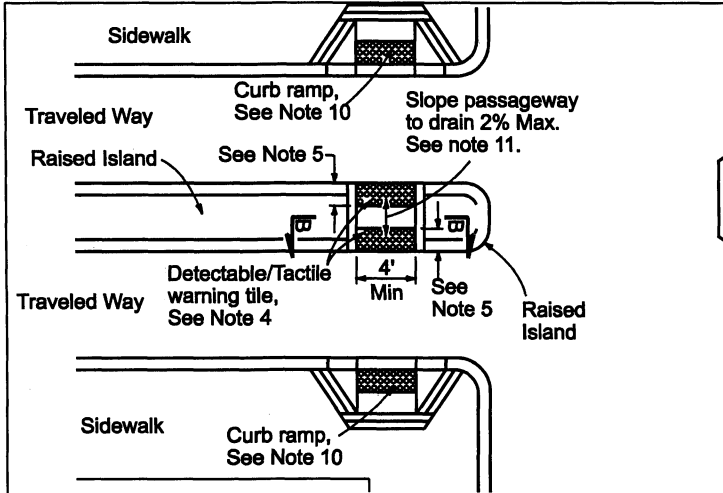


DETAIL B
See Note #7

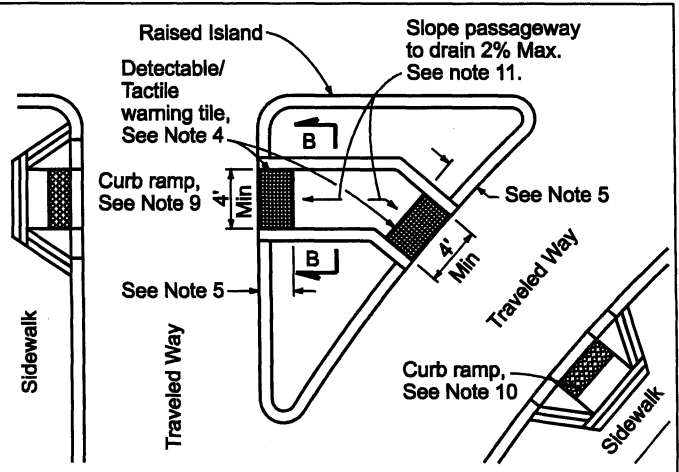
NOTES

1. The removal of existing concrete curb, gutter, sidewalk, and pavement (or curb ramp) for a new curb ramp shall comply with G-11. The removal of additional sidewalk panels may be required to meet existing grade and to comply with the accessibility regulations.
2. Curb ramp surfaces (flares and ramp) shall have a medium to heavy broom textured finish, perpendicular to the axis of travel.
3. Curb ramps shall be of concrete class 520-C-2500.
4. If obstructions such as inlets, light poles, fire hydrants, etc., are encountered, the curb ramp location(s) may be adjusted only upon the evaluation & approval of the designated Resident Engineer.
5. The cross slope of the ramp shall be 1.5%.
6. The landing slope shall be 1.5% in both directions.
7. All projections (new construction & alteration), the lower end of 48" width ramp shall be flush and free of abrupt changes between the bottom of the ramp and the street pavement surface.
8. Install 1/4" expansion joint filler material between a new curb ramp and the existing sidewalks.

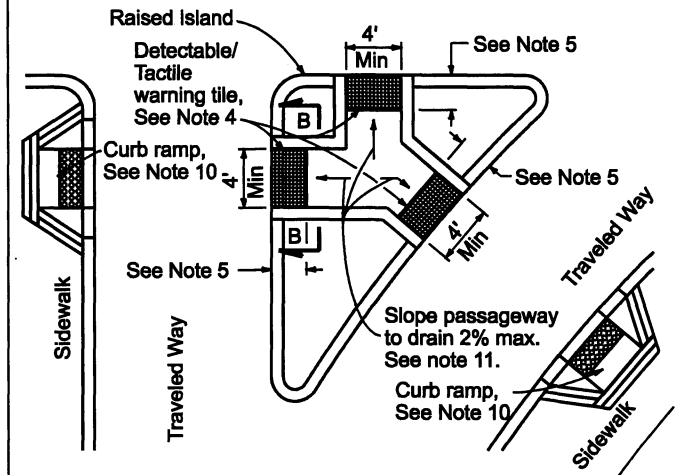
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	SS	A. Oskoui	12/03			
Update	FC	A. Oskoui	12/06	GENERAL NOTES for CURB RAMPS	<i>dt. dtal: 12/16/6</i>	
					COORDINATOR R.C.E 65271 - Date	
					DRAWING	SDG-137
					NUMBER	



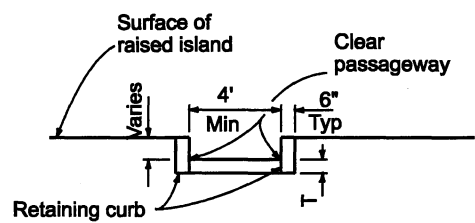
TYPE A PASSAGEWAY



TYPE B PASSAGEWAY



TYPE C PASSAGEWAY



SECTION B-B

NOTE:

1. Sidewalk, ramp and passageway thickness "T", shall be 4' min. See section B-B
2. Minimum width of the passageway through raised islands shall be 4', except for locations where right of way restrictions, natural barriers, or other existing conditions create an unreasonable hardship, the min clear width of the passageway may be reduced to 3'.
3. Details of grooving, see SDG-137.
4. Details of Detectable/Tactile warning tile, see SDG-130.
5. Where an island passage way length is less than 6'-0", the Detectable/Tactile warning tile shall extend the full width and full length of the passage way length. Where an island passage way length is greater than or equal to 6'-0", but less than 8'-0", a Detectable/Tactile warning tile shall extend the full width and 2'-0" depth of the passage way length. Where an island passage way length is greater than or equal to 8'-0", a Detectable/Tactile warning tile shall extend the full width and 3'-0" depth of the passage way length.
6. The Detectable/Tactile warning tiles at flush refuge or passage way shall be in line with median edge.
7. Transitions from ramps to walks, gutters or streets shall be flush and free of abrupt changes.
8. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp and continuous passage to the curb ramp shall not exceed 5% within 4'-0" of the top or bottom of the curb ramp.
9. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp are to be relocated or adjusted to grade prior to, or in conjunction with the curb ramp construction. Coordinate relocation or adjustment with Resident Engineer.
10. See SDG-137 for additional curb ramp details and information.
11. Cross slope at passage way on refuge shall be 1.5%.

Revision	By	Approved	Date
Original	SS	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

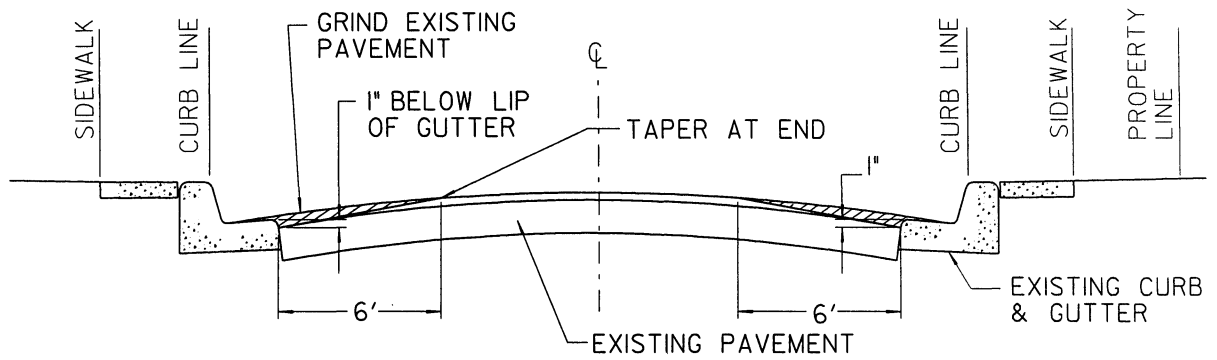
CITY OF SAN DIEGO - STANDARD DRAWING

ISLAND REFUGE / PASSAGEWAY DETAILS

CITY OF SAN DIEGO
STANDARDS COMMITTEE

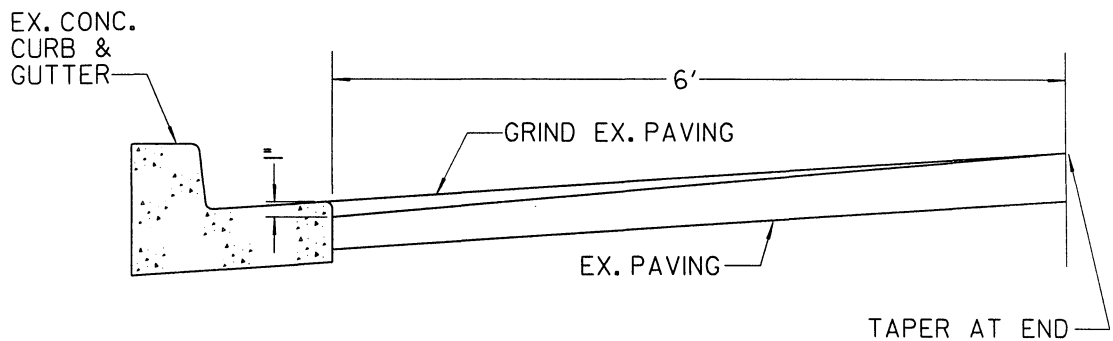
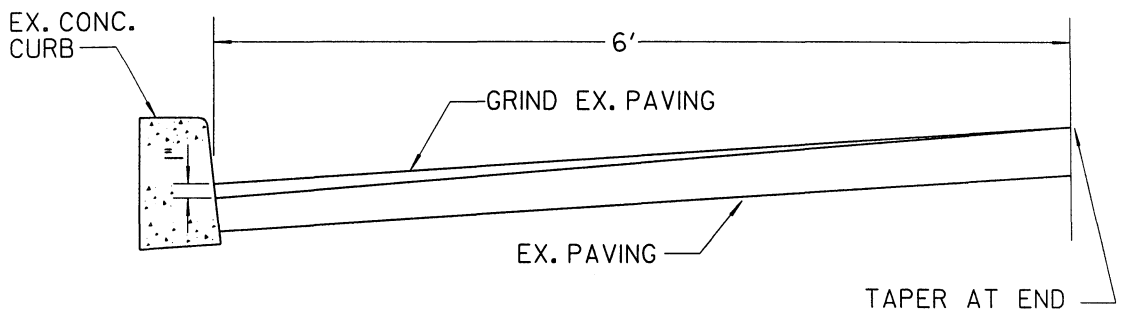
Michael 12/16/16
COORDINATOR R.C.E 65271 - Date

DRAWING NUMBER SDG-138



GRINDING & PREPARATION

TYPICAL SECTION
NO SCALE



TYPICAL PAVEMENT COLD MILLING
NO SCALE

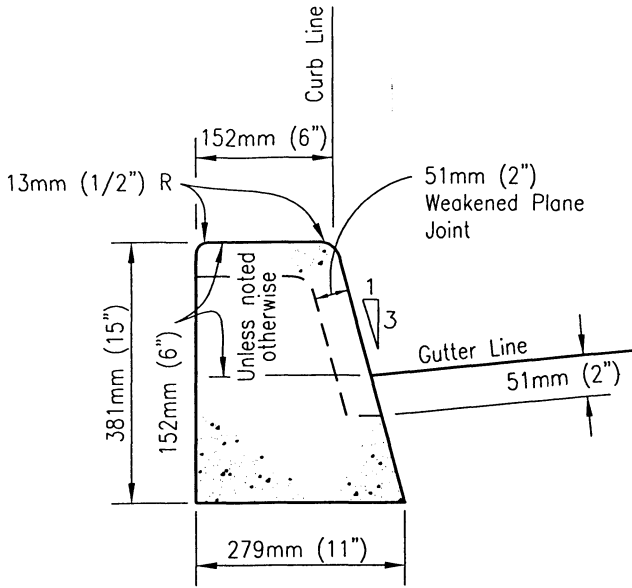
REVISION	BY	APPROVED	DATE
ORIGINAL	BB	A. Oskoui	SJ

CITY OF SAN DIEGO - STANDARD DRAWING

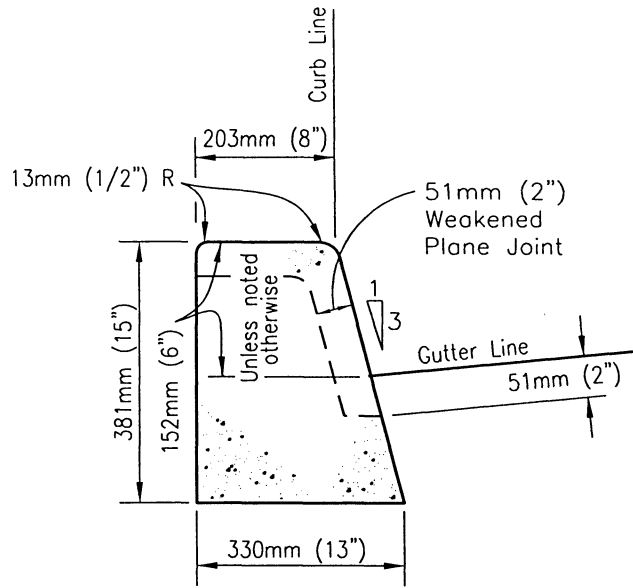
COLD MILLING ASPHALT
CONCRETE PAVEMENT DETAIL

CITY OF SAN DIEGO
STANDARDS COMMITTEE
M. Alami 12/16/6
COORDINATOR R.C.E. 65271 DATE

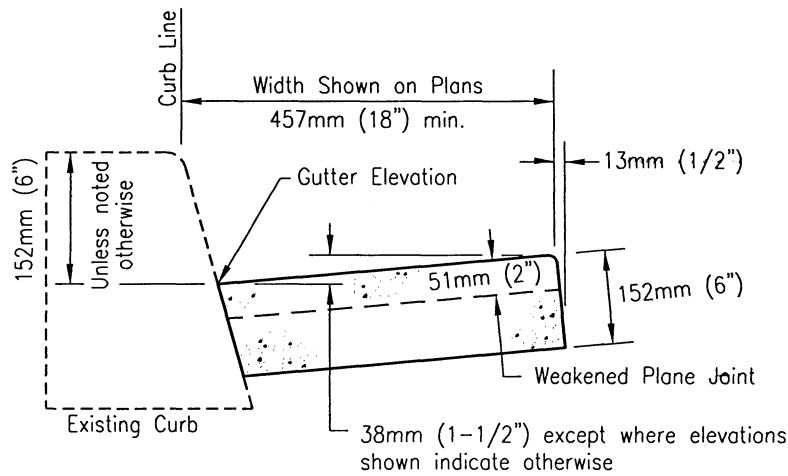
DRAWING NUMBER **SDG-139**



152mm (6") CURB
Area=0.083m (0.89 Sq. Ft.)



203mm (8") CURB
Area=0.1m (1.09 Sq. Ft.)



GUTTER

NOTES:

1. Concrete shall be 308kg/M³-C-17-MPa (520-C-2500).
2. See Standard Drawings G-9 and G-10 for joint details.
3. Slope top of curb 6.35mm (1/4") per foot toward street.

LEGEND ON PLANS

152mm (6") curb

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

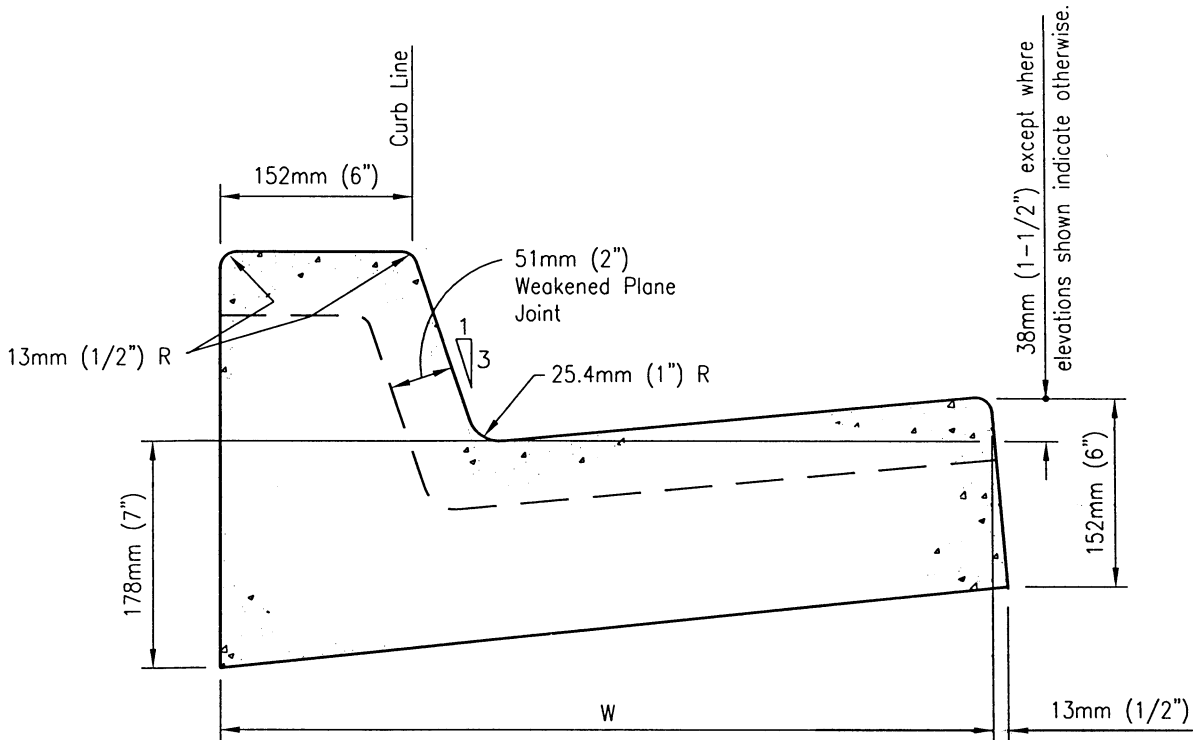
SAN DIEGO REGIONAL STANDARD DRAWING

CURBS AND GUTTER - SEPARATE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-1**

SEE SDG-100



TYPE	W	*AREA
G	610mm (24")	0.124sq. m (1.34sq ft.)
H	762mm (30")	0.150sq. m (1.61sq ft.)

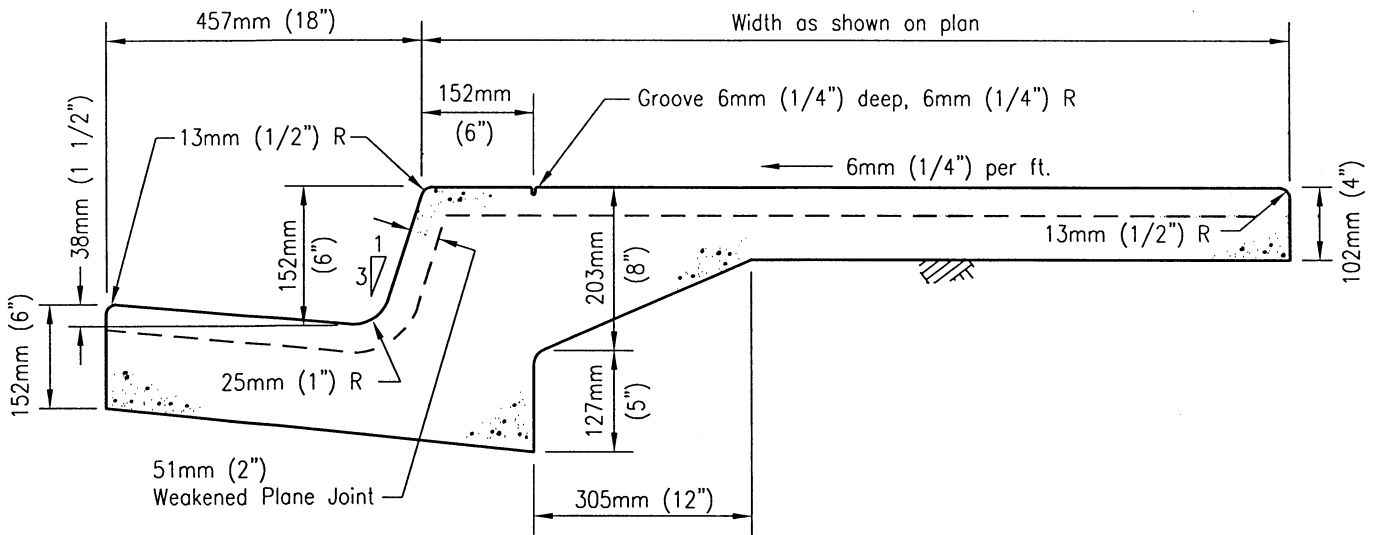
* with 152mm (6") Curb Face

NOTES:

1. Concrete shall be 308kg/M³-C-17-MPa (520-C-2500).
2. See Standard Drawings G-9 and G-10 for joint details.
3. Slope top of curb 6.35mm (1/4") per foot toward street.

LEGEND ON PLANS

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	CURB AND GUTTER - COMBINED	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 3/10/2003	
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246	Date
Reformatted		T. Stanton	04/06			DRAWING NUMBER	G-2



NOTES:

1. Concrete shall be 308kg/M³-C-17-MPa (520-C-2500).
2. See Standard Drawings G-9 and 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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

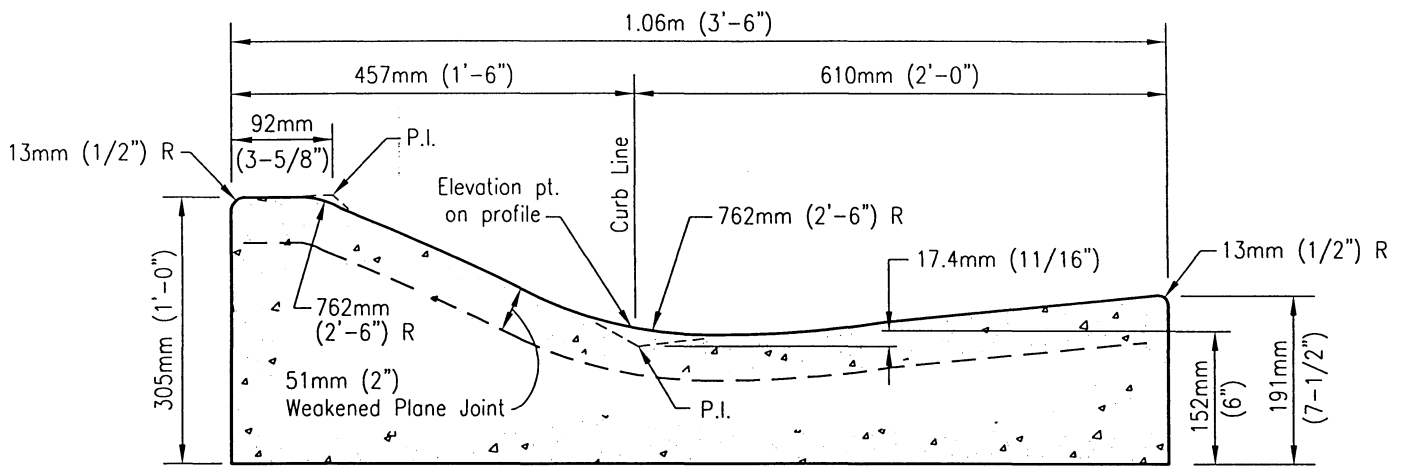
**MONOLITHIC CURB,
GUTTER AND SIDEWALK**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

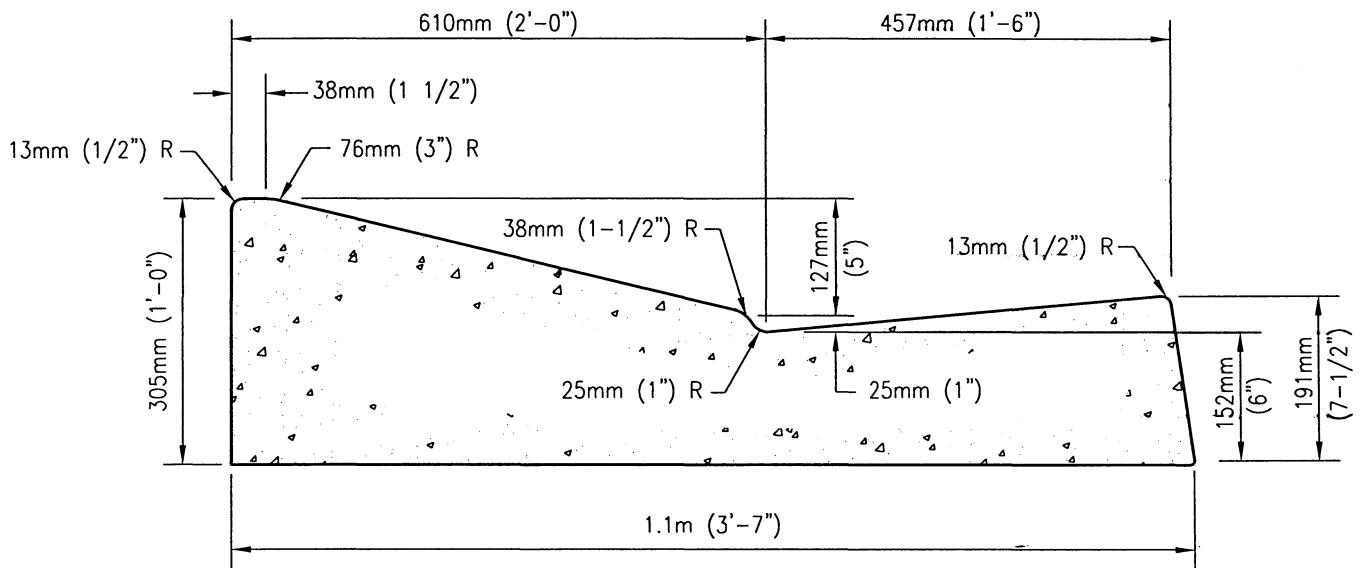
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-3**

SEE SDG-100



**TYPE A
CURB AREA**
(0.21 sq. m (2.23 sq. ft.))



**TYPE B
CURB AREA**
(0.23 sq. m (2.48 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. Concrete shall be 308kg/M³-C-17-MPa (520-C-2500).
3. See Standard Drawings G-9 and G-10 for joint details.

LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

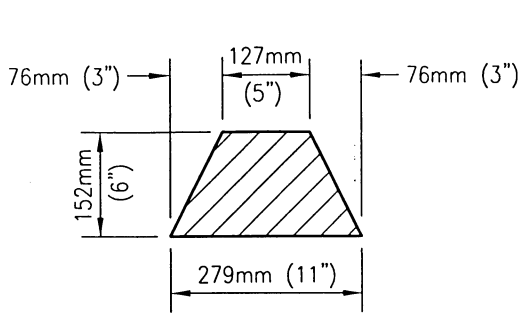
CURB AND GUTTER - ROLLED

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

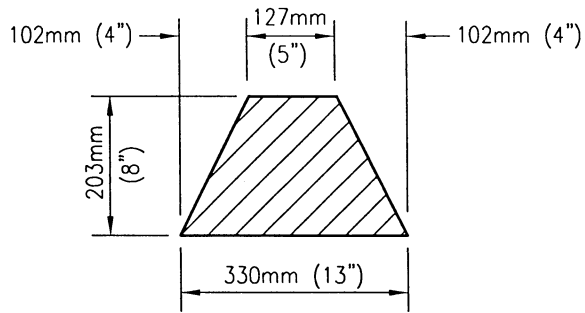
T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-4**

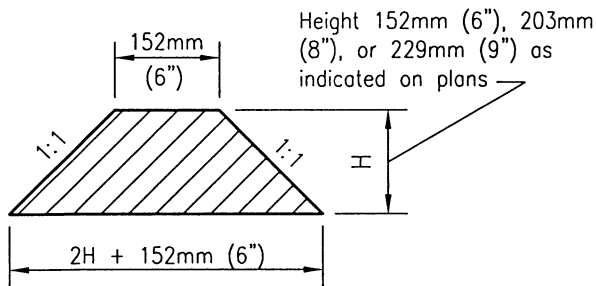
SEE SDG-100



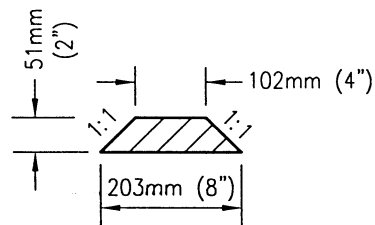
TYPE A



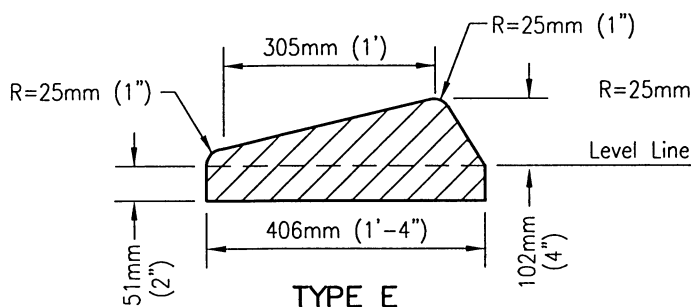
TYPE B



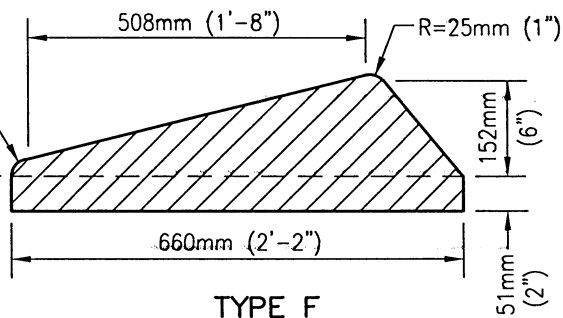
TYPE C



TYPE D

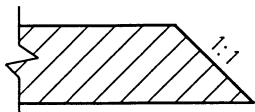


TYPE E



TYPE F

MOUNTABLE DIKES



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

ALL TYPES - SIDE VIEW

NOTES:

1. Dikes shall be placed on a 51mm (2") of A.C. surfacing, extending throughout the width of the dike.
2. PG-70-10 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	REQD PER LIN. FT.
A	25.4kg (0.0250 tn.)
B	38.1kg (0.0375 tn.)
C-152mm (6")	38.1kg (0.0375 tn.)
C-203mm (8")	59.2kg (0.0583 tn.)
C-229mm (9")	71.3kg (0.0702 tn.)
D	6.3kg (0.0062 tn.)
E	41.4kg (0.0407 tn.)
F	63.3kg (0.0623 tn.)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

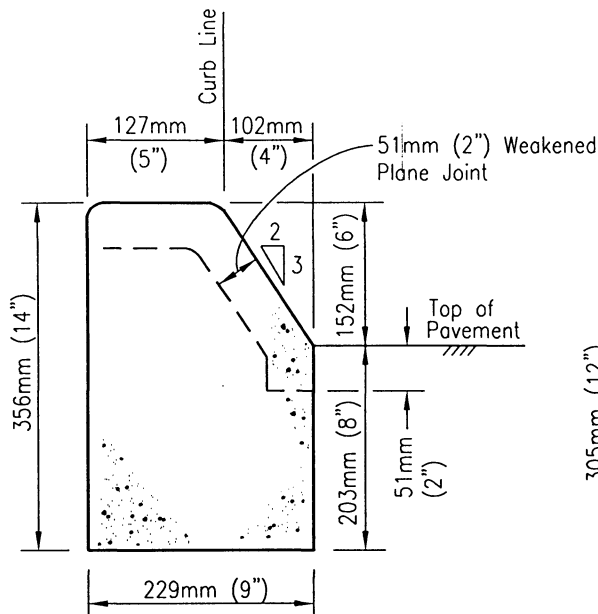
DIKES - ASPHALT CONCRETE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

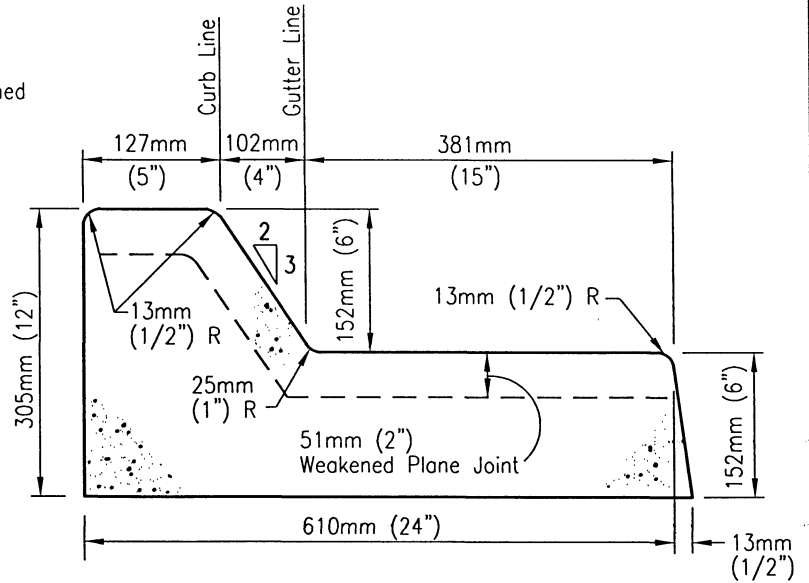
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-5**



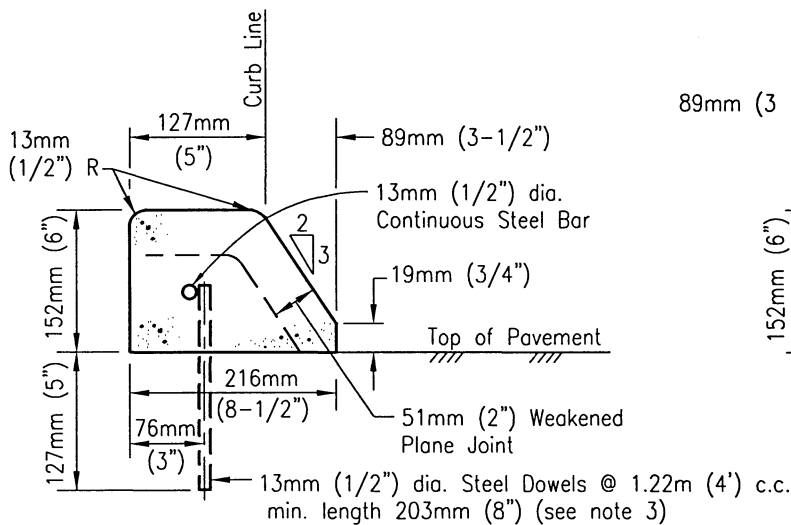
B-1

Area=0.073 sq. m (0.79 Sq.Ft.)



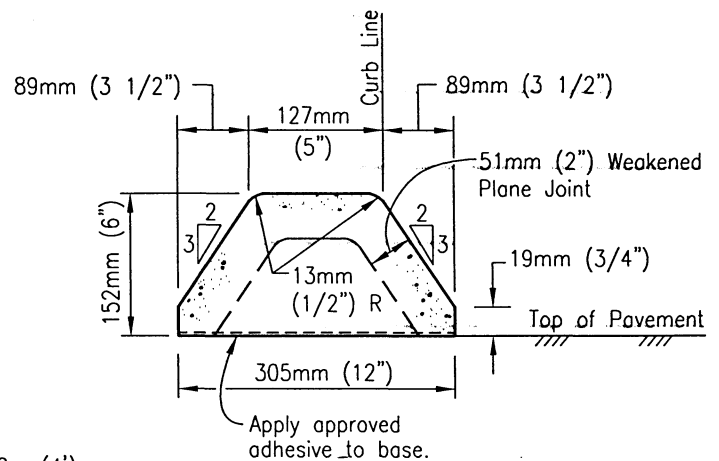
B-2

Area=0.120 sq. m (1.29 Sq.Ft.)



B-3

Area=0.027 sq. m (0.29 Sq.Ft.)



B-4

Area=0.033 sq. m (0.35 Sq.Ft.)

NOTES:

- Concrete shall be 308kg/m³-C-17-MPa (520-C-2500).
- See Standard Drawings G-9 and 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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

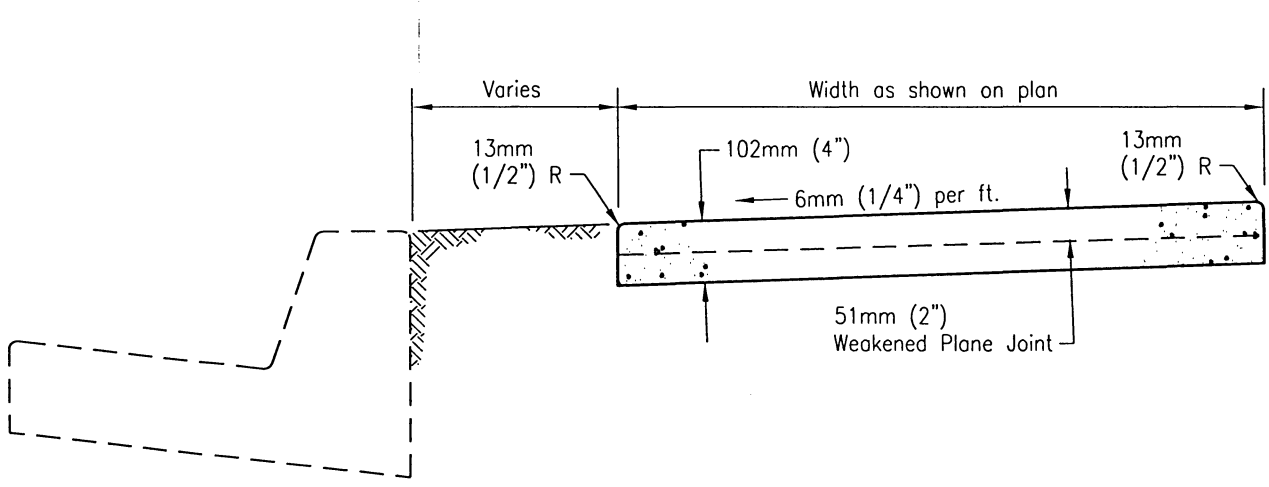
SAN DIEGO REGIONAL STANDARD DRAWING

CURBS AND GUTTER - MEDIANS

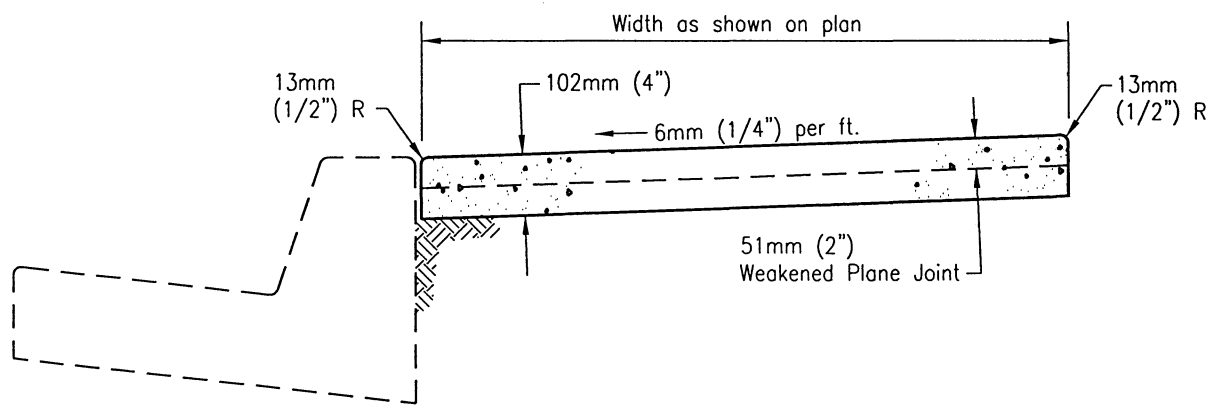
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-6**



NON-CONTIGUOUS

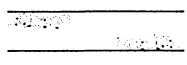


CONTIGUOUS

NOTES:

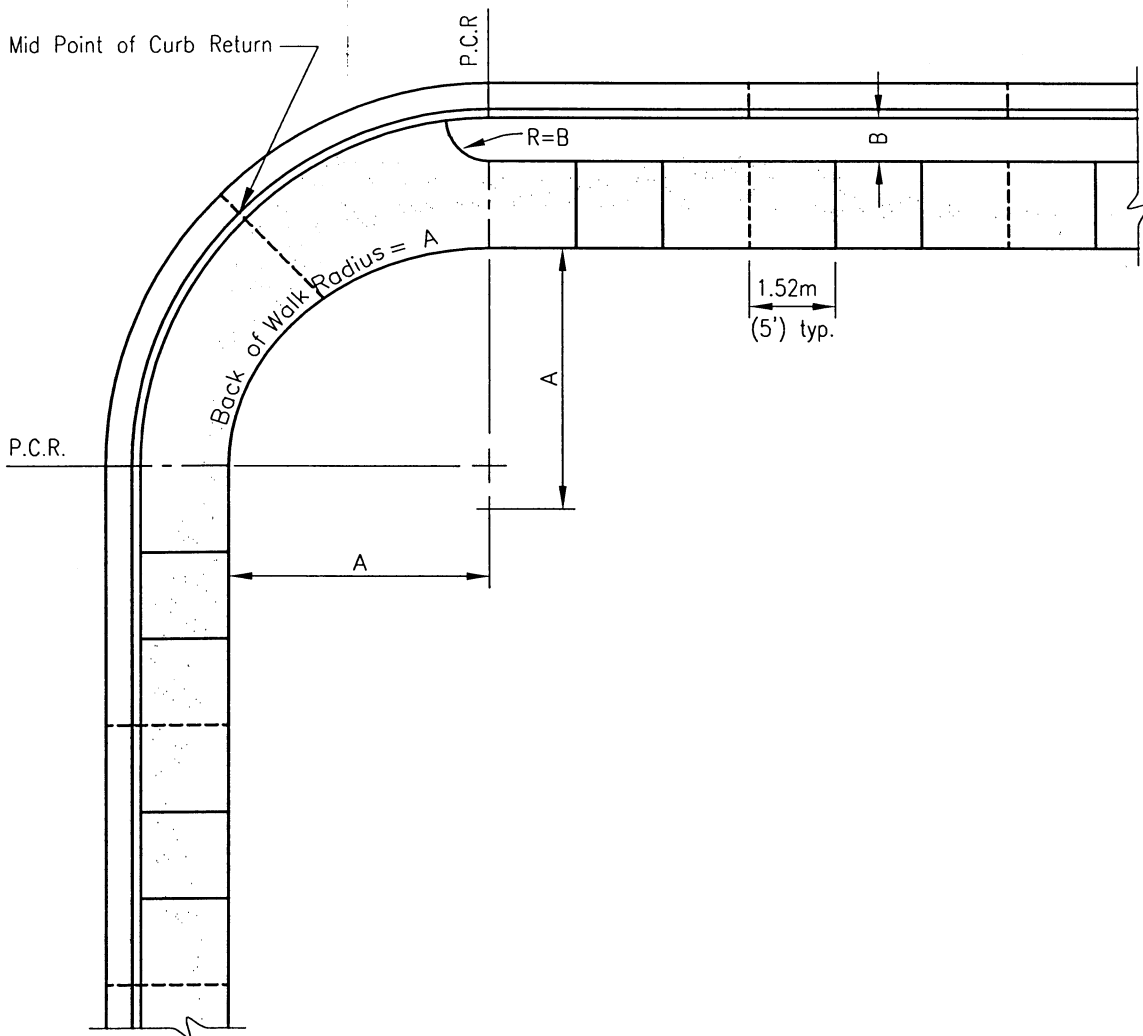
1. Concrete shall be 308kg/M³-C-17-MPa (520-C-2500).
2. See Standard Drawings G-9 and G-10 for joint details.

LEGEND ON PLANS



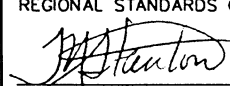
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		SIDEWALK - TYPICAL SECTIONS
Add Metric		T. Stanton	03/03		Chairperson R.C.E. 19246 Date
Reformatted		T. Stanton	04/06		DRAWING NUMBER G-7

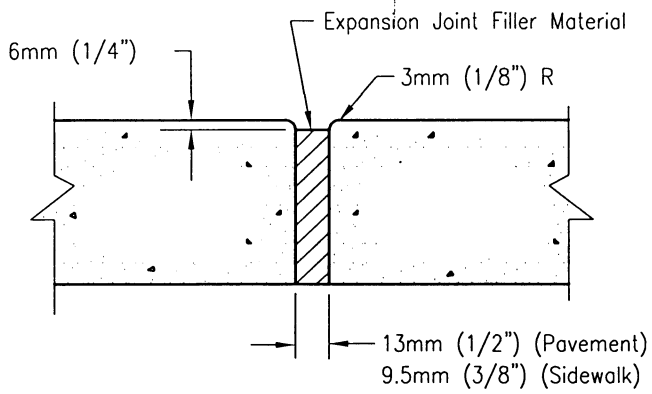
SEE SDG-100



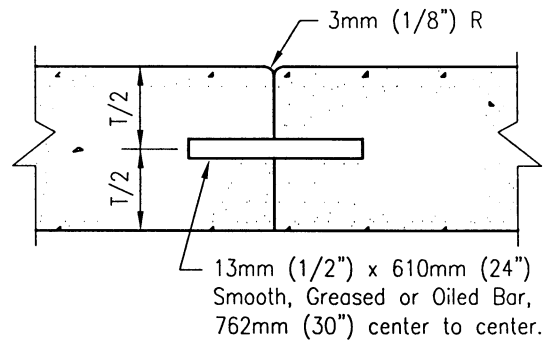
NOTES:

1. Expansion joints --- at curb returns, adjacent to structures and at 13.7m (45') intervals. (See Standard Drawing G-10).
2. Weakened Plane Joints - - - - - at mid point of curb return, when required, and at 4.57m (15') intervals from P.C.R.'s (See Standard Drawing G-10).
3. 6.35mm (1/4") grooves ——— with 6.35mm (1/4") radius edges at 1.52m (5') intervals.

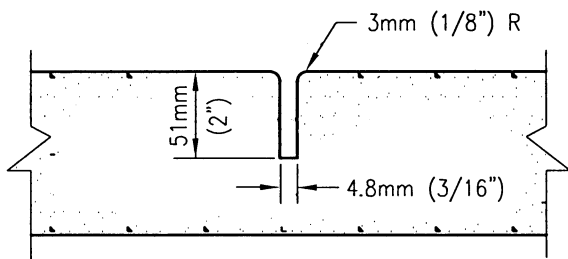
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING SIDEWALK JOINT LOCATIONS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		 3/10/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03		
Reformatted		T. Stanton	04/06		
				DRAWING NUMBER G-9	



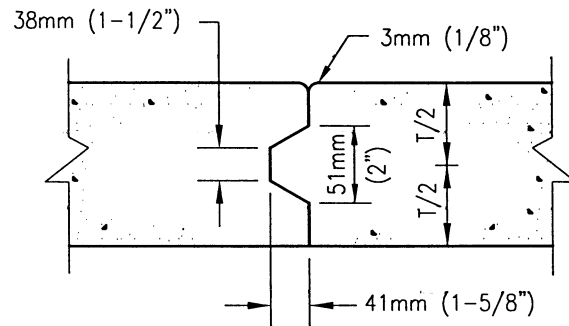
EXPANSION JOINT



CONTACT JOINT



WEAKENED PLANE JOINT
CURB AND SIDEWALK



KEYED JOINT

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

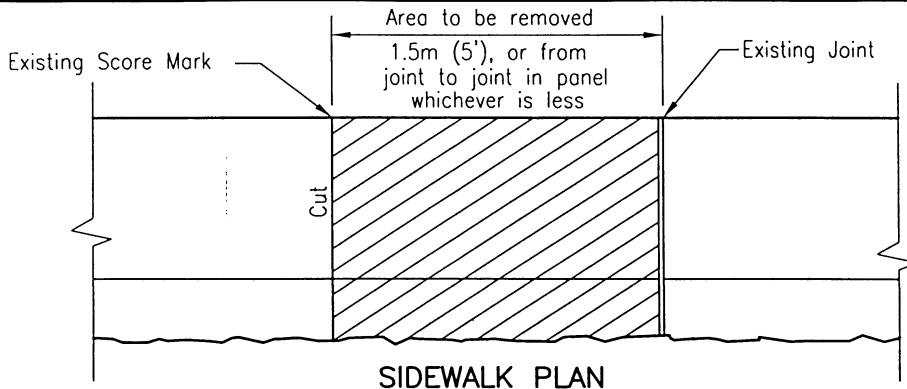
CONCRETE JOINT DETAILS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

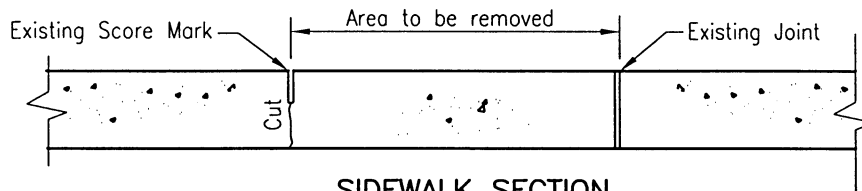
T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

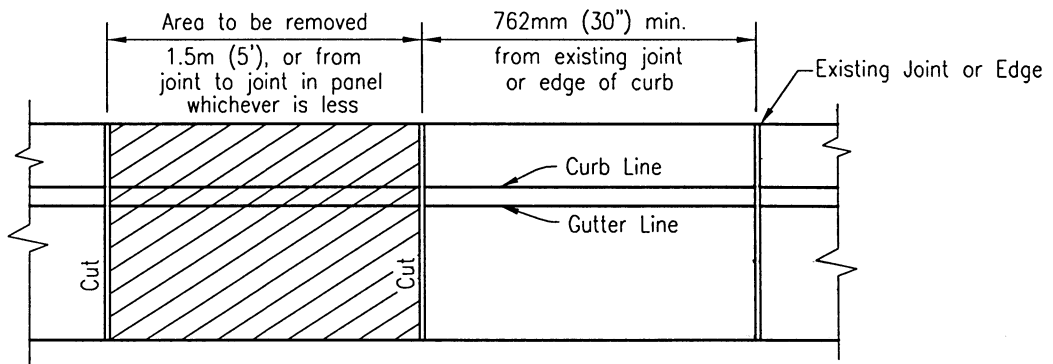
DRAWING NUMBER **G-10**



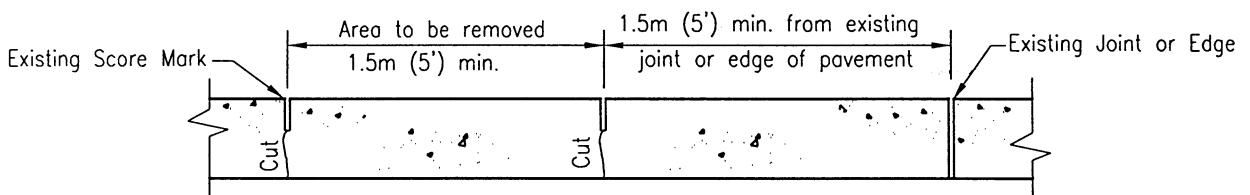
SIDEWALK PLAN



SIDEWALK SECTION



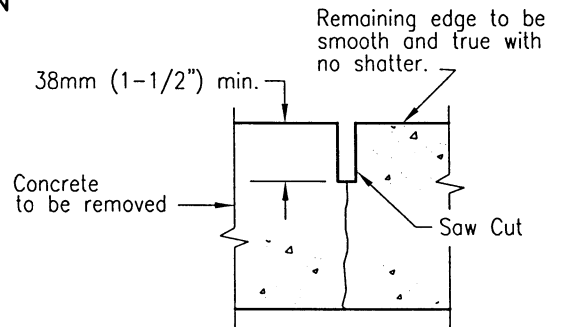
CURB PLAN



PAVEMENT SECTION

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 joint, edge or score mark.



SECTION Showing Cut

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

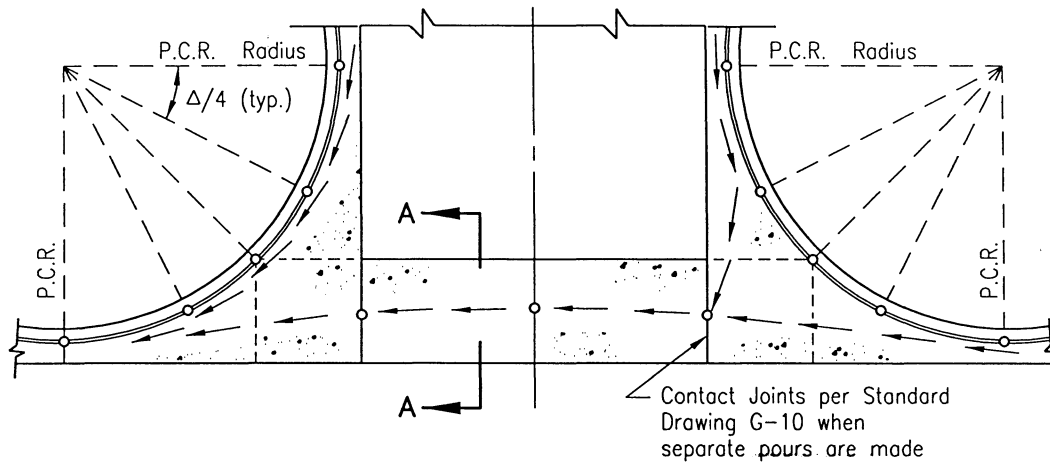
SAN DIEGO REGIONAL STANDARD DRAWING

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

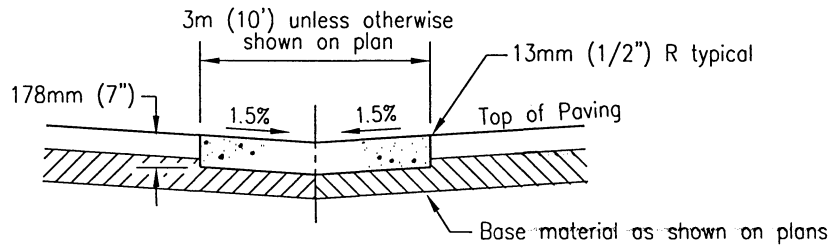
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-11**



PLAN

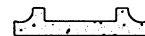


SECTION A-A

NOTES:

1. Concrete shall be 332kg/m³-C-22-MPa (560-C-3250).
2. ----- = Weakened plane joints.
3. ← ← ← = Typical flowlines.
4. o = Elevations to be shown on plans.
5. Return segments to be 178mm (7") Thick.
6. Curb between P.C.R.s shall be considered as part of cross gutter.
7. In all cases subgrade shall be compacted to 95% min. relative compaction to depth of 305mm (12").

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

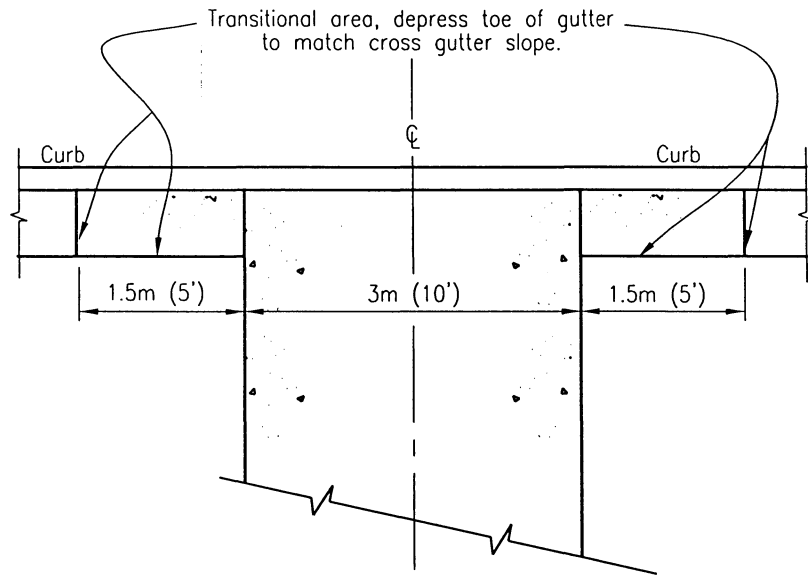
CROSS GUTTER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

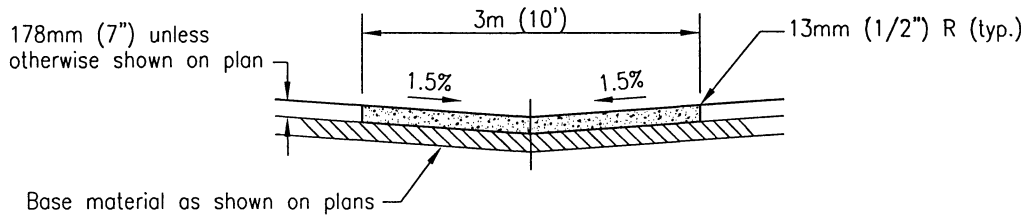
T. Stanton 3/10/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-12**

SEE SDG-100



PLAN

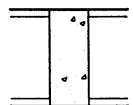


SECTION

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 332kg/m^3 -C-22-MPa (560-C-3250).
4. In all cases subgrade shall be compacted to 95% minimum relative compaction to depth of 305mm (12").

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	03/03

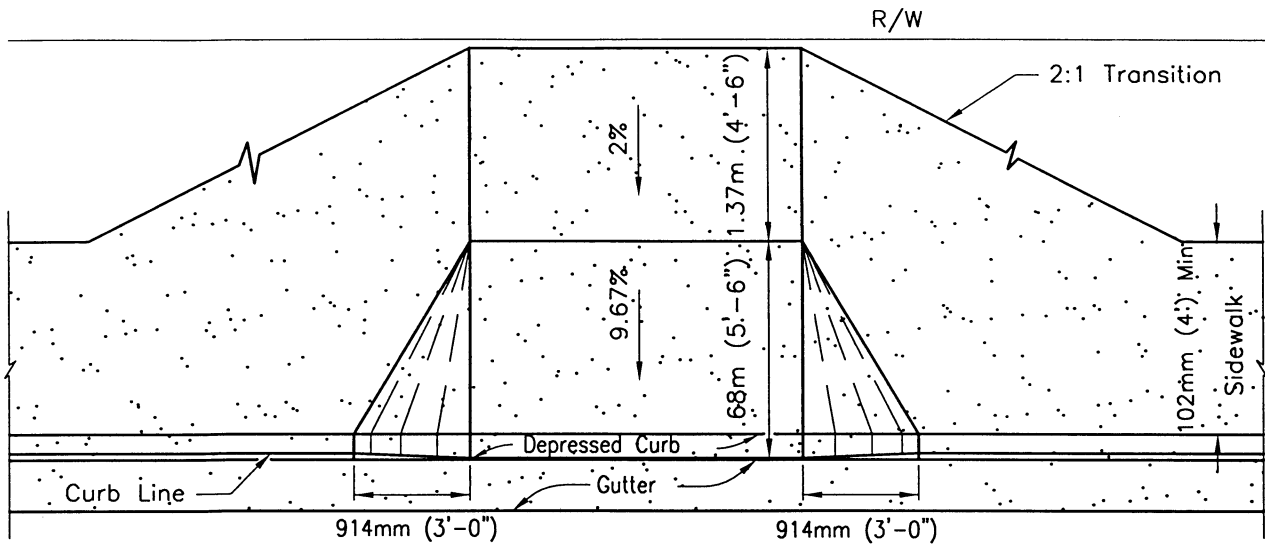
SAN DIEGO REGIONAL STANDARD DRAWING

MID-BLOCK CROSS GUTTER

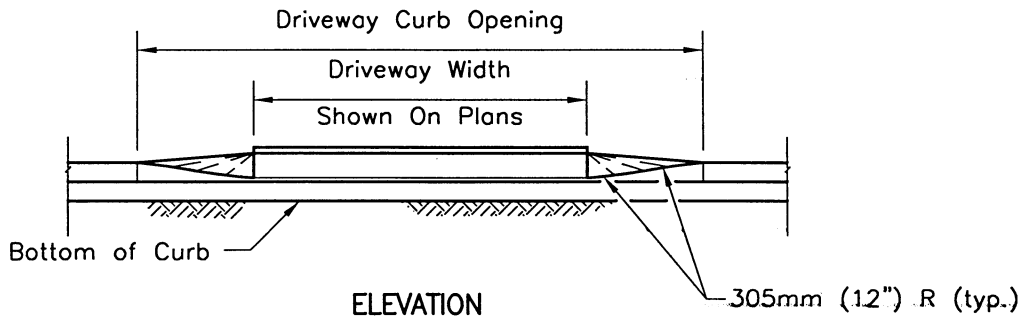
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

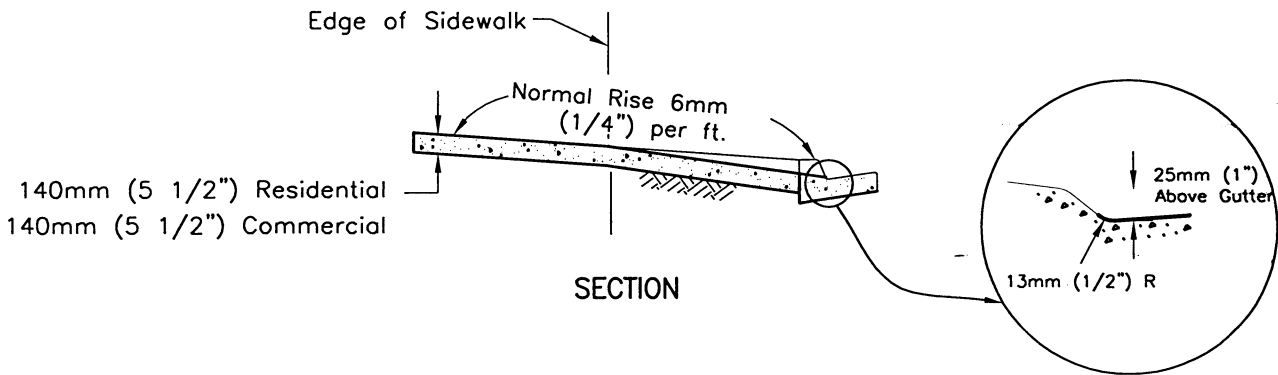
DRAWING NUMBER **G-13**



PLAN



ELEVATION



SECTION

NOTES:

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 332 kg/M³C 22 Mpa (520-C-2500).
3. See Standard Drawings G-15 and G-16 for width and location requirements.
4. Driveway ramp to extend to 3m (10') 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.

Revision	By	Approved	Date
ORIGINAL		R. Munoz	4/97
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

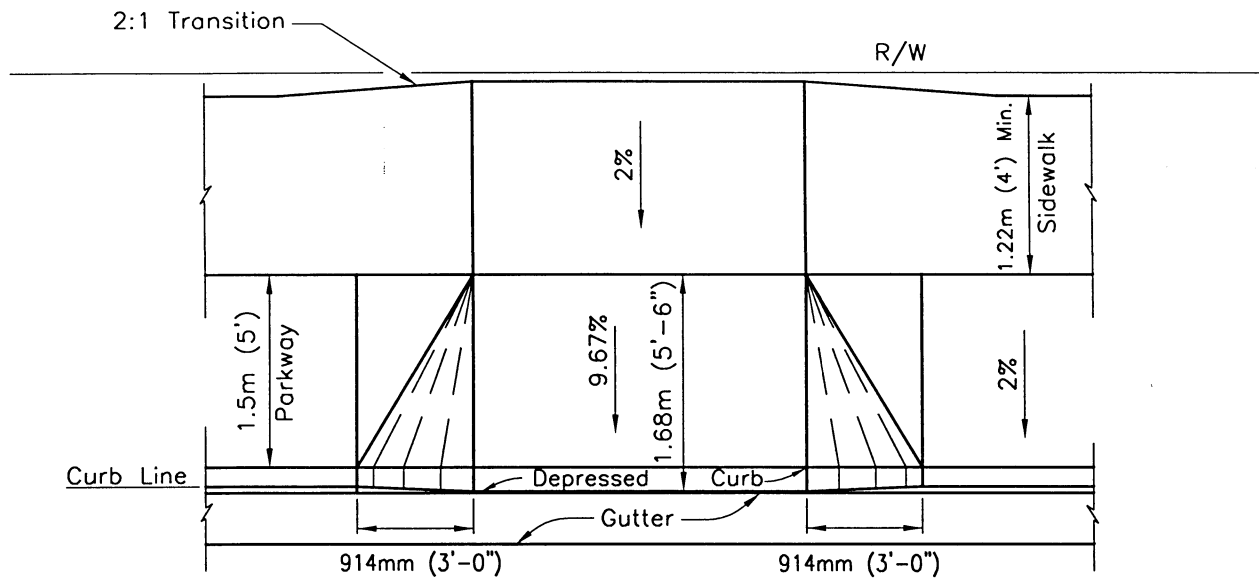
CONCRETE DRIVEWAY
(CONTIGUOUS SIDEWALK)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

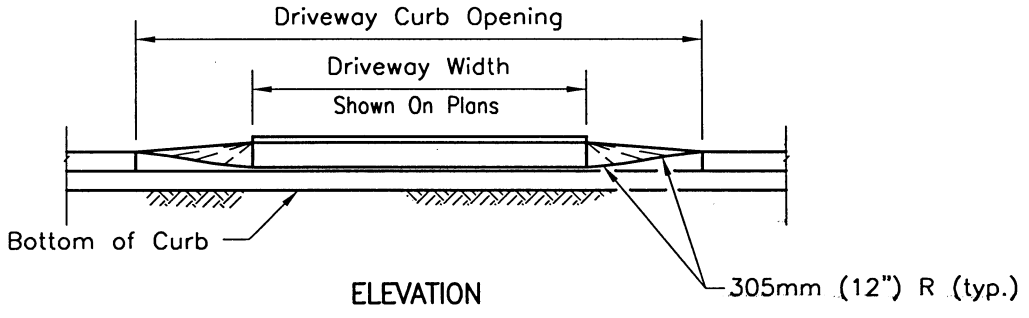
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-14A**

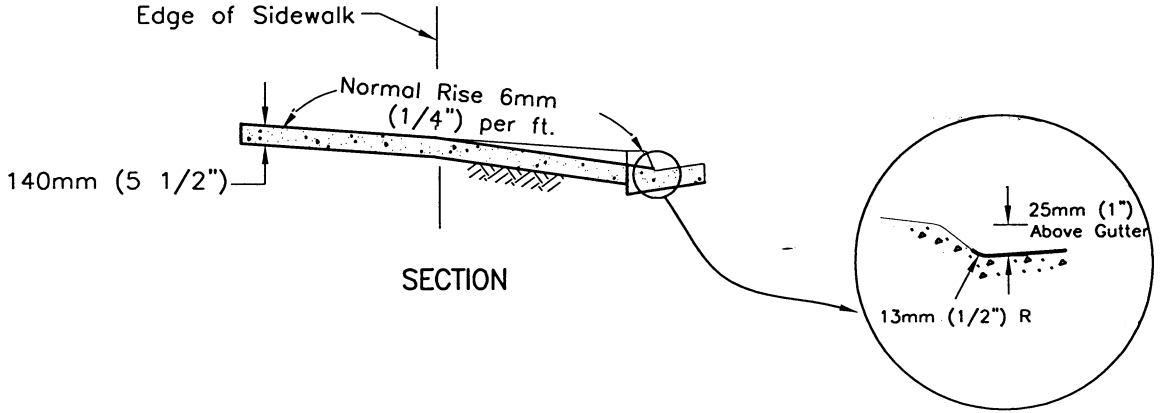
SEE SDG-100



PLAN



ELEVATION

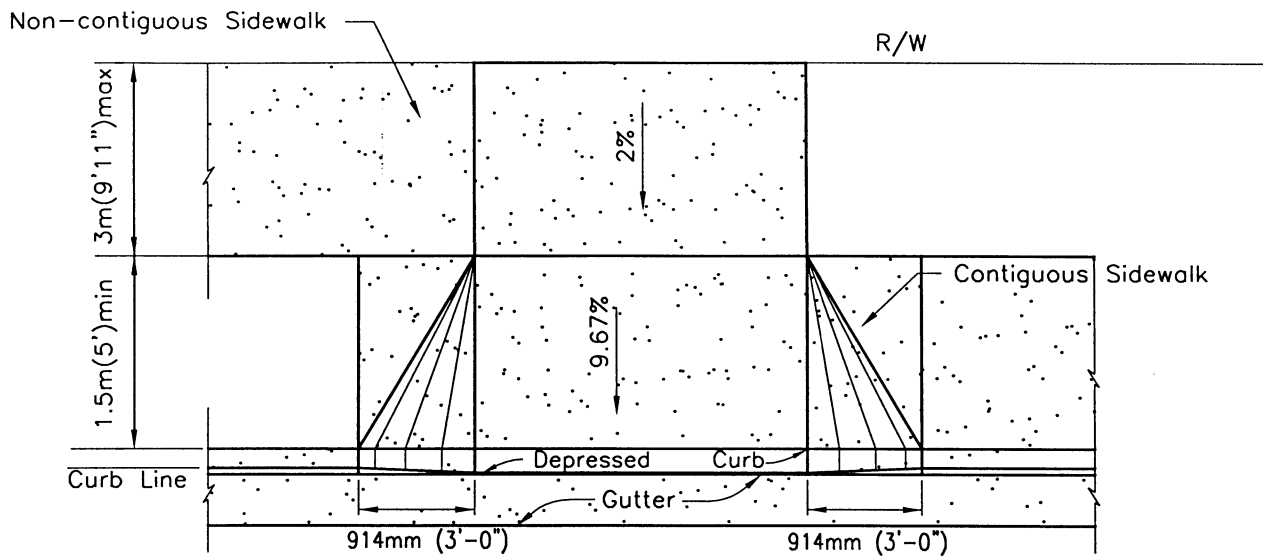


SECTION

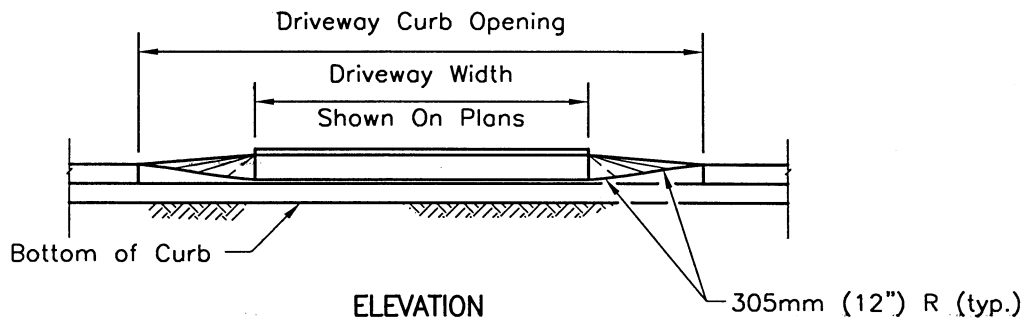
NOTES:

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 308 kg/M³ C 17 Mpa (520-C-2500).
3. See Standard Drawings G-15 and G-16 for width and location requirements.
4. Driveway ramp to extend to 3m (10') 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.

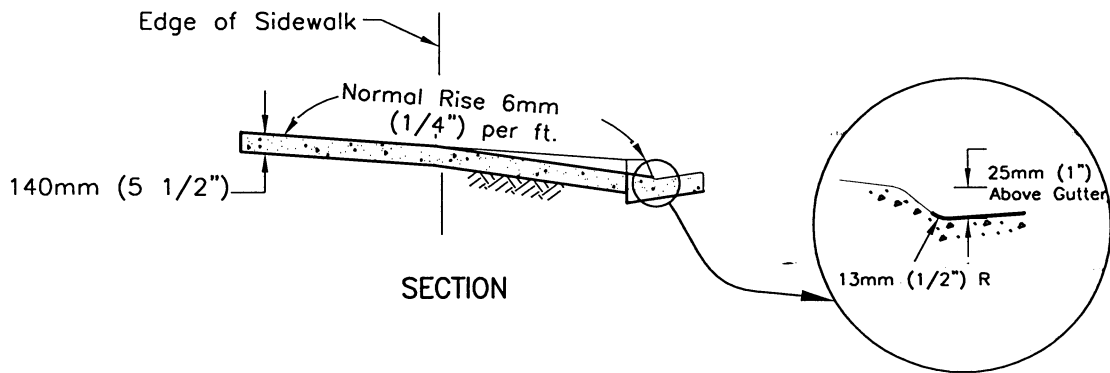
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		R. Munoz	4/97		CONCRETE DRIVEWAY (NON-CONTIGUOUS SIDEWALK)	<i>T. Stanton</i> 3/10/2003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reformatted		T. Stanton	04/06			DRAWING NUMBER G-14B



PLAN



ELEVATION



SECTION

NOTES:

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 308 kg/M³ C 17 Mpa (520-C-2500).
3. See Standard Drawings G-15 and G-16 for width and location requirements.
4. Driveway ramp to extend to 3m (10') 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.

Revision	By	Approved	Date
ORIGINAL		R. Munoz	4/97
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06

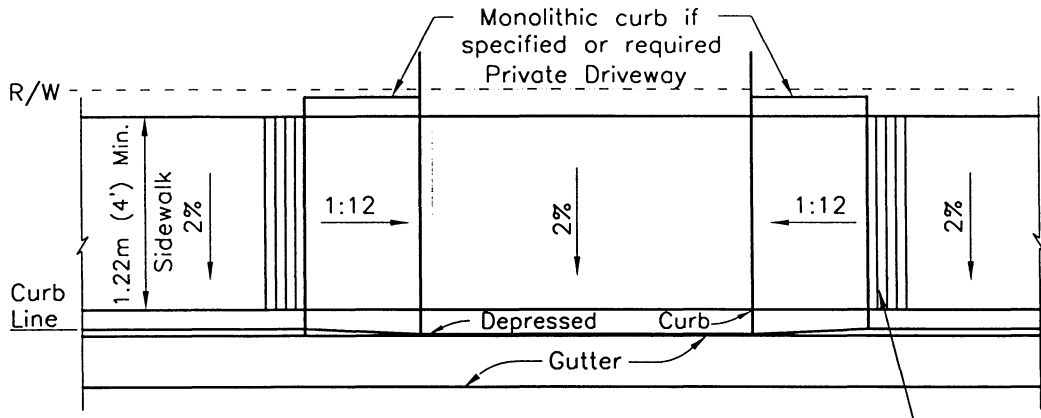
SAN DIEGO REGIONAL STANDARD DRAWING

RESIDENTIAL
CONCRETE DRIVEWAY
(PARKWAY LESS THAN 3.0m (10') IN DEPTH)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

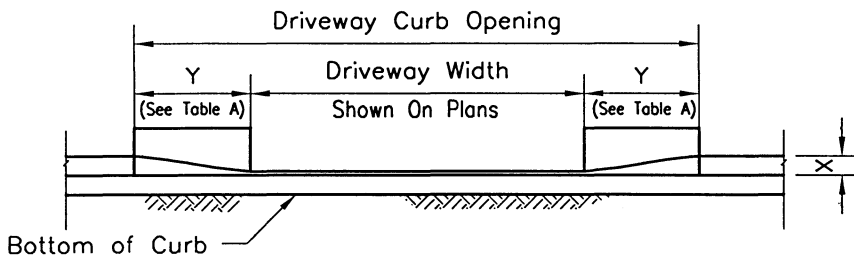
T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-14C**



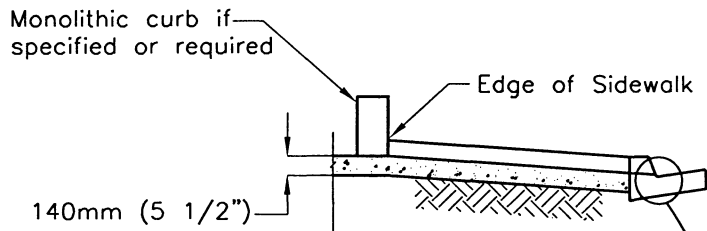
PLAN

305mm (12") wide border with 6mm (1/4") grooves approx. 19mm (3/4") O.C.



ELEVATION

TABLE A	
X	Y
CURB HEIGHT	RAMP LENGTH
25mm (1")	152mm (0'-6")
51mm (2")	457mm (1'-6")
76mm (3")	762mm (2'-6")
102mm (4")	1.10m (3'-6")
127mm (5")	1.40m (4'-6")
152mm (6")	1.70m (5'-6")
178mm (7")	2.0m (6'-6")
203mm (8")	23m (7'-6")



SECTION

NOTES:

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 308 kg/M³ C 17 Mpa (520-C-2500).
3. See Standard Drawings G-15 and G-16 for width and location requirements.
4. See Standard Drawings G-2 and G-10 for curb and joint details.

Revision	By	Approved	Date
ORIGINAL	HH	T. Stanton	02/03
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

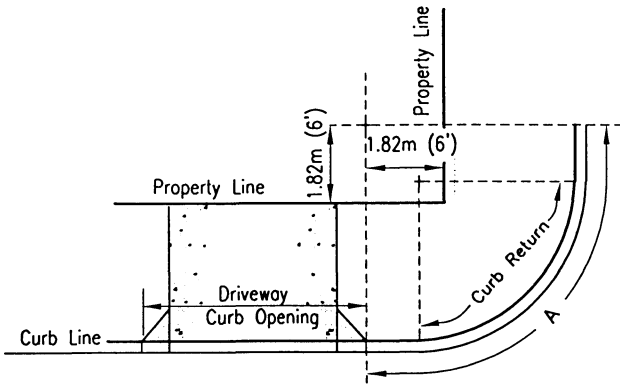
CONCRETE DRIVEWAY
(FOR CONFINED RIGHT-OF-WAY)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

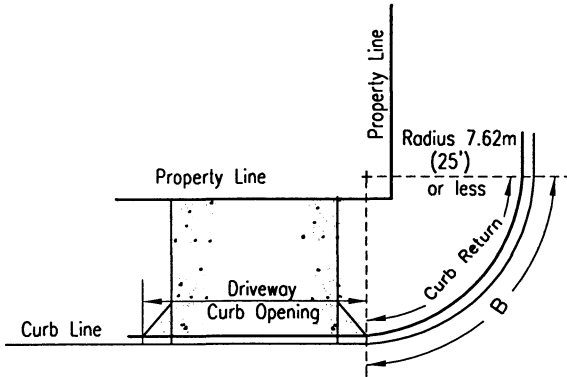
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-14D**



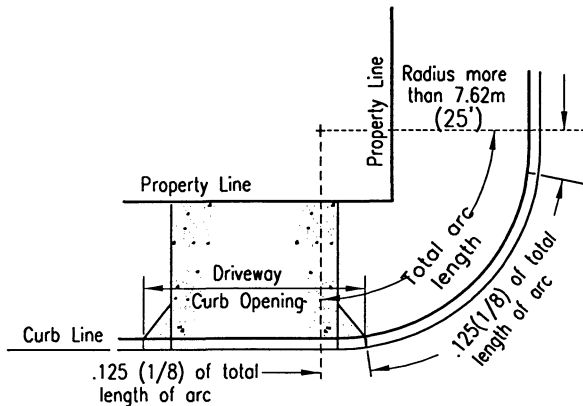
REQUIREMENT 1

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.



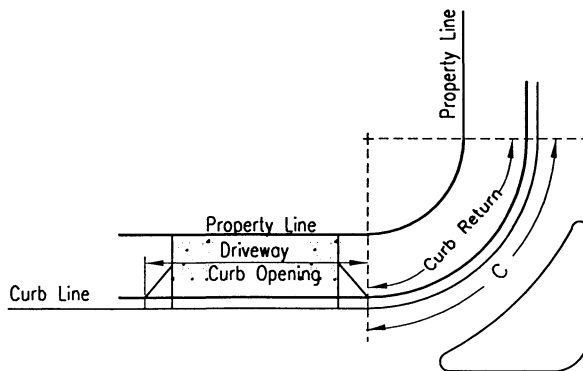
REQUIREMENT 2

No portion of any curb opening shall be permitted in the curb return where the radius of curb is 7.62m (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 .125 (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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

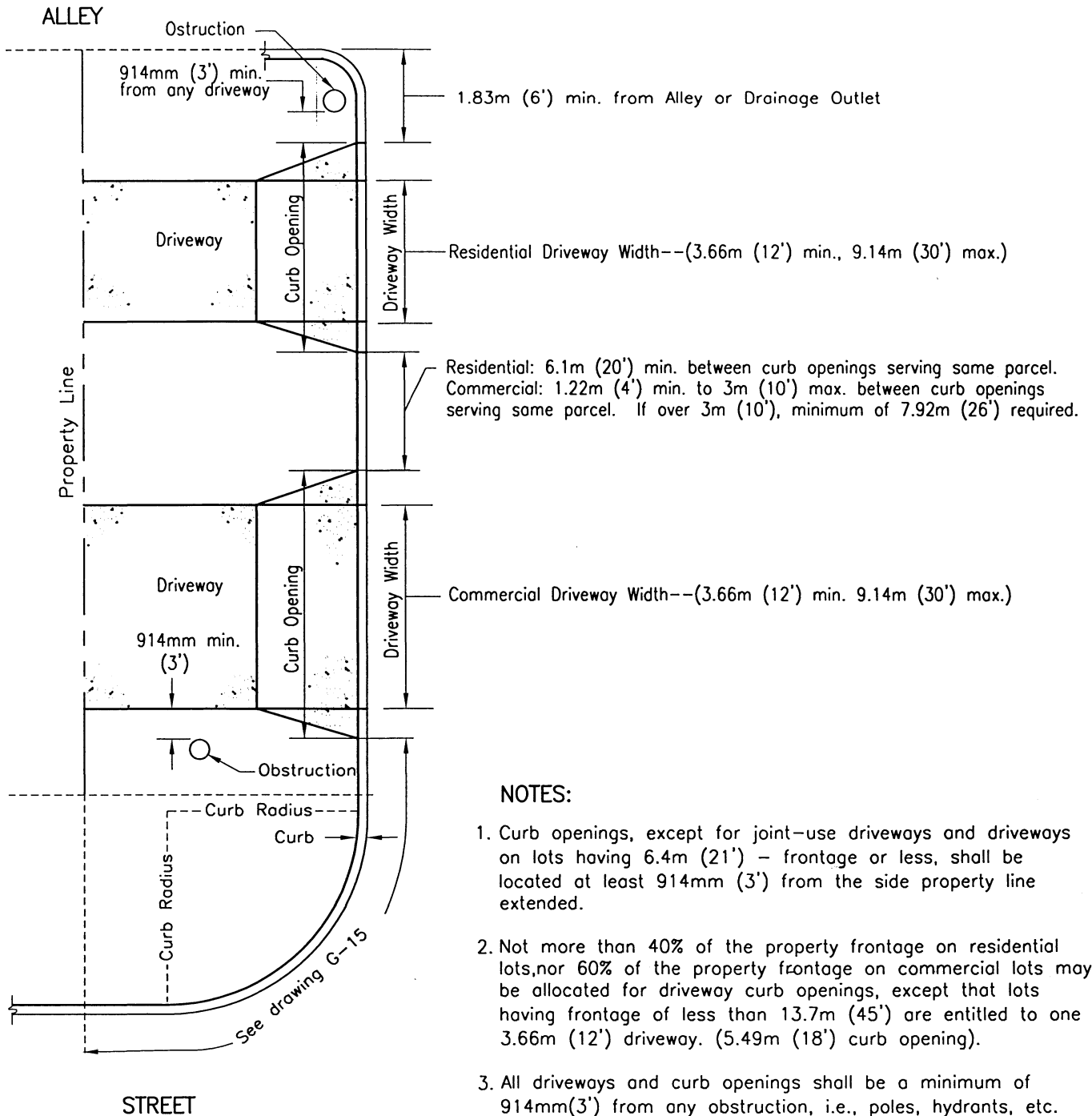
DRIVEWAY LOCATION - ADJACENT TO CURB RETURNS AND STREET LINES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-15**



NOTES:

1. Curb openings, except for joint-use driveways and driveways on lots having 6.4m (21') - frontage or less, shall be located at least 914mm (3') 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 less than 13.7m (45') are entitled to one 3.66m (12') driveway. (5.49m (18') curb opening).
3. All driveways and curb openings shall be a minimum of 914mm(3') 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.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

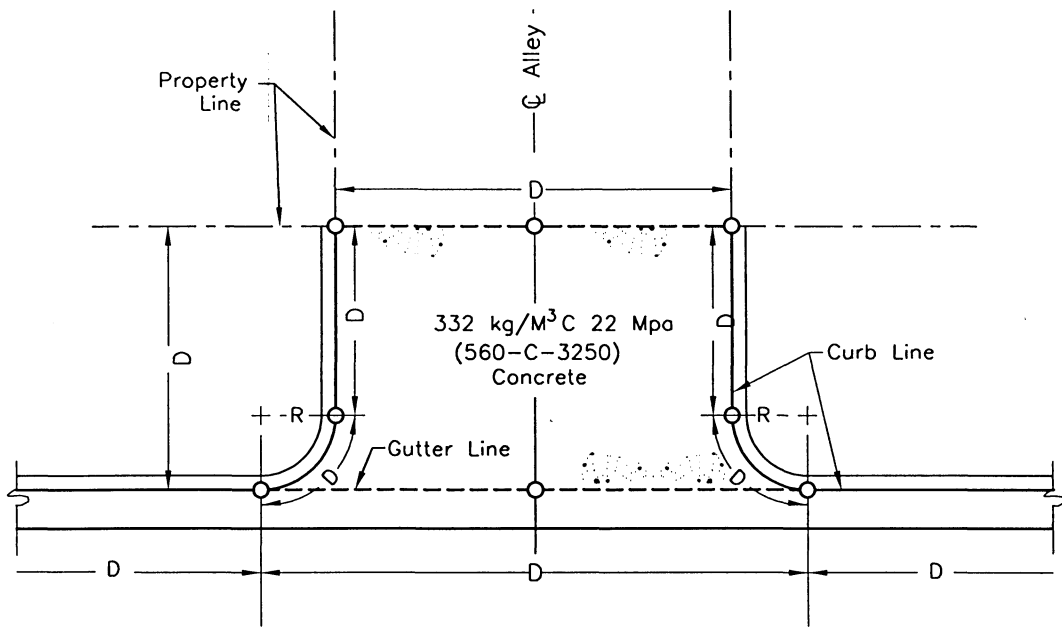
SAN DIEGO REGIONAL STANDARD DRAWING

**DRIVEWAY LOCATION
AND WIDTH REQUIREMENTS**

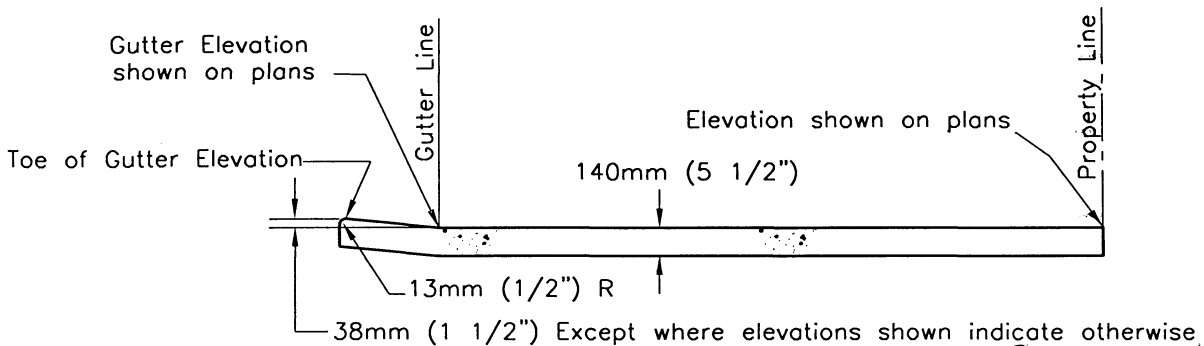
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **G-16**



PLAN



C SECTION

NOTES:

1. Sidewalk ramps shall be installed as required by Agency.
2. D= distance shown on plans.
3. R= radius shown on plans (914mm (3') minimum).
4. O= elevations shown on plans (top of curb, and gutter elev.)
5. --- = 13mm (1/2") expansion joints.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

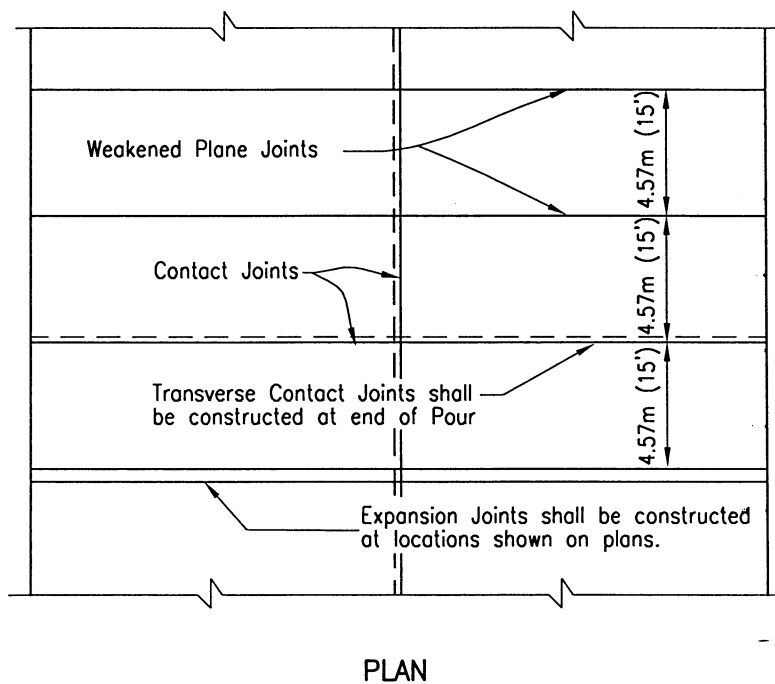
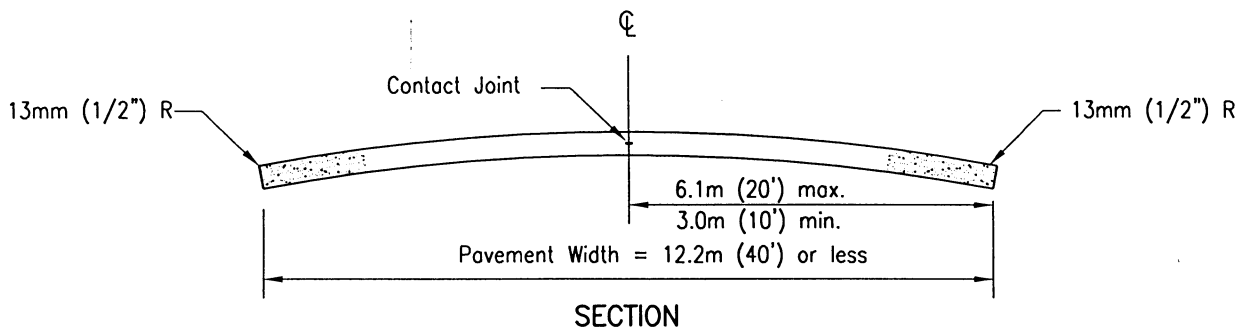
SAN DIEGO REGIONAL STANDARD DRAWING

ALLEY APRON

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-17**



NOTES:

1. Concrete shall be 332 kg/M³ C 22 Mpa (560-C-3250).
2. See Standard Drawing G-10 for joint details.
3. Adjust 4.57m (15') interval between Transverse Joints to match adjacent existing improvements.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

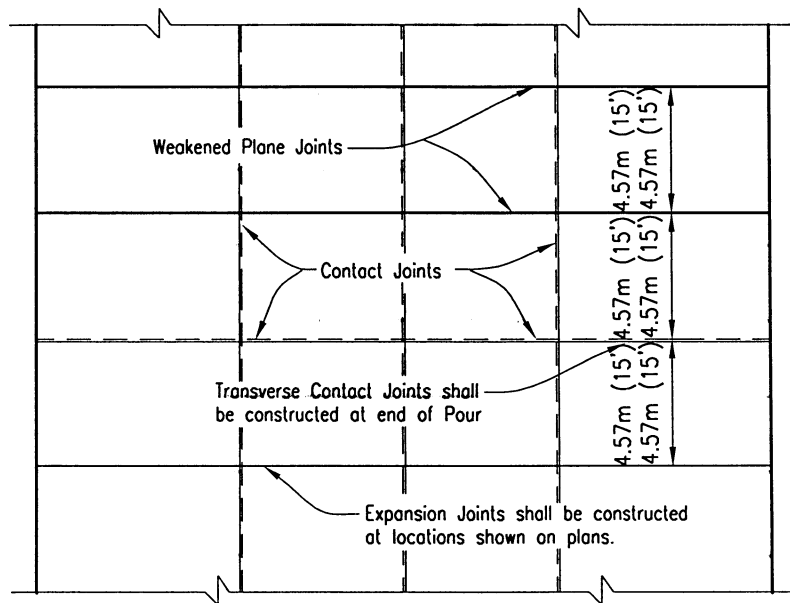
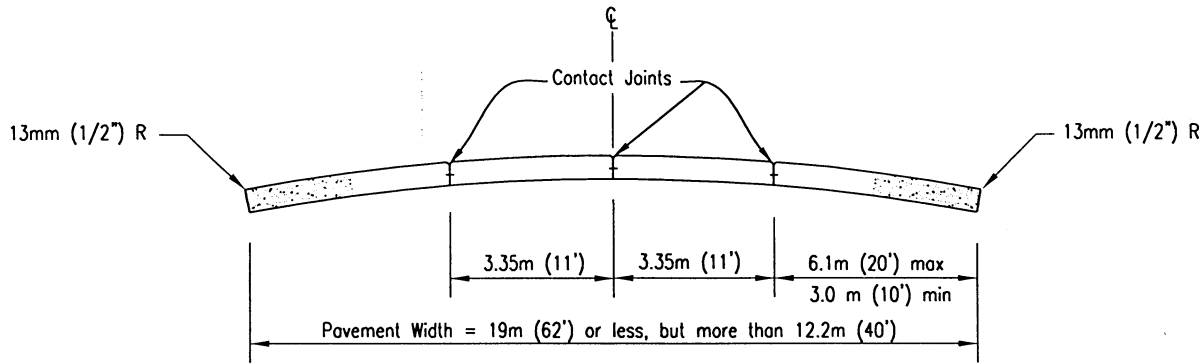
CONCRETE PAVEMENT

WIDTH 12.2m (40') OR LESS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER G-18



NOTES:

1. Concrete shall be 332 kg/M³ C 22 Mpa (560-C-3250).
2. See Standard Drawing G-10 for joint details.
3. Adjust 4.57m (15') interval between Transverse Joints to match adjacent existing improvements.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

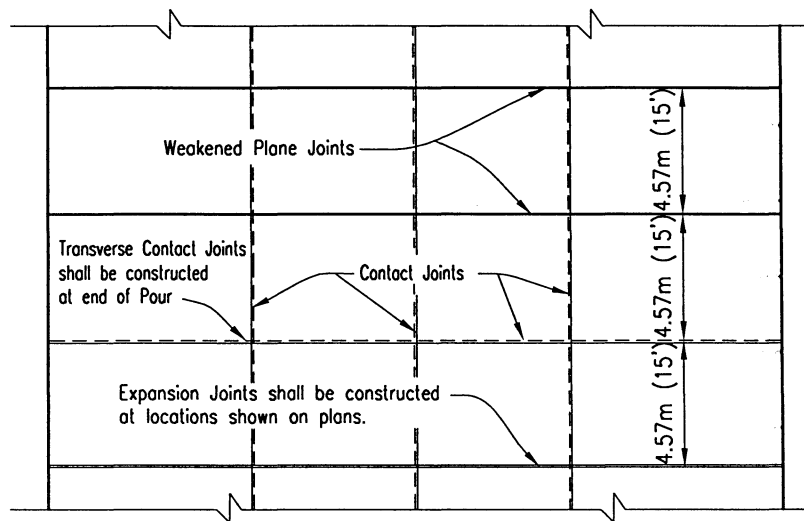
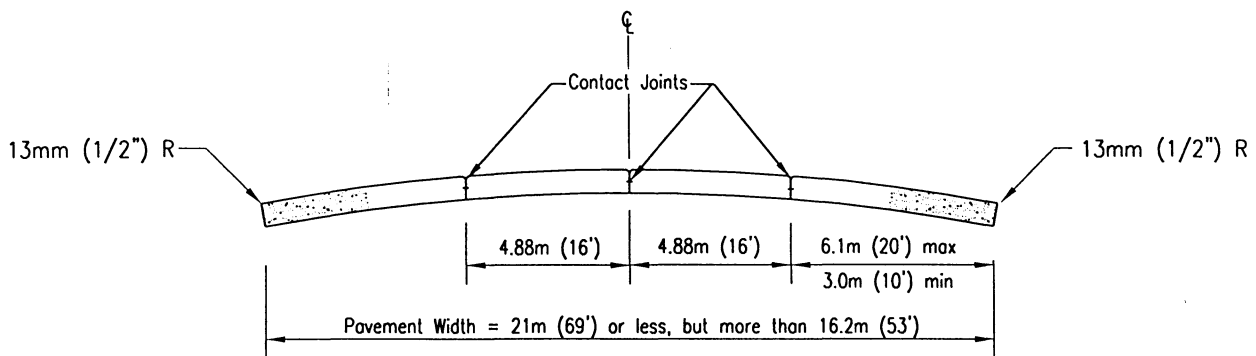
SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE PAVEMENT
WIDTH 12.2m (40') TO 19m (62')**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-19**



NOTES:

1. Concrete shall be 332 kg/M³ C 22 Mpa (560-C-3250).
2. See Standard Drawing G-10 for joint details.
3. Adjust 4.57m (15') interval between Transverse Joints to match adjacent existing improvements.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE PAVEMENT, ALLEY SECTION
WIDTH 16.2m (53') TO 21m (69')**

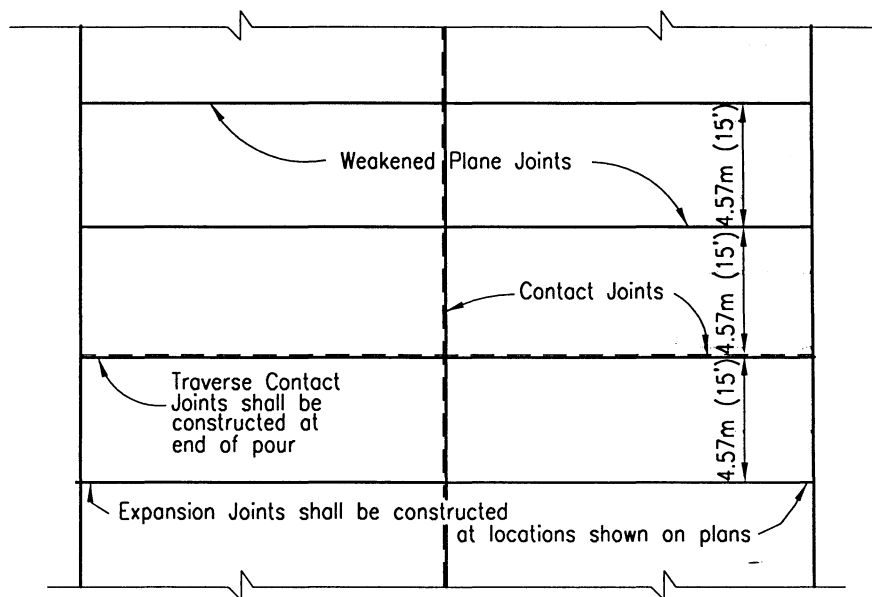
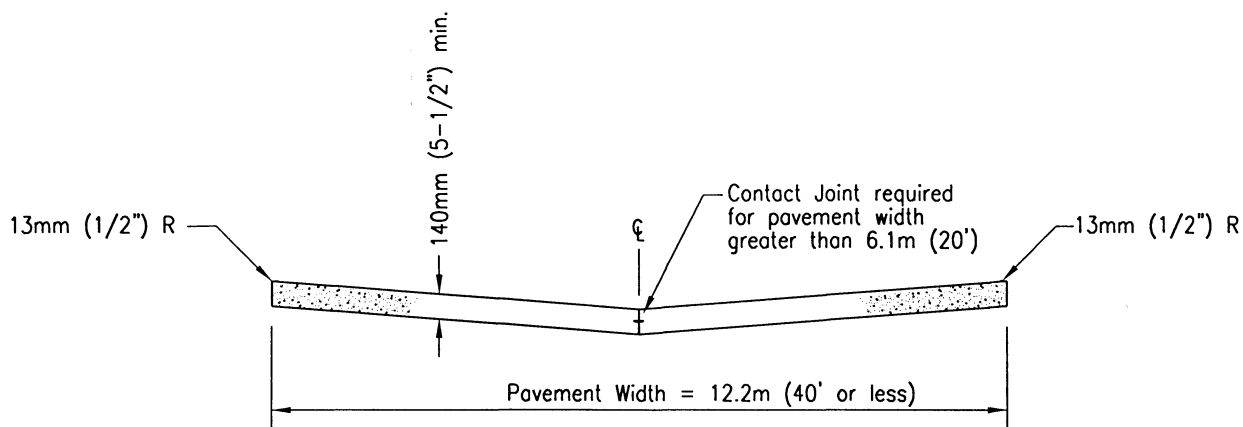
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER

G-20



NOTES:

1. Concrete shall be 332 kg/M³ C 22 Mpa (560-C-3250).
2. See Standard Drawing G-10 for joint details.
3. Adjust 4.57m (15') interval between Transverse Joints to match adjacent existing improvements.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

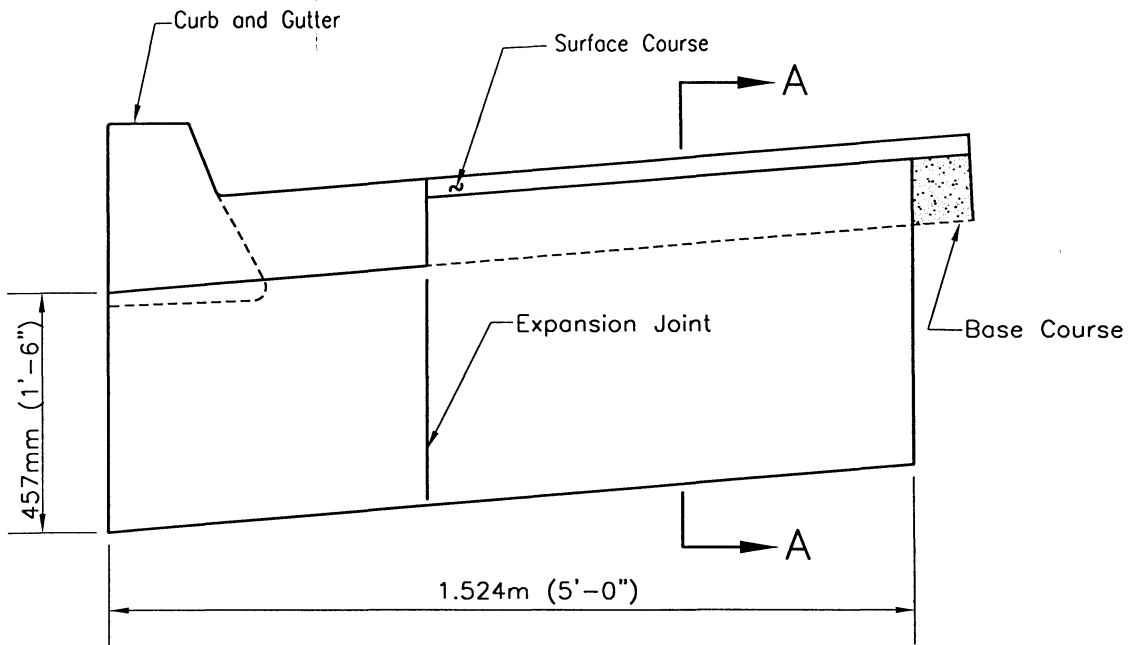
SAN DIEGO REGIONAL STANDARD DRAWING

**CONCRETE PAVEMENT ALLEY SECTION,
WIDTH 12.2m (40') OR LESS**

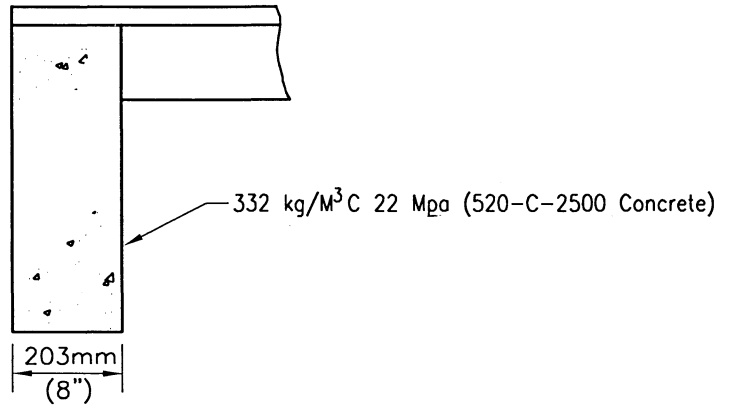
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-21**



ELEVATION

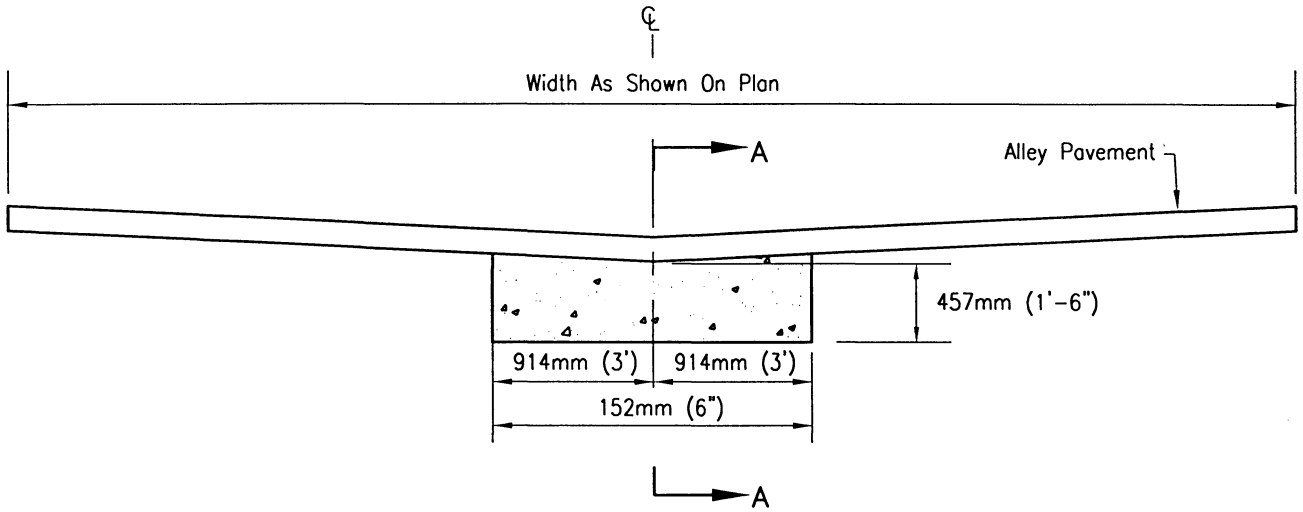


SECTION A-A

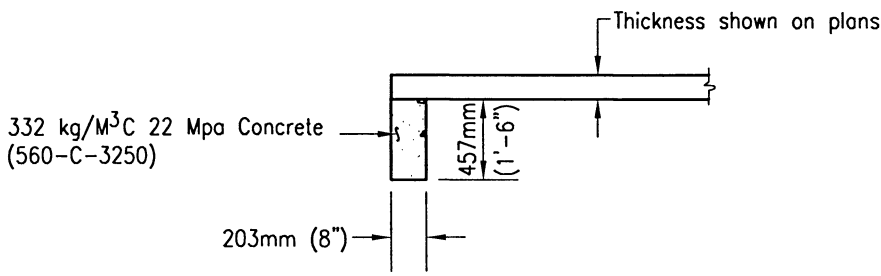
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		CUTOFF WALL AT END OF PAVEMENT
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06	DRAWING NUMBER	
				G-22	



ELEVATION



SECTION A-A

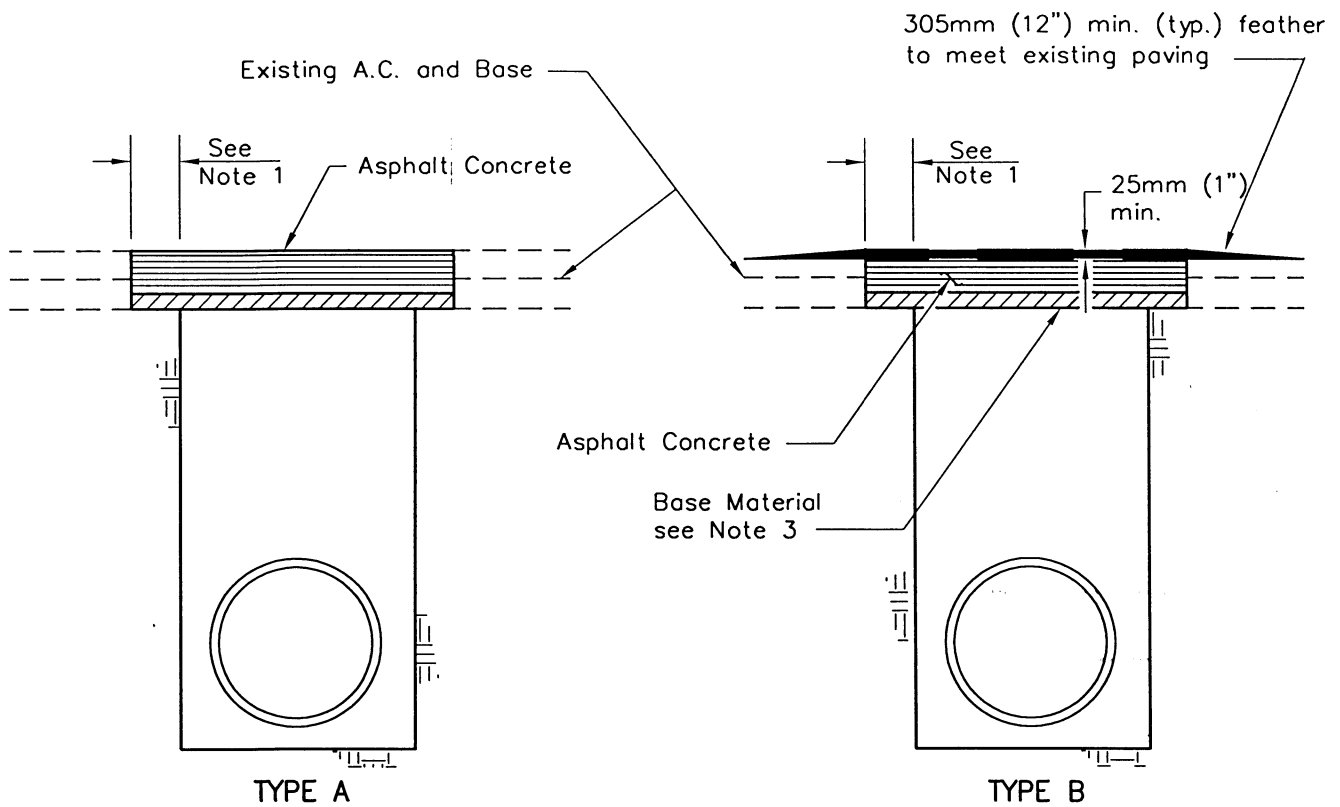
LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING
CUTOFF WALL
AT END OF ALLEY PAVEMENT

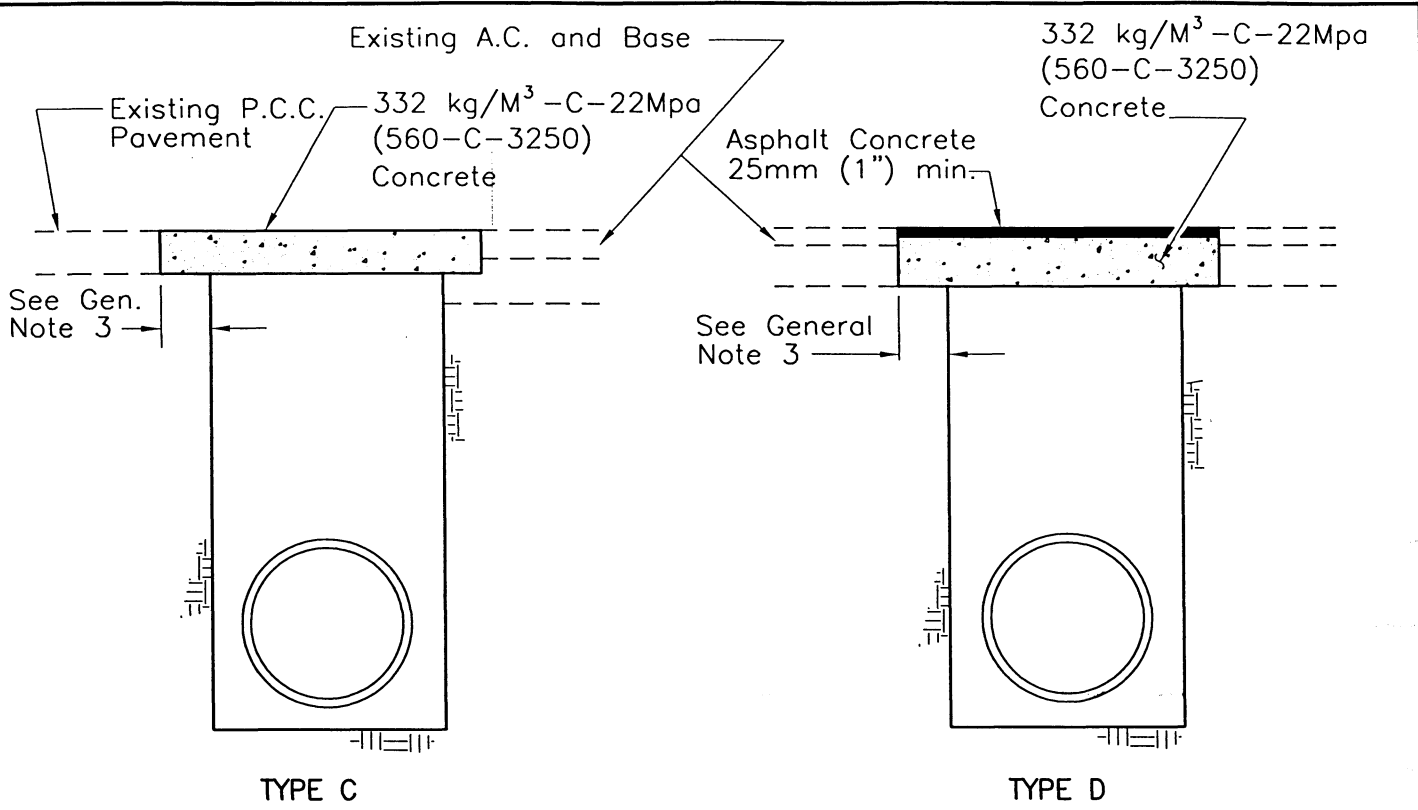
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
T. Stanton 3/01/2003
 Chairperson R.C.E. 19246 Date
DRAWING NUMBER G-23



NOTES:

1. Trench edges to be cut a minimum of 152mm (6") wider than trench for 914mm (3') wide or less, and 305mm (12") wider for trenches over 914mm (3') wide.
2. 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.
3. Base material shall be replaced to depth of existing base. A.C. may be substituted for base material.
4. A tack coat of asphaltic emulsion or paving asphalt shall be applied to existing A.C. or P.C.C. contact surfaces, prior to resurfacing.
5. Asphalt 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.
6. 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.
7. Type B shall not be used on lateral crossings.
8. Sloughing of trench under pavement shall be cause for requiring additional pavement and base.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Parkinson	2/95		TRENCH RESURFACING TYPES A & B	<i>T. Stanton</i> 3/01/2003
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date		
Reviewed		T. Stanton	04/06	DRAWING NUMBER		G-24



GENERAL NOTES:

- Existing A.C. shall be cut and removed in such a manner so as not to tear, bulge or displace adjacent pavement. Edges shall be clean and vertical. All cuts shall be parallel or perpendicular to street centerline, when practical.
- Sloughing of trench under pavement shall be cause for requiring additional pavement and base.
- Trench edges to be cut a minimum of 152mm(6") wider than trench for 914mm (3') wide or less, and 305mm (12") wider for trenches over 914mm (3') wide.

NOTES TYPE-C:

- Concrete shall be colored black where required to match existing pavement, method to be specified by Agency.
- Minimum concrete thickness:
 Alleys and local residential street -----127mm (5")
 Major streets and highway -----178mm (7")
 Trench resurfacing in P.C.C. pavement shall have the above minimum thickness or match the existing concrete thickness plus one inch, whichever is greater.

NOTES TYPE-D:

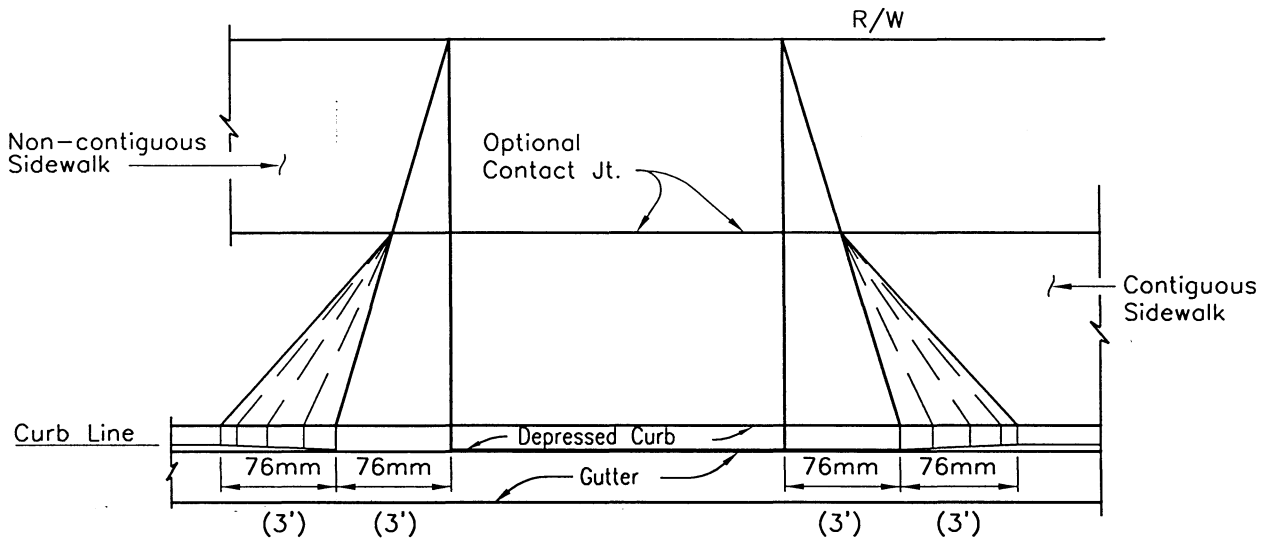
- A.C. shall be hot plant mix.
- A tack coat of asphaltic emulsion or paving asphalt shall be applied to the existing A.C. at all contact surfaces and to portland cement concrete prior to placing new A.C.
- A.C. resurfacing shall be seal coated with an emulsified asphalt and covered with sand. Chip sealing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

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

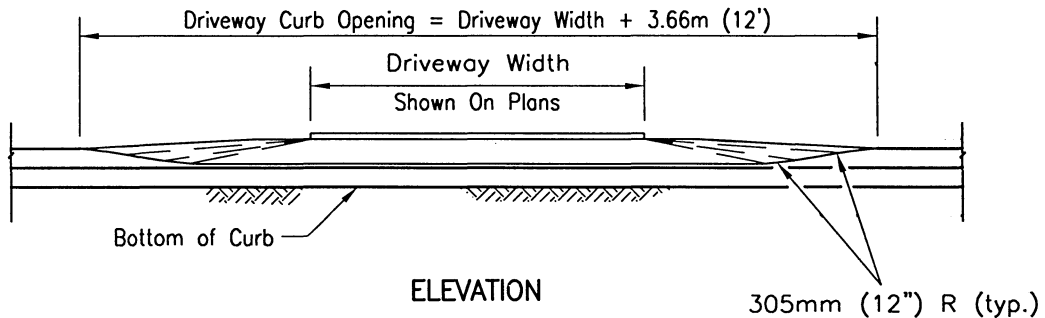
SAN DIEGO REGIONAL STANDARD DRAWING

**TRENCH RESURFACING
TYPES C & D**

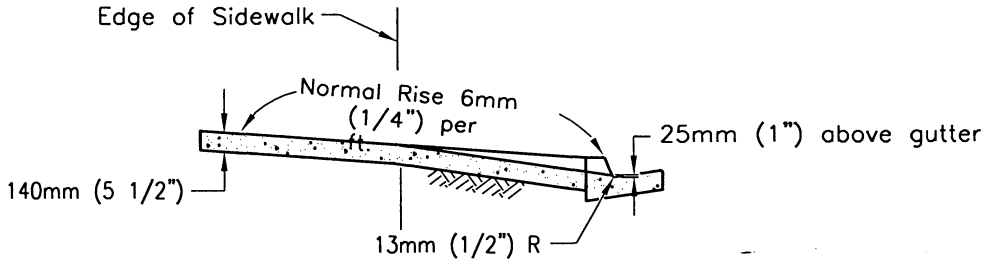
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
<i>T. Stanton</i>	3/01/2003
Chairperson R.C.E. 19246	Date
DRAWING NUMBER	G-25



PLAN



ELEVATION

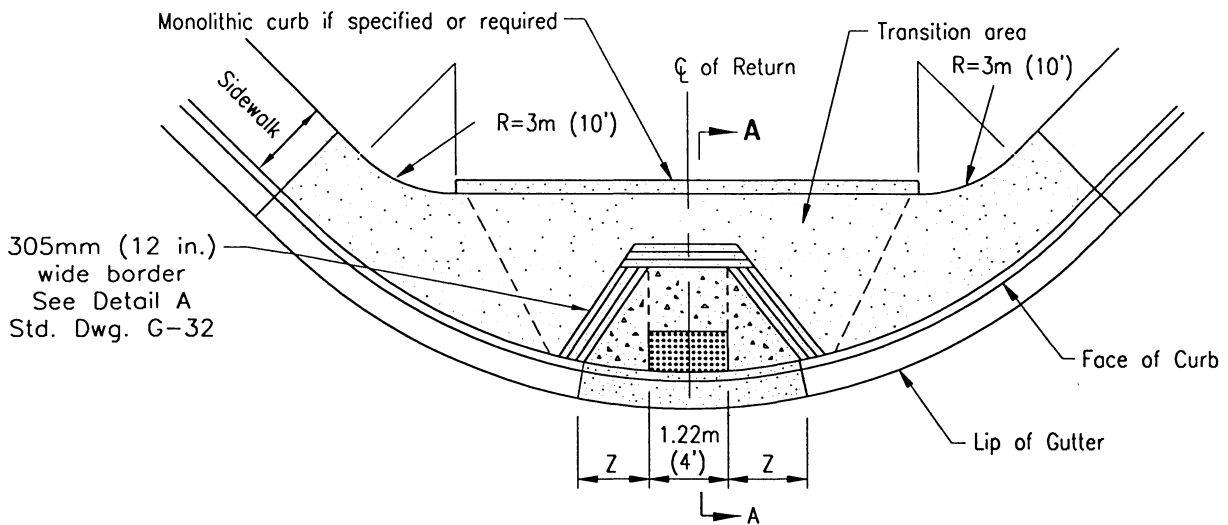


SECTION

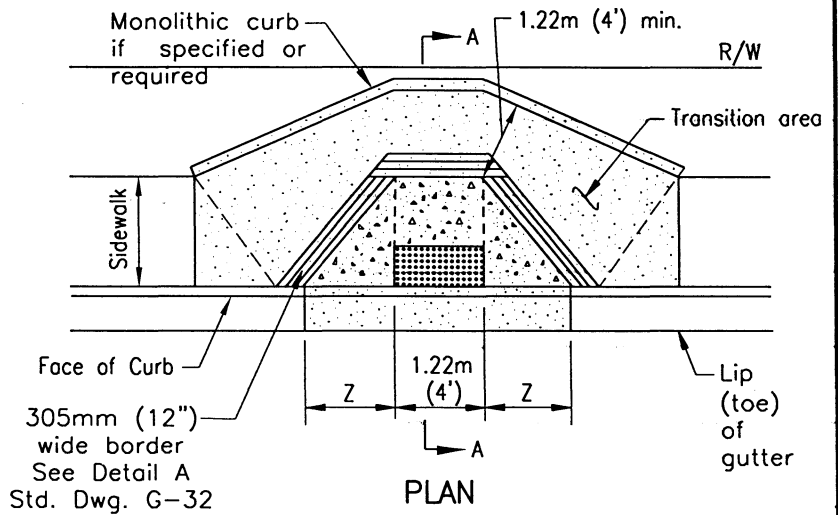
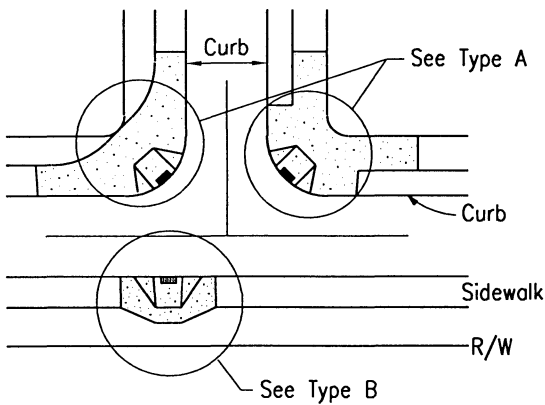
NOTES:

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 308 kg/M³C 17 Mpa (520-C-2500.)
3. See Standard Drawings G-15 and G-16 for width and location requirements
4. Driveway ramp to extend to 3m (10') 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.

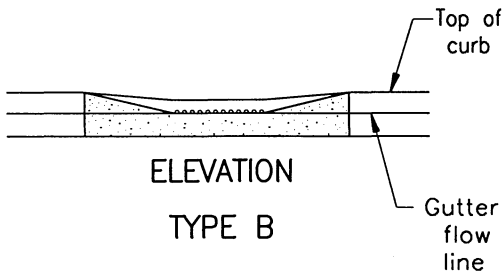
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		H. Hecht	10/82		CONCRETE DRIVEWAY COMMERCIAL ALTERNATE
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246	
Reviewed		T. Stanton	04/06		DRAWING NUMBER G-26



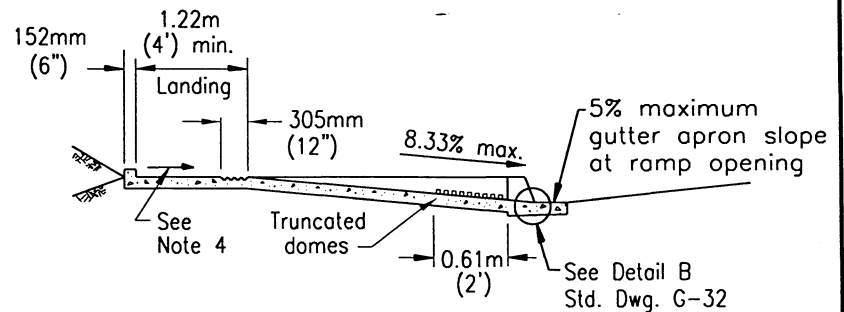
PLAN - TYPE A



PLAN



ELEVATION
TYPE B



SECTION A-A

NOTES:

1. See Drawing G-32 for general notes.
2. For truncated domes details, please see Drawing G-30.
3. Z side slope shall be 10:1.
4. Landing cross slope shall be 2.0% max. in both directions.

Revision	By	Approved	Date
ORIGINAL		M. Bahmanian	4/86
Add Metric		T. Stanton	03/03
UPDATE		D. Davies	12/04
Revised		T. Stanton	04/06

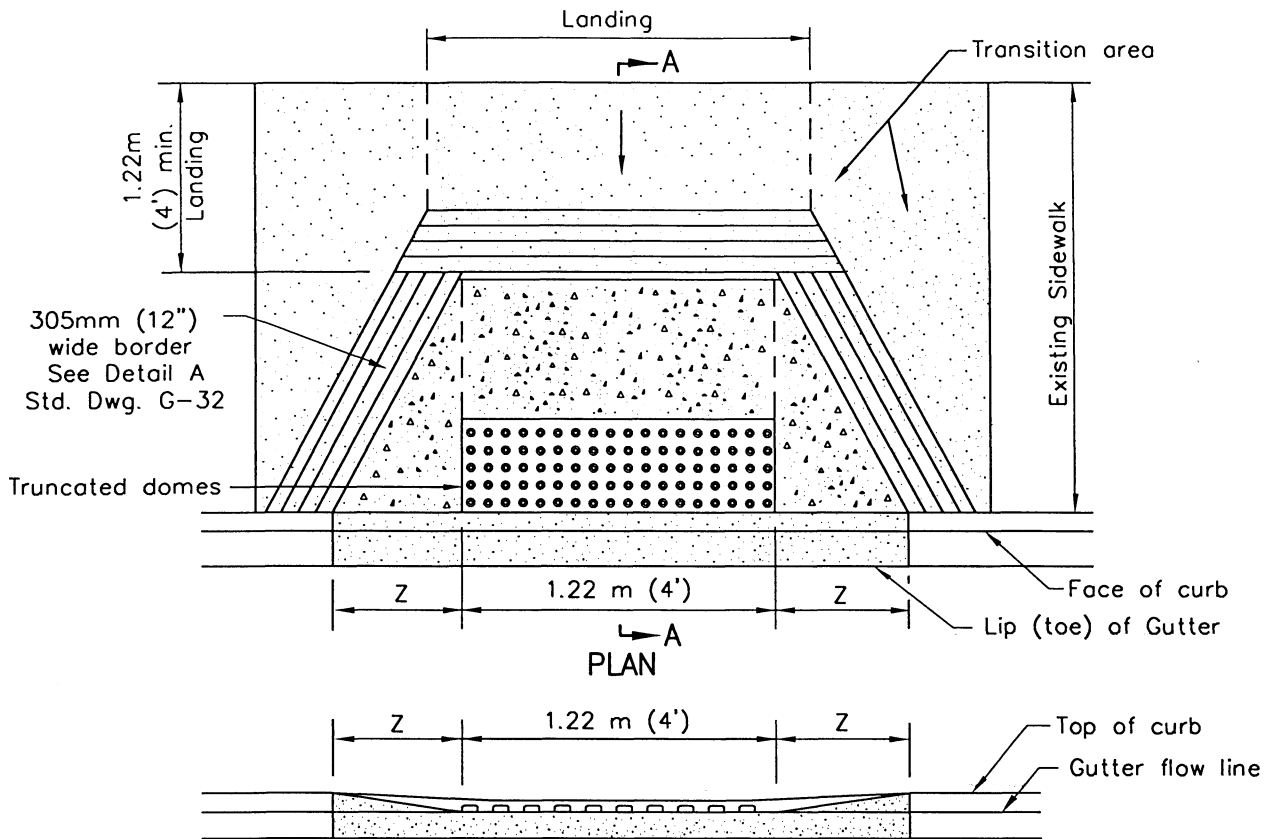
SAN DIEGO REGIONAL STANDARD DRAWING

**CURB RAMP - TYPES A AND B
(NEW CONSTRUCTION)**

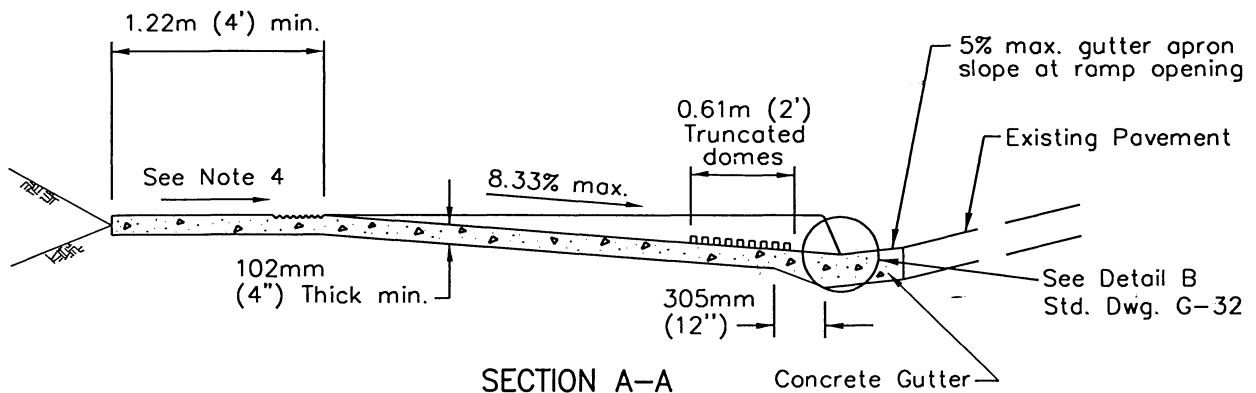
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 12-09-2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-27**



ELEVATION



SECTION A-A

NOTES:

1. See Standard Drawing G-32 for general notes.
2. Type A-1 is a designation for ramp at curb return.
3. Type B-1 is a designation for ramp at straight curb (shown above).
4. Landing cross slope shall be 2.0% max. in both directions.
5. For truncated domes details, please see Standard Drawing G-30.
6. Z side slope shall be 10:1.

Revision	By	Approved	Date
ORIGINAL		M. Bahmanian	2/95
Add Metric		T. Stanton	03/03
UPDATE		D. Davies	12/04
Revised		T. Stanton	04/06

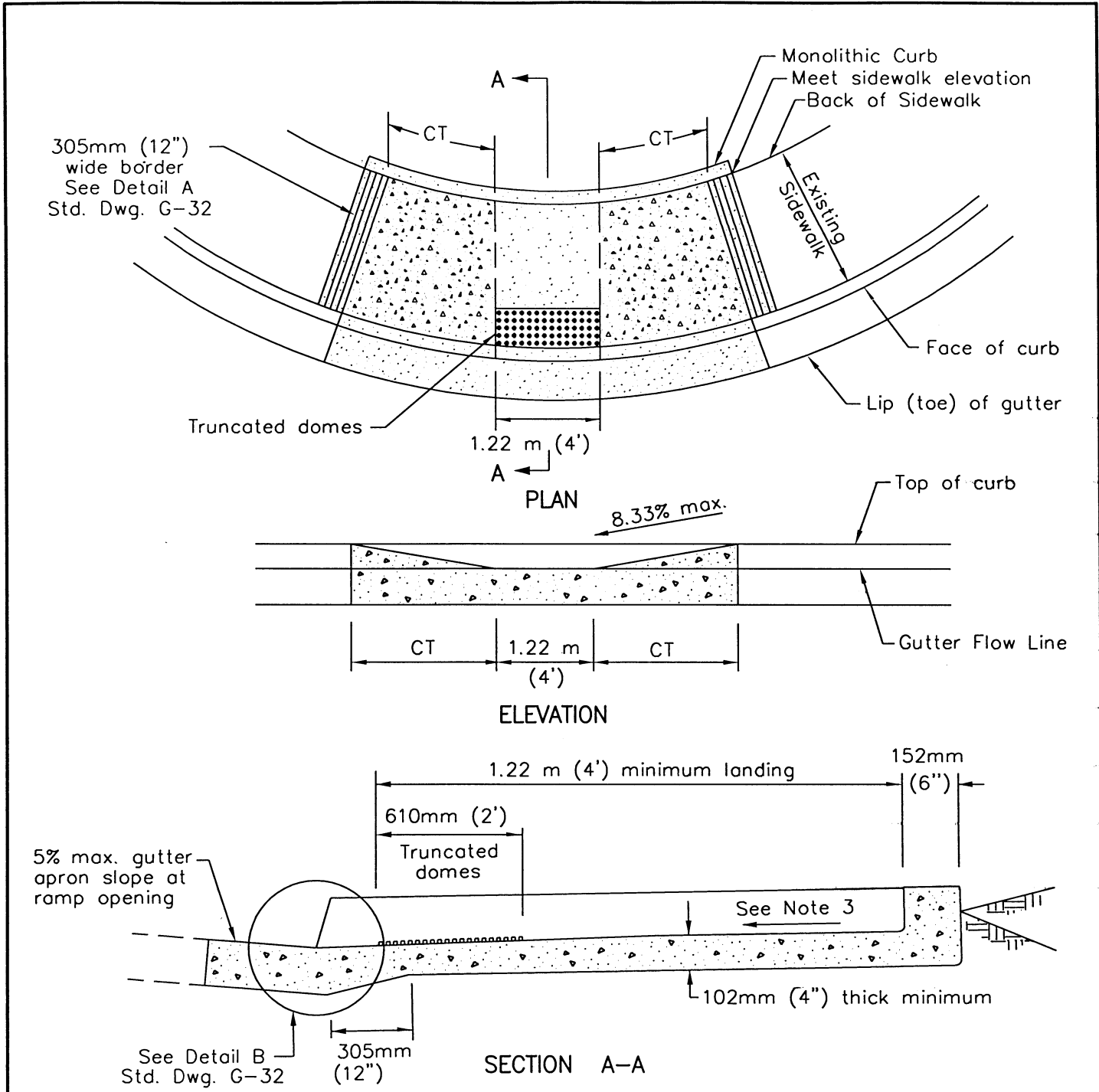
SAN DIEGO REGIONAL STANDARD DRAWING

**CURB RAMP - TYPES A-1 AND B-1
(FOR EXISTING SIDEWALK)**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 12-09-2004
Chairperson R.C.E. 19246 Date

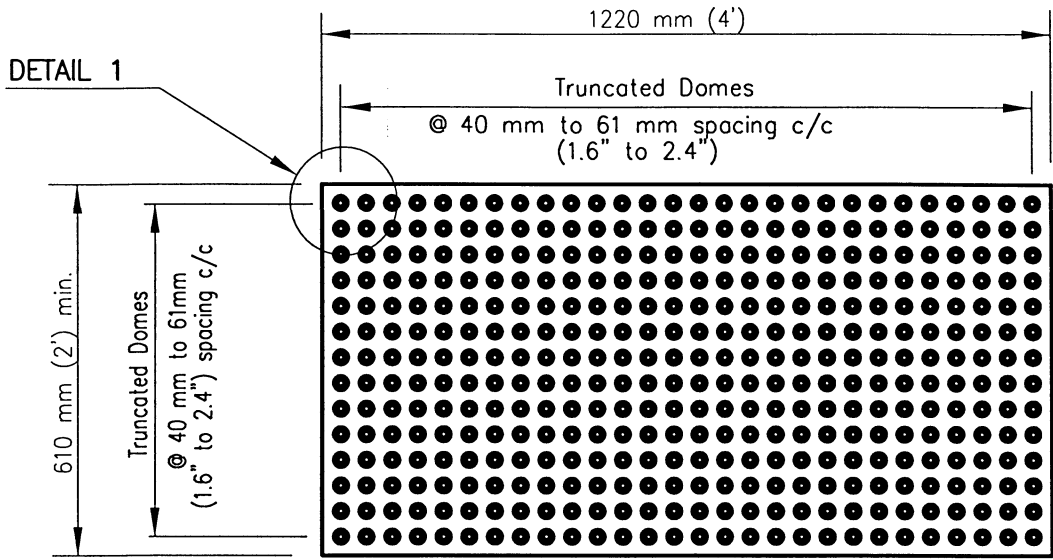
DRAWING NUMBER **G-28**



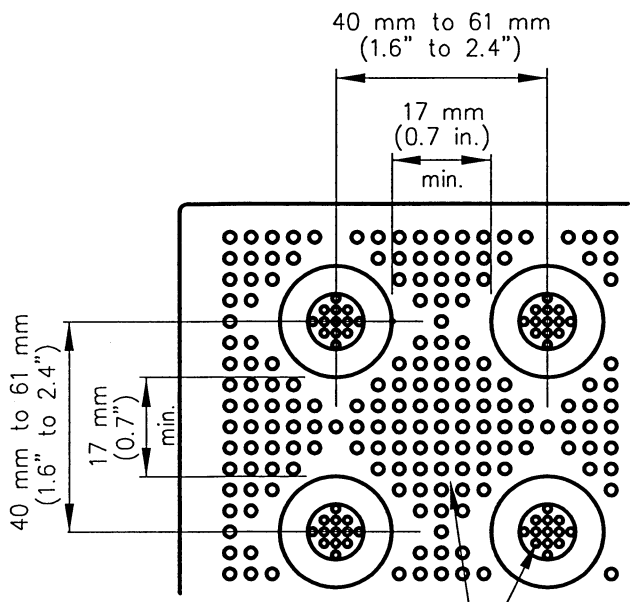
NOTES:

1. Type C ramps are only to be used to mitigate existing conditions where inadequate right of way exists to use Standard Drawing G-28, and are not to be used in new construction.
2. See Standard Drawing G-32 for general notes.
3. Landing cross slope shall be 2.0% max. in both directions.
4. For truncated domes, please see Standard Drawing G-30.
5. CT Curve Transition slope shall be 8.33% maximum.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		R. Munoz	5/97		CURB RAMP - TYPE C (FOR EXISTING SIDEWALK)
Add Metric		T. Stanton	03/03		
UPDATE		D. Davies	12/04	DRAWING NUMBER	
Revised		T. Stanton	04/06	G-29	

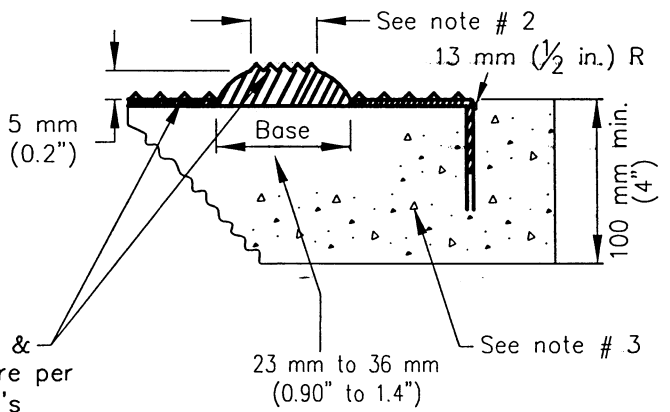


PLAN - TILE
NOT TO SCALE



DETAIL 1
NOT TO SCALE

Note:
Pattern, size &
orientation are per
manufacturer's
recommendation



NOTES:

1. Detectable warning surface color shall be yellow conforming to federal standards 595B Table IV, color No. 33538, or as specified by the agency. Color shall be homogeneous throughout the tile.
2. Truncated dome top diameter of 50% of the base diameter minimum to 65% of the base diameter maximum.
3. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile to rock the tile, causing a void between the underside of tile and concrete.

Revision	By	Approved	Date
ORIGINAL		G. Parkinson	2/95
Add-Metric		T. Stanton	03/03
UPDATE		D. Davies	12/04

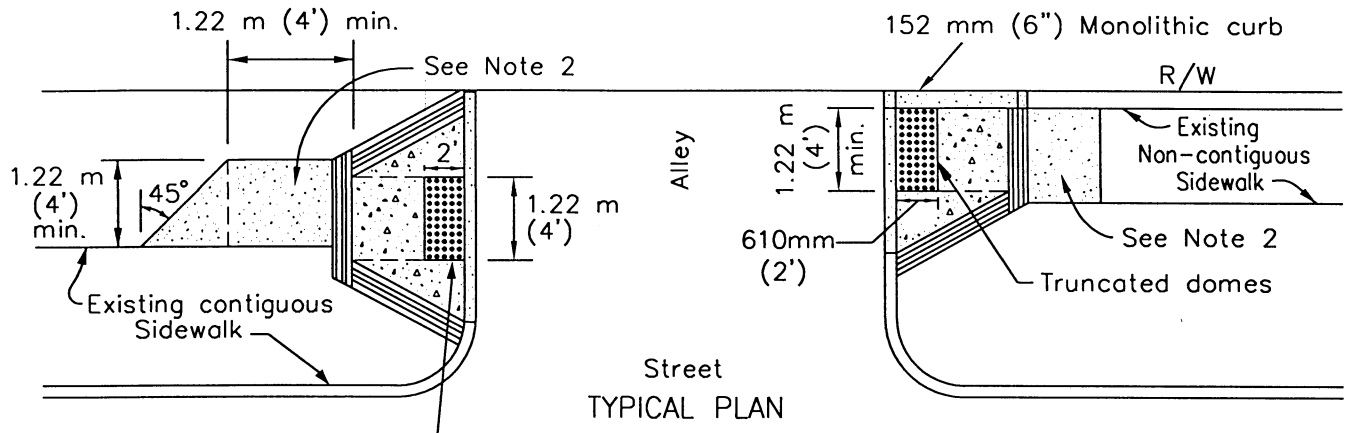
SAN DIEGO REGIONAL STANDARD DRAWING

TRUNCATED DOMES

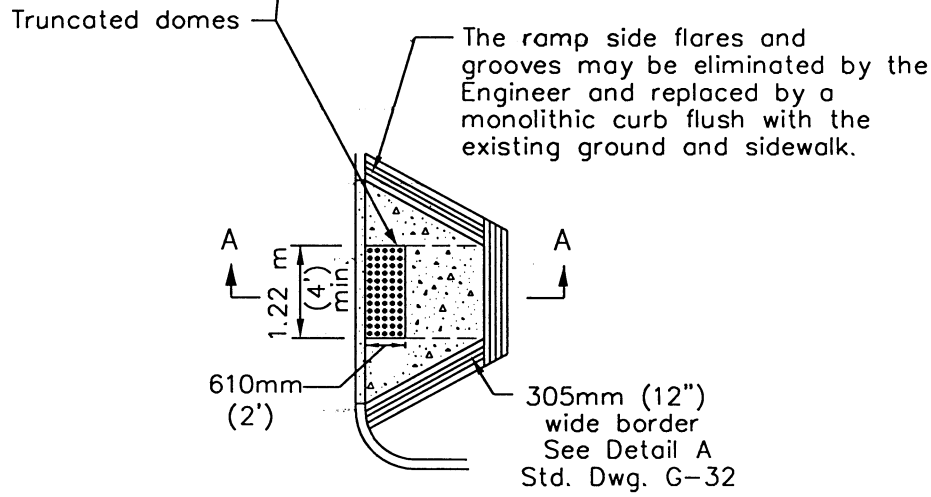
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 12-09-2004
Chairperson R.C.E. 19246 Date

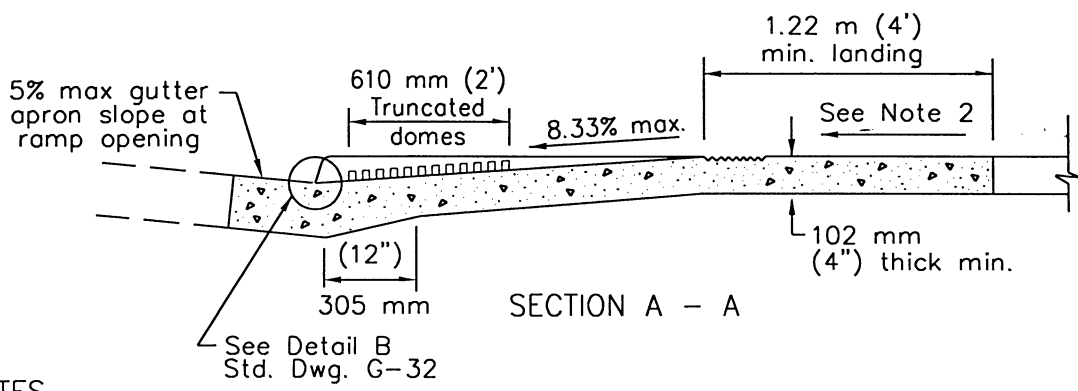
DRAWING NUMBER **G-30**



TYPICAL PLAN



PLAN VIEW



SECTION A - A

NOTES

1. See Standard Drawing G-32 for general notes.
2. Landing cross slope shall be 2.0% max. in both directions.
3. For truncated domes details, see Standard Drawing G-30.

Revision	By	Approved	Date
ORIGINAL		G. Parkinson	2/95
Add Metric		T. Stanton	03/03
UPDATE		D. Davies	12/04
Revised		T. Stanton	04/06

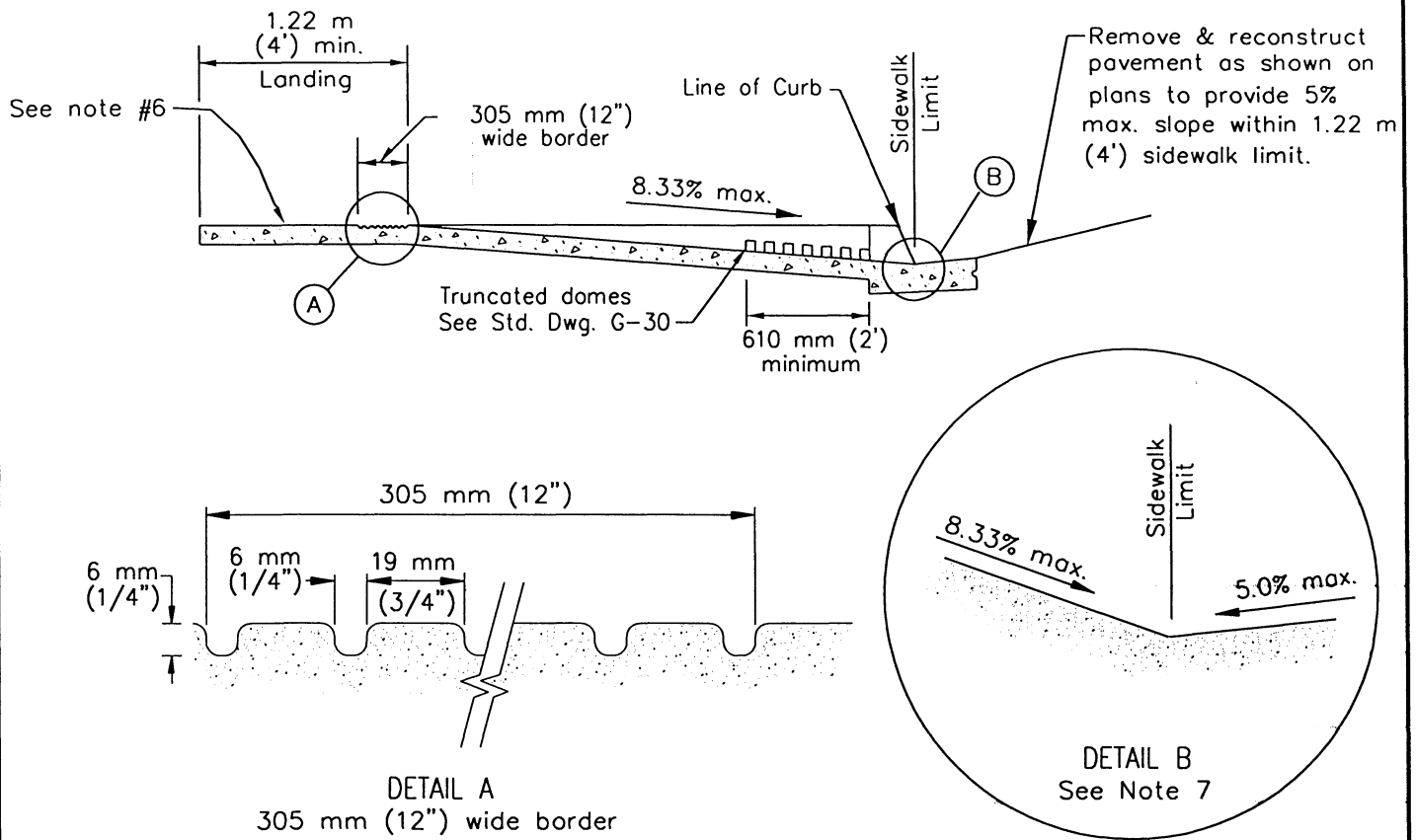
SAN DIEGO REGIONAL STANDARD DRAWING

CURB RAMP - TYPE D

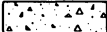
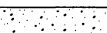
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 12-09-2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-31**



NOTES

1. The removal of existing concrete curb, gutter, sidewalk and pavement for pedestrian ramp installation shall comply with Standard Drawing G-11. For construction of Curb Ramps on existing sidewalks, removal of additional sidewalk maybe required to comply with ADA requirements to meet the existing grade.
2. Areas shown thus:  shall have a medium to heavy broom texture finish, perpendicular to the axis of the ramp.
3. Areas shown thus:  are the minimum required for a complete ramp installation and shall be concrete class 520-C-2500.
4. If obstructions such as inlets, utility poles, fire hydrants, etc., are encountered, the ramp locations may be adjusted upon the approval of the Resident Engineer, or Local Agency Inspector.
5. The ramp slopes will be measured relative to the sidewalk slope. Adjoining slope beyond ramp shall not exceed 20:1 (5%).
6. Landing cross slope shall be 2.0% max. in both directions.
7. All projects (new construction & alteration), the lower end of 1.22 m (48 in.) width of the ramp shall be flush and free of abrupt changes between the bottom of the ramp and the street pavement surface.
8. There shall be no more than 203.2 mm (8 in.) separation between the face of the curb and any given point on the nearest edge of the truncated domes.

Revision	By	Approved	Date
ORIGINAL		G.Parkinson	2/95
Add Metric		T. Stanton	03/03
UPDATE		D. Davies	12/04
Revised		T. Stanton	04/06

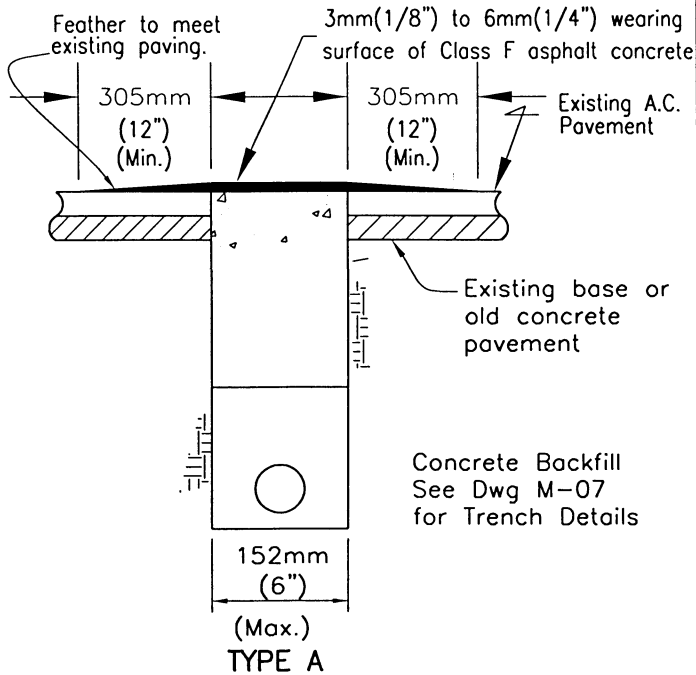
SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES FOR CURB RAMPS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

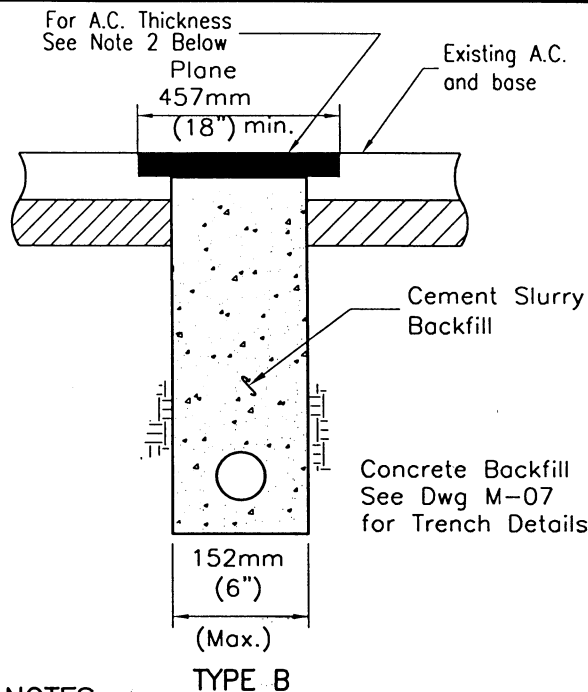
T. Stanton 12-09-2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-32**



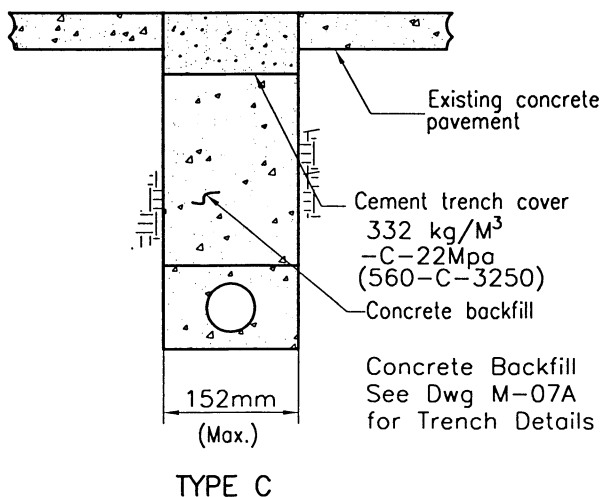
NOTES:

1. Concrete shall be screeded off to match pavement grade and floated to assure proper edge match.
2. A tack coat shall be applied to the concrete and existing asphalt pavement prior to placing the new asphalt pavement wearing surface.
3. Existing A.C. pavement will not require saw cutting when using rockwheel for excavation.
4. Allow concret backfill to cure for seven prior to paving operation



NOTES:

1. A tack coat shall be applied to the cement slurry backfill and existing asphalt pavement prior to placing the new asphalt surface.
2. Asphaltic Concrete Resurfacing:
 - a. Allow cement slurry backfill seven days minimum to cure before planing.
 - b. Thickness of Asphaltic Concrete shall be a minimum of 51mm (2") or as specified by the Agency's engineer.
 - c. A.C. shall be hot mix.
3. A.C. shall be sealed or chip sealed when required by the Agency's Engineer.



NOTES:

1. Concrete shall be screeded off to match existing pavement grade and floated to assure proper edge match.
2. Concrete trench cover shall be a minimum of 140mm (5 1/2") thick in alley or local residential streets and 178mm (7") thick in all other streets.
3. Existing concrete pavement will require sawcutting when using rockwheel for excavation.
4. In major or prime arterial streets, an approved set accelerating admixture, such as Calcium Chloride, may be used only with prior approval of the Agency's engineer.

Revision	By	Approved	Date
ORIGINAL	HH	T. Stanton	11/02
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

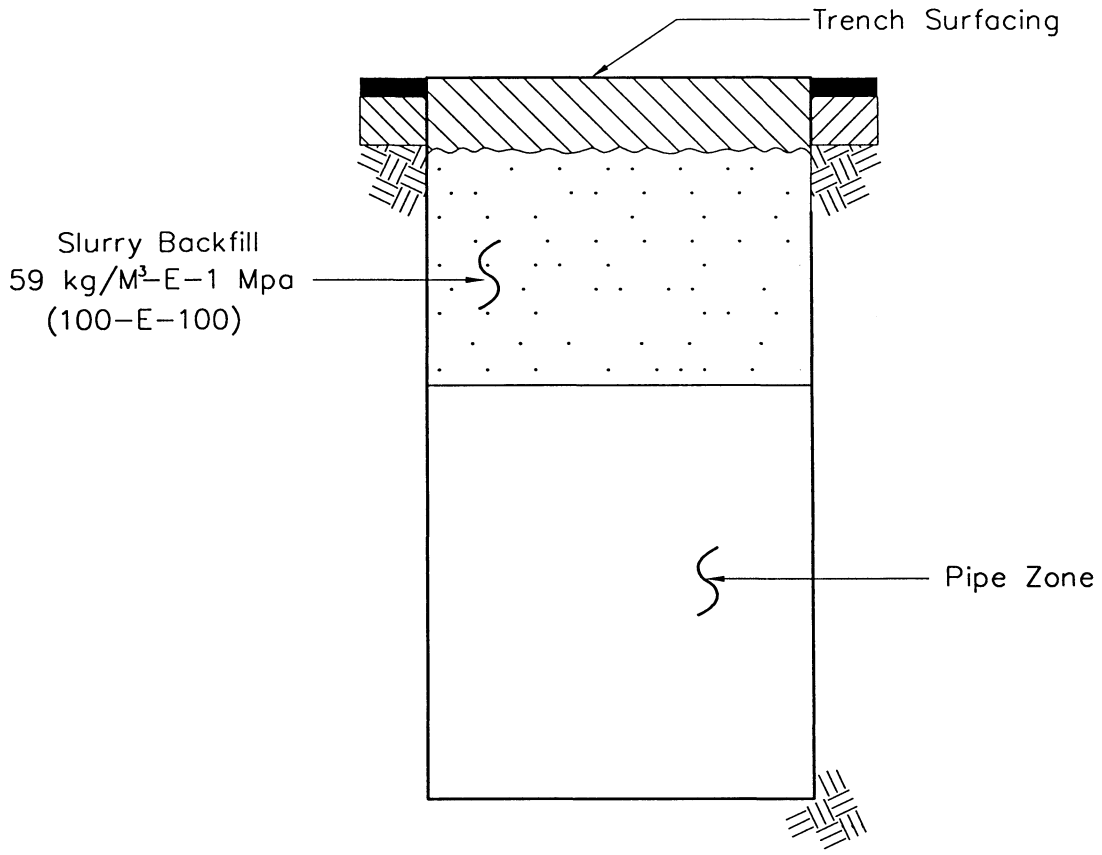
SAN DIEGO REGIONAL STANDARD DRAWING

**NARROW TRENCHES
TRENCHING & BACKFILLING**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **G-33**

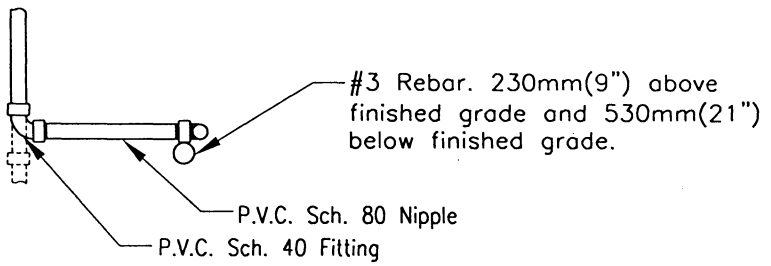


NOTES

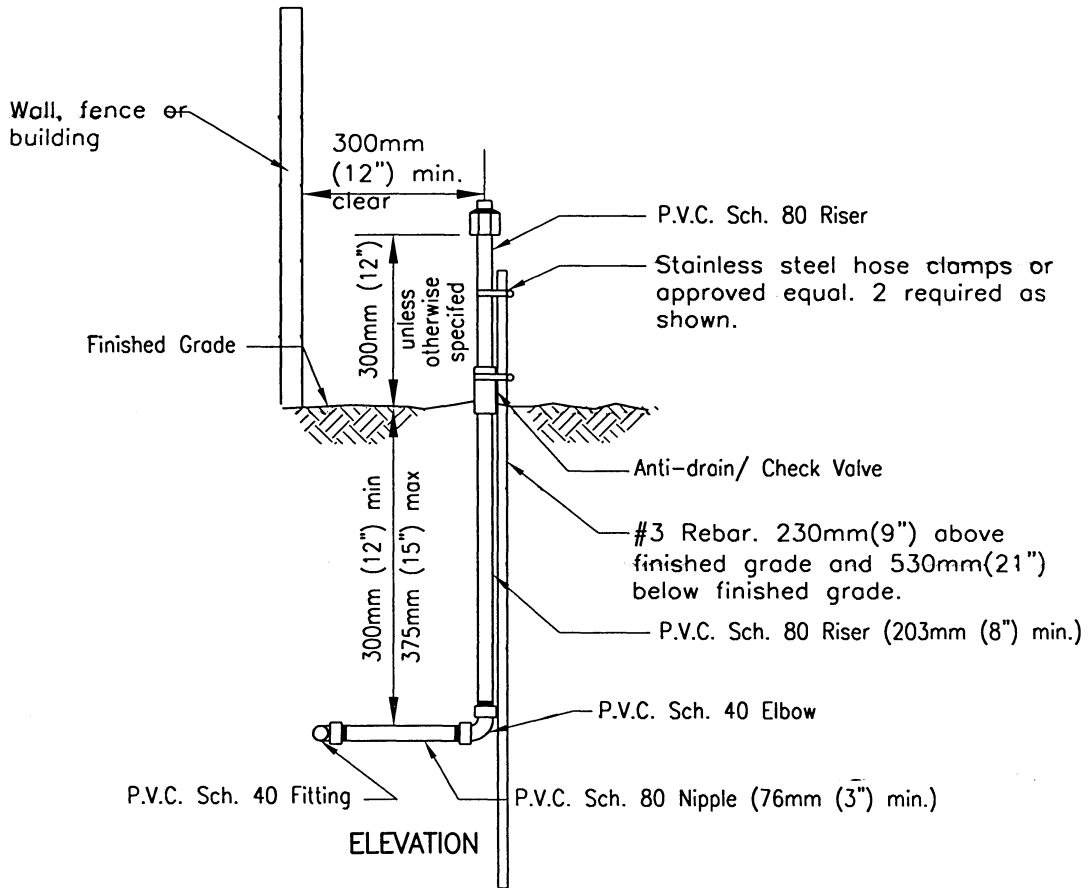
1. Trench resurfacing shall be done according to governmental (permitting) agency's requirements.
2. The sand used for the slurry backfill shall meet the requirements for fine aggregate (subsection 400-1.3) listed in the Standard Specifications for Public Works Construction. Slurry must be firm prior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

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Parkinson	9/88		SLURRY BACKFILL	<i>T. Stanton</i> 3/10/2003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06			DRAWING NUMBER G-36

SPRINKLER IRRIGATION SYSTEMS



PLAN VIEW



ELEVATION

NOTES

1. Teflon tape, 19mm (3/4") wide, shall be used on all threaded connections.
2. Close nipples shall not be used.
3. No fixed risers allowed in public right-of-ways or adjacent to vehicular or pedestrian traffic, unless otherwise approved by agency.

LEGEND ON PLANS

Show a number to indicate type head

Or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	03/04

SAN DIEGO REGIONAL STANDARD DRAWING

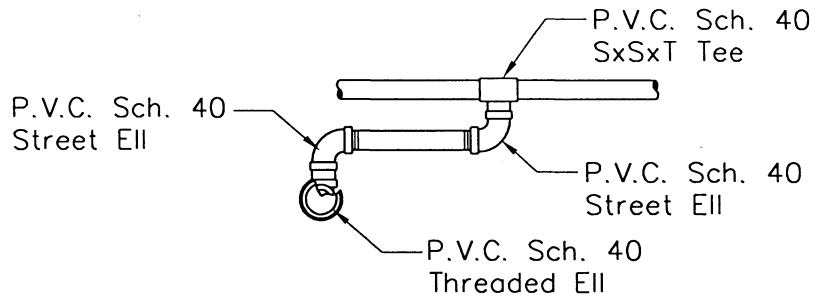
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

SHRUB SPRAY HEAD
ON FIXED RISER

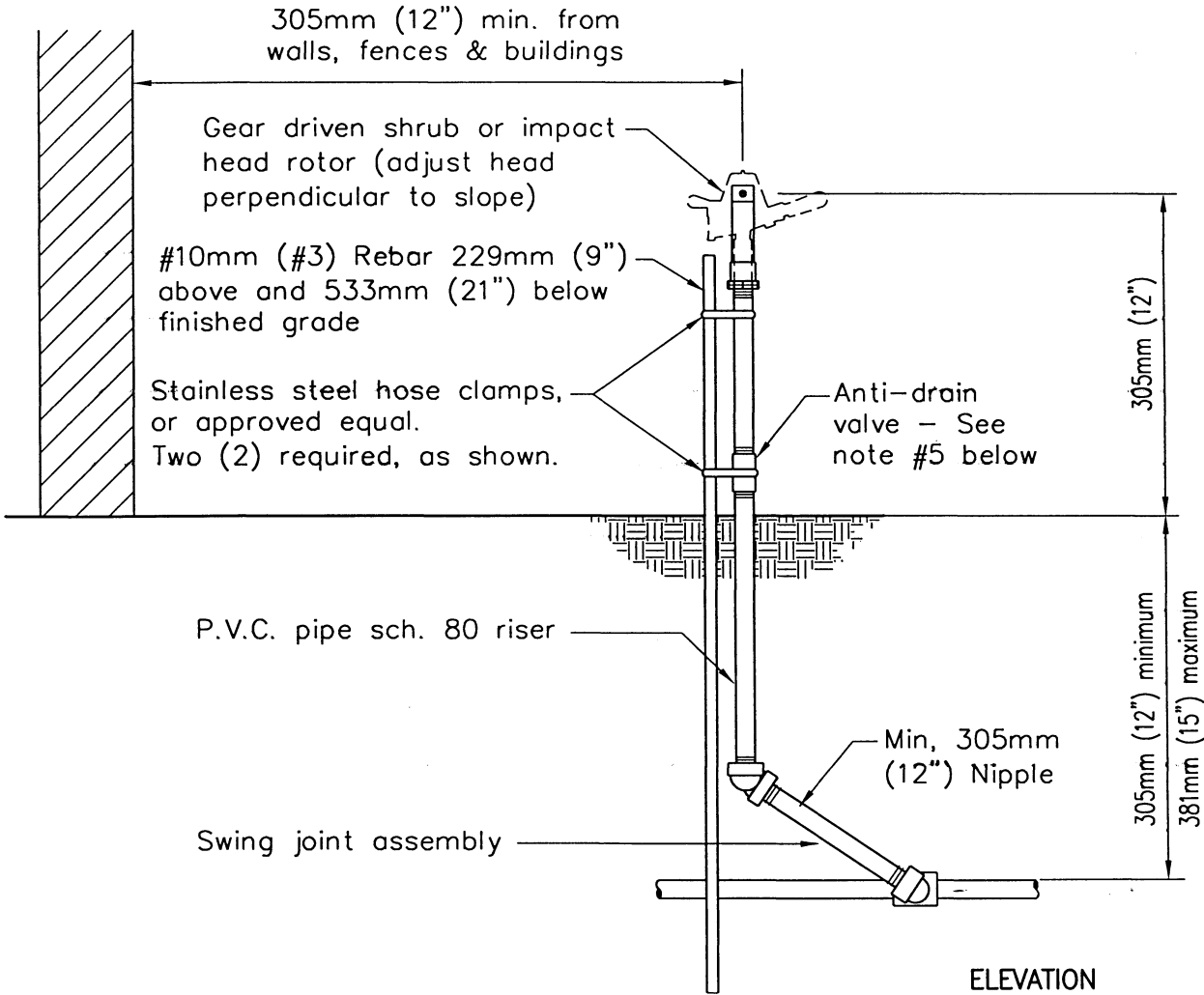
03-25-2004
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

1-1



PLAN

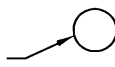


ELEVATION

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 shall be used on all threaded connections.
4. Close nipples shall not be used.
5. Anti-drain valves shall be installed under all heads unless otherwise specified.
6. No fixed risers allowed in right-of-way or adjacent to vehicular or pedestrian traffic unless otherwise approved by agency.

LEGEND ON PLANS

Show a number to  indicate head type Or approved agency symbol.

Revision	By	Approved	Date
ORIGINAL		Parkinson	5/92
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	06/04

SAN DIEGO REGIONAL STANDARD DRAWING

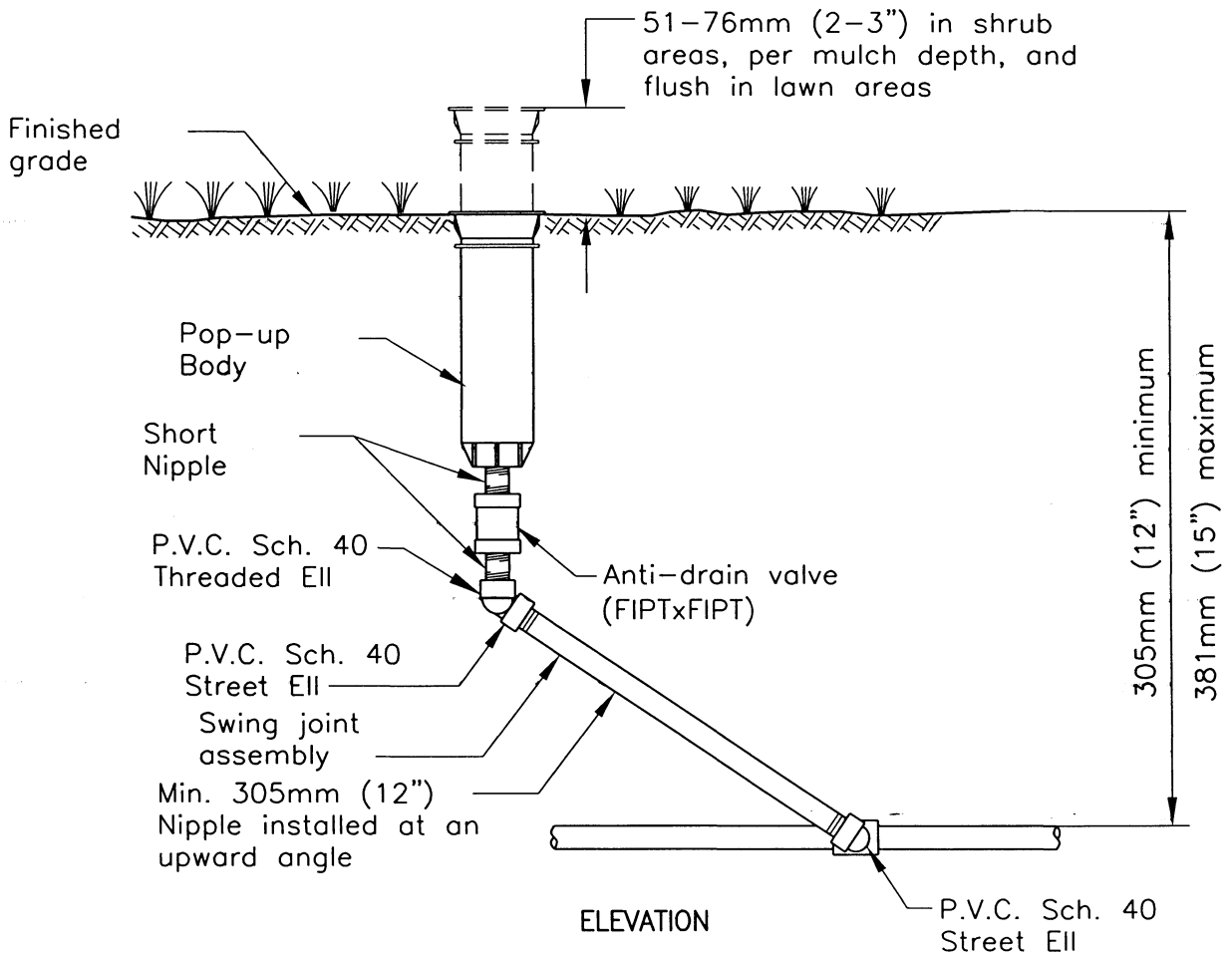
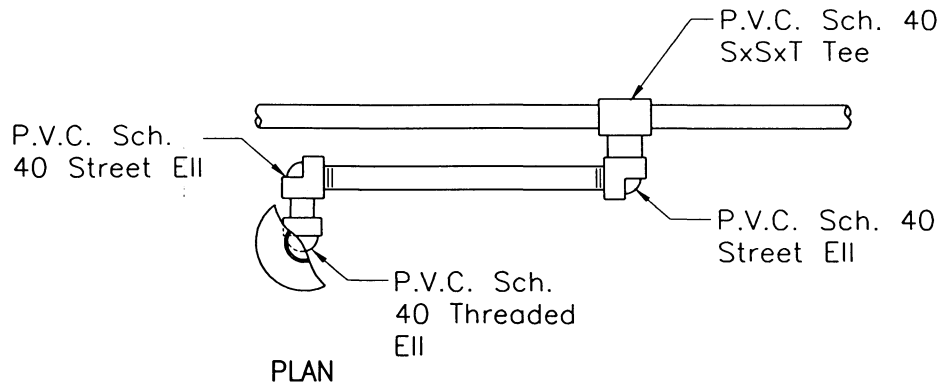
ROTOR OR IMPACT HEAD
ON FIXED RISER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

 06/24/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER I-2



NOTES

1. All fittings shall be P.V.C. Schedule 40.
2. All nipples shall be P.V.C. Schedule 80.
3. Teflon tape shall be used on all threaded connections.
4. Close nipples shall not be used.
5. Lateral depth shall be 457mm (18") when 305mm (12") pop-up bodies are used.

LEGEND ON PLANS

Show a number to indicate type head or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Coro	06/04

SAN DIEGO REGIONAL STANDARD DRAWING

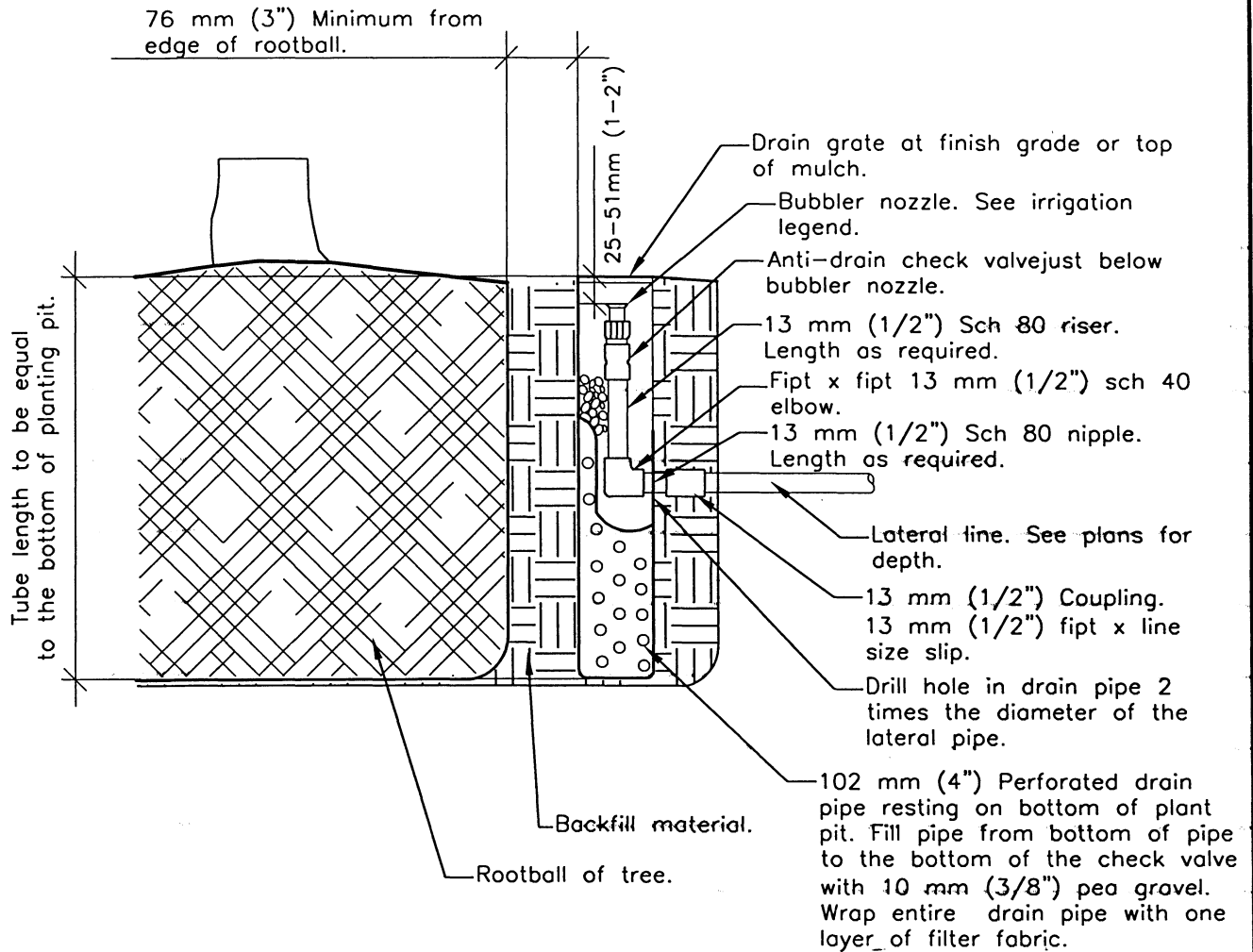
ROTOR OR SPRAY POP-UP HEAD

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 06/24/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-3**



NOTES

1. Refer to the planting plans and appropriate details for plant material and installation procedures.

Revision	By	Approved	Date
ORIGINAL		M. Caro	02/05

SAN DIEGO REGIONAL STANDARD DRAWING

DEEP ROOT TREE BUBBLER

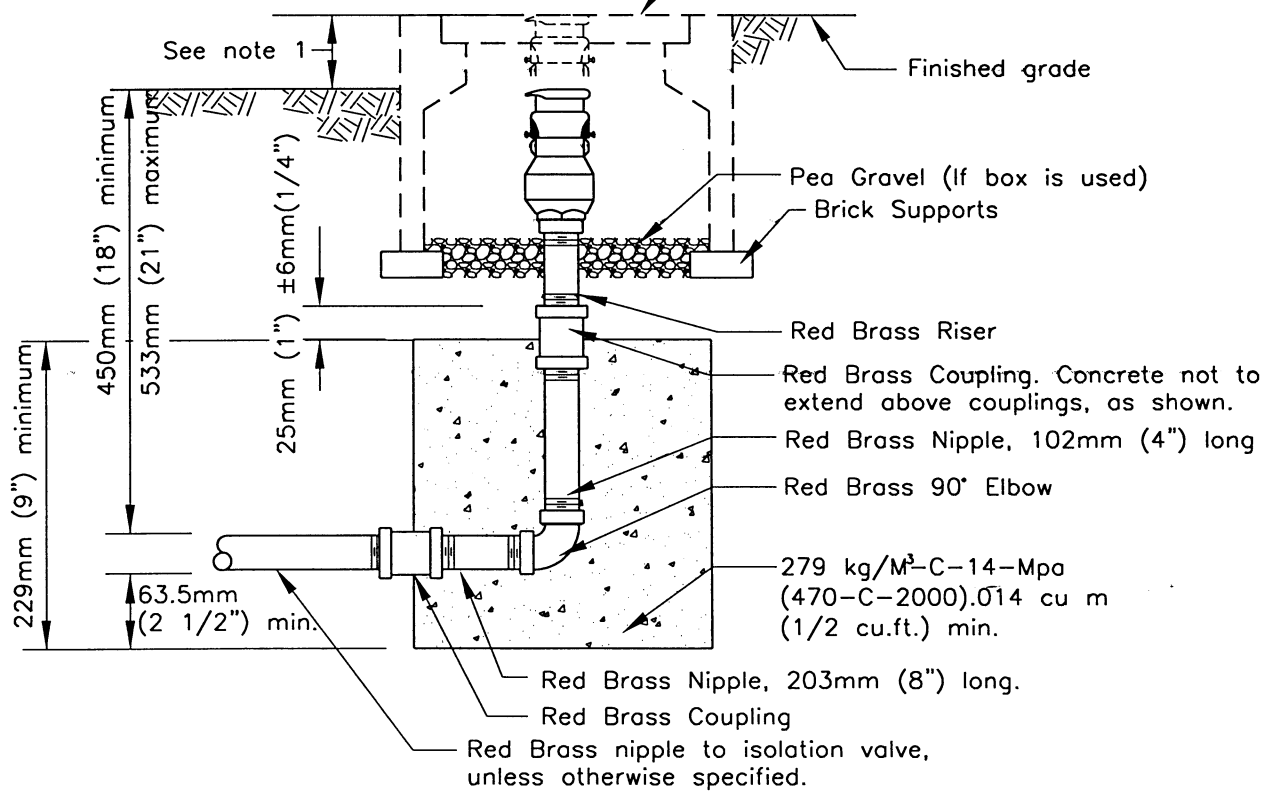
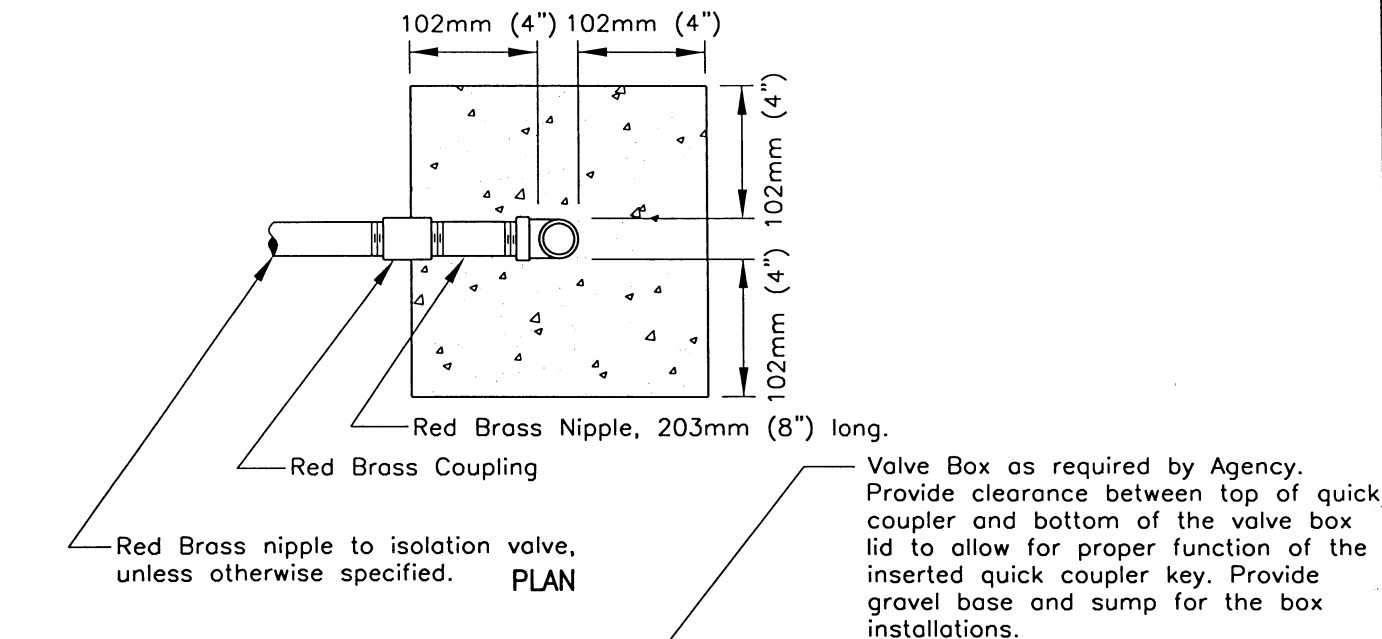
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

M. Stanton 02/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER

1-4



NOTES

1. Quick coupling valves or boxes shall be set flush in lawn and 51-76mm (2-3") above finish grade in shrub/ groundcover areas, per mulch depth
2. Dimensions of concrete anchors are minimum.
3. Close nipples shall not be used.
4. Provide appropriate key and swivel adapter as specified on plans.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	05/04

SAN DIEGO REGIONAL STANDARD DRAWING

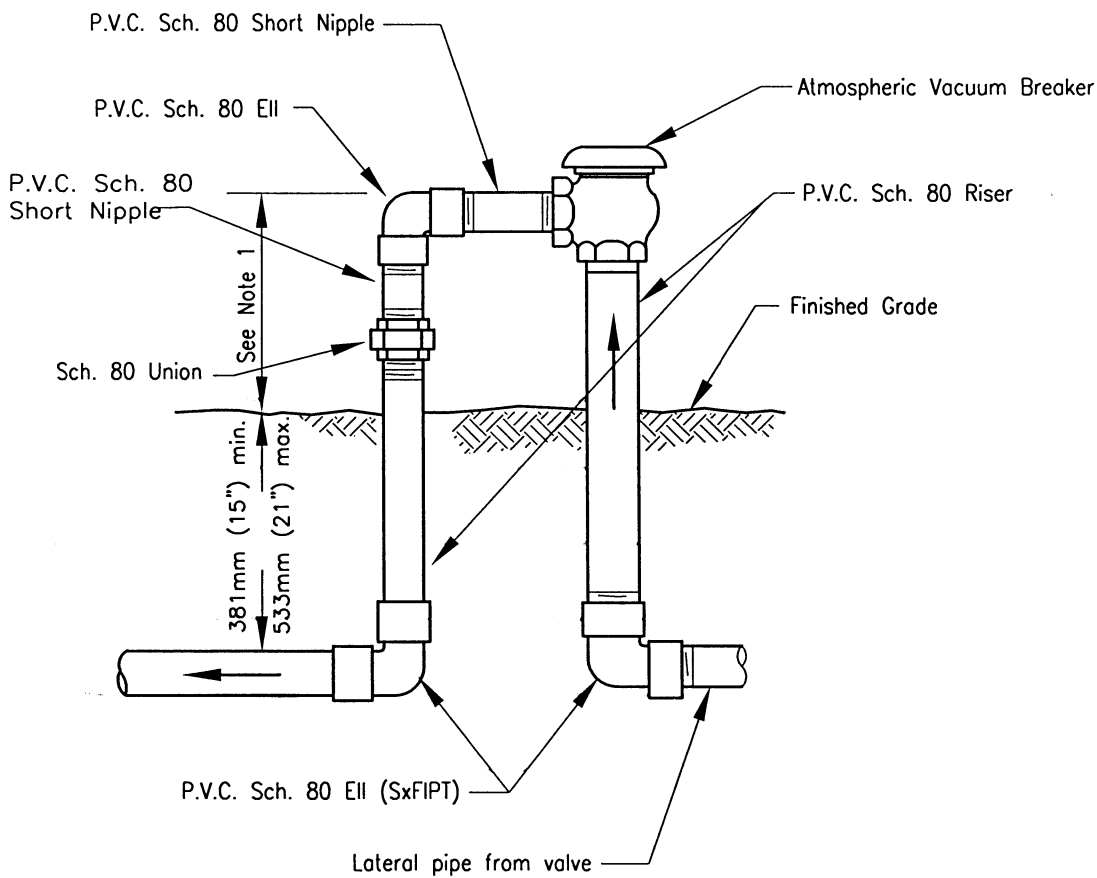
QUICK COUPLING VALVE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 05-27-2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-5**



NOTES

1. Atmospheric vacuum breakers shall be installed a minimum of 305mm (12") above the highest sprinkler head so that at no time will it be subjected to
2. back pressure or drainage.
3. Close nipples shall not be used.
4. Teflon tape shall be used on all threaded connections.
For use on lines 51mm (2") inches and smaller.

LEGEND ON PLANS



Or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	02/05

SAN DIEGO REGIONAL STANDARD DRAWING

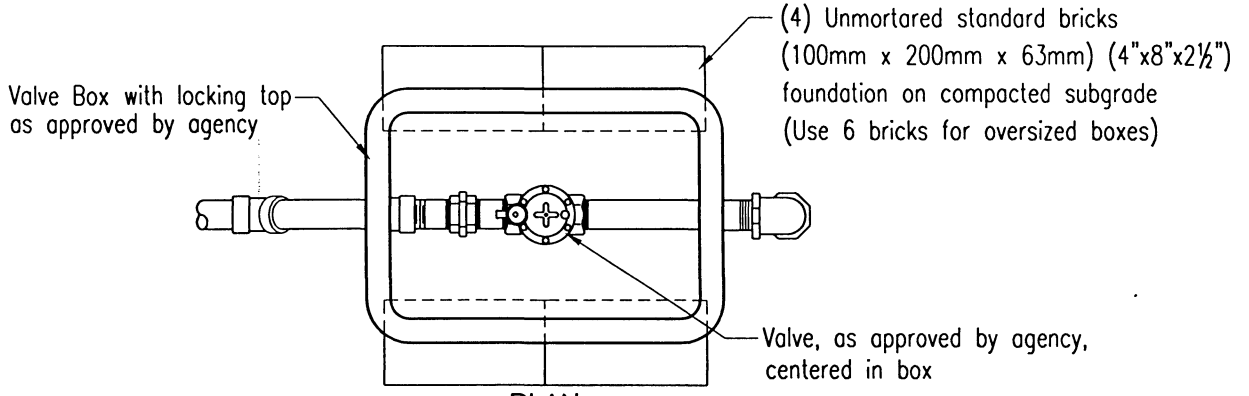
**ATMOSPHERIC VACUUM BREAKER
(50mm (2") & SMALLER)**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

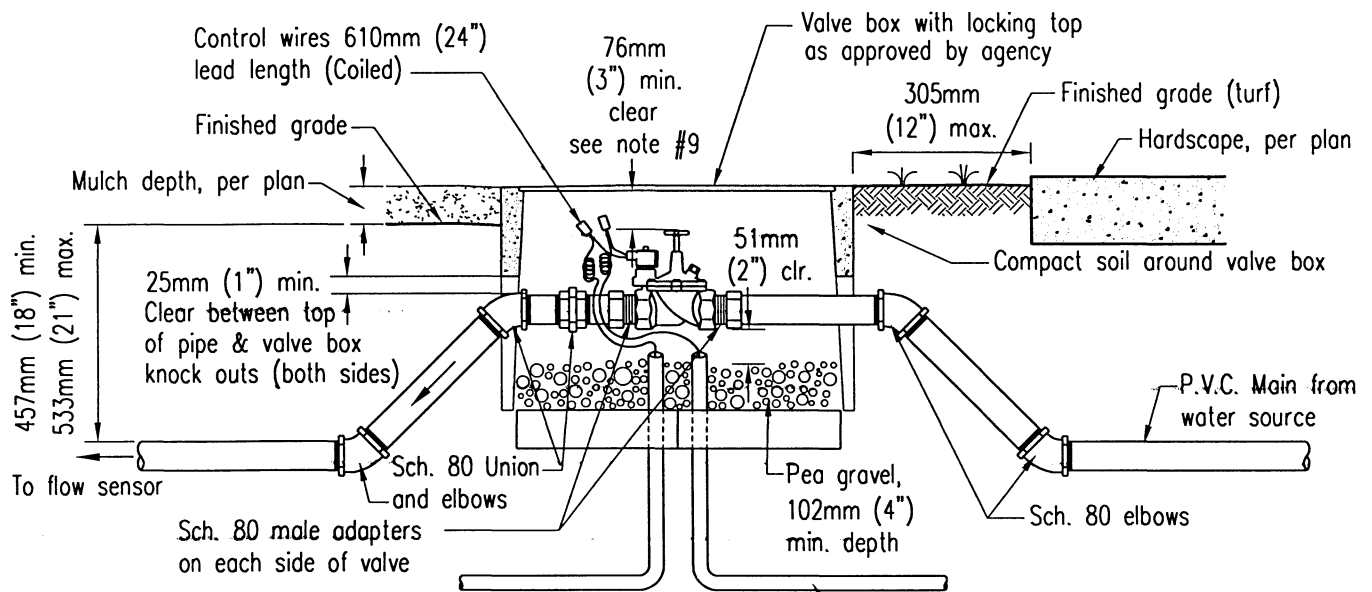
T. Stanton 02/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **1-7**



PLAN



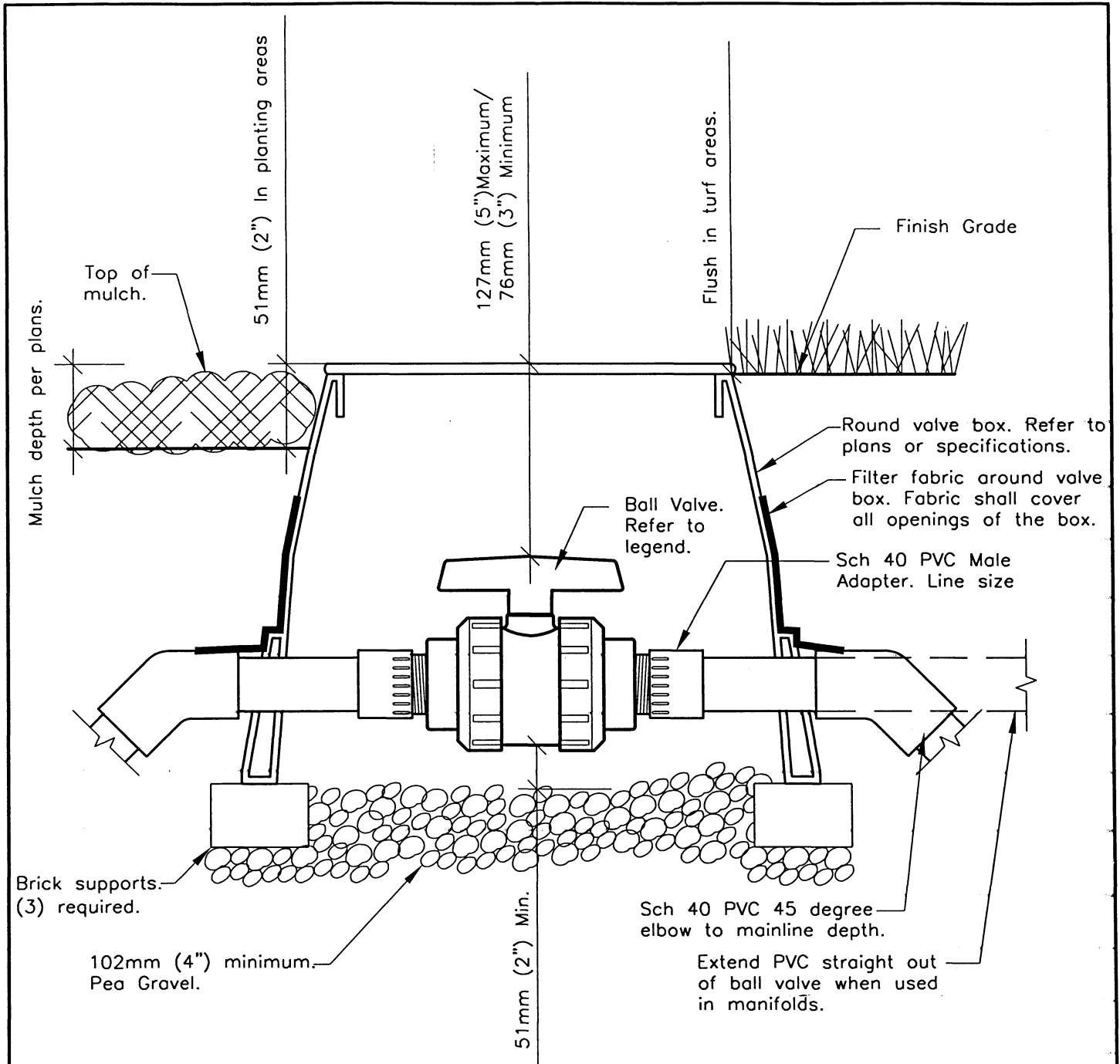
ELEVATION

NOTES:

1. Splicing shall be made in valve boxes and pull boxes only. See Standard Drawing I-15 for splice/soldering notes.
2. All splices shall be made with a properly set mechanical splice connector entirely enclosed in self-curing resin and shall be completely water-proof.
3. Duct seal conduit openings per agency requirements.
4. All PVC pipe used in master valve assembly shall be of the same class as specified for the mainline.
5. Conduit shall be 25mm (1") min. or as approved by agency.
6. Valve/controller identification shall be labeled on the valve box and tagged on the valve per agency requirements.
7. Knock outs shall not be enlarged unless approved by agency.
8. Install only one valve per box.
9. 76mm (3") min. clear from bottom of box lid to highest point of valve assembly.
10. Valve boxes shall be set perpendicular to hardscape, a max. 305mm (12") from edge of hardscape, 51-76mm (2-3") above finished grade in shrub/groundcover areas, per mulch depth. If necessary to be set in turf, valve boxes shall be set flush with finished grade.
11. Close nipples shall not be used.

LEGEND ON PLANS
 ▼ M.V.
 Or approved agency symbol.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>T. Stanton</i> 04/28/2005 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
UPDATE		M. Caro	04/05		
IRRIGATION MASTER VALVE				DRAWING NUMBER	I-10



NOTES

1. Teflon tape, 19mm (3/4") wide, shall be used on all threaded connections.
2. Close nipples shall not be used.
3. All PVC Pipe used in manifold assemblies shall of the same class as specified for the mainline.
4. All plastic valve boxes shall be heat branded with the appropriate identification. Refer to plans and specifications.
5. Do not cut additional holes in valves boxes.
6. Add single unions on each side of valve when True Union ball valves are not used.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Coro	02/05

SAN DIEGO REGIONAL STANDARD DRAWING

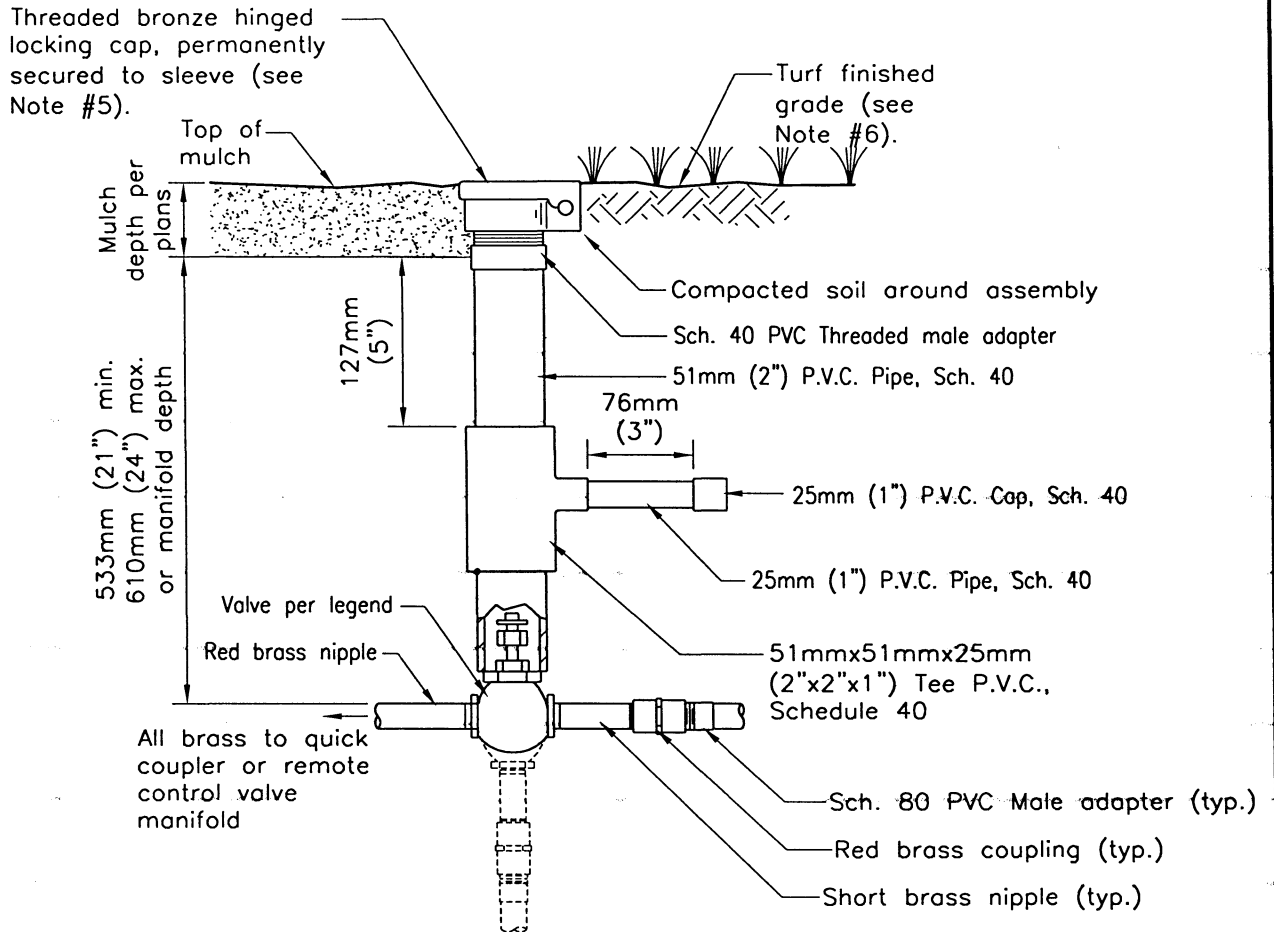
**ISOLATION BALL VALVE
50mm (2") AND SMALLER**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 02/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-11**



NOTES

1. All Globe Valves shall be furnished with a standard manual control valve bronze cross handle, centered in pipe sleeve.
2. All valves shall be installed within 305mm (12") of hardscape, unless otherwise shown on the plans.
3. All Globe 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 and 51-76mm (2-3") above finish grade in shrub areas, per depth of mulch.
6. Locate outside of turf when possible.

LEGEND ON PLANS



GV

Revision	By	Approved	Date
ORIGINAL		A. Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	02/05

SAN DIEGO REGIONAL STANDARD DRAWING

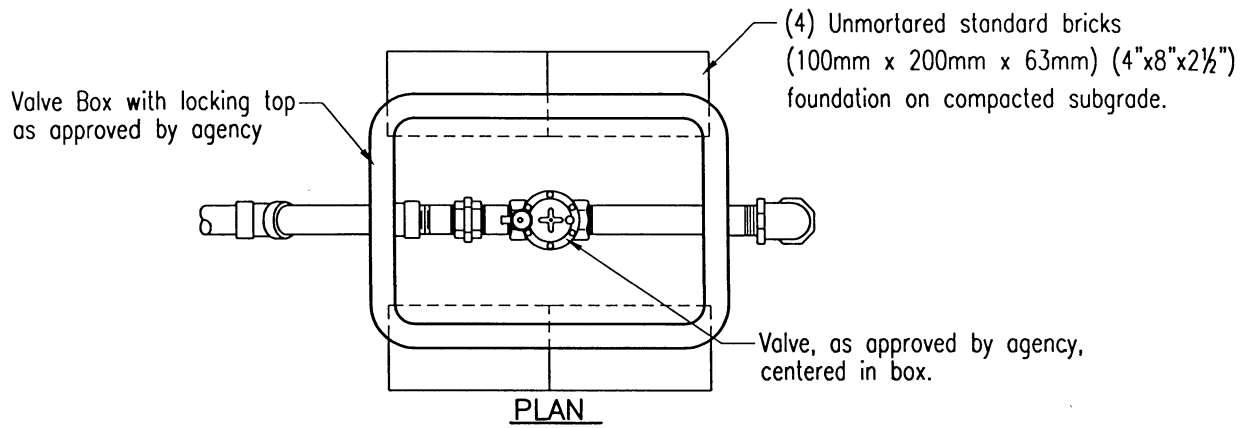
**ISOLATION GLOBE VALVE
50mm (2") AND SMALLER**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

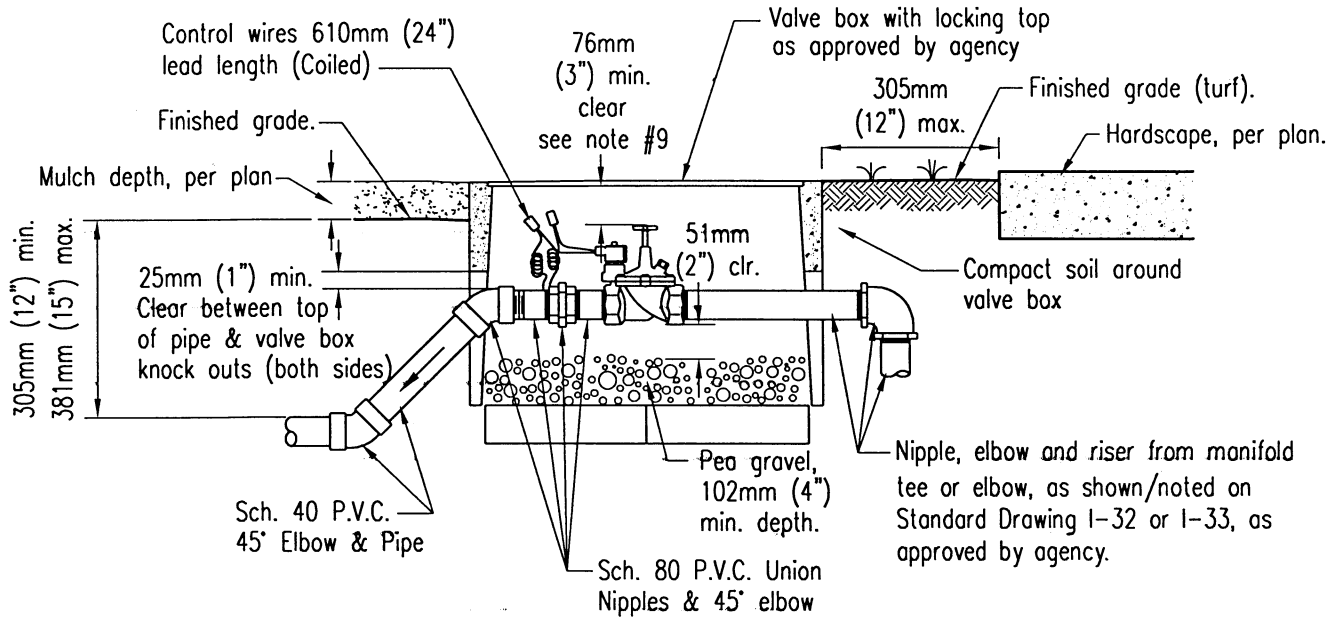
T. Stanton 02/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-13**



PLAN



ELEVATION

NOTES:

1. Splicing shall be made in valve boxes and pull boxes only. See Standard Drawing I-15 for splice/soldering notes.
2. All splices shall be made with a properly set mechanical splice connector entirely enclosed in self-curing resin and shall be completely water-proof.
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, see Standard Drawing I-32 or I-33, per agency standards.
5. All valves shall be installed with a union on the downstream side of the valve. The union shall be Sch. 80 P.V.C.
6. Valve/controller identification shall be labeled on the valve box and tagged on the valve per agency requirements.
7. Knock outs shall not be enlarged unless approved by agency.
8. Install only one valve per box.
9. 76mm (3") min. clear from bottom of box lid to highest point of valve assembly.
10. Valve boxes shall be set perpendicular to hardscape, a max. 305mm (12") from edge of hardscape, 51-76mm (2-3") above finished grade in shrub/groundcover areas, per mulch depth. If necessary to be set in turf, valve boxes shall be set flush with finished grade.
11. Close nipples shall not be used.

LEGEND ON PLANS

▼ R.C.V

Or approved agency symbol.

Revision	By	Approved	Date
ORIGINAL		R.Munoz	3/97
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	04/05

SAN DIEGO REGIONAL STANDARD DRAWING

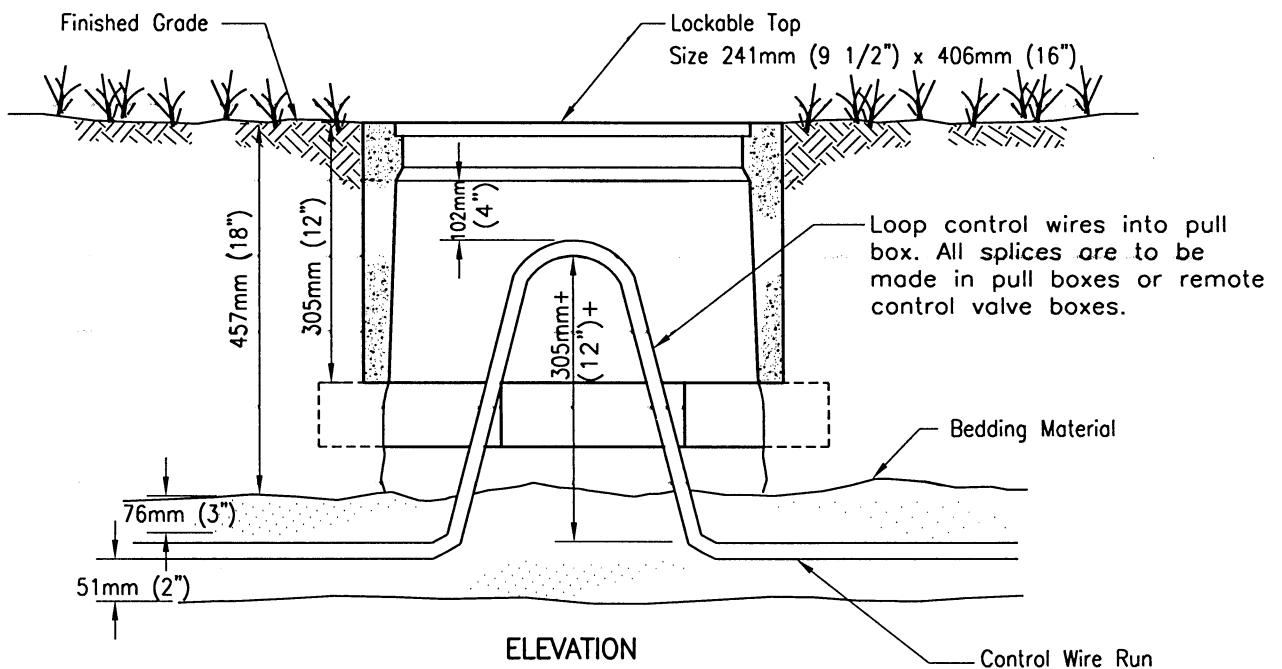
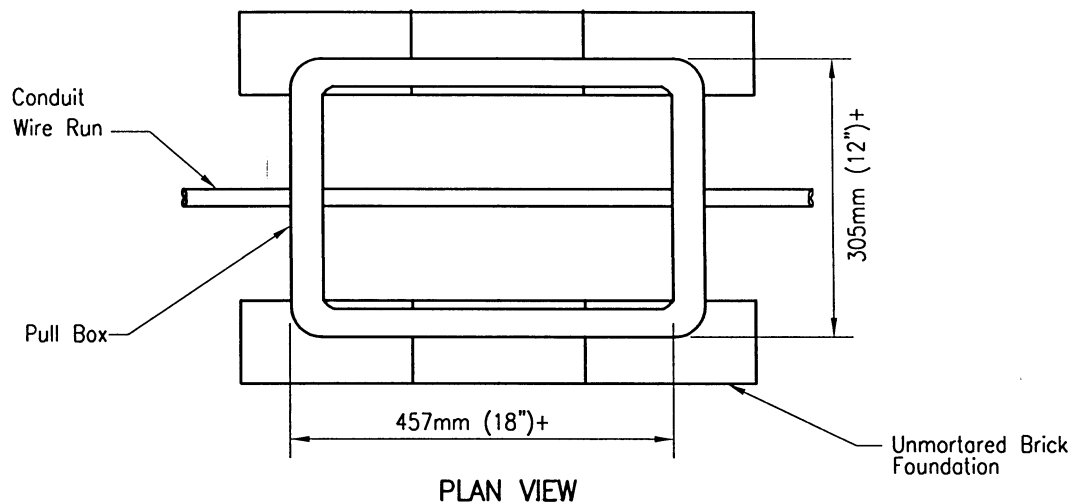
REMOTE CONTROL VALVE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 04/28/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-14**

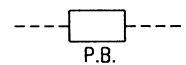


NOTES

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
8. installing connectors.

Wire bundles inside pull boxes shall be at least 102mm (4") from the under side of the box cover. Minimum size pull box shall be as shown above. Larger boxes may be necessary to meet 102mm (4") clearance required.

LEGEND ON PLANS



P.B.

Revision	By	Approved	Date
ORIGINAL		A.Kercheval	12/75
Add Metric		T. Stanton	03/03

SAN DIEGO REGIONAL STANDARD DRAWING

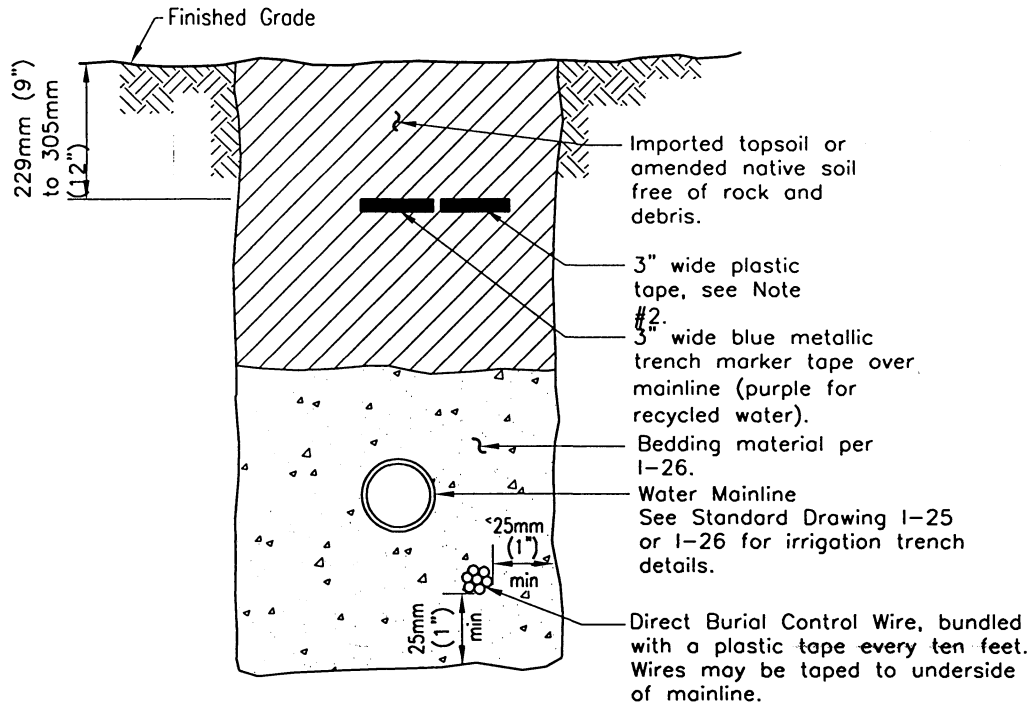
**ELECTRICAL PULL BOX
FOR DIRECT BURIAL CONTROL WIRES
AND SPLICE DETAILS**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

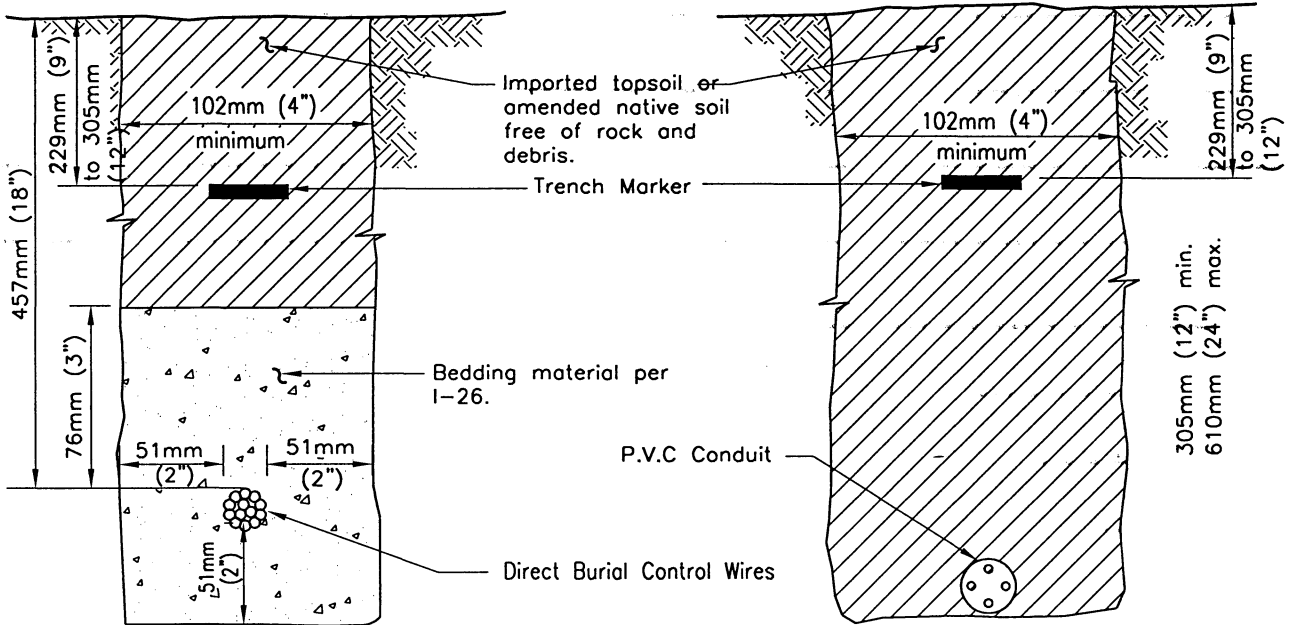
T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-15**



NORMAL LOCATIONS OF CONTROL WIRES



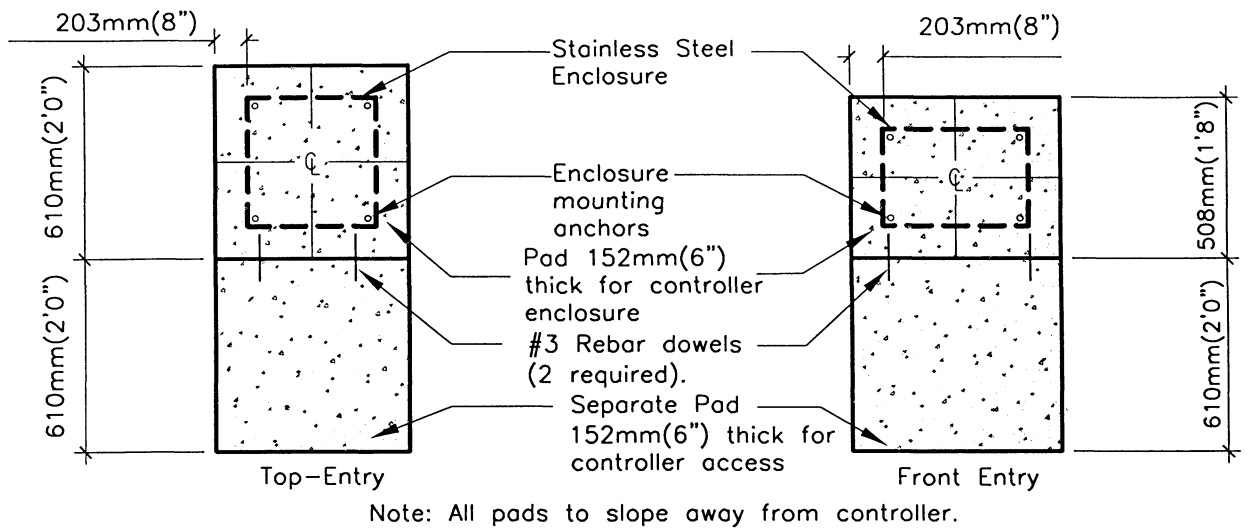
ALTERNATE LOCATION OF CONTROL WIRES

COMMUNICATION CABLE

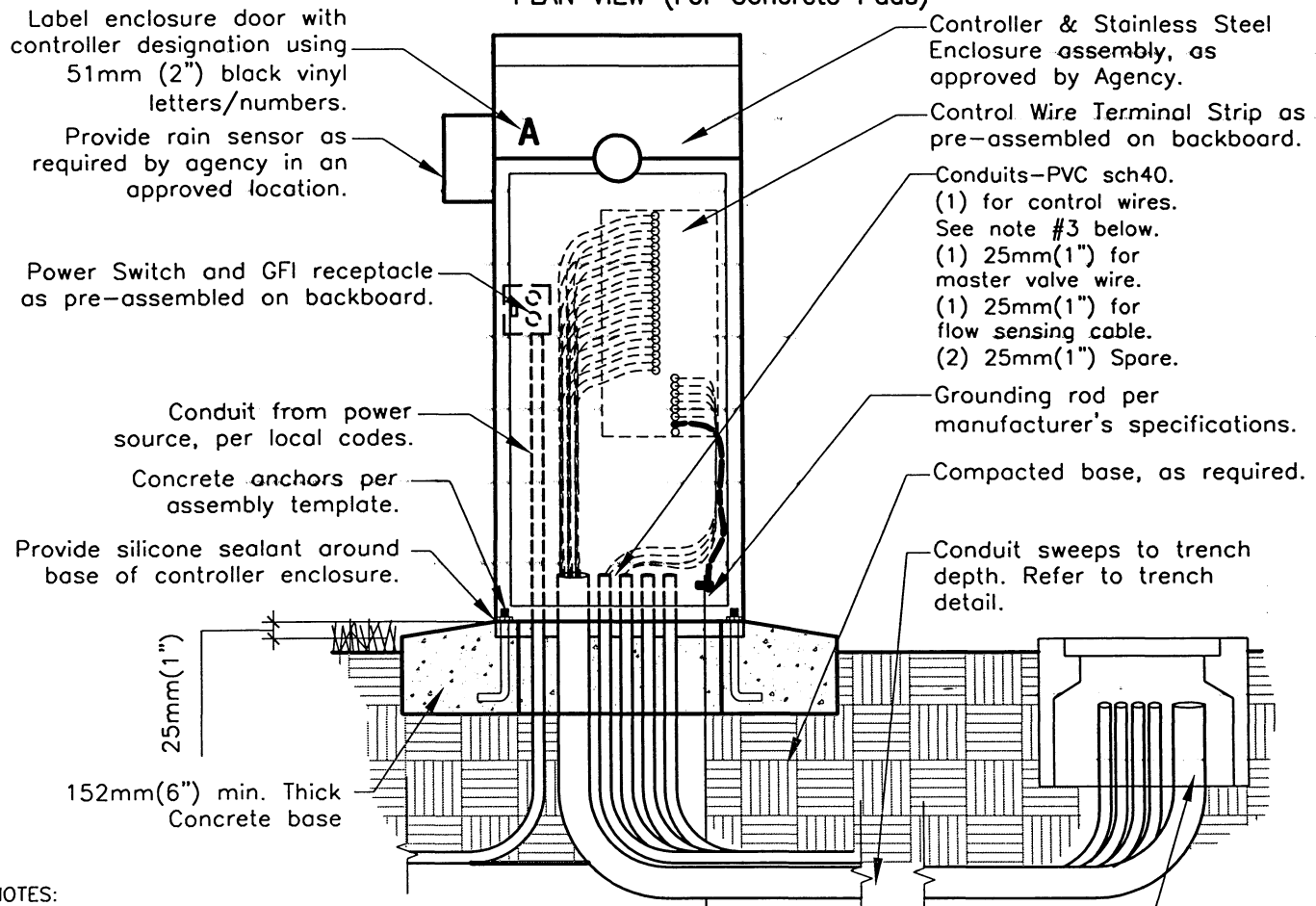
NOTES

1. Bedding material shall be sand as approved by the agency and trench shall be
 2. free of rocks.
- Place a 76mm (3") wide red continuous plastic tape trench marker, 229mm (9") to 305mm (12") below finish grade, directly above the direct burial control wires.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		CONTROL WIRE / CABLE INSTALLATION
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246	
UPDATE		M. Coro	02/05	Date	
				DRAWING NUMBER I-16	

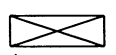


PLAN VIEW (For Concrete Pads)



- NOTES:**
1. All controller assemblies and options shall be completely pre-assembled in a stainless steel enclosure.
 2. Pre-assembly shall include 25mm(1") rubber grommets where controller is attached to backboard.
 3. Control wire conduit shall be twice the diameter of the wire bundle, 51mm(2") minimum.
 4. Provide separate circuit breaker for controller(s) at electrical control panel and label.

Pull box installed within 1.5m (5') of controller enclosure, **LEGEND ON PLANS** as required by agency.



Or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Coro	05/04

SAN DIEGO REGIONAL STANDARD DRAWING

**AUTOMATIC CONTROLLER
PEDESTAL MOUNTED**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 05-27-2004

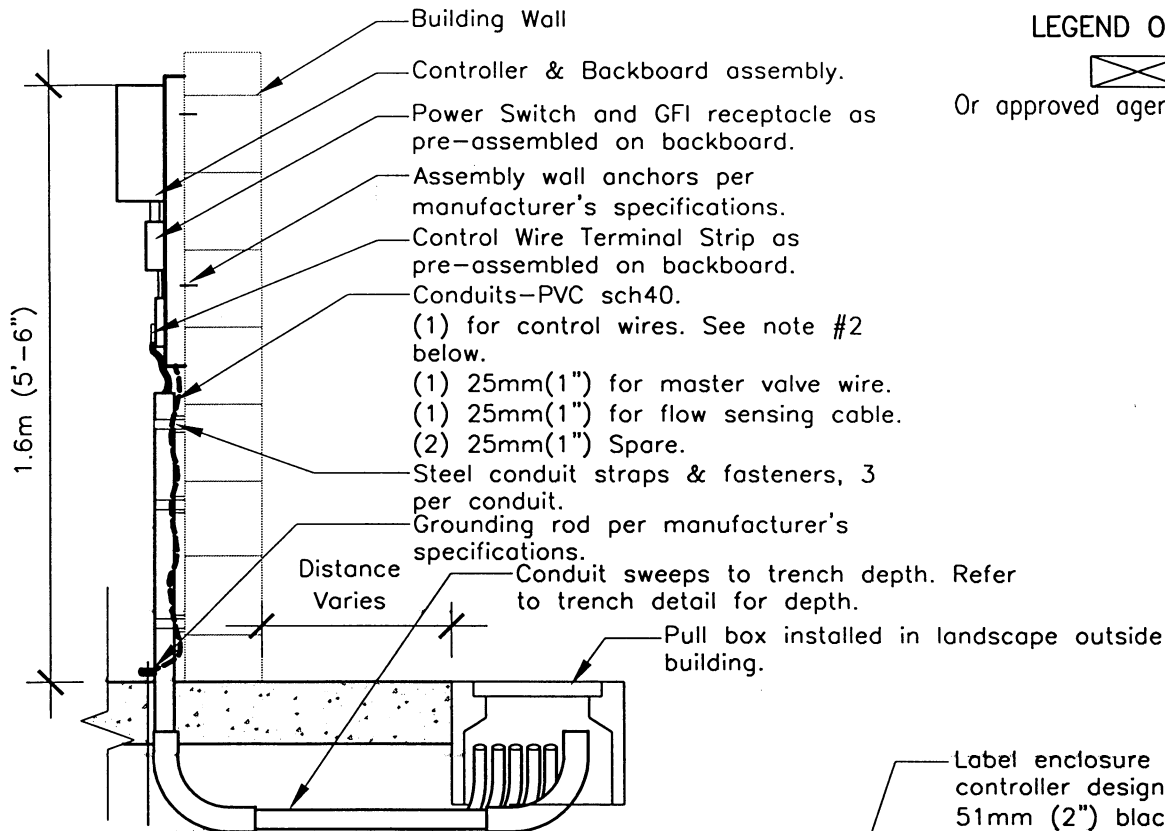
Chairperson R.C.E. 19246 Date

DRAWING NUMBER 1-17

LEGEND ON PLANS



Or approved agency symbol



SIDE VIEW

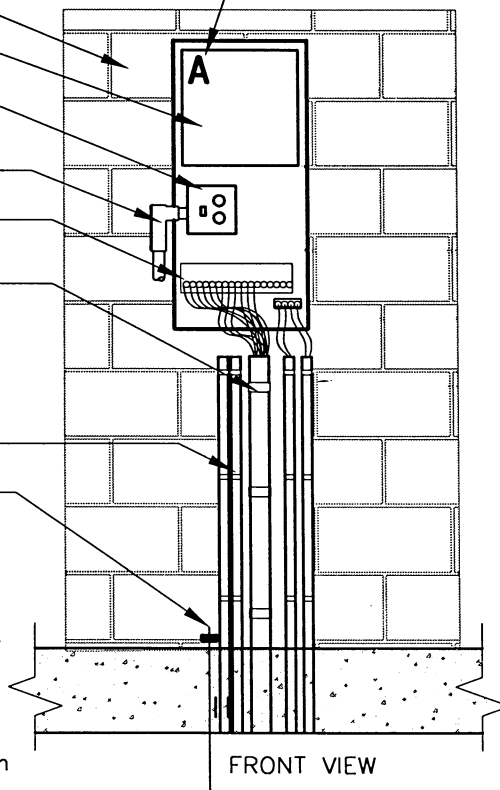
Building Wall

Label enclosure door with controller designation using 51mm (2") black vinyl letters/numbers.

- Controller & Backboard assembly.
- Power Switch and GFI receptacle as pre-assembled on backboard.
- Power source conduit per local codes.
- Control Wire Terminal Strip as pre-assembled on backboard.
- Conduits-PVC sch40.
- (1) for control wires. See note #2 below.
- (1) 25mm(1") for master valve wire.
- (1) 25mm(1") for flow sensing cable.
- (2) 25mm(1") Spare.
- Steel conduit straps & fasteners, 3 per conduit.
- Grounding rod per manufacturer's specifications.

NOTES:

- 1) All controller assemblies and options shall be completely pre-assembled on a stainless steel backboard.
- 2) Control wire conduit shall be twice the diameter of the wire bundle, 50mm(2") minimum.
- 3) Provide separate circuit breaker for controller(s) at electrical control panel and label.
- 4) Provide rain sensor as required by agency in an approved location.



FRONT VIEW

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	05/04

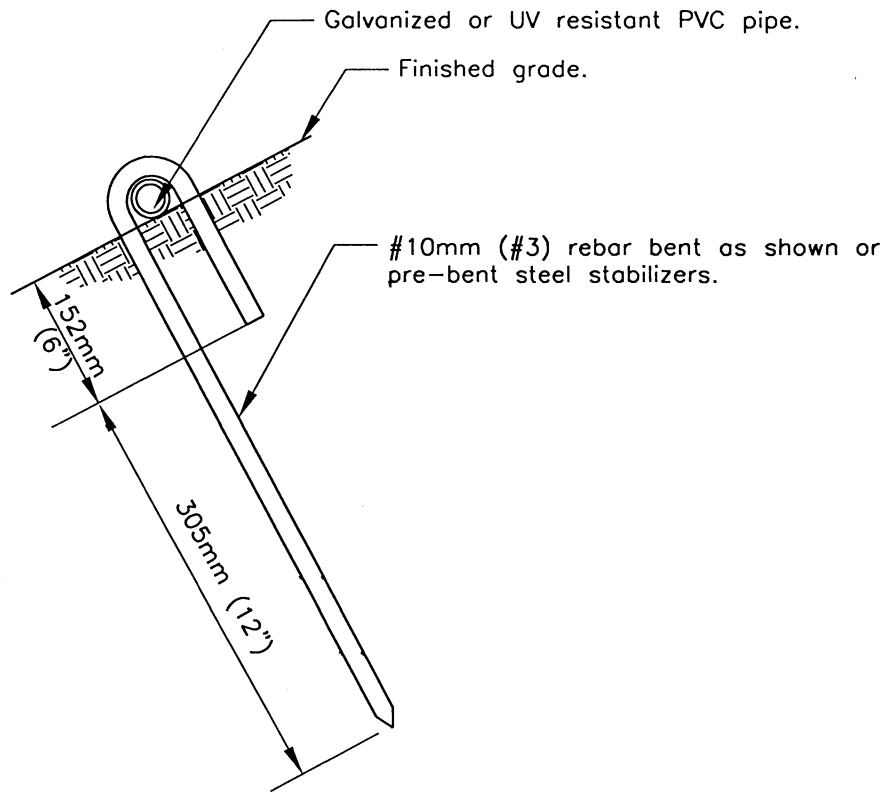
SAN DIEGO REGIONAL STANDARD DRAWING

**AUTOMATIC CONTROLLER
INDOOR WALL MOUNT**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 05-27-2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-18**

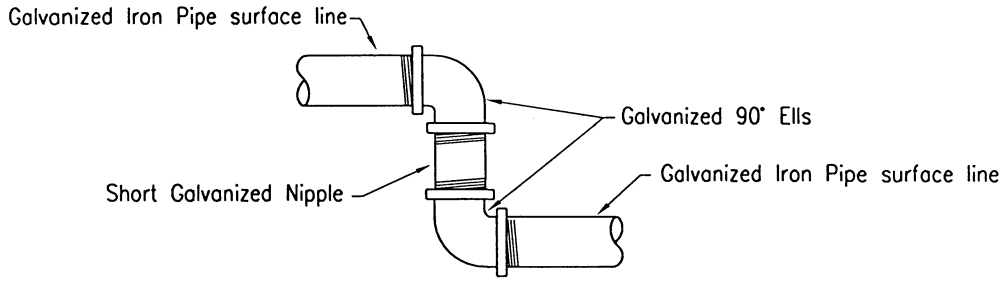


SIDE VIEW

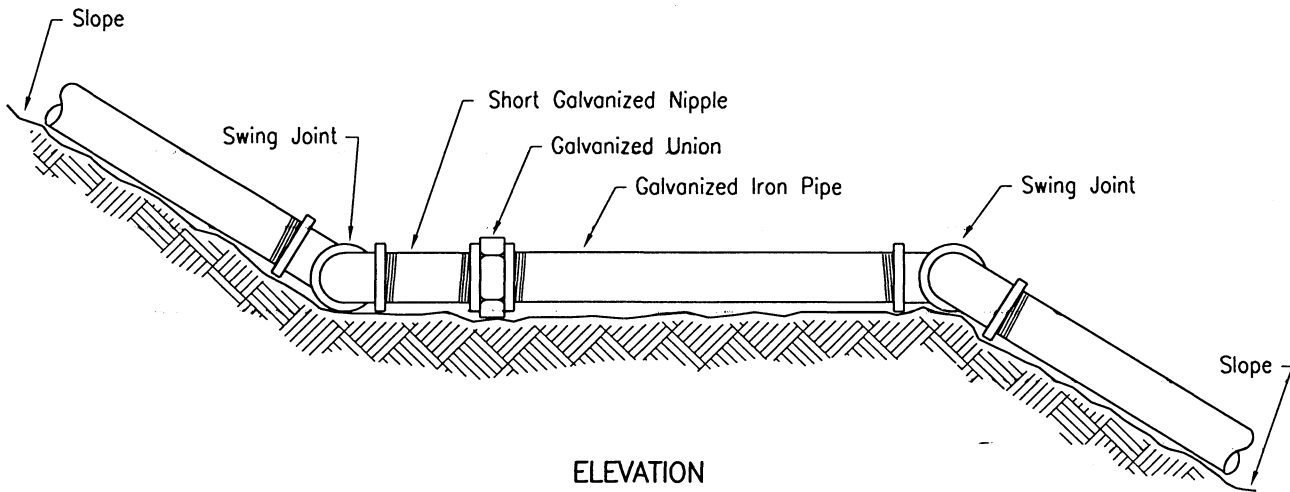
NOTE

Stabilizers shall be placed no greater than 4.50 m (15') apart, at each riser and at all fittings.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		ON-GRADE PIPE STABILIZATION
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
UPDATE		M. Caro	05/04	DRAWING NUMBER	
				1-20	



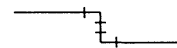
SWING JOINT DETAIL
PLAN



ELEVATION

NOTE
Swing Joints shall be used at each change of grade.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

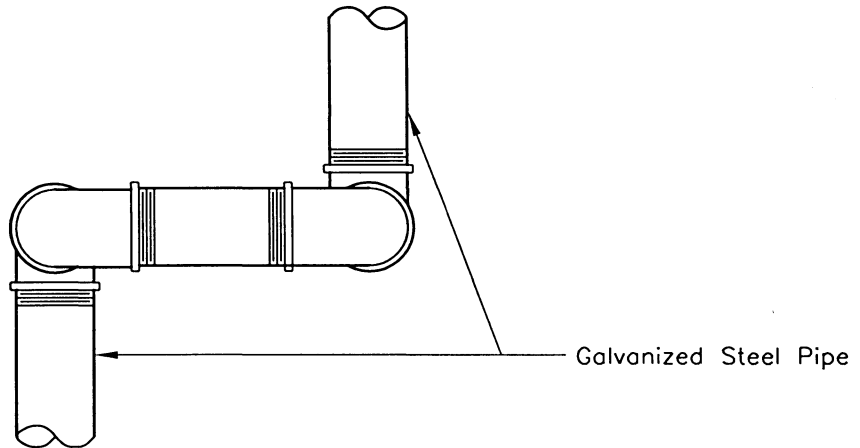
**SWING JOINT AND PIPE INSTALLATION
ON SLOPES
ABOVE GROUND PIPE INSTALLATIONS**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

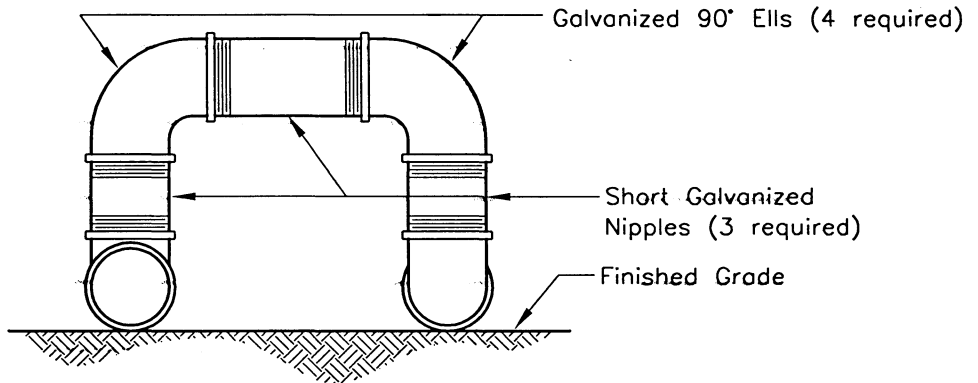
T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **1-23**



PLAN

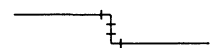


ELEVATION

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. (91.44m (300') maximum runs)

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE SWING JOINT
ABOVE GROUND PIPE INSTALLATIONS**

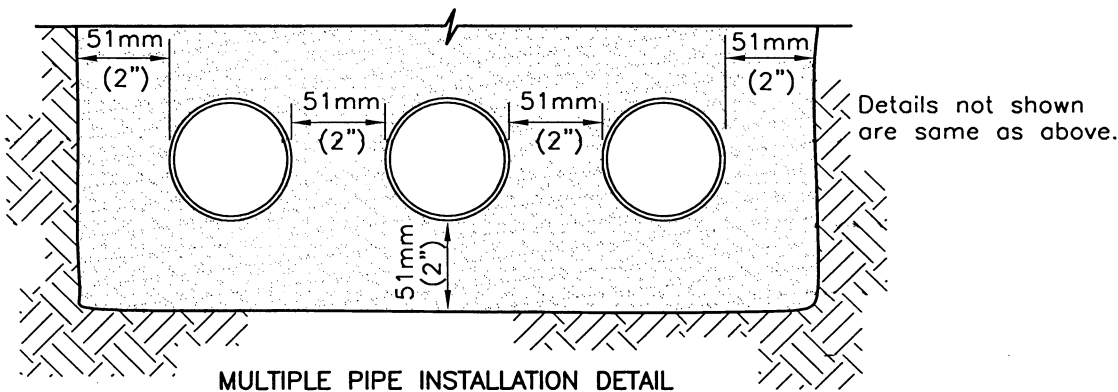
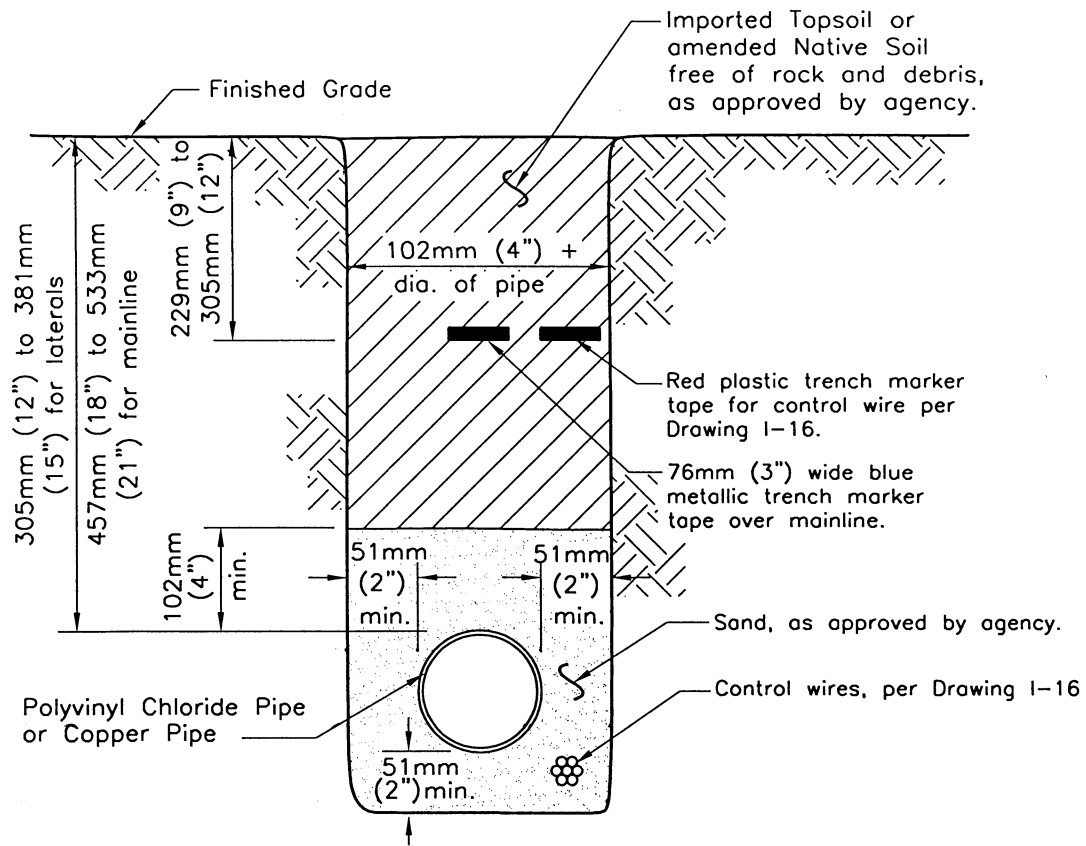
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

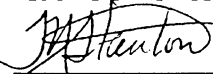
1-24

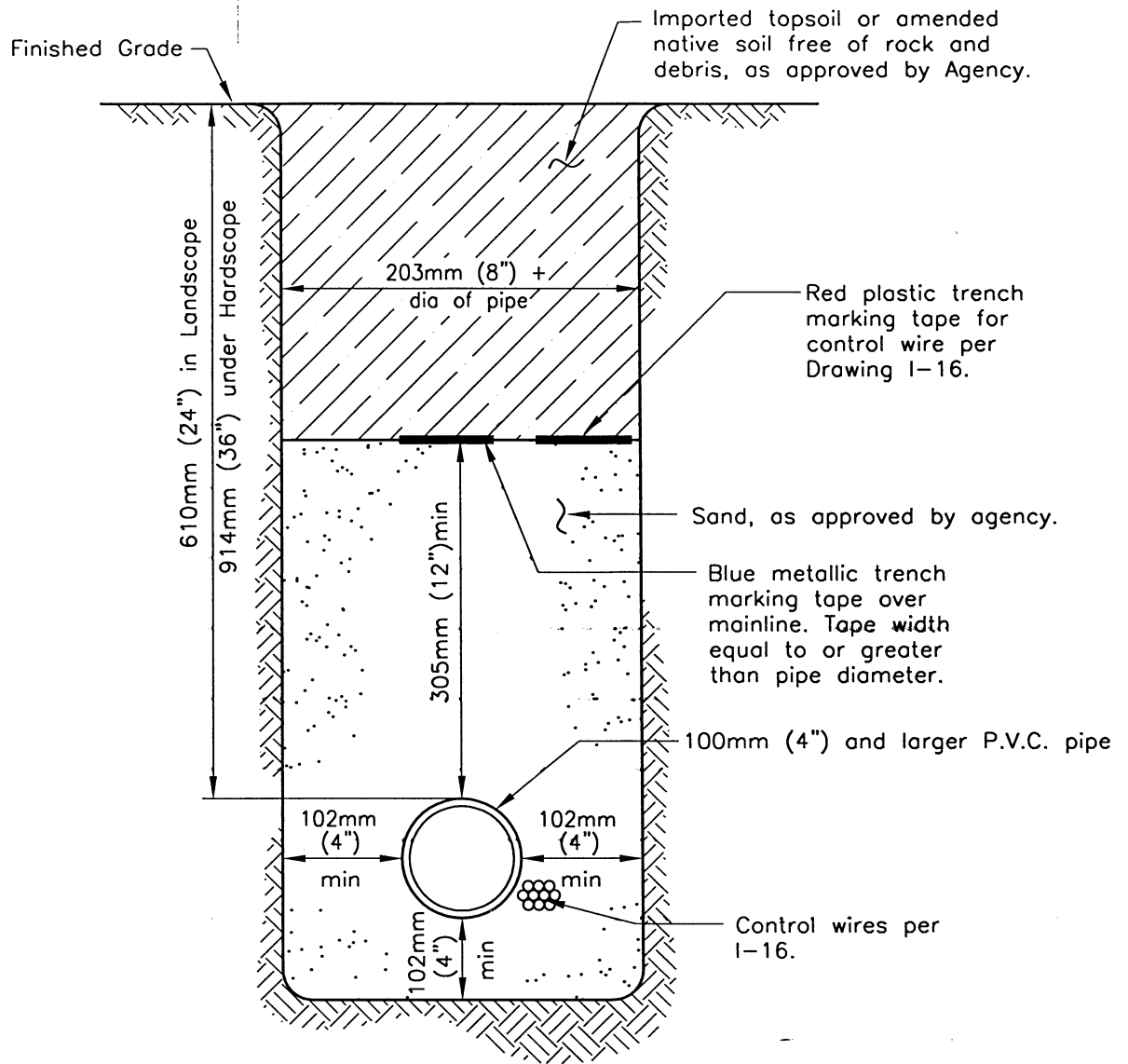


MULTIPLE PIPE INSTALLATION DETAIL
 (Non-pressure pipe only, see Note 6 for pressure pipe)

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, 19mm (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 pipe under pavement shall be installed in a Sch. 40 P.V.C. sleeve twice the diameter of the pipe.
6. Minimum horizontal clearance between pressure pipes shall be 152mm (6")

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Parkinson	02/95	IRRIGATION TRENCH P.V.C. AND/OR COPPER PIPE (76mm (3") AND SMALLER)		 Chairperson R.C.E. 19246 Date 06/24/2004
Add Metric		T. Stanton	03/03			
UPDATE		M. Caro	06/04			
						DRAWING NUMBER I-25



NOTES

1. Backfill material shall be compacted to a relative compaction of 90% or more.
2. All pipeline fittings shall be epoxy coated ductile iron. All fittings shall have thrust blocks per W-17 or joint restraints.
3. The letter 'W', for pressure pipeline and 'E', for control wires shall be stamped or chiseled on the improvement (curb-sidewalk) directly above the pressure pipeline and wires respectively.
4. No P.V.C. pressure pipeline shall be installed within 914mm (3') of any utility, unless otherwise specified.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	05/04

SAN DIEGO REGIONAL STANDARD DRAWING

**IRRIGATION TRENCH DETAIL
100mm (4") AND LARGER P.V.C. MAINLINE**

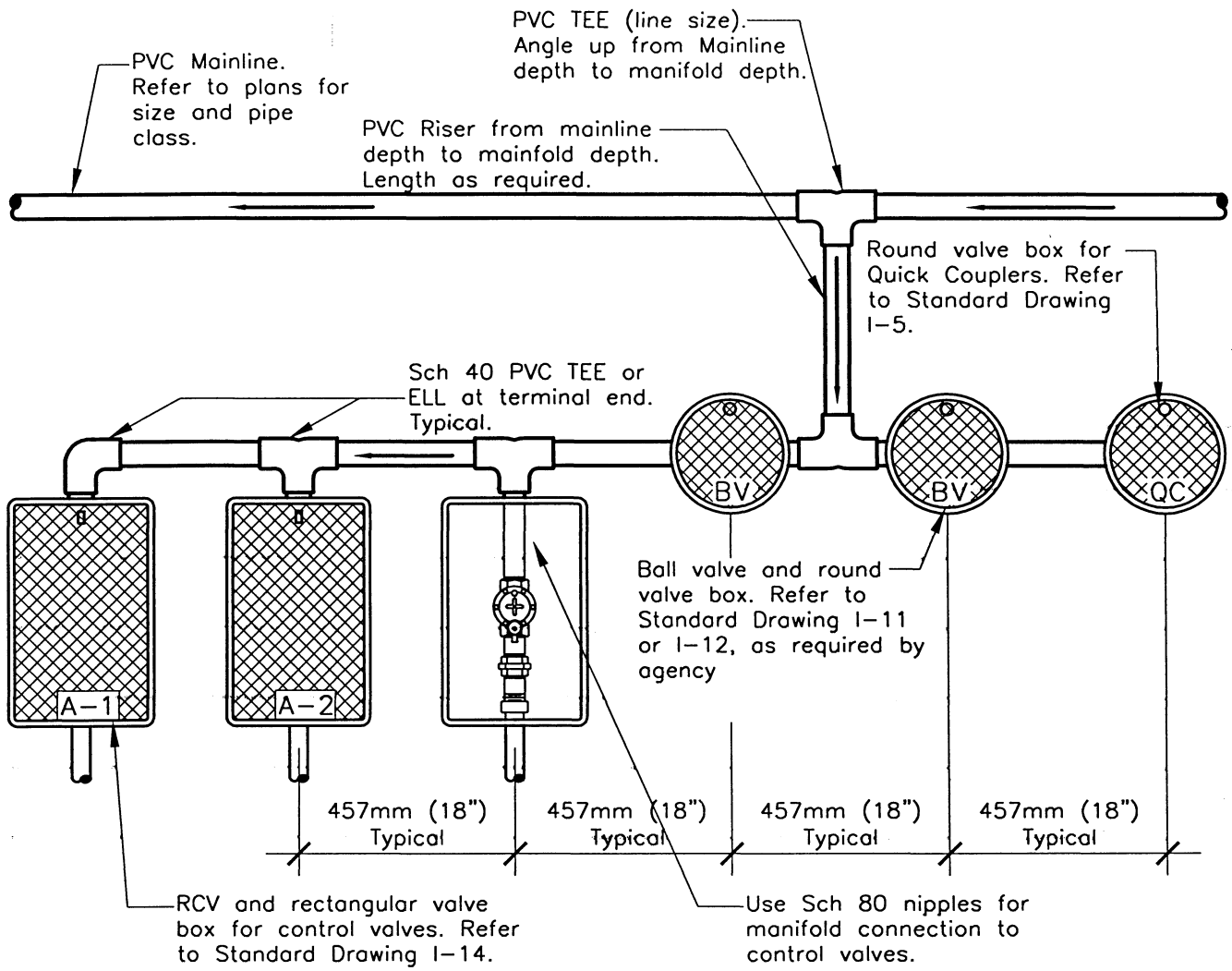
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 05-27-2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER

I-26



NOTES

1. All PVC Pipe used in manifold assemblies shall of the same class as specified for the mainline, unless otherwise specified.
2. All valve boxes shall be heat branded with the appropriate identification. Refer to plans and specifications.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	04/05

SAN DIEGO REGIONAL STANDARD DRAWING

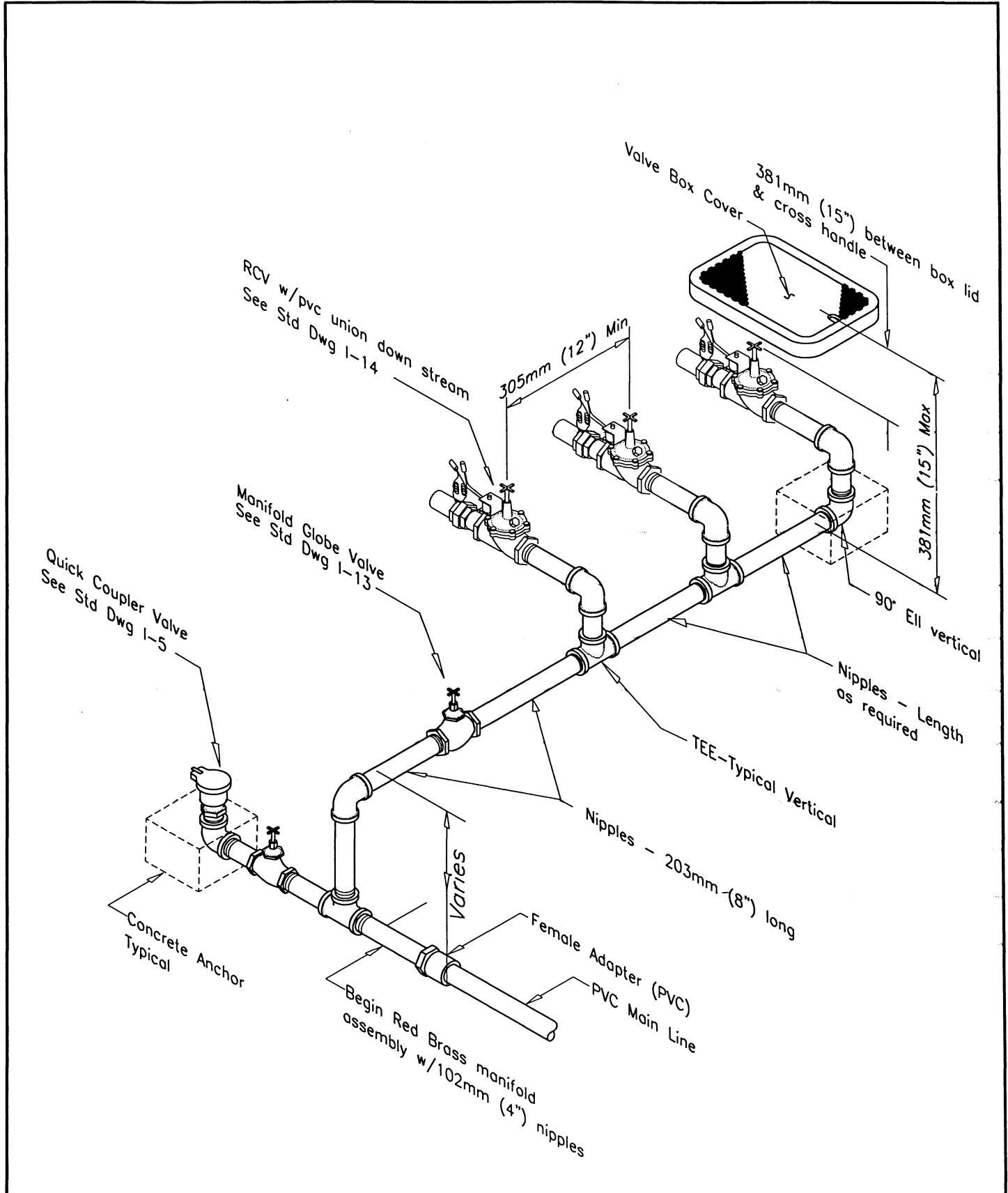
**REMOTE CONTROL VALVE MANIFOLD
ASSEMBLY WITH P.V.C. PIPE**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 04/28/2005

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **I-32**



Revision	By	Approved	Date
ORIGINAL		Parkinson	05/92
Add Metric		T.Stanton	03/03
Updated		M.Caro	04/05

SAN DIEGO REGIONAL STANDARD DRAWING

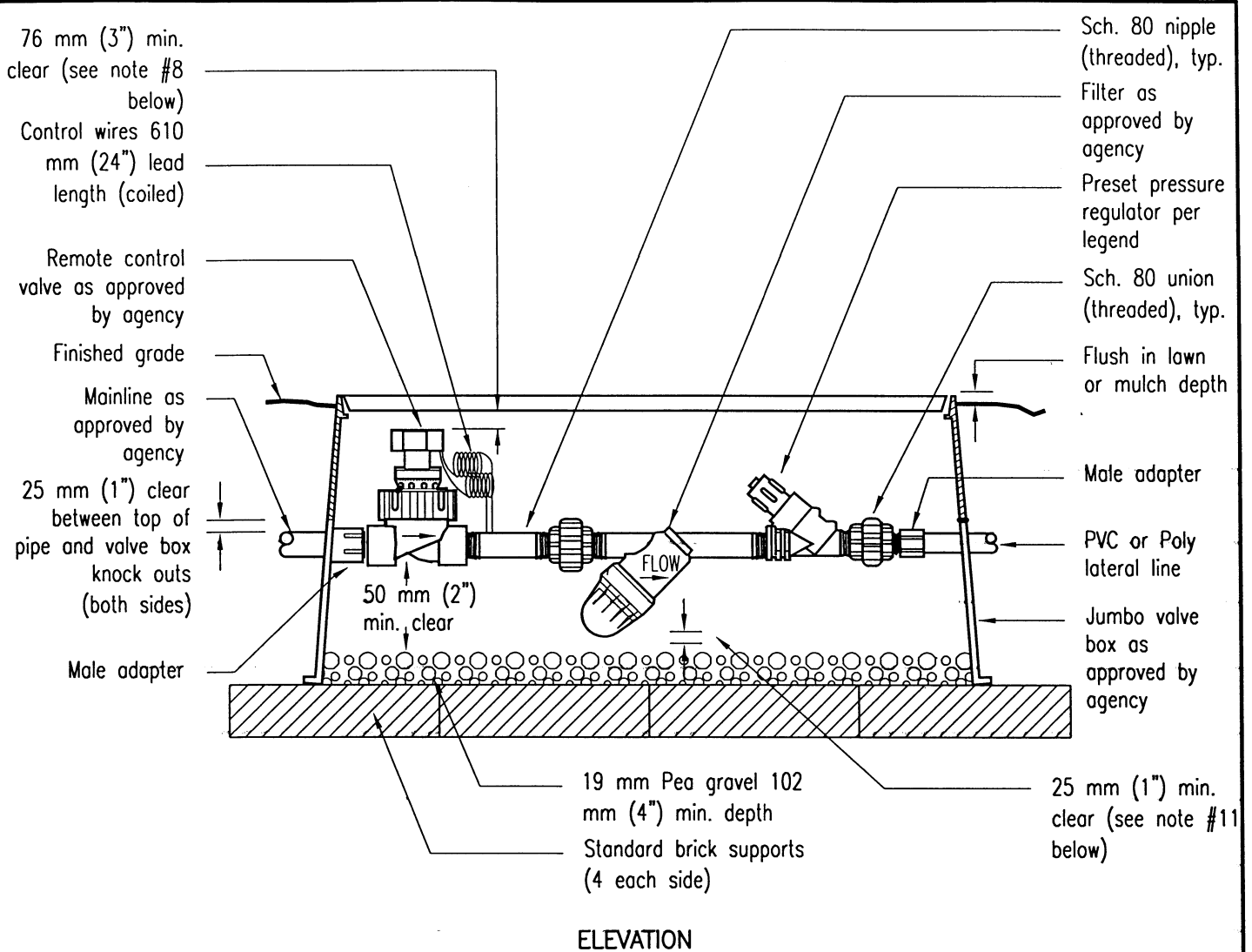
**REMOTE CONTROL VALVE
MANIFOLD ASSEMBLY WITH BRASS PIPE**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 04/28/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **1-33**



NOTES:

1. Splicing shall be made in valve boxes and pull boxes only. See Standard Drawing I-15 for splice/soldering notes.
2. All splices shall be made with a properly set mechanical splice connector entirely enclosed in self-curing resin and shall be completely water-proof.
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, see Standard Drawing I-32 or I-33, per agency standards.
5. Valve/controller identification shall be labeled on the valve box and tagged on the valve per agency requirements.
6. Knock outs shall not be enlarged unless approved by agency.
7. Install only one valve assembly per box.
8. 76 mm (3") min. clear from bottom of box lid to highest point of valve assembly.
9. Valve boxes shall be set perpendicular to hardscape, a max. 305 mm (12") from edge of hardscape, 51-76 mm (2-3") above finished grade in shrub/groundcover areas, per mulch depth. If necessary to be set in turf, valve boxes shall be set flush with finished grade.
10. Close nipples shall not be used.
11. Filter shall be installed to allow for maintenance access.

LEGEND ON PLANS

▽
Or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		M. Caro	1/06

SAN DIEGO REGIONAL STANDARD DRAWING

**REMOTE CONTROL VALVE
DRIP IRRIGATION**

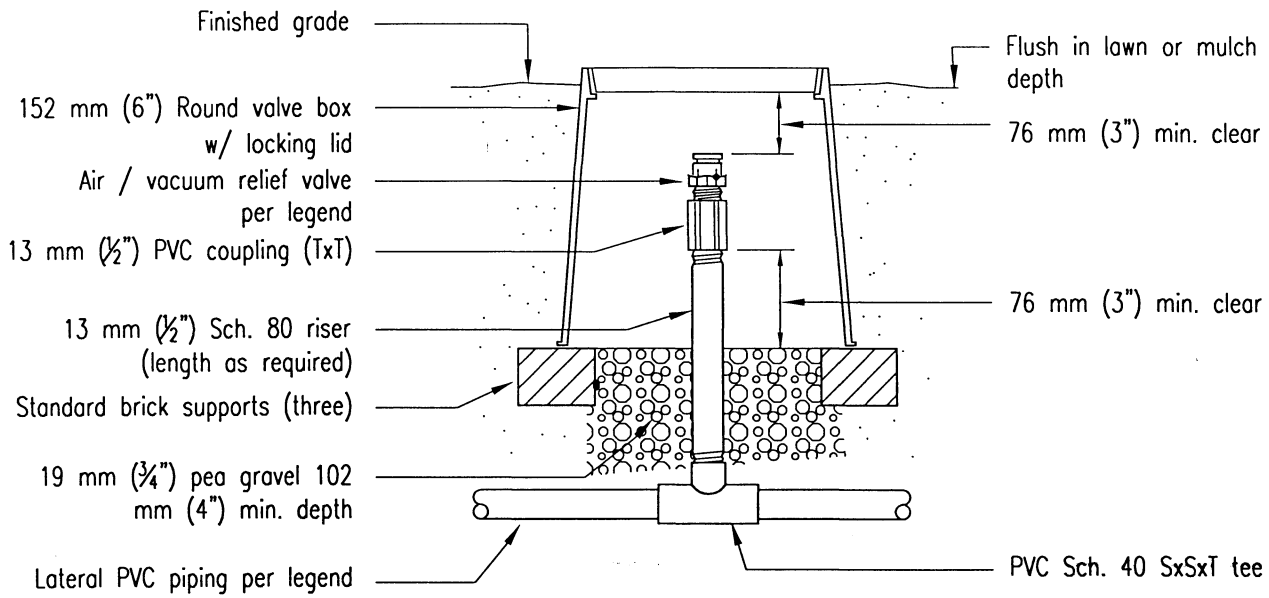
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

J. Stanton 01/26/2006

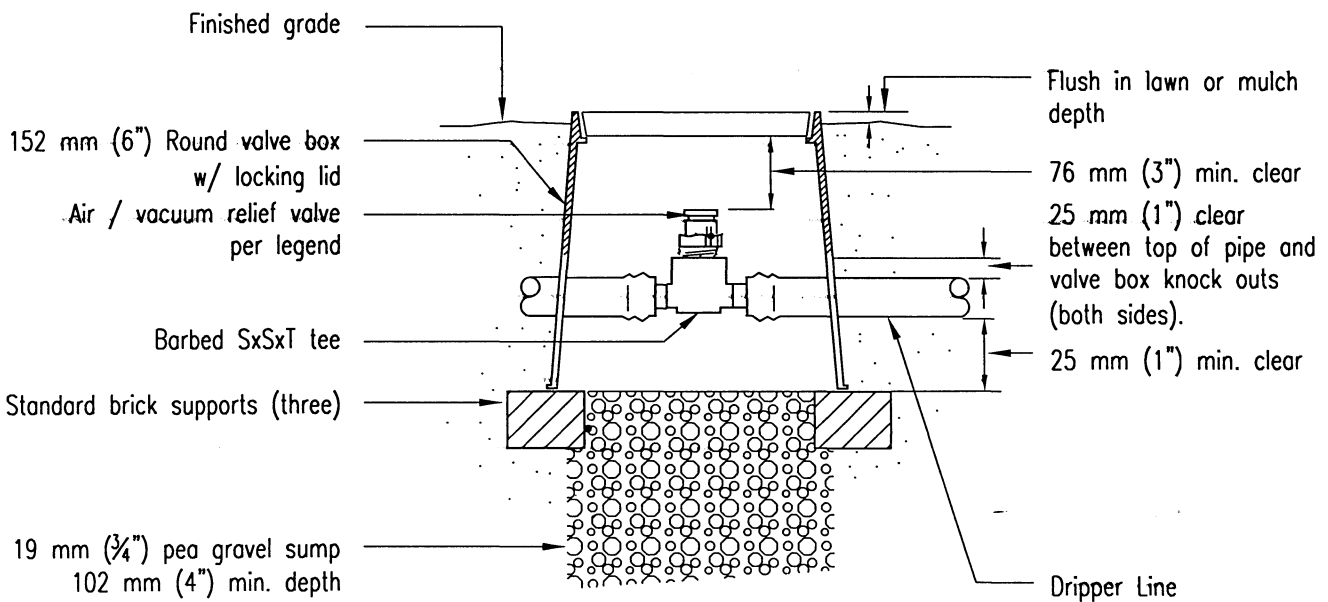
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

I-35



PLUMBED TO PVC



PLUMBED TO DRIPPER LINE

NOTES:

1. Install air/vacuum relief valve at high point(s) in valve circuit.
2. Heat-brand valve box lid "AR" or as per agency requirement.
3. Valve shall be centered in box.

LEGEND ON PLANS

(A)

Or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		M. Caro	1/06

SAN DIEGO REGIONAL STANDARD DRAWING

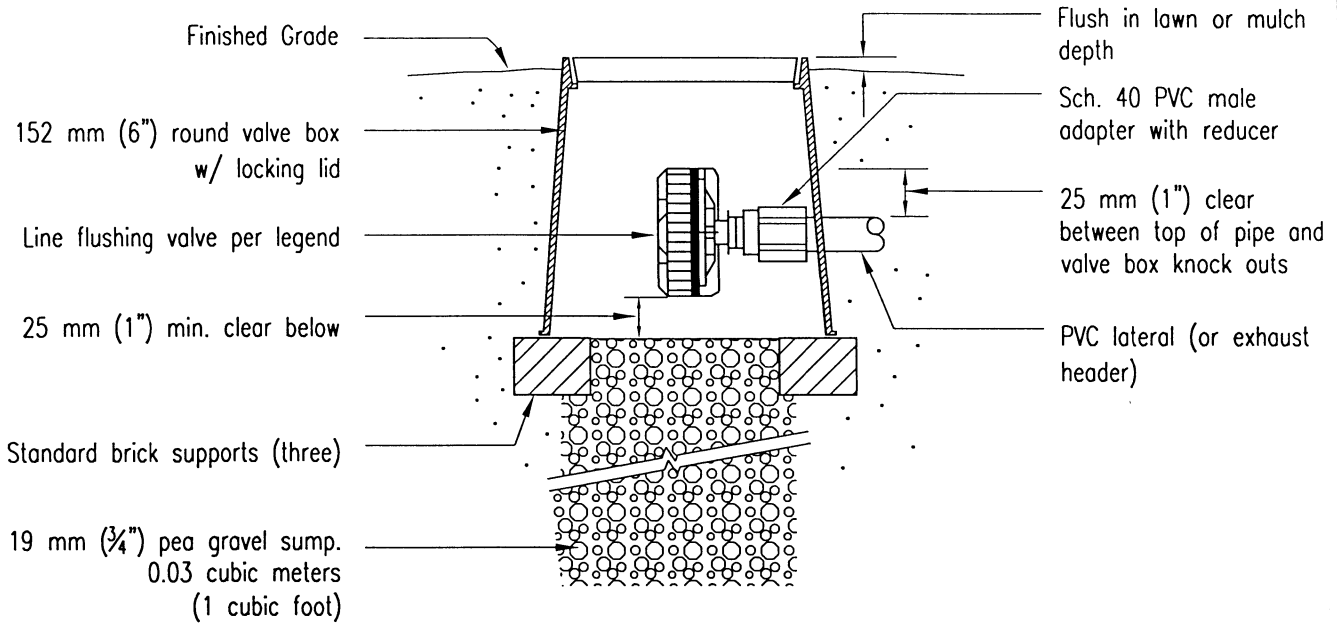
AIR/VACUUM RELIEF VALVE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

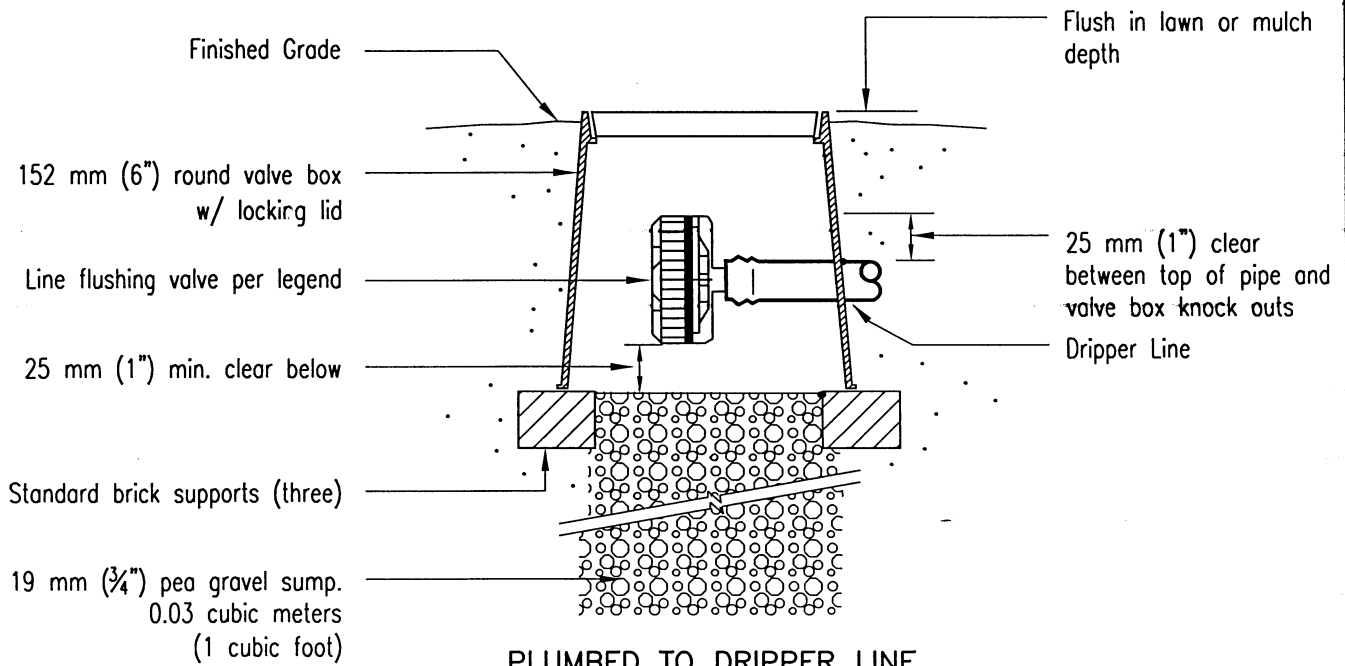
M. Stanton 01/26/2006

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-36**



PLUMBED TO PVC



PLUMBED TO DRIPPER LINE

NOTES:

1. Install flush valve(s) at furthest point(s) in system from the control valve and at low points as needed per plans.
2. Heat brand valve box lids "FV" or as per agency requirement.
3. Valve shall be centered in box.

LEGEND ON PLANS



Or approved agency symbol

Revision	By	Approved	Date
ORIGINAL		M. Caro	1/06

SAN DIEGO REGIONAL STANDARD DRAWING

**DRIP IRRIGATION
FLUSH VALVE (AUTOMATIC)**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

J. Stanton 01/26/2006

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **I-37**

LANDSCAPING

SUPPLEMENT TO REGIONAL STANDARD DRAWING (L-SERIES)

DRAWING L-4

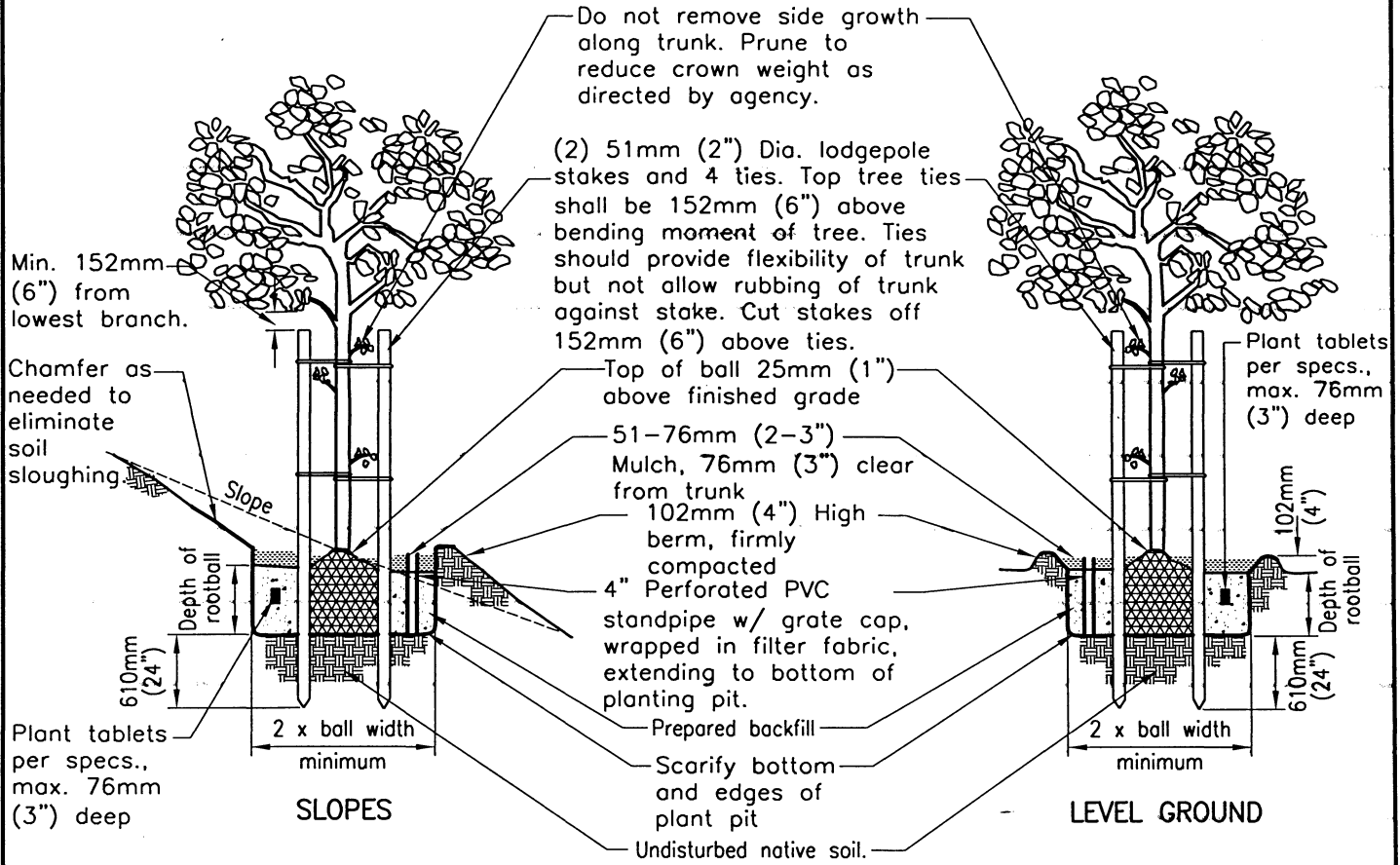
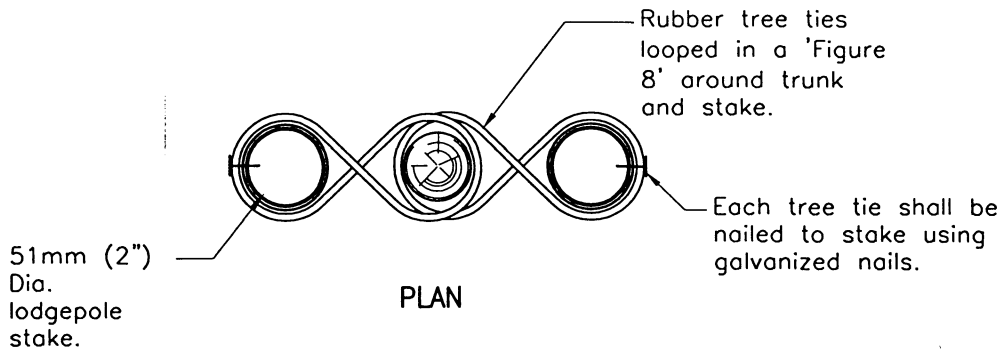
NOTES: Amend Note #3 to Read: If required to secure the grate, all bolts, nuts, and washers shall be Grade 316 stainless steel. All fabricated steel items shall be hot dipped galvanized after fabrication.

Add: 8. Adjacent sidewalk shall have a minimum clear width of four feet inches (4'-4") from the edge of grate.

Add: 9. Sidewalk cross slope shall be 1.5%

Add: 10. Steel grate to have a permanent slip resistant finish.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	DC	A. Oskoui	12/06		<i>A. Oskoui</i> 12/16/06 COORDINATOR R.C.E 65271 Date	
				SUPPLEMENT TO REGIONAL STANDARD DRAWING ("L" SERIES)	DRAWING NUMBER	SDL-100



NOTES

1. Double stake #15 (15 gal.) and larger trees.
2. For single staked trees, place stake on windward side of tree.
3. Locate stakes outside of rootball.
4. Lodgepoles treated with Chromated Copper Arsenate (CCA) are not allowed.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	02/05

SAN DIEGO REGIONAL STANDARD DRAWING

TREE PLANTING AND STAKING

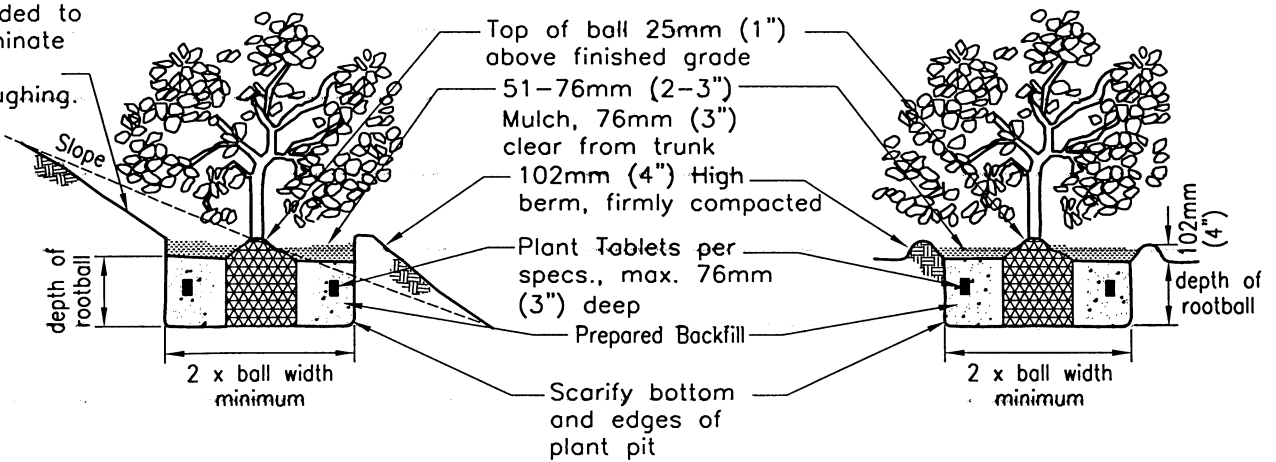
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 02/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **L-1**

Chamfer as needed to eliminate soil sloughing.



SHRUB PLANTING - SLOPES

SHRUB PLANTING - LEVEL GROUND

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	02/05

SAN DIEGO REGIONAL STANDARD DRAWING

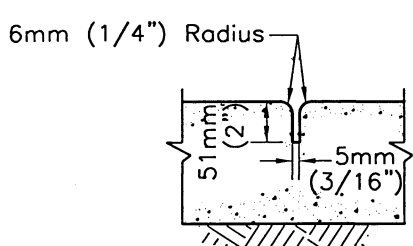
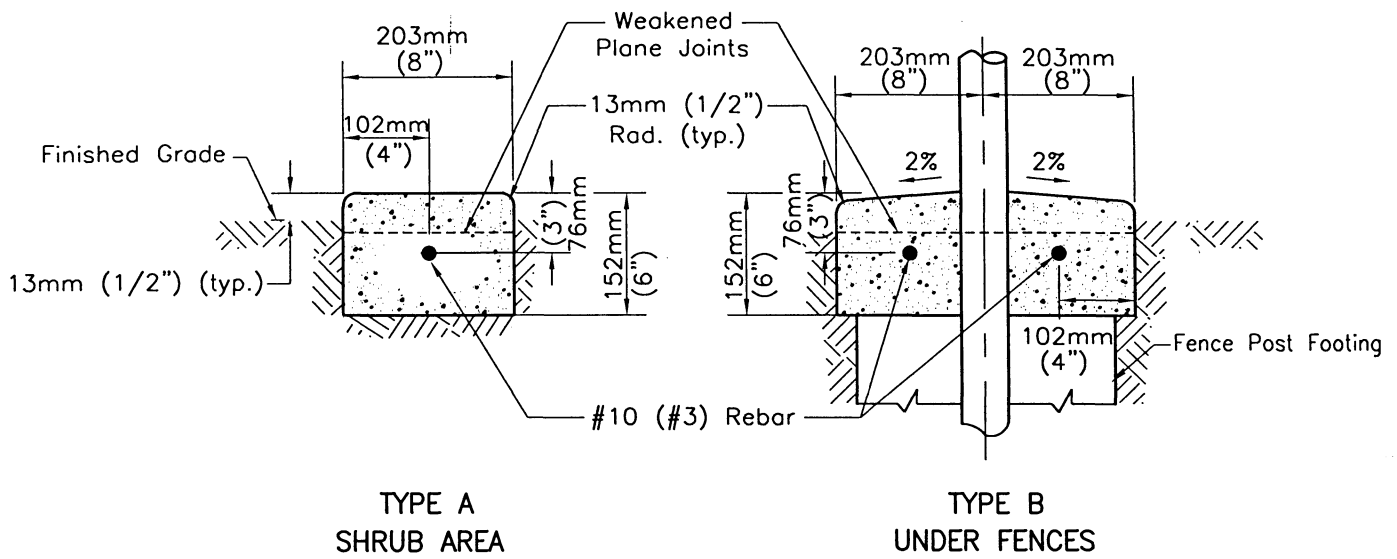
SHRUB PLANTING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

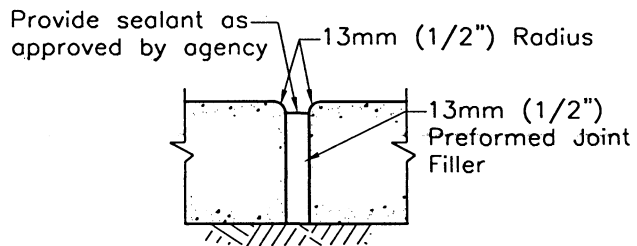
T. Stanton 02/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **L-2**



WEAKENED PLANE JOINT
Max. 6m (20') O.C.

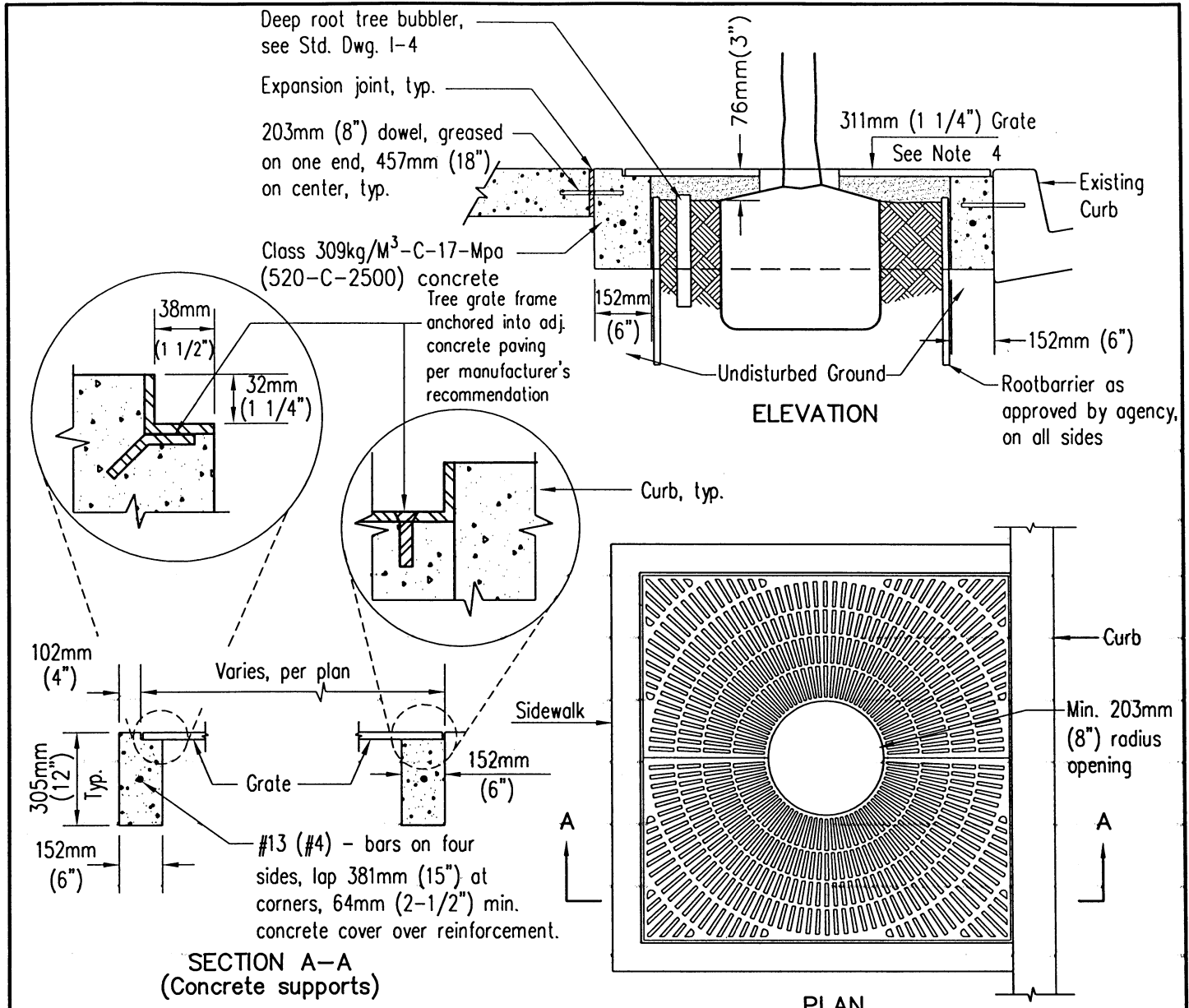


EXPANSION JOINT
Max. 36.6m (120') O.C.

NOTES

1. Rebar shall be continuous with 305mm (12") overlap at splices.
2. Concrete shall be class 308kg/M³-C-17-Mpa (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 and at location approved by agency.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		H.Hecht	10/82		<i>T. Stanton</i> 02/24/2005
Add Metric		T. Stanton	03/03	CONCRETE MOWING STRIP	Chairperson R.C.E. 19246 Date
UPDATE		M. Coro	02/05		DRAWING NUMBER
					L-3



SECTION A-A
(Concrete supports)

NOTES:

1. Sidewalk to be removed for each tree planting shall be saw cut full depth.
2. Fill below grate with shredded bark mulch. Do not fill tree grate opening.
3. If the grate is to be secured, all bolts, nuts and washers shall be hot dipped galvanized.
4. Grates shall be min. 3.7 sq. m. (40 sq. ft.) in size, and two separate pieces, unless otherwise specified on the plans. Slot openings in grate design shall have 10mm (3/8") maximum width. Grate designs shall be in accordance with current A.D.A. standards as well as the latest edition of the Uniform Building Code, with a minimum uniform live load of 250 pounds per square foot in sidewalks, and have a method of symmetrical interior expandable rings/openings (detailed on the plans) as selected and approved by the agency.
5. Immediate notification shall be given to the Engineer of any below grade improvements encountered.
6. Set grate in frame prior to placement of pavement.
7. Tree shall be centered in grate opening.

Revision	By	Approved	Date
ORIGINAL		Parkinson	5/92
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	1/06

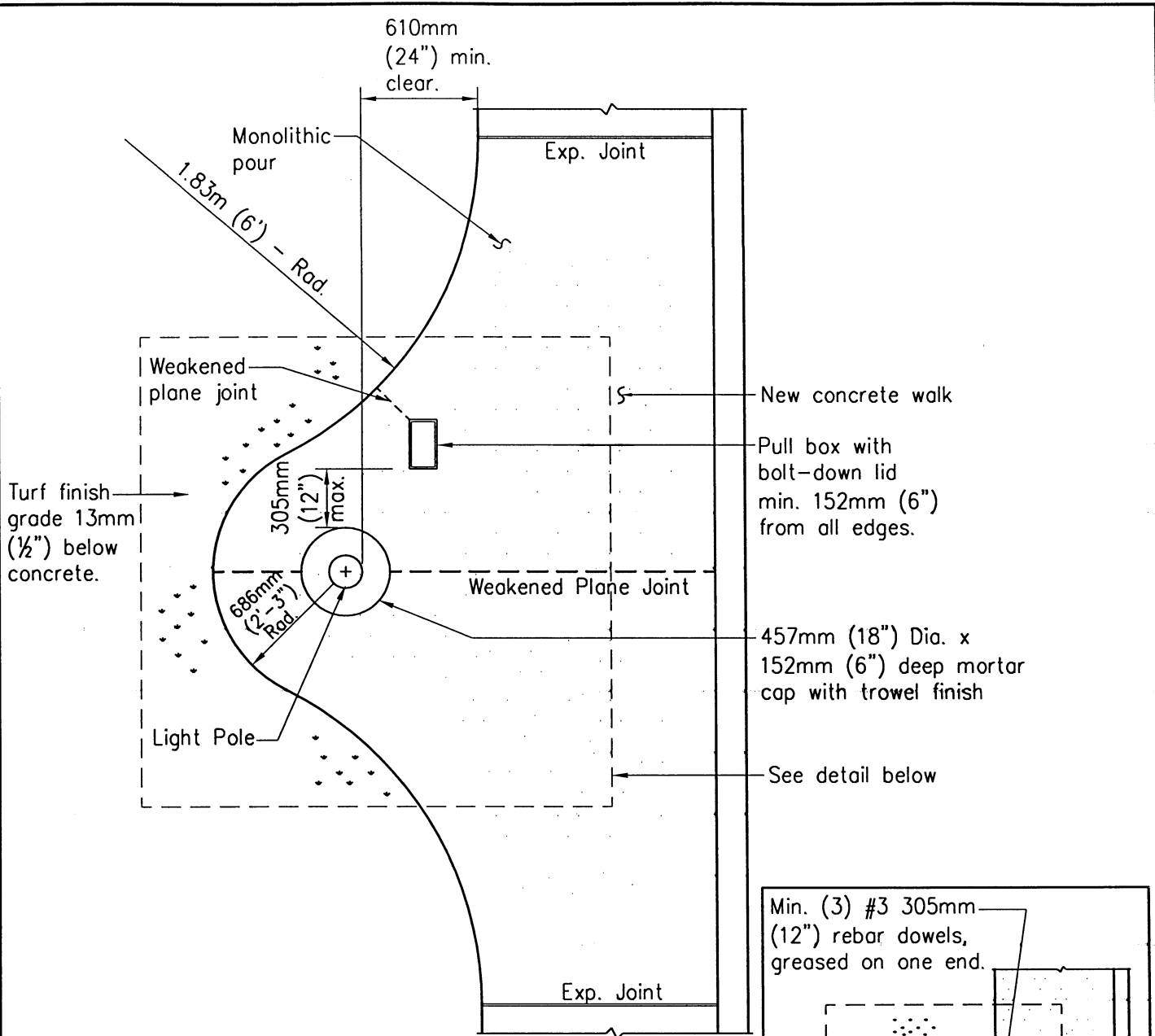
SAN DIEGO REGIONAL STANDARD DRAWING

TREE GRATE

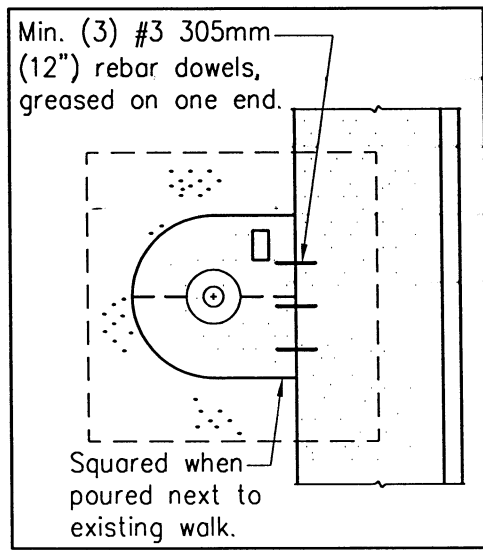
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 01/26/2006
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **L-4**



PLAN VIEW



PAD WHEN ADJ. TO EXISTING CONCRETE

NOTES

1. See Electric Plans for fixture/pole/footing and pull box details.
2. Use monolithic pour for new construction.
3. Pole pads shall drain at 2% minimum in same direction as sidewalk.
4. Concrete pad shall be the same as specified for sidewalk.
5. Locate light poles in shrub areas where possible.

Revision	By	Approved	Date
ORIGINAL		Parkinson	9/88
Add Metric		T. Stanton	03/03
UPDATE		M. Caro	08/05

SAN DIEGO REGIONAL STANDARD DRAWING

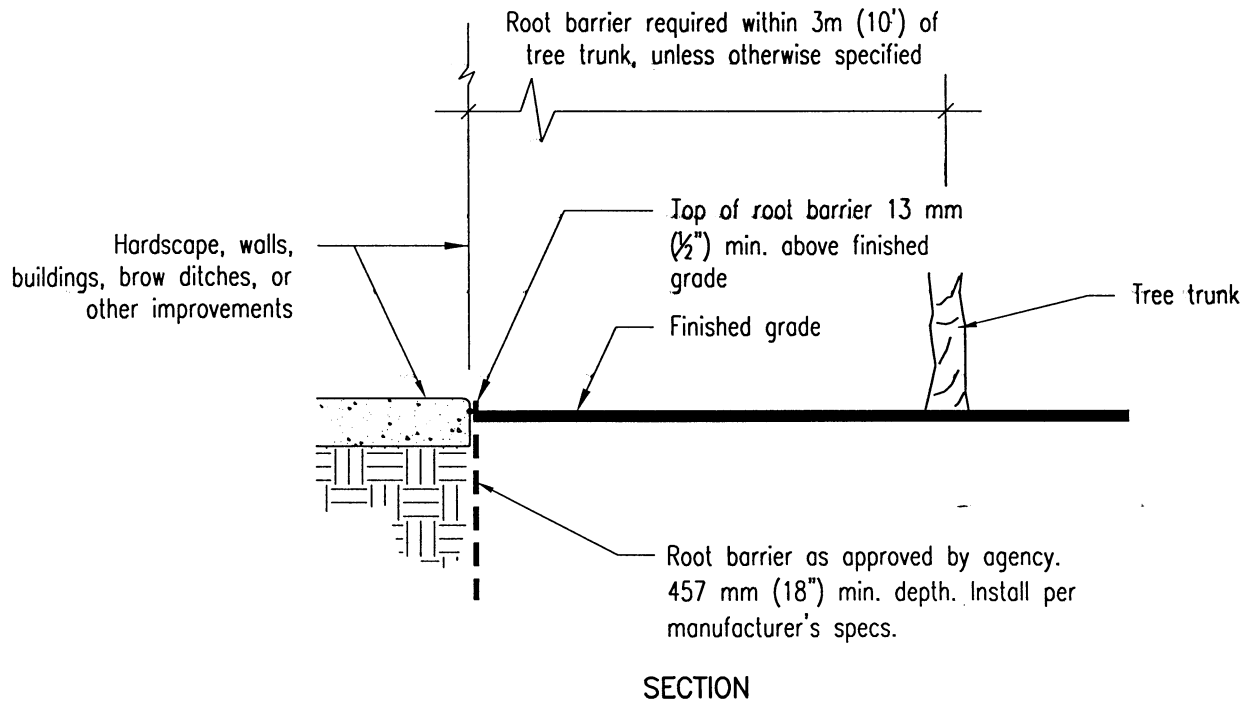
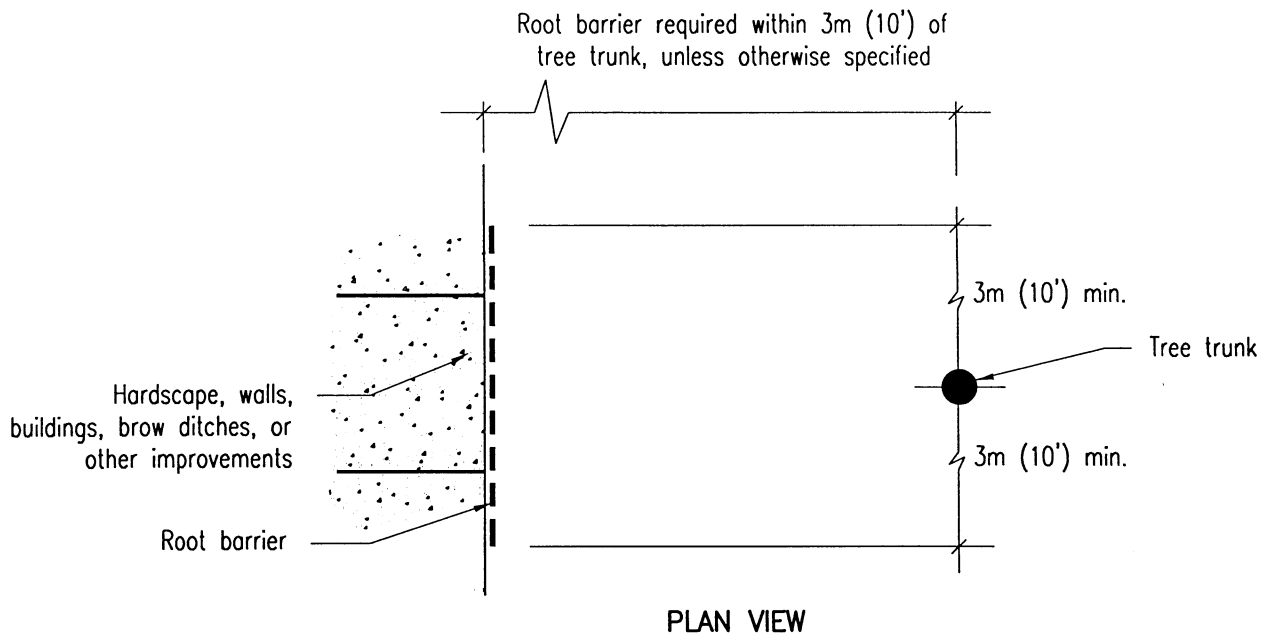
LIGHT POLE PAD IN TURF AREAS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 08/25/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **L-5**



NOTE:

1. Root barrier shall be installed adjacent to the improvement and not around the rootball.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		M. Caro	2/06	ROOT CONTROL BARRIER		<i>M. Steinton</i> 02/23/2006	
						Chairperson R.C.E. 19246 Date	
						DRAWING NUMBER	L-6

MISCELLANEOUS

M

MISCELLANEOUS

SUPPLEMENT TO REGIONAL STANDARD DRAWING (M-SERIES)

DRAWING M-17

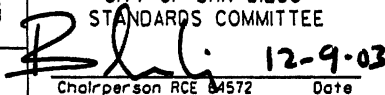
NOTES ADD the following SPECIAL NOTE:

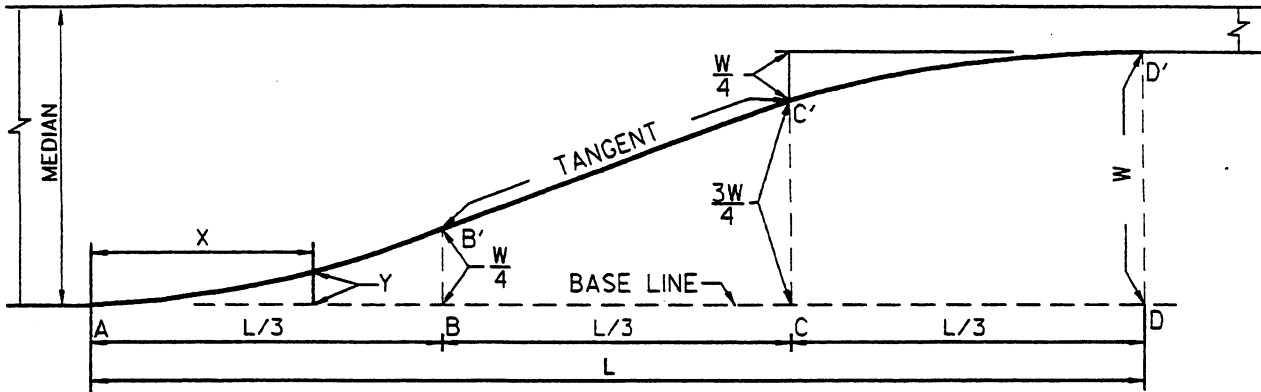
1. Chain link fabric shall have knuckled finish on top edge.

DRAWING M-24

NOTES Amend Note 5: " $\Delta < 4$ ". Guardrails and handrails for stairs and ramps more than 30" above have intermediate rails equally spaced such that a sphere 4" in diameter cannot pass through."

7. The clearance between handrail and wall is 1-1/2" absolute.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL		M. V. Rollinger	5-20-92			
NOTES		G. Parkinson	2-7-95			
NOTES	SM	Oskoui	12-9-03	SUPPLEMENTAL TO REGIONAL STANDARD DRAWING ("M" SERIES)	 <small>Chairperson RCE #4572 Date</small>	
					DRAWING NUMBER	SDM-100



$$Y = 2.25W \left(\frac{X}{L} \right)^2$$

L=LENGTH OF TRANSITION
 W=MAXIMUM OFFSET DISTANCE
 X=DISTANCE ALONG BASELINE
 Y=OFFSET FROM BASELINE

L	DISTANCE X												
	60'	5'	10'	15'	20'	25'	30'	35'	40'	45'	50'	55'	60'
90'	7.5'	15'	22.5'	30'	37.5'	45'	52.5'	60'	67.5'	75'	82.5'	90'	
120'	10'	20'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	
W	OFFSET Y												
	10'	0.16'	0.62'	1.41'	2.50'	3.75'	5.00'	6.25'	7.50'	8.59'	9.38'	9.84'	10.00'
	11'	0.17'	0.69'	1.55'	2.75'	4.13'	5.50'	6.88'	8.25'	9.45'	10.31'	10.83'	11.00'
	20'	0.31'	1.25'	2.81'	5.00'	7.50'	10.00'	12.50'	15.00'	17.19'	18.75'	19.69'	20.00'
	22'	0.34'	1.38'	3.09'	5.50'	8.25'	11.00'	13.75'	16.50'	18.91'	20.62'	21.66'	22.00'

NOTE:

TO DETERMINE OFFSET DISTANCE FOR ANY LENGTH OF TRANSITION USE THE FORMULA $Y = 2.25W \left(\frac{X}{L} \right)^2$ FOR THE PORTIONS AB' AND C'D' WHICH ARE PARABOLIC CURVES. THE PORTION B'C' IS A TANGENT. WHEN THE BASELINE IS CURVED, THE OFFSETS ARE APPLIED TO THE CURVED BASELINE, AND B'C' IS NO LONGER A TANGENT.

Revision	By	Approved	Date
ORIGINAL	JJD	G. PARKINSON	2-9-95

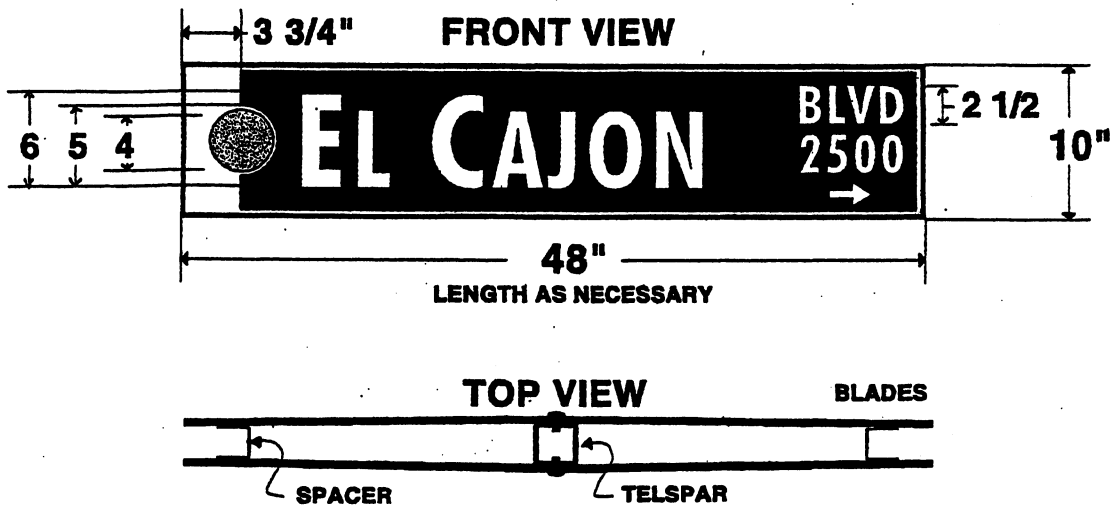
CITY OF SAN DIEGO - STANDARD DRAWING

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature]
COORDINATOR R.C.E. 25902 2-9-95
DATE

LEFT TURN MEDIAN TRANSITION

DRAWING NUMBER **SDM-101**



LETTER STYLE: FUTURA BOLD CONDENSED

LETTER SIZE: 6" 5" 2 1/2"

CITY SEAL: 4"

BACKGROUND: TYPE IV PRISMATIC SHEETING

ELECTRO CUT BLUE OVER WHITE

.065 ALUMINUM

MOUNTED TO TELSPAR WITH 3/8" DRIVE RIVETS

4" TALL BY 1 1/4" SQ. CHANNEL SPACER HELD WITH VHB 4950 TAPE

Contractor shall contact City Of San Diego Sign Shop, (619) 527-7528 for a list of approved vendors for City Seal.

SHEET 1 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>Hon. R. H.</i> 8/17/00 COORDINATOR DATE C-35390
ORIGINAL		J.P. CASEY	11/8/88		
				STREET NAME SIGN	DRAWING NUMBER
					SDM-102

PERMANENT STREET NAME SIGNS

GENERAL:

Street name sign assembly for post top mounting shall consist of: Name Blade units, 24" long 1-1/2" Square Telespar extension and Drive Rivets. All as indicated on the Standard Drawings and/or specified in these notes. Assemblies shall be mounted to 1-3/4" square Telespar posts.

NAME BLADE UNITS:

Name Blade units shall be single faced and made from 10" wide (top to bottom) aluminum sheet stock, mill flat, 6061-T6 or 5052 alloy, .063 thick. Ends of blade to be perpendicular to top bottom edges. All edges shall be free of sharp burrs.

Each blade shall be drilled with two 7/16" holes, one at top and one at bottom edge of sign. Holes to be centered on blade and 1/2" from edge.

Blade shall be covered with type IV prismatic white reflective sheeting.

LETTERING:

Street name shall be cut from blue E.C. Film material and applied over the white background, creating a sign with a blue background and white lettering. Type font to be Futura Bold Condensed. Lettering height of street name shall be 6" for first letter and 5" for the rest of the name. Street and block number suffix to be 2-1/2" Futura Bold Condensed. Layout to be as shown on Sheet 1 of 4 on the Standard Drawing.

MOUNTING OF SIGN:

Each Name Blade shall be mounted to the 1-1/2" Telespar extension with a 3/8" Drive Rivet.

Each Street Name shall be mounted back to back with the Telespar sandwiched in between and the ends fastened together with VHB double stick tape. A Square channel spacer is required on blades shorter than 36". The extension is to be placed inside the 1-3/4" Telespar post and fastened with a Drive Rivet.

Sheet 2 of 4

REVISION	BY	APPROVED	DATE	<p align="center">CITY OF SAN DIEGO - STANDARD DRAWINGS</p>	<p align="center">CITY OF SAN DIEGO STANDARDS COMMITTEE</p> <p align="right"><i>Clayton</i> 8/17/00 COORDINATOR DATE</p> <p align="center">C-35390</p>
ORIGINAL		J.P.CASEY	11-8-88		<p align="center">STREET NAME SIGN</p>

STREET NAME SIGN STANDARDS

Suffix and Prefix Abbreviations:

Avenue	AVE
Street	ST
Court	CT
Drive	DR
Road	RD
Boulevard	BLVD
Terrace	TER
Mountain	MTN
Mount	MT
Caminito	CMTO
Camino	CAM
Rancho	RCHO

Spell out "FIRST AVE through TWELFTH AVE"
Then: 13TH ST — 14TH ST etc.

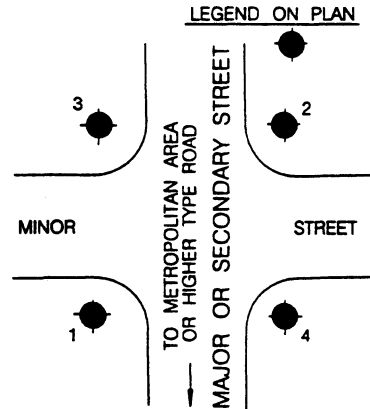
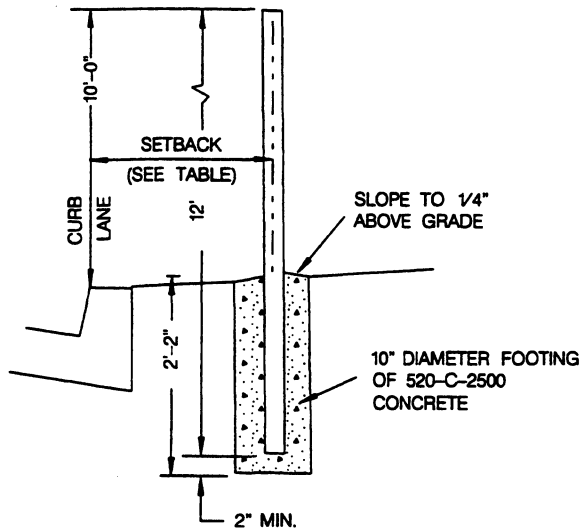
SHT. 3 OF 4

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		J.P. Casey	8-88		<i>[Signature]</i> 2-7-95
Rev. - 1	TLH		7/28/00	STREET NAME SIGN	COORDINATOR R.C.E. 25902 DATE
					DRAWING NUMBER SDM-102

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

LOCATION NOTES

1. ALONG MAJOR OR PRIMARY STREETS THERE SHALL BE 2 SIGN INSTALLATIONS PER INTERSECTION PLACED ON OPPOSITE CORNERS
2. ALONG A COLLECTOR OR LOCAL STREETS THERE SHALL BE ONE SIGN INSTALLATION PER INTERSECTION



STREET NAME SIGN LOCATION
 (NUMBERS INDICATE PRIORITY OF LOCATION SELECTION WHEN THERE IS A CONFLICT WITH OTHER IMPROVEMENTS)

Sheet 4 of 4

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	11-8-88
Rev. - 1	TLH		7/28/00

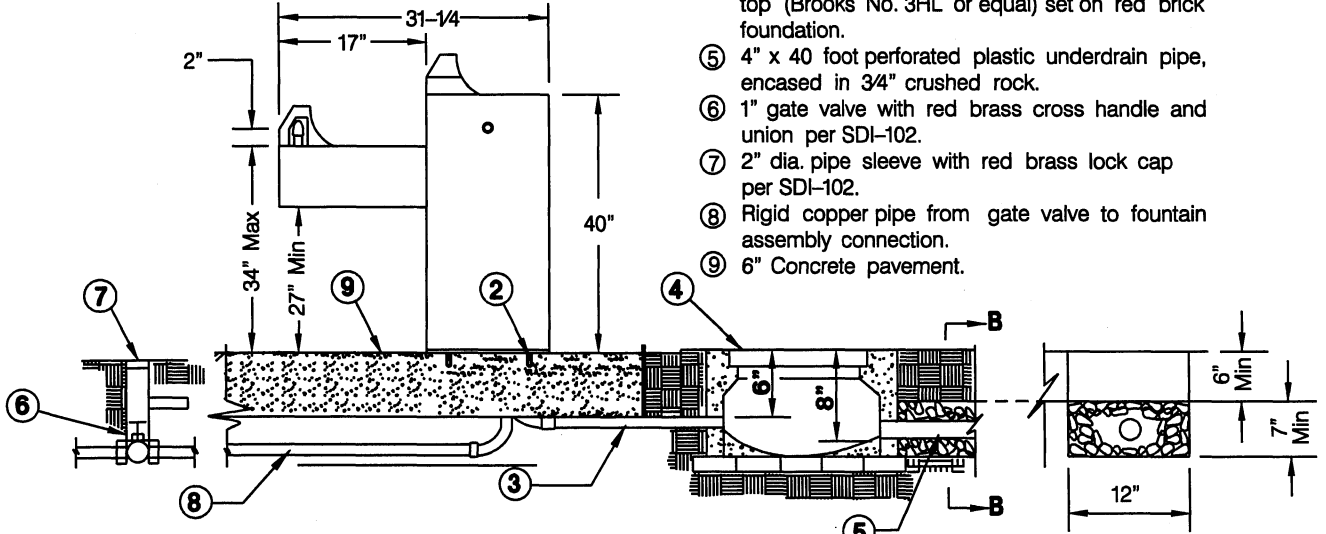
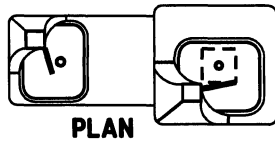
CITY OF SAN DIEGO - STANDARD DRAWING

STREET NAME SIGN

CITY OF SAN DIEGO
 STANDARDS COMMITTEE
Steve J. Paul 2-7-95
 COORDINATOR R.C.E. 25902 DATE
 DRAWING NUMBER **SDM-102**

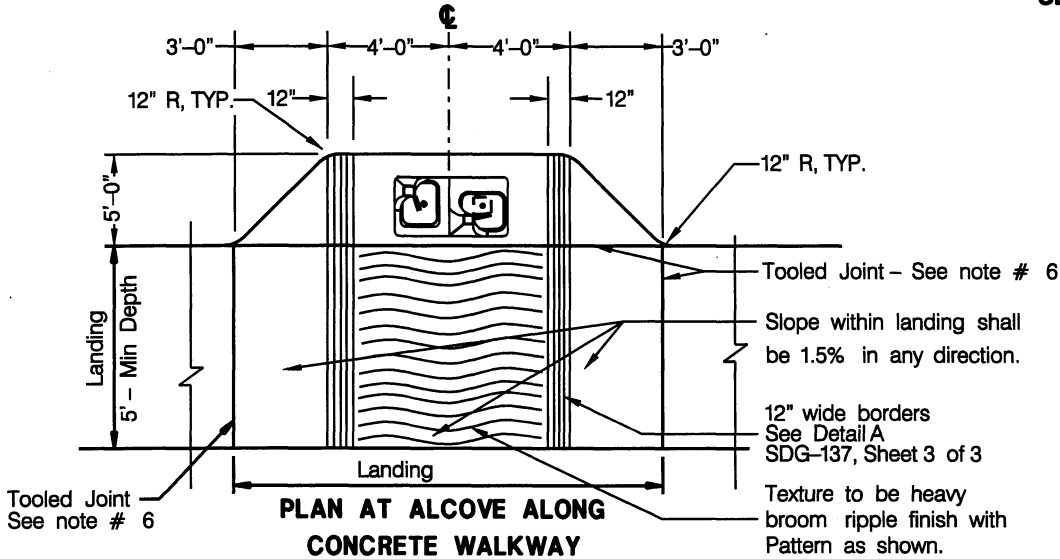
LEGEND:

- ① Dual-height drinking fountain as approved by the City Engineer.
- ② 12" x 4" loop anchors and 1/2" x 1-1/2" bolts at all locations or per manufacturer's recommendation.
- ③ 1-1/4" P.V.C. pipe with sweep 90 degree elbow 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 foot perforated plastic underdrain pipe, encased in 3/4" crushed rock.
- ⑥ 1" gate valve with red brass cross handle and union per SDI-102.
- ⑦ 2" dia. pipe sleeve with red brass lock cap per SDI-102.
- ⑧ Rigid copper pipe from gate valve to fountain assembly connection.
- ⑨ 6" Concrete pavement.



ELEVATION/SECTION

SECTION B-B



PLAN AT ALCOVE ALONG CONCRETE WALKWAY

NOTES

- 1. Install drinking fountains 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.
- 4. Item no. 6 is a one-inch gate valve. Use red brass bushing reducers to adapt to feed pipe.
- 5. Locate drinking fountains in an alcove or at areas outside the path-of-travel otherwise provide protective railing Per SDM-108.
- 6. Tooled Joint - 1/4" deep groove with 1/4" radius edges.
- 7. The running and cross slopes within the landing shall be 1.5% and designed so water does not accumulate.

LEGEND ON PLANS



Revision	By	Approved	Date
Original	SM	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

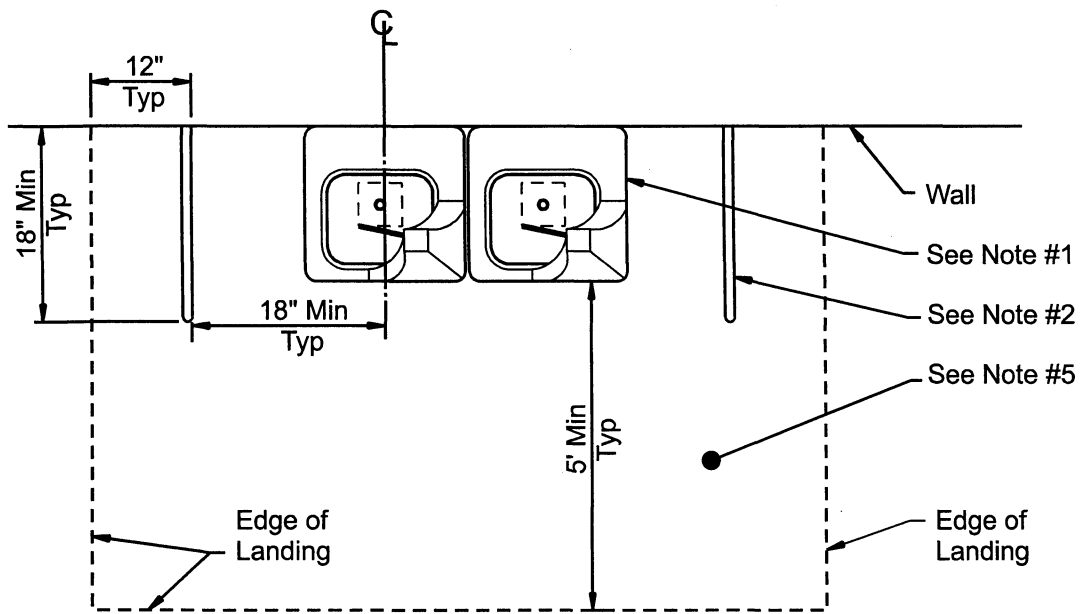
CITY OF SAN DIEGO - STANDARD DRAWING

DRINKING FOUNTAINS

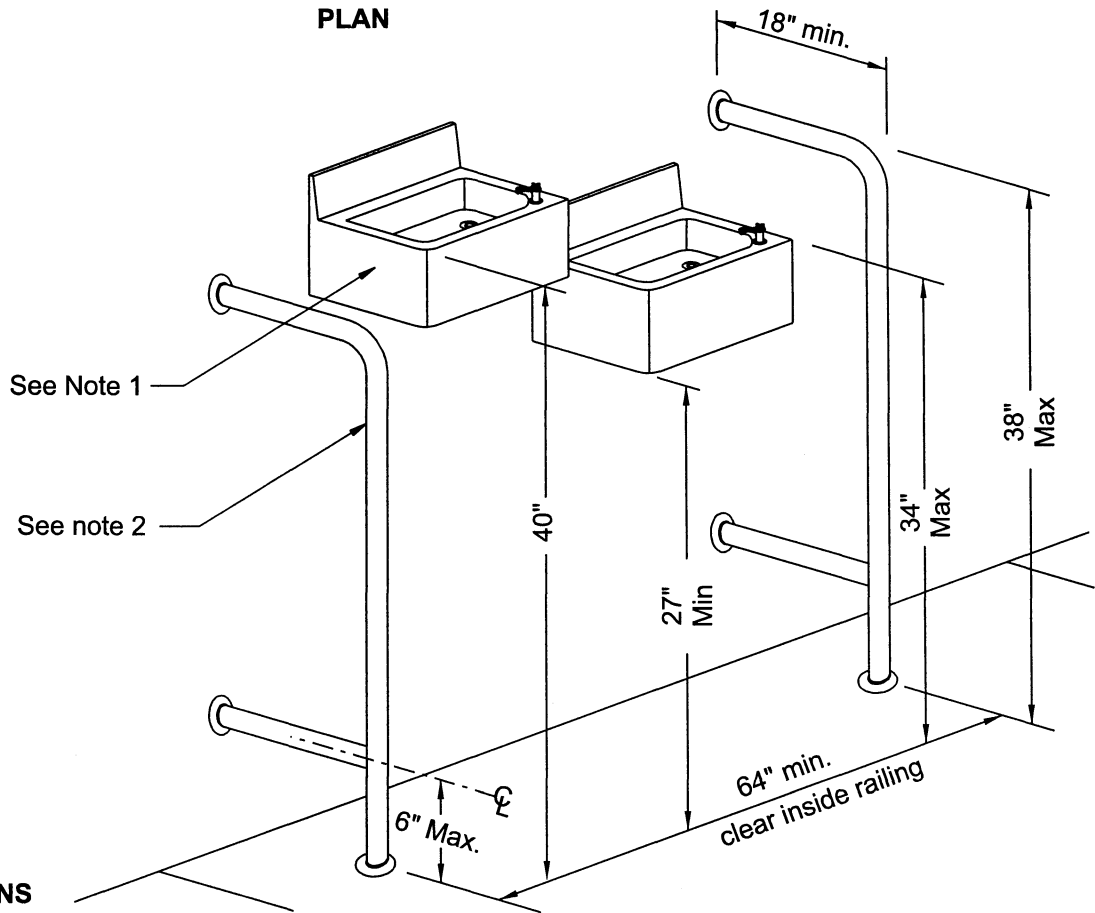
CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. C. E. 12/16/6
COORDINATOR R.C.E 65271-Date

DRAWING NUMBER **SDM-107**



PLAN



LEGEND ON PLANS



ISOMETRIC VIEW

Sheet 1 of 2

Revision	By	Approved	Date
Original	SS	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

DRINKING FOUNTAINS NON-ALCOVE

CITY OF SAN DIEGO
STANDARDS COMMITTEE
A. Oskoui 12/16/06
COORDINATOR R.C.E 65271 - Date

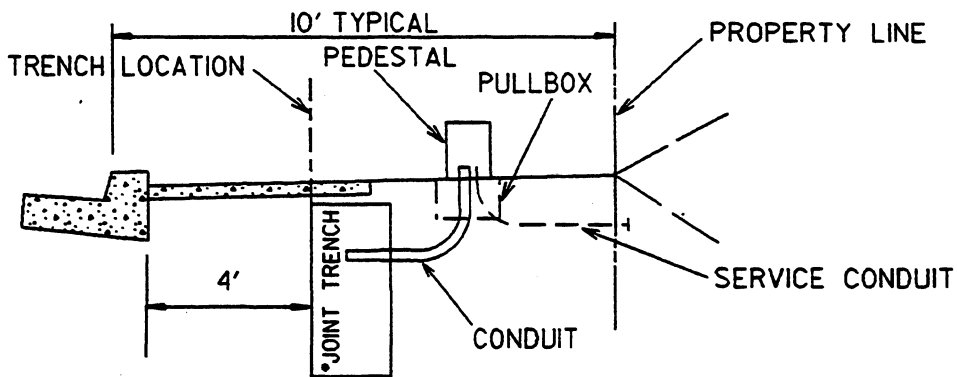
DRAWING NUMBER **SDM-108**

NOTES:

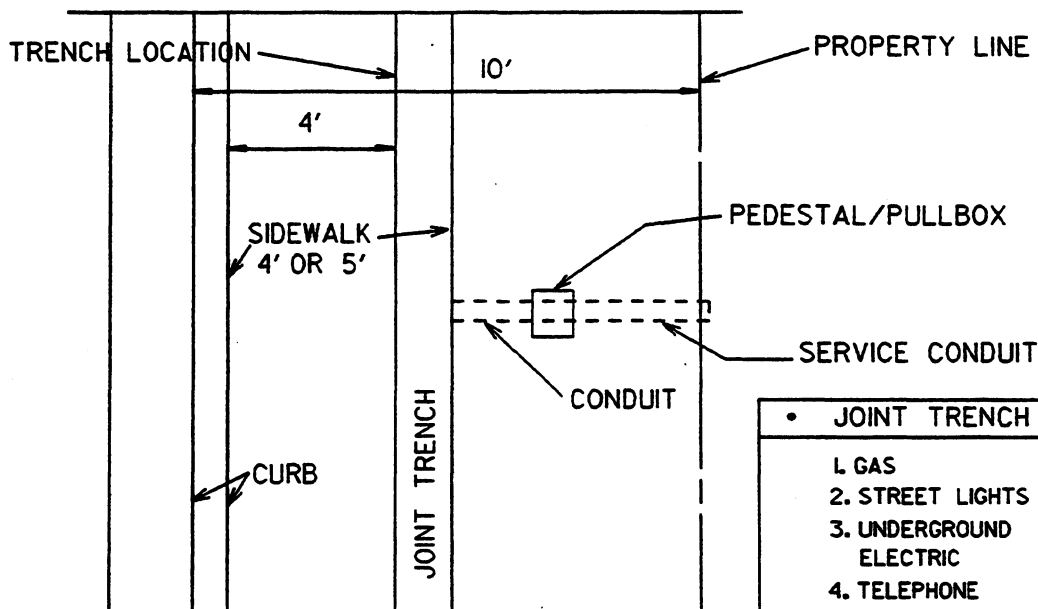
1. Dual height drinking fountains.
2. Unless located in an alcove, wing walls or protective railings are required on both sides of drinking fountains that project into the path of travel. Railings shall be 1-1/4" to 1-1/2" diameter pipe.
3. Handrails and Guardrails Material & Finish:
 - a. Pipe railings shall be hot dipped galvanized or austenitic (non-corrosive) stainless steel.
 - b. Pipe railings shall be seamless steel, ASTM A53 Grade B.
4. The landing shall be paved with a solid and stable material with a slip-resistant finish heavy broom textured finish. Requests for other slip-resistant finishes not specified here can be submitted to the designated Resident Engineer for review and approval prior to fabrication and installation.
5. The running and cross slope within the landing shall be 1.5% and designed so water does not accumulate within the entire landing surface.

Sheet 2 of 2

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original	FC	A. Oskoui	12/06		<i>Ad. H. H. H. 12/16/06</i>
				DRINKING FOUNTAINS NON-ALCOVE	COORDINATOR R.C.E 65271 - Date
					DRAWING NUMBER
					SDM-108



SECTION VIEW



- | | |
|----|----------------------|
| • | JOINT TRENCH |
| 1. | GAS |
| 2. | STREET LIGHTS |
| 3. | UNDERGROUND ELECTRIC |
| 4. | TELEPHONE |
| 5. | CATV |

PLAN VIEW

NOTE: SIDEWALK SHALL HAVE A MINIMUM OF FOUR (4) FOOT CLEAR (PATH) PASSING PEDESTALS, PULLBOXES AND OTHER STRUCTURES.

Revision	By	Approved	Date
ORIGINAL		J.P. Casey	8-3-86

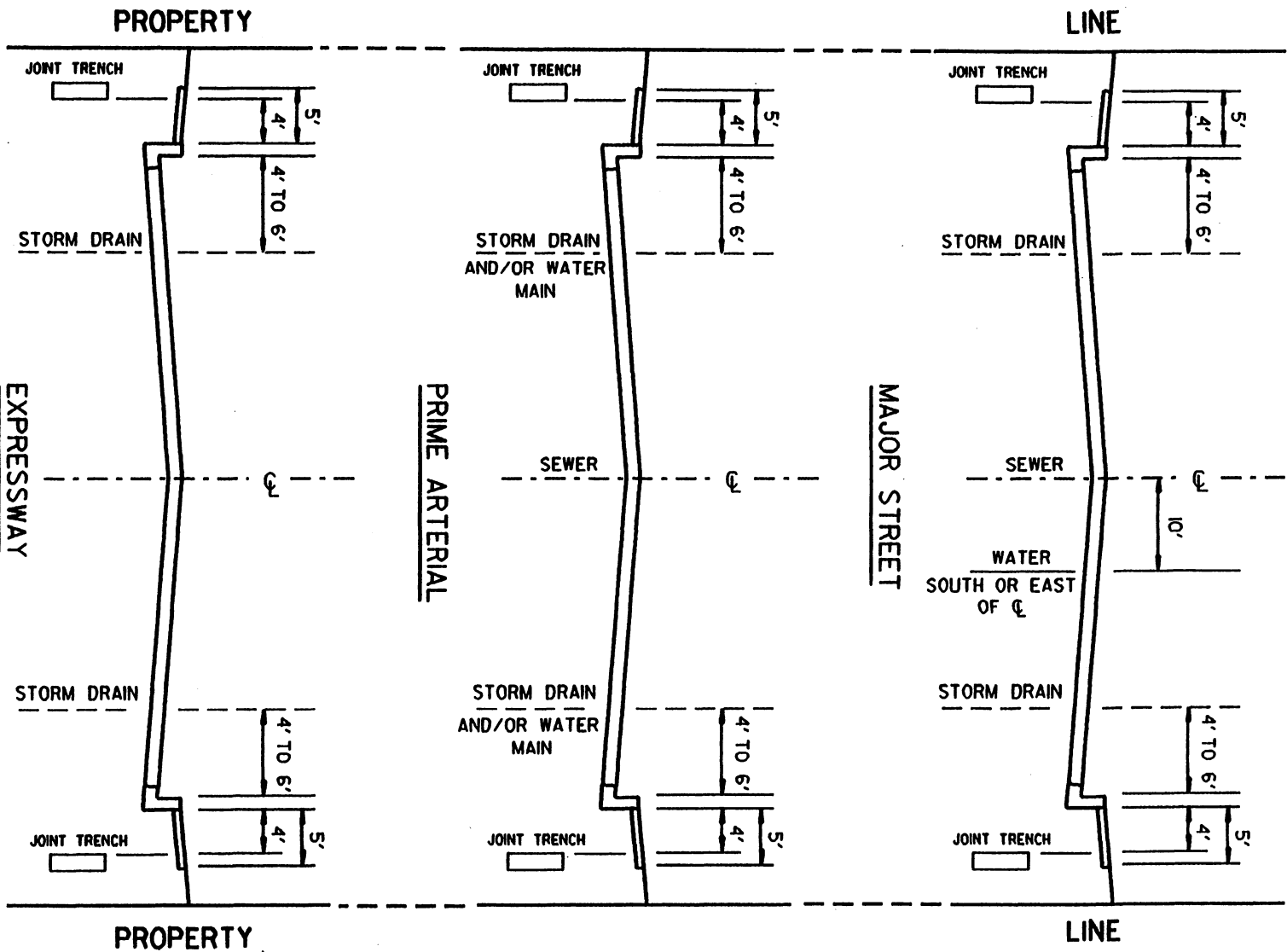
CITY OF SAN DIEGO - STANDARD DRAWING

**UNDERGROUND TYPICAL LOCATION
NEW CONSTRUCTION**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

James L. ... 2-7-95
COORDINATOR R.C.E. 25902 DATE

DRAWING NUMBER **SDM-109**



NOTE: SEE M-23 FOR LOCATION OF RECLAIMED WATER

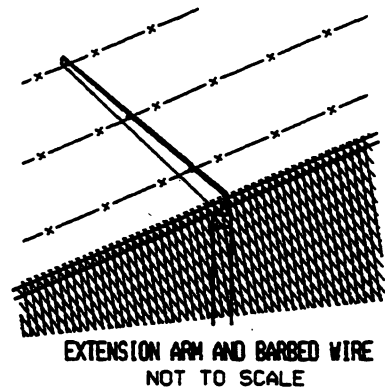
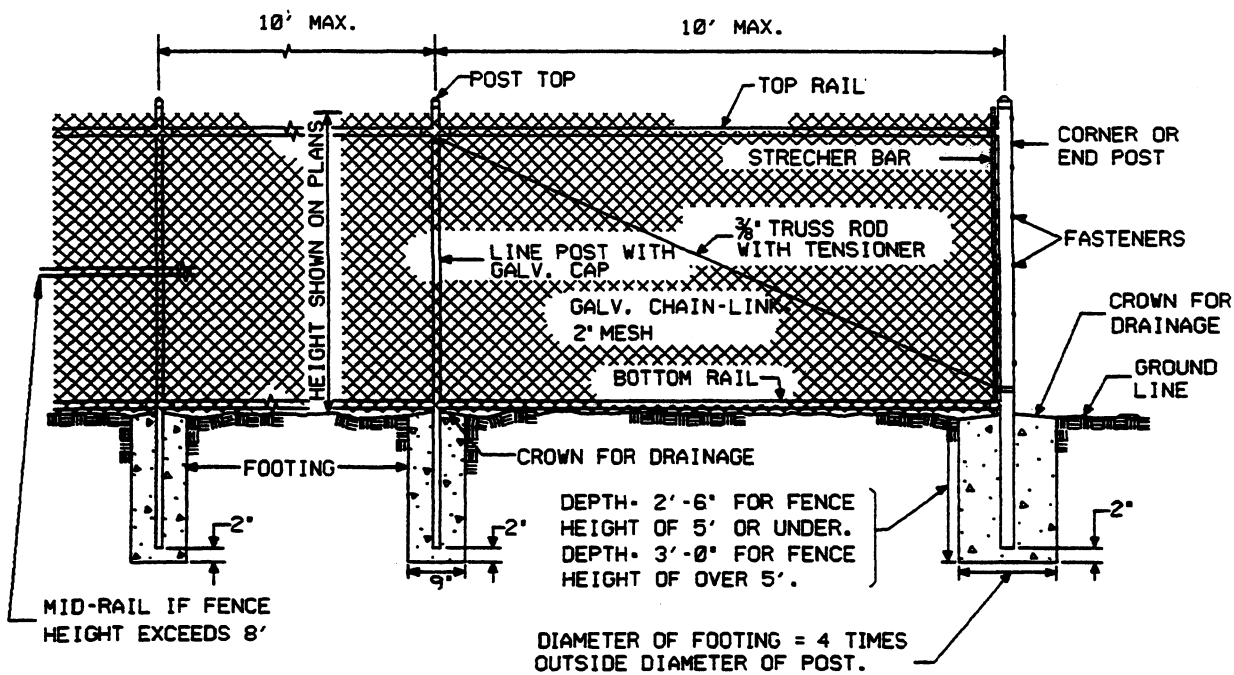
Revision	By	Approved	Date
ORIGINAL		J.P. Casey	5-8-95

CITY OF SAN DIEGO - STANDARD DRAWING

**UTILITY LOCATIONS IN MAJOR STREETS
PRIME ARTERIALS AND EXPRESSWAYS**

CITY OF SAN DIEGO
STANDARDS COMMITTEE
COORDINATOR: RAE 2592
DATE: 2-7-95

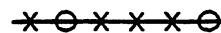
DRAWING NUMBER **SDM-111**



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
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.
5. CHAIN LINK FENCE AND ALL FITTINGS SHALL BE BLACK 22 MIL PRESSURE-BONDED OR 7 MIL THERMALLY-FUSED VINYL COATED, OVER 9 GAUGE ALUMINIZED STEEL CORE FABRIC PRIOR TO COATING. POSTS AND RAILS SHALL BE GALVANIZED STEEL, PVC VINYL BONDED, 10-14 MIL (COLOR TO MATCH FABRIC).
6. CHAIN LINK FABRIC SHALL HAVE KNUCKLED FINISH ON TOP EDGE.

LEGEND:



Revision	By	Approved	Date
ORIGINAL		J.P. Casey	5-20-92

CITY OF SAN DIEGO - STANDARD DRAWING

VINYL COATED CHAIN LINK FENCE

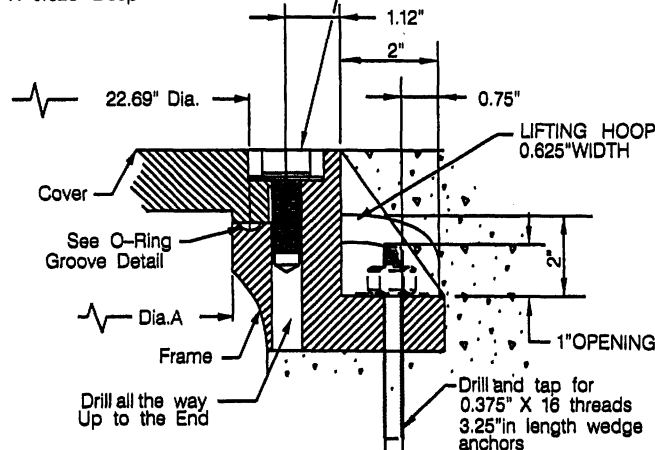
CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 2-7-95
COORDINATOR R.C.E. 2502 DATE

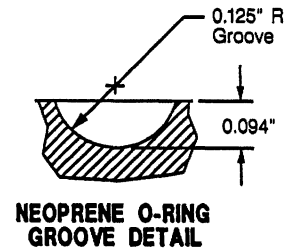
DRAWING
NUMBER

SDM-112

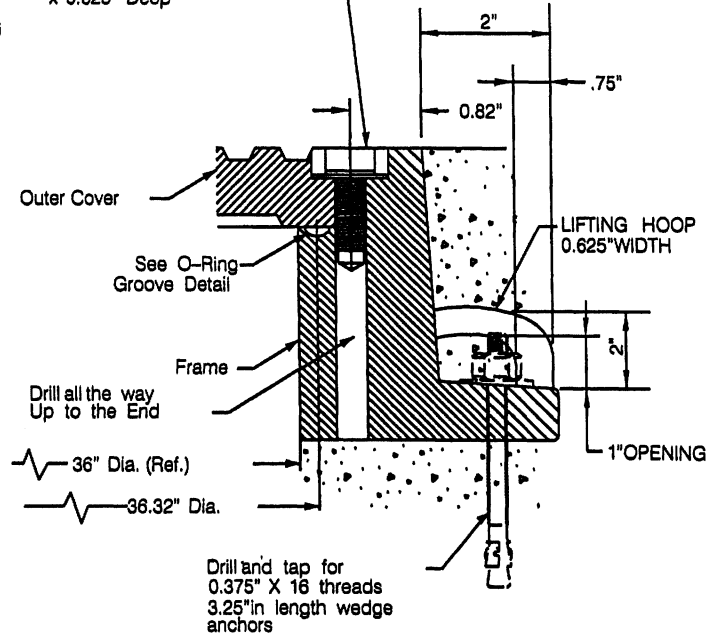
Drill and tap for 0.625" X 20
Penta Bolt SS UNC Thread,
1.50" Deep Cbore 1.625" Dia.
X 0.625" Deep



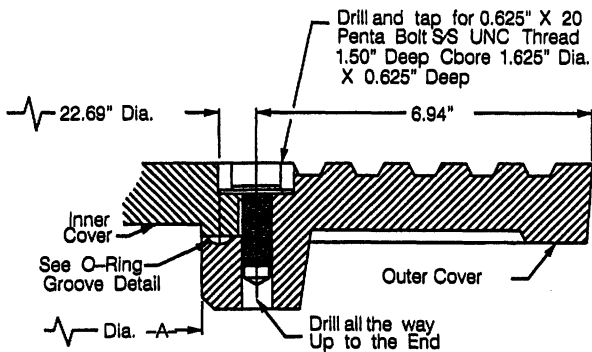
**M-1 Detail:
COVER TO FRAME**



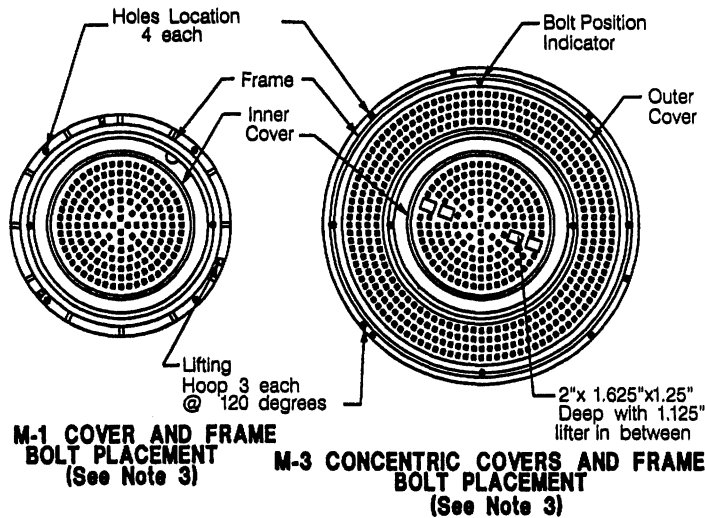
Drill and tap for 0.625" x 20
Penta Bolt SS UNC Thread.
1.50" deep Cbore 1.625" Dia.
x 0.625" Deep



**M-3B Detail:
OUTER COVER TO FRAME**



**M-3A Detail:
INNER COVER TO OUTER COVER**



NOTES:

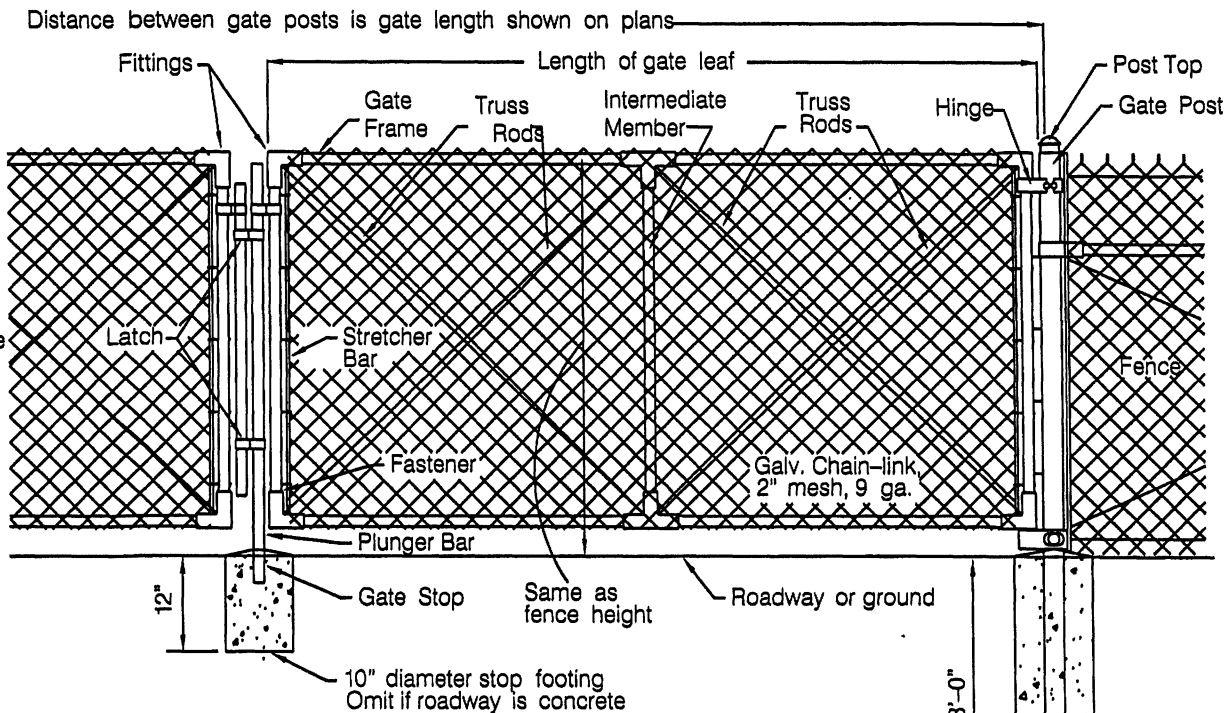
- 0.625" X 20 PENTA BOLT SS UNC THREAD, 316 STAINLESS STEEL SOCKET HEAD CAP SCREW AND 1.50" O.D. x 0.687" I.D. X 0.078 THICK 316 STAINLESS STEEL WASHER.
 - 0.25" NEOPRENE O-RING GASKET SHALL BE GLUED INTO MACHINED GROOVE. GLUE SHALL MEET THE REQUIREMENTS OF MIL-M-81288 (AMEND. 1)
 - BOLTDOWN PATTERNS:
 - M-1 DETAIL (24" COVER & FRAME): INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3A DETAIL (CONCENTRIC COVERS): BETWEEN INNER AND OUTER COVERS INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3B DETAIL (OUTER COVER & FRAME): BETWEEN OUTER COVER & FRAME INSTALL FOUR (4) BOLTS AT 90 DEGREES.
- FOR M-1 AND M-3 OUTER COVER FRAME DRILL 4 HOLES FOR 0.375"x16 STAINLESS STEEL WEDGE ANCHORS 3.75" IN LENGTH AT 90 DEGREES.

Revision	By	Approved	Date
Original	Oskoui		12/03

CITY OF SAN DIEGO - STANDARD DRAWING

MANHOLE COVER - LOCKING DEVICE

CITY OF SAN DIEGO
STANDARDS COMMITTEE
[Signature] 12-9-03
Chairperson RCE #4572 Date
DRAWING NUMBER **SDM-113**

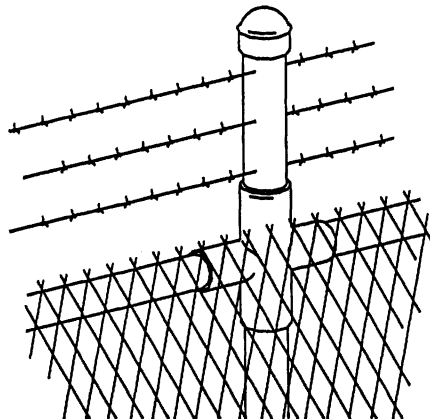


HALF ELEVATION DOUBLE SWING GATE

NOTES

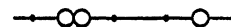
1. All footings shall be 520-C-2500 concrete.
2. The following items shall be furnished and installed only when shown on the plans and/or called for in the special provisions:
 - a. Barbed wire
 - b. Extension post
3. Chain link fence shall conform to Section 206-6 of the Standard Specification for Public Works Construction unless specifically noted on this drawing.
4. Chain link fabric shall have knuckled finish on top edge.

Diameter of footing = 4 times outside diameter of post.



EXTENSION POST AND BARBED WIRE

LEGEND ON PLANS



SHEET 1 OF 2

Revision	By	Approved	Date
DETAIL	SM	Oskoui	12/03

SAN DIEGO REGIONAL STANDARD DRAWING

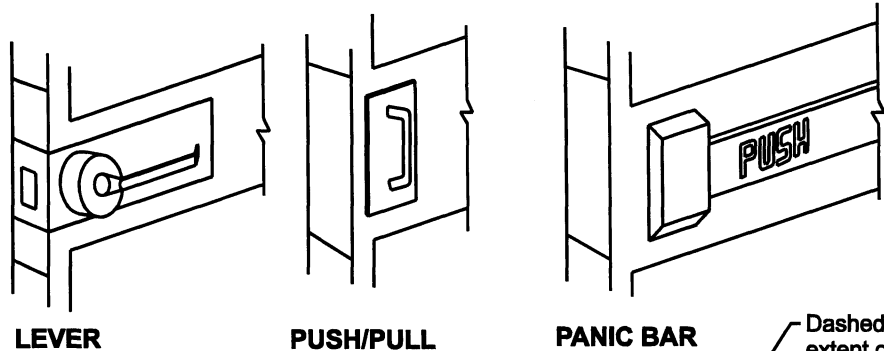
**CHAIN LINK GATE &
CHAIN LINK PEDESTRIAN GATE**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 12-9-03
Chairperson RCE 64572 Date

DRAWING NUMBER **SDM-114**

ACCEPTABLE GATE HARDWARE



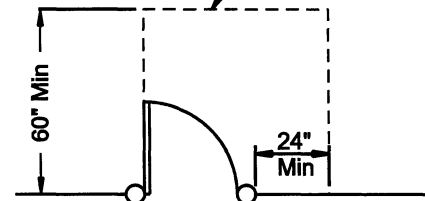
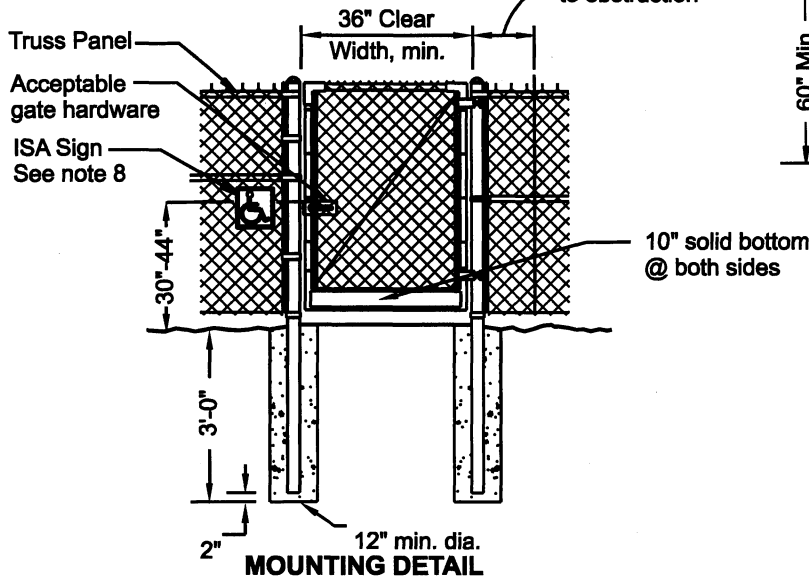
LEVER

PUSH/PULL

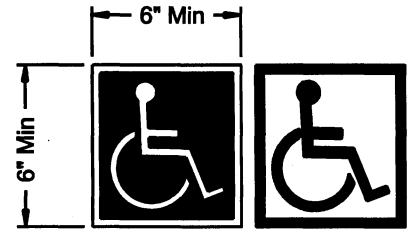
PANIC BAR

Dashed lines indicate extent of maneuvering clearance area. See Note 2 and 9.

12" hinge side clearance to obstruction



Level Maneuvering Clearance



International Symbol of Accessibility Sign (ISA)

NOTES

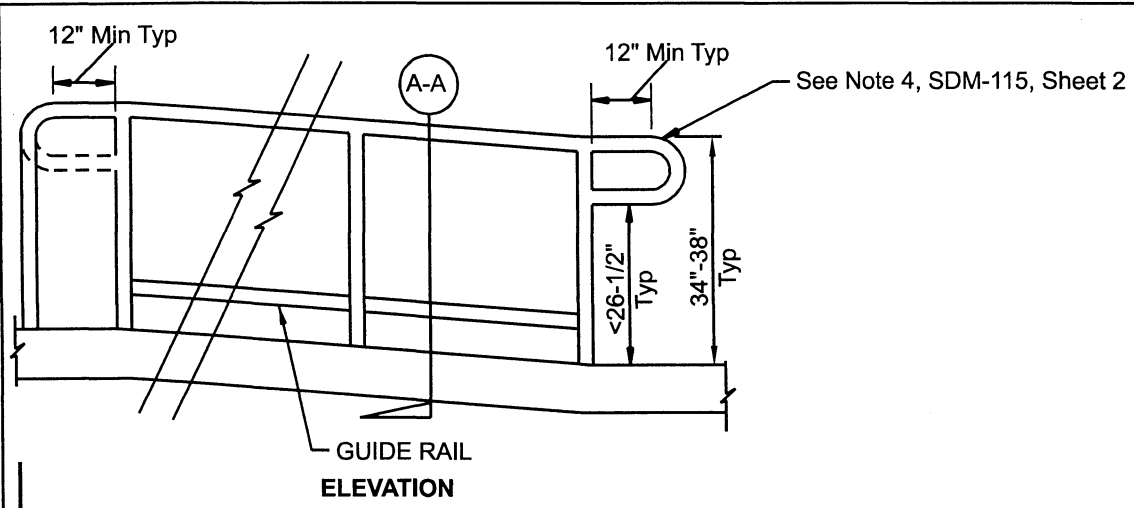
1. Gates that are accessible to and usable by persons with disabilities shall be provided with a least one International Symbol of Accessibility sign as shown above.
2. The running and cross slope within the level maneuvering clearance area shall be 1.5% and designed so water does not accumulate within the entire surface.
3. If the gate is not self-closing, provide acceptable gate hardware on both sides.
4. Provide 3/8" diameter tension rod and tightener for gates that are over 3 feet in width.
5. If provided, tie fabric top and frame with 11 gauge wire.
6. Latching and locking gates that are hand operated shall be operable with a single effort not to exceed 5-pound pressure.
7. The symbol contrast on sign shall be light on dark or dark on light.
8. Mounting height- the sign shall be installed on the fence/wall adjacent to the latch outside of the door. It shall be mounted to the centerline of the Acceptable Gate Hardware.
Mounting location shall be determined so that a person may approach within 3" of signage without encountering protruding objects or standing within the swing of a door.
9. Landing & approach space must comply with CBC Title 24 and ADA/ADAAG accessibility regulations.

LEGEND ON PLANS

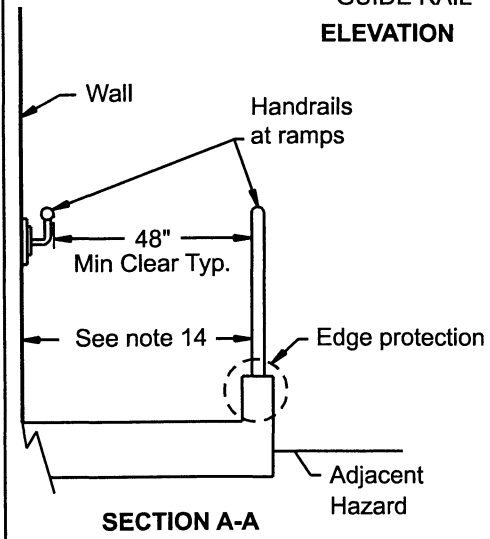


SHEET 2 OF 2

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	SM	A. Oskoui	12/03			CHAIN LINK PEDESTRIAN GATE
Update	FC	A. Oskoui	12/06	COORDINATOR R.C.E 65271 - Date		
				DRAWING NUMBER	SDM-114	

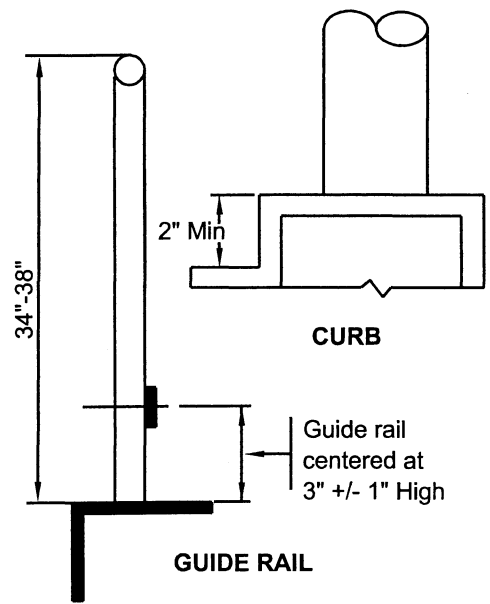


GUIDE RAIL ELEVATION



SECTION A-A

Examples of edge protection:



CURB

GUIDE RAIL

NOTES:

1. Any part of an accessible route with a running slope greater than 5.0% shall be considered a pedestrian ramp and must comply with the pedestrian ramp standards.
2. The least possible slope shall be used for a pedestrian ramp without exceeding the maximum running slope of 6.67% (1:15) gradient.
3. If site conditions restrict the use of 6.67% (1:15) gradient or less, then the running slope of the pedestrian ramp(s) should not exceed 8.33% (1:12) gradient.
4. The cross slope of the ramp shall not exceed 1.5%.
5. Top, intermediated and bottom landings shall have a slope of 1.5% in both directions.
6. The minimum width of a ramp shall be 48".
7. The maximum rise for the ramp run shall be 30".
8. The landing(s) shall be at least as wide as the pedestrian ramp run leading to it.
9. The minimum size for a landing is 60" x 60" clear. At intermediate landings where the ramp changes direction of 30 degrees or more, the landing dimension must be a minimum of 72" in length to accommodate the handrail extensions, and incorporate a 60" x 60" turning circle within the landing.
10. If a doorway is located at a landing, then the area in front of the doorway shall comply with the ADAAG and CBC Title 24 regulations on encroachment of doors onto pedestrian ramp landings.
11. All travel surfaces shall have a minimum medium broom finish.
12. Warning Curb Edge Protection: If a drop-off of more than 4" exists between the ramp and landing surface and the adjacent grade, a 2" minimum high guide curb on each side, or a wheel guide rail centered 3" plus or minus 1" on each side of the ramp shall be provided.
13. Ramps and landings shall be designed so water does not accumulate on the walking surfaces.
14. Ramp Width shall be 60" minimum when serving an occupant load of 300 or more.

See Note 4, SDM-115, Sheet 2

Revision	By	Approved	Date
Original	SM	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

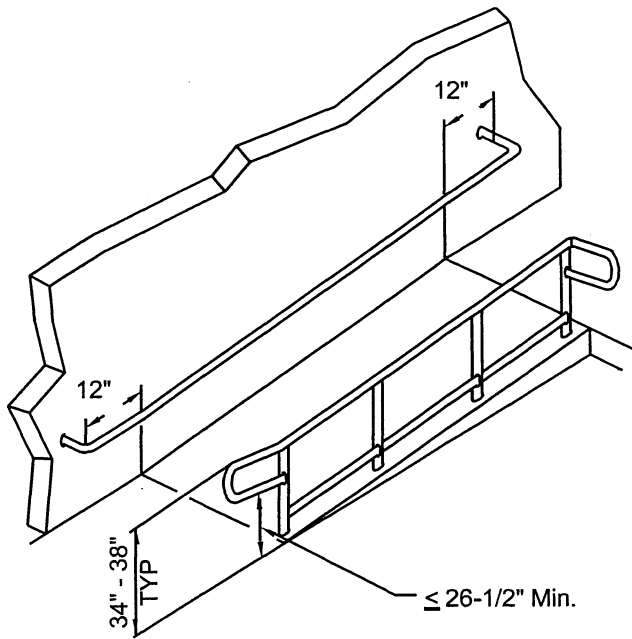
CITY OF SAN DIEGO - STANDARD DRAWING

PEDESTRIAN RAMP AND PROTECTIVE RAILING

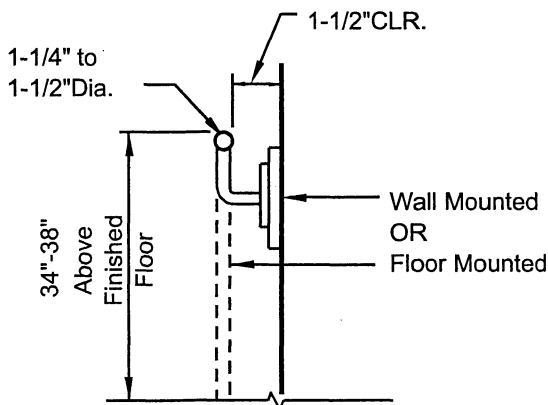
CITY OF SAN DIEGO
STANDARDS COMMITTEE

M. A. ... 12/16/16
COORDINATOR R.C.E 65271 - Date

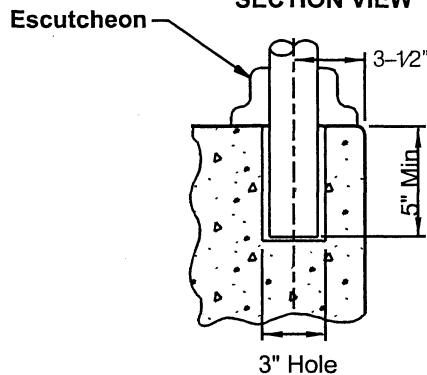
DRAWING NUMBER **SDM-115**



ISOMETRIC VIEW



SECTION VIEW



VERTICAL RAIL MOUNTING DETAIL

Post shall be grouted in place using non-shrink grout.

NOTES:

1. Handrails are required on both sides of a pedestrian ramp.
2. In addition to handrails, ramps and landings open on one or both sides whose surface is more than 30" above the adjacent ground surface shall be provided with guardrails that are at least 42" high. See M-24 and SDM-100 for guardrail details.
3. The inside handrail on switchbacks or dogleg ramps shall be continuous throughout the ramp and landing(s) run.
4. Where the handrails are not continuous, they shall extend at least 12" above the top and bottom of each ramp segment and shall be parallel with the floor or ground surface.
5. The clear space between the handrail and the adjacent wall shall be 1-1/2". See Section A, SDM-115, sheet 2 of 2.
6. The top of the handrail gripping surfaces shall be mounted between 34" and 38" above ramp and landing surfaces.
7. The gripping portion of the handrail shall be 1-1/4" to 1-1/2" in diameter or cross-sectional equivalent. Equivalent gripping design must be submitted to the designated Resident Engineer for review and approval prior to fabrication and installation.
8. The handrail gripping surfaces shall have a smooth and continuous surface, no sharp edges or corners, and edges have a minimum radius of 1/8". Weld and grind smooth all connections.
9. The ends of the handrails shall be either rounded or returned smoothly to the floor, wall or post. See ELEVATION.
10. Where the extension of the handrail in the direction of the ramp run would create a hazard such as an encroachment onto a pedestrian way, the extension of the handrail may be turned 90 degrees to the run of the ramp, or the termination of the extension shall be made either rounded or returned smoothly to the floor, wall or post.
11. Handrails and Guardrails Materials and Finishes:
 - a. Pipe railings shall be stainless steel or hot dipped galvanized after fabrication.
 - b. Pipe railings shall be seamless steel, ASTM A53 Grade B.
 - c. Provide 1/4" expansion joints at 16" on center.
 - d. Provide slip joints and vertical rail spacing per welding details on M-24.

SHEET 2 OF 2

Revision	By	Approved	Date
Original	SM	A. Oskoui	12/03
Update	FC	A. Oskoui	12/06

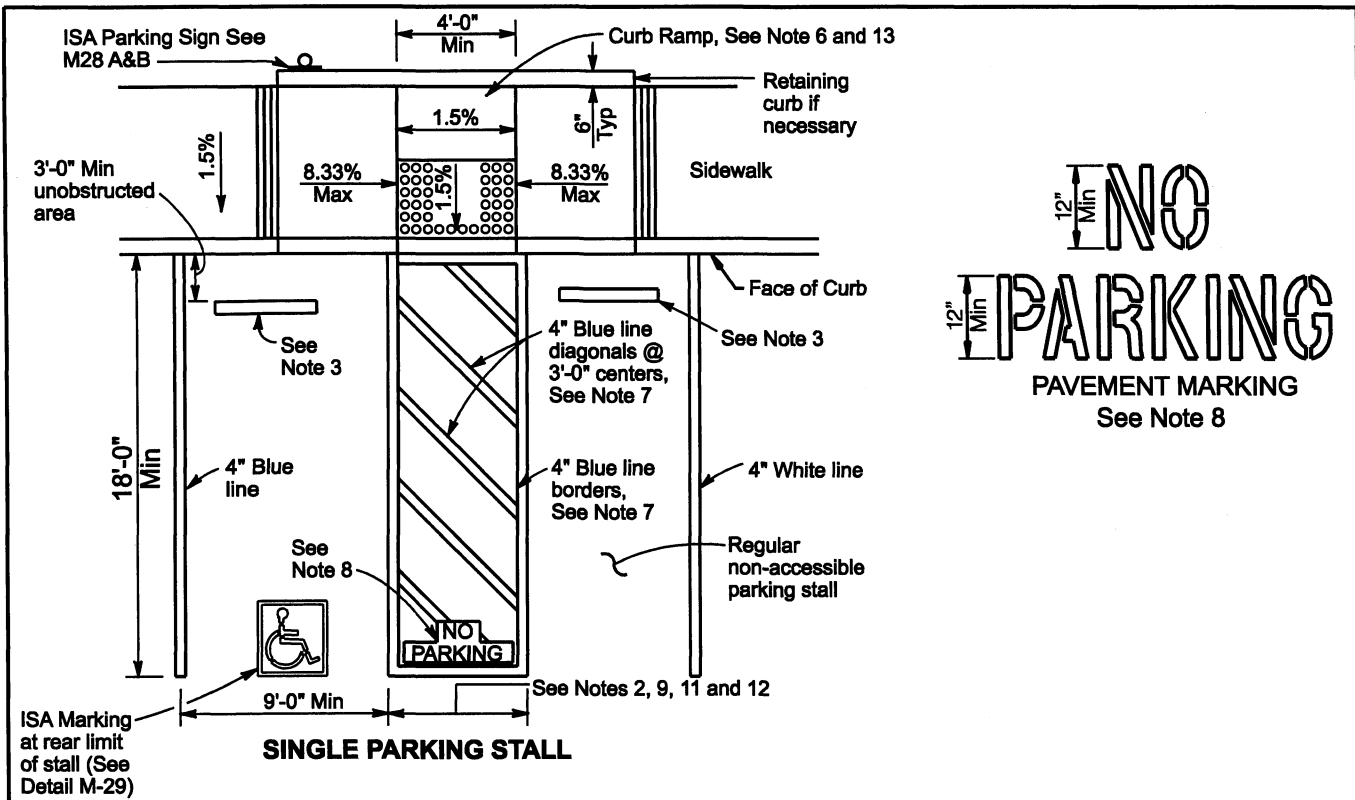
CITY OF SAN DIEGO - STANDARD DRAWING

**PEDESTRIAN RAMP
AND PROTECTIVE RAILING**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

M. Huel: 12/16/6
COORDINATOR R.C.E 65271 - Date

**DRAWING
NUMBER SDM-115**



12" Min

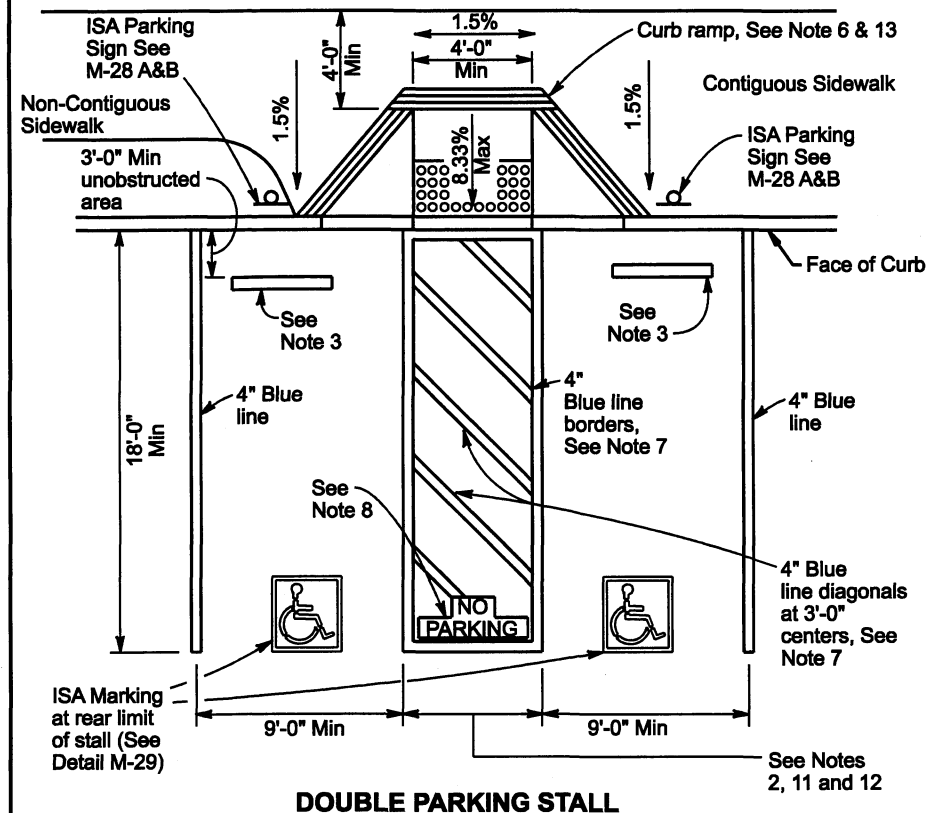
NO

12" Min

PARKING

PAVEMENT MARKING

See Note 8



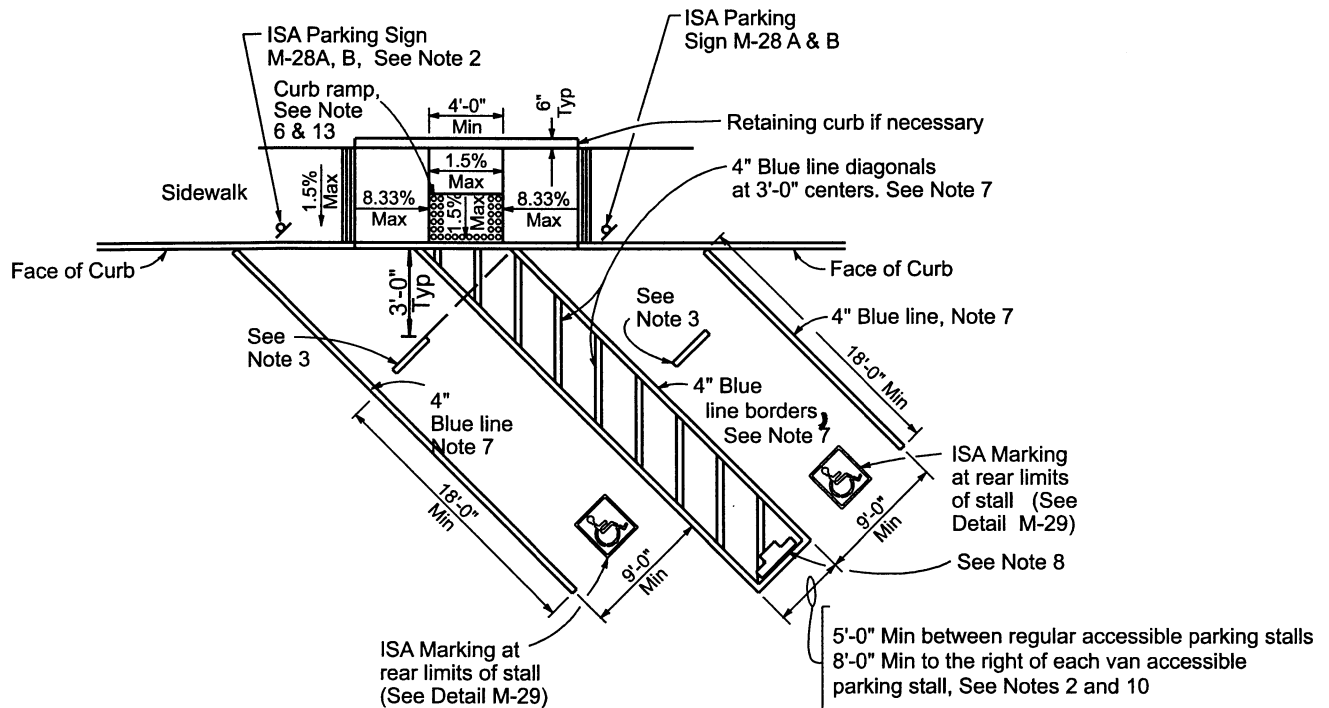
REQUIRED ACCESSIBLE PARKING STALLS
TABLE A

Total No. of Parking Spaces or Stalls	Minimum No. of Disabled Accessible Parking Spaces or Stalls
1-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-300	7
301-400	8
401-500	9
501-1000	2 % of Total
Greater than 1001	20 plus 1 for each 100 or fraction thereof over 1001

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original	FC	A. Oskoui	12/06		
				ACCESSIBLE PARKING	COORDINATOR R.C.E 65271 - Date
					DRAWING NUMBER SDM-117

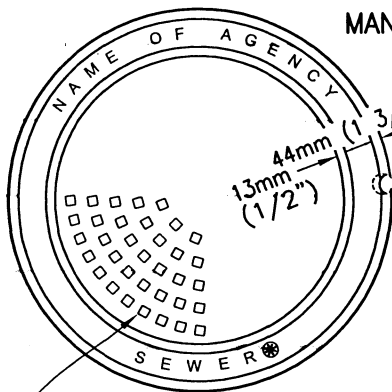
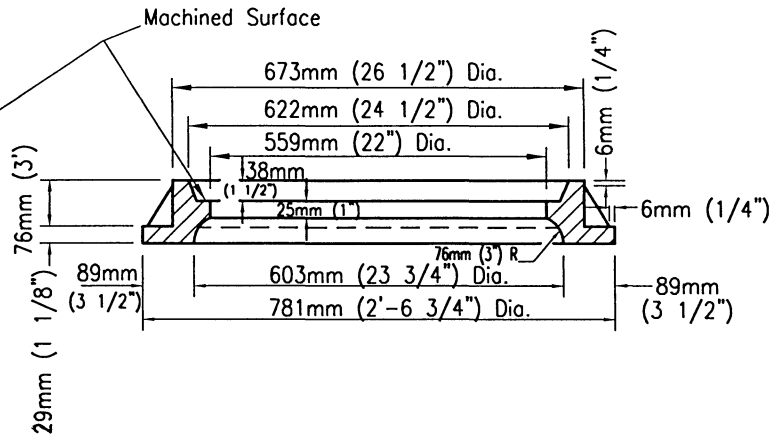
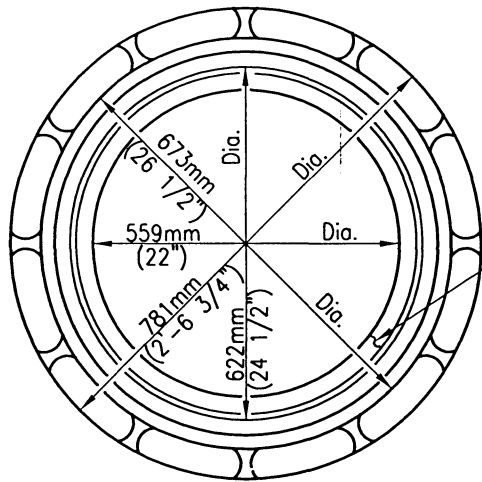
NOTES:

1. Accessible parking spaces serving a particular building shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance. In parking facilities or parking lots that do not serve a particular building or facility, the accessible parking shall be located on the shortest accessible route of travel to an accessible pedestrian entrance of the parking facility or parking lot.
2. Min 5'-0" for regular-accessible parking stall, one in every eight accessible parking stalls, but not less than one, shall be served by a van-accessible aisle of 8'-0" minimum width and shall be designated and signed as "van accessible." For signage, see M-28A and M-28B.
3. In each off-street parking stall, a curb or bumper shall be provided and located to prevent encroachment of vehicles over the required width of walkways. Parking stalls shall be located that persons with disabilities are not compelled to wheel or walk behind parked cars other than their own.
4. Surface slopes of all accessible parking stalls and aisles shall be 1.5% in any direction. Assure that proper drainage is provided. EXCEPTION: Surface slopes of parking stalls and aisles shall be the minimum feasible without exceeding 2.0% in any direction. If existing slopes exceed 2.0%, then the accessible parking space shall be located on an area approved by the City Engineer.
5. Table A in SDM-117 Sheet 1 of 2 shall be used to determine the required number of accessible parking stalls in any parking lot or garage.
6. All curb ramps serving accessible parking stalls and aisles shall comply with the appropriate curb ramp standard with the required detectable/tactile warning tile.
7. Striping for the access aisle shall be laid at 45 degrees and shall be of a reflective blue color to match color no. 15090 in the Federal Standard 595a as specified in Section 522(b)2.
8. The words "NO PARKING," shall be painted in reflective white letters no less than 12" high and located so that it is visible to traffic enforcement officials. See "NO PARKING" detail in SDM-117 Sheet 1 of 2.
9. Where a single (non-van) accessible parking space is provided, the loading and unloading access aisle shall be on the passenger side of the vehicle as the vehicle is going forward into the parking space.
10. Where a van accessible parking space is provided, the loading and unloading access aisle shall only be on the passenger side of the vehicle as the vehicle is going forward into the parking space.
11. There shall be no obstructions on the sidewalk adjacent to and for the full length of the parking space, except for the ISA parking sign.
12. Provide for adequate drainage so water does not accumulate within the accessible parking stalls & aisles.
13. If a walk crosses or adjoins a vehicular way (i.e. parking lots, loading and unloading zones), and the walking surfaces are not separated by curbs, railing, or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be identified by continuous detectable/tactile warning tiles. The depth of which shall be 36" and placed at boundary to vehicular way. Refer to SDG-130.

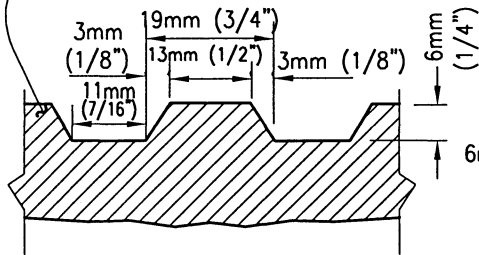
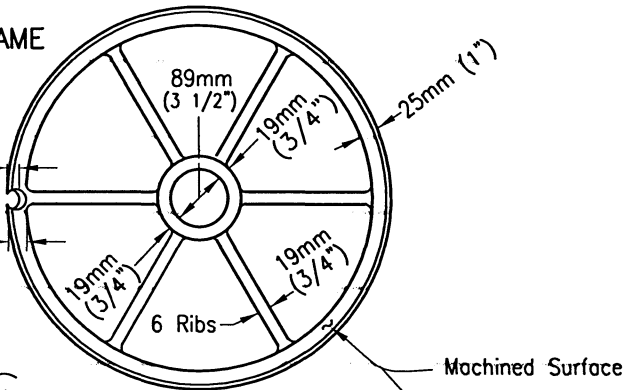


DIAGONAL DOUBLE PARKING STALLS

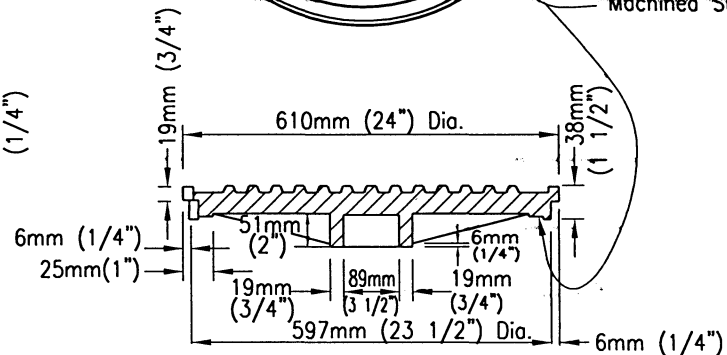
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original	FC	A. Oskoui	12/06		
				ACCESSIBLE PARKING	<i>M. Hale</i> 12/16/06
					COORDINATOR R.C.E 65271 - Date
					DRAWING NUMBER SDM-117



MANHOLE COVER FRAME



DETAIL



NOTES

MANHOLE COVER

1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 35B.
2. Weights: Frame 75.3kg (166) – 87.6kg (193)lbs.
Cover 67.7kg (147) – 77.6kg (171)lbs.
3. Machine all matching surfaces and seats of frame and cover to prevent rocking.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

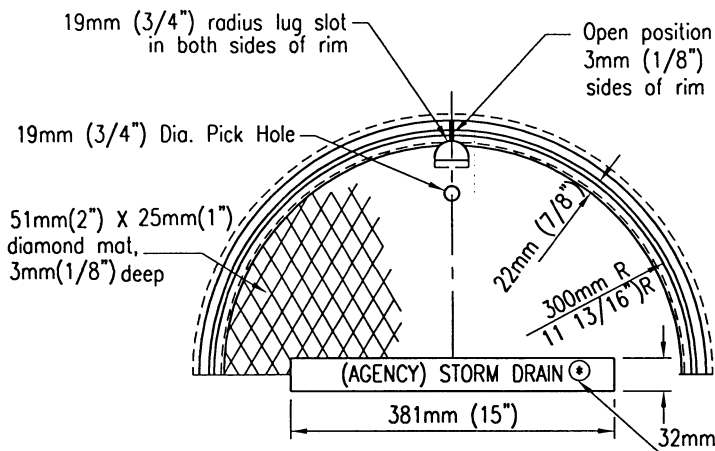
SAN DIEGO REGIONAL STANDARD DRAWING

.61m (24") MANHOLE FRAME AND COVER
HEAVY DUTY

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

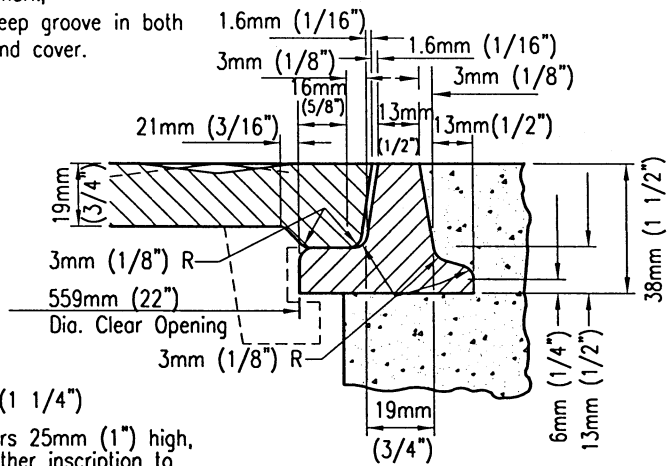
T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-1**

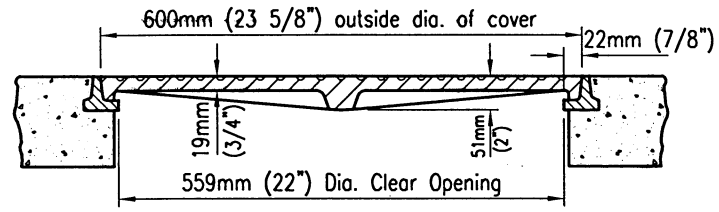


TOP OF FRAME & COVER

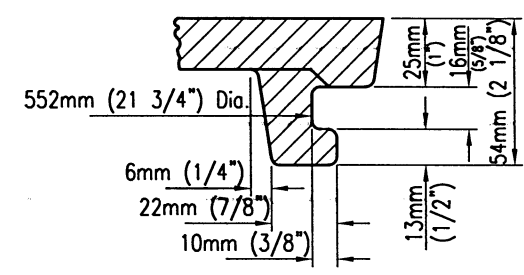
Letters 25mm (1 inch) high, no other inscription to appear on exposed surfaces.



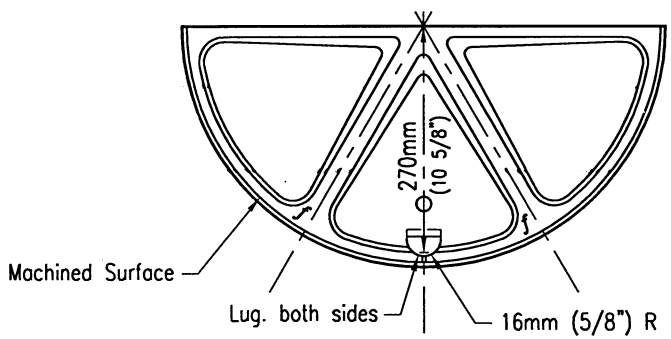
SECTION THROUGH RIM



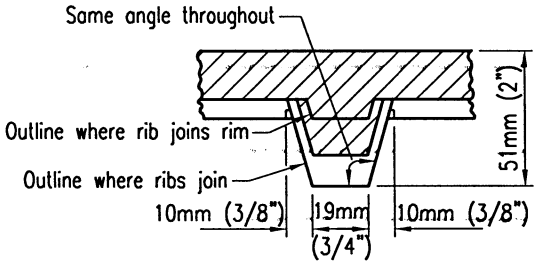
SECTION THROUGH FRAME & COVER



SECTION THROUGH LUG



BOTTOM OF COVER



SECTION THROUGH RIB AT MID RADIUS


NOTES

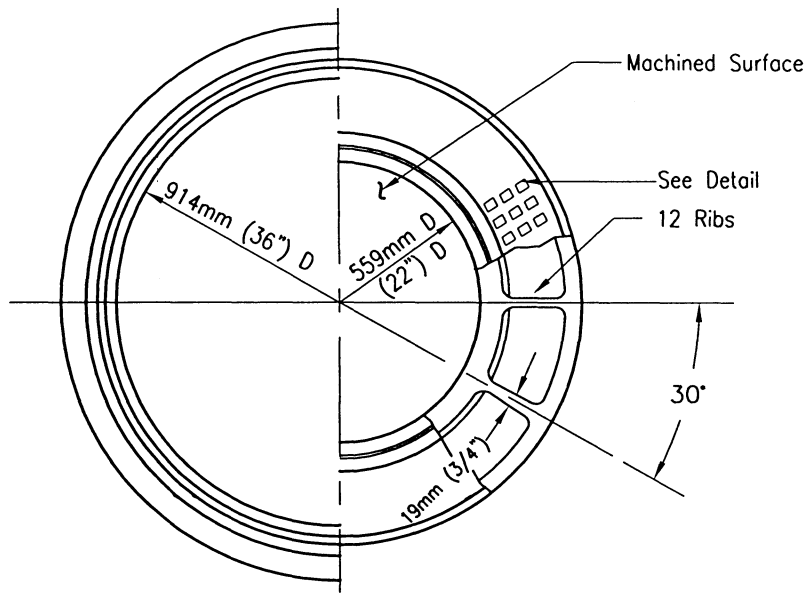
1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 30.
2. Frame and cover for use in non-traffic area only.
3. Weights: Frame 13.2kg (29) - 15kg (33) lbs.
Cover 4.3kg (9.5) - 50kg (110) lbs.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.

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

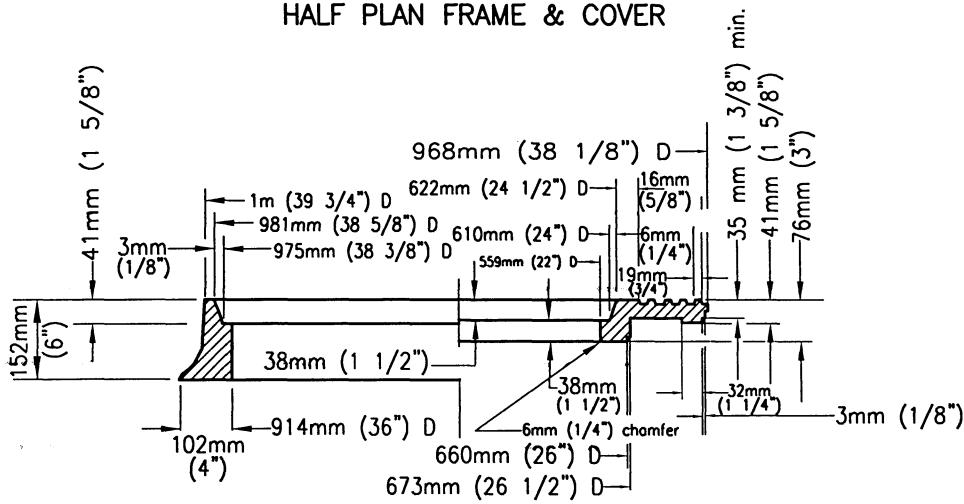
Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING
.61m (24") MANHOLE FRAME AND COVER
LIGHT DUTY

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

 Chairperson R.C.E. 19246 Date
DRAWING NUMBER M-2



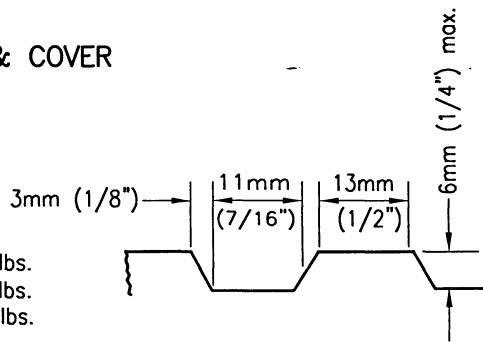
HALF PLAN FRAME & COVER



HALF SECTION FRAME & COVER

NOTES

1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 35B.
2. Weights: Frame 142.4kg (314) - 164.6kg (363) lbs.
Outer Cover 129.3kg (285) - 149.7kg (330) lbs.
Inner Cover 66.7kg (147) - 77.5kg (171) lbs.
3. Machine all matching surfaces and seats of frame and cover to prevent rocking.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.



DETAIL

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

914mm (36") MANHOLE FRAME
AND TWO CONCENTRIC COVERS
HEAVY DUTY

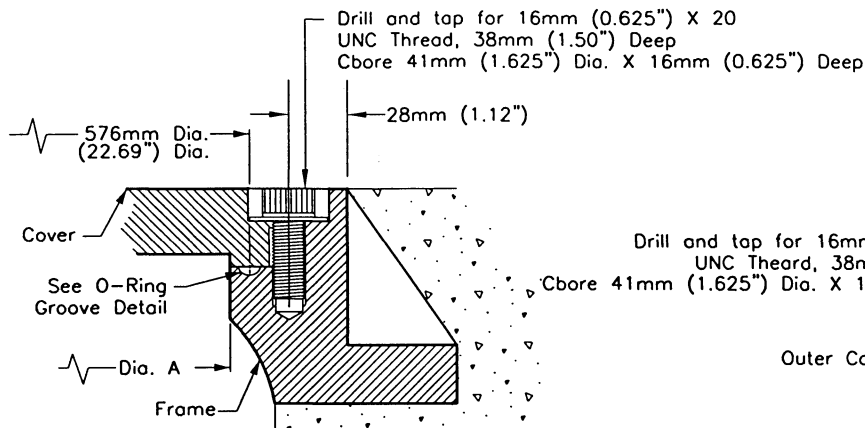
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

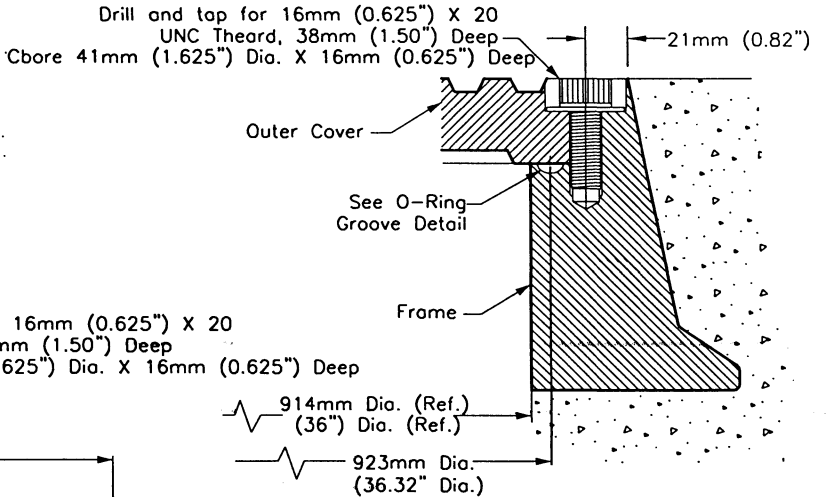
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

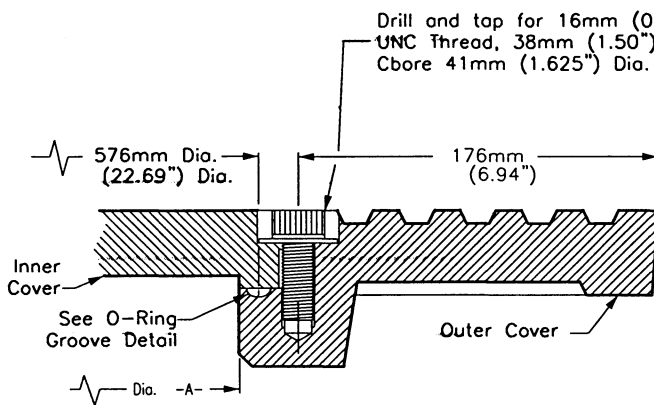
M-3



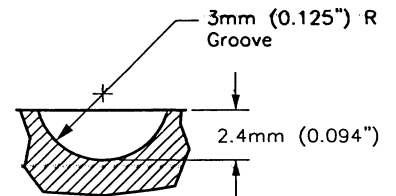
M-1 Detail:
COVER TO FRAME



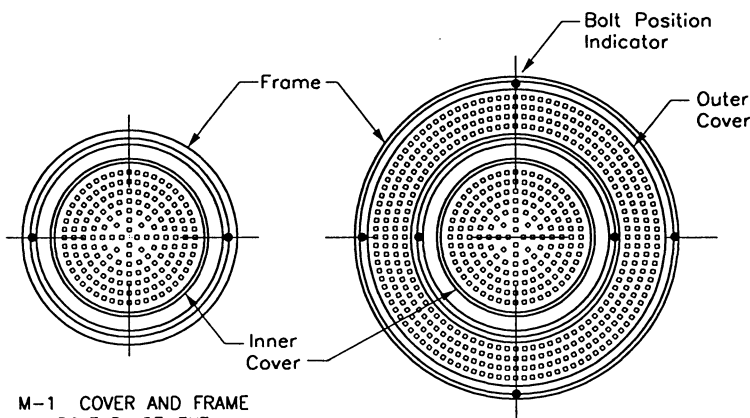
M-3B Detail:
OUTER COVER TO FRAME



M-3A Detail:
INNER COVER TO OUTER COVER



NEOPRENE O-RING
GROOVE DETAIL



M-1 COVER AND FRAME
BOLT PLACEMENT
(See Note 3)

M-3 CONCENTRIC COVERS AND FRAME
BOLT PLACEMENT
(See Note 3)

NOTES:

- 16mm (0.625") X 20 UNC THREAD, 316 STAINLESS STEEL SOCKET HEAD CAP SCREW AND 38mm (1.50") O.D. X 17mm (0.687") I.D. X 0.078 THICK 316 STAINLESS STEEL WASHER.
- 6mm (0.25") NEOPRENE O-RING GASKET SHALL BE GLUED INTO MACHINED GROOVE. GLUE SHALL MEET THE REQUIREMENTS OF MIL-M-81288 (AMEND. 1)
- BOLTDOWN PATTERNS:
 - M-1 DETAIL (610mm (24") COVER & FRAME): INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3A DETAIL (CONCENTRIC COVERS): BETWEEN INNER AND OUTER COVERS INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3B DETAIL (OUTER COVER & FRAME): BETWEEN OUTER COVER & FRAME INSTALL FOUR (4) BOLTS AT 90 DEGREES.

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

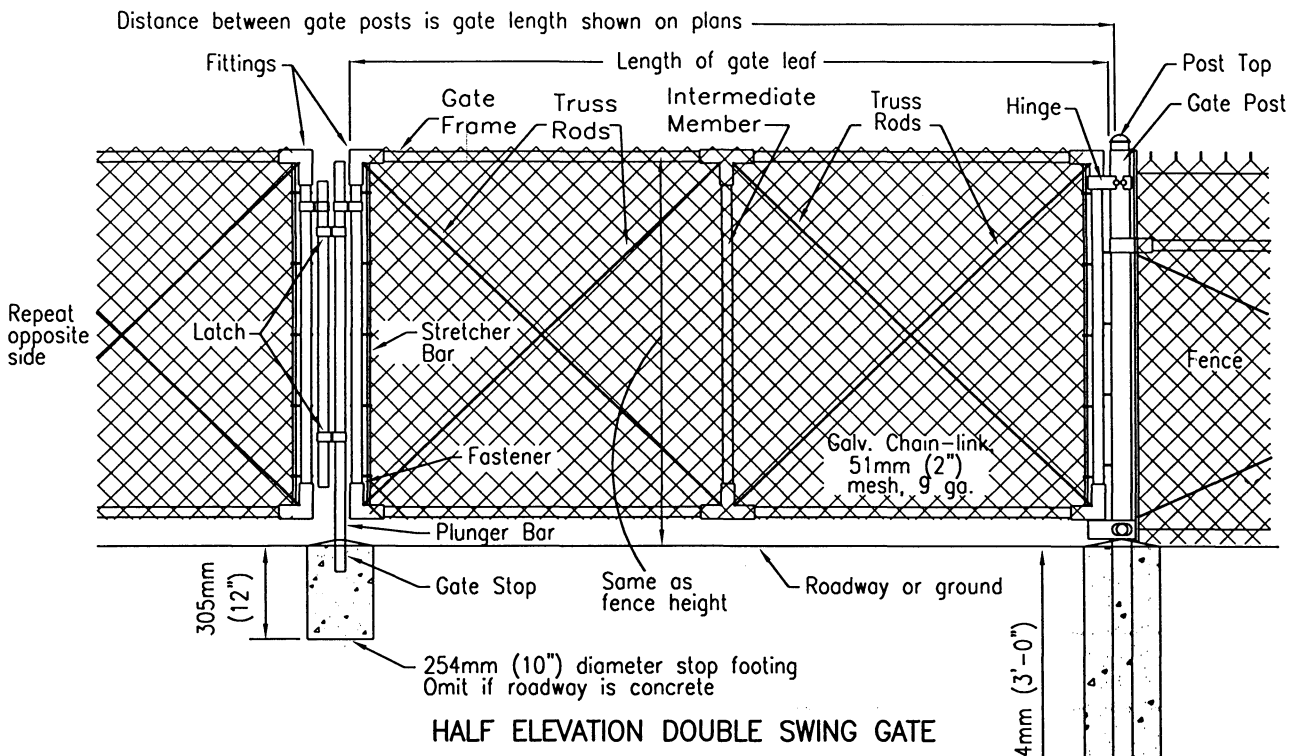
SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE COVER - LOCKING DEVICE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-4**



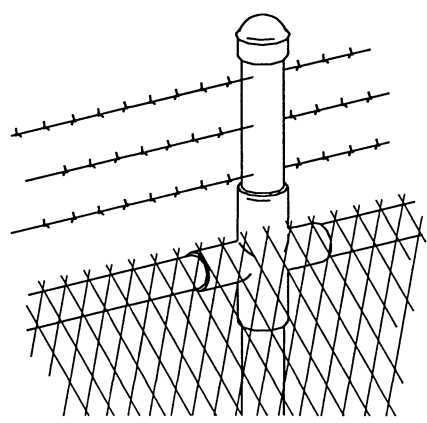
HALF ELEVATION DOUBLE SWING GATE

NOTES

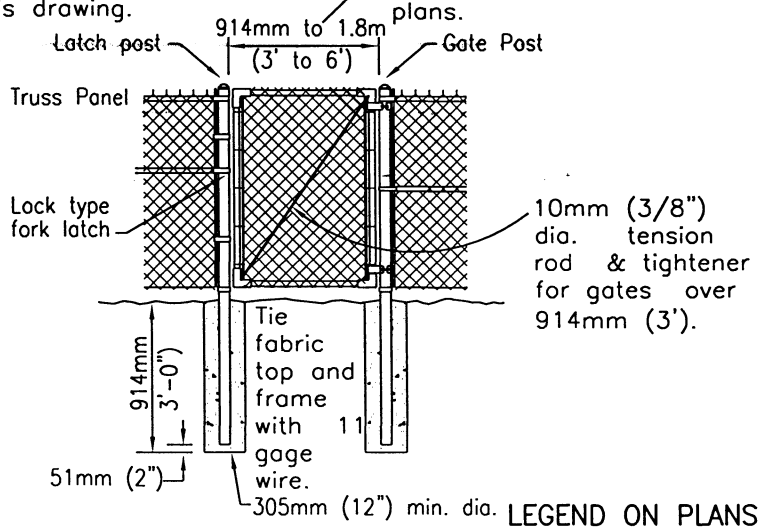
1. All footings shall be 309kg/M³ -C-22-Mpa (520-C-2500) concrete.
2. The following items shall be furnished and installed only when shown on the plans and/or called for in the special provisions:
 - a. Barbed wire
 - b. Extension post
3. Chain link fence shall conform to Section 206-6 of the Standard Specification for Public Works Construction unless specifically noted on this drawing.

Diameter of footing = 4 times outside diameter of post.

Clear opening shown on plans.



EXTENSION POST AND BARBED WIRE



WALK GATE

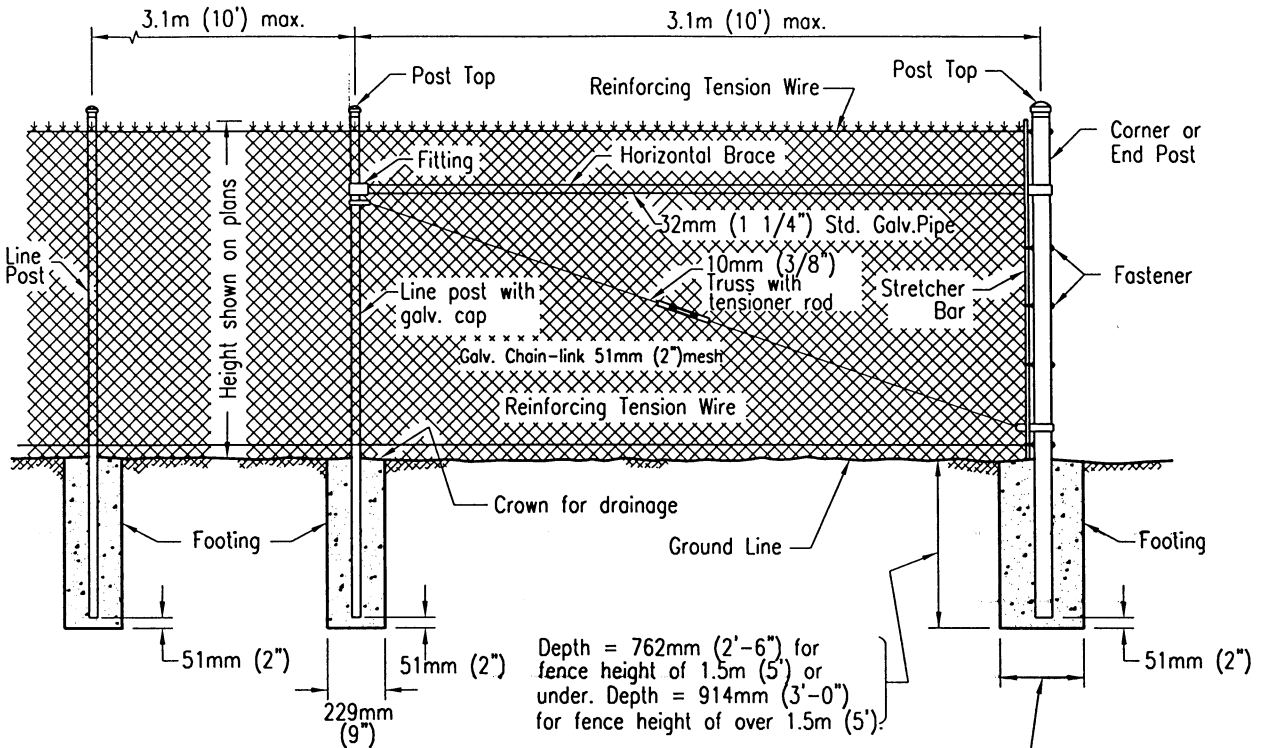
Revision	By	Approved	Date
ORIGINAL		A. Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

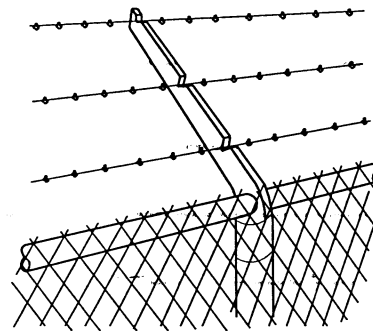
CHAIN LINK GATE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
T. Stanton 3/10/2003
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-5**



Diameter of footing = 4 times outside diameter of post.

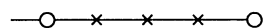


EXTENSION ARM AND BARBED WIRE

NOTES

1. All footings shall be 309kg/M³-C-22-Mpa (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



Revision	By	Approved	Date
ORIGINAL		A. Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

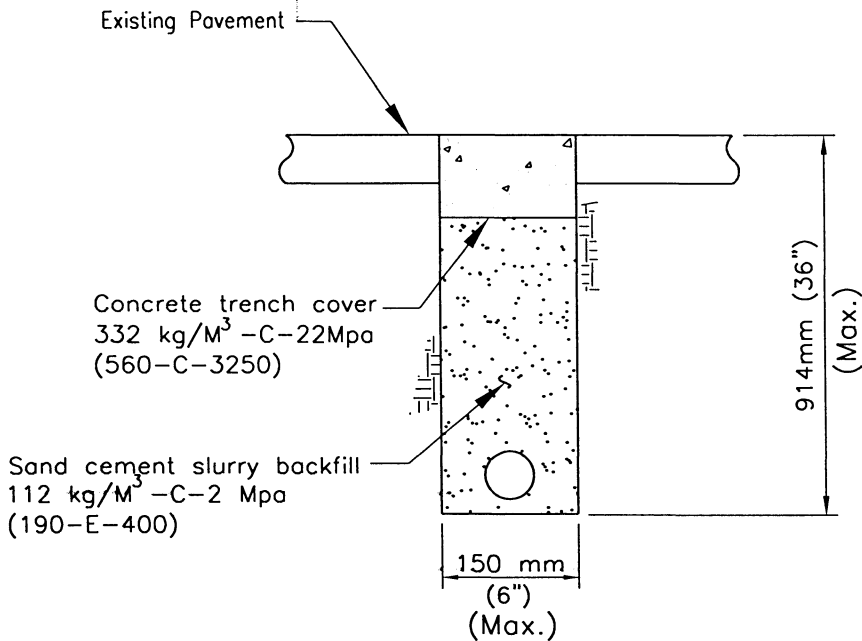
CHAIN LINK FENCE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

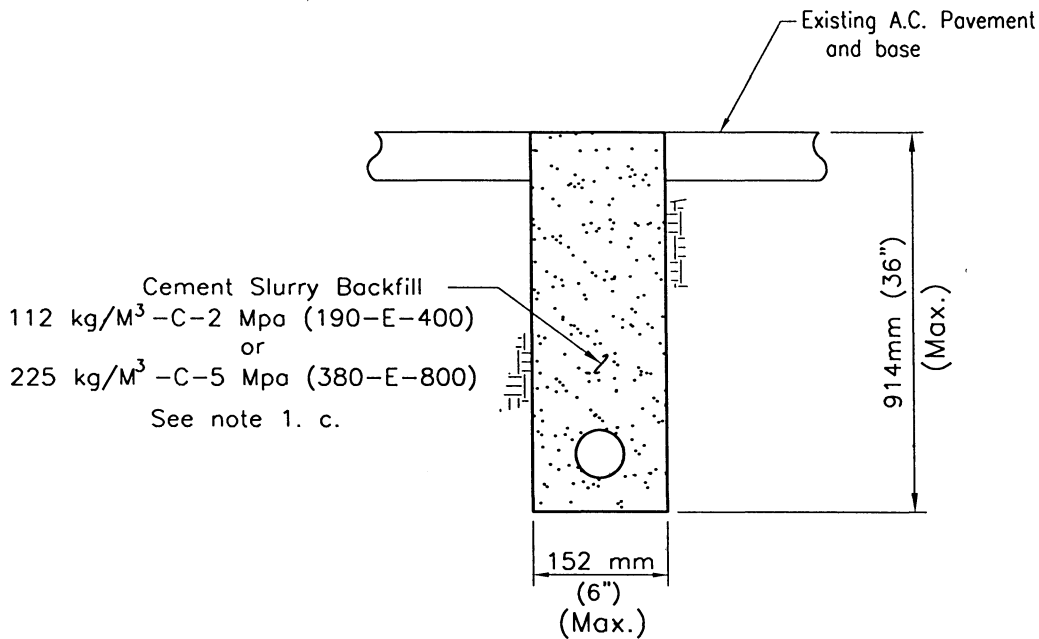
DRAWING NUMBER **M-6**



NOTES

1. Concrete encasement or sand cement slurry backfill shall have a minimum slump of 102mm (4").
2. 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 pavement grade and floated to assure proper edge match.
4. Existing pavement will not require saw cutting when using rockwheel for excavation except when the existing pavement is concrete and trench finish is concrete.
5. All cuts shall be parallel or perpendicular to street centerline, when practical.
6. Allow concrete backfill or concrete trench cover 7 calendar days minimum, but no longer than 30 calendar days to cure and dry before applying any road surface finishes.
7. In major or prime arterial streets, an approved set accelerating admixture, such as calcium chloride, may be used only with prior approval of the Agency's Engineer otherwise the contractor shall protect the trench with the approval of the agency's Engineer.
8. See drawing G-33 for narrow trench resurfacing.
9. See table on drawing M-15 for standard minimum conduit depths.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Hoshemian	9/02		NARROW TRENCHES TRENCHING & BACKFILLING	<i>T. Stanton</i> 3/10/2003
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date		
Reviewed		T. Stanton	04/06	DRAWING NUMBER		M-7

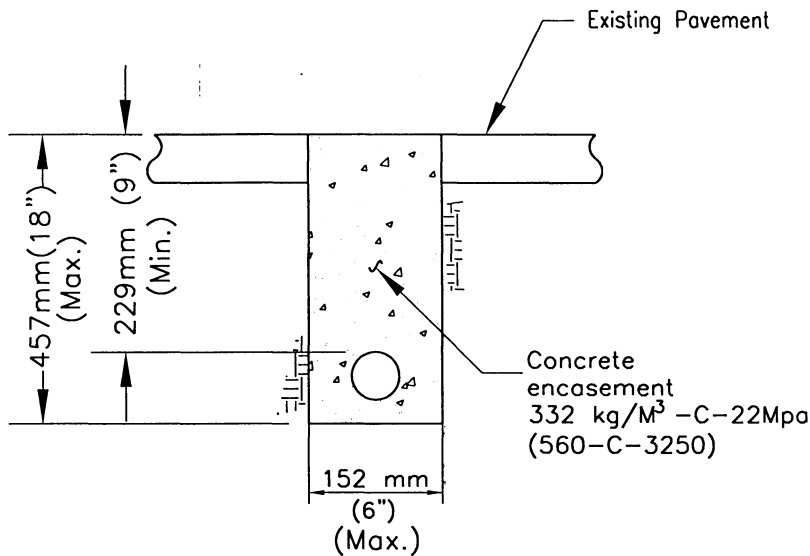


NOTES

1. Cement Slurry Backfill:
 - a. Cement slurry backfill shall have a maximum slump of 102 mm (4").
 - 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 112 kg/M ³ -C-2 Mpa (190-E-400)
All other streets	Class 225 kg/M ³ -C-5 Mpa (380-E-800)
2. Existing A.C. pavement will not require sawcutting when using rockwheel for excavation.
3. All cuts shall be parallel or perpendicular to street centerline, when practical.
4. See drawing G-33 for narrow trench resurfacing.
5. See table on drawing M-15 for standard minimum conduit depths.

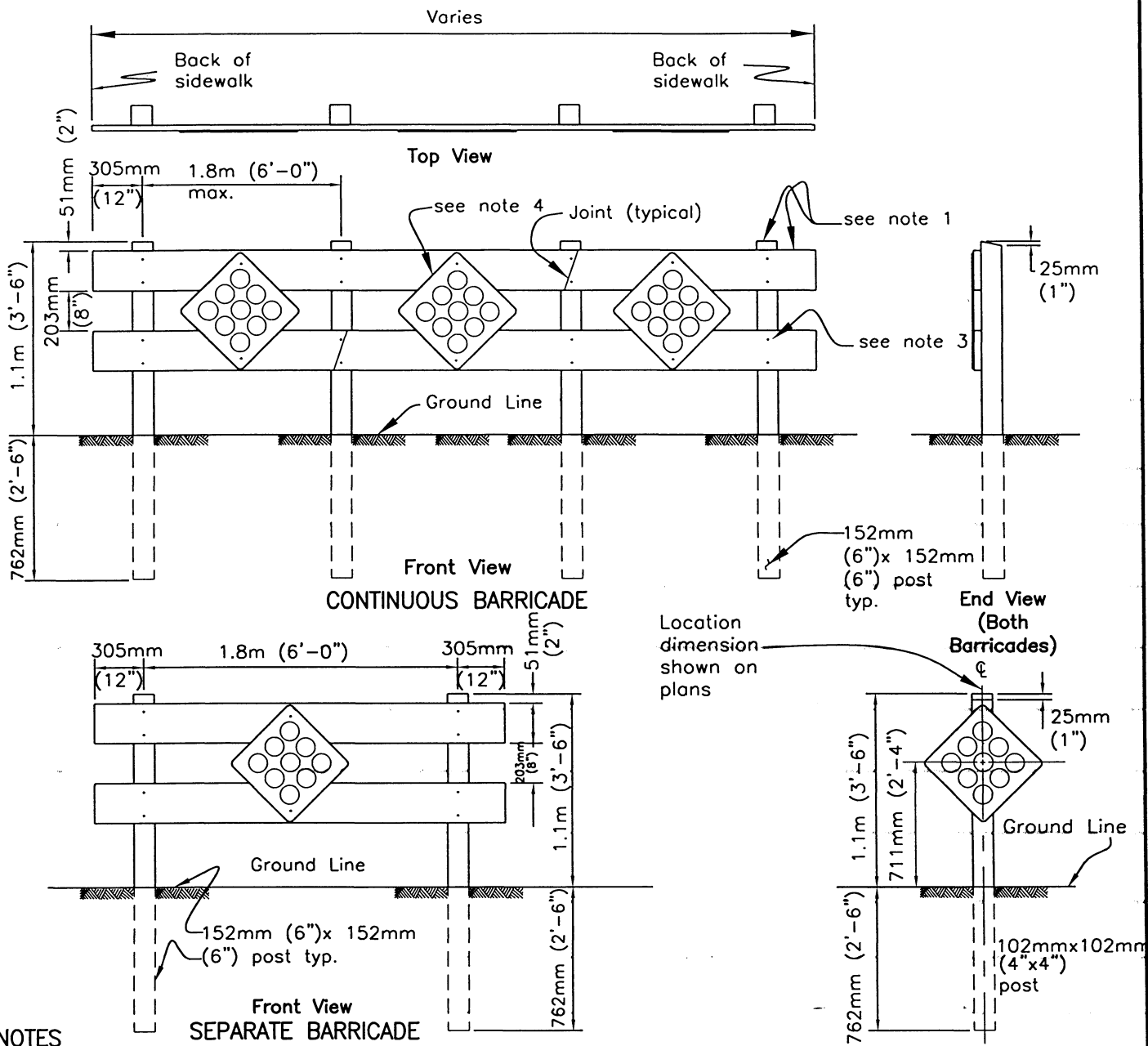
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Hoshemian	9/02		<i>T. Stanton</i> 3/01/2003
Add Metric		T. Stanton	03/03	NARROW TRENCHES TRENCHING & BACKFILLING	Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06		DRAWING NUMBER M-7A



NOTES

1. Concrete encasement or backfill shall have a minimum slump of 102 mm (4").
2. Concrete encasement and/or 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 pavement grade and floated to assure proper edge match.
4. Existing pavement will not require saw cutting when using rockwheel for excavation except when the existing pavement is concrete and trench finish is concrete.
5. All cuts shall be parallel or perpendicular to street centerline, when practical.
6. Allow concrete backfill or concrete trench cover 7 calendar days minimum, but no longer than 30 calendar days to cure and dry before applying any road surface finishes.
7. In major or prime arterial streets, an approved set accelerating admixture, such as calcium chloride, may be used only with prior approval of the Agency's Engineer otherwise the contractor shall protect the trench with the approval of the Agency's Engineer.
8. This type of trench 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) and where the conduit can not be placed at the proper recommended depth.
9. See drawing G-33 for narrow trench resurfacing.
10. This detail shall be used only when there is underground conflicts. See table on drawing M-15 for standard minimum conduit depths.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Hashemian	9/02		NARROW TRENCHES TRENCHING & BACKFILLING SHALLOW CONDUIT DEPTH	<i>T. Stanton</i> 3/01/2003
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date		
Reviewed		T. Stanton	04/06	DRAWING NUMBER		M-8



NOTES

1. Posts to be structural grade redwood or pressure treated (with wood preservative) Douglas Fir, surfaced four sides; cross pieces to be 51mm (2") x 203mm (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 10mm (3/8") x 152mm (6") galvanized lag screws with one (1) washer each.
Reflector sign fastners to be 10mm (3/8") x 38mm (1 1/2") galvanized lag screws.
4. Reflector signs - California Type N. Size 457mm (18") x 457mm (18") - Yellow with nine (9) - 83mm (3 1/4") 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 1.6mm (0.063").
5. 1.8m (6') long hat section metal post per Caltrans Std. Plan A74-A optional for guard post.

LEGEND ON PLANS

- Barricade
- Guard Post

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

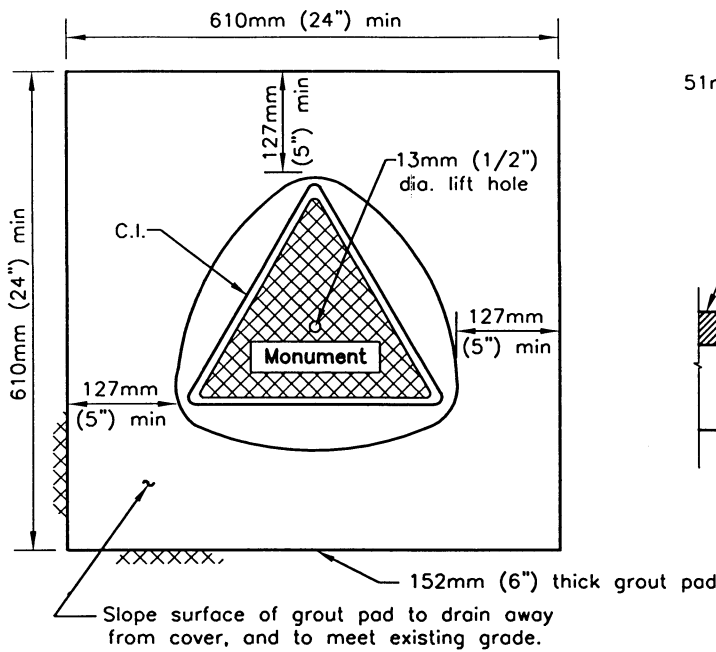
SAN DIEGO REGIONAL STANDARD DRAWING

GUARD POST AND BARRICADE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

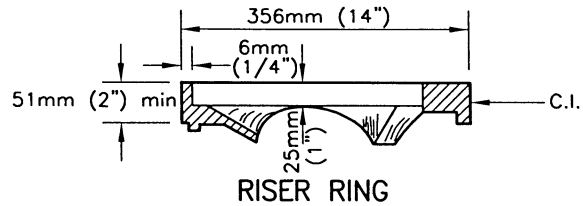
T. Stanton 31012003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-9**

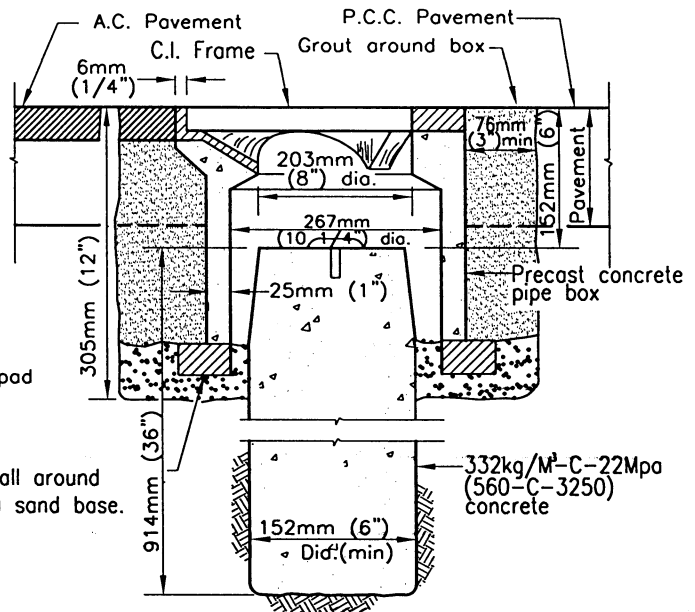


PLAN-IN UNPAVED AREA

Brick support all around on 51mm (2") sand base.



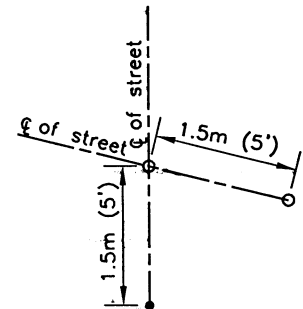
RISER RING



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 152mm (6") of cast-in-place base to a top diameter of 127mm (5"). (Precast base shall be sand backfilled).
4. Monument marker shall be a domed brass, 76mm (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 1.5m (5') 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 3m (10') diameter circle, whose center is the point.
 - b) Set on centerline at intervals not exceeding 305m (1000') 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 therewith 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 91.4m (300') from the point on which the deleted monument would have been placed.



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

LOCATION OF STREET SURVEY MONUMENT

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

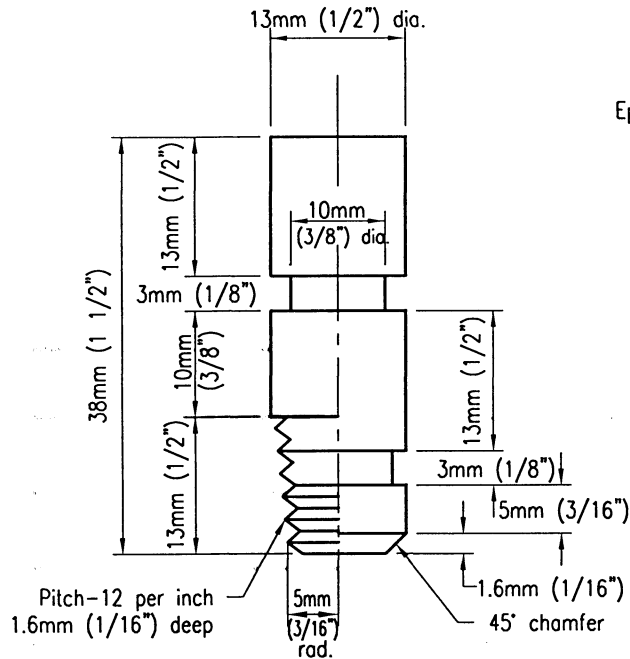
STREET SURVEY MONUMENT

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

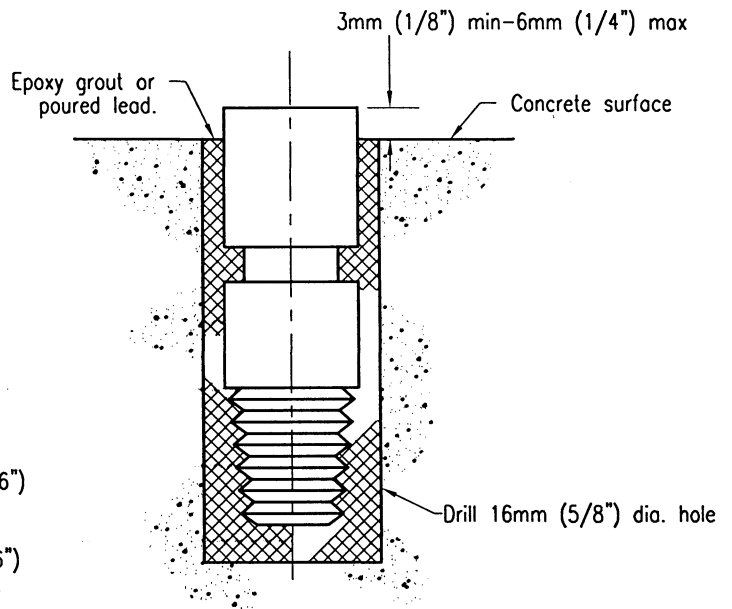
T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-10**



TYPE-A TYPE-B
ELEVATION



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

NOTES

1. Material- Brass A.S.T.M. B-16. All machine tolerances $\pm 0.4\text{mm}$ ($1/64$ ") 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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

BENCH MARK - BRASS PLUG

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 310112003

Chairperson R.C.E. 19246 Date

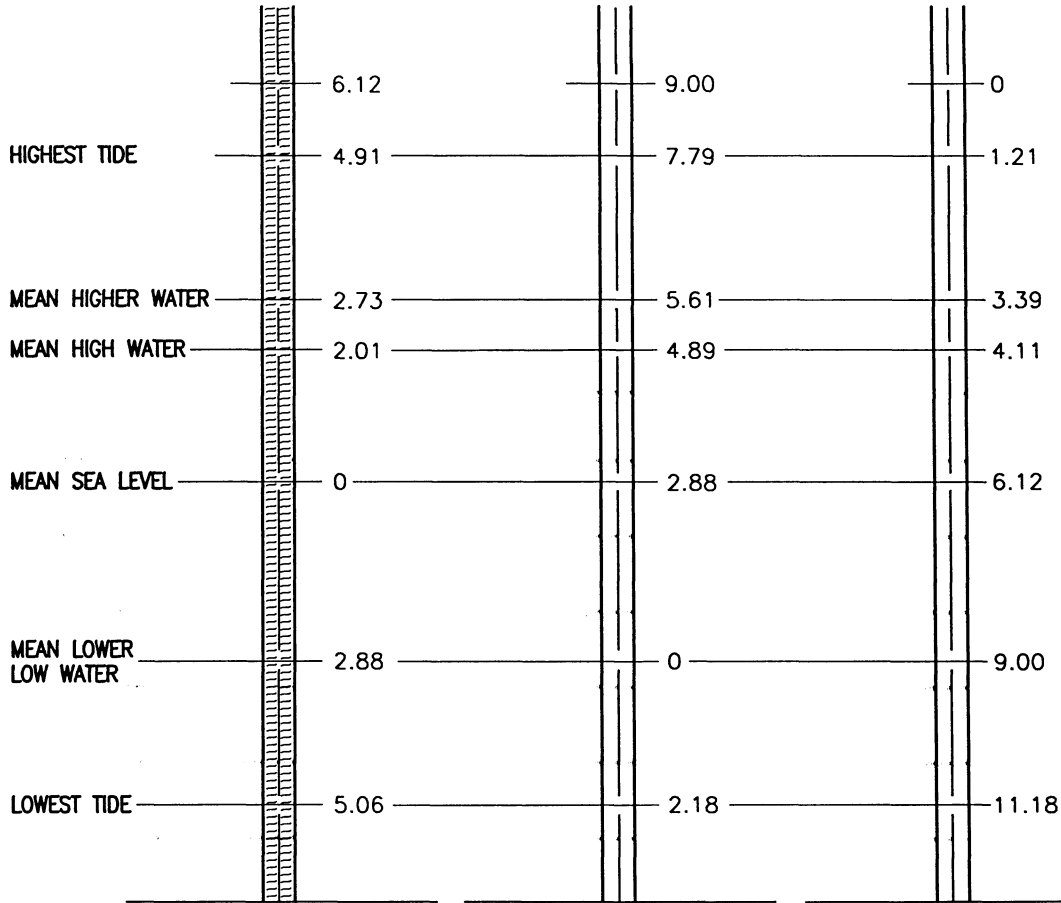
DRAWING NUMBER

M-11

COUNTY OF SAN DIEGO
CITY OF SAN DIEGO
U.S.C. & G. (LAND)
U.S.G.S. STAFF

PORT OF SAN DIEGO
U.S.C. & G.
(BAY CHART)

OLD CITY OF
SAN DIEGO STAFF
(PRIOR TO MARCH 1963)



LEGEND

- U.S.C. & G. = United States Coast and Geodetic Survey.
- U.S.G.S. = United States Geological Survey.
- MEAN HIGH WATER = Mean of all high water in San Diego Bay.
- MEAN HIGHER WATER = 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 1923".

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DATUMS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-12**

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 610mm (2') 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. The metal plug shall be anchored 25mm (1") deep in sidewalk.

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 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, 457mm (18") long, set flush with the surface.

LEGEND

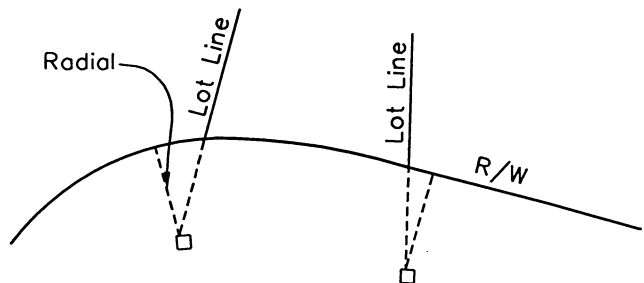
- Fd 51mm (2") Iron Pipe Marked RCE XXXX or per Map XXX unless otherwise noted
- ▲ Fd Street Survey Monument Stamped RCE XXXX or LS XXXX
- ◎ Set 51mm (2") x 610mm (24") Iron Pipe Marked RCE XXXX or LS XXXX
- Set Lead and Disc Stamped RCE XXXX or LS XXXX
- Set 13mm (1/2") x 457mm (18") Iron Pipe Marked 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 13mm (1/2") by 457mm (18") 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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

SURVEY MONUMENTS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 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 Once = 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 gal. (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)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

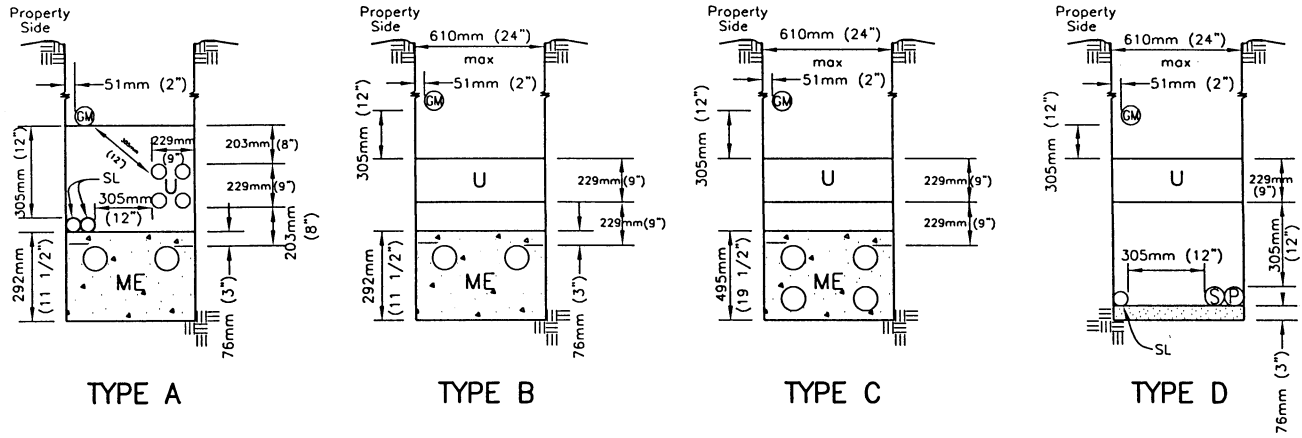
METRIC EQUIVALENTS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-14**

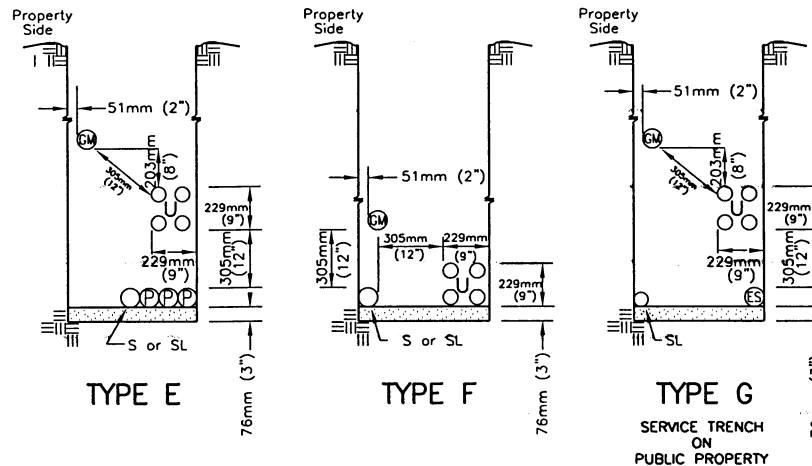


TYPE A

TYPE B

TYPE C

TYPE D



TYPE E

TYPE F

TYPE G

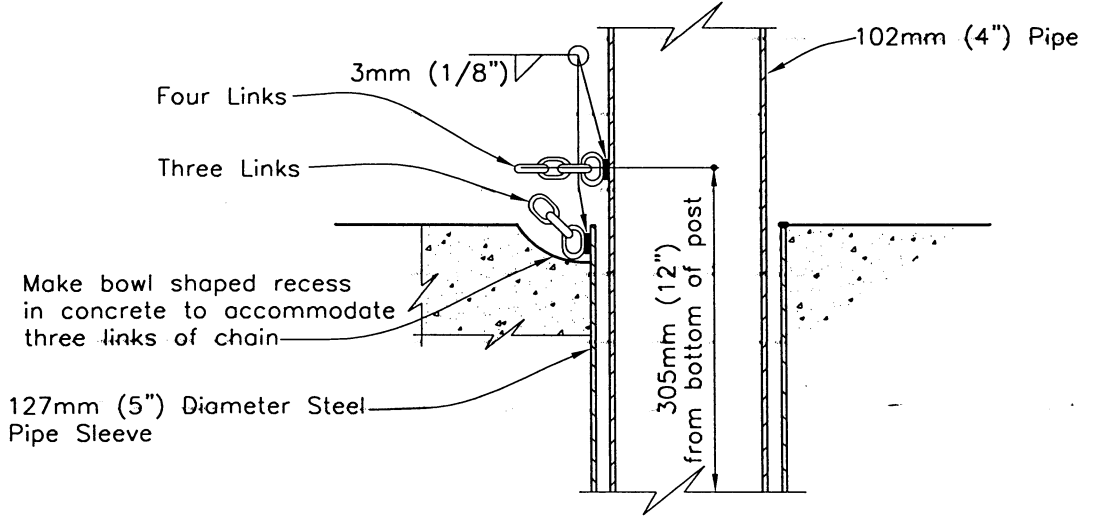
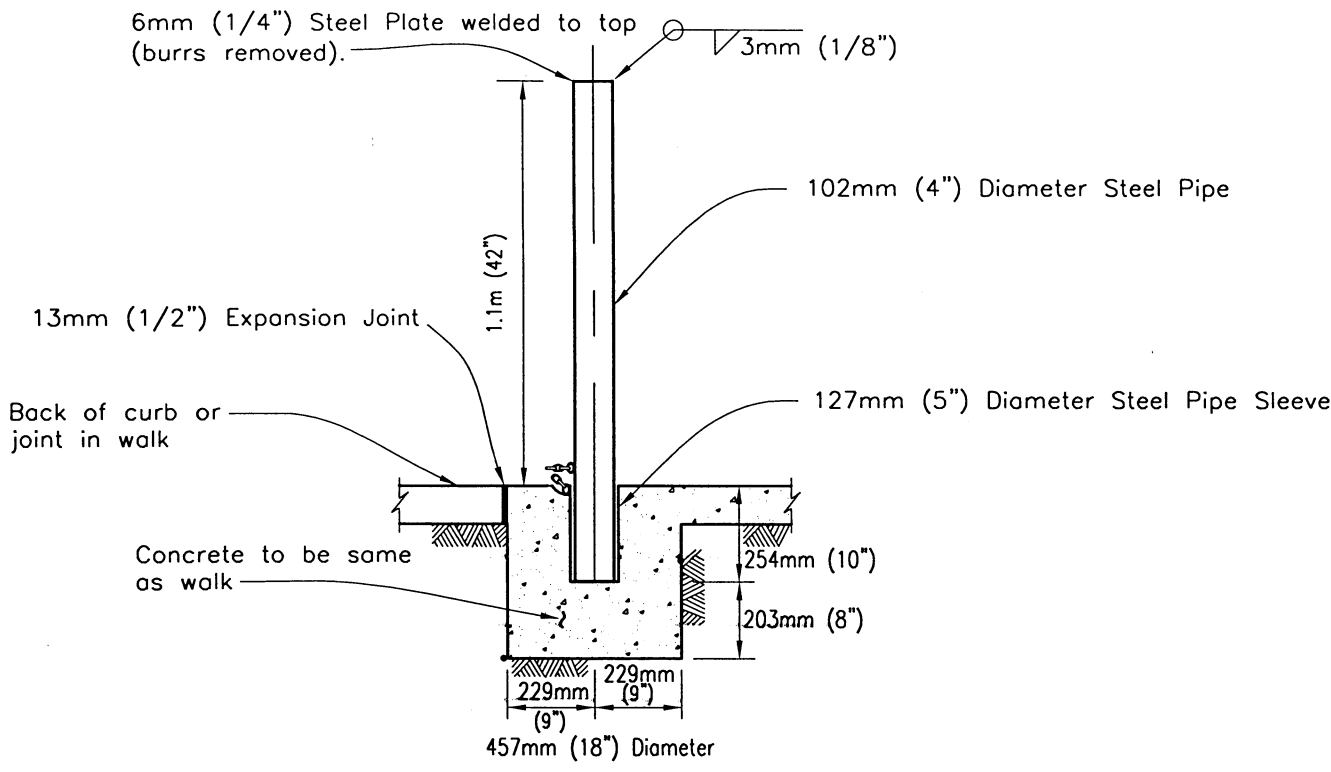
SERVICE TRENCH
ON
PUBLIC PROPERTY

	Legend	Minimum Cover
GM	Gas Main	762mm (30")
GS	Gas Service	762mm (30")
P	Primary Electric	1.1m (42")
S	Secondary Electric	762mm (30")
ES	Electric Service	762mm (30")
ME	Multiple Electric (P, S or ES in Spacers) Concrete Encased	610mm (24")
SL	Street Light (not series)	762mm (30")
U	CATV TELCO	610mm (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 trenches shown above.
5. Minimum depth of gas pipe may, subject to gas company inspectors approval, be reduced to 610mm (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 305m (1,000') in length which may be served by feeder lines only.
8. CATV 38mm (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 305mm (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	SAN DIEGO REGIONAL STANDARD DRAWING	JOINT TRENCH LOCATIONS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Parkinson	9/88			<i>T. Stanton</i> 3/10/2003 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reviewed		T. Stanton	04/06			
						DRAWING NUMBER M-15



HASP DETAIL

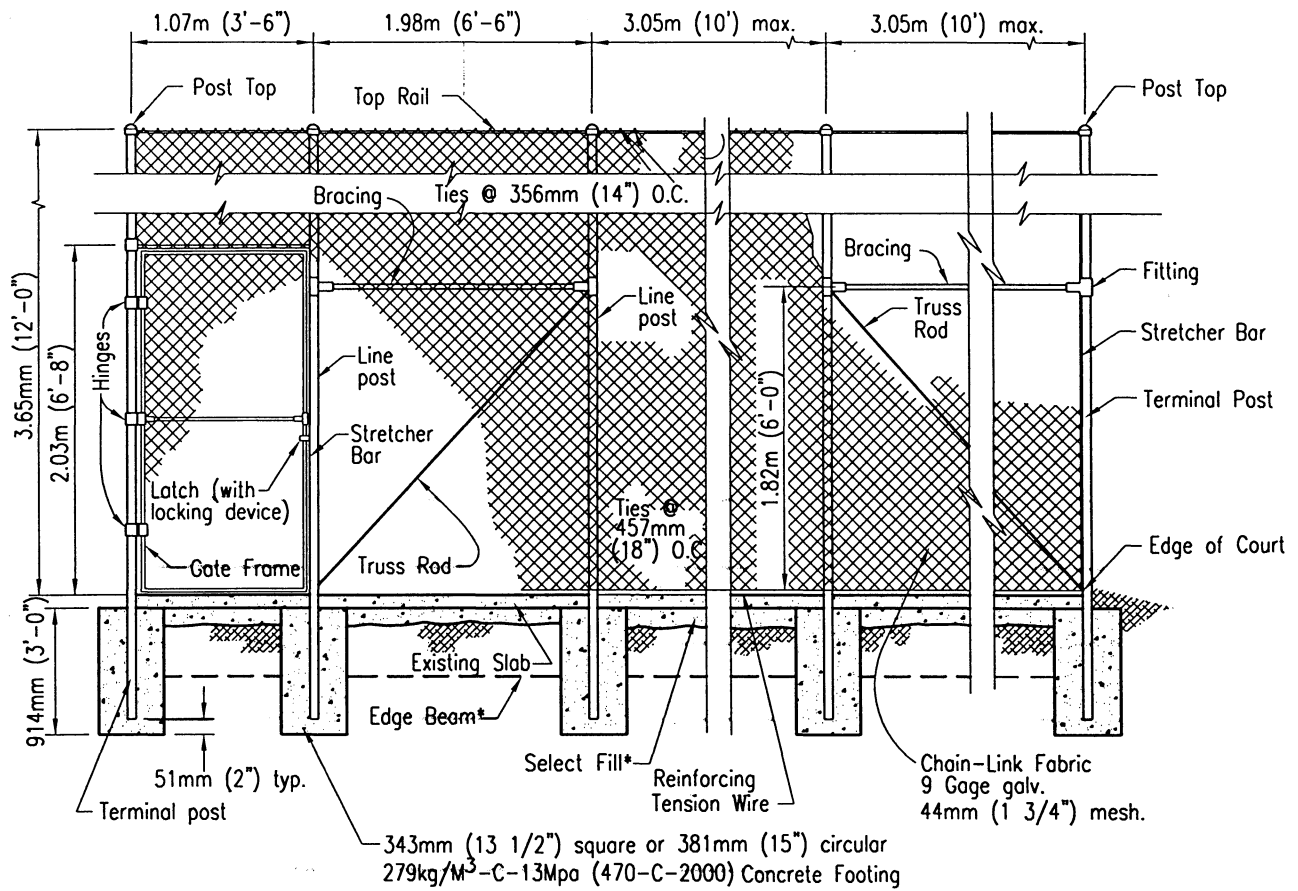
NOTES

1. Chain to be 6mm (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



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Solomon	7/79		DEMOUNTABLE POST	<i>T. Stanton</i> 310112003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06	DRAWING NUMBER M-16		



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

ELEVATION

DESCRIPTION	MIN. SIZE IN KILOGRAMS / (INCHES)	MIN. WEIGHT PER LIN FT IN KILOGRAMS / (LBS).
Line Post	60mm (2.375) O.D.	1.65kg (3.65)
Terminal Post	73mm (2.875) O.D.	2.63kg (5.79)
Top Rail	42mm (1.660) O.D.	1.03kg (2.27)
Bracing	42mm (1.660) O.D.	1.03kg (2.27)
Gate Frame	42mm (1.660) O.D.	1.03kg (2.27)

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.

Revision	By	Approved	Date
ORIGINAL		Solomon	7/79
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

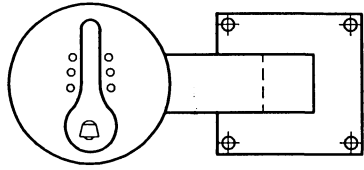
SAN DIEGO REGIONAL STANDARD DRAWING

**TENNIS COURT FENCE
CHAIN LINK**

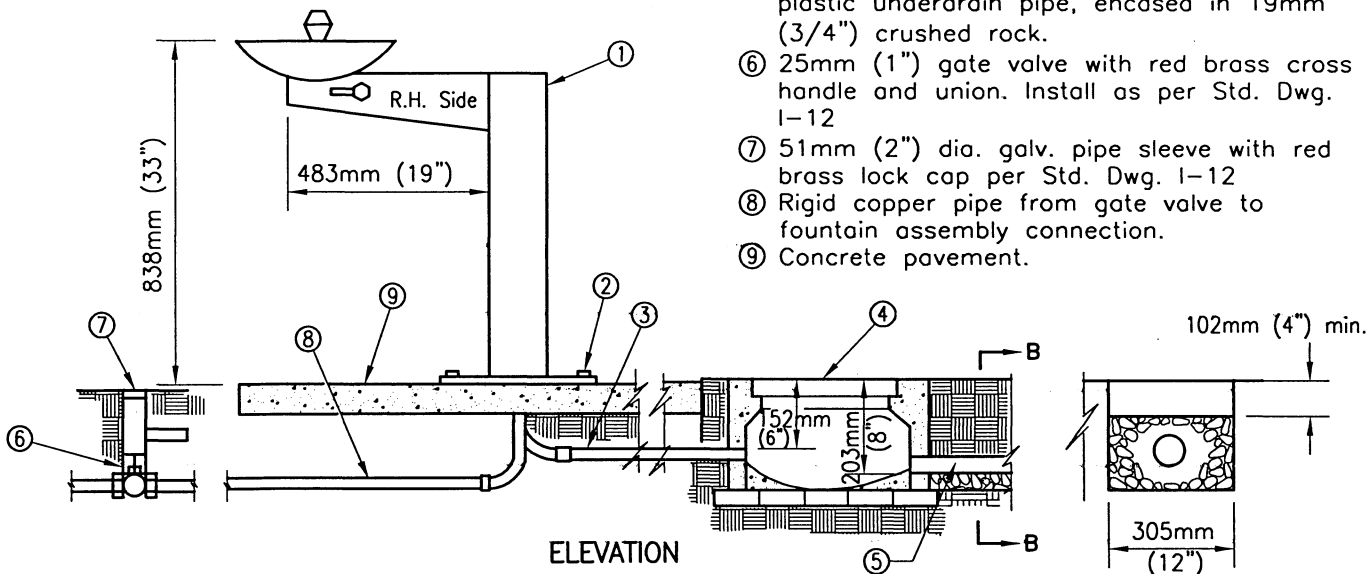
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **M-17**

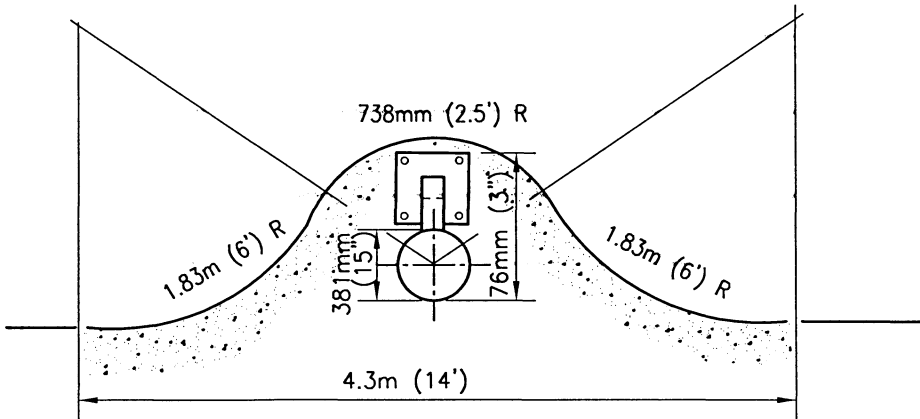


- ① Drinking Fountain – Haws model 3376 or approved equal.
- ② 10mm (3/8") dia. Expansion anchors with flat (recessed heads) screws 4 places.
- ③ 32mm (1 1/4") P.V.C. pipe with sweep 90° ell connection to fountain drain.
- ④ 241mm (9 1/2") x 406mm (16") concrete yard box with hinged locking top (Brooks No. 3HL or equal) set on red brick foundation.
- ⑤ 102mm (4") x 12.2m (40') perforated plastic underdrain pipe, encased in 19mm (3/4") crushed rock.
- ⑥ 25mm (1") gate valve with red brass cross handle and union. Install as per Std. Dwg. I-12
- ⑦ 51mm (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.



ELEVATION

SECTION B-B



PLAN

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 25mm (1") gate valve. Use red brass bushing reducers to adapt to feed pipe.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		H. Hecht	10/82
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

DRINKING FOUNTAIN

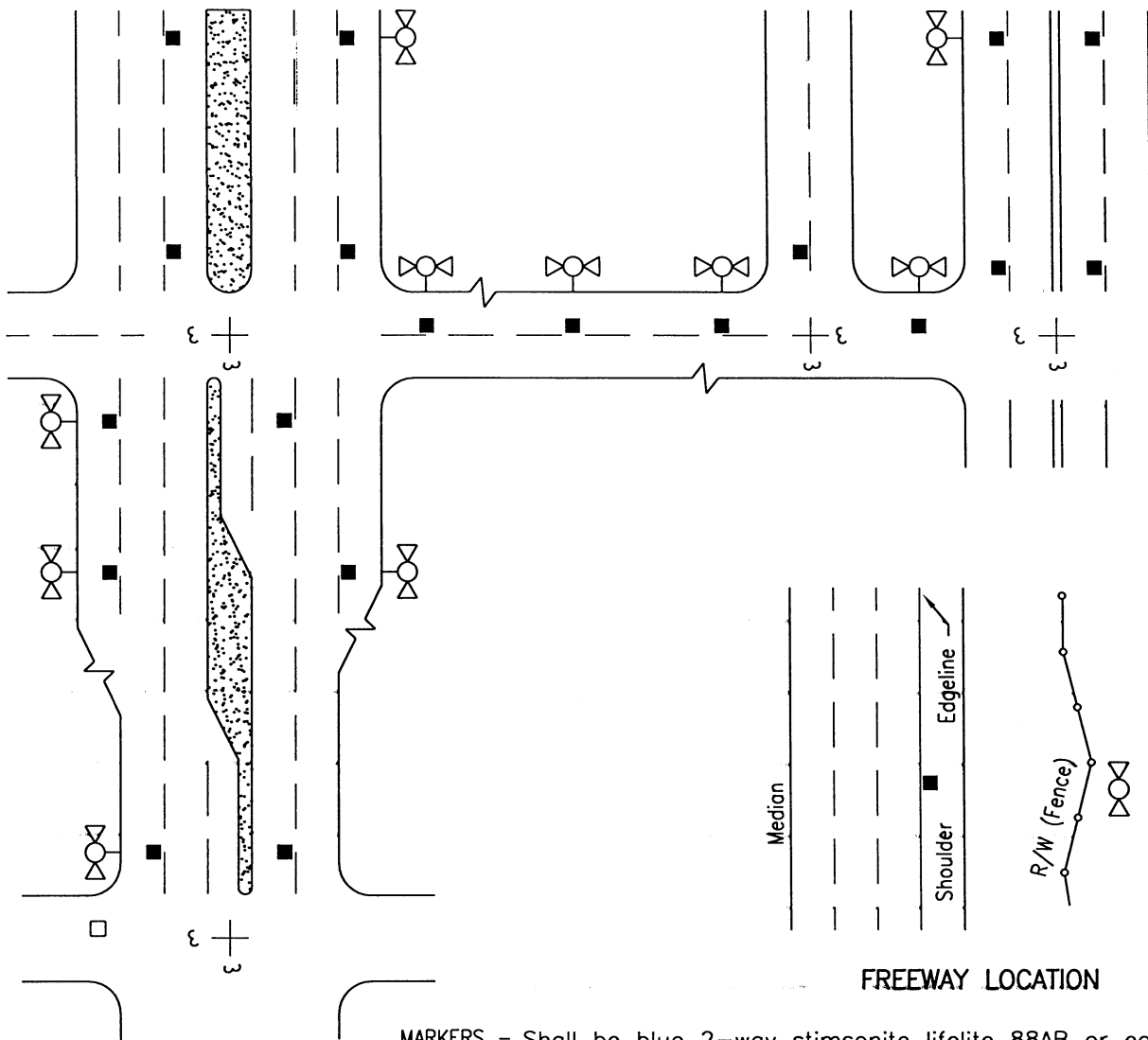
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 310112003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-18**

STREET LOCATIONS

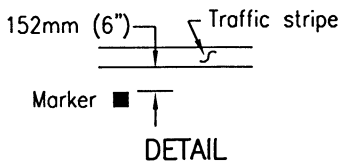


FREEWAY LOCATION

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

ADHESIVE - An ample amount of two (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 51mm (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 the 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 152mm (6") from centerline or existing markers.

LEGEND ON PLANS

- Marker ■
- Fire Hydrant ⊗

Revision	By	Approved	Date
ORIGINAL		H. Hecht	10/82
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

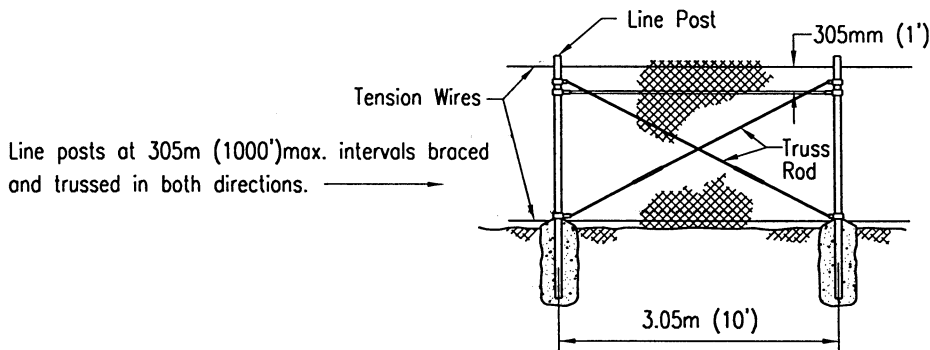
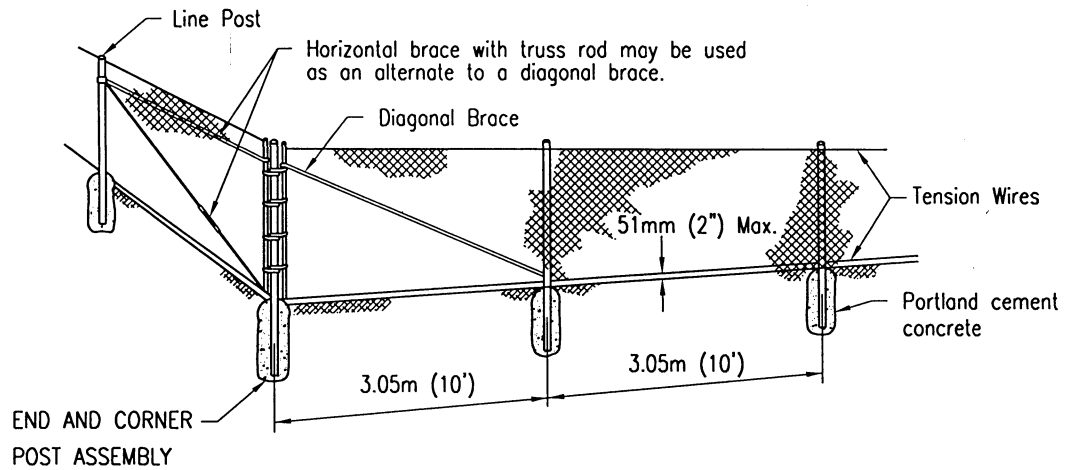
FIRE HYDRANT MARKERS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

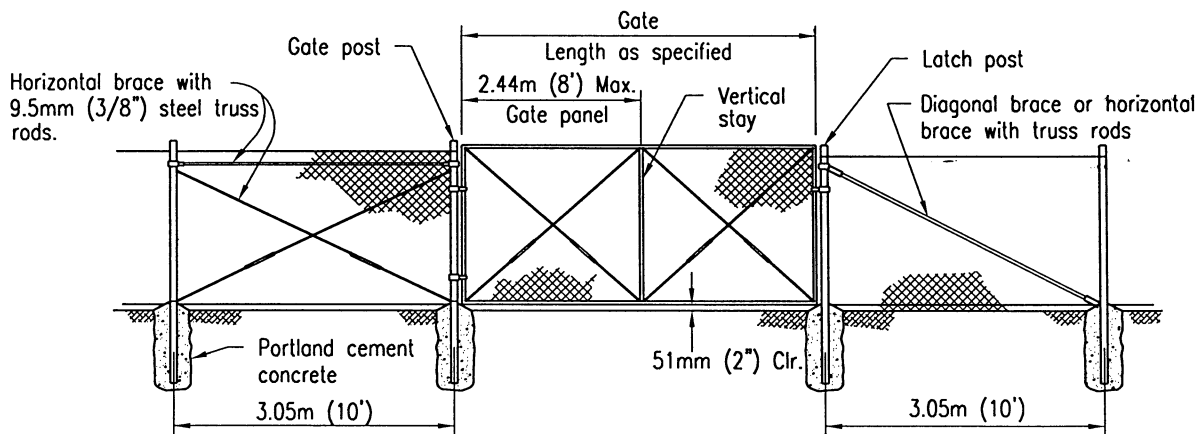
T. Stanton 3/11/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-19**



LINE POST BRACING



GATE ASSEMBLY

Revision	By	Approved	Date
ORIGINAL		Bahmanian	4/86
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

CHAIN LINK FENCE
DETAILS

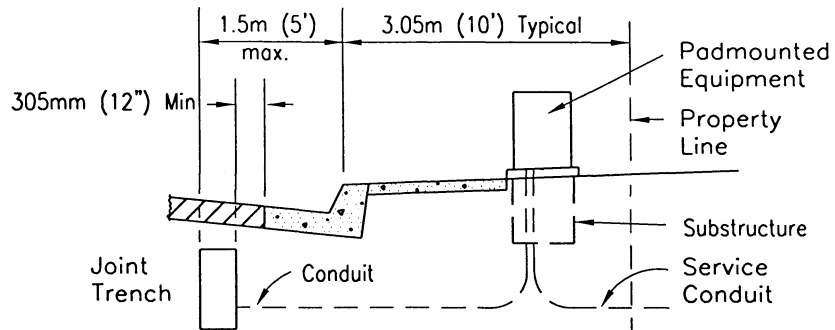
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003

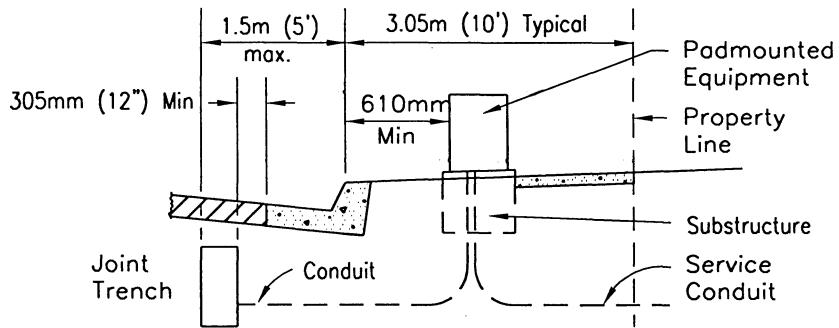
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

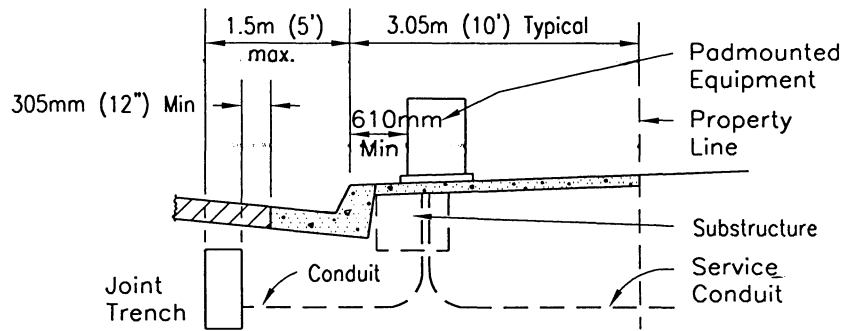
M-20



SIDEWALK NEXT TO CURB



SIDEWALK NEXT TO PROPERTY LINE



SIDEWALK NEXT TO CURB AND PROPERTY LINE

NOTES

1. Sidewalk shall have a minimum of 1.2m (4') 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
ORIGINAL		Parkinson	9/88
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

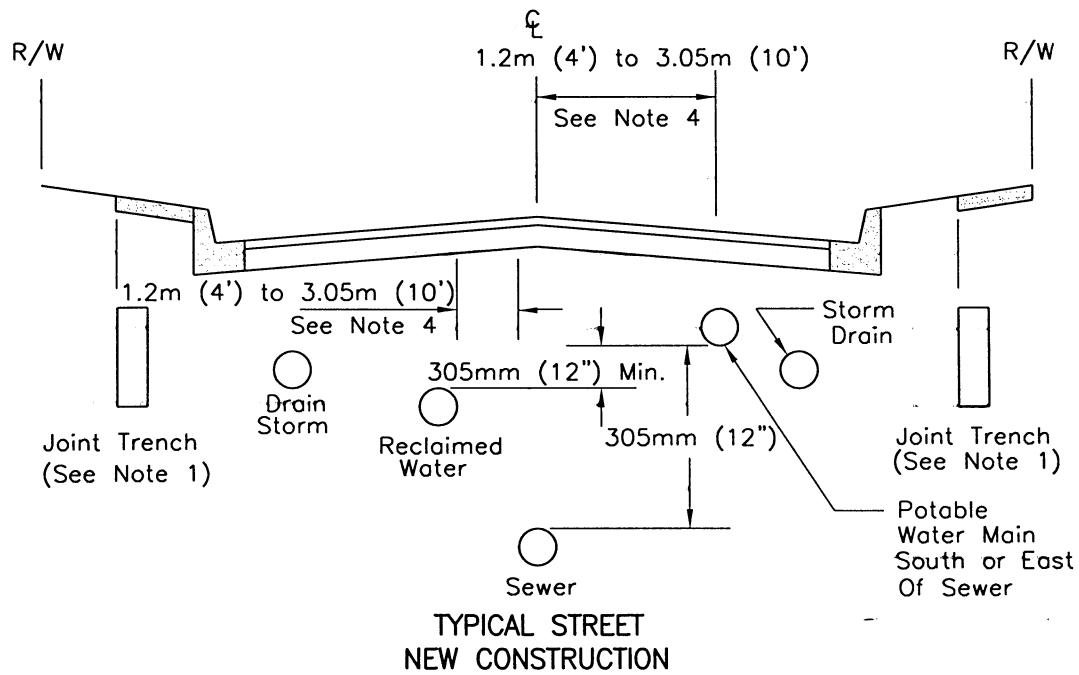
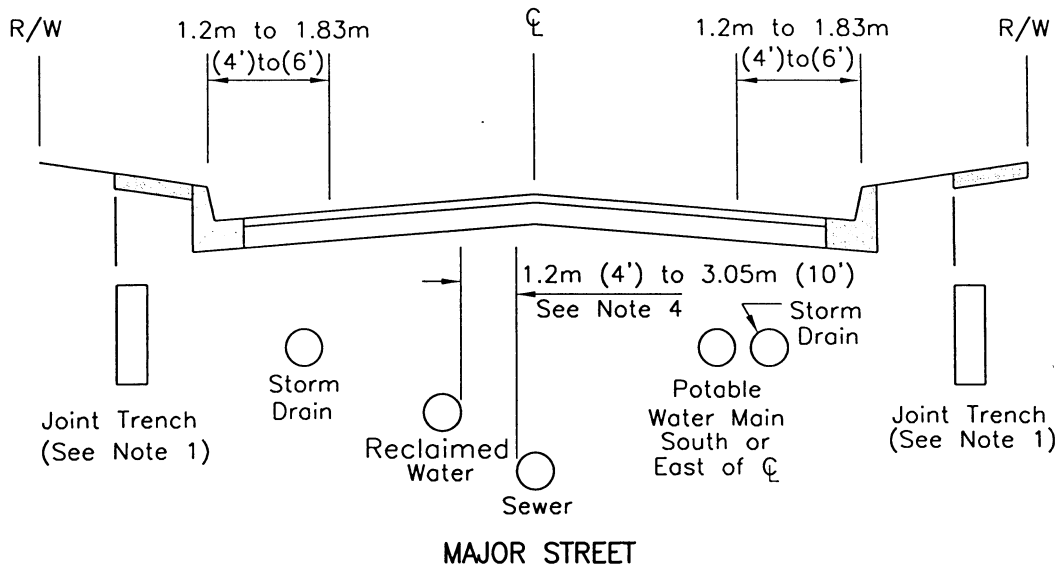
**UNDERGROUND TYPICAL LOCATION
CONVERSION/REPLACEMENT/UPGRADE**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-21**



NOTES

1. At catch basin locations, joint trench shall be 1.2m (4') minimum from back of curb to inside wall of trench. See Standard Drawing M-15 for configuration of utilities in joint trench.
2. Sewer and reclaimed water mains shall be designed to cross under potable water mains. The vertical separation between potable water and reclaimed water shall be a minimum of 305mm (12").
3. Sewer and reclaimed water laterals shall cross under potable water main, with a minimum vertical separation of 305mm (12").
4. Sewer and reclaimed water mains shall maintain a 3.05m (10') minimum horizontal separation, O.D. to O.D., with any potable water or sewer/reclaimed main. This separation may be reduced utilizing special construction, with special approval from the Agency and the County Health Dept. For sewer or reclaimed water mains less than 610mm (24") in diameter, only Agency approval is required.

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

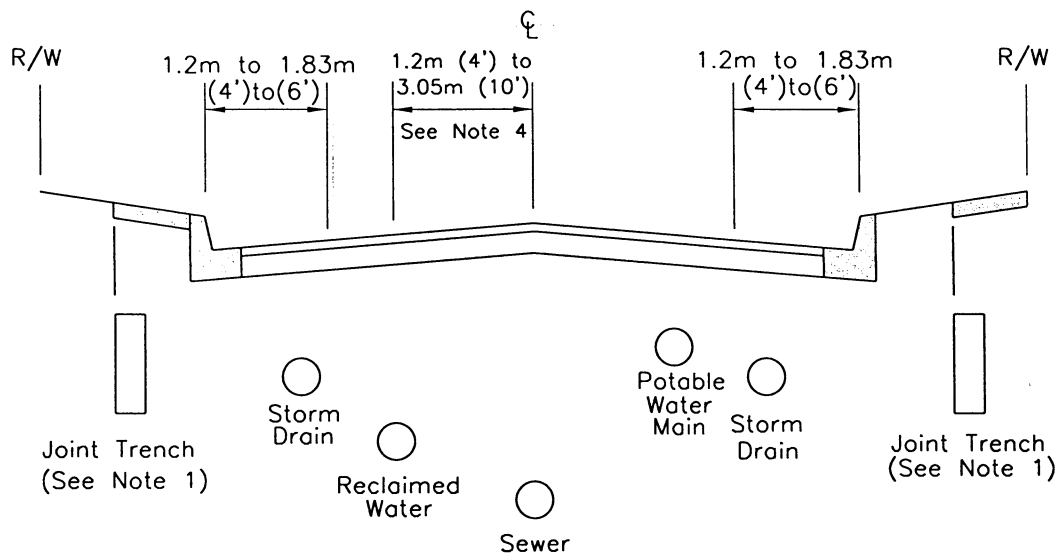
SAN DIEGO REGIONAL STANDARD DRAWING

**UTILITY LOCATIONS
LOCAL AND MAJOR STREETS**

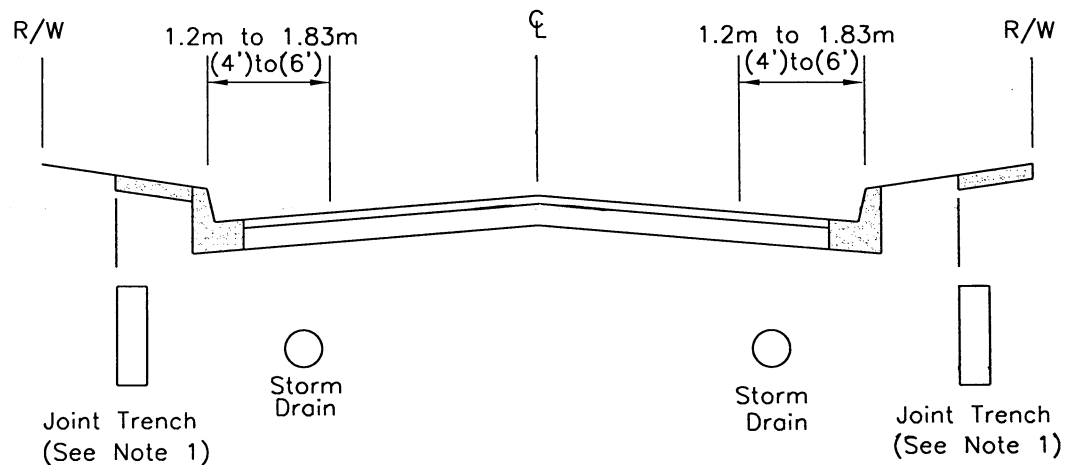
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-22**



PRIME ARTERIAL

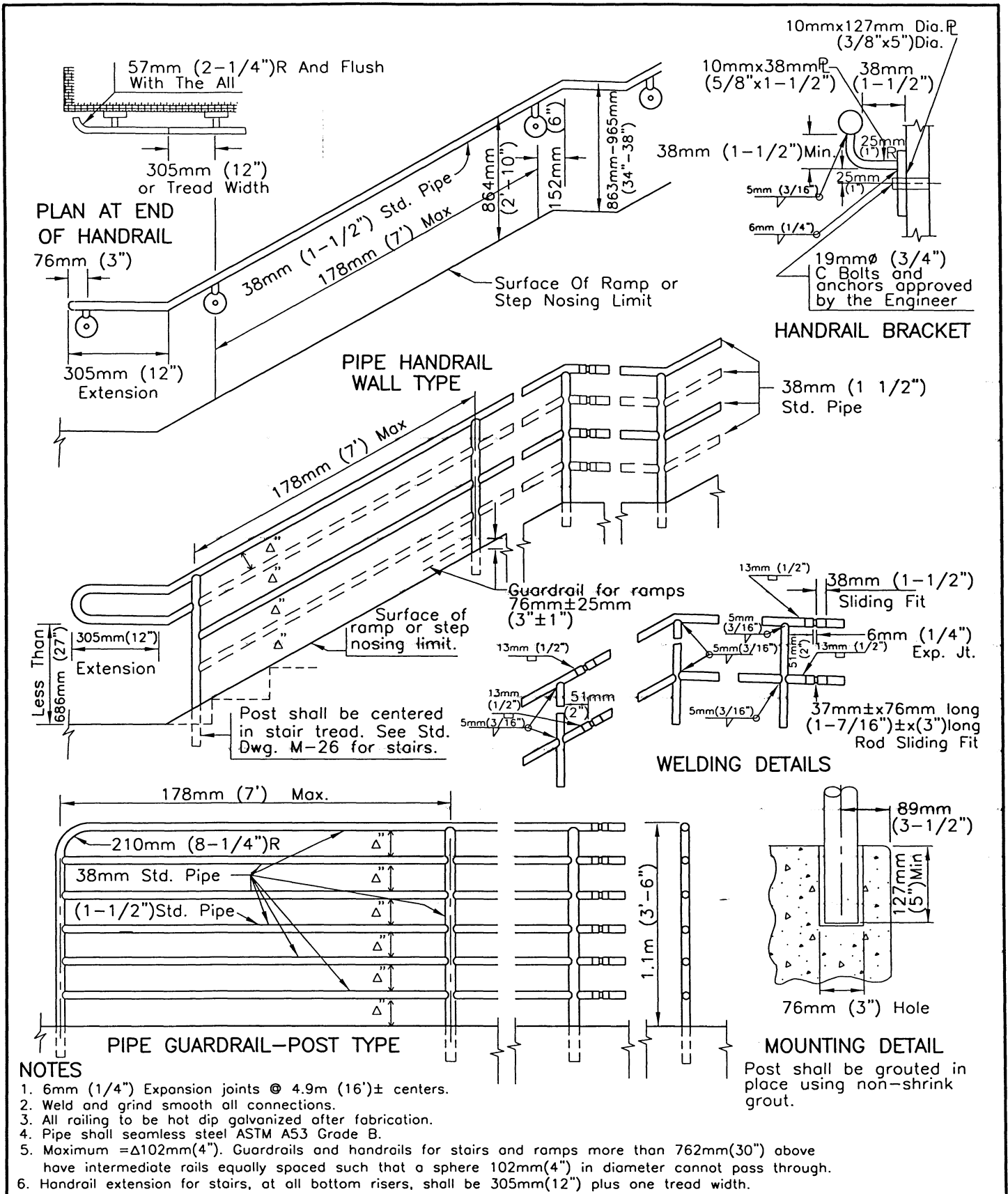


EXPRESSWAY

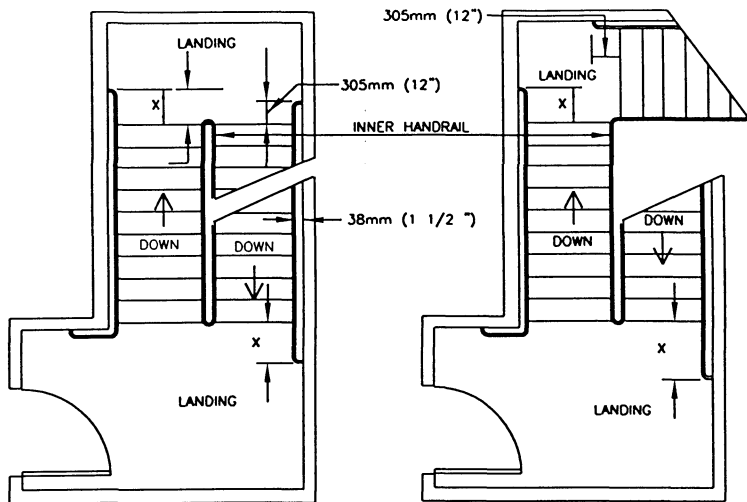
NOTES

1. At catch basin locations, joint trench shall be 1.2m (4') minimum from back of curb to inside wall of trench. See Standard Drawing M-15 for configuration of utilities in joint trench.
2. Sewer and reclaimed water mains shall be designed to cross under potable water mains. The vertical separation between potable water and reclaimed water shall be a minimum of 305mm (12").
3. Sewer and reclaimed water laterals shall cross under potable water main, with a minimum vertical separation of 305mm (12").
4. Sewer and reclaimed water mains shall maintain a 3.05m (10') minimum horizontal separation, O.D. to O.D., with any potable water or sewer/reclaimed main. This separation may be reduced utilizing special construction, with special approval from the Agency and the County Health Dept. For sewer or reclaimed water mains less than 610mm (24") in diameter, only Agency approval is required.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		G. Parkinson	2/95		UTILITY LOCATIONS PRIME ARTERIALS AND EXPRESSWAYS
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
Reviewed		T. Stanton	04/06	DRAWING NUMBER	
				M-23	

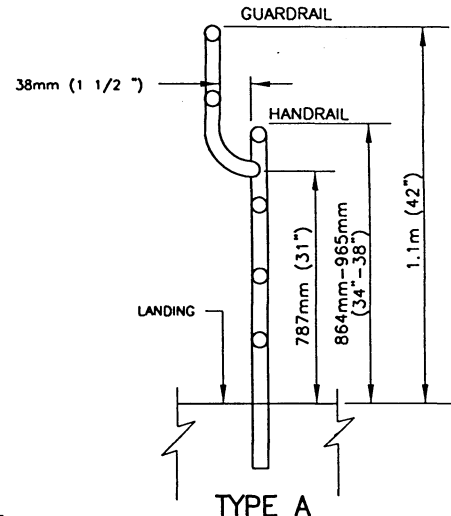


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		G.Parkinson	2/95	PEDESTRIAN PROTECTIVE RAILING DETAILS No. 1		 Chairperson R.C.E. 19246 Date 31/11/2003
Add Metric		T. Stanton	03/03			
Reviewed		T. Stanton	04/06			
						DRAWING NUMBER M-24

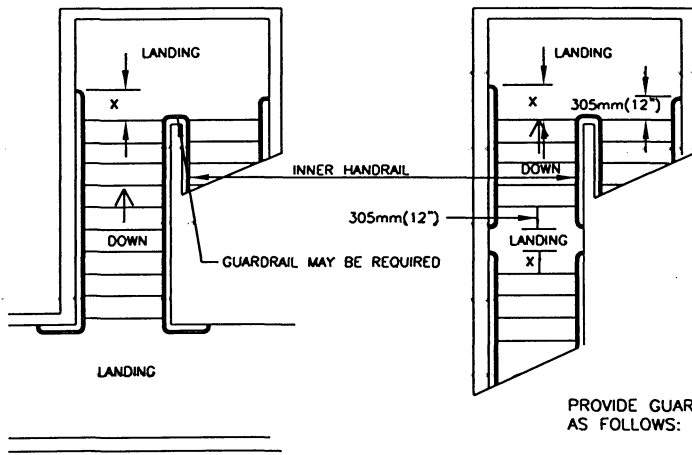


X IS THE MINIMUM HANDRAIL EXTENSION OF 12 INCHES PLUS THE WIDTH OF ONE TREAD AT EACH BOTTOM RISER.

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



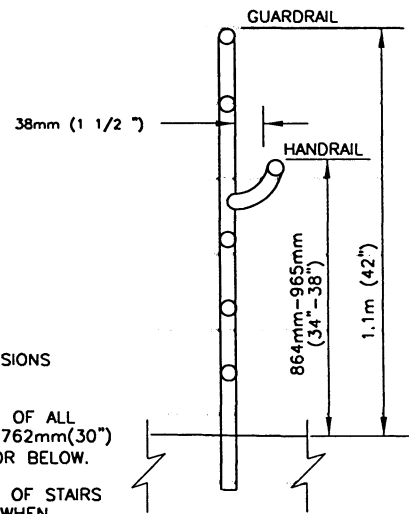
TYPE A
GUARDRAIL EXTENSION



STAIR HANDRAILS

PROVIDE GUARDRAIL EXTENSIONS AS FOLLOWS:

1. TYPE A ON OPEN SIDE OF ALL LANDINGS MORE THAN 762mm(30") ABOVE GRADE OR FLOOR BELOW.
2. TYPE B ON OPEN SIDE OF STAIRS (INCLUDING LANDINGS) WHEN SPECIFIED.



TYPE B
GUARDRAIL EXTENSION

NOTES

1. Post type guardrails, and handrails for stairs or landings 762mm(30") 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 762mm(30") above grade or floor below shall have intermediate rails equally spaced such that a sphere 102mm(4") 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.
4. The top of guardrails for stairways, exclusive of their landings, may have a height as specified for handrails.

Revision	By	Approved	Date
ORIGINAL		G.Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

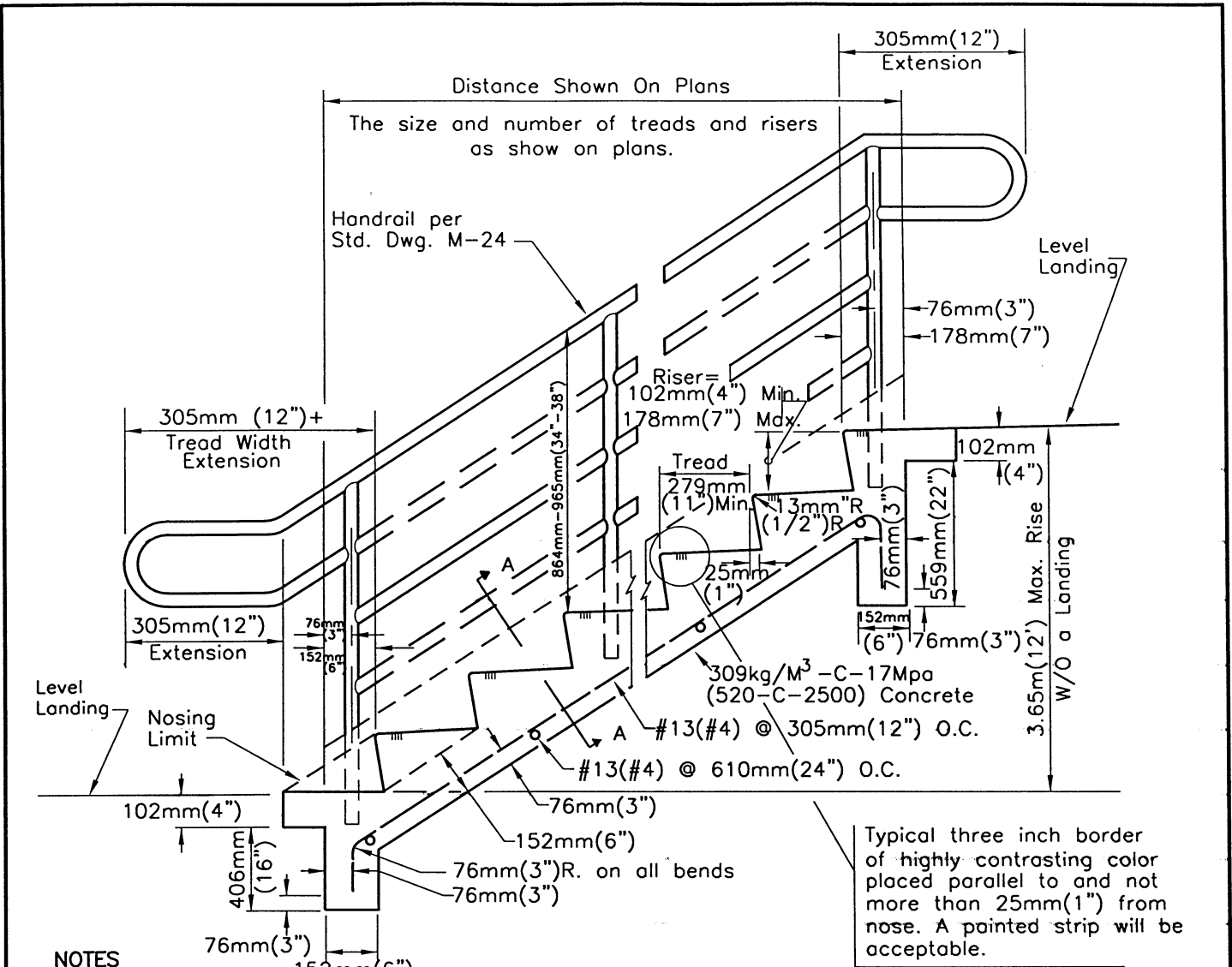
PEDESTRIAN PROTECTIVE RAILING
DETAILS No. 2

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003
Choirperson R.C.E. 19246 Date

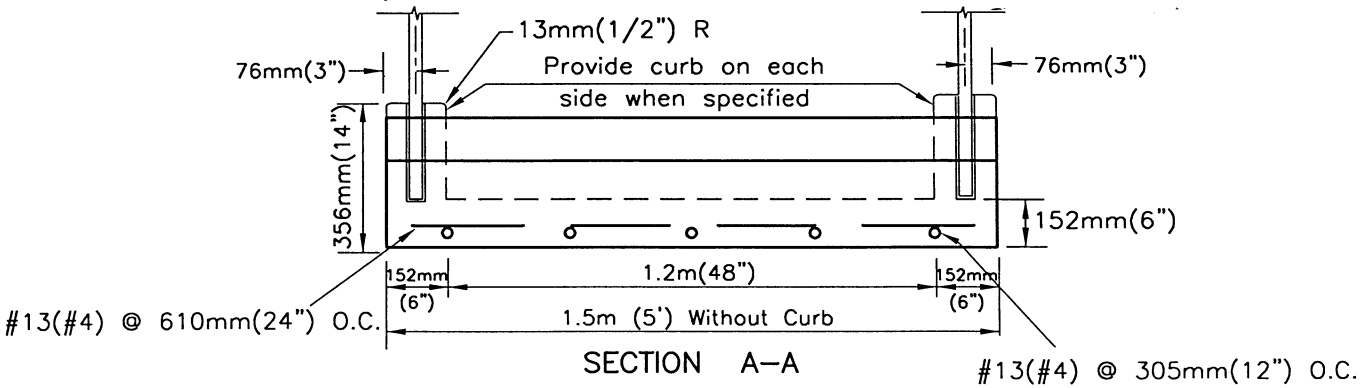
DRAWING
NUMBER

M-25



NOTES

1. Broom finish on treads, trowel finish on all other exposed surfaces.
2. 6mm(1/4") per 305mm(1') slope on treads for drainage.
3. Locate handrails on both sides.
4. Handrail may project into the required width a distance of 89mm(3-1/2") from each side of stairway.



Revision	By	Approved	Date
ORIGINAL		G.Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

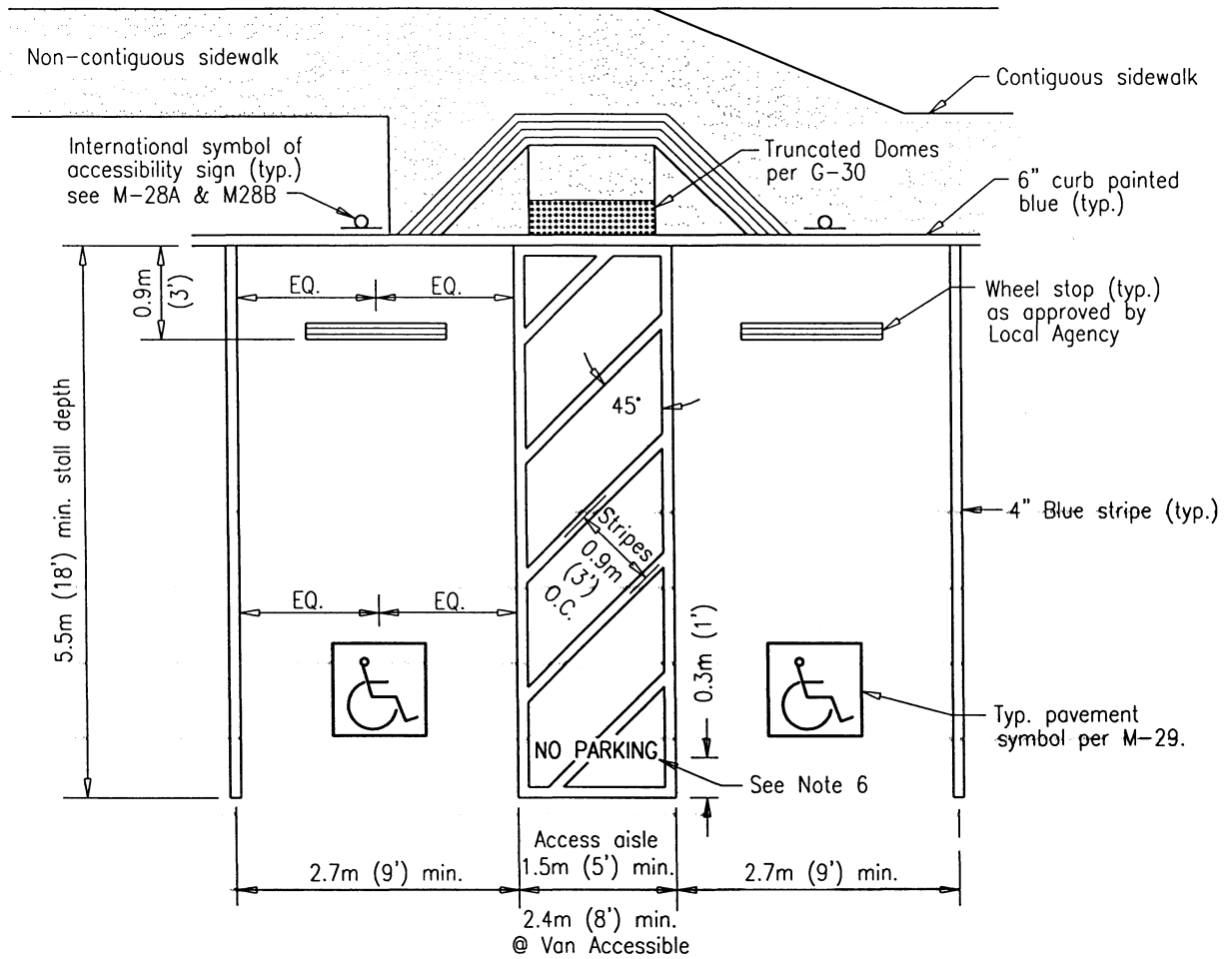
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE STEPS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 310112003
Chairperson R.C.E. 19246 Date

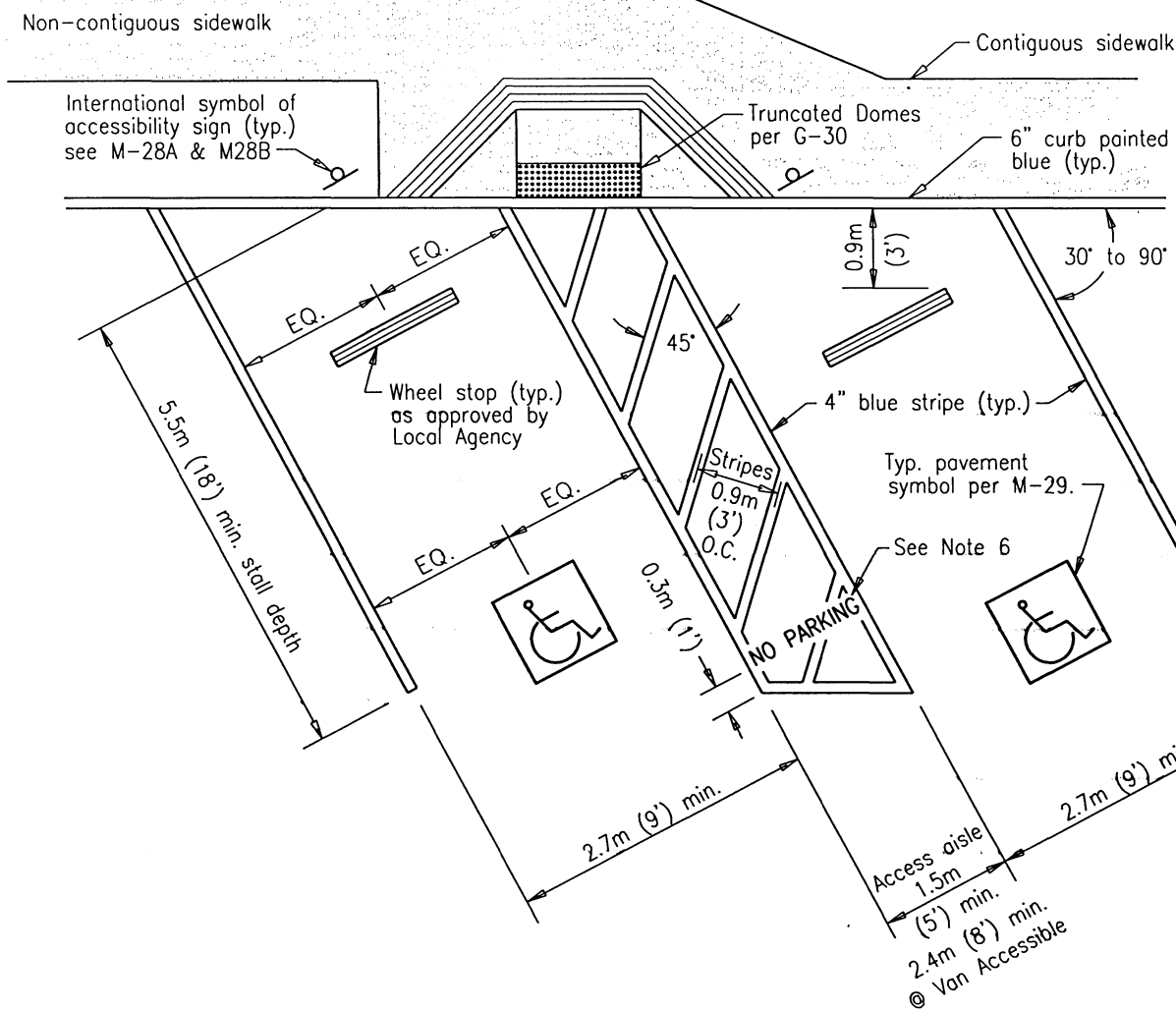
DRAWING NUMBER **M-26**



NOTES:

1. Provide for adequate drainage.
2. For appropriate ramp alternate to conform to topographical conditions, see standard drawings G-27 through G-30.
3. Blue color should match color No. 15090 in the Federal Standard 595a as specified in Section 522(b)2.
4. If only one accessible parking stall is going to be provided, the access aisle shall be 2.4m (8') (van accessible) and located on the passenger side.
5. Sidewalk cross slope shall not exceed 2.0%.
6. "NO PARKING" 12" high stencil marking, reflective white over blue stripes.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Parkinson	02/95		DISABLED PARKING STALL(S)
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
Update		D. Davis	04/06	DRAWING NUMBER	
				M-27A	



NOTES:

1. Provide for adequate drainage.
2. For appropriate ramp alternate to conform to topographical conditions, see standard drawings G-27 through G-30.
3. Blue color should match color No. 15090 in the Federal Standard 595a as specified in Section 522(b)2.
4. If only one accessible parking stall is going to be provided, the access aisle shall be 2.4m (8') (van accessible) and located on the passenger side.
5. Sidewalk cross slope shall not exceed 2.0%.
6. "NO PARKING" 12" high stencil marking, reflective white over blue stripes.

Revision	By	Approved	Date
ORIGINAL		G.Parkinson	02/95
Add Metric		T.Stanton	03/03
Update		D.Davis	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

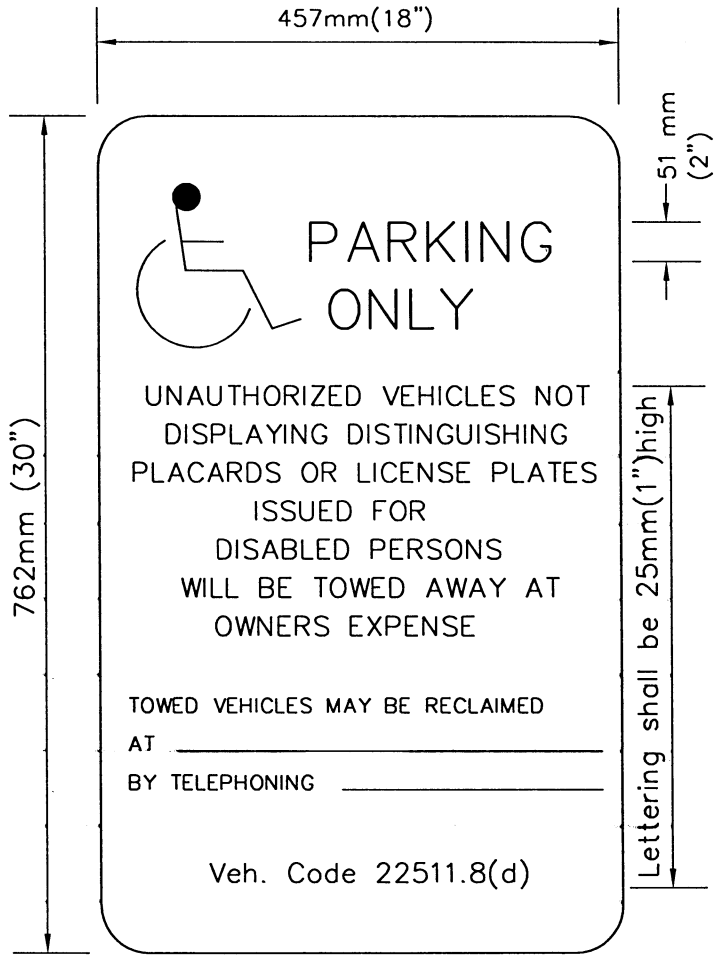
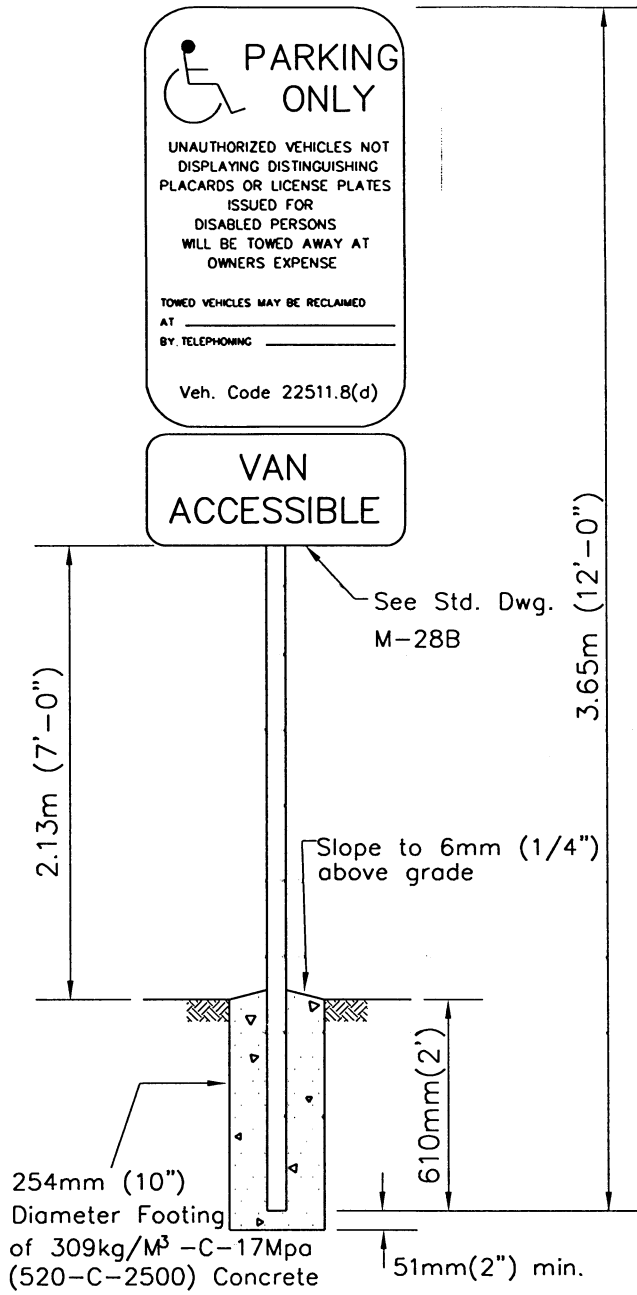
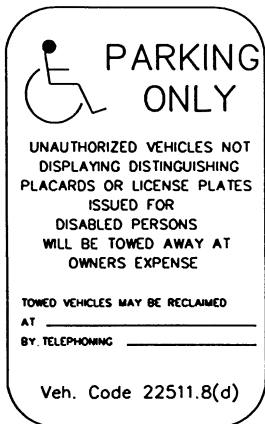
**DIAGONAL DISABLED PARKING
STALL(S)**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 04/27/2006

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-27B**

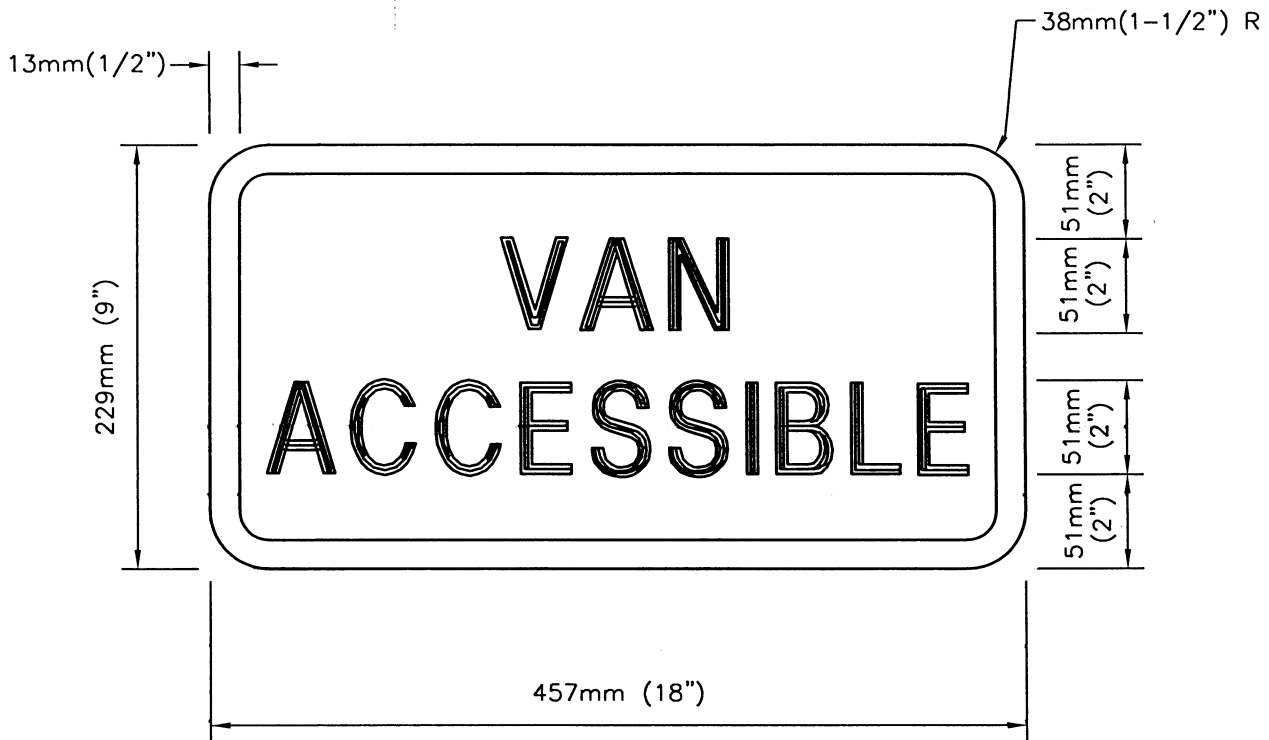


SIGN DETAIL

NOTES:

1. Sign shall be constructed of a minimum 1.57mm (0.062") thick aluminum.
2. Lettering, symbol and border shall be reflectorized white, on a blue background.
3. Lettering shall be 25mm (1") and 51mm (2") high.
4. Where space is designed for van accessibility, a sign "VAN ACCESSIBLE" shall be installed.
5. Minimum van accessible vertical clearance is 2.5m (8'-2").

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		G.Parkinson	2/95		DISABLED PARKING SIGN	<i>T. Stanton</i> 310112003
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06			DRAWING NUMBER M-28A



NOTES

1. Sign shall be constructed of aluminum, 1.57mm (0.062") minimum thickness.
2. Colors: Background—Reflectorized Blue
 Border and letters— Reflectorized White
 Blue color shall match color No. 15090 in the
 Federal Standard 595a as specified in Section 522(b)2.

Revision	By	Approved	Date
ORIGINAL		G.Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

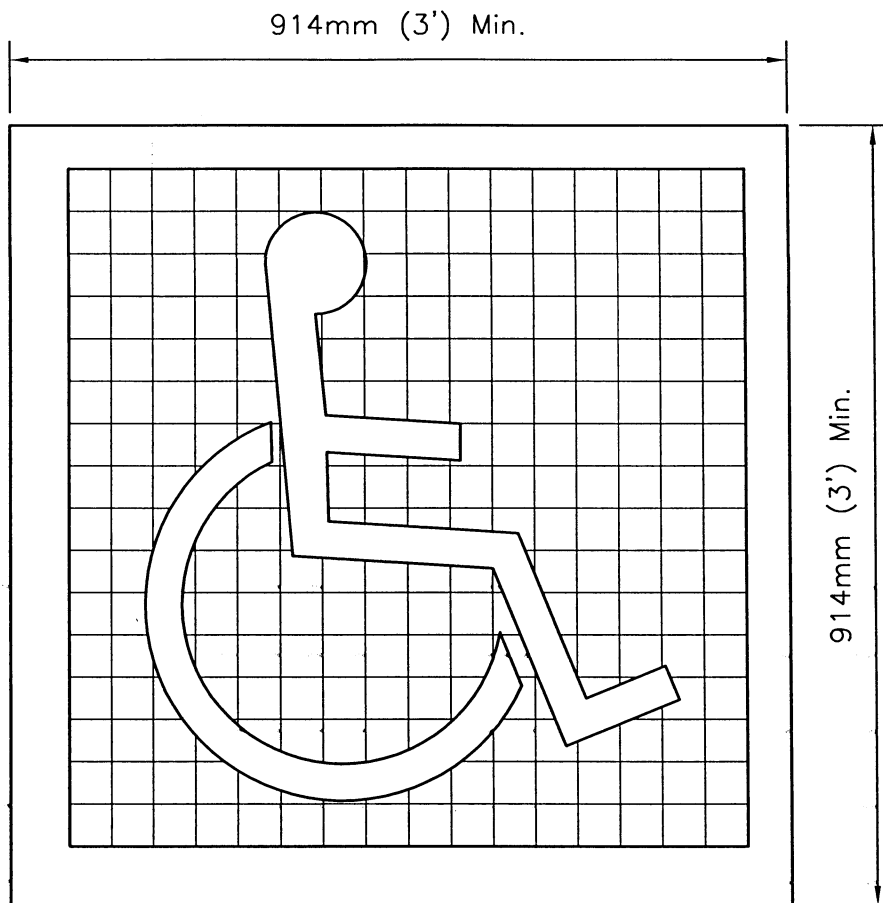
SAN DIEGO REGIONAL STANDARD DRAWING

**VAN ACCESSIBLE SIGN
 FOR DISABLED PARKING SPACE**

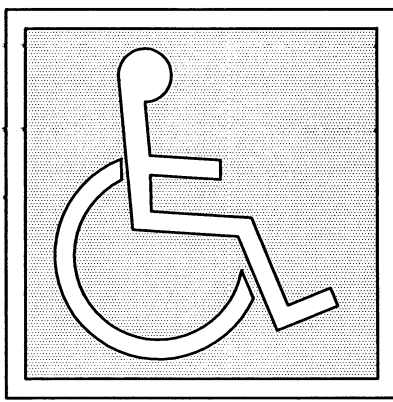
RECOMMENDED BY THE SAN DIEGO
 REGIONAL STANDARDS COMMITTEE

T. Stanton 3/01/2003
 Chairperson R.C.E. 19246 Date

DRAWING
 NUMBER **M-28B**



(a) SYMBOL PROPORTIONS



INTERNATIONAL SYMBOL
OF ACCESSIBILITY

(b) DISPLAY CONDITIONS

NOTES

1. Pavement symbol shall be painted white on a blue background.
2. Blue color shall match color No. 15090 in the Federal Standard 595a as specified in Section 522(b)2.

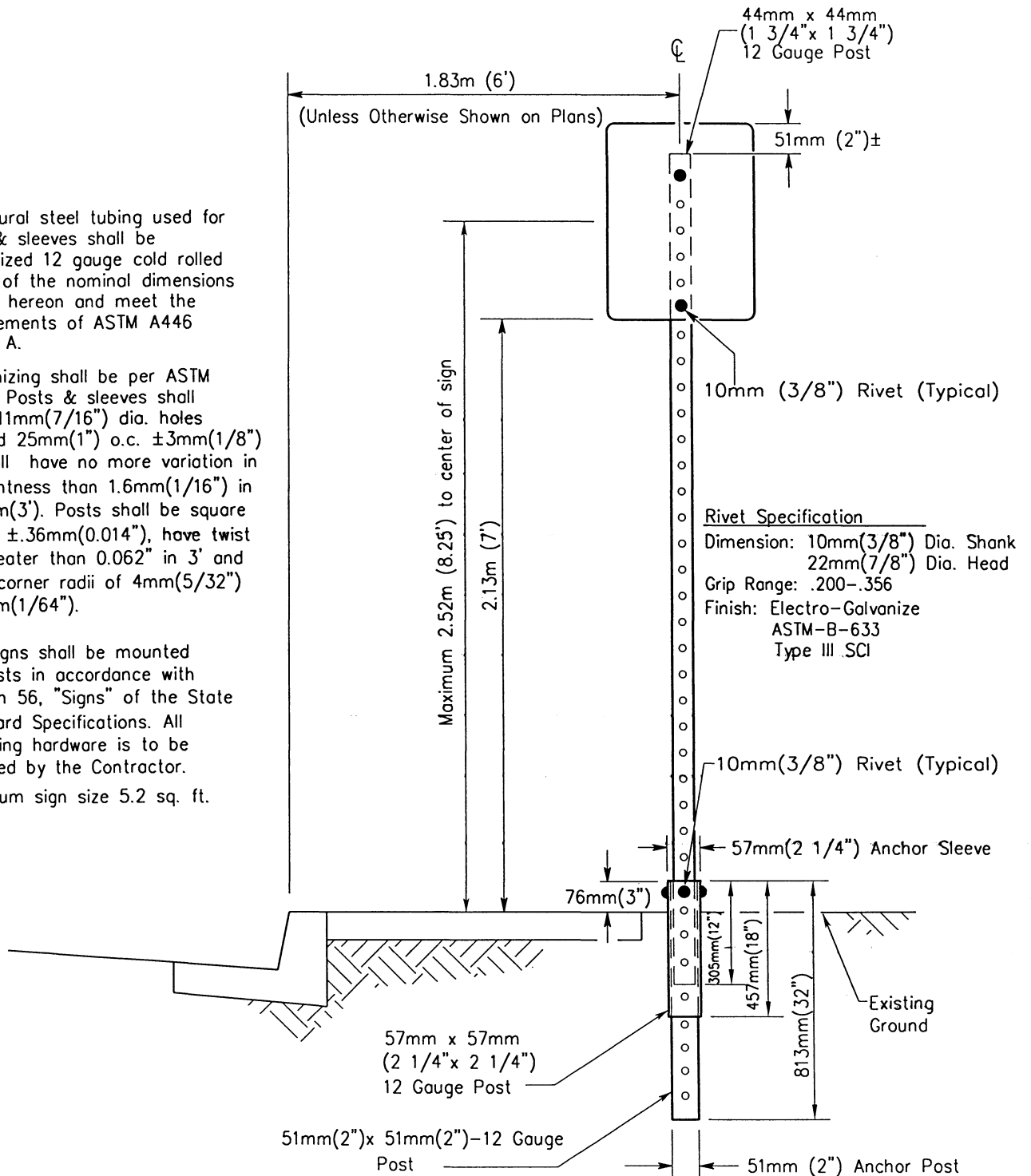
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		G. Parkinson	2/95		<i>T. Stanton</i> 3/11/2003
Add Metric		T. Stanton	03/03	PAVEMENT SYMBOL - DISABLED PARKING	Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06		DRAWING NUMBER
					M-29

FOR GUARDRAIL STANDARDS USE:
 Caltrans "Standard Plans for
 Construction of Local
 Streets and Roads"

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		G.Parkinson	5/92		GUARD RAIL REFERENCE NOTE	<i>T. Stanton</i> 04/27/2006
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246		Date
Remove GD Std. Dwgs.		T. Stanton	04/06	DRAWING NUMBER		M-30

NOTES

1. Structural steel tubing used for post & sleeves shall be galvanized 12 gauge cold rolled steel, of the nominal dimensions shown hereon and meet the requirements of ASTM A446 Grade A.
2. Galvanizing shall be per ASTM A525. Posts & sleeves shall have 11mm(7/16") dia. holes spaced 25mm(1") o.c. ±3mm(1/8") & shall have no more variation in straightness than 1.6mm(1/16") in 914mm(3'). Posts shall be square within ±.36mm(0.014"), have twist no greater than 0.062" in 3' and have corner radii of 4mm(5/32") ±.4mm(1/64").
3. The signs shall be mounted on posts in accordance with Section 56, "Signs" of the State Standard Specifications. All fastening hardware is to be provided by the Contractor.
4. Maximum sign size 5.2 sq. ft.



Revision	By	Approved	Date
ORIGINAL		G.Parkinson	2/95
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 3/10/2003

Ch. G. Parkinson R.C.E. 19246 Date

BREAK-AWAY SIGN POST

DRAWING NUMBER **M-45**

SEWER SYSTEMS

SUPPLEMENT TO REGIONAL STANDARD DRAWINGS ("S" SERIES)

NOTES All material used must be on the City of San Diego MWWD "Approved Materials List."


DRAWING S-4

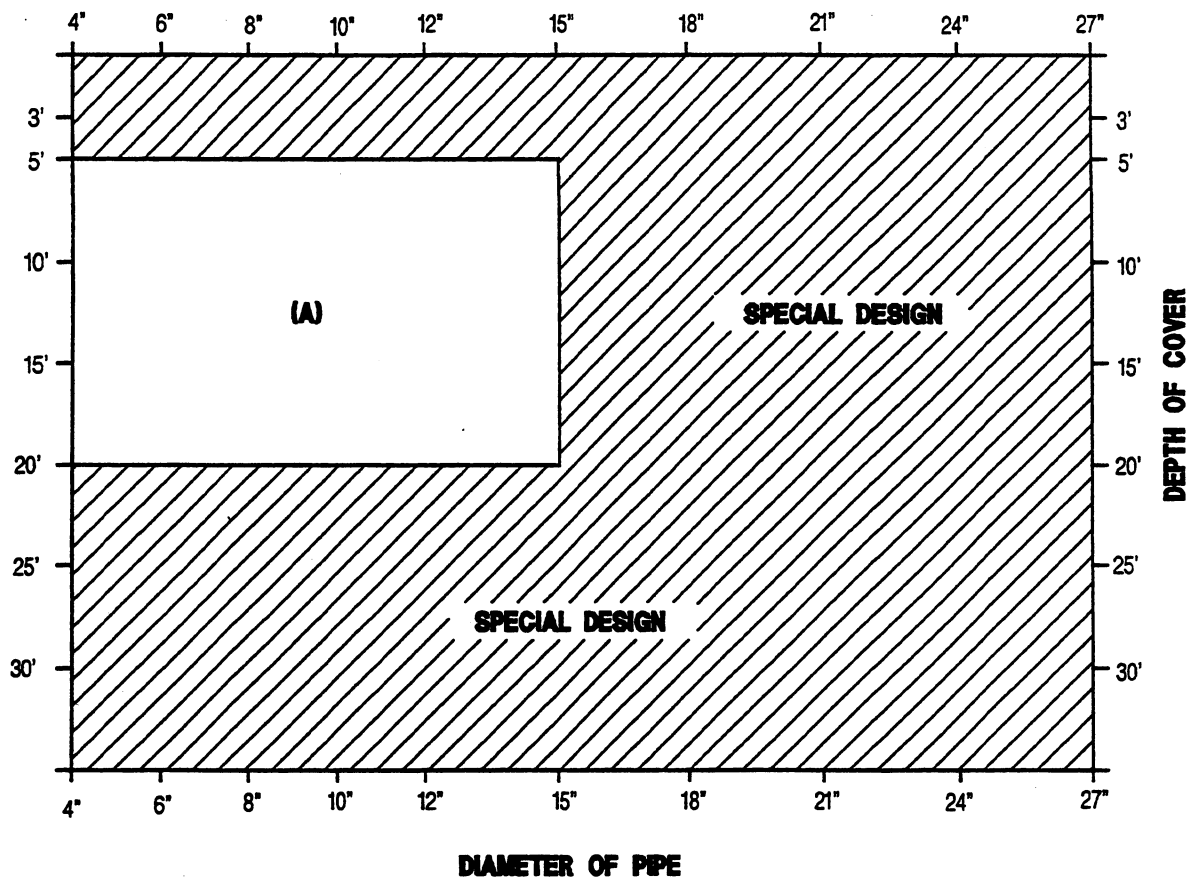
NOTES Amend note 1 to read: "For trenching in improved streets, use Standard Drawings SDG-107 and SDG-108 for trench resurfacing."

Add: 5. "All sanitary sewer pipes shall be bedded using a Type C rock envelope with 3/8 inch max. crushed rock (in lieu of 3/4 inch max.). Side wall clearance for pipe size encasement larger than 15 inches shall be 12 inches maximum or as specified on plans."

DRAWING S-10

Unless otherwise noted, Type "A" shall be used.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE  Chairperson R.C.E. 64572
ORIGINAL		M. Rollinger	5-20-92		
NOTES	SM	Oskoui	12/03	SUPPLEMENT TO REGIONAL STANDARD DRAWING ("S" SERIES)	DRAWING NUMBER SDS-100



(A) SDR - 35 or pipe stiffness of 46 PSI per ASTM D2412

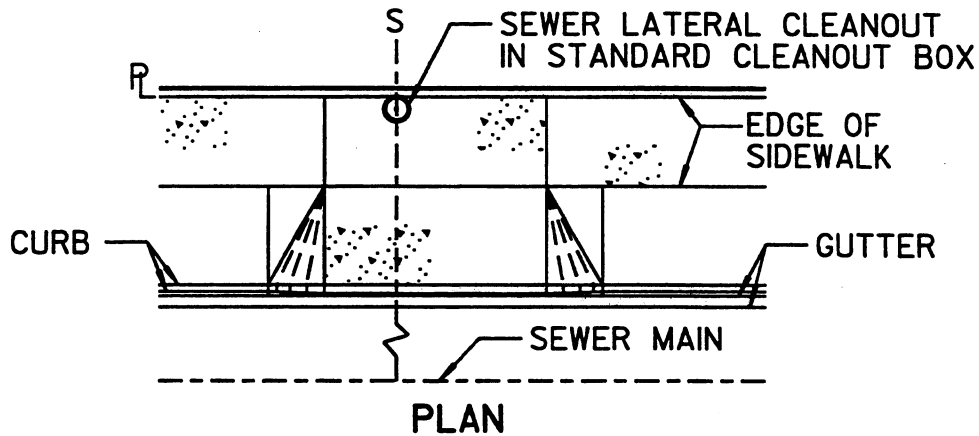
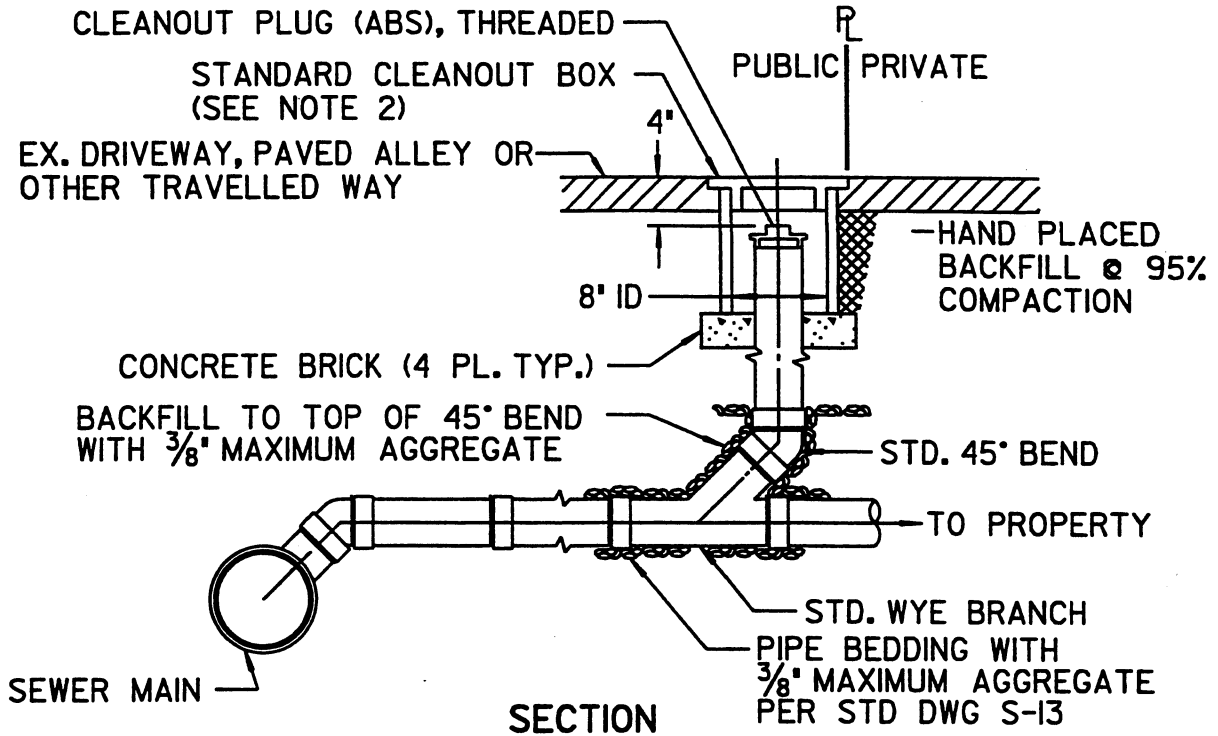
NOTE:

1. This standard drawing shall be used only where existing soil conditions are stable. Stable soil is defined as standard penetration test blow count equal to or greater than 13 blows per foot or shear strength greater than 750 psf. Obtained from unconfined compression test.
2. Standard design assumption : $K_b = .110$, $D_L = 1.0$, $E' = 750$ psi
 $W_c = \text{Prism load @ } W = 125 \text{ lbft}^3$
3. Bedding requirements per Regional Drawing S-4 Type C and SDS-100
4. Installations in ground water shall require a special design.

Design Ref. : ASCE Manuals and reports on Engineering Practice - No. 60 "Gravity Sanitary Sewer Design and Construction."

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>Thomas L. Palmer</i> 12-23-04 COORDINATOR R.C.E. 25902 DATE
ORIGINAL		J. Mueller	6-15-83		
		J.P. Casey	8-25-86		
		J.P. Casey	11-9-88		

REVISED 9/30/94



NOTES:

1. RISER AND CLEANOUT PLUG SHALL BE SAME DIAMETER AS SEWER LATERAL.
2. CLEANOUT SHALL BE PLACED INSIDE A STANDARD CLEANOUT BOX (SEE S-3, TYPE B CLEANOUT BOX) WITH CAST IRON LID MARKED "CLEANOUT", OR EQUAL. EQUAL.

(NO SCALE)

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE

APPROVED MINIMUM 6" ID CONCRETE ROUND ENCLOSURE WITH CONCRETE COVER MARKED "SEWER"

PUBLIC PRIVATE

5" THICK LAYER OF GRAVEL

CLEANOUT PLUG (ABS), THREADED

BACKFILL TO TOP OF 45° BEND WITH 3/8" MAXIMUM AGGREGATE

STD. 45° BEND

TO PROPERTY

SEWER MAIN

STD. WYE BRANCH

PIPE BEDDING WITH 3/8" MAXIMUM AGGREGATE PER STD DWG S-13

SECTION
NOT TO SCALE

SEWER LATERAL CLEANOUT

PARKWAY

CURB

GUTTER

SEWER MAIN

PLAN

NOTES:

1. RISER AND CLEANOUT PLUG SHALL BE SAME DIAMETER AS SEWER LATERAL.
2. CLEANOUT SHALL BE LOCATED WITHIN CITY RIGHT OF WAY, BEHIND THE SIDEWALK.

Revision	By	Approved	Date
DETAIL	SMS	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

**SEWER LATERAL CLEANOUT
OUTSIDE TRAVELED WAY**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

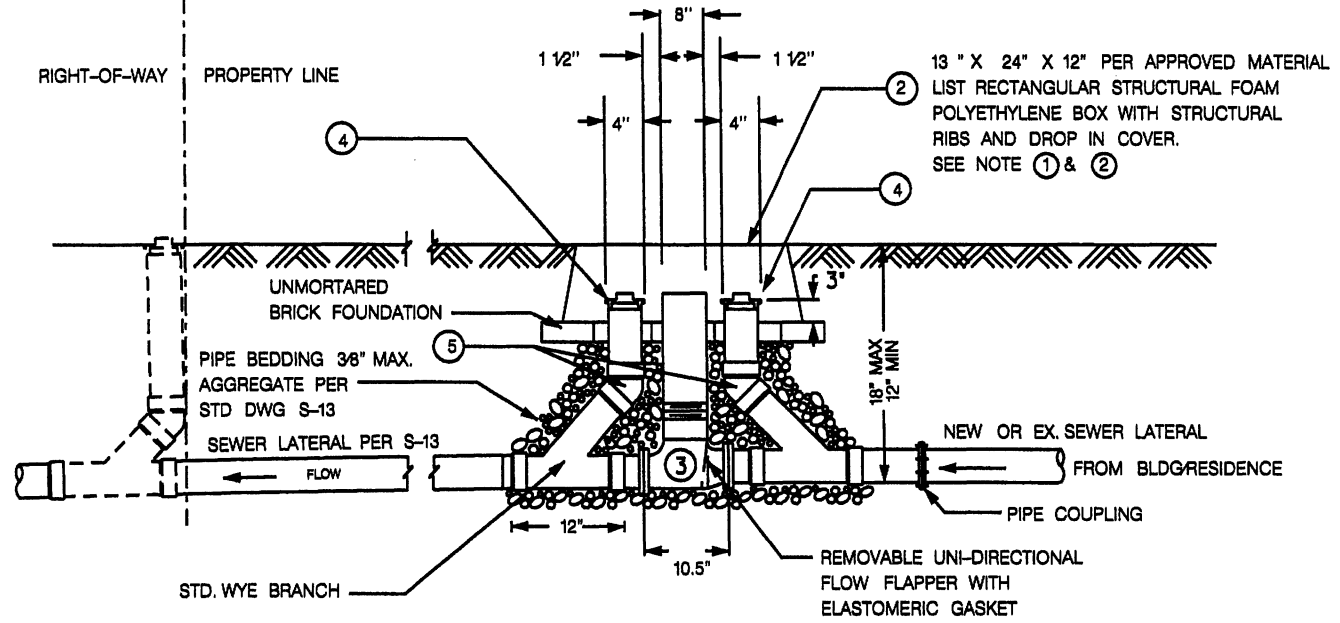
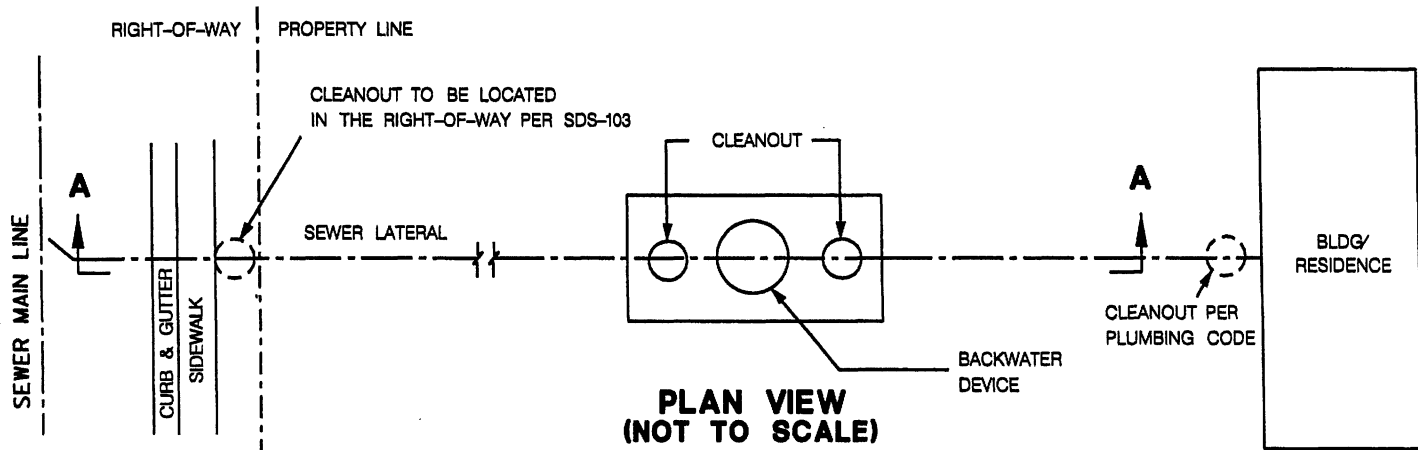
Chairperson RCE 64572

Date

DRAWING
NUMBER

SDS-103

R. L. 12-9-03



**SECTION A-A
(NOT TO SCALE)**

Notes:

- ① WHEN BACKWATER DEVICE IS INSTALLED IN THE DRIVEWAY, SEE PAGE 2
- ② INSTALL VALVE BOX SO THAT IT IS FLUSH WITH EXISTING PAVEMENT SURFACE OR 1" ABOVE GROUND COVER.
- ③ PVC BACKWATER DEVICE AND ATTACHED PARTS SHALL BE PER THE APPROVED MATERIAL LIST.
- ④ CLEANOUT PLUG (ABS) THREADED.
- ⑤ STANDARD 45° BEND.
- ⑥ OVERSIZED POP-UP CAP.
- ⑦ THREADED PLUG.

Revision	By	Approved	Date
DETAIL	C9S	Oskoui	12/03

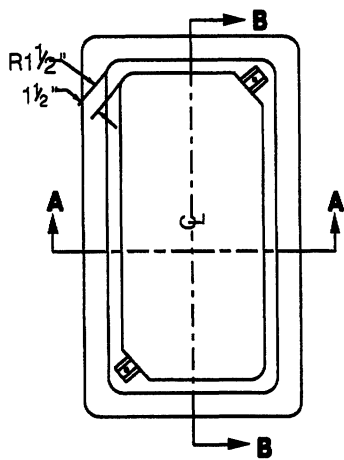
CITY OF SAN DIEGO - STANDARD DRAWING

4" BACKWATER DEVICE

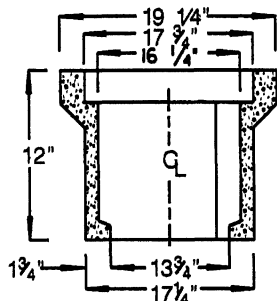
CITY OF SAN DIEGO
STANDARD COMMITTEE

[Signature] 12-9-03
Chairperson RCE 64672 Date

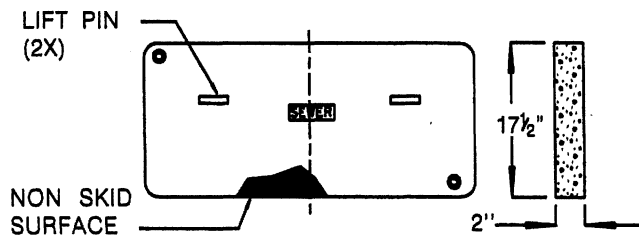
DRAWING NUMBER **SDS-104**



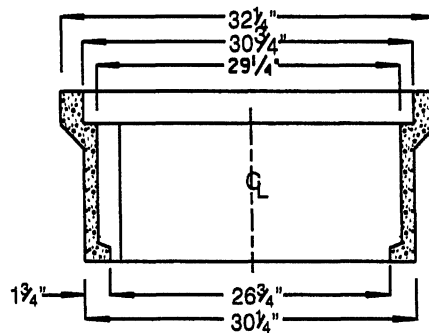
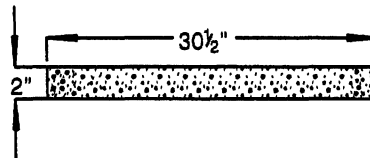
TOP VIEW



SECTION A-A



POLYMER CONCRETE COVER



SECTION B-B

(2X) HEX HEAD BOLTDOWN

LIFT PIN

POLYMER CONCRETE COVER

NON SKID SURFACE

FLOATING NUT

UNISTRUT CHANNEL

RPM BOX

DETAIL-A

DETAIL-A

POLYMER CONCRETE BOX

NOT TO SCALE

NOTE:

1. THE BOX & COVER IS 10K LOAD RATED.

SHEET 2 OF 2

Revised	By	Approved	Date
DETAIL	SMS	Oskoui	12/03

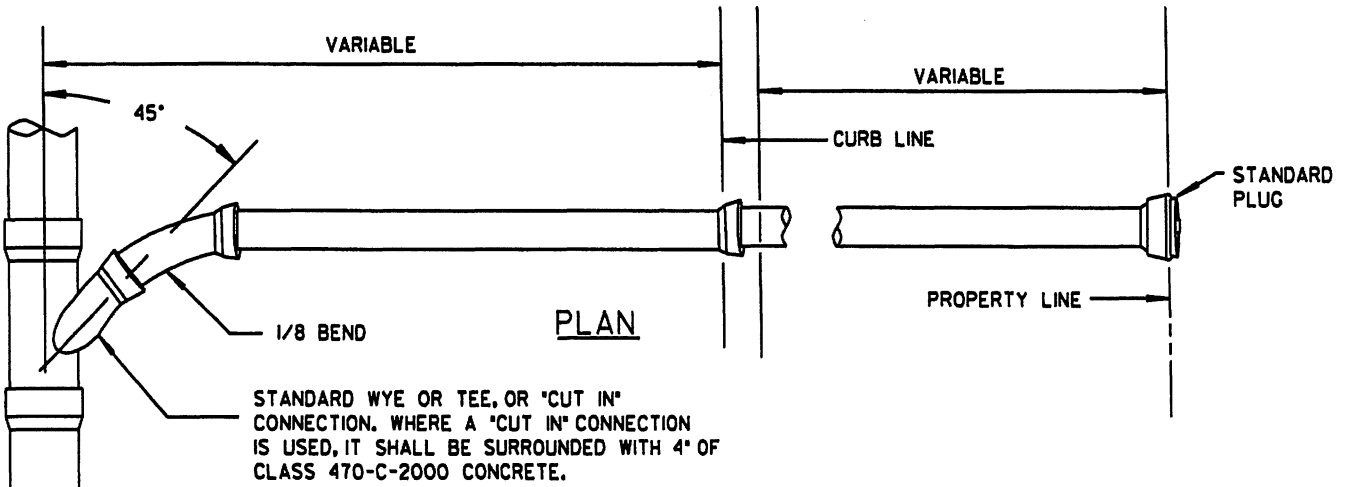
CITY OF SAN DIEGO - STANDARD DRAWING

4" BACKWATER DEVICE

CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature] 12-9-03
Chairperson RCE 64572 Date

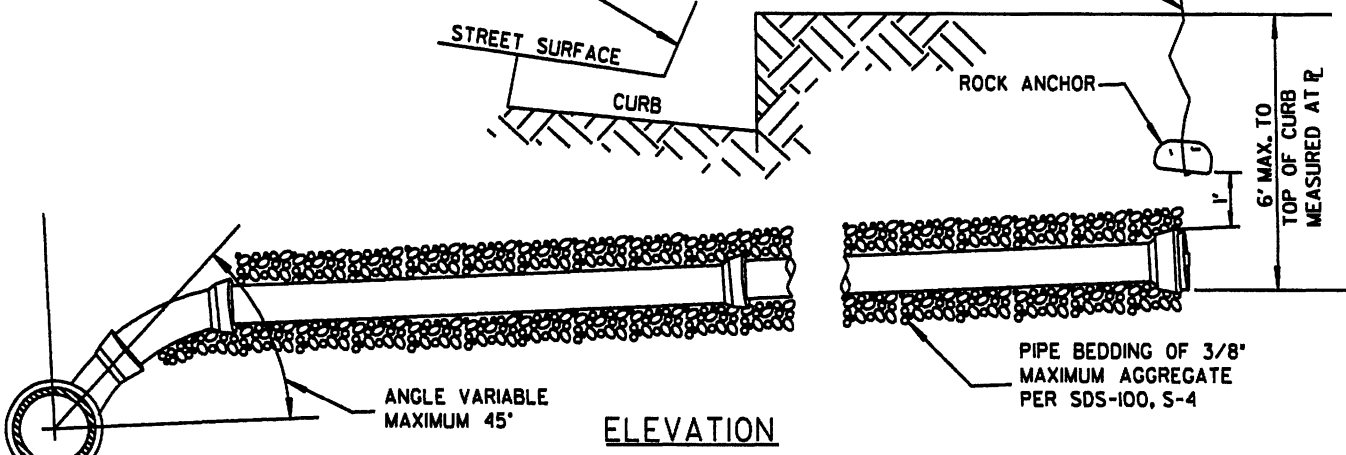
DRAWING NUMBER **SDS-104**



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.

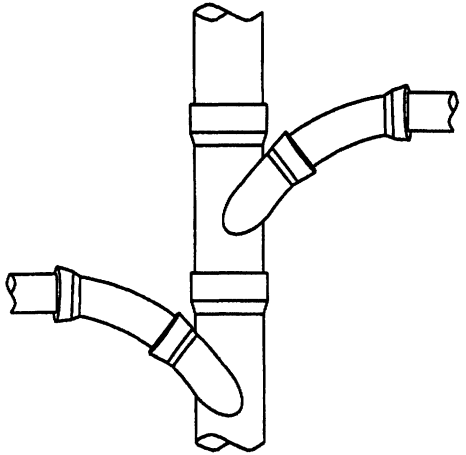
LETTER 'S' STAMPED OR CHISELED IN FACE OF CURB NOT LESS THAN 1 1/2" HIGH AND 3/16" DEEP

WIRE, #12 OR HEAVIER. EXTEND 2' TO 3' ABOVE GROUND AT TIME OF BACKFILL.

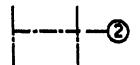


NOTES

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
5. DO NOT TAP HOLE AND INSERT LATERAL PIPE DIRECTLY INTO MAIN. ALL CONNECTIONS SHALL BE MADE USING A SADDLE OR WYE CUT IN.
6. SEWER LATERAL SHALL HAVE 6 INCH METAL TAPE WITH GREEN LETTERING INDICATING 'SEWER' INSTALLED ABOVE THE ALIGNMENT OF THE PIPE FROM SEWER MAIN TO PROPERTY LINE, AT A MINIMUM 12 INCHES FROM THE FINISH GRADE AND A MINIMUM OF 12 INCHES FROM THE TOP OF PIPE.



LEGENDS ON PLANS



Revision	By	Approved	Date
DETAIL	JFP	Oskoui	12/03

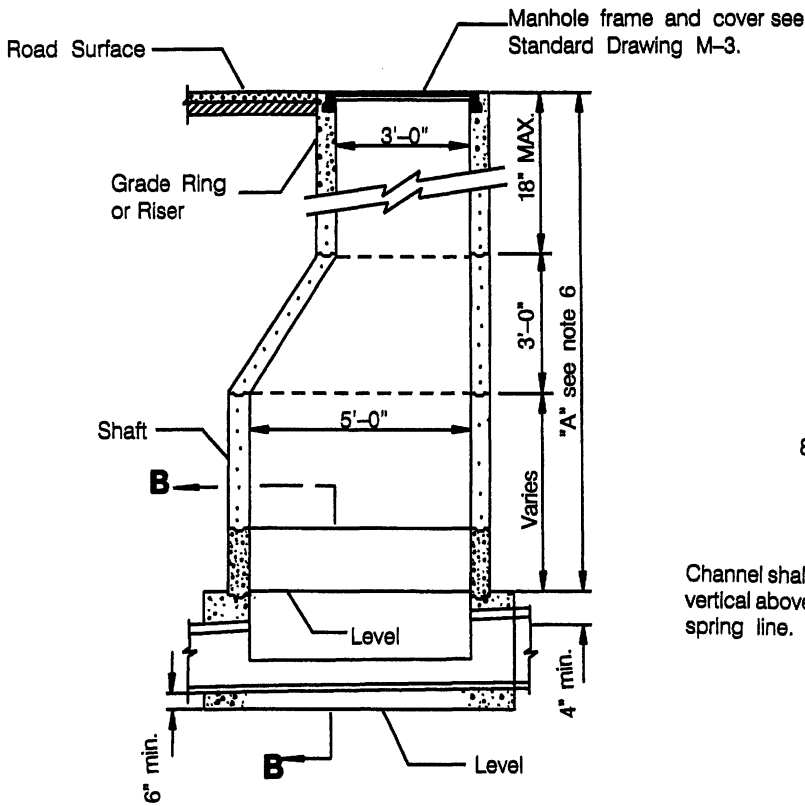
CITY OF SAN DIEGO - STANDARD DRAWING

HOUSE CONNECTION
(SEWER LATERAL)

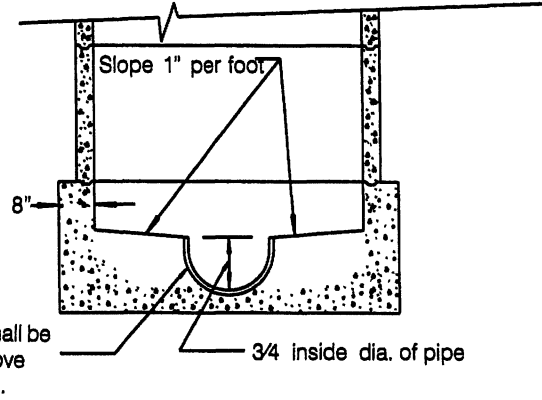
CITY OF SAN DIEGO
STANDARDS COMMITTEE

Bl... 12-9-03
Chairperson RCE 64572 Date

DRAWING NUMBER SDS-105



SECTION A-A



SECTION B-B

NOTES

1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 560-C-3250 concrete..
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 ft.)
 - B) 6" to 18" of 3' diameter grade rings and/or risers.
 - C) 5 ft. diameter shaft variable height.
7. Flexible pipe joints shall be required within 12 inches 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



Revision	By	Approved	Date
DETAIL	SMS	Oskoui	12/03

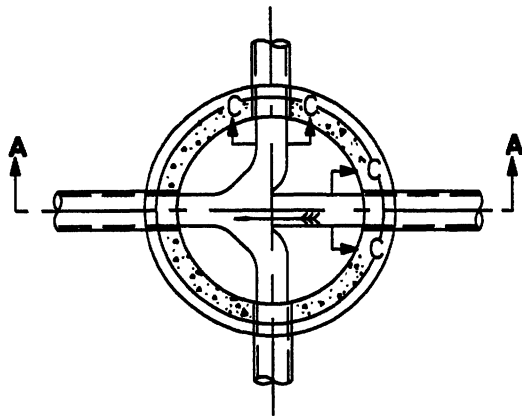
CITY OF SAN DIEGO - STANDARD DRAWING

MANHOLE 5' X 3' DIAMETER

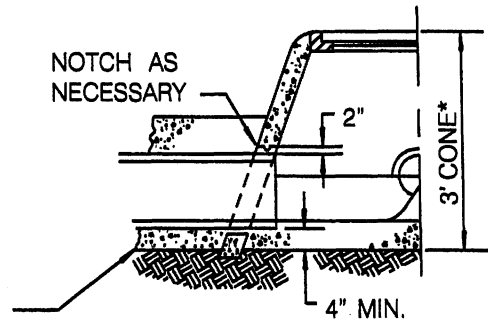
CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. L. H. 12-9-03
Chairperson RCE 64572 Date

DRAWING NUMBER **SDS-106**

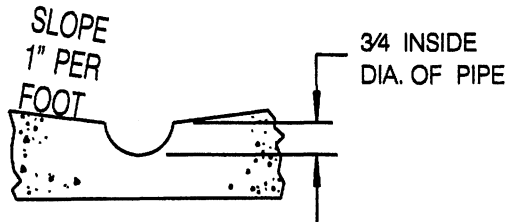


SECTION B-B



CONCRETE
ENCASEMENT
OR BACKFILL

* EITHER CONCENTRIC OR
ECCENTRIC CONE MAY BE USED

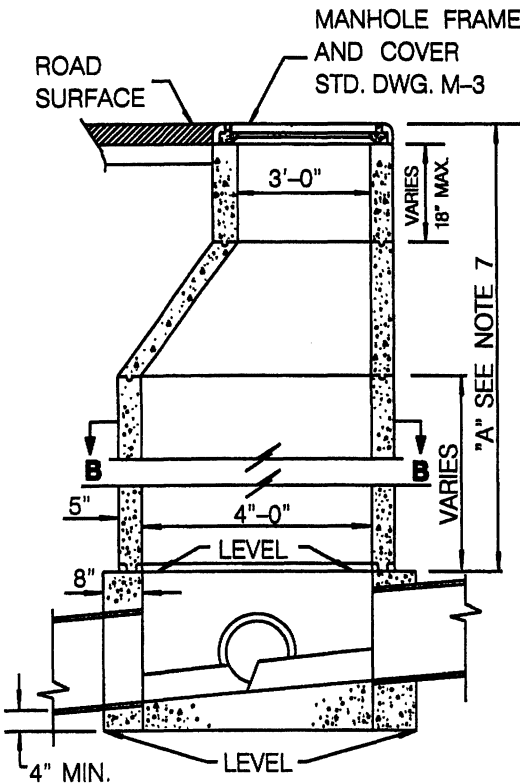


SECTION C-C

HALF SECTION SHALLOW MANHOLE

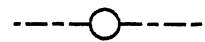
NOTES

1. ALL RISER JOINTS SHALL BE EPOXY MORTARED.
2. ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. VERTICAL WALL OF CONE SHALL BE ON THE UPSTREAM SIDE OF THE MANHOLE.
4. CONCRETE BASE SHALL BE 560-C-3250.
5. APPROVED WATER STOP REQUIRED FOR PLASTIC PIPE CONNECTIONS.
6. FLEXIBLE JOINTS SHALL BE REQUIRED WITHIN 12" OF INSIDE FACE OF MANHOLE (EXCEPT FOR PLASTIC PIPE).
7. 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 3FT.
 - B) 3" TO 18" OF 3' DIAMETER GRADE RINGS AND /OR RISERS.
 - C) 4FT. DIAMETER SHAFT VARIABLE HEIGHT.
8. ALL PATCHING WITHIN MANHOLE BASE SHALL BE EPOXY MORTAR.
9. PRIOR APPROVAL OF PRECAST BASE IS REQUIRED BY THE AGENCY.
10. MANHOLES SERVING 18 INCH DIAMETER PIPE AND LARGER SHALL USE PRECAST RISERS LINED WITH WHITE PVC SHEETS IMBEDDED WITH LOCKING EXTENSIONS TO THE CONCRETE WALL. THE BASE AND ALL REMAINING EXPOSED CONCRETE SHALL BE COATED WITH AN APPROVED POLYURETHANE COATING.



SECTION A-A

LEGEND ON PLANS



M.H. NO. 2

Revision	By	Approved	Date
DETAIL	JFP	Oskoui	12/03

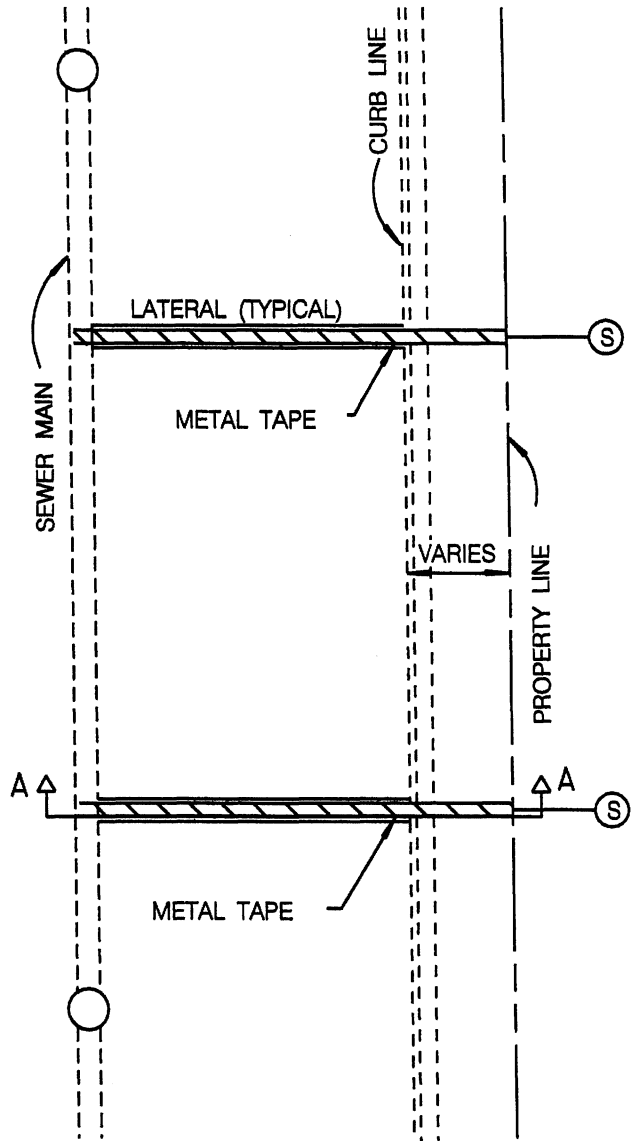
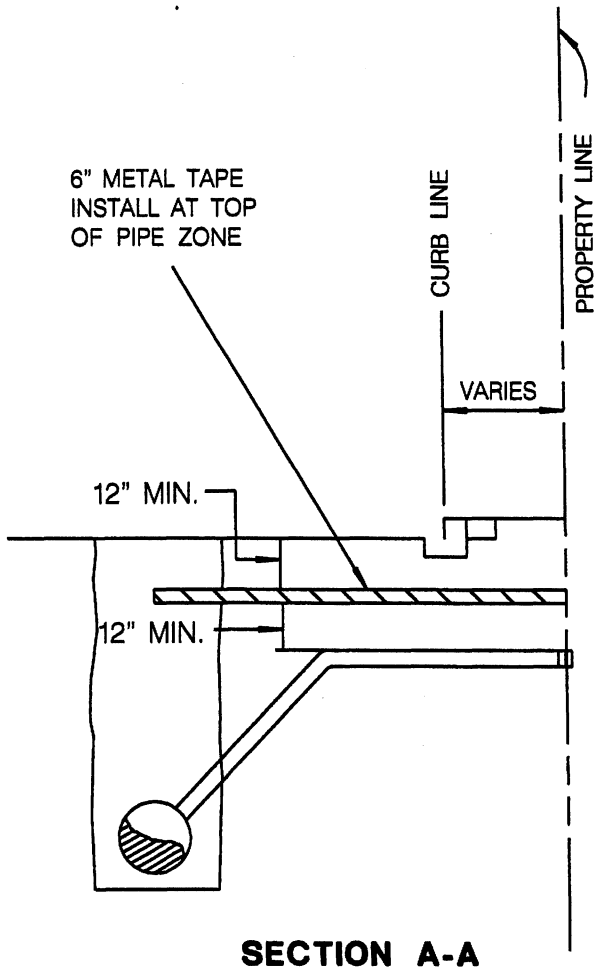
CITY OF SAN DIEGO - STANDARD DRAWING

**MANHOLE - 4' X 3' DIAMETER
(FOR 15" MAXIMUM DIAMETER PIPE)**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. L. H. 12-9-03
Chairperson RCE 64572 Date

DRAWING
NUMBER **SDS-107**



NOTE

METAL TAPE SHALL BE INSTALLED ABOVE TOP OF PIPE (ZONE) APPROXIMATELY 12" BELOW PAVEMENT SECTION.

PLAN

REVISION	BY	APPROVED	DATE
DETAIL	SMS	Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

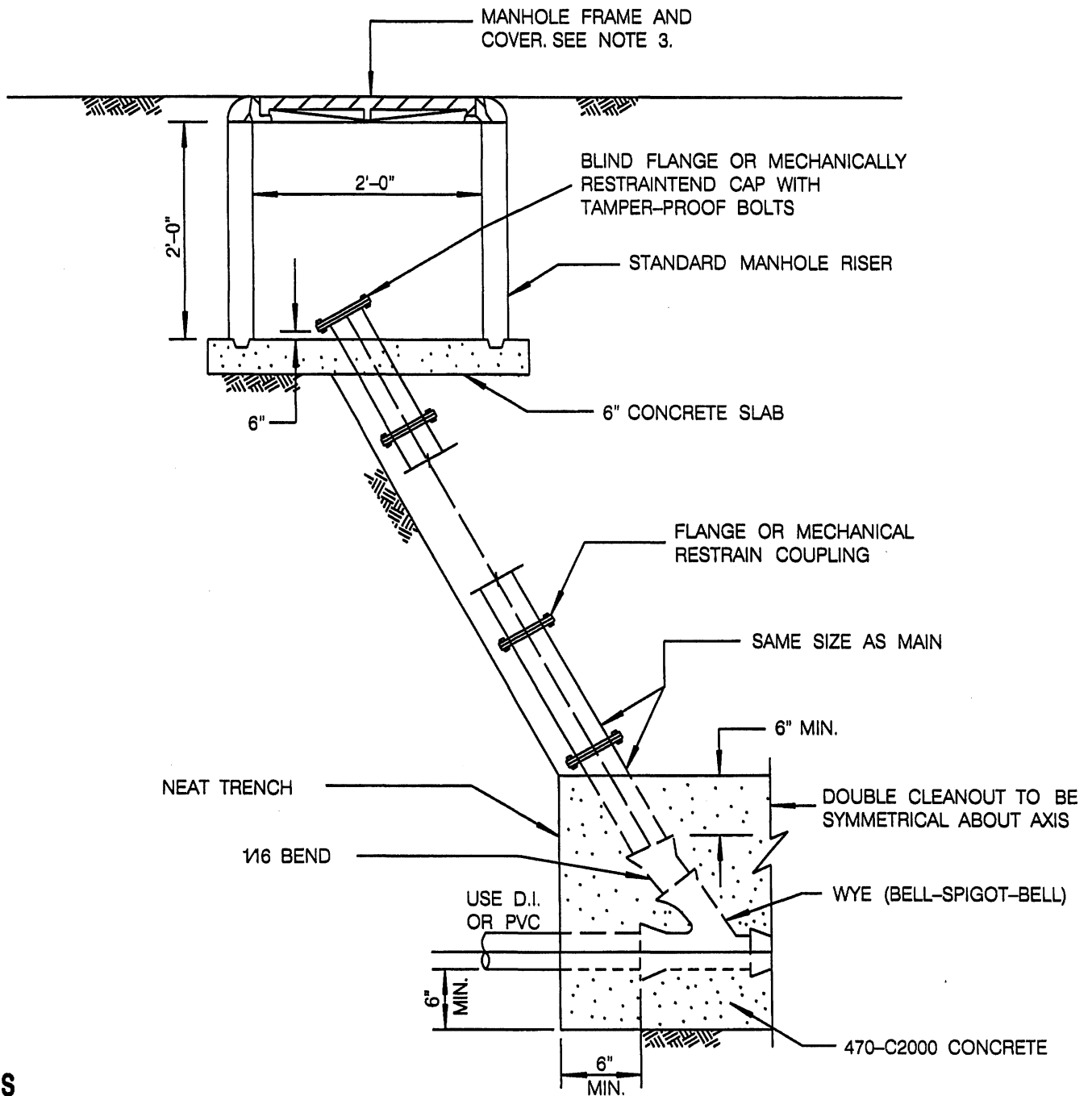
**METALLIC TAPE LOCATOR
FOR NON-METALLIC SEWER PIPE**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. Bluh 12-9-03
Chairperson RCE 84572 Date

DRAWING
NUMBER

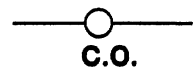
SDS-108



NOTES

1. SIMILAR POLYVINLY CHLORIDE COMPONENTS MAY BE USED IN ACCORDANCE WITH A.S.T.M. STANDARD SPECIFICATION D-2241 AND D-3139.
2. CONCRETE SLAB SHALL BE 560-C-3250 CONCRETE.
3. USE HEAVY DUTY MANHOLE FRAME AND COVER, STANDARD DRAWING M-1, IN AREAS SUBJECT TO VEHICULAR TRAFFIC; USE LIGHT DUTY MANHOLE FRAME AND COVER, STANDARD DRAWING M-2, IN ALL OTHER LOCATIONS.
4. MINIMUM PIPE PRESSURE CLASS 200.

LEGEND ON PLANS



Revision	By	Approved	Date
DETAIL	JFP	Oskoui	12/03

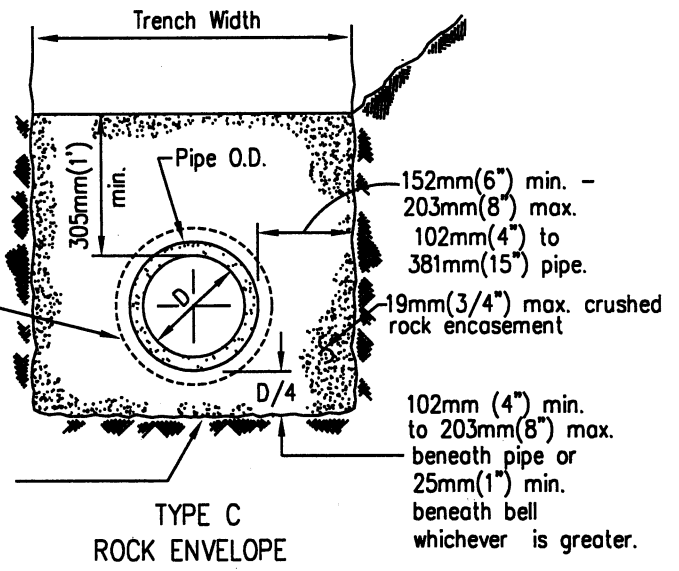
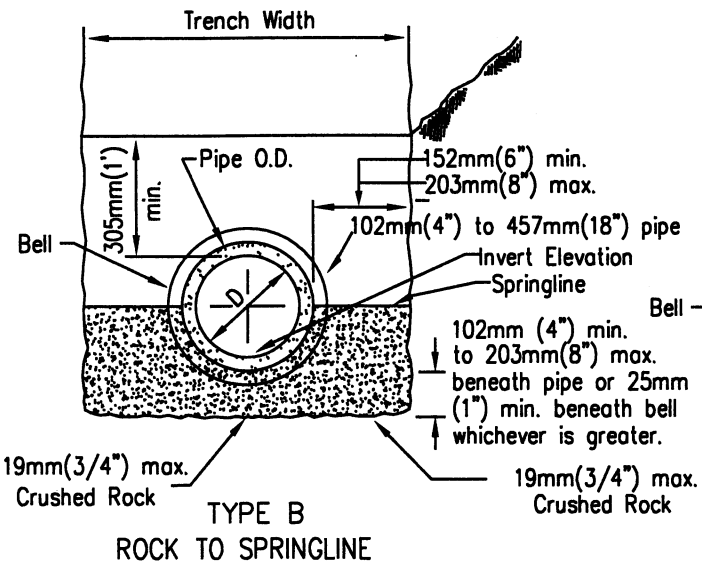
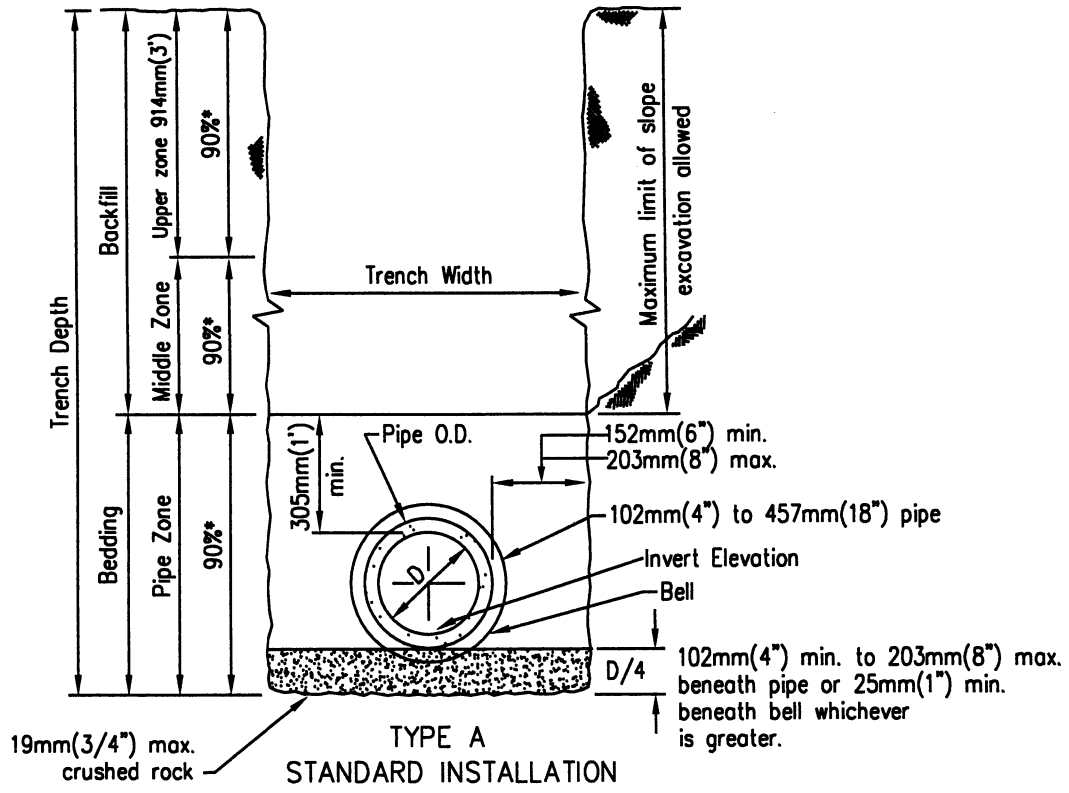
CITY OF SAN DIEGO - STANDARD DRAWING

CLEANOUT - SEWER FORCE MAIN

CITY OF SAN DIEGO
STANDARDS COMMITTEE

Bl... 12-9-03
Chairperson RCE 64572 Date

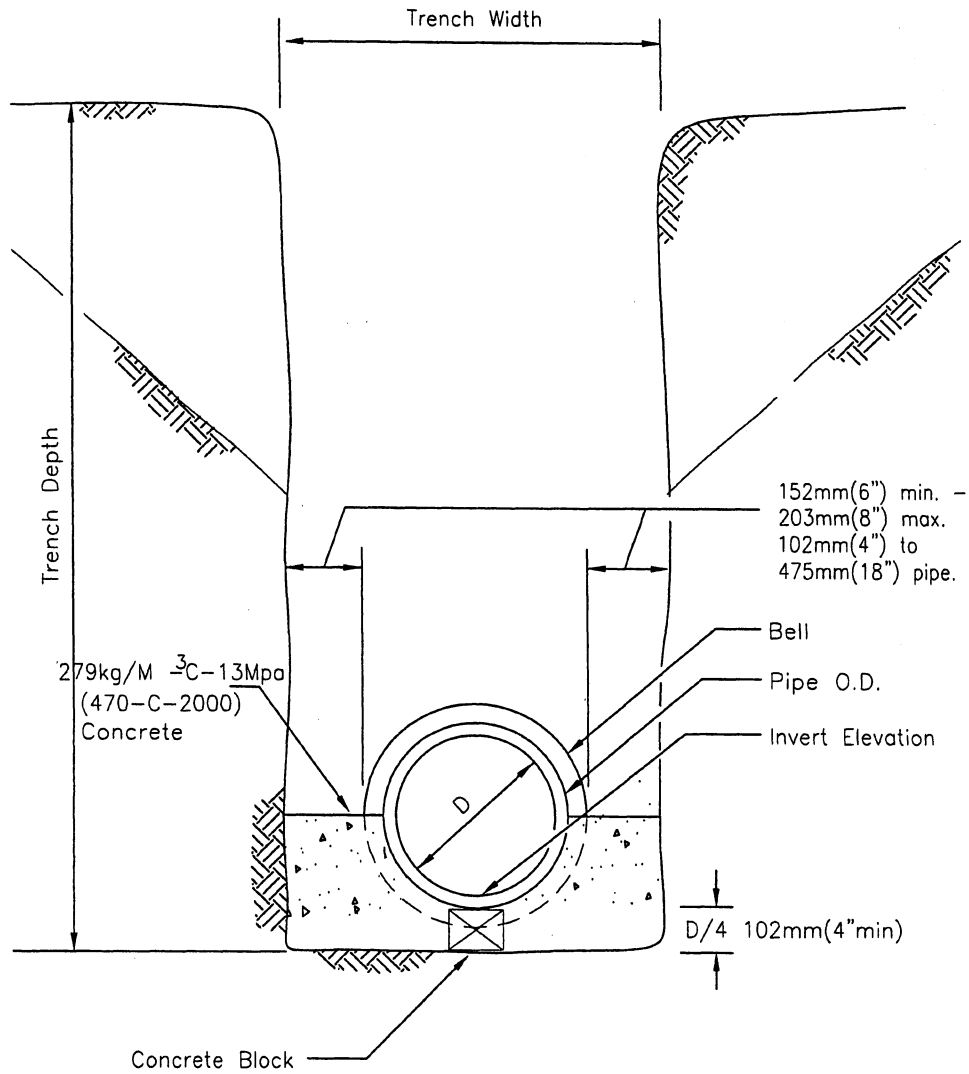
DRAWING NUMBER SDS-109



NOTES

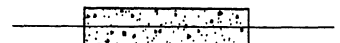
1. For trenching in improved streets, see Standard Drawings G-24 or G-25 for trench resurfacing.
2. (*) indicates minimum relative compaction.
3. Minimum depth of cover from the top of pipe to finish grade for all sanitary sewer installations shall be 914mm (3') For cover less than 914mm (3'), see Standard Drawing S-7 for concrete encasement.
4. See Type A installation for details not shown for Types B and C.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06		<i>M. Neal</i> 12/16/06 COORDINATOR R.C.E 65271 Date	
				PIPE BEDDING AND TRENCH BACKFILL FOR SEWERS	DRAWING	SDS-110
					NUMBER	



SECTION

LEGEND ON PLANS

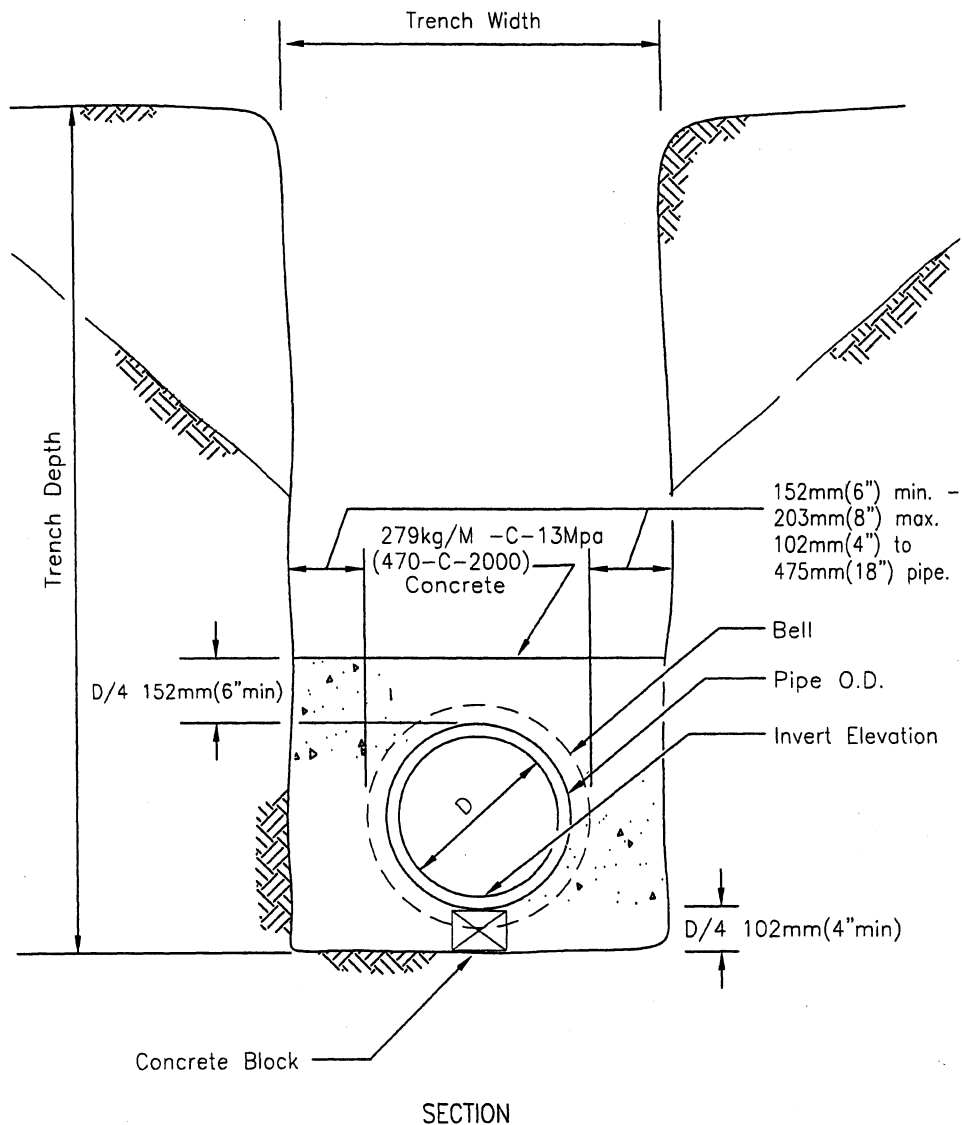


Revision	By	Approved	Date
Original	R.A.A. Oskoui		12/06

CITY OF SAN DIEGO - STANDARD DRAWING

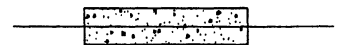
CONCRETE CRADLE

CITY OF SAN DIEGO STANDARDS COMMITTEE	
<i>Ch. Wenzel</i> 12/16/06	
COORDINATOR R.C.E 65271 Date	
DRAWING NUMBER	SDS-111

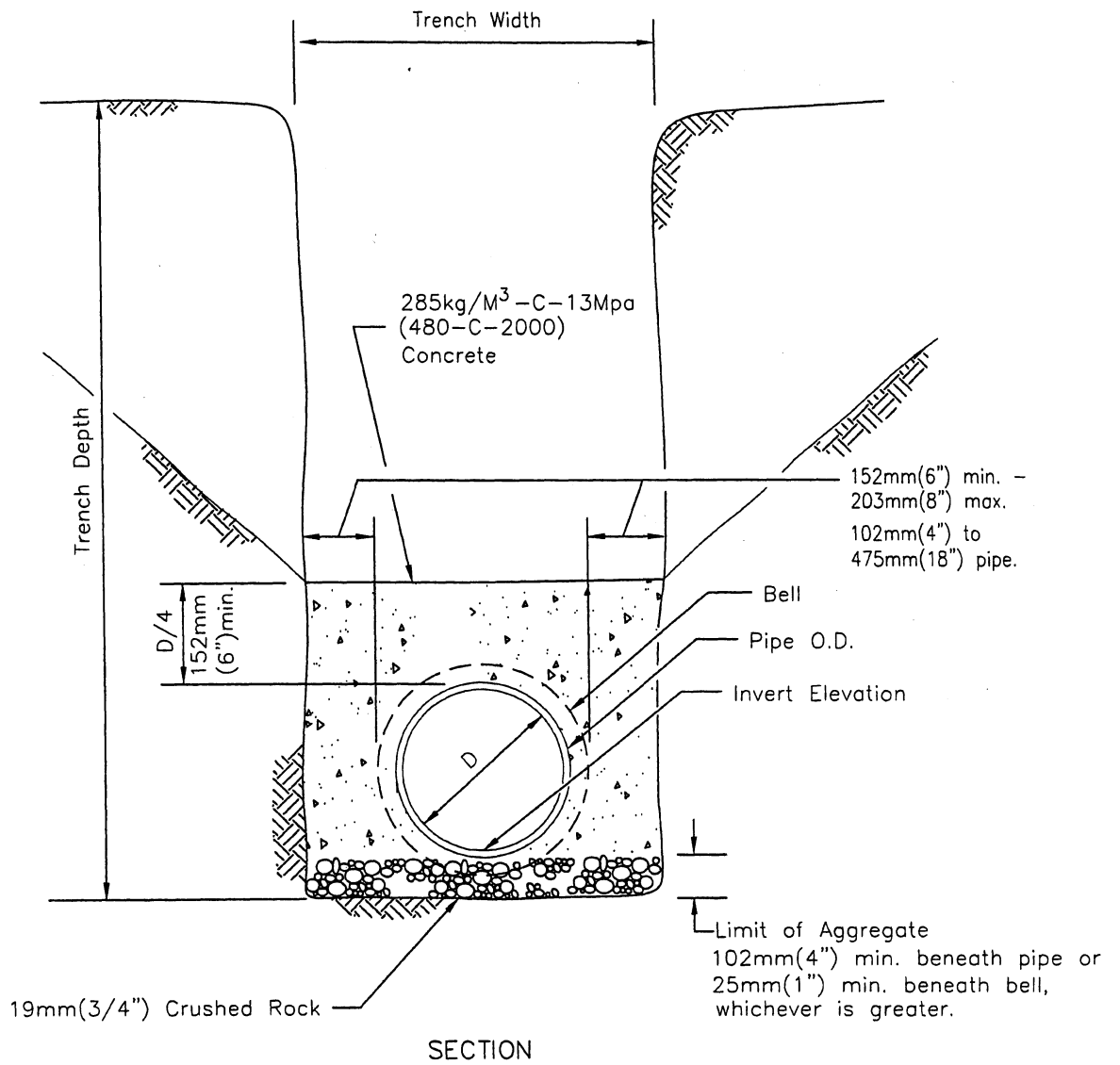


NOTE
Encase pipe to the nearest flexible joint.

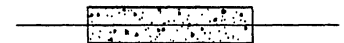
LEGEND ON PLANS



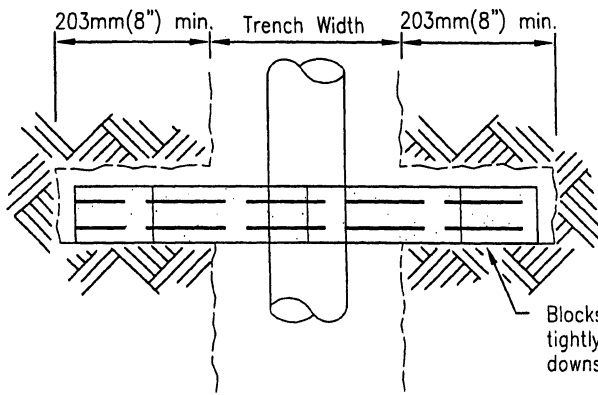
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A. A. Oskoui		12/06		CONCRETE ENCASEMENT	<i>H. Haal</i> 12/16/6 COORDINATOR R.C.E 65271 Date
				DRAWING		SDS-112
				NUMBER		



LEGEND ON PLANS



Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06		CONCRETE BACKFILL	<i>M. Havel</i> 12/16/6
				COORDINATOR R.C.E 65271 Date		
				DRAWING		
				NUMBER		
				SDS-113		

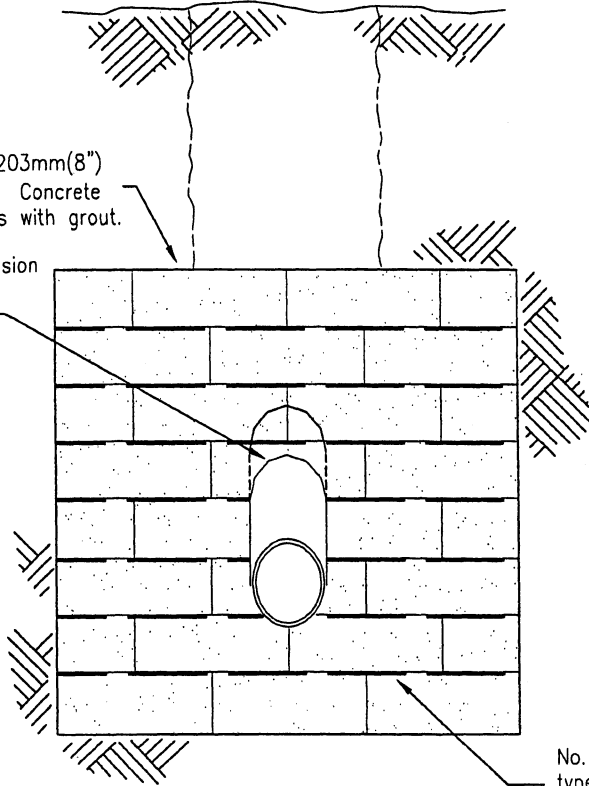


Blocks to be laid as tightly as possible to downstream side of notch.

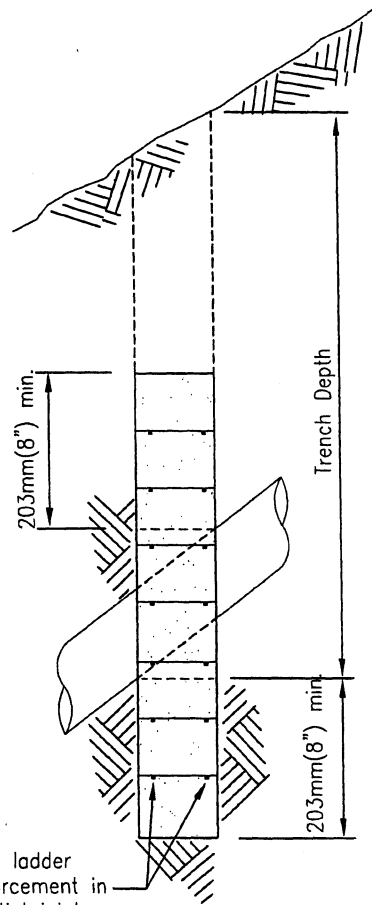
PLAN

203mm(8") x 203mm(8") x 406mm(16") Concrete Block. Fill cores with grout.

13mm(1/2") expansion joint material or jute around pipe.



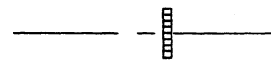
FRONT ELEVATION



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

SIDE ELEVATION

LEGEND ON PLANS



Revision	By	Approved	Date
Original	R.A.	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

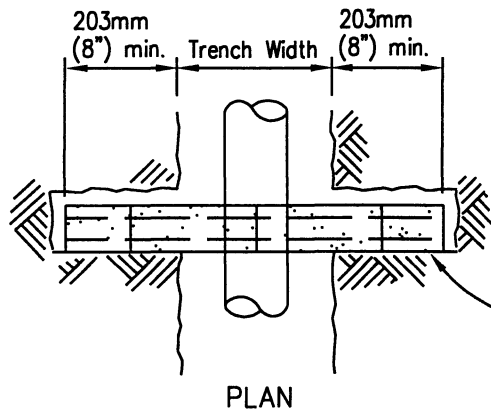
CONCRETE ANCHOR

CITY OF SAN DIEGO
STANDARDS COMMITTEE

A. D. D. 12/16/6
COORDINATOR R.C.E 65271 Date

DRAWING
NUMBER

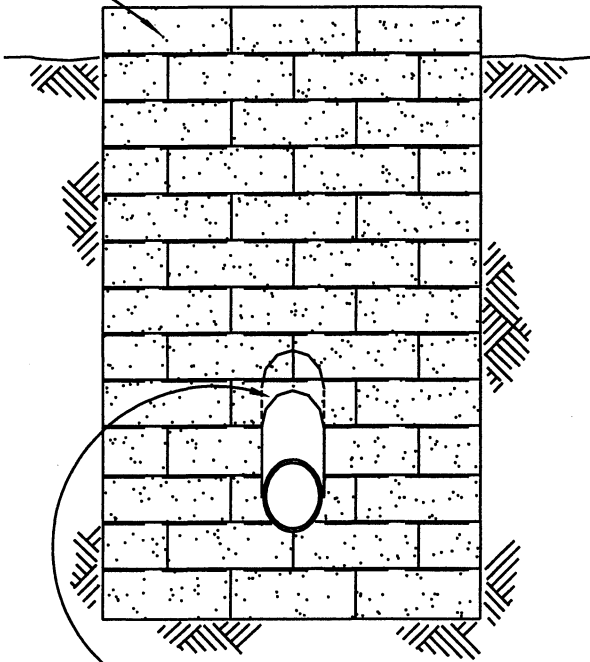
SDS-114



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

PLAN

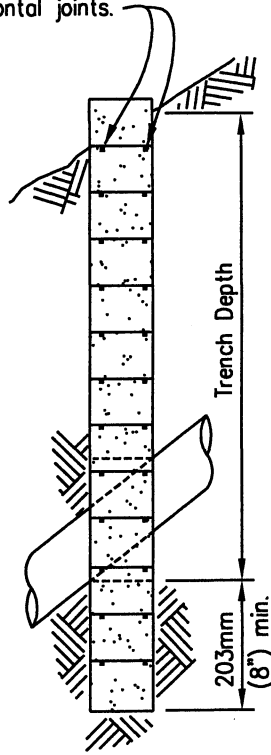
203mm x 203mm x 406mm concrete block.
(8" x 8" x 16" concrete block.)
Fill cores with grout.



13mm (1/2") expansion joint material or jute around pipe.

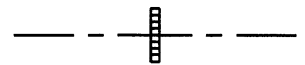
FRONT ELEVATION

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



SIDE ELEVATION

LEGEND ON PLANS



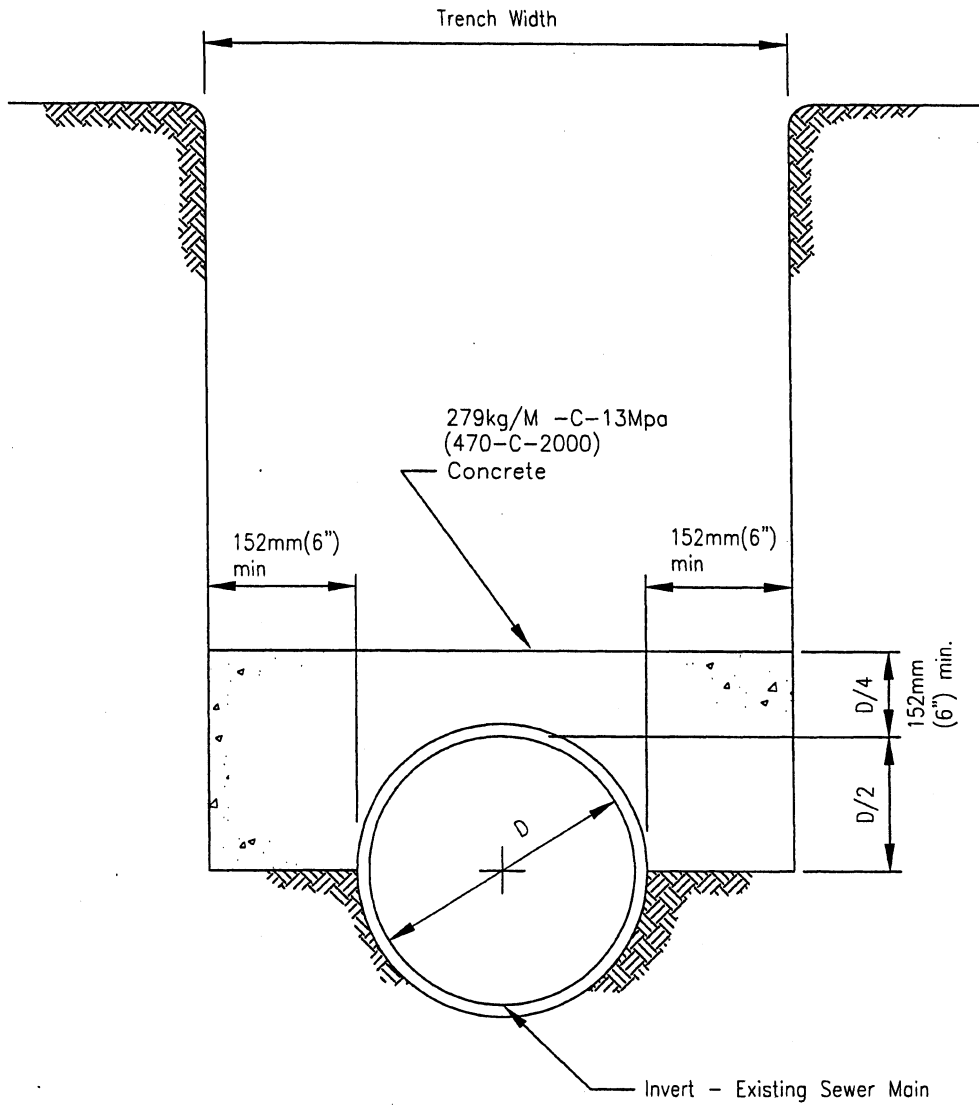
Revision	By	Approved	Date
Original	R.A. A. Oskoui		12/06

CITY OF SAN DIEGO - STANDARD DRAWING

CUTOFF WALL

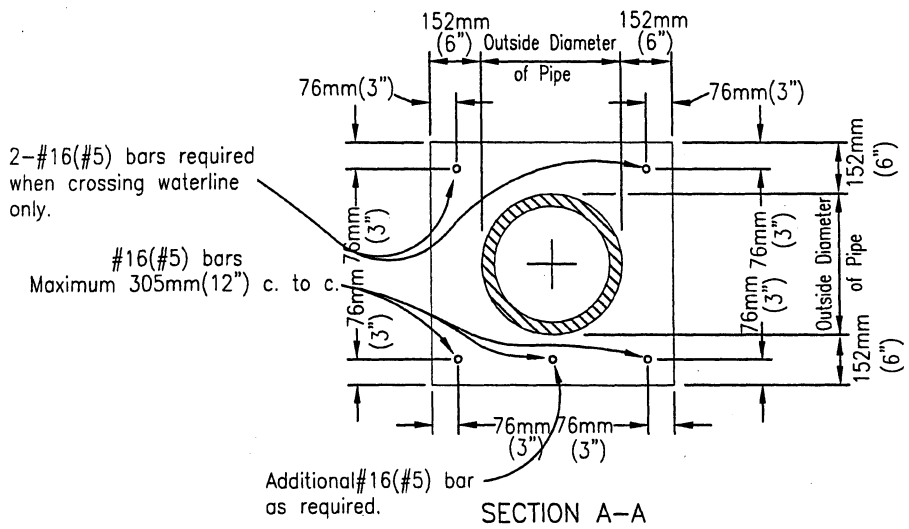
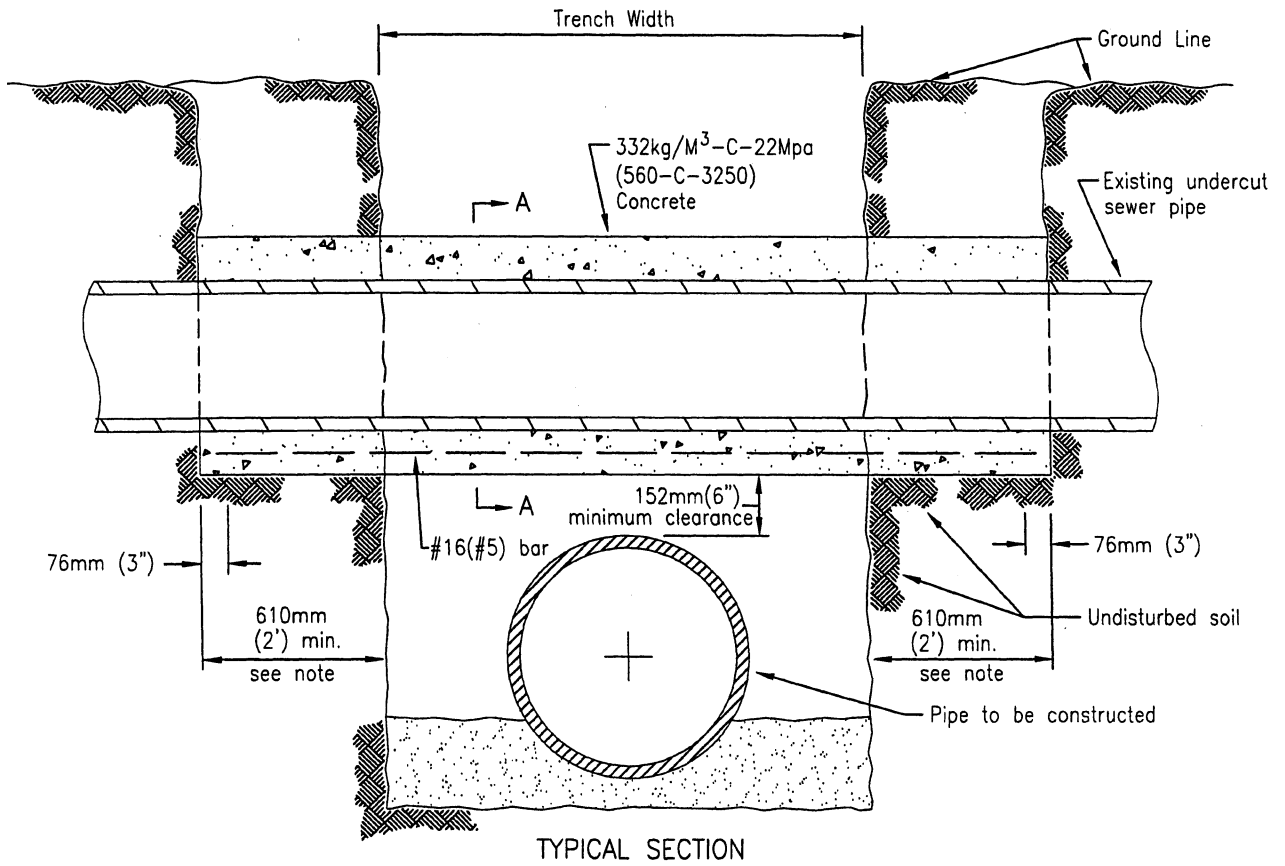
CITY OF SAN DIEGO STANDARDS COMMITTEE	
<i>H. Huel</i> 12/16/06	
COORDINATOR R.C.E 65271 Date	
DRAWING NUMBER	SDS-115

SEE SDS-100



SECTION

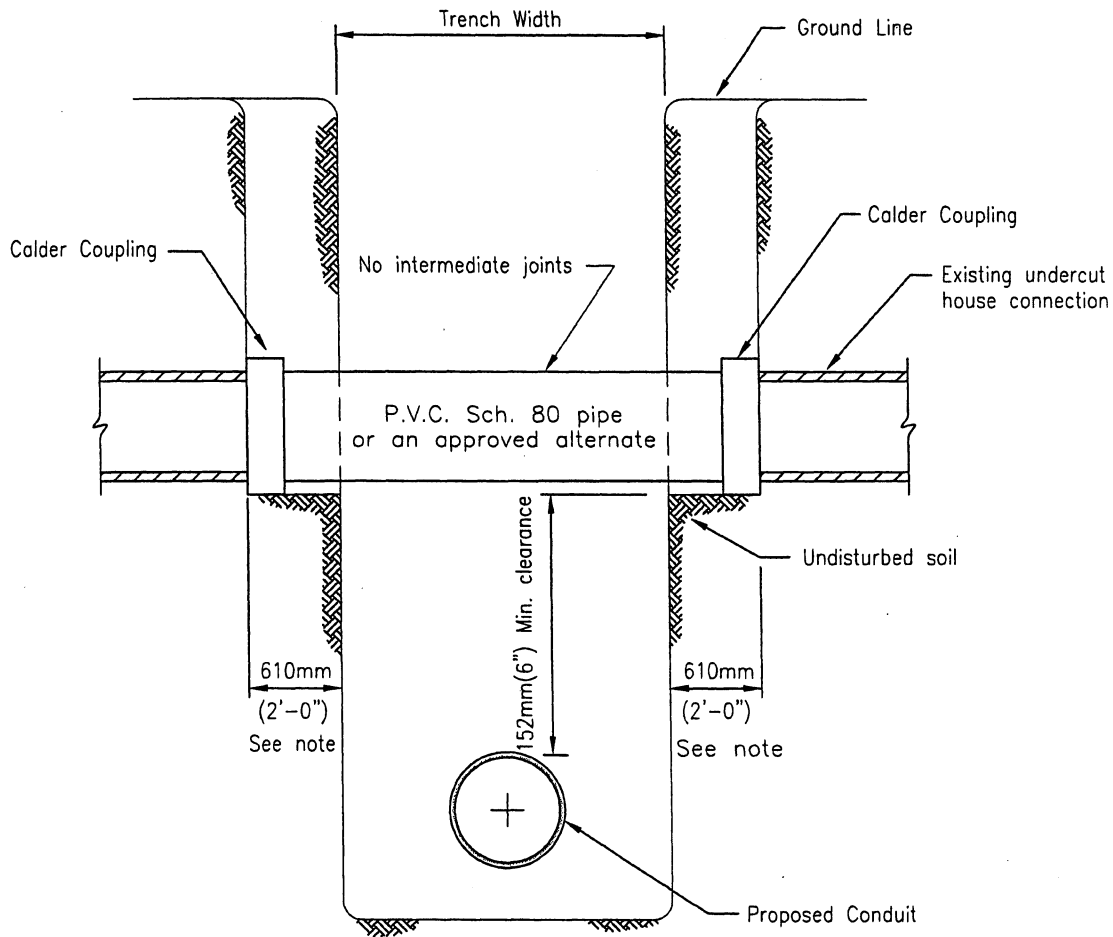
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06		<i>M. Ghali</i> 12/10/6 COORDINATOR R.C.E 65271 Da	
				CONCRETE PROTECTION FOR EXISTING SEWER PIPE	DRAWING NUMBER	SDS-116



NOTE
 For water line construction encasement shall extend to first joint beyond 610mm(2') at both sides of trench or to a distance of 1.2m(4'), whichever is less.

LEGEND ON PLANS

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06		<i>M. Almal</i> 12/16/06 COORDINATOR R.C.E 65271 Da	
				CONCRETE SUPPORT FOR UNDERCUT SEWER PIPE	DRAWING NUMBER	SDS-117

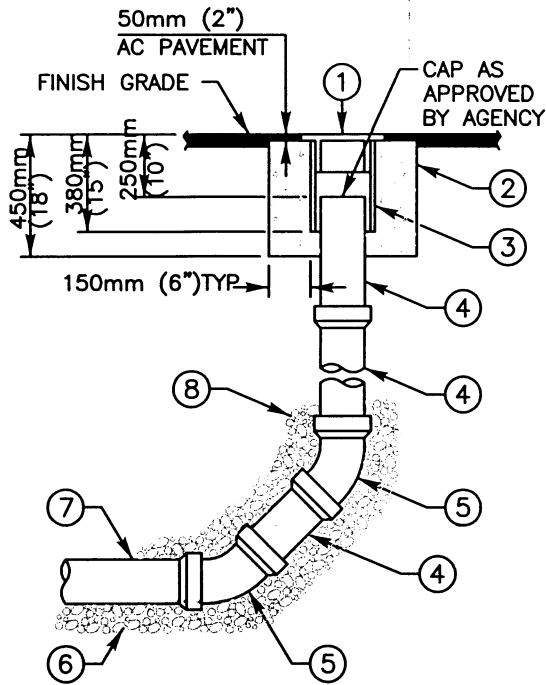


SECTION

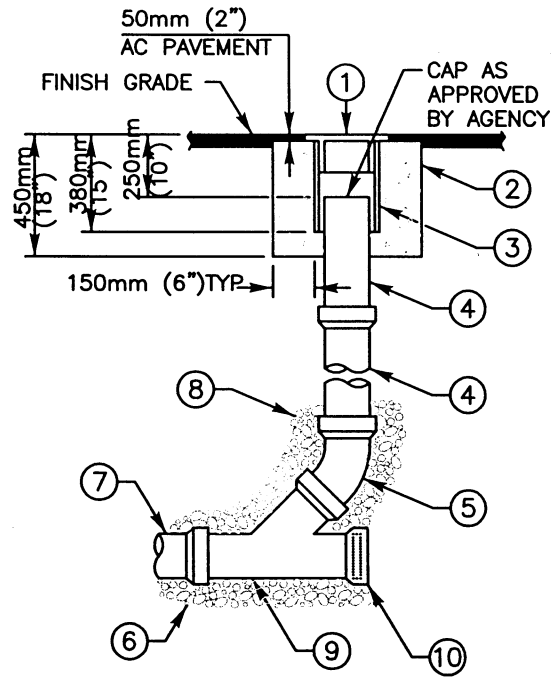
NOTE

For water line construction, repair pipe shall extend to first joint beyond 610mm(2') at both sides of trench or to a distance of 1.22m (4'), whichever is less.

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	R.A.	A. Oskoui	12/06			<i>M. H. H. 12/16/06</i> COORDINATOR R.C.E 65271 Da
				HOUSE CONNECTION SEWER REPAIR	DRAWING NUMBER	SDS-118



TYPE A
MAINS FOR 150mm (6")
AND 200mm (8")



TYPE B
SEWER LATERAL
CLEANOUT

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) CLEANOUTS TO BE INSTALLED AT THE END OF MAINS WHERE INDICATED ON THE PLANS
- 3) CLEANOUT PIPE TO BE SAME SIZE AND MATERIAL AS SEWER MAIN UP TO 200mm (8")
- 4) BACKFILL TO TOP OF 45° BEND WITH 19mm (3/4") CRUSHED ROCK
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

—○—
LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	300mm (12") CI CLEANOUT BOX COVER MARKED 'SEWER' AND AGENCY NAME AS REQUIRED	⑤	45° ELBOW
②	CONCRETE RING	⑥	19mm (3/4") CRUSHED ROCK PIPE BEDDING
③	300mm (12") PVC, C-900 x 380mm (15") LONG (CLEANOUT BOX)	⑦	SEWER MAIN
④	SIZE x REQUIRED LENGTH PVC PIPE	⑧	19mm (3/4") CRUSHED ROCK SEE NOTE 4
		⑨	STANDARD WYE BRANCH
		⑩	INSTALL PLUG AND CONCRETE LUG

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-03		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

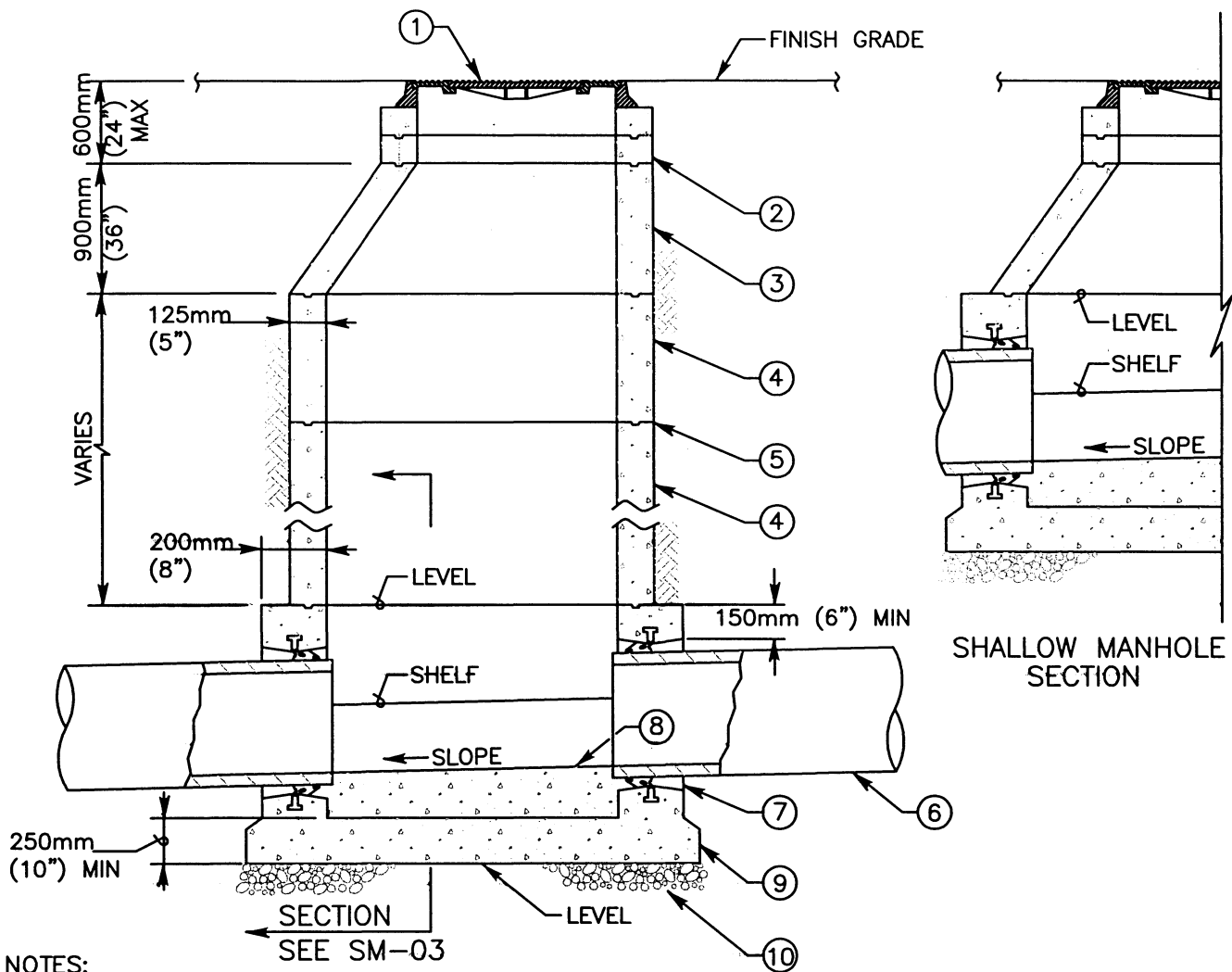
SEWER CLEANOUT

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

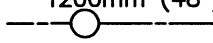
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **SC-01**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VERTICAL WALL OF CONE TO BE ON THE UPSTREAM SIDE OF MANHOLE SEE SM-05 FOR ACCESS LOCATIONS
- 3) FOR MANHOLE BASES SEE SM-03
- 4) MANHOLES FOR MAINS 450mm (18") AND LARGER SHALL BE COATED AND LINED PER SM-07
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

1200mm (48")

 LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	900mm (36") MANHOLE FRAME AND TWO CONCENTRIC COVERS SEE S.D.R.S.D. M-3	⑤	WATER TIGHT JOINTS SEE SM-05
②	900mm (36") DIA GRADE RING(S) 150mm (6") TO 450mm (18") HIGH	⑥	SEWER MAIN
③	ECCENTRIC CONE SEE NOTE 2	⑦	MANHOLE PIPE CONNECTOR SEE SM-04
④	1200mm (48") DIA RING(S) VARIABLE HEIGHT	⑧	FIELD INSTALLED INVERT SEE SM-04
		⑨	CONCRETE BASE, PRECAST OR CAST IN PLACE
		⑩	150mm (6") OF 19mm (3/4") CRUSHED ROCK

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-02		J. Tomasulo	03/05

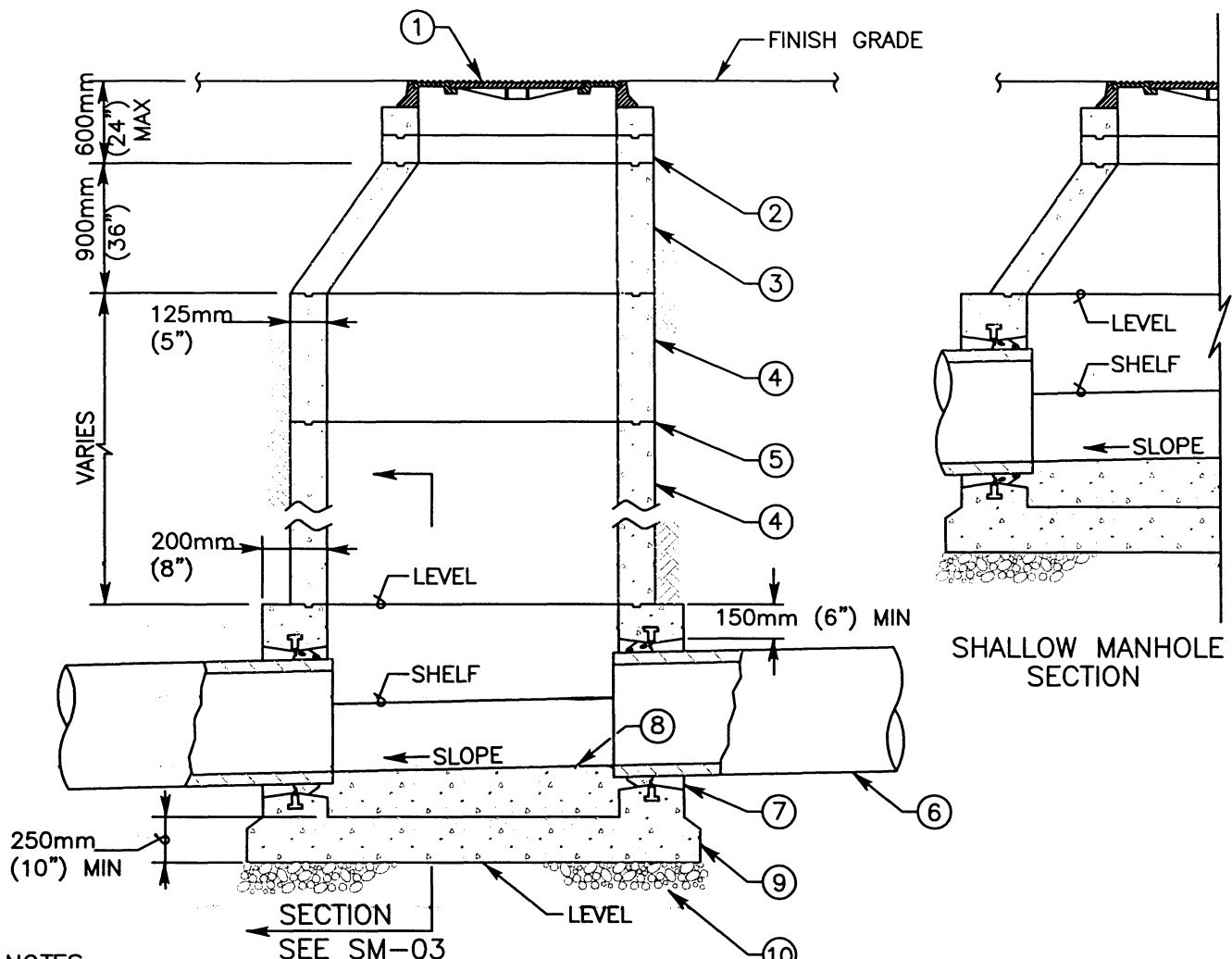
SAN DIEGO REGIONAL STANDARD DRAWING

**1200mm (48") DIAMETER PRECAST
MANHOLE INSTALLATION**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

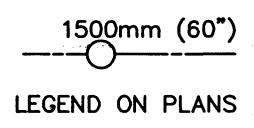
T. Stanton 03/24/2005
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **SM-01**




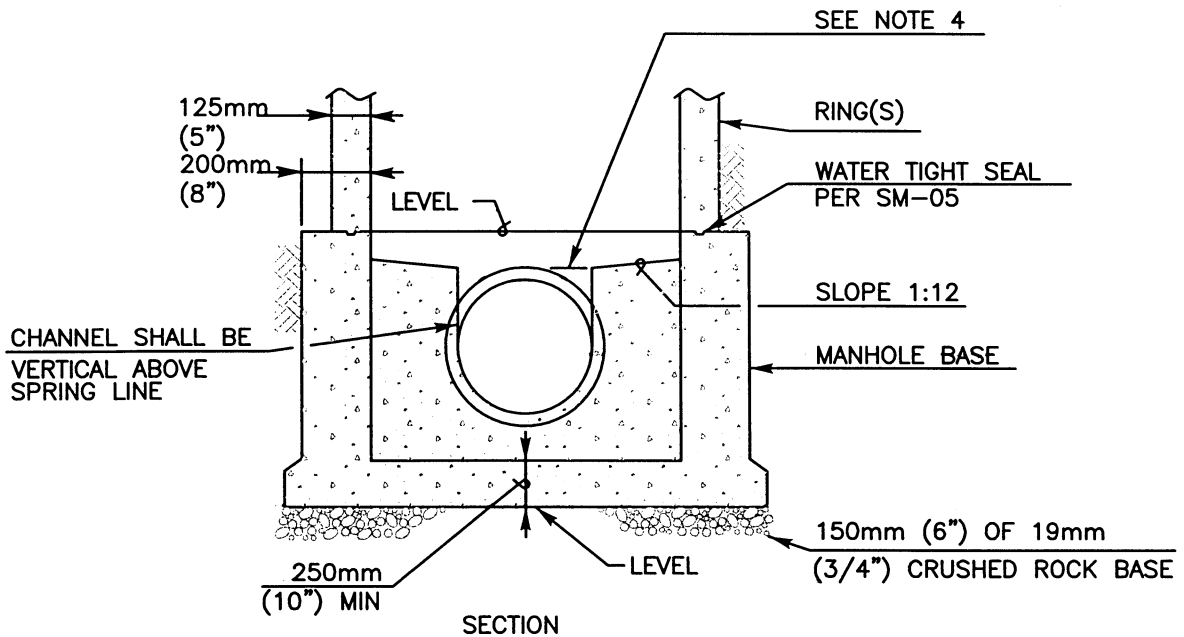
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VERTICAL WALL OF CONE TO BE ON THE UPSTREAM SIDE OF MANHOLE SEE SM-05 FOR ACCESS LOCATIONS
- 3) FOR MANHOLE BASES SEE SM-03
- 4) MANHOLES FOR MAINS 450mm (18") AND LARGER SHALL BE COATED AND LINED PER SM-07
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	900mm (36") MANHOLE FRAME AND TWO CONCENTRIC COVERS SEE S.D.R.S.D. M-3	⑤	WATER TIGHT JOINTS SEE SM-05
②	900mm (36") DIA GRADE RING(S) 150mm (6") TO 450mm (18") HIGH	⑥	SEWER MAIN
③	ECCENTRIC CONE SEE NOTE 2	⑦	MANHOLE PIPE CONNECTOR SEE SM-04
④	1500mm (60") DIA RING(S) VARIABLE HEIGHT	⑧	FIELD INSTALLED INVERT SEE SM-04
		⑨	CONCRETE BASE, PRECAST OR CAST IN PLACE
		⑩	150mm (6") OF 19mm (3/4") CRUSHED ROCK

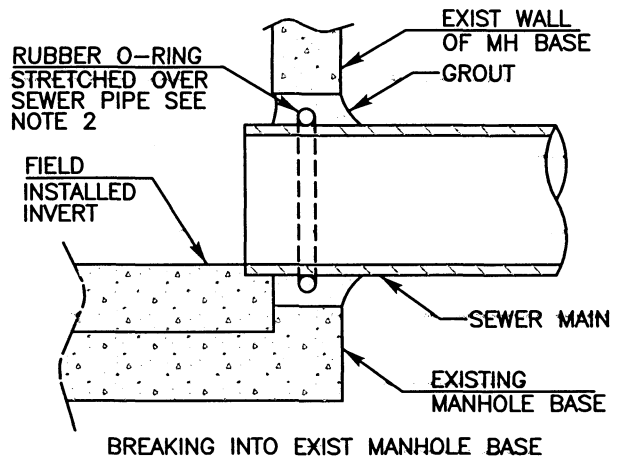
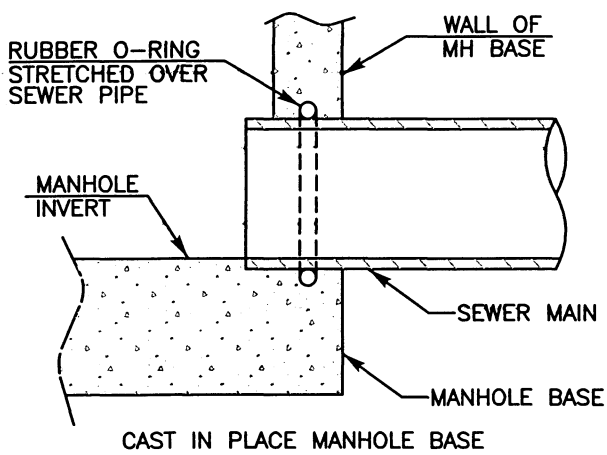
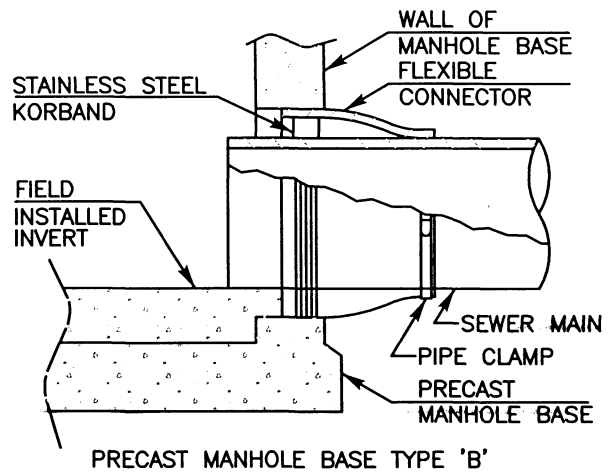
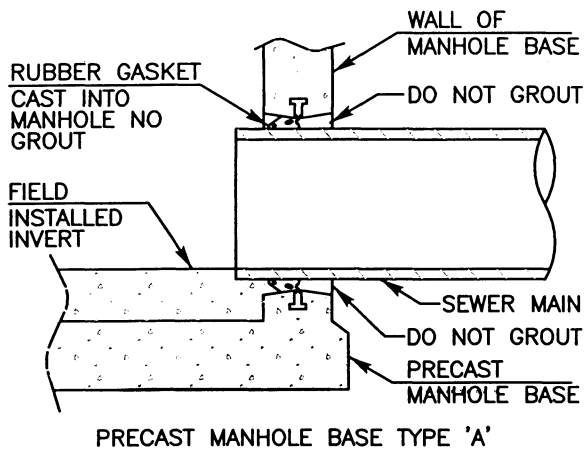
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	1500mm (60") DIAMETER PRECAST MANHOLE INSTALLATION	 Chairperson R.C.E. 19246 Date 03/24/2005
Replaced S-02		J. Tomasulo	03/05		
				DRAWING NUMBER	SM-02



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) FOR MANHOLE INSTALLATIONS SEE SM-01 AND SM-02
- 3) MANHOLE BASES FOR MAINS 450mm (18") AND LARGER SHALL BE COATED PER SM-07
- 4) LOWEST POINT ON SHELF SHALL BE EVEN WITH TOP OF PIPE
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		SEWER MANHOLE BASE
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
Replaced S-02		J. Tomasulo	03/05	DRAWING NUMBER	
				SM-03	



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) A RUBBER O-RING OR A FLEXIBLE CONNECTOR (AS SHOWN IN PRECAST MANHOLE BASE TYPE 'B') CAN BE USED WHEN BREAKING INTO EXISTING MANHOLE
- 3) FOR MANHOLES REQUIRING COATING AND LINING SEE SM-07
- 4) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-02		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

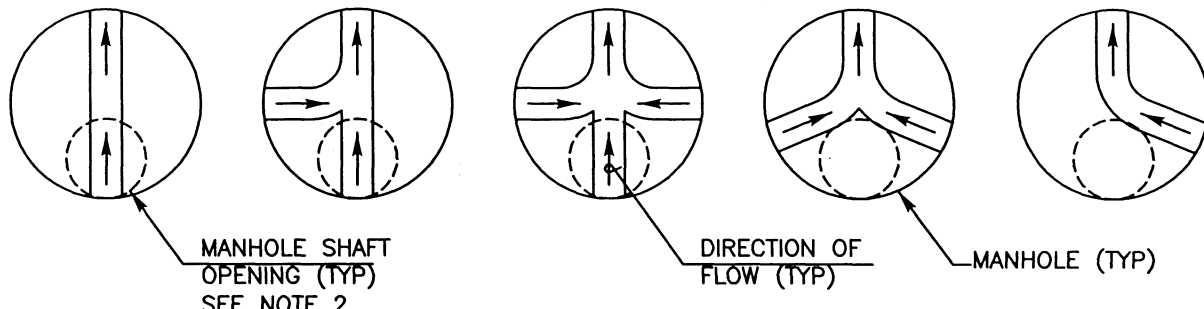
MANHOLE PIPE CONNECTORS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

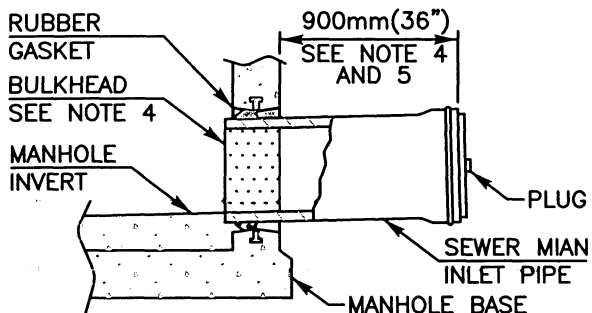
T. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

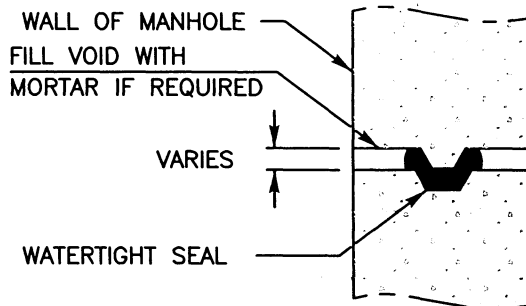
DRAWING NUMBER **SM-04**



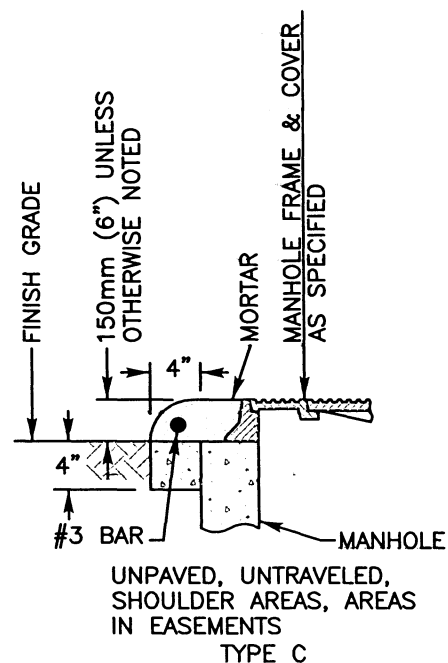
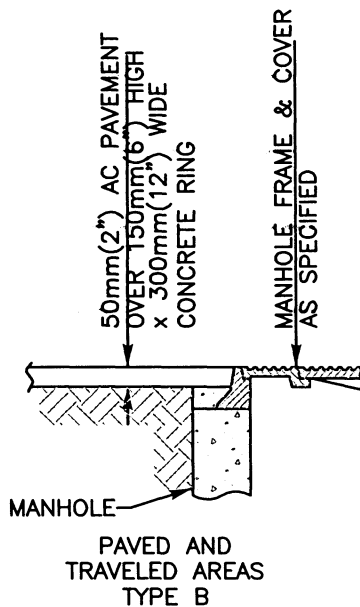
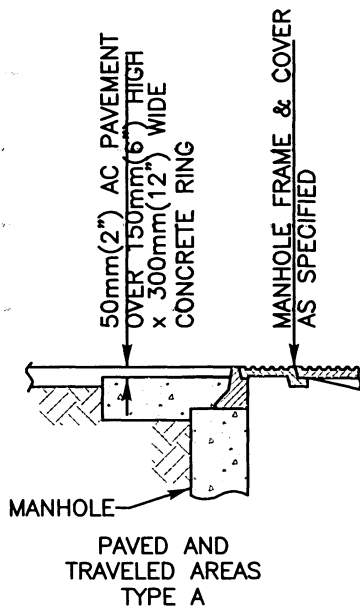
MANHOLE ACCESS LOCATION PLAN VIEW



MANHOLE STUB OUT FOR FUTURE CONNECTION



WATERTIGHT MANHOLE JOINT



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VERTICAL WALL OF CONE TO BE ON THE UP STREAM SIDE OF MANHOLE
- 3) FOR MANHOLES REQUIRING COATING AND LINING SEE SM-07
- 4) BULDHEADS SHALL BE INSTALLED AT THE MANHOLE END OF STUBS
- 5) SEWER MAIN TO BE LAID WITH BELLS UP-GRADE
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-02		J. Tomosulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE MISCELLANEOUS
DETAILS

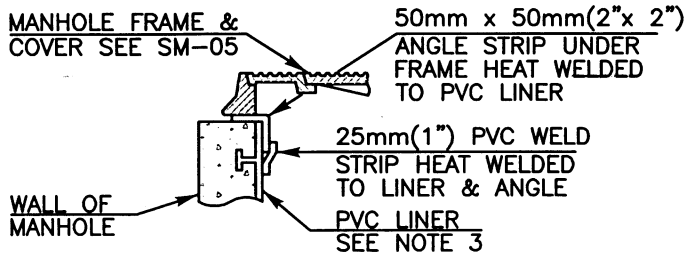
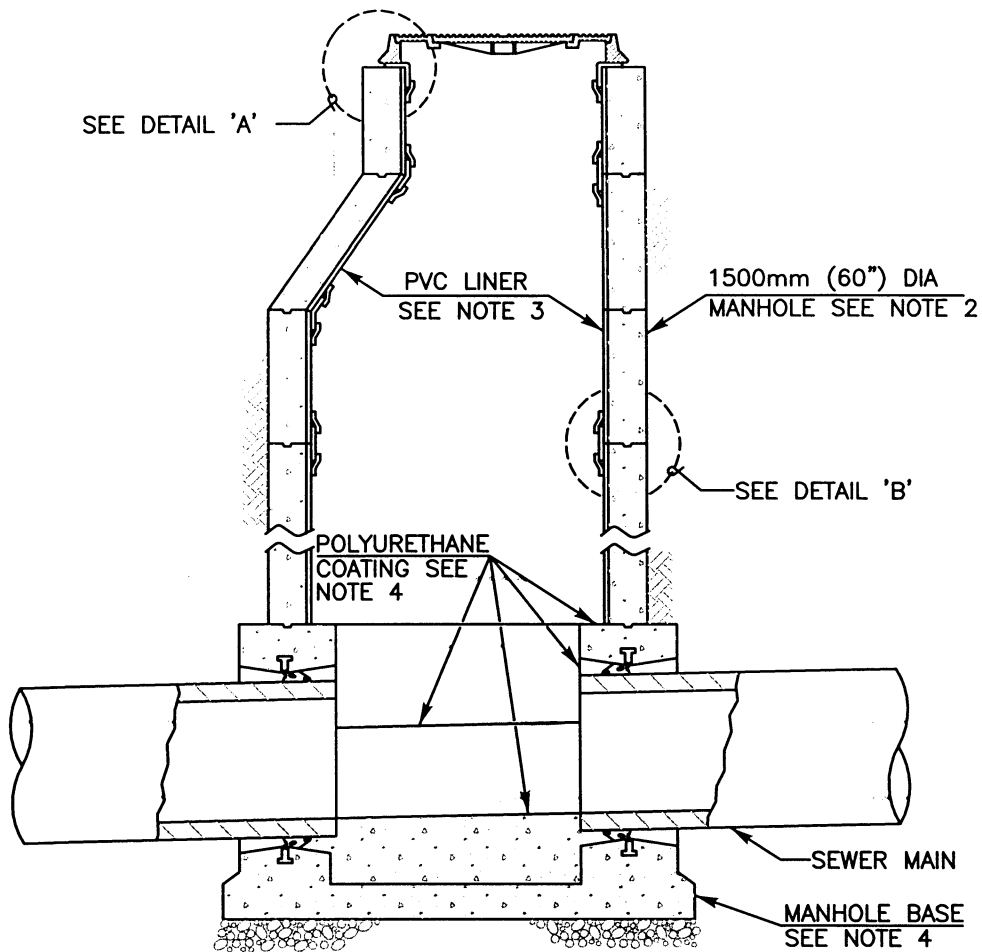
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

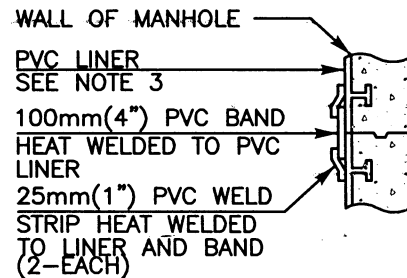
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER SM-05

NOT USED



DETAIL "A" MANHOLE
FRAME & COVER

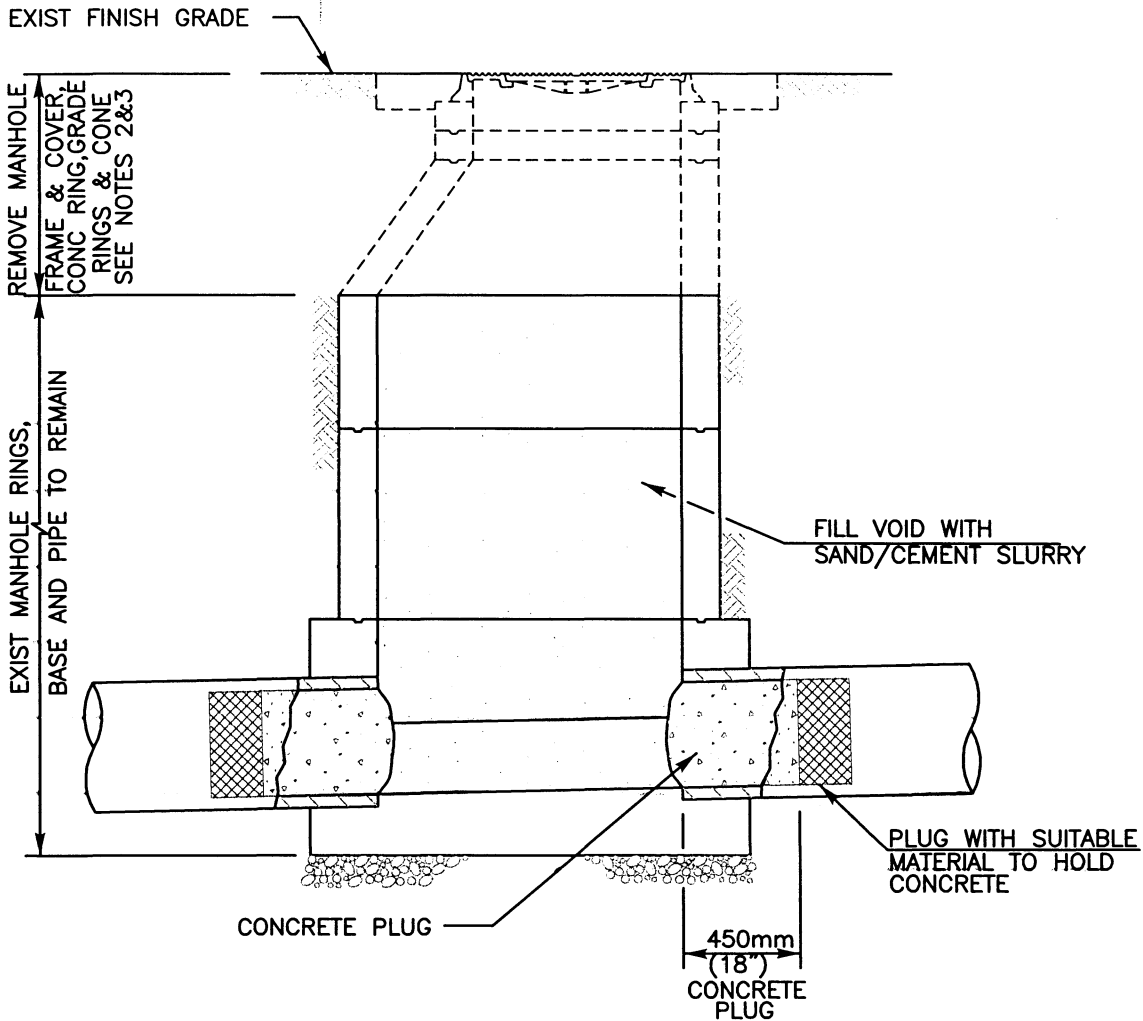


DETAIL "B" MANHOLE
JOINT SECTIONS

NOTES:

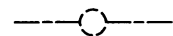
- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) MANHOLES FOR SEWER MAINS 450mm(18") AND LARGER SHALL BE COATED AND LINED
- 3) MANHOLE SHAFT AND CONE SECTIONS, AND GRADE RINGS SHALL HAVE A PVC LINER PLACED WITH T-SHAPED SUPPORTS INTEGRALLY CAST INTO THE CONCRETE
- 4) ELASTOMERIC POLYURETHANE COATING SHALL BE APPLIED TO THE INTERIOR OF MANHOLE BASES
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		MANHOLE COATING AND LINING SYSTEM
Add Metric		T. Stanton	03/03		
Replaced S-02		J. Tomosulo	03/05	DRAWING NUMBER	
				SM-07	



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) ALL SALVAGED MATERIAL BECOMES PROPERTY OF AGENCY OF JURISDICTION
- 3) BACKFILL PER AGENCY'S REQUIREMENT
- 4) FOR CUTTING & PLUGGING ABANDONED SEWER MAINS SEE WP-03



LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-02		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

**EXISTING MANHOLE
ABANDONMENT**

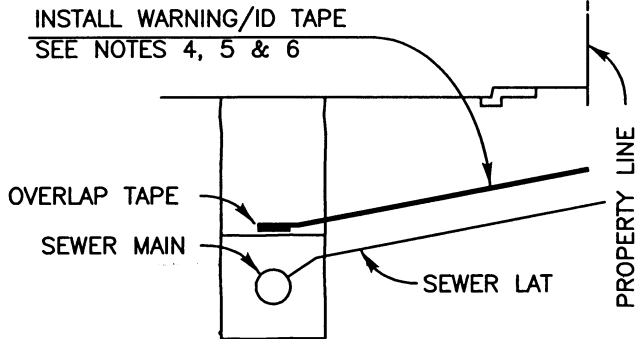
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

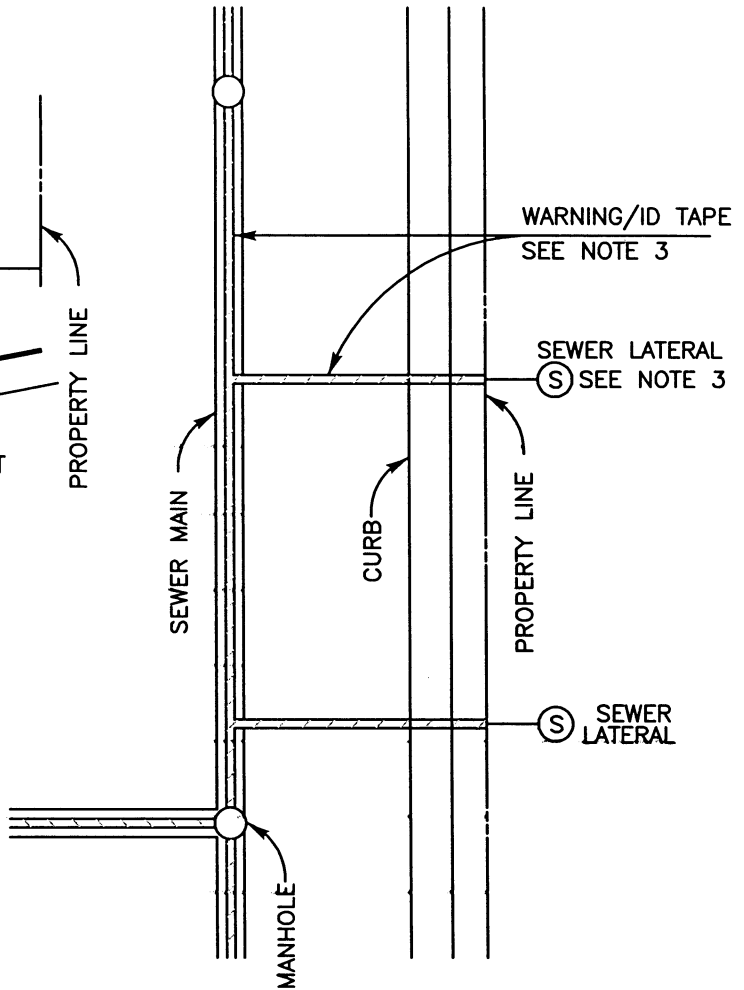
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

SM-08



SECTION AT SEWER LATERALS



PLAN

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) WARNING/IDENTIFICATION TAPE SHALL BE INSTALLED AS SPECIFIED BY AGENCY
- 3) STAMP OR CHISEL A 50mm (2") HIGH 'S' IN CURB FACE TO IDENTIFY SEWER LATERAL LOCATION
- 4) FOR SEWER LATERALS EXTEND TAPE TO PROPERTY LINE
- 5) DEPTH OF WARNING/IDENTIFICATION TAPE AS SPECIFIED BY AGENCY
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-19		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

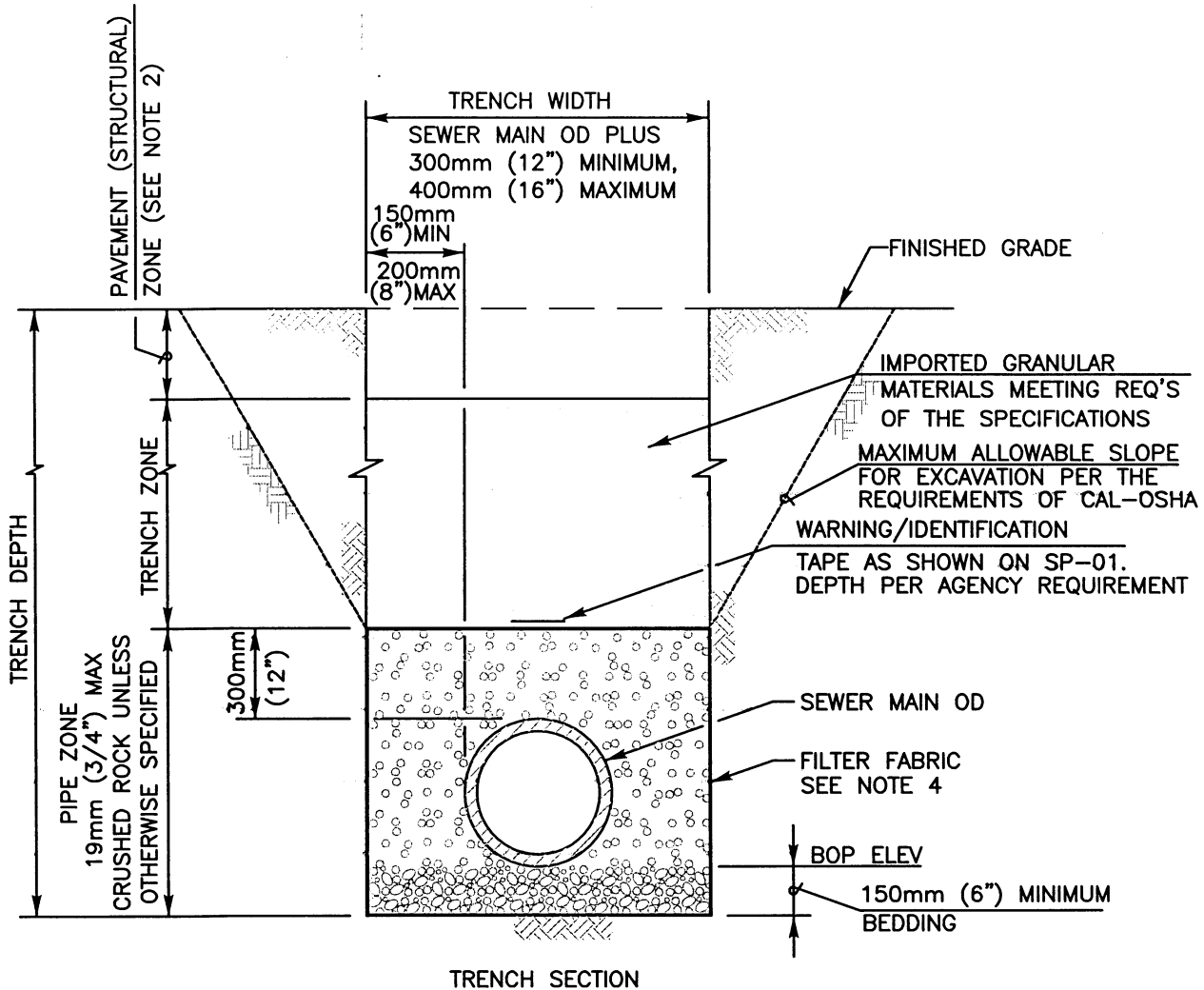
WARNING/IDENTIFICATION
TAPE INSTALLATION

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **SP-01**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS FOR TRENCHING, BACKFILLING AND COMPACTING WHERE APPLICABLE
- 2) PAVING OR PAVEMENT REPAIR TO BE DONE IN ACCORDANCE WITH AGENCY OF JURISDICTION
- 3) EXCAVATE BELL HOLES AT EACH JOINT TO PERMIT PROPER ASSEMBLY AND INSPECTION OF THE ENTIRE JOINT
- 4) FILTER FABRIC AS REQUIRED BY AGENCY OF JURISDICTION (WITH A MINIMUM 12" OVERLAP).

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-04		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

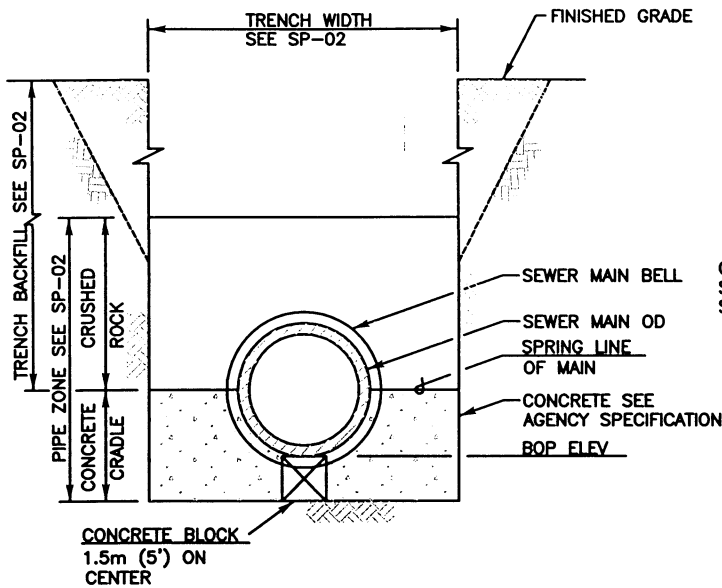
**PIPE BEDDING AND TRENCH
BACKFILL FOR SEWER FACILITIES**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

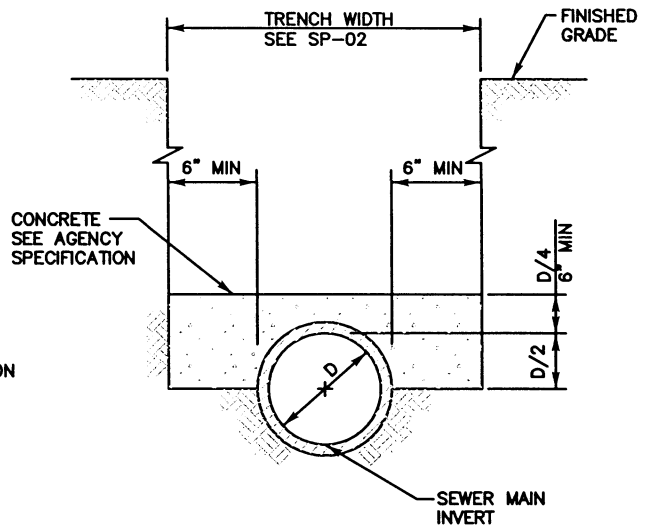
T. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

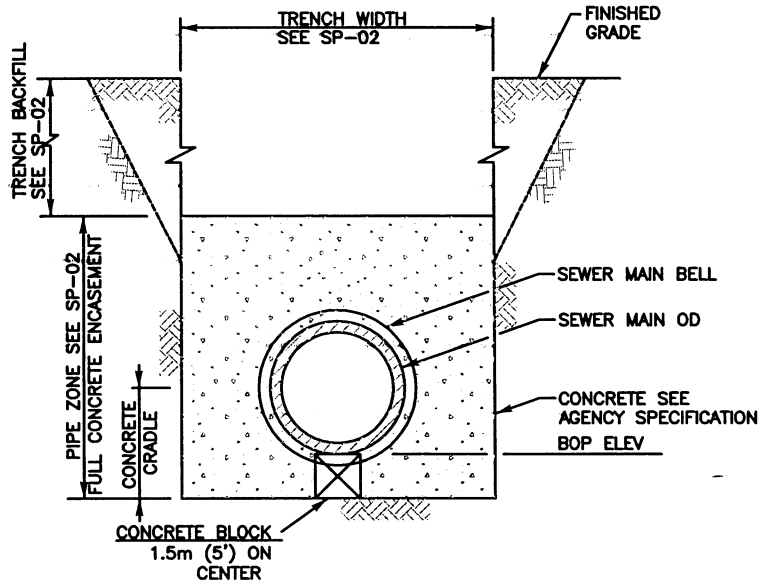
DRAWING NUMBER **SP-02**



TRENCH SECTION
CONCRETE PIPE CRADLE



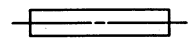
TRENCH SECTION
CONCRETE PROTECTION



TRENCH SECTION
CONCRETE PIPE ENCASEMENT

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS FOR TRENCHING, BACKFILLING AND COMPACTING WHERE APPLICABLE
- 2) CONCRETE CRADLE SHALL BE USED WHEN THE TRENCH WIDTH AT THE UPPER LIMIT OF THE PIPE ZONE EXCEEDS THE MAX WIDTH SPECIFIED ON SP-02 AND OR DIRECTED BY AGENCY'S ENGINEER
- 3) FOR PIPE BEDDING AND TRENCH BACKFILL SEE SP-02



LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-06		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

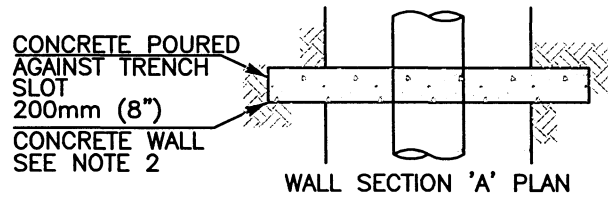
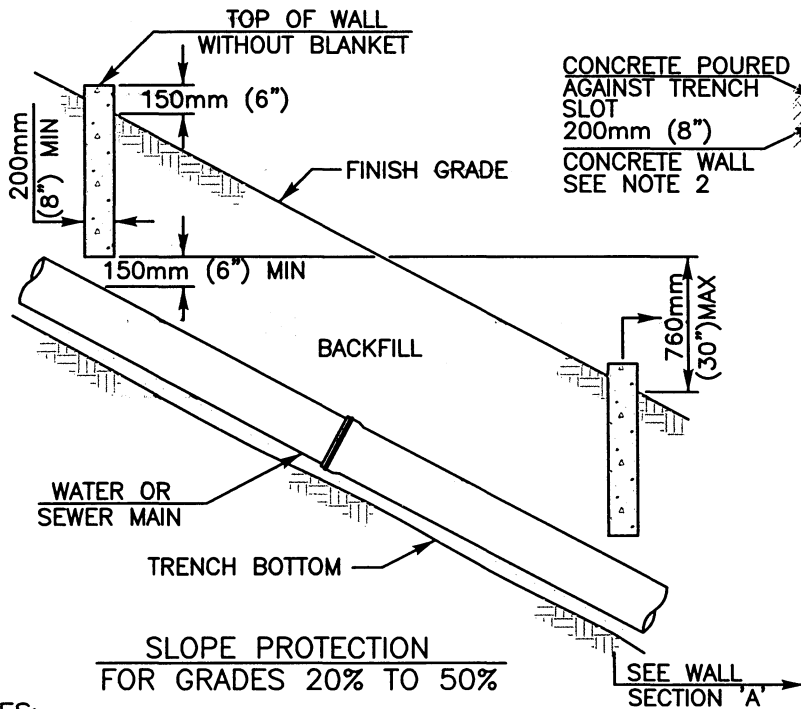
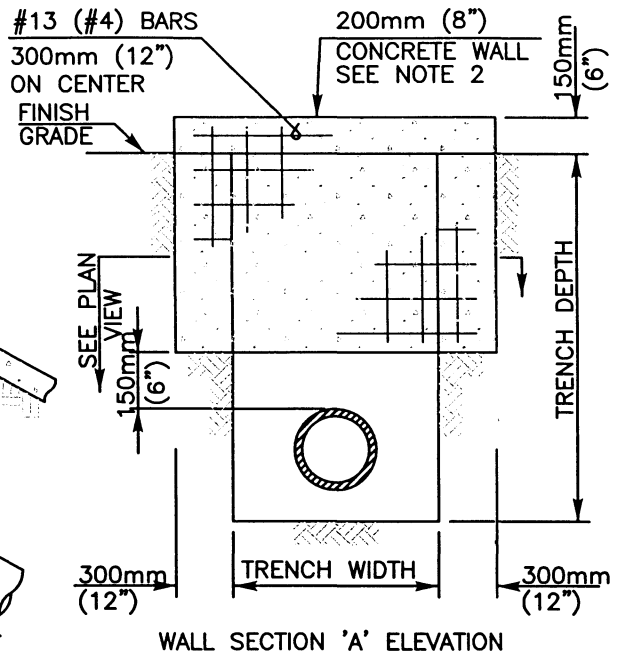
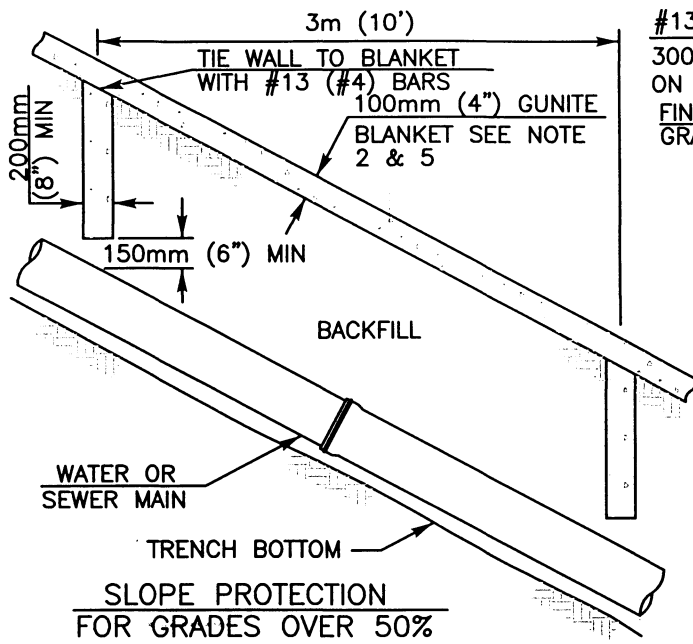
CONCRETE PROTECTION FOR
SEWER PIPE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER SP-03



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) THE DETAILS SHOWN REPRESENT THE MINIMUM REQUIRED. THE ENGINEER OF WORK IS REQUIRED TO PROVIDE A SUBMITTAL TO THE AGENCY OF JURISDICTION FOR REVIEW AND APPROVAL BY THE AGENCY'S ENGINEER PRIOR TO INSTALLATION
- 3) WALLS SHALL BE REINFORCED CONCRETE OR 200mm x 200mm x 400mm (8" x 8" x 16") CONCRETE BLOCK, REINFORCED AND ALL CORES FILLED WITH GROUT SEE SPECIFICATIONS
- 4) FOR GRADES OVER 50%, SLOPE PROTECTION SHALL ALSO INCLUDE AC PAVING, CONCRETE SLAB OR GUNITE BLANKET PLACED OVER THE PIPELINE ALIGNMENT
- 5) 100mm (4") GUNITE BLANKET WITH 150mm (6") SQUARE x 10 GAGE WIRE FABRIC AT THE ENGINEERS DISCRETION

LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

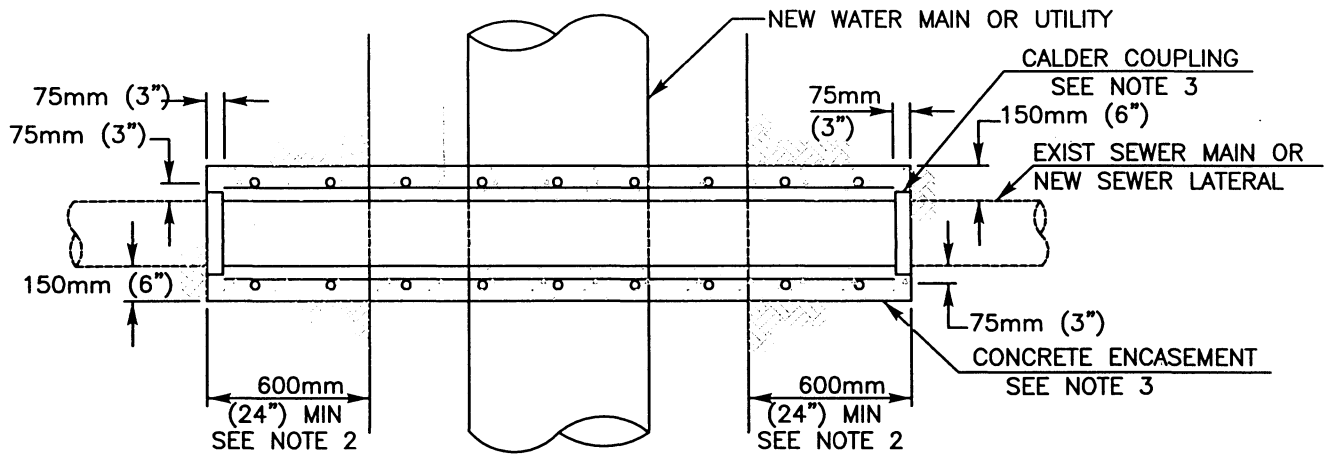
SLOPE PROTECTION INSTALLATIONS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

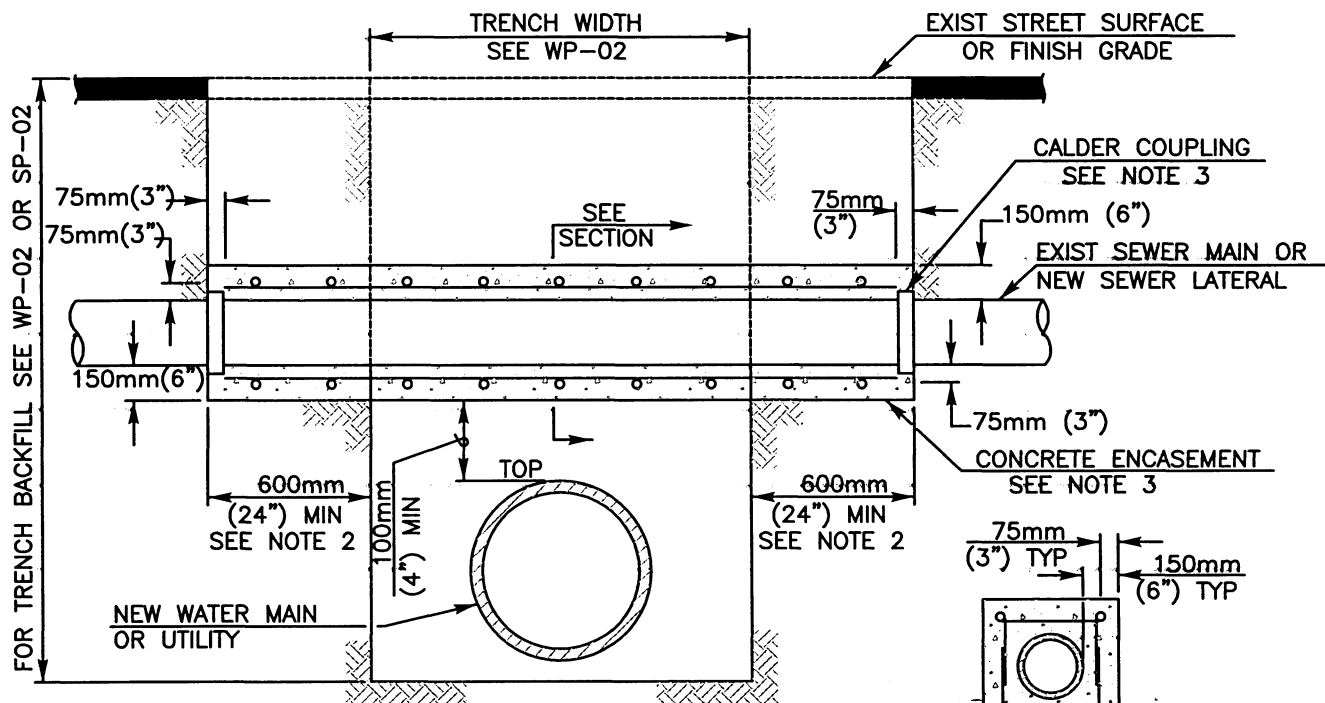
R. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

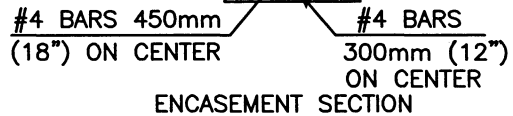
DRAWING NUMBER SP-05



PLAN

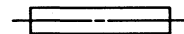


ELEVATION



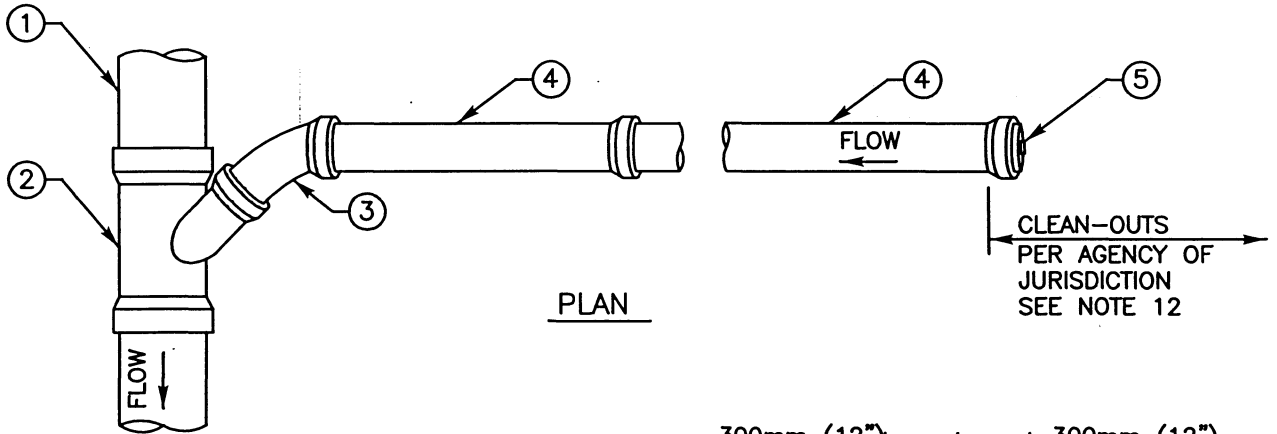
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS FOR PROTECTION OF EXISTING FACILITIES
- 2) ENCASEMENT SHALL EXTEND TO FIRST JOINT BEYOND BOTH SIDES OF TRENCH [600mm (24") MIN 1200mm (48") MAX OF SUITABLE NATIVE SUPPORT BEYOND EDGE OF TRENCH].
- 3) CONCRETE ENCASEMENT REQUIRED FOR SEWER MAINS ONLY. CALDER COUPLINGS REQUIRED FOR SEWER LATERALS ONLY. SEWER LATERALS TO BE REPLACED WITH SCH. 80 PVC WITH NO INTERMEDIATE JOINTS.
- 4) FOR PIPE BEDDING AND TRENCH BACKFILL SEE WP-02 OR SP-02.

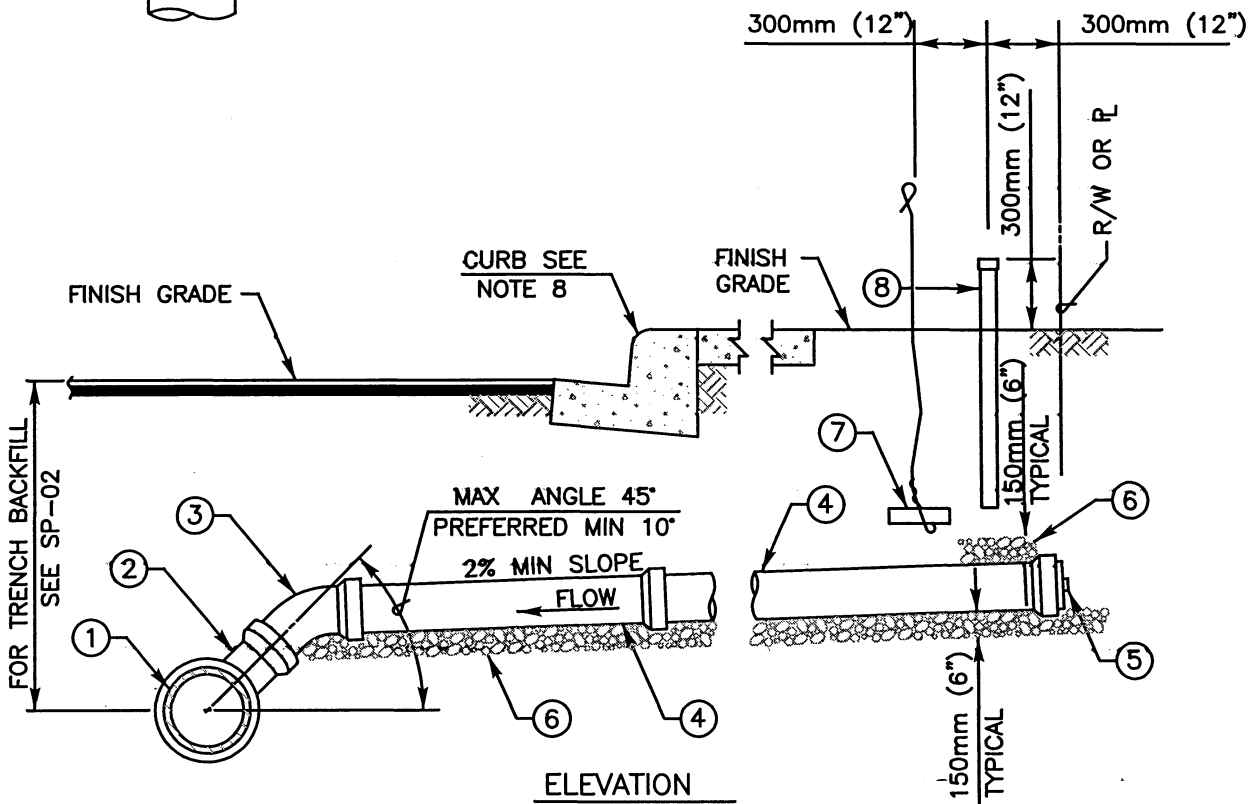


LEGEND ON PLANS

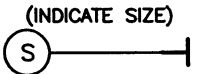
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		J. Tomasulo	03/05		PIPE SUPPORT FOR UNDERCUT SEWER MAINS OR SEWER LATERALS
				DRAWING NUMBER SP-09	



PLAN



ELEVATION



LEGEND ON PLANS

FOR SEWER LATERAL NOTES SEE DETAIL SS-03

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	SEWER MAIN	⑤	PLUG OR CAP
②	45° WYE	⑥	19mm (3/4") MAXIMUM CRUSHED ROCK
③	45° ELBOW	⑦	#9 WIRE ATTACHED TO A BRICK
④	PIPE LATERAL SEE NOTE 3 & 5	⑧	100mm (4") PVC PIPE WITH GLUED CAP

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-13		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

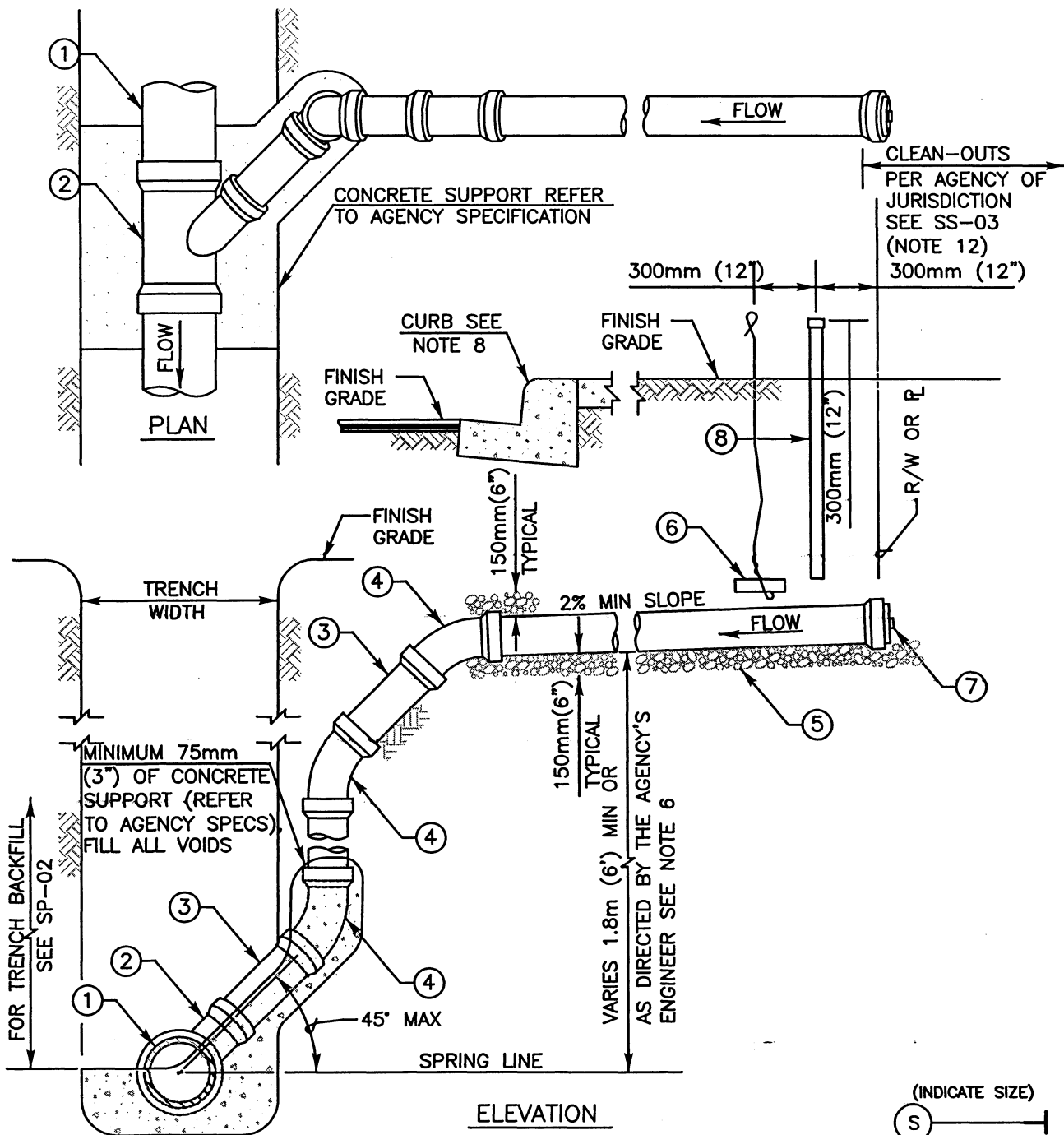
**100mm (4") AND 150mm (6")
SEWER LATERAL INSTALLATION**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

J. Stanton 03/24/2005

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **SS-01**



FOR SEWER LATERAL NOTES SEE DETAIL SS-03

(INDICATE SIZE)
 S ————
 LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	SEWER MAIN	⑤	19mm (3/4") MAXIMUM CRUSHED ROCK
②	45° WYE	⑥	#9 WIRE ATTACHED TO A BRICK
③	PIPE	⑦	PLUG OR CAP
④	45° ELBOW	⑧	100mm (4") PVC PIPE WITH GLUED CAP

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-13		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

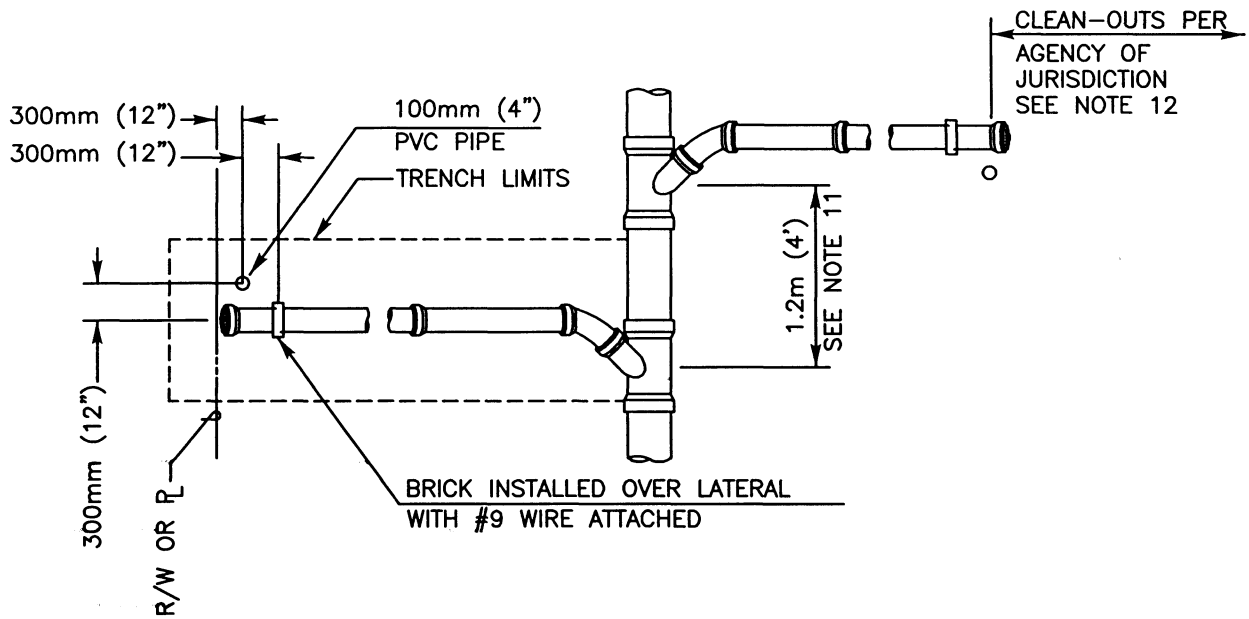
**100mm (4") AND 150mm (6")
 DEEP-CUT SEWER LATERAL INSTALLATION**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 03/24/2005
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **SS-02**

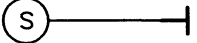
NOT USED



SEWER LATERAL DETAIL
SEE NOTE 10 BELOW

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) IN NO CASE SHALL LATERAL CONNECT DIRECTLY ON TOP OF SEWER MAIN
- 3) LATERAL SHALL BE INSTALLED TO PROPERTY LINE UNLESS SPECIFIED ON PLANS
- 4) MINIMUM 1.2m (4') COVER ABOVE LATERAL AT PROPERTY LINE
- 5) LATERAL TO HAVE A MINIMUM SLOPE OF 2%
- 6) VERTICAL PIPE SHALL BE BRACED WHILE BACKFILLING TRENCH
- 7) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON SP-01
- 8) STAMP OR CHISEL A 50mm (2") HIGH "S" IN CURB FACE OVER LATERAL TO IDENTIFY SEWER LATERAL LOCATION
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST
- 10) FOR SEWER LATERAL INSTALLATIONS SEE SS-01 AND SS-02
- 11) FOR SEWERS SPECIFIED AS PVC PIPE, A MINIMUM 0.9m (3') SECTION OF PIPE IS REQUIRED BETWEEN FITTINGS
- 12) SEWER CLEAN-OUT SEE SC-01 TYPE B AS REQUIRED BY AGENCY OF JURISDICTION

(INDICATE SIZE)

 LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced S-13		J. Tomasulo	03/05

SAN DIEGO REGIONAL STANDARD DRAWING

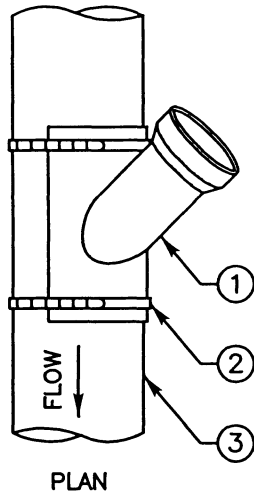
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

SEWER LATERAL NOTES AND DETAIL

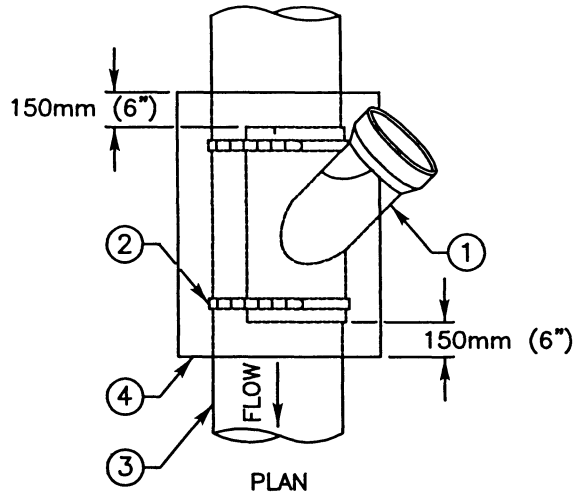
 03/24/2005
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER SS-03

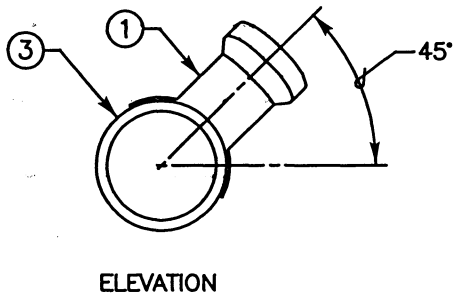
NOT USED



PLAN

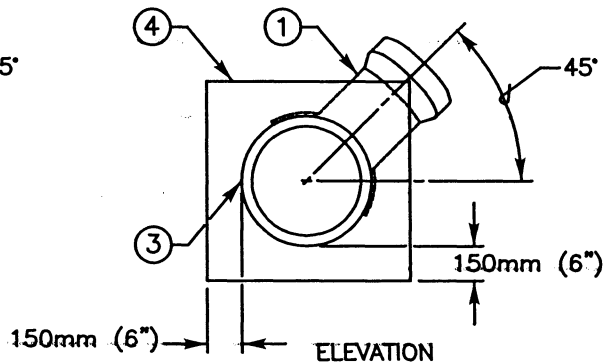


PLAN



ELEVATION

CUT IN WYE CONNECTION
TYPE A

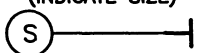


ELEVATION

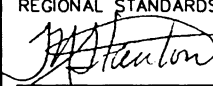
CUT IN WYE CONNECTION
TYPE B

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) CONNECTIONS TO EXISTING SEWER MAINS TO BE MADE BY AGENCY PERSONNEL IN ACCORDANCE WITH SPECIFICATIONS UNLESS OTHERWISE NOTED ON PLANS
- 3) IN NO CASE SHALL CONNECTION BE MADE DIRECTLY ON TOP OF SEWER MAIN
- 4) NO MORE THAN ONE CUT IN WYE WILL BE ALLOWED FOR EACH LENGTH OF EXISTING VCP SEWER MAIN
- 5) FOR SEWER LATERAL INSTALLATION SEE SS-01 AND SS-02
- 6) FOR TRENCH BACKFILL SEE SP-02
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

(INDICATE SIZE)

 LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	45° SADDLE WYE WITH GASKET	③	EXISTING SEWER MAIN
②	STAINLESS STEEL HOSE CLAMPS (2-EACH)	④	CONCRETE ENCASEMENT

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	100mm (4") AND 150mm (6") SEWER CUT-IN WYE CONNECTIONS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			 03/24/2005	
Add Metric		T. Stanton	03/03			Chairperson R.C.E. 19246	Date
Replaced S-13		J. Tomasulo	03/05			DRAWING NUMBER	SS-04

NOT USED

WATER SYSTEMS

SUPPLEMENT TO REGIONAL STANDARD DRAWINGS ("W" SERIES)

NOTES

All materials used must be on the City of San Diego Water Department's "Approved Materials List."

DRAWING WA-02

- ITEM NO.** (12) Delete and substitute with the following: "Copper Tubing or PE 200 for 1 inch, PVC (iron pipe size) for 2 inches."
- (13) Delete and substitute with the following: "90° ELL. (No sweat joints allowed)."

DRAWING WB-01

- NOTES** Add: 10. Delete End of Main Detail and use SDW-106 for End of Main Blow-off.
- ITEM NO.** (10) Delete and substitute with the following: "90° ELL. (No sweat joints allowed)."
- (12) Delete and substitute with the following: "Bronze corporation stop (install with key on side and open tap)."

DRAWING WB-02

- ITEM NO.** (10) Delete and substitute with the following: "Use steel pipe only."
- (11) Delete and substitute with the following: "Valve Well Frame and cover." (See Standard Drawings WV-01, WV-02).

DRAWING WB-03

- ITEM NO.** (7) Delete and substitute with the following: "Flange x Flange 90° Bend."
- (8) Delete and substitute with the following: "Cast Iron Pipe, Ductile Iron or C-900 PVC."

SHT. 1 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>M. Rollinger</i> 12/16/16 COORDINATOR R.C.E. 65271 DATE
ORIGINAL		M. Rollinger	5-20-92		
NOTES	JS	A. Oskoui	1206	SUPPLEMENT TO REGIONAL STANDARD DRAWING ("W" SERIES)	DRAWING NUMBER SDW-100

DRAWING WP-02

NOTES 2. Delete and substitute with the following: "For trenching on improved streets see Standard Drawings SDG-107 and SDG-108 for resurfacing details."

DRAWING WR-01

NOTES Add: 11. Dimension from slab to bottom of backflow device to be "12" minimum to 18" maximum".

 12. Location must be approved by Water Department, Customer Support Division, Meter Services and shown on plans.

 13. All risers, elbows and underground piping shall be type (L) or (M) copper, brass or Water Department approved material. Brass unions are acceptable.

DRAWING WS-01

NOTES Add: 10. "Bronze pipe saddles are required for all taps into polyvinyl chloride (PVC) pipe. Top taps are not permitted."

ITEM NO. (4) Delete and substitute with the following: Use copper tubing type (K) soft for 1 inch services only. No intermediate joints permitted within the first 60 feet from the main. For lengths longer than 60 feet, use flare joint union or lok-pac fitting with locking clamp and stainless steel bolt only. No sweat joints are allowed.

 (5) Delete and substitute with the following: "Bronze angle meter stop with locking device and meter coupling attached. "Furnish and install bronze property valve. Use spacer for meter."

DRAWING WS-02

NOTES: Add: 10. "Top taps not permitted. Any glue joint shall be beveled prior to assembly."

ITEM NO. (1) Delete and substitute with the following: "Size x 50mm (2") Bronze service saddle (double strap)".

SHT. 3 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>W. Wadi</i> 12/16/6 COORDINATOR R.C.E. 65271 DATE
ORIGINAL		M. Rollinger	5-20-92		
NOTES	JS	A. Oskoui	1206	SUPPLEMENT TO REGIONAL STANDARD DRAWING ("W" SERIES)	DRAWING NUMBER SDW-100

DRAWING WT-01

NOTES

- Add: 3. "A minimum of 6 inches of concrete shall be poured on virgin or compacted soil beneath each installation."
- Add: 4. "Tee shall be concrete blocked a minimum of 6 inches on all three sides."
- Add: 5. "Use 12 inches – 18 inches length of pipe between the end cap and the last joint as a bond breaker on dead end blocking."

DRAWING WV-03

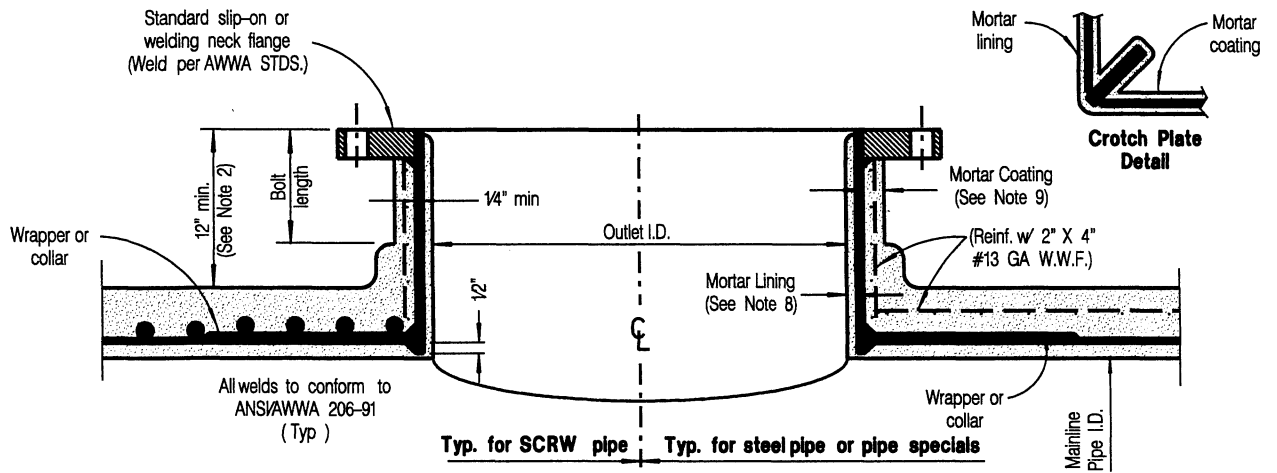
NOTES

Add: 8.

COLOR	GATE WELL LIDS USED FOR:
YELLOW	BUTTERFLY VALVES
WHITE	GATE VALVES

SHT. 4 OF 4

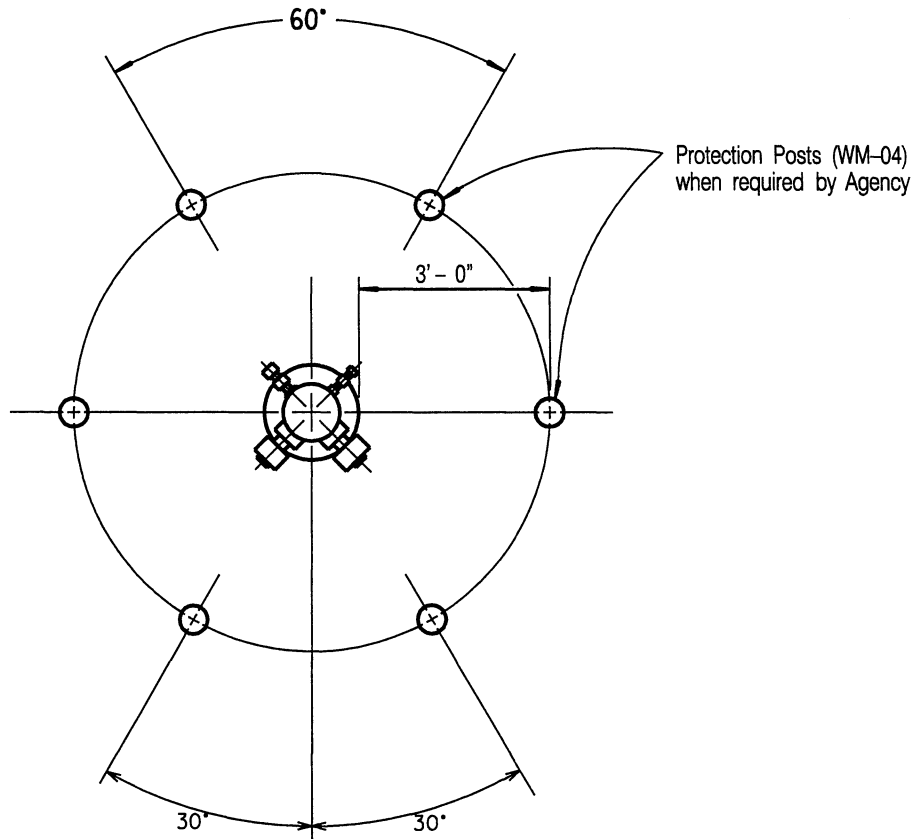
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>A. Oskoui</i> 12/16/16 COORDINATOR R.C.E. 65271 DATE
ORIGINAL		M. Rollinger	5-20-92		
NOTES	JS	A. Oskoui	1206	SUPPLEMENT TO REGIONAL STANDARD DRAWING ("W" SERIES)	DRAWING NUMBER SDW-100



OUTLET REINFORCING			
Ratio of Outlet I.D. to pipe I.D.	Pipe Class	Angle between outlet axis and mainline axis	Type of Reinforcing
0.2 AND LESS	All All	0° to 75° 75° to 90°	Wrapper Collar
0.2 TO 0.6	Under 150 Under 150 150 and over	0° to 75° 75° to 90° 0° to 90°	Wrapper Collar Wrapper
0.6 TO 1.0	Under 150 150 and over	0° to 90° 0° to 90°	Wrapper 1 Pl. Crotch
1.0	Under 150 150 and over	0° to 90° 0° to 90°	Wrapper 2 Pl. Crotch

- NOTES:**
- Collar O.D. or wrapper width shall be equal to twice the length of the opening in the mainline pipe measured along the pipe axis. Thickness shall be equal to that specified for pipe specials.
 - If a crotch plate is required, the outlet length shall be adjusted to clear the maximum length of bolt used for flange.
 - Outlets less than 3-inches in dia. may be installed without collars providing that rod reinforcing is not cut and outlets are welded to rods.
 - Reinforcing for outlets on pipe, other than SCRW pipe or steel pipe, shall be as shown on design drawings or submitted for approval.
 - Nozzle fabrication details are typical for all sizes of outlets.
 - Repeat Note 1 from SDW-103
 - Flanges shall conform to AWWA C207 and drilling shall match the above flange drilling.
 - Minimum lining thickness for outlets shall be:
 - 1/4-inch for 8-inch I.D. and less
 - 1/2-inch for 10-inch I.D. through 16-inch I.D.
 - 3/4-inch for 18-inch I.D. and greater
 - Coating thickness for outlets shall be:
 - 3/4-inch for 16-inch I.D. and less
 - 1 1/4-inch for 18-inch I.D. and greater
 Specified coating thickness shall be reduced by 50% for the distance of one bolt length back from the flange face.
 - Reinforcement of fittings, collar, wrapper and crotch plate design shall conform to M-11, Steel Pipe-Guide for Design and Installation 1989 Edition.

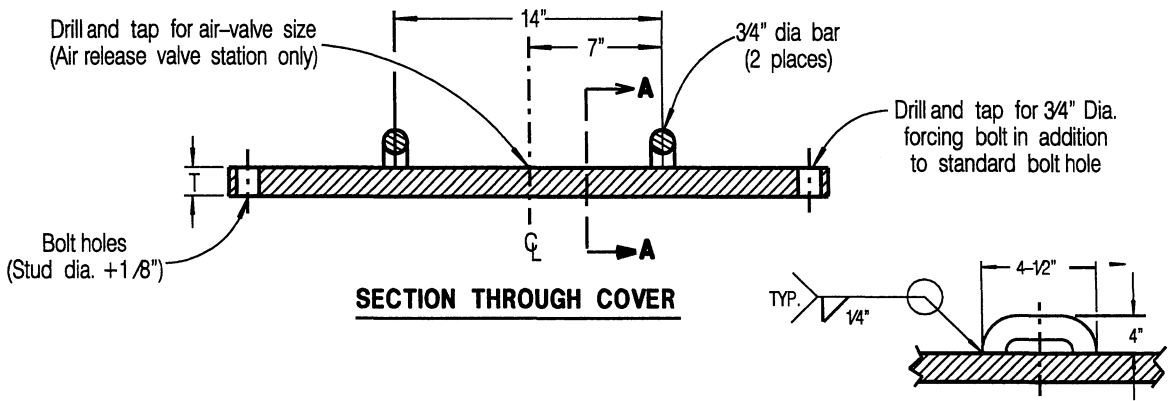
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>George L. Perkins</i> COORDINATOR R.C.E. 25902 12-23-94 DATE
ORIGINAL		H. Horn	5-6-80		
		J.P. Casey	6-3-83	TYPICAL OUTLET FOR SCRW PIPE STEEL PIPE AND PIPE SPECIALS	DRAWING NUMBER SDW-101
		J.P. Casey	8-23-86		



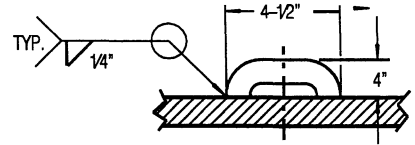
NOTE:

Number of posts to be determined by Engineer.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL		W.J. Tomas	5-18-75			FIRE HYDRANT PROTECTION POSTS
		J.P. Casey	6-3-83	DRAWING NUMBER	SDW-102	



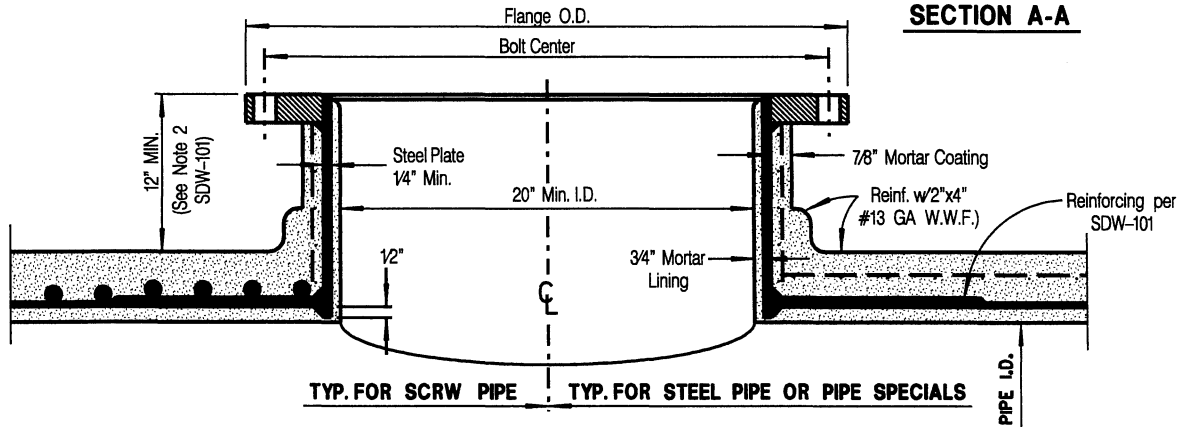
SECTION THROUGH COVER



HANDLE DETAIL

(Typical 2 Places)

SECTION A-A



TYP. FOR SCRW PIPE TYP. FOR STEEL PIPE OR PIPE SPECIALS

SECTION ON PIPE AXIS

TYPE	PRESSURE RANGE (P.S.I.)	FLANGE		BOLT CENTER	NO. OF BOLTS	STUD DIA. & LENGTH	THICKNESS (T)
		I.D.	O.D.				
175	0 - 175	22"	29-1/2"	27-1/4"	20	6"x 1-1/4"	1-3/16"
250	175 - 250	22"	33"	29-1/4"	24	7"x 1-1/2"	1-11/16"
325	250 - 325	22"	33"	29-1/4"	24	7"x 1-1/2"	1-7/8"

FURNISH: Required stud bolts w/full length thread & two (2) hex nuts each 1/16" thick full face gasket and 3/4 inch dia. stainless steel forcing bolt on D.C.

- NOTES:**
1. Apply two (2) coats of coal-tar epoxy 16 mils total (min) to all exposed metal surfaces. Amercoat 78 or Kop-coat 300 M or equal meeting U.S. Public Health Standards are approved for such application per manufacturer's standards.
 2. Details of manholes on pipelines less than 24 inches in diameter shall be shown on design drawings or submitted for approval.
 3. Manholes shall be beveled during fabrication, so that they are true to vertical upon installation.
 4. All welds to conform to ANSI/AWWA C206 - 91

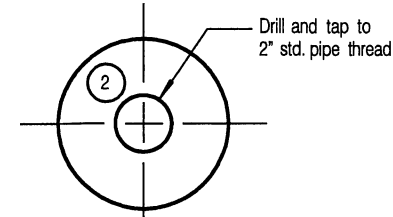
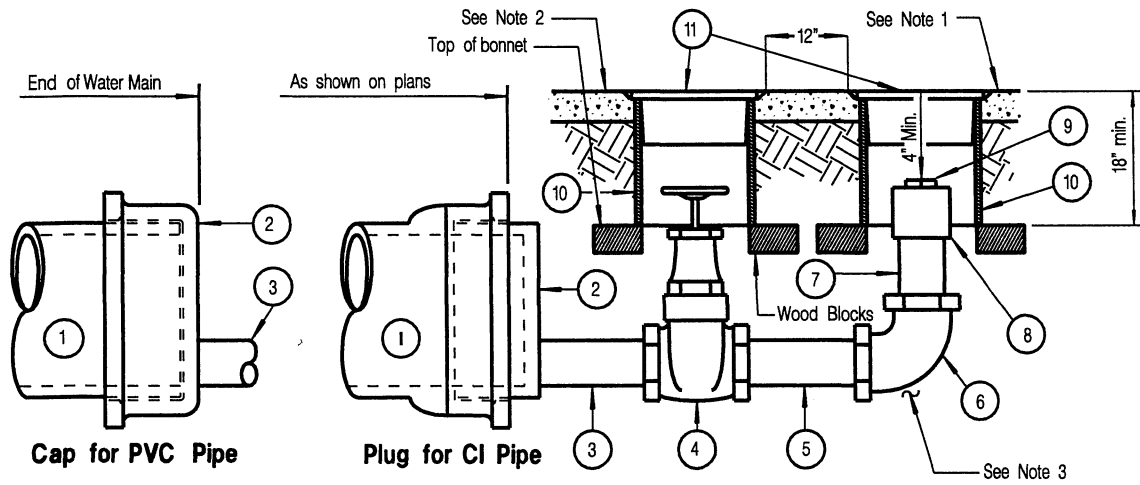
REVISION	BY	APPROVED	DATE
ORIGINAL		H. Horn	5-8-80
		J.P. Casey	6-8-83
		J.P. Casey	8-22-86

CITY OF SAN DIEGO - STANDARD DRAWING

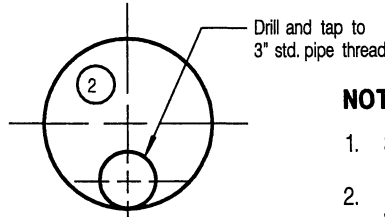
ACCESS MANHOLE

CITY OF SAN DIEGO
STANDARDS COMMITTEE
George J. ... 12-23-94
COORDINATOR R.C.E. 25802 DATE

DRAWING NUMBER **SDW-103**



Concentric plug drilled for 2" Blow-off for 3"-8" Mains



Eccentric plug drilled for 3" Blow-off for 10"-20" Mains

NOTES:

1. Set to finish grade
2. Provide concrete pads per WW-01, WW-02, WW-03
3. For Thrust Blocks, see WT-01

SCHEDULE				
ITEM	STD. DWG. NUMBER	SIZE AND DESCRIPTION		
1	WP-02	3" - 8" Incl.	10" - 20" Incl.	
2		Main size x 2"	Main size x 3"	
3		2" x 8"	3" x 8"	
4		2"	3"	
5		As needed	As needed	
6	WT-01	2"	3"	
7		2" x Variable to Grade Minus 4"	3" x Variable to Grade Minus 4"	
8		2"	3"	
9		2"	3"	
10	WW-01,02,03	8" x Variable to Grade minus 3/4"	8" x Variable to Grade minus 3/4"	
11	WW-01,02,03	8"	8"	

REVISION	BY	APPROVED	DATE
ORIGINAL		J. Mueller	3-3-83
		J.P. Casey	6-3-83
		J.P. Casey	8-26-86
NOTES	AO	F. Belock	04-96
NOTES	SM	A. Oskoui	12-03
NOTES	JS	A. Oskoui	1206

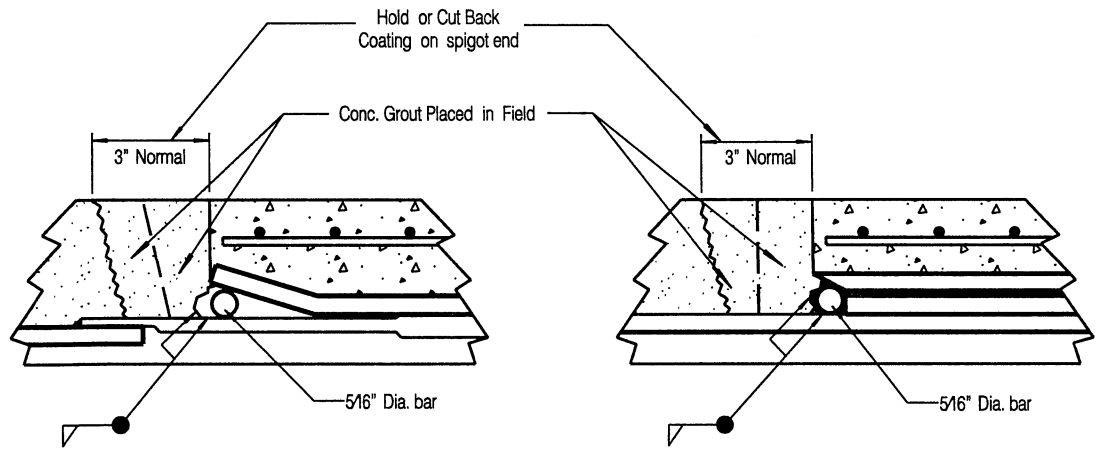
CITY OF SAN DIEGO - STANDARD DRAWING

**BLOW-OFF ASSEMBLIES
AT THE END OF
PVC AND CAST IRON MAINS**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

J. Mueller 12/16/16
COORDINATOR R.C.E. 65271 DATE

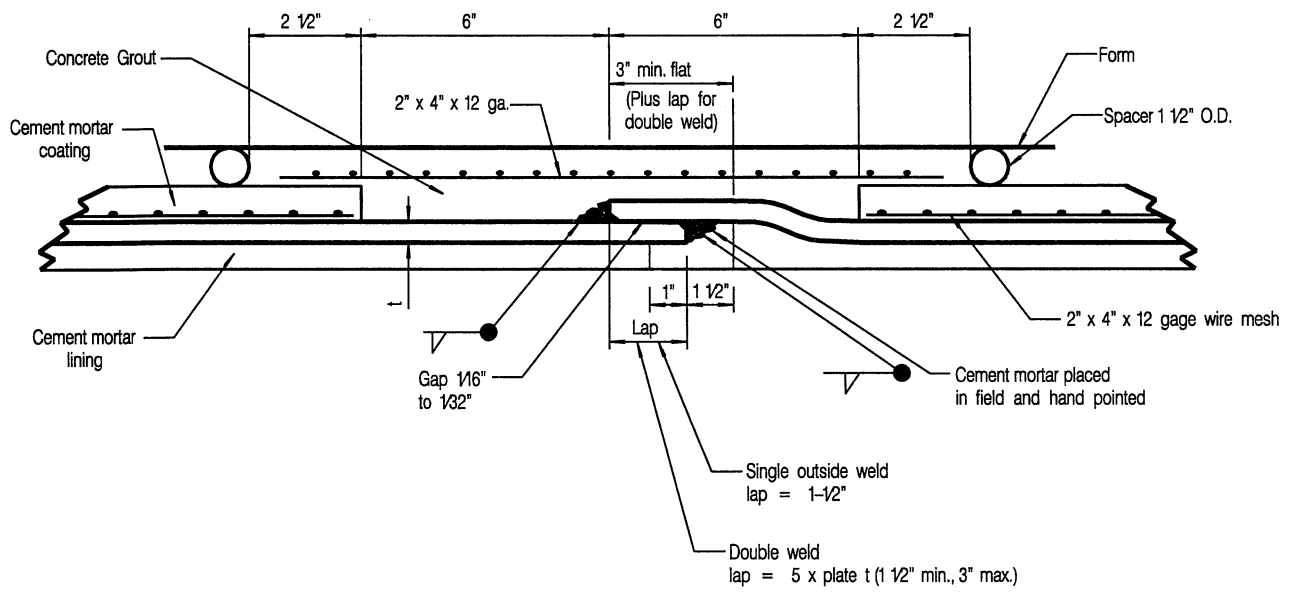
DRAWING NUMBER **SDW-106**



WELDED BELL AND SPIGOT RINGS

FORMED BELL AND WELDED SPIGOT RING

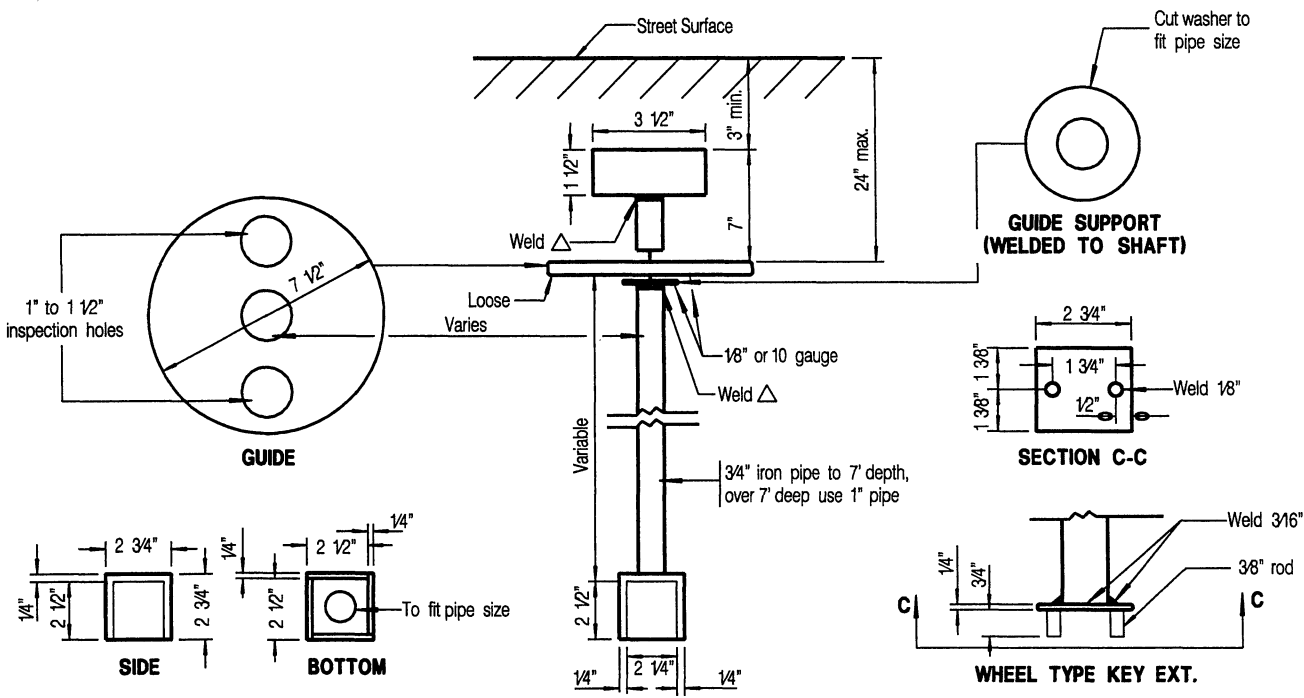
NOTE:
See Std. Dwg. SDW-111 for full details of above joints.



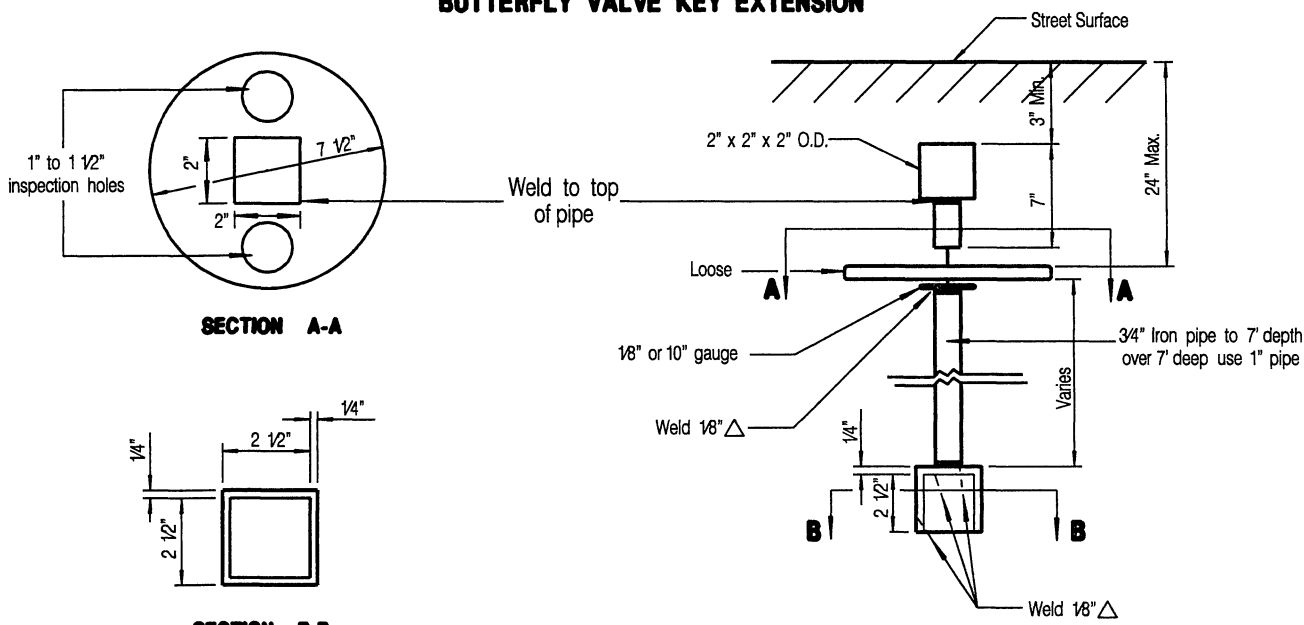
SLIP JOINT

NOTES:
1. All welds to conform to ANSI/AWWA C206 - 91

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		H. Hom	5-6-80		
		J.P. Casey	6-3-83		
					DRAWING NUMBER SDW-108



BUTTERFLY VALVE KEY EXTENSION



GATE VALVE KEY EXTENSION

- NOTES:**
1. Valve key extensions shall be installed: a) For all butterfly valves, and b) For all gate valves when top of gate valve nut is twenty-five inches (25") or more below ground or pavement surface.
 2. Paint all finished surfaces with asphalt varnish.
 3. Materials and Workmanship shall be as required by Sections 206 and 304 of Std. Specs.
 4. For valve box and cover, see WV-01, WV-02, WV-03
 5. All welds to conform to ANSI/AWWA C206 - 91

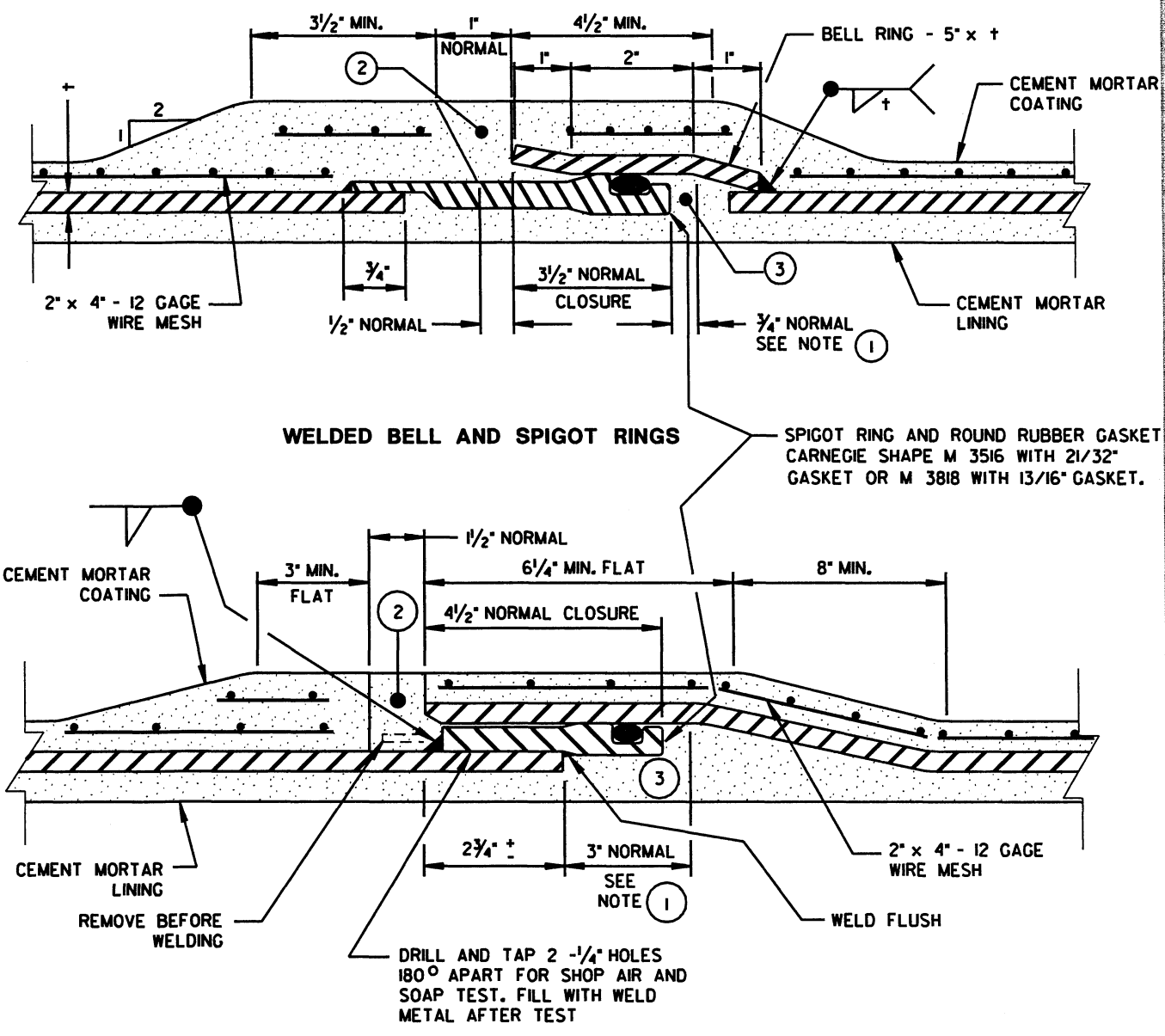
REVISION	BY	APPROVED	DATE
ORIGINAL		H. Horn	5-6-90
		J.P. Casey	6-3-83
		J.P. Casey	8-22-86
NOTES	AO	A. Oskoui	12/03
NOTES	JS	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

VALVE KEY EXTENSIONS

CITY OF SAN DIEGO
STANDARDS COMMITTEE
M. Abner 12/16/6
COORDINATOR R.C.E. 65271 DATE

DRAWING NUMBER **SDW-109**

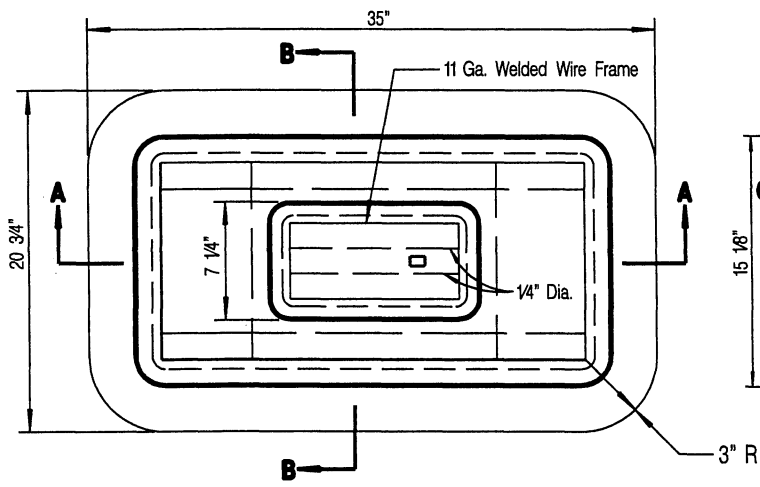


FORMED BELL END AND WELDED SPIGOT RING

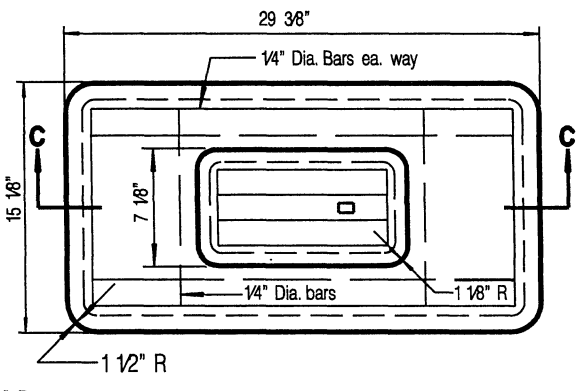
NOTES:

- ① MAXIMUM FIELD DEFLECTION IN A JOINT IS $\frac{3}{8}$ " PULL AND $\frac{3}{8}$ " PUSH, THE PULL TO BE UTILIZED FIRST.
- ② CONCRETE GROUT PLACED IN FIELD.
- ③ CEMENT MORTAR PLACED IN FIELD AND HAND POINTED.
- 4 TOLERANCE BETWEEN BELL ID AND SPIGOT OD TO BE $\frac{1}{32}$ " TO $\frac{1}{16}$ " ON THE DIAMETER.
- 5 ALL WELDS TO CONFORM TO ANSI/AWWA C206 - 91.

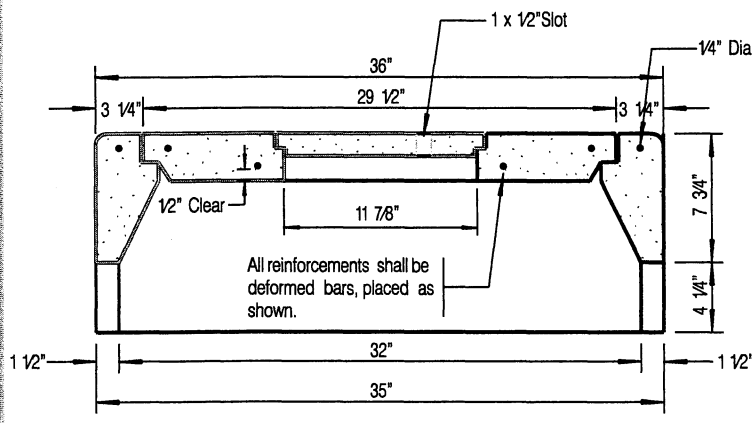
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>d. Wade</i> 12/14/6 COORDINATOR R.C.E. 65271 DATE
ORIGINAL		H. Horn	5-6-90		
		J.P. Casey	6-3-83	SPIGOT RING & GASKET JOINT FOR WELDED STEEL PIPE	DRAWING NUMBER SDW-111
NOTES	SM	A. Oskoui	12-03		
NOTES	JS	A. Oskoui	1206		



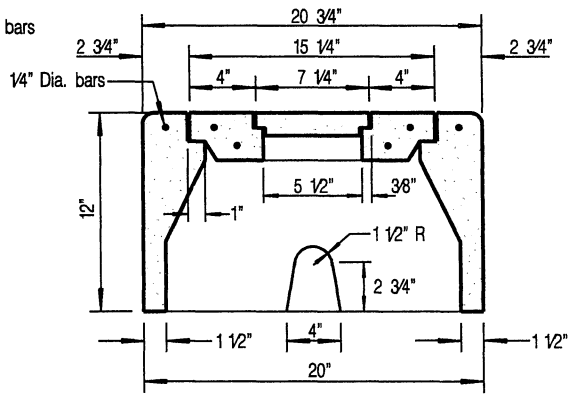
PLAN



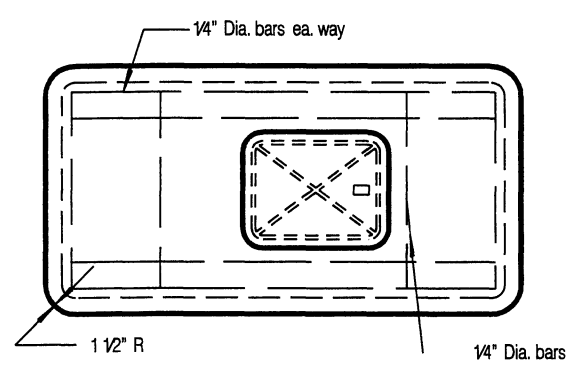
COVER W/ CONC. READING LID



SECTION A-A

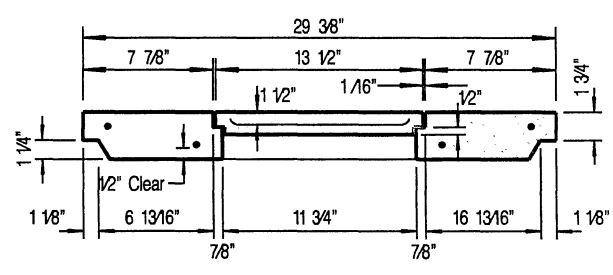


SECTION B-B



5 7/16" X 7 1/2"
C.I. Reading Lid

COVER W/ C.I. READING LID



SECTION C-C

NOTE: Unless otherwise indicated on the detail plans and/or specified in special conditions Covers with Concrete reading lid shall be used.

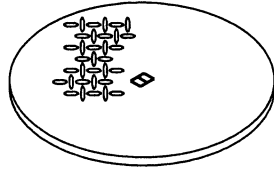
REVISION	BY	APPROVED	DATE
ORIGINAL		H. Hom	5-6-90
		J.P. Casey	6-3-83

CITY OF SAN DIEGO - STANDARD DRAWING

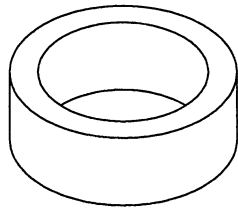
**CONCRETE WATER METER BOX
FOR 1 1/2" OR 2" WATER METER**

CITY OF SAN DIEGO
STANDARDS COMMITTEE
George F. Baker 12-23-94
COORDINATOR R.C.E. 25902 DATE

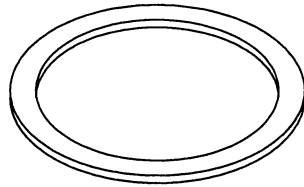
DRAWING NUMBER **SDW-113**



Weld top of cap to pipe

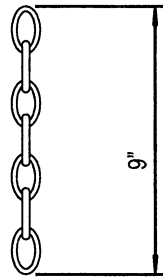


Weld plate ring to underside of cover

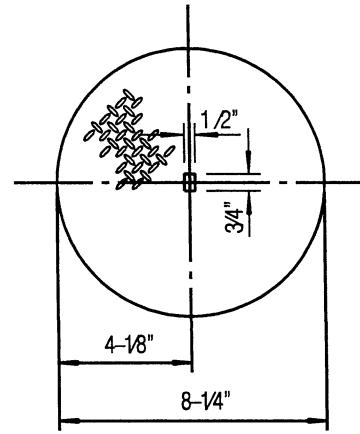


Weld chain to inside of cap's pipe and to underside of cover

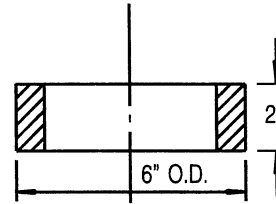
Hot dipped galvanized steel chain



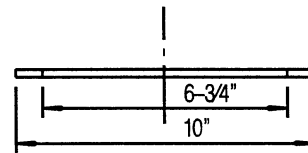
1/4" x 9" Chain



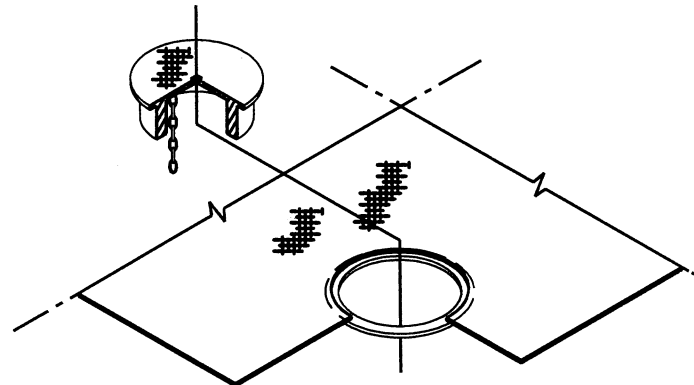
1/4" Floor Plate



3/16" Steel pipe



1/8" Steel Plate Ring



COVER (Typ.)

NO SCALE

NOTES:

1. 8-1/4 inches floor plate shall be cut out of the cover and the opening shall be finished for tight fit.
2. Read hole in cover shall be centered over each meter register.

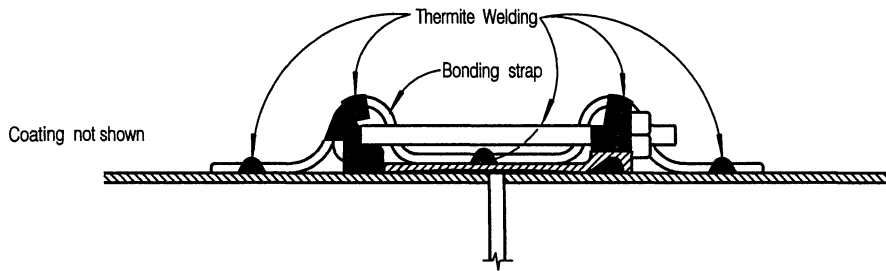
REVISION	BY	APPROVED	DATE
ORIGINAL		T. Mueller	2-4-86
		J.P. Casey	8-22-86

CITY OF SAN DIEGO - STANDARD DRAWING

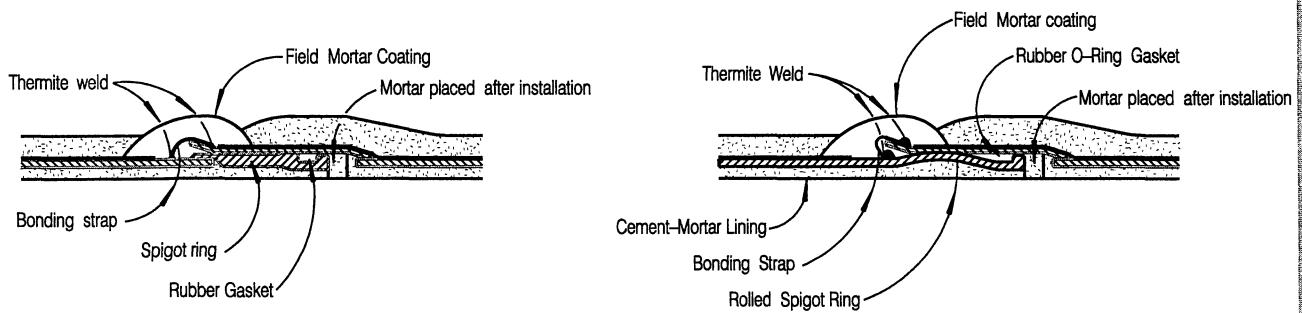
**READ HOLE
CAP & CHAIN DETAIL
(For Metal Meter Vault Covers)**

CITY OF SAN DIEGO
STANDARDS COMMITTEE
12-23-94
COORDINATOR R.C.E. 25902 DATE

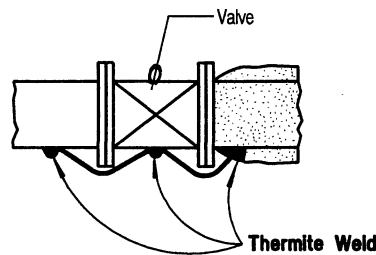
DRAWING NUMBER **SDW-115**



Bonding Strap Installed on Sleeve-Type Coupling



Bonding Strap for Bell and Spigot Rubber-Gasketed Joint



Bonding Strap Installed on Valve

NOTES:

1. Remove coating and clean approx. 2 inch area to a bright metal surface for welding.
2. The exact type, size and number of bonding wire / strap shall be determined by pipe size and type.
3. Where not protected by cement mortar coating, thermite weld shall be covered with cold applied coal tar solution.

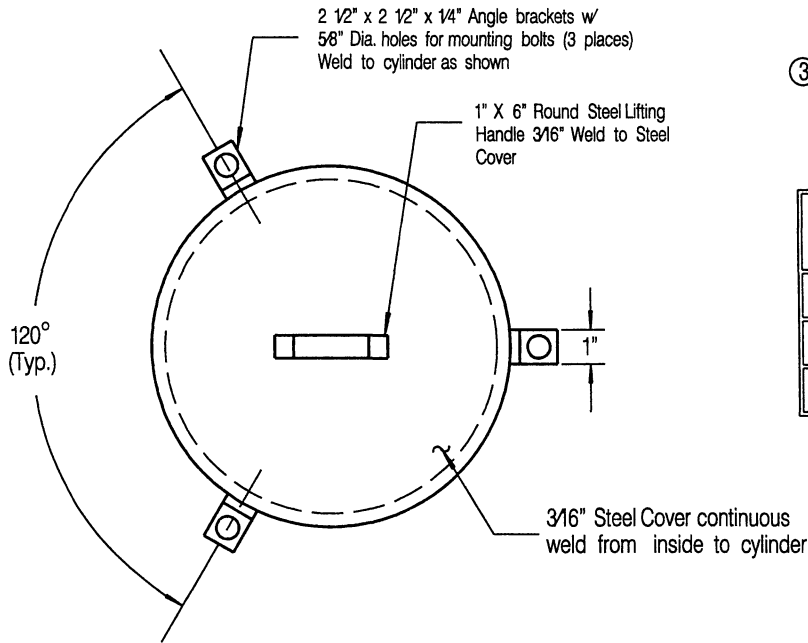
REVISION	BY	APPROVED	DATE
ORIGINAL		T. Mueller	2-12-86
		J.P. Casey	8-22-86

CITY OF SAN DIEGO - STANDARD DRAWING

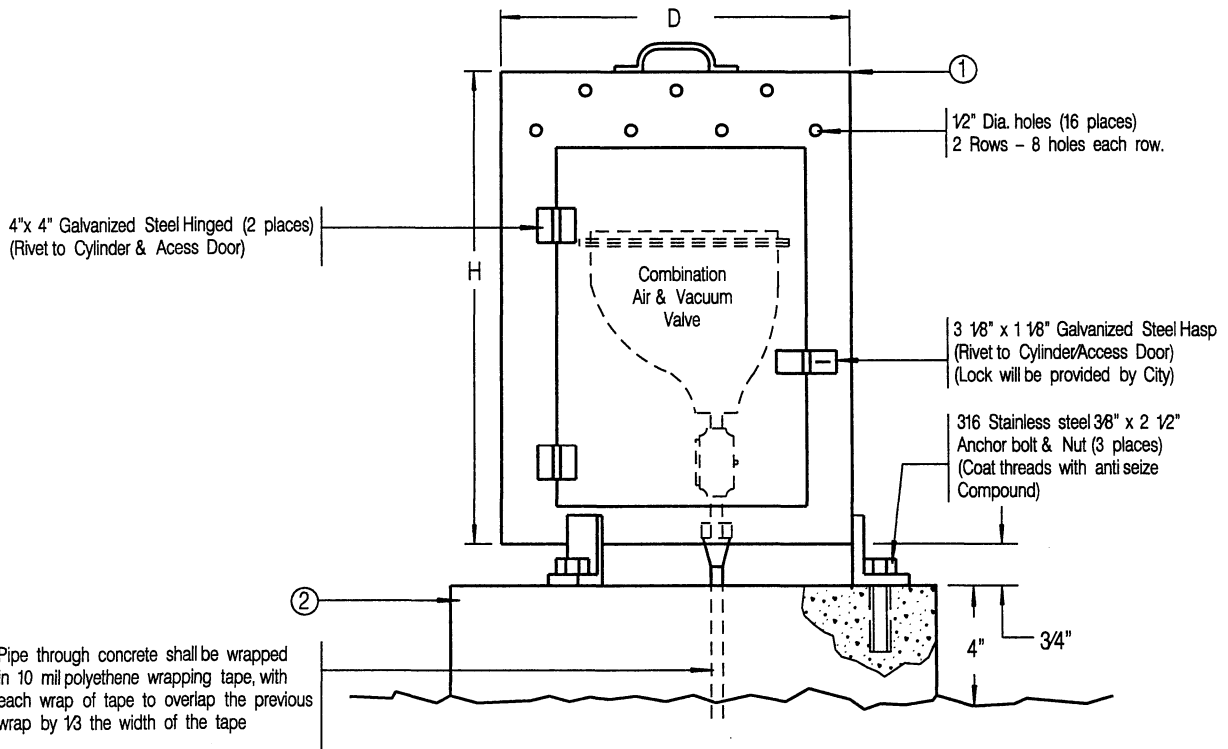
**BONDING STRAP FOR
STEEL AND SCRW PIPE**

CITY OF SAN DIEGO
STANDARDS COMMITTEE
George F. Perkins 12-23-94
COORDINATOR R.C.E. 25802 DATE

DRAWING NUMBER **SDW-116**



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



- ① 3/16 inch steel enclosure with access door, misc. hardware. Cabinet and hardware should be zinc rich epoxy powder primer (2-3 mil Dry Film Thickness) and polyester powder top coat (2-3 mil Dry Film Thickness).
- ② 3' x 3' x 4" Concrete pad (520-C-2500 Concrete)
- ③ D and H changes only with approval of Water Department, Operations Division Engineer.

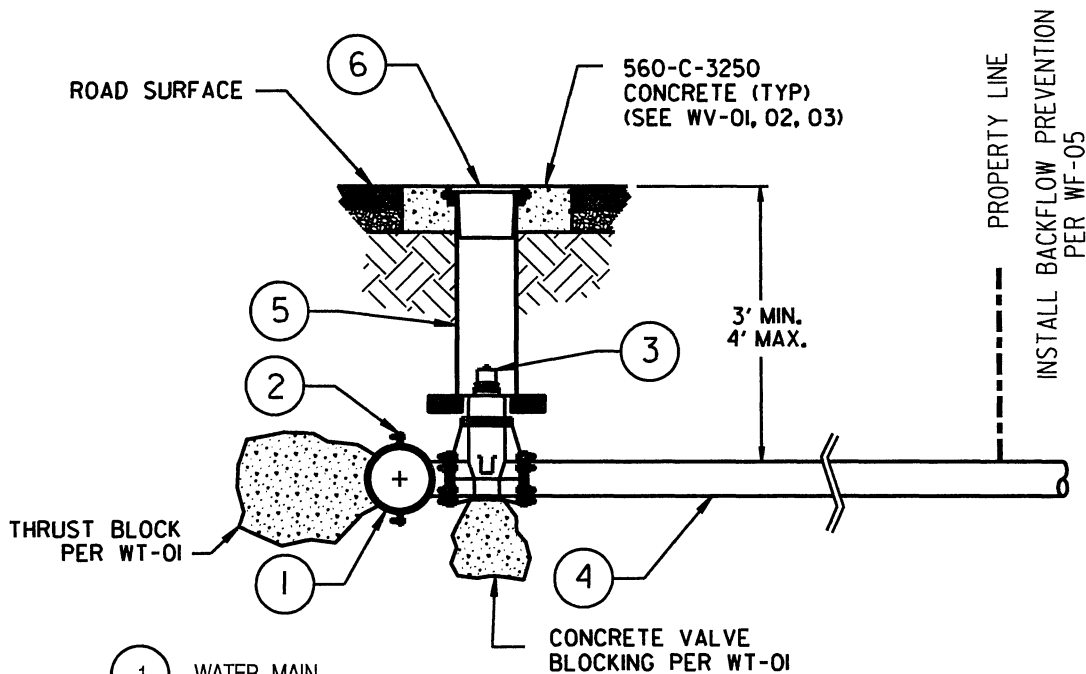
REVISION	BY	APPROVED	DATE
ORIGINAL		M. Rollinger	5-20-92
NOTES	JS	A. Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

AIR AND VACUUM VALVE ENCLOSURE

CITY OF SAN DIEGO
STANDARDS COMMITTEE
M. Kraljic 12/16/06
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER **SDW-117**



- 1 WATER MAIN
- 2 FLANGED TAPPING SLEEVE OR TEE (NO SIZE-ON-SIZE TAPS ALLOWED) (4 X 4, 6 X 6, ETC.). NO EXTENSIONS ALLOWED.
- 3 FULL RESILIENT SEAT GATE VALVE . SIZE OF VALVE SHALL MATCH SIZE OF FIRE SERVICE (4-INCH MINIMUM DIAMETER) . SEE NOTE #1.
- 4 4-INCH OR LARGER DIAMETER OF PIPE (DUCTILE IRON OR PVC PER APPROVED MATERIALS LIST).
- 5 VALVE WELL PER WV-01, WV-02.
- 6 VALVE WELL COVER PER WV-03.

- NOTES:
1. FOR SMALLER FIRE SERVICE REQUIREMENTS, USE REDUCER AT PROPERTY LINE.
 2. CONSTRUCT WATER MAIN & FIRE SERVICE PER SDW-100, SDW-109 & WV-01, WV-03, WT-01, & WP-02 (ALSO USE WP-01 WHEN REQUIRED).
 3. FOR CORROSION CONTROL REQUIREMENTS, SEE WATER DEPARTMENT DESIGN GUIDE.

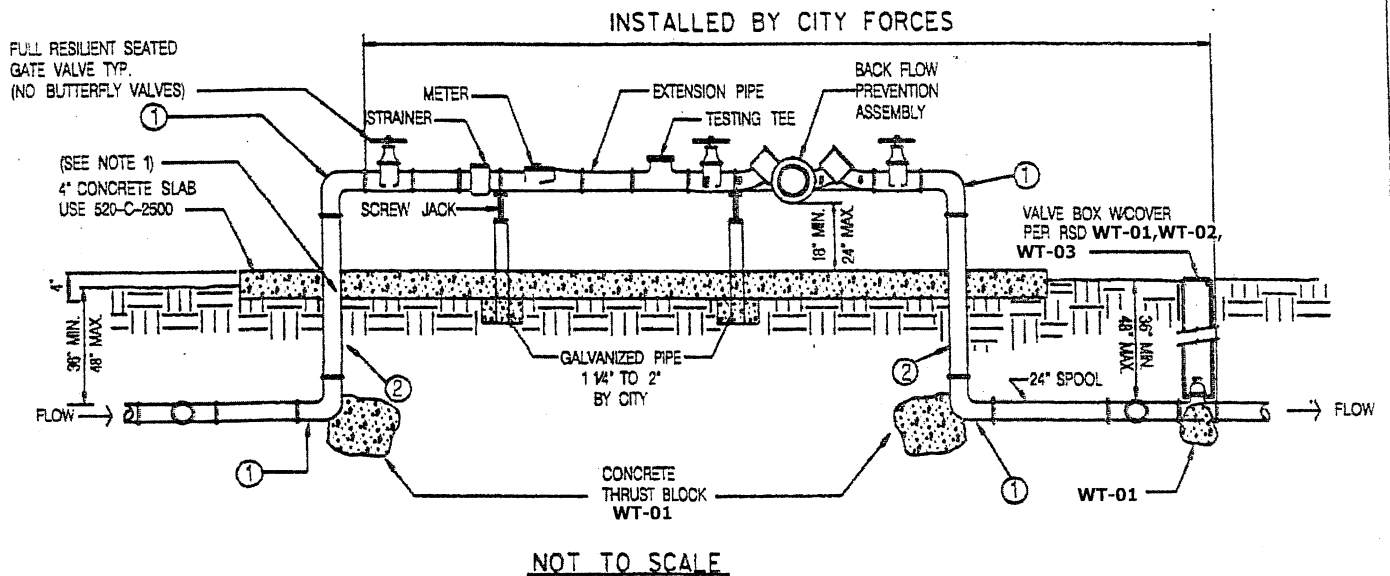
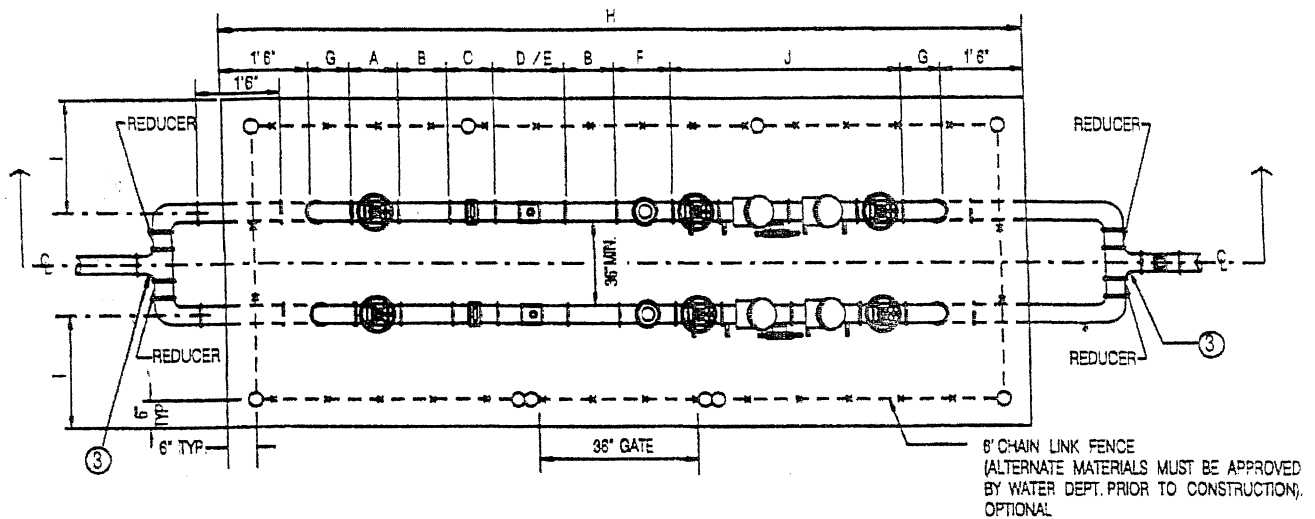
REVISION	BY	APPROVED	DATE
ORIGINAL			
NOTES	AO	F. Belock	4-96
NOTES	JS	A. Oskoui	1206

CITY OF SAN DIEGO - STANDARD DRAWING

FIRE SERVICE CONNECTION

CITY OF SAN DIEGO
STANDARDS COMMITTEE
M. Haeali 12/16/06
COORDINATOR R.C.E. 65271 DATE

DRAWING NUMBER **SDW-118**



NOTES:

1. ALL BURIED DUCTILE IRON PIPE, FITTINGS, VALVES AND APPURTENANCES SHALL BE COATED WITH A DIELECTRIC COATING, A LIQUID EPOXY COATING SYSTEM PER AWWA C-210 AT 24 MILS MIN. DRY FILM THICKNESS (MDFT), OR A COLD APPLIED THREE-PART SYSTEM PETROLEUM WAX TAPE PER AWWA C-217, OR A 100% POLYURETHANE COATING OF 24 MILS (MDFT) SUITABLE.
2. ANY CHANGES MUST HAVE WATER DEPARTMENT APPROVAL.
3. PIPING TO BE SYMMETRICAL TO SLAB CENTERLINE.
4. SUPPLY PIPE IS ONE COMMERCIAL SIZE LARGER THAN PROPOSED METER.
5. CONCRETE SLAB AND FENCE WILL BE INSTALLED BY CONTRACTOR.

- ① 90° FLANGED DUCTILE IRON ELBOW (TYP).
- ② FLANGED DUCTILE IRON SPOOL. BOTH ENDS SHALL BE FLANGED (UNI-FLANGE SHALL NOT BE USED).
- ③ DIAMETER OF TEE IS EQUAL TO THE DIAMETER OF THE SUPPLY PIPE.


SHEET 1 OF 2

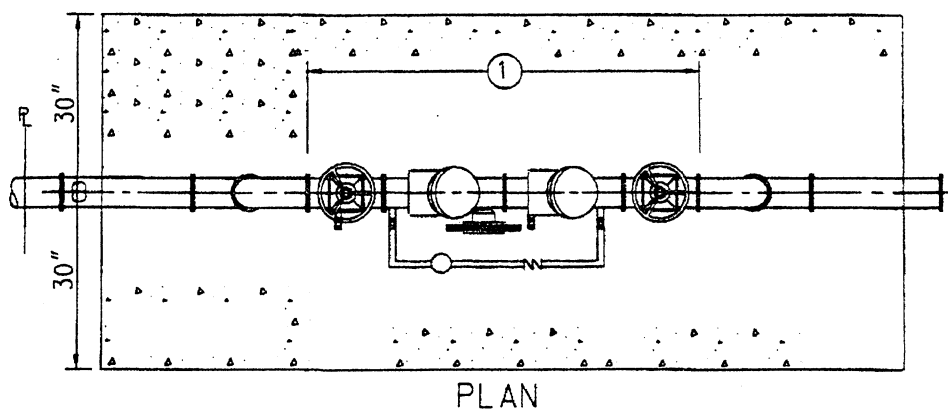
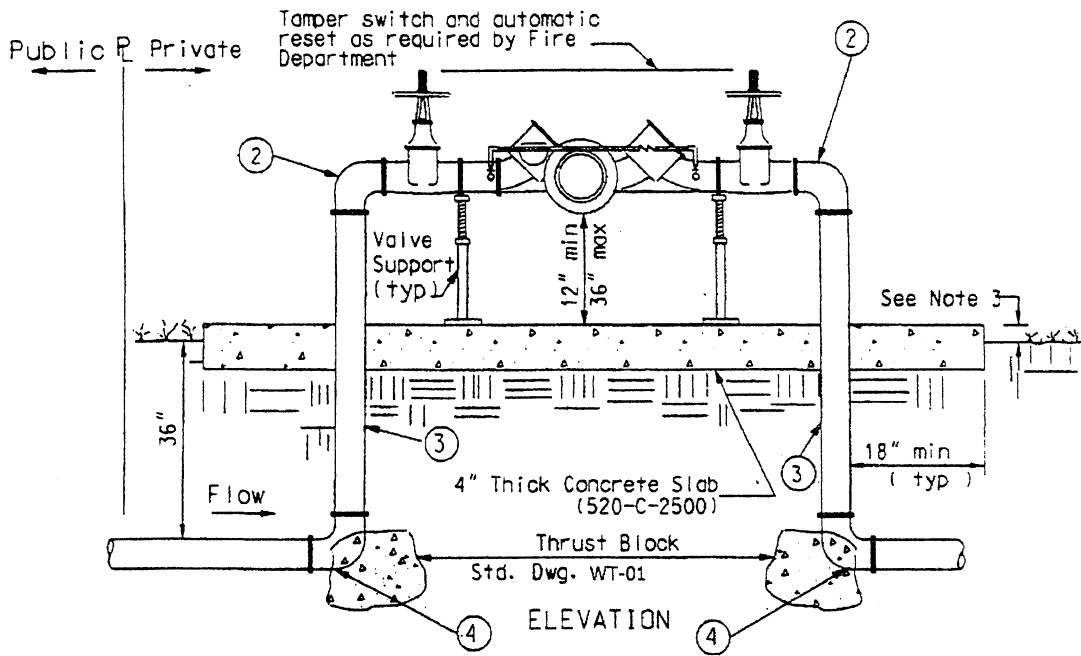
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	J2C				
REVISION	SM	A.Oskoui	12/03		
NOTES	JS	A.Oskoui	12/06		
				DRAWING NUMBER	SDW-119

LTR. CODE	PART DESCRIPTION	METER SIZE				
		3"	4"	6"	8"	10"
A	GATE VALVE	8"	9"	10 1/2"	11 1/2"	1' - 1"
B	PIPE EXTENSION	1' - 0"	1' - 0"	1' - 0"	1' - 0"	1' - 0"
C	STRAINER *	7"	9"	9"	10"	1' - 0"
D	TURBINE WATER METER *	1' - 0"	1' - 2"	1' - 6"	1' - 9"	2' - 2"
E	COMPOUND METER *	1' - 5"	2' - 0"	2' - 5"	3' - 1"	4' - 7"
F	TESTING TEE	11"	1' - 1"	1' - 4"	1' - 6"	1' - 10"
G	90 DEG. ELBOW (SHORT)	5 1/2"	6 1/2"	8"	9"	11"
H	OVERALL SLAB LENGTH *	11' - 10"	12' - 11"	14' - 9"	16' - 3"	18' - 10"
I	SLAB TO CL PIPE	3' - 0"	3' - 0"	3' - 0"	3' - 0"	3' - 6"
J	BACKFLOW *	3' - 2"	3' - 4"	4' - 1/2"	4' - 4 1/2"	4' - 7 1/2"

- NOTES: INDIVIDUAL DIMENSIONS MAY VARY PER MANUFACTURER
OVERALL DIMENSIONS INCREASE WITH USE OF THESE COMPONENTS

SHEET 2 OF 2

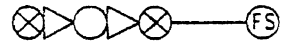
REVISION	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
	J2C				
REVISION	SM	Oskoui	12/03	DUAL ABOVE GROUND METER AND BACKFLOW PREVENTION ASSEMBLIES	 Chairperson RCE 64572 DATE 12-9-03
				DRAWING NUMBER	SDW-119



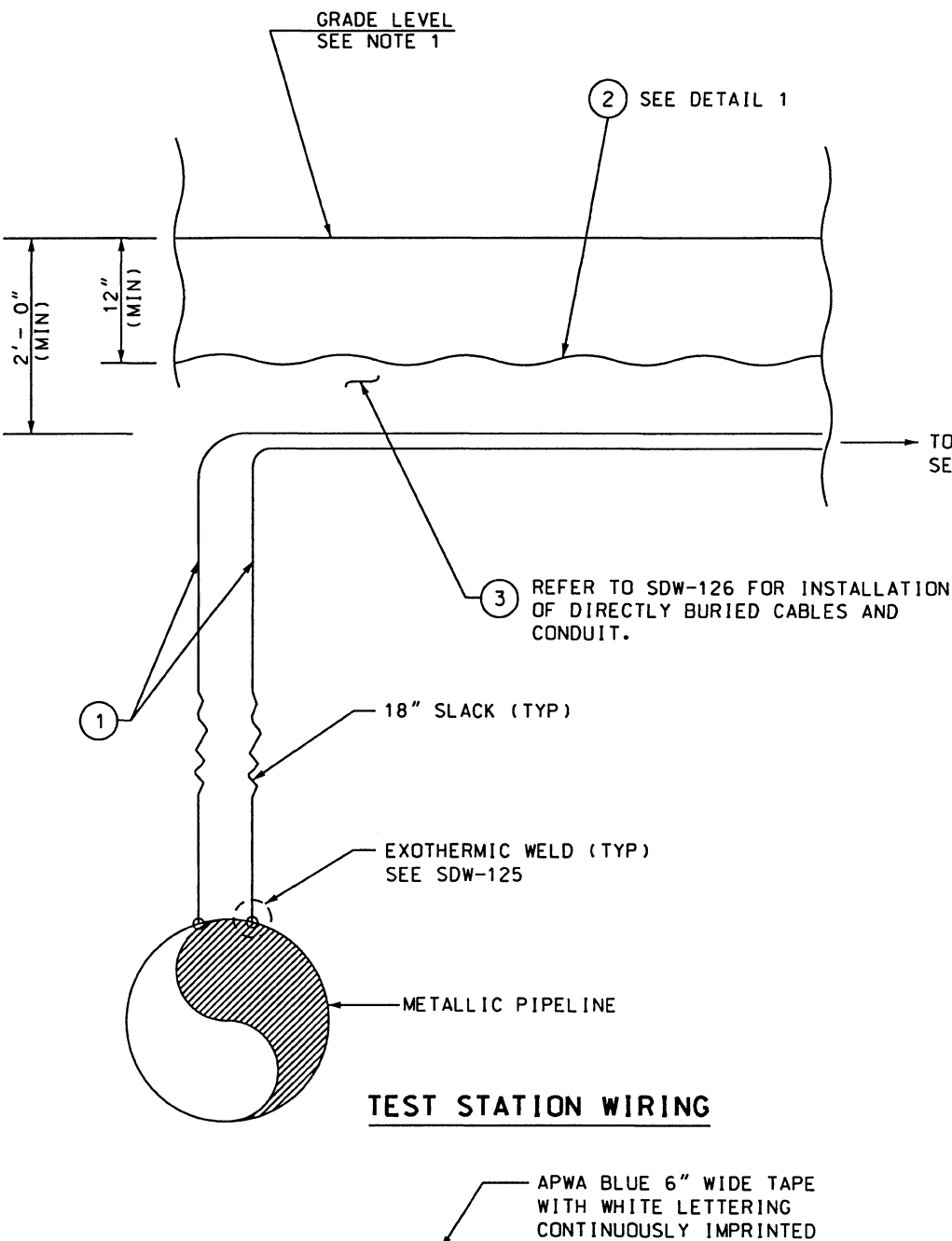
NOTES:

1. Backflow preventer assembly shall be tested upon installation by a certified backflow assembly tester. Contractor shall provide the Engineer with written test results completed by a certified backflow tester prior to backflow preventer assembly's acceptance by the Engineer.
2. All pipe below grade shall be wrapped as required by agency.
3. Concrete pad to be 2" above grade unless installed in lawn area where it will be at 1" above grade. Slope to drain.
4. Valve supports as required by agency.
- ① Reduced Pressure Principle Detection Assembly shall be included in the latest edition of the "Approved for Service Isolation California Public Water Systems" issued by the State of California Department of Health Services, Office of Drinking Water.
- ② 90° Flanged Cast Iron or Ductile Iron Elbow (typ)
- ③ Flanged Ductile Iron Spool. Both ends shall be flanged (uni-flange shall not be used)
- ④ 90° Ductile Iron Flanged Elbow
- 5 Location must be approved by Water Department, Water Operations Division, Meter/Backflow Group and shown on plans.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	LEC	J. NAVARRO	6/00		
				BACKFLOW PREVENTER REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY FOR FIRE SERVICE-3" AND LARGER	<i>Howe-Rubin</i> 8/9/00 DATE
					DRAWING NUMBER SDW-120



- MATERIALS:**
- ① CABLE AWG #8
COPPER ASTM B3
STRANDED ASTM B8
INSULATION ASTM D1248
TYPE 1, CLASS C,
GRADE 5.
 - ② POLYETHYLENE WARNING
TAPE. SEE DETAIL 1.
 - ③ SAND: 50 SIEVE
COMPLIES TO
SSPWC-200-1.5

- NOTES:**
1. IN PAVED, CITY-OWNED ROADWAYS, THE REPAIR OF THE ROAD SURFACE SHALL BE PER APPLICABLE SDRSD SDG-117 OR SDG-118. IN STATE HIGHWAYS, CONFORM TO APPLICABLE CALTRANS STANDARDS.
 2. FOR LOCATION OF TEST STATION, USE REGIONAL STD DWG WS-03. EXACT LOCATION SHALL BE APPROVED BY CORROSION ENGINEER.
 3. AT ROADWAYS, USE SDW-129 AND AT UNDEVELOPED AREAS USE SDW-127.
 4. FOR INSTALLATION OF DIRECTLY BURIED CABLES & CONDUIT SEE SDW-126.

CAUTION CAUTION
 BURIED CATHODIC PROTECTION LINE BELOW
 CALL 619-515-3525

DETAIL 1
 BURIED TAPE
 NTS

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

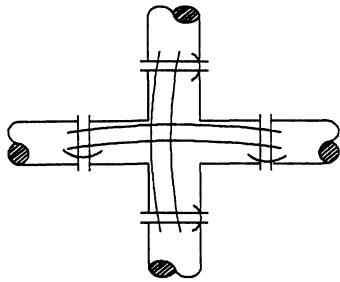
CITY OF SAN DIEGO - STANDARD DRAWING

**AT-GRADE CATHODIC PROTECTION
 TEST STATION
 INSTALLATION FOR ROADWAYS**

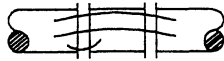
CITY OF SAN DIEGO
 STANDARDS COMMITTEE

A. Oskoui 12/16/06
 Coordinator R.C.E. 65271 Date

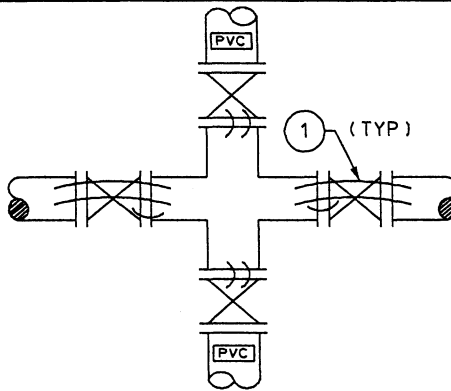
DRAWING
 NUMBER **SDW-121**



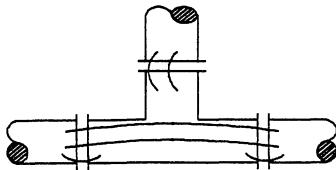
CROSS



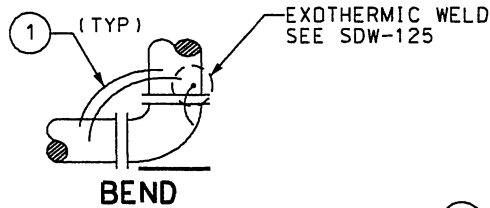
SPOOL



VALVE CROSSING

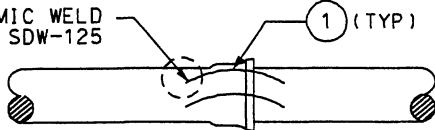


TEE



BEND

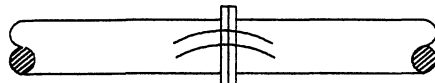
EXOTHERMIC WELD
SEE DWG SDW-125



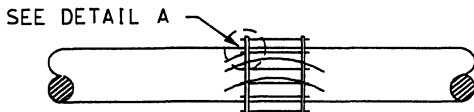
BELL AND SPIGOT PIPE JOINT



FLANGED VALVE

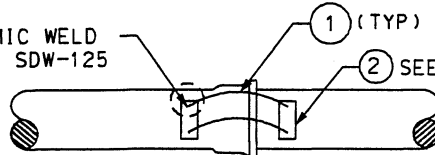


FLANGED OR MECHANICAL PIPE JOINT

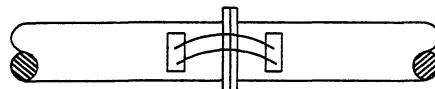


FLEXIBLE COUPLING PIPE JOINT

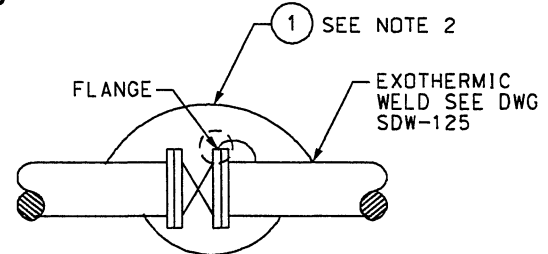
EXOTHERMIC WELD
SEE DWG. SDW-125



NON-MORTAR LINED

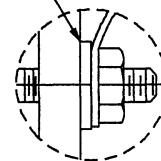


NON-MORTAR LINED



BOND ACROSS FLANGES

BOND WIRE W/ LUG
COATED WITH
BITUMASTIC



DETAIL A

WIRE CONNECTION TO
FLANGE BOLT
SEE NOTE 5

MATERIALS:

- ① BOND CABLE: AWG #6
COPPER ASTM B3
STRANDED ASTM B8
INSULATED ASTM D1248
TYPE 1, CLASS C
GRADE 5.
- ② STEEL PLATE: 1/8"
THICK. WELD TO THE
PIPE.

NOTES:

- 1. ALL BOND CABLE SHALL BE INSTALLED AT MINIMUM LENGTH.
- 2. BOND CABLES SHALL NOT BE INSTALLED ACROSS INSULATING JOINTS.
- 3. ONE ADDITIONAL CABLE SHALL BE REQUIRED FOR PIPE DIAMETERS FROM 36" TO 48" AND 2 MORE FOR DIAMETERS LARGER THAN 48".
- 4. WELD BEFORE APPLYING INTERNAL COATING.
- 5. ONLY AT THE APPROVAL OF CITY'S CORROSION ENGINEER.
- 6. REFER TO SDW-116, FOR SCRW PIPE BOND DETAIL

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

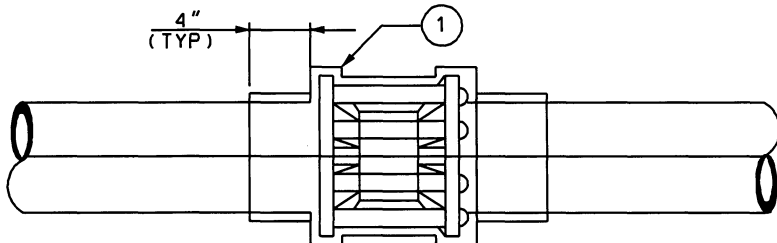
CITY OF SAN DIEGO - STANDARD DRAWING

JOINT BONDING OF NON-WELDED
PIPE JOINTS & FITTINGS

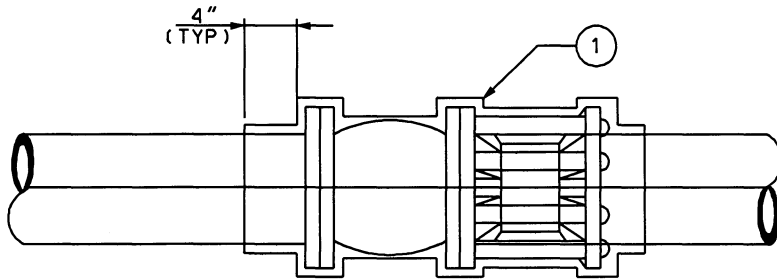
CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. C. E. 12/14/06
Coordinator R.C.E. 65271 Date

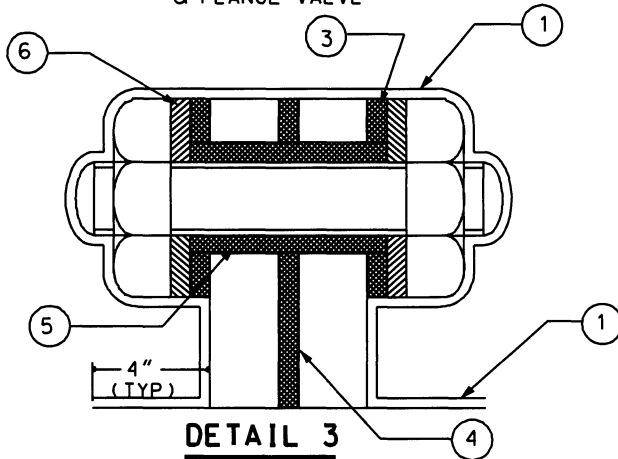
Drawing Number **SDW-122**



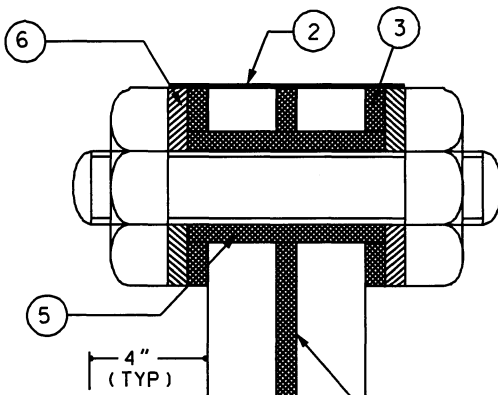
DETAIL 1
MECHANICAL
COUPLING



DETAIL 2
MECHANICAL COUPLING
& FLANGE VALVE



DETAIL 3
INSULATING FLANGE JOINTS,
UNDERGROUND INSTALLATION



DETAIL 4
INSULATING FLANGE JOINTS,
ABOVE-GROUND INSTALLATION

MATERIALS:

- ① PROTECTIVE COATING:
3-PARTS PETROLATUM AWWA
C217 OR APPROVED EQUAL.
- ② TAPE: WRAPAROUND 3"
WIDE, 0.050" THICK.
CROSS LINKED POLYOLEFIN.
HEAT SHRINKABLE.
PRECOATED WITH HOT MELT-
ADHESIVE.
- ③ WASHER: INSULATING
EPOXY GLASS
- ④ GASKET: 1/8" THICK EPOXY
GLASS INSULATING
MATERIALS WITH NEOPRENE
SEALING ELEMENT.
- ⑤ SLEEVE: INSULATING EPOXY
GLASS. 1/32" THICK.
ID=BOLT DIAMETER + 1/64.
- ⑥ WASHER: STEEL. 1/8"
THICK.

NOTES:

- 1. WHEREVER POSSIBLE,
INSULATING FLANGE
ASSEMBLIES SHOULD BE
ASSEMBLED PRIOR TO
INSTALLATION & TESTED
ELECTRICALLY USING GAS
ELECTRONIC TOOL OR
APPROVED EQUAL TO INSURE
THAT THE INSTALLATION IS
EFFECTIVE.
- 2. WRAP FLANGE ASSEMBLY AS
SHOWN WITH 3-PART PETRO-
LATUM TAPE PER AWWA C217.
- 3. INSULATING FLANGE BOLT
HOLE DIAMETER SHOULD BE
1/8" BIGGER THAN THE
INSULATING SLEEVE OD.
- 4. RECOMMENDED FLANGE
INSTALLATION PROCEDURE:
-CLEAN & INSPECT PIPE
FLANGE FACES. APPLY NON-
CONDUCTIVE LUBRICANT TO
ALL THREADS.
-INSTALL THE GASKET, ALIGN
FLANGES & GASKETS.
-USE ALIGNMENT PIN IN TWO
DIAMETRICALLY OPPOSITE
BOLT HOLES.
-INSERT INSULATING SLEEVES
INTO BOLT HOLES.
-INSERT THE BOLT WITH BOTH
INSULATING WASHERS.
-TIGHTEN TWO DIAMETRICALLY
OPPOSITE BOLTS TO 30%
TOTAL TORQUE.
-TIGHTEN ALL BOLTS TO 50%
AFTER REPLACING TWO
ALIGNMENT PINS WITH BOLTS
AND TO 100% OF FINAL
TORQUE VALUE.

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

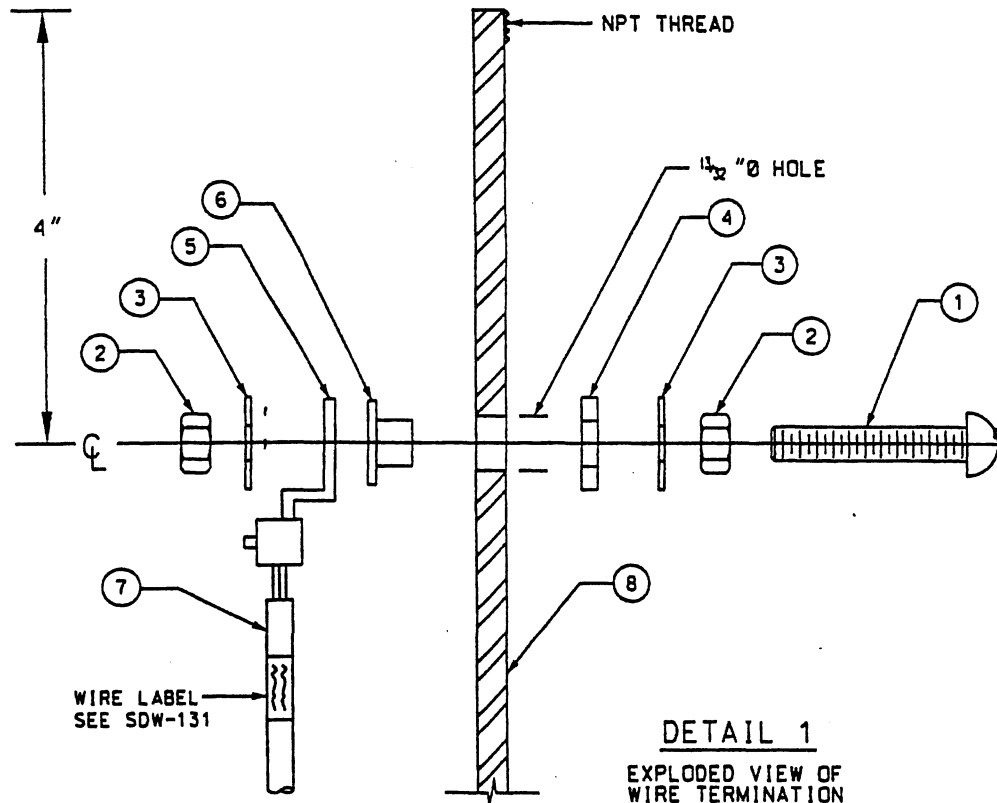
CITY OF SAN DIEGO - STANDARD DRAWING

**INSULATING FLANGE AND MECHANICAL
JOINTS EXTERNAL PROTECTION**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

W. H. ... 12/16/06
Coordinator R.C.E. 65271 Date

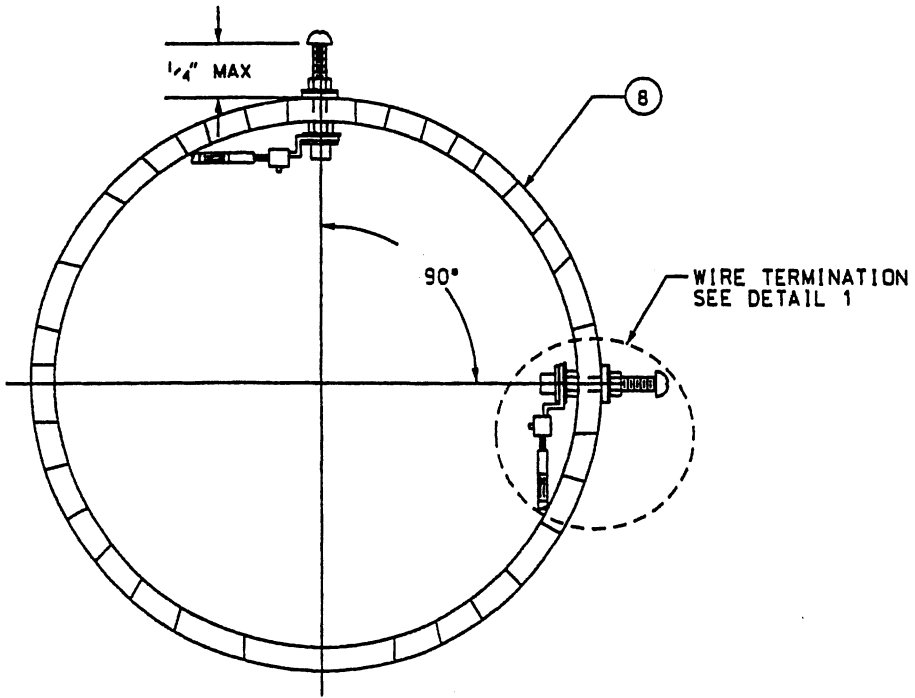
DRAWING NUMBER **SDW-123**



- MATERIALS:**
- ① SCREW: MACHINE BRASS. ROUND HEAD SLOTTED. 1/4" - 20T 1 1/2" LONG
 - ② NUT: BRASS 1/4" 20 THREADS.
 - ③ WASHER: BRASS 1/4"
 - ④ WASHER, INSULATION NYLON. 0.719" OD, 0.281" ID, 0.062" THICK NATURAL.
 - ⑤ LUG: OFFSET TONGUE SOLDERNESS. COPPER.
 - ⑥ WASHER: INSULATING. SHOULDER. NYLON. NATURAL. 0.260" OD. 0.625" OD FLANGE. 0.342" OD SHANK. 0.065" FLANGE THK. 0.270" SHANK THK.
 - ⑦ CABLE: AWG #8, COPPER ASTM B3. STRANDED ASTM B8. INSULATED ASTM D1248 TYPE 1. CLASS C. GR. 5.
 - ⑧ PIPE: 4" DIAMETER SCH 40 ASTM A53. GALVANIZED.

WIRE LABEL
SEE SDW-131

DETAIL 1
EXPLODED VIEW OF
WIRE TERMINATION



POST-MOUNTED TEST STATION
WIRE TERMINATION DETAIL

- NOTES:**
1. MOUNT WIRE TERMINATIONS AT 90 DEGREE ORIENTATION, FOR MORE THAN 4-WIRES. MOUNT WIRE TERMINATIONS 4" BELOW.
 2. OFFSET MACHINE SCREW HEAD BY 3/4" FROM PIPE EXTERIOR WALL.
 3. TAG WIRE WITH LINE NAME, PIPE SIZE, MATERIALS AND STATION USING SELF-ADHESIVE LABELS. LABELS SHALL BE WRAPPED AROUND THE INSULATION AND ENCASED WITH CLEAR HEAT-SHRINK SEE SDW-131

Revision	By	Approved	Date
Original		Oskoui	12/08

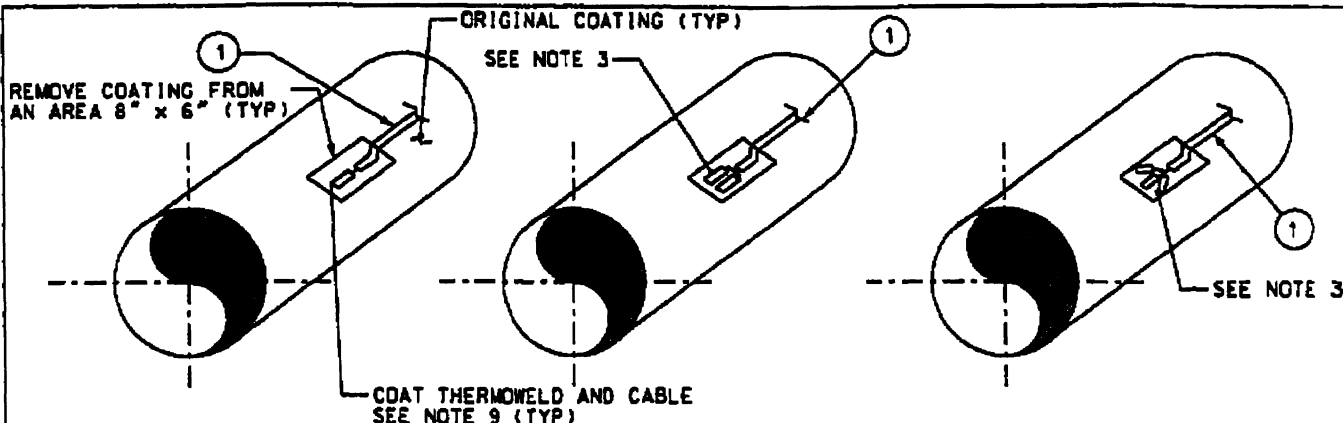
CITY OF SAN DIEGO - STANDARD DRAWING

POST-MOUNTED TEST STATION
WIRE TERMINATION DETAIL

CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. C. E. 12-9-03
Chairperson RCE 4572 Date

DRAWING NUMBER SDW-124



DETAIL 1

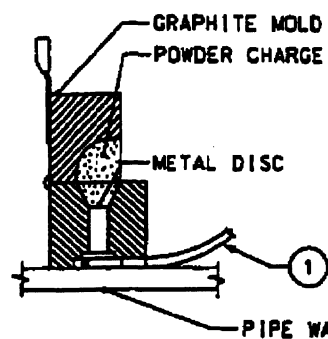
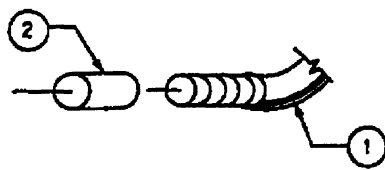
TYPICAL CONNECTIONS OF NO. 6 AWG CABLE AND SMALLER CABLES

DETAIL 2

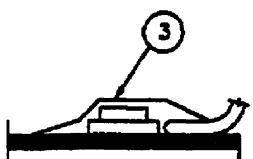
TYPICAL CONNECTIONS OF NO. 4 AWG CABLE

DETAIL 3

TYPICAL CONNECTIONS OF NO. 2 AWG CABLE AND LARGER CABLES



EXOTHERMIC CONNECTION DETAIL



EXOTHERMIC CONNECTION SECTION

MATERIALS:

- ① CABLE: AWG SIZE, ASTM B3/B8, ASTM D-1248, TYP 1, CLASS C, GR. 5 INSULATION
- ② SLEEVE: ADAPTER
- ③ APPROVED PRIMER & WELD CAP OR MORTAR OVER WELD LOCATION

NOTES:

1. CLEAN AREA OF STEEL SURFACE APPROXIMATELY 2" x 2" FOR EACH THERMOWELD CONNECTION. WIRE BRUSH FILE AND SCRAPE TO OBTAIN SSPC-SP-5 WHITE METAL SURFACE FINISH.
2. SELECT PROPER MOLD BASED ON STRUCTURE GEOMETRY, ORIENTATION AND MATERIAL TYPE.
3. STRIP CABLE END AND TWIST TO FIT THERMOWELD MOLD. CABLE SIZES LARGER THAN 6 AWG SHALL BE THERMOWELDED BY TWISTING CONDUCTORS INTO GROUPS APPROXIMATELY NUMBER 6 AWG CABLE SIZE. MINIMUM SPACING BETWEEN WELDS WILL BE DETERMINED BY MOLD GEOMETRY, NOMINALLY 3".
4. HOLD MOLD FIRMLY AGAINST PIPE WITH OPENING AWAY FROM THE OPERATOR. IGNITE WITH FLINT GUN.
5. REMOVE ALL WELD SLAG, SPLATTER, SHARP EDGES AND BURRS WITH CHIP HAMMER AND METAL FILE.
6. TEST STRENGTH OF CONNECTION BY LIGHTLY TAPPING WITH 1 LB HAMMER, AND PULL WITH 5 LB FORCE ON CABLE.
7. WIPE PIPE SURFACE WITH CLEAN, OIL FREE RAGS TO REMOVE ANY LOOSE DUST.
8. PRIME CLEANED SURFACE WITH APPROVED PRIMER.
9. COAT THERMOWELD AND 6" OF CABLE TAIL WITH COMPATIBLE COATING, SUCH THAT ALL CORNERS ARE FILLED. THE COATING SHALL EXTEND FOR AT LEAST 2" AROUND THE THERMOWELD AREA.
10. THERMOWELD CARTRIDGE SIZE SHALL BE COMPATIBLE TO STEEL MATERIALS. MULTIPLE POWDER CARTRIDGE CHARGERS SHALL NOT BE USED. IF A THERMOWELD MUST BE REPEATED, A NEW PIPE SURFACE MUST BE PREPARED AT LEAST 3" FROM THE ORIGINAL WELD ATTEMPT. MORE THAN ONE WELD ATTEMPT ON THE SAME SPOT SHALL NOT BE PERMITTED.
11. IN NON-CONCRETE LINED PIPES, ALL EXOTHERMIC WELDS SHALL BE MADE IN A STEEL PAD.

CABLE STRAND DETAILS			
CABLE NO. OF SIZE	NO. OF STRANDS	NO. OF EXOTHERMIC GROUPS PER CABLE CONNECTION	CABLE STRANDS PER GROUP
8	19	1	19
6	7	1	7
	19		19
4	7	2	3-4
	19		10-9
2	7	3	3-2-2
	19		7-6-6

Revision	By	Approved	Date
Original		A.Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

EXOTHERMIC WELDING OF CABLES AND COATING OF WELDING

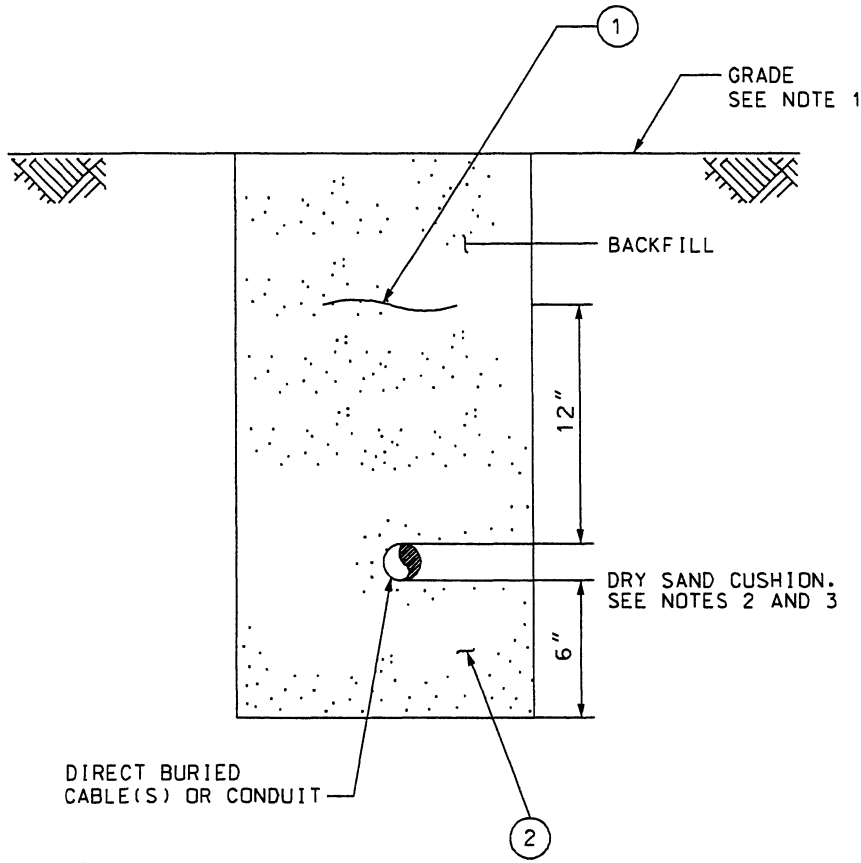
CITY OF SAN DIEGO STANDARDS COMMITTEE

R. G. 12-9-03

Chairperson RCE 64572 Date

DRAWING NUMBER SDW-125

- MATERIALS:**
- ① POLYETHYLENE WARNING TAPE. REFER TO DETAIL 1 ON SDW-121.
 - ② SAND: 50 SIEVE COMPLIES TO SSPWC 200-1.5



CABLE(S) AND CONDUIT TRENCH SECTION

NOTES:

- 1. IN PAVED, CITY-OWNED ROADWAYS, THE REPAIR OF THE ROAD SURFACE SHALL BE PER APPLICABLE SDRSD SDG-117 OR SDG-118. IN STATE HIGHWAYS, CONFORM TO APPLICABLE CALTRANS STANDARDS.
- 2. CLEAN SHARP STONES AND RUBBLE FROM THE BOTTOM OF DITCH.

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

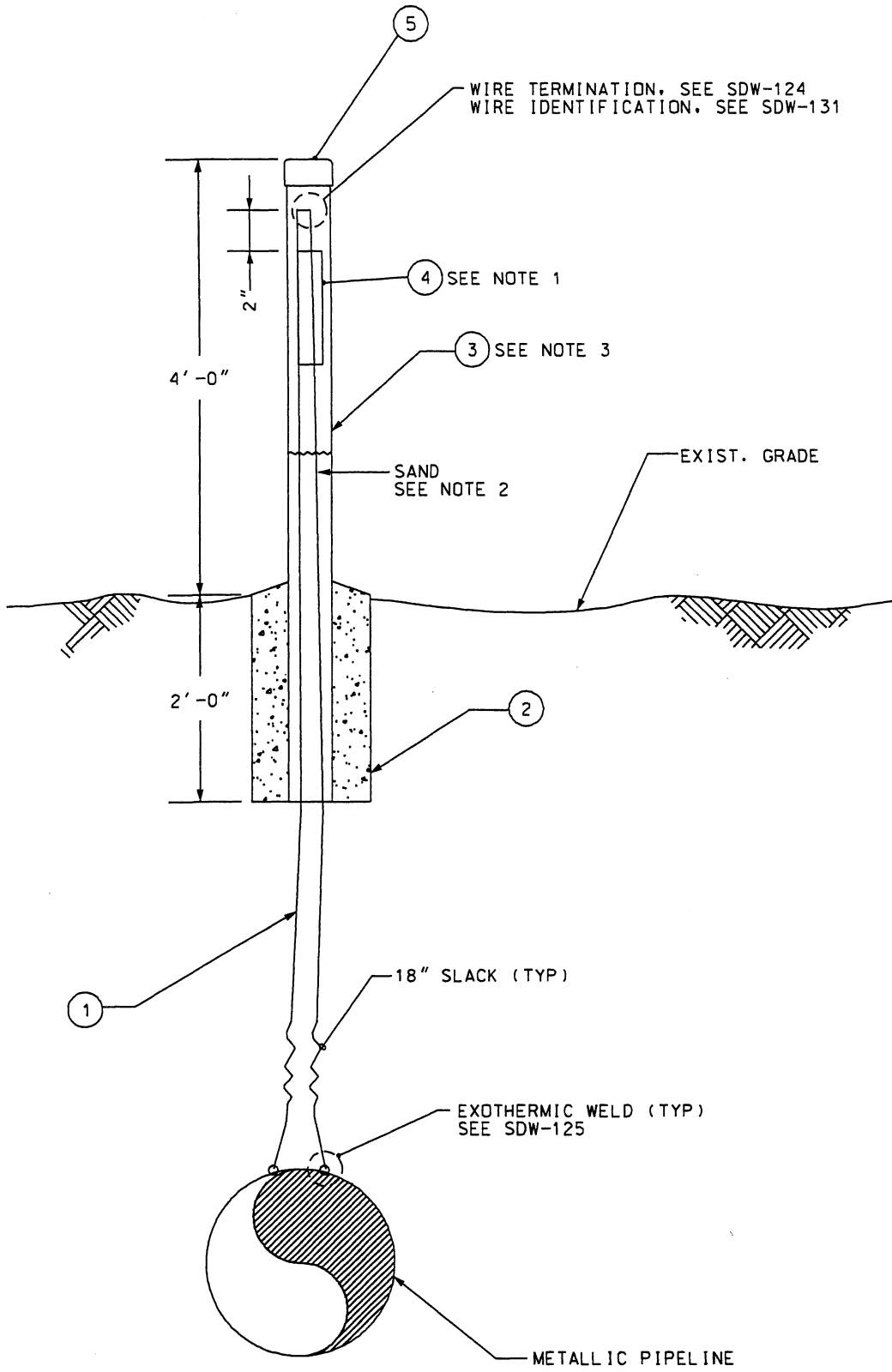
CITY OF SAN DIEGO - STANDARD DRAWING

INSTALLATION OF DIRECTLY BURIED CABLES AND CONDUIT

CITY OF SAN DIEGO STANDARDS COMMITTEE

A. Oskoui 12/16/06
Coordinator R.C.E. 65271 Done

DRAWING NUMBER SDW-126



- MATERIALS:**
- ① CABLE: AWG #8 COPPER ASTM B3 STRANDED ASTM B8 INSULATION ASTM D 1248 TYPE 1, CLASS C, GR. 5.
 - ② FOOTING: CONCRETE 12" DIA., SSPWC 295-C-17.
 - ③ PIPE: 4" DIAMETER, SCH 40, ASTM A 53 GALVANIZED.
 - ④ DECAL: SEE SDW-132.
 - ⑤ CAP: THREADED 4" DIAMETER GALVANIZED.

- NOTES:**
- 1. PLACE TWO DECALS, ONE FACING ROADWAY.
 - 2. FILL THE PIPE WITH 50 SIEVE SAND FROM BOTTOM OF CONCRETE FOOTING TO 12" ABOVE GRADE.
 - 3. THIS POST-MOUNTED STATION IS FOR USE ONLY IN AREAS WITH NO VEHICULAR TRFFIC.

POST-MOUNTED TEST STATION

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

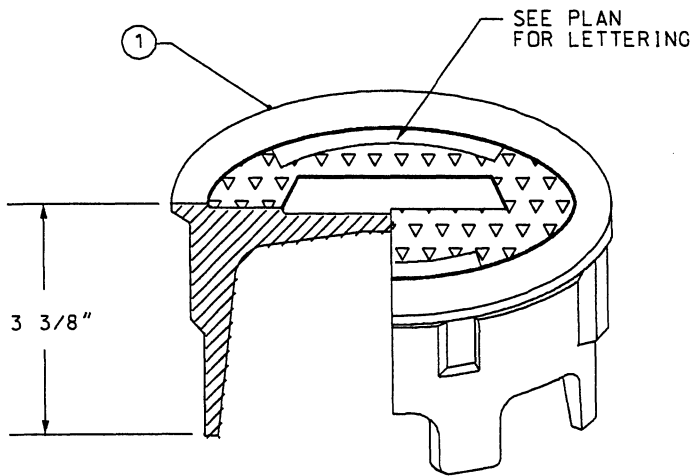
CITY OF SAN DIEGO - STANDARD DRAWING

ABOVE GRADE CATHODIC PROTECTION TEST STATION INSTALLATION FOR UNDEVELOPED AREAS

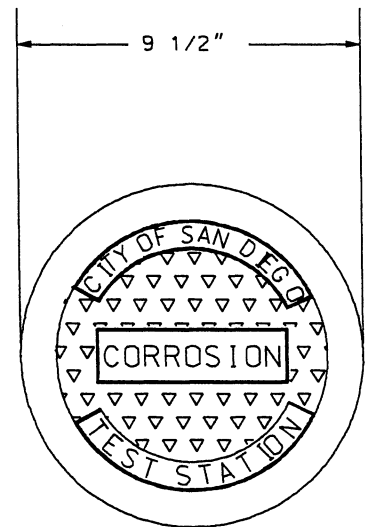
CITY OF SAN DIEGO STANDARDS COMMITTEE

W. Haddi 12/16/6
Coordinator R.C.E. 65271 **Date**

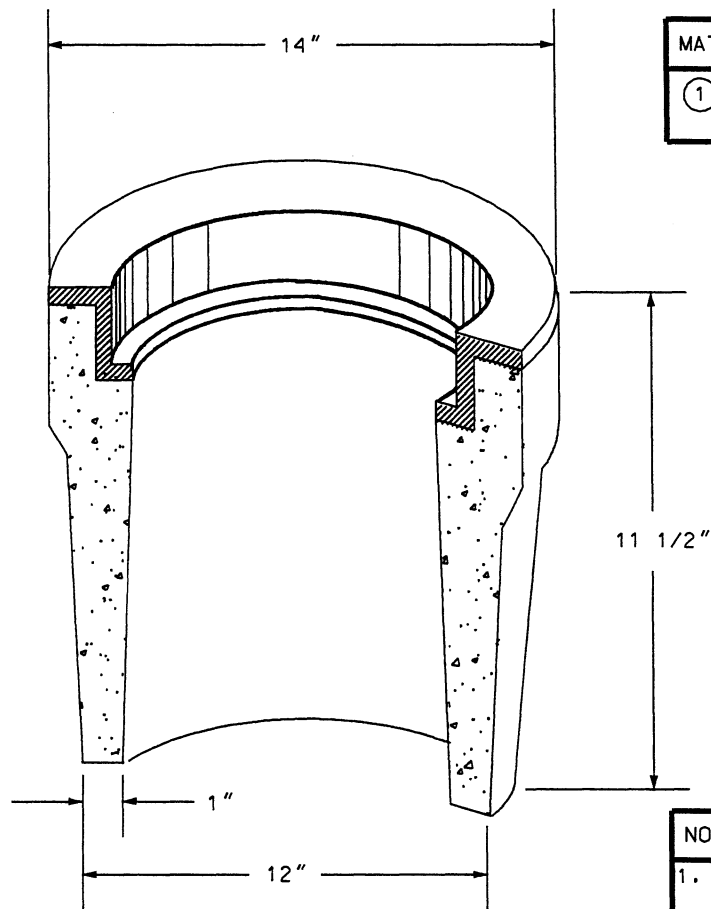
DRAWING NUMBER SDW-127



TEST BOX COVER ISOMETRIC



TEST BOX COVER PLAN



TEST BOX ISOMETRIC SECTION

MATERIALS:
 ① COVER: ASTM A 48 CLASS 30.

NOTES:
 1. COVER WEIGHT: 12 LB.
 2. BODY WEIGHT: 58 LB.
 3. THE COVER SHALL HAVE CASTED MARKING IN 1/2" HIGH RAISED LETTERS.

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

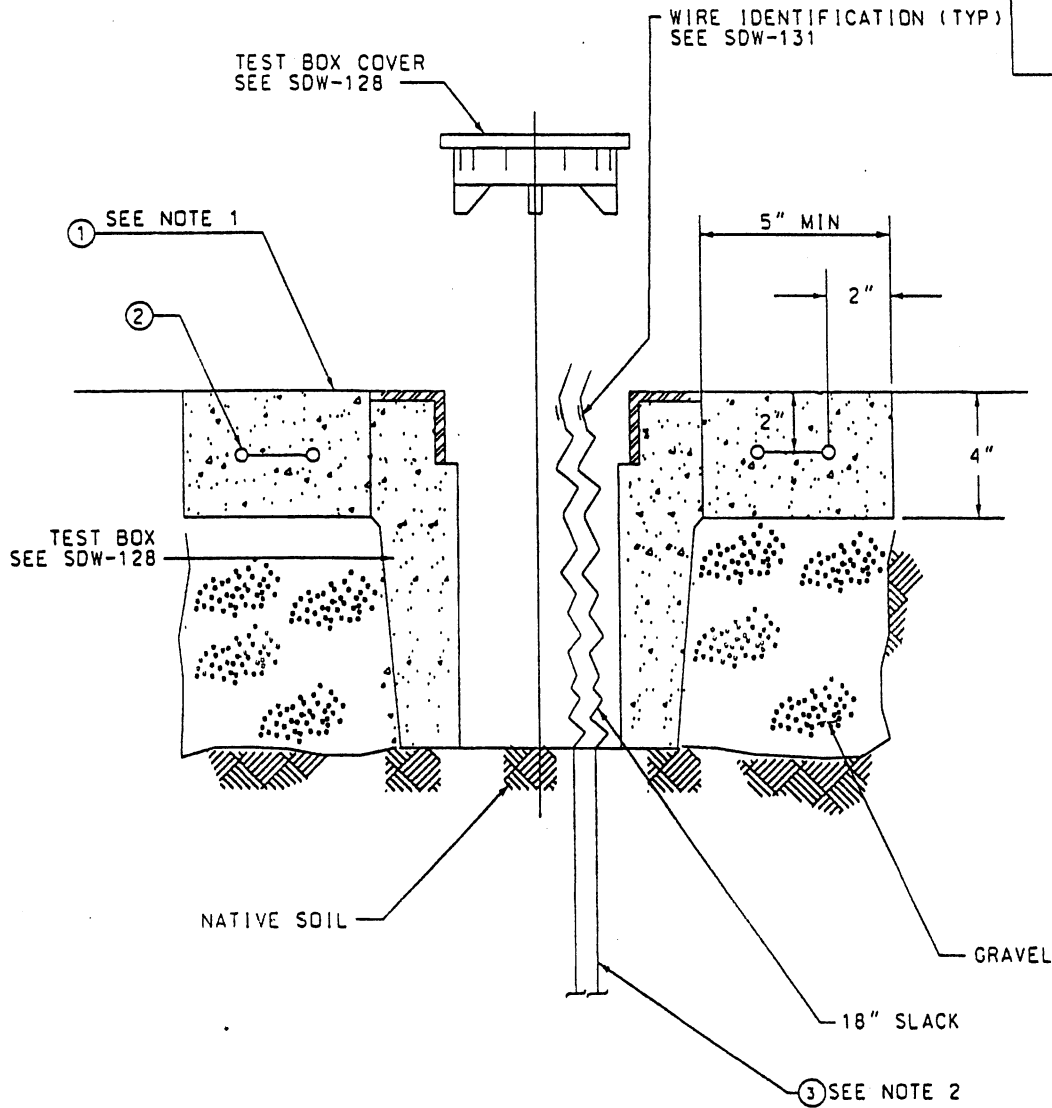
CITY OF SAN DIEGO - STANDARD DRAWING

**AT-GRADE
 CONCRETE TEST BOX**

**CITY OF SAN DIEGO
 STANDARDS COMMITTEE**
A. Oskoui 12/16/06
 Coordinator R.C.E. 65271 Date
**DRAWING
 NUMBER SDW-128**

MATERIALS:

- ① CONCRETE: 2' X 2' X 4" THK. PER SSPWC 330-C-23.
- ② REINFORCING FABRIC 4" X 4" GAUGE 10 WIRE.
- ③ CABLE: REFER TO NOTE 2.



TEST STATION SECTION

NOTES:

- 1. SLOPE CONCRETE PAD AWAY FROM COVER.
- 2. FOR CONTINUATION OF CABLES, REFER TO SDW-127 OR SDW-130, AS APPLICABLE.

Revision	By	Approved	Date
Original		Oskoui	12/03

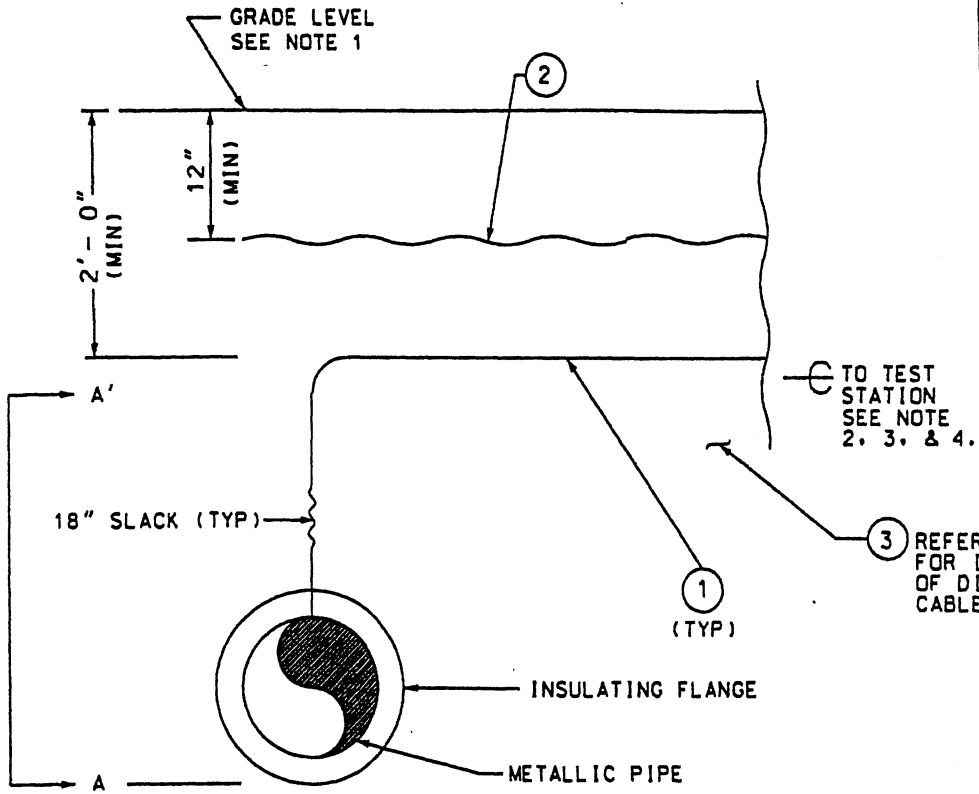
CITY OF SAN DIEGO - STANDARD DRAWING

AT-GRADE CATHODIC PROTECTION TEST STATION WIRING DIAGRAM FOR ROADWAYS

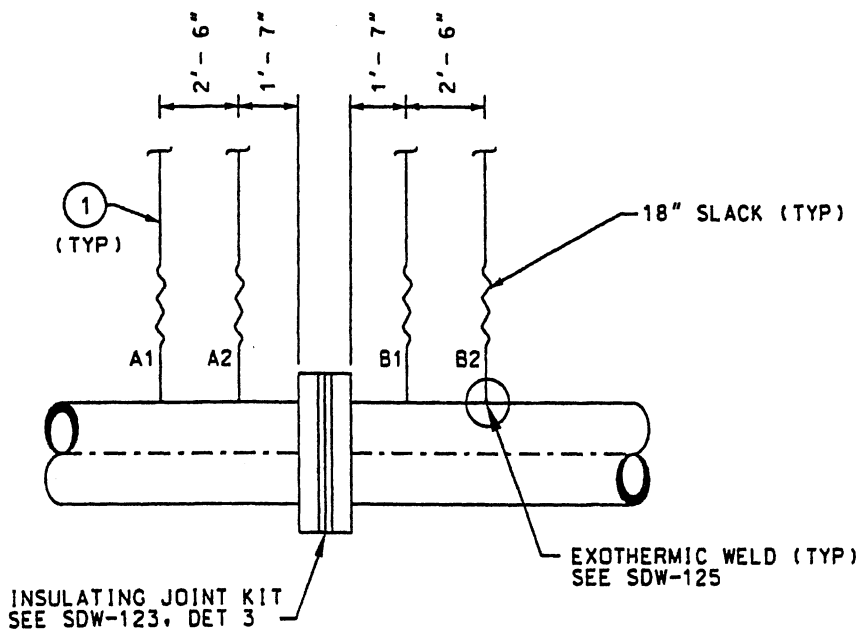
CITY OF SAN DIEGO STANDARDS COMMITTEE
Rh 12-9-03
 Chairperson RCE 6492 Date

DRAWING NUMBER SDW-129

- MATERIALS:**
- ① CABLE: AWG #2, COPPER ASTM B3, STRANDED ASTM B8, INSULATED PER ASTM D1248, TYPE 1 CLASS C, GRADE 5.
 - ② POLYETHYLENE WARNING TAPE, SEE DETAIL 1 SDW-121.
 - ③ SAND: 50 SIEVE COMPLIES TO SSPWC 200-1.5.



SECTION



ELEVATION 'A'-A

- NOTES:**
1. IN PAVED, CITY OWNED ROADWAYS, THE REPAIR OF THE ROAD SURFACE SHALL BE PER APPLICABLE TO SDRSD SDG-117 OR SDG-118. IN STATE HIGHWAYS, CONFORM TO APPLICABLE CALTRANS STANDARD.
 2. FOR LOCATION, OF TEST STATION, USE REGIONAL STD DWG W15. EXACT LOCATION SHALL BE APPROVED BY CORROSION ENGR.
 3. AT ROADWAYS, USE SDW-129 & AT UNDEVELOPED AREAS USE SDW-127.
 4. FOR INSTALLATION OF DIRECTLY BURIED CABLES & CONDUIT SEE SDW-126.

Revision	By	Approved	Date
Original	Oskoui		12/03

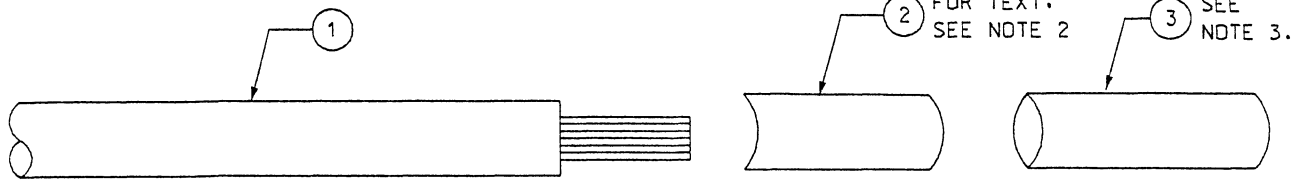
CITY OF SAN DIEGO - STANDARD DRAWING

INSULATING FLANGE FOUR-WIRE TEST STATION INSTALLATION

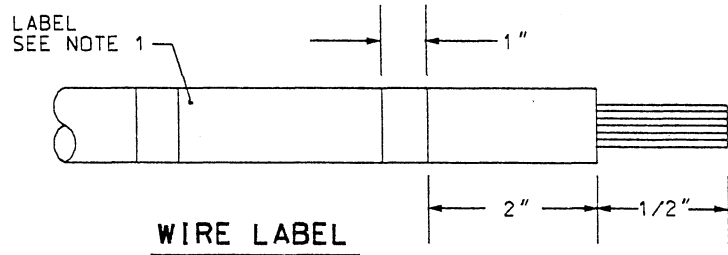
CITY OF SAN DIEGO STANDARDS COMMITTEE

R. G. 12-9-03
Chairperson RCE 84572 Date

DRAWING NUMBER SDW-130



WIRE LABEL DETAIL STATION



WIRE LABEL

LEGEND

PIPE MATERIAL

- CCI - COATED CAST IRON
- CDI - COATED DUCTILE IRON
- SCRC - STEEL CYLINDER REINFORCED CONCRETE
- PSCS - PRE-STRESSED CONCRETE-STEEL CYLINDER
- RCCP - REINFORCED CONCRETE CYLINDER PIPE (W/D STEEL)
- SCRW - STEEL CYLINDER REINFORCED ROD WRAPPED
- CMLC - CEMENT MORTAR LINED-COATED STEEL CYLINDER
- CMLCT - CEMENT MORTAR LINED-COATED-TAPED STEEL CYLINDER
- CSTL - COATED STEEL CYLINDER

CPTS# (CATHODIC PROTECTION TEST STATION NUMBERING)

CPTS#1, 2, 3,N

TYPE OF INSTALLATION

- 2WTS - 2-WIRE TEST STATION
EXAMPLE: CPTS#1, 2WTS, 180+00, 30, DTAY 2, CSTL
- 4WIJTS - 4-WIRE INSULATING JOINT TEST STATION
EXAMPLE: CPTS#2, 4WIJTS, 180+00, 30, DTAY 2, CSTL, NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS
- 6WTS - 6-WIRE TEST STATION
EXAMPLE: STRUCTURE#1 - CPTS#3, 6WTS, 180+00, 30, DTAY 2, CSTL NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS
STRUCTURE#2 - CPTS#3, 6WTS, 120+60, 24, MIDCITY, SCRW NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS
STRUCTURE#3 - CPTS#3, 6WTS, 101+25, 54, TRDJAN, RCCP, NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS
- CTS - CURRENT TEST STATION
EXAMPLE: CPTS#10, CTS, 180+00, 200 FT., DTAY 2, CSTL, NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS
- CSGTS - CASING TEST STATION
EXAMPLE: CPTS#12, CSGTS, 180+00, 30, DTAY 2, CSTL NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS
- ASTA - ANODE STATION
EXAMPLE: ANODE#1, 2, 3,N FOR ANODE WIRES;
30, DTAY 2, CSTL, 180+00, CPTS#6 FOR STRUCTURE WIRE
- BSTA - BOND STATION
EXAMPLE: CPTS#18, BSTA, 30, DTAY 2, CSTL, 180+00;
54, DTAY 3, SCRW, 65+20
- FXSTA - FOREIGN CROSSING STATION
EXAMPLE: CPTS#4, FXSTA; 30, DTAY 2, CSTL, 180+00; 24 SDGE

- MATERIALS:**
- ① CABLE: AWG ASTM B8 & B3.
 - ② LABEL: FILE FOLDER, SELF ADHESIVE WHITE 2/3" X 3 1/16".
 - ③ SLEEVE: HEAT SHRINK, ADHESIVE LINED POLYDLEFIN, CLEAR THIN WALL TUBING.

- NOTES:**
1. CABLES SHALL BE TAGGED USING TIMES ROMAN 10 POINT FONT.
 2. TEXT SHALL BE PRESENTED IN THE FOLLOWING ORDER:
 - . CPTS #
 - . TYPE OF INSTALLATION
 - . STATIONING
 - . PIPE DIAMETER
 - . FACILITY NAME
 - . PIPE MATERIAL
 - . WIRE DIRECTIONAL ORIENTATION
 - . NDRTH
 - . SOUTH
 - . EAST
 - . WEST
 3. PLACE SLEEVE AFTER ATTACHMENT OF LABEL TO CABLE.

Revision	By	Approved	Date
Original		A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

WIRE IDENTIFICATION

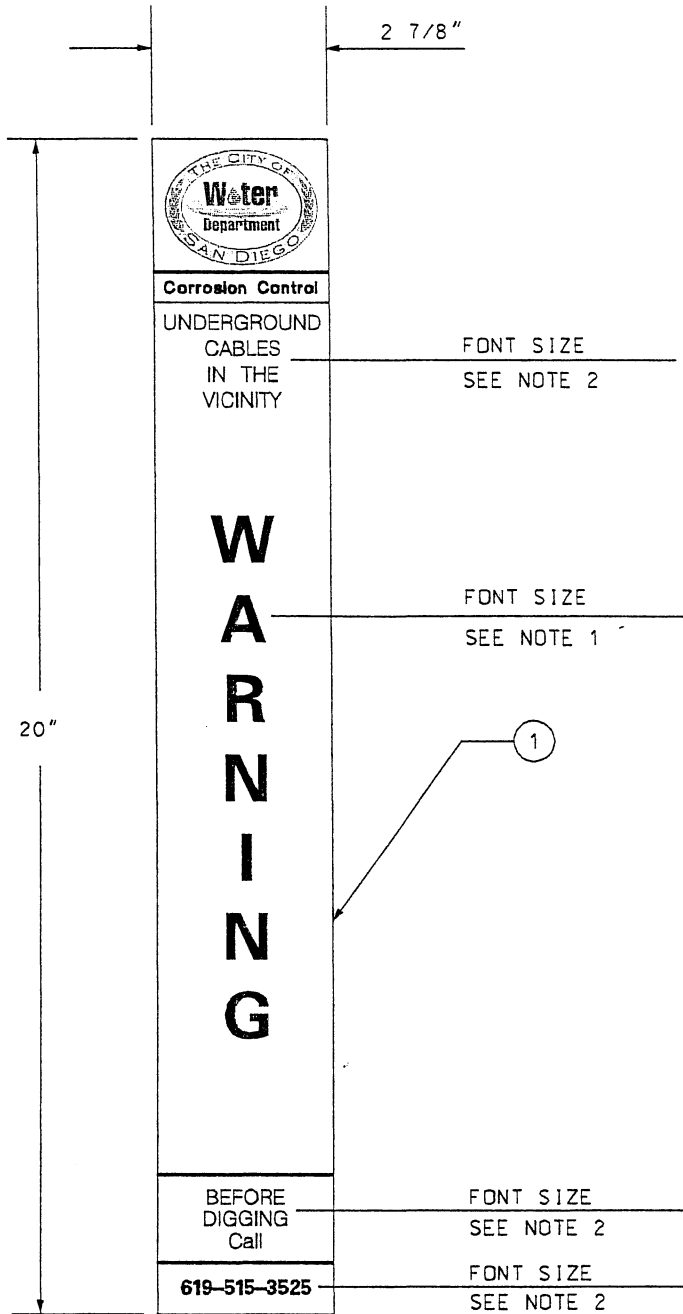
CITY OF SAN DIEGO
STANDARDS COMMITTEE

A. Oskoui 12/16/6
Coordinator R.C.E 65271 Date

DRAWING NUMBER SDW-131

MATERIALS:

① DECAL: APWA BLUE, WITH WHITE REFLECTIVE LETTERS. DECAL MATERIAL SHALL BE UV RESISTANT PREMIUM GRADE CAST VINYL SHEETING WITH AGGRESSIVE ADHESIVE AND UNDER PROTECTIVE LAMINATE.



DECAL ELEVATION

NOTES:

1. 1" TEXT BOLD
 2. 1/4" TEXT BOLD

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

POST-MOUNTED CATHODIC PROTECTION WARNING DECAL

CITY OF SAN DIEGO
STANDARDS COMMITTEE

M. H. ... 12/16/16
 Coordinator R.C.E. 65271 Date

DRAWING NUMBER **SDW-132**

ANODES

AV Vertical AH Horizontal
 Where X:

- | | |
|-------------------------------|-------------------------------|
| AV1 - Al (Aluminum) | AH1 - Al (Aluminum) |
| AV2 - Pm (Polymeric) | AH2 - Pm (Polymeric) |
| AV3 - Pt (Platinum) | AH3 - Pt (Platinum) |
| AV4 - Fe (Scrap Iron) | AH4 - Fe (Scrap Iron) |
| AV5 - Gr (Graphite) | AH5 - Gr (Graphite) |
| AV6 - Ci (HS C Iron) | AH6 - Ci (HS C Iron) |
| AV7 - Zn (Zinc) | AH7 - Zn (Zinc) |
| AV8 - Mg (Magnesium) | AH8 - Mg (Magnesium) |
| AV9 - MMO (Mixed Metal Oxide) | AH9 - MMO (Mixed Metal Oxide) |

CABLES (CB)

- | | | |
|-----|--|---------------------|
| CB1 | | Positive |
| CB2 | | Positive in Conduit |
| CB3 | | Negative |
| CB4 | | Negative in Conduit |

CABLE CONNECTION (CC)

- | | | |
|-----|--|-----------------|
| CC1 | | Exothermic Weld |
| CC2 | | Splice Tee |
| CC3 | | Straight Splice |

CASING (CS)

- | | | |
|-----|--|--------------------|
| CS1 | | Unprotected Casing |
| CS2 | | Protected Casing |

ANODE GROUNDBEDS (AG)

- | | | |
|-----|--|---------------------------|
| AG1 | | Deep Anode Well |
| AG2 | | Polymeric or Platinum |
| AG3 | | Conventional - Vertical |
| AG4 | | Conventional - Horizontal |

JUNCTION BOX (JB)

- JB Where X:
- JBN - Negative Cables
 - JBP - Positive Cables
 - JBR - Resistor
 - JBD - Diode
 - JBA - Galvanic Anode Shunts
 - JBI - Impressed Anode Shunts
 - JBS - Cable Splice

INSULATING JOINTS (IJ)

- | | | |
|------|--|---|
| IJ1 | | Dielectrically Insulated Flange Joint |
| IJ2 | | Non-Dielectrically Insulated Flange Joint |
| IJ3 | | Flanged insulating Protective Device |
| IJ4 | | Bonded Insulated Flange Joint |
| IJ5 | | Insulated Flange w/Adjustable Resistance |
| IJ6 | | Gate Valve Insulated Flange Joint |
| IJ7 | | Butterfly Valve Insulated Flange Joint |
| IJ8 | | MOV Insulated Flange Joints |
| IJ9 | | Monolithic Insulating Joint |
| IJ10 | | Bonded Mechanical Coupling |
| IJ11 | | Dielectrically Insulated Union |
| IJ12 | | Bonded Dielectric Union |
| IJ13 | | Dielectrically Insulated Coupling |

RECTIFIERS (RE)

- | | | |
|-----|--|------------------|
| RE1 | | Pedestal Mounted |
| RE2 | | Post Mounted |

REFERENCE CELL (RC)

- | | | |
|-----|--|-----------------------------|
| RC1 | | Copper-Copper Sulfate Cell |
| RC2 | | 99.9% High Purity Zinc Cell |
| RC3 | | Silver-Silver Chloride Cell |

TEST STATION (TS)

- Above Grade At Grade Where X:
- TS1 - IR-Free Coupon
 - TS2 - 2-Wires Station
 - TS3 - Foreign Crossing Station
 - TS4 - 4-Wires Station
 - TS5 - Calibrating Station
 - TS6 - 6-Wires Station
 - TS7 - Interference Current
 - TS8 - 8-Wires Station
 - TS9 - Electrical Resistance Probe

Revision	By	Approved	Date
Original	BM	A.Oskoui	12/03
Notes	BM	A.Oskoui	12/06

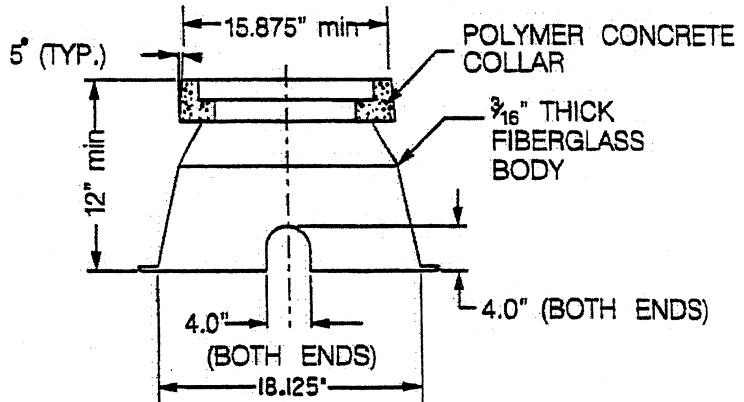
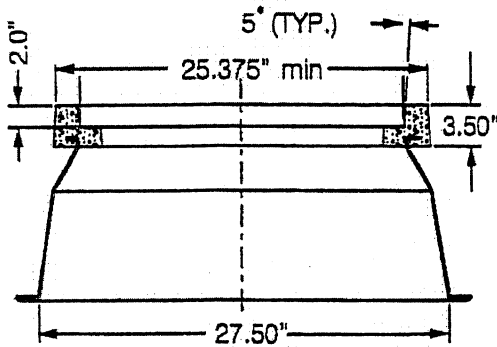
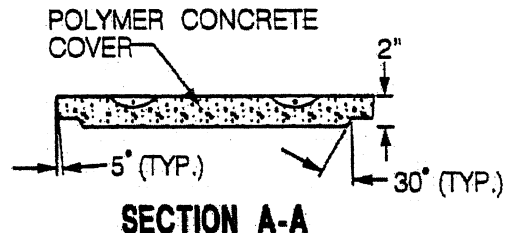
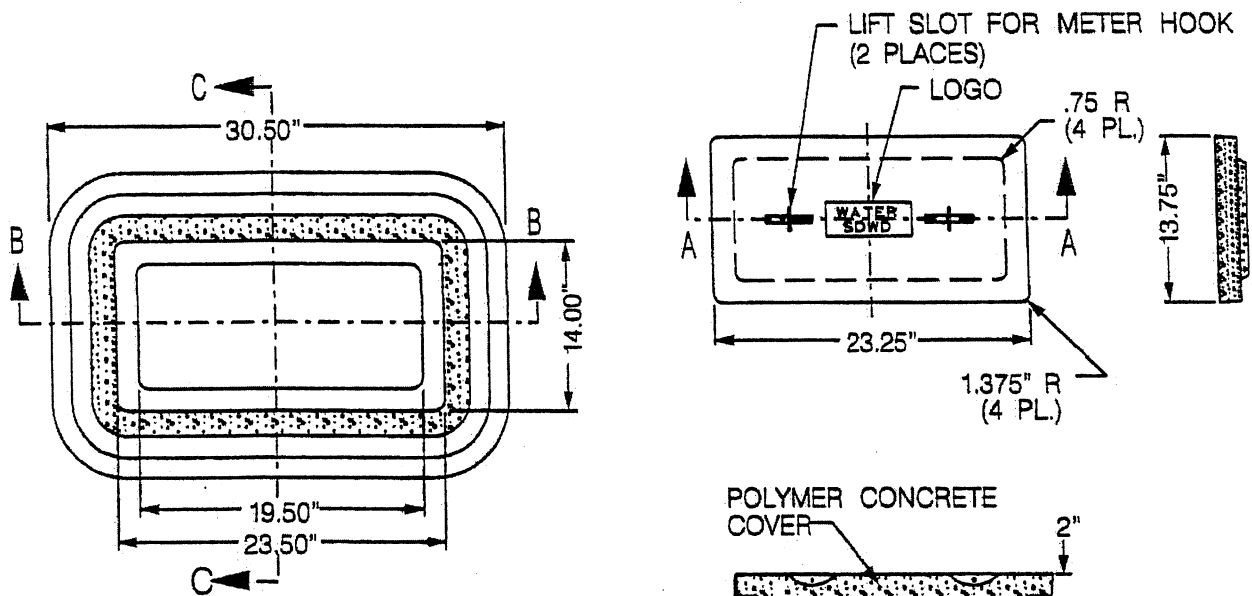
CITY OF SAN DIEGO - STANDARD DRAWING

**SYMBOLS
CATHODIC PROTECTION**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

A.S. ... 12/16/06
Coordinator R.C.E 65271 Date

DRAWING NUMBER **SDW-133**

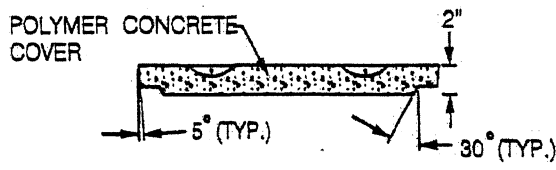
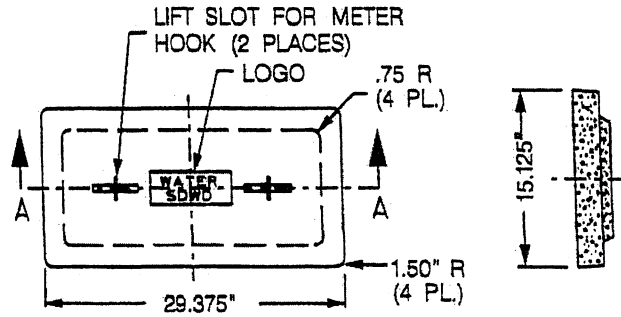
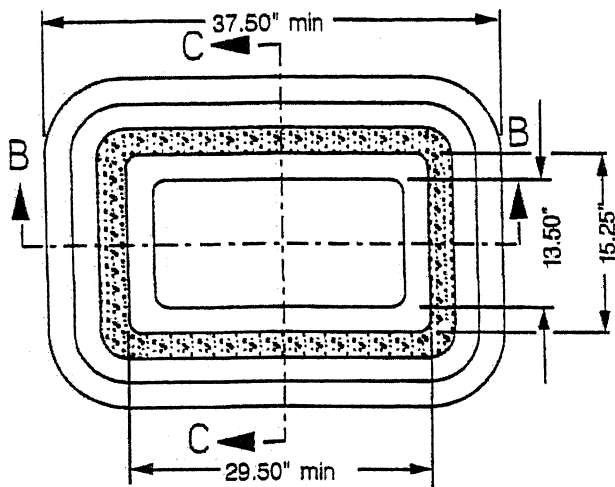


NOT TO SCALE

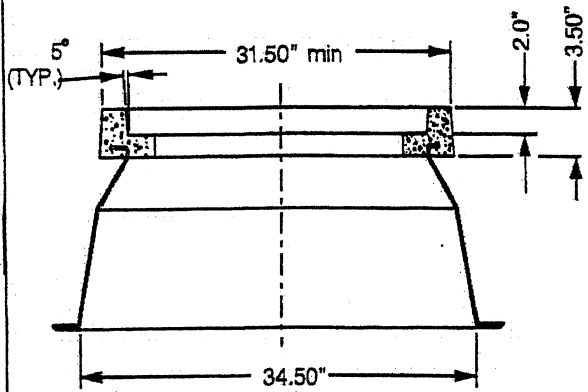
NOTE:

1. METER BOX COLLAR AND COVER SHALL BE OF POLYMER CONCRETE REINFORCED WITH CONTINUOUS LAYERS OF WOVEN FIBERGLASS.
2. BOX AND COVER SHALL WITHSTAND A-16 LOADINGS (ASTM C857-95)
3. LOGO = SDWB WATER
4. FOR COVER DETAIL WITH READER LID, SEE SDW-136
5. SEE SDW-137 FOR INSTALLATION PROCEDURE.

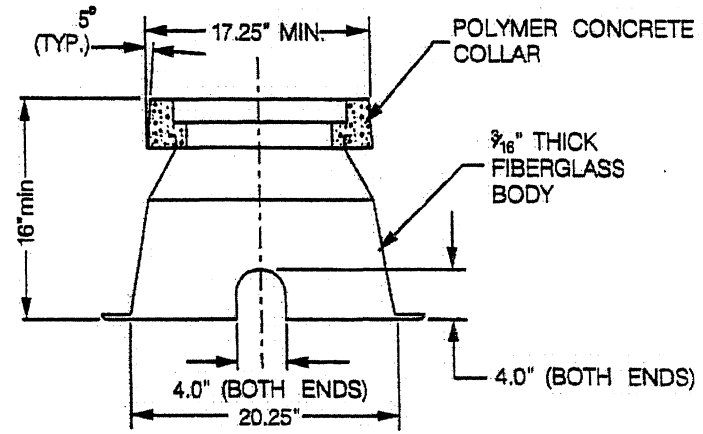
Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE	
Original	SMS	A.Oskoui	12/03			POLYMER CONCRETE WITH LAYER OF WOVEN FIBERGLASS WATER METER BOX FOR 1" WATER SERVICE
				DRAWING NUMBER SDW-134		



SECTION A-A



SECTION B-B



SECTION C-C

NOT TO SCALE

NOTE:

1. METER BOX COLLAR AND COVER SHALL BE OF POLYMER CONCRETE REINFORCED WITH CONTINUOUS LAYERS OF WOVEN FIBERGLASS.
2. BOX AND COVER SHALL WITHSTAND A-16 LOADINGS (ASTM C857-95)
3. LOGO = SDWD WATER
4. FOR COVER DETAIL WITH READER LID, SEE SDW-136
5. SEE SDW-137 FOR INSTALLATION PROCEDURE.

Revision	By	Approved	Date
Original	SMS	A.Oskoui	12/03

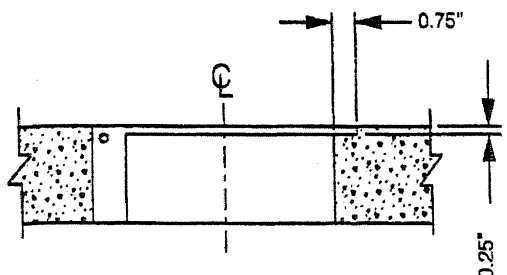
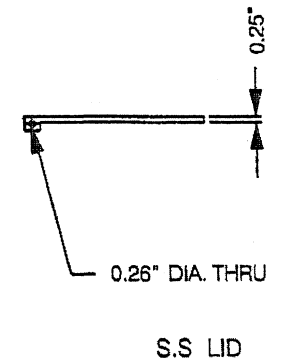
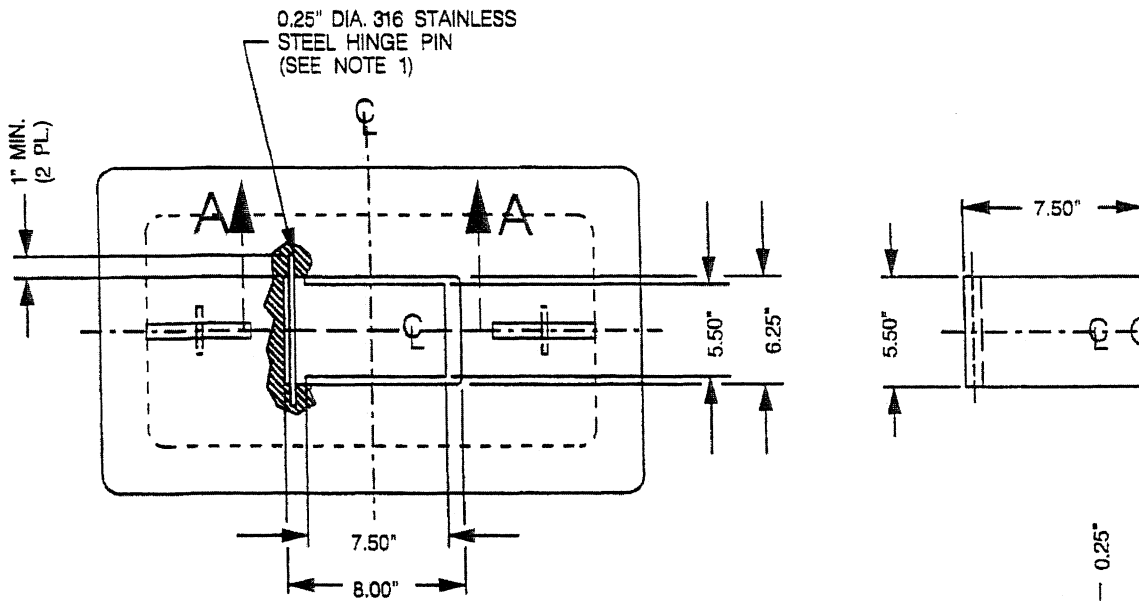
CITY OF SAN DIEGO - STANDARD DRAWING

POLYMER CONCRETE WITH LAYER OF WOVEN FIBERGLASS WATER METER BOX FOR 2" WATER SERVICE

CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. [Signature] 12-9-03
Chairperson FCE 64512 Date

DRAWING NUMBER **SDW-135**



SECTION A-A

1" METER BOX COVER
(38 LBS)
2" METER BOX COVER
(43 LBS)

NOT TO SCALE

NOTE:

1. CAST IRON LID & 316 STAINLESS STEEL HINGE PIN TO OPEN LESS THAN 90 DEGREES SHALL BE ASSEMBLED AND MOLDED INTO METER BOX COVER DURING MANUFACTURE.
2. SEE SDW-134 OR SDW-135 FOR DIMENSIONS OF METER BOX COVER.
3. LID SHALL WITHSTAND A-10 LOADINGS (ASTM C857-95)

Revision	By	Approved	Date
Original	SMS	A.Oskoui	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

METER BOX COVER WITH READER LID

CITY OF SAN DIEGO
STANDARDS COMMITTEE

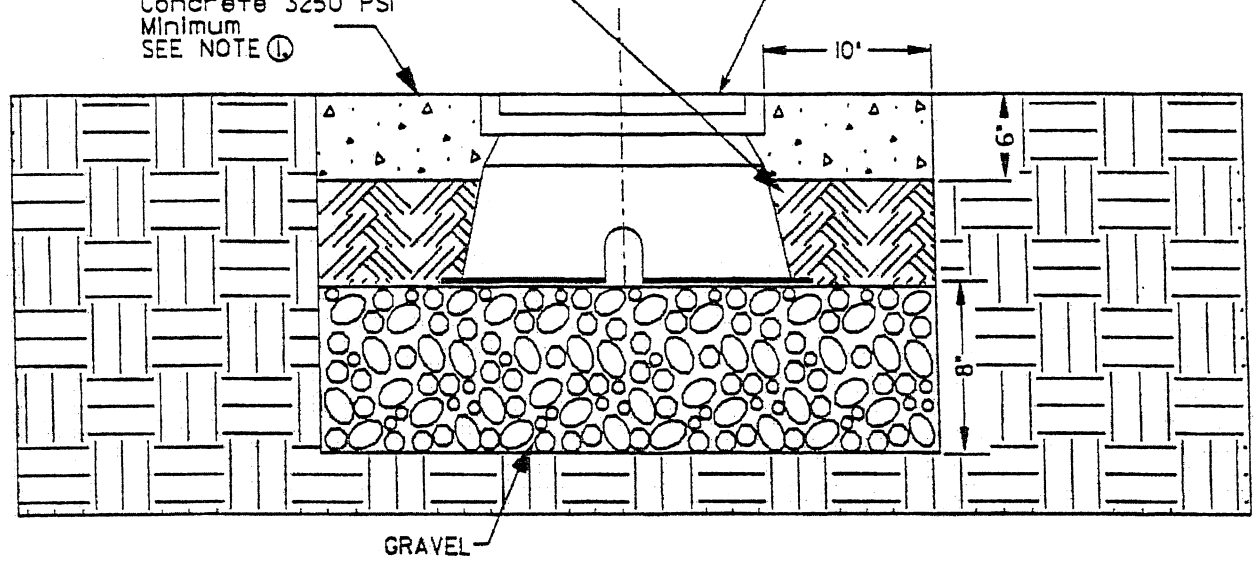
R. L. ... 12-9-03
Chairperson RCE 64572 Date

DRAWING NUMBER **SDW-136**

Fill @ 95% RELATIVE
Compaction

Concrete 3250 PSI
Minimum
SEE NOTE ①

SEE SDW-135
METER BOX



NOT TO SCALE

INSTALLATION PROCEDURE FOR METER BOXES IN AREAS WHICH ARE SUBJECT TO HEAVY TRAFFIC INCLUDING DRIVEWAYS, PARKING LOTS AND ALLEYS

STEP 1. PREPARE THE EXCAVATION APPROXIMATELY 8 INCHES DEEPER THAN THE DEPTH OF THE BOX, THEN ADD 8 INCHES OF GRAVEL.

STEP 2. PLACE BOX IN HOLE WITH TOP AT GRADE LEVEL.

STEP 3. BACKFILL AND COMPACT TO 95% RELATIVE COMPACTION MINIMUM.

NOTE

① CONCRETE IS REQUIRED TO BE 3250 PSI MINIMUM STRENGTH AND PLACED AT STREET GRADE.

Revision	By	Approved	Date
Original	SMS	A.Oskou	12/03

CITY OF SAN DIEGO - STANDARD DRAWING

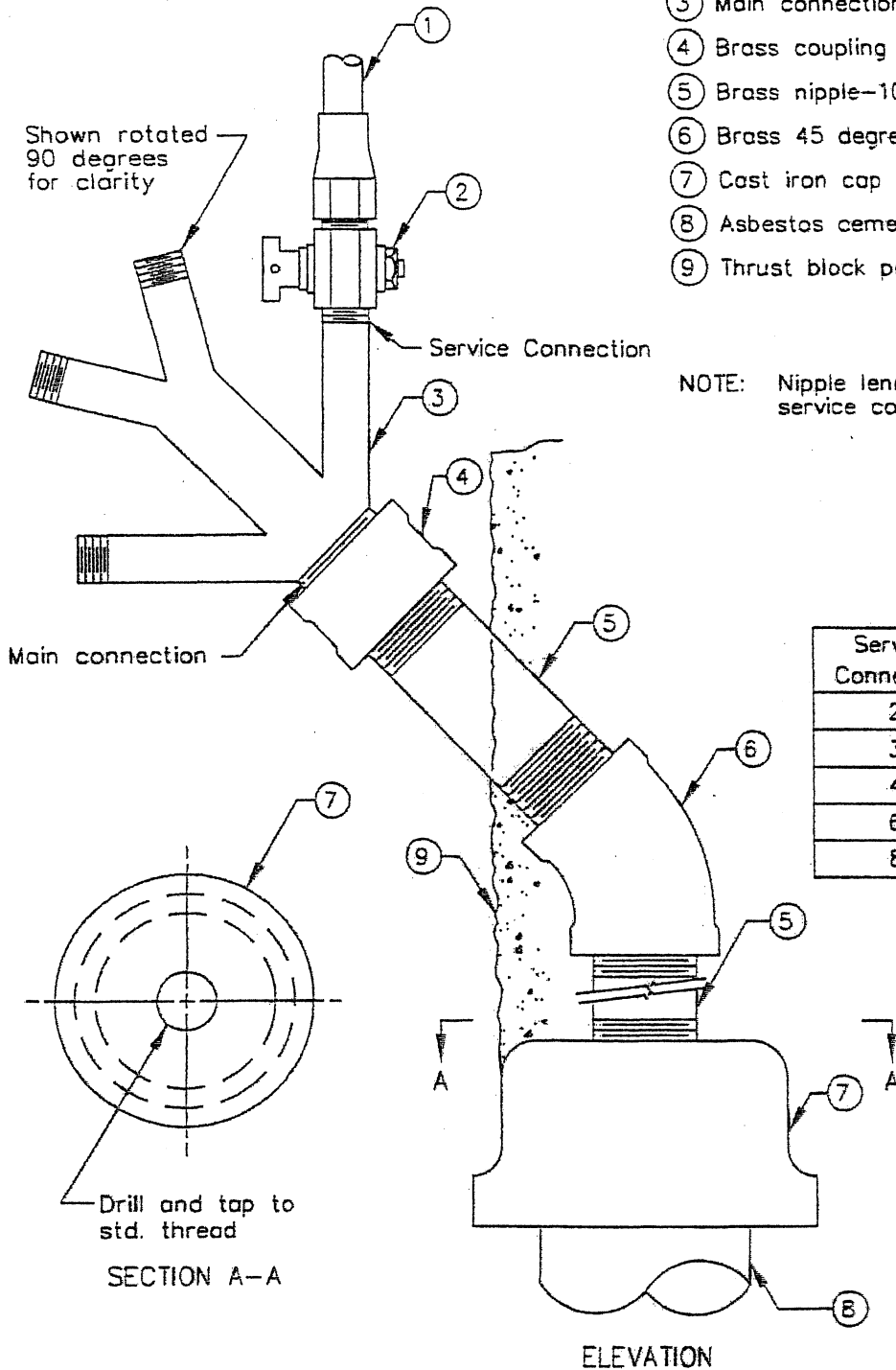
INSTALLATION PROCEDURE FOR HEAVY TRAFFIC METER BOX

CITY OF SAN DIEGO
STANDARDS COMMITTEE

R. L. ... 12-9-03
Chairperson RCE 84572 Date

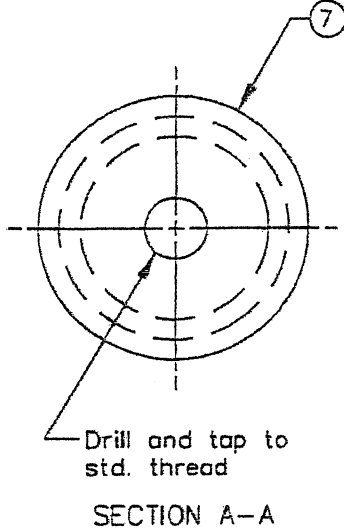
DRAWING NUMBER **SDW-137**

- ① 25mm(1") Water service per Std. Dwg WS-01
- ② 25mm (1") Curb stop
- ③ Main connection X multiple branch connection
- ④ Brass coupling or 45 degree elbow
- ⑤ Brass nipple-102mm(4") min. length
- ⑥ Brass 45 degree elbow
- ⑦ Cast iron cap
- ⑧ Asbestos cement pipe
- ⑨ Thrust block per Std. Dwg WT-01



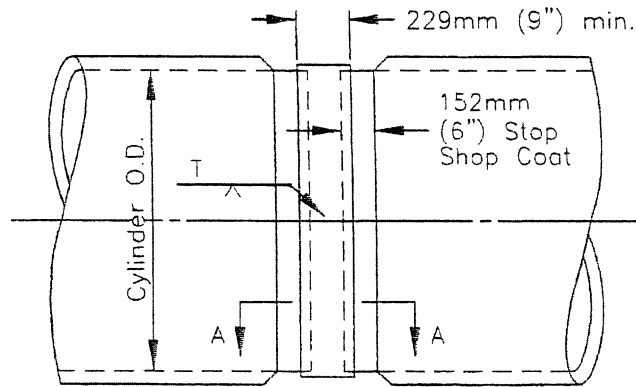
NOTE: Nipple lengths to be sufficient to allow service connection to clear thrust block.

Service Connection	Main Connection Item 5
2	32mm (1 1/4")
3	38mm (1 1/2")
4	51mm (2")
6	64mm (2 1/2")
8	76mm (3")

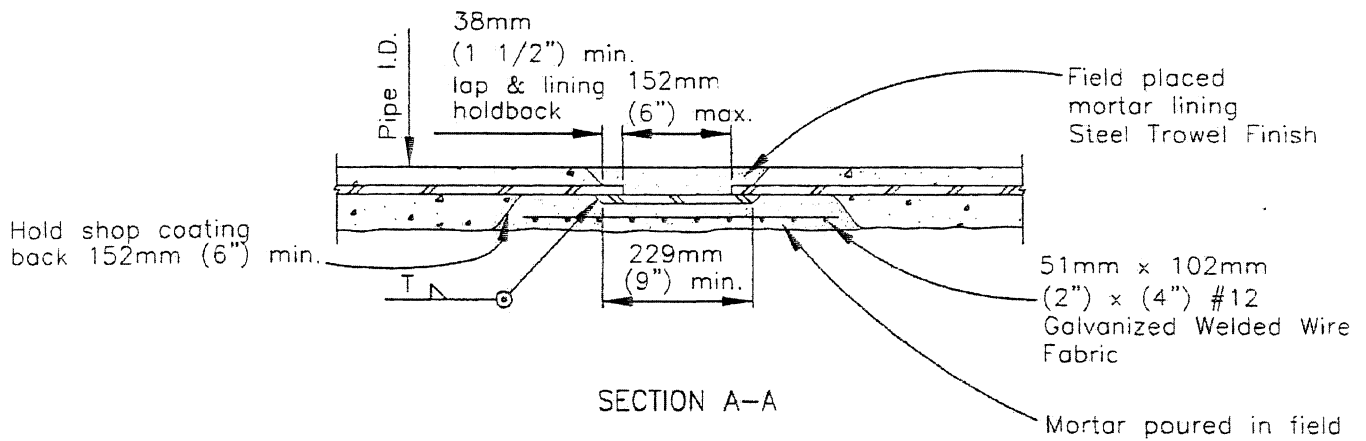


ELEVATION

Revision	By	Approved	Date	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE
Original	JS	A.Oskoui	12/06	MULTIPLE SERVICE ASSEMBLY DEAD END MAIN	<i>K. W. Neal</i> 12/16/6 <small>Coordinator R.C.E 65271 Date</small>
					DRAWING NUMBER SDW-138



ELEVATION



SECTION A-A

NOTE:

Contractor shall provide handholes as required to complete the work

Revision	By	Approved	Date
Original	JS	A.Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

SPLIT BUTT STRAP

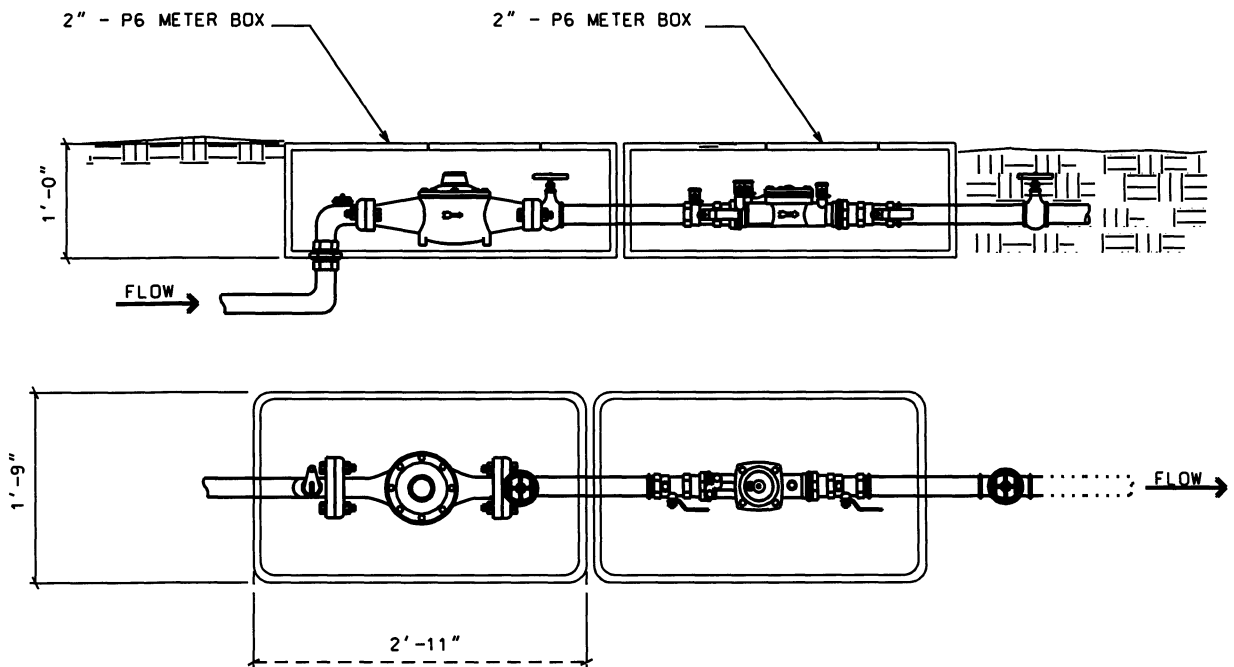
City of San Diego
Standards Committee

H. Hadi 12/16/06
Coordinator R.C.E 65271 Date

DRAWING NUMBER **SDW-139**

NOTE:

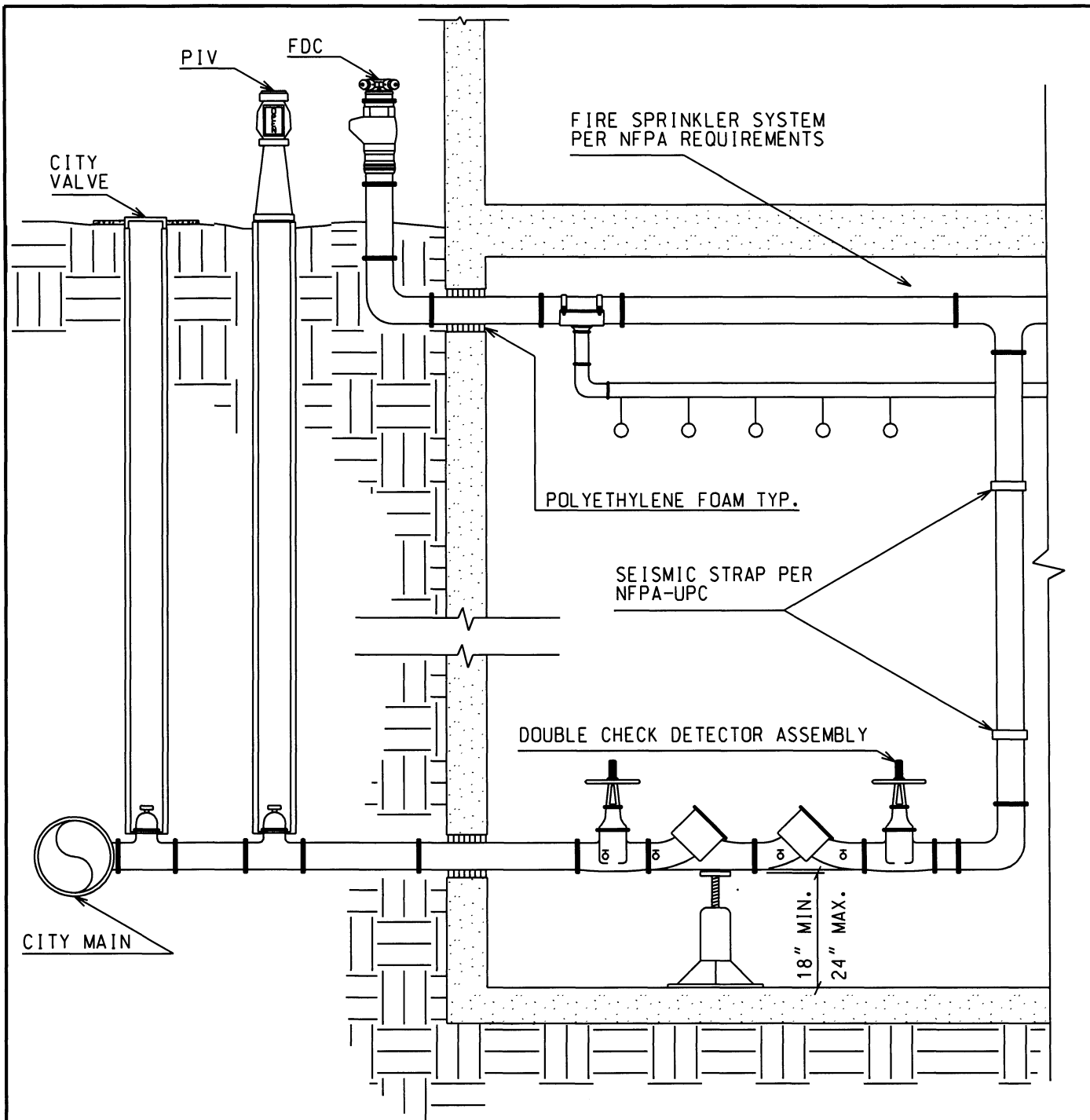
SEE SDRSD WR-01 FOR COMPLETE BACKFLOW INSTALLATION REQUIREMENTS



NOTES:

1. 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 a certified backflow tester prior to backflow preventer assembly's acceptance by the Engineer.
2. All metal in contact with concrete pipe shall be polyethylene wrapped using 2" wide plastic backed adhesive tape min. 8 mils. thick with 1/2" overlap.
3. Concrete pad to be 51mm (2") above grade unless in lawn area where it will be at 25mm (1") above grade. Concrete pad shall be 102mm (4") thick and 457mm (18") wide (min.) 308kgM -C 3 -17Mpa (520-C-2500). (Optional with Water Department approval).
4. Factory assembled Reduced Pressure Principle Assembly/Double Check Assembly shall be included in the latest edition of the "Approved for Service Isolation in California Public Water Systems issued by the State of California Department of Health services, Office of drinking Water.
5. Regulator may be installed upstream of the backflow preventer assembly when water pressure exceeds backflow preventer assembly rating.
6. Wye strainer and regulator, when required, shall be located downstream of the #2 shutoff valve.
7. Protective enclosure for backflow preventer assembly shall be used at the discretion of the property owner.
8. Locate preventer assembly as close to meter as practical as approved by the agency.
9. All risers, elbows and underground piping shall be M or L copper, brass, or Water Department approved material.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	CITY OF SAN DIEGO STANDARDS COMMITTEE <i>W.H. Noel: 12/16/06</i> COORDINATOR R.C.E 65271 DATE
ORIGINAL					
REVISED				WATER METER WITH 2" AND SMALLER DOUBLE CHECK VALVE ASSEMBLY	DRAWING NUMBER SDW-140
REVISED	MIC		9-06		
NOTES	JS	A.Oskoui	12/06		



NOTES:

1. SEE CITY OF SAN DIEGO STANDARD DRAWING SDW-120 FOR COMPLETE INSTALLATION REQUIREMENTS.
2. LOCATION MUST BE APPROVED BY WATER DEPARTMENT, WATER OPERATIONS DIVISION, METER/BACKFLOW GROUP AND SHOWN ON PLANS.

REVISION	BY	APPROVED	DATE
ORIGINAL			
REVISED	MIC		8/06
REVISED			
NOTES	JS	A.Oskoui	12/06

CITY OF SAN DIEGO - STANDARD DRAWING

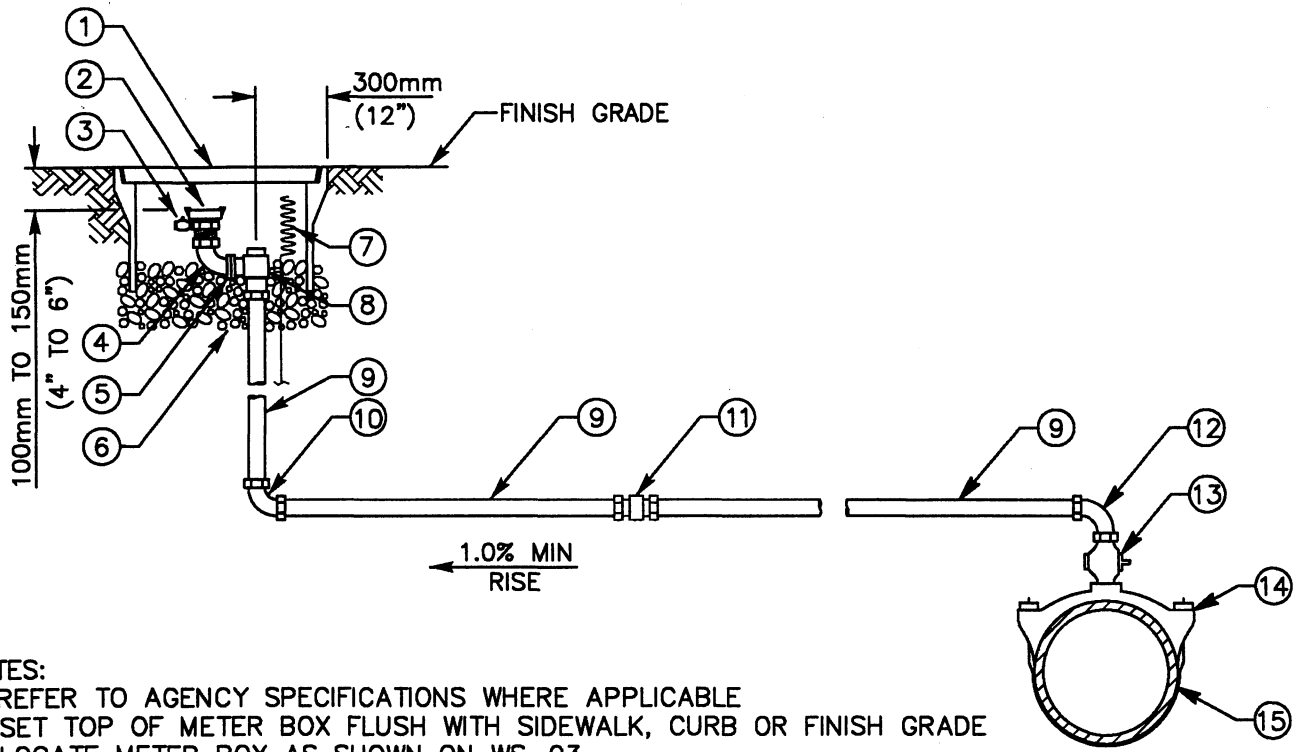
**BACKFLOW PREVENTER
DOUBLE CHECK DETECTOR ASSEMBLY
FOR FIRE SERVICE 3" AND LARGER**

CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadi: 12/16/6

COORDINATOR R.C.E. 65271 DATE

DRAWING NUMBER SDW-141



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB OR FINISH GRADE
- 3) LOCATE METER BOX AS SHOWN ON WS-03
- 4) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 5) MANUAL AIR VALVE INSTALLATION AT END OF MAIN TO BE SADDLED 24" FROM END CAP
- 6) MANUAL AIR VALVE ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 7) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 8) CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE RELEASE PET COCK
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

50mm (2")

 LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	POLYMER METER BOX WITH LID 430mm x 760mm (17" x 30"), SEE NOTE 3	⑧	50mm (2") BRONZE COMP x FLG ANGLE METER STOP WITH LOCK WING
②	50mm (2") CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 8	⑨	50mm (2") x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT
③	6mm (1/4") PRESSURE PET COCK	⑩	50mm (2") 90° BRONZE COMPRESSION ELL
④	50mm (2") 90° BRONZE MIPT x FIPT ELL	⑪	50mm (2") BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
⑤	50mm (2") OVAL METER FLANGE FLG x FIPT, WITH GASKET	⑫	50mm (2") 90° BRONZE FIPT x COMP ELL
⑥	10mm (3/8") ROCK 100mm TO 150mm (4" TO 6") DEEP	⑬	50mm (2") BRONZE MIPT x MIPT CORPORATION STOP
⑦	TRACER WIRE (AS REQUIRED), SEE WP-01	⑭	SIZE x 50mm (2") SERVICE SADDLE
		⑮	WATER MAIN

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-03		J. Tomasulo	10/04

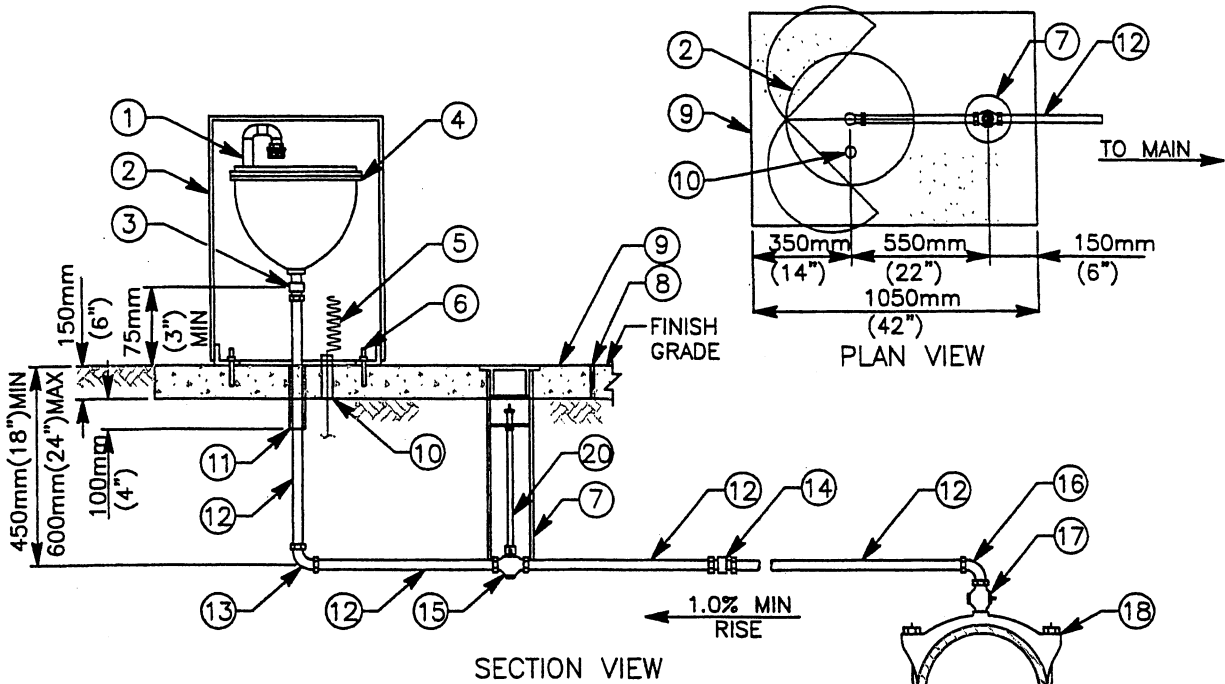
SAN DIEGO REGIONAL STANDARD DRAWING

50mm (2") MANUAL AIR VALVE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

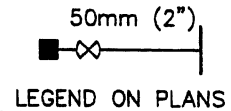
T. Stanton 10/28/2004
 Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WA-01**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) NO DIPS OR LOW SPOTS WILL BE ALLOWED IN PIPING INSTALLATION
- 3) LOCATE ENCLOSURE AS SHOWN ON WA-06
- 4) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 5) AIR & VACUUM VALVES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 6) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	50mm (2") PVC SCH 80 CLOSE NIPPLE & 2-SCH 80 STREET ELLS & INSECT SCREEN	⑪	50mm (2") x 13mm (1/2") BLACK FOAM SLEEVE
②	VALVE ENCLOSURE	⑫	50mm (2") x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT
③	50mm (2") MIPT x COMPRESSION ADAPTER	⑬	50mm (2") 90° BRONZE COMPRESSION ELL
④	50mm (2") AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE	⑭	50mm (2") BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
⑤	TRACER WIRE (AS REQUIRED), SEE WP-01	⑮	50mm (2") COMP BALL VALVE W/ TEE HEAD
⑥	13mm x 75mm (1/2" x 3") STAINLESS STEEL DROP-IN ANCHORS (3 EA @ 120° APART)	⑯	50mm (2") 90° BRONZE FIPT x COMP ELL
⑦	100mm (4") SDR 35 SEWER PIPE GATE WELL WITH CAP	⑰	50mm (2") BRONZE MIPT x MIPT CORPORATION STOP
⑧	COLD JOINT STRIP	⑱	SIZE x 50mm (2") SERVICE SADDLE
⑨	1050mm x 750mm x 150mm THICK (3'-6" x 2'-6" x 6" THICK) CONCRETE SLAB	⑲	WATER MAIN
⑩	25mm (1") PVC CONDUIT FOR TRACER WIRE INSTALLED 50mm (2") ABOVE SLAB	⑳	VALVE STEM EXTENSION, SEE WV-05

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-04		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

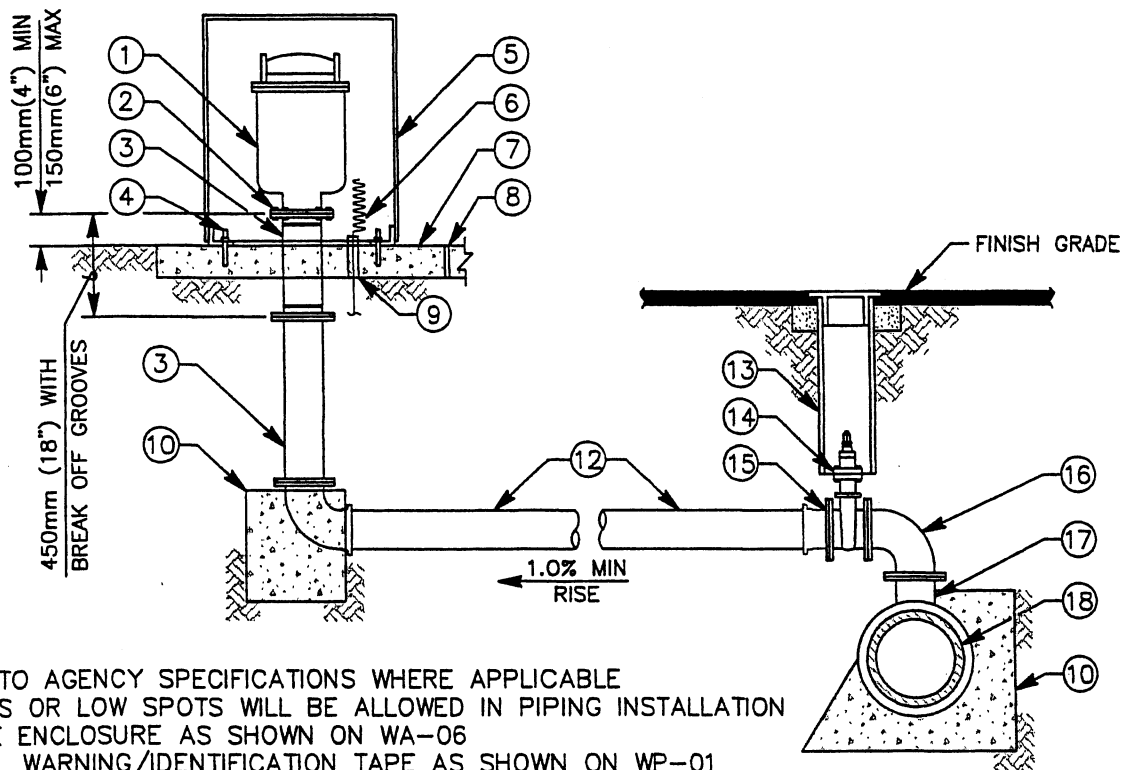
50mm (2") AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE INSTALLATIONS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/23/2004

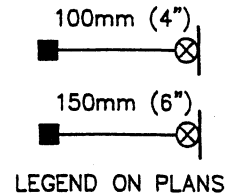
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WA-02**



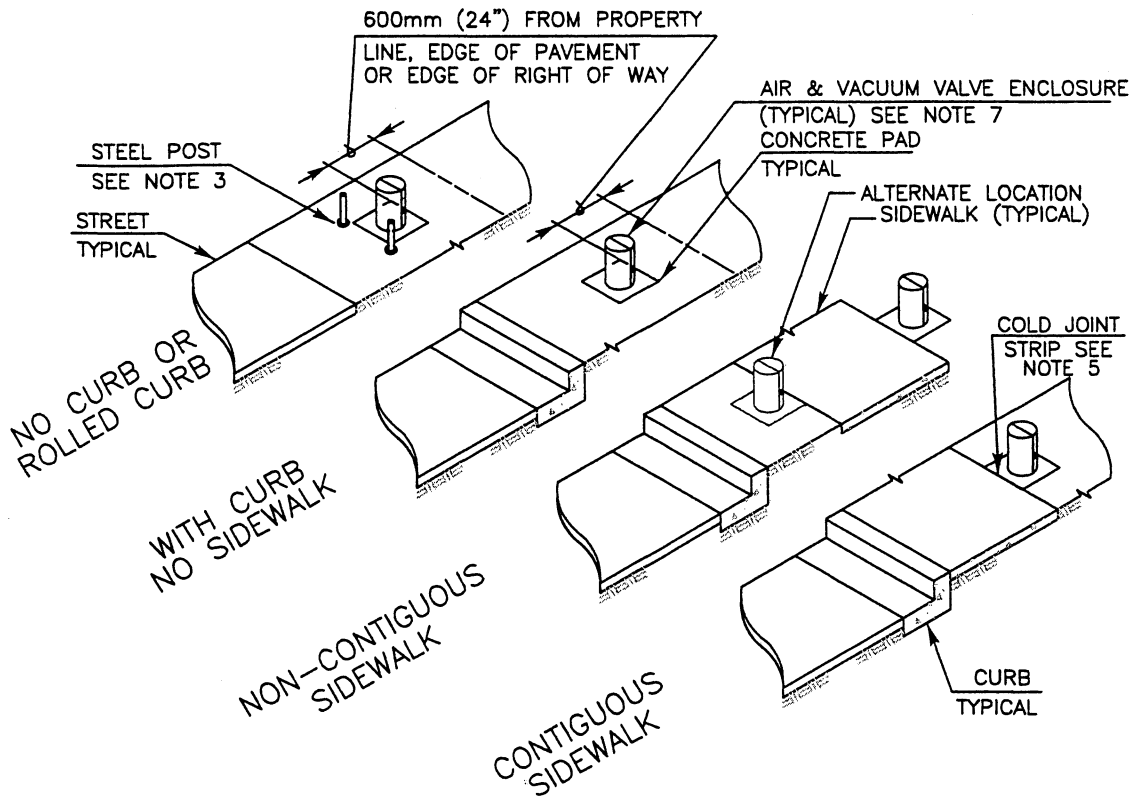
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) NO DIPS OR LOW SPOTS WILL BE ALLOWED IN PIPING INSTALLATION
- 3) LOCATE ENCLOSURE AS SHOWN ON WA-06
- 4) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 5) BREAK-AWAY BOLTS SHALL BE 15.6mm x 75mm (5/8" x 3") WITH 9.4mm (3/8") HOLE DRILLED IN THE SHAFT OF THE BOLT. INSTALL WITH NUTS ON TOP OF THE FLANGE. BOLT SHAFT SHALL BE FILLED WITH SILICONE SEALANT
- 6) AIR & VACUUM VALVES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	100mm (4") OR 150mm (6") AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE ASSEMBLY	⑩	CONCRETE THRUST/ANCHOR BLOCK SEE WT-01
②	BREAK-AWAY BOLTS, SEE NOTE 5	⑪	100mm (4") OR 150mm (6") FLG x MJ/PO 90° BEND
③	100mm (4") OR 150mm (6") FLANGED 8-BOLT DUCTILE IRON PIPE x REQ'D LENGTH (MAX OF 2 SPOOLS)	⑫	100mm (4") OR 150mm (6") C-900 PVC PIPE
④	13mm x 75mm (5/8" x 3") STAINLESS STEEL DROP-IN ANCHORS (3 EA @ 120° APART)	⑬	GATE WELL WITH CAP SEE WV-01 OR WV-02
⑤	VALVE ENCLOSURE	⑭	100mm (4") OR 150mm (6") FLG x MJ/PO/FLG RWGV
⑥	TRACER WIRE (AS REQUIRED), SEE WP-01	⑮	100mm (4") OR 150mm (6") FLG x MJ/PO ADAPTER (IF REQUIRED)
⑦	1050mm x 1050mm x 150mm THICK (42" x 42" x 6" THICK) CONCRETE SLAB	⑯	100mm (4") OR 150mm (6") FLANGE 90° BEND
⑧	COLD JOINT STRIP	⑰	SIZE x 100mm (4") OR 150mm (6") MJ/PO/FLG x FLG TEE
⑨	25mm (1") PVC CONDUIT FOR TRACER WIRE INSTALLED 50mm (2") ABOVE SLAB	⑱	WATER MAIN

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced W-05		J. Tomasulo	10/04		
				100mm (4") & 150mm (6")	
				AUTOMATIC COMBINATION AIR RELEASE &	
				AIR/VACUUM VALVE INSTALLATIONS	
				Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER WA-04	



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) REFER TO WA-02 AND WA-04
- 3) PROTECTION POSTS SHALL BE INSTALLED AS CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER PER WM-04
- 4) AN EASEMENT MAY BE NEEDED DEPENDING ON LOCATION OF ENCLOSURE
- 5) IF THE CONCRETE SLAB IS TO BE INSTALLED ADJACENT TO A CONCRETE CURB OR SIDEWALK A COLD JOINT STRIP SHALL BE INSTALLED
- 6) AIR & VACUUM VALVES & APPURTENANCES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN THE AGENCY'S SPECIFICATIONS
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-14		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

AIR & VACUUM VALVE ENCLOSURE LOCATIONS

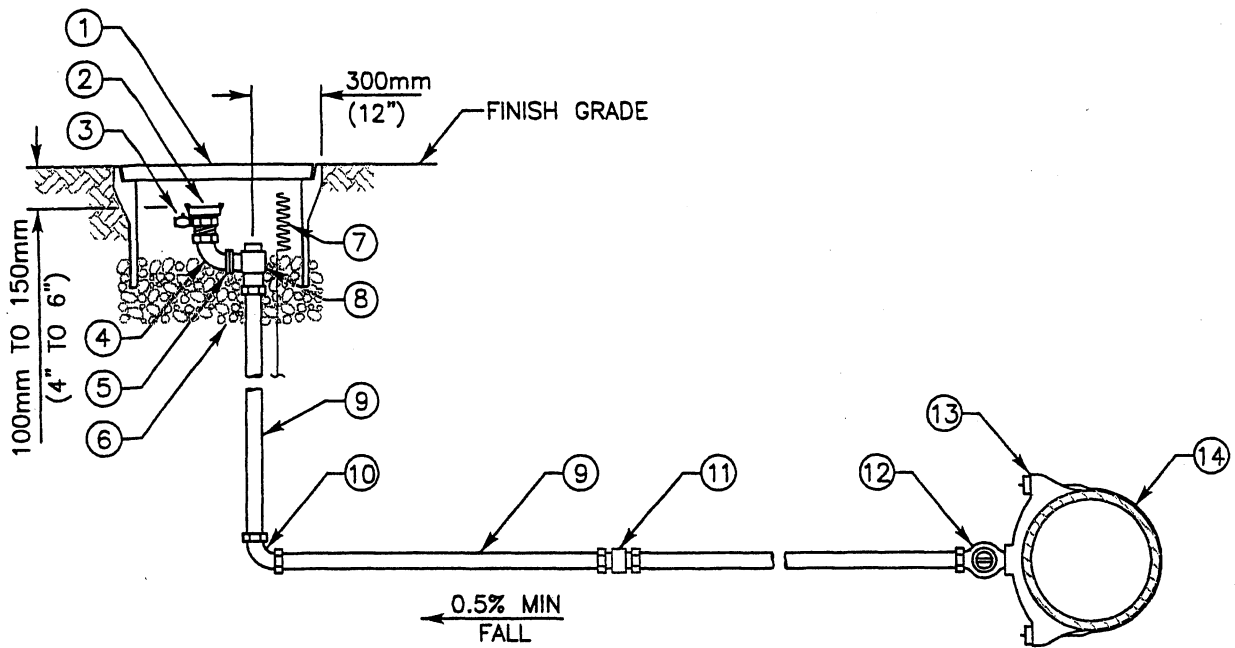
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WA-06**

SEE SDW-117



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB OR FINISH GRADE
- 3) LOCATE METER BOX AS SHOWN ON WS-03
- 4) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 5) FOR BLOW-OFF INSTALLATION AT END OF MAIN SEE WB-04
- 6) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 7) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 8) CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE PET COCK
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

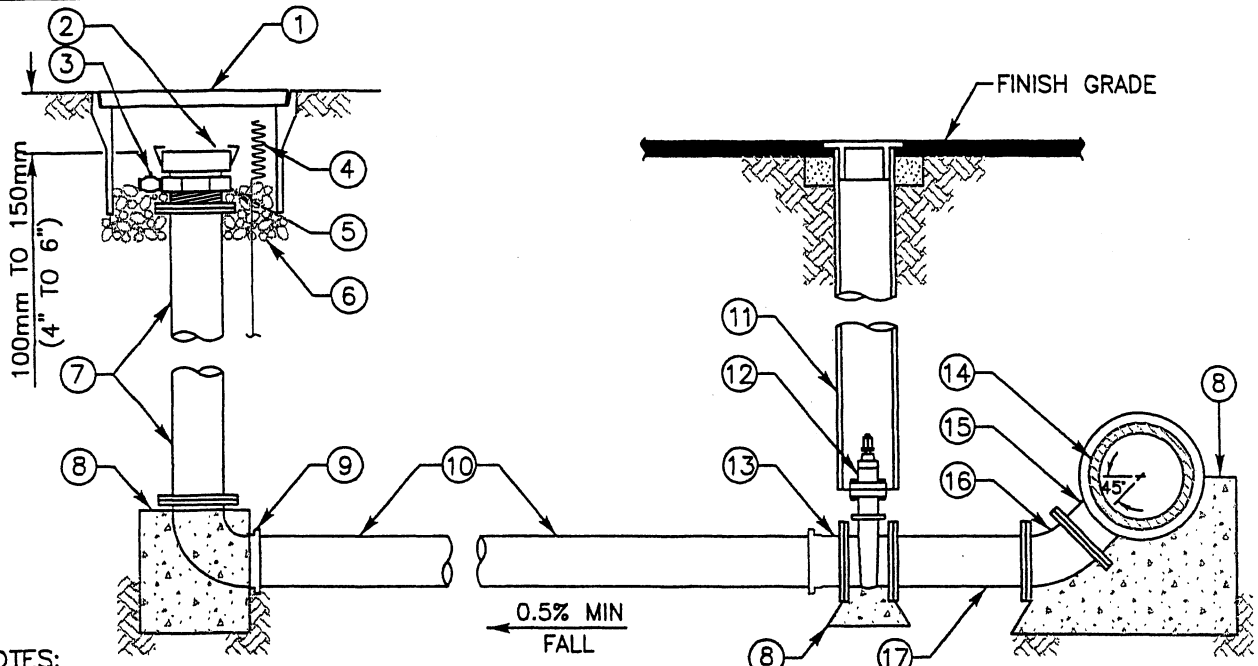
50mm (2")

 LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	POLYMER METER BOX WITH LID 430mm x 760mm (17" x 30"), SEE NOTE 3	⑧	50mm (2") BRONZE COMP x FLG ANGLE METER STOP WITH LOCK WING
②	50mm (2") CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 8	⑨	50mm (2") x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT
③	6mm (1/4") PRESSURE PET COCK	⑩	50mm (2") 90° BRONZE COMPRESSION ELL
④	50mm (2") 90° BRONZE MIPT x FIPT ELL	⑪	50mm (2") BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
⑤	50mm (2") OVAL METER FLANGE FLG x FIPT, WITH GASKET	⑫	50mm (2") BRONZE MIPT x COMP CORPORATION STOP
⑥	10mm (3/8") ROCK 100mm TO 150mm (4" TO 6") DEEP	⑬	SIZE x 50mm (2") SERVICE SADDLE
⑦	TRACER WIRE (AS REQUIRED), SEE WP-01	⑭	WATER MAIN

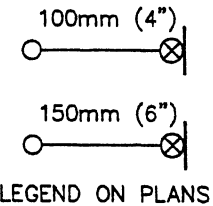
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>T. Stanton</i> 10/28/2004 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced W-06		J. Tomasulo	10/04		
50mm (2") BLOW-OFF INSTALLATION				DRAWING NUMBER	WB-01

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB OR FINISH GRADE
- 3) LOCATE METER BOX AS SHOWN ON WS-03
- 4) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 5) FOR BLOW-OFF INSTALLATION AT END OF MAIN SEE WB-04
- 6) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 7) 45° BEND SHALL BE USED FOR MAINS UP TO 750mm (30"). 90° BEND SHALL BE USED FOR MAINS IN EXCESS OF 750mm (30") AS DIRECTED BY THE ENGINEER
- 8) CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE PET COCK
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	POLYMER METER BOX WITH LID 430mm x 760mm (17" x 30"), SEE NOTE 3	⑨	100mm (4") OR 150mm (6") FLG x MJ/PO 90° BEND
②	100mm (4") OR 150mm (6") CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 8	⑩	100mm (4") OR 150mm (6") C-900 PVC PIPE
③	6mm (1/4") PRESSURE PET COCK	⑪	GATE WELL WITH CAP SEE WV-01 OR WV-02
④	TRACER WIRE (AS REQUIRED), SEE WP-01	⑫	100mm (4") OR 150mm (6") FLG x MJ/PO/FLG RWGV
⑤	100mm (4") OR 150mm (6") FLANGED COMPANION x FIPT	⑬	100mm (4") OR 150mm (6") FLG x MJ/PO ADAPTER (IF REQUIRED)
⑥	10mm (3/8") ROCK 100mm TO 150mm (4" TO 6") DEEP	⑭	WATER MAIN
⑦	100mm (4") OR 150mm (6") FLG DI PIPE x REQUIRED LENGTH (MAXIMUM OF 2 SPOOLS)	⑮	SIZE x 100mm (4") OR 150mm (6") MJ/PO/FLG x FLG TEE
⑧	CONCRETE THRUST BLOCK SEE WT-01	⑯	100mm (4") OR 150mm (6") FLANGED 45° BEND
		⑰	100mm (4") OR 150mm (6") x 600mm (24") FLG DI SPOOL

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-08		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

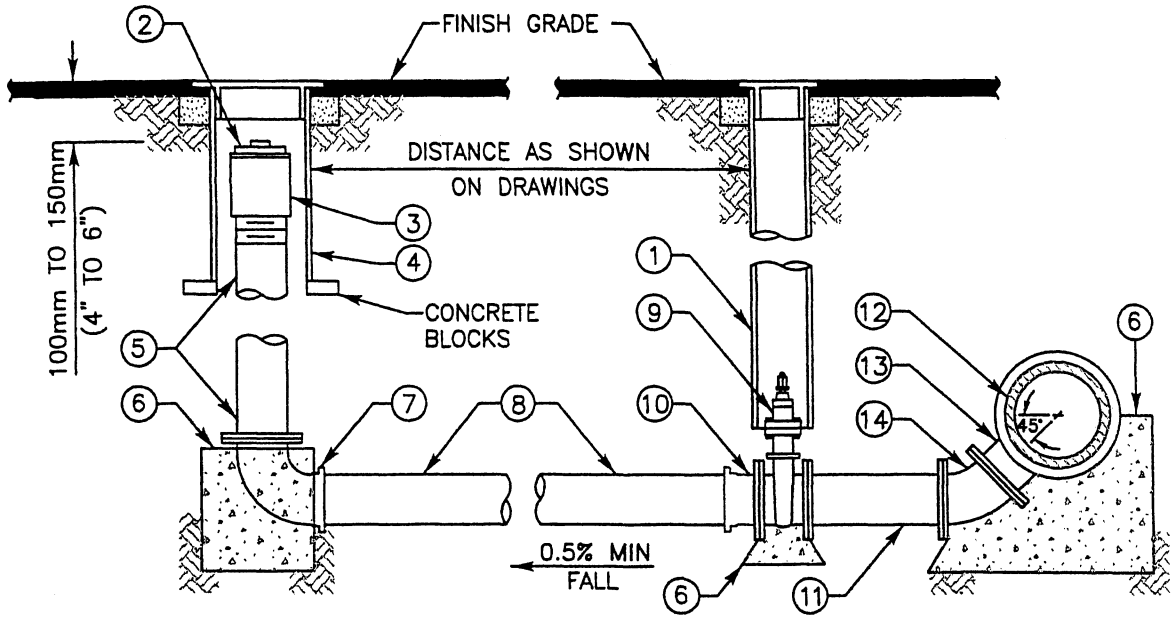
**100mm (4") & 150mm (6")
BLOW-OFF INSTALLATION TYPE A**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004
Chairperson R.C.E. 19246 Date

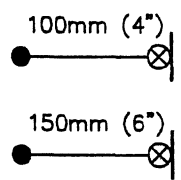
DRAWING NUMBER **WB-02**

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) FOR BLOW-OFF INSTALLATION AT END OF MAIN SEE WB-04
- 3) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 4) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 5) 45° BEND SHALL BE USED FOR MAINS UP TO 750mm (30"). 90° BEND SHALL BE USED FOR MAINS IN EXCESS OF 750mm (30") AS DIRECTED BY THE ENGINEER
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	GATE WELL WITH CAP SEE WV-01 OR WV-02	⑧	100mm (4") OR 150mm (6") C-900 PVC PIPE
②	GALVANIZED IRON PLUG	⑨	100mm (4") OR 150mm (6") FLG x MJ/PO/FLG RWGV
③	GALVANIZED IRON COUPLING, THREADED	⑩	100mm (4") OR 150mm (6") FLG x MJ/PO ADAPTER (IF REQUIRED)
④	250mm (10") STEEL GATE WELL WITH CAP	⑪	100mm (4") OR 150mm (6") x 600mm (24") FLG DI SPOOL
⑤	100mm (4") OR 150mm (6") FLG DI PIPE x REQUIRED LENGTH (MAXIMUM OF 2 SPOOLS)	⑫	WATER MAIN
⑥	CONCRETE THRUST BLOCK SEE WT-01	⑬	SIZE x 100mm (4") OR 150mm (6") MJ/PO/FLG x FLG TEE
⑦	100mm (4") OR 150mm (6") FLG x MJ/PO 90° BEND	⑭	100mm (4") OR 150mm (6") FLANGED 45° BEND, SEE NOTE 5

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-09		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

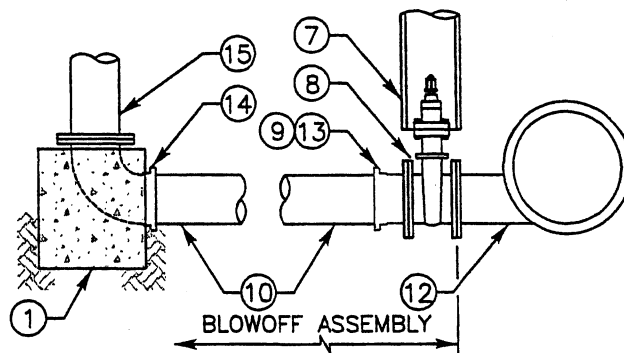
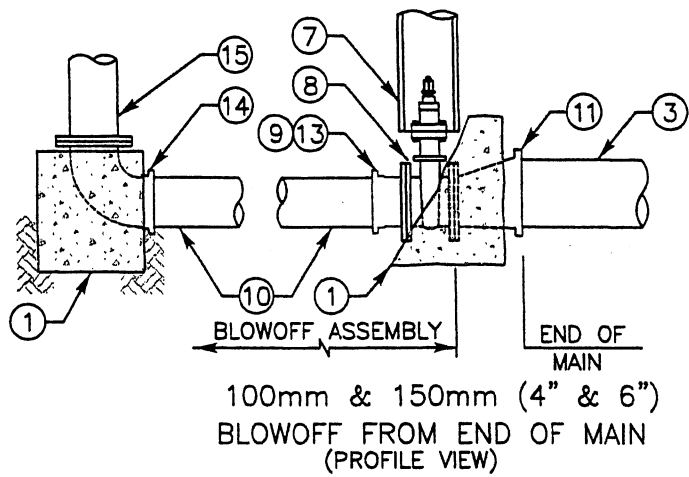
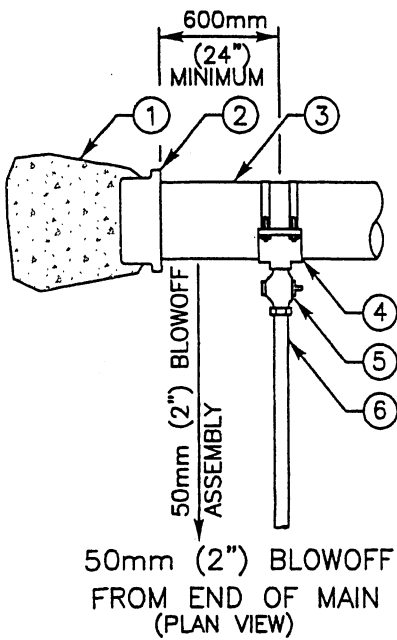
**100mm (4") & 150mm (6")
BLOW-OFF ASSEMBLIES IN STREET
TYPE B**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/23/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WB-03**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 3) FOR 2" BLOW-OFFS ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 4) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

100mm & 150mm (4" & 6")
BLOWOFF FROM STEEL MAIN
(PROFILE VIEW)

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	CONCRETE THRUST BLOCKS SEE WT-01	⑧	FLG x MJ/PO/FLG RWGV
②	DI END CAP	⑨	FLG x MJ/PO ADAPTER (IF REQUIRED)
③	WATER MAIN	⑩	C-900 PVC PIPE
④	SIZE x 50mm (2") SERVICE SADDLE	⑪	FLG x MJ/PO ECCENTRIC DI REDUCER
⑤	50mm (2") BRONZE MIPT x COMP CORPORATION STOP	⑫	MAIN SIZE x BLOWOFF SIZE FLANGE MANUFACTURED STEEL TANGENTIAL OUTLET
⑥	50mm (2") x REQ'D LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT	⑬	FLG x MJ/PO BEND (IF REQUIRED)
⑦	GATE WELL WITH CAP SEE WV-01 & WV-02	⑭	FLG x MJ/PO 90° BEND
		⑮	FLG DI PIPE x REQUIRED LENGTH (MAXIMUM OF 2 SPOOLS)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-07		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

BLOW-OFF INSTALLATION FROM END OF MAINS AND FROM STEEL MAINS

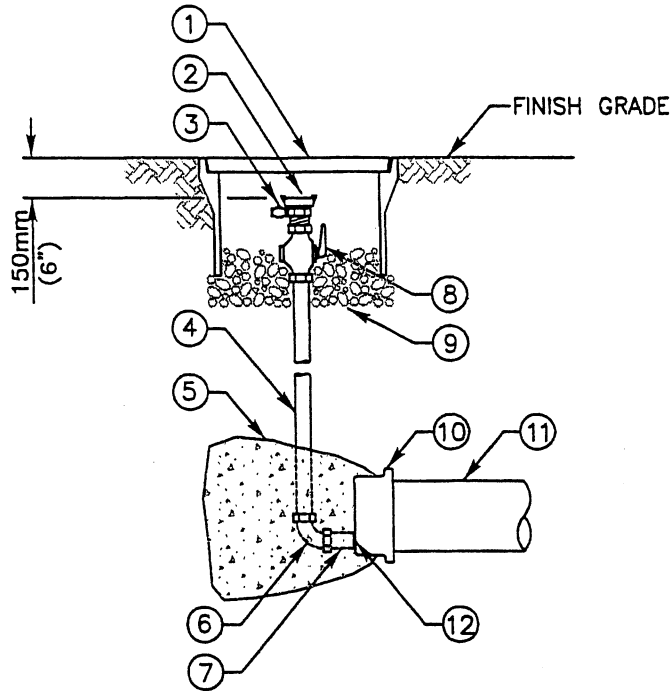
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004
Chairperson R.C.E. 19246 Date

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WB-04**

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) SET TOP OF METER BOX 50mm (2") ABOVE FINISH GRADE
- 3) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 4) THE CONSTRUCTION OF A TEMPORARY BLOW-OFF FOR THE USE OF TESTING AND FLUSHING OF NEW MAINS ONLY
- 5) CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE PET COCK
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

TEMP 50mm (2")



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	POLYMER METER BOX WITH LID 430mm x 760mm (17" x 30")	⑥	50mm (2") 90° BRONZE IRON PIPE THREAD BY COMPRESSION ELL
②	50mm (2") CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 5	⑦	50mm (2") CLOSE NIPPLE IPT
③	6mm (1/4") PRESSURE PET COCK	⑧	50mm (2") COMPRESSION x FIPT BALL VALVE WITH HANDLE
④	50mm (2") x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT	⑨	10mm (3/8") ROCK 150mm (6") DEEP
⑤	CONCRETE THRUST BLOCK SEE WT-01	⑩	DI END CAP WITH 63mm (2.5") FIPT OUTLET
		⑪	WATER MAIN
		⑫	NYLON DIELECTRIC BUSHING

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-07		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

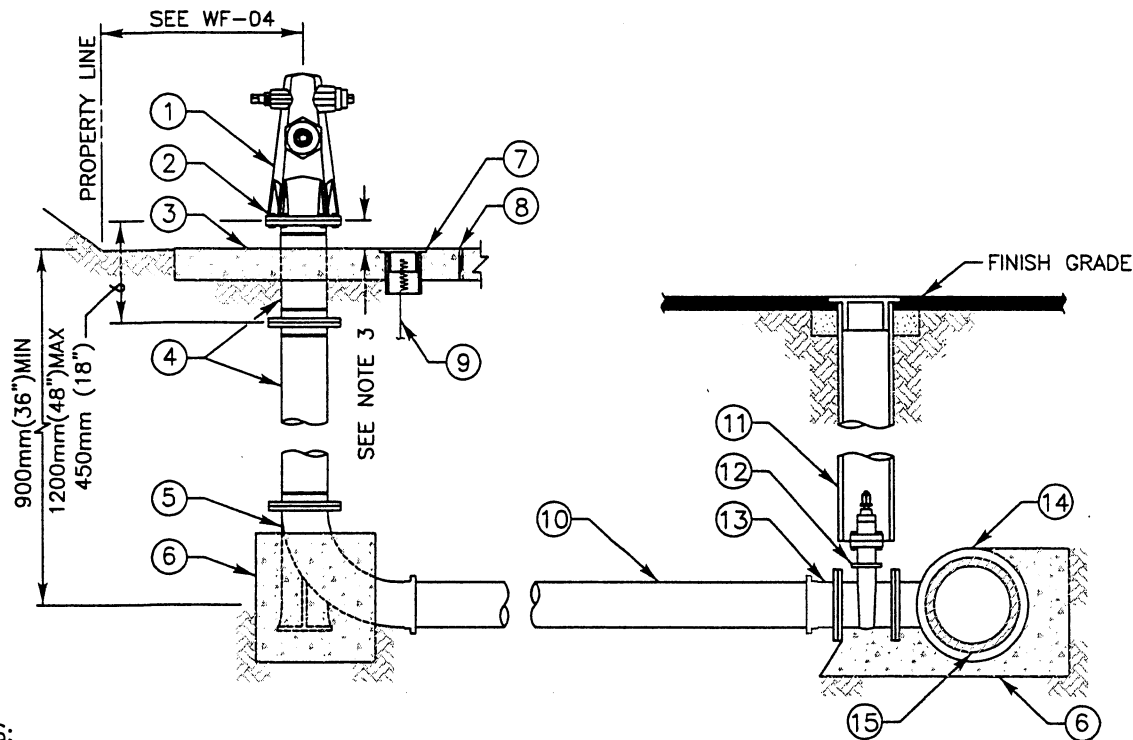
TEMPORARY 50mm (2") BLOW-OFF INSTALLATION

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

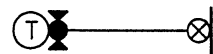
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WB-05**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) THE NUMBER OF OUTLETS SHALL BE AS SHOWN ON PLANS
- 3) FIRE HYDRANT FLANGE SHALL BE 150mm ± 25mm (6" ± 1") ABOVE TOP OF CURB OR SPLASH PAD SEE PLANS FOR ELEVATION
- 4) LOCATE FIRE HYDRANT AS SHOWN ON WF-04
- 5) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 6) FIRE HYDRANT FLANGE BOLTS SHALL BE BREAK AWAY BOLTS INSTALLED WITH NUTS ON TOP OF THE FLANGE. BOLT SHAFT SHALL BE FILLED WITH SILICONE SEALANT
- 7) CONNECTIONS TO STEEL MAINS WILL BE MADE IN ACCORDANCE WITH AGENCY'S SPECIFICATIONS
- 8) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	150mm (6") FIRE HYDRANT SEE NOTE 2	⑧	COLD JOINT STRIP
②	BREAK-AWAY BOLTS, SEE NOTE 6	⑨	TRACER WIRE (AS REQUIRED) PER WP-01
③	1200mm x 1200mm x 150mm THICK (4' x 4' x 6" THICK) CONCRETE SPLASH PAD	⑩	150mm (6") C-900 PVC PIPE
④	150mm (6") FLANGE DI HYDRANT EXTENSION SPOOL(S) WITH BREAK OFF GROOVES (MAXIMUM OF 2 SPOOLS)	⑪	GATE WELL WITH CAP SEE WV-01 OR WV-02
⑤	150mm x 400mm (6" x 16") LONG RADIUS FLG x MJ/PO BURY ELL	⑫	150mm (6") FLG x MJ/PO/FLG RWGV
⑥	CONCRETE THRUST BLOCK SEE WT-01	⑬	150mm (6") FLG x MJ/PO ADAPTER (IF REQUIRED)
⑦	TRACER WIRE ACCESS PORT, 100mm (4") x 200mm 8" LONG SDR 35 SEWER PIPE W/ CAP (AS-REQUIRED)	⑭	SIZE x 150mm (6") MJ/PO/FLG x FLG TEE
		⑮	WATER MAIN

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-10		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

150mm (6") FIRE HYDRANT INSTALLATION

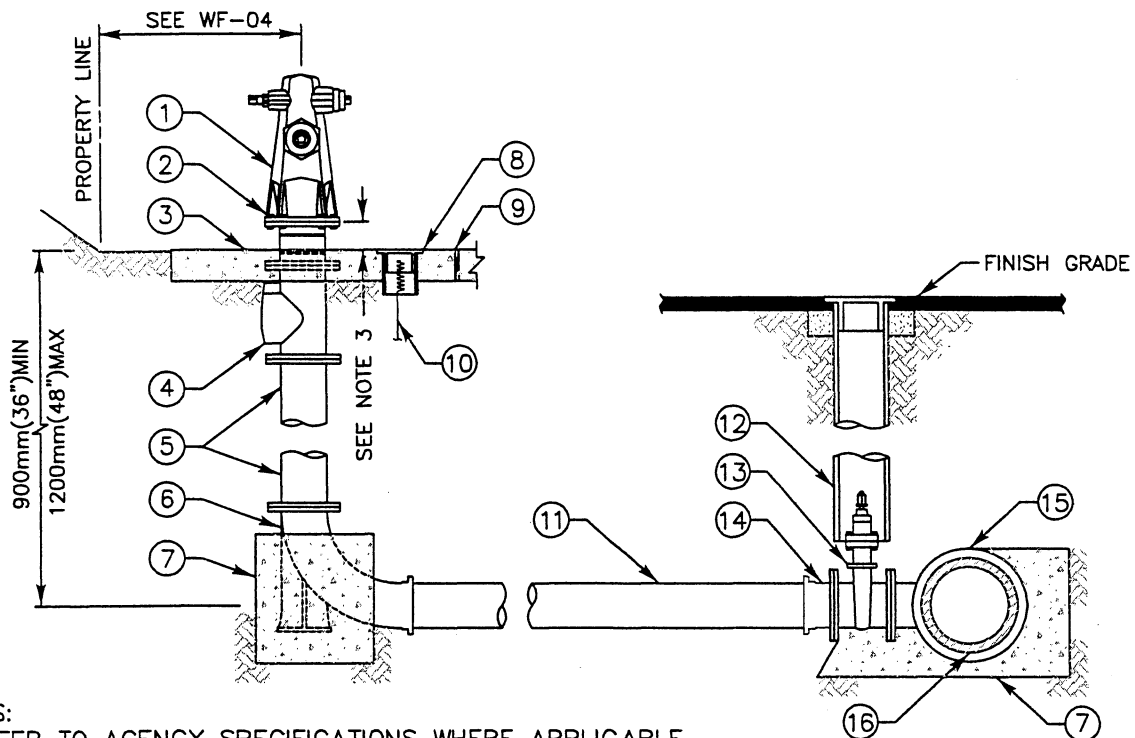
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

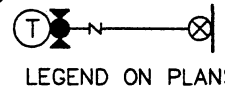
DRAWING NUMBER **WF-01**

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) THE NUMBER OF OUTLETS SHALL BE AS SHOWN ON PLANS
- 3) TOP FLANGE OF BREAK-OFF CHECK VALVE SHALL BE SET WITHIN THE CONCRETE PAD. BREAK OFF GROOVE, MINIMUM OF ONE, SHALL BE PLACED ABOVE THE PAD
- 4) LOCATE FIRE HYDRANT AS SHOWN ON WF-04
- 5) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 6) FIRE HYDRANT FLANGE BOLTS SHALL BE A307 ZINC-PLATED BOLTS INSTALLED WITH NUTS ON TOP OF THE FLANGE. BREAK AWAY BOLTS SHALL NOT BE USED
- 7) CONNECTIONS TO STEEL MAINS WILL BE MADE IN ACCORDANCE WITH AGENCY'S SPECIFICATIONS
- 8) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



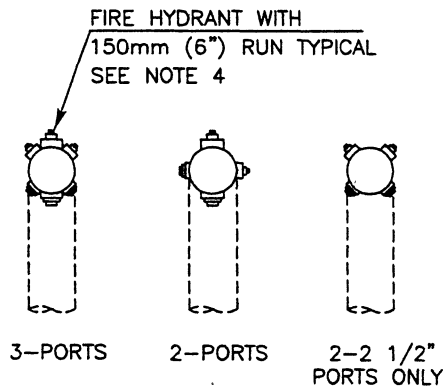
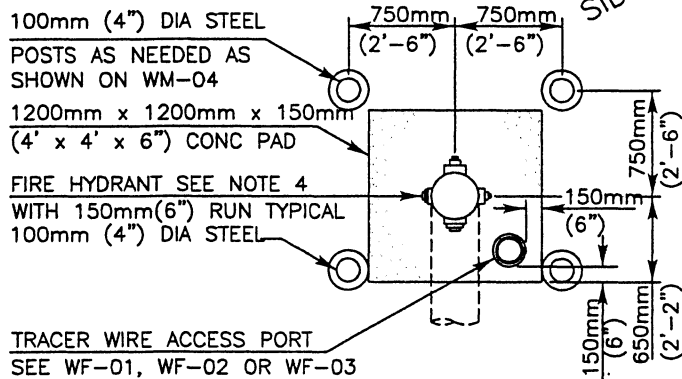
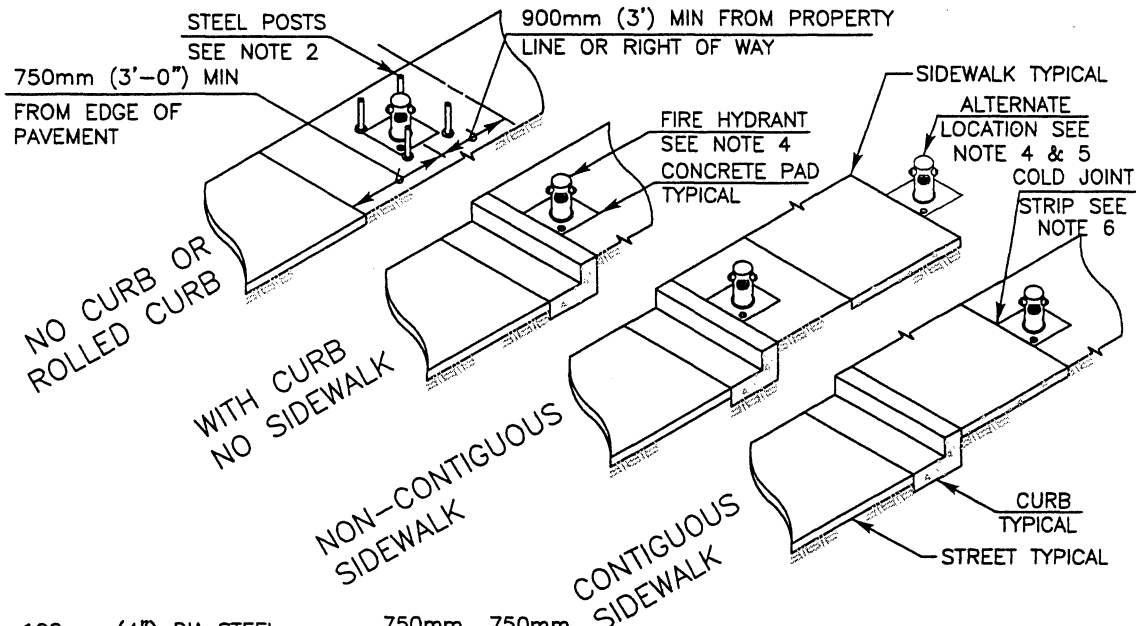
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	150mm (6") FIRE HYDRANT SEE NOTE 2	⑨	COLD JOINT STRIP
②	BOLTS, SEE NOTE 6	⑩	TRACER WIRE (AS REQUIRED) PER WP-01
③	1200mm x 1200mm x 200mm THICK (4' x 4' x 8" THICK) CONCRETE SPLASH PAD	⑪	150mm (6") C-900 PVC PIPE
④	150mm (6") BREAK-OFF CHECK VALVE	⑫	GATE WELL WITH CAP SEE WV-01 OR WV-02
⑤	150mm (6") FLANGE DI SPOOL(S) (MAXIMUM OF 2 SPOOLS) NO GROOVES	⑬	150mm (6") FLG x MJ/PO/FLG RWGV
⑥	150mm x 400mm (6" x 16") LONG RADIUS FLG x MJ/PO BURY ELL	⑭	150mm (6") FLG x MJ/PO ADAPTER (IF REQUIRED)
⑦	CONCRETE THRUST BLOCK SEE WT-01	⑮	SIZE x 150mm (6") MJ/PO/FLG x FLG TEE
⑧	TRACER WIRE ACCESS PORT, 100mm (4") x 200mm 8" LONG SDR 35 SEWER PIPE W/ CAP (AS-REQUIRED)	⑯	WATER MAIN

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-10		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

**150mm (6") FIRE HYDRANT
INSTALLATION WITH BREAK-OFF
CHECK VALVE**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
T. Stanton 10/28/2004
 Chairperson R.C.E. 19246 Date
 DRAWING NUMBER **WF-02**

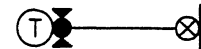


PROTECTION POST LOCATIONS

PORT ORIENTATION

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) PROTECTION POSTS SHALL BE INSTALLED AS CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER PER WM-04
- 3) LOCATE FIRE HYDRANT AS SHOWN ABOVE OR AS DIRECTED BY THE ENGINEER
- 4) FIRE HYDRANTS SHALL BE INSTALLED WITH THE LARGEST PORT PERPENDICULAR TO THE STREET
- 5) AN EASEMENT MAY BE NEEDED DEPENDING ON LOCATION OF FIRE HYDRANT
- 6) IF THE CONCRETE SLAB IS TO BE INSTALLED ADJACENT TO A CONCRETE CURB OR SIDEWALK A COLD JOINT STRIP SHALL BE INSTALLED
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-11		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

FIRE HYDRANT LOCATIONS AND PORT ORIENTATION

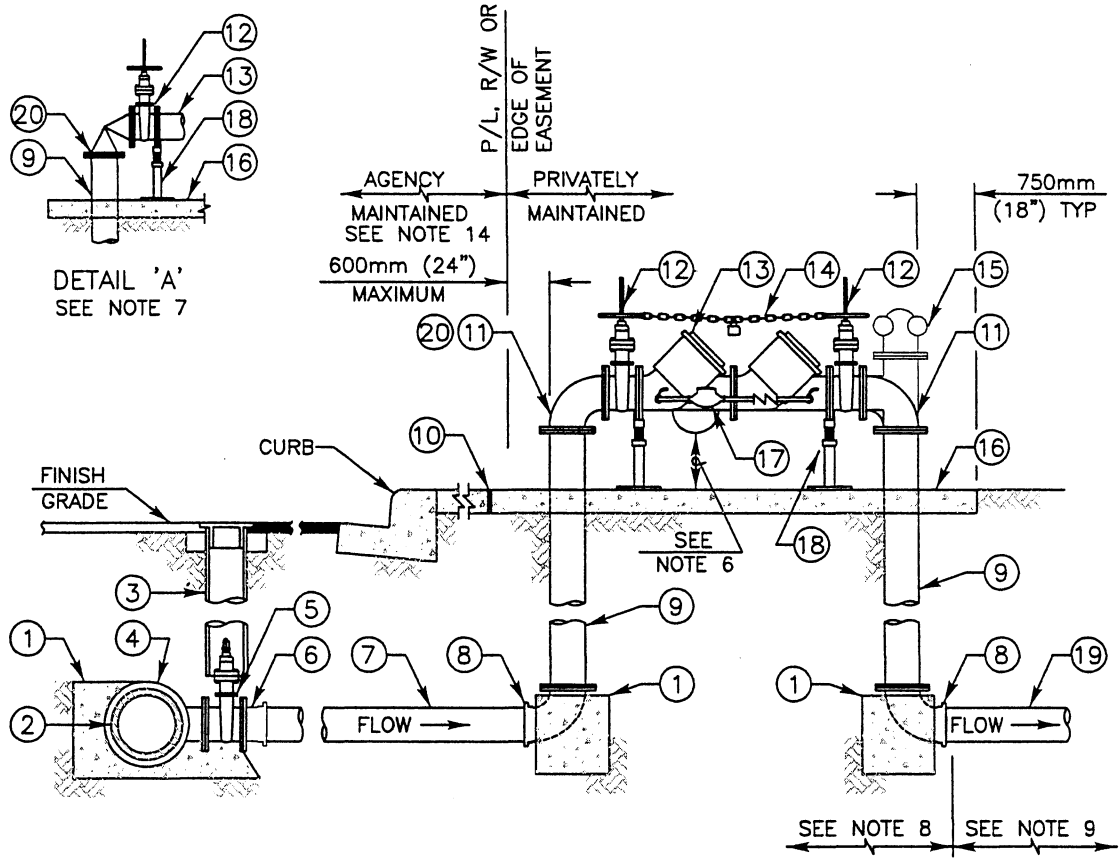
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WF-04**

SEE SDW-100



FOR NOTES REGARDING THE INSTALLATION OF
FIRE SERVICES SEE WF-05 SHEET 2 OF 2

RPFS LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	CONCRETE THRUST BLOCK SEE WT-01	⑬	RPDA UNLESS OTHERWISE SPECIFIED BY AGENCY OF JURISDICTION SEE NOTE 4
②	WATER MAIN	⑭	CHAIN WITH KNOX LOCK SEE NOTE 4
③	GATE WELL WITH CAP SEE WV-01 OR WV-02	⑮	FLANGED TEE WITH "FDC" SEE NOTE 4
④	SIZE x SIZE MJ/PO/FLG x FLG TEE	⑯	CONCRETE SLAB AS REQUIRED BY AGENCY OF JURISDICTION. MINIMUM 100mm (4") THICK x 900mm (36") WIDE x AS REQUIRED
⑤	FLG x MJ/PO/FLG RWGV	⑰	19mm (3/4") BYPASS, METER & RP DEVICE
⑥	FLG x MJ/PO ADAPTER (IF REQUIRED)	⑱	ADJUSTABLE VALVE SUPPORT
⑦	C-900 PVC PIPE	⑳	PVC OR DI PIPE SEE NOTE 9
⑧	MJ/PO x FLG 90° BEND		
⑨	FLANGED DUCTILE IRON PIPE		
⑩	COLD JOINT STRIP		
⑪	FLANGED 90° BEND, SEE NOTE 7		
⑫	FLANGED OS&Y RWGV WITH HAND WHEEL		

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-26		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING


100mm (4") AND LARGER FIRE
SERVICE INSTALLATION


RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
T. Stanton 10/28/2004
Chairperson R.C.E. 19246 Date
DRAWING NUMBER **WF-05** (1 OF 2)

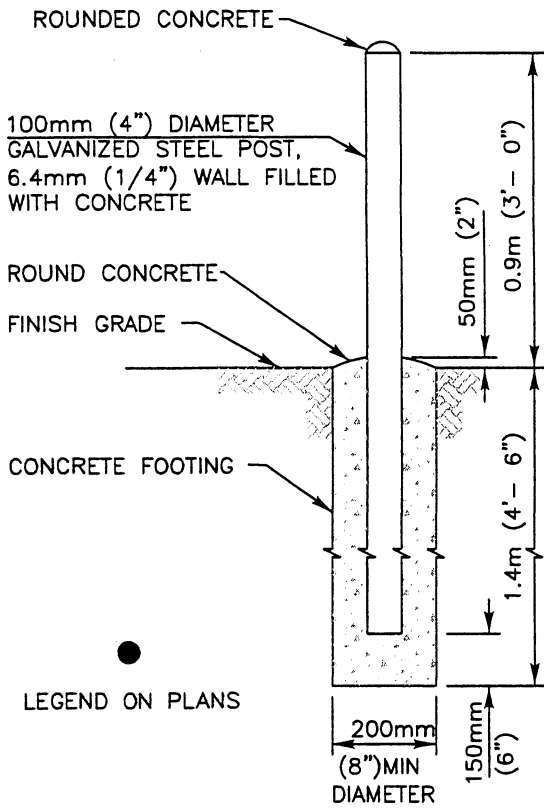
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 3) LOCATION OF FIRE SERVICES SHALL BE AS DIRECTED BY THE FIRE DEPARTMENT OF JURISDICTION. FIRE SERVICES SHOULD BE LOCATED IN SUCH A MANNER THAT WILL ALLOW THE DEVICE TO BE READILY ACCESSIBLE FOR INSPECTION, REPAIR, AND USAGE
- 4) TAMPER SWITCH, AUTOMATIC RESET, CHAIN WITH KNOX LOCK, AND FIRE DEPARTMENT CONNECTION ("FDC") SHALL BE AS REQUIRED BY THE FIRE DEPARTMENT OF JURISDICTION
- 5) BALL VALVE TEST COCKS SHALL BE PROVIDED AND LOCATED PER THE MANUFACTURERS RECOMMENDATIONS AND THE REQUIREMENTS OF THE WATER AGENCY STANDARDS
- 6) INSTALL FIRE SERVICES SO THAT THE DISTANCE BETWEEN THE BOTTOM OF THE RELIEF DIAPHRAM AND THE CONCRETE SLAB OR FINISH GRADE IS 300mm (12") MINIMUM AND 600mm (24") MAXIMUM
- 7) INSTALL AN ANGLE PRESSURE REDUCING VALVE IN LIEU OF THE FIRST 90° BEND WHEN SYSTEM STATIC PRESSURE EXCEEDS 1.03 MPa (150 PSI) OR WHEN RECOMMENDED BY THE BACKFLOW MANUFACTURER
- 8) INSTALL PIPE AND RELATED APPURTENANCES IN THIS AREA PER THE REQUIREMENTS OF THE WATER AGENCY STANDARDS
- 9) INSTALL PIPE AND RELATED APPURTENANCES IN THIS AREA AS REQUIRED BY THE FIRE DEPARTMENT OF JURISDICTION
- 10) ABOVE GROUND APPURTENANCES SHALL BE PAINTED AND IDENTIFIED AS CALLED FOR BY THE FIRE DEPARTMENT OF JURISDICTION
- 11) TESTING SHALL BE CONDUCTED AS CALLED FOR IN AGENCY'S SPECIFICATIONS PRIOR TO ACCEPTANCE BY THE DISTRICT
- 12) CONNECTIONS TO STEEL MAINS SHALL BE IN ACCORDANCE WITH AGENCY'S SPECIFICATIONS
- 13) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST
- 14) AGENCY RESPONSIBILITY ENDS AT EDGE OF PROPERTY LINE, RIGHT OF WAY, OR EASEMENT.

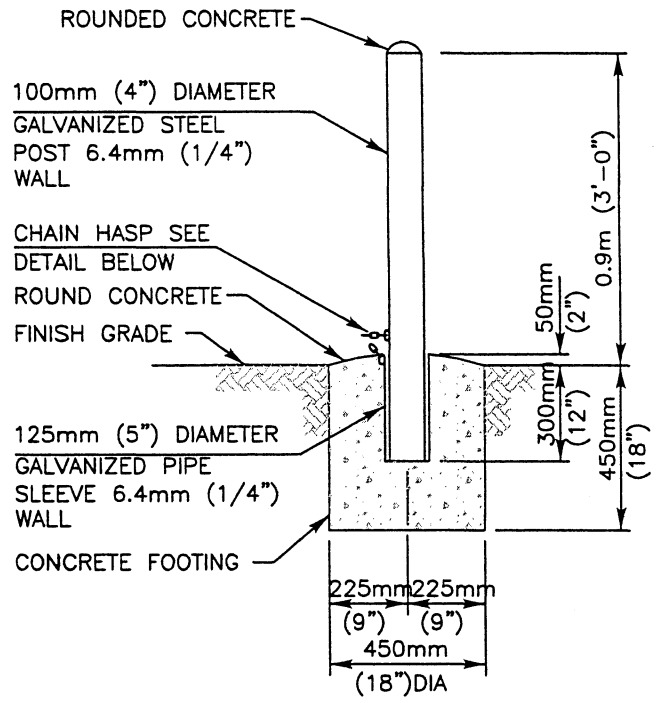
FOR DETAILS REGARDING THE INSTALLATION OF
FIRE SERVICES SEE WF-05 SHEET 1 OF 2

RPFS 
LEGEND ON PLANS

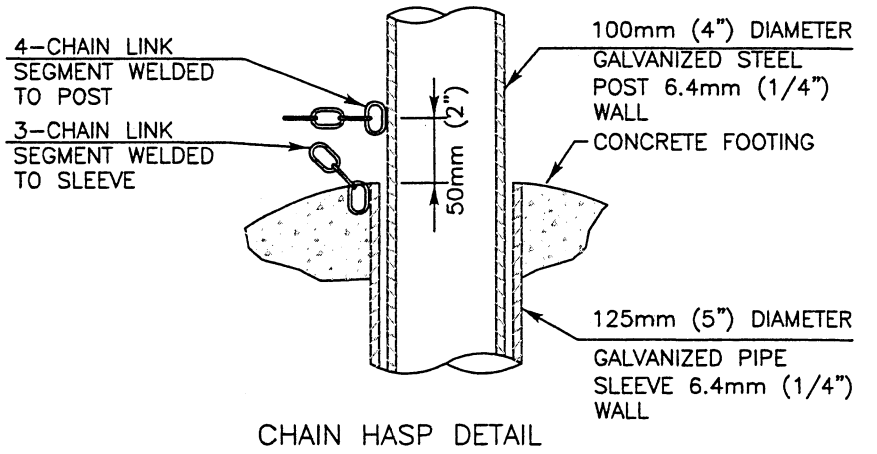
Revision	By	Approved	Date	<p style="text-align: center;">SAN DIEGO REGIONAL STANDARD DRAWING</p> <p style="text-align: center;">100mm (4") AND LARGER FIRE SERVICE INSTALLATION NOTES</p>	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		 10/28/2004 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03		
Replaced W-26		J. Tomasulo	10/04		
				DRAWING NUMBER WF-05 (2 OF 2)	



PROTECTION POST TYPE "A"



DEMOUNTABLE PROTECTION POST TYPE "B"



CHAIN HASP DETAIL

NOTES:

- 1) TYPE "A" AND TYPE "B" PROTECTION POSTS SHALL BE INSTALLED WHERE INDICATED ON THE APPROVED PLANS OR AS DIRECTED BY THE ENGINEER. SDG&E REQUIREMENTS DICTATE IN AREAS OF SDG&E EQUIPMENT
- 2) CHAIN TO BE 6.4mm (1/4") PROOF COIL CHAIN GALVANIZED STEEL. WELD 4-LINK SEGMENT TO POST AND 3-LINK SEGMENT TO SLEEVE
- 3) TYPE "A" AND TYPE "B" PROTECTION POSTS SHALL BE COATED USING SAFETY YELLOW IN ACCORDANCE WITH AGENCY'S STANDARDS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-16		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

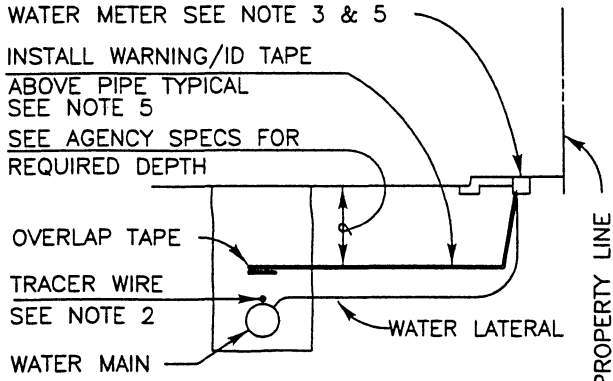
PROTECTION POST INSTALLATION

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

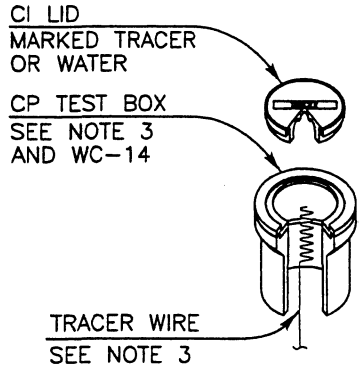
T. Stanton 10/23/2004

Chairperson R.C.E. 19246 Date

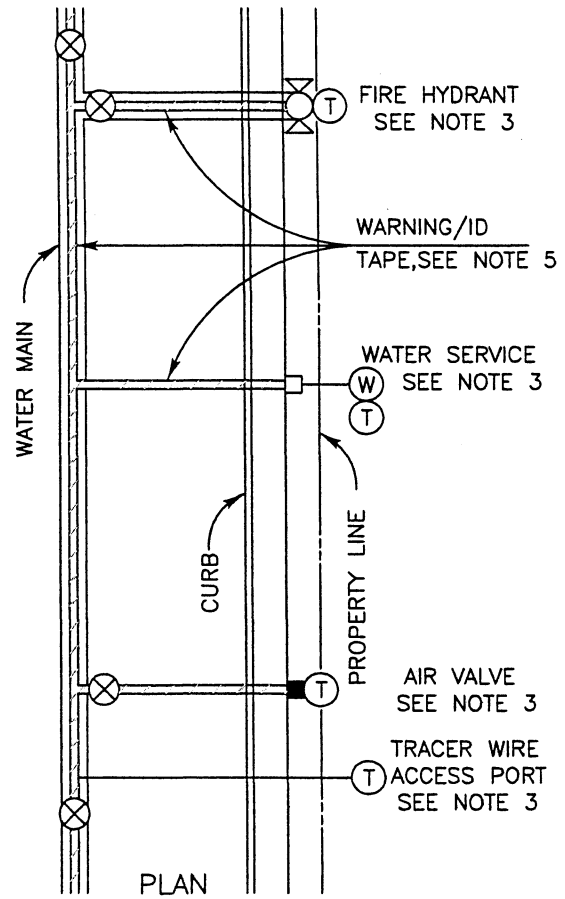
DRAWING NUMBER **WM-04**



SECTION AT WATER LATERALS



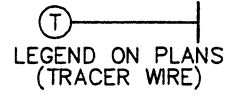
TRACER WIRE ACCESS PORT (CP BOX) DETAIL



PLAN

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) WHERE SPECIFIED, TRACER WIRE AND OR WARNING ID TAPE, TO RUN CONTINUOUSLY ALONG THE ENTIRE LENGTH OF WATER MAINS. WIRE SHALL BE SECURED TO THE PIPE AND MAINTAINED ON PIPE CENTERLINE DURING TRENCH BACKFILL
- 3) TRACER WIRE ACCESS PORTS SHALL BE INSTALLED WITHIN THE CONCRETE SPLASH PAD OF ALL FIRE HYDRANTS IN ACCORDANCE WITH THE STANDARD DRAWINGS. TRACER WIRE MAY TERMINATE WITHIN METER BOX, BLOWOFF BOX OR AIR VALVE PER AGENCY'S SPECIFICATIONS. TRACER WIRE MAY TERMINATE IN A CP TEST BOX ONLY IF NO OTHER APPURTENANCE EXISTS WITHIN THE REQUIRED 305m (1,000') INTERVAL. ALL BURIED WIRES THAT REQUIRE TRENCHING TO A TEST BOX LOCATION SHALL BE INSTALLED, WITHOUT SPLICE, IN A CONDUIT IN THE TRENCH AT A MINIMUM DEPTH OF 600mm (24")
- 4) WIRE SPLICE CONNECTORS SHALL BE SILICONE FILLED TYPE
- 5) WARNING/IDENTIFICATION TAPE SHALL BE INSTALLED ABOVE THE PIPE AS SPECIFIED AND RUN CONTINUOUSLY ALONG THE ENTIRE LENGTH OF THE PIPE AND ALL RELATED APPURTENANCES
- 6) FOR PIPE BEDDING AND TRENCH BACKFILL SEE WP-02
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-25		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

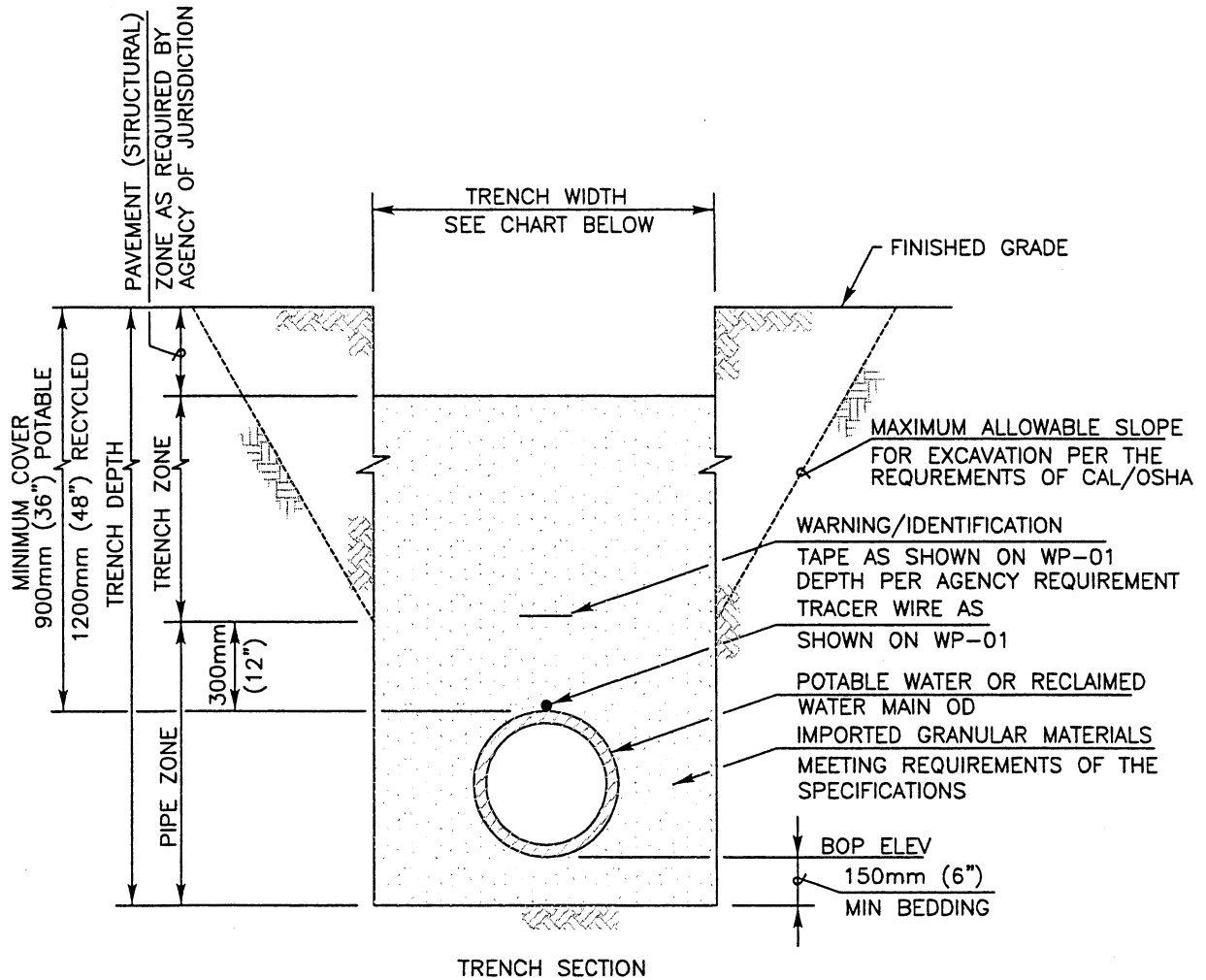
WARNING/IDENTIFICATION TAPE AND TRACER WIRE INSTALLATIONS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WP-01**

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) PAVING OR PAVEMENT REPAIR TO BE DONE IN ACCORDANCE TO CITY OR COUNTY STANDARDS
- 3) EXCAVATE BELL HOLES AT EACH PIPE JOINT TO PERMIT PROPER ASSEMBLY AND INSPECTION OF THE ENTIRE JOINT
- 4) ALL PIPELINE TRENCHES SHALL BE EXCAVATED SO THAT THE DISTANCE BETWEEN TRENCH WALLS AT THE TOP OF PIPE SHALL BE AS SHOWN BELOW:

TRENCH WIDTH

NOMINAL PIPE INSIDE DIAMETER	MINIMUM DISTANCE	MAXIMUM DISTANCE
100mm (4") & SMALLER	450mm (18")	700mm (28")
150mm & 200mm (6" & 8")	600mm (24")	800mm (32")
250mm & 300mm (10" & 12")	700mm (28")	900mm (36")
400mm THRU 900mm (16" THRU 36")	OD PLUS 600mm(24")	OD PLUS 900mm(36")

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-21		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE BEDDING AND TRENCH BACKFILL FOR POTABLE AND RECYCLED WATER MAINS

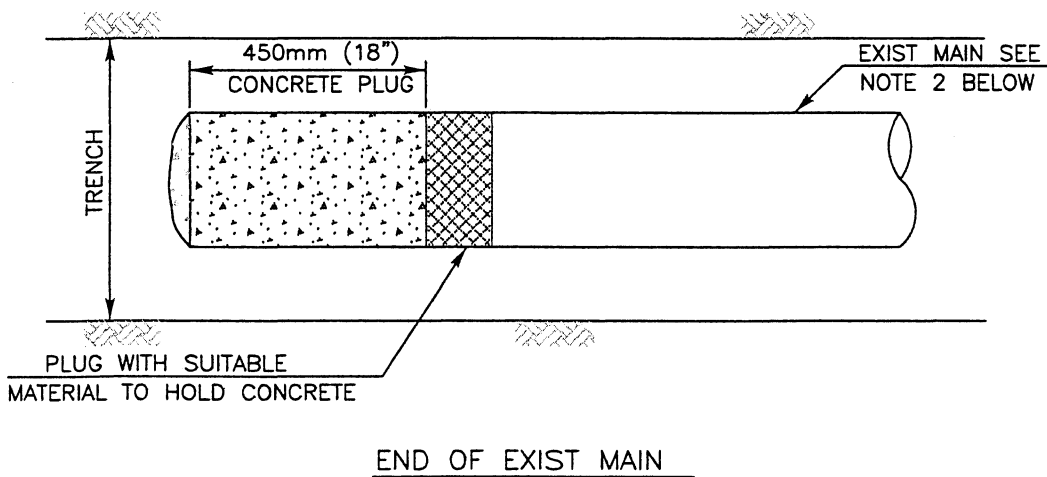
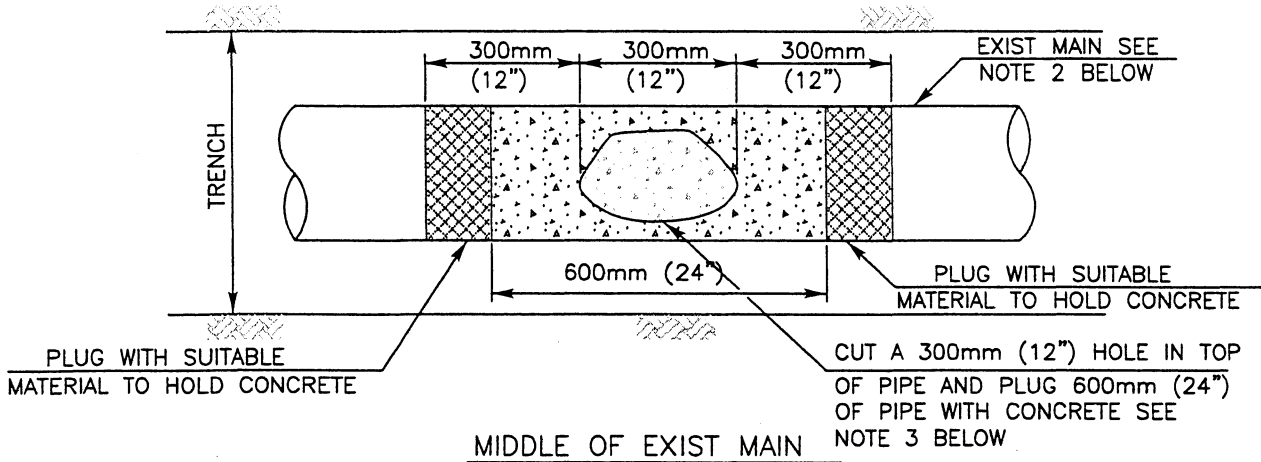
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WP-02**

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) WATER AND RECYCLED WATER MAINS AND SEWER LATERALS 100mm (4") DIAMETER AND SMALLER SHALL HAVE A SHORT SECTION OF PIPE REMOVED AND PIPE ENDS ENCASED IN CONCRETE
- 3) EXISTING MAIN TO BE PLUGGED WITH CONCRETE OR PRESSURE GROUTED AT INTERVALS OF ABOUT 61m (200') OR AS DIRECTED BY THE ENGINEER
- 4) EXISTING MAINS 400mm (16") AND LARGER REQUIRE THE ENTIRE LENGTH OF THE PIPE TO BE FILLED BY PRESSURE GROUTING OR BY BLOWN SAND
- 5) EXISTING VALVES SHALL BE TURNED TO THE CLOSED POSITION. REMOVE GATE WELL AND REPLACE WITH COMPACTED BACKFILL
- 6) FOR ABANDONMENT OF MANHOLES SEE SM-08
- 7) PRIOR AGENCY APPROVAL REQUIRED FOR CUTTING AND PLUGGING

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

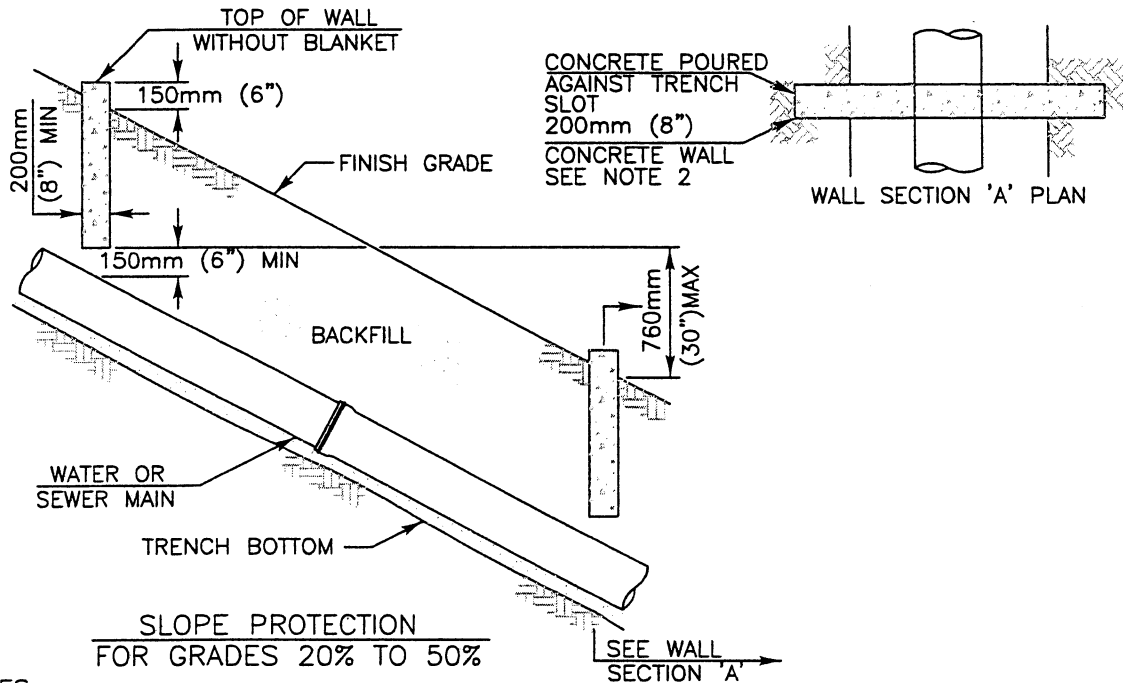
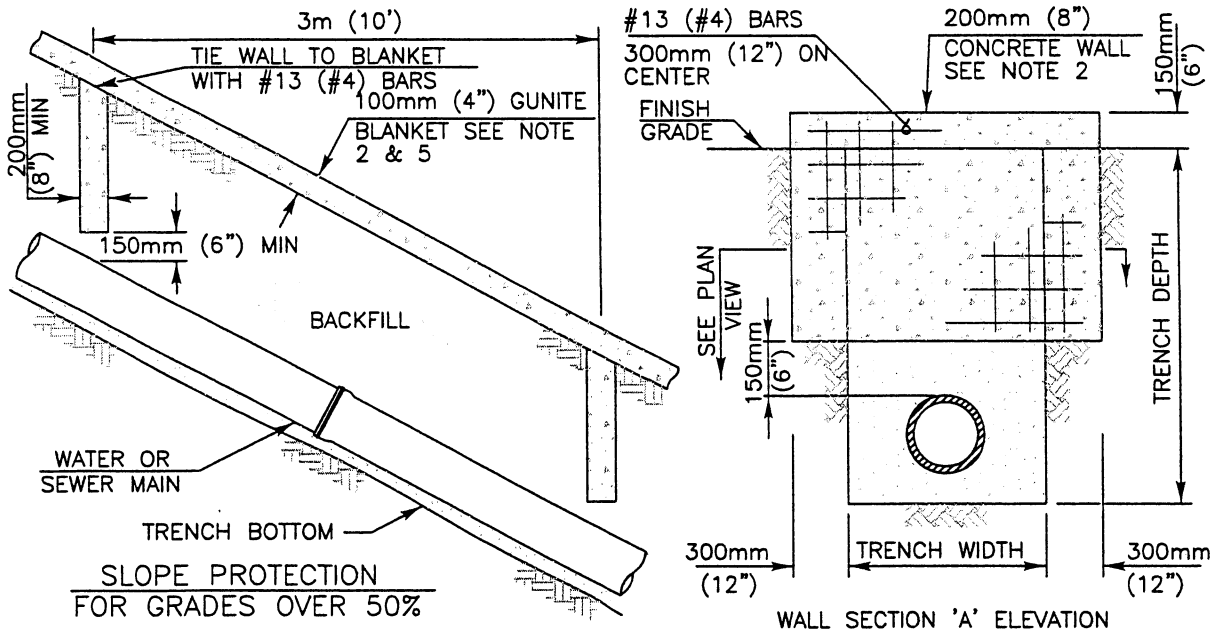
**CUTTING AND PLUGGING ABANDONED WATER,
RECYCLED WATER AND SEWER MAINS**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

R. C. E. 10/28/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WP-03**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) THE DETAILS SHOWN REPRESENT THE MINIMUM REQUIRED. THE ENGINEER OF WORK IS REQUIRED TO PROVIDE A SUBMITTAL TO THE AGENCY OF JURISDICTION FOR REVIEW AND APPROVAL BY THE AGENCY'S ENGINEER PRIOR TO INSTALLATION
- 3) WALLS SHALL BE REINFORCED CONCRETE OR 200mm x 200mm x 400mm (8" x 8" x 16") CONCRETE BLOCK, REINFORCED AND ALL CORES FILLED WITH GROUT SEE SPECIFICATIONS
- 4) FOR GRADES OVER 50%, SLOPE PROTECTION SHALL ALSO INCLUDE AC PAVING, CONCRETE SLAB OR GUNITE BLANKET PLACED OVER THE PIPELINE ALIGNMENT
- 5) 100mm (4") GUNITE BLANKET WITH 150mm (6") SQUARE x 10 GAGE WIRE FABRIC AT THE ENGINEERS DISCRETION

LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

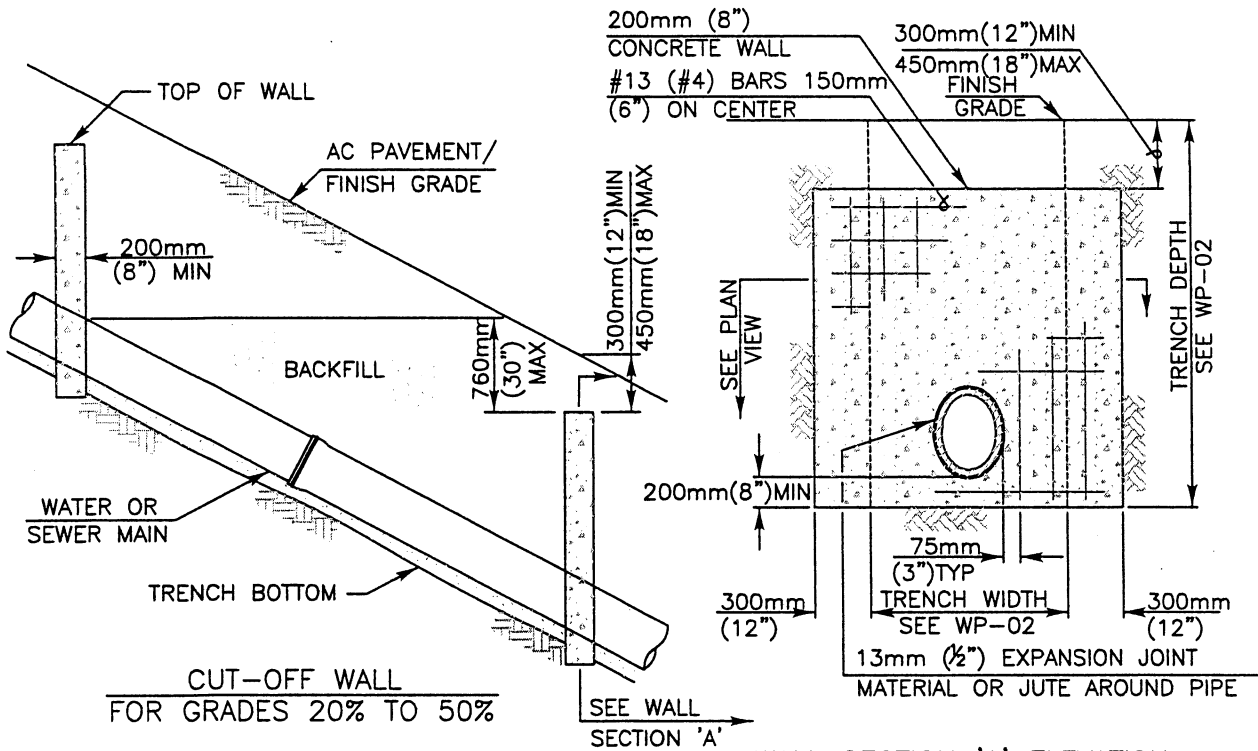
SLOPE PROTECTION INSTALLATIONS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

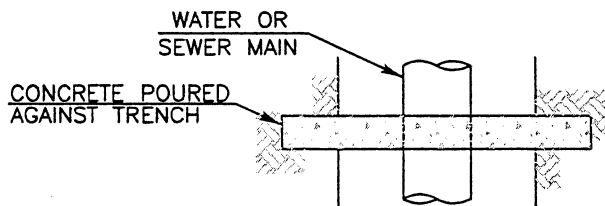
J. Steanton 10/28/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER WP-05



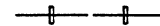
WALL SECTION 'A' ELEVATION



WALL SECTION 'A' PLAN

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) FOR USE AS TRENCH BACKFILL STABILIZATION IN TRAVELED AREAS
- 3) THE DETAILS SHOWN REPRESENT THE MINIMUM REQUIRED. THE ENGINEER OF WORK IS REQUIRED TO PROVIDE A SUBMITTAL TO THE AGENCY OF JURISDICTION FOR REVIEW AND APPROVAL BY THE AGENCY'S ENGINEER PRIOR TO INSTALLATION
- 4) WALLS SHALL BE REINFORCED CONCRETE OR 200mm x 200mm x 400mm (8" x 8" x 16") CONCRETE BLOCK, REINFORCED AND ALL CORES FILLED WITH GROUT SEE SPECIFICATIONS
- 5) FOR GRADES OVER 50% SEE WP-05/SP-05



LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	10/04

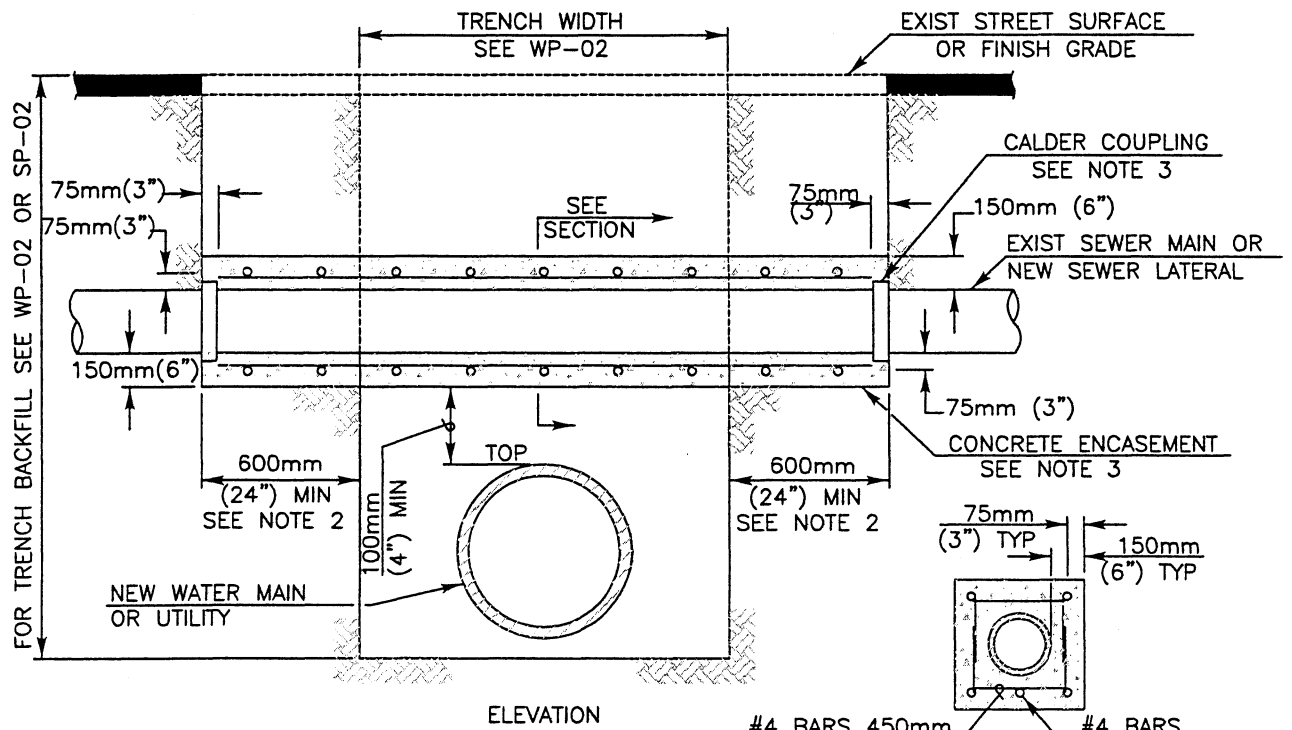
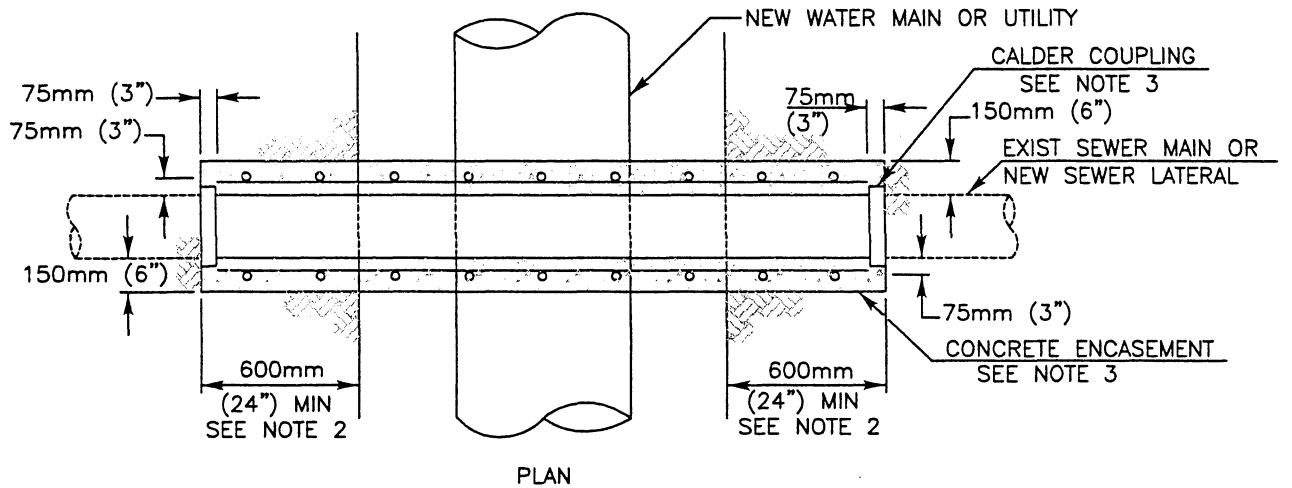
SAN DIEGO REGIONAL STANDARD DRAWING

CUT-OFF WALL INSTALLATION IN TRAVELED AREAS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

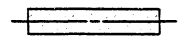
[Signature] 10/28/2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER WP-07



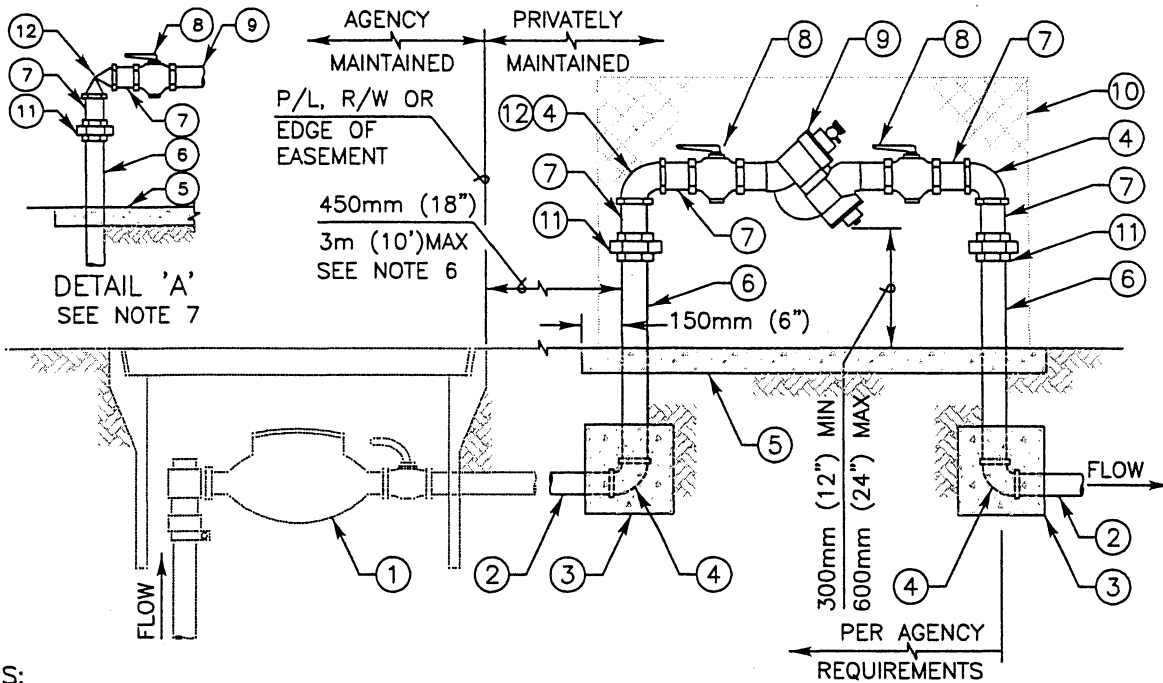
NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS FOR PROTECTION OF EXISTING FACILITIES
- 2) ENCASEMENT SHALL EXTEND TO FIRST JOINT BEYOND BOTH SIDES OF TRENCH [600mm (24") MIN 1200mm (48") MAX OF SUITABLE NATIVE SUPPORT BEYOND EDGE OF TRENCH].
- 3) CONCRETE ENCASEMENT REQUIRED FOR SEWER MAINS ONLY. CALDER COUPLINGS REQUIRED FOR SEWER LATERALS ONLY. SEWER LATERALS TO BE REPLACED WITH SCH. 80 PVC WITH NO INTERMEDIATE JOINTS.
- 4) FOR PIPE BEDDING AND TRENCH BACKFILL SEE WP-02 OR SP-02.



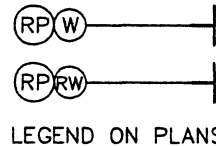
LEGEND ON PLANS

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		J. Tomasulo	10/04	PIPE SUPPORT FOR UNDERCUT SEWER MAINS OR SEWER LATERALS		 Chairperson R.C.E. 19246 Date
				DRAWING NUMBER		WP-09



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 3) LOCATE BACKFLOW PREVENTION DEVICE (BPD) IN SUCH A MANNER THAT WILL ALLOW THE DEVICE TO BE READILY ACCESSIBLE FOR INSPECTION AND REPAIR
- 4) STRAINERS SHALL NOT BE INSTALLED PRIOR TO THE FIRST SHUT-OFF VALVE
- 5) ALL ABOVE GROUND PIPING, UNIONS, ELBOWS, & NIPPLES SHALL BE SOLDERED OR THREADED BRASS
- 6) INSTALL A CASING ENCASED IN CONCRETE WHEN THE DISTANCE BETWEEN THE METER BOX AND THE RISER TO THE BPD EXCEEDS 450mm (18")
- 7) INSTALL AN ANGLE PRESSURE REDUCING VALVE IN LIEU OF THE FIRST 90° ELL WHEN SYSTEM PRESSURE EXCEEDS 1.03 MPa (150 PSI) PER AGENCY SPECIFICATIONS
- 8) TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH AGENCY SPECIFICATIONS PRIOR TO ACCEPTANCE
- 9) BPD & APPURTENANCES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY SPECIFICATIONS
- 10) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	METER BOX & METER ASSEMBLY SEE WS-01 & WS-02	⑥	BRASS OR COPPER PIPE SEE NOTE 5
②	SCH 80 PVC, BRASS OR COPPER PIPE	⑦	75mm (3") LONG NIPPLE SEE NOTE 5
③	CONCRETE THRUST BLOCK SEE WT-01	⑧	BALL VALVE "SHUT-OFF"
④	90° ELL SEE NOTES 5 & 7	⑨	REDUCED PRESSURE BACKFLOW DEVICE
⑤	CONCRETE SLAB, MINIMUM 100mm (4") THICK x 450mm (18") WIDE	⑩	ENCLOSURE (OPTIONAL)
		⑪	UNION SEE NOTE 5
		⑫	ANGLE PRV SEE NOTES 5 & 7

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-27		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

**19mm THRU 50mm (3/4" THRU 2")
REDUCED PRESSURE BACKFLOW
PREVENTION DEVICE**

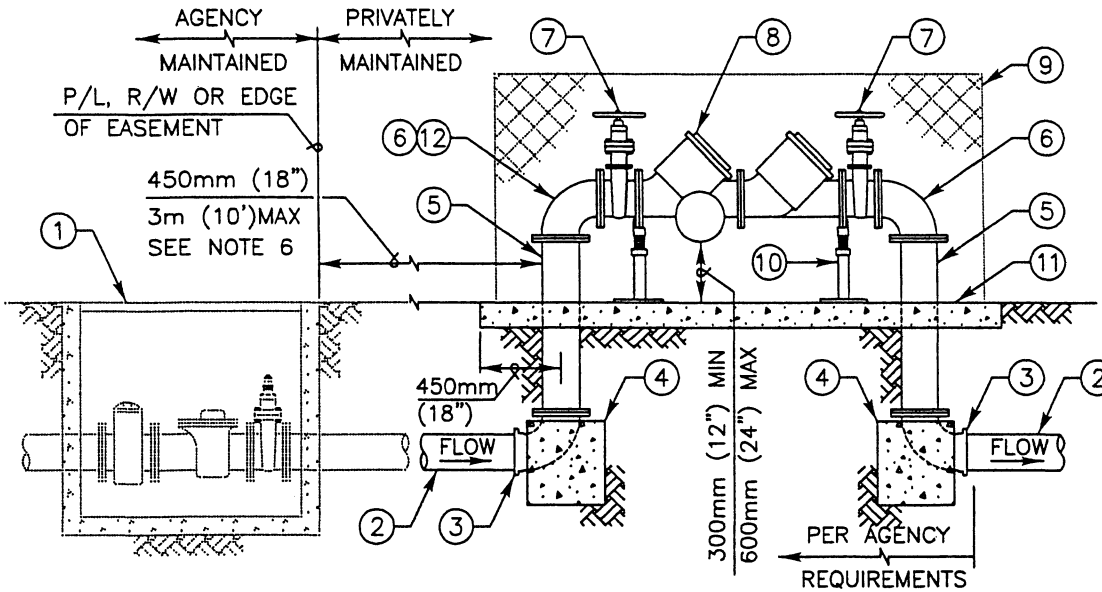
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

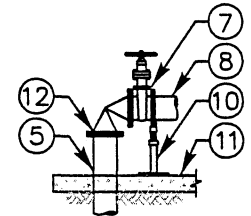
DRAWING NUMBER **WR-01**

SEE SDW-100

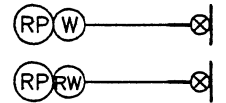


NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 3) LOCATE BACKFLOW PREVENTION DEVICE (BPD) IN SUCH A MANNER THAT WILL ALLOW THE DEVICE TO BE READILY ACCESSIBLE FOR INSPECTION AND REPAIR.
- 4) STRAINERS SHALL NOT BE INSTALLED PRIOR TO THE FIRST SHUT-OFF VALVE
- 5) INSTALL A CASING ENCASED IN CONCRETE WHEN THE DISTANCE BETWEEN THE METER BOX AND THE RISER TO THE BPD EXCEEDS 450mm (18")
- 6) INSTALL AN ANGLE PRESSURE REDUCING VALVE IN LIEU OF THE FIRST 90° ELL WHEN SYSTEM PRESSURE EXCEEDS 1.03 MPa (150 PSI) PER AGENCY SPECIFICATIONS
- 7) TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH AGENCY SPECIFICATIONS PRIOR TO ACCEPTANCE
- 8) BPD & APPURTENANCES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY SPECIFICATIONS
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



DETAIL 'A'
SEE NOTE 7



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	METER VAULT & METER ASSEMBLY SEE WS-04	⑦	FLANGED RESILIENT WEDGE GATE VALVE
②	PVC OR DUCTILE IRON PIPE	⑧	REDUCED PRESSURE BACKFLOW DEVICE
③	FLG x FLG OR MJ/PO x FLG 90° BEND	⑨	ENCLOSURE (OPTIONAL)
④	CONCRETE THRUST BLOCK SEE WT-01	⑩	ADJUSTABLE VALVE SUPPORT
⑤	FLANGED DUCTILE IRON PIPE	⑪	CONCRETE SLAB, MINIMUM 100mm (4") THICK x 900mm (36") WIDE
⑥	FLANGED 90° BEND, SEE NOTE 6	⑫	FLANGED ANGLE PRESSURE REDUCING VALVE SEE NOTE 6

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-28		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

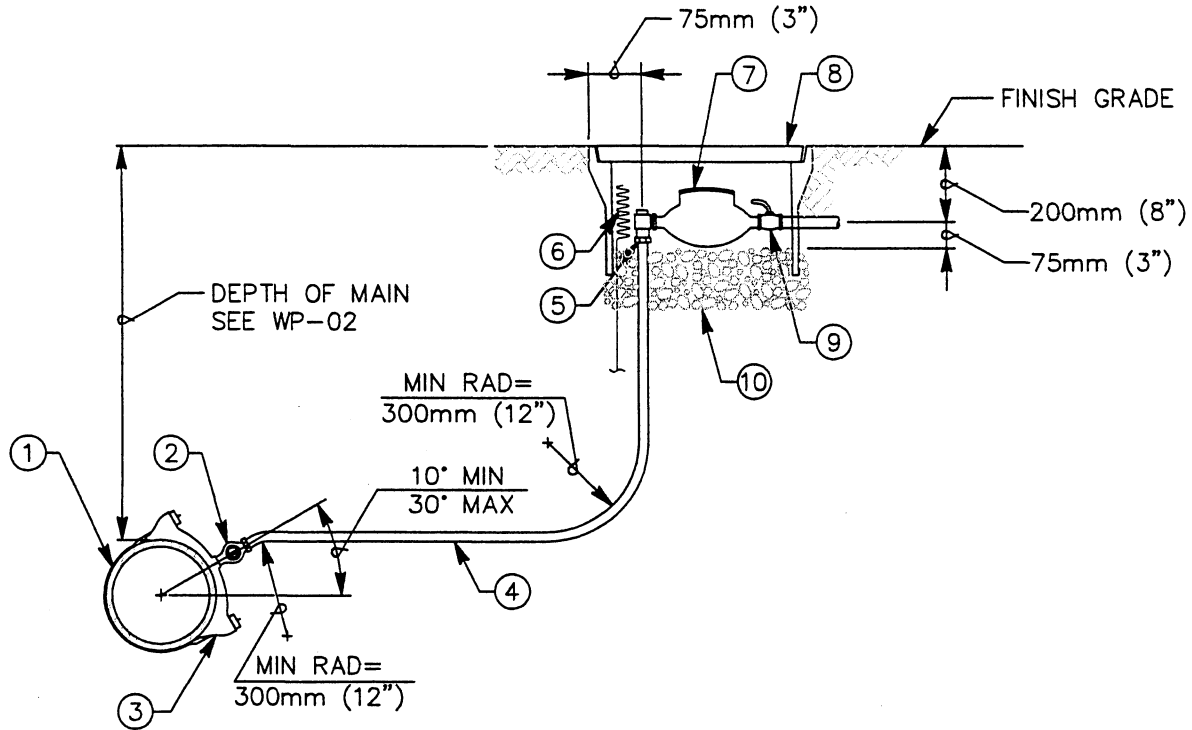
100mm (3") AND LARGER REDUCED PRESSURE BACKFLOW PREVENTION DEVICE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

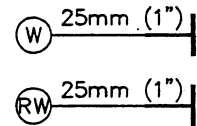
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WR-02**



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) INSTALL CORPORATION STOP WITH KEY IN THE SIDE POSITION
- 3) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB, OR FINISH GRADE
- 4) LOCATE METER BOX AS SHOWN ON WS-03
- 5) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 6) WATER LATERALS INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY SPECIFICATIONS
- 7) SILVER SOLDER JOINTS SHALL NOT BE USED
- 8) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	WATER MAIN	⑦	WATER METER FURNISHED & INSTALLED BY THE WATER AGENCY OF JURISDICTION
②	25mm (1") BRONZE CORPORATION STOP	⑧	METER BOX WITH LID, 250mm x 500mm (10" x 20")
③	SIZE x 25mm (1") SERVICE SADDLE	⑨	CUSTOMER SHUT-OFF VALVE (LOCKABLE) FURNISHED AND INSTALLED BY THE WATER AGENCY OF JURISDICTION
④	25mm (1") x REQUIRED LENGTH COPPER PIPE TYPE "K" SOFT	⑩	10mm (3/8") ROCK, 100mm TO 150mm (4" TO 6") DEEP
⑤	25mm (1") BRONZE ANGLE METER STOP WITH LOCKWING		
⑥	TRACER WIRE (AS REQUIRED), SEE WP-01		

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-01		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

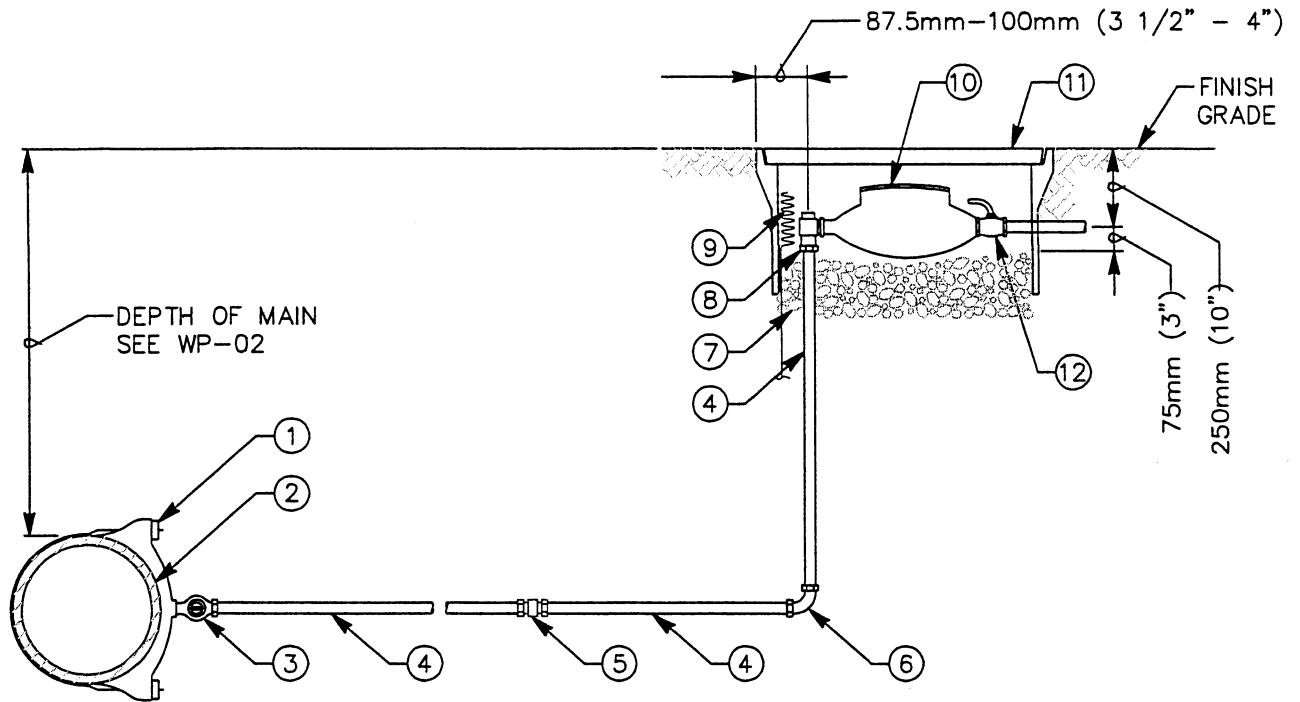
25mm (1") WATER SERVICE INSTALLATION

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004
Chairperson R.C.E. 19246 Date

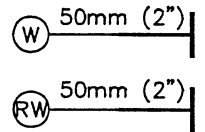
DRAWING NUMBER **WS-01**

SEE SDW-100



NOTES:

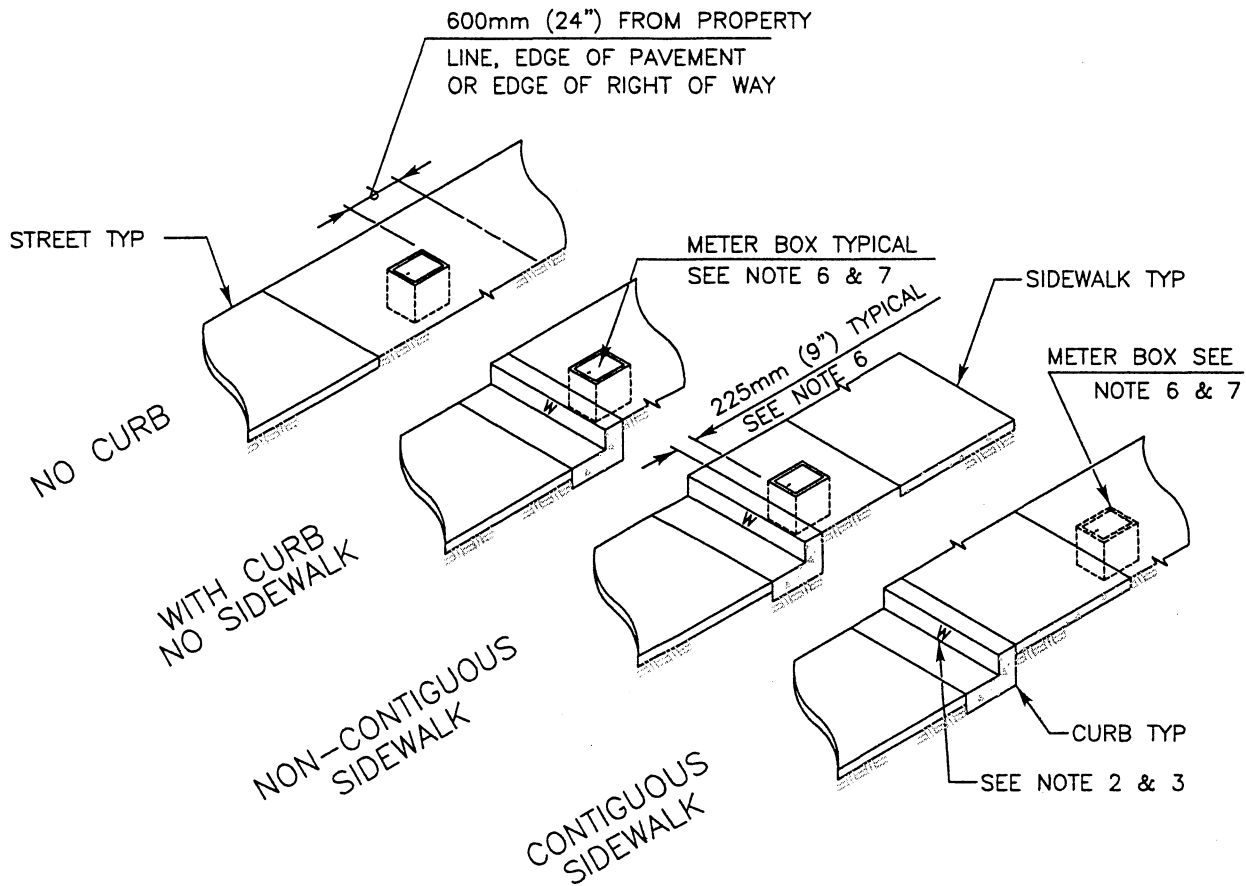
- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE.
- 2) INSTALL CORPORATION STOP WITH KEY IN THE SIDE POSITION
- 3) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB, OR FINISH GRADE
- 4) LOCATE METER BOX AS SHOWN ON WS-03
- 5) INSTALL WARNING/IDENTIFICATION TAPE AS SHOWN ON WP-01
- 6) WATER LATERALS INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY SPECIFICATIONS
- 7) SILVER SOLDER JOINTS SHALL NOT BE USED
- 8) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	SIZE x 50mm (2") SERVICE SADDLE	⑦	10mm (3/8") ROCK, 100mm x 150mm (4" TO 6") DEEP
②	WATER MAIN	⑧	50mm (2") BRONZE ANGLE METER STOP WITH LOCKWING
③	50mm (2") BRONZE CORPORATION STOP	⑨	TRACER WIRE (AS REQUIRED), SEE WP-01
④	50mm (2") x REQUIRED LENGTH COPPER PIPE TYPE "K" SOFT/RIGID OR UNLESS OTHERWISE SPECIFIED BY AGENCY OF JURISDICTION	⑩	WATER METER FURNISHED AND INSTALLED BY THE WATER AGENCY OF JURISDICTION
⑤	50mm (2") BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)	⑪	METER BOX WITH LID, 425mm x 750mm (17"x 30")
⑥	50mm (2") BRONZE COMPRESSION ELL	⑫	CUSTOMER SHUT-OFF VALVE (LOCKABLE)

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE <i>T. Stanton</i> 10/28/2004 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced W-02		J. Tomasulo	10/04		
50mm (2") WATER SERVICE INSTALLATION				DRAWING NUMBER	WS-02



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) STAMP OR CHISEL A 50mm (2") HIGH 'W' IN CURB FACE TO IDENTIFY POTABLE WATER SERVICE LOCATION
- 3) STAMP OR CHISEL A 50mm (2") HIGH 'RW' IN CURB FACE TO IDENTIFY RECYCLED WATER SERVICE LOCATION
- 4) METER BOXES ARE NOT TO BE INSTALLED IN DRIVEWAYS, SIDEWALKS OR WITHIN PAVED ROADWAYS
- 5) MULTIPLE METER BOXES SHALL BE INSTALLED WITH A MINIMUM OF 225mm (9") BETWEEN BOXES
- 6) METER BOX SHALL BE INSTALLED 225mm (9") FROM THE BACK OF BERM, CURB, OR SIDEWALK (TYP)
- 7) AN EASEMENT MAY BE NEEDED DEPENDING ON LOCATION OF METER BOX
- 8) METER BOXES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Replaced W-15		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

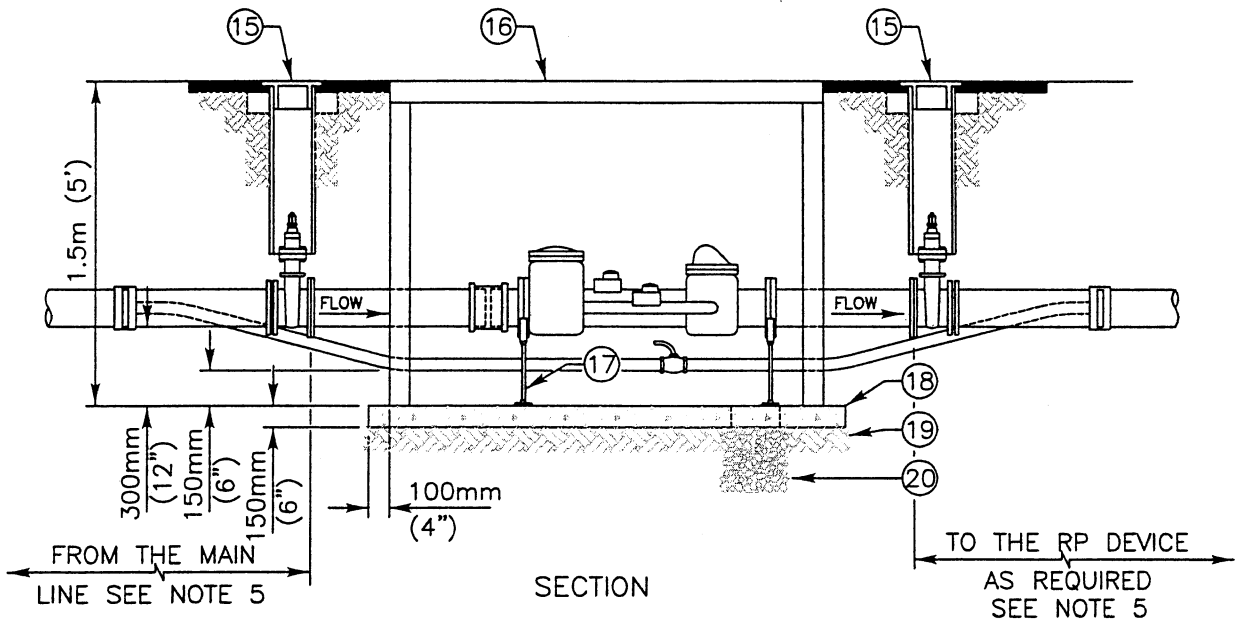
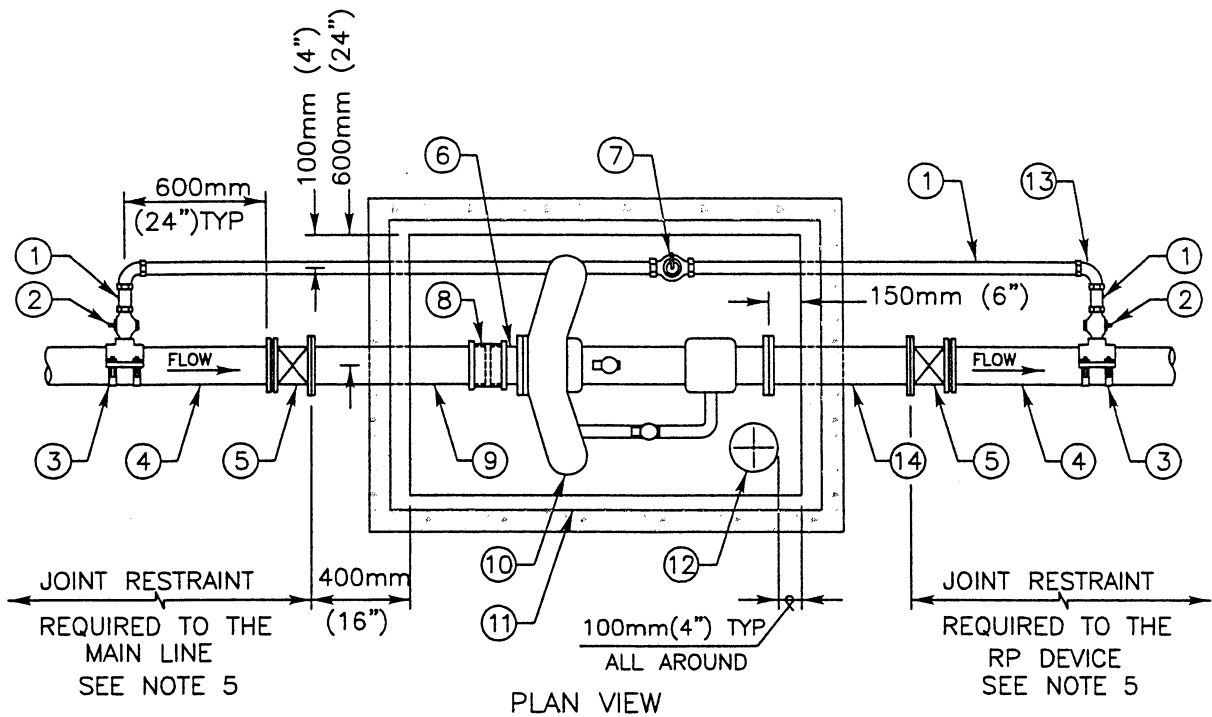
METER BOX LOCATIONS FOR WATER AND RECYCLED WATER APPURTENANCES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

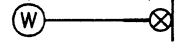
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WS-03**



FOR MATERIAL DESCRIPTIONS AND NOTES SEE WS-04 (2 OF 2)

(INDICATE SIZE)



LEGEND ON PLANS

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

**100mm (4") OR 150mm (6")
FIRELINE/MASTER METER INSTALLATION**

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

[Signature] 10/23/2004

Chairperson R.C.E. 19246 Date

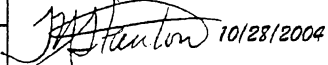
DRAWING NUMBER **WS-04** (1 OF 2)

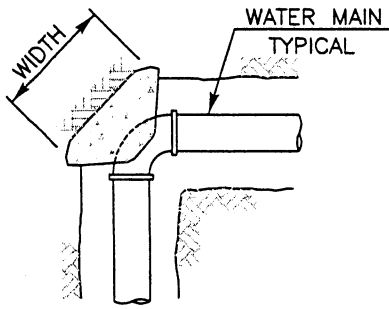
FOR DRAWING OF THE METER INSTALLATION SEE WS-04 (SHEET 1 OF 2)

NOTES:

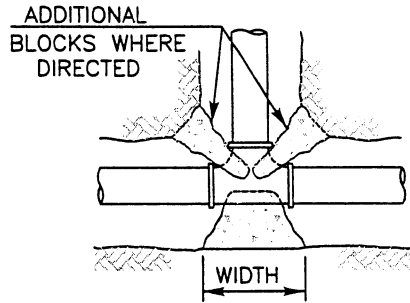
- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) TO BE USED WHERE BOTH DOMESTIC SERVICE AND FIRE PROTECTION ARE INSTALLED ON THE SAME PRIVATE SYSTEM
- 3) LOCATION OF METER SHALL BE APPROVED BY THE DISTRICT ENGINEER PRIOR TO INSTALLATION IN ACCORDANCE WITH STANDARD DWG WS-06
- 4) 200mm (8") OR 250mm (10") METERS TO BE DESIGNED BY AN ENGINEER AND SUBMITTED FOR AGENCY'S APPROVAL AS NEEDED ON A CASE-BY-CASE BASIS
- 5) JOINT RESTRAINT SHALL BE IN ACCORDANCE WITH AGENCY SPECIFICATIONS
- 6) METERS SHALL BE FURNISHED AND INSTALLED BY THE AGENCY OF JURISDICTION
- 7) 100mm (4") METER REQUIRES A 1200mm x 1500mm (48" x 60") VAULT
150mm (6") METER REQUIRES A 1200mm x 1800mm (48" x 72") VAULT
- 8) IN AREAS WHERE GROUND WATER IS PRESENT THE AGENCY'S ENGINEER MAY REQUIRE A SEALED SUMP TO BE CONSTRUCTED
- 9) CONNECTIONS TO STEEL WATER MAINS SHALL BE IN ACCORDANCE WITH AGENCY SPECIFICATIONS
- 10) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	50mm (2") x REQUIRED LENGTH TYPE "K" COPPER PIPE	⑪	FRP VAULT WITH HINGED ACCESS DOOR, SEE NOTE 7
②	50mm (2") BRONZE CORPORATION STOP	⑫	300mm (12") DIAMETER x 150mm (6") LONG PVC PIPE
③	LINE SIZE x 50mm (2") SERVICE SADDLE	⑬	50mm (2") 90° COMPRESSION ELL (TYPICAL)
④	100mm (4") OR 150mm (6") PVC PIPE	⑭	LINE SIZE x 600mm (24") LONG FLANGED DUCTILE-IRON SPOOL
⑤	100mm (4") OR 150mm (6") FLG x MJ RWGV MECHANICALLY RESTRAINED, SEE NOTE 5	⑮	200mm (8") GATE WELL. SEE WV-01 & WV-02
⑥	LINE SIZE x 150mm (6") LONG FLG x PE DUCTILE-IRON SPOOL	⑯	HINGED VAULT ACCESS DOOR
⑦	50mm (2") COMPRESSION, LOCKABLE BALL VALVE	⑰	ADJUSTABLE PIPE SUPPORT (TYPICAL)
⑧	100mm (4") OR 150mm (6") FLEXIBLE COUPLING	⑱	150mm (6") CLASS "B" CONCRETE FLOOR WITH #3 BARS @ 300mm (12") C.C.
⑨	LINE SIZE x 750mm (30") LONG FLG x PE DUCTILE-IRON SPOOL	⑲	150mm (6") DG BASE COMPACTED TO 90%
⑩	100mm (4") OR 150mm (6") FIRELINE METER SEE NOTE 6	⑳	300mm (12") DIAMETER x 300mm (12") DEEP, 19mm (3/4") GRAVEL SUMP, SEE NOTE 8

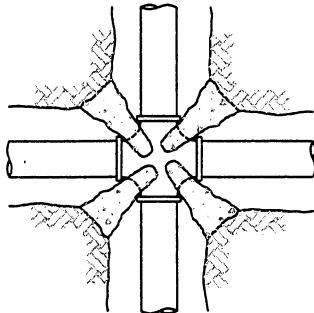
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 100mm (4") OR 150mm (6") FIRELINE/MASTER METER INSTALLATION	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  Chairperson R.C.E. 19246 Date
ORIGINAL		J. Tomasulo	10/04		
				DRAWING NUMBER WS-04 (2 OF 2)	



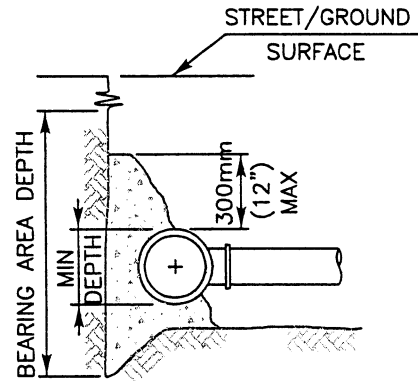
BEND



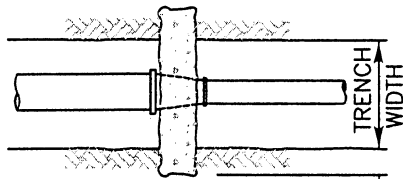
TEE PLAN



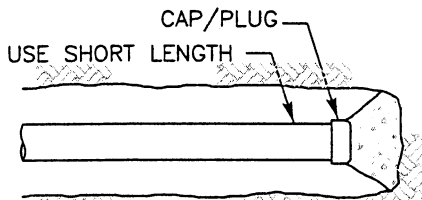
CROSS



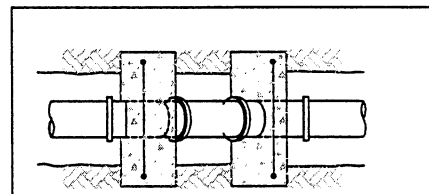
TEE ELEVATION



450mm (18") MINIMUM INTO NATIVE MATERIAL REDUCER

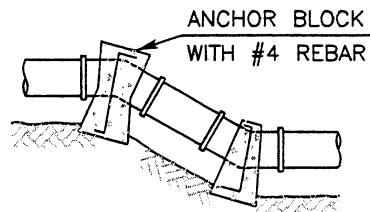


END CAP



VERT BENDS PLAN

SEE NOTE 2 BELOW



VERT BENDS ELEVATION

NOTES:

- 1) FOR ADDITIONAL THRUST BLOCKS, ANCHOR BLOCKS AND NOTES SEE WT-01 (2 OF 3) & (3 OF 3)
- 2) THE ANCHOR BLOCKS ON VERTICAL BENDS REQUIRE AGENCY APPROVAL

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Repl. W-17 through W-22		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE THRUST AND ANCHOR BLOCK INSTALLATIONS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WT-01** (1 OF 3)

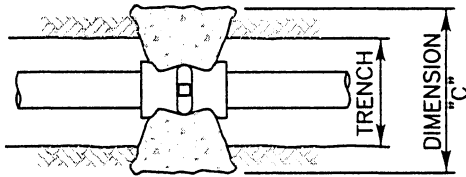
SEE SDW-100

VALVE SUPPORT BLOCK

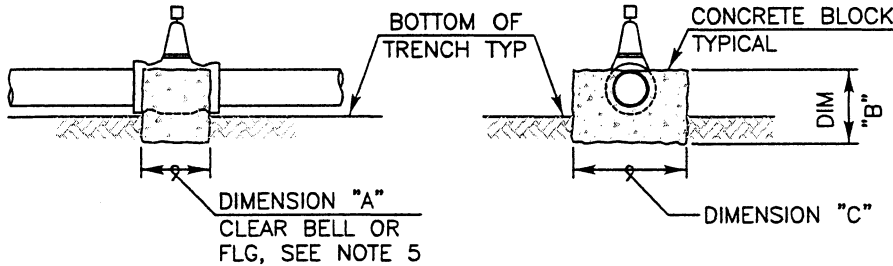
VALVE SIZE	DIMENSION "A"	DIMENSION "B"
100mm(4")	300mm(12")	300mm(12")
150mm(6")	300mm(12")	300mm(12")
200mm(8")	325mm(13")	350mm(14")
250mm(10")	350mm(14")	400mm(16")
300mm(12")	375mm(15")	450mm(18")
DIMENSION "C" = TRENCH WIDTH PLUS TWO TIMES THE PIPE DIAMETER		

THRUST AND ANCHOR BLOCKS

MINIMUM BEARING AREA IN SQUARE METERS (SQUARE FOOT) SEE NOTE 2				
MAIN SIZE	TEES	90° BEND	45° BEND	22½° BEND
100mm(4")	0.4(4)	0.5(5)	0.3(3)	0.1(1.5)
150mm(6")	0.7(8)	0.9(10)	0.5(5)	0.2(2.5)
200mm(8")	1.1(12)	1.5(16)	0.8(9)	0.4(4.5)
250mm(10")	1.6(17)	2.2(24)	1.2(13)	0.6(6.5)
300mm(12")	2.2(24)	3.1(33)	1.8(19)	0.9(9.5)



VALVE SUPPORT PLAN



VALVE SUPPORT ELEVATION

NOTES:

- REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- BEARING AREA BASED ON SOIL BEARING VALUE OF 71,821 kPa (1500 PSF) AND 1551 kPa (225 PSI) LINE PRESSURE AND A MINIMUM OF 900mm (36") COVER
FOR BEARING= 47,880 kPa (1000 PSF), 1.5 x AREA SHOWN
FOR BEARING= 23,940 kPa (500 PSF), 3.0 x AREA SHOWN
- DESIGN ENGINEER SHALL DETERMINE SIZES, REFER TO AGENCY SPECIFICATIONS FOR THRUST AND ANCHOR BLOCK SIZING
- THRUST BLOCKS SHALL BE CENTERED ON THE FITTING SO THAT THE BEARING AREA IS EXACTLY OPPOSITE THE RESULTANT DIRECTION OF THRUST
- CONCRETE SHALL BE PLACED SO THAT FITTINGS AND VALVES WILL BE ACCESSABLE FOR REPAIR OR REPLACEMENT
- ALL THRUST AND ANCHOR BLOCKS SHALL BE POURED AGAINST WETTED UNDISTURBED SOIL
- FOR MINIMUM CONCRETE CURING TIME REFER TO AGENCY SPECIFICATIONS
- FOR ADDITIONAL THRUST BLOCKS SEE WT-01 (1 OF 3) & (3 OF 3)

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Repl. W-17 through W-22		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE THRUST AND ANCHOR BLOCK INSTALLATIONS

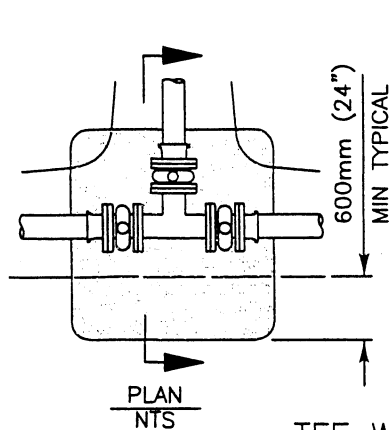
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

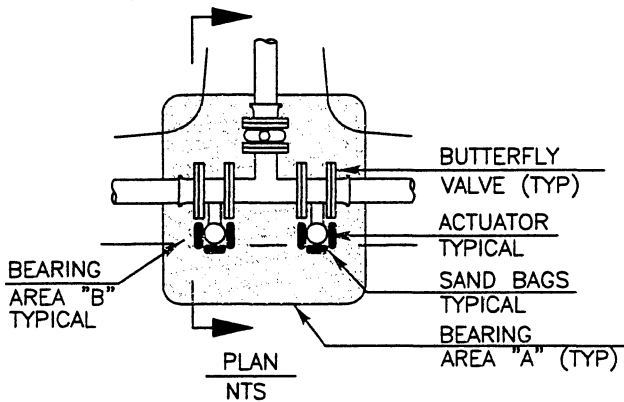
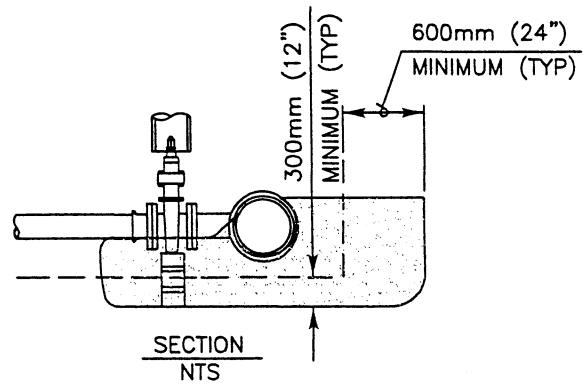
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WT-01** (2 OF 3)

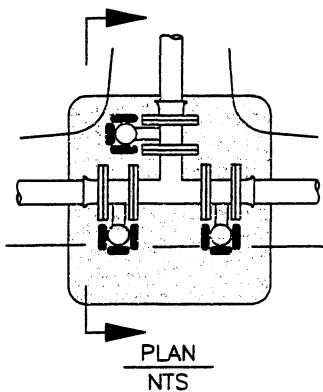
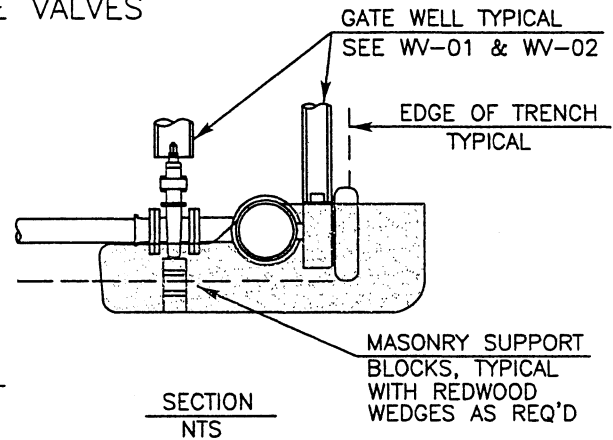
SEE SDW-100



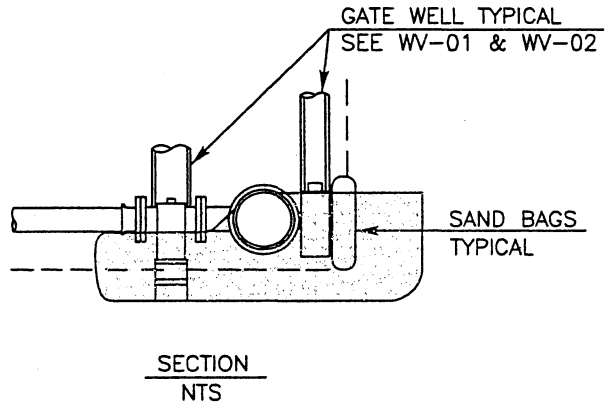
TEE WITH GATE VALVES



TEE WITH BUTTERFLY VALVES ON MAIN



TEE WITH BUTTERFLY VALVES



NOTES:

- 1) BEARING AREA "B" MUST BE EQUAL TO OR GREATER THAN THE AREA REQUIRED FOR A 90° ELBOW INSTALLATION
- 2) INSTALL SAND BAGS AROUND BUTTERFLY VALVE ACTUATOR TO ISOLATE IT FROM CONCRETE
- 3) BFV'S INSTALLED AT CROSSES OR TEES REQUIRE A FLANGED DUCTILE IRON SPOOL TO BE INSTALLED BETWEEN THE FITTING AND VALVE IN ACCORDANCE WITH THE AGENCY SPECIFICATIONS

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Repl. W-17 through W-22		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE THRUST AND ANCHOR BLOCK INSTALLATIONS

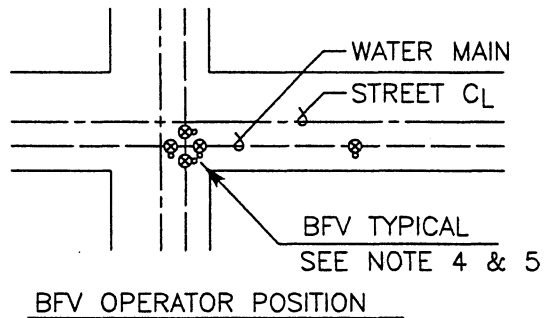
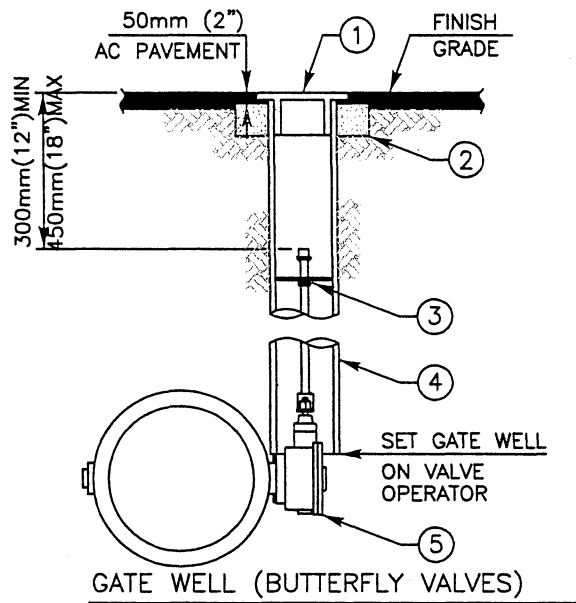
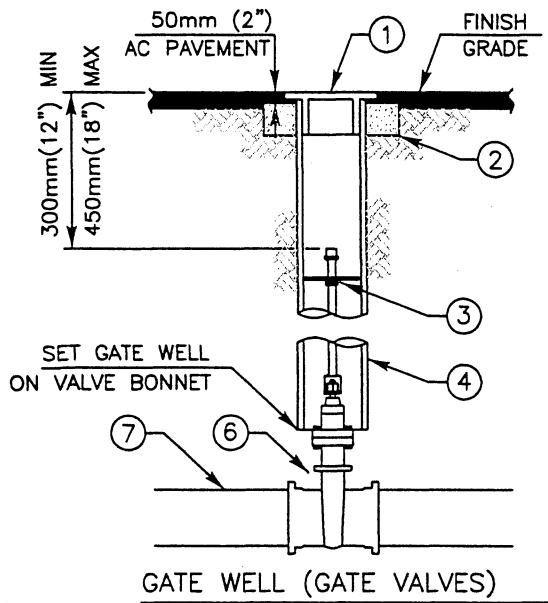
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

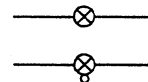
DRAWING NUMBER WT-01 (3 OF 3)

SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VALVES DEEPER THAN 1.5m (5') REQUIRE A VALVE STEM EXTENSION
- 3) EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT
- 4) GATE WELL AND CAP SHALL BE SET SO THAT NO MORE THAN TWO 25mm (1") ADJUSTMENT RINGS ARE USED
- 5) BFV OPERATORS TO BE LOCATED TO THE CURBLINE SIDE OF WATER MAIN
- 6) BFV'S INSTALLED AT CROSSES OR TEES REQUIRE A FLANGED DUCTILE IRON SPOOL TO BE INSTALLED BETWEEN THE FITTING AND VALVE IN ACCORDANCE WITH THE AGENCY'S SPECIFICATIONS
- 7) GATE WELLS AND CAPS SHALL BE IDENTIFIED AS DESCRIBED ON WV-03
- 8) FOR INLINE VALVE ANCHOR BLOCK INSTALLATION SEE WT-02
- 9) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	GATE WELL WITH CAP SEE NOTE 7	④	200mm (8") PVC CL 200, C-900 PIPE x REQUIRED LENGTH GATE WELL SEE NOTE 7
②	150mm (6") HIGH x 150mm (6") WIDE COMPACTED ASPHALT-CONCRETE RING	⑤	BUTTERFLY VALVE
③	VALVE STEM EXTENSION SEE NOTES 2 & 3	⑥	RESILIENT WEDGE GATE VALVE
		⑦	WATER MAIN

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Repl. W-12A and W-12B		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

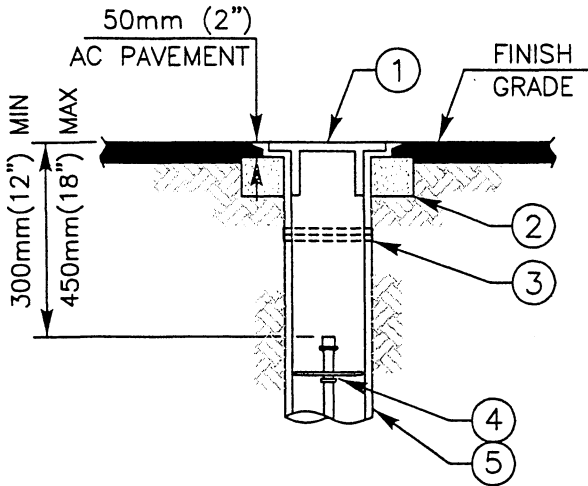
GATE WELL CAP INSTALLATION, FOR VALVES 100mm (4") AND LARGER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

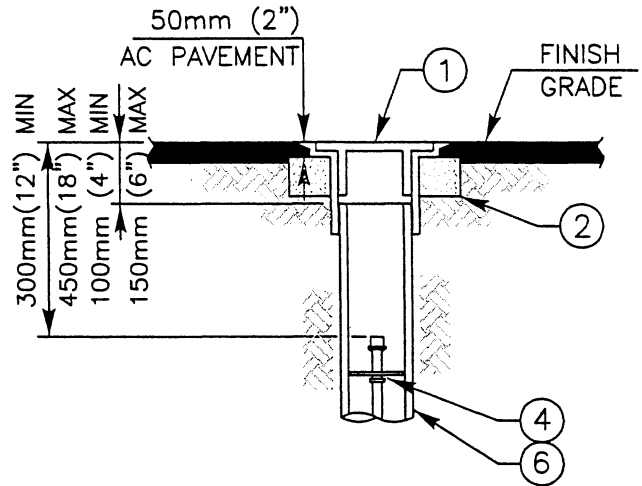
T. Stanton 10/28/2004

Chairperson R.C.E. 19246 Date

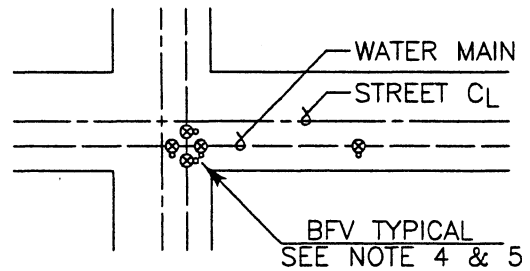
DRAWING NUMBER **WV-01**



8" GATE WELL TYPE A



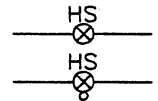
6" GATE WELL TYPE B



BFV OPERATOR POSITION

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) VALVES DEEPER THAN 1.5m (5') REQUIRE A VALVE STEM EXTENSION
- 3) EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT
- 4) GATE WELL AND CAP SHALL BE SET SO THAT NO MORE THAN TWO 25mm (1") ADJUSTMENT RINGS ARE USED
- 5) BFV OPERATORS TO BE LOCATED TO THE CURBLINE SIDE OF WATER MAIN
- 6) BFV'S INSTALLED AT CROSSES OR TEES REQUIRE A FLANGED DUCTILE IRON SPOOL TO BE INSTALLED BETWEEN THE FITTING AND VALVE IN ACCORDANCE WITH THE AGENCY'S SPECIFICATIONS
- 7) GATE WELLS AND CAPS SHALL BE IDENTIFIED AS DESCRIBED ON WV-03
- 8) FOR INLINE VALVE ANCHOR BLOCK INSTALLATION SEE WT-02
- 9) GATE WELL TYPE AS APPROVED BY AGENCY
- 10) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	GATE WELL WITH CAP SEE NOTE 7	④	VALVE STEM EXTENSION SEE NOTES 2 & 3
②	150mm (6") HIGH x 150mm (6") WIDE COMPACTED ASPHALT-CONCRETE RING	⑤	200mm (8") PVC CL 200, C-900 PIPE x REQUIRED LENGTH GATE WELL SEE NOTE 7
③	CAULDER COUPLING	⑥	150mm (6") PVC CL 200, C-900 PIPE x REQUIRED LENGTH GATE WELL SEE NOTE 7

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Repl. W-12A and W-12B		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

GATE WELL CAP & CAN INSTALLATION,
FOR VALVES 100mm (4") AND LARGER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004

Chairperson R.C.E. 19245 Date

DRAWING NUMBER **WV-02**



RECYCLED
WATER



POTABLE
WATER

GATE WELL LIDS
SEE NOTE 2 BELOW

COLOR	GATE WELL LIDS USED FOR:
RED	NORMALLY CLOSED SYSTEM VALVES (NCV)
PURPLE	RECYCLED WATER VALVES: LINE VALVES & AIR VALVES
YELLOW	POTABLE WATER VALVES: LINE VALVES, FIRE SERVICES, & AIR VALVES
WHITE	FIRE HYDRANTS

GATE WELL LID COLORS
SEE NOTE 5 BELOW

COLOR	GATE WELL AND LIDS USED FOR:
RED	NORMALLY CLOSED SYSTEM VALVES (NCV)
WHITE	RESILIENT WEDGE GATE VALVES
GREEN	BUTTERFLY VALVES

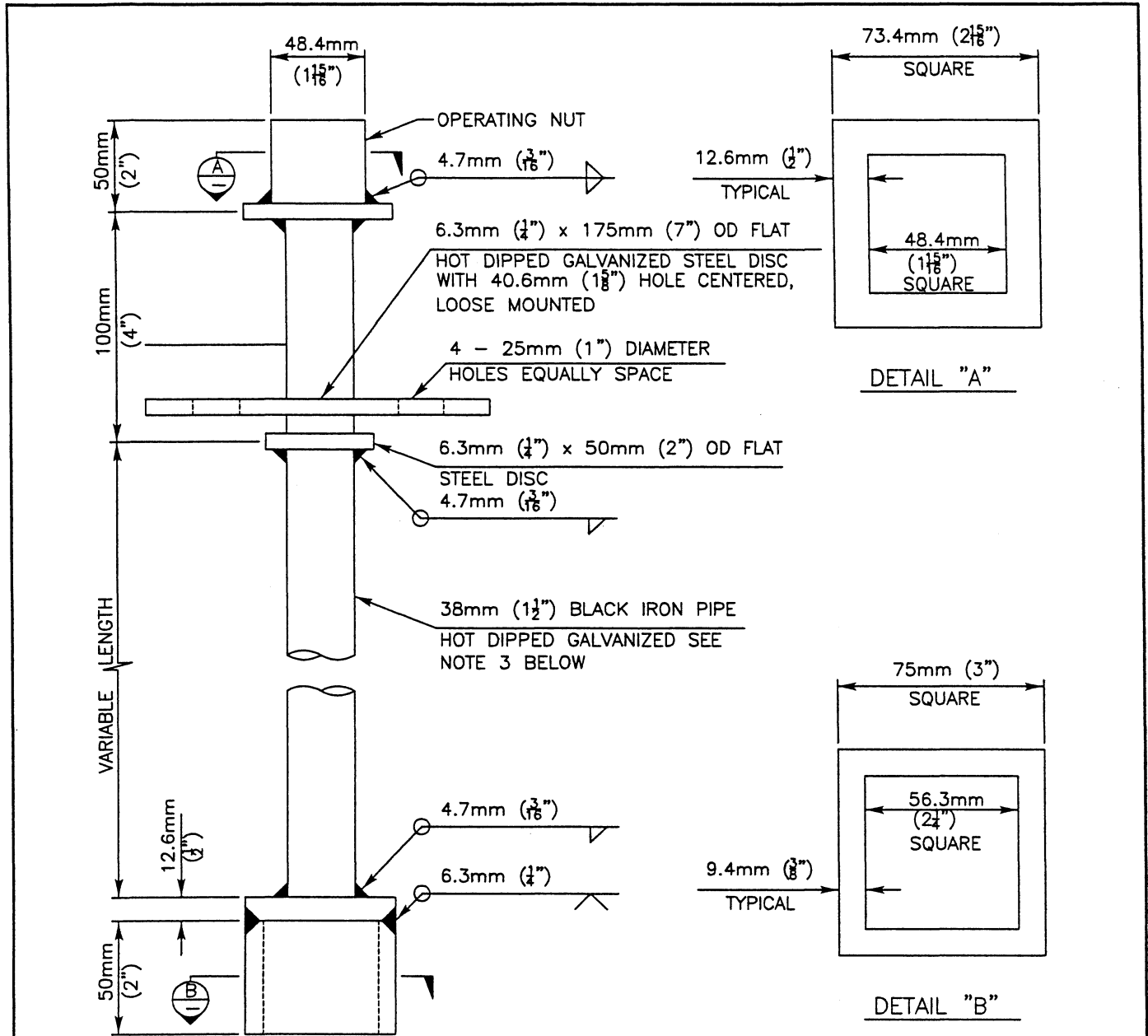
PAINTED IDENTIFICATION MARKING
SEE NOTE 4 BELOW

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) GATE WELL LIDS SHALL BE CAST WITH THE "AGENCY NAME" AND THE WORD "WATER" FOR USE WITH POTABLE WATER SYSTEMS AND "RECYCLED" FOR USE WITH RECYCLED WATER SYSTEMS. LIDS SHALL INCLUDE A 25mm (1") LIFTING SLOT
- 3) PVC GATE WELLS SHALL BE MANUFACTURED IN WHITE OR BLUE FOR USE WITH POTABLE WATER, AND PURPLE FOR USE WITH RECYCLED WATER
- 4) THE INSIDE PORTIONS OF THE GATE WELL LID AND PVC GATE WELL SHALL BE IDENTIFIED WITH A PAINTED IDENTIFICATION MARKING.
- 5) THE TOP EXTERIOR PORTION OF GATE WELL LIDS SHALL BE PAINTED WITH COLORS TO IDENTIFY THE USE OF THE VALVE INSTALLED, AS SHOWN ABOVE
- 6) INSTALLATION FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN AGENCY'S SPECIFICATIONS AND AS NOTED ABOVE
- 7) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		GATE WELL IDENTIFICATION
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
Repl. W-12A and W-12B		J. Tomasulo	10/04	DRAWING NUMBER	
				WV-03	

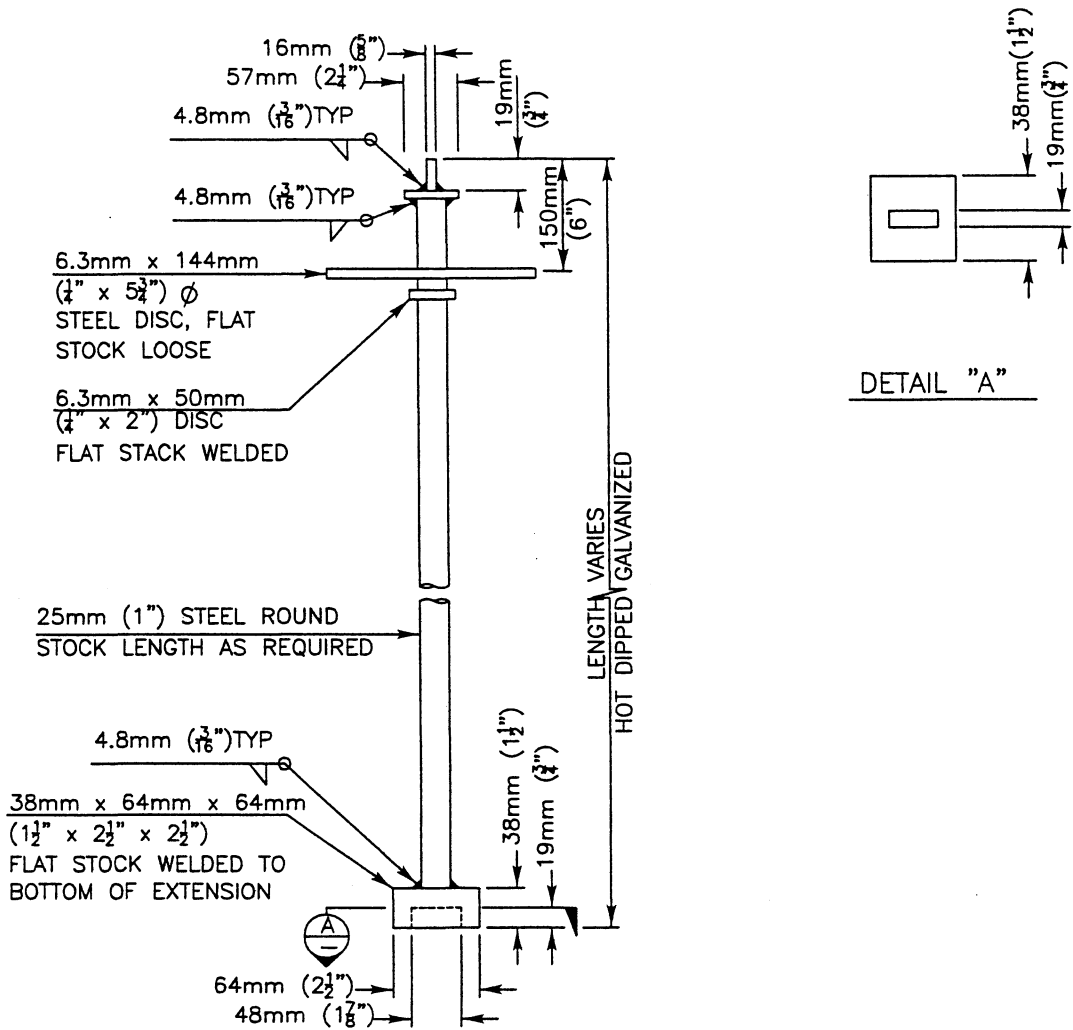
SEE SDW-100



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE AND STANDARD DRAWINGS WV-01 AND WV-02
- 2) STEEL EXTENSION STEMS SHALL BE USED ONLY WHERE THE MAXIMUM LENGTHS OF THE EXTENSION EXCEEDS 2.4m (8') AND AT THE REQUEST OF THE AGENCY'S ENGINEER
- 3) EXTENSION STEMS SHALL BE ROUND OR SQUARE STEEL TUBING OF SOLID DESIGN (NO PINNED COUPLINGS PERMITTED)
- 4) VALVES DEEPER THAN 1.5m (5') REQUIRE A VALVE STEM EXTENSION
- 5) EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT OF THE VALVE
- 6) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		G.Parkinson	5/92		STEEL VALVE STEM EXTENSION FOR VALVES 100mm (4") AND LARGER
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246 Date	
Replaced W-13		J. Tomasulo	10/04	DRAWING NUMBER	
				WV-04	



DETAIL "A"

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) EXTENSION STEMS SHALL BE ROUND STEEL TUBING OF SOLID DESIGN (NO PINNED COUPLINGS PERMITTED)
- 3) VALVES DEEPER THAN 1.5m (5') AND 2" AIR VALVES REQUIRE A VALVE STEM EXTENSION OR AS REQUIRED BY THE AGENCY OF JURISDICTION
- 4) EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT OF THE VALVE
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

Revision	By	Approved	Date
ORIGINAL		G.Parkinson	5/92
Add Metric		T. Stanton	03/03
Replaced W-13		J. Tomasulo	10/04

SAN DIEGO REGIONAL STANDARD DRAWING

STEEL VALVE STEM EXTENSION FOR VALVES 50mm (2") AND SMALLER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 10/28/2004
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **WV-05**

APPENDIX "A"

TRAFFIC CONTROL PLANS

TRAFFIC CONTROL PLANS

REVISION	BY	APPROVED	DATE	SAN DIEGO REGIONAL STANDARD - APPENDIX "A"	DWG. NO.
				TRAFFIC CONTROL PLANS	TC

TRAFFIC CONTROL PLANS

GENERAL INFORMATION

The Traffic Control Plans depicted in this Appendix are intended to supplement Part 6 "Temporary Traffic Control" of the 2003 Manual on Uniform Traffic Control Devices (MUTCD) and 2003 MUTCD California Supplement in providing guidance and information on preparing traffic control plans. Other references may also provide useful information on traffic control procedures. It should be understood that implementation of traffic control plans must conform with the latest revisions of Part 6 of the 2003 MUTCD and 2003 MUTCD California Supplement.

Part 6 of the MUTCD Manual "Temporary Traffic Control" are published by the Federal Highway Administration (FHWA) and the California Department of Transportation (Caltrans). These manuals in combination are issued to provide the basic standards for uniform types of warning signs, lights, and other devices to be placed upon any public roadway or street by a person engaged in performing work which interferes with or endangers the safe movement of traffic flow upon such highway or street, in accordance with sections 21367 and 21400 of the California Vehicle Code.

It is the responsibility of the Contractor or Organization performing work on, or adjacent to, a roadway to install and maintain such devices which are necessary to provide safe passage for the traveling public through the work area and for the safety of the workers. Before work begins, traffic control plans for handling traffic through a construction or maintenance project shall be approved by the engineer of the public agency or authority having jurisdiction over the roadway.

Typical plans for intersections that are controlled by a traffic signal or a multi-way stop are not identified in this Appendix. These instructions require special attention in the preparation of traffic control plans. The approving agency should be notified prior to the preparation of traffic control plans when the work is in or near these intersections.

Special attention is also needed on the traffic control plans when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Notification of the approving agency is desirable prior to the preparation of the plan when bicycles and pedestrian routes are affected by the work.

Nothing contained in this Appendix shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. The text and typical drawings in this Appendix are not a legal standard. Criteria for position, location, and use of traffic control devices is furnished solely for the purpose of guidance and information to assist in the preparation of traffic control plans.

Revision	By	Approved	Date	APPENDIX "A" SAN DIEGO REGIONAL STANDARD	
DRAWING	CRH		4/06	TRAFFIC CONTROL PLANS GENERAL INFORMATION	
ORIGINAL		<i>[Signature]</i>	4/27/06		
				DRAWING NUMBER TC-1	

TRAFFIC CONTROL PLANS

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Revision	By	Approved	Date
DRAWING	CRH		4/06
ORIGINAL		<i>[Signature]</i>	4/27/06

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

TRAFFIC CONTROL PLANS

GENERAL INFORMATION

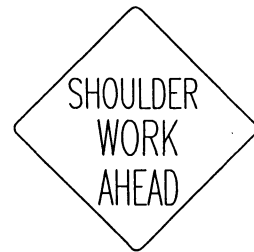
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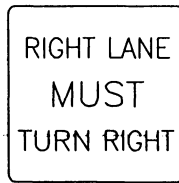
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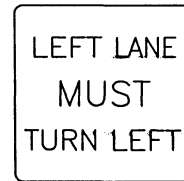
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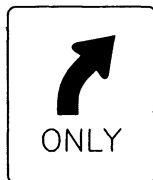
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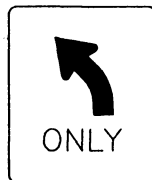
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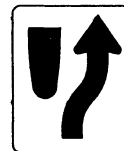
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R3-5R



R3-5L



R4-7



R1-1



R3-1



R3-2



R3-4



R3-18

Revision	By	Approved	Date
DRAWING	CRH		4/06
ORIGINAL		<i>[Signature]</i>	4/27/06

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

TYPICAL CONSTRUCTION SIGNS

DRAWING NUMBER TC-3A



W20-3



W20-5R



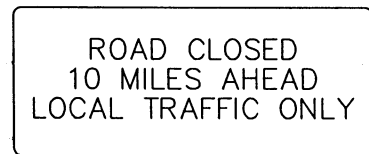
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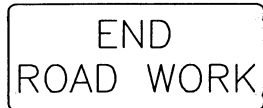
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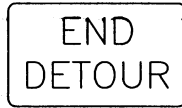
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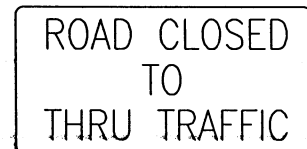
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G20-2



M4-8a



R11-4



M4-10R



M4-10L

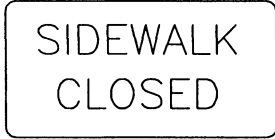


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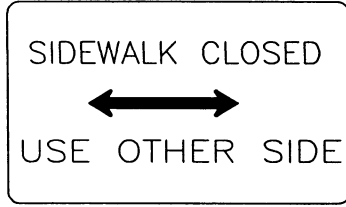
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DRAWING	CRH		4/06
ORIGINAL		<i>[Signature]</i>	4/27/06

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 TYPICAL CONSTRUCTION SIGNS

DRAWING NUMBER TC-3B



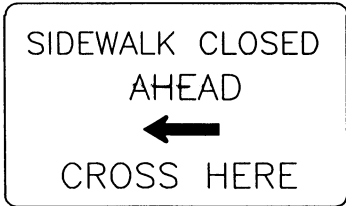
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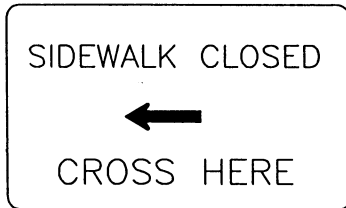
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R9-3a



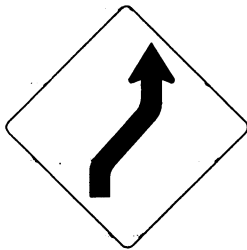
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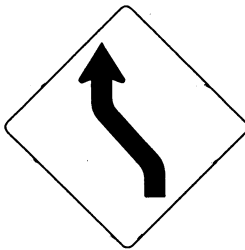
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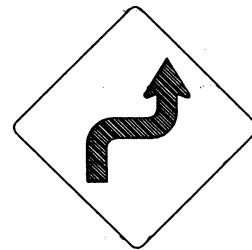
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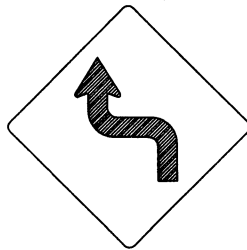
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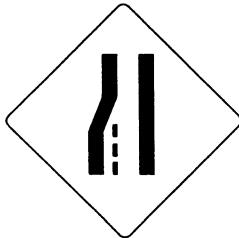
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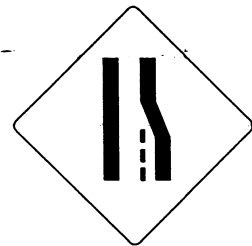
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W1-3L



W4-2L



W4-2R

Revision	By	Approved	Date
DRAWING	CRH		4/06
ORIGINAL		<i>[Signature]</i>	4/27/06

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

TYPICAL CONSTRUCTION SIGNS

DRAWING NUMBER TC-3C



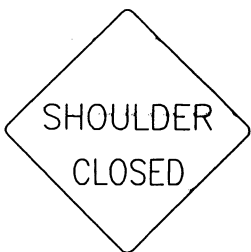
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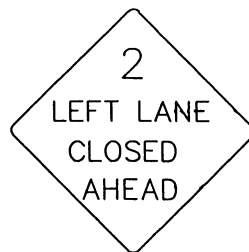
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C30A (CA)



C20R (CA)



C20L (CA)



C9A (CA)



R26 (CA)



C28A (CA)



C28B (CA)

(FLAGGER PADDLES)

Revision	By	Approved	Date
DRAWING	CRH		4/06
ORIGINAL		<i>[Signature]</i>	4/27/06

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

TYPICAL CONSTRUCTION SIGNS

DRAWING
NUMBER

TC-3D

TABLE 1

RECOMMENDED SIGN SPACING FOR ADVANCE WARNING SIGN SERIES AND
MINIMUM TAPER LENGTH

APPROACH SPEED (S) (MPH)	MINIMUM DISTANCE (FEET) BETWEEN SIGNS AND FROM LAST SIGN TO TAPER	MINIMUM TAPER LENGTHS (L) (FEET) FOR 12-FOOT LANE		
		L	1/2L	1/3L
25	150-200	125	65	45
30	200-300	180	90	60
35	250-400	245	125	85
40	350-500	320	160	110
45	500-750	540	270	180
50	500-1000	600	300	200
55+	500-1500	660	330	220

L for Merge Taper
1/2L for Shift Taper
1/3L for Shoulder Taper

TABLE 2

RECOMMENDED TAPER LENGTH AND MAXIMUM CHANNELIZER/CONE SPACING

APPROACH SPEED (S) (MPH)	BUFFER LENGTH (FEET)	MAX CONE SPACING		
		TAPER	TANGENT	CONFLICT(*)
25	55	25	50	10
30	85	30	60	15
35	120	35	70	15
40	170	40	80	20
45	220	45	90	20
50	280	50	100	25
55+	335+	55	100	25

(*) Facing Opposing Traffic, Adjacent to Work Area
or Conflicting with Existing Striping

NOTES:

Taper Formula

$L = S \times W$ for speeds greater than 40 mph

$L = \frac{-W \times S^2}{60}$ for speeds of 40 mph or less

Where:

L = Minimum length of taper (feet)

S = Approach Speed (mph) =
Posted Speed Limit or
off-peak 85th % speed
prior to work starting
or anticipated operating
speed

W = Width of offset (feet)

DRAWING NUMBER	TC-4	APPENDIX "A" SAN DIEGO REGIONAL STANDARD DEVICE SPACING TABLES SIGN SPACING TABLE TAPER LENGTH AND CONE SPACING TABLE	Revision	By	Approved	Date
			DRAWING	CRH		4/06
			ORIGINAL		<i>[Signature]</i>	4/27/06

TRAFFIC CONTROL PLAN/PERMIT & PERMIT EXTENSION

Public Utility or Company: _____ Project Contact: _____
 Address: _____
 City: _____ State: _____ Zip Code: _____

24 Hour Local Phone: _____
 Cellular: _____
 Pager: _____
 Fax: _____

Contractor/Subcontractor: _____ Project Contact: _____
 Address: _____
 City: _____ State: _____ Zip Code: _____

24 Hour Local Phone: _____
 Cellular: _____
 Pager: _____
 Fax: _____

Revision: _____
 By: _____
 Approved: _____
 Date: 4/27/06

JOB LOCATION	BEGIN CROSS STREET	END CROSS STREET	PERMIT NO.
WORK HOURS FROM _____ A.M. TO _____ A.M. P.M. P.M.	SPEED LIMIT	WORK TO BE DONE	
START DATE	END DATE	1st WORK DATE EXTENSION FROM	TO NEW END DATE
		2nd WORK DATE EXTENSION FROM	TO NEW END DATE

THOMAS BROS.
PAGE:
COORD.:

PERMIT WORK EXTENSIONS MUST BE OBTAINED BY THE END OF PERMIT DATE

REQUIREMENTS: *

1. The contractor is responsible for promptly restoring the road back to satisfactory condition which includes, but is not limited to, paving, striping, markings, signing, and loop detection.
2. The Agency reserves the right to observe these traffic control plans in operation and to make changes as field conditions warrant.
3. Trenches shall be back-filled or steel-plated during non-work hours. Steel plates shall have an asphaltic ramp on all edges, securely supported so they won't rock and a sign posted near the plates identifying the contractor's name and 24 hour emergency telephone number.

3. (cont.) All dirt, dust, and debris shall be removed from the street at the end of each day and at the end of the job. The street shall be kept in a driveable condition at all times.
4. Any work that creates an undue safety risk or that creates severe congestion will be shut down by the agency.
5. A copy of all traffic requirements and traffic control plans issued by the Agency must be kept on the job site.
6. Approval of this plan does not constitute an official Permit. Contact the Agency for information on obtaining a permit.

7. All travel lanes will typically be a minimum of 12 feet wide, 14 feet if adjacent to bike lanes, unless otherwise specifically approved by the Agency.
8. Flashing arrow boards as required by the Agency.
9. Warning (W) series signs used in work zones shall be Black on an Orange background.
10. Cones and pylons shall have yellow reflectorized sleeves when placed along the centerline and white reflectorized sleeves along the outside shoulder.
11. If parking is allowed in the advance warning area, advance warning signs shall be mounted on high level devices.
12. All conflicting signs shall be covered

13. The contractor shall post tow-away/no parking signs twenty-four (24) hours in advance, with the day of week, date and work hours noted, and shall bag parking meters (where applicable).

The applicant is responsible for complete representation of the actual road conditions shown on this plan including, but not limited to, existing striping and marking, signing, sidewalks, and bike lanes.

APPLICANTS:
 Name (print) _____
 Address _____
 Phone Number _____
 Signature _____

Agent of:
 Owner
 Contractor
 Sign/Barricade co.
 Other _____

THIS TRAFFIC CONTROL PLAN IS NOT VALID UNLESS AN APPLICABLE AGENCY PERMIT OR APPROVAL IS ATTACHED/AFFIXED.

PERMIT APPROVED

By: _____
 DATE: _____

* SUBJECT TO LOCAL AGENCY REQUIREMENTS

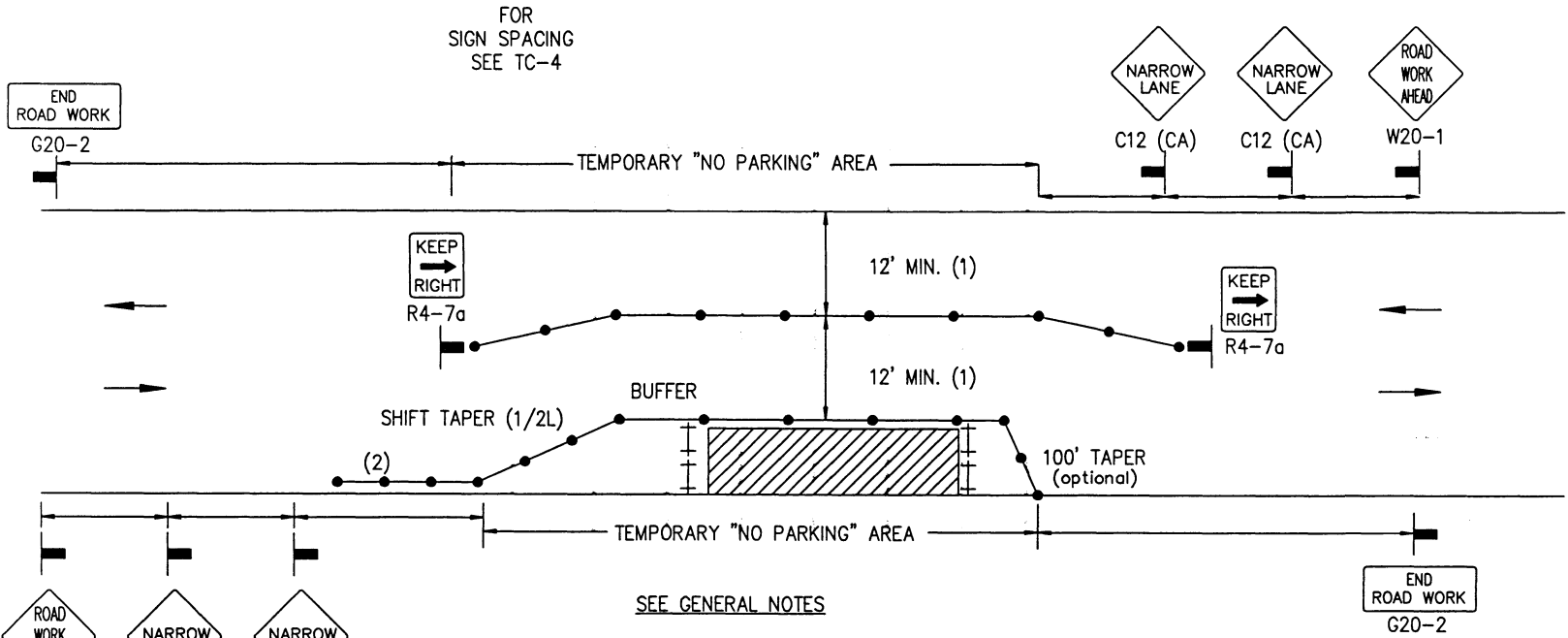
SEE ATTACHED SHEET(S) OR REFERENCED STANDARD DRAWING(S) THAT MAY BE APPLICABLE

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 TRAFFIC CONTROL PLAN
 COVER SHEET

DRAWING NUMBER TC-5

DRAWING NUMBER
TC-6

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD
SIDE OF ROAD WORK AREA
TWO LANE TRAFFIC CONTROL
WITHOUT CENTERLINE



SEE GENERAL NOTES

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. CONES OPTIONAL WHERE NO PARKING IS ALLOWED

LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA → TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, taper and buffer lengths
 For hours of darkness, change cones to vertical barricades with steady burn lights.
 This plan DOES NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.
 This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan or these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing or adopting new specifications deemed necessary. Criteria for position, location and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:
 NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

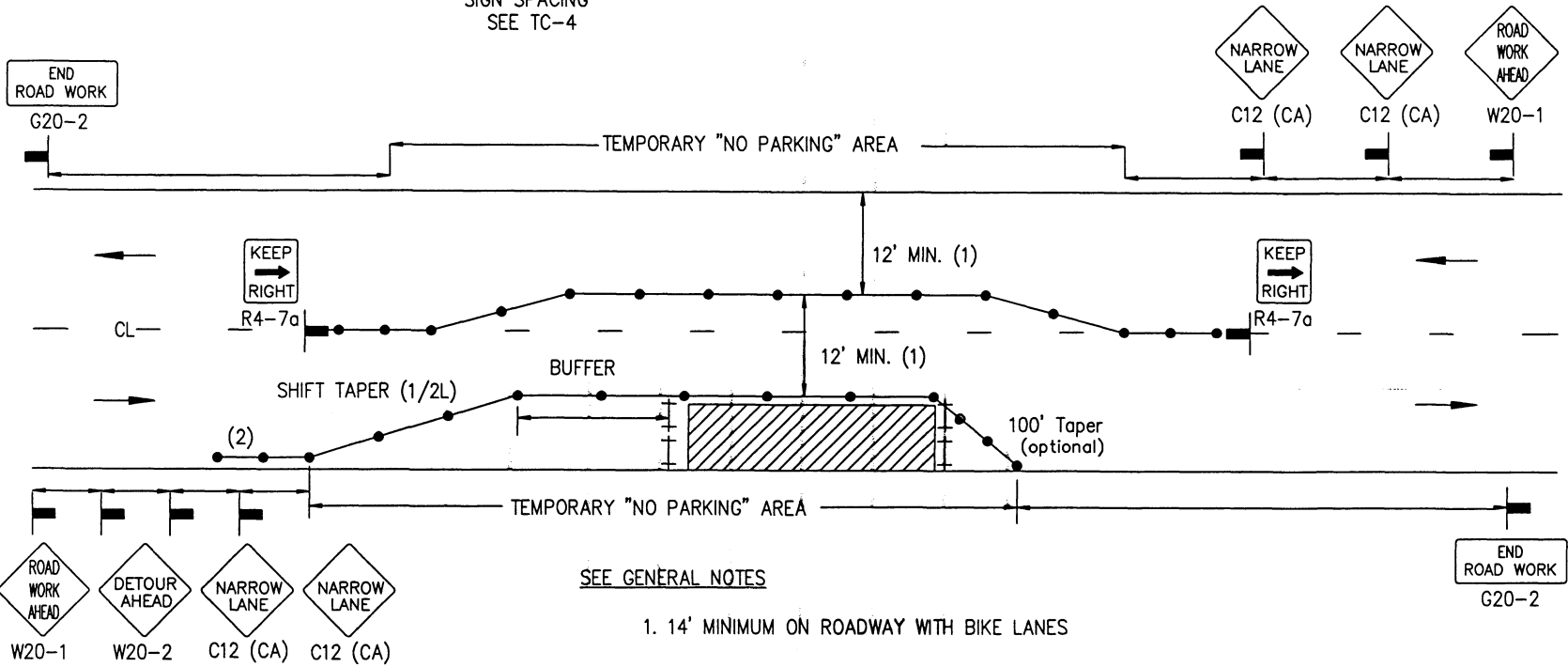
Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

FOR
SIGN SPACING
SEE TC-4



LEGEND

- CONE ++ BARRICADE ■ FLAGGER ▬ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan or these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing or adopting new specifications deemed necessary. Criteria for position, location and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 TWO LANE TRAFFIC CONTROL WITH CENTERLINE

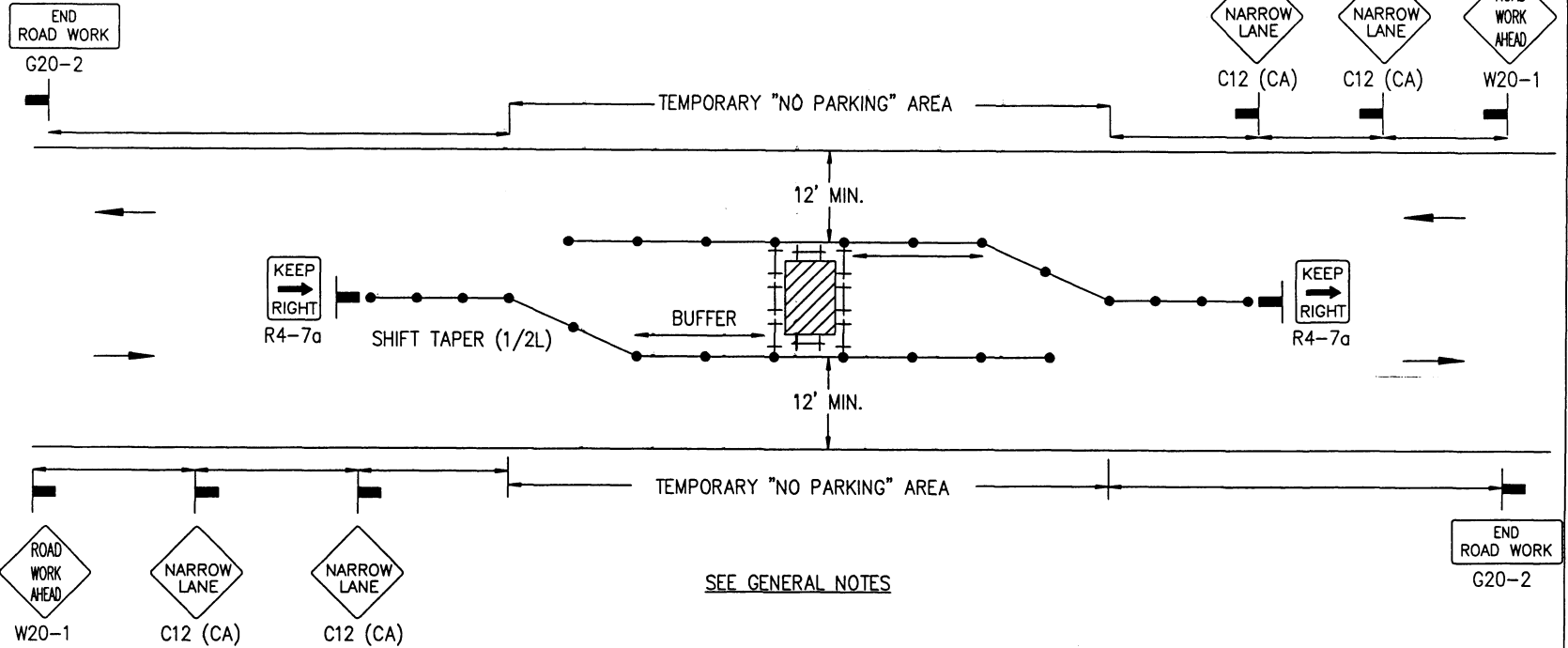
DRAWING NUMBER
 TC-7

DRAWING NUMBER TC-8

CENTER OF ROAD WORK AREA
TWO LANE TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

FOR
SIGN SPACING
SEE TC-4



LEGEND

- CONE ++ BARRICADE ■ FLAGGER ▬ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths.

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan or these areas.

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TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

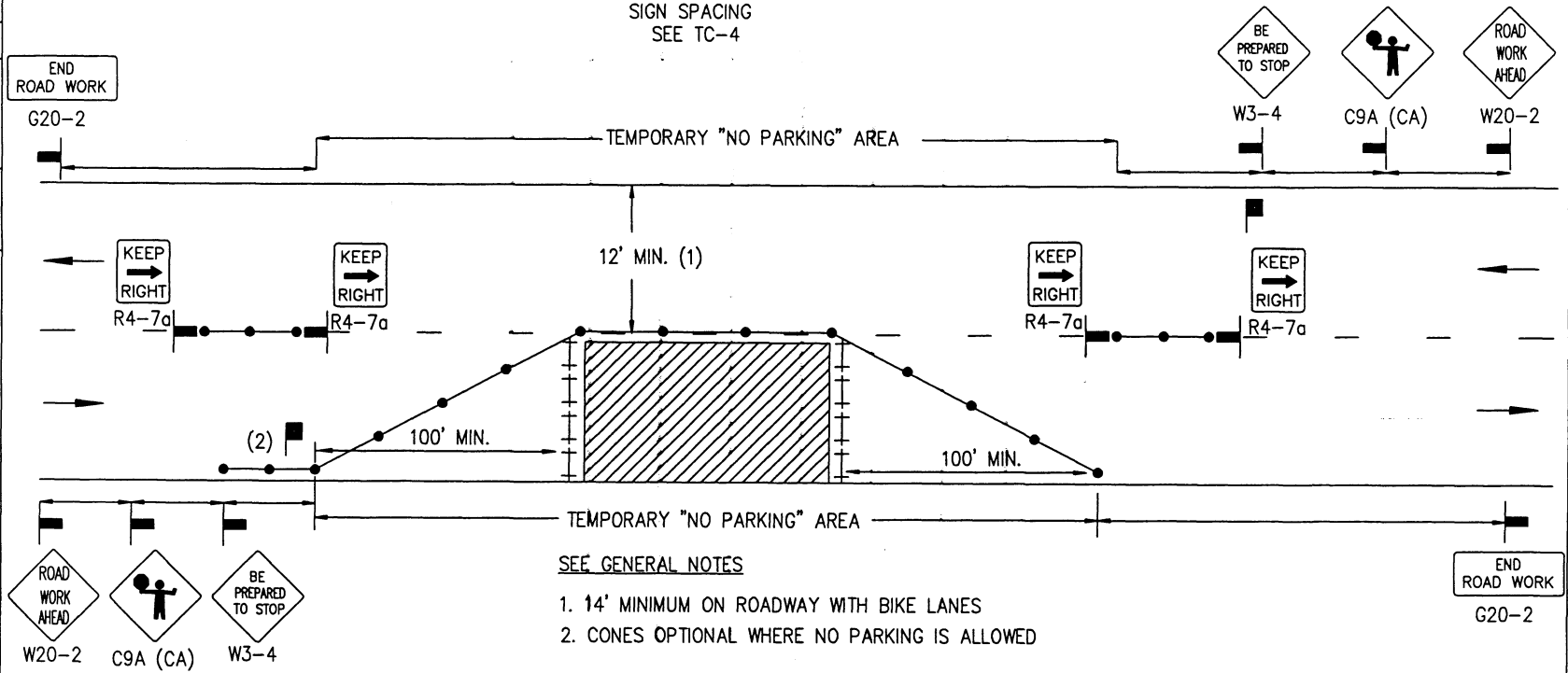
Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

FOR
SIGN SPACING
SEE TC-4



EYE CONTACT MUST BE MAINTAINED BETWEEN FLAGGERS OR USE 2-WAY COMMUNICATION

LEGEND

- CONE † BARRICADE ■ FLAGGER ▬ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

AGENCY USE

APPLICANT USE

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths.
For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

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COMPANY _____

ADDRESS _____

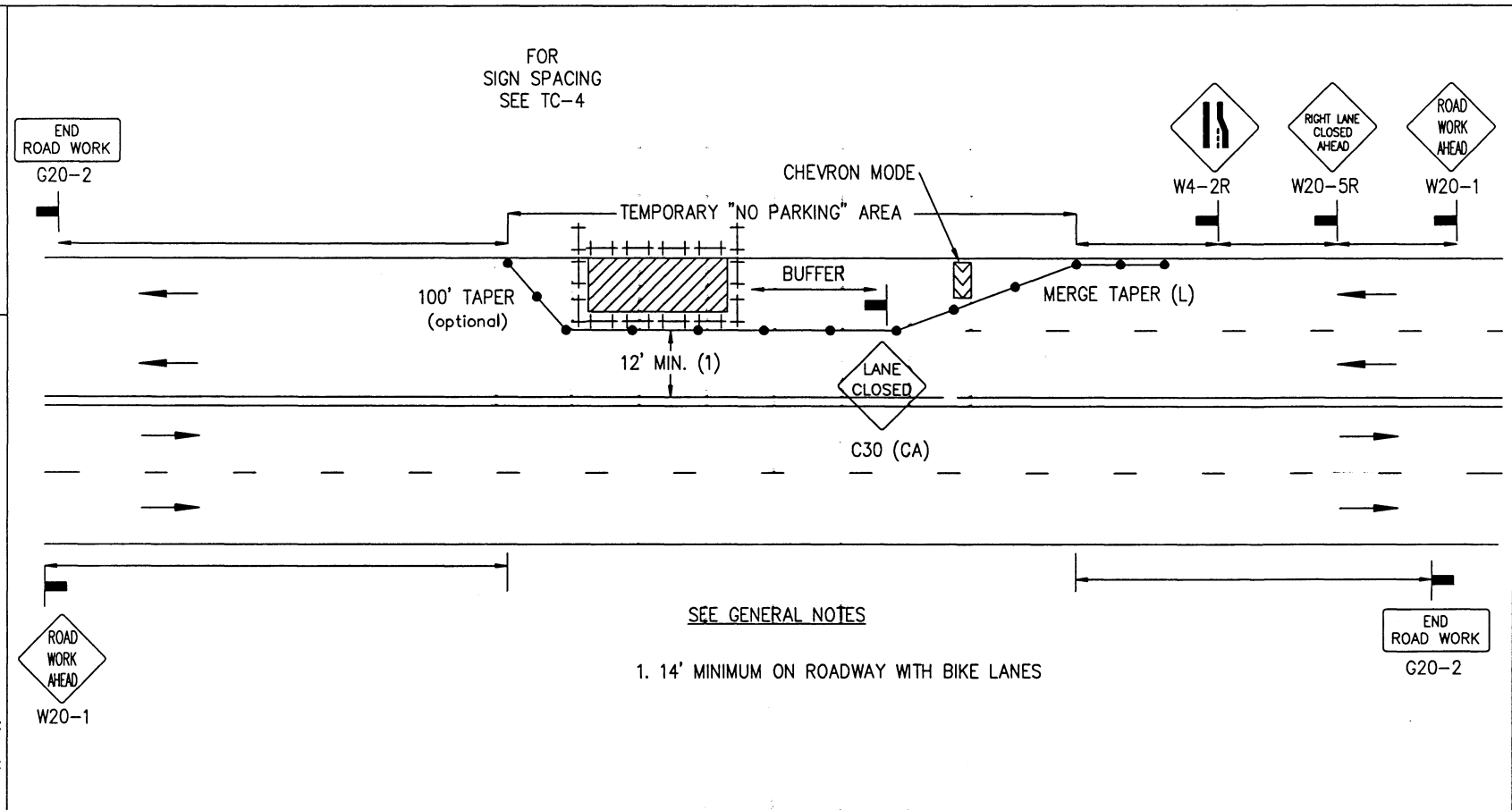
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APPENDIX "A"
SAN DIEGO REGIONAL STANDARD
SIDE OF ROAD WORK AREA
TWO LANE TRAFFIC CONTROL WITH FLAGGERS

DRAWING NUMBER
TC-9

DRAWING NUMBER TC-10

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH CENTERLINE
 RIGHT LANE TRAFFIC CLOSURE - ONE LANE



LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- SIGN
- ⚡ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths.
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 NAME _____
 COMPANY _____
 ADDRESS _____
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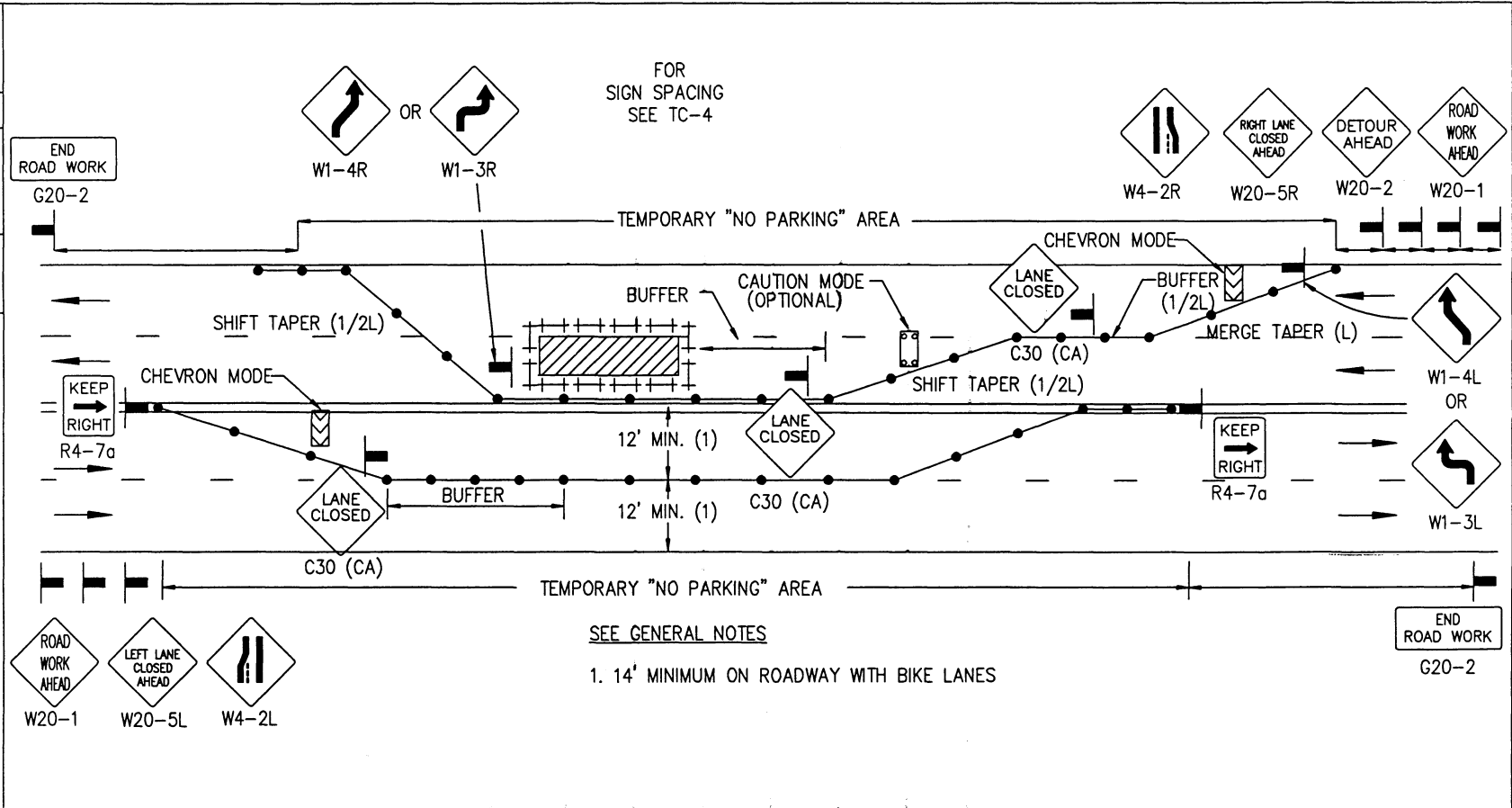
Revision	By	Approved	Date
ORIGINAL	CHR	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH CENTERLINE
 RIGHT TRAFFIC LANE CLOSURE - TWO LANES



SEE GENERAL NOTES
 1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- ▬ SIGN
- ◻ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths.
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NAME _____
 COMPANY _____
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 PHONE _____

AGENCY USE

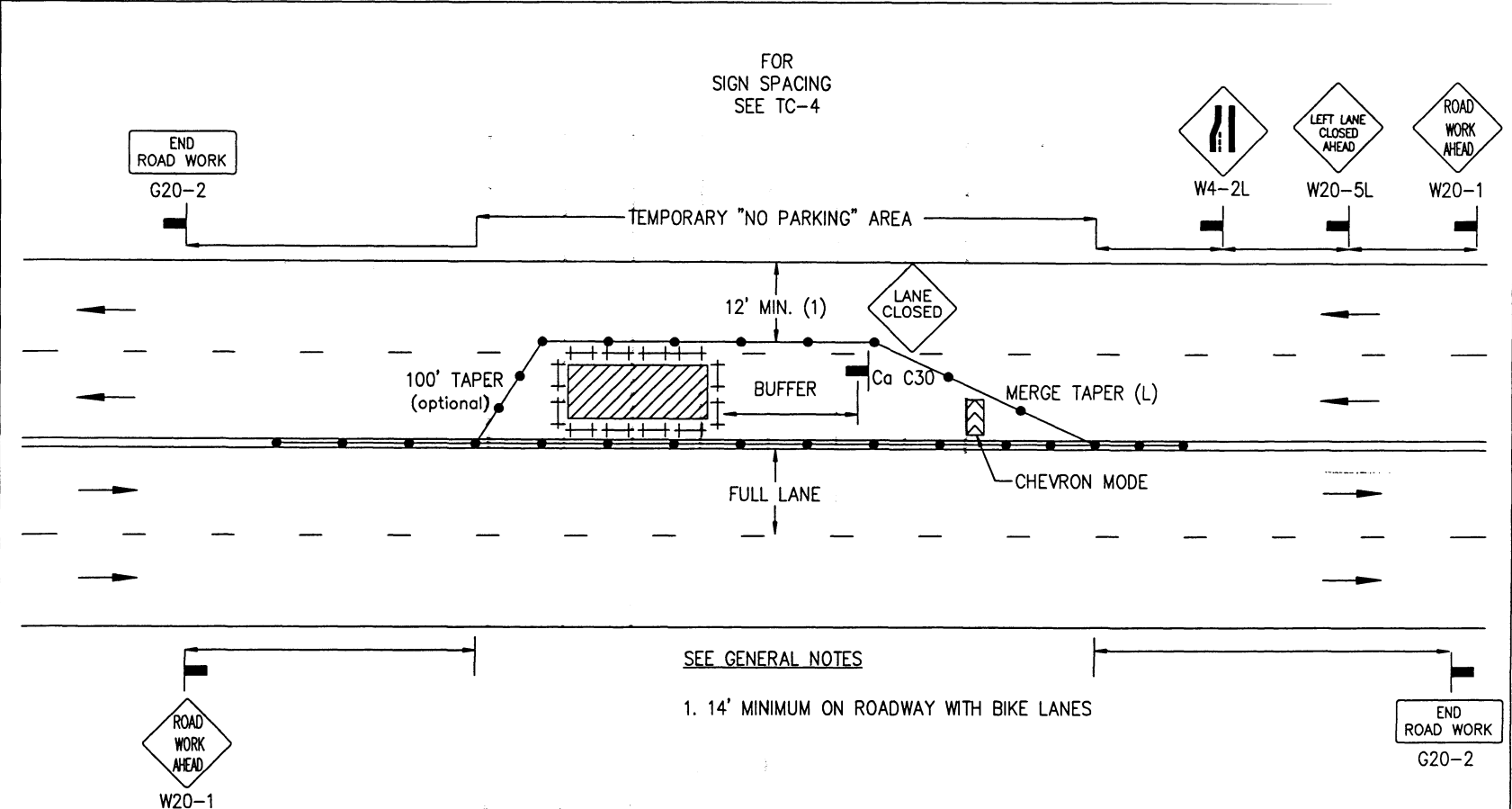
DRAWING NUMBER TC-11

DRAWING NUMBER

TC-12

CENTER OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH CENTERLINE LEFT TRAFFIC LANE CLOSURE - ONE LANE

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD



FOR SIGN SPACING SEE TC-4

SEE GENERAL NOTES

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE † BARRICADE ■ FLAGGER ▬ SIGN ◻ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths.

For hours of darkness, change cones to vertical barricades with steady burn lights.

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SUBMITTED BY:

NAME _____

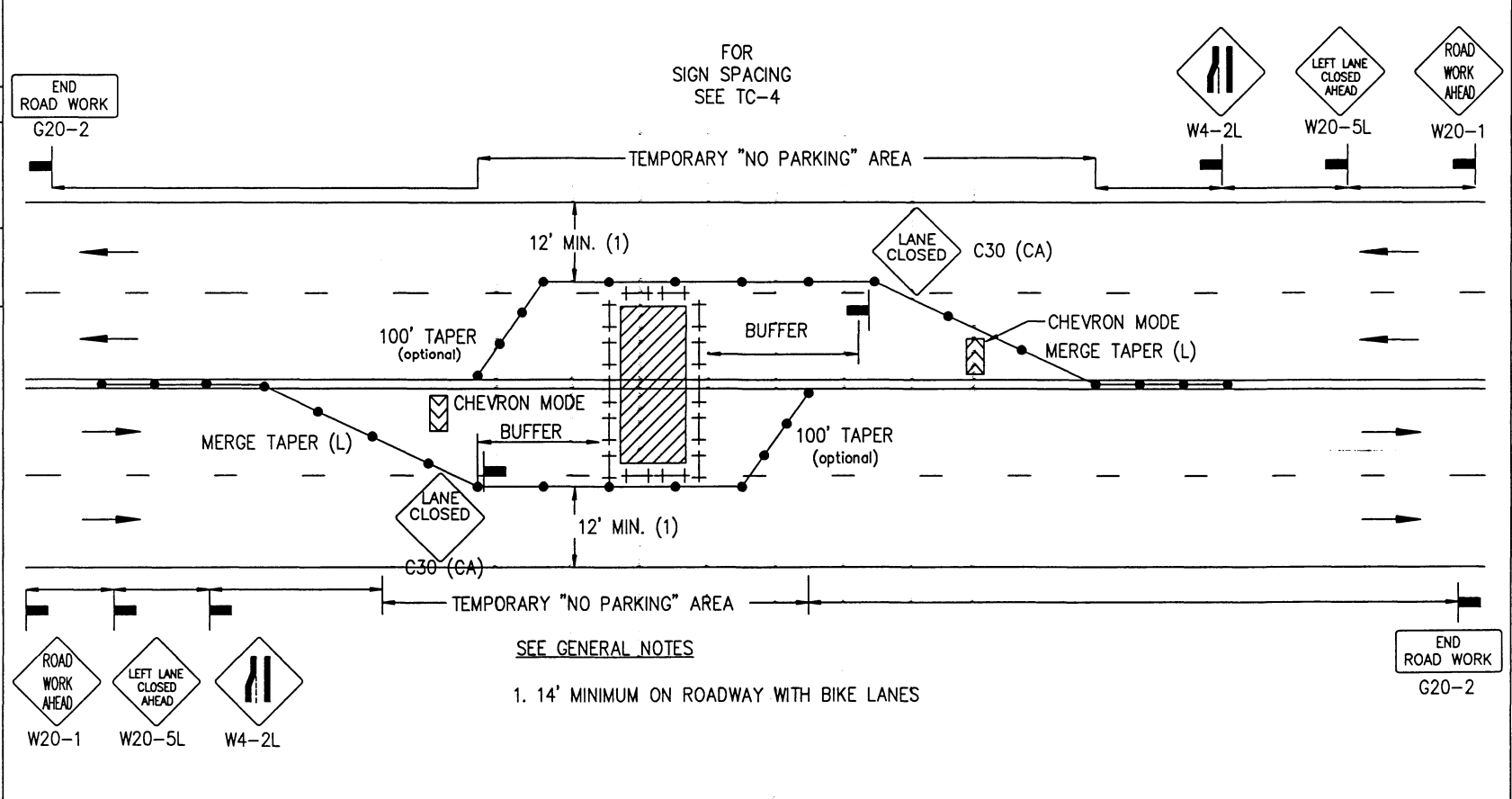
COMPANY _____

ADDRESS _____

PHONE _____

Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



SEE GENERAL NOTES
 1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- ▬ SIGN
- ▨ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, and taper and buffer lengths.
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SUBMITTED BY:

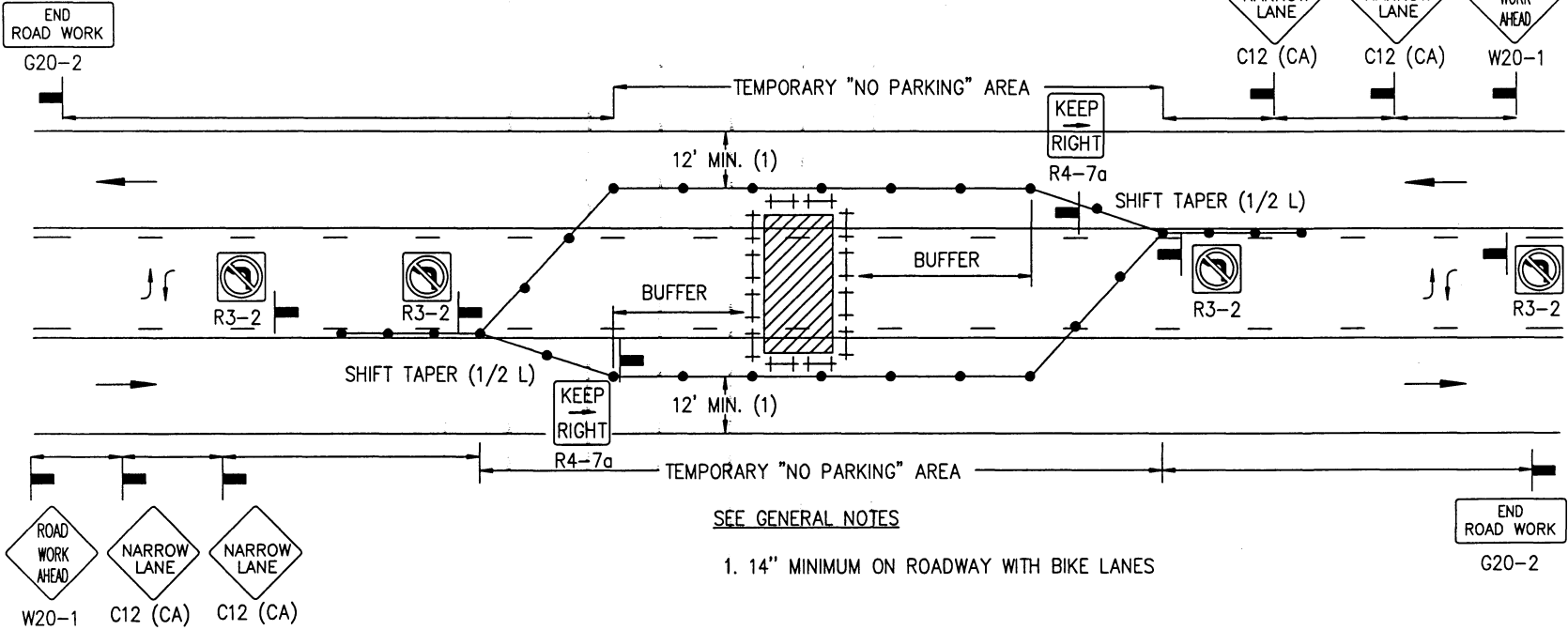
NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH CENTERLINE
 LEFT TRAFFIC LANE CLOSURE - TWO LANES

DRAWING NUMBER
 TC-13

Revision	By	Approved	Date
DRAWING ORH			4/06
ORIGINAL			4/27/06

FOR
SIGN SPACING
SEE TC-4



SEE GENERAL NOTES

1. 14" MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE †† BARRICADE ■ FLAGGER ▬ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing of cones, taper and buffer lengths.
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TC-5 is required for all Traffic Control Plans.

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COMPANY _____

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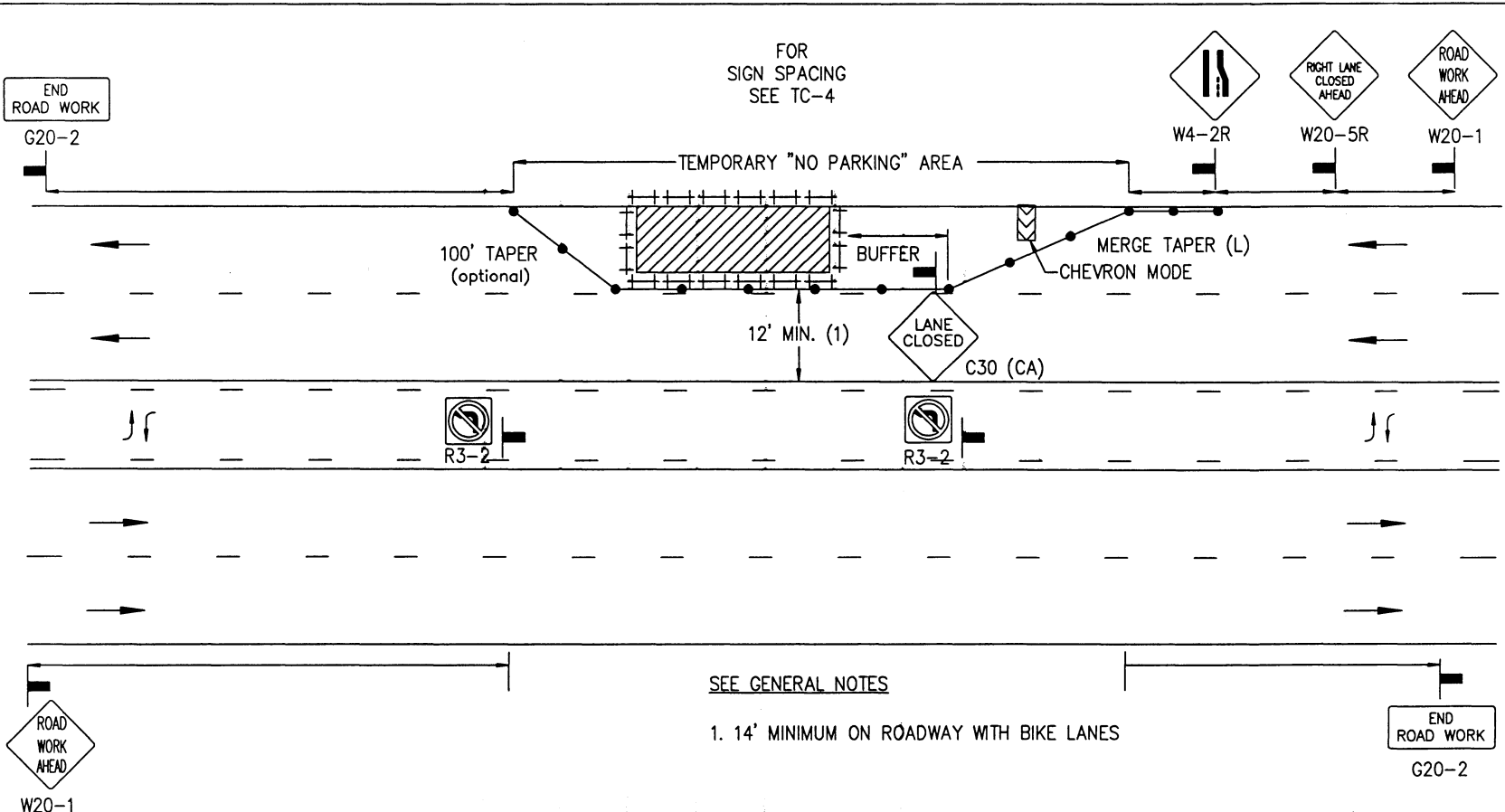
APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH CENTERLINE
 LEFT TRAFFIC LANE CLOSURE - ONE LANE

DRAWING NUMBER
 TC-15

DRAWING NUMBER TC-16

SIDE OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH TWO WAY LEFT TURN
 RIGHT TRAFFIC LANE CLOSURE - ONE LANE

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD



LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- SIGN
- ⚡ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

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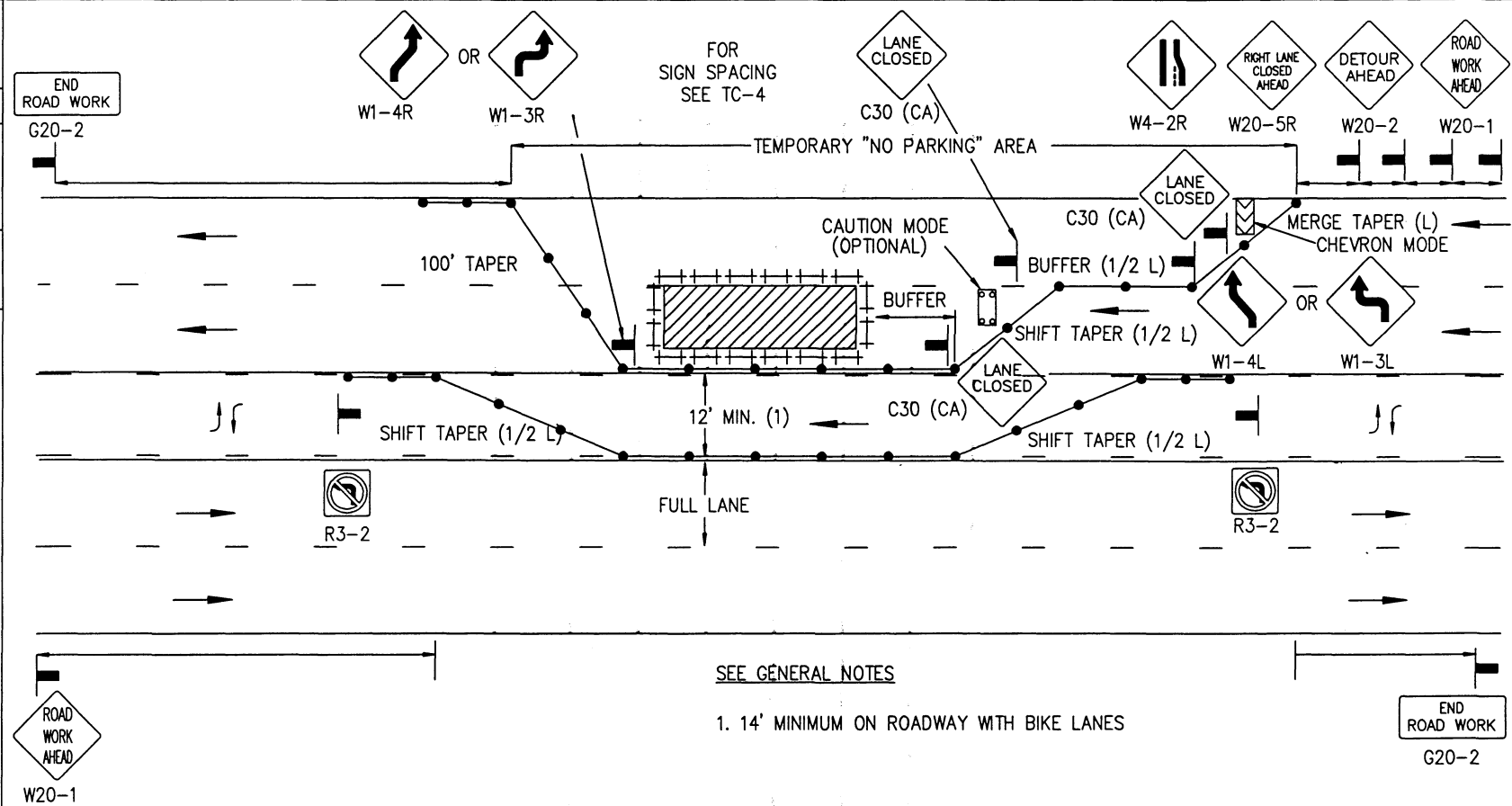
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Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



SEE GENERAL NOTES
1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN [] FLASHING ARROW SIGN [/ /] WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

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COMPANY _____

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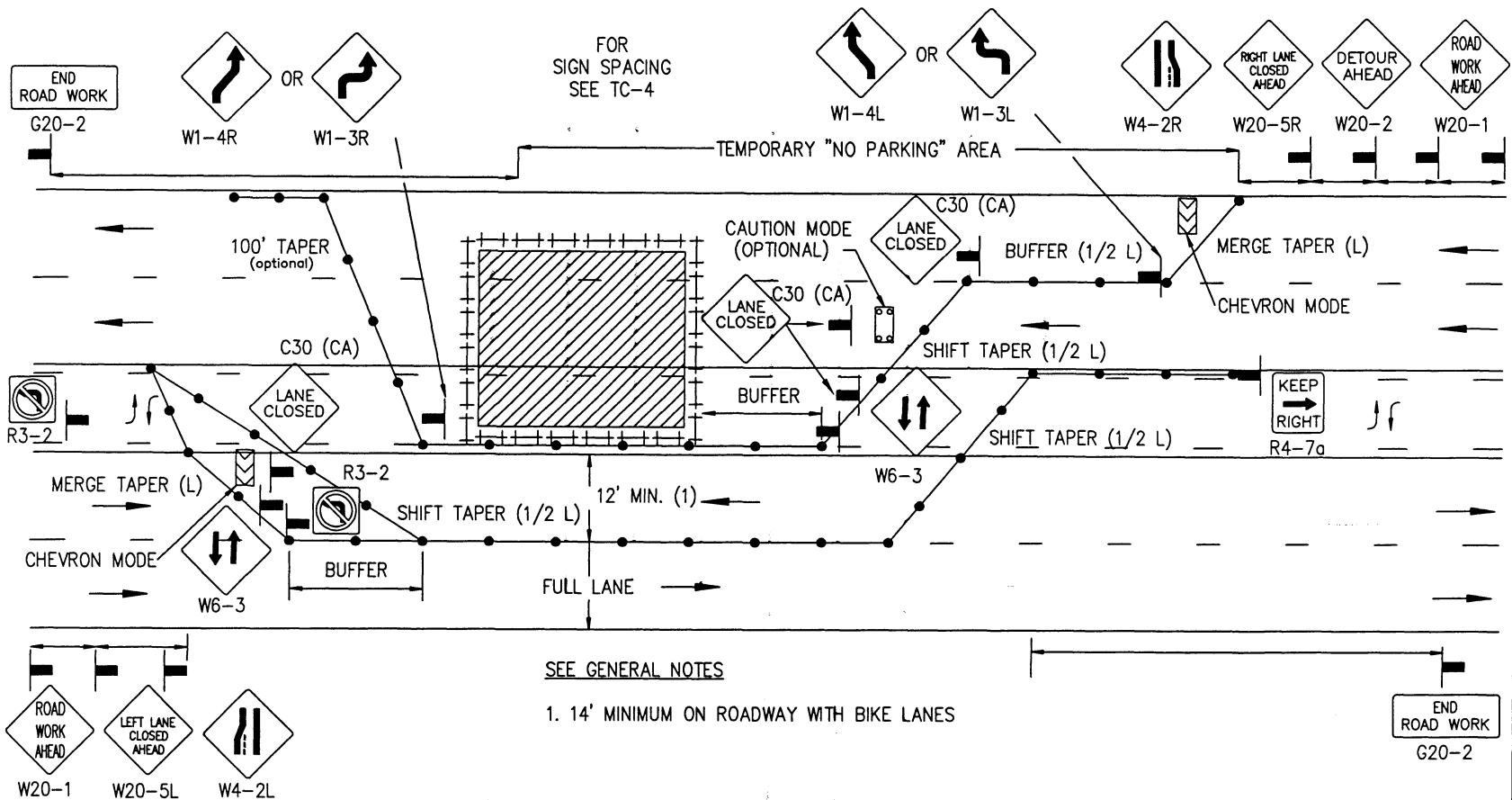
APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH TWO WAY LEFT TURN
 RIGHT TRAFFIC LANE CLOSURE - TWO LANES

DRAWING NUMBER
 TC-17

DRAWING NUMBER
TC-18

MULTILANE TRAFFIC CONTROL WITH TWO WAY LEFT TURN
RIGHT TRAFFIC LANE CLOSURE - THREE LANES

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



SEE GENERAL NOTES

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE ++ BARRICADE ■ FLAGGER □ SIGN □ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

AGENCY USE

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

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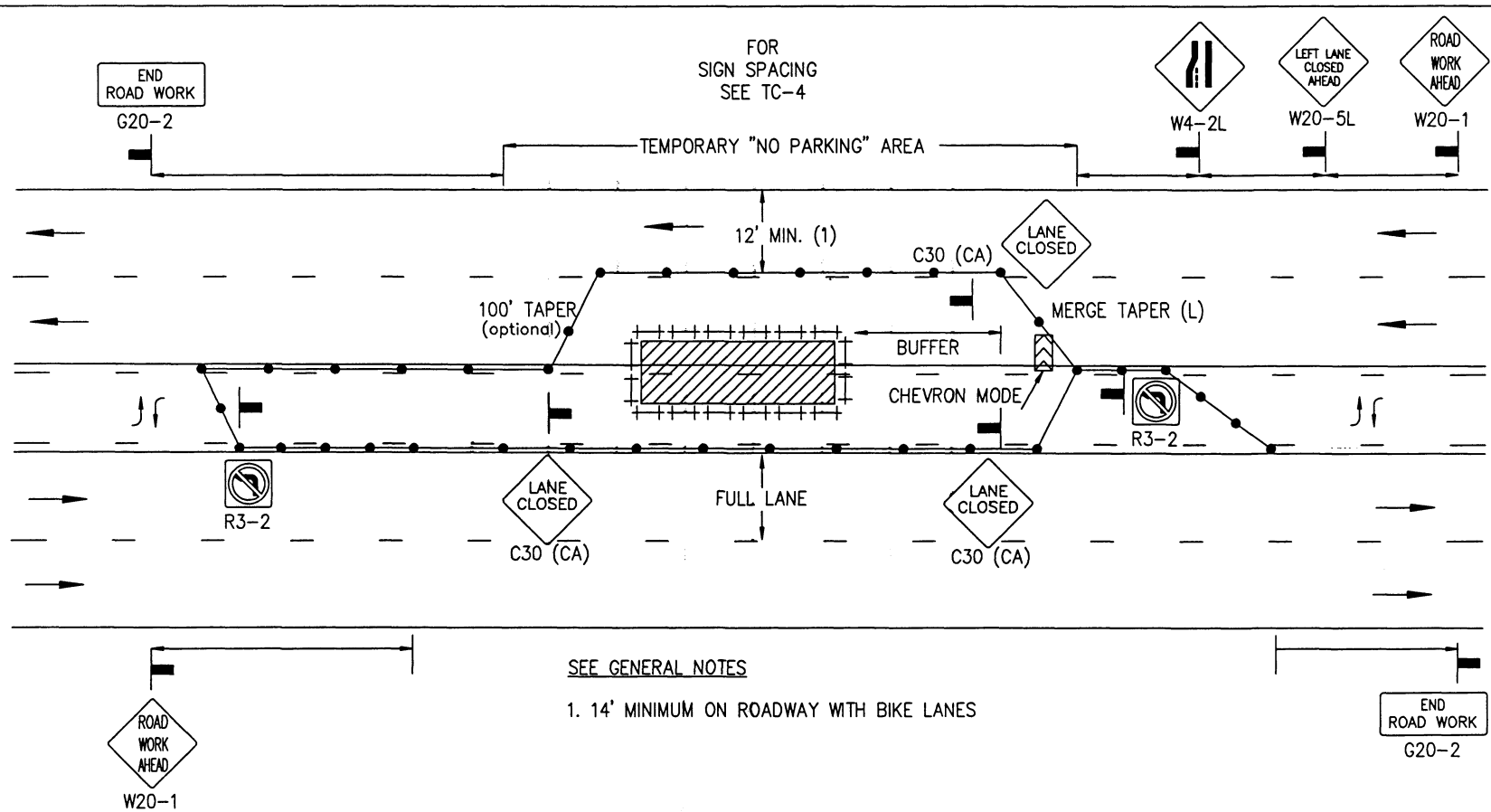
TC-5 is required for all Traffic Control Plans.

APPLICANT USE

SUBMITTED BY:
NAME _____
COMPANY _____
ADDRESS _____
PHONE _____

Revision	By	Approved	Date
DRAWING	CHH		4/06
ORIGINAL			4/27/06

Revision	By	Date
DRAWING CRH	Approved	4/06
ORIGINAL		4/27/06



SEE GENERAL NOTES

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE †† BARRICADE ■ FLAGGER ▬ SIGN ◀▶ FLASHING ARROW SIGN ▨ WORK AREA → TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing for cones, and taper and buffer lengths.

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TC-5 is required for all Traffic Control Plans.

AGENCY USE

APPLICANT USE

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH TWO WAY LEFT TURN
 LEFT TRAFFIC LANE CLOSURE - TWO LANES

DRAWING NUMBER TC-19

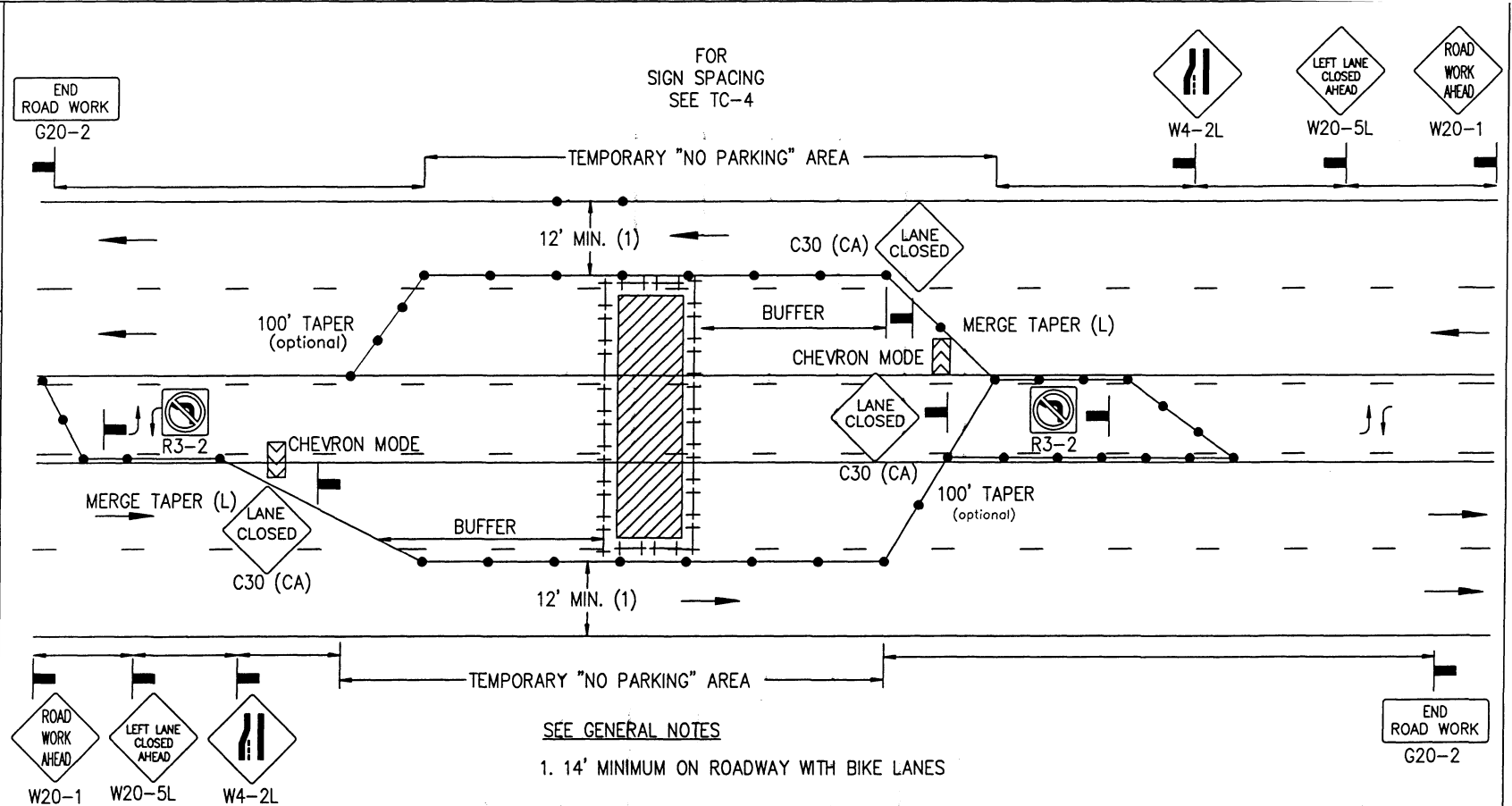
DRAWING NUMBER

TC-20

MULTILANE TRAFFIC CONTROL WITH CENTERLINE LEFT LANE TRAFFIC LANE CLOSURE - THREE LANES

CENTER OF ROAD WORK AREA

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



FOR SIGN SPACING SEE TC-4

SEE GENERAL NOTES

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE † BARRICADE ■ FLAGGER ▬ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

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SUBMITTED BY:

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Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL		<i>[Signature]</i>	4/27/06

AGENCY USE

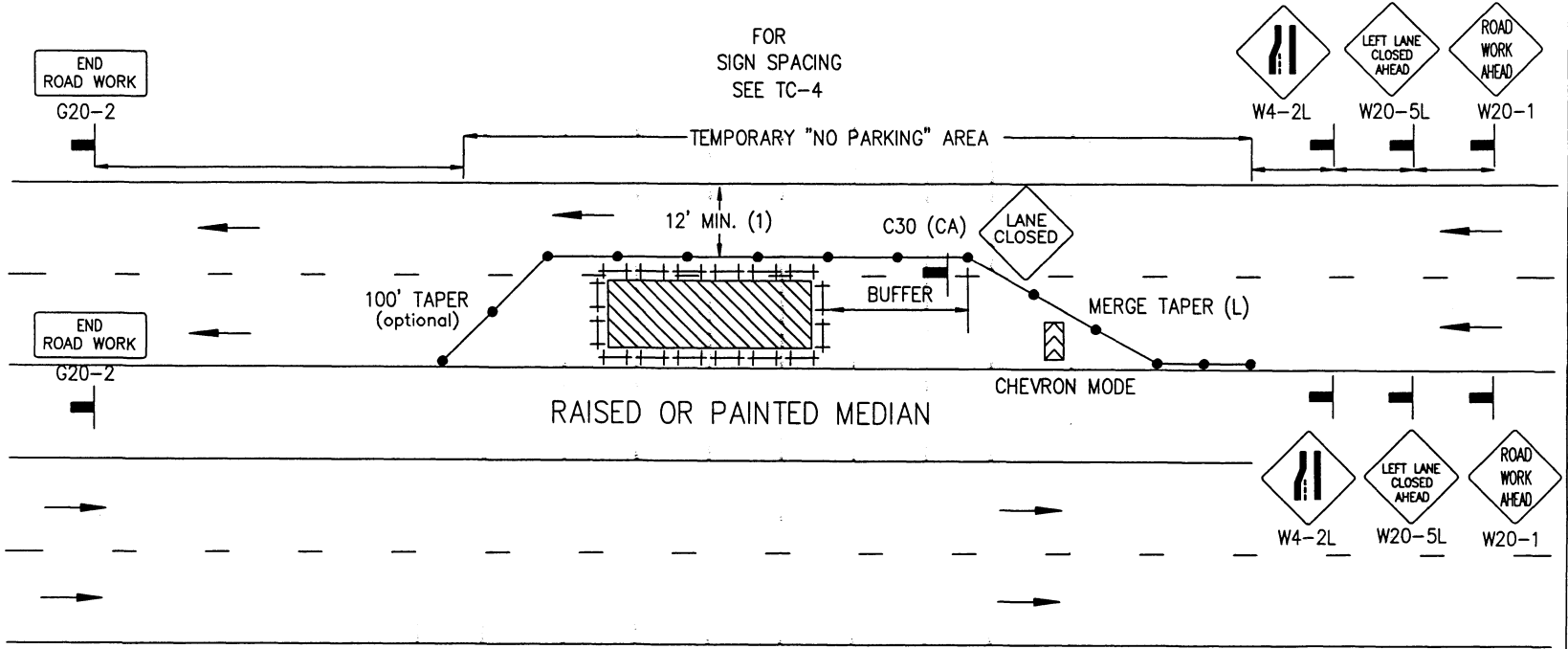
APPLICANT USE

DRAWING NUMBER

TC-22

CENTER OF ROAD WORK AREA
 MULTILANE TRAFFIC CONTROL WITH RAISED MEDIAN
 LEFT LANE TRAFFIC LANE CLOSURE - ONE LANE

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD



SEE GENERAL NOTES

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA → TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

See TC-4 for sign spacing, spacing for cones, taper and buffer lengths.
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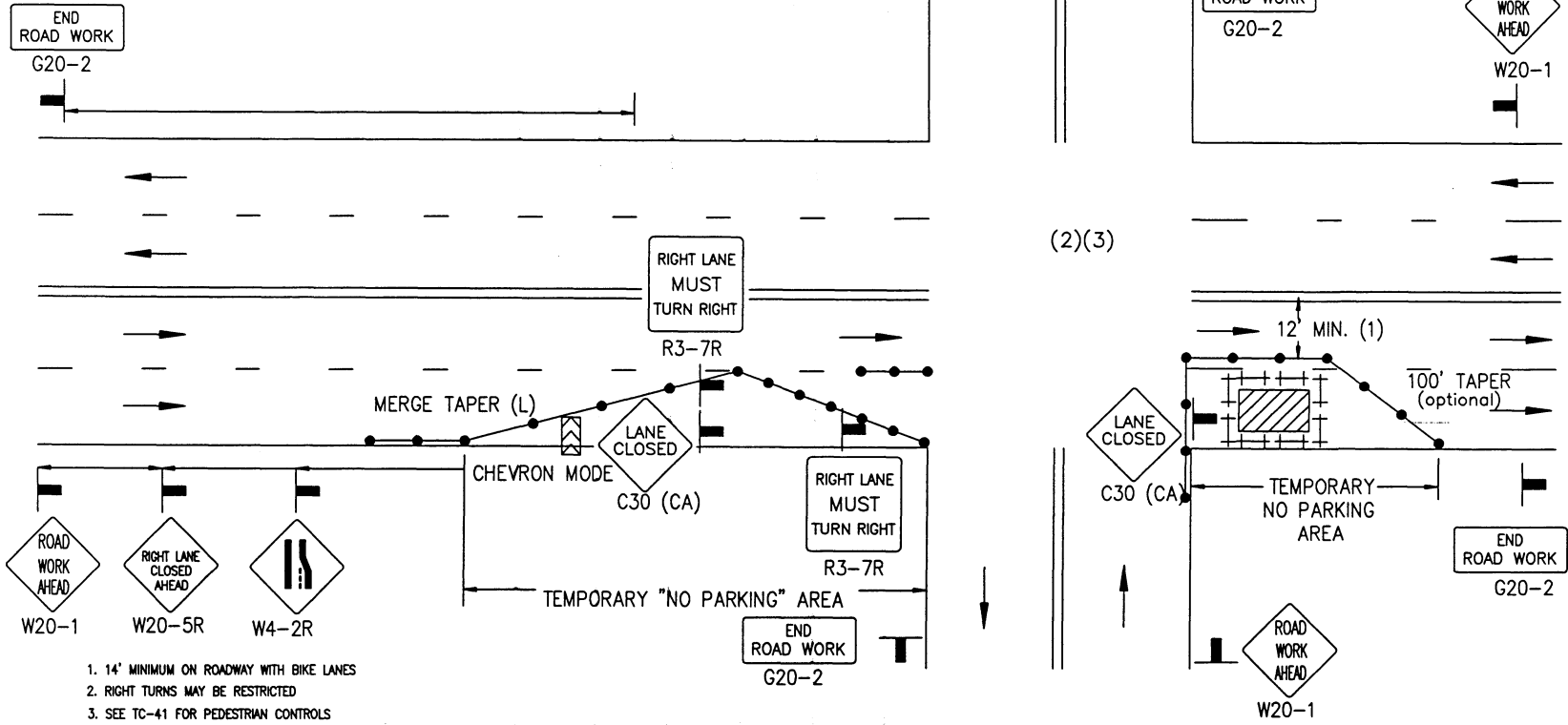
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ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

SIGN SPACING
SEE TC-4
USE FOR ALL
INTERSECTION LEGS



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. RIGHT TURNS MAY BE RESTRICTED
3. SEE TC-41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE
- ⊢ BARRICADE
- FLAGGER
- ▬ SIGN
- ⚡ FLASHING ARROW SIGN
- ▨ WORK AREA
- ↔ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

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APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 INTERSECTION TRAFFIC CONTROL

AGENCY USE

 APPLICANT USE

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

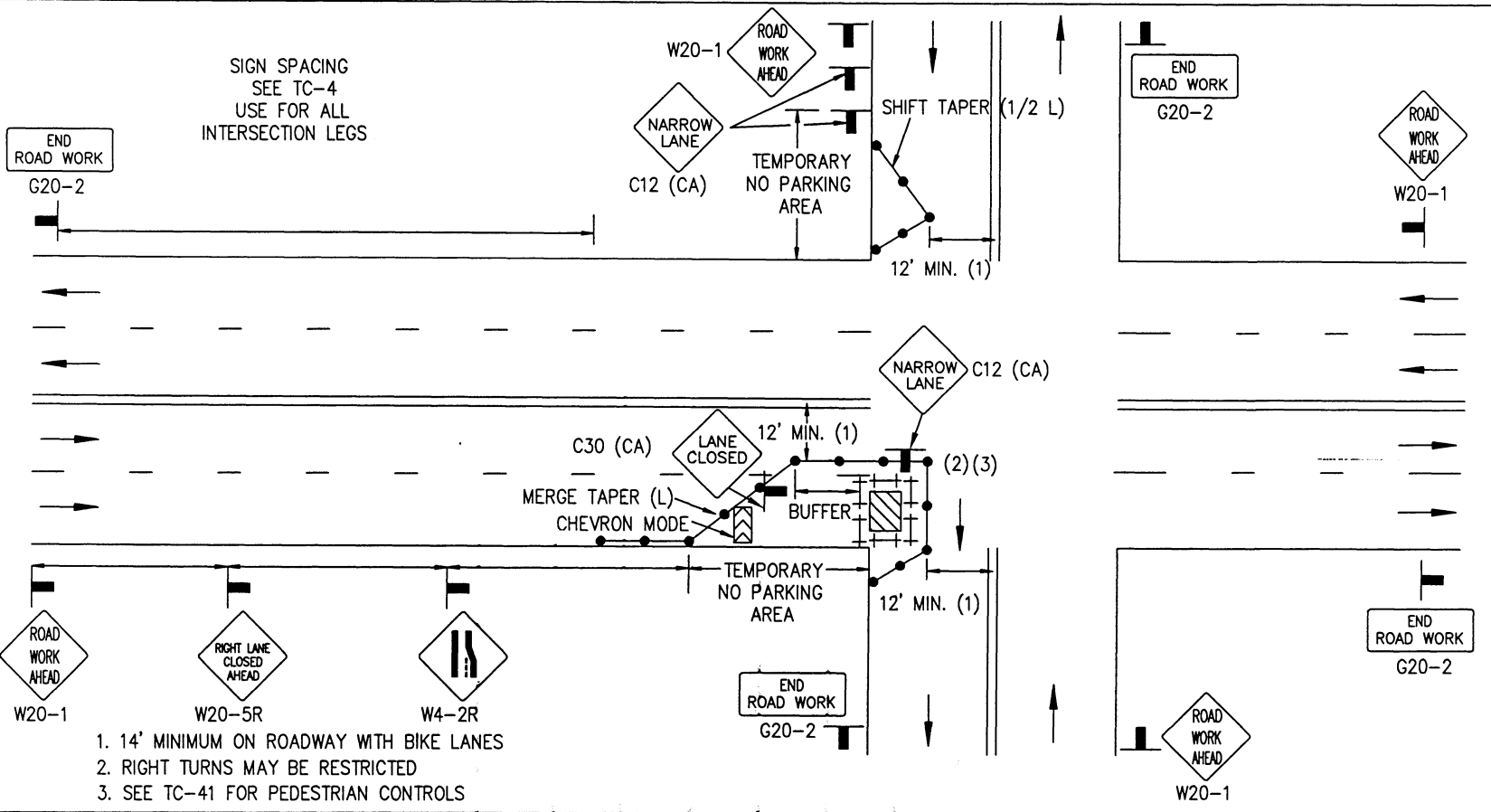
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DRAWING NUMBER
 TC-23

DRAWING NUMBER TC-24

SIDE OF ROAD WORK AREA
INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. RIGHT TURNS MAY BE RESTRICTED
3. SEE TC-41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- SIGN
- ▨ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING	BUFFER LENGTH

GENERAL NOTES

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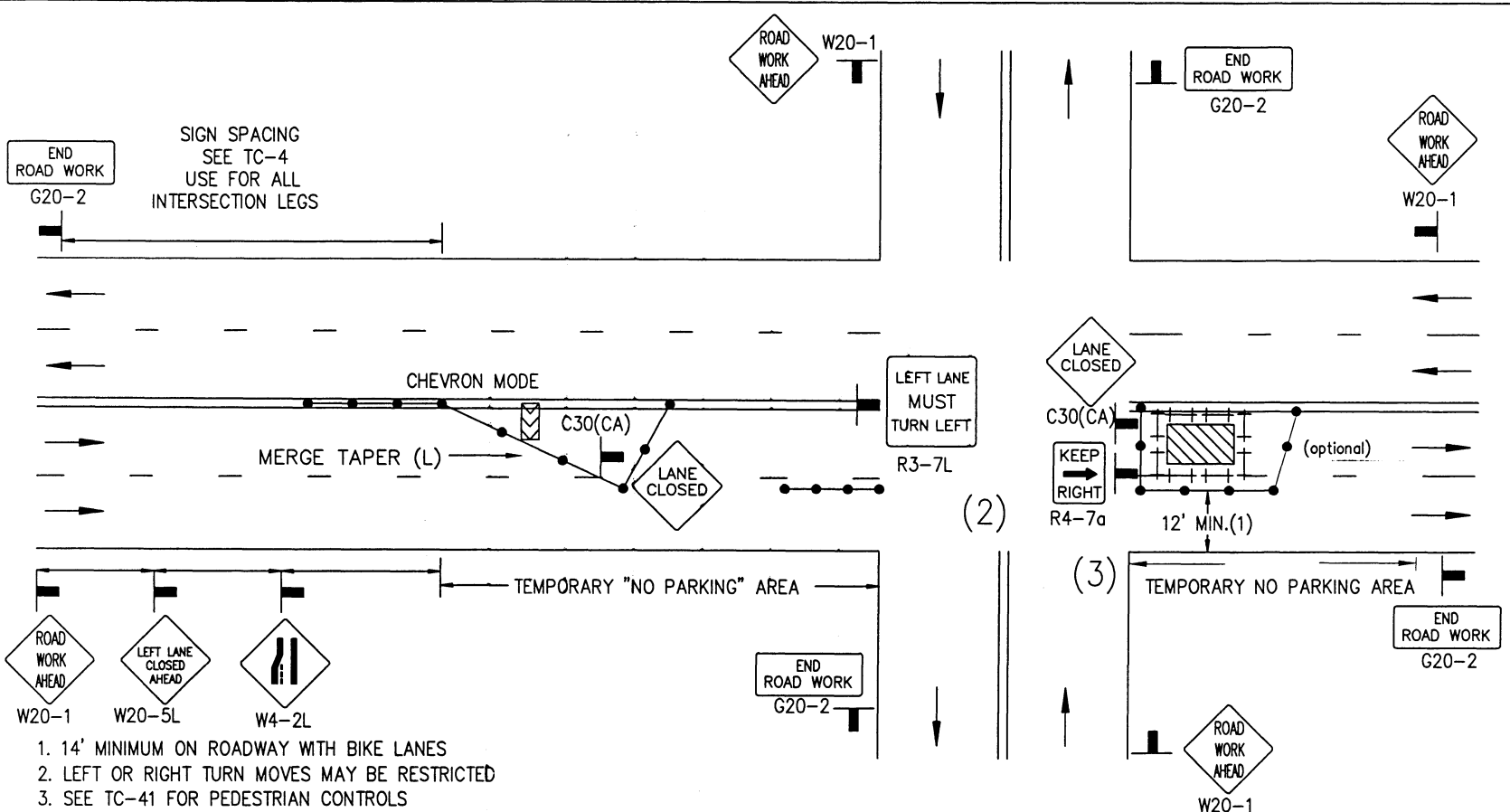
SUBMITTED BY:
 NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

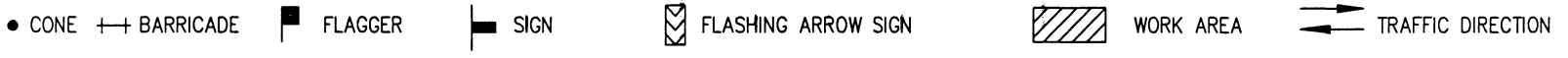
APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED
3. SEE TC-41 FOR PEDESTRIAN CONTROLS

LEGEND



AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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AGENCY USE

APPLICANT USE

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 INTERSECTION TRAFFIC CONTROL

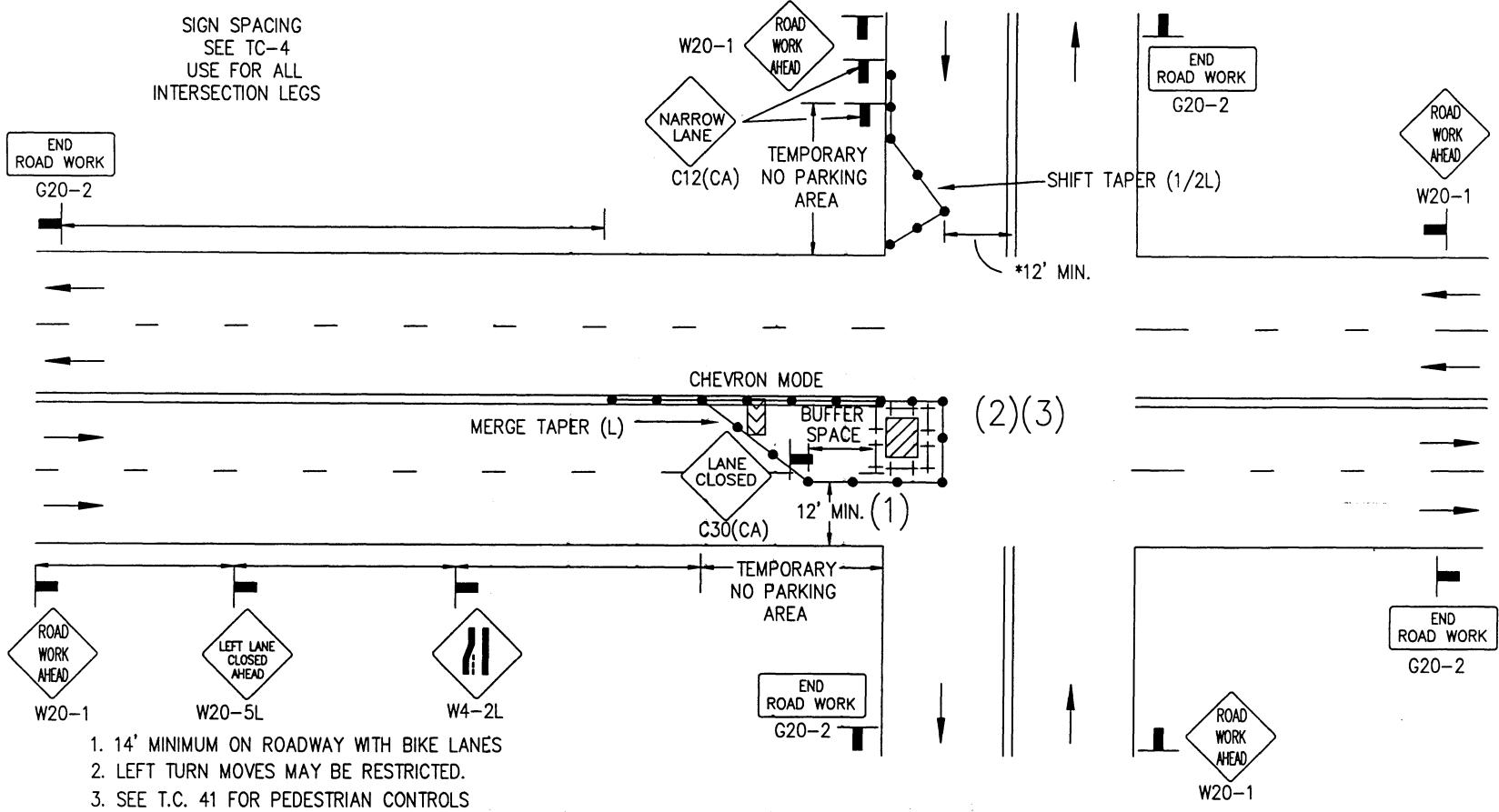
DRAWING NUMBER TC-25

DRAWING NUMBER
TC-26

CENTER OF ROAD WORK AREA
INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

SIGN SPACING
SEE TC-4
USE FOR ALL
INTERSECTION LEGS



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. LEFT TURN MOVES MAY BE RESTRICTED.
3. SEE T.C. 41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- ⊥ SIGN
- ⊘ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

- For hours of darkness, change cones to vertical barricades with steady burn lights.
- This plan MAY NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.
- This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan or these areas.
- nothing contained on this drawing shall prevent local jurisdictions from modifying, changing or adopting new specifications deemed necessary. Criteria for position, location and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.
- TC-5 is required for all Traffic Control Plans.

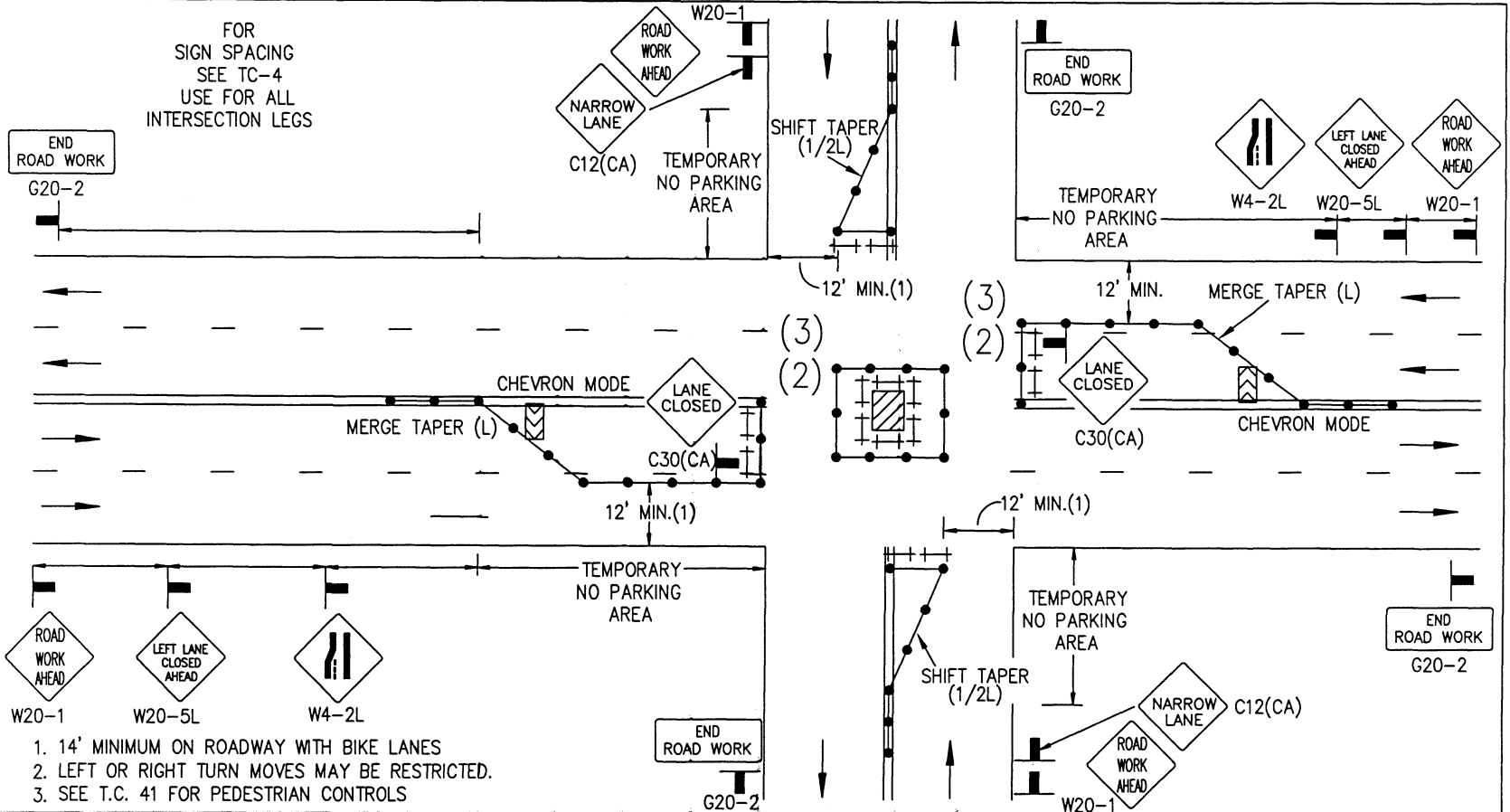
AGENCY USE

SUBMITTED BY:
 NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

Revision	By	Approved	Date
ORIGINAL	DRWING CRH	<i>[Signature]</i>	4/06

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

FOR
SIGN SPACING
SEE TC-4
USE FOR ALL
INTERSECTION LEGS



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED.
3. SEE T.C. 41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN ☒ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 INTERSECTION TRAFFIC CONTROL

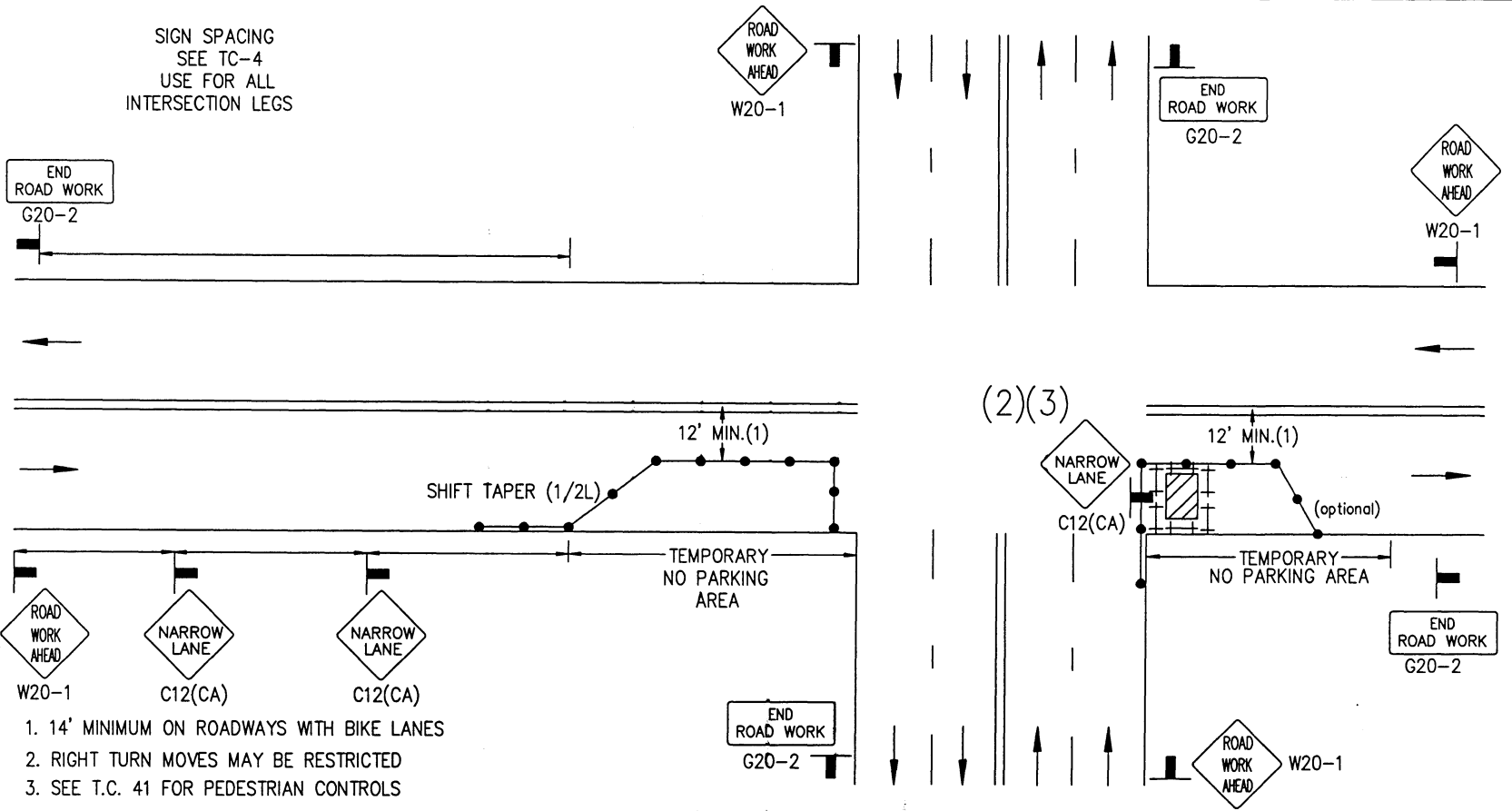
DRAWING NUMBER
 TC-27

DRAWING NUMBER
TC-28

SIDE OF ROAD WORK AREA
INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD

SIGN SPACING
SEE TC-4
USE FOR ALL
INTERSECTION LEGS



1. 14' MINIMUM ON ROADWAYS WITH BIKE LANES
2. RIGHT TURN MOVES MAY BE RESTRICTED
3. SEE T.C. 41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- SIGN
- ◻ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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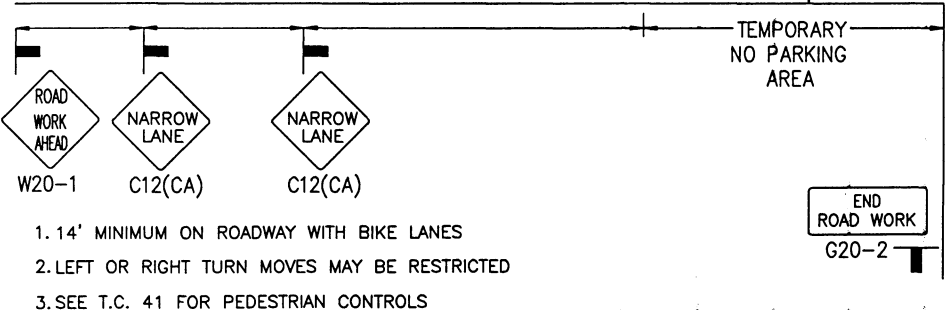
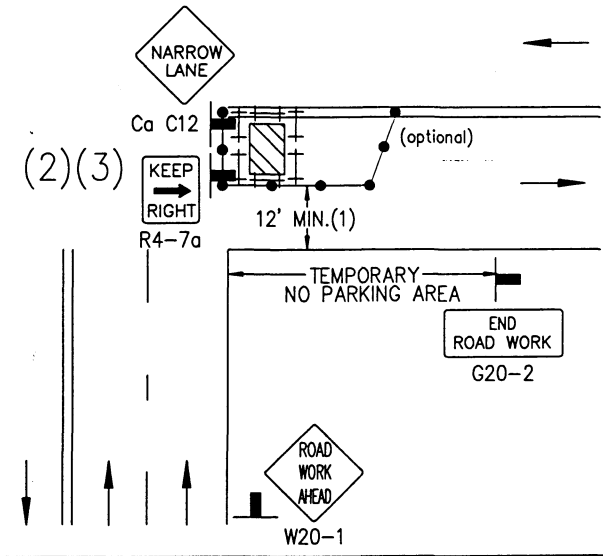
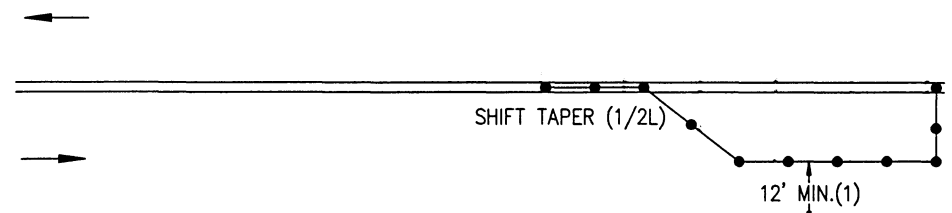
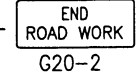
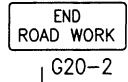
Revision	By	Approved	Date
ORIGINAL	DRWING CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

SIGN SPACING
SEE TC-4
USE FOR ALL
INTERSECTION LEGS



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED
3. SEE T.C. 41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN [] FLASHING ARROW SIGN [/ /] WORK AREA → TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

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TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

AGENCY USE

APPLICANT USE

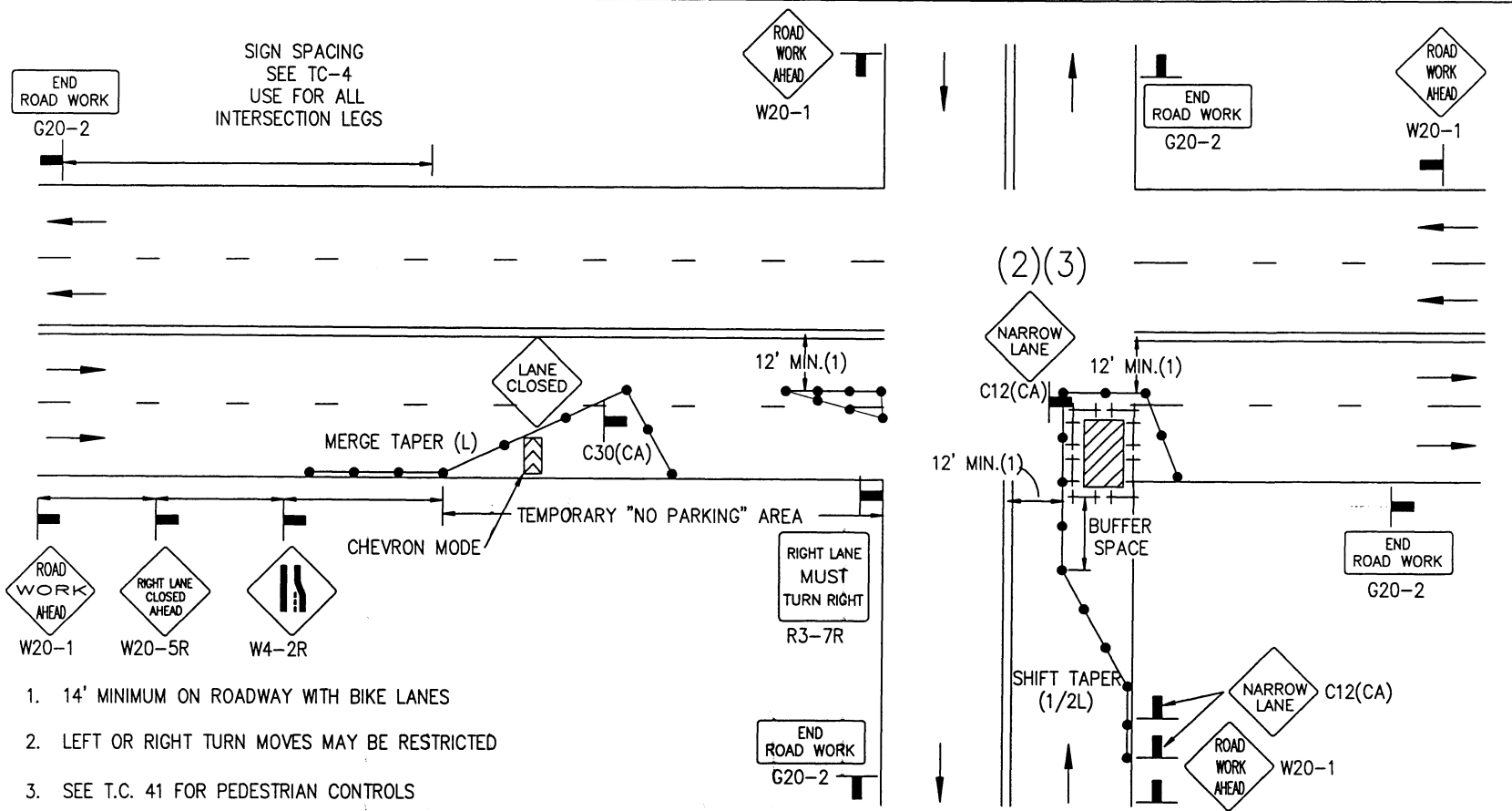
APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 INTERSECTION TRAFFIC CONTROL

DRAWING NUMBER TC-29

DRAWING NUMBER
TC-30

SIDE OF ROAD WORK AREA
INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED
3. SEE T.C. 41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN [] FLASHING ARROW SIGN [] WORK AREA → TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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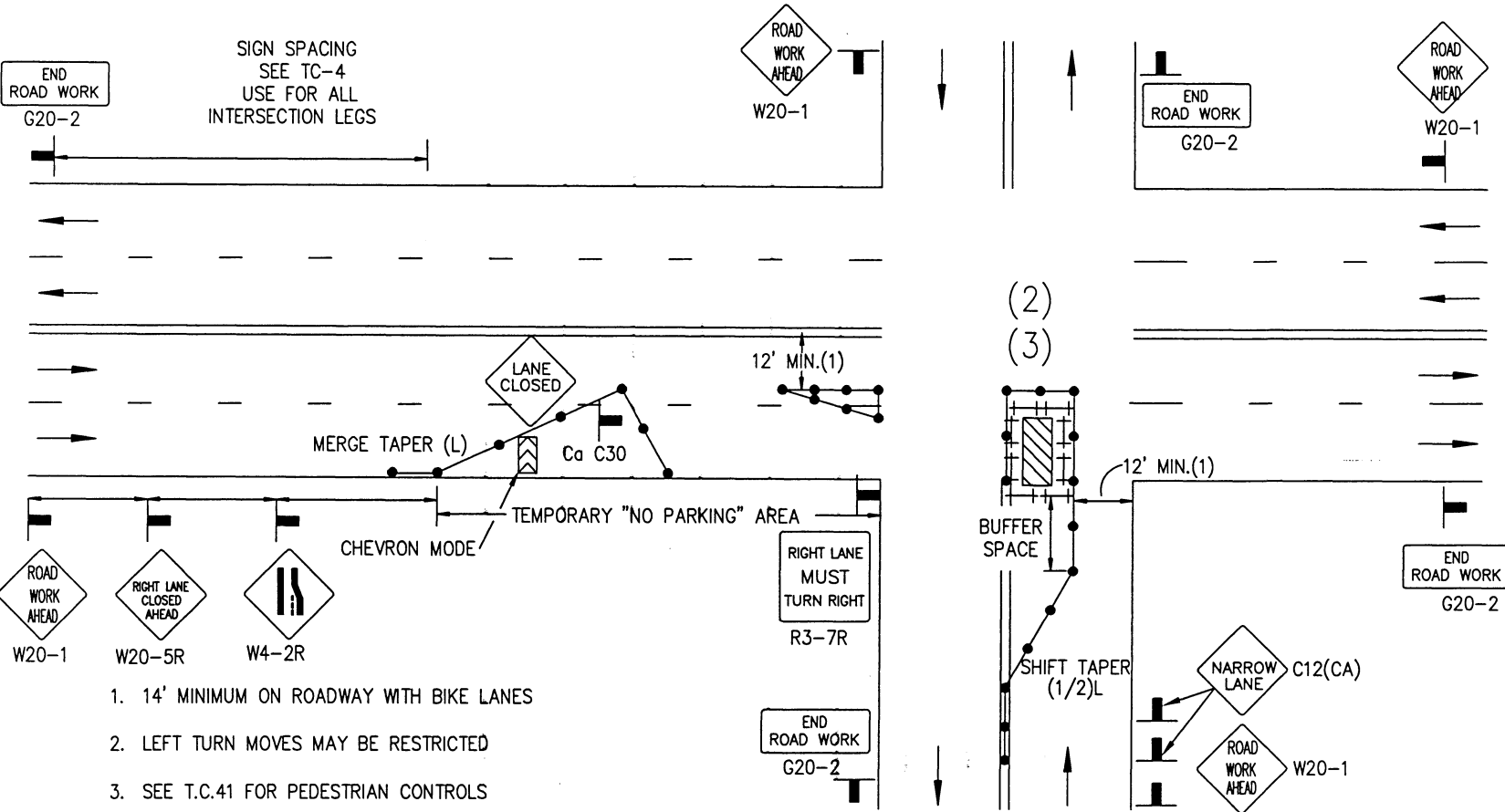
TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. LEFT TURN MOVES MAY BE RESTRICTED
3. SEE T.C.41 FOR PEDESTRIAN CONTROLS

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- SIGN
- ⊠ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

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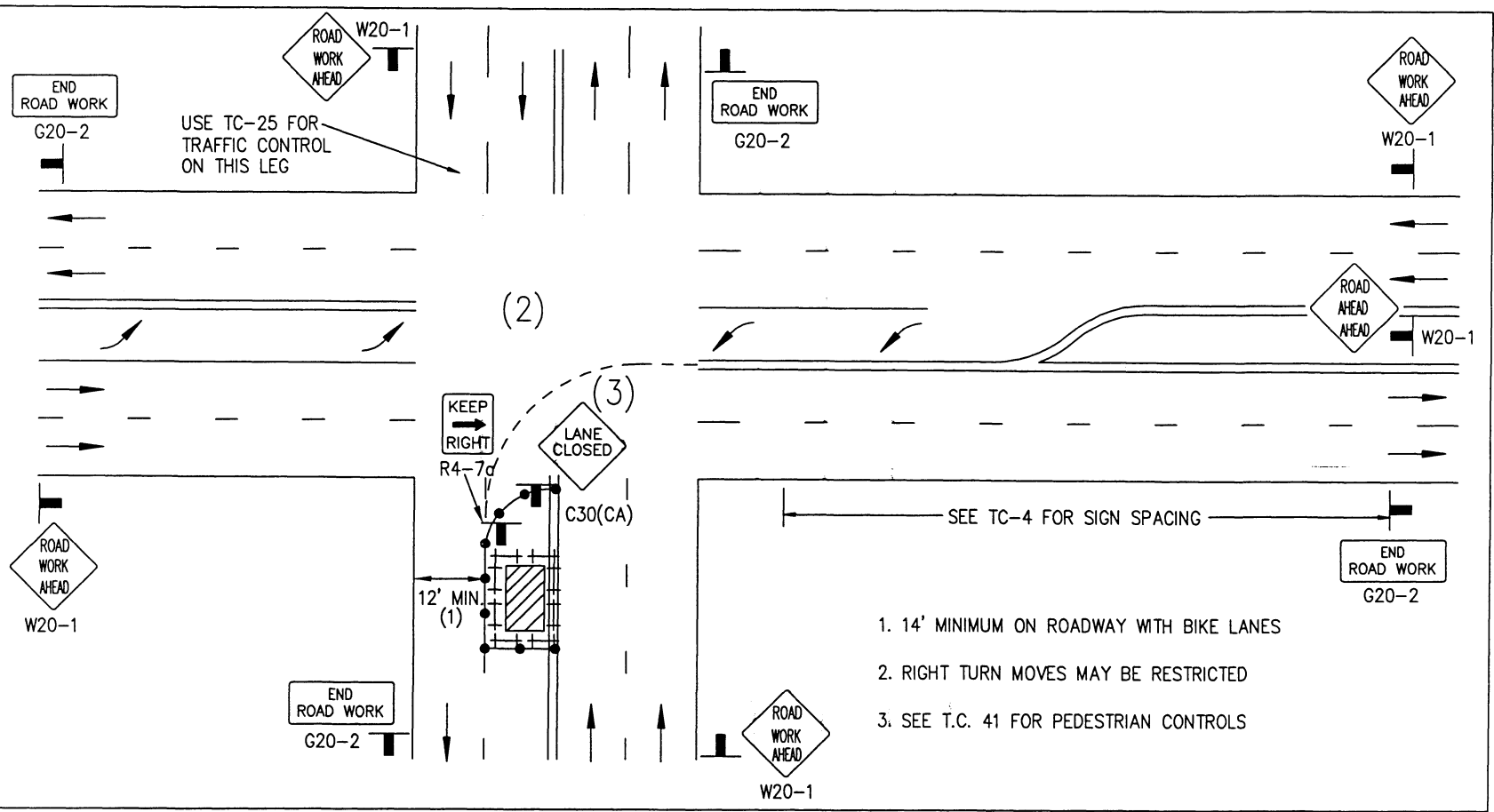
APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 CENTER OF ROAD WORK AREA
 INTERSECTION TRAFFIC CONTROL

DRAWING NUMBER
 TC-31

DRAWING NUMBER
TC-32

SIDE OF ROAD WORK AREA
LEFT TURN INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



LEGEND

- CONE ++ BARRICADE ■ FLAGGER ┌ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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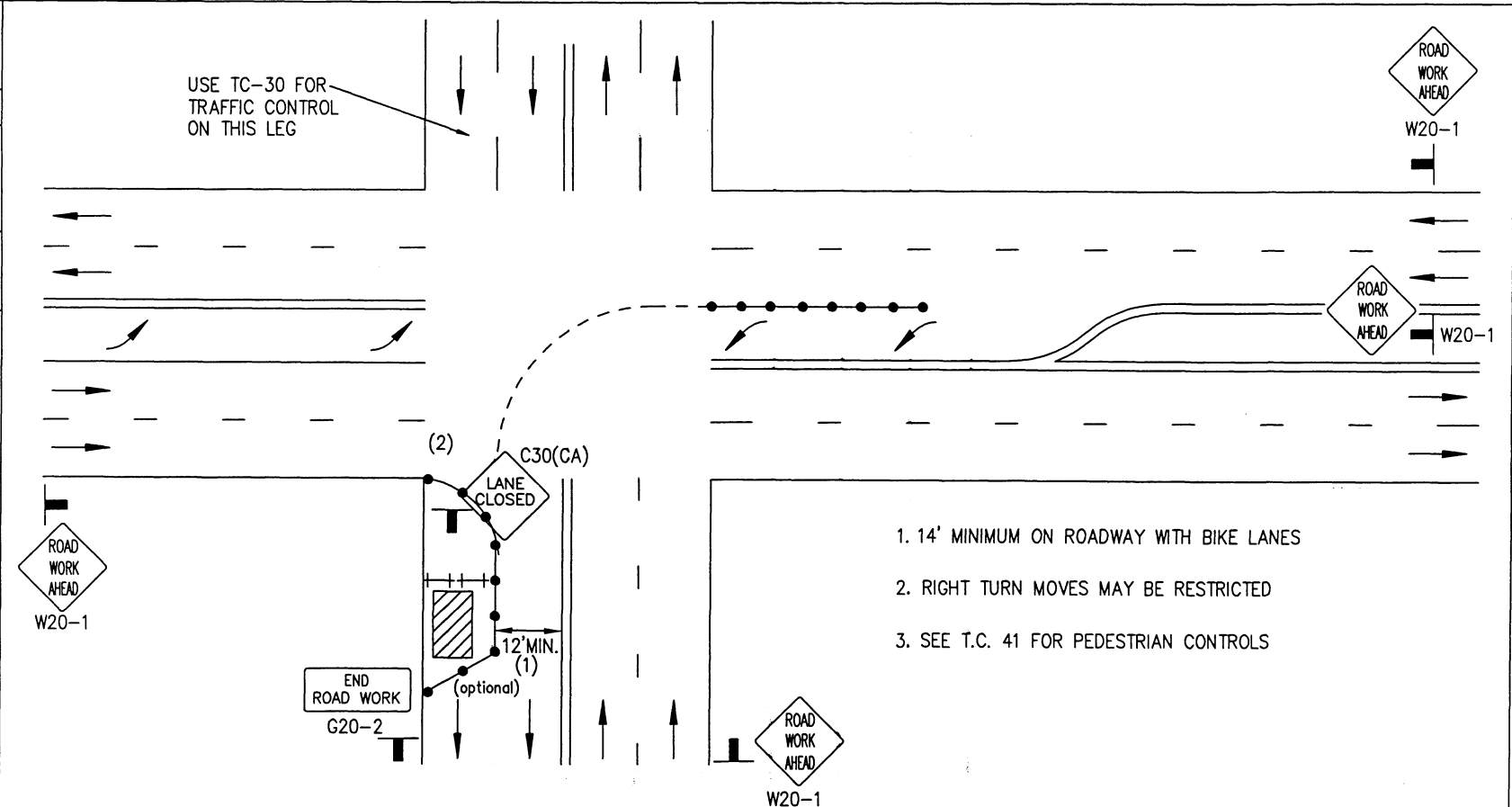
SUBMITTED BY:
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 COMPANY _____
 ADDRESS _____
 PHONE _____

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 LEFT TURN INTERSECTION TRAFFIC CONTROL

LEGEND

● CONE †† BARRICADE ■ FLAGGER ┌ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇨ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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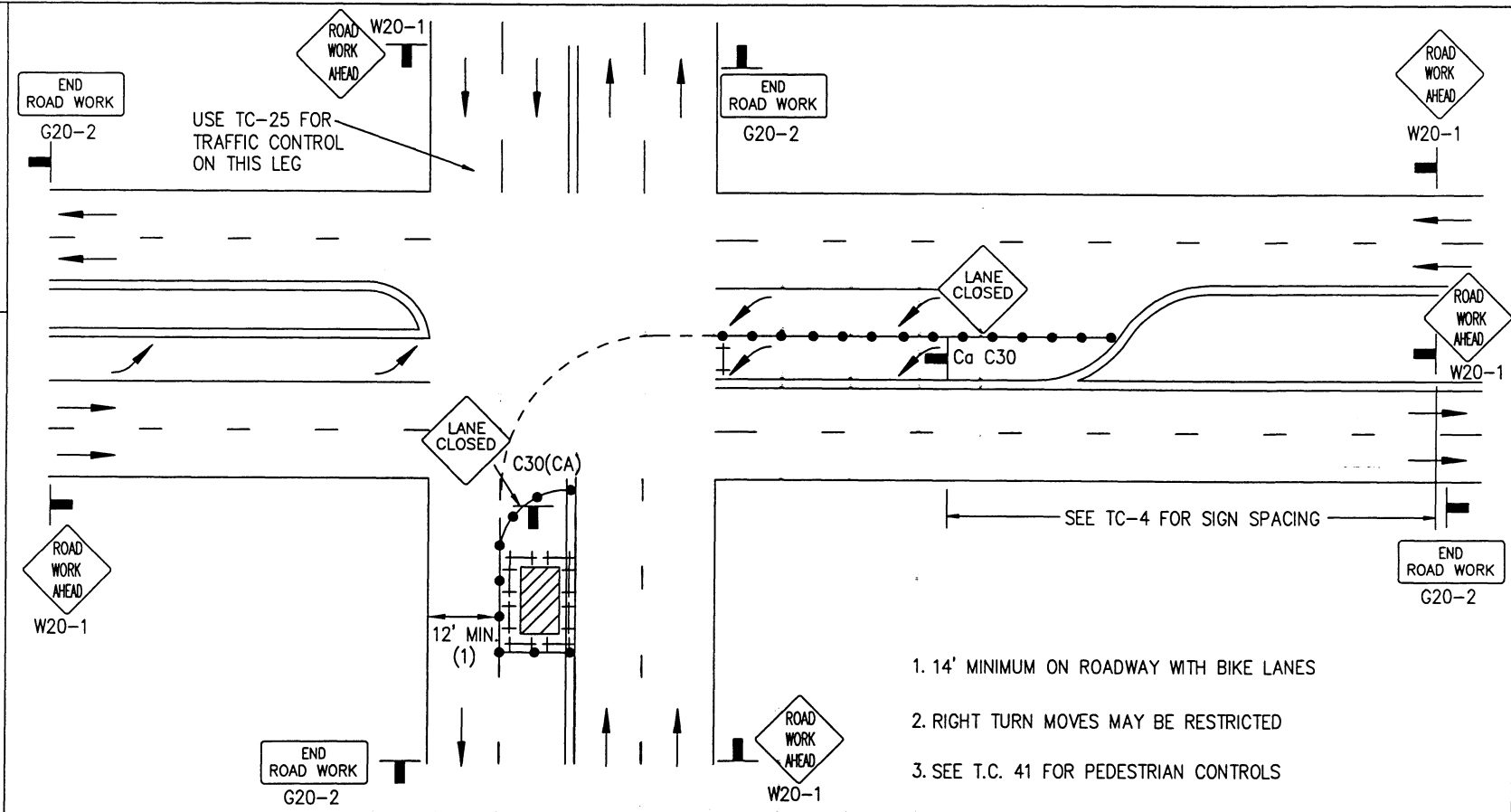
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DRAWING NUMBER
 TC-33

DRAWING NUMBER TC-34

SIDE OF ROAD WORK AREA
LEFT TURN INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



LEGEND

- CONE ++ BARRICADE ■ FLAGGER — SIGN [] FLASHING ARROW SIGN [/ /] WORK AREA → TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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SUBMITTED BY:
NAME _____
COMPANY _____
ADDRESS _____
PHONE _____

Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

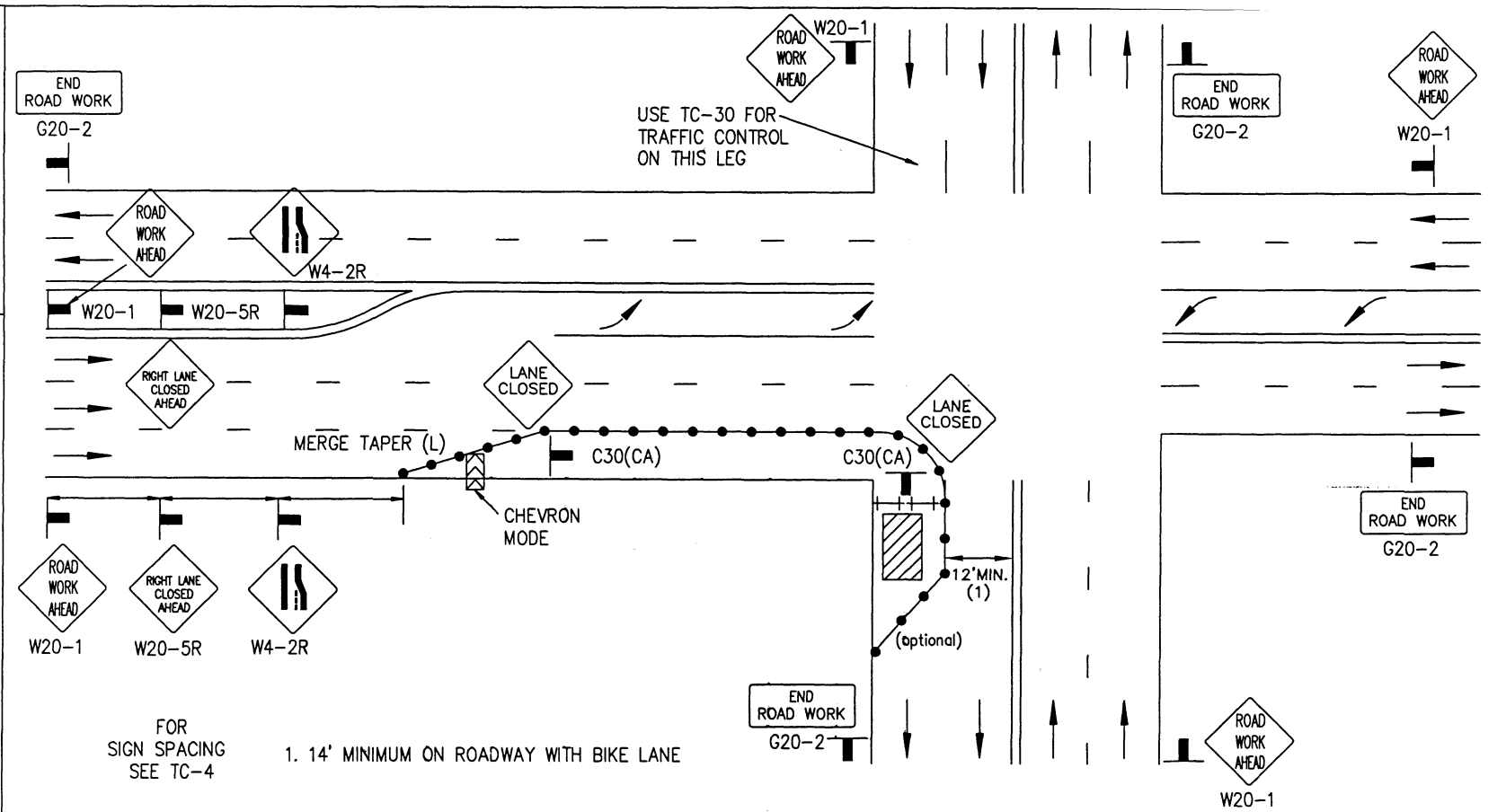
APPLICANT USE

DRAWING NUMBER

TC-36

SIDE OF ROAD WORK AREA
RIGHT TURN INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



FOR SIGN SPACING SEE TC-4
 1. 14' MINIMUM ON ROADWAY WITH BIKE LANE

LEGEND

- CONE ++ BARRICADE ■ FLAGGER ▬ SIGN ◻ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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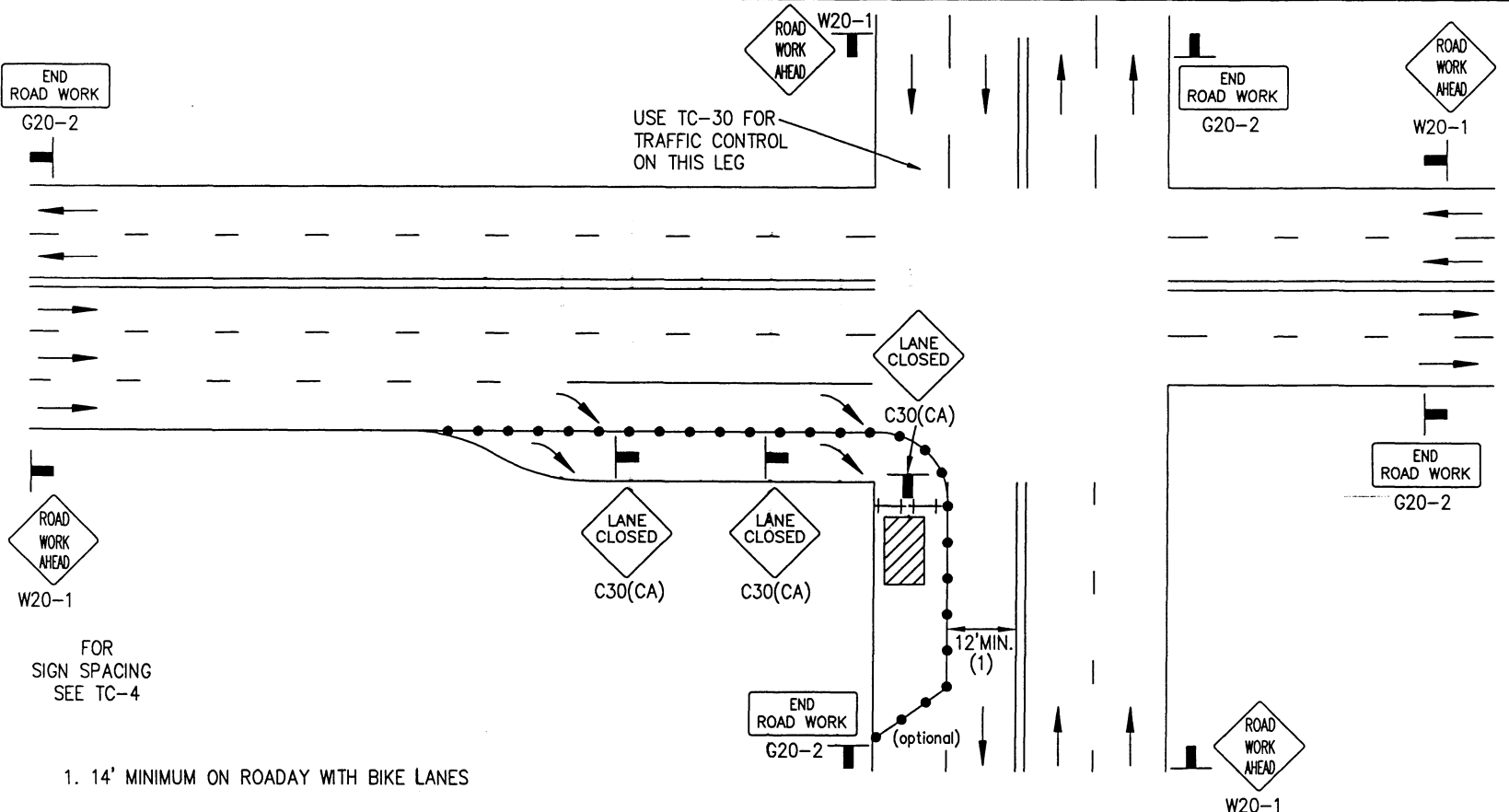
Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

AGENCY USE
APPLICANT USE

DRAWING NUMBER TC-38

SIDE OF ROAD WORK AREA
RIGHT TURN INTERSECTION TRAFFIC CONTROL

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



FOR SIGN SPACING SEE TC-4

1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE ++ BARRICADE ■ FLAGGER ┌ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

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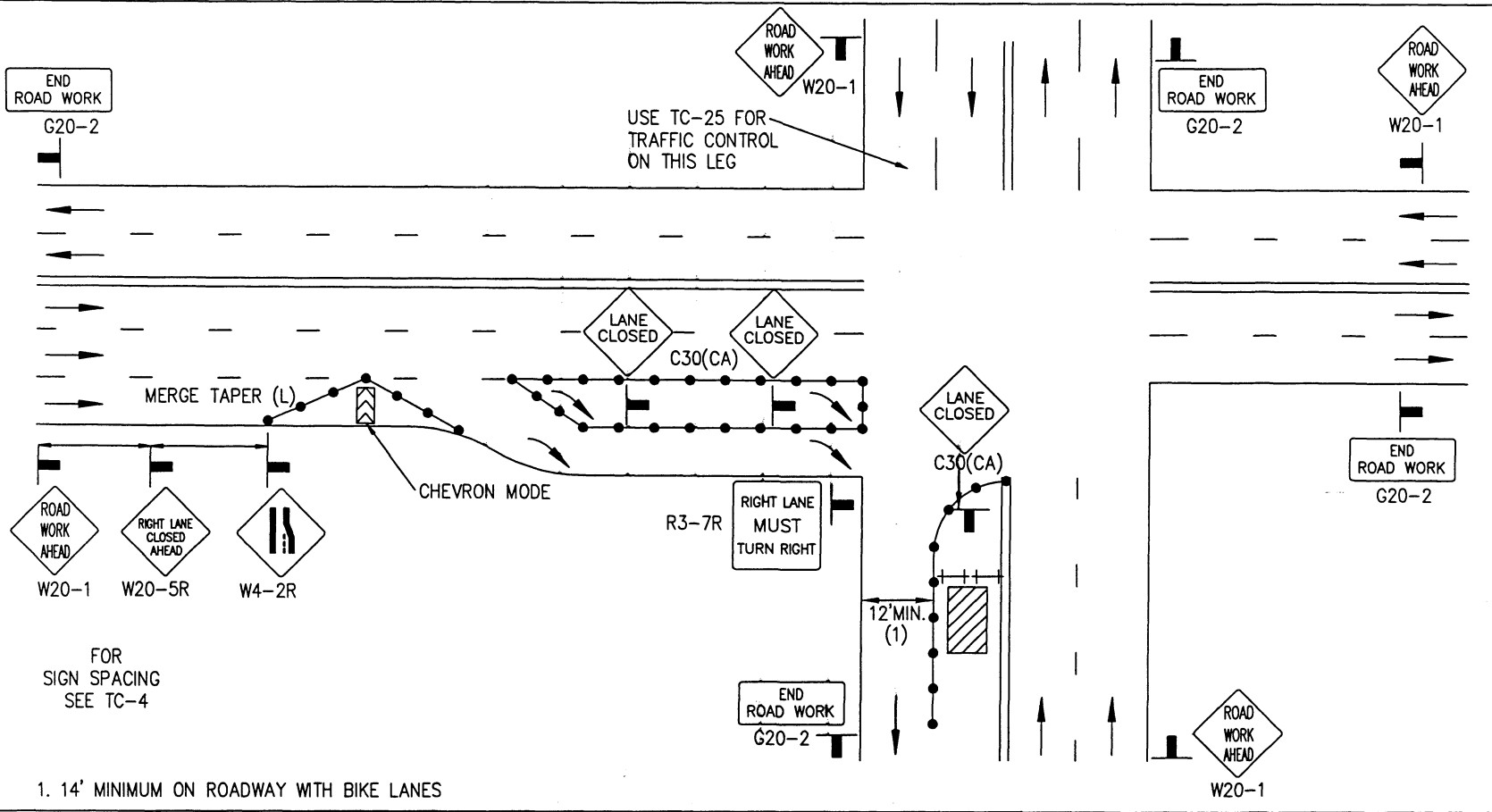
Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 RIGHT TURN INTERSECTION TRAFFIC CONTROL



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES

LEGEND

- CONE † BARRICADE ■ FLAGGER ▬ SIGN ☐ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

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SUBMITTED BY:

NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

DRAWING NUMBER TC-39

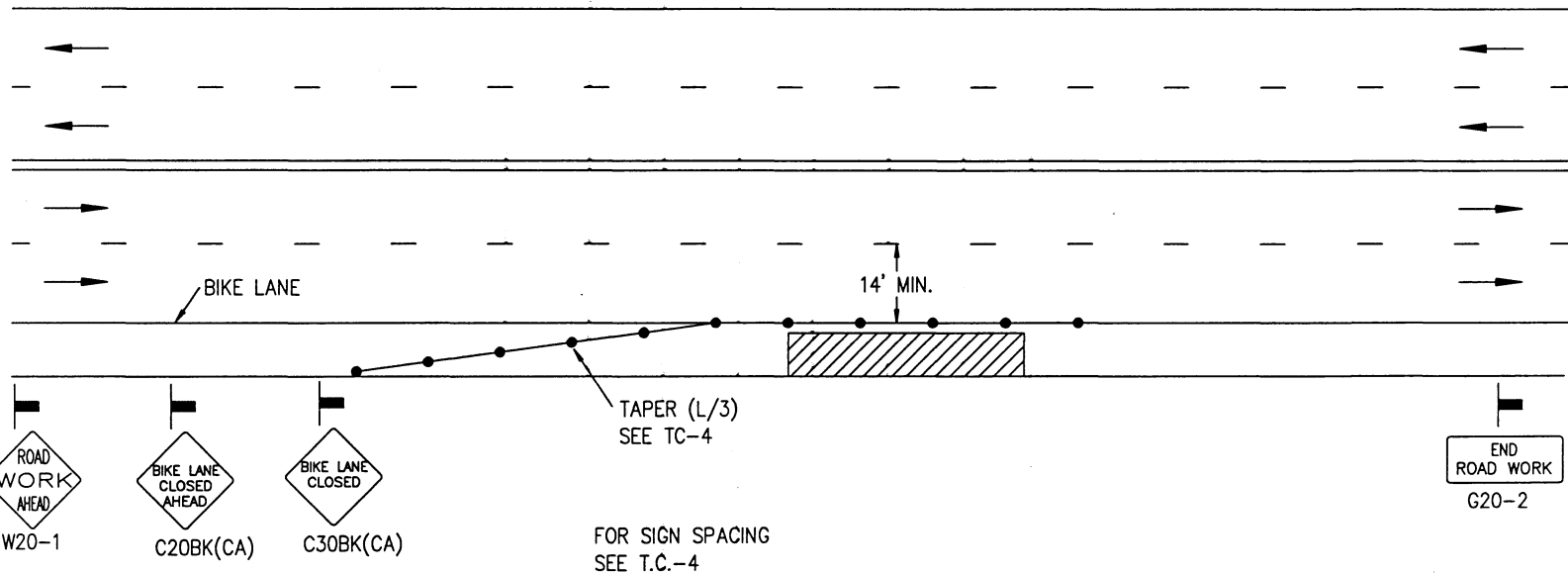
AGENCY USE

APPLICANT USE

DRAWING NUMBER TC-40

SIDE OF ROAD WORK AREA
BIKE LANE CLOSURE

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



FOR SIGN SPACING SEE T.C.-4

LEGEND

- CONE †† BARRICADE █ FLAGGER █ SIGN ▣ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

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SUBMITTED BY:

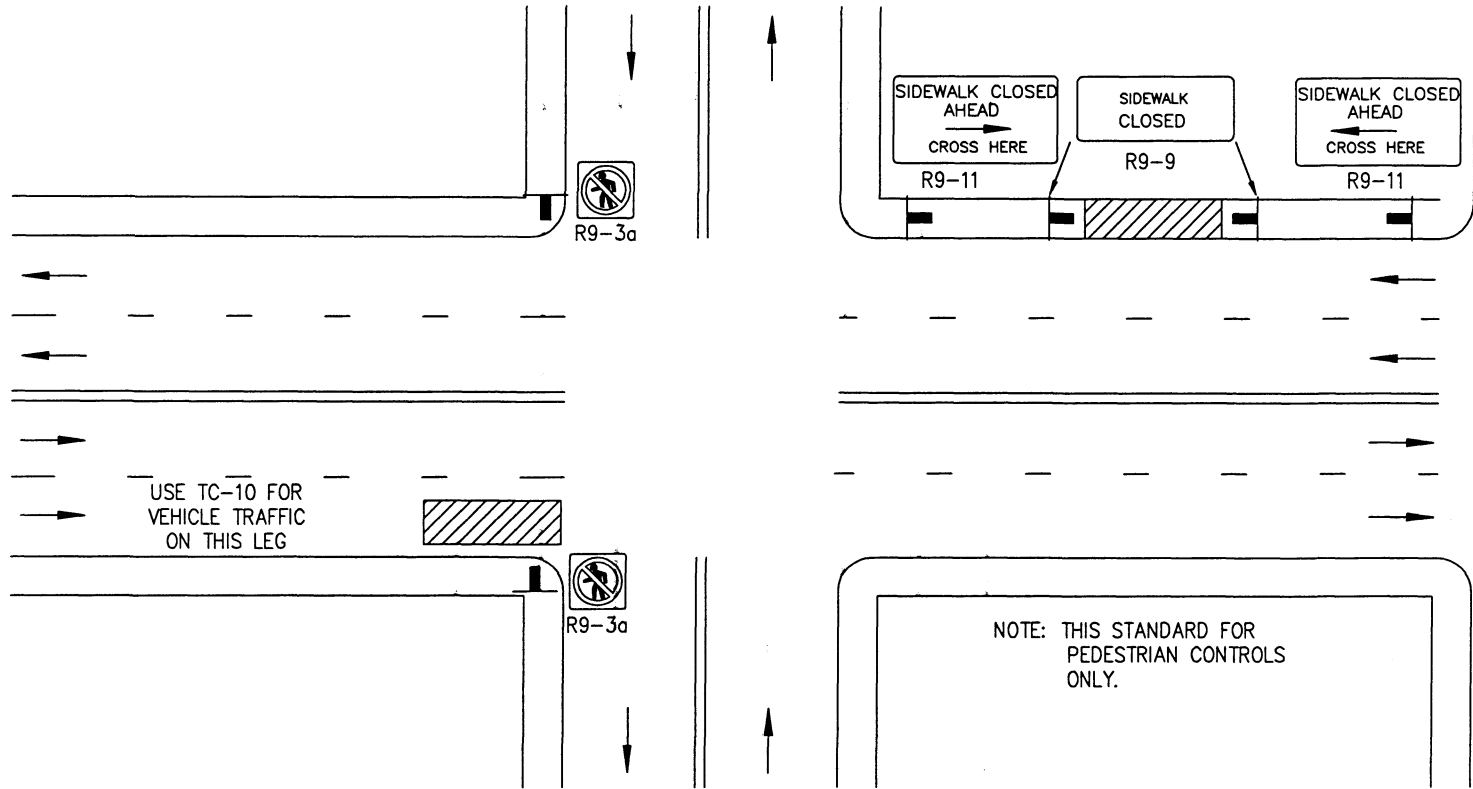
NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

Revision	By	Approved	Date
ORIGINAL	CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



APPENDIX "A"
 SAN DIEGO REGIONAL STANDARD
 SIDE OF ROAD WORK AREA
 TYPICAL PEDESTRIAN CONTROL SIGNS

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- ▬ SIGN
- ▧ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

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TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

AGENCY USE

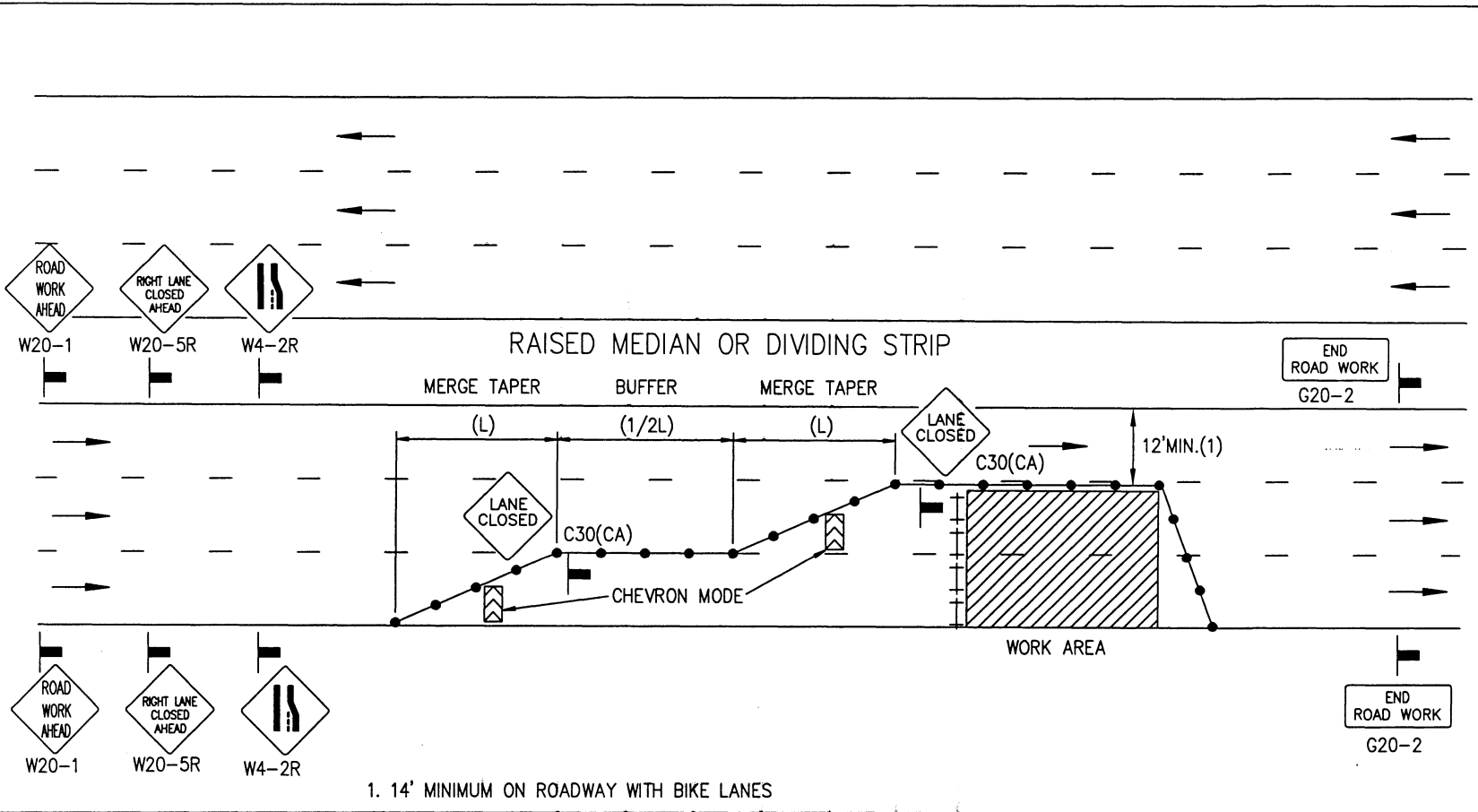
APPLICANT USE

DRAWING NUMBER TC-41

DRAWING NUMBER
TC-42

SIDE OF ROAD WORK AREA
MULTILANE ROADWAY WITH RAISED MEDIAN

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



LEGEND

- CONE †† BARRICADE ■ FLAGGER ▬ SIGN ▨ FLASHING ARROW SIGN ▨ WORK AREA ⇄ TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

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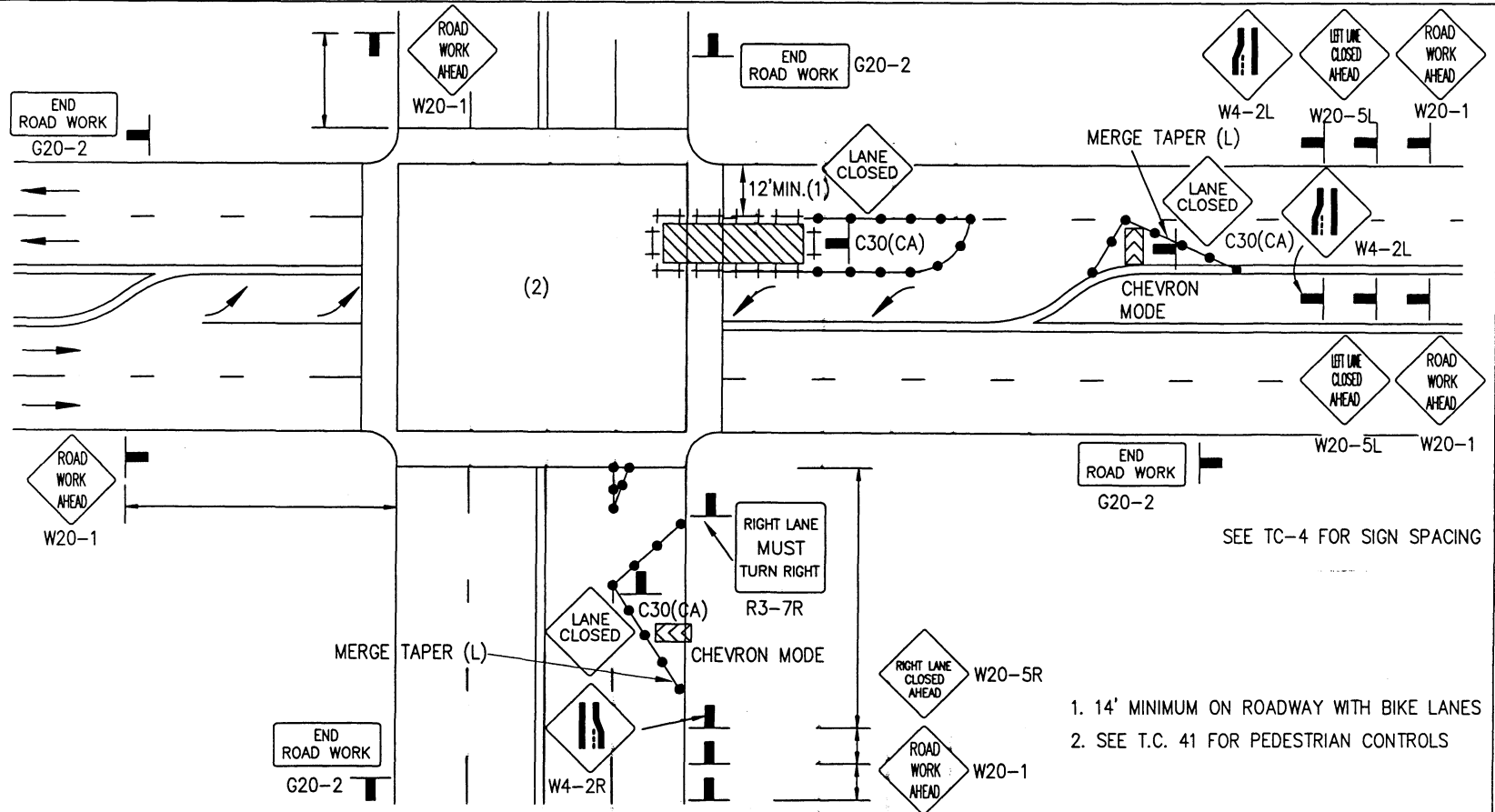
TC-5 is required for all Traffic Control Plans.

AGENCY USE

SUBMITTED BY:
 NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

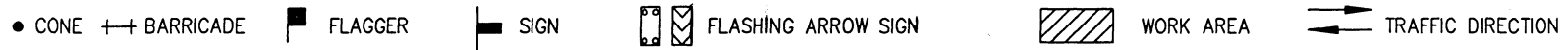
Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06

Revision	By	Approved	Date
DRAWING CRH			4/06
ORIGINAL			4/27/06



1. 14' MINIMUM ON ROADWAY WITH BIKE LANES
2. SEE T.C. 41 FOR PEDESTRIAN CONTROLS

LEGEND



AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan MAY NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan or these areas.

nothing contained on this drawing shall prevent local jurisdictions from modifying, changing or adopting new specifications deemed necessary. Criteria for position, location and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

AGENCY USE

APPLICANT USE

SUBMITTED BY:

NAME _____

COMPANY _____

ADDRESS _____

PHONE _____

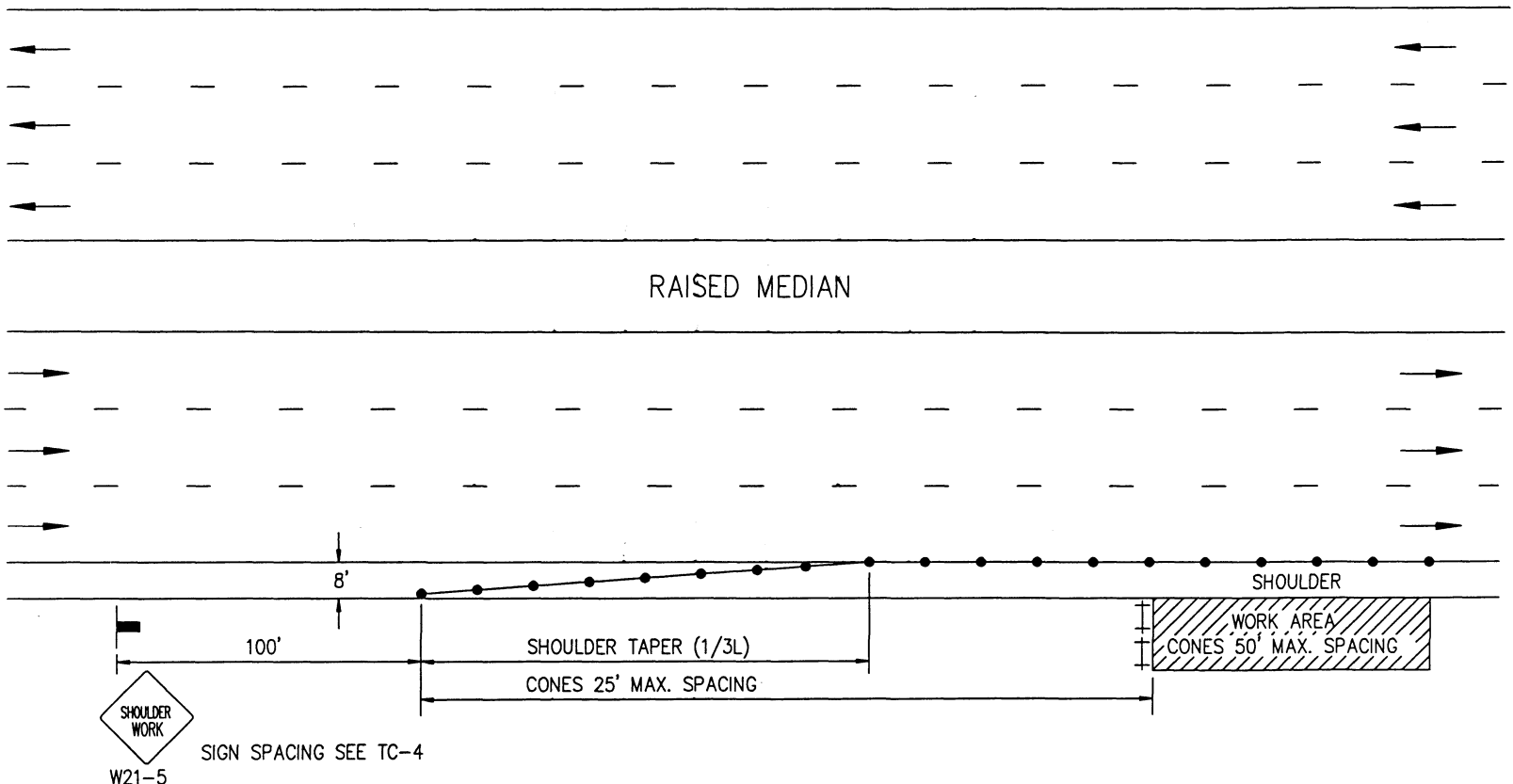
APPENDIX "A"
SAN DIEGO REGIONAL STANDARD
WORK WITHIN INTERSECTION
RIGHT LANE / LEFT LANE

DRAWING NUMBER
TC-43

DRAWING NUMBER
TC-44

TYPICAL SHOULDER CLOSURE
MULTILANE ROADWAY WITH RAISED MEDIAN

APPENDIX "A"
SAN DIEGO REGIONAL STANDARD



SHOULDER WORK
W21-5

SIGN SPACING SEE TC-4

RAISED MEDIAN

LEGEND

- CONE
- ++ BARRICADE
- FLAGGER
- SIGN
- ▨ FLASHING ARROW SIGN
- ▨ WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT	APPROACH SPEED	TAPER LENGTH	SPACING OF CONES	SIGN SPACING

SEE TC-4 FOR SIGN, CONE SPACING AND TAPER LENGTH

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan or these areas.

nothing contained on this drawing shall prevent local jurisdictions from modifying, changing or adopting new specifications deemed necessary. Criteria for position, location and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME _____
 COMPANY _____
 ADDRESS _____
 PHONE _____

Revision	By	Approved	Date
ORIGINAL	DRWING CRH	<i>[Signature]</i>	4/27/06

AGENCY USE

APPLICANT USE

APPENDIX "B"

CITY OF SAN DIEGO

FIRE AND HAZARD PREVENTION SERVICES POLICY

DESIGN STANDARDS

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	DRAWING NUMBER
1	RDM	R.Medan	07/21/00	FIRE AND HAZARD PREVENTION SERVICES POLICY	FHSP

FIRE AND HAZARD PREVENTION SERVICES POLICY

A-00-1

**FIRE ACCESS ROADWAYS
UNIFORM FIRE CODE 901.4.2**

I. PURPOSE

This policy clarifies the Fire and Life Safety Services' access roadway requirements as outlined in UFC 901.4.2, and California Vehicle Code Section 22500.1.

II. SCOPE

Fire access roadways for new and existing buildings are regulated by this policy. Both public streets and private roadways fall under the scope of this policy.

III. PERMITS

No permits are required.

IV. WHERE ROADWAYS ARE REQUIRED

Buildings shall be accessible to emergency vehicle access. Access roadways shall be not less than 20 feet of unobstructed width, shall have an adequate roadway turning radius and shall have a minimum vertical clearance of 15 feet 6 inches. Access roads shall be extended to within 150 feet of all portions of the first story of the building served (as measured around the exterior of the building), and shall be installed with an all-weather driving surface. All access, including bridges, shall support the imposed load of fire apparatus to withstand a minimum 95,000 pound vehicle load.

Exceptions:

- A. Proposed surfaces other than concrete or asphalt shall be designed and installed in accordance with FHPS Policy A-96-9.
- B. For buildings construction prior to February 9, 1975, private roadway widths less than 20 feet may be permitted to remain. The ability to conduct fire fighting operations will be the primary consideration in grandfathering these reduced roadway widths.

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				FIRE AND HAZARD PREVENTION SERVICES POLICY	FHPS-101

- C. Bridges constructed prior to April 22, 1982 shall suffice as access if such bridge was built according to the building standards in effect at that time. If the bridge will not safely support the imposed load of fire apparatus, the Chief is authorized not to operate fire apparatus over such bridge.
- D. These access roadway requirements do not apply to Group U occupancies or to two or less group R-3 Occupancies located more than 150 feet from a public street or roadway.
- E. These requirements may be modified when authorized by the Chief. The Chief may require installation of a fire access roadway when circumstances warrant.

V. **RED CURBS/NO PARKING SIGNS**

The required width of access roadways shall not be obstructed in any manner, including the parking of vehicles. Where no space is provided for parking along access roadways, they shall be kept clear by the posting of signs or the painting of curbs as follows:

- A. Owners or property representatives shall post the entrance to the required roadway with an approved sign. Sign shall read "NO PARKING FIRE LANE" in letters of 1" or greater in heights. (See attached specification sheet.) Signs shall be placed every 100 feet facing traffic at a height of 7 feet. Requests for placement variations, alternative sign designs, or omission of signs shall be submitted in writing and must be approved by the Plans Review Officer.

Exception: Signs may be omitted on public streets.

- B. All curbs that outline the access roadway shall be painted red. White 4 inch high letters reading "No Parking - Fire Lane" shall be stenciled every 30 feet on the red curb. If no curb is present, an 8 inch wide red stripe shall be painted on the pavement. The stripe shall be lettered the same as a curb.

Exception: Red fire lane curbs on public streets do not require the white stenciled lettering.

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C. Signs, red curbing, and white lettering shall be maintained to ensure visibility.

NOTE: Fire and Life Safety Services recommends that signs as well as red curbs with white lettering be provided.

VI. ADDITIONAL REQUIREMENTS (FOR NEW CONSTRUCTION)

A. 26 foot access roadway

1. When adjacent to buildings that are greater than 35 feet in height above natural grade, the access roadway shall have a minimum width of 26 feet. The location shall be 15 - 25 feet from the building and shall be positioned parallel to one entire side of the building.
2. When adjacent to a fire hydrant, access roadways shall be a minimum of 26 feet in width for 20 feet in either direction from the hydrant. (See attached specification sheet).
3. Fire access roadway over 300 feet in length shall be 26 feet in width.

B. Turning radius

A minimum 50 foot turning radius is required and shall be in accordance with the semi-trailer template detailed on the attached sheet. Inside measurement shall be according to California Truck Semi-Trailer Wheel Tracks. An additional two feet of width shall be provided to allow for clearance of apparatus bumper over-hang.

C. Maximum grades shall not exceed:

1. 15% (6.75°) for concrete
2. 12% (5.4°) for asphalt

D. Large buildings

Buildings exceeding 100 feet in width and 600 feet in length shall have access roadways serving the two long sides of the building.

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VII. NOTIFICATION OF PROPERTY OWNERS

A. New Construction

Fire access roadway requirements for new buildings are addressed during the plans review.

B. Existing Buildings

1. On Private Streets

The Department will notify affected property owners when it is determined that a fire access roadway is required. The notice shall advise the property owners of their right to appeal to the Board of Appeals per Uniform Fire Code, Section 103.1.4. If an appeal takes place and is decided in favor of the City, or after 30 days if no appeal is requested, a Notice to Install Fire Lane will be issued to the property owner(s). The owner is responsible for the installation of signs and/or the painting of curbs and will be given fifteen (15) days to do so. If the owner does not comply within the given time frame, the Chief may order installation to be done by the City. The administrative and direct costs incurred will then be assessed to the property owners.

2. On Public Streets

When it is determined that a public street needs to be designated as a fire access roadway, the Department will notify the affected property owners by mail. The Department's letter advises the property owners to address questions or appeals to the Fire and Hazard Prevention Services. Once questions and appeals have been addressed or after 30 days if no appeals have been filed, the Department will contact the Traffic Engineering Division of the Public Works Business Center. A site meeting will be held between the Department and Traffic Engineering to clarify exactly which curbs are to be painted and where signs, if any, are to be placed. Traffic Engineering will issue the work order for the installation of signs and/or the painting of curbs to the Streets Division of the Public Works Business Center.

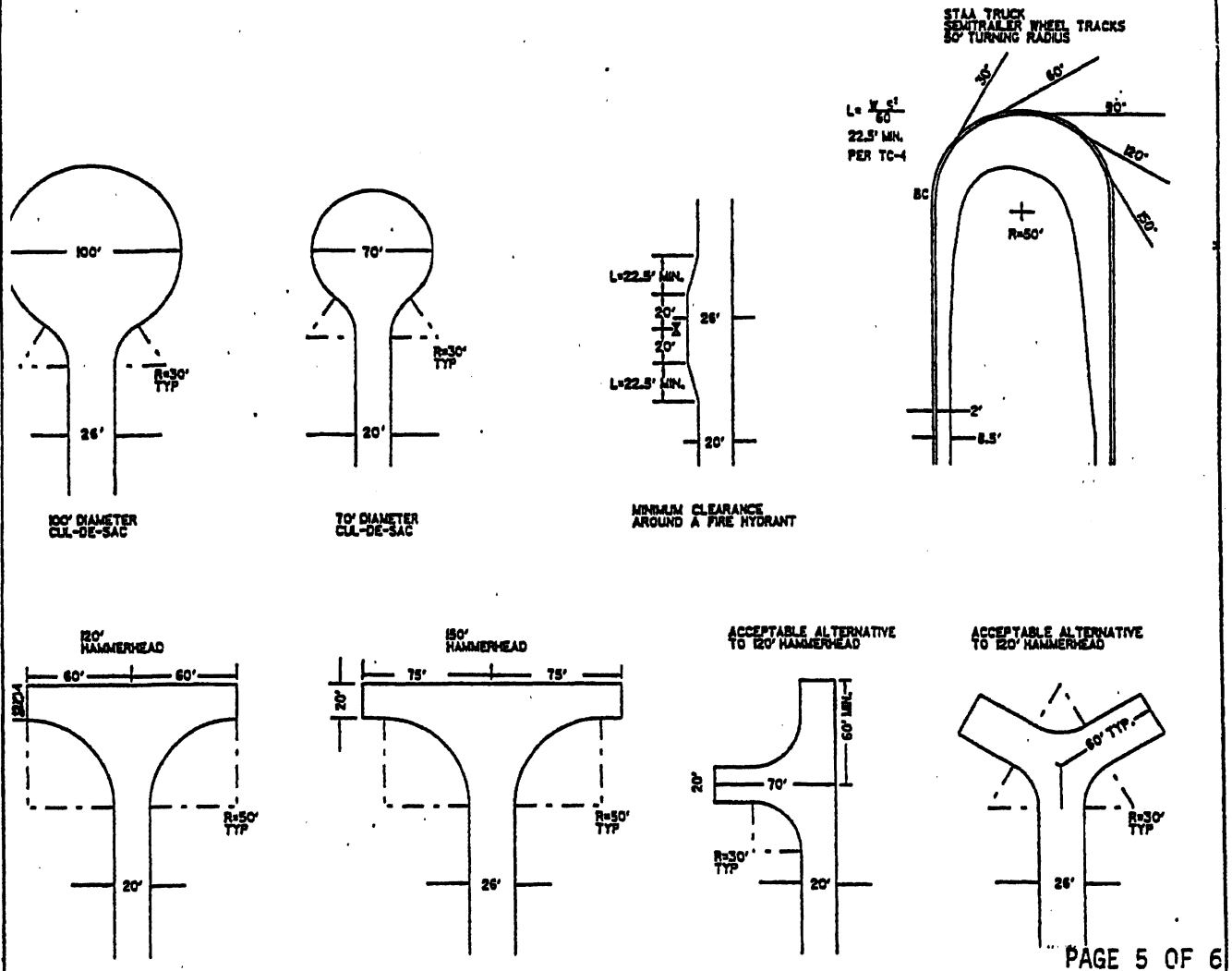
C. Copies of all correspondence between the Department and property owners shall be retained in fire and Hazard Prevention Services' geographical files.

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REQUIREMENTS FOR DEAD-END AND LOOPED ACCESSWAYS

LENGTH	WIDTH	TURNAROUND REQUIRED
0-150'	20'	NONE REQUIRED
150'-300'	20'	70' Diameter Cul-de-sac 120' Hammerhead
300'-750'	26'	100' Diameter Cul-de-sac 150' Hammerhead
OVER 750' - SPECIAL APPROVAL REQUIRED		

Curves and topographical conditions could alter the requirements for turnarounds and the width of accessways. When access road is serving more than 100 units two means of access are required.



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ALL DIMENSIONS ARE IN INCHES

R27 Suffix	SIZE	BORDER WIDTH	MARGIN WIDTH	LETTER SIZE SERIES & STROKE WIDTH					CODE RA
				LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	
-1.1	12 X 18	1/4	1/4	3 1/2B-.49	3B-.42	2 1/4B-.33	2 1/4 B-.33	3/8 F-.08	1

R27 SUFFIX	SIZE	DIMENSIONS											
		A	B	C	D	E	F	G	H	I	J	K	L
-1.1	12 x 18	1 1/2	15	2-3/8	7/8	1-1/8	5-1/2	9-3/4					

WHITE BACKGROUND WITH RED BORDER & SYMBOL

3/8" DIA HOLES

SIGN

ReflectORIZED Material
Aluminum Sign

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	DWG. NO.
				FIRE AND HAZARD PREVENTION SERVICES POLICY	PAGE 6 OF 6
					FHPS-101

FIRE AND HAZARD PREVENTION SERVICES POLICY
A-00-9

ACCESS ROADWAYS
MODIFIED ROADWAY SURFACE
UNIFORM FIRE CODE 902

I. Purpose

The purpose of this policy is to establish procedures and standards for all weather access roads for Fire and Hazard Prevention Services vehicles when modified access road materials are used.

II. Scope

This policy shall govern and include all access roads using modified road surfaces, other than the SDG-113 Standard Portland Cement Concrete or Asphalt Concrete pavements, that may be utilized by Fire and Hazard Prevention Services vehicles/apparatus to approach or stage for an emergency response to a structure, hazard, equipment, or process.

III. Definition

- A. **Standard Road Surface** - SDG-113 pavement such as Portland Cement Concrete or Asphalt Concrete within the improved Public Rights-of-Way.
- B. **Modified Road Surface** - a type of material surface that provides for the structural stability and minimum coefficient of friction needed to traverse the access road over difficult topographic conditions for Fire and Hazard Prevention Services vehicle access, such as monolithic stamped concrete, interlocking concrete pavers, etc.
- C. **Combined Material Road Surface** - the combined use of grass with reinforced concrete pavement, interlocking block systems, or other acceptable reinforced and retained road products.

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				FIRE AND HAZARD PREVENTION SERVICES POLICY	FHPS-102

IV. Procedures

- A. Access roads in conformance with Fire Prevention Bureau (FPB) Policy #A-96-1, with other than standard material surfaces, shall be approved by the Fire and Hazard Prevention Services Plans Review Officer and/or the New Construction Plan Check Supervisor in writing on an individual case-by-case basis only. The Fire and Hazard Prevention Services approval letter shall be included with all plan sets and in the record file prior to the commencement of construction.
- B. The required width of the Fire and Hazard Prevention Services vehicle access road shall not be obstructed in any manner, including parked vehicles, landscaping, trees, shrubbery, or decorative objects.
- C. The requirements of the FPB Policy #A-96-1 are applicable except as modified herein:
 - 1. The maximum grade for any Fire and Hazard Prevention Services Vehicle Access road is "five percent" (5%) or (2.25 degrees) for combination surfaces (like grass and concrete panels/blocks or pavement).
 - 2. A minimum eight-inch (8") width concrete border shall be used to define the sides of the Fire and Hazard Prevention Services access road. This border may be level with or rise (height not to exceed 8") above the finished road grade. The "No Parking - Fire Lane" lettering may be stamped into or painted upon the border. Signage shall comply with #A-96-1.
 - 3. For combined road surfaces, the support shall be adequately reinforced with structural steel to fully support the dead, live and impact loads necessary for Fire and Hazard Prevention Services vehicles with a gross vehicle weight of 95,000 pounds.
 - 4. Grass within the combined access road surface shall be well maintained with a height not exceeding two-inches (2"). The road surface shall be free of over growth from adjacent areas.
 - 5. Any settlement of the road surface or other damage shall be repaired immediately.
 - 6. The Fire Marshall may require removal of the modified access road surface and the construction of an approved standard all weather road surface (concrete or asphalt), for continued violations of this modified access policy.

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2. For separate **single family residential (SFR)** structures up to two stories in height, the structural section shall meet the requirements of the city designated test location for taking the "R" value test. The structural section shall be based on the actual "R" value test and shall be designed for a Traffic Index (TI) equal to or greater than 5.0.
 3. For attached **residential structures** up to two stories in height, the structural section shall meet the requirements of the city designated test location for taking the "R" value test. The structural section shall be based on the actual "R" value test and shall be designed for a Traffic Index (TI) equal to or greater than 7.5.
 4. For all other **structures greater than two stories in height**, the structural section shall meet the requirements of the city designated test location for taking the "R" value test. The structural section shall be based on the actual "R" value test and shall be designed for a Traffic Index (TI) equal to or greater than 9.5.
 5. All retaining borders for the access road, regardless of width, shall be placed on the same base material as required for the road.
 6. The completed road surface and borders shall be designed to withstand a 95,000 pound gross vehicle weight plus an additional "thirty percent" (30%) impact load.
- E. Access road engineering plans shall meet or exceed Fire and Hazard Prevention Services requirements (U.F.C. 902, FPB Policy A-96-1, and those requirements contained herein).
1. In addition to normal Development Services Permit Inspection, Fire and Hazard Prevention Services Inspection approval is required at the following stages of a project:
 - a. Subgrade materials shall be tested and verified by an certified independent soils laboratory approved by the Fire and Hazard Prevention Services and the Engineering and Capital Projects Department laboratory.
 - b. When structural steel reinforcing is in place, but prior to the placing of the concrete.
 - c. At the completion of the combined road, with the grass in place and being mowed and maintained.

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				FIRE AND HAZARD PREVENTION SERVICES POLICY	FHPS-102

2. Fire and Hazard Prevention Services shall have final approval of the completed road.

F. A plot plan of the project site showing all access roads, fire hydrants, fire protection systems, and building access locations, suitable for pre-fire planning (8 1/2" x 11"), is required. Fire Companies will maintain up-to-date pre-fire plans of all Fire and Hazard Prevention Services vehicle access road installations.

G. Access road maintenance will be monitored annually by the Fire Company Inspection Program and will include actual operation of Fire and Hazard Prevention Services apparatus over the access road surface to verify access road stability.

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FIRE AND HAZARD PREVENTION SERVICES POLICY
A-00-9

FIRE AND HAZARD PREVENTION SERVICES ACCESS STANDARDS

The following criteria are the acceptable standards permitted for Fire Access:

I. SLOPE TO SLOPE TRANSITIONS:

1. Maximum access grade permitted, when paved with Portland Cement Concrete (required for grades over 12%), is 15% (either for uphill or downhill grades).
2. A full standard structural pavement section is required for access grades over 5%.
3. Minimum continuous length of slope between changes or transitions in slope shall be 20 feet.
4. Maximum percent change in grade for a crest vertical change condition is 14%, providing the length of access road is a constant grade for twenty feet before and after the change.
5. Maximum percent change in grade for a sag vertical change condition is 8%, providing the length of access road is a constant grade for thirty-one feet before and after the change.

II. DRIVEWAY STANDARDS FOR FIRE ACCESS:

1. See the typical profile section for requirements.
2. Maximum percent change in grade for a crest condition is 14%.
3. Maximum percent change in grade for a sag condition is 8%.
4. Minimum constant transition length before change is twenty (20) feet.

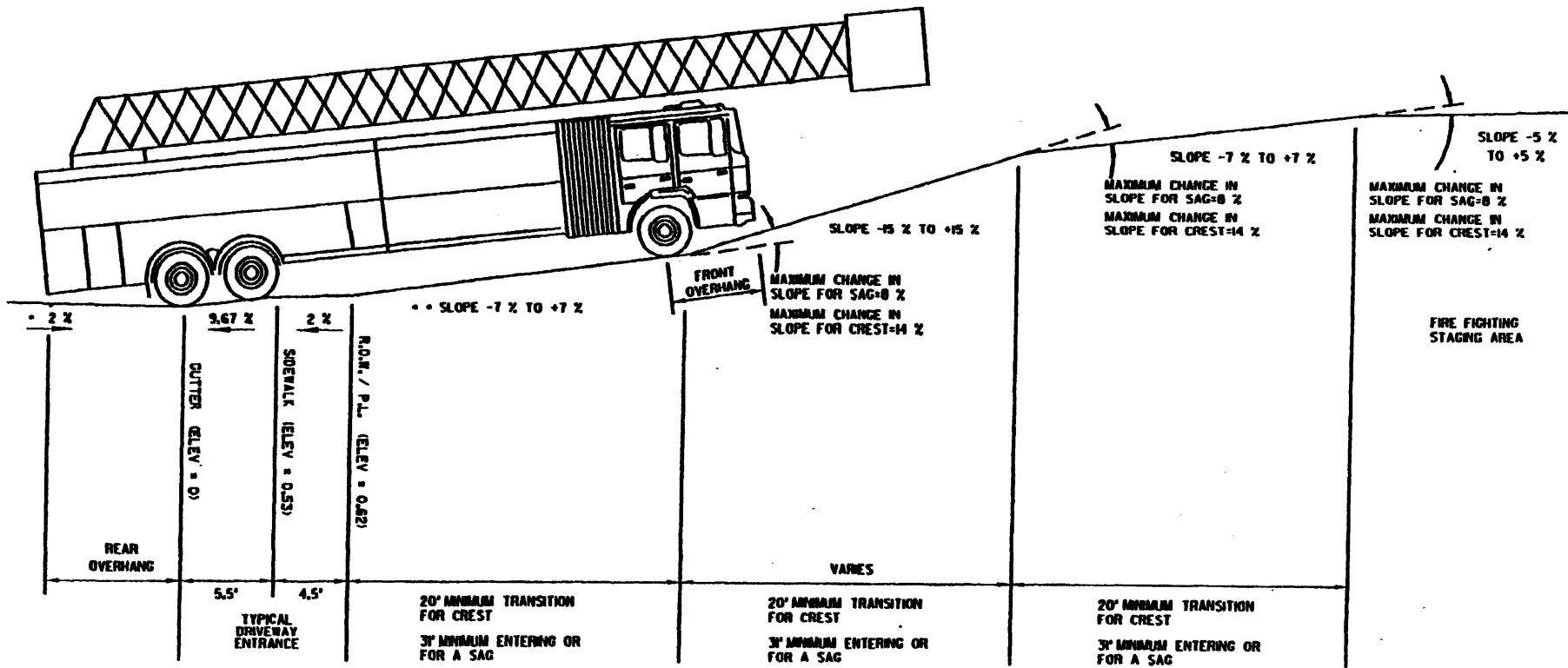
III. FIRE FIGHTING STAGING AREA:

1. The slope for all staging areas shall be a maximum 5% slope in any direction.

For fire access requirements refer to FHPS-102.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWINGS	DRAWING NUMBER
				FIRE AND HAZARD PREVENTION SERVICES POLICY	FHPS-103

CITY OF SAN DIEGO FIRE AND HAZARD PREVENTION SERVICES POLICY DRIVEWAY ACCESS STANDARDS (NOT TO SCALE) TYPICAL PROFILE



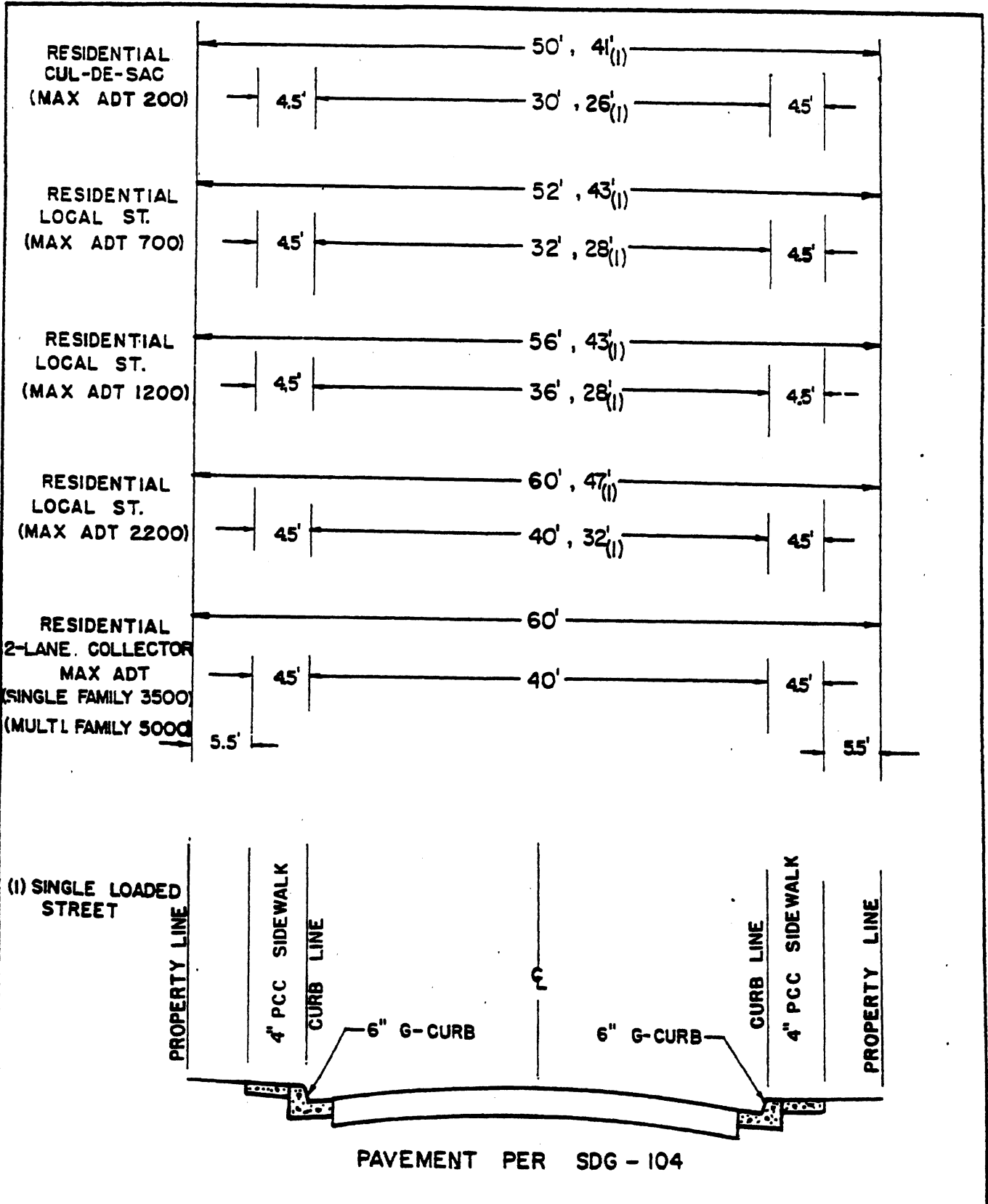
• IF STREET CROWN IS GREATER THAN 2 % SLOPE AT • • MUST BE REDUCED BY 1% FOR EVERY 2 % THAT THE STREET IS ABOVE THE NORMAL CROWN (2 %)

APPENDIX "C"

CITY OF SAN DIEGO DESIGN STANDARDS

DESIGN STANDARDS

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	DWG. NO.
				DESIGN STANDARDS	SDDS



REVISION	BY	APPROVED	DATE
		<i>J. L. [Signature]</i>	11-8-95

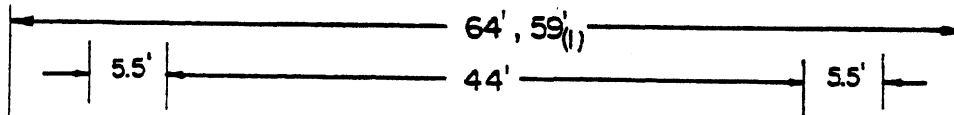
CITY OF SAN DIEGO - STANDARD DRAWING

STANDARD STREET SECTION
RESIDENTIAL STREETS

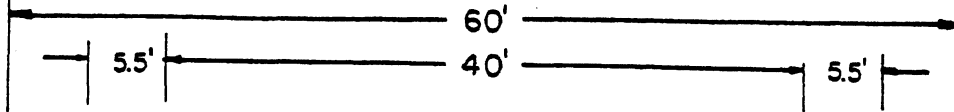
DWG. NO.

SDDS-102

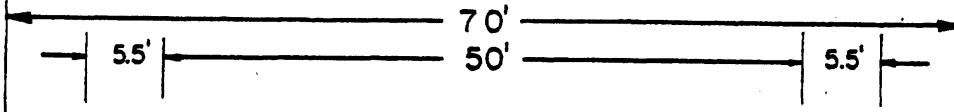
INDUSTRIAL
LOCAL STREET
(MAX ADT 2000)



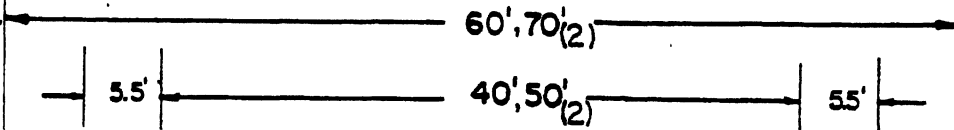
COMMERCIAL
2-LANE COLLECTOR
(MAX ADT 5000)



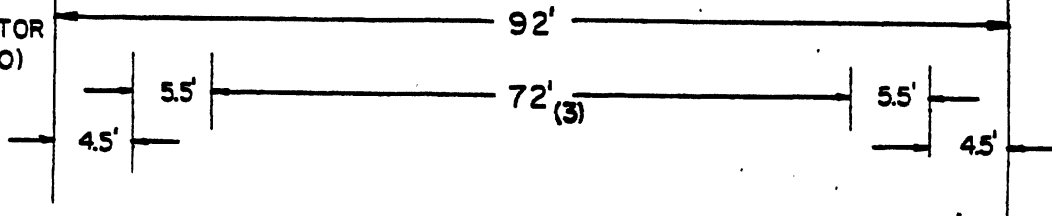
INDUSTRIAL
2-LANE COLLECTOR
(MAX ADT 5000)



NO FRONTING PROPERTY
2-LANE COLLECTOR
(MAX ADT 7500)



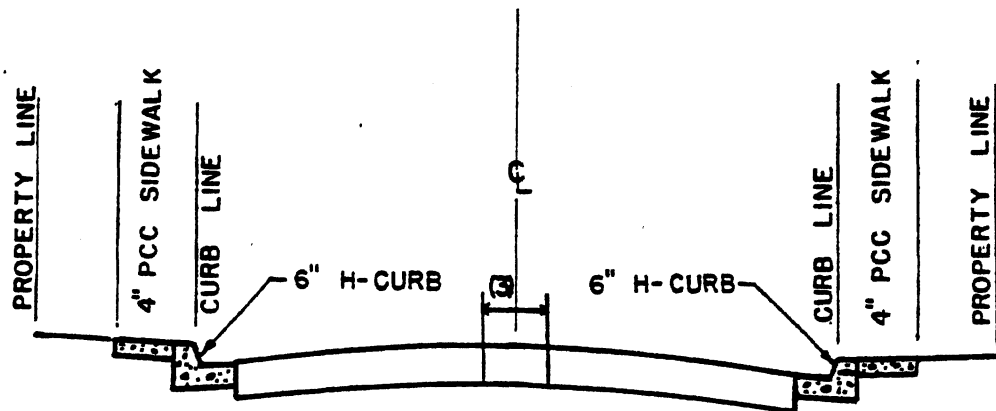
4-LANE COLLECTOR
(MAX ADT 15,000)



(1) SINGLE LOADED
STREET

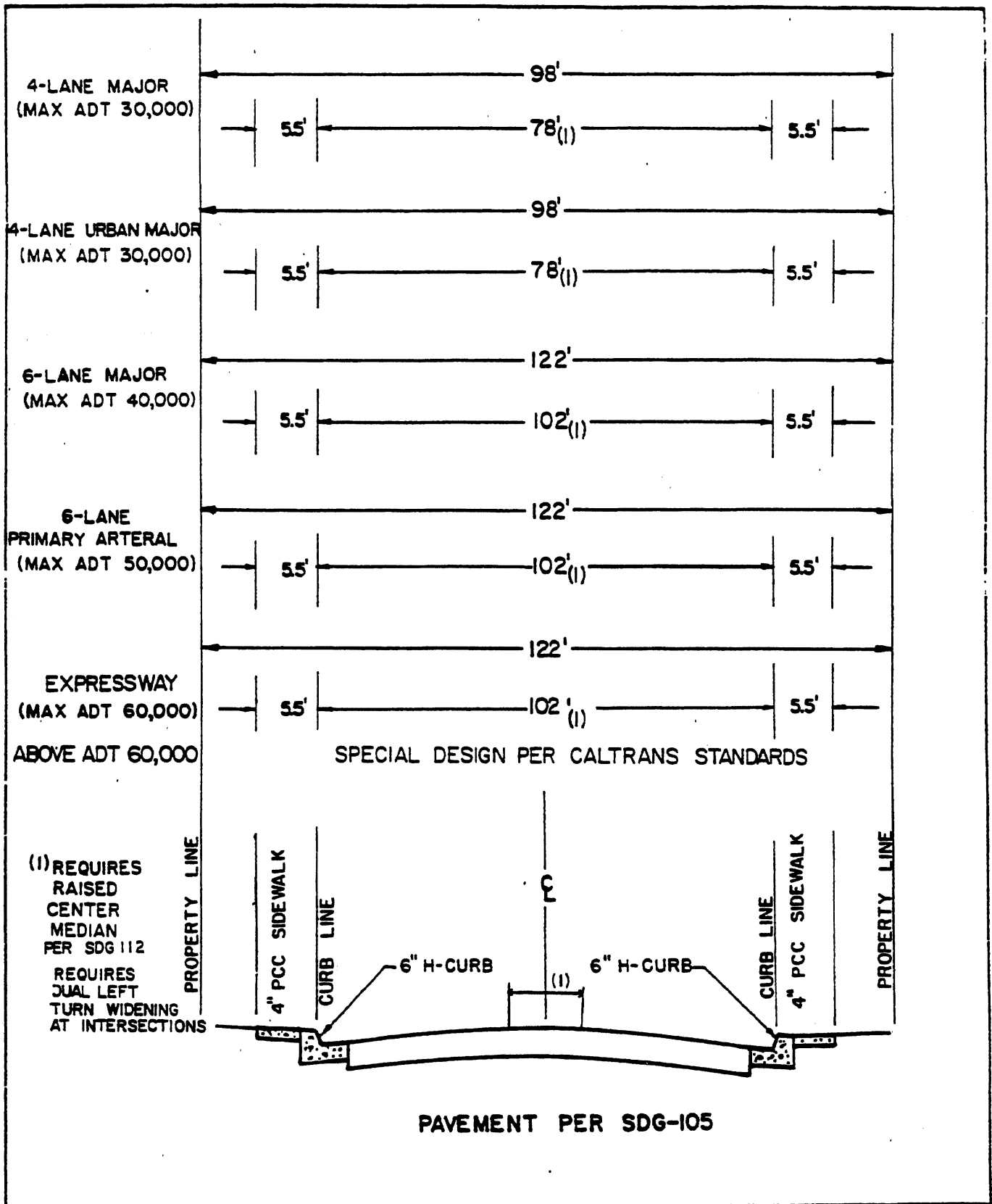
(2) INDUSTRIAL ZONE

(3) REQUIRES RAISED
CENTER MEDIAN
PER SDG-112

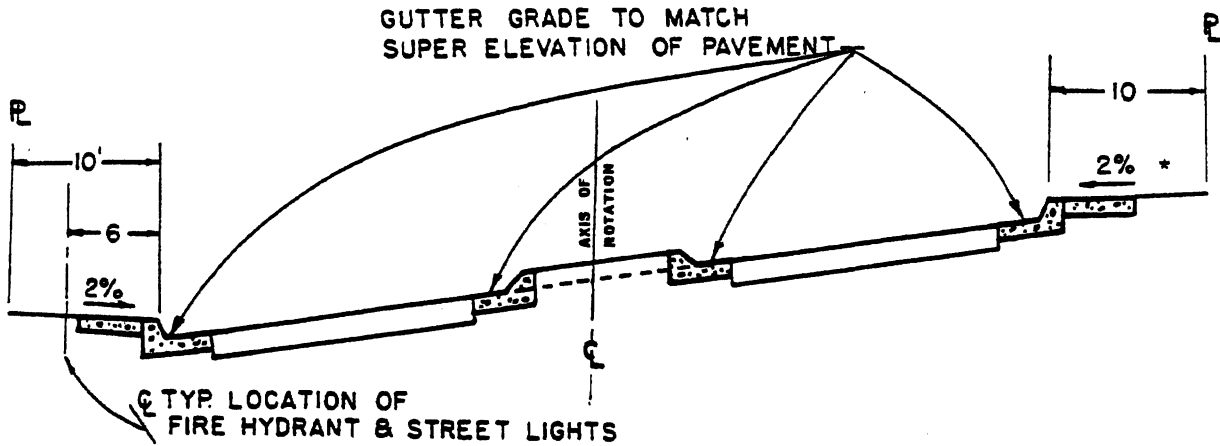


PAVEMENT PER SDG 105

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	DWG. NO.
		<i>[Signature]</i>	11-6-87	STANDARD STREET SECTION INDUSTRIAL, COMMERCIAL, COLLECTOR STREETS	SDDS-103



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	DWG. NO.
		<i>J. Gary</i>	11-8-88	STANDARD STREET SECTION MAJOR & PRIMARY ARTERIAL STREETS	SDDS-104



NOTE:

- 1) SUPERELEVATION SHALL EXTEND FROM CURB TO CURB REGARDLESS OF TYPE OF MEDIAN.
- * 2) REFER TO DRAINAGE DESIGN MANUAL FOR CONTROL OF STORM AND IRRIGATION RUN OFF.

SPECIFICATION REFERENCE	CITY OF SAN DIEGO	STANDARD DRAWING
BY	APPROVED	DATE
	<i>[Signature]</i>	1-2-87
TYPICAL STREET SECTION IN SUPERELEVATION		DRAWING NO. SDDS-105

