

STANDARD DRAWINGS

For Public Works Construction
2016 Edition



City of San Diego
Standard Drawings
For
Public Works Construction
2016 Edition

Prepared by
Public Works Department
Project Implementation Division
Standards and Contract Documents Section

INTRODUCTION

These "**Standard Drawings for Public Works Construction 2016 Edition**" (Standard Drawings) have been prepared and adopted by the City of San Diego. They are for use in concert with the "**2015 WHITEBOOK – Standard Specifications for Public Works Construction**" and the **2015 Edition of the "GREENBOOK – Standard Specifications for Public Works Construction"**. The Standard Drawings include some San Diego Regional Standard Drawings that have been adopted by the City of San Diego.

The electronic copy of the Standard Drawings is available for download from the City's website: <http://www.sandiego.gov/publicworks/edocref/standarddraw/>

Updates to the Standard Drawings will be posted to this website as they are adopted by the City of San Diego:

<http://www.sandiego.gov/publicworks/edocref/standarddraw/updates.shtml>

Users of the Standard Drawings are encouraged to submit corrections and proposed changes to the Standards Drawings to Public Works Department, Standards and Contract Documents Section at engineering@sandiego.gov.

The Standard Drawings has discontinued the use of dual units and adopted U.S. Standard Measures, also referred to as Customary System Units or English Units. The 2015 Greenbook continues to have U.S. Customary System Units followed by International System of Units also referred to SI or metric units in parenthesis.

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WP-05	Slope Protection Installations
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WS-03	Meter Box Locations for Water and Recycled Water Appurtenances
WS-04	4" or 6" Fireline/Master Meter Installation (2)
WV-05	Steel Valve Stem Extension for Valves 2" and Smaller

ABBREVIATIONS AND SYMBOLS

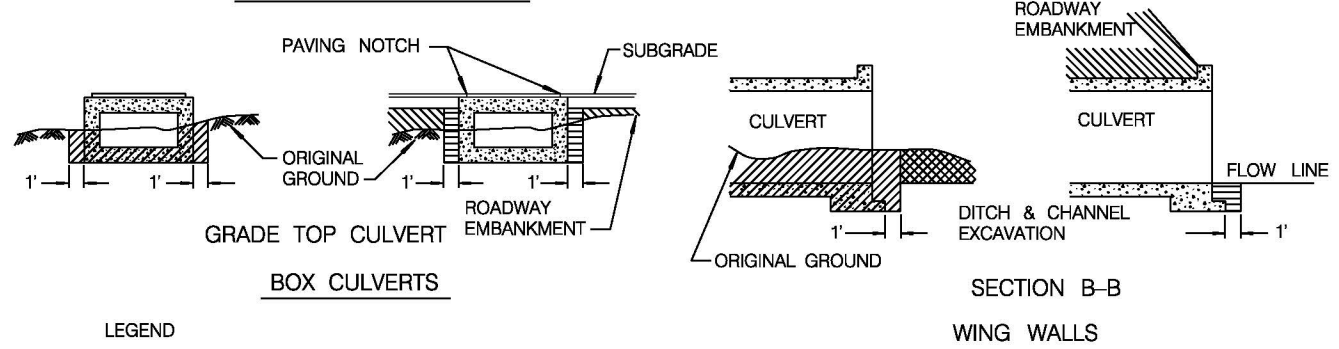
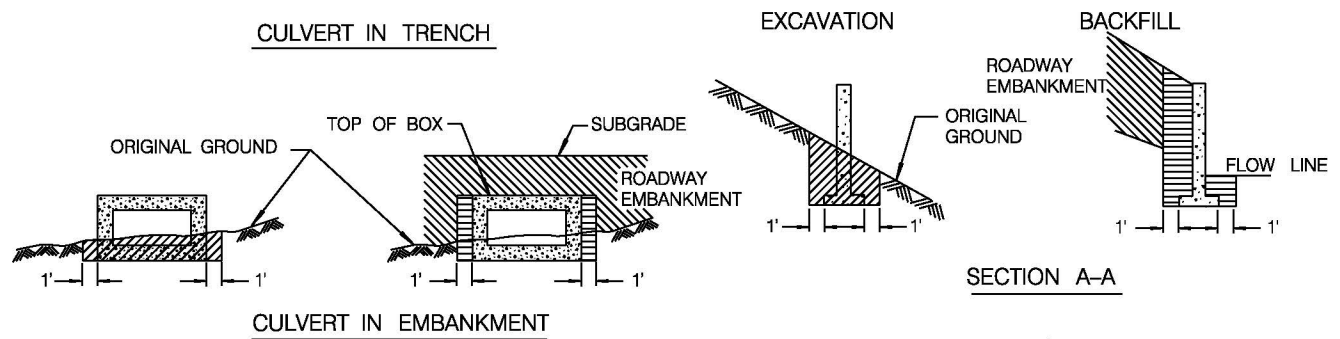
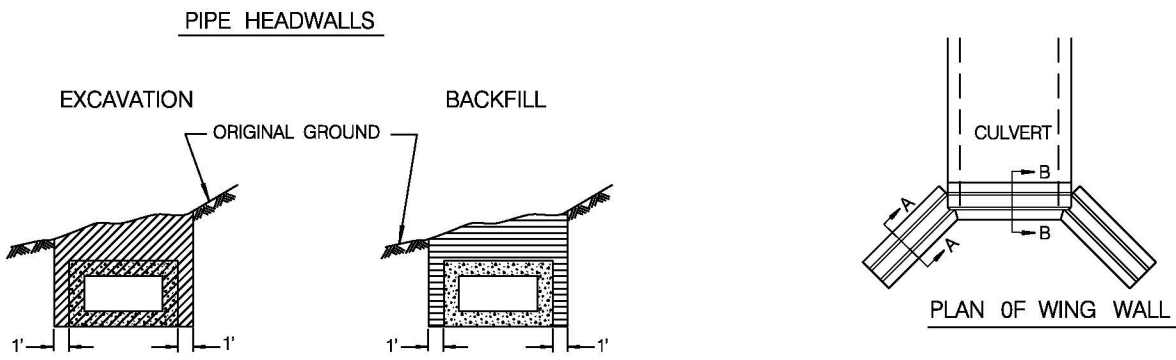
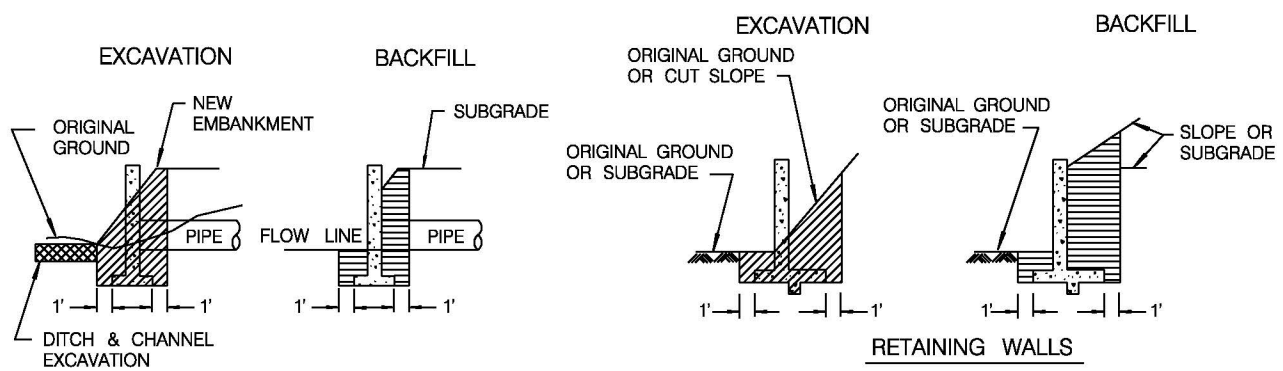
ABS	Acrylonitrile – butadiene – styrene	CSP	Corrugated steel pipe
AC	Asphalt Concrete	CTB	Cement treated base
ACI	American Concrete Institute	CV	Check valve
ACP	Asbestos Cement Pipe	CY	Cubic Yard
ADA	Americans with Disabilities Act	D	Diameter or Load of Pipe
ADAS	Americans with Disabilities Act Standards	DIA	Diameter
AGG	Aggregates	DWG	Drawing
ANSI	American National Standards Institute	EA.	Each
ASCE	American Society of Civil Engineers	ELEV	Elevation
ASTM	American Society for Testing and Materials	EX	Existing
AWWA	American Water Work Association	EXP	Expansion
CAL/OSHA	California Occupational Safety and Health Administration	F	Fahrenheit or Flange
CalTrans	California Department of Transportation	FG	Finished grade
CATV	Cable/TV	FL	Flow line
CC	Calcium Chloride	GA	Gauge
C/C	Center to Center	GALV	Galvanized
CF	Cubic Foot	GFI	Ground Fault Interrupter
CFS	Cubic Foot per second	H	High or height
CL	Center Line	HEX	Hexagonal
CLR	Clear	HORIZ	Horizontal
CLSM	Controlled low strength material	HPS	High pressure sodium (Light)
CONC	Concrete	HT	Height
CONST	Construct, Construction	ID	Inside diameter or Identification Joint
		JT	Joint
		LAP	Overlap
		LOL	Layout line
		MAX	Maximum
		MJ	Mechanical Joint
		MIN	Minimum
		MVL	Mercury vapor light

ABBREVIATIONS AND SYMBOLS

OC	On center	TYP	Typical
OD	Outside diameter	VERT	Vertical
PC	Point of curvature	W	Water, Wider or width
PCC	Portland cement concrete	W/	With
PCC	Point of compound curvature	WWF	Welded wire fabric
PCF	Pounds per cubic foot		
PCR	Point of curb return		
PL	Property line or Place	@	At
PO	Push on	%	Percent
PPB	Pedestrian Push Button	'	Feet or minutes
PSF	Pound per square foot	"	Inches or seconds
PUD	Public Utilities Department	¹	Number
PVC	Polyvinyl Chloride	/	Per or (between words)
R	Radius	°	Degree
RCV	Remote Control Valve	∅	Diameter
R/W	Right-of-way, Recycled water	PL	Property line
REINF	Reinforced or reinforcement	CL	Centerline
RPDA	Reduced pressure detector assembly		
RWGV	Resilient wedge gate valve		
RW	Recycled water		
S	Slope or second		
SCRW	Steel cylinder rod wrapped		
SD	Storm drain		
SE	Sand Equivalent		
SI	International System of Units (Metric)		
Sqft	Square foot		
STD	Standard		
STR	Straight		
TOT	Total		

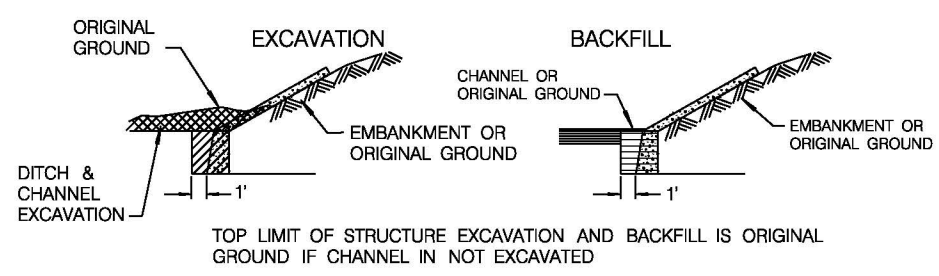
CHAPTER 1

*CONCRETE
STRUCTURES*



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

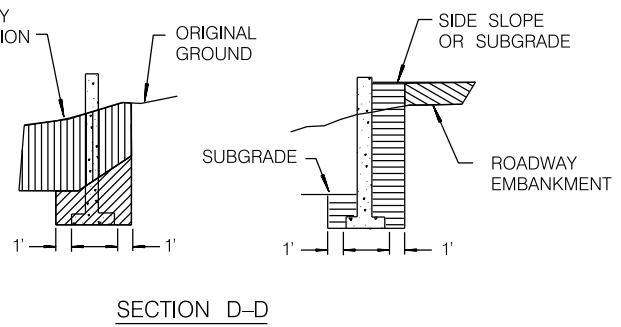
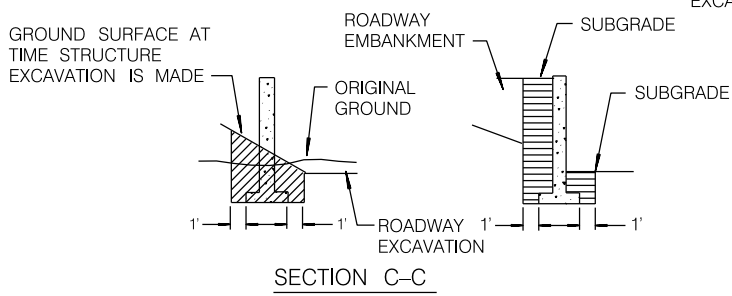
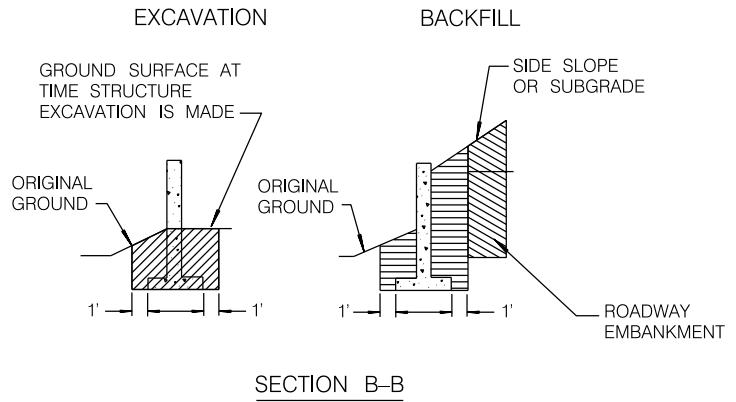
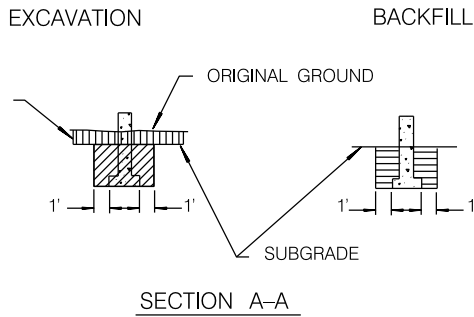
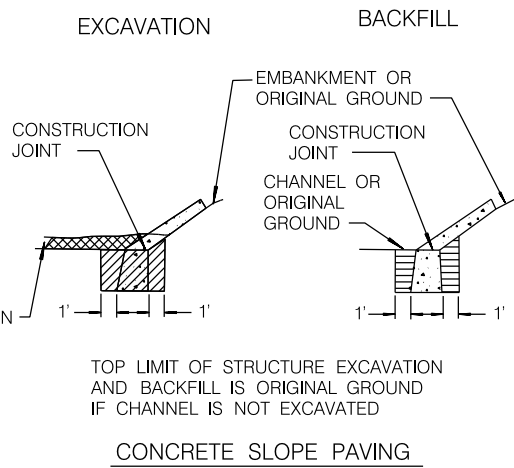
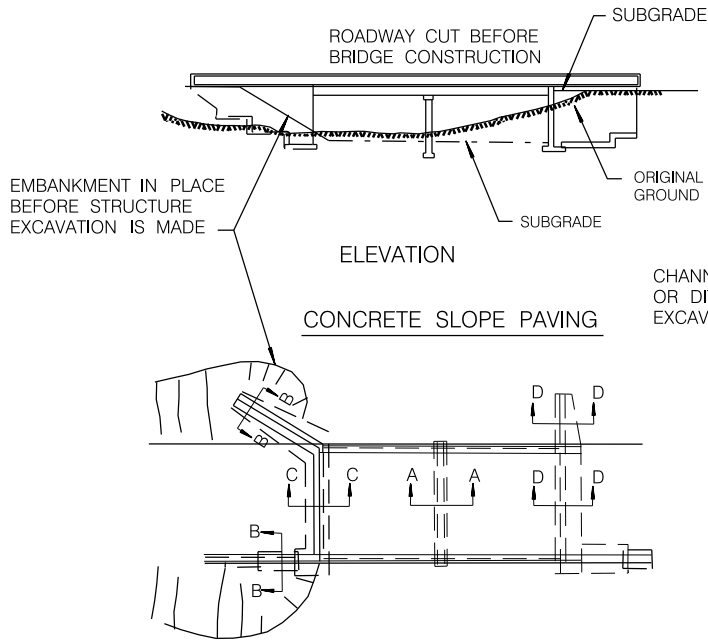
NOTE:
SUBGRADE SHALL BE LOWEST SUBGRADE AS
DEFINED IN THE STANDARD SPECIFICATIONS



MONOLITHIC CONCRETE SLOPE PAVING: RIPRAP

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		J. CASEY	6-3-83		
UPDATED	KA	J. NAGELVOORT	01/12	STRUCTURE EXCAVATION & BACKFILL	1/31/2012
					COORDINATOR R.C.E. 65271 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

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL		J. CASEY	6-3-83
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

STRUCTURE EXCAVATION & BACKFILL

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE


DRAWING
NUMBER

SDC-103

FOR RETAINING WALL (6' MAXIMUM HEIGHT) / LEVEL BACKFILL,
REFER TO DEVELOPMENT SERVICES DEPARTMENT INFORMATION
BULLETIN NO. 221. (WWW.SANDIEGO.GOV / DEVELOPMENT-SERVICES)

FOR RETAINING WALL (5' MAXIMUM HEIGHT) / SLOPING BACKFILL,
REFER TO DEVELOPMENT SERVICES DEPARTMENT INFORMATION
BULLETIN NO. 222. (WWW.SANDIEGO.GOV / DEVELOPMENT-SERVICES)

FOR MASONRY FENCES (6' MAXIMUM HEIGHT), REFER TO
DEVELOPMENT SERVICES DEPARTMENT INFORMATION BULLETIN
NO. 223. (WWW.SANDIEGO.GOV / DEVELOPMENT-SERVICES)

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL	KA	J. NAGELVOORT	01/12			1/31/2012
				MASONRY WALL	COORDINATOR	R.C.E. 65271
					DATE	
					DRAWING	
					NUMBER	SDC-105

REFERENCES:

THIS DRAWING IS TO BE USED IN CONJUNCTION WITH SAN DIEGO REGIONAL STANDARD DRAWINGS C-1 THROUGH C-6 AND C-9 THROUGH C-15, AND CITY OF SAN DIEGO STANDARD DRAWING SDC-108.

DESIGN CONDITIONS:

WALLS ARE TO BE USED FOR THE LOADING CONDITIONS SHOWN FOR EACH TYPE WALL. DESIGN H SHALL NOT BE EXCEEDED. FOOTING KEY IS REQUIRED EXCEPT AS SHOWN OTHERWISE OR WHEN FOUND UNNECESSARY BY THE ENGINEER. SPECIAL FOOTING DESIGN IS REQUIRED WHERE FOUNDATION MATERIAL IS INCAPABLE OF SUPPORTING TOE PRESSURE LISTED IN TABLE.

DESIGN DATA:

REINFORCED CONCRETE:

Fc=1,200 psi F'c=3,000 psi
Fs=20,000 psi n=10

REINFORCED MASONRY:

F'm=600 psi Fm=200 psi
Fs=20,000 psi n=50

EARTH=120 pcf AND EQUIVALENT FLUID PRESSURE=36 psf PER FOOT OF HEIGHT. WALLS SHOWN FOR 1 1/2:1 UNLIMITED SLOPING SURCHARGE ARE DESIGNED IN ACCORDANCE WITH RANKINE'S FORMULA FOR UNLIMITED SLOPING SURCHARGE WITH A $\phi=42^\circ$.

REINFORCEMENT:

INTERMEDIATE GRADE, HARD GRADE, OR RAIL STEEL DEFORMATION SHALL CONFORM TO ASTM A615, A616, A617. BARS SHALL LAP 40 DIAMETERS, WHERE SPLICED, UNLESS OTHERWISE SHOWN ON THE PLANS. BENDS SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE, A.C.I. BACKING FOR HOOKS IS FOUR DIAMETERS. ALL BAR EMBEDMENTS ARE CLEAR DISTANCES TO OUTSIDE OF BAR. SPACING FOR PARALLEL BARS IS CENTER TO CENTER BARS.

MASONRY:

ALL REINFORCED MASONRY RETAINING WALLS SHALL BE CONSTRUCTED OF REGULAR OR LIGHT WEIGHT STANDARD UNITS CONFORMING TO THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION."

JOINTS:

VERTICAL CONTROL JOINTS SHALL BE PLACED AT 32' INTERVALS MAXIMUM. JOINTS SHALL BE DESIGNED TO RESIST SHEAR AND OTHER LATERAL FORCES WHILE PERMITTING LONGITUDINAL MOVEMENT. VERTICAL EXPANSION JOINTS SHALL BE PLACED AT 96' INTERVALS MAXIMUM.

CONCRETE:

FOOTING CONCRETE SHALL BE 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 WALL GREATER THAN 4' HIGH WHEN AREA BEHIND THE WALL IS ACCESSIBLE TO THE PUBLIC OR MAINTENANCE CREWS.

INSPECTIONS:

CALL FOR INSPECTIONS AS FOLLOWS:

- A. WHEN THE FOOTING HAS BEEN FORMED, WITH THE STEEL TIED SECURELY IN FINAL POSITION, AND IS READY FOR THE CONCRETE TO BE PLACED.
- B. WHERE CLEANOUT HOLES ARE NOT PROVIDED:
 - (1) AFTER THE BLOCKS HAVE BEEN LAID UP TO A HEIGHT OF 4' OR FULL HEIGHT FOR WALLS UP TO 5', WITH STEEL IN PLACE BUT BEFORE THE GROUT IS POURED AND...
 - (2) AFTER THE FIRST LIFT IS PROPERLY GROUTED, THE BLOCKS HAVE BEEN LAID UP TO THE TOP OF THE WALL WITH THE STEEL TIED SECURELY IN PLACE BUT BEFORE THE UPPER LIFT IS GROUTED.
- WHERE CLEANOUT HOLES ARE PROVIDED:
 - AFTER THE BLOCKS HAVE BEEN LAID UP TO THE TOP OF THE WALL, WITH THE STEEL TIED SECURELY IN PLACE, BUT BEFORE GROUTING.
- C. AFTER GROUTING IS COMPLETE AND AFTER ROCK OR RUBBLE WALL DRAINS ARE IN PLACE BUT BEFORE EARTH BACKFILL IS PLACED.
- D. FINAL INSPECTION WHEN ALL WORK HAS BEEN COMPLETED.

CONCRETE GROUT AND MORTAR MIXES:

CONCRETE GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI IN 28 DAYS AND MORTAR SHALL ATTAIN 1,800 PSI IN 28 DAYS. ALL CELLS SHALL BE FILLED WITH GROUT. ROD OR VIBRATE CONSOLIDATION. BRING GROUT WITHIN 10 MINUTES OF POURING TO ENSURE GROUT TO A POINT 2" FROM THE TOP OF MASONRY UNITS WHEN GROUTING OF SECOND LIFT IS TO BE CONTINUED AT ANOTHER TIME.

MORTAR KEY:

TO ENSURE 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 SDC-108.

DRAINAGE DITCHES:

BROW DITCHES WILL BE REQUIRED ON SLOPED BACKFILLS. SDD 106 TYPE A WITH THE MASONRY WALL HEIGHTS ABOVE DITCH TO BE AT A MINIMUM OF 1'. THE BROW DITCH WILL LEAD TO A WALL DRAIN DETAIL AS SHOWN ON C-14.

SOIL:

ALL FOOTINGS SHALL EXTEND AT LEAST 12" INTO UNDISTURBED NATURAL SOIL OR APPROVED COMPACTED FILL. SOIL SHOULD BE DAMPENED PRIOR TO PLACING CONCRETE IN FOOTINGS.

CABLE RAILING:

USE CALTRANS STANDARD PLAN B11-47.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	AR	J. NAGELVOORT	02/16		 2/25/16
					COORDINATOR R.C.E. 56523 DATE
					DRAWING
					NUMBER
				RETAINING WALL NOTES	SDC-107

LEVEL BACKFILL

The diagram illustrates a cross-section of a wall and its foundation. The wall is constructed from blocks with vertical reinforcement and grout-filled cells. Horizontal reinforcement is shown passing through the wall and into the foundation. The ground surface is finished, and the backfill is level. Labels include: MORTAR OR CAST IN PLACE CONCRETE, FINISHED GROUND, VERTICAL REINFORCEMENT, GROUT FILLED BLOCK CELLS, HORIZONTAL REINFORCEMENT THRU BOND BEAM BLOCK, and LEVEL BACKFILL.

5 1/4" 8" BLOCK WALL

9" 12" BLOCK WALL

VERTICAL REINFORCEMENT


TOP OF FOOTING

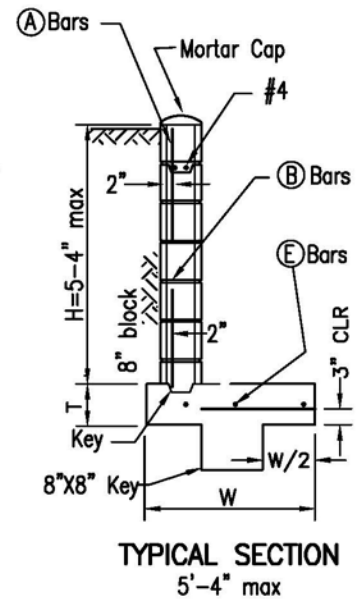
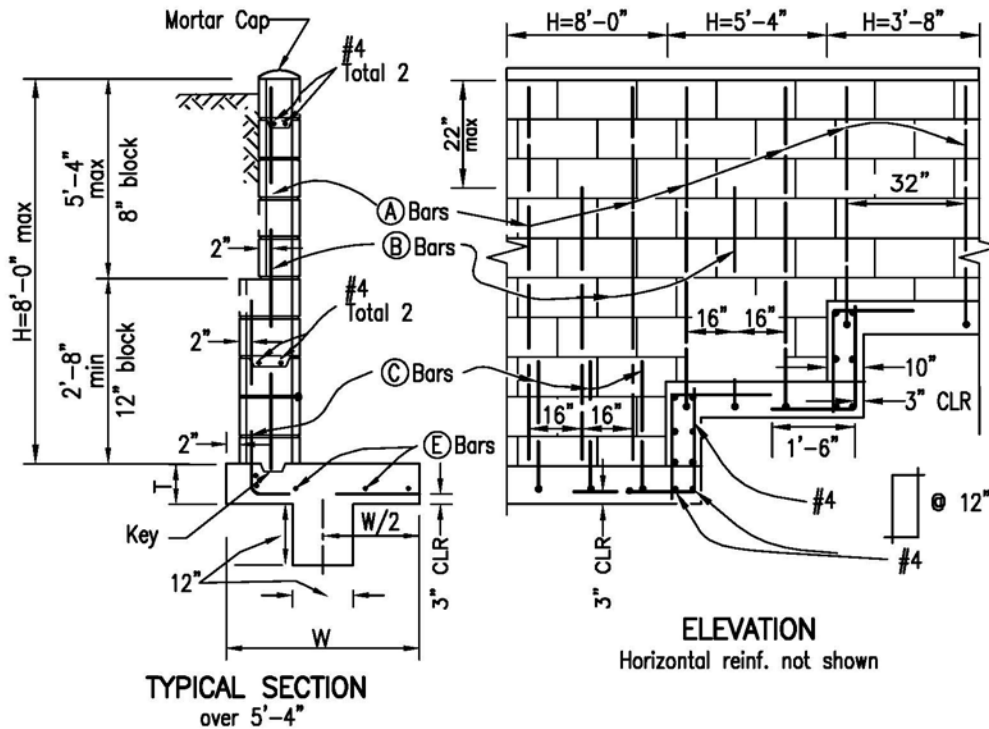
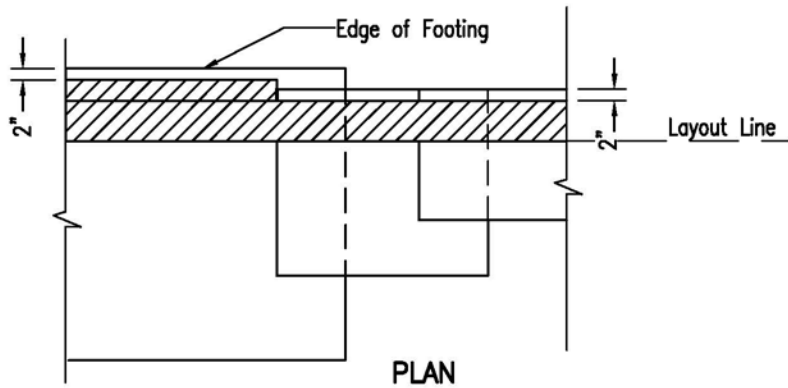
2" X 4" (NOMINAL) KEY

KEY DETAIL

NOTES:

1. ALL MASONRY RETAINING WALLS SHALL BE CONSTRUCTED WITH CAP, KEY AND DRAINAGE DETAILS AS SHOWN.
2. 4" DIAMETER DRAIN MAY BE FORMED BY PLACING A BLOCK ON IT'S SIDE.
3. ALL MASONRY WALLS SHALL BE WATERPROOFED WITH COAL TAR EMULSION SYSTEM AS APPROVED BY THE CITY.
4. FOR MORE INFORMATION SEE SDC-107.
5. IF H IS GREATER THAN 6 FT, THE RETAINING WALL WILL NEED TO BE ENGINEERED AND DESIGNED.
6. H=HEIGHT. SEE PLANS FOR HEIGHT AND FOOTING DETAILS.

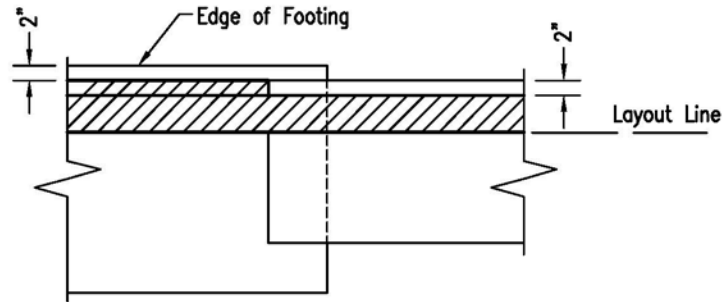
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	AR	J. NAGELVOORT	02/16		 <div> <div>COORDINATOR</div> <div>R.C.E. 56523</div> </div> <div> <div>2/25/16</div> <div>DATE</div> </div>
				RETAINING WALL DETAILS	DRAWING
					NUMBER



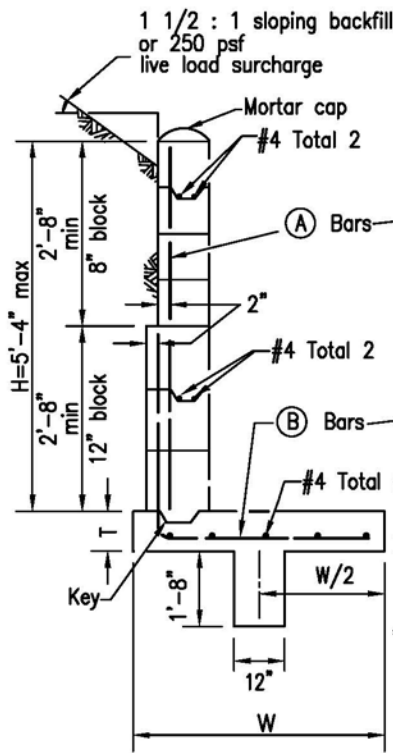
DIMENSIONS AND REINFORCING STEEL			
H (max)	3'-8"	5'-4"	8'-0"
T (min)	0'-8"	0'-10"	1'-0"
W (min)	2'-4"	3'-6"	5'-4"
(A) Bars	#4@32"	#4@32"	#4@32"
(B) Bars	—	#4@32"	#4@32"
(C) Bars	—	—	#6@16"
(E) Bars	#4 Total 4	#4 Total 5	#4 Total 6
max soil pressure	500psf	600psf	800psf

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

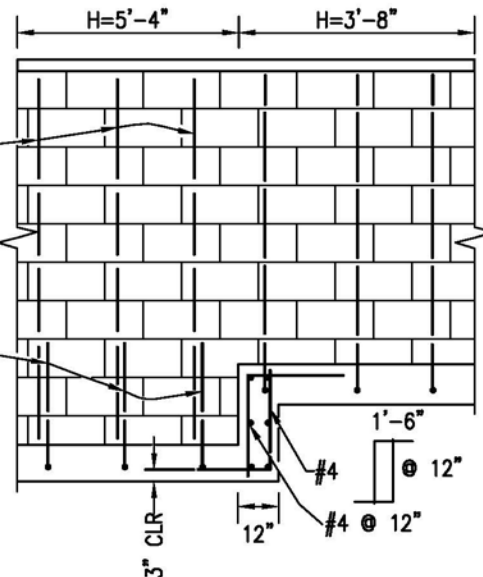
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75				
Add Metric		T. Stanton	03/03	MASONRY RETAINING WALL TYPE 1 (LEVEL BACKFILL)		Chairperson R.C.E. 19246 Date	
Delete Metric	S.S.	T. Shell	03/11			DRAWING NUMBER C-1	



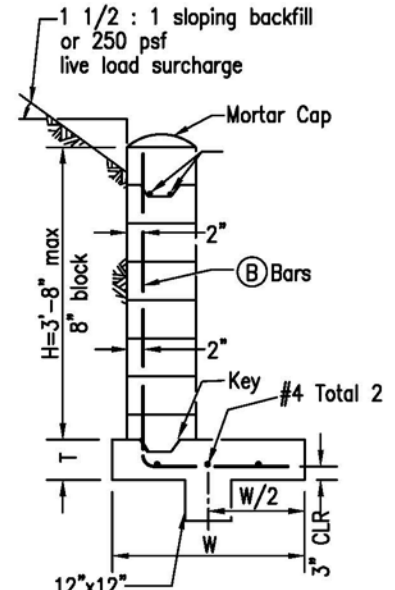
PLAN



TYPICAL SECTION
over 3'-8"



ELEVATION
Horizontal reinf. not shown



TYPICAL SECTION
3'-8" max

DIMENSIONS AND REINFORCING STEEL

	5'-4"	3'-8"
H (max)	5'-4"	3'-8"
T (min)	0'-10"	0'-10"
W (min)	5'-0"	3'-9"
(A) Bars	#4@16"	—
(B) Bars	#6@16"	#4@16"
max soil pressure	700psf	550psf

NOTES:

1. See 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
Delete Metric	S.S.	T. Shell	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

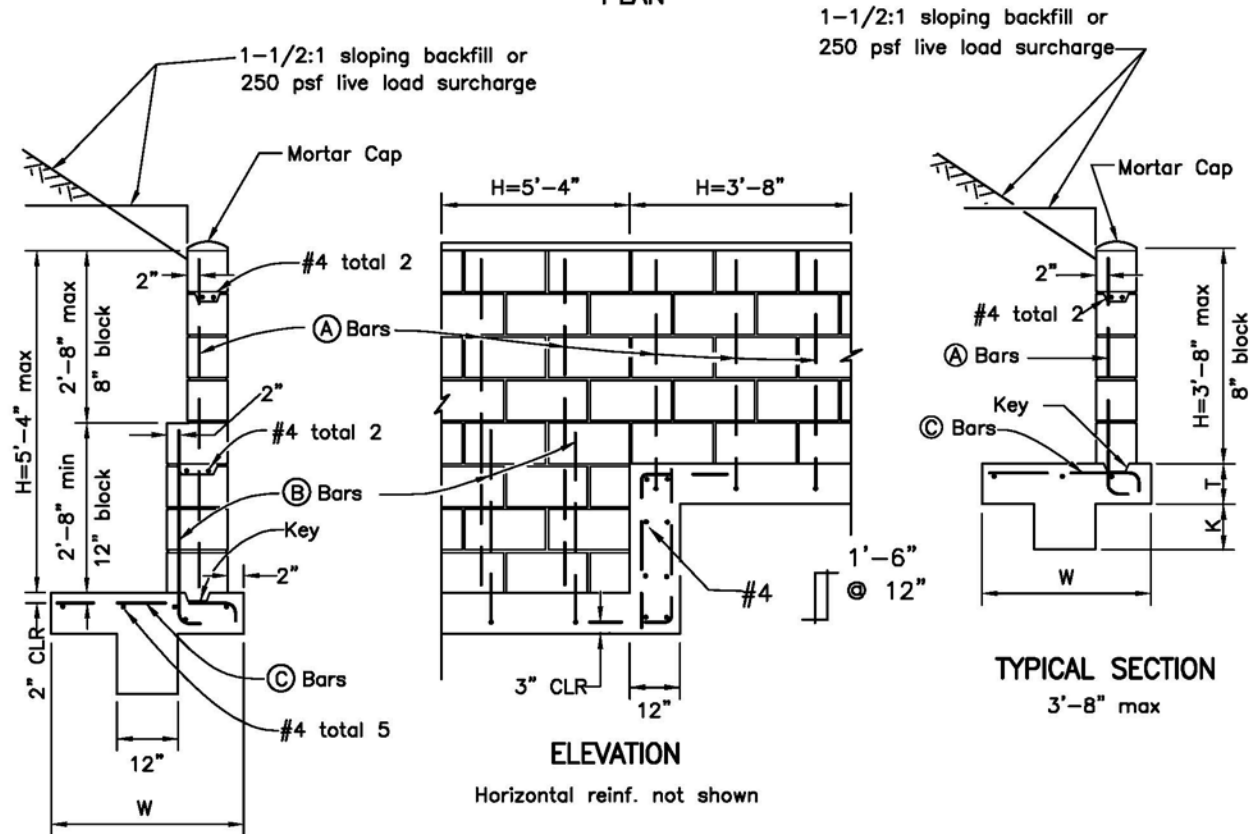
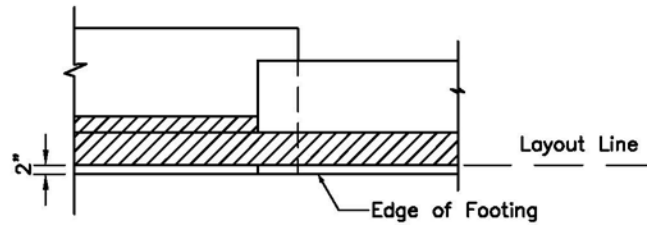
MASONRY RETAINING WALL TYPE 2
(LIVE LOAD SURCHARGE OR SLOPING BACKFILL)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **C-2**

DRAWING NUMBER **C-3**



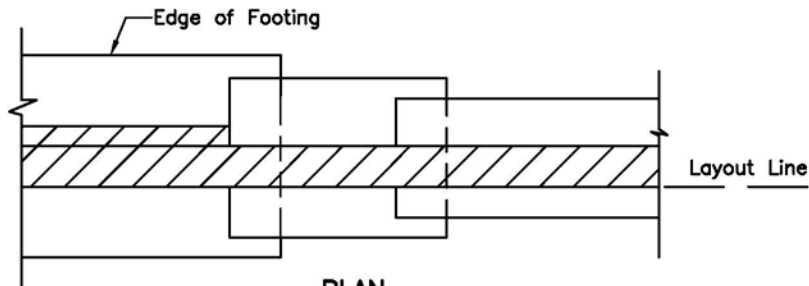
DIMENSIONS AND REINFORCING STEEL

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

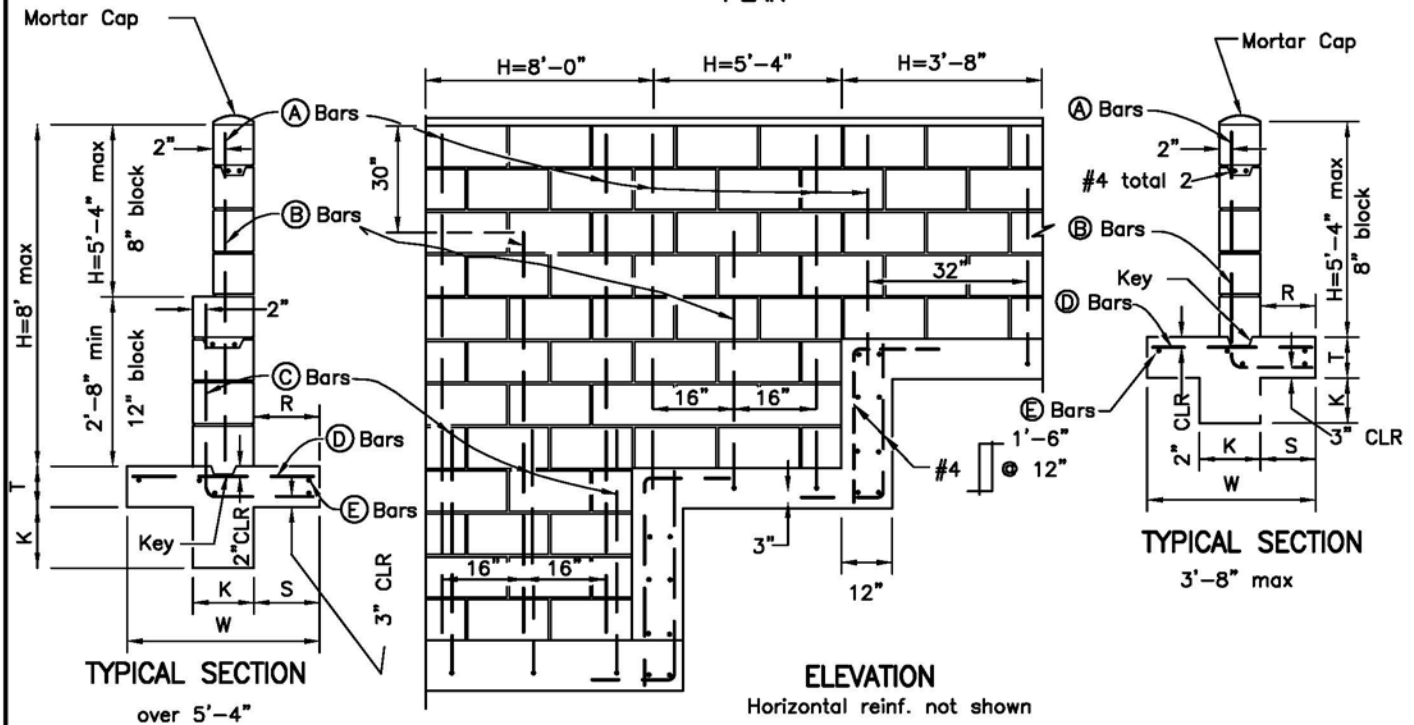
NOTES:

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

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Parkinson	02/95				
Add Metric		T. Stanton	03/03	MASONRY RETAINING WALL TYPE 4 (LIVE LOAD SURCHARGE OR SLOPING BACKFILL)		Chairperson R.C.E. 19246 Date	
Reformatted		T. Stanton	04/06				
Delete Metric	S.S.	T. Shell	03/11				
						DRAWING NUMBER	C-4



PLAN



DIMENSIONS AND REINFORCING STEEL

H (max)	3'-8"	5'-4"	8'-0"
T (min)	0'-8"	0'-10"	1'-0"
W (min)	2'-1"	3'-1"	4'-3"
R	0'-9"	1'-2"	1'-5"
S	0'-8 1/2"	1'-1 1/2"	1'-7 1/2"
K	0'-8"	0'-8"	1'-0"
(A) Bars	#4@32"	#4@32"	#4@32"
(B) Bars	—	#4@32"	#4@32"
(C) Bars	—	—	#7@16"
(D) Bars	#4@32"	#4@16"	#4@16"
(E) Bars	#4 total 5	#4 total 5	#4 total 6
Max Toe Pressure	774 psf	1,030 psf	1,660 psf

NOTES:

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

Revision	By	Approved	Date
ORIGINAL		Parkinson	2/95
Add Metric		T. Stanton	03/03
Delete Metric	S.S.	T. Shell	03/11

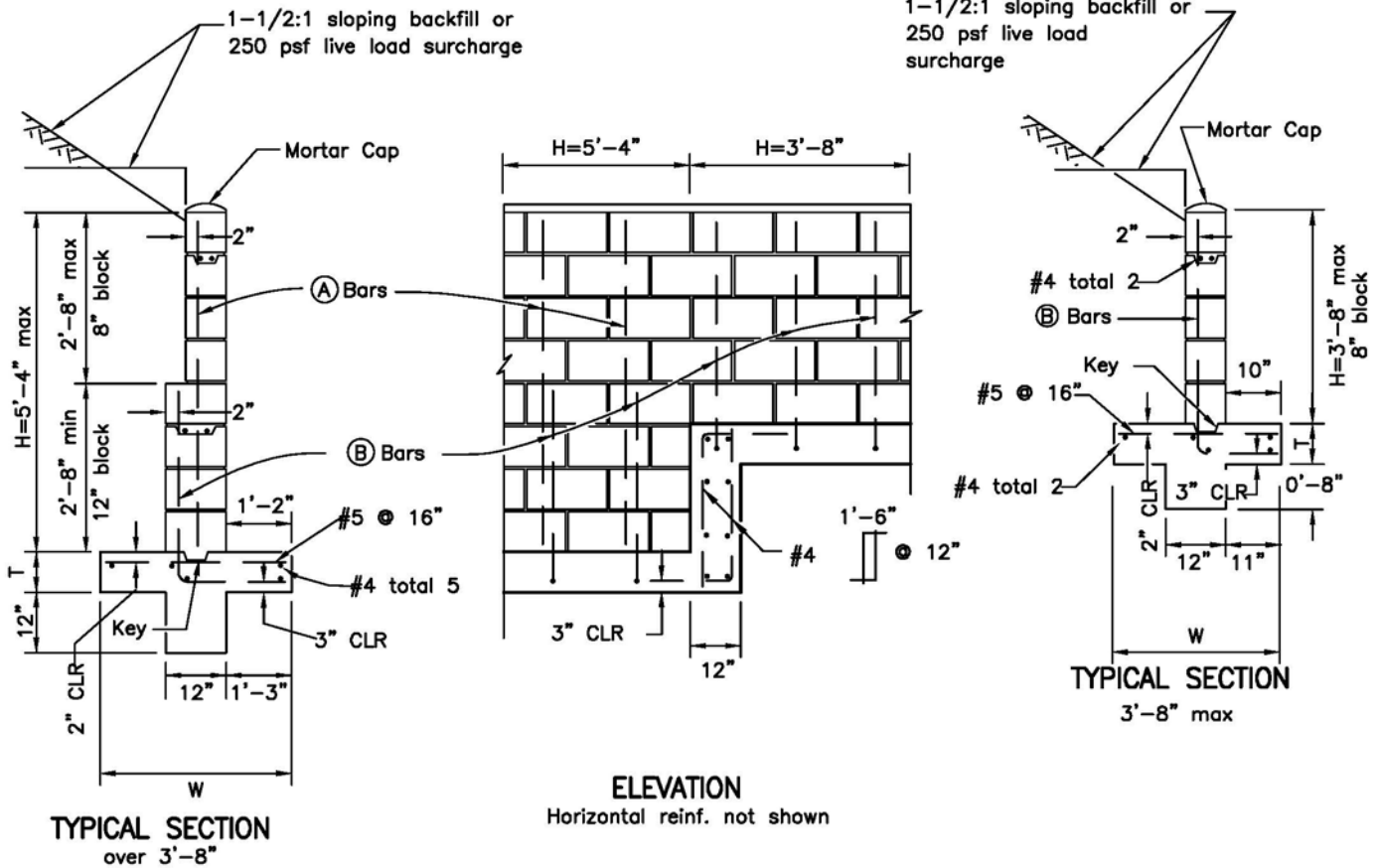
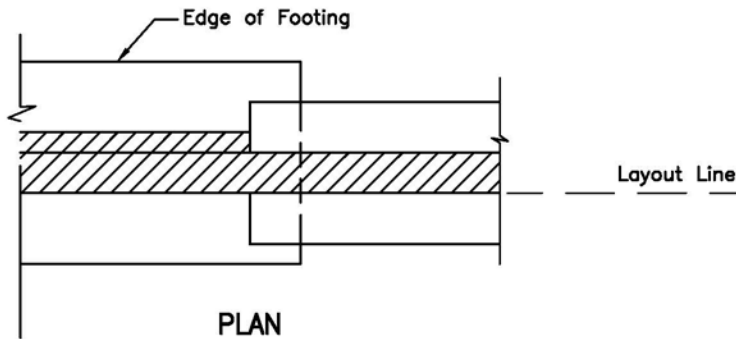
SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 5
(LEVEL BACKFILL)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

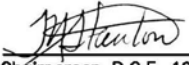
DRAWING
NUMBER C-5

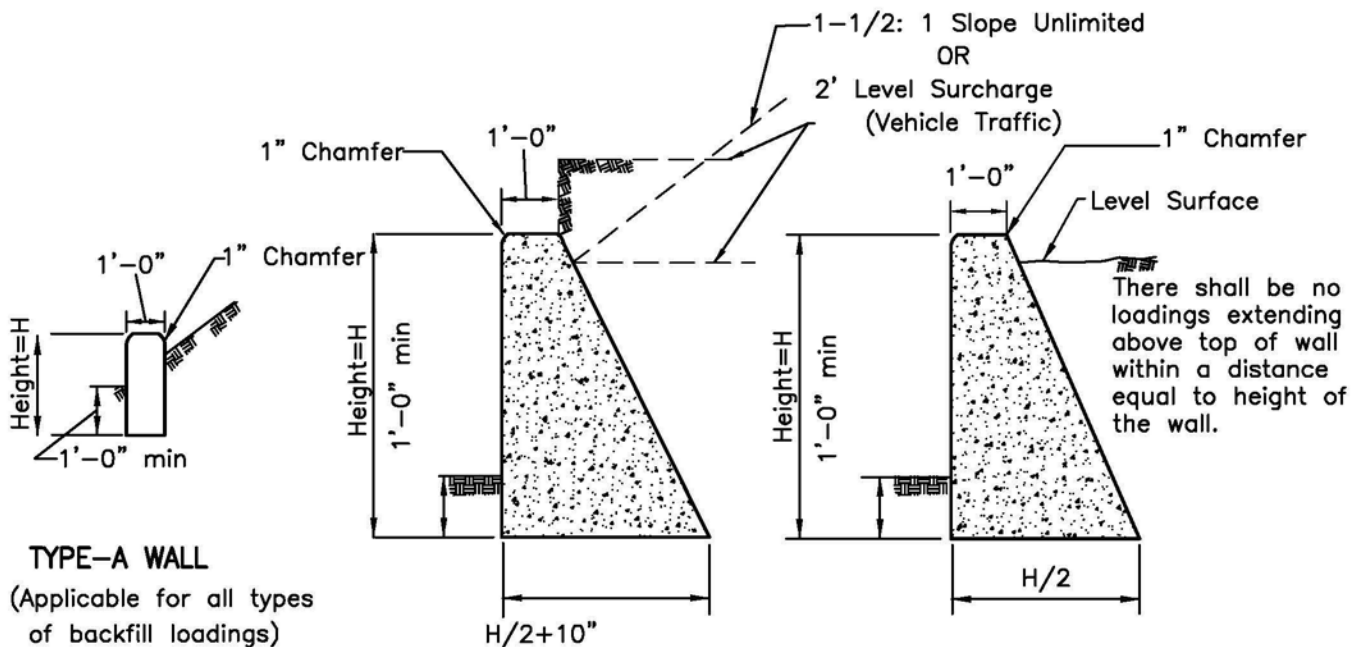


DIMENSIONS AND REINFORCING STEEL		
H (max)	5'-4"	3'-8"
T (min)	0'-10"	0'-8"
W (min)	3'-10"	2'-9"
(A) Bars	#4 @ 16"	—
(B) Bars	#6 @ 16"	#4 @ 16"
Max Toe Pressure	2,000 psf	1,400 psf

NOTES:

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

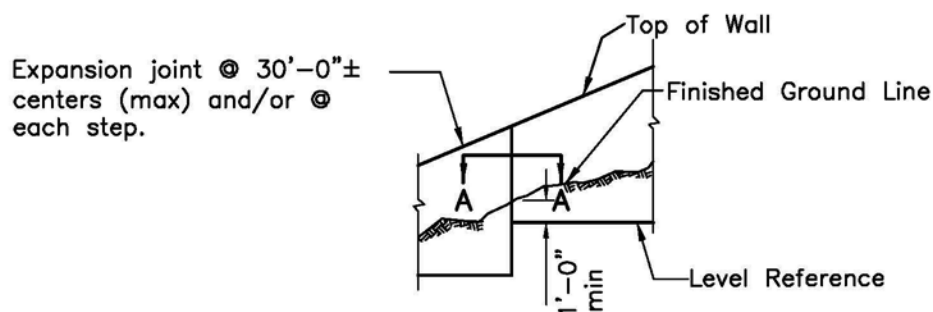
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Parkinson	2/95				
Add Metric		T. Stanton	03/03	MASONRY RETAINING WALL TYPE 6 (LIVE LOAD SURCHARGE OR SLOPING BACKFILL)		 7/26/2012 Chairperson R.C.E. 19246 Date	
Delete Metric	S.S.	T. Shell	03/11				
						DRAWING NUMBER C-6	



TYPE-A WALL
(Applicable for all types
of backfill loadings)

TYPE-B WALL


TYPE-C WALL



ELEVATION

WALL TYPE	HEIGHT	BASE	CONCRETE CF/FT
A	1'-6"	1'-0"	1.50 cu ft.
	2'-0"	1'-0"	2.00 cu ft.
B	3'-0"	2'-4"	4.99 cu ft.
	4'-0"	2'-10"	7.66 cu ft.
	5'-0"	3'-4"	10.82 cu ft.
	6'-0"	3'-10"	14.49 cu ft.
C	3'-0"	1'-6"	3.75 cu ft.
	4'-0"	2'-0"	6.00 cu ft.
	5'-0"	2'-6"	8.75 cu ft.
	6'-0"	3'-0"	12.00 cu ft.

NOTE:
See 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		 7/26/2012	
Add Metric		T. Stanton	03/03			
Delete Metric	S.S.	T. Shell	03/11			
				GRAVITY RETAINING WALLS	Chairperson R.C.E. 19246 Date	
					DRAWING NUMBER	C-9

CONCRETE

Concrete shall be 560-C-3250.

DESIGN CONDITIONS

Walls are to be used for the loading conditions shown for each type wall. Design H may be exceeded by six inches before going to next size.

DESIGN DATA

$F_c = 1200$ psi

$F'_c = 3000$ psi

Earth = 120 pcf

and equivalent fluid pressure = 36 psf per foot of height

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

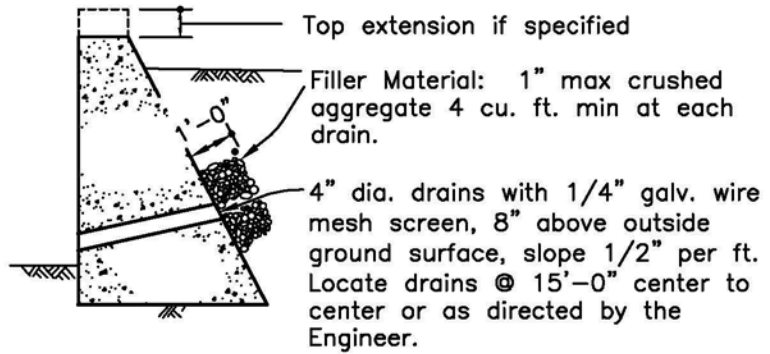
Note: Maximum toe pressure under wall footing = 1-1/2 tons/sq. ft. Special design required where footing material is incapable of supporting this pressure.

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.

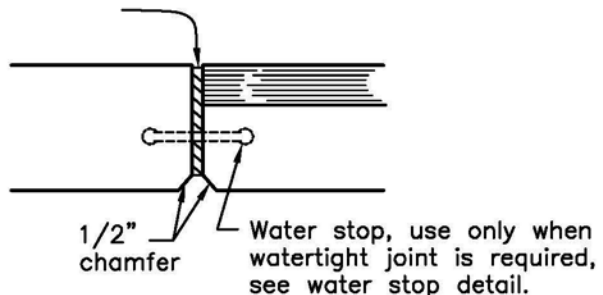
No backfill material shall be deposited against concrete retaining walls until the concrete has developed a strength of 2,500 psi in compression as determined by test cylinders, or until 28 days after wall has been placed.



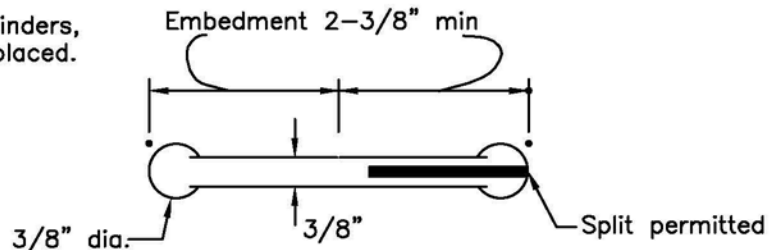
TYPICAL DRAINAGE

WHEN H IS GREATER
THAN 4'-0"

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



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
Delete Metric	S.S.	T. Shell	03/11

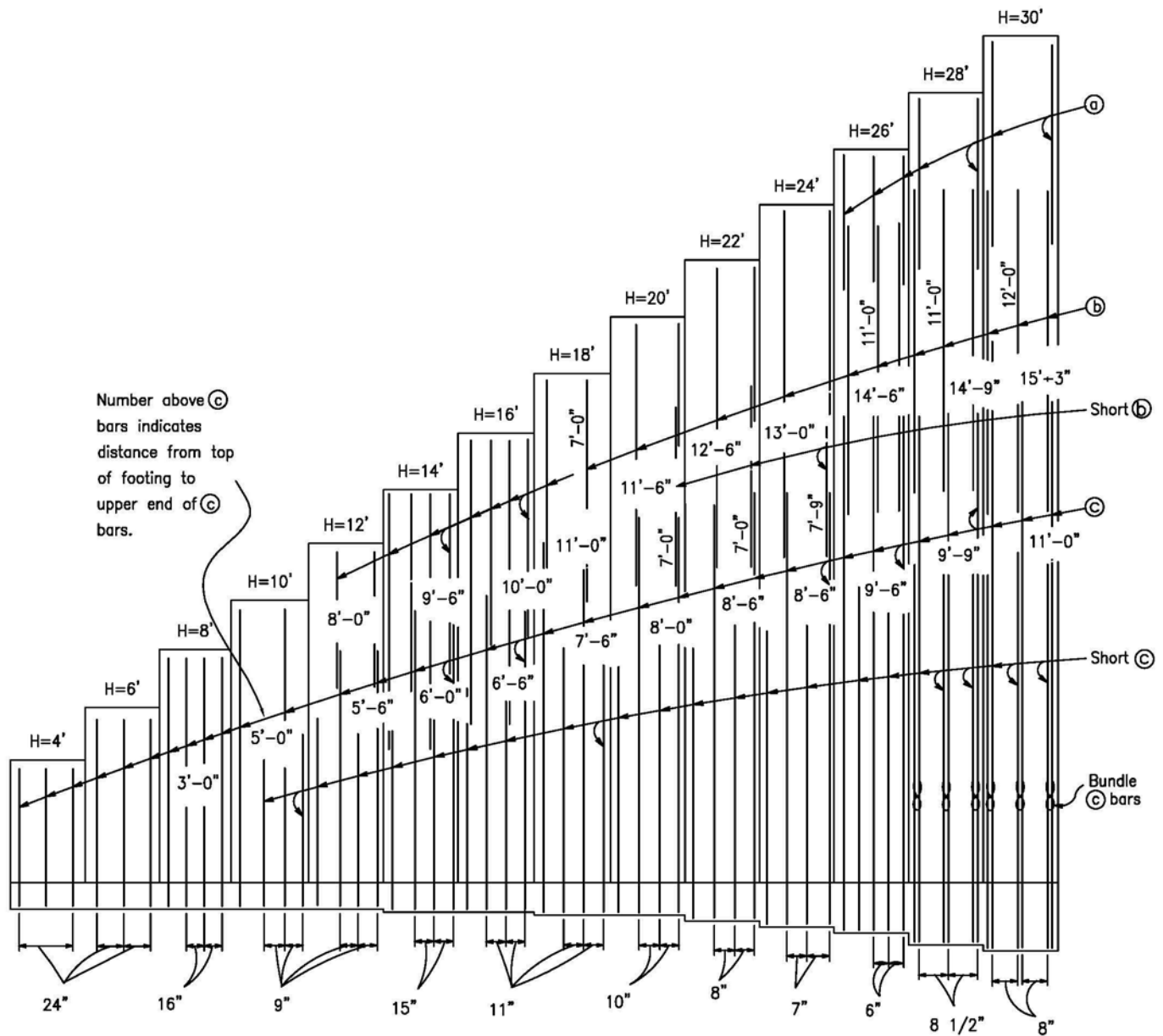
SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES AND DETAILS FOR GRAVITY RETAINING WALLS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **C-10**

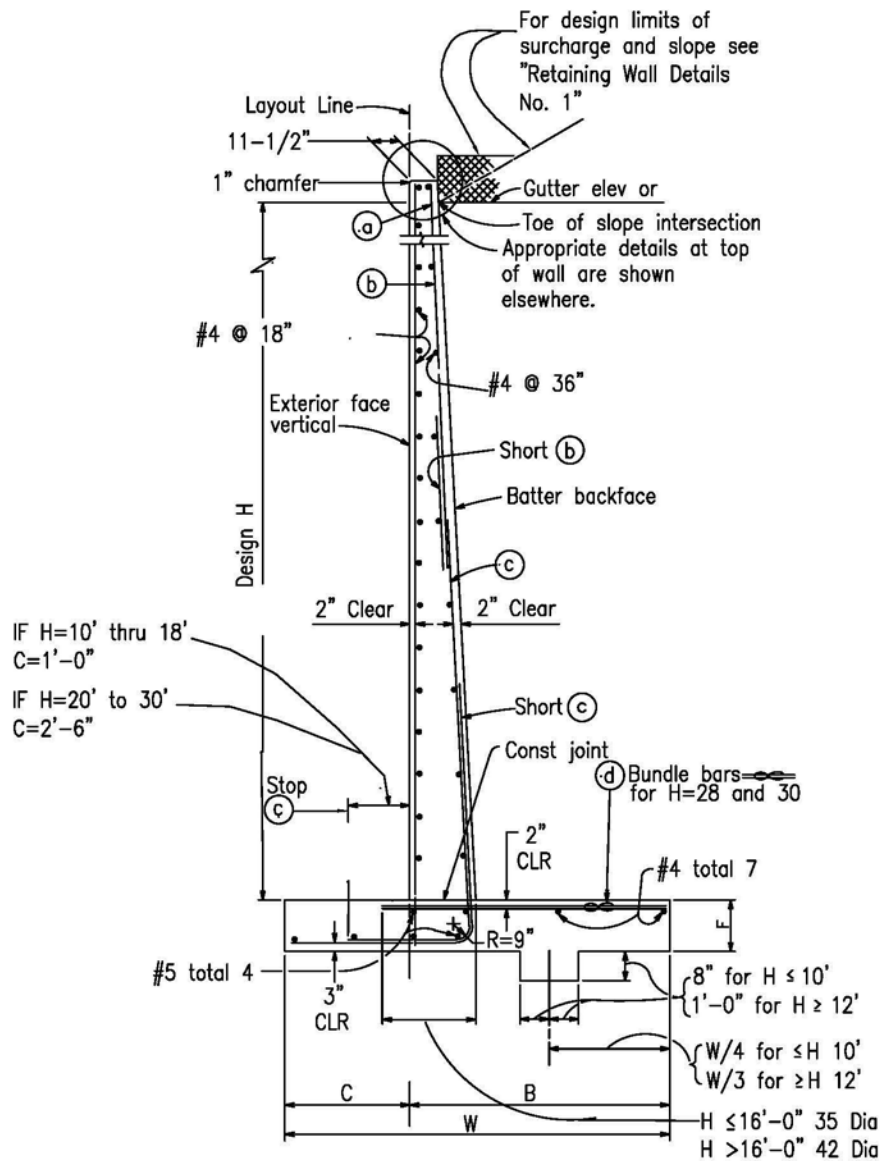


ELEVATION

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-11D
4. For TABLE OF REINFORCING STEEL DIMENSIONS AND DATA see C-11D

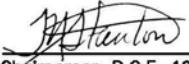
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75				
Add Metric		T. Stanton	03/03	REINFORCED CONCRETE RETAINING WALL TYPE 1		Chairperson R.C.E. 19246 Date	
Delete Metric	S.S.	T. Shell	03/11			7/26/2012	
						DRAWING NUMBER C-11A	

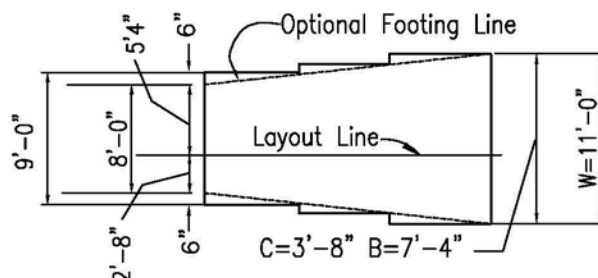


SPREAD FOOTING SECTION

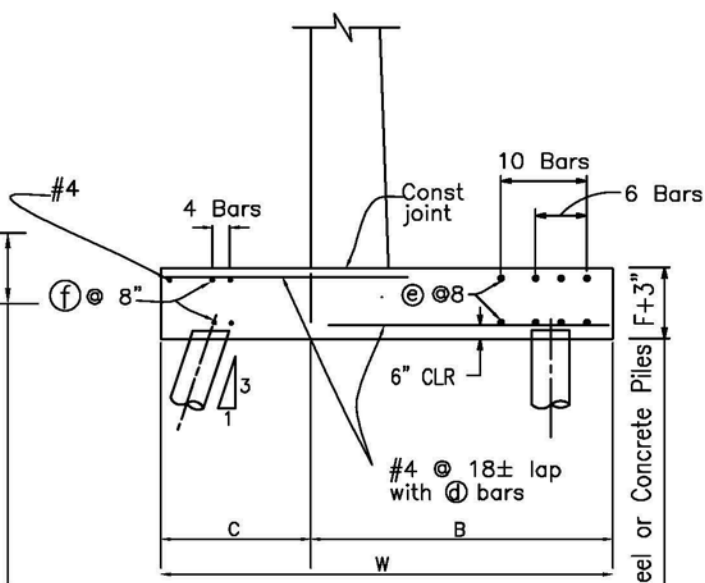
NOTES:

- For details not shown and drainage notes see "Retaining Wall Details No.1".
Standard Drawings C-13A to C-13D.
- 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		 7/26/2012 Chairperson R.C.E. 19246 Date	
Add Metric		T. Stanton	03/03				
Delete Metric	S.S.	T. Shell	03/11				
						DRAWING NUMBER C-11B	



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



45T PILE FOOTING SECTION

H=4' Thru H=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 TYPE 1	 7/26/2012
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246		Date
Delete Metric	S.S.	T. Shell	03/11	DRAWING NUMBER		C-11C

TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

Design H	4'	6'	8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
W	3'-2"	4'-2"	5'-2"	6'-2"	7'-2"	8'-0"	9'-0"	10'-0"	11'-0"	12'-0"	13'-3"	14'-3"	15'-3"	16'-9"
C	1'-0"	1'-4"	1'-8"	2'-0"	2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-0"	4'-5"	4'-9"	5'-1"	5'-5"
B	2'-2"	2'-10"	3'-6"	4'-2"	4'-10"	5'-4"	6'-0"	6'-8"	7'-4"	8'-0"	8'-10"	9'-6"	10'-2"	11'-4"
F Spread Ftg.	1'-2"	1'-2"	1'-2"	1'-2"	1'-2"	1'-3"	1'-3"	1'-4"	1'-4"	1'-6"	1'-8"	1'-11"	2'-2"	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	—	—	—	—	—	—	—	—	—	—	—	#6@24	#6@17	#6@16
Ⓑ bars	—	—	—	—	#4@18	#6@30	#6@22	#7@22	#8@20	#8@16	#8@14	#8@12	#8@8-1/2	#8@8
Ⓒ bars	#5@24	#5@24	#5@16	#5@9	#6@9	#9@15	#9@11	#10@11	#11@10	#11@8	#11@7	#11@6	#10@8-1/2	#10@8
Ⓓ bars	#5@24	#5@24	#4@16	#4@9	#5@9	#8@15	#8@11	#10@11	#10@11	#10@8	#10@7	#10@6	#9@8-1/2	#9@8
Total Ⓔ bars	6-#6	6-#6	10-#7	10-#7	10-#7	10-#7	6-#7	6-#7	6-#7	6-#7	4-#7	4-#7	4-#7	4-#7
Total Ⓕ bars				4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	4-#7	2-#7	2-#7	2-#7	2-#7
2' Level surcharge	Toe Pressure k/sf	1.6	1.9	2.2	2.3	2.8	3.3	3.5	4.0	4.3	4.6	5.3	5.7	6.2
2:1 unlimited slope	Toe Pressure k/sf	1.1	1.5	2.0	2.5	2.7	3.3	3.6	4.2	4.7	5.5	6.5	7.1	7.5
1-1/2:1 limited slope	Toe Pressure k/sf	1.3	1.7	2.1	2.5	2.9	3.4	3.8	4.3	4.8	5.4	6.5	7.2	7.5
Spread Footing	Steel lbs/ft.	17	20	28	37	51	80	105	147	187	246	303	449	507
	Conc cf/ft	8.9	12.5	16.3	20.2	25.4	30.1	34.6	40.1	45.0	52.1	63.3	77.0	104.8
Pile ftg.	Steel lbs/ft.	29	32	41	70	84	113	140	172	212	270	322	469	528
	Conc cf/ft	10.2	12.7	16.7	20.8	25.2	30.1	34.8	40.6	45.7	53.1	64.7	89.9	107.0

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Delete Metric	S.S.	T. Shell	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL TYPE 1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

**DRAWING
NUMBER C-11D**

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Delete Metric	S.S.	T. Shell	03/11

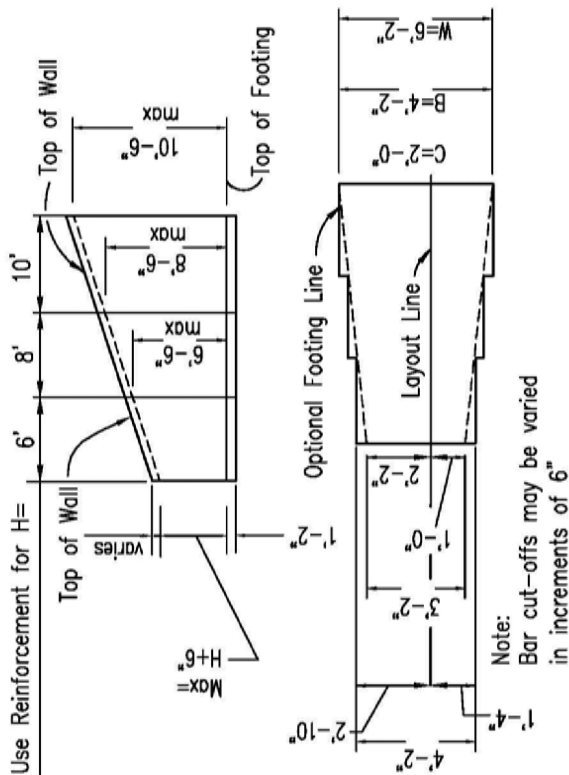
SAN DIEGO REGIONAL STANDARD DRAWING

REINFORCED CONCRETE RETAINING WALL TYPE 1A

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **C-12B**



TYPICAL LAYOUT EXAMPLE

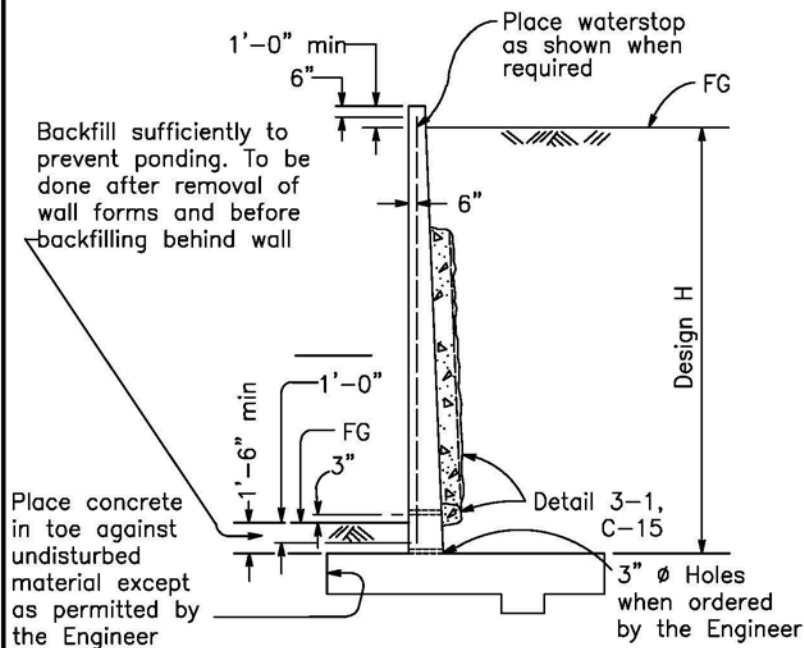
For joints required, see Details 3-3 and 3-4,
Std Dwg C-15

TABLE OF REINFORCING STEEL DIMENSIONS AND DATA

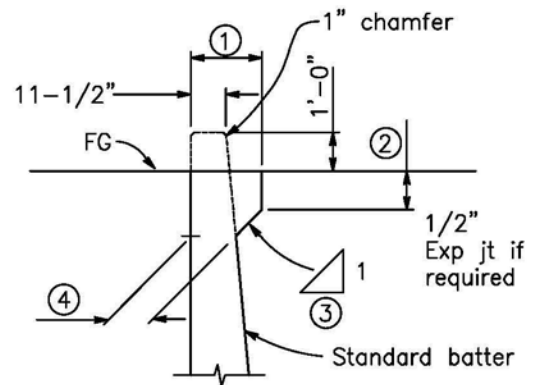
Design H	* 4'	6'	8'	10'	12'
W	3'-2"	4'-2"	5'-2"	6'-2"	7'-2"
C	1'-0"	1'-4"	1'-8"	2'-0"	2'-4"
B	2'-2"	2'-10"	3'-6"	4'-2"	4'-10"
© bars	#5@24"	#5@22"	#5@11"	#6@9"	#7@7'-1/2"
© bars	#5@24"	#5@22"	#5@22"	#7@18"	#8@15"
Total © bars	6-#6	6-#6	6-#6	10-#7	10-#7
Total © bars	6-#6	6-#6	6-#6	4-#7	4-#7
Case I - Toe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

Note:

Quantities apply to Design H portion and exclude the added portion above
"Gutter Elevation". *For pile footing Design H=4' use same footing dimensions as Design H=6'.



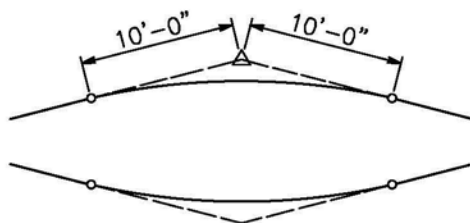
DESIGN AND DRAINAGE



Dimensions ①, ② and ③ to be as shown elsewhere in the project plans

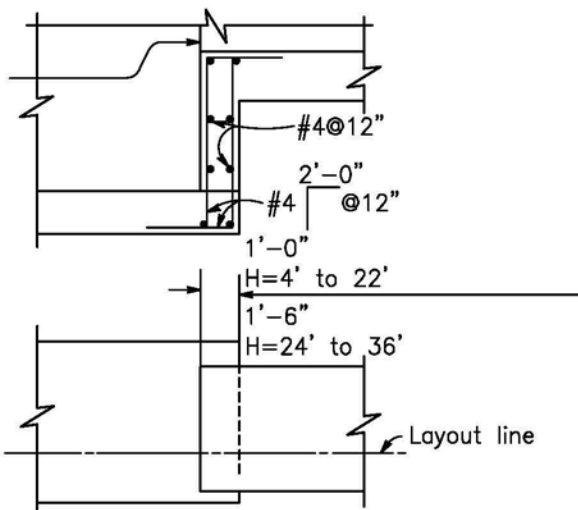
④ Stem width at base of haunch to be determined as shown

STEM WIDTH AT BASE OF HAUNCH

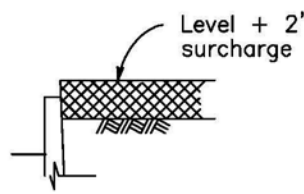


20' VC AT TOP OF WALL SLOPE CHANGE

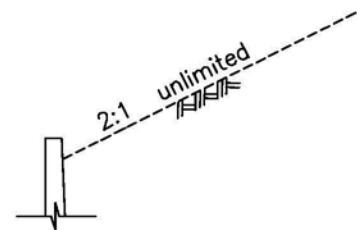
Where shown on the plans



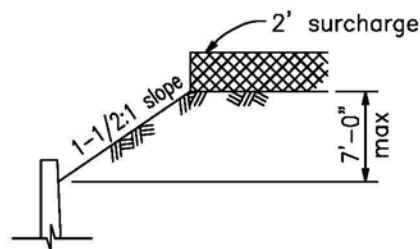
FOOTING STEP



CASE I



CASE II



CASE III

DETAIL OF DESIGN LOADING CASES

CASE I Level + 2' surcharge

CASE II 2:1 unlimited slope

CASE III 1-1/2:1 limited slope (7'-0" max height) + 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
Delete Metric	S.S. T. Shell		03/11

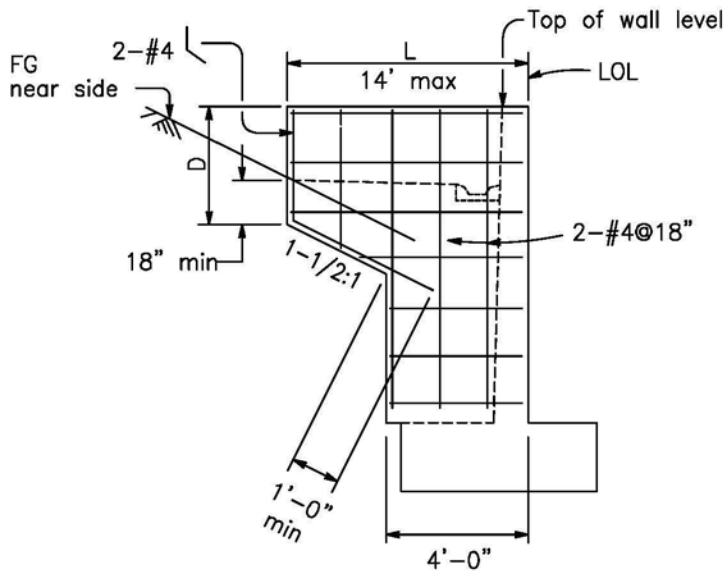
SAN DIEGO REGIONAL STANDARD DRAWING

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

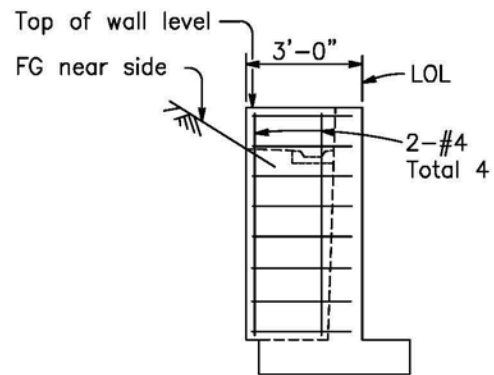
DRAWING
NUMBER **C-13A**



ELEVATION

RETURN WALL TYPE A

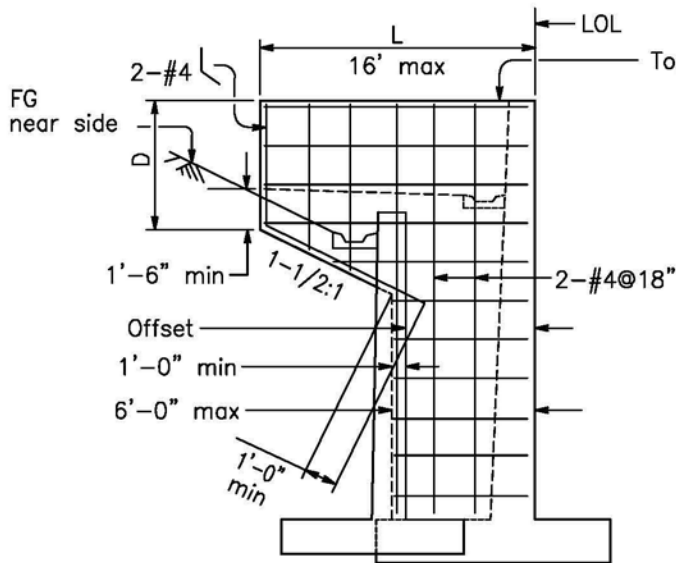
Use where H=8' or less



ELEVATION

RETURN WALL TYPE D

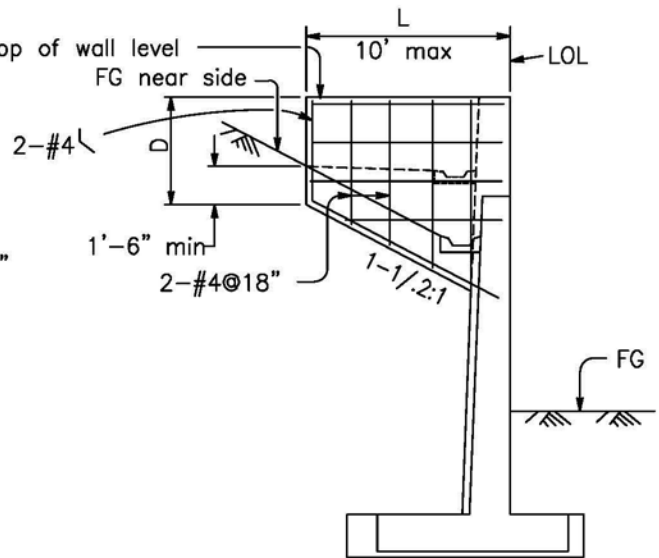
Use where H=6' or less



ELEVATION

RETURN WALL TYPE B

Use where H=10' or more on offset walls



ELEVATION

RETURN WALL TYPE C

Use where H=10' or more on straight walls

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Delete Metric	S.S.	T. Shell	03/11

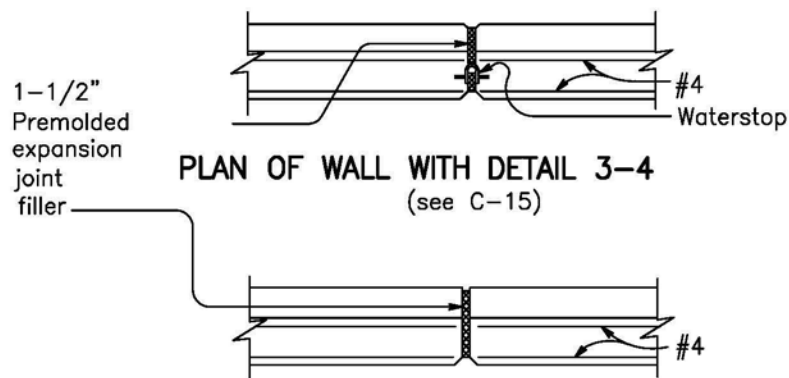
SAN DIEGO REGIONAL STANDARD DRAWING

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

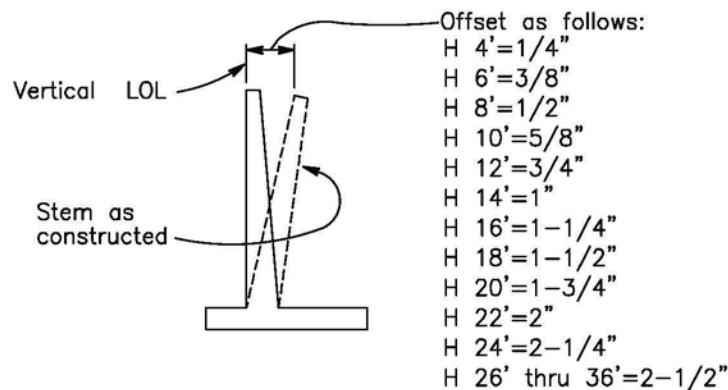
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
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 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:

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

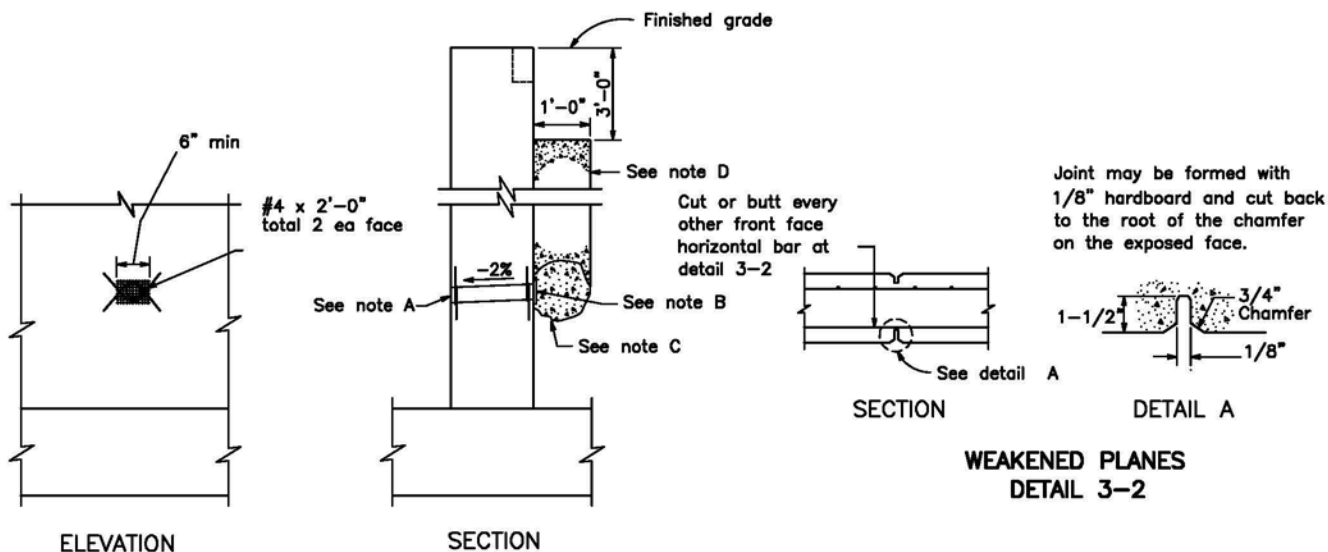
Equivalent fluid pressure =

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 $\phi = 33^\circ - 42^\circ$.

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 DETAILS No. 1		 7/26/2012 Chairperson R.C.E. 19246 Date	
Delete Metric	S.S.	T. Shell	03/11				
						DRAWING NUMBER C-13D	

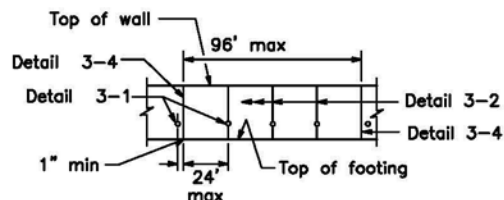
DRAWING NUMBER **C-14**



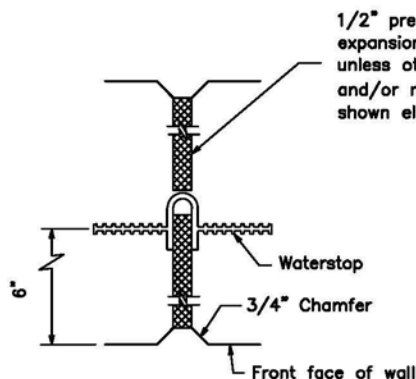
**WEEP HOLE AND PERVIOUS BACKFILL
DETAIL 3-1**

NOTES

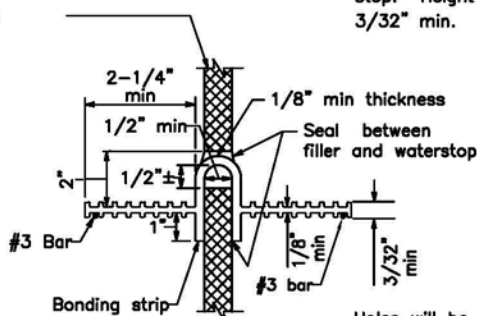
- A. 4" diameter drain @ 25' max center to center (9' c-c for Type 3 and 9'-3" c-c for Type 4 Retaining Walls). For walls adjacent to sidewalks or curbs, provide 4" cast iron or asbestos cement pipe under the sidewalk to discharge thru curb face. Exposed wall drains shall be located 3" ± above finished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



**WALL EXPANSION JOINTS
AND WEAKENED PLANES
DETAIL 3-3**



**WALL EXPANSION JOINT
DETAIL 3-4**



**WATERSTOP
DETAIL 3-6**

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

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Delete Metric	S.S.	T. Shell	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

**REINFORCED CONCRETE
RETAINING WALL DETAILS No. 3**

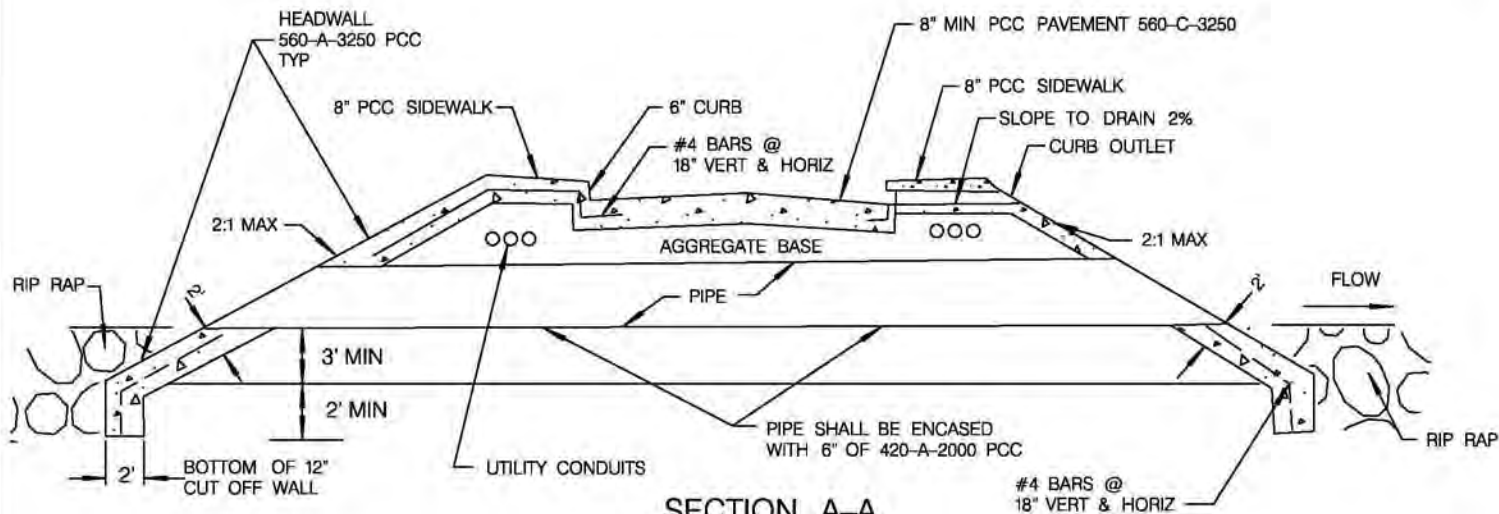
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

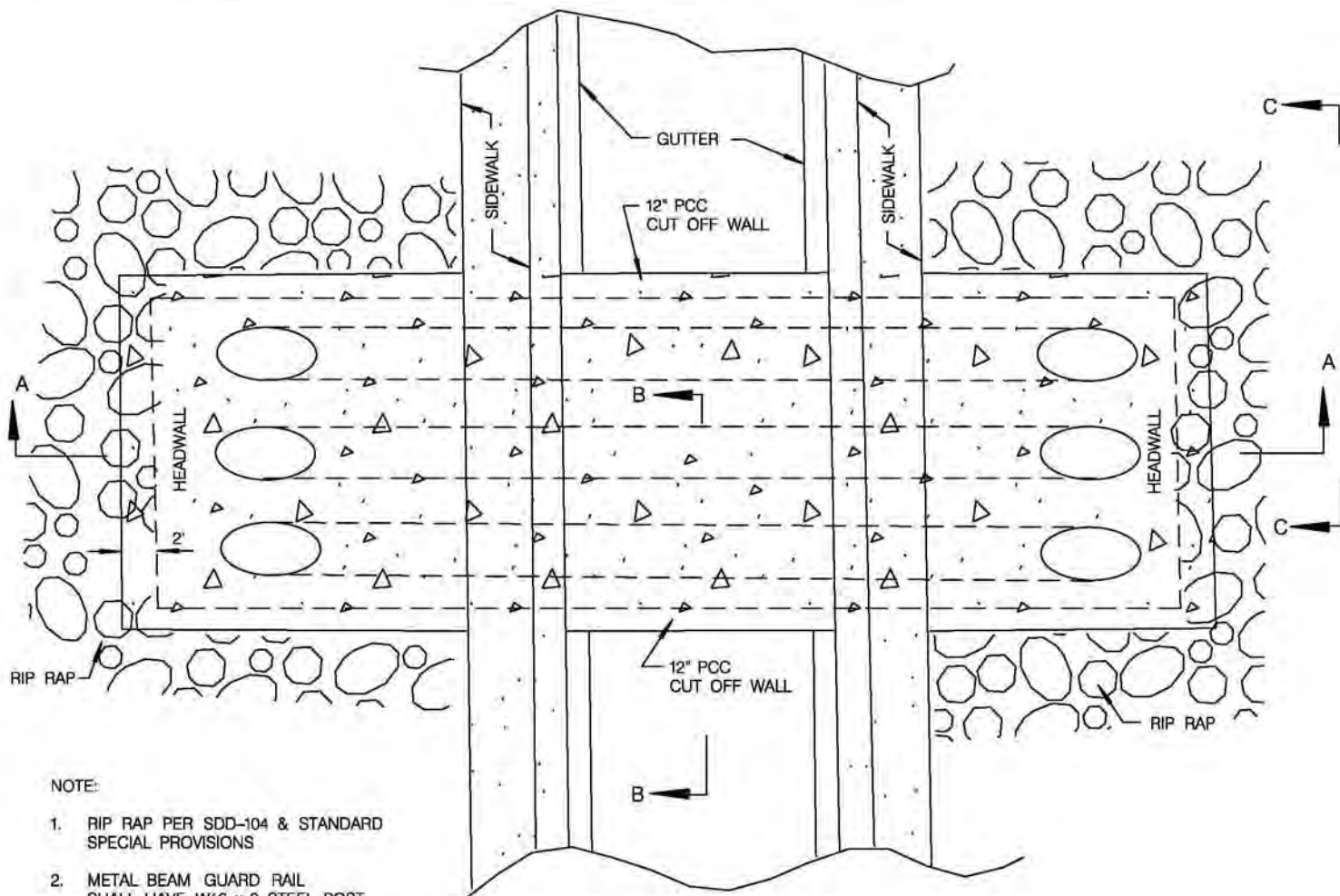
**DRAWING
NUMBER C-15**

CHAPTER 2

*DRAINAGE
SYSTEM*



SECTION A-A



PLAN

NOTE:

1. RIP RAP PER SDD-104 & STANDARD SPECIAL PROVISIONS
2. METAL BEAM GUARD RAIL SHALL HAVE W6 x 9 STEEL POST
3. SIDEWALK, CURB, PAVEMENT AND HEADWALL'S SHALL BE TIED WITH #4 BARS 18" OC HORIZONTAL AND VERTICAL
4. CONCRETE JOINTS PER SDG-109 AND G-10

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL		J. CASEY	06/83
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

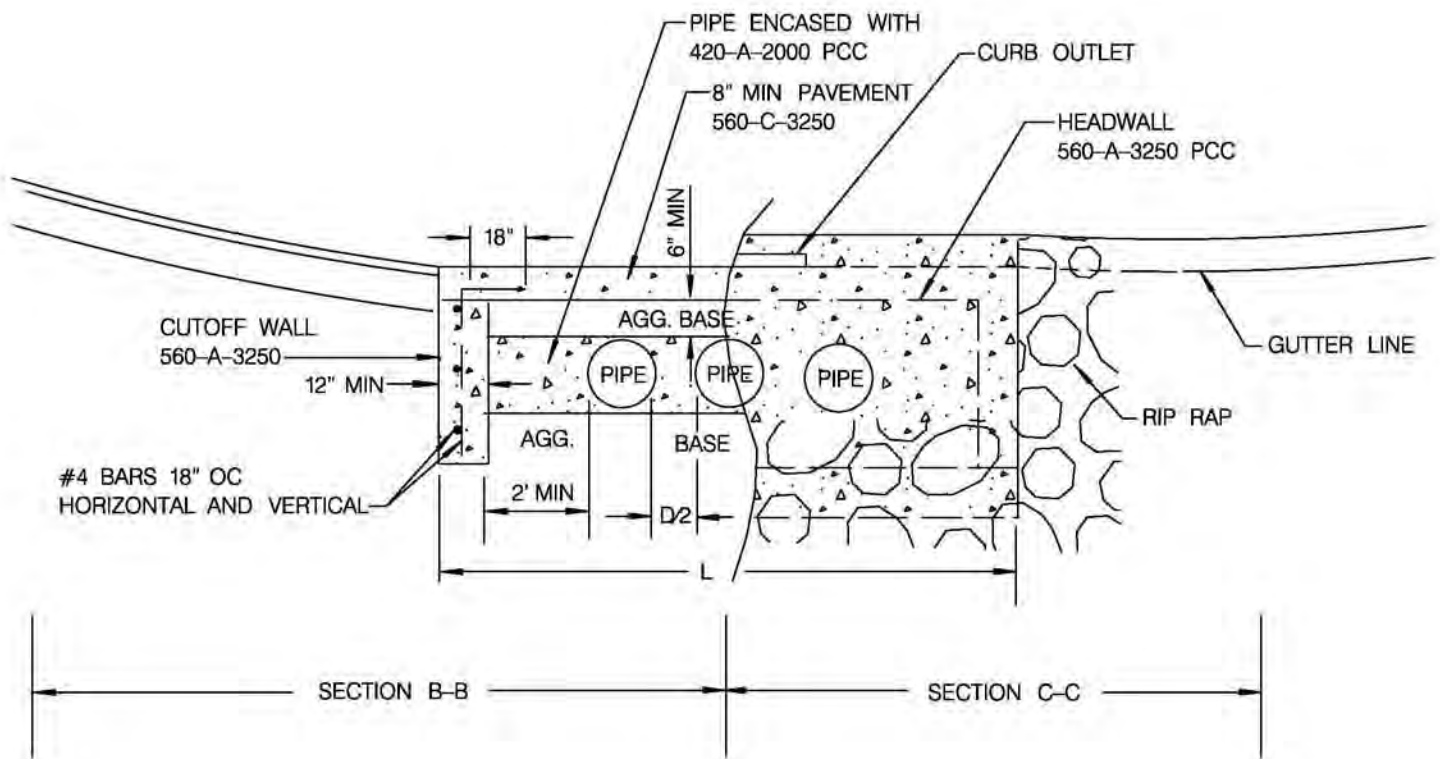
TYPICAL FORD

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadli 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

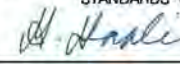
SDD-101

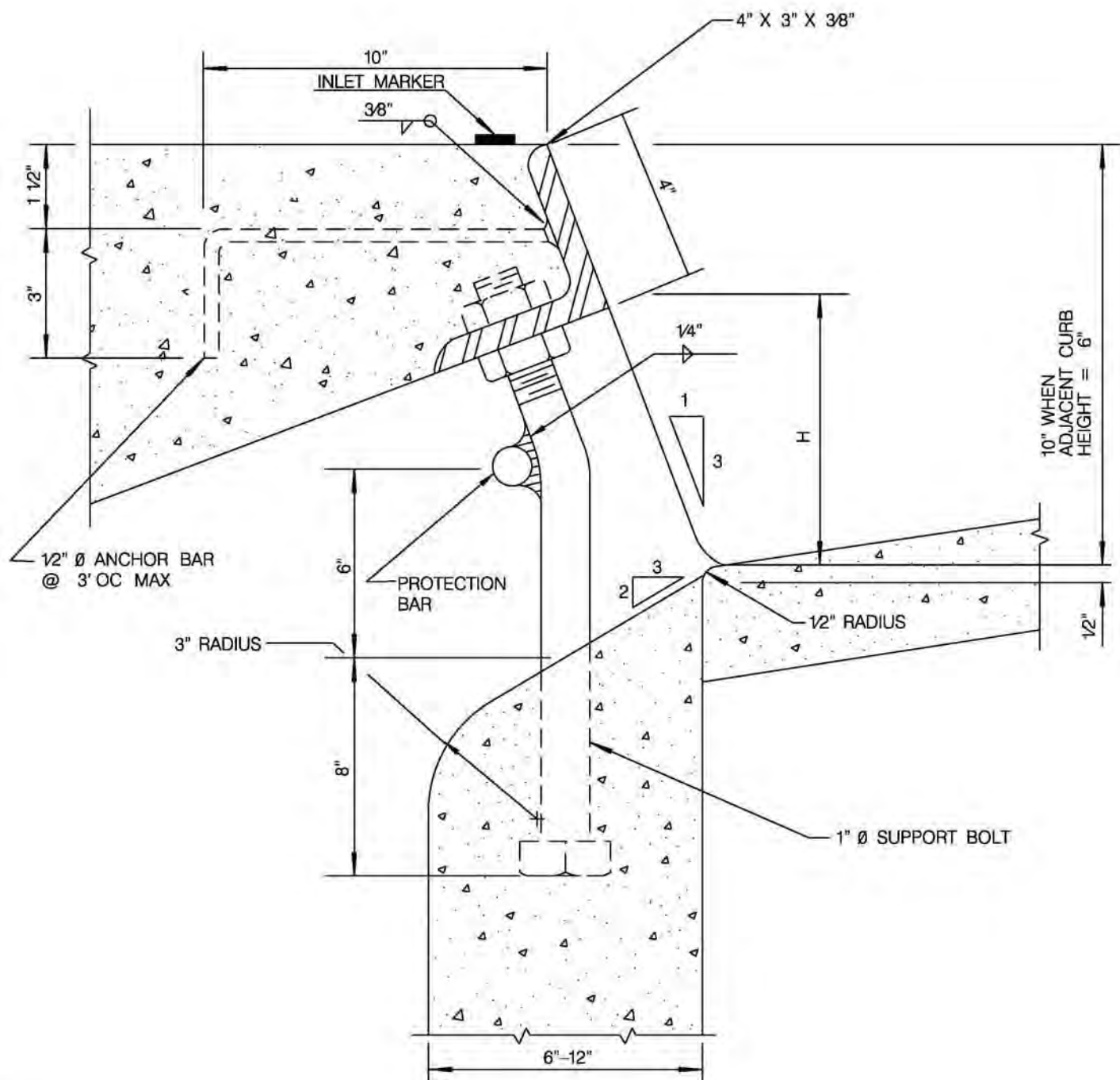


NOTE:

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

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		J. CASEY	08/83		
UPDATED	KA	J. NAGELVOORT	01/12	TYPICAL FORD	 1/31/2012 COORDINATOR R.C.E. 65271 DATE
					DRAWING NUMBER SDD-101



NOTES:

1. FACE ANGLE SHALL BE CAST INTO STRUCTURE CONTINUOUS FOR THE FULL LENGHT "L".
2. EXPOSED METAL PARTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
3. WHEN CURB INLET OPENING HEIGHT (H) EXCEEDS 8" INSTALL 1" Ø STEEL PROTECTION BAR.
4. INSTALL ADDITIONAL BARS AT 3 1/2" CLEAR SPACING ABOVE FIRST BAR WHEN OPENING EXCEEDS 16".
5. WHEN CURB INLET OPENING LENGTH EXCEEDS 8' INSTALL 1" Ø STEEL SUPPORT BOLTS, SPACED AT NOT MORE THAN 5' OC.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

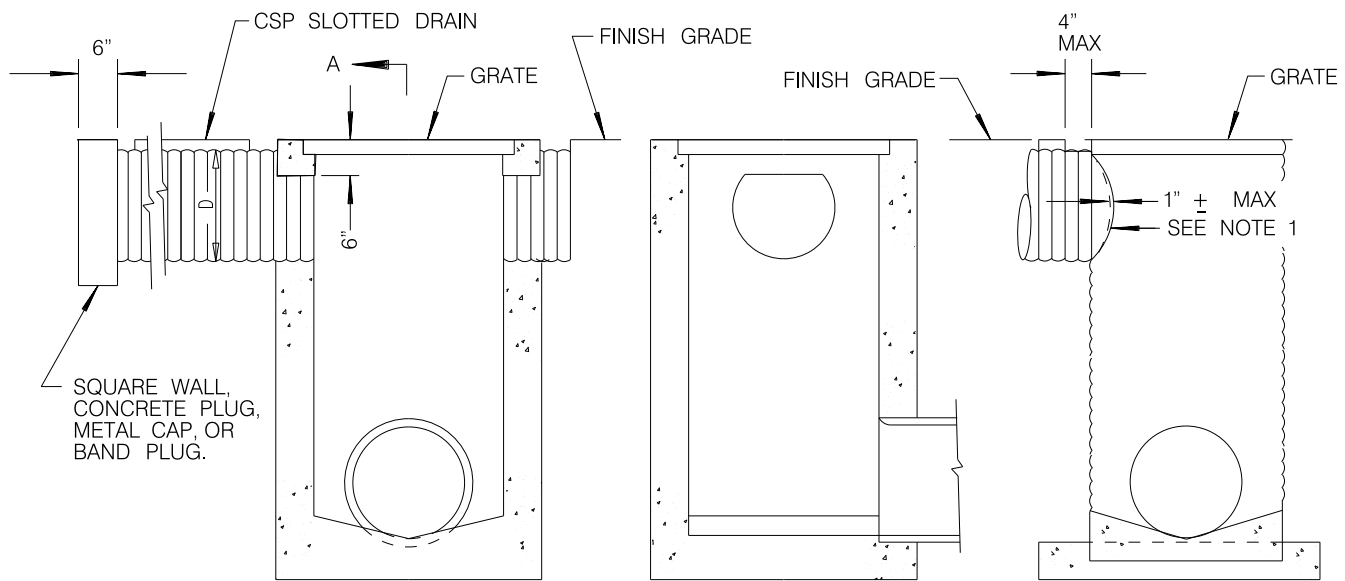
CURB INLET OPENING

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadi 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

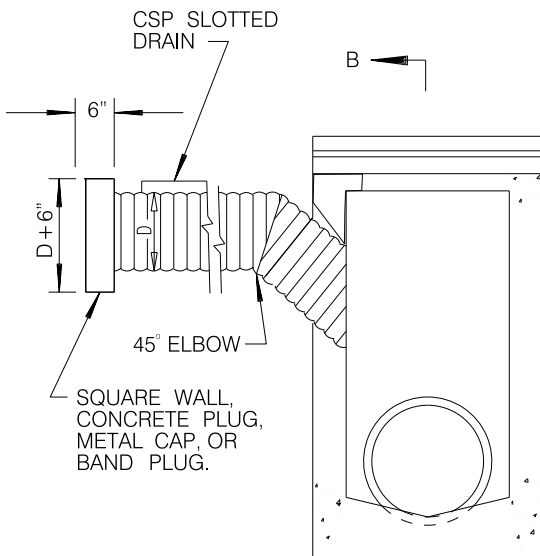
SDD-102



SECTION A-A

CSP INLET

CATCH BASIN



SECTION B-B

INLETS

ALTERNATE
SECTION B-B

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 D-18 FOR ADDITIONAL NOTES AND DETAILS
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.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

**SLOTTED DRAIN CONNECTIONS
TO STANDARD INLETS**

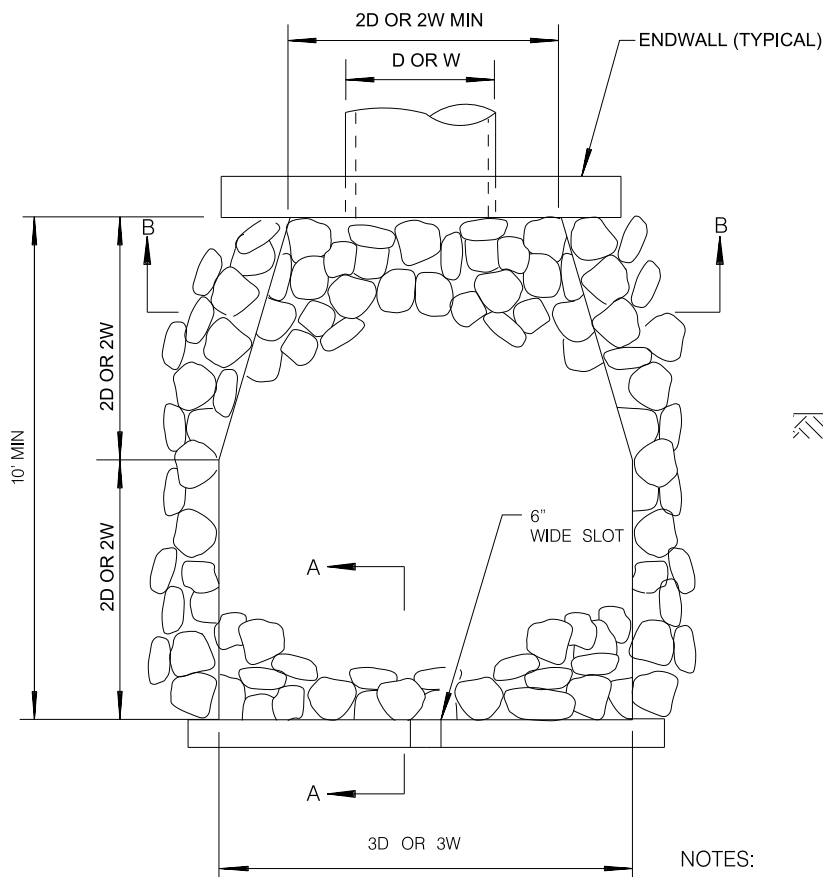
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

2/25/16
DATE

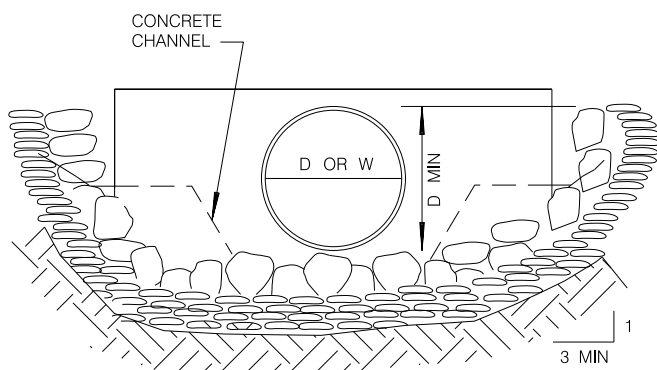
DRAWING
NUMBER

SDD-103

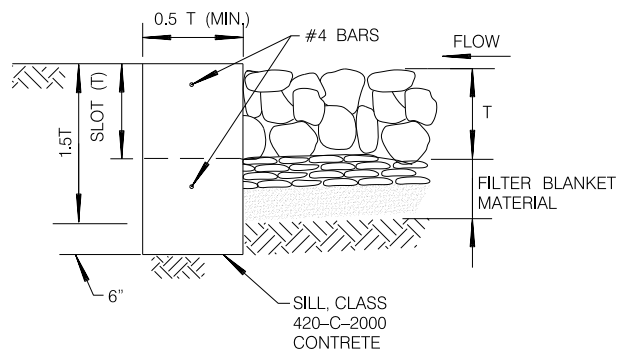


PLAN

D = PIPE DIAMETER
W = BOTTOM WIDTH OF CHANNEL



SECTION B-B



SECTION A-A

NOTES:

1. PLANS SHALL SPECIFY:

A) ROCK CLASS AND THICKNESS (T).

B) FILTER BLANKET MATERIAL, NUMBER OF LAYERS AND THICKNESS

2. RIP RAP SHALL BE EITHER QUARRY STONE OR BROKEN CONCRETE (IF SHOWN ON THE PLANS). COBBLES ARE NOT ACCEPTABLE.

3. RIP RAP SHALL BE PLACED OVER A GEOTEXTILE FILTER FABRIC. FILTER BLANKET MATERIAL SHALL BE PLACED UNDER THE FABRIC WHEN SPECIFIED.

4. SEE CITY SUPPLEMENT FOR SELECTION OF FILTER MATERIAL.

5. 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.

6. FOR STRUCTURAL DETAILS, SEE D-42 FOR PIPELINE SIZES FROM 18" TO 30" AND SEE D-43 FOR PIPELINE SIZES FROM 36" TO 72".

7. FOR RIP RAP SELECTION SEE TABLE 200-1.7 OF THE WHITEBOOK.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	AB	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

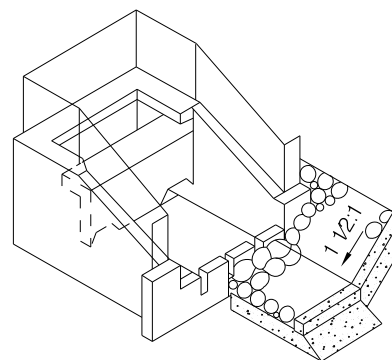
**RIP RAP
ENERGY DISSIPATOR**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

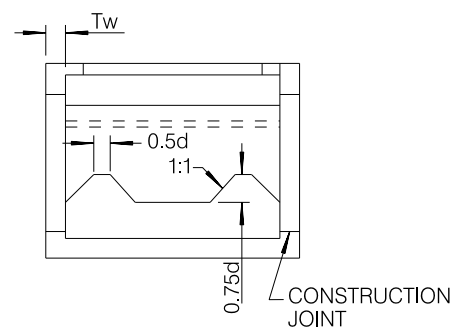
Chungoa 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

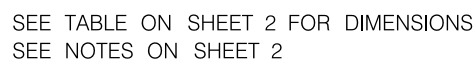
SDD-104



PLAN



SECTION B-B



CONCRETE ENERGY DISSIPATOR DIMENSIONS

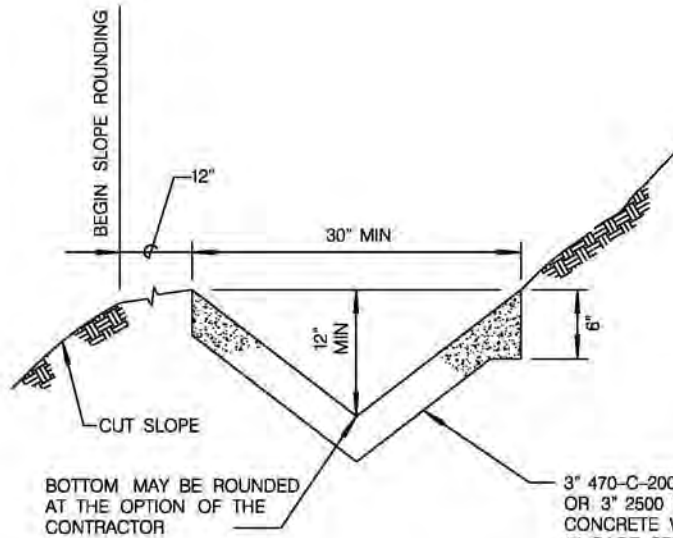
Pipe Dia (in)	18	24	30	36	42	48	54	60	72
Area (sq ft)	1.77	3.14	4.91	7.07	9.62	12.57	15.90	19.63	28.27
Max Q (cfs)	21	38	59	85	115	151	191	236	339
W	5'-6"	6'-9"	8'-0"	9'-3"	10'-6"	11'-9"	13'-0"	14'-3"	16'-6"
H	4'-3"	5'-3"	6'-3"	7'-3"	8'-0"	9'-0"	9'-9"	10'-9"	12'-3"
L	7'-4"	9'-0"	10'-8"	12'-4"	14'-0"	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"					

NOTES:

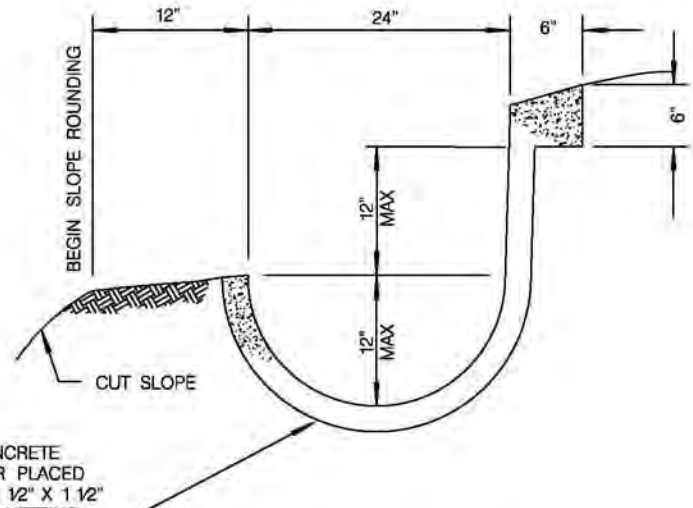
- DESIGN EQUIVALENT FLUID PRESSURE (EARTH LOADING) = 60 pcf MAXIMUM OUTLET VELOCITY = 35 ft/s
- CONCRETE SHALL BE 560-C-3250
- REINFORCING SHALL CONFORM TO ASTM DESIGNATION A615 AND MAY BE GRADE 40 OR 60. REINFORCING SHALL BE PLACED WITH 2" CLEAR CONCRETE COVER UNLESS NOTED OTHERWISE. SPLICES SHALL NOT BE PERMITTED EXCEPT AS INDICATED ON THE PLANS.
- FOR PIPE GRADES NOT EXCEEDING 20%, INLET BOX MAY BE OMITTED.
- IF INLET BOX IS OMITTED, CONSTRUCT PIPE COLLAR AS SHOWN.
- UNLESS NOTED OTHERWISE, ALL REINFORCING BAR BENDS SHALL BE FABRICATED WITH STANDARD HOOKS. FOR STRUCTURAL DETAILS, SEE D-42 FOR PIPELINE SIZES FROM 18" TO 30" AND SEE D-43 FOR PIPELINE SIZES FROM 36" TO 72".
- 5' HIGH CHAIN LINK FENCING, EMBED POST 18" DEEP IN WALLS AND ENCASE WITH CLASS B MORTAR.
- IN SANDY AND SILTY SOIL:
 - RIP RAP AND AGGREGATE BASE CUTOFF WALL REQUIRED AT THE END OF ROCK APRON.
 - FILTER CLOTH (POLYFILTER X OR EQUIVALENT) SHALL BE INSTALLED ON NATIVE SOIL BASE, MINIMUM OF 1' OVERLAPS AT JOINTS
- RIP RAP AND SUBBASE CLASSIFICATION SHALL BE AS SHOWN ON PLANS.
- FOR RIP RAP SELECTION SEE TABLE 200-1.7 OF THE WHITEBOOK.

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL*	KA	J. NAGELVOORT	01/12			2/25/16
UPDATED	BD	J. NAGELVOORT	08/15		COORDINATOR	R.C.E. 56523
UPDATED	AB	J. NAGELVOORT	02/16			DATE
				CONCRETE ENERGY DISSIPATOR	DRAWING	SDD-105
					NUMBER	

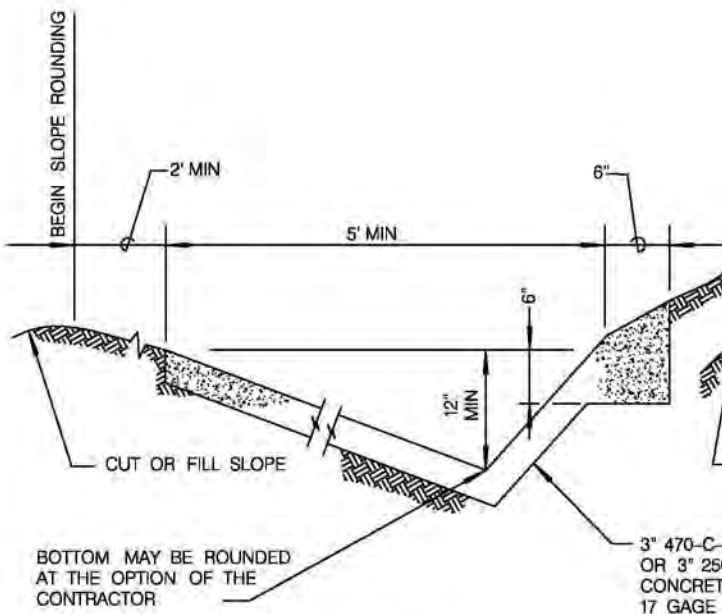


TYPE A

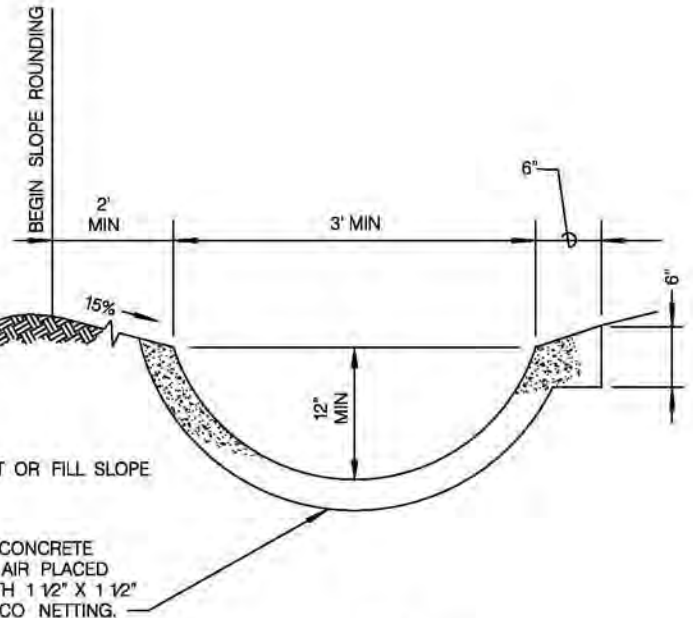


TYPE B

BROW DITCH



TYPE C



TYPE D

TERRACE DITCH

NOTES:

1. LONGITUDINAL SLOPE OF LINED DITCH SHALL BE 2% MINIMUM.
2. OVER SLOPE DOWN DITCHES SHALL EMPLOY 6" THICKENED EDGE SECTION AT BOTH SIDES OF DITCH.
3. STUCCO NETTING SHALL BE GALVANIZED AND SHALL HAVE 1 1/2" COVER.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12

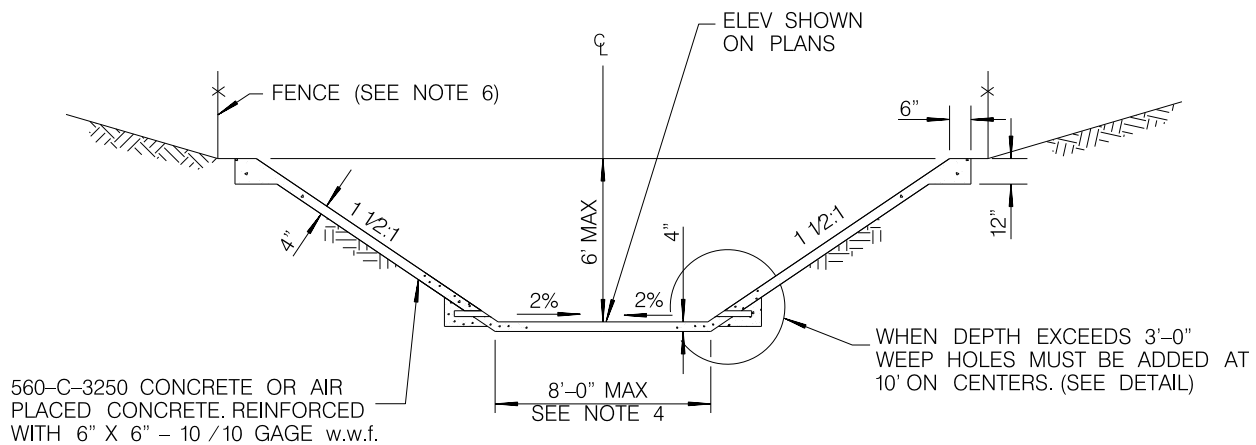
CITY OF SAN DIEGO - STANDARD DRAWING

DRAINAGE DITCHES

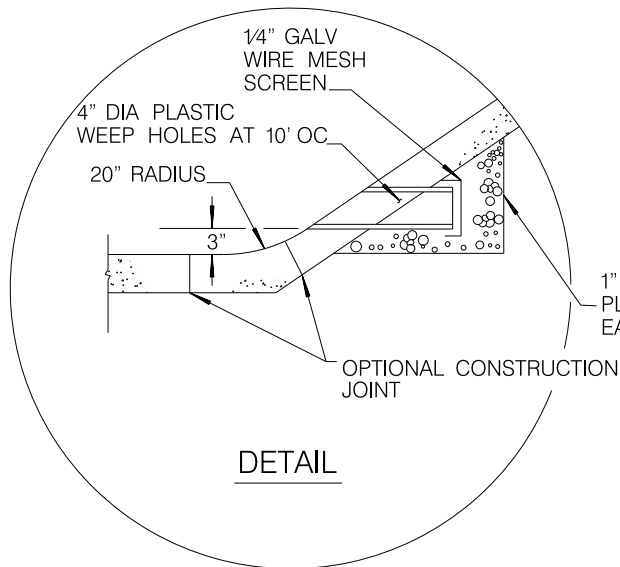
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Kadi 1/31/2012
COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER **SDD-106**

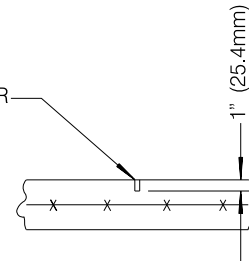


TYPICAL SECTION

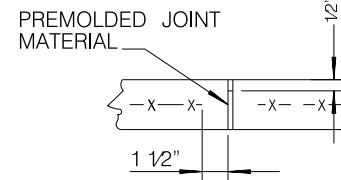


DETAIL

316" PREMOLDED JOINT MATERIAL OR 1/8" SAWED JOINT.



WEAKENED PLANE JOINT




EXPANSION JOINT

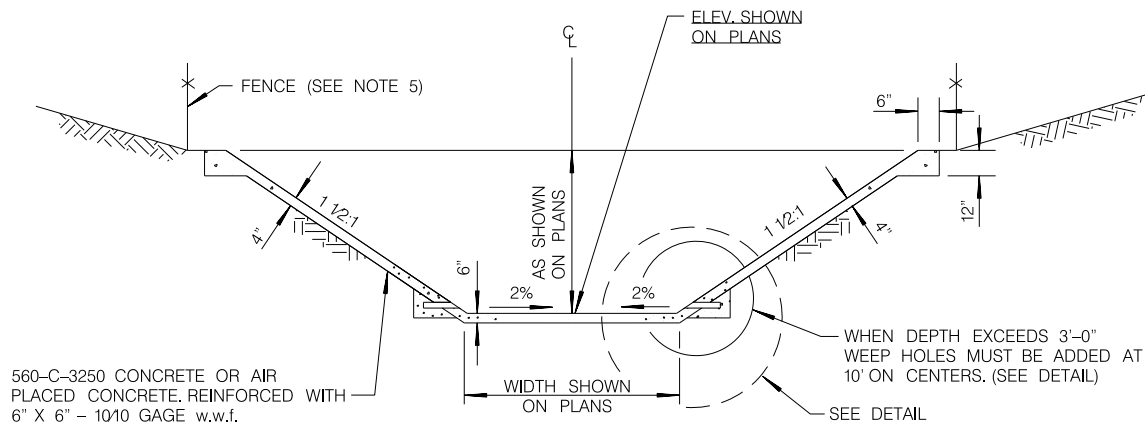
NOTES:

1. CLAY PIPE MAY BE SUBSTITUTED FOR PLASTIC PIPE AT WEEP HOLES.
2. WEAKENED PLANE JOINTS SHALL BE PLACED EVERY 12' TO 15'. EXPANSION JOINTS SHALL BE PLACED AT ALL CHANGES OF SECTION AND AT ENDS OF CURVES.
3. CUTOFF WALLS SHALL BE CONSTRUCTED AT EACH END OF THE CHANNEL ALONG THE FULL WIDTH OF SECTION. SEE D-72.
4. FOR BOTTOM WIDTHS GREATER THAN 8' SEE SDD-108.
5. REINFORCEMENT SHOWN IS MINIMUM.
6. CHANNELING FENCING IS REQUIRED. UNLESS OTHERWISE SHOWN ON THE PLANS A CHAIN LINK FENCE (PER SDM-112 AND SDM-114) 6' IN HEIGHT, WITH A TOP RAIL SET AT 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 10' GATES OR ONE 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 4' GATES.

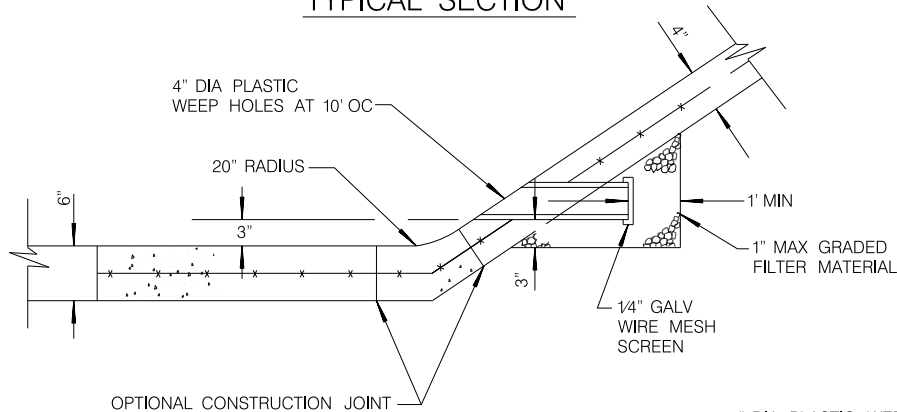
LEGEND ON PLANS



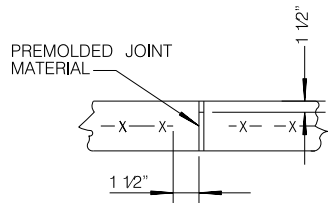
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	02/16	MINOR DRAINAGE CHANNEL	 COORDINATOR R.C.E. 56523 DATE 2/25/16
					DRAWING NUMBER SDD-107



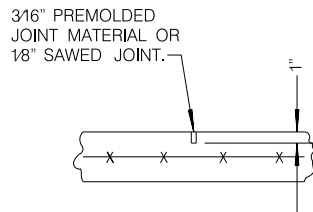
TYPICAL SECTION



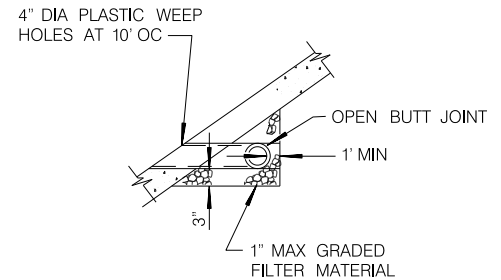
DETAIL



EXPANSION JOINT



WEAKENED PLANE JOINT



ALTERNATE CONTINUOUS DRAIN

NOTES:

1. CLAY PIPE MAY BE SUBSTITUTED FOR PLASTIC PIPE AT WEEP HOLES.
2. WEAKENED PLANE JOINTS SHALL BE PLACED EVERY 12' TO 15'. EXPANSION JOINTS SHALL BE PLACED AT ALL CHANGES OF SECTION AND AT ENDS OF CURVES.
3. CUTOFF WALLS SHALL BE CONSTRUCTED AT EACH END OF THE CHANNEL ALONG THE FULL WIDTH OF SECTION. SEE D-72.
4. REINFORCEMENT SHOWN IS MINIMUM.
5. CHANNELING FENCING IS REQUIRED PER SDM-112 OR SDM-114. UNLESS OTHERWISE SHOWN ON THE PLANS, A CHAIN LINK FENCE 6' IN HEIGHT, WITH A TOP RAIL SET AT 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 10' GATES OR ONE 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 4' GATES.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

MAJOR DRAINAGE CHANNEL

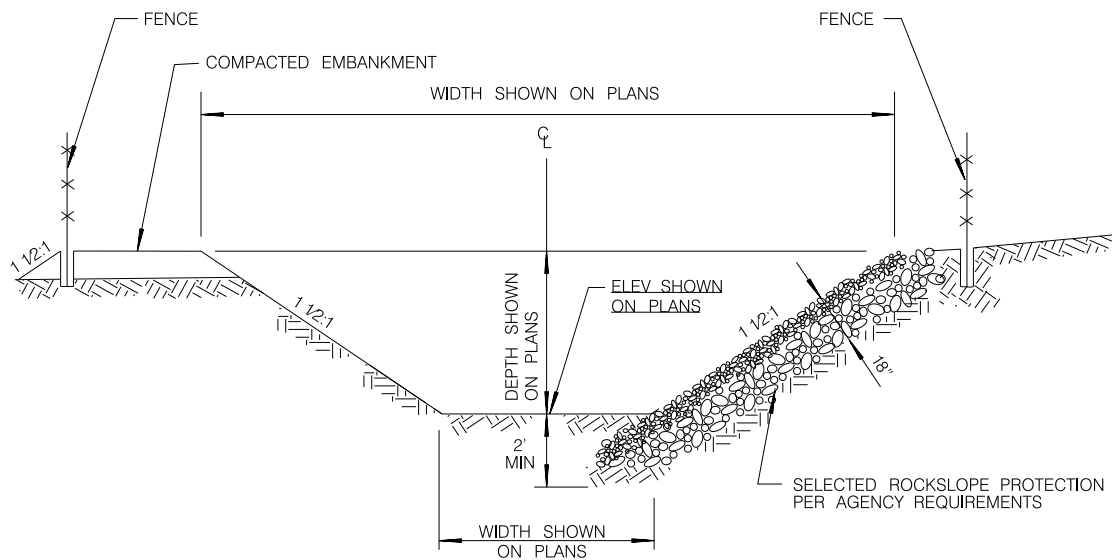
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CAJUNGA
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDD-108



SECTION

NOTES:


1. THE FOLLOWING SHALL BE AS REQUIRED:

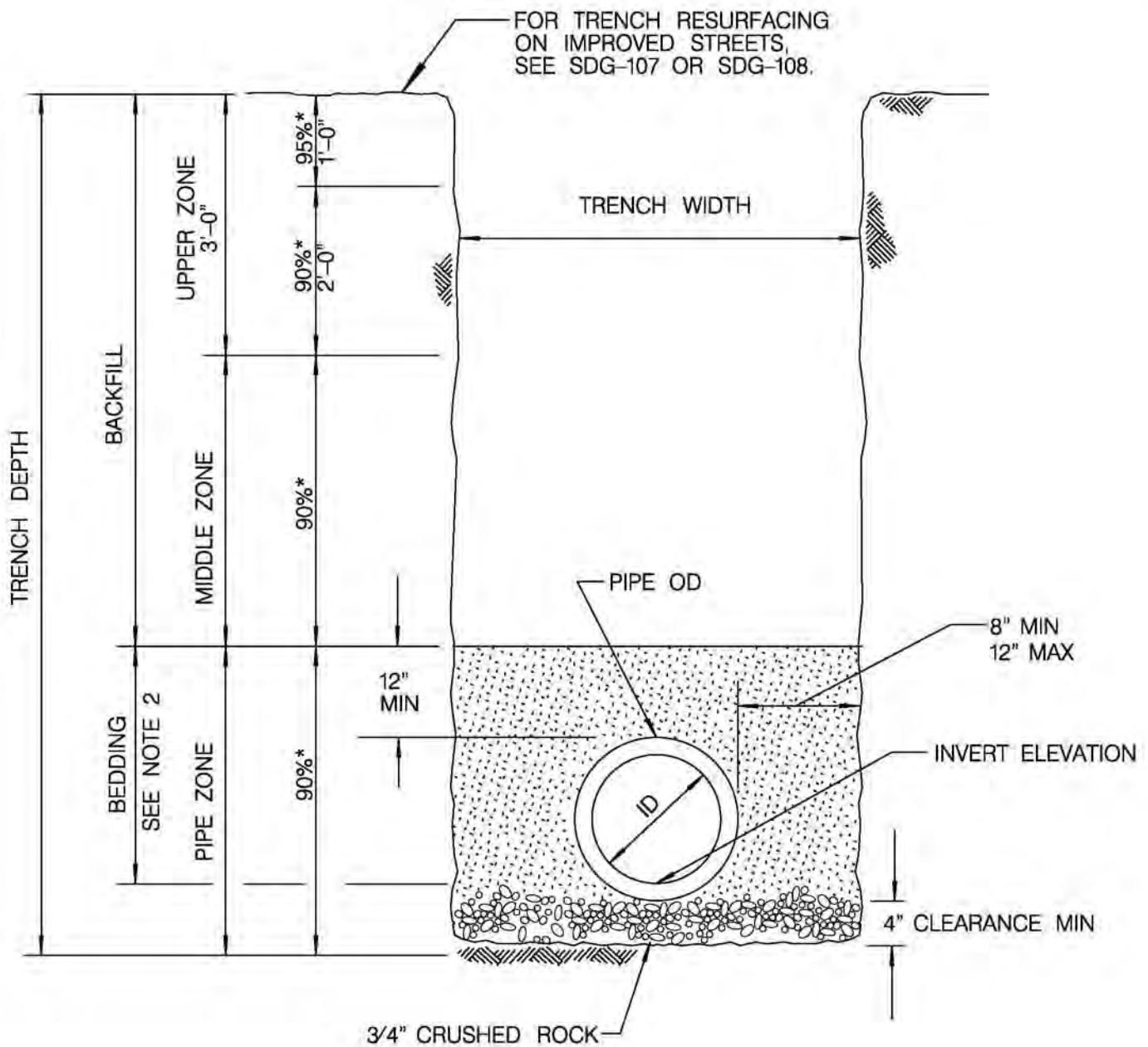
- A. LOW FLOW CHANNEL
- B. FILTER BLANKET
- C. CUTOFF WALL
- D. FENCE

2. CHANNELING FENCING IS REQUIRED PER DRAWING SDM-112 OR SDM-114. UNLESS OTHERWISE SHOWN ON THE PLANS, A CHAIN LINK FENCE 6' HEIGHT, WITH A TOP RAIL SET AT 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 10' GATES OR ONE 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 4' GATES.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	02/16	GRADED EARTH CHANNEL	 COORDINATOR R.C.E. 56523 2/25/16 DATE
					DRAWING NUMBER SDD-109



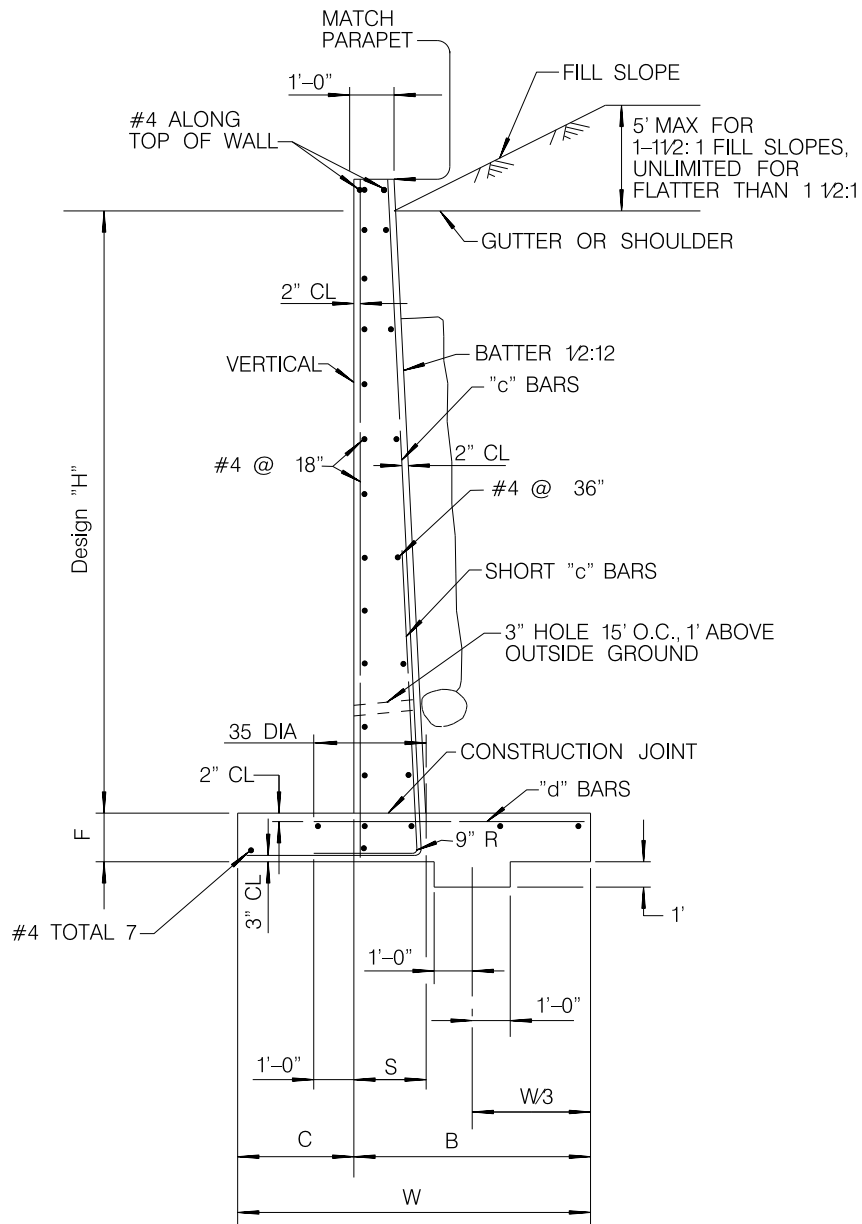
SECTION

NOTES:

- (*) INDICATES MINIMUM RELATIVE COMPACTION.
- BEDDING MATERIAL SHALL BE SAND, CRUSHED AGGREGATE, OR NATIVE FREE-DRAINING GRANULAR MATERIAL. 100% SHALL PASS NO. 4 SIEVE AND HAVE A SAND EQUIVALENT OF NOT LESS THAN 30.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
				PIPE BEDDING AND TRENCH BACKFILL FOR STORM DRAINS	<i>H. Hadi</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDD-110

SDD-111



TYPICAL SECTION
H = 13'-0" THRU 16'-0"

SHEET 3 OF 6

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

BOX CULVERT WINGWALL

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

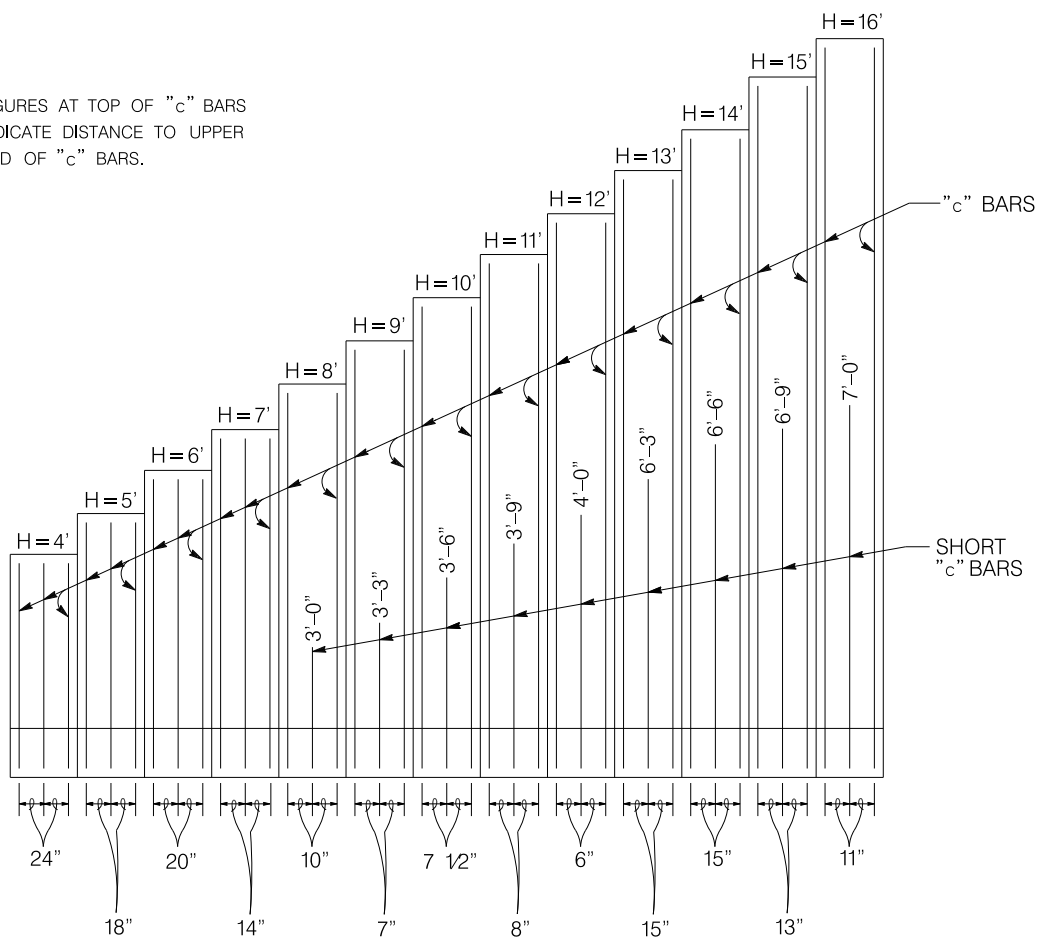
Chung
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

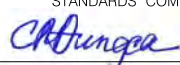
SDD-111

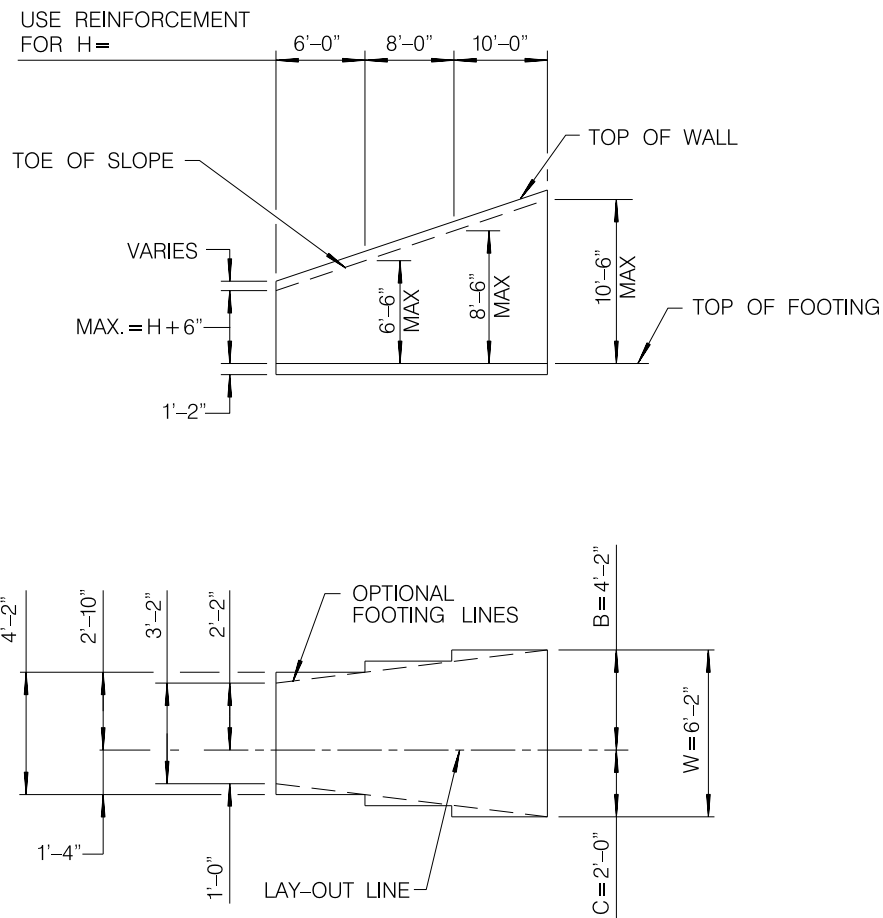
FIGURES AT TOP OF "c" BARS
INDICATE DISTANCE TO UPPER
END OF "c" BARS.



TYPICAL LAYOUT EXAMPLE 1

SHEET 4 OF 6

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	AR	J. NAGELVOORT	02/16	BOX CULVERT WINGWALL	
					COORDINATOR R.C.E. 56523
					DATE
					DRAWING NUMBER SDD-111




TYPICAL LAYOUT EXAMPLE 2

NOTES:

1. UNIT STRESSES: $f_s = 20,000$ PSI, $f_c = 1,200$ PSI, $n = 10$
 MAXIMUM TOE PRESSURE = $1 \frac{1}{2}$ TONS/SQ. FT.
 ELEVATIONS, LENGTH AND ANGLE OF FLARE OF WINGS MAY BE VARIED BY THE ENGINEER
 TO SUIT CONDITIONS ENCOUNTERED IN THE FIELD.
2. WALLS DESIGNED FOR 2'-0" LIVE LOAD SURCHARGE, 1 1/2:1 SLOPING SURCHARGE
 NOT TO EXCEED 5'-0" IN ELEVATION PLUS 2'-0" LIVE LOAD SURCHARGE, OR
 UNLIMITED 2:1 SURCHARGE. DIMENSIONS "H", "L", "M", "N", ELEVATION "A" AND "ANGLE OF FLARE"
 (AS APPLY) ARE SHOWN ON THE PLANS.
3. WALL HEIGHT MAY BE EXCEEDED BY 6" BEFORE GOING TO NEXT GREATER "H".
 ELIMINATE CUTOFF WALL IF ADJACENT CHANNEL IS PAVED AND SKEW IS 20° MAXIMUM.

SHEET 5 OF 6

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	AR	J. NAGELVOORT	02/16	BOX CULVERT WINGWALL	 COORDINATOR R.C.E. 56523
					2/25/16 DATE
					DRAWING NUMBER
					SDD-111

REINFORCED CONCRETE WINGWALLS – US

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

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

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

BOX CULVERT WINGWALL

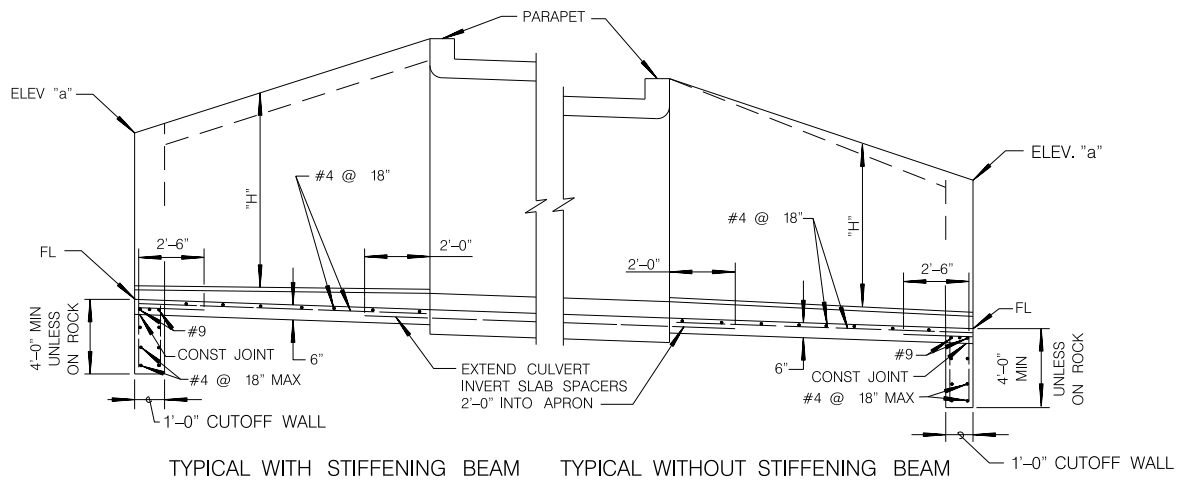
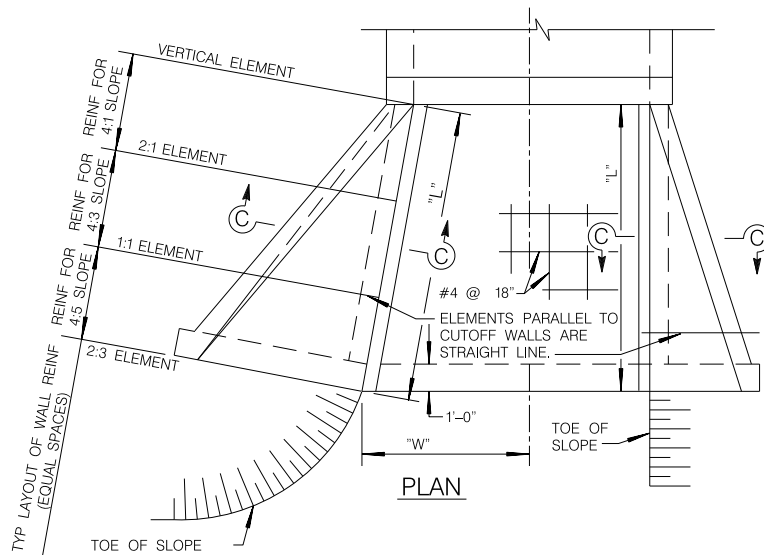
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR

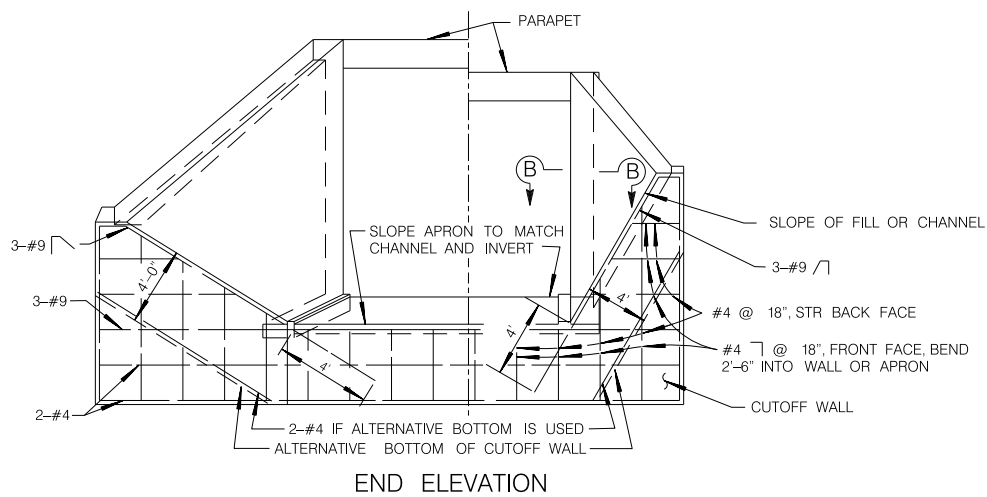
2/25/16
DATE

DRAWING
NUMBER

SDD-111



PART LONGITUDINAL SECTION



END ELEVATION

SHEET 1 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

BOX CULVERT WARPED WINGWALL

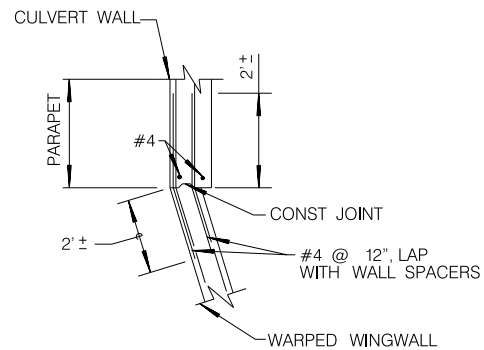
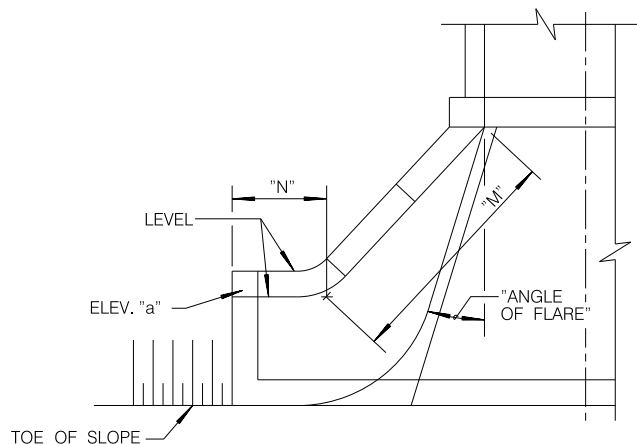
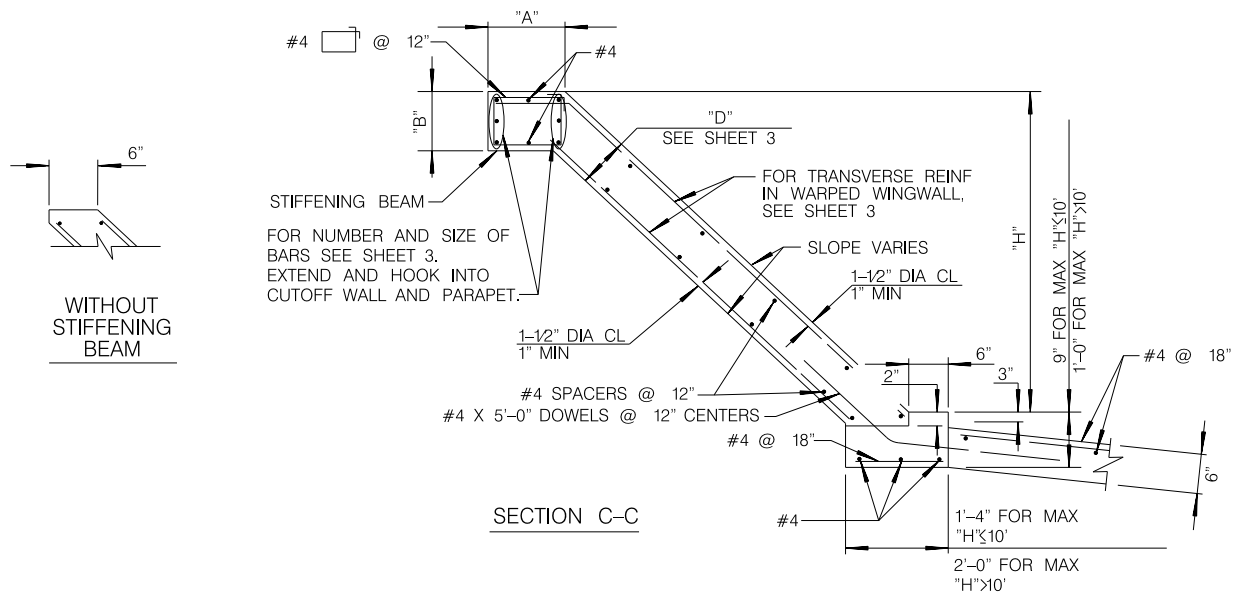
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CDRinger
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER


SDD-112



NOTES:

1. WALLS DESIGNED FOR 2' SURCHARGE; EARTH DENSITY=120 #/CU. FT.; EQUIVALENT FLUID PRESSURE = 36 #/CU. FT.
2. VARY "D" OF WARPED WALL UNIFORMLY FROM THAT CUTOFF WALL TO THAT AT CULVERT, FOR MAXIMUM "H" > 12' (3.66)
3. WHERE ABRASION IS ANTICIPATED INCREASE APRON THICKNESS TO 7" MINIMUM TO PROVIDE 2" MINIMUM REINFORCEMENT COVERAGE.
4. DIMENSIONS "L", "W", "H", "N", ELEVATION "a", "ANGLE OF FLARE", AND END "SLOPE (AS APPLY) ARE SHOWN ON THE PLANS.
5. CONCRETE SHALL BE 560-C-3250.
6. CHANNEL FENCING IS REQUIRED PER SDM-112 OR SDM-114. UNLESS OTHERWISE SHOWN ON THE PLANS, A CHAIN LINK FENCE 6' IN HEIGHT, WITH A TOP RAIL SET AT 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 10' GATES OR ON 20' GATE FOR VEHICULAR ACCES ARE REQUIRED AT A MAXIMUM OF 1000' INTERVALS AND BE PLACED ON EITHER SIDE. THE REMAINING ACCESS POINTS SHALL BE 4' GATES.

SHEET 2 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL*	KA	J. NAGELVOORT	01/12			2/25/16
UPDATED	RB	J. NAGELVOORT	02/16		COORDINATOR	R.C.E. 56523 DATE
				BOX CULVERT WARPED WINGWALL	DRAWING	SDD-112
					NUMBER	

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'	"L"				"H" max															
1/4:1	Front face reinf	#4@12	#4@7	#5@7	#5@5	#6@6	#7@7	#7@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																				
3/4:1	Front face reinf	#4@12	#4@12	#4@12	#4@12	#4@10	#4@8	#4@6											"A" = 1'-0"									
	Rear face reinf	#4@12	#4@12	#4@12	#4@12	#4@10	#4@7	#4@6																				
1-1/4:1	Front face reinf	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	#4@12	Total 6-#6																			
	Rear face reinf	#4@8	#4@8	#4@5	#5@6	#6@7	#6@6	#7@6																				
"D" at Cutoff Wall		6"	6"	6"	7-12"	8"	9-12"	11"											Total 6-#7									
"D" at Culvert		6"	6"	6"	8"	9-12"	11"	1'-1"	Total 6-#8																			
																			Total 8-#9									
									"A" = 1'-0"																			
									"B" = 1'-0"																			
									"B" = 1'-6"																			
									Total 8-#9																			

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

BOX CULVERT WARPED WINGWALL

SHEET 3 OF 3

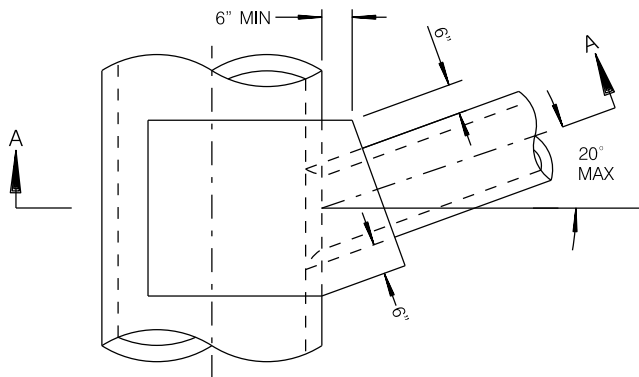
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chungwa
COORDINATOR

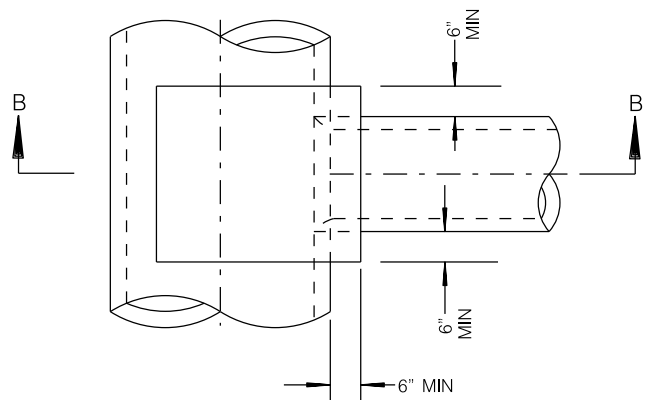
2/25/16
R.C.E. 56523 DATE

DRAWING
NUMBER

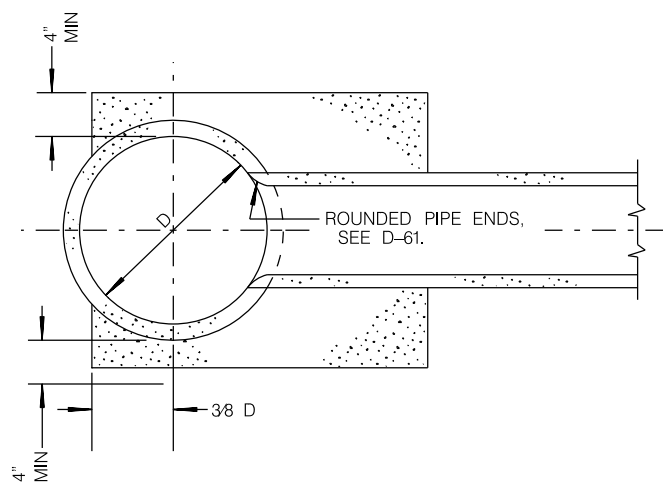
SDD-112



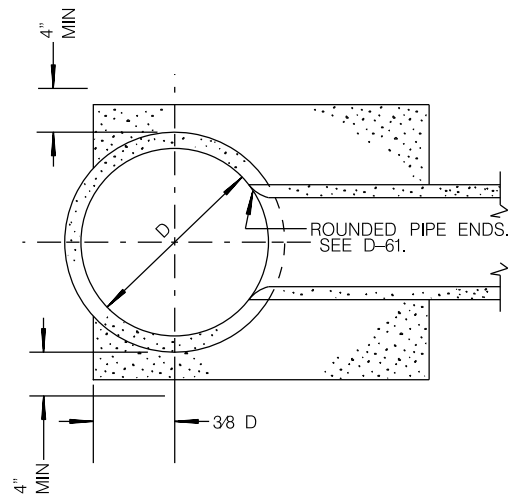
PLAN
SKEWED CONNECTION



PLAN
PERPENDICULAR CONNECTION



SECTION A-A

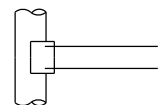



SECTION B-B

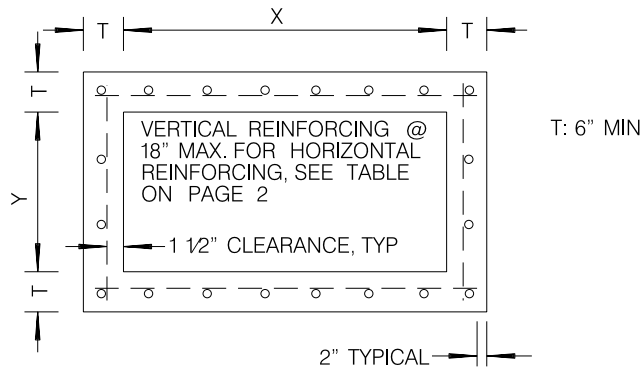
NOTES:

1. THE END OF CONNECTING PIPE SHALL NOT PROJECT INTO THE WATERWAY OF THE LARGER PIPE.
2. THE LARGER PIPE SHALL NOT BE LESS THAN 24" ID.
3. THE OD OF SMALLER PIPE SHALL NOT BE MORE THAN 2/3 THE SIZE OF THE LARGER PIPE ID.
4. CONCRETE SHALL BE 470-C-2000.

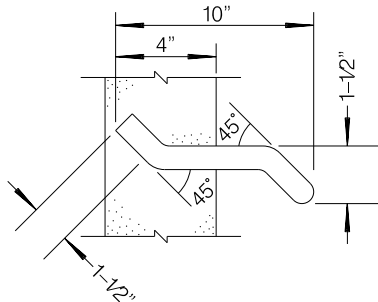
LEGEND ON PLANS



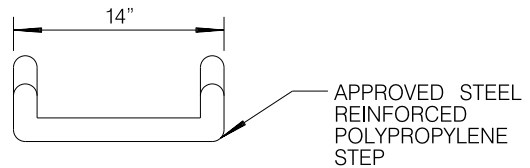
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
UPDATED*	KA	J. NAGELVOORT	01/12		
				CONCRETE LUG	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
					DRAWING NUMBER SDD-113



TYPICAL BOX SECTION



STEP DETAIL



APPROVED STEEL
REINFORCED
POLYPROPYLENE
STEP

NOTES:


1. CONCRETE SHALL BE 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 LOCATED ON SHEET 2.
9. WALL THICKNESS SHALL BE STEPPED ON THE OUTSIDE OF THE BOX.
10. WHEN THE STRUCTURE DEPTH V EXCEEDS 4', STEPS SHALL BE CAST INTO THE WALL AT 15" INTERVALS FROM 15" ABOVE FLOOR TO WITHIN 12" OF TOP OF STRUCTURE. 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 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.
13. TYPICAL REINFORCEMENT LAP SHALL BE 30 TIMES THE BAR DIAMETER MINIMUM. DIMENSION T SHALL BE 6" MINIMUM.
14. MARK EVERY STORM DRAIN INLET WITHIN THE PROJECT BOUNDARIES WITH ADHESIVE DECAL-DISCS ON EXISTING INLETS OR AN IMBEDED CONCRETE STAMP ON NEW INLETS.
15. ON CURB INLETS, PLACE MARKER ON TOP OF THE INLET ROOF. ON CATCH BASIN, IMPRINT STAMP NEXT TO INLET GRATE.
16. NO RECYCLED WATER SHALL ENTER INTO STORM DRAIN.

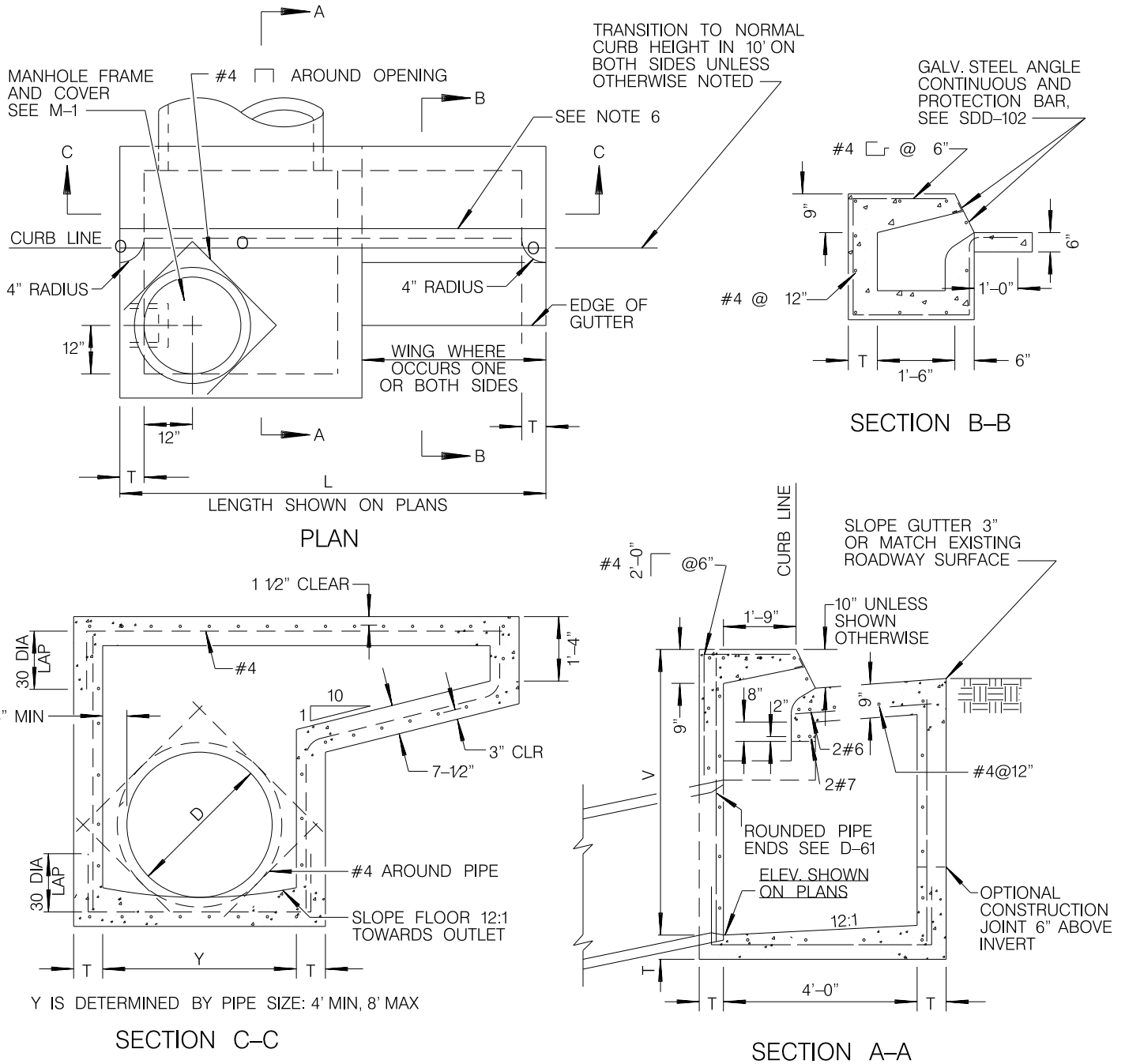
SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	FR	J. NAGELVOORT	07/15	INLETS AND CLEANOUTS NOTES AND DETAILS	<i>CRDungwa</i> 7/21/15 COORDINATOR R.C.E. 56523 DATE
				DRAWING NUMBER SDD-114	

BOX SECTION HORIZONTAL REINFORCEMENT				
MAXIMUM SPAN X OR Y	DEPTH V	THICKNESS T	HOR. & FLR. REINF.	
3'-0" TO 4'-0"	4'-0"	6"	#4	18"
4'-1" TO 7'-0"		6"	#4	12"
7'-0" TO 8'-0"		6"	#4	8"
3'-0" TO 4'-0"	4'-1" TO 8'-0"	6"	#4	18"
4'-1" TO 5'-0"		6"	#4	12"
5'-1" TO 6'-0"		6"	#4	8"
6'-1" TO 8'-0"		6"	#4	6"
3'-0" TO 4'-0"	8'-1" TO 12'-0"	6"	#4	15"
4'-1" TO 5'-0"		8"	#4	12"
5'-1" TO 6'-0"		8"	#4	8"
6'-1" TO 8'-0"		8"	#4	6"
3'-0" TO 4'-0"	12'-1" TO 16'-0"	8"	#4	12"
4'-1" TO 5'-0"		8"	#4	12"
5'-1" TO 6'-0"		8"	#4	8"
6'-1" TO 7'-0"		8"	#4	6"
7'-1" TO 8'-0"		8"	#5	8"
3'-0" TO 4'-0"	16'-1" TO 20'-0"	8"	#4	12"
4'-1" TO 5'-0"		10"	#4	12"
5'-1" TO 6'-0"		10"	#4	8"
6'-1" TO 7'-0"		10"	#4	6"
7'-1" TO 8'-0"		10"	#5	8"
3'-0" TO 4'-0"	20'-1" TO 24'-0"	8"	#4	12"
4'-1" TO 5'-0"		10"	#4	12"
5'-1" TO 6'-0"		10"	#4	8"
6'-1" TO 7'-0"		10"	#4	6"
7'-1" TO 8'-0"		12"	#5	8"

SHEET 2 OF 2

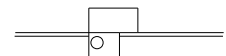
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR R.C.E. 56523	7/21/15 DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12			
UPDATED	FR	J. NAGELVOORT	07/15	INLETS AND CLEANOUTS NOTES AND DETAILS	DRAWING NUMBER	SDD-114

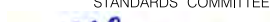


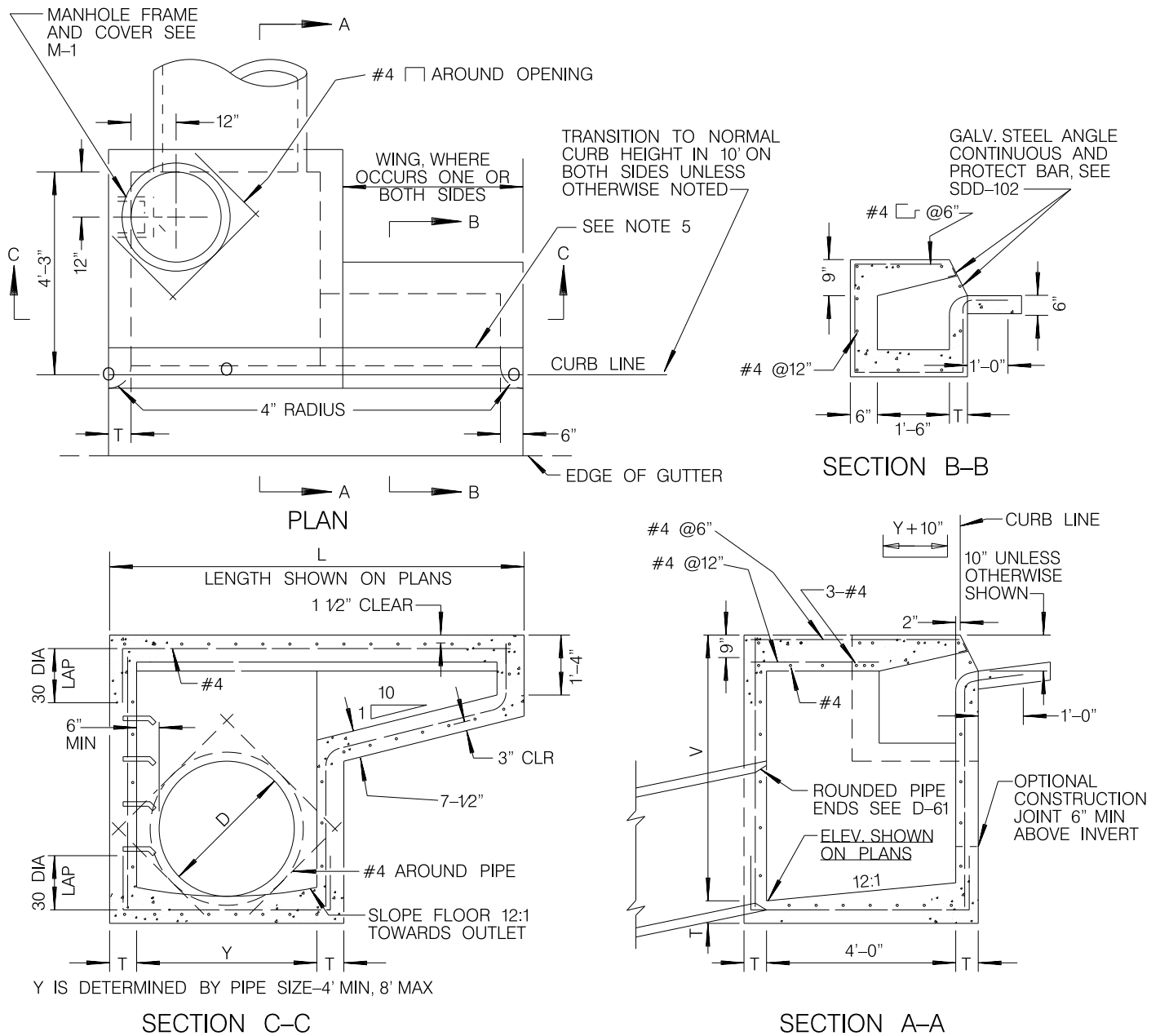
NOTES

1. TYPES ARE DESIGNATED AS FOLLOWS: (NO WING)A, (ONE WING)A-1, (TWO WINGS)A-2.
2. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF 12".
3. WHEN V EXCEEDS 4', STEPS SHALL BE INSTALLED.
4. CONCRETE GUTTER TO MATCH ADJACENT GUTTERS
5. AN EXPANSION JOINT SHALL BE PLACED AT THE ENDS OF THE INLET WHERE THE CURB IS TO ADJOIN PER G-10.
6. PROVIDE 1/4" TOOLED GROOVE IN TOP SLAB IN LINE WITH BACK OF ADJACENT CURB.
7. SURFACE OF TOP SLAB BE SIDEWALK FINISHED TO DRAIN TOWARD STREET AT A SLOPE OF 1/4" PER FOOT.
8. ELEVATION SHALL BE SHOWN ON THE PLANS WHERE INDICATED "O" SYMBOL.
9. SEE SDD-102 AND SDD-114 FOR ADDITIONAL NOTES AND DETAILS.

LEGEND ON PLANS



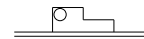
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	<div>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</div> <div> COORDINATOR R.C.E. 56523</div> <div>2/25/16 DATE</div>
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	10/15		
UPDATED	HN	J. NAGELVOORT	02/16		
				CURB INLET - TYPE A	DRAWING NUMBER
					SDD-115




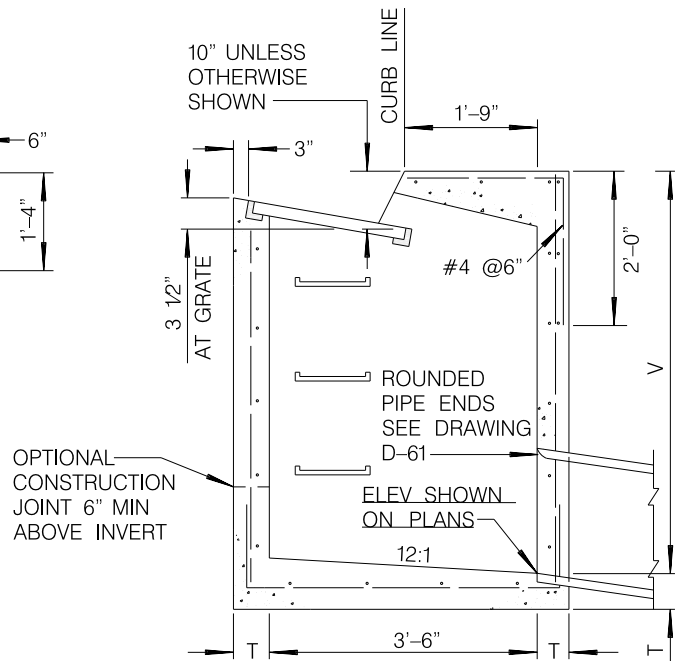
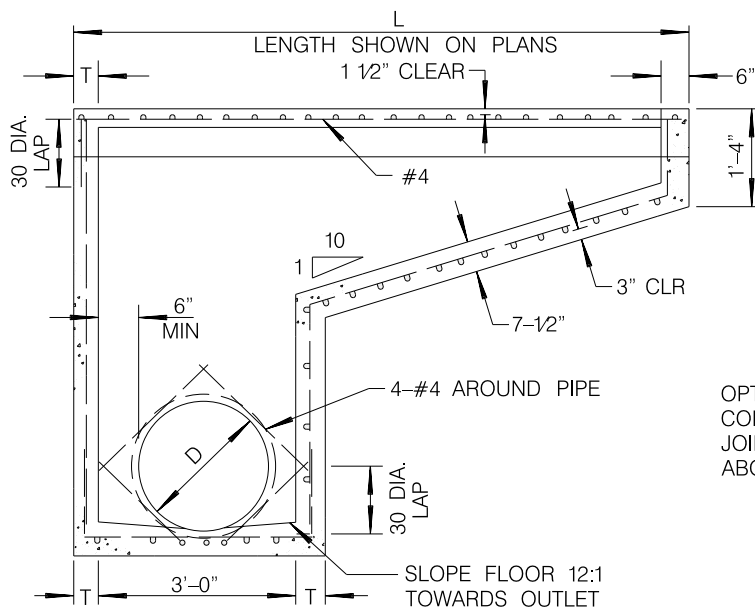
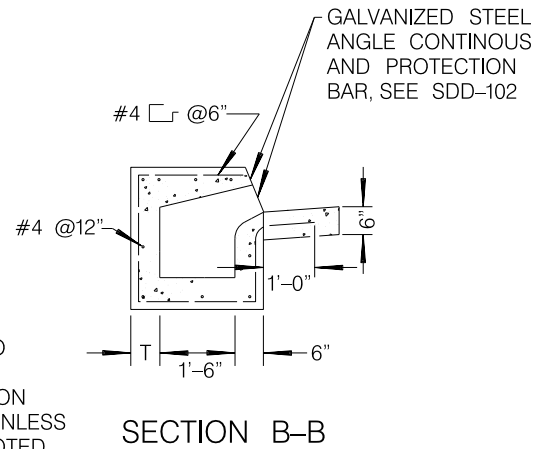
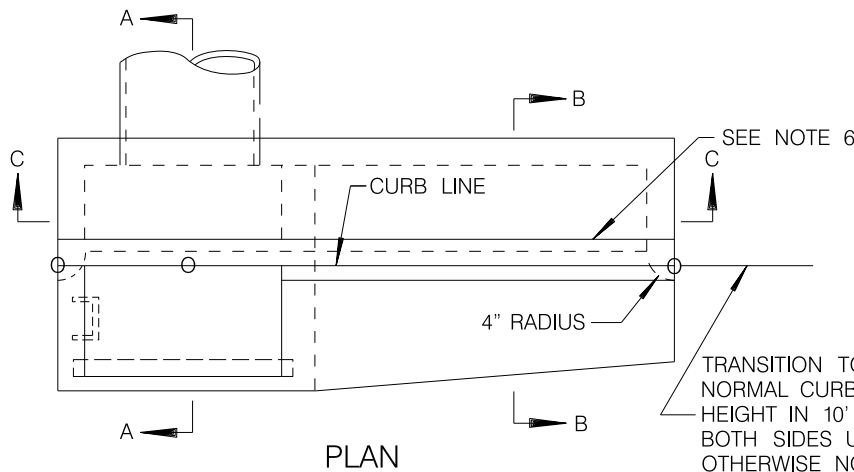
NOTES

1. TYPES ARE DESIGNATED AS FOLLOWS: (NO WING)B, (ONE WING)B-1, (TWO WINGS)B-2.
2. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF 1/2".
3. WHEN V EXCEEDS 4', STEPS SHALL BE INSTALLED.
4. CONCRETE GUTTER TO MATCH ADJACENT GUTTERS.
5. AN EXPANSION JOINT SHALL BE PLACED AT THE ENDS OF THE INLET WHERE THE CURB IS TO ADJOIN PER G-10.
6. PROVIDE 1/4" TOOLED GROOVE IN TOP SLAB IN LINE WITH BACK OF ADJACENT CURB.
7. SURFACE OF TOP SLAB BE SIDEWALK FINISHED TO DRAIN TOWARD STREET AT A SLOPE OF 1/4" PER FOOT.
8. ELEVATIONS SHALL BE SHOWN ON THE PLANS WHERE INDICATED BY "O" SYMBOL.
9. SEE SDD-102 AND SDD-114 FOR ADDITIONAL NOTES AND DETAILS.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	10/15	CURB INLET - TYPE B	 COORDINATOR R.C.E. 56523
UPDATED	HN	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDD-116



NOTES

1. TYPES ARE DESIGNATED AS FOLLOWS: (NO WING) C, (ONE WING) C-1, (TWO WINGS) C-2.
2. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF 12".
3. WHEN V EXCEEDS 4', STEPS SHALL BE INSTALLED.
4. CONCRETE GUTTER TO MATCH ADJACENT GUTTERS.
5. AN EXPANSION JOINT SHALL BE PLACE AT THE ENDS OF THE INLET WHERE THE CURB IS TO ADJOIN PER G-10.
6. PROVIDE 1/4" TOOLED GROOVE IN TOP SLAB IN LINE WITH BACK OF ADJACENT CURB.
7. SURFACE OF TOP SLAB SHALL BE SIDEWALK FINISHED TO DRAIN TOWARD STREET AT A SLOPE OF 1/4" PER FOOT.
8. WHERE INLET IS TO BE CONSTRUCTED ON GRADE AND D-3B CONCRETE APRON IS REQUIRED, LIFT DOWN-GRADE END OF GRATE.
9. SEE SDD-102 AND SDD-114 FOR ADDITIONAL NOTES AND DETAILS.
10. ELEVATION SHALL BE SHOWN ON PLANS WHERE INDICATED BY "O" SYMBOL.
11. DIAMETER D SHALL BE 24" MAXIMUM. FOR LARGER DIAMETER PIPES THIS DRAWING MUST BE MODIFIED.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HN	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

CURB INLET - TYPE C

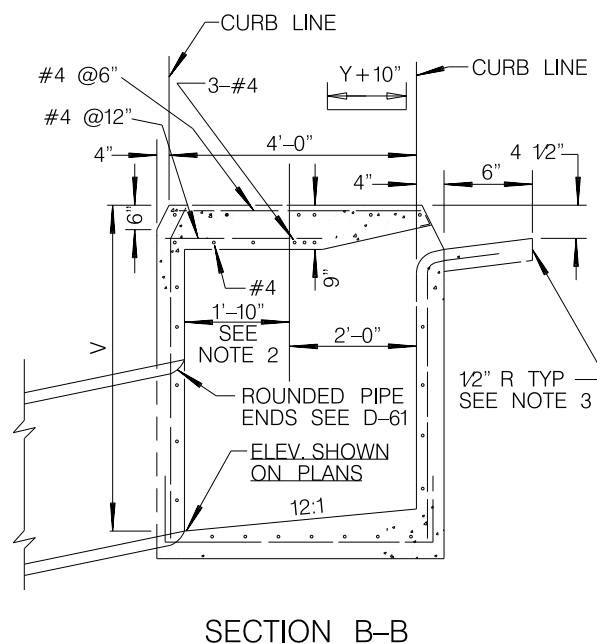
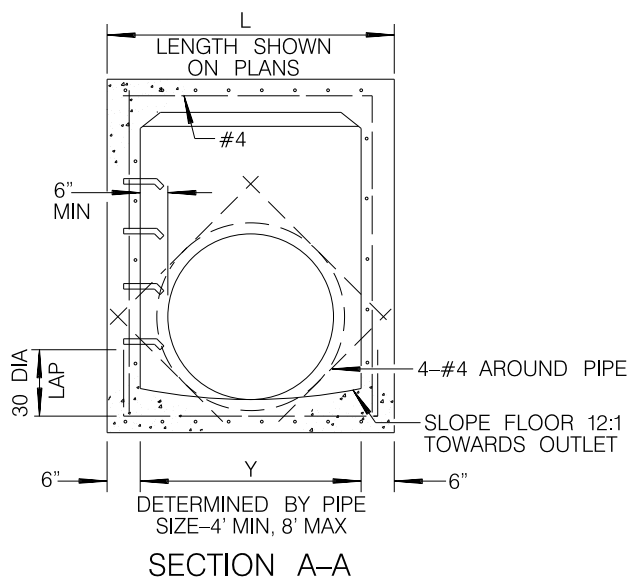
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Bungea
COORDINATOR

2/25/16
R.C.E. 56523 DATE

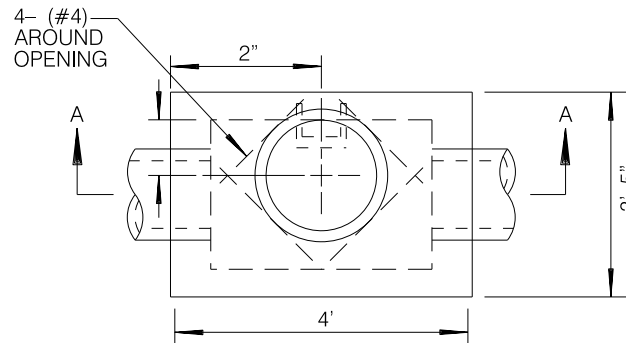
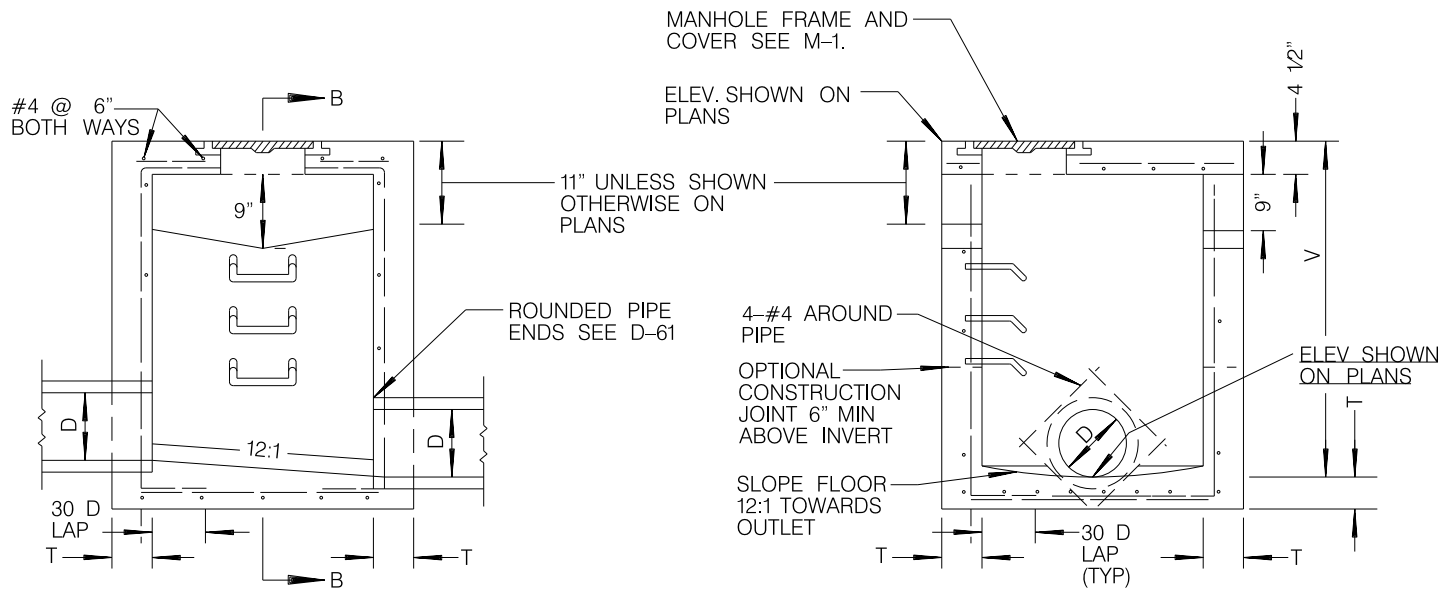
DRAWING
NUMBER

SDD-117



SECTION A-A

SDD-118




NOTES

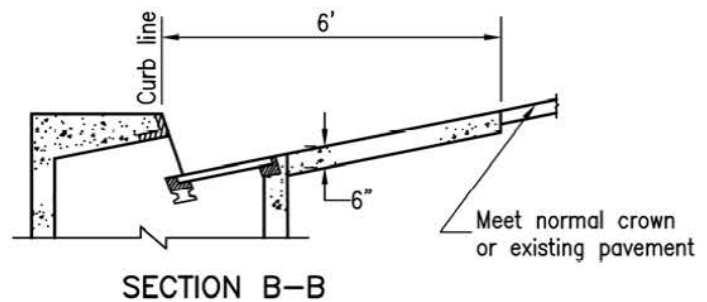
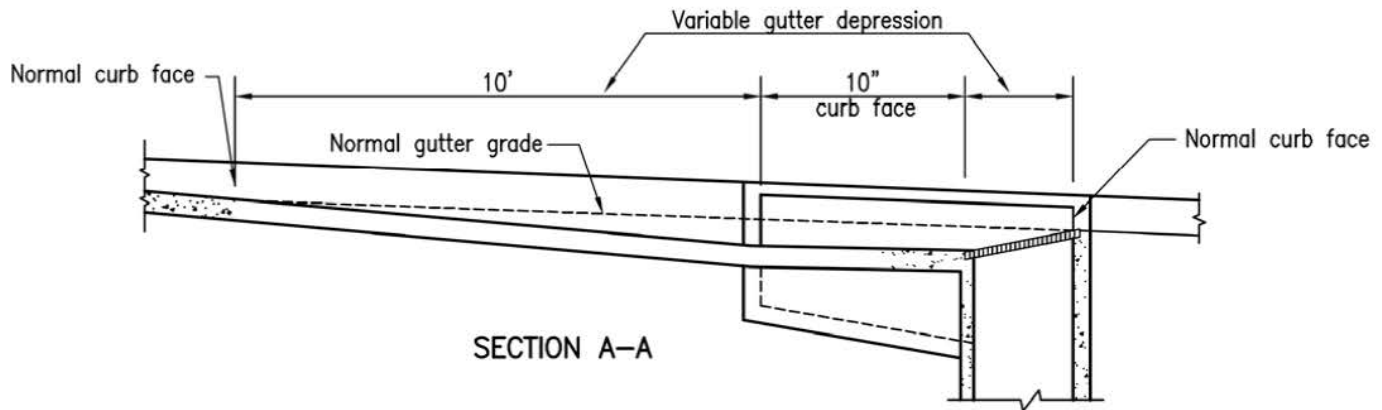
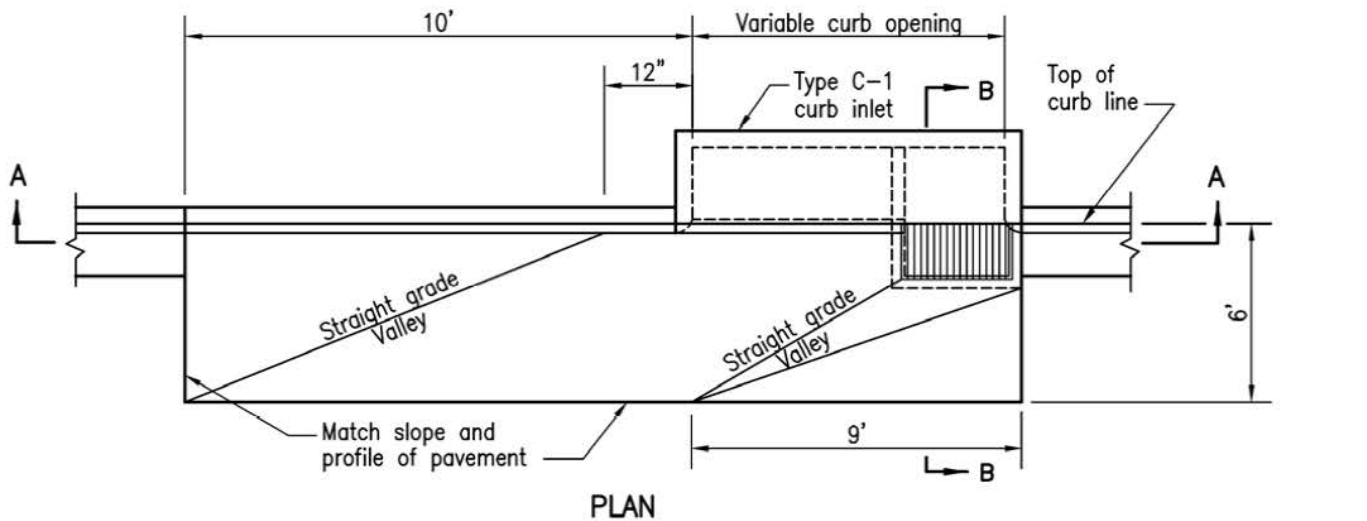
1. WHEN V EXCEEDS 4', STEPS SHALL BE INSTALLED.
2. EXPOSED EDGES OF CONCRETE SHALL BE ROUNDED WITH A RADIUS OF 1/2".
3. CONSTRUCT OPENINGS ON BOTH SIDES UNLESS OTHERWISE SHOWN ON PLANS.
4. MAINTAIN 1-1/2" CLEAR SPACING BETWEEN REINFORCING AND SURFACE.
5. INSTALL 1" STEEL PROTECTION BAR.
6. DIAMETER "D" SHALL BE 18" MAX, FOR LARGER DIAMETER PIPES THIS DRAWING MUST BE MODIFIED.
7. SEE SDD-114 FOR ADDITIONAL NOTES AND DETAILS.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	10/15	CATCH BASIN - TYPE F	 COORDINATOR R.C.E. 56523
UPDATED	HN	J. NAGELVOORT	02/16		
					2/25/16 DATE
					DRAWING NUMBER

SDD-119



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 shown on Section B-B of D-03A.
4. Concrete shall be 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
Replaced D-20		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE APRON FOR TYPE C CURB INLET

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

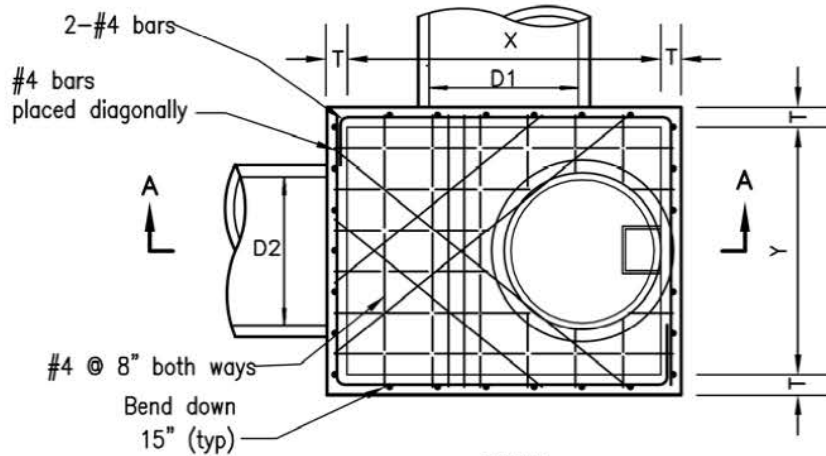
T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

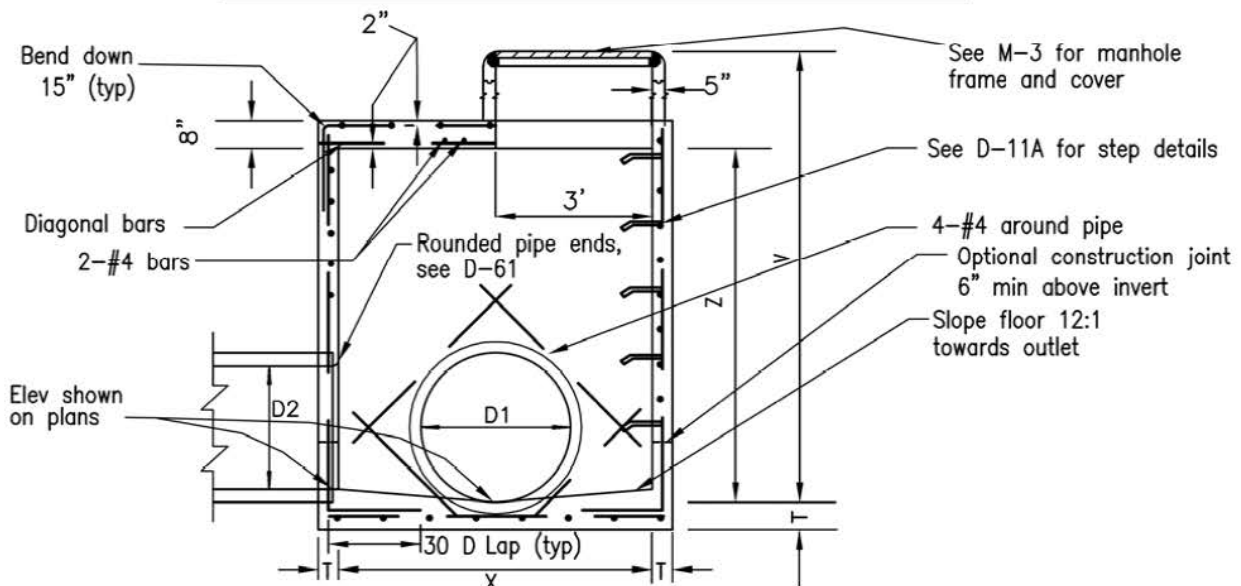
D-03B

FOR DRAWING D-3A SEE DRAWING SDD-117



PLAN

TYPE	PIPE DIAMETER (D1)	X	Y (See Note 8)	Z
A4	up to 39"	4'	4'	6'
A5	42" to 48"	5'	4'	6'
A6	51" to 60"	6'	4'	6'
A7	63" to 66"	7'	4'	7'
A8	69" to 78"	8'	4'	8'

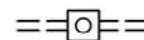


SECTION A-A

NOTES

1. See D-11A & D-11B for additional notes and details.
2. Concrete base shall be 560-C-3250.
3. All precast components shall be reinforced with 1/4" diameter steel, wound spirally on 4" centers.
4. All joints shall be set in Class C mortar.
5. Maintain 1-1/2" clear spacing between reinforcing and concrete surface unless otherwise noted.
6. Exposed edges of concrete shall be rounded with a radius of 1/2".
7. Manhole cover to be marked "Storm Drain".
8. Modifications to "Y" dimension required if pipe (D2) exceeds 39".
9. If constructed adjacent to sidewalk, top of manhole to match sidewalk slope.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

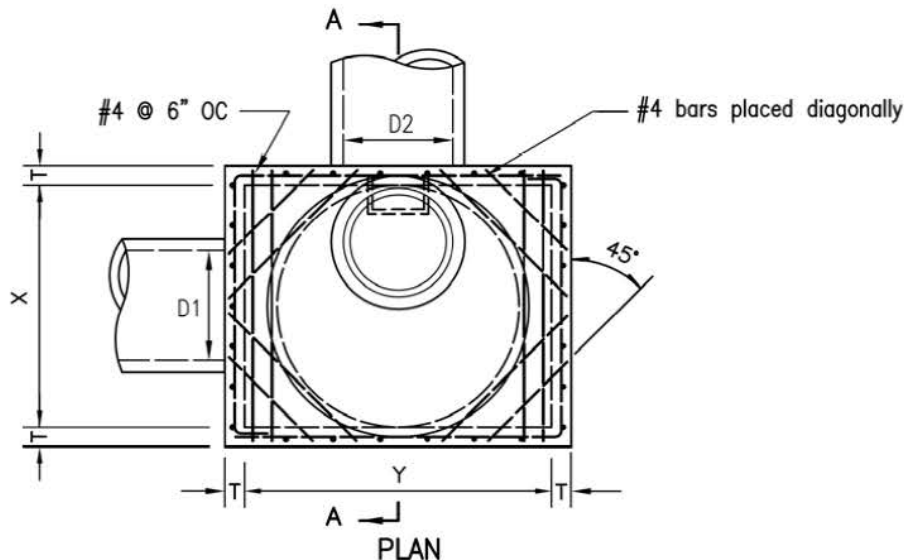
STORM DRAIN CLEANOUT - TYPE A

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-09**

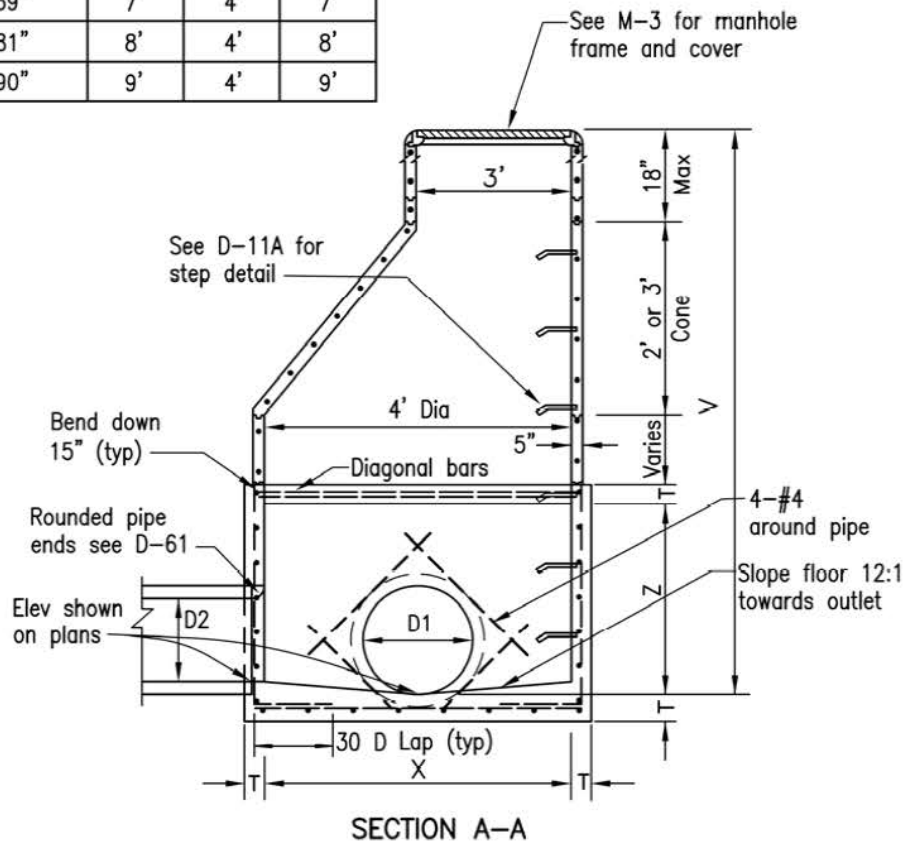
FOR DRAWINGS D-11A AND D-11B, SEE DRAWING SDD-114



TYPE	PIPE DIAMETER (D1)	X	Y	Z
B5	up to 51"	5'	4'	5'
B6	54" to 60"	6'	4'	6'
B7	63" to 69"	7'	4'	7'
B8	72" to 81"	8'	4'	8'
B9	84" to 90"	9'	4'	9'

NOTES

1. See D-11A & D-11B for additional notes and details.
2. All joints shall be set in Class C mortar.
3. All precast components shall be reinforced with 1/4" diameter steel wound spirally on 4" centers.
4. Maintain 1-1/2" clear spacing between reinforcing and concrete surface.
5. Concrete base shall be 560-C-3250.
6. Exposed edges of concrete shall be rounded with a 1/2" radius.
7. Manhole cover to be marked "Storm Drain".
8. Modifications to "Y" dimension required if pipe (D2) exceeds 39".
9. If constructed adjacent to sidewalk, top of manhole to match sidewalk slope.



LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

STORM DRAIN CLEANOUT - TYPE B

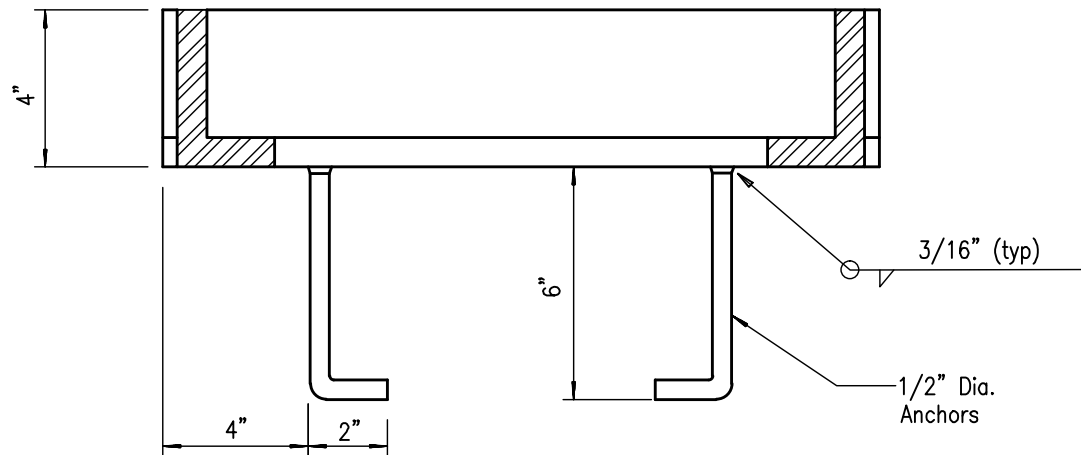
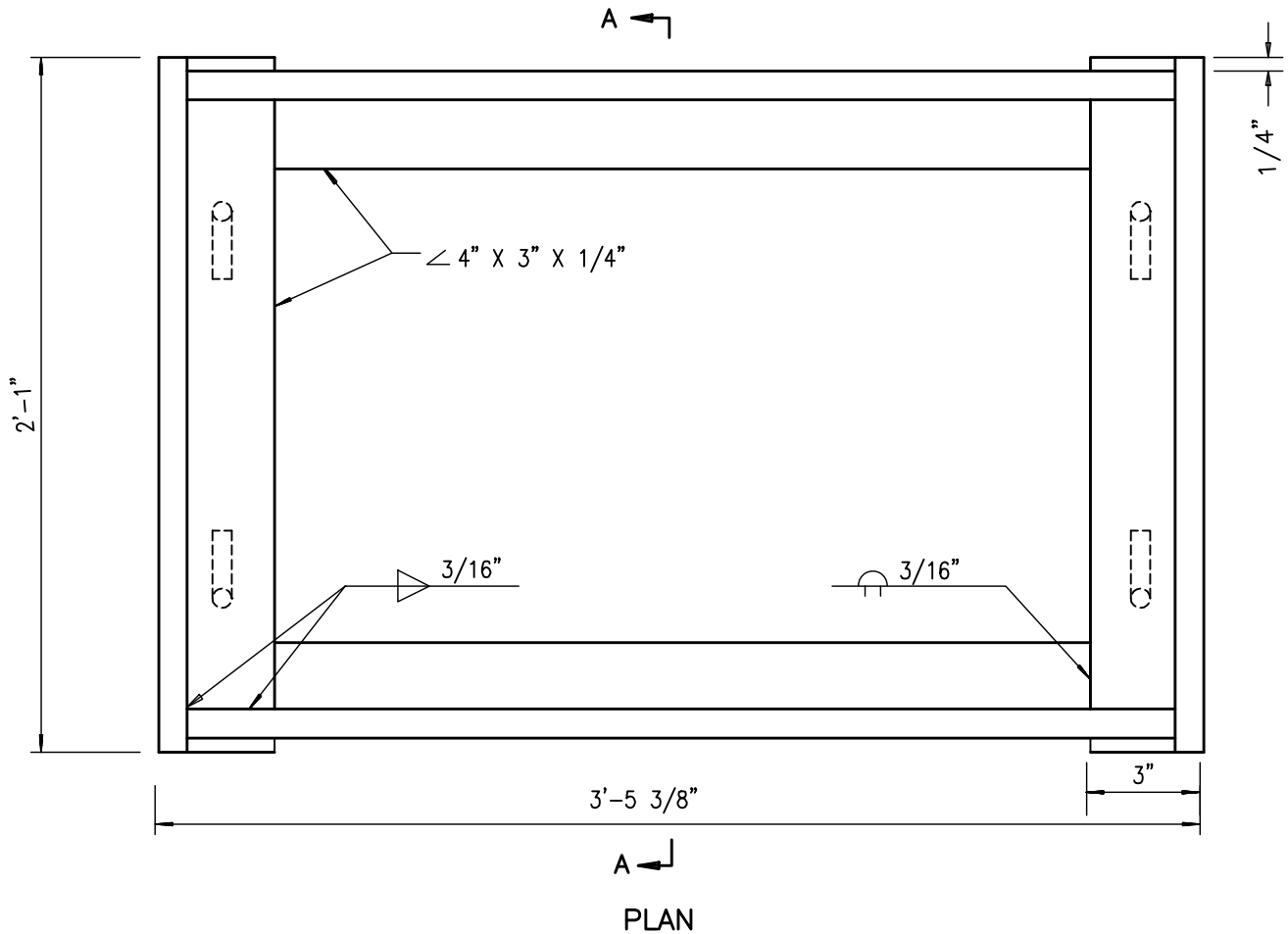
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-10**

FOR DRAWINGS D-11A AND D-11B, SEE DRAWING SDD-114



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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

WELDED STEEL GRATE FRAME

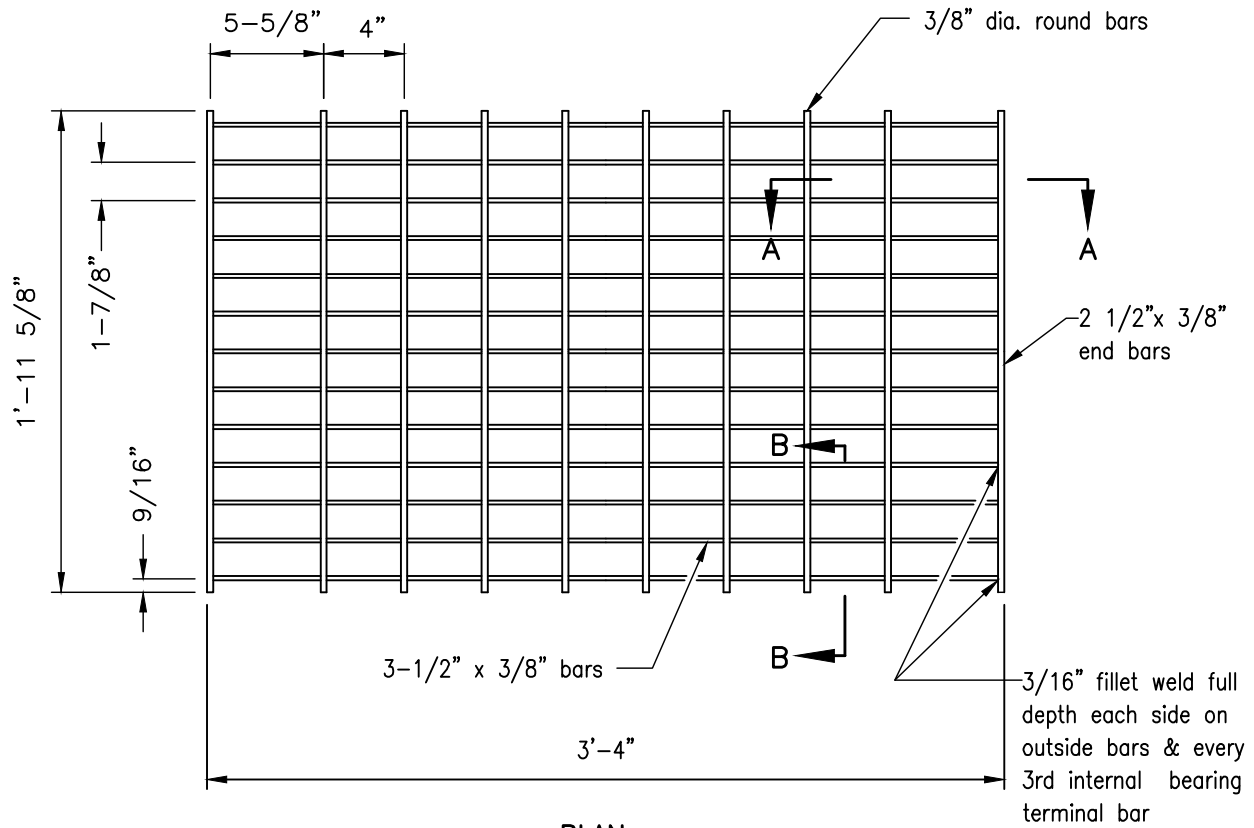
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

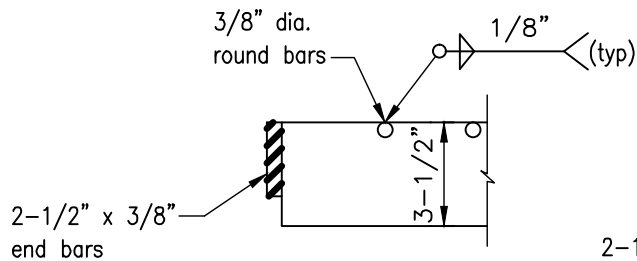
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

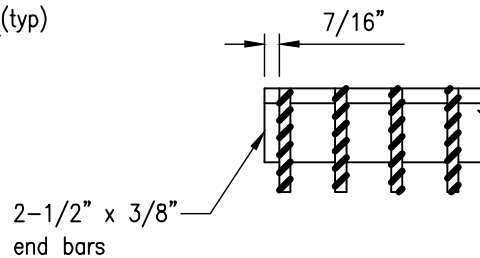
D-13



PLAN



SECTION A-A



SECTION B-B

NOTES

1. Hot dip galvanize all parts after fabrication.
2. Dimensions are to centerline of bars unless otherwise noted.
3. Not to be used in pedestrian areas.
4. Weight: 200lbs +/-

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE STRUCTURE GRATE

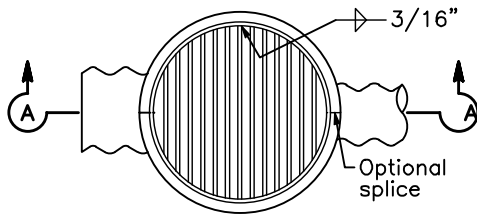
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

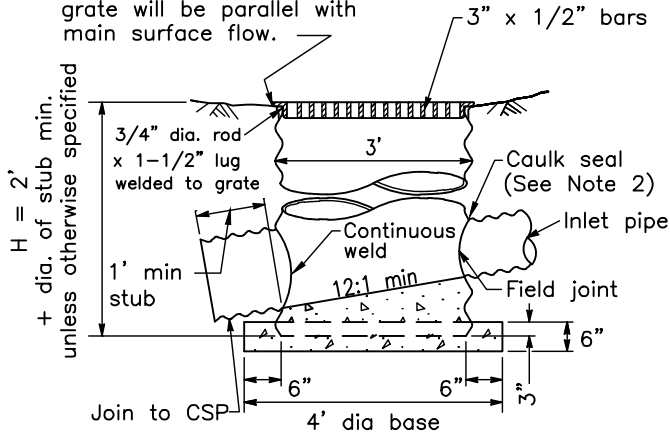
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

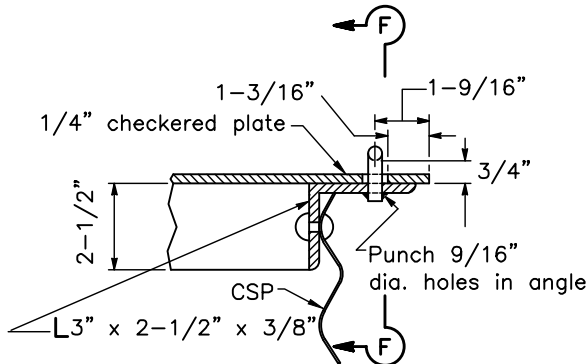
D-15



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



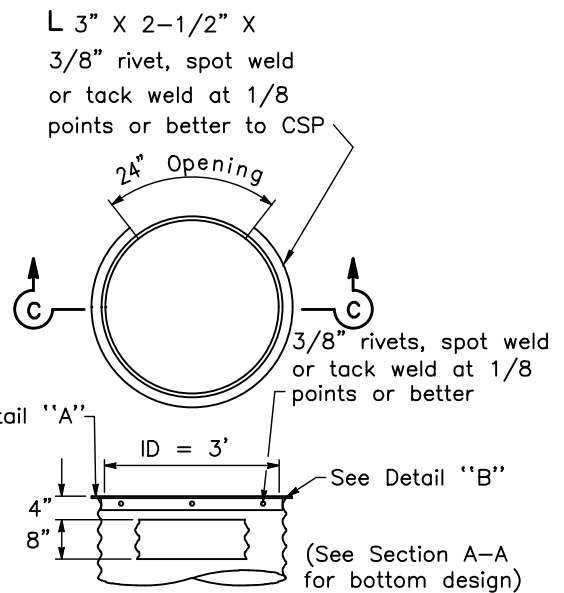
SECTION A-A
TYPE A



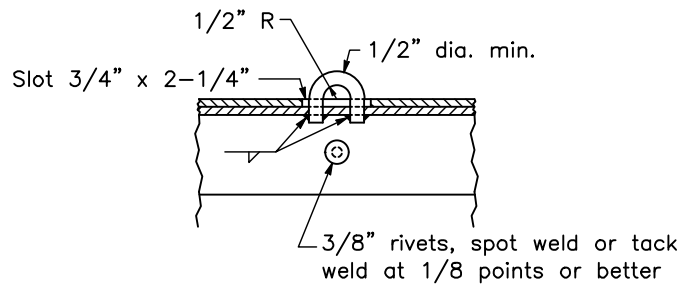
DETAIL "B"

NOTES

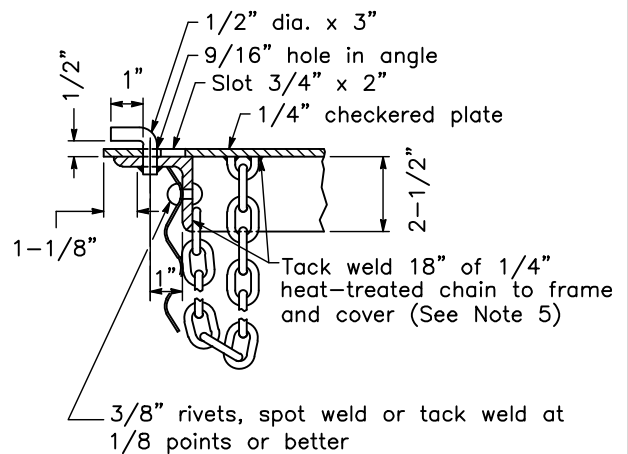
1. All components shall be galvanized.
2. Inlet and outlet pipes shall be set at factory and positioned as shown on plans.
3. See D-17B for ladder and step details.
4. See D-17A for additional grate details.
5. Grate to be provided when specified.
6. Grate detail shall be as shown on D-17A unless otherwise approved by Agency.



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
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

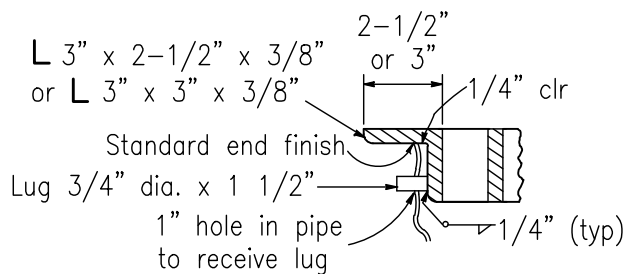
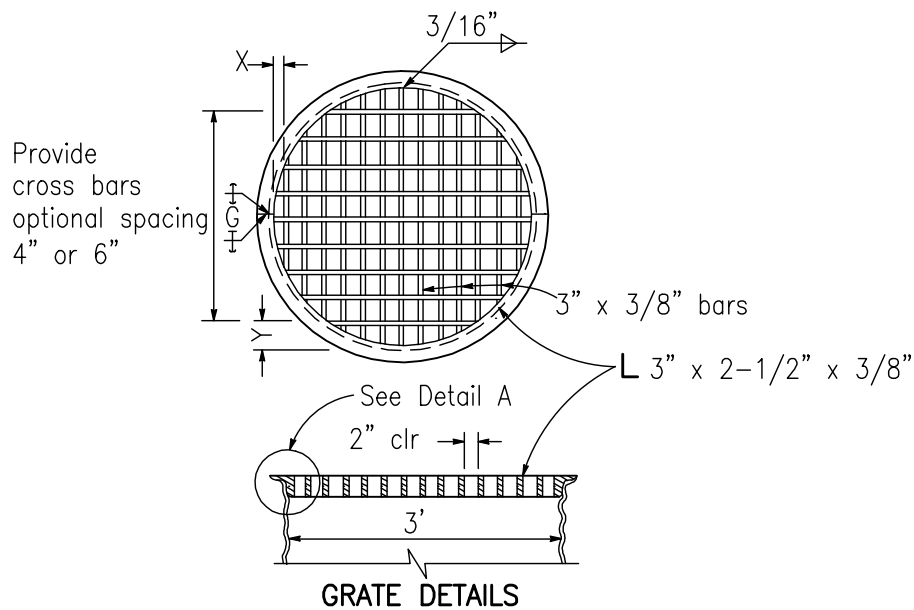
CORRUGATED STEEL PIPE INLETS TYPES A AND B

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

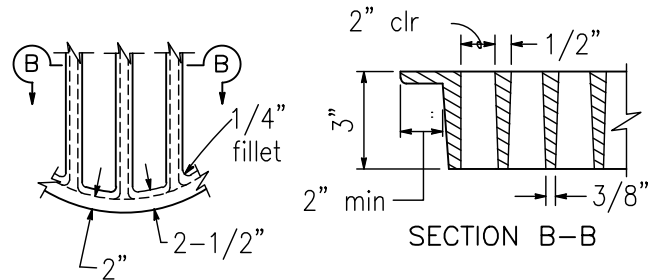
T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

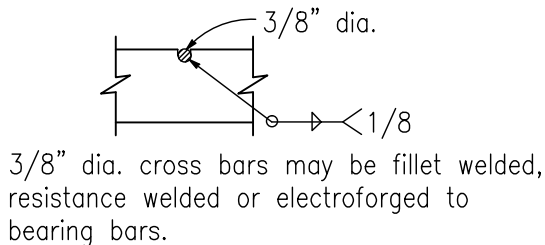
DRAWING
NUMBER **D-16**



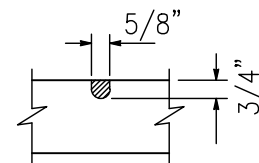
DETAIL A



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



**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	
				4" SPACING	6" SPACING
Welded Steel	15	2"	9/16"	3-3/4"	5-3/4"
Cast	13	2"	2-1/8"	3-3/4"	5-3/4"

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

**CORRUGATED STEEL PIPE INLETS,
DETAILS**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

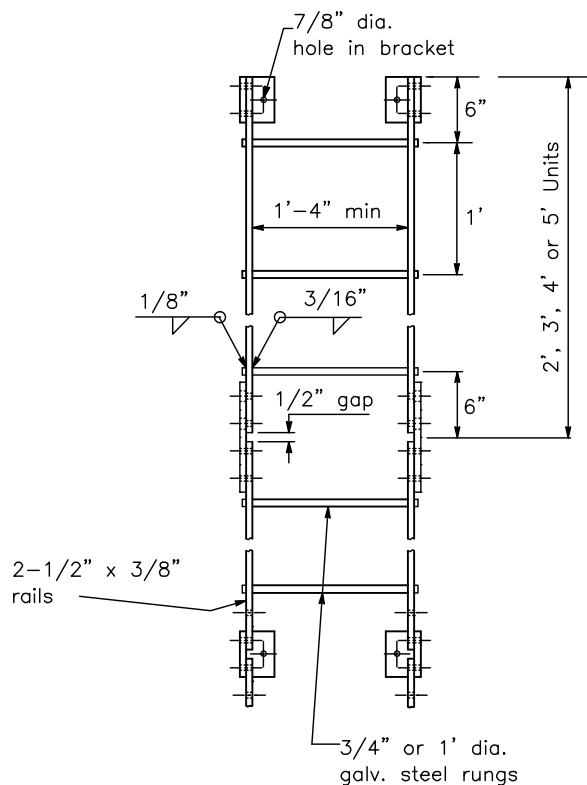
T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

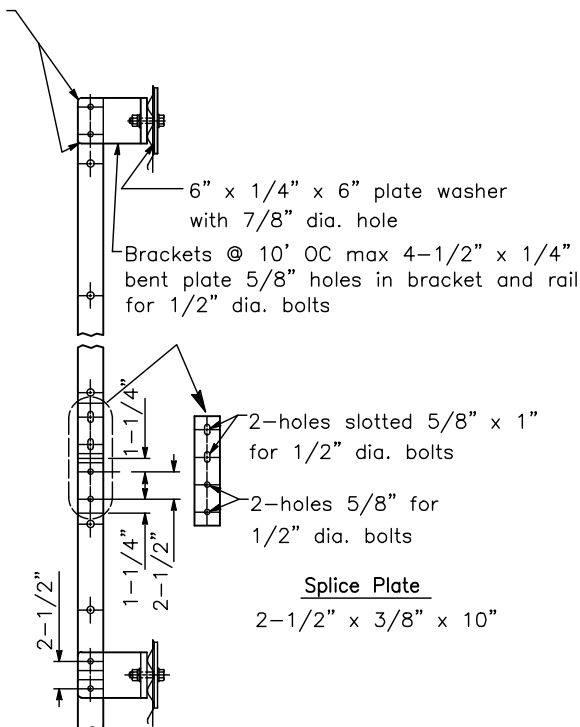
DRAWING
NUMBER

D-17A

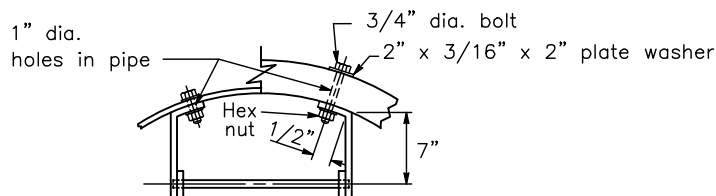
Grind all exposed corners 1/4" radius



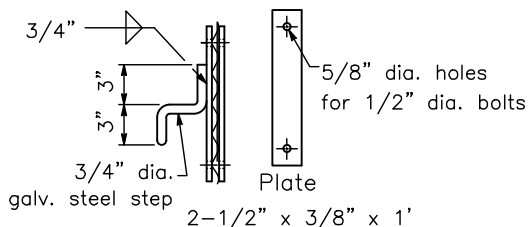
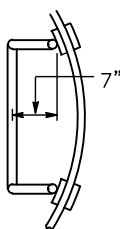
FRONT VIEW



SIDE VIEW



LADDER DETAIL
H=5' or greater



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

NOTE

See Note 3 on D-16 for ladder requirements.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

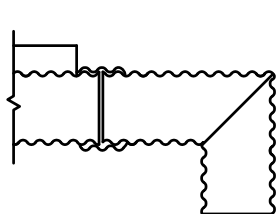
SAN DIEGO REGIONAL STANDARD DRAWING

**CORRUGATED STEEL PIPE INLETS,
DETAILS**

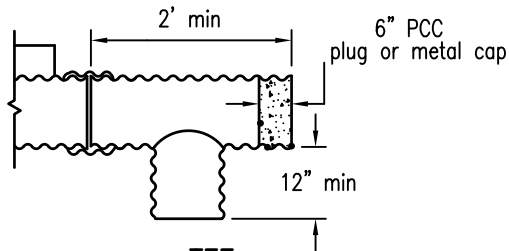
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

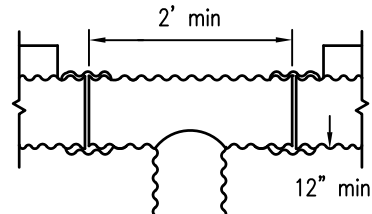
DRAWING
NUMBER **D-17B**



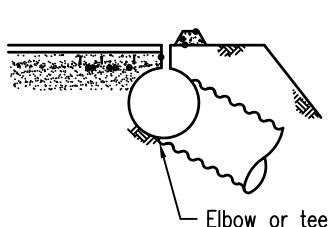
ELBOW



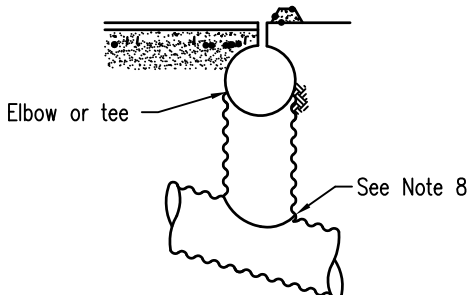
TEE



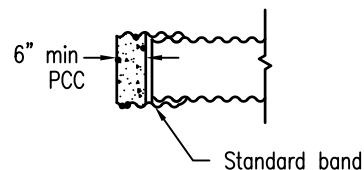
TEE-SAG CONDITION



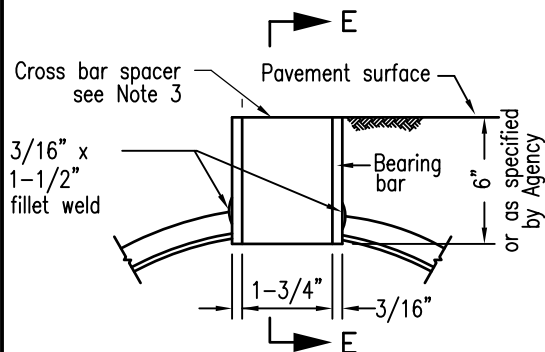
OVERSIDE DRAIN



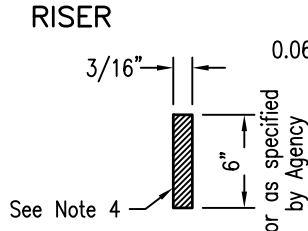
RISER



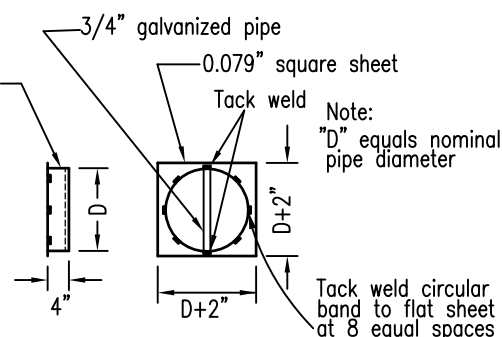
BAND PLUG



SECTION D-D
GRATE SLOT DETAIL

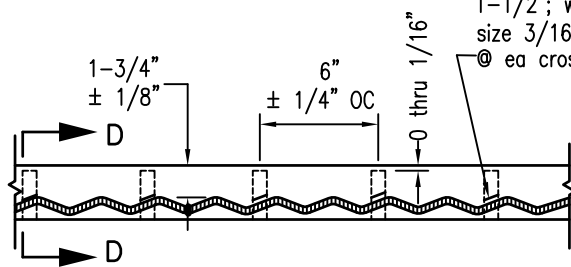


SECTION E-E

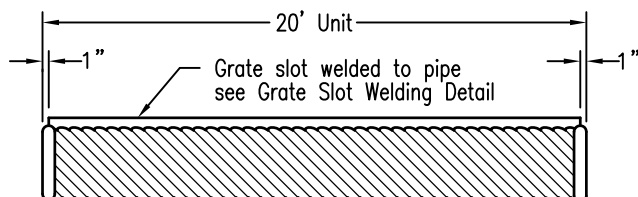


METAL CAP DETAIL

Min weld length
1-1/2"; weld
size 3/16" min
@ ea cross bar



GRATE SLOT WELDING DETAIL



GRATE SLOT DRAIN

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 1/2" in 20'.
7. Installation lengths shall be 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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SLOTTED CORRUGATED STEEL PIPE DRAINS

12" THROUGH 24"

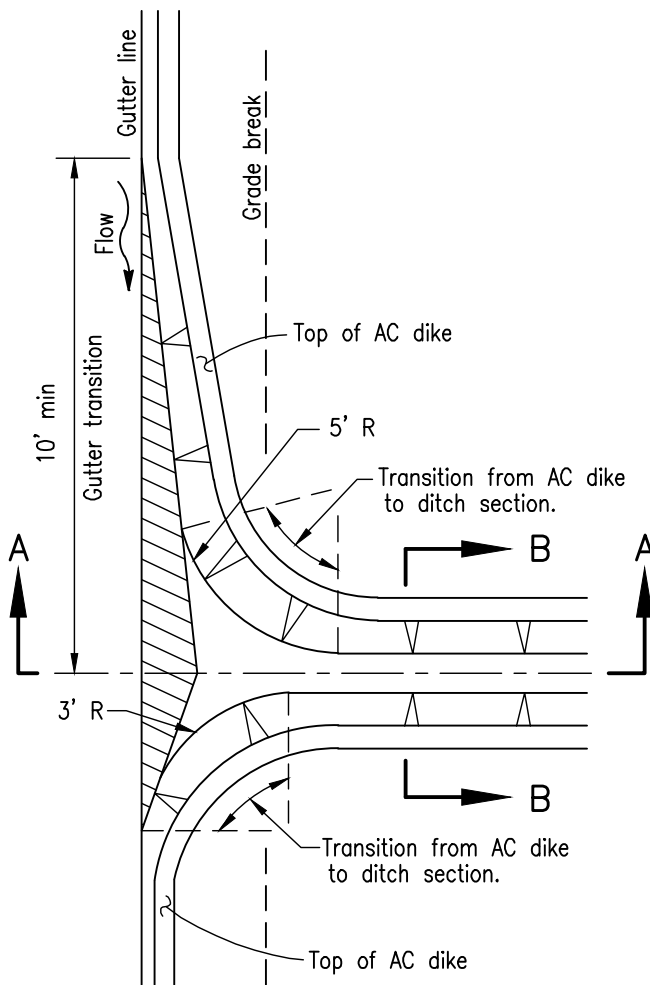
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

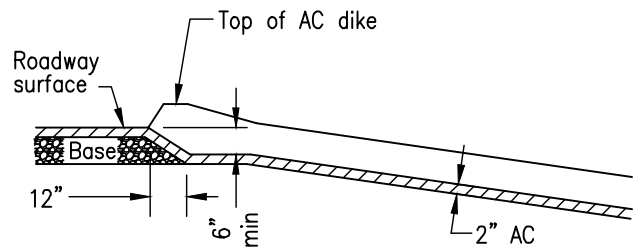
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

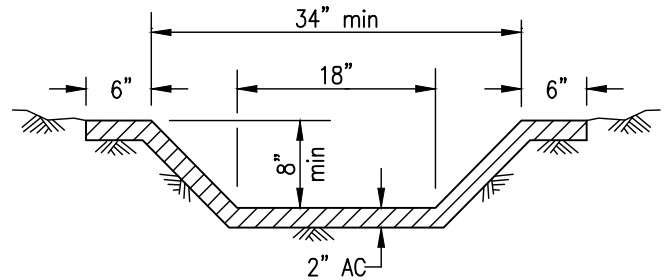
D-18



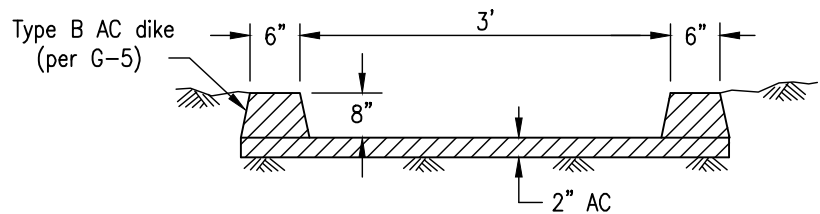
PLAN



SECTION A-A



SECTION B-B

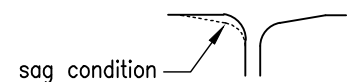


ALTERNATE SECTION B-B

NOTES

1. AC spillway may be used when fill is 10' or less, and where fill slope 1-1/2:1 or flatter.
2. Use 10' min length of gutter transition on each side of downdrain in sag condition.
3. Cross sectional area of ditch (Section B-B) may be trapezoidal or semi-circular; semi-circular sectional area must provide an equal flow capacity as trapezoidal.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

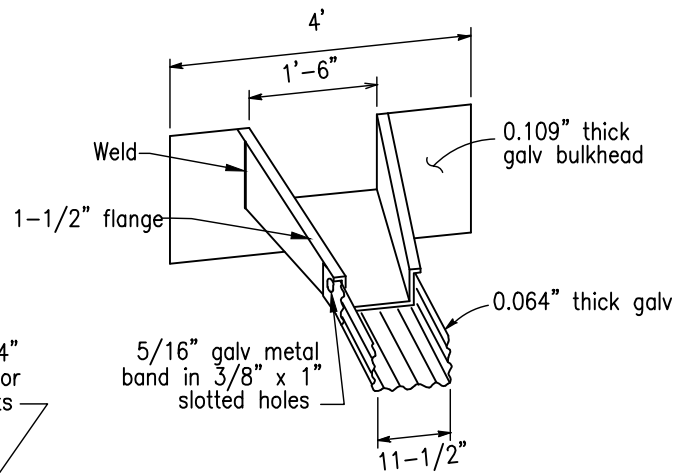
ASPHALT CONCRETE SPILLWAY

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

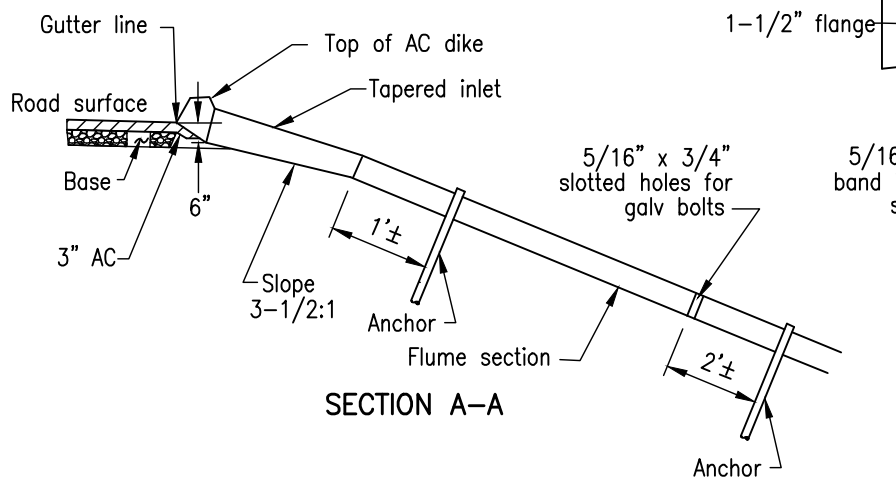
T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

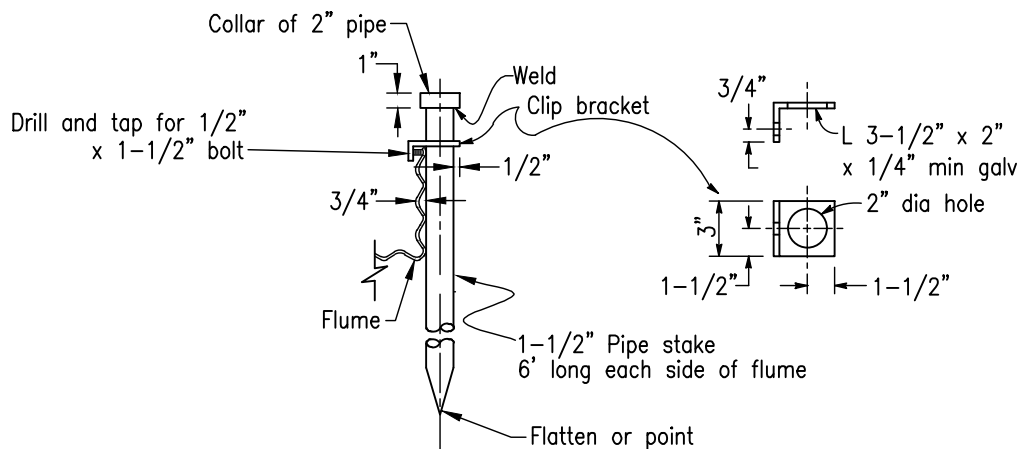
DRAWING NUMBER **D-22**



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 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



sag condition

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

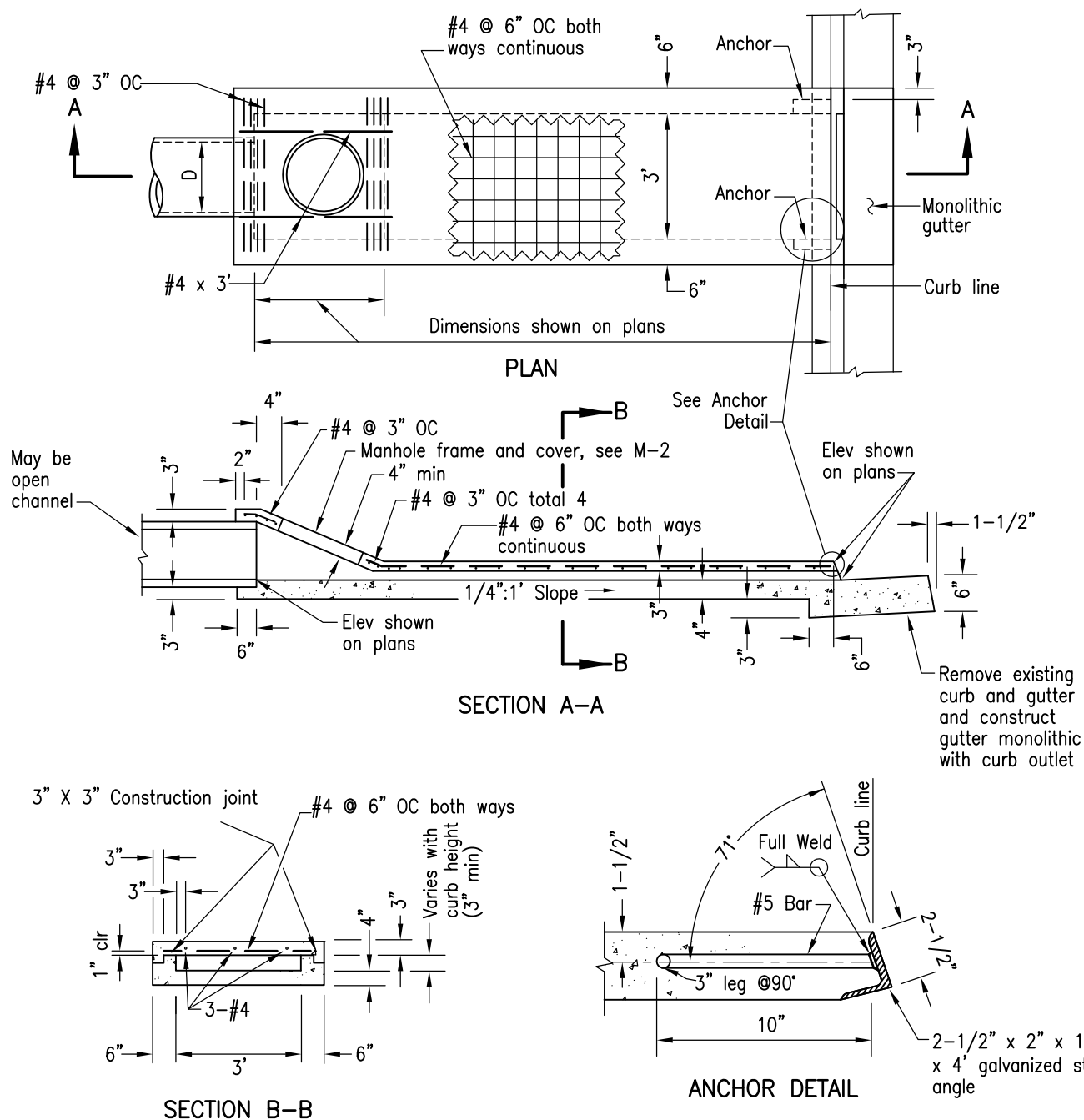
TAPERED INLET AND DOWNDRAIN FLUME

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

[Signature] 7/26/2012

Chairperson R.C.E. 19246 Date

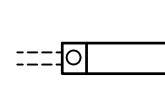
D-23



NOTES

- Concrete shall be 560-C-3250.
- D=inside diameter of pipe or depth of channel.
- Section to be sloped laterally with top conforming to the grades of the existing sidewalk and curb.
- Manhole frame and cover may be deleted with open channel.
- Trowel finish top surface and reproduce markings of existing sidewalk and curb.
- Trowel finish floor of outlet.
- Provide 1/4" tooled groove in top slab in line with back of curb.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T.Stanton	03/03
Reformatted		T.Stanton	04/06
Revised		T.Stanton	11/08
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

CURB OUTLET - TYPE A

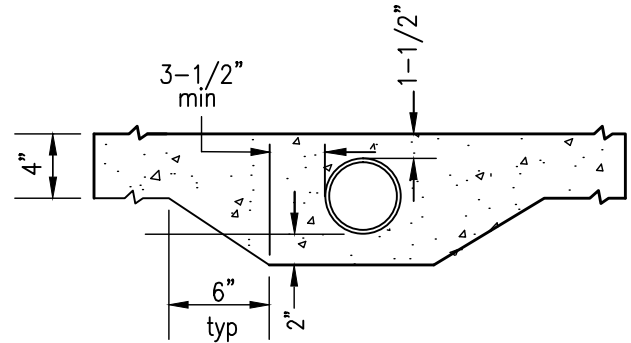
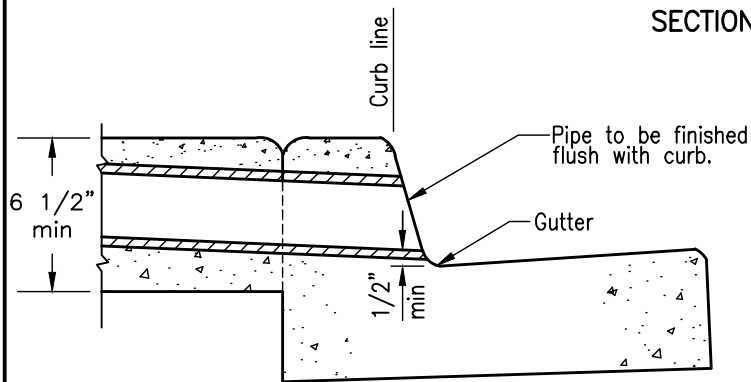
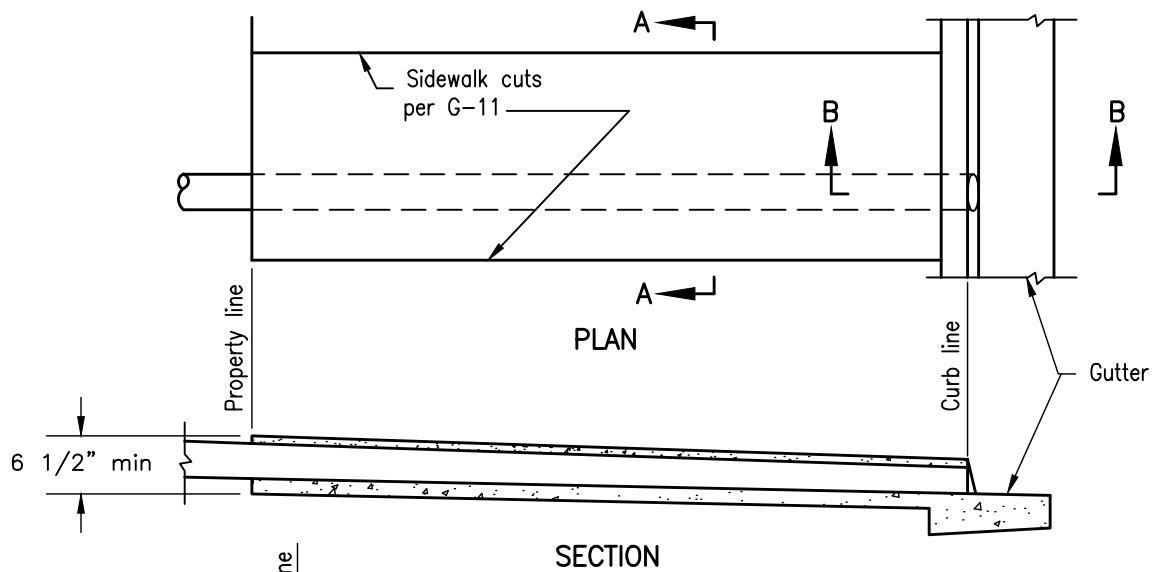
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

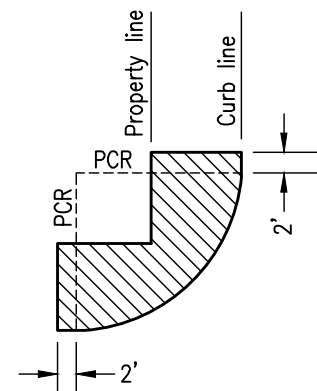
D-25



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

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 max).
3. Concrete shall be 520-C-2500.
4. Pipe shall be circular rigid plastic, or approved equal.
5. Coring of existing curb may be used as an alternative.
6. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.



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
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SIDEWALK UNDERDRAIN PIPE

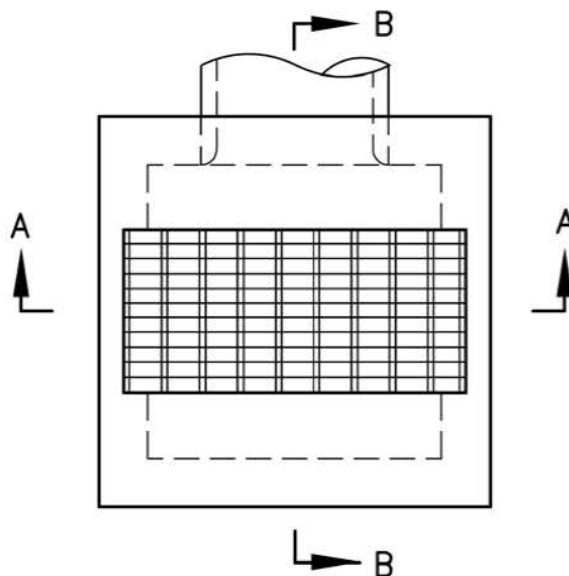
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

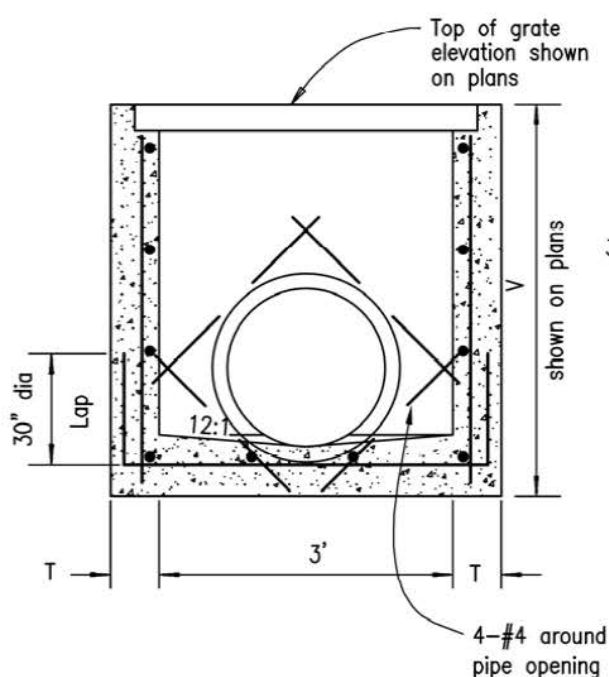
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

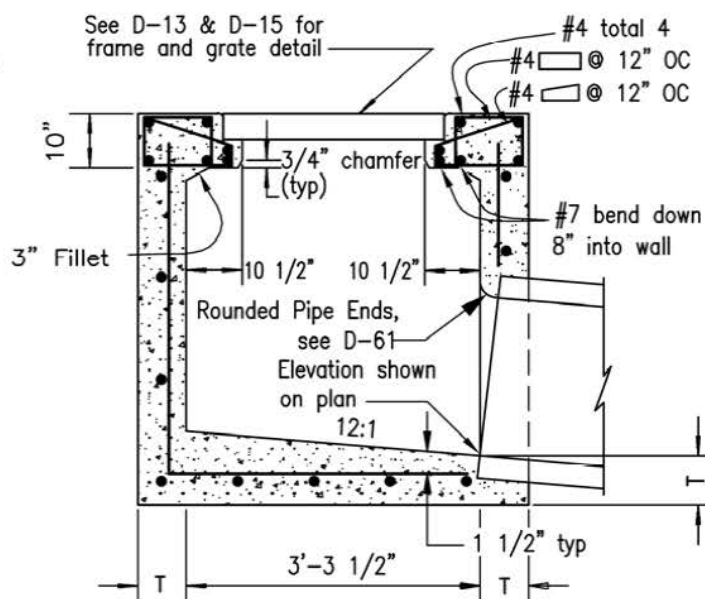
D-27



PLAN



SECTION A-A

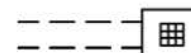


SECTION B-B

NOTES

1. See D-11A & D-11B for additional notes and details.
2. When V exceeds 4', steps shall be installed per D-11A.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Solomon	7/79
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

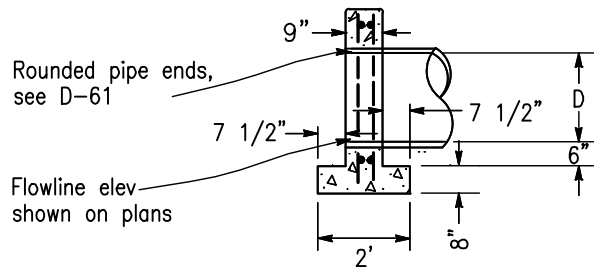
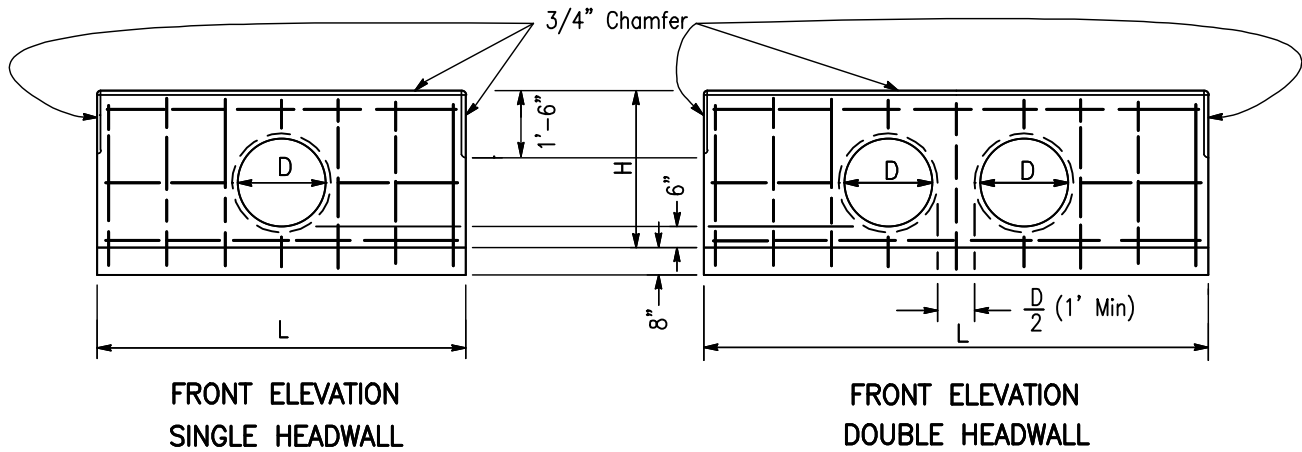
CATCH BASIN - TYPE I

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **D-29**

FOR DRAWINGS D-11A AND D-11B, SEE DRAWING SDD-114



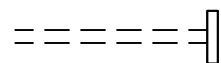
SECTION, SINGLE &
DOUBLE HEADWALLS

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

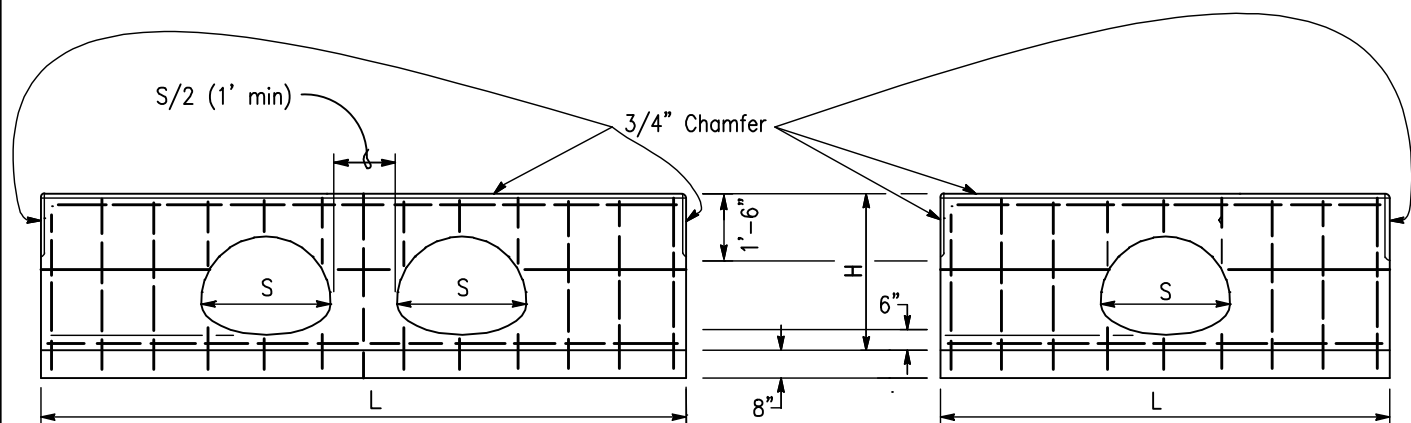
NOTES

- Concrete shall be 560-C-3250.
- All reinforcing shall be #4 bars. All vertical and horizontal tie bars @ 18" maximum spacing.
- Exposed corners shall be 3/4" chamfered.

LEGEND ON PLANS

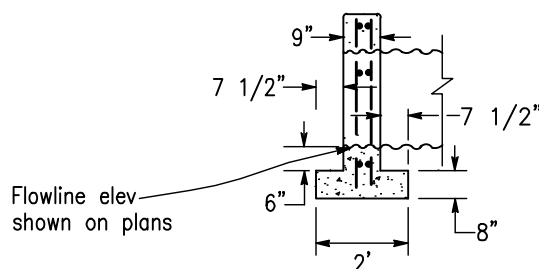


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			<div>STRAIGHT HEADWALL - TYPE A [CIRCULAR PIPE]</div>	
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246	Date		
Reformatted		T. Stanton	04/06	DRAWING	D-30		
Edited		T. Stanton	02/09	NUMBER			
Edited	S.S.	T. Regello	03/11				



ELEVATION - DOUBLE HEADWALL

ELEVATION - SINGLE HEADWALL



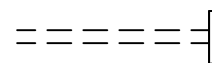
SECTION, SINGLE &
DOUBLE HEADWALLS

C.S.P. ARCH SIZE inches	SINGLE				DOUBLE		
	H ft/in	L ft/in	Steel Lbs.	Concrete C.Y.	L ft/in	Steel Lbs.	Concrete C.Y.
18x11	2'-7"	5'-6"	37	0.64	8'	52	0.91
21x15	2'-11"	6'-6"	45	0.80	10'	60	1.22
24x18	3'-2"	7'-6"	50	0.96	11'-6"	70	1.45
28x20	3'-4"	8'-6"	60	1.12	13'-6"	90	1.76
35x24	3'-8"	10'-6"	85	1.47	15'-6"	120	2.16
42x29	4'-1"	12'-6"	110	1.76	18'	145	2.57
49x33	4'-5"	14'-6"	130	2.26	21'	170	3.13
57x38	4'-10"	17'	155	2.81	24'-6"	210	3.86
64x43	5'-3"	19'	175	3.31	27'	230	4.42
71x47	5'-7"	21'	195	3.81	30'	255	5.09

NOTES

- Concrete shall be 560-C-3250.
- All reinforcing shall be #4 bars. All vertical and horizontal tie bars @ 18" maximum spacing.
- Exposed corners shall be 3/4" chamfered.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

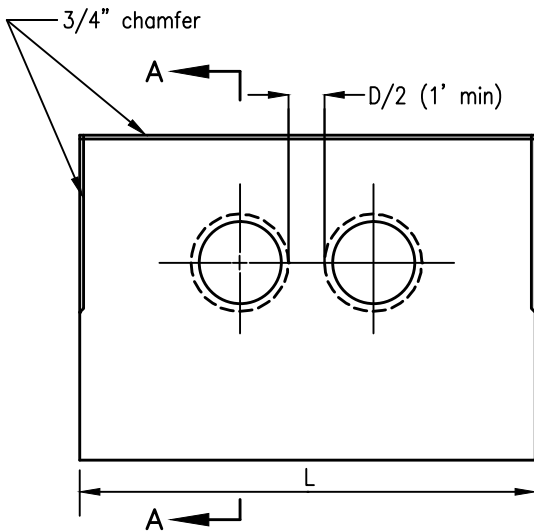
STRAIGHT HEADWALL - TYPE A (CORRUGATED STEEL PIPE - ARCH)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

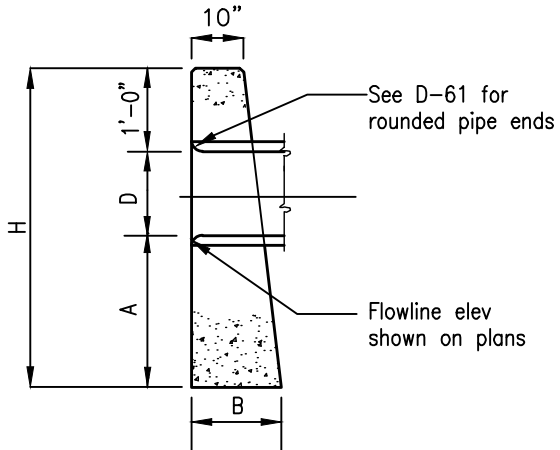
T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

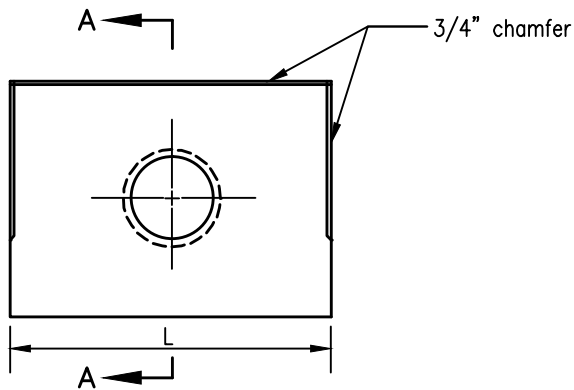
D-31



DOUBLE PIPE
ELEVATION



SECTION A-A



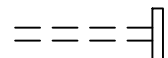
SINGLE PIPE
ELEVATION

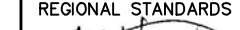
D	A	B	H	SINGLE		DOUBLE	
				L	Concrete C.Y.	L	Concrete C.Y.
12"	2'	1'	4'	4'	0.45	5'-8"	.62
15"	2'	1'-1"	4'-3"	5'	0.63	7'-1"	.85
18"	2'	1'-2"	4'-6"	6'	0.83	8'-6"	1.12
24"	2'-6"	1'-5"	5'-6"	8'	1.54	11'-4"	2.09
30"	2'-6"	1'-9"	6'	10'	2.41	14'-2"	3.26
36"	3'	2'	7'	12'	3.74	17'	5.05

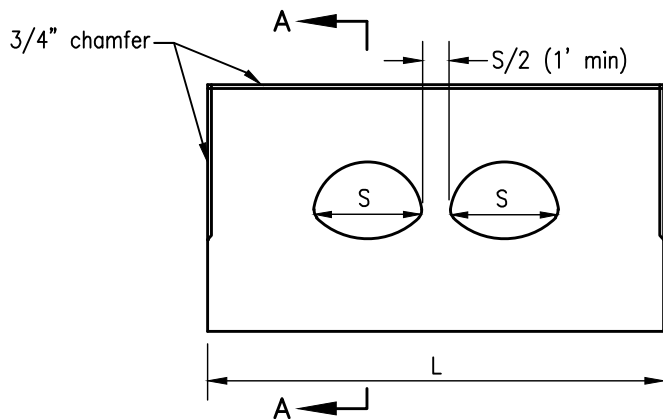
NOTES

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

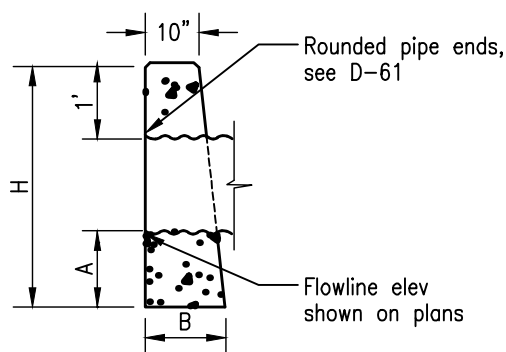
LEGEND ON PLANS



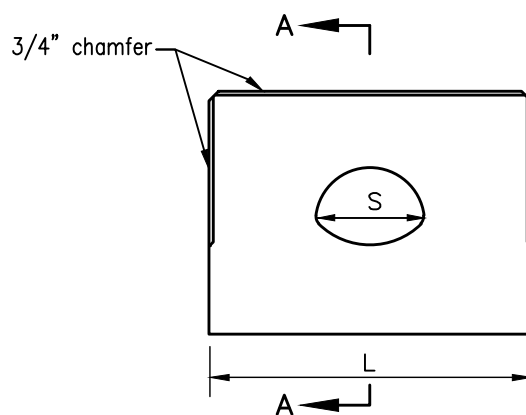
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			 7/26/2012 Chairperson R.C.E. 19246 Date	
Add Metric		T. Stanton	03/03				
Reformatted		T. Stanton	04/06				
Edited		T. Stanton	02/09				
Edited	S.S.	T. Regello	03/11				
				STRAIGHT HEADWALL - TYPE B (CIRCULAR PIPE)		DRAWING NUMBER	D-32



DOUBLE PIPE
ELEVATION



SECTION A-A



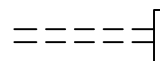
SINGLE PIPE
ELEVATION

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

NOTES

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

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

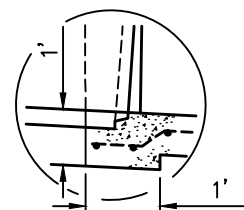
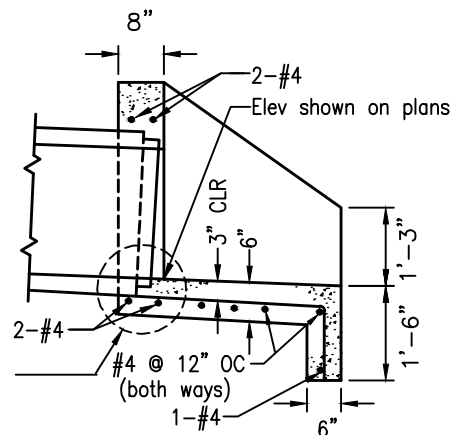
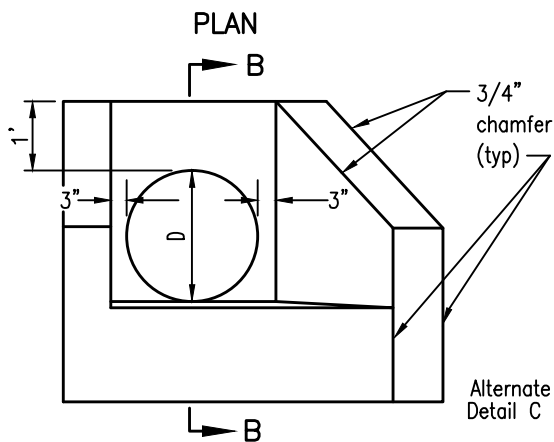
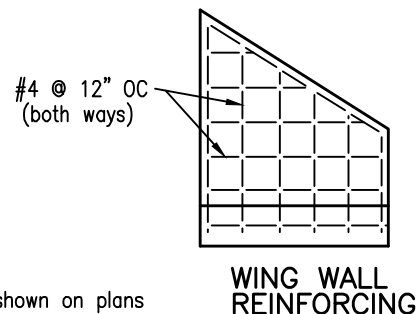
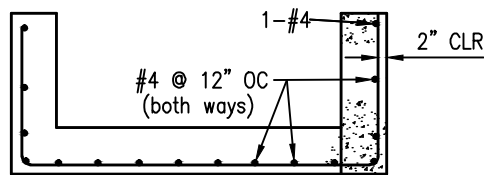
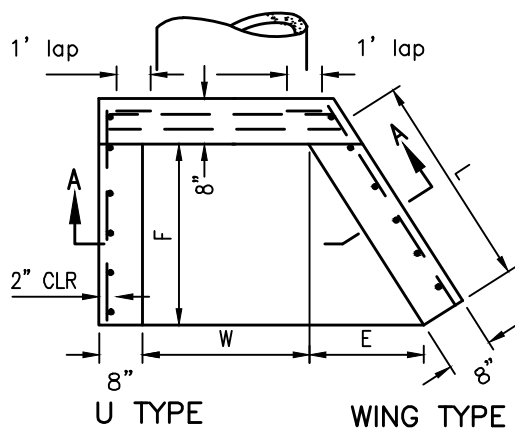
SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE B (CORRUGATED STEEL PIPE - ARCH)

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-33**



DIA OF PIPE	DIMENSIONS			SINGLE PIPE				DOUBLE PIPE					
				W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
	L	E	F		CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)		CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)
18"	2'-3 1/8"	1'-3"	1'-10 1/2"	2'	0.55	35	0.63	43	AS SHOWN ON PLANS	0.82	53	0.90	61
24"	3'-1 7/8"	1'-9"	2'-7 1/2"	2'-6"	0.79	47	0.93	60		1.22	73	1.36	86
30"	4'-5/8"	2'-3"	3'-4 1/2"	3'	1.05	71	1.29	85		1.66	109	1.92	123
36"	4'-11 1/2"	2'-9"	4'-1 1/2"	3'-6"	1.33	88	1.69	114		2.19	136	2.55	162

NOTES

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

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

WING AND U TYPE HEADWALLS FOR 18" TO 36" PIPES

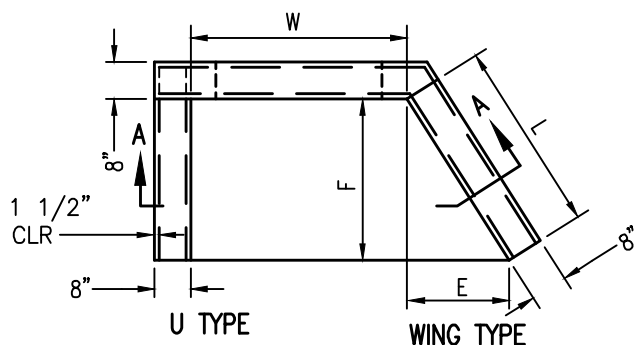
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

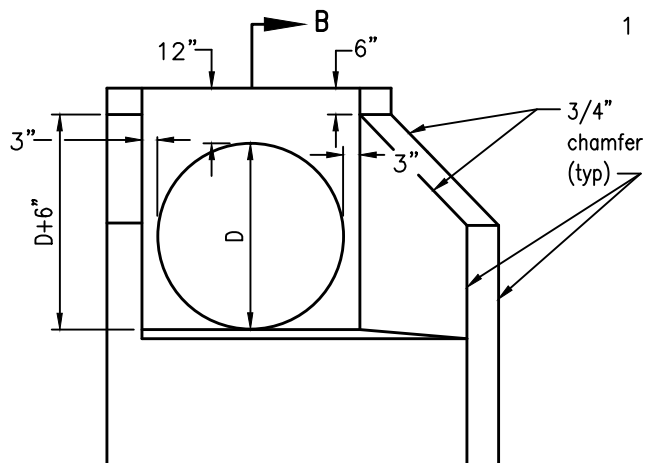
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

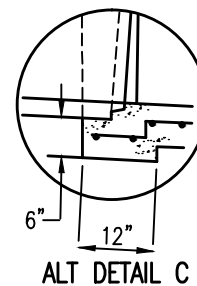
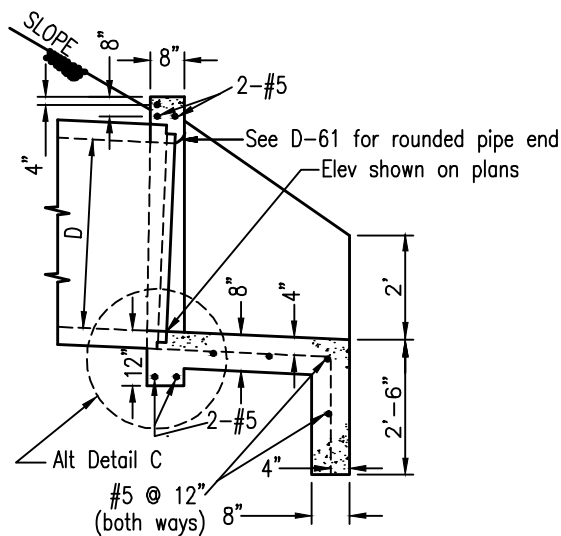
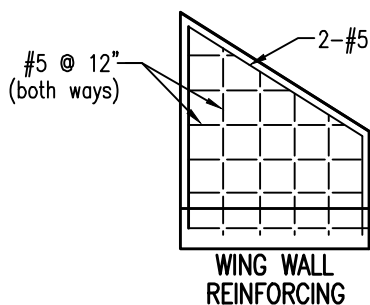
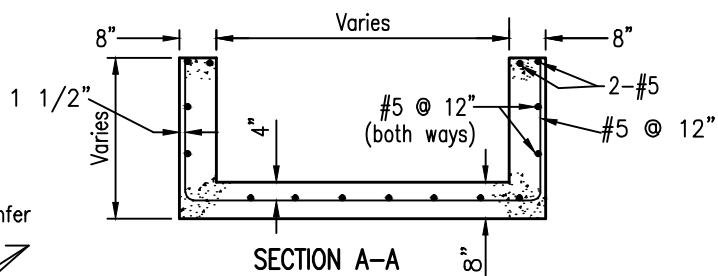
D-34



PLAN



ELEVATION



LEGEND ON PLANS

NOTE

See D-35B for Dimension Table and General Notes.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-35A**

**TABLE OF DIMENSIONS AND QUANTITIES
FOR HEADWALLS SHOWN ON D-35A**

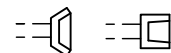
DIA OF PIPE	DIMENSIONS			SINGLE PIPE					DOUBLE PIPE				
				W	U TYPE		WING TYPE		W	U TYPE		WING TYPE	
	L	E	F		CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)		CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)
42"	3'-7 1/4"	2'	3'	4'	1.57	117	1.90	135	10'	2.69	190	3.16	214
48"	4'-6"	2'-6"	3'-9"	4'-6"	1.97	153	2.48	184	11'-4"	3.43	252	4.06	288
54"	5'-4 7/8"	3'	4'-6"	5'	2.41	190	3.07	246	12'-8"	4.24	319	5.06	368
60"	6'-3 3/4"	3'-6"	5'-3"	5'-6"	2.88	239	3.75	294	14'	5.13	386	6.17	442
66"	7'-2 1/2"	4'	6'	6'	3.38	294	4.52	356	15'-4"	6.08	454	7.20	516
72"	8'-1 3/8"	4'-6"	6'-9"	6'-6"	3.93	368	5.52	417	16'-8"	7.11	522	8.30	588
78"	9'	5'	7'-6"	7'	4.50	444	6.70	503	18'	8.20	595	9.50	693
84"	9'-10 3/4"	5'-6"	8'-3"	7'-6"	5.21	540	8.15	619	19'-4"	9.50	687	10.80	786

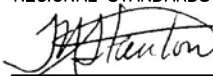
Note: Dimensions E and L apply to wing type only.

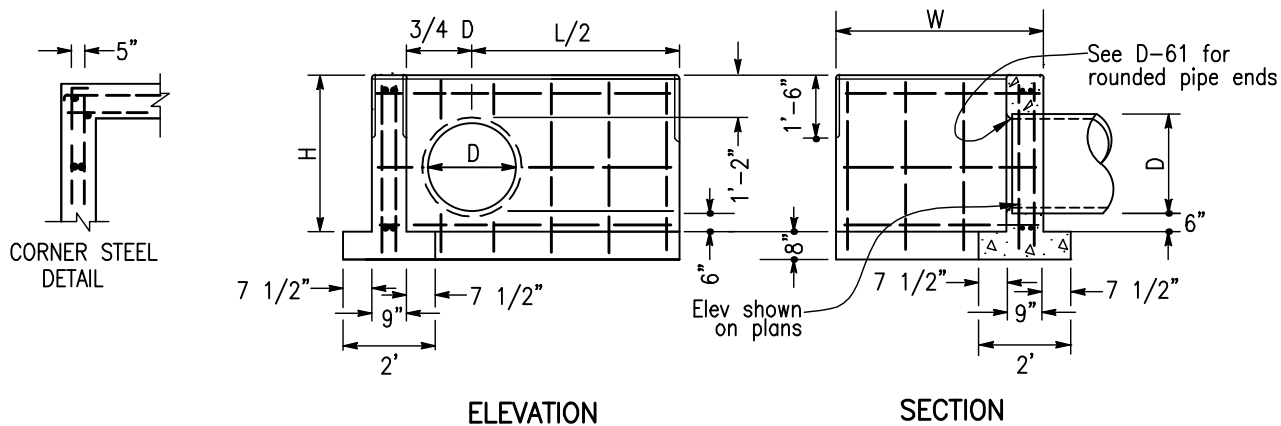
NOTES

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

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			 7/26/2012	
Add Metric		T. Stanton	03/03	WING AND U TYPE HEADWALLS FOR 42" TO 84" PIPE		Chairperson R.C.E. 19246 Date	
Reformatted		T. Stanton	04/06			DRAWING NUMBER D-35B	
Edited		T. Stanton	02/09				
Edited	S.S.	T. Regello	03/11				

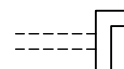


D	H	L/2	W									
			3'-4"		4'-10"		6'-4"		7'-10"		9'-4"	
			STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)
12"	2'-8"	2'-6"	50	0.79	60	0.98	—	—	—	—	—	—
15"	2'-11"	3'	55	0.91	65	1.11	—	—	—	—	—	—
18"	3'-2"	3'-6"	65	1.04	75	1.25	—	—	—	—	—	—
21"	3'-5"	3'-9"	75	1.15	90	1.36	—	—	—	—	—	—
24"	3'-8"	4'-3"	85	1.29	100	1.51	110	1.74	—	—	—	—
27"	3'-11"	4'-9"	90	1.44	105	1.67	115	1.91	—	—	—	—
30"	4'-2"	5'	95	1.55	110	1.80	120	2.05	135	2.29	—	—
33"	4'-5"	5'-6"	105	1.71	120	1.97	135	2.23	150	2.48	—	—
36"	4'-8"	6'	110	1.88	125	2.15	140	2.41	155	2.68	170	2.95
39"	4'-11"	6'-3"	—	—	150	2.28	170	2.56	185	2.84	200	3.12
42"	5'-2"	6'-9"	—	—	155	2.42	175	2.76	190	3.05	210	3.34
45"	5'-5"	7'-3"	—	—	—	—	180	2.97	200	3.27	215	3.57
48"	5'-8"	7'-6"	—	—	—	—	190	3.13	216	3.44	230	3.75
51"	5'-11"	8'	—	—	—	—	—	—	220	3.67	235	3.99
54"	6'-2"	8'-6"	—	—	—	—	—	—	235	3.91	250	4.24

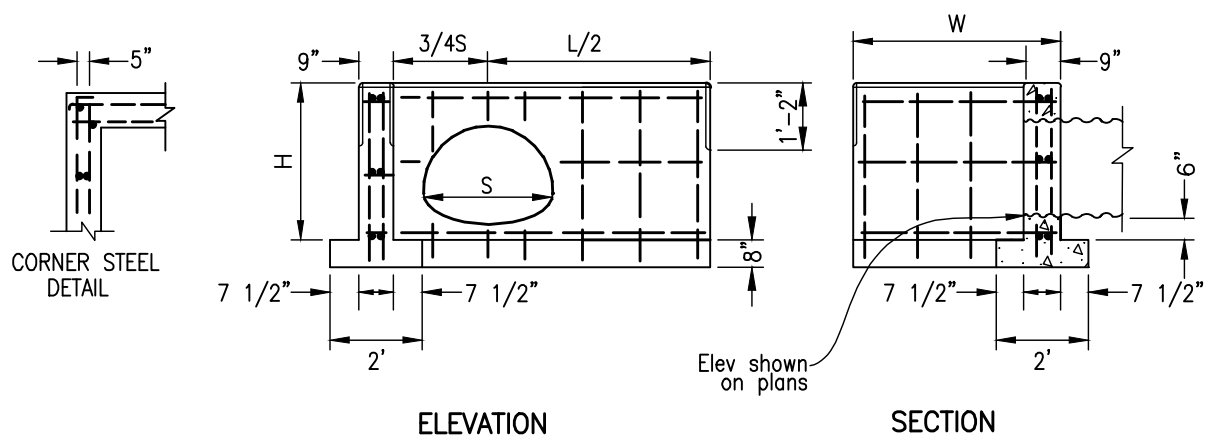
NOTES

- Concrete shall be 560-C-3250.
- All reinforcing steel shall be #4 bars. All vertical and horizontal tie bars shall have 18" maximum spacing.
- When multiple pipes are used, the distance between pipes shall be D/2 (1' min). The dimension L/2 is from the center of the pipe to the end of the headwall as shown.
- Exposed corners shall be 3/4" chamfered.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 7/26/2012	
Add Metric		T. Stanton	03/03	L TYPE HEADWALLS (CIRCULAR PIPES)		Chairperson R.C.E. 19246 Date	
Reformatted		T. Stanton	04/06			DRAWING NUMBER D-36	
Edited		T. Stanton	02/09				
Edited	S.S.	T. Regello	03/11				

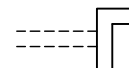


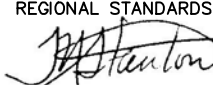
CSP ARCH SIZE	H	L/2	LENGTH OF W									
			3'-4"		4'-10"		6'-4"		7'-10"		9'-4"	
			STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)	STEEL (LBS)	CONC. (CY)
18"x11"	2'-7"	2'-9"	50	0.84	60	1.03	70	1.21	80	1.39	90	1.57
21"x15"	2'-11"	3'-3"	60	1.00	65	1.18	75	1.38	90	1.58	100	1.77
24"x18"	3'-2"	3'-9"	60	1.07	70	1.32	80	1.53	95	1.74	110	1.94
28"x20"	3'-4"	4'-3"	70	1.26	80	1.47	90	1.68	100	1.90	115	2.11
35"x24"	3'-8"	5'-3"	100	1.51	110	1.74	120	1.97	140	2.20	155	2.42
42"x29"	4'-1"	6'-3"	115	1.82	130	2.06	140	2.31	155	2.55	170	2.83
49"x33"	4'-5"	7'-3"	130	2.12	145	2.37	155	2.64	170	2.90	185	3.15
57"x38"	4'-10"	8'-6"	145	2.52	160	2.79	175	3.07	190	3.35	205	3.61
64"x43"	5'-3"	9'-6"	185	2.89	200	3.11	215	3.48	235	3.77	250	4.06
71"x47"	5'-7"	10'-6"	200	3.25	215	3.56	235	3.86	250	4.17	270	4.48

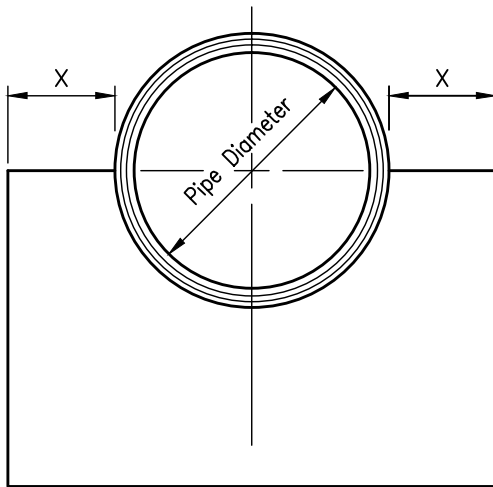
NOTES

- Concrete shall be 560-C-3250.
- All reinforcing steel shall be #4 bars. All vertical and horizontal tie bars shall have 18" maximum spacing.
- When multiple pipes are used, the distance between pipes shall be S/2 (1' min). The dimension L/2 is from the center of the pipe to the end of the headwall as shown.
- Exposed corners shall be 3/4" chamfered.

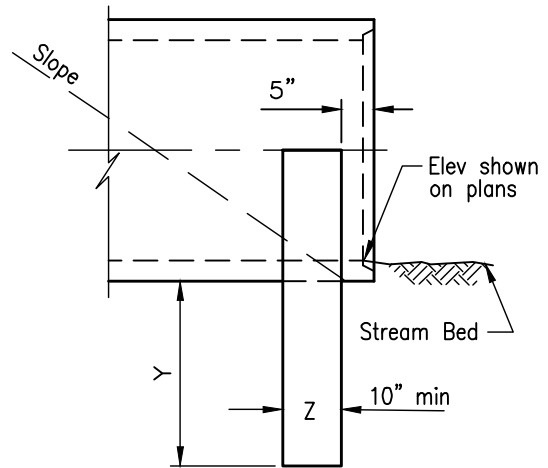
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			 7/26/2012 Chairperson R.C.E. 19246 Date	
Add Metric		T. Stanton	03/03				
Reformatted		T. Stanton	04/06				
Edited	S.S.	T. Regello	03/11				
				L TYPE HEADWALLS (CORRUGATED STEEL PIPE - ARCH)		DRAWING NUMBER	
						D-37	



FACE ELEVATION



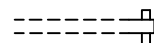
SIDE ELEVATION

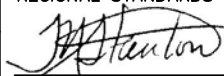
PIPE DIAMETER	X	Y	Z
12" TO 24"	1'	2'	10"
21" TO 36"	1'-6"	2'-6"	12"
39" TO 48"	2'	3'	12"
51" TO 60"	2'-6"	3'	14"
63" & LARGER	3'	3'	14"

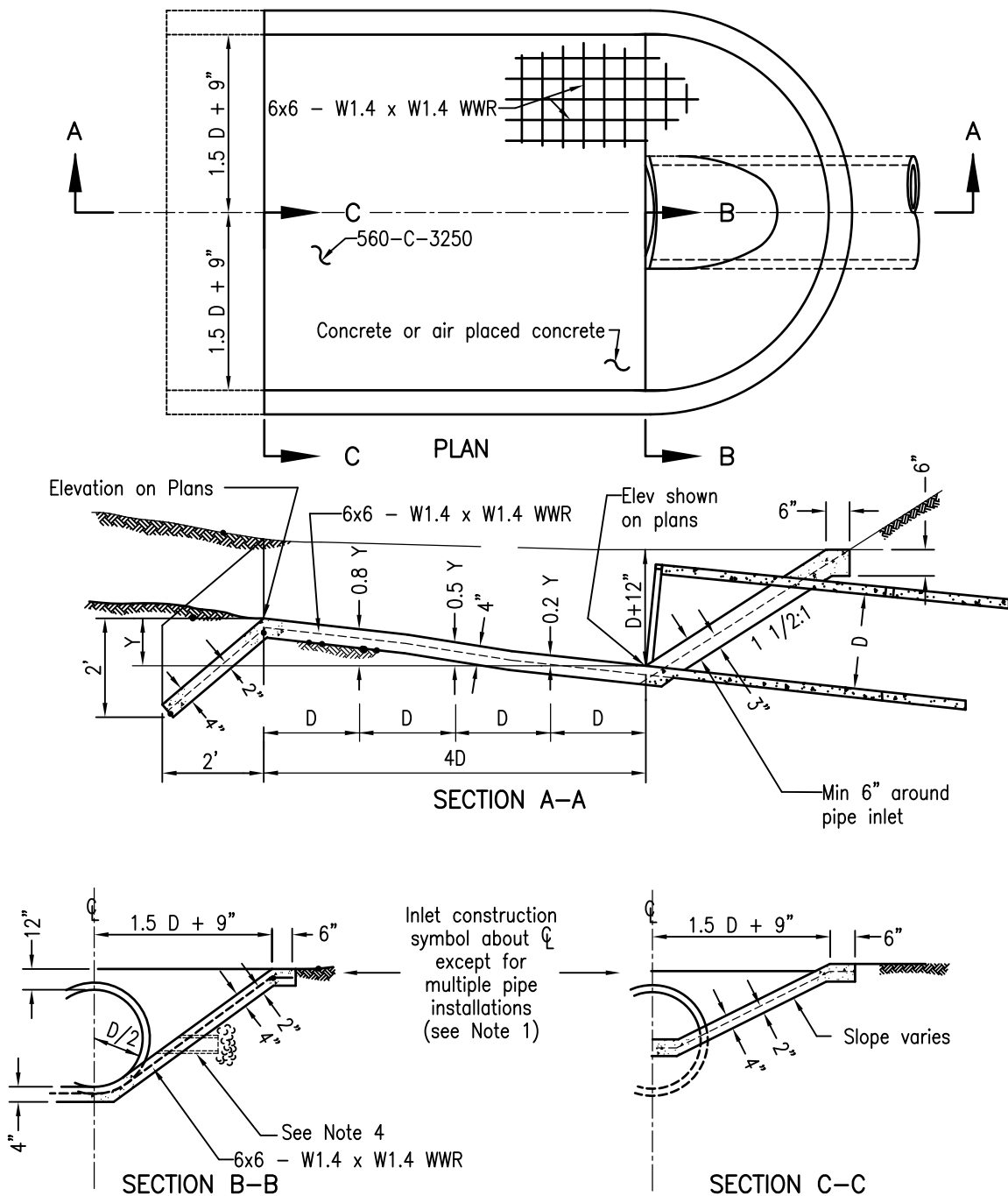
NOTES

1. A curtain wall shall be used in place of a headwall at culvert ends where extension of the culvert is considered imminent or, no fill is retained.
2. Concrete shall be 560-C-3250.
3. Keep the pipe-end clear of obstructions to permit easy placing of culvert extension.

LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
ORIGINAL		Kercheval	12/75	CURTAIN WALL	
Add Metric		T. Stanton	03/03		
Reformatted		T. Stanton	04/06		
Edited	S.S.	T. Regello	03/11		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				 7/26/2012 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 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 $\text{Span}/3$ for arch pipe (12" minimum).
2. Culvert shall be cut off even with apron surface when required by the Agency.
3. Use Inlet Apron only where a flared 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
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

INLET APRON FOR CULVERTS UP TO 42" DIAMETER

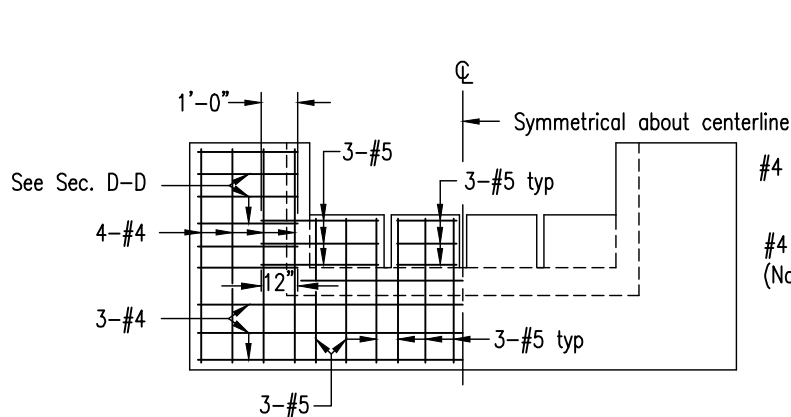
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

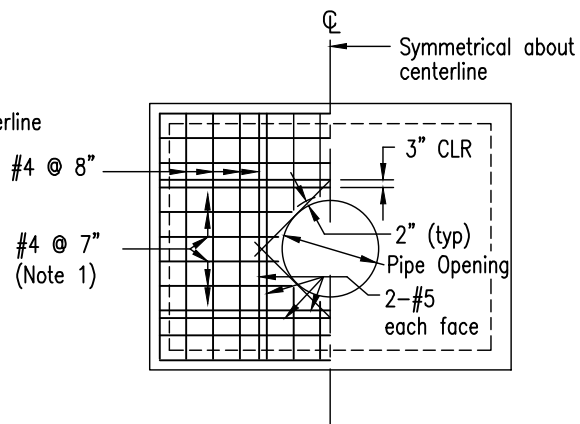
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

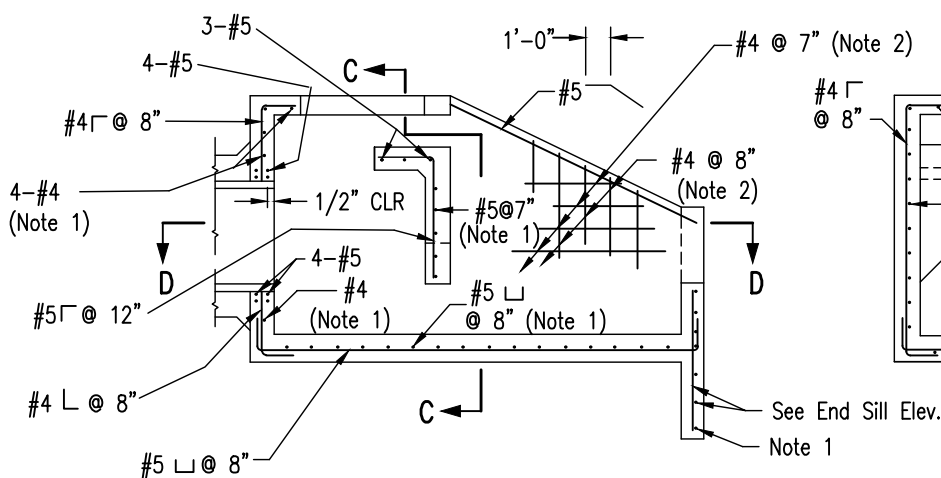
D-39



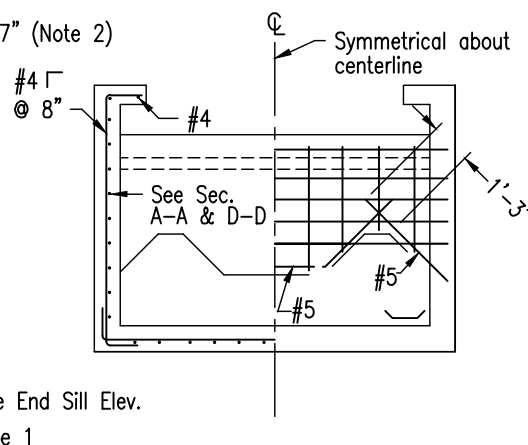
END SILL ELEVATION



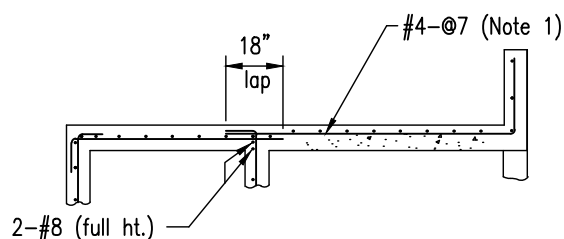
HEADWALL ELEVATION



SECTION A-A



SECTION C-C



SECTION D-D

NOTES

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

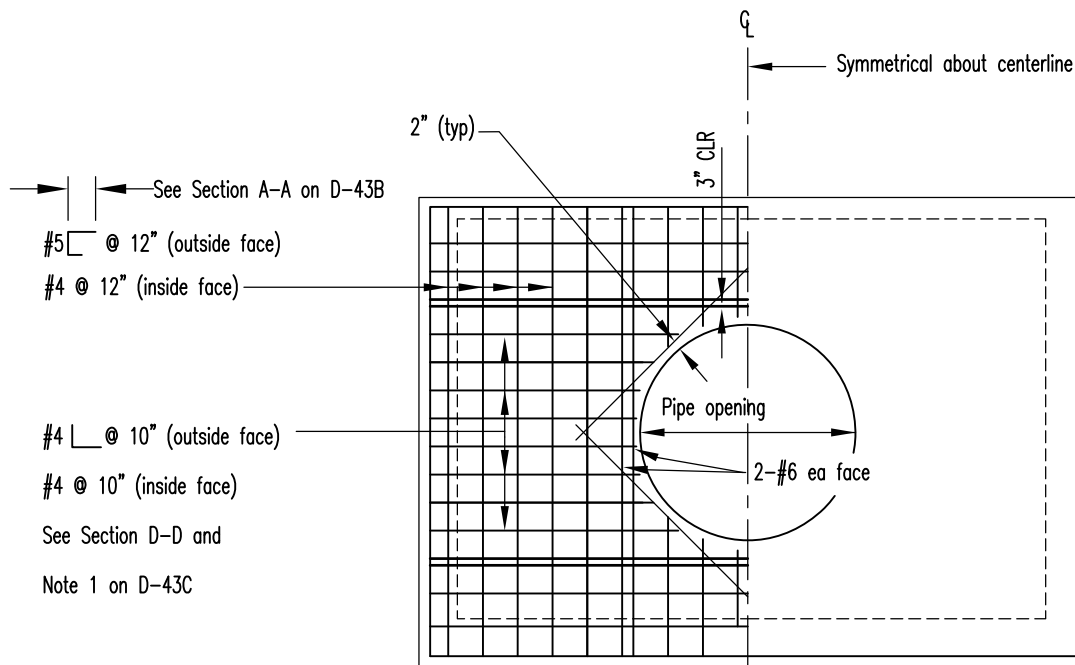
SAN DIEGO REGIONAL STANDARD DRAWING

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

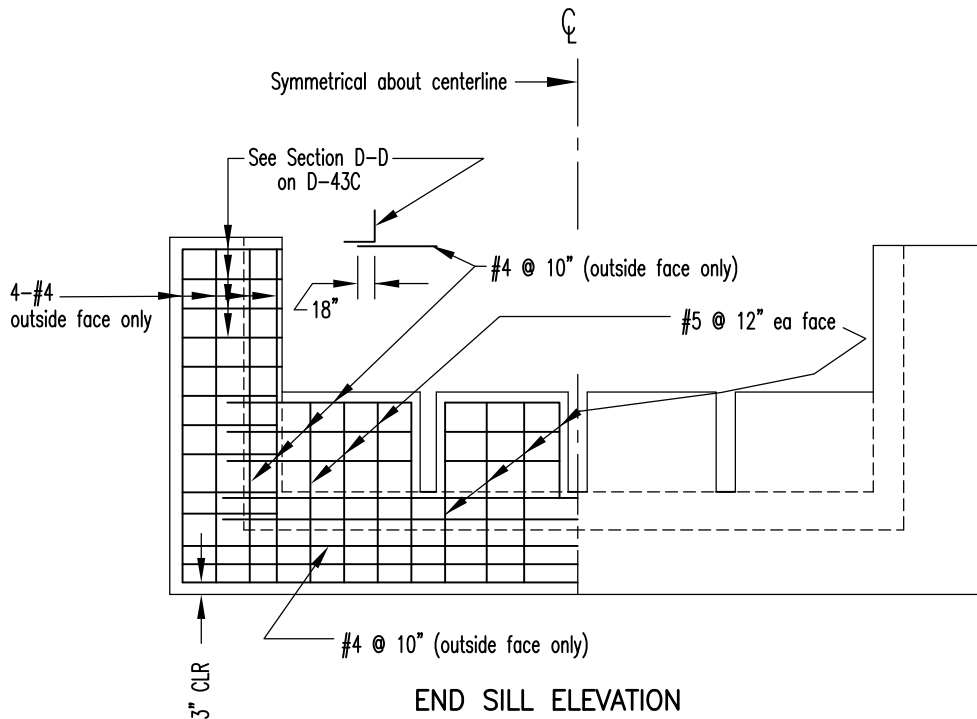
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

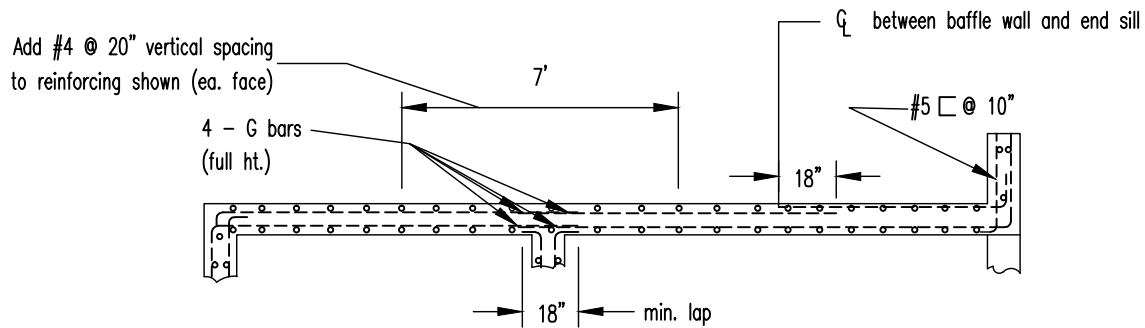
SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE ENERGY DISSIPATER
(REINFORCEMENT)
36" TO 72" DIAMETER PIPE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-43A**

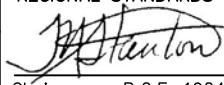


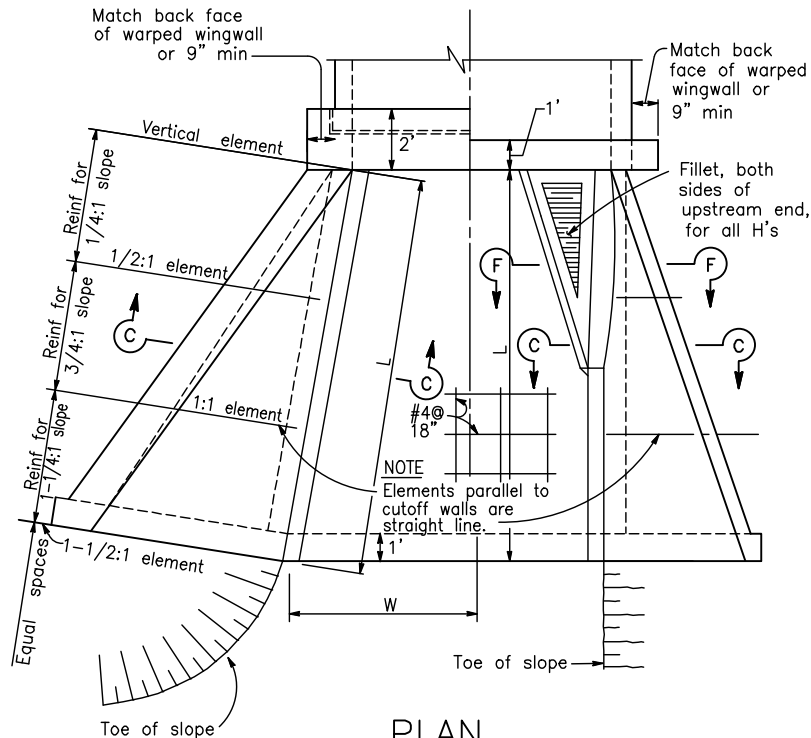
SECTION D-D

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

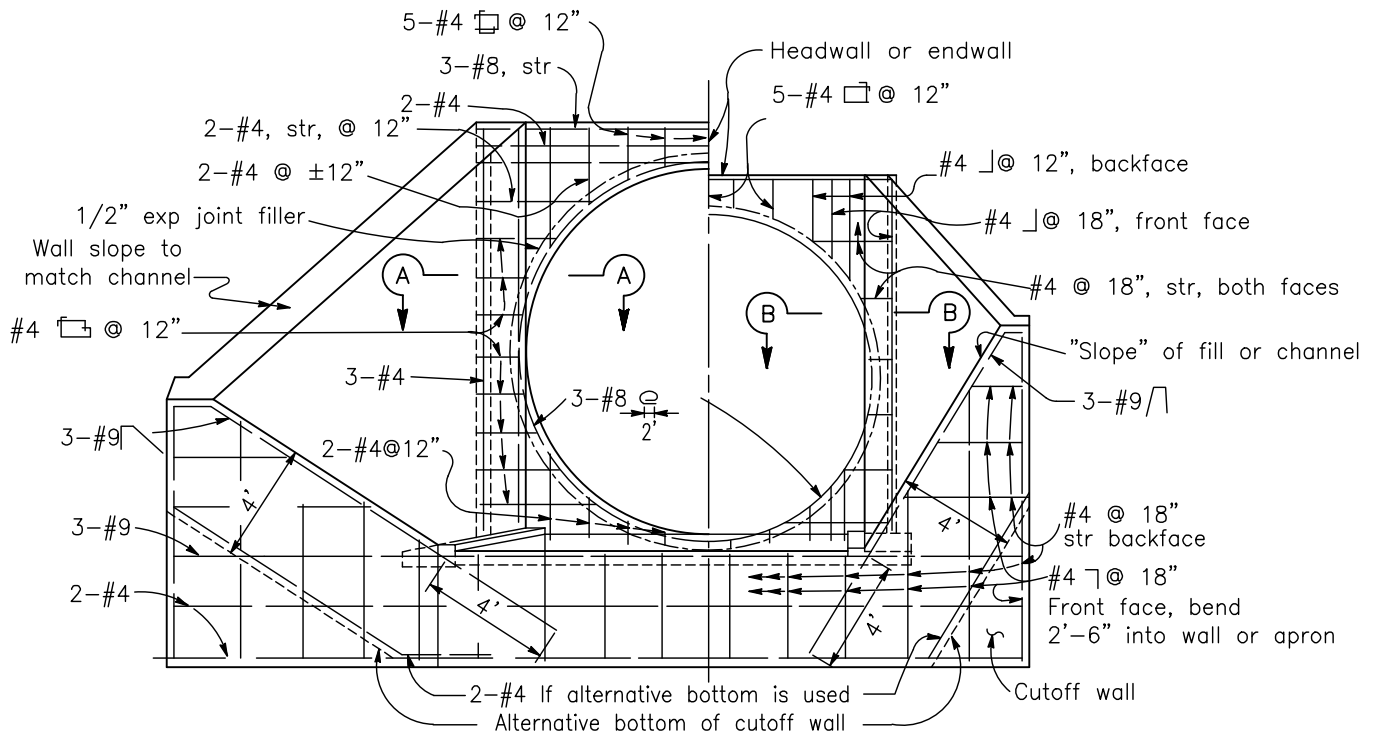
NOTES

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 DISSIPATER (REINFORCEMENT) 36" TO 72" DIAMETER PIPE		 7/26/2012 Chairperson R.C.E. 19246 Date	
Add Metric		T. Stanton	03/03				
Reformatted		T. Stanton	04/06				
Edited		T. Stanton	02/09				
Edited	S.S.	T. Regello	03/11				
						DRAWING NUMBER	D-43C



PLAN



TYPICAL FOR MAXIMUM H > 10'

TYPICAL FOR MAXIMUM H ≤ 10'

END ELEVATION

NOTE

See notes on D-44D.

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
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE CULVERT - HEADWALLS,
ENDWALLS & WARPED WINGWALLS

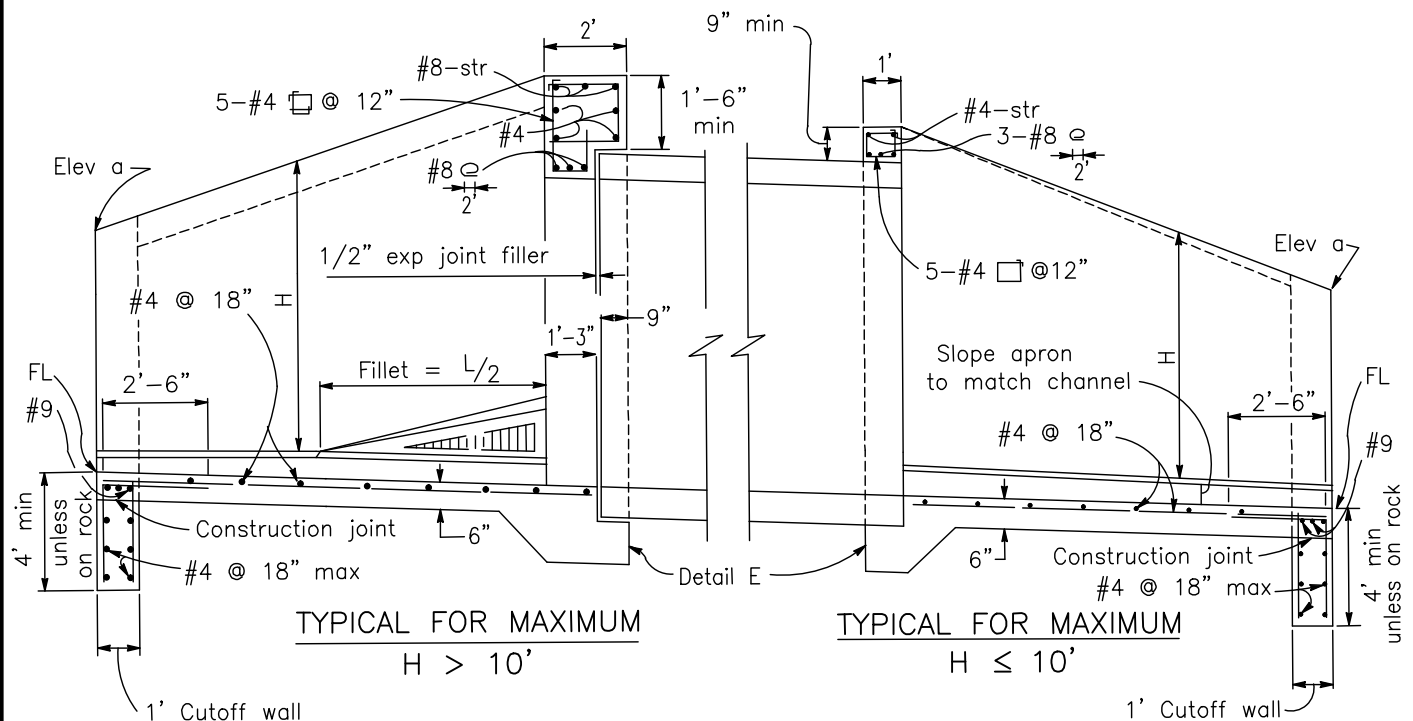
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

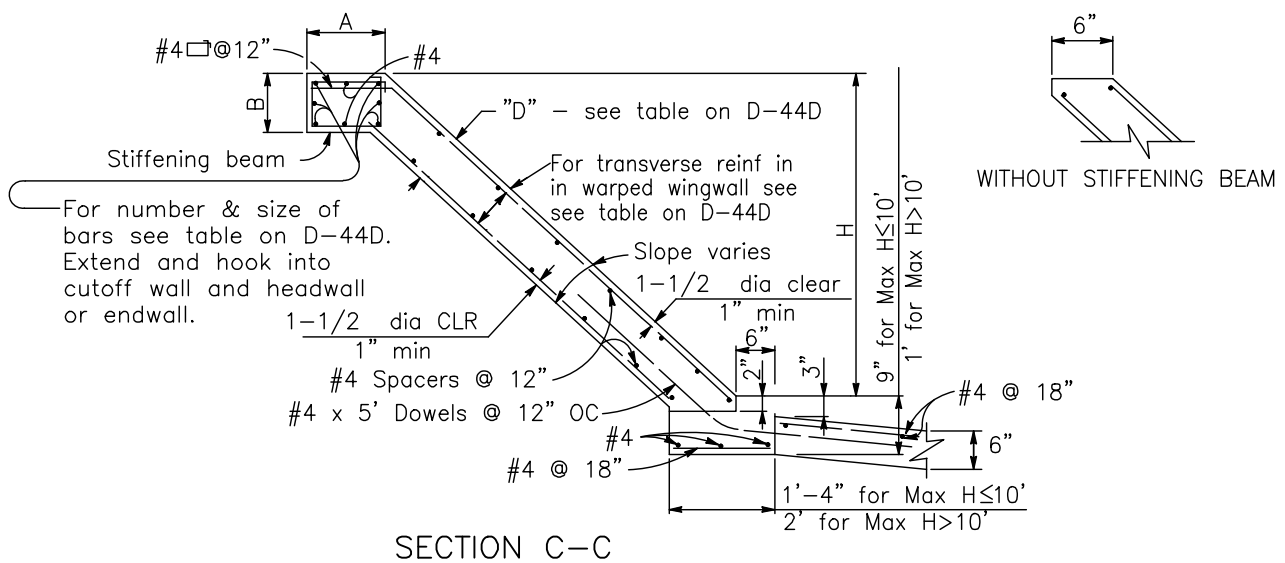
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

D-44A



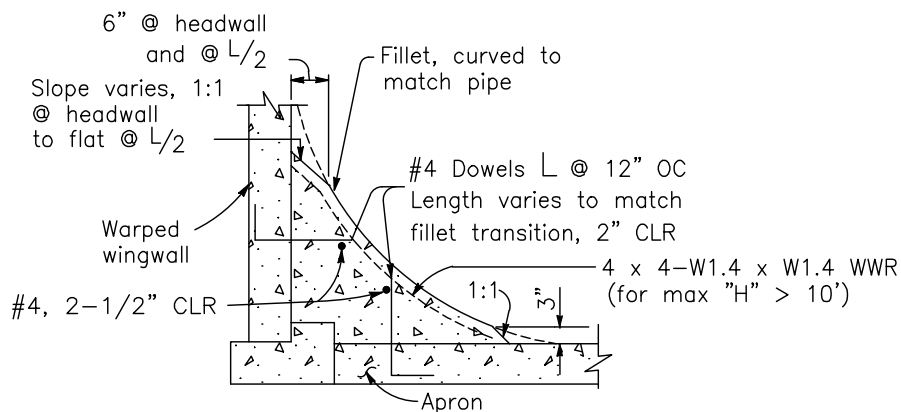
PART LONGITUDINAL SECTION



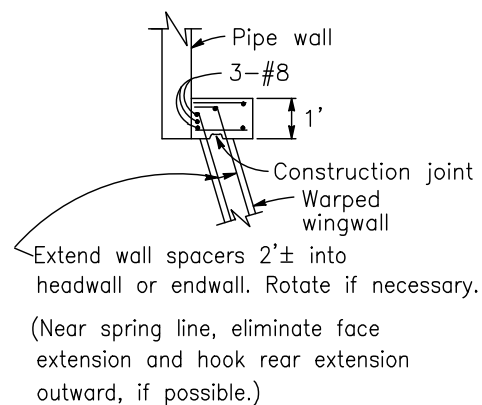
NOTES

1. RCP is shown. When using metal pipe eliminate the expansion joint and use hook bolts @ 19"± spacing (size and length provided by manufacturer).
2. Where abrasion is anticipated, increase apron thickness to 7" minimum to provide 2" minimum reinforcement coverage.

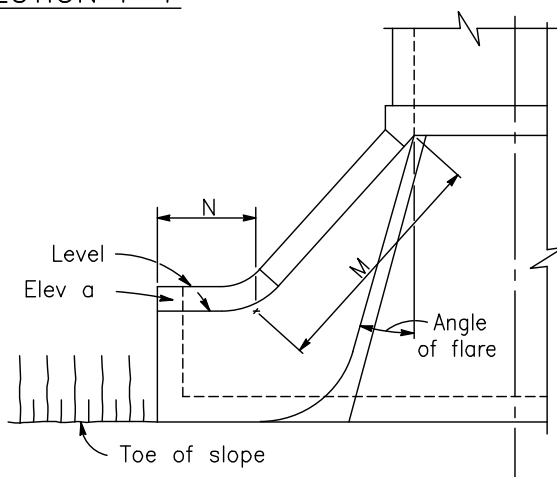
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75	PIPE CULVERT - HEADWALLS, ENDWALLS & WARPED WINGWALLS		 7/26/2012 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reformatted		T. Stanton	04/06			
Edited	S.S.	T. Regello	03/11			
						DRAWING NUMBER D-44B



SECTION F-F

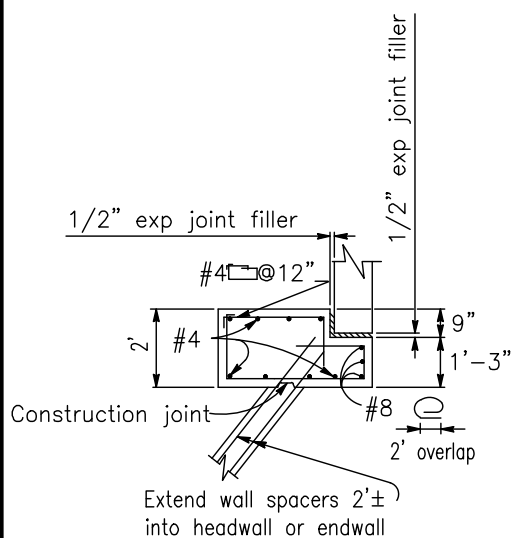


SECTION B-B

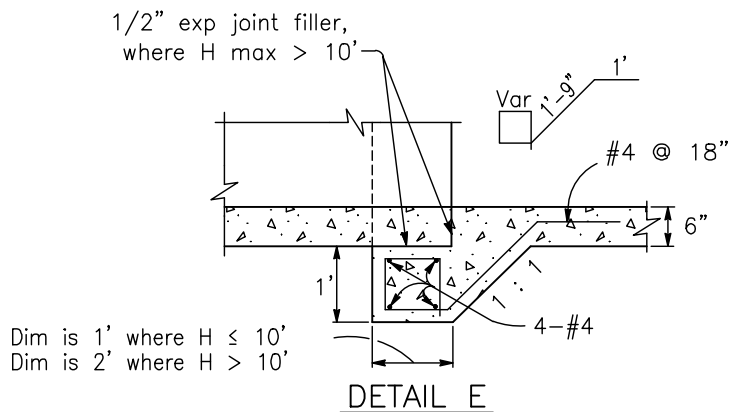


ALTERNATIVE WARPED WINGWALL

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



SECTION A-A



DETAIL E

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE CULVERT - HEADWALLS,
ENDWALLS & WARPED WINGWALLS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-44C**

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reformatted		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE CULVERT - HEADWALLS, ENDWALLS & WARPED WINGWALLS

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012

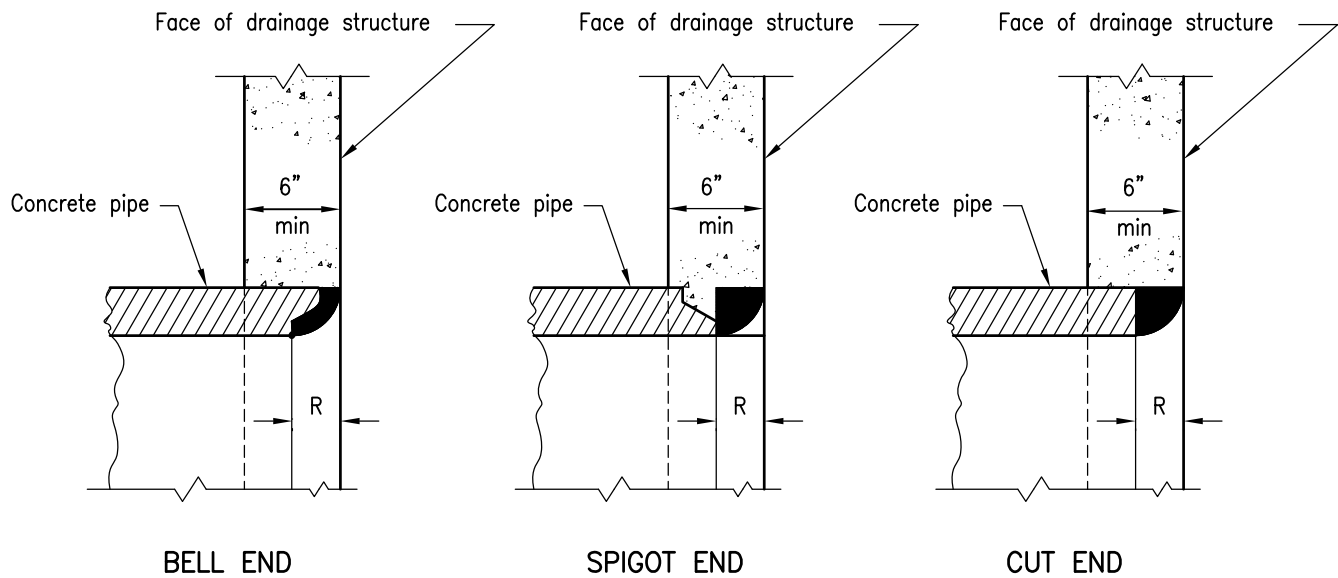
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-44D**

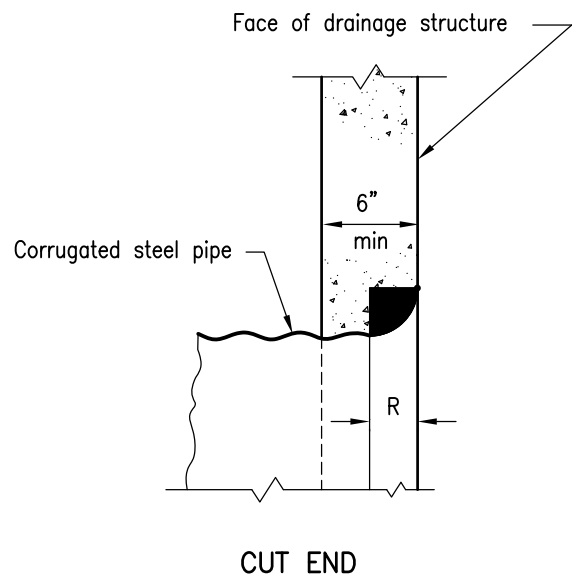
WARPED WINGWALLS (all measurements in feet and/or inches unless otherwise noted)																				
WALL DIMENSIONS AND REINFORCING										STIFFENING BEAM DIMENSIONS AND REINFORCING										
Element Slope	H	8' or less	10'	12'	14'	16'	18'	20'	H max	12'	14'	16'	18'	20'	25'	30'	35'	40'	or more	
1 / 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												
3 / 4:1	Front face reinf	#4@12	#4@12	#4@12	#4@12	#4@10	#4@ 8	#4@ 6	10'	A = 1'										
	Rear face reinf	#4@12	#4@12	#4@12	#4@10	#4@ 7	#4@ 6	#5@ 8												
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@12	#4@12	#4@12	#4@10	#4@12	#4@12	#4@12												
		#4@ 8	#4@ 8	#4@ 5	#5@ 6	#6@ 7	#6@ 6	#7@ 6												
		#4@ 8	#4@ 5	#5@ 6	#6@ 7	#6@ 6	#7@ 6													
D at Cutoff Wall		6"	6"	6"	7-1/2"	8"	9-1/2"	11"	18'	Total 6-#7 B = 1'										
D at Culvert		6"	6"	6"	8"	9-1/2"	11"	1'-1"												
										20'	Total 6-#8 B = 1'-6"									
										20'	Total 8-#9									

NOTES

1. Walls designed for 2' surcharge; earth density = 120 # / cu. ft.; equivalent fluid pressure = 36 #/cu. ft.
2. Vary "D" at warped wall uniformly from that at cutoff wall to that at culvert, for maximum H > 12'.
3. Dimensions "L", "W", "H", "M", "N", "Elev a", "Angle of flare", and end "slope" (as apply) are shown on the plans.
4. All exposed concrete edges to be chamfered 3/4".



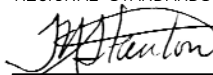
R = Thickness of pipe

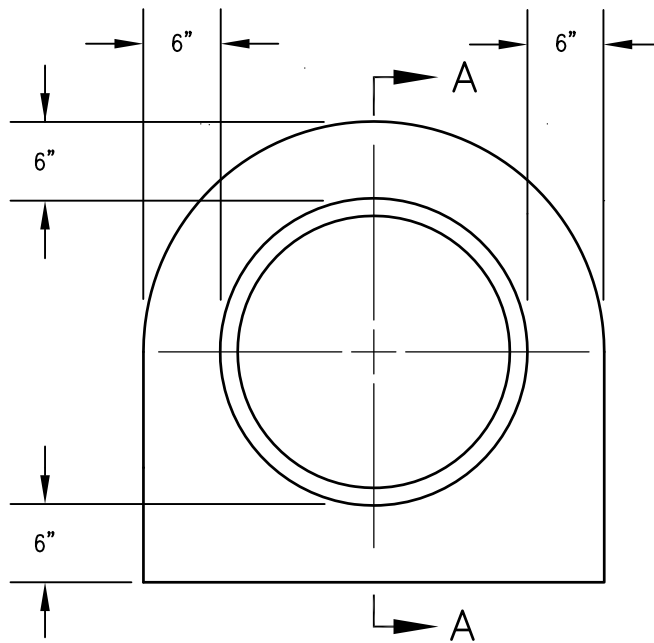


R = $\frac{\text{Inside diameter of pipe}}{10}$

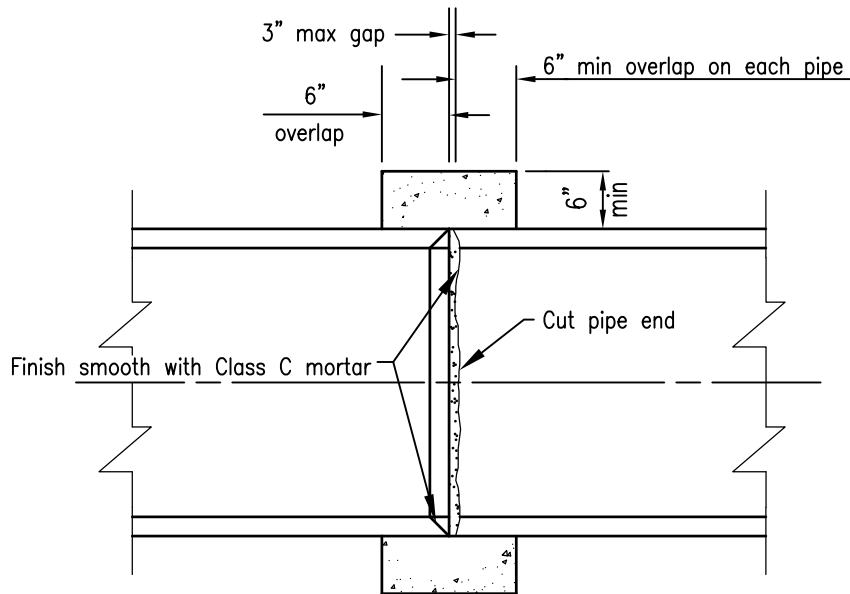
NOTE

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	
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	ROUNDED PIPE ENDS IN DRAINAGE STRUCTURES	
Reviewed		T. Stanton	04/06		
Edited	S.S.	T. Regello	03/11		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  7/26/2012 Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER D-61	



ELEVATION

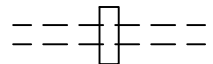


SECTION A-A

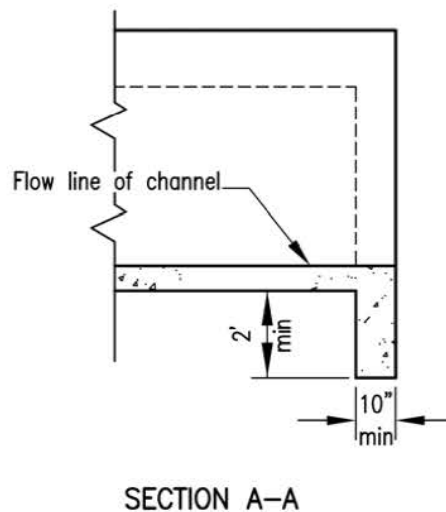
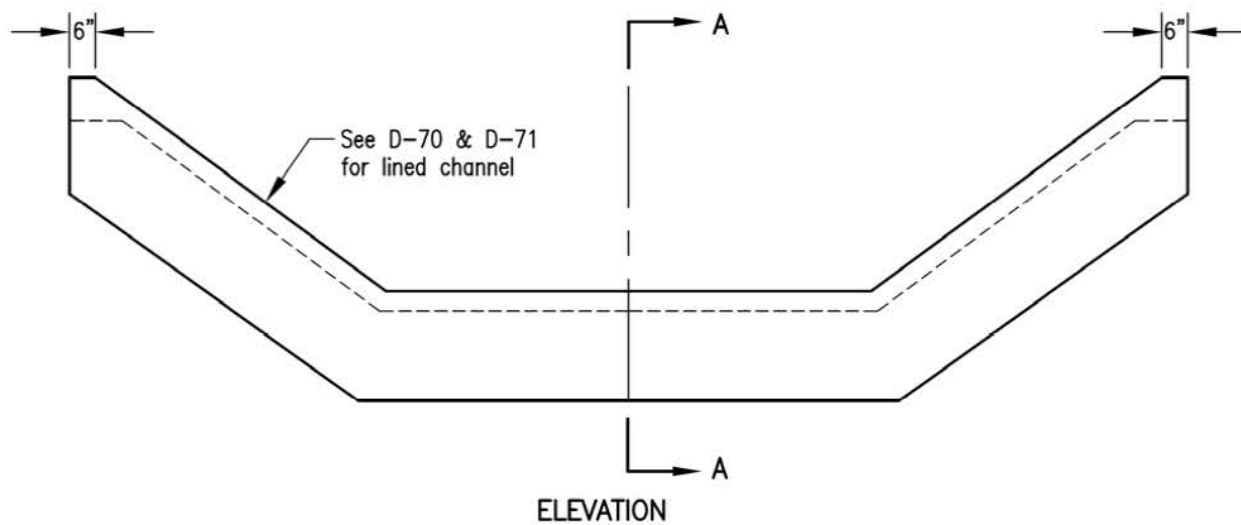
NOTES

1. Pipe collar does not have to be finished if covered.
2. Concrete shall be 560-C-3250.
3. Where gap exceeds 3" but is not more than 6" an internal form shall be used.

LEGEND ON PLANS



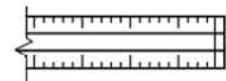
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75			<i>T. Stanton</i> 7/26/2012
Add Metric		T. Stanton	03/03	PIPE COLLAR		Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06			
Edited	S.S.	T. Regello	03/11			
						DRAWING NUMBER D-62



NOTES

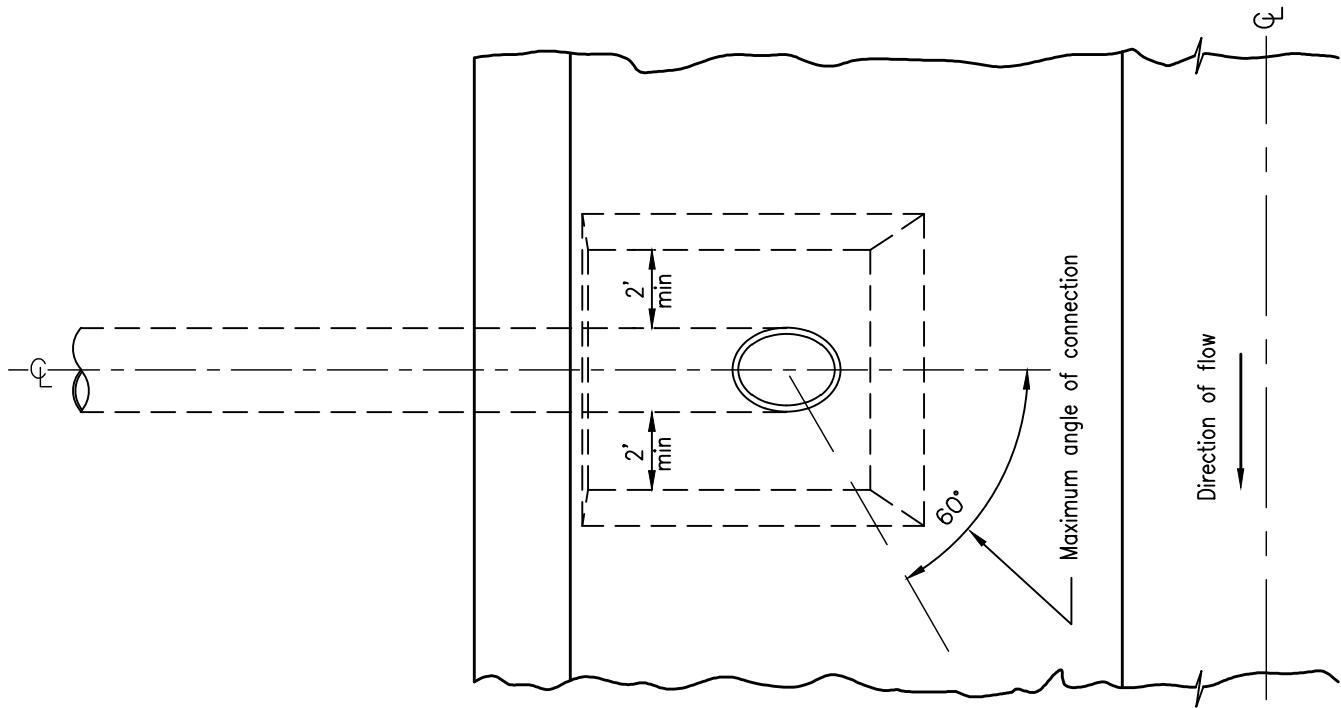
1. Thickness and wall depth shall be as shown on plan.
2. Reinforcing in cutoff wall shall be the same as that required in channel.
3. Concrete shall be 560-C-3250.

LEGEND ON PLANS

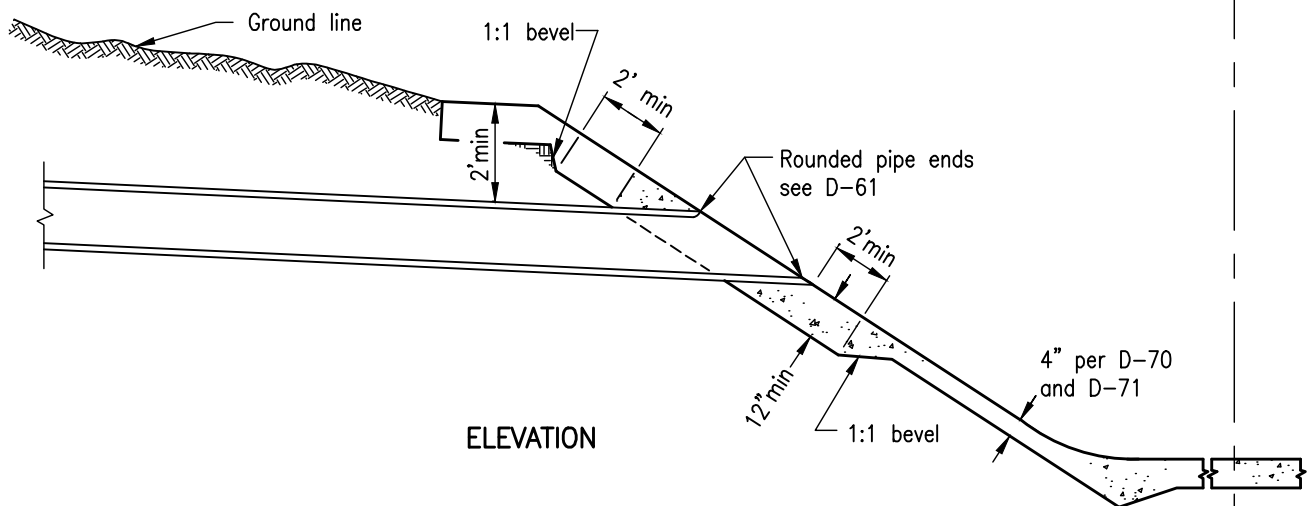


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
ORIGINAL		Kercheval	12/75	CUTOFF WALL FOR DRAINAGE CHANNEL	
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06		
Edited	S.S.	T. Regello	03/11		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				 7/26/2012 Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER D-72	

FOR DRAWINGS D-70 AND D-71, SEE DRAWINGS SDD-107 AND SDD-108



PLAN

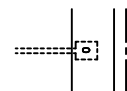


ELEVATION

NOTES:

1. Concrete shall be 560-C-3250.
2. Pipe shall connect to channel as high as possible and not be constructed directly above a weep hole.
3. The maximum angle of connection is 60° downstream. In no case shall a pipe angle upstream.
4. Install 6 x 6-W1.4 x W1.4 WWR in concrete around pipe.

LEGEND ON PLANS



Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

PIPE TO CHANNEL CONNECTION

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

D-73

Revision	By	Approved	Date
ORIGINAL		A.Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS No.1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-76A**

SPANS UP TO 5' (all measurements in feet and/or inches)

SPAN	2'		3'		4'		5'	
	1'-6"	2'	2'	3'	2'	3'	4'	5'
HEIGHT	A	A	A	A	A	A	A	A
STRENGTH CLASSIFICATION	A	A	A	A	A	A	A	A
MAX FILL OVER TOP	66	38	38	38	37	28	37	50
Top Slab	T ₁	6	6	6	6	6	6	6
Bottom Slab	T ₂	6	6	6	6	6	6	6
Sidewalls	T ₃	6	6	6	6	6	6	6
Size Bar "	4	4	4	4	5	5	5	5
Spacing	3 1/2	3 1/2	3 1/2	3 1/2	4	5	4 1/2	5
Length	3-2	3-2	4-2	4-2	5-3	5-3	5-3	5-2
Top Slab-No. of Bars	2	2	2	2	3	3	3	3
Bottom Slab-No. of Bars	2	2	2	2	3	3	3	3
Spacing	18	18	18	18	18	18	18	18
Number	12	12	12	12	12	12	14	16
Concrete: C.Y. per lin. ft.	17	18	23	27	31	33	36	43
Reinf. lbs per lin. ft.	27	29	34	36	44	45	47	52
QUAN.								

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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS No.1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-76B**

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	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
MAX FILL OVER TOP		10	18	10	18	10	18	25	9	18	25	9	17	25	36	45	9	17	25	36	45	9	17	25	36	45
CONC.	Top Slab	8 1/4	8 1/4	8 1/4	8 1/4	8 1/4	8 1/4	1/4 9	1/4 8	1/4 8	1/4 9	1/4 8	1/4 8	1/4 9	1/4 11	1/4 12	8 1/4	8 1/4	8 1/4	9 1/4	11 1/4	8 1/4	8 1/4	9 1/4	11 1/4	
	Bottom Slab	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	7 1/4	8 1/4	10 1/2	11 1/4	7 1/4	8 1/4	10 1/2	11 1/4	12 1/4	
	Sidewalls	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6 1/4	7	6	6	6 1/4	7	6	6	6 1/4	7 3/4	
	"a" Size Bar "	5	5	5	5	5	5	6	5	5	6	5	5	5	6	7	7	5	5	6	7	5	5	6	7	
Steel	Spacing	4	4	4	4	4	4	5	4	4	5	4 1/2	4	4	5	5 1/2	4	4	5	5 1/2	5	4	4	5	5 1/2	
	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	7-3	7-3	7-2	7-3	7-5	7-3	7-3	7-2	7-5	
	"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	7	4	4	4	
	Bars Bottom Slab-No. of	4		4								4	4	4	4	4	4	4			4	4	4		4	
Reinforcing	"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	12	7 1/2	5	4 1/2
	Spacers	12		12				14				16				16					18					
	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	88	88	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	139	139	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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS No.1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-76C**

SPAN 7' (all measurements in feet and/or inches unless otherwise noted)

SPAN		7'											
HEIGHT		3'			4'			5'			6'		
STRENGTH CLASSIFICATION		A	B	C	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
CONC.	Top Slab	T ₁	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4	8 1/4	7 1/4
	Bottom Slab	T ₂	7 1/2	8 3/4	7 1/2	8 3/4	7 1/2	8 3/4	7 1/2	8 3/4	7 1/2	8 3/4	7 1/2
	Sidewalls	T ₃	6	7	6	7	6	7	6	7	6	7	6
Reinforcing Steel	Size Bar "	5	5	5	5	5	5	5	5	5	5	5	5
	Spacing	9	7	9	7	9	7	9	7	9	7	9	7
	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
	Size Bar "	5	5	5	5	5	5	5	5	5	5	5	5
	Spacing	9	7	9	7	9	7	9	7	9	7	9	7
	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
	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
	Size Bar "	5	5	5	5	5	5	5	5	5	5	5	5
	Spacing	9	7	9	7	9	7	9	7	9	7	9	7
	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
	Length	5-2	5-4	6-2	6-4	7-2	7-4	7-10	8-2	8-4	8-10	9-2	9-4
	Size Bar "	5	5	5	5	5	5	5	5	5	5	5	5
QUAN.	Spacing	9	7	9	7	9	7	9	7	9	7	9	7
	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
	Length	3-8	3-10	3-8	3-10	3-8	3-10	4-6	3-8	3-10	4-6	3-8	3-10
	Top Slab-No. of Bars	7	4	7	4	7	4	4	7	4	4	7	4
	Bottom Slab-No. of Bars	4	4	4	4	4	4	4	4	4	4	4	4
	"e" Bars	18	18	18	18	18	18	18	18	18	18	18	18
	Spacing	24	24	24	24	24	24	28	24	24	28	24	24
	Spacers	24	24	24	24	24	24	28	24	24	28	24	24
	Total Number	47	56	51	60	55	64	78	58	68	84	62	73
	Concrete: C.Y. per lin. ft.	107	130	114	138	118	143	168	125	150	176	132	158
	Reinf lbs per lin. ft.												

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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS No.1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-76D**

SPAN 8' (all measurements in feet and/or inches unless otherwise noted)

SPAN		8'											
HEIGHT		3'			4'			5'			6'		
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C
MAX FILL OVER TOP		13	21	31	13	21	31	13	21	31	13	21	31
Top Slab	T ₁	7 1/4	8 1/2	1/27 1/4	8 1/2	1/27 1/4	8 1/2	1/27 1/4	8 1/2	1/27 1/4	8 1/2	1/27 1/4	8 1/2
Bottom Slab	T ₂	7 1/4	9 1/2	1/27 1/4	9 1/2	1/27 1/4	9 1/2	1/27 1/4	9 1/2	1/27 1/4	9 1/2	1/27 1/4	9 1/2
Sidewalls	T ₃	6 1/2	7 1/2	1/27 1/2	7 1/2	1/27 1/2	7 1/2	1/27 1/2	7 1/2	1/27 1/2	7 1/2	1/27 1/2	7 1/2
Reinforcing Steel	Size Bar "	5	5	5	5	5	5	5	5	5	5	5	5
	"a"	9	7	9	9	7	9	7	9	7	9	7	9
	Spacing	7-7	7-8	7-7	7-8	7-7	7-8	7-7	7-8	7-7	7-8	7-7	7-8
	Length	5	5	5	5	5	5	5	5	5	5	5	5
Reinforcing Steel	Size Bar "	9	7	9	9	7	9	7	9	7	9	7	9
	"b"	1-6	1-7	1-6	1-7	1-6	1-7	1-6	1-7	1-6	1-7	1-6	1-7
	Dimension "X"	3-4	3-5	3-4	3-5	3-4	3-5	3-4	3-5	3-4	3-5	3-4	3-5
	Length	5	5	5	5	5	5	5	5	5	5	5	5
Reinforcing Steel	Size Bar "	9	7	9	9	7	9	7	9	7	9	7	9
	"c"	2	2-5	2	2-5	2	2-5	2	2-5	2	2-5	2	2-5
	Dimension "Y"	3-4	3-10	6-4	6-10	7-4	7-10	8-4	8-10	9-3	9-4	9-10	10-3
	Length	5	5	5	5	5	5	5	5	5	5	5	5
Reinforcing Steel	Size Bar "	9	7	9	9	7	9	7	9	7	9	7	9
	"c ₁ "	2	2-5	2	2-5	2	2-5	2	2-5	2	2-5	2	2-5
	Dimension "Y"	3-9	4-5	3-9	4-5	3-9	4-5	3-9	4-5	3-9	4-5	3-9	4-5
	Length	7	5	7	5	7	5	7	5	7	5	7	5
Reinforcing Steel	Top Slab-No. of Bars	5	5	5	5	5	5	5	5	5	5	5	5
	"d"	18	18	18	18	18	18	18	18	18	18	18	18
	Bottom Slab-No. of Bars	18	18	18	18	18	18	18	18	18	18	18	18
	"e"	28	28	28	32	32	36	36	40	40	40	40	40
QUAN.	Spacers	52	65	56	70	60	74	65	79	100	69	83	106
	Concrete: C.Y. per lin. ft.	118	146	125	154	129	139	136	167	211	143	174	220
QUAN.	Reinf lbs per lin. ft.												

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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS No.1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-76E**

SPAN 10' (all measurements in feet and/or inches unless otherwise noted)

SPAN		10'																							
HEIGHT		4'			5'			6'			7'			8'			9'			10'					
STRENGTH CLASSIFICATION		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	C			
MAX FILL OVER TOP		9	18	9	18	9	18	9	18	9	18	9	18	9	18	9	18	9	18	9	18	28			
CONC.	Top Slab	T ₁	8	9	1/2	8	3/4	8	1/4	9	3/4	8	1/2	9	3/4	8	1/2	9	3/4	8	1/2	9	3/4		
	Bottom Slab	T ₂	8	3/4	10	1/2	9	10	3/4	9	10	3/4	9	11	9	1/4	11	13	1/4	9	1/4	11	13		
	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		
	Size Bar "		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7		
Reinforcing Steel	Spacing		11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	9		
	Length		9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-5	9-8	9-9		
	Size Bar "		5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	6		
	Spacing		11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	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	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	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	12-3	12-1	12-10	13-3	13-1	13-10	14-3	13-1	13-10	14-3		
	Size Bar "		5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	5	6	6		
	Spacing		11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	11	8	9		
Reinforcing Steel	Dimension "Y"		2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	2-8	3-4	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	4-7	5-8	4-7	5-8	4-7	5-8	4-7	5-8	4-7	5-8	6-2		
	Top Slab-No. of Bars	"d"	9	5	9	5	9	5	9	5	9	5	9	5	9	5	9	5	9	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	5	5	5	5		
	Spacing	"e"	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
	Spacers		32		34		36		40		44		48		48		48		48		48		48		
	Total Number		75	94	82	108	86	108	92	115	97	121	150	106	126	157	118	132	165		118	132	165		
	Concrete: C.Y. per lin. ft.		143	221	148	228	154	235	160	244	164	250	265	170	259	273	178	267	281		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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

SINGLE BOX CULVERT DETAILS No.1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012
Chairperson R.C.E. 19246 Date

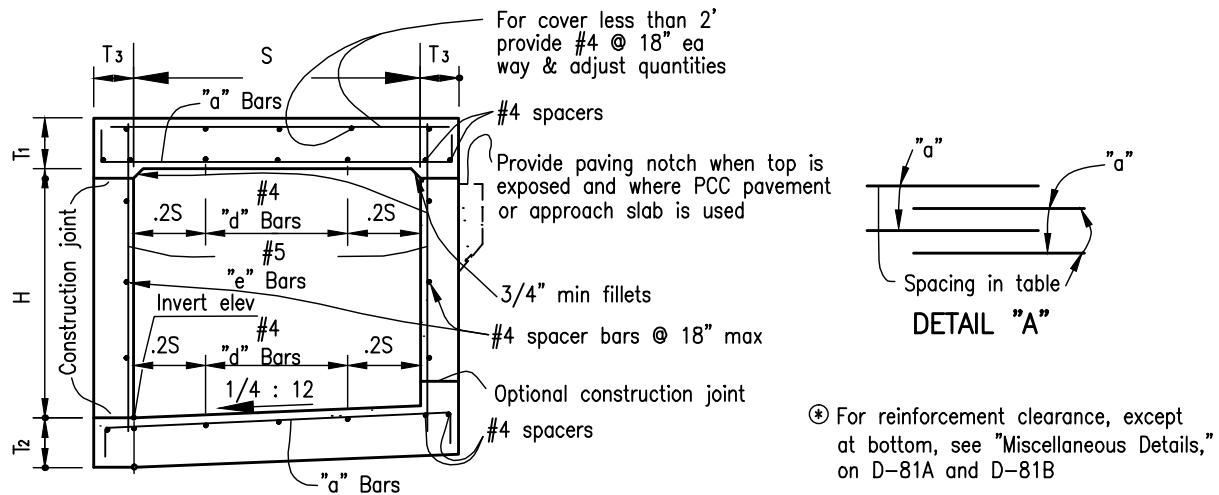
DRAWING
NUMBER **D-76F**

SPAN 12' (all measurements in feet and/or inches unless otherwise noted)

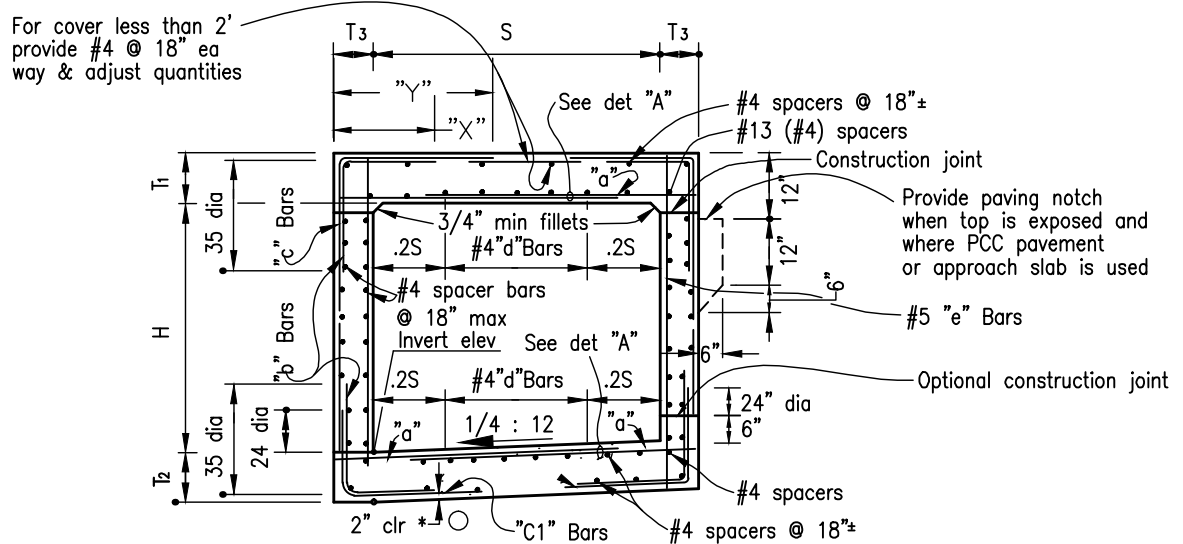
SPAN		12'																			
HEIGHT		6'			7'			8'			9'			10'			12'				
STRENGTH CLASSIFICATION		A	B		A	B		A	B		A	B		A	B		A	B		C	
MAX FILL OVER TOP		5	16		5	16		5	16		5	16		5	16		5	16		24	
CONC.	Top Slab	T ₁	8	3/4	11	1/4	8	3/4	11	1/4	8	3/4	11	1/4	8	3/4	11	1/4	13	1/4	
	Bottom Slab	T ₂	8	3/4	12	1/4	8	3/4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

NOTE

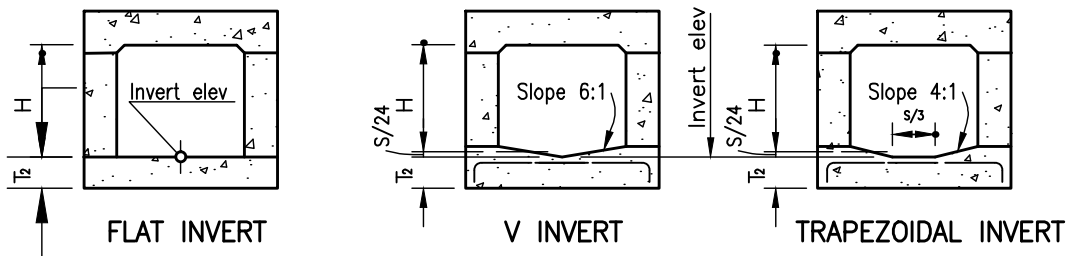
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.

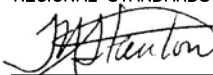


TYPICAL SECTIONS 2' THRU 6' SPANS



TYPICAL SECTIONS 7' THRU 12' SPANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75	SINGLE BOX CULVERT DETAILS NO.2		 7/26/2012 Chairperson R.C.E. 19246 Date
Add Metric		T Stanton	03/03			
Reviewed		T Stanton	04/06			
Edited	S.S.	T. Regello	03/11			
						DRAWING NUMBER D-76G

SPAN 4' (all measurements in feet and/or inches unless otherwise noted)

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	
Concrete	Top Slab	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	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	6	6	6	6	6	6	6	6	6	6	6	
	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	
Reinforcing Steel	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" or "b ₁ "	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	
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	
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	
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		23						26			29		
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
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-77A**

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

**DOUBLE BOX CULVERT
DETAILS No. 1**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-77B**

SPAN 5' (all measurements in feet and/or inches unless otherwise noted)

SPAN		5'											
HEIGHT		2'				3'				4'			
		A	B	C		A	B	C		A	B	C	D
STRENGTH CLASSIFICATION		6	36	36		6	24	36		6	23	34	46
MAX FILL OVER TOP		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
Top Slab		T1				T1				T1			
Bottom Slab		T2				T2				T2			
Sidewalls		T3				T3				T3			
Size Bar #		5	4	4		5	4	4		5	4	4	4
Spacing		10	8 1/2	10		10	8 1/2	10		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
Size Bar #		5	5	6		5	5	6		5	5	6	6
Spacing		10	8 1/2	10		10	8 1/2	10		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
Length "b1"		11-4	11-6	11-7		11-4	11-6	11-7		11-4	11-6	11-7	11-8
Size Bar #		4	5	6		4	5	6		4	5	6	6
Spacing		10	8 1/2	10		10	8 1/2	10		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
Top Slab-Tot. No.		12	6	6		12	6	6		12	6	6	6
Bottom Slab-Tot. No.		6	6	6		6	6	6		6	6	6	6
Size Bar #		4	4	4		4	4	4		4	4	4	4
Spacing		18	18	18		18	18	16		18	12	10 1/2	9
Spacers		23				26				29			32
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
Reinf. lbs per lin. ft.		99	100	109		103	104	112		106	109	119	133
Quant.													

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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING







DOUBLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-77C**

SPAN 6' (all measurements in feet and/or inches unless otherwise noted)

SPAN		6'															
HEIGHT		3'				4'				5'				6'			
STRENGTH CLASSIFICATION	MAX FILL OVER TOP	A	B	C	A	B	C	A	B	C	D	A	B	C	D		
		4	20	34	4	20	34	4	19	33	43	4	19	33	43		
Concrete	Top Slab	T1	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		
	Bottom Slab	T2	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		
	Sidewalls	T3	6	6	6	6	6	6	6	6	6	6	6	6	6		
			5	4	4	5	4	4	5	4	4	4	5	4	4		
Reinforcing Steel	"a" 	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		
	Length	14-3	14-2	14-2	14-3	14-2	14-2	14-3	14-2	14-2	14-2	14-2	14-3	14-2	14-8		
	"b" 	Size Bar #	5	6	6	5	6	6	5	6	6	7	5	6	6		
	Spacing	9 1/2	11	8 1/2	9 1/2	11	8 1/2	9 1/2	11	8 1/2	11	8 1/2	10 1/2	9 1/2	11		
Reinforcing Steel	"b" or "b1" 	Length	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		
	Length	13-5	13-7	13-8	13-5	13-7	13-8	13-5	13-6	13-6	13-8	13-9	13-6	13-6	13-8		
	"c" 	Size Bar #	4	6	6	4	6	6	4	6	6	7	4	6	6		
	Spacing	9 1/2	11	8 1/2	9 1/2	11	8 1/2	9 1/2	11	8 1/2	11	8 1/2	10 1/2	9 1/2	11		
Reinforcing Steel	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		
	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	5	6	6	
Reinforcing Steel	Bars 	18	18	16	18	14	8 1/2	18	10	9 1/2	7	18	11	9	6		
	Spacers	Number	30				33				36				36		
Reinforcing Steel	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
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-77D**

SPAN 8' (all measurements in feet and/or inches unless otherwise noted)

SPAN		8'											
HEIGHT		4'				5'				6'			
STRENGTH CLASSIFICATION		A	B	C		A	B	C		A	B	C	D
MAX FILL OVER TOP		3	14	25		3	14	25		3	14	25	37
Conc.	Top Slab	T1	8 1/2	9 1/2	12	8 1/2	9 1/2	12	12	8 1/2	9 1/2	12	14 1/4
	Bottom Slab	T2	7 1/2	10 1/2	12 3/4	7 1/2	10 1/2	12 3/4	12	7 1/2	10 3/4	13	15
	Sidewalls	T3	6	6	6	6	6	6	6	7	7	7	8
Reinforcing Steel	Size Bar #	6	4	4	4	6	4	4	4	6	4	4	4
	Spacing	12	9 1/2	10 1/2	12	9 1/2	10 1/2	10	11 1/2	9 1/2	10 1/2	10	8 1/2
	Length	18-4	18-2	18-2	18-4	18-2	18-4	18-2	18-2	18-7	18-5	18-8	18-10
Reinforcing Steel	Size Bar #	6	6	7	6	6	6	7	7	6	6	6	7
	Spacing	12	9 1/2	10 1/2	12	9 1/2	10 1/2	10	11 1/2	9 1/2	10 1/2	10	8 1/2
	Length	17-7	17-8	17-9	17-7	17-8	17-9	17-9	17-9	17-10	17-10	17-10	18-3
Reinforcing Steel	Size Bar #	4	6	7	4	6	7	7	7	4	6	7	7
	Spacing	12	9 1/2	10 1/2	12	9 1/2	10 1/2	10	11 1/2	9 1/2	10 1/2	10	8 1/2
	Length	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-6	8-7	8-7	8-7	8-9
Reinforcing Steel	Size Bar #	8	8	8	8	8	8	8	8	8	8	8	8
	Spacing	4	4	5	4	4	4	5	6	4	5	5	7
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Spacing	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
	Length	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2
Reinforcing Steel	Size Bar #	18	18	10 1/2	18	12	10	10	11 1/2	14	9 1/2	7 1/2	8 1/2

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	03/03
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-77E**

SPAN 10' (all measurements in feet and/or inches unless otherwise noted)

SPAN		10'																				
HEIGHT		5'				6'				7'				8'				10'				
STRENGTH CLASSIFICATION		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	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				
Comments:	Top Slab	T1	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	8 3/4	12 3/4	16	17 1/4	36			
	Bottom Slab	T2	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	8 3/4	13 1/2	16 1/2	18 1/4	36			
	Sidewalls	T3	6	6	6	6	6	6	6	6 1/2	7	7	7 1/2	7 1/2	8	8	9	10				
			6	4	4	6	4	4	6	4	4	6	4	4	6	4	4	4				
Reinforcing Steel	"a" └───┘	11	10	10	11	9 1/2	10	11	9 1/2	10	11	10	10	9	11	10	10	9				
		22-4	22-2	22-2	22-4	22-2	22-2	22-4	22-4	22-2	22-4	22-2	22-2	22-5	22-7	22-5	22-10	22-8	22-11	23-2		
	"b" └───┘ or "b1"	6	7	8	6	7	8	6	7	8	6	7	8	6	7	8	6	7	8			
		11	10	10	11	9 1/2	10	11	9 1/2	10	11	10	10	9	11	10	10	9				
	"c" └───┘	21-7	21-10	22	21-7	21-10	22	21-7	21-11	22-3	21-10	22-1	22-4	22-9	22-1	22-4	22-9	22-9	23-1			
		21-5	21-10	22	21-5	21-10	22	21-5	21-11	22-3	21-9	22	22-4	22-9	22	22-3	22-8	23-2				
	"d" └───┘	6	7	8	6	7	8	6	7	8	6	7	8	6	7	8	6	7	8			
		11	10	10	11	9 1/2	10	11	9 1/2	10	11	10	10	9	11	10	10	9				
	"e" └───┘	10-6	10-6	10-6	10-6	10-6	10-6	10-6	10-6	10-7	10-7	10-7	10-7	10-8	10-8	10-8	10-9	10-9	10-10			
		18	10	10	18	10	10	18	10	10	10	18	10	10	18	10	10	10	10			
Formwork	"d" Dist Bars	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10			
	"e" Bars	4	4	5	4	4	5	4	4	6	4	5	6	7	4	6	6	7				
		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		
Quantities	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				
	Reinforcing Steel: lbs per lin. ft.	236	254	310	238	274	324	243	280	339	252	278	355	430	279	327	400	476				

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

DOUBLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-77F**

SPAN 12' (all measurements in feet and/or inches unless otherwise noted)

SPAN		12'																							
HEIGHT		6'				7'				8'				9'				10'				12'			
STRENGTH CLASSIFICATION		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
MAX FILL OVER TOP		2	14	26	36	2	14	26	36	2	14	26	36	2	14	26	36	2	14	26	36	2	14	26	36
Concrete	Top Slab	T ₁	10	14	17 1/2	20	14 1/4	17 3/4	20 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	17 3/4	20 3/4	10 1/4	14 1/2	17 3/4	20 3/4
	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 1/2	9	9	10	9	10	9	9 1/2	11	9	10	11	12			
	Size Bar #		6	4	4	4	6	4	4	4	6	4	4	4	6	4	4	4	6	4	4	4	4	4	4
Reinforcing Steel	Spacing		9	11 1/2	9	9	11 1/2	9	9	11 1/2	9	11	8 1/2	9	9	11	8 1/2	9	9	11	8 1/2	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	27-5	27-8	
	Size Bar #		6	8	8	6	8	8	6	8	8	6	8	8	9	6	8	8	9	6	8	8	9	9	
	Spacing		9	11 1/2	9	9	11 1/2	9	9	11	8 1/2	9	9	11	8 1/2	9	9	11	8 1/2	9	9	11	8 1/2	9	
Reinforcing Steel	Length		25-8	25-10	26-3	25-11	26-1	26-4	26-2	26-4	26-9	26-5	26-9	26-9	26-5	26-8	26-10	27-4	26-5	26-8	27-2	26-5	26-11	27-10	
	Size Bar #		5	8	8	5	8	8	5	8	8	5	8	8	5	8	8	9	5	8	8	9	8	9	
	Spacing		9	11 1/2	9	9	11 1/2	9	9	11	8 1/2	9	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	12-9	12-9	12-9	12-10	12-9	12-9	12-10	12-11	12-9	12-10	
Reinforcing Steel	Top Slab-Tot. No. Bars		24	10	10	24	10	24	10	24	10	24	10	24	10	24	10	24	10	24	10	24	10	10	
	Bottom Slab-Tot. No. Bars		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
	Size Bar #		4	4	5	4	4	5	4	4	5	4	4	5	4	4	5	7	8	4	7	8	6	7	
	Spacing		18	8	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		52				55				68				68				72				76			
Concrete: C.Y. per lin. ft.		1.84	2.59	3.16	3.28	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	562	371	477	567	673			

For cover less than 2" provide #4 @ 18" ea way & adjust quantities

Provide paving notch when top is exposed and where PCC pavement or approach slab is used

#4 spacers @ 18"

T₃ S T₃ S T₃

c Bars

b Bars

a Bars 3/4" min fillet

#4 spacers @ ±18"

e Bars Invert elev 1/4 : 12

Const joint

H

12"

12"

6"

6"

6"

Optional const joint

#4 spacers @ ±18"

#4 @ 18"

6"

#4 spacers

c Bars

2" cl

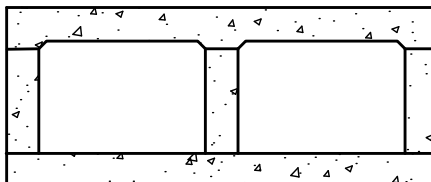
b1 Bars

a Bars

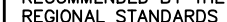
Reinforcement for interior walls under 8"

(Showing reinforcement for interior walls 8" and over)

* For reinforcement clearance, except at bottom, see "Miscellaneous Details," on D-81A and D-81B.



"FLAT INVERT" ALTERNATIVE
(When specified)

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75		DOUBLE BOX CULVERT DETAILS NO. 2	 7/26/2012
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246		Date
Reviewed		T. Stanton	04/06	DRAWING NUMBER		D-77G
Edited	S.S.	T. Regello	03/11			

SPAN 4' (all measurements in feet and/or inches)

SPAN		4'											
HEIGHT		2'				3'				4'			
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	T1	6 1/4	6 1/4	7 1/4	6 1/4	6 1/4	7 1/4	7 1/4	6 1/4	6 1/4	7 1/4	7 1/4
	Bottom Slab	T2	6	7	8 1/4	6	7	8 1/4	8 1/4	6	7	8 1/4	8 1/4
	Sidewalls	T3	6	6	6	6	6	6	6	6	6	6	6
Reinforcing Steel	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	
Reinforcing Steel	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	14-2	14-2	14-3		14-2	14-2	14-3		14-2	14-2	14-3	
Reinforcing Steel	Length "b"	14	14-2	14-3		14	14-2	14-3		14	14-2	14-3	
	Length "b1"	4	5	6		4	5	6		4	5	6	
	Size Bar #	11	11 1/2	13		11	11 1/2	13		11	11 1/2	13	
Reinforcing Steel	Spacing	9	9	9		9	9	9		9	9	9	
	Length	15	9	9		15	9	9		15	9	9	
	Top Slab-Tot. No.	9	9	9		9	9	9		9	9	9	
Reinforcing Steel	Bottom Slab-Tot. No.	4	4	4		4	4	4		4	4	4	
	Size Bar #	18	18	18		18	18	18		18	18	18	
	Spacing	34	34	34		34	34	34		34	34	34	
Reinforcing Steel	Spacers Number	0.67	0.71	0.81		0.75	0.79	0.89		0.82	0.86	0.96	
	Concrete: C.Y. per lin. ft.	122	110	133		127	115	138		131	122	147	
	Reinf :lbs per lin. ft.												

NOTE

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

D-78A

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

D-78B

SPAN 5' (all measurements in feet and/or inches)

SPAN		5'											
HEIGHT		2'				3'				4'			
STRENGTH CLASSIFICATION		A	B	C		A	B	C		A	B	C	D
MAX FILL OVER TOP		8	17	26		8	17	26		8	17	26	35
Top Slab	T1	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
	T2	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
	T3	6	6	6		6	6	6		6	6	6	6
Sidewalls		5	4	5		5	4	5		5	4	5	5
Size Bar #		10	11 1/2	13		10	11 1/2	13		10	11 1/2	13	11 1/2
Spacing		17-9	17-8	17-9		17-9	17-8	17-9		17-9	17-8	17-9	17-9
Length		5	5	6		5	5	6		5	5	6	6
Size Bar #		10	11 1/2	13		10	11 1/2	13		10	11 1/2	13	11 1/2
Spacing		17-3	17-3	17-3		17-3	17-3	17-3		17-3	17-3	17-3	17-3
Length "b"		17	17-2	17-4		17	17-2	17-4		17	17-2	17-4	17-5
Length "b1"		4	5	6		4	5	6		4	5	6	6
Size Bar #		10	11 1/2	13		10	11 1/2	13		10	11 1/2	13	11 1/2
Spacing		11	11	11		11	11	11		11	11	11	11
Length		18	9	9		18	9	9		18	9	9	9
Top Slab-Tot. No.		9	9	9		9	9	9		9	9	9	9
Bottom Slab-Tot. No.		4	4	4		4	4	4		4	4	4	4
Size Bar #		18	18	18		18	18	18		18	18	18	18
Spacing		34	34	34		34	34	34		34	34	34	34
Number		38	38	38		38	38	38		38	38	38	38
Spacers		0.82	0.87	0.98		0.90	0.95	1.05		0.97	1.02	1.13	1.23
Concrete: C.Y. per lin. ft.		150	126	153		155	130	157		157	136	161	181
Reinf :lbs per lin. ft.													
Quan.													

NOTE

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-78C**

SPAN 6' (all measurements in feet and/or inches)

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	T1	7 1/2	7 1/2	8 1/4	7 1/2	8 1/4	7 1/2	8 1/4	7 1/2	8 1/4	7 1/2	8 1/4	7 1/2	8 1/4		
	Bottom Slab	T2	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		
	Sidewalls	T3	6	6	6	6	6	6	6	6	6	6	6	6	6		
	Size Bar #	6	5	5	6	5	5	6	5	5	5	6	5	5	5		
	Spacing	13	14	11 1/2	13	14	11 1/2	13	14	11 1/2	10	13	14	11 1/2	10		
	Length	20-10	20-9	20-9	20-10	20-9	20-9	20-10	20-9	20-9	20-9	20-10	20-10	20-9	20-9		
	Size Bar #	6	6	6	6	6	6	6	6	6	6	6	6	6	6		
	Spacing	13	14	11 1/2	13	14	11 1/2	13	14	11 1/2	10	13	14	11 1/2	10		
	Length "b" or "b1"	20-3	20-3	20-5	20-3	20-3	20-5	20-3	20-3	20-3	20-6	20-3	20-3	20-5	20-6		
	Length "b1"	20	20-2	20-5	20	20-2	20-5	20	20-2	20-5	20-6	20	20	20-5	20-7		
	Size Bar #	4	6	6	4	6	6	4	6	6	6	4	6	6	6		
	Spacing	13	14	11 1/2	13	14	11 1/2	13	14	11 1/2	10	13	14	11 1/2	10		
	Length	13	13	13	13	13	13	13	13	13	13	13	13	13	13		
	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		
	Size Bar #	4	4	4	4	4	4	4	4	4	5	4	4	6	6		
	Spacing	18	18	18	18	18	11 1/2	18	11 1/2	12	10	18	8	12	10		
	Bars	48															
Spacers		40				40				52				48			
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 all cells.

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-78D**

SPAN 8' (all measurements in feet and/or inches)

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
Concrete	Top Slab	8 1/4	8 1/4	10 1/4	10 1/4	8 1/4	8 1/4	10 1/4	10 1/4	8 1/4	8 1/4	10 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	11 1/2
	Bottom Slab	6 1/2	9	11	11	6 1/2	9 1/4	11	11	6 1/2	9 1/4	11	11	6 3/4	9 1/4	11	12 1/4	6 3/4	9 1/4	11	12 1/4
	Sidewalls	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6 1/2	7	7	7 1/2	8 1/2
	Size Bar #	6	5	5		6	5	5		6	5	5		6	5	5	6	6	5	5	6
	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	10 1/2
	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	27-8
	Size Bar #	6	6	7		6	6	7		6	6	7		6	6	7	7	6	6	7	7
Reinforcing Steel	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	10 1/2
	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	27-7
	Length "b1"	26	26-4	26-7		26	26-5	26-7		26	26-5	26-7		26-1	26-5	26-9	27-3	26-5	26-9	27-1	27-7
	Size Bar #	4	6	7		4	6	7		4	6	7		4	6	7	7	4	6	7	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	10 1/2
	Length	17	17	17		17	17	17		17	17	17		17	17	17-1	17-3	17-2	17-2	17-3	17-5
Reinforcing Steel	Top Slab-Tot. No.	24	12	12		24	12	12		24	12	12		24	12	12	12	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
	Size Bar #	4	4	4		4	4	4		4	4	4		4	4	6	7	4	6	7	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	10 1/2
	Length	147	167	199		154	176	206		162	184	214		162	184	214	257	190	210	246	279
Reinforcing Steel	Concrete: C.Y. per lin. ft.	261	250	301		266	257	310		267	264	320		276	277	336	409	283	295	347	441
	Reinforcing Steel: lbs per lin. ft.	261	250	301		266	257	310		267	264	320		276	277	336	409	283	295	347	441
	Quantity	147	167	199		154	176	206		162	184	214		162	184	214	257	190	210	246	279

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-78E**

SPAN 10' (all measurements in feet and/or inches)

SPAN	10'																	
	5'			6'			7'			8'			10'					
HEIGHT																		
STRENGTH CLASSIFICATION	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
MAX FILL OVER TOP	2	11	20	2	11	20	2	11	20	2	11	20	2	11	20	2	11	20
Top Slab	9	10	12	9	10	12	9	10	12	9	10	12	9	10	12	9	10	12
Bottom Slab	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	8	11	13 1/2	8	11	13 1/2
Sidewalls	6	6	6	6	6	6	6	6	6	7	7	7 1/2	8	8 1/2	9	8	8 1/2	9
Size Bar #	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Spacing	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10
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	34-2
Size Bar #	6	7	7	6	6	7	6	6	7	6	7	7	6	6	7	6	7	8
Spacing	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10
Length "b"	32-6	32-7	32-10	32-6	32-7	32-10	32-6	32-7	32-10	32-6	32-7	33	32-4	33-11	32-2	33-5	33-11	34-5
Length "b1"	32-2	32-7	32-11	32-2	32-7	32-11	32-2	32-7	32-11	32-2	32-7	33-1	32-6	32-11	32-11	32-11	33-5	34-5
Size Bar #	5	7	7	5	7	7	5	7	7	5	7	7	5	7	7	5	7	8
Spacing	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10	10 1/2	13	10
Length	21	21	21	21	21	21	21	21	21	21-2	21-2	21-3	21-5	21-4	21-5	21-6	21-8	21-8
"d" Dist	27	15	15	27	15	15	27	15	15	27	15	15	27	15	15	15	15	15
Top Slab-Tot. No. Bars	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Bottom Slab-Tot. No. Bars	4	4	5	4	4	5	4	4	5	4	4	6	7	4	6	5	6	8
Size Bar #	18	13	10	18	13	10	13	13	10	10 1/2	12	10	11	10 1/2	9	10	10	9
Spacing	68	68	68	68	68	68	68	68	68	72	76	76	94	94	102	102	102	102
Spacers Number	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	4.22
Concrete: C.Y. per lin. ft.	358	372	470	359	379	482	367	391	502	377	402	514	590	421	453	577	632	632
Reinf :lbs per lin. ft.																		

NOTE

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

SPAN 12' (all measurements in feet and/or inches)

SPAN		12'																															
HEIGHT		6'				7'				8'				9'				10'				12'											
STRENGTH CLASSIFICATION	MAX FILL OVER TOP	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	D	A	B	C	D									
		2	10	18	2	10	18	2	10	18	2	11	20	30	2	11	20	30	2	11	20	30	2	11	20	30							
Concrete	Top Slab	T1	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		
	Bottom Slab	T2	8	1/4	12	14	1/2	8	1/2	12	14	3/4	8	3/4	12	15	1/2	18	1/4	8	3/4	12	15	1/2	18	1/4	9	12	3/4	15	3/4	18	1/4
	Sidewalls	T3	6	6	6	1/2	6	6	6	1/2	6	6	7	7	1/2	8	8	9	10	8	8	8	8	9	10	1/2	9	9	10	1/2	12	12	
	Size Bar #		7	6	7	7	6	7	7	6	7	7	6	7	7	6	7	6	7	6	7	6	7	6	7	8	7	6	7	8	7	8	
Reinforcing Steel	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	
	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	40-1	39-10	40-7	41-6	39-7	41-6								
	Size Bar #		7	7	8	7	7	8	7	7	8	7	8	7	8	9	7	7	8	9	7	7	8	9	7	8	9						
	Spacing "b" or "b1"		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	
Reinforcing Steel	Length "b1"		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	39-7	39-10	40-8	41-6	39-7	41-6								
	Size Bar #		6	7	8	6	7	8	6	7	8	6	7	8	9	6	7	8	9	6	7	8	9	6	7	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	
	Length		25	25	25-1	25	25	25-2	25-2	25-2	25-3	25-4	25-4	25-6	25-8	25-4	25-4	25-6	25-9	25-6	25-6	25-6	25-9	26	26								
Reinforcing Steel	"d" Dist Bars		36	15	15	36	15	15	36	15	15	36	15	15	36	15	15	15	15	36	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	15	15	15	15	15	15								
	Size Bar #		4	4	6	4	4	6	4	4	6	4	6	7	8	5	7	8	8	6	7	9	9	9									
	Spacing		18	7	11	1/2	12	5	3/4	11	1/2	12	5	1/2	9	10	10	11	1/2	11	6	1/2	12	9	11	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										
	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										

NOTE

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

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited		T. Stanton	02/09
Edited	S.S.	T. Regello	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

TRIPLE BOX CULVERT DETAILS No. 1

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

Chairperson R.C.E. 19246 Date

DRAWING
NUMBER


D-78F

Provide paving notch when top is exposed and where PCC pavement or approach slab is used



(When specified)

1. Spacers shall be #4 @ 18" oc in top slab and sidewall mats.
2. Remaining #4 Spacers shall be equally distributed in bottom slab mats.

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75		TRIPLE BOX CULVERT DETAILS NO.2	 7/26/2012
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246		Date
Reviewed		T. Stanton	04/06	DRAWING NUMBER		D-78G
Edited	S.S.	T. Regello	03/11			

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 (e.g. 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.

REINFORCEMENT PLACEMENT: Main Reinforcement is positioned transverse or, for curved culverts, radial. When radial, reinforcing spacing is measured along C/L.

CONSTRUCTION NOTES

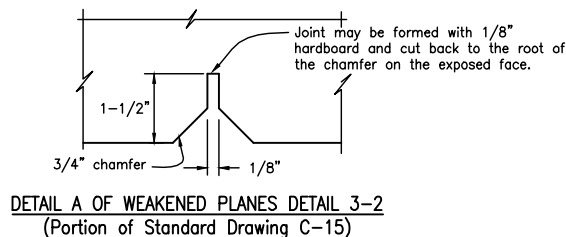
CONCRETE: Bottom slab & walls shall be Class 560-B-3250. Top slab shall be Class 560-C-3250.

EXPANSION JOINTS: Bottom Slab - No expansion joints shall be placed.

Top Slab and Walls - When cover is less than span length, place 1/2" expansion joint filler at 50'± centers outside the paved roadway lanes and place weakened plane joints per Detail A of Weakened Planes Detail 3-2 of C-15 at 30'± centers under paved roadway lanes. When cover depth is greater than span length, place 1/2" expansion joint filler at 30'± centers and additional 1/2" expansion joints at locations of change of foundation character as directed by the Engineer.

CONSTRUCTION LOADS: Not permitted until concrete has reached a strength of 3,000 p.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/L of RCB. Otherwise, the Contractor is to submit a proposal for consideration.



DESIGN NOTES

SPECIFICATIONS

DESIGN: AASHTO's publication titled A Policy on Geometric Design of Highways, dated 1984, 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. Special design will be required for culverts on piles or rock foundations.

LOADING

LIVE LOAD: For legal highway loads, use HS20-44 or alternative with 30% impact for all cover depths with no impact on invert.

COVER LESS THAN 2': Wheel load distribution on the top slab is $E=0.175S+3.2'$ longitudinally and concentrated along the span. Wheel load distribution on the invert slab is 7.5' longitudinally and uniformly over the breadth of the culvert.

COVER 2' OR MORE: Wheel loads distributed uniformly over a square, the sides of which are 1.75 times the depth of cover, but not less longitudinally than E on the top slab, or 7.5' on the invert slab when such areas from several wheel concentrations overlap. The total load shall be considered as uniformly distributed over the area defined by the outside limits of the individual areas, but the overall longitudinal dimension shall not exceed the total length of the supporting slab. Neglect live load, on single spans when cover is more than 8' and exceeds span, and on multiple spans when cover exceeds distance between exterior walls.

DEAD LOAD: Earth load of 120 pcf and an equivalent fluid pressure of 36 pcf, reduced to 84 pcf and 25 pcf respectively for clear spans of 20' or less.

UNIT STRESSES: $F_s = 20,000$ psi, $N = 10$
 $F_c = 1,200$ psi

Reinforcement embedment is 1-1/2 dia. clear, min 1" and in 1/4" increments, except as noted.

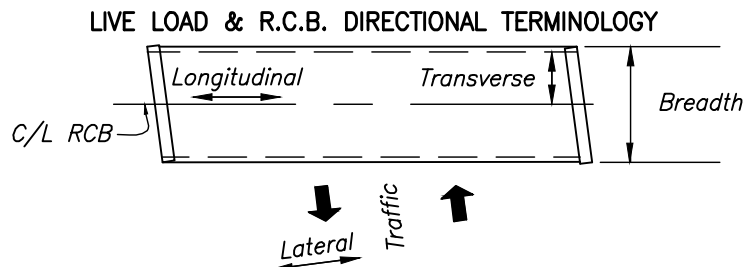
Distribution "d" bars expressed as a percent of main positive reinforcement.

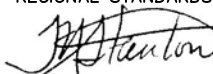
Classification "A" top slab = $\frac{100}{SPAN}$, max. 50% (unless traffic longitudinal)

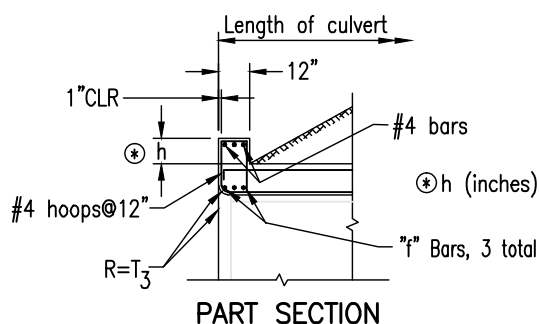
Classification "B" to "E": Top and bottom slabs #4 @ 18" max.

USE OF STANDARD DRAWING

"Strength Classification," as symbolized by the letters ("A", "B", "C" or "D") 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.



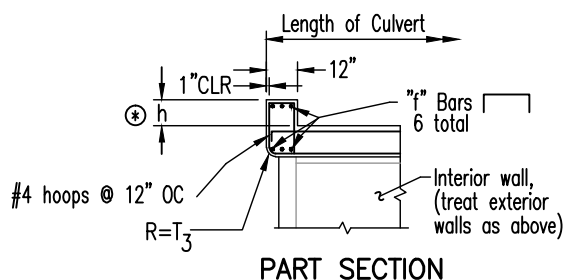
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75			 7/26/2012 Chairperson R.C.E. 19246 Date	
Add Metric		T. Stanton	03/03	BOX CULVERT MISCELLANEOUS DETAILS No. 1			
Reviewed		T. Stanton	04/06				
Edited	S.S.	T. Regello	03/11				
						DRAWING NUMBER	D-81A



PART PLAN-SKEWED

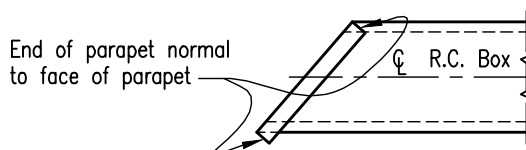
PARAPET DETAILS FOR SINGLE SPAN CULVERTS

PARAPET f BAR SIZE			
SPAN (S)	SKEW ANGLE	0° TO 15°	16° TO 30°
	31° TO 45°		
4'		#4	#4
6'		#4	#4
8'		#4	#5
10'		#5	#6
12'		#6	#7
14'		#7	#8

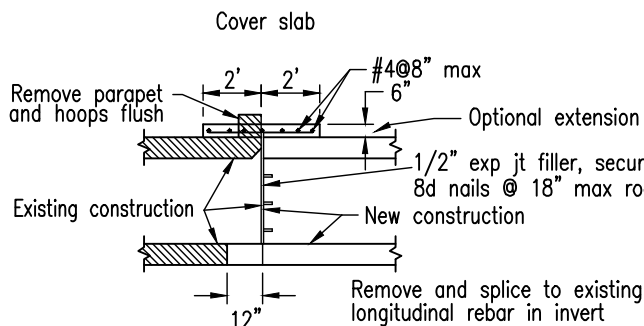


PART PLAN-SKEWED

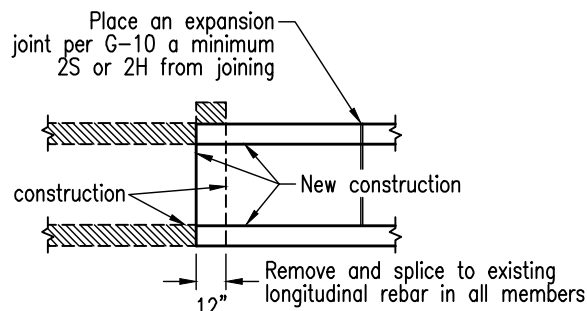
PARAPET DETAILS FOR MULTIPLE SPAN CULVERTS



PARAPET DETAIL FOR SKEWED CULVERTS W/O WINGWALLS



COVER: 1' AND GREATER



COVER: EXPOSED TOP AND LESS THAN 1'

CULVERT EXTENSION
20° SKEW MAXIMUM

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Edited	S.S.	T. Regello	03/11

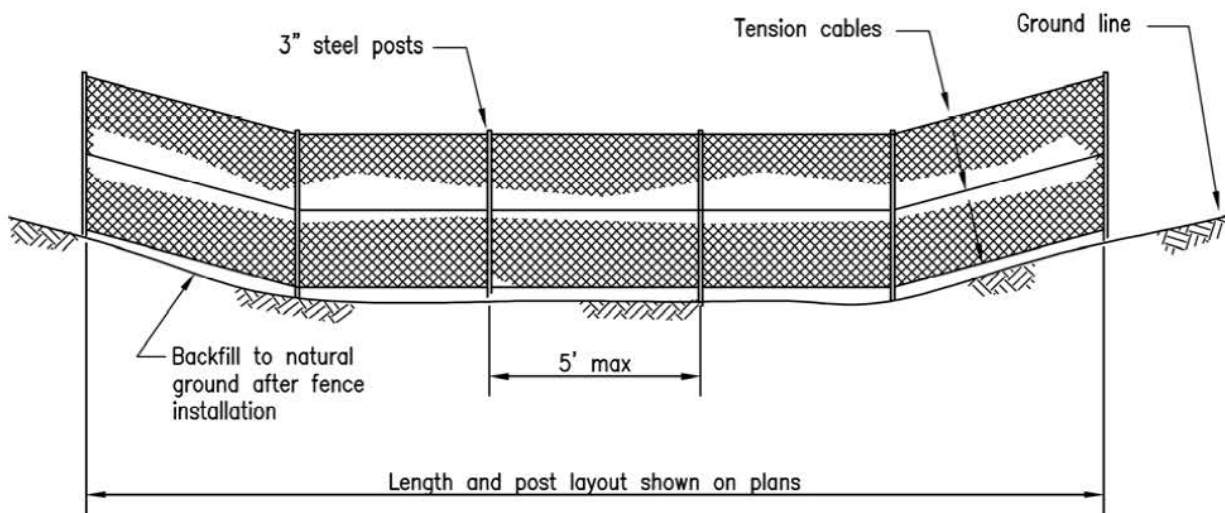
SAN DIEGO REGIONAL STANDARD DRAWING

BOX CULVERT
MISCELLANEOUS DETAILS NO. 2

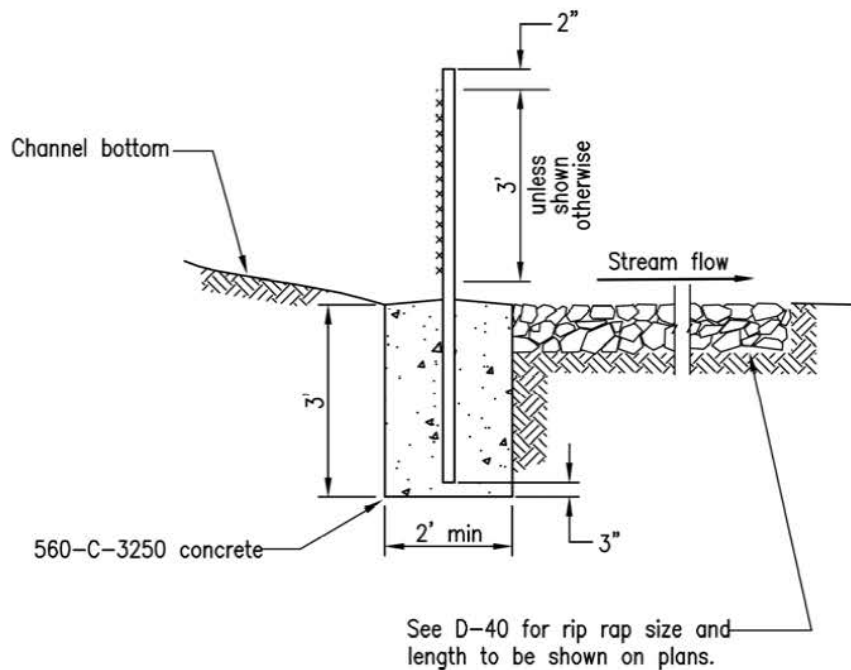
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **D-81B**



ELEVATION



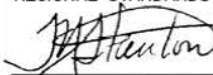
SECTION

NOTES

1. Fence fabric shall be 2" mesh, 9 gage galvanized steel wire, placed on the upstream side of the posts and tension cables.
2. Tension cable shall be 5/16" dia. steel at 18" OC, secured at ends with cable clamps. Secure fence to cable with 12 gage galvanized steel wire looped at 6" OC.
3. Posts shall be 3" steel pipe, 5.79 lb/ft. Fill with mortar after placing.
4. Fence fabric shall be secured to posts with 9 gage wire clips at 9" OC.

LEGEND ON PLANS

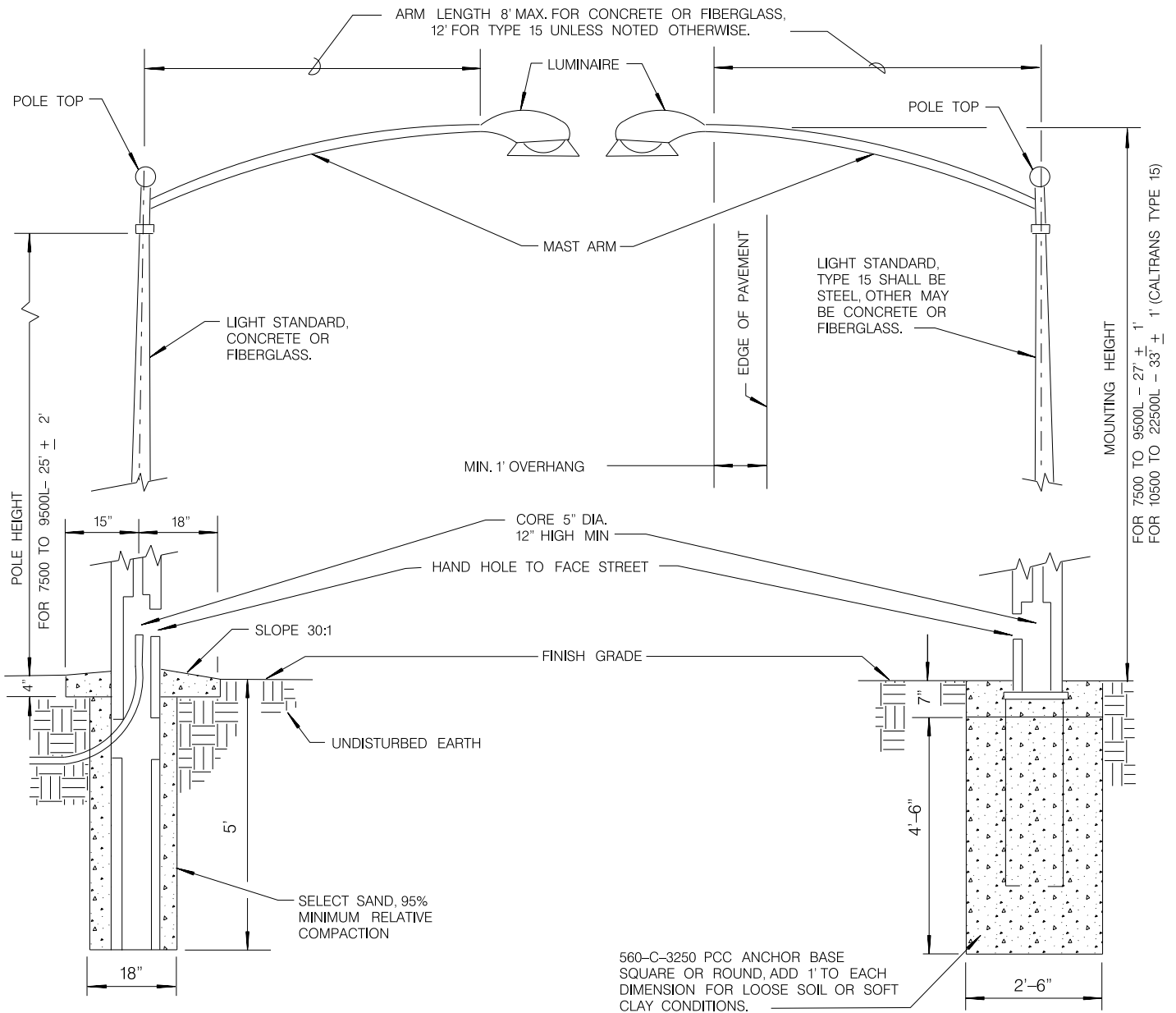


Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		H. Hecht	10/82	DEBRIS FENCE		 7/26/2012 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reviewed		T. Stanton	04/06			
Edited	S.S.	T. Regello	03/11			
						DRAWING NUMBER D-82

FOR DRAWING D-40, SEE DRAWING SDD-104

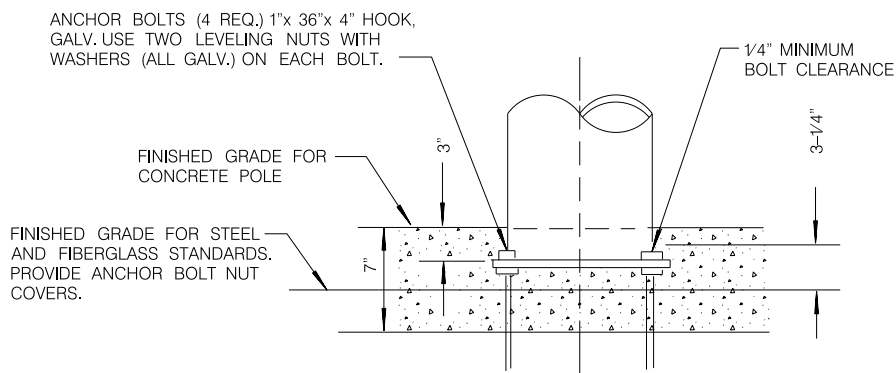
CHAPTER 3

*ELECTRICAL
SYSTEM*



DIRECT BURIAL FOUNDATION

ANCHOR BASE FOUNDATION



REVISION	BY	APPROVED	DATE
ORIGINAL		J. CASEY	06/83
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	KA	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

STREET LIGHTING STANDARD

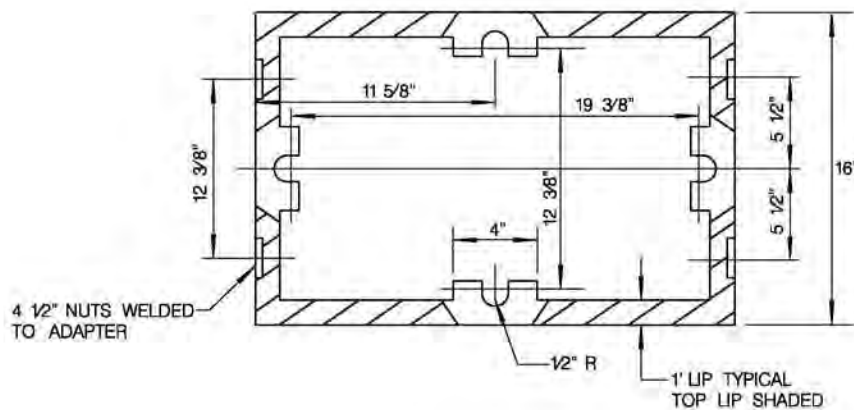
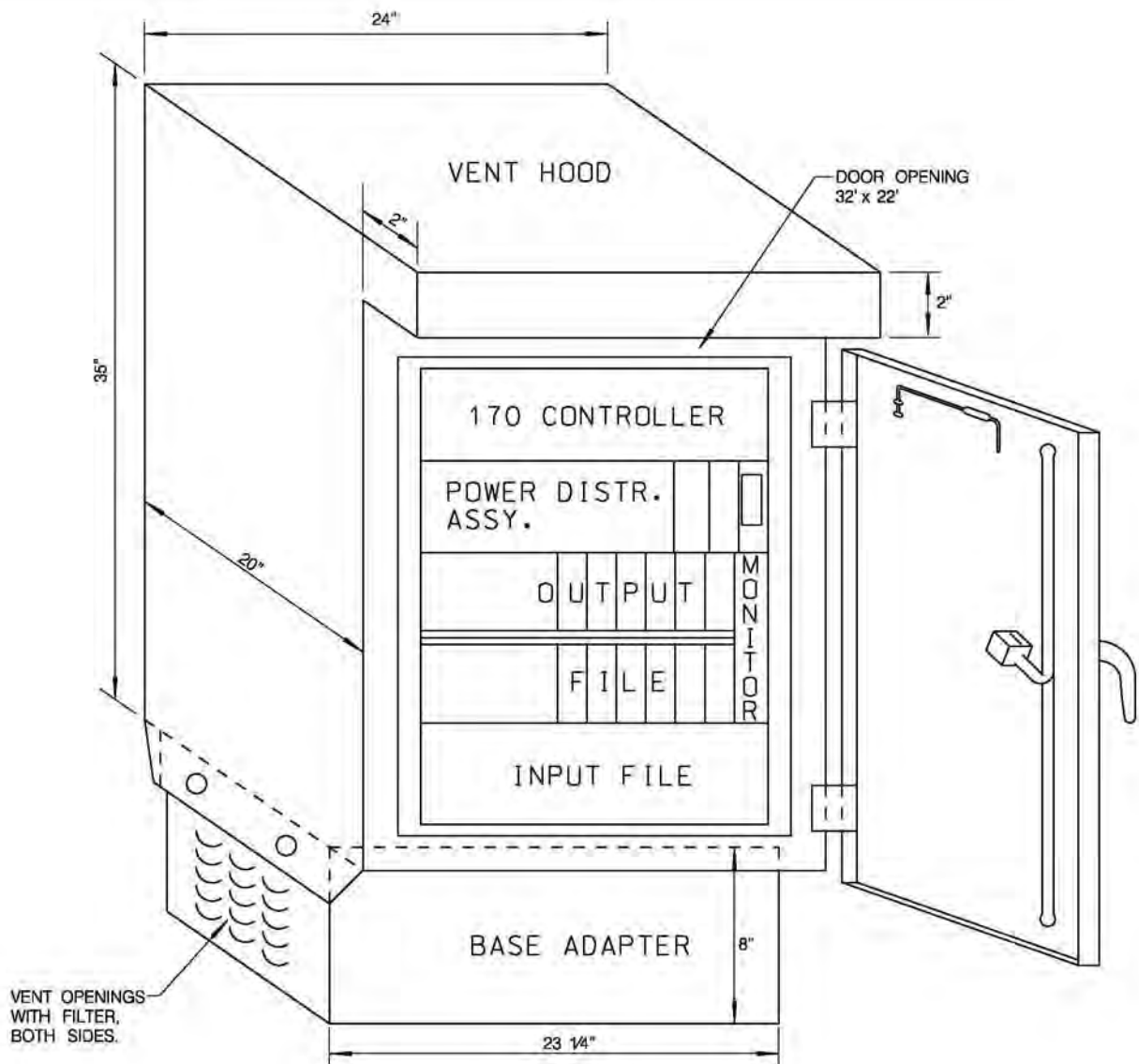
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CRDinger
COORDINATOR R.C.E. 56523

2/25/16
DATE

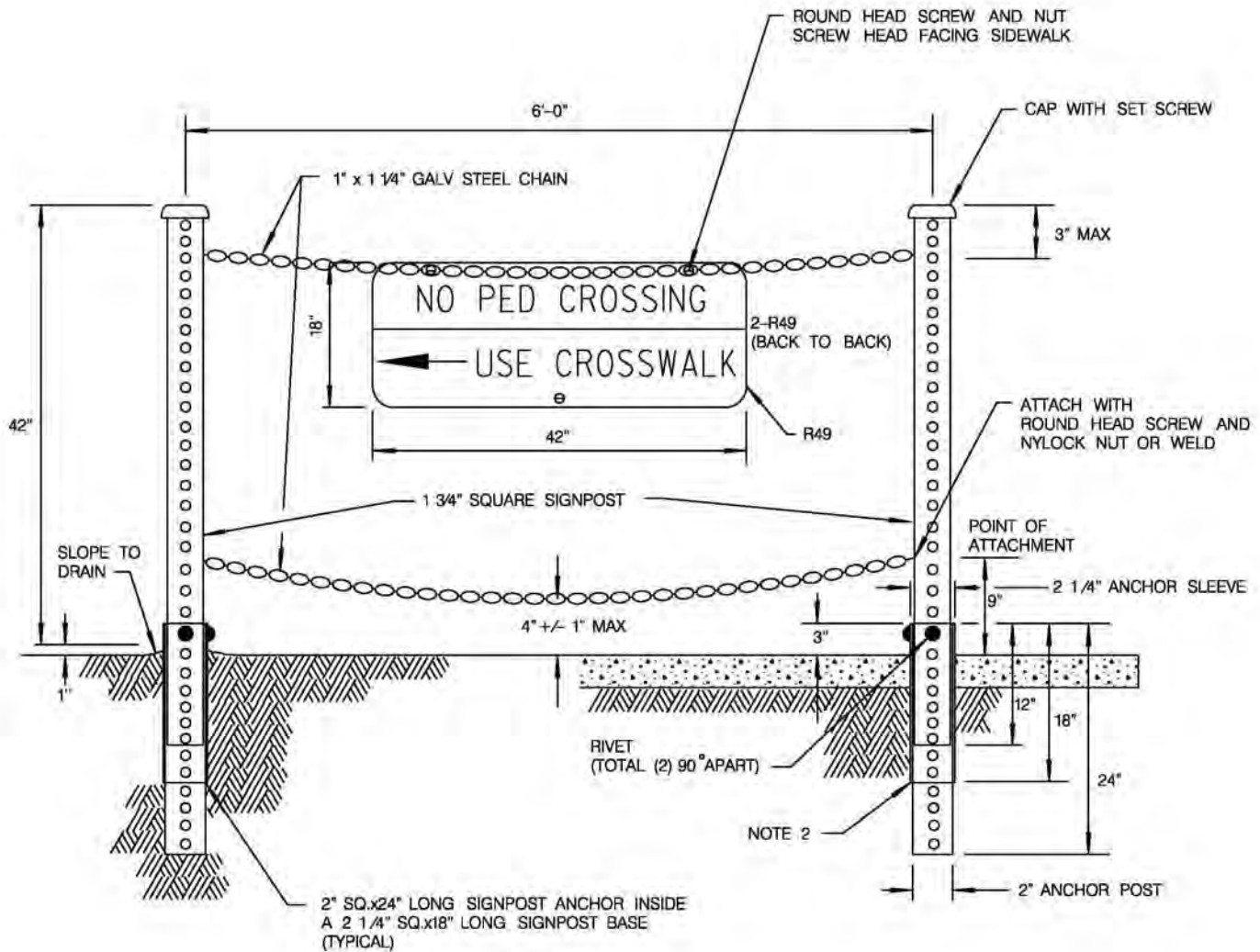
DRAWING
NUMBER

SDE-101



BASE ADAPTOR PLAN VIEW

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				MODEL 336 CABINET	<i>H. Hadli</i> 1/31/2012
					COORDINATOR R.C.E. 66271 DATE
					DRAWING
					NUMBER SDE-102



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. CASEY	08/86
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

PEDESTRIAN BARRICADE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

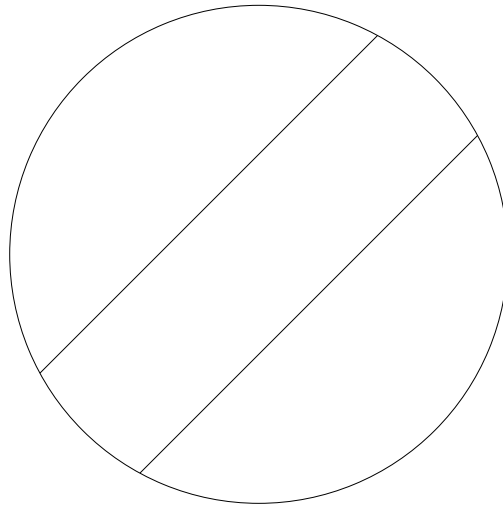
H. Hadli

1/31/2012

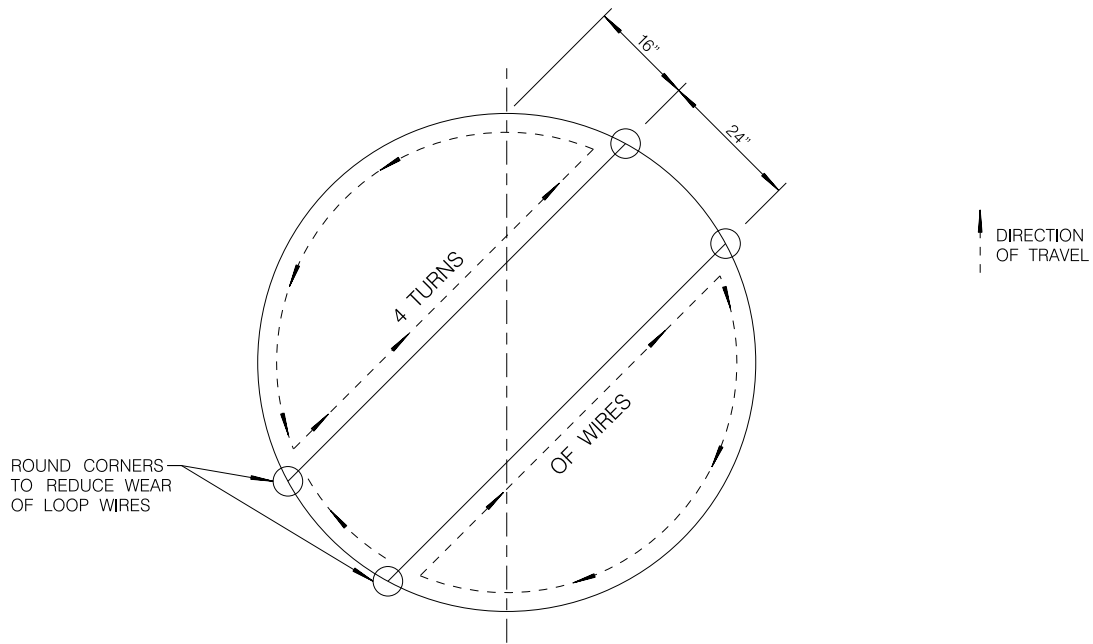
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDE-103



PLAN DRAWING SYMBOL



SAWCUT & WINDING DETAIL

NOTES:

1. LOOP DIAMETER = 6' TYP
2. DEPTH OF CUT = 3 1/8" MIN
3. NO LOOPS SHALL BE CUT INTO BRIDGE DECKS

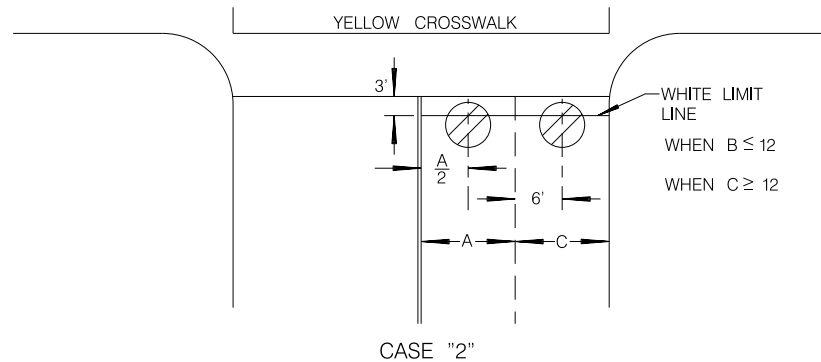
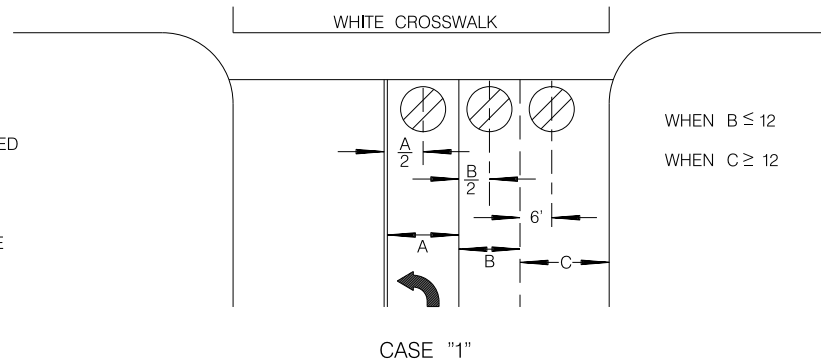
MODIFIED TYPE E LIMIT LINE / CROSSWALK DETECTOR

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE		
ORIGINAL	KA	J. NAGELVOORT	01/12		 COORDINATOR R.C.E. 56523	2/25/16 DATE	DRAWING NUMBER
UPDATE	KA	J. NAGELVOORT	02/16				
				TYPE E MODIFIED LOOP			

NOTES:

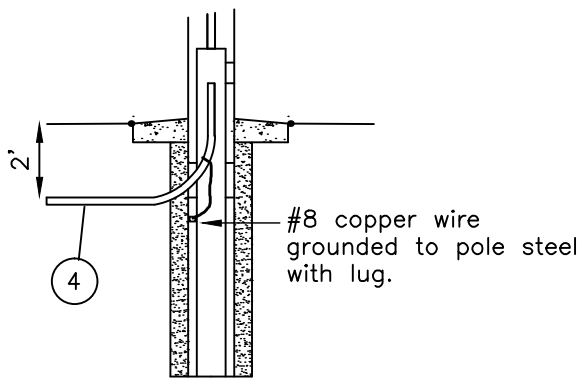
1. ALL FRONT LOOPS SHALL BE MODIFIED TYPE "E" LOOPS
2. FRONT LOOPS, SHALL BE INSTALLED IN FRONT OF THE LIMIT LINE OR CROSSWALK ACTING AS A LIMIT LINE



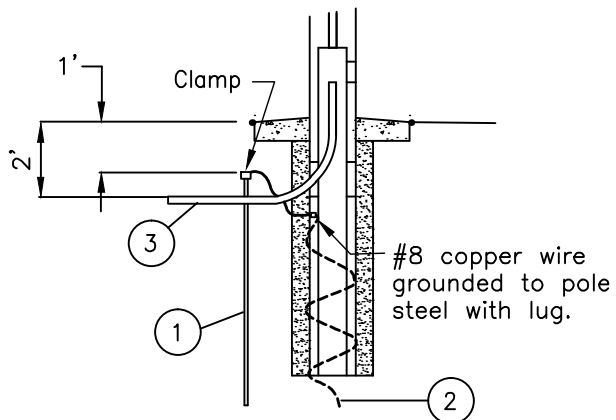
FRONT LOOP REPLACEMENT

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
UPDATE	KA	J. NAGELVOORT	02/16	TYPE E MODIFIED LOOP	
					COORDINATOR R.C.E. 56523
					DATE 2/25/16
					DRAWING NUMBER SDE-104

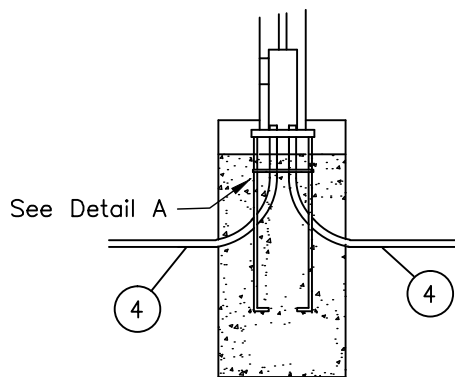


STEEL CONDUIT

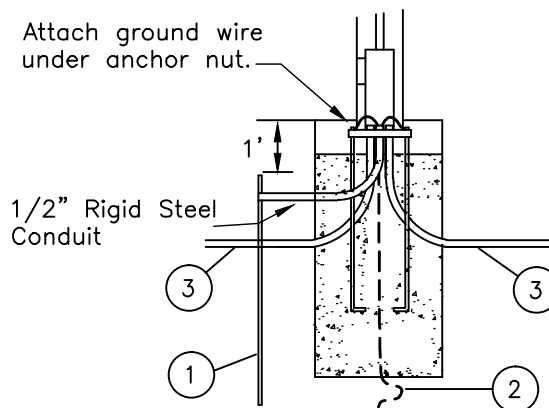


NON-METALLIC CONDUIT

DIRECT BURIAL FOUNDATION



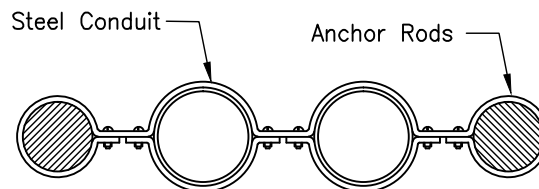
STEEL CONDUIT



NON-METALLIC CONDUIT

ANCHOR BASE FOUNDATION

- ① 3/4" x 8' copper covered steel ground rod.
- ② Alternate Ground: 15' no. 4 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
Delete Metric		D. Gerschoffer	06/12

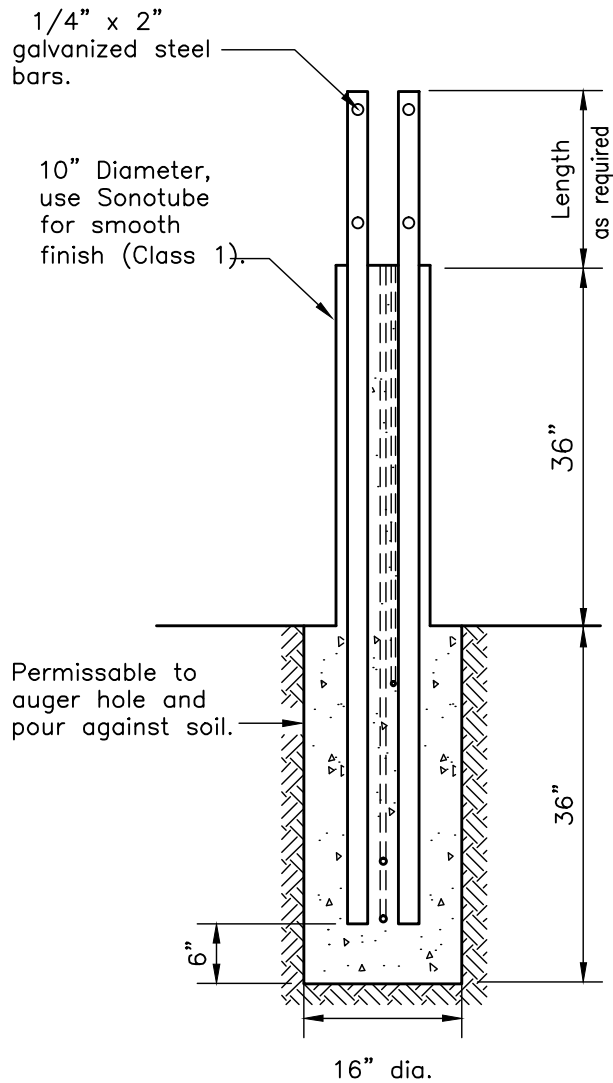
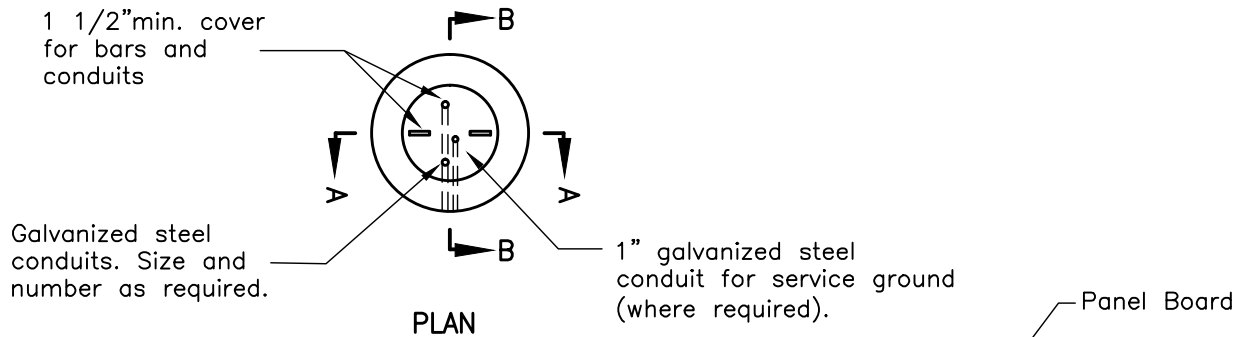
SAN DIEGO REGIONAL STANDARD DRAWING

GROUNDING
OF CONCRETE LIGHTING STANDARDS

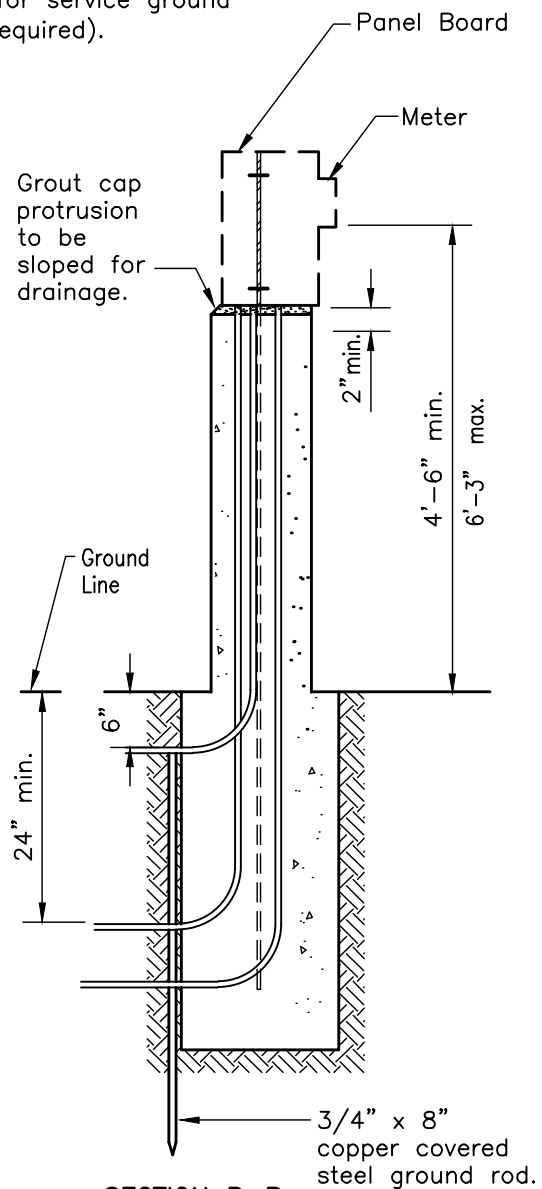
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **E-2**



SECTION A-A
STEEL & CONCRETE
DIMENSIONS



SECTION B-B
CONDUIT & EQUIPMENT

NOTE: Concrete shall be class 560-C-3250

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

SAN DIEGO REGIONAL STANDARD DRAWING

**PEDESTAL FOR
ELECTRICAL EQUIPMENT**

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

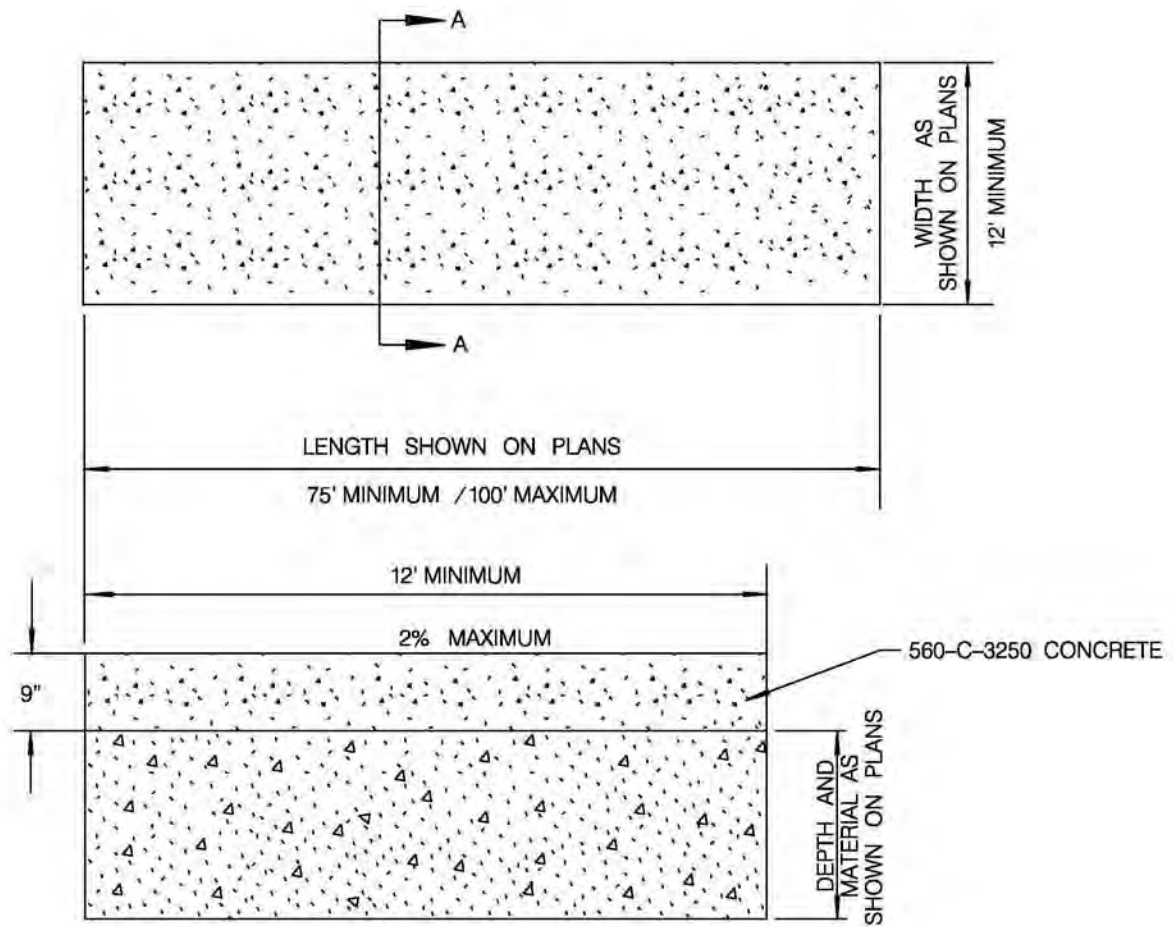
T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

E-3

CHAPTER 4

GENERAL SURFACE IMPROVEMENTS

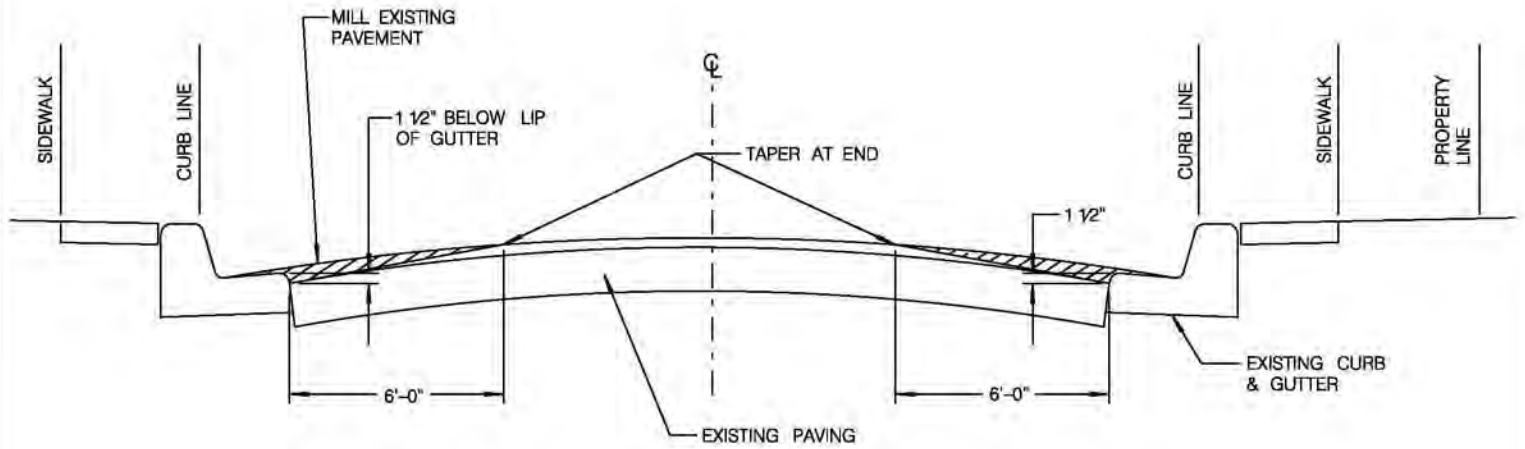


SECTION A-A

NOTE

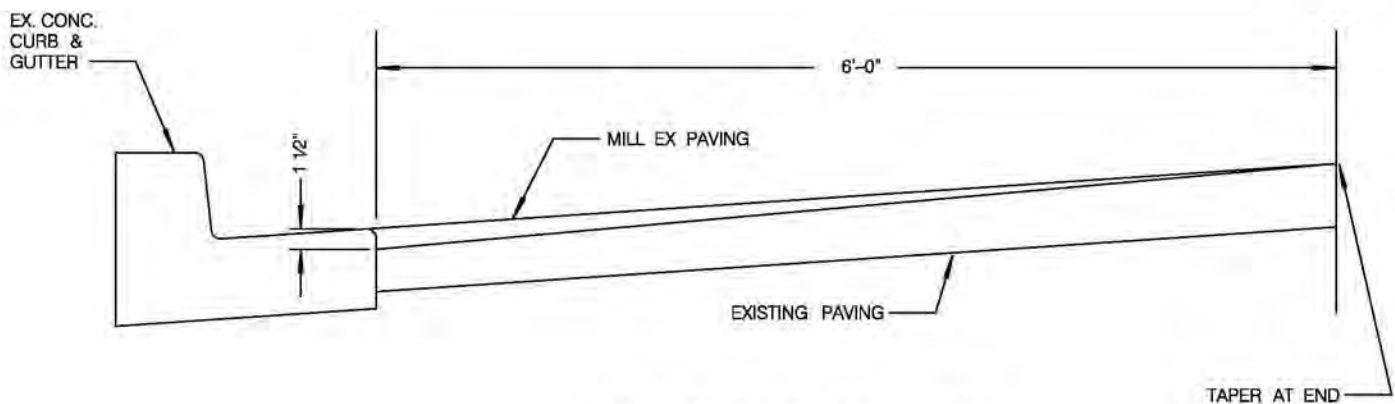
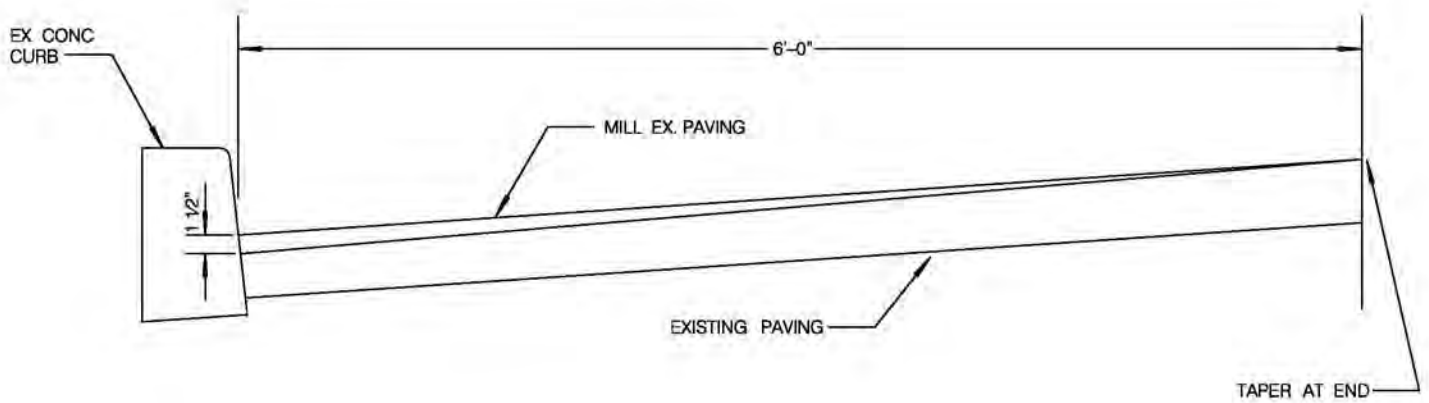
1. BROOM FINISH PARALLEL WITH TRAFFIC.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadi</i> 1/31/2012 COORDINATOR R.C.E. 65271 DATE
ORIGINAL		G. PARKINSON	05/80		
REVISION		J. CASEY	06/83	BUS STOP SLAB	DRAWING NUMBER SDG-102
DRAWING	LC	A. OSKOUJ	06/94		
MAX	GP	F. BELOCK	4/96		
UPDATED	KA	J. NAGELVOORT	01/12		



GRINDING & PREPARATION

TYPICAL SECTION



TYPICAL PAVEMENT COLD MILLING

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**COLD MILLING ASPHALT
CONCRETE PAVEMENT DETAIL**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

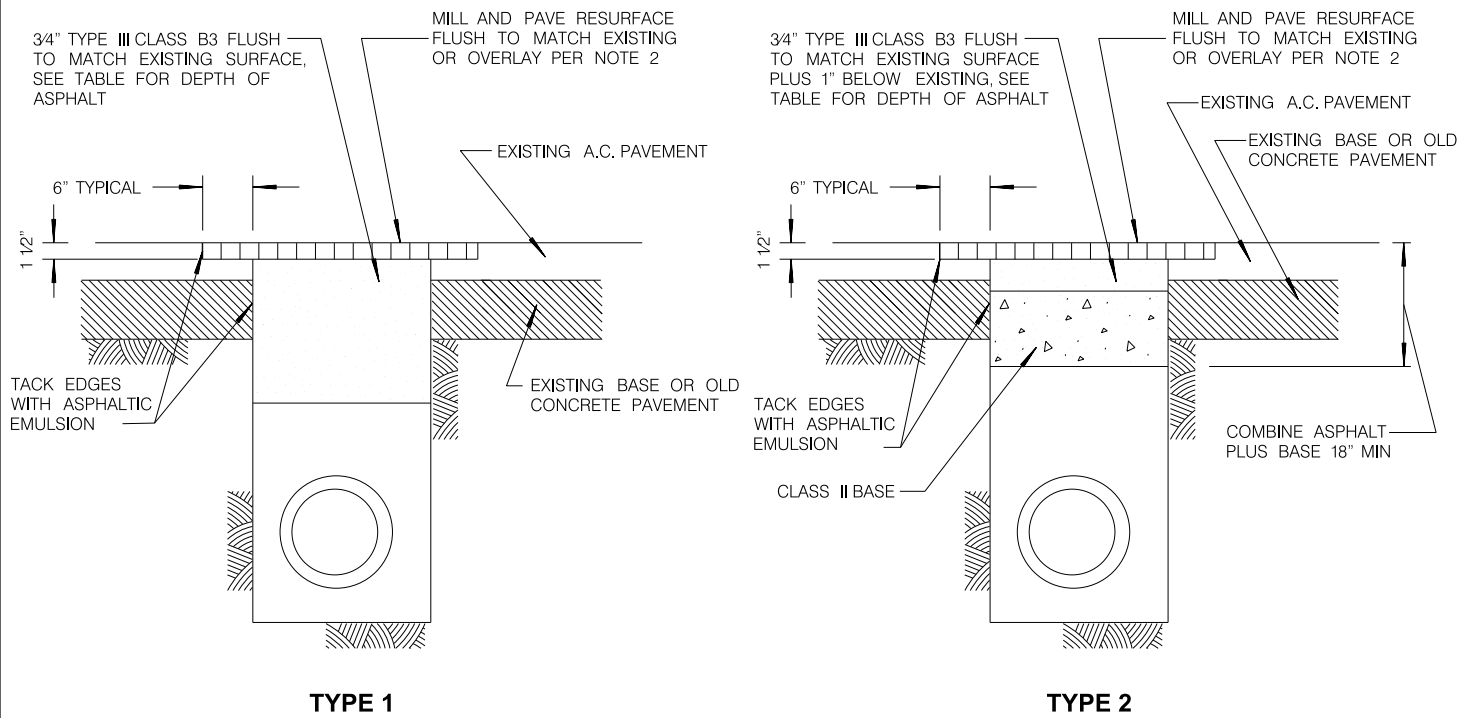
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDG-106

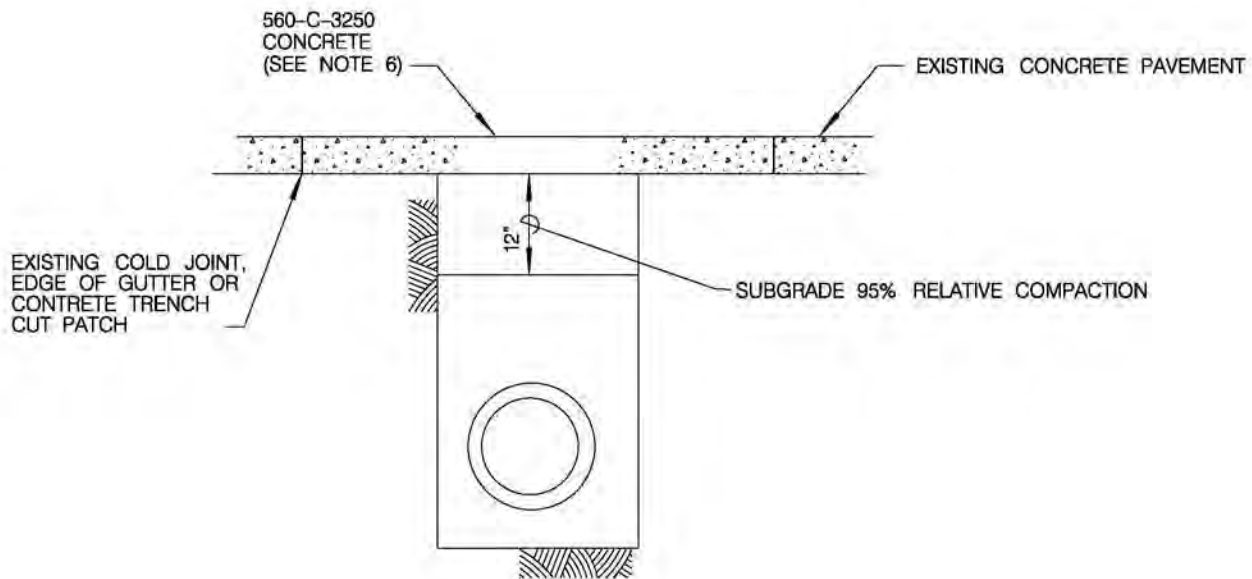


	TYPE 1	TYPE 2
MIX DESIGN	ASPHALT	ASPHALT PLUS BASE
ALLEYS	3/4" TYPE III CLASS B3	3/4" TYPE III CLASS B3 PLUS CLASS II BASE
LOCAL THROUGH 4 LANE COLLECTORS	8.0"	ASPHALT THICKNESS TO EQUAL
MAJOR	10.0"	EXISTING PLUS 1", MIN 4" TO MAX. 9".
	12.0"	COMBINED ASPHALT PLUS BASE 18" MIN.

NOTES:

1. 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).
2. ASPHALT TRENCH CAPS IN STREETS NOT RECEIVING A FULL WIDTH OVERLAY PRIOR TO ACCEPTANCE SHALL BE MILLED AS SHOWN AND RESURFACED WITH 12" TYPE III CLASS C2 ASPHALT NO LESS THAN 30 CALENDAR DAYS AFTER INITIAL ASPHALT PLACEMENT.
3. WHEN DIRECTED BY CITY ENGINEER OR SHOWN ON THE PLANS, CONCRETE PER SDG-108 (NOTE #5) MAY BE PLACED; A 18" - 1/4" WEARING SURFACING OF TYPE III CLASS F ASPHALT CONCRETE WILL BE REQUIRED.

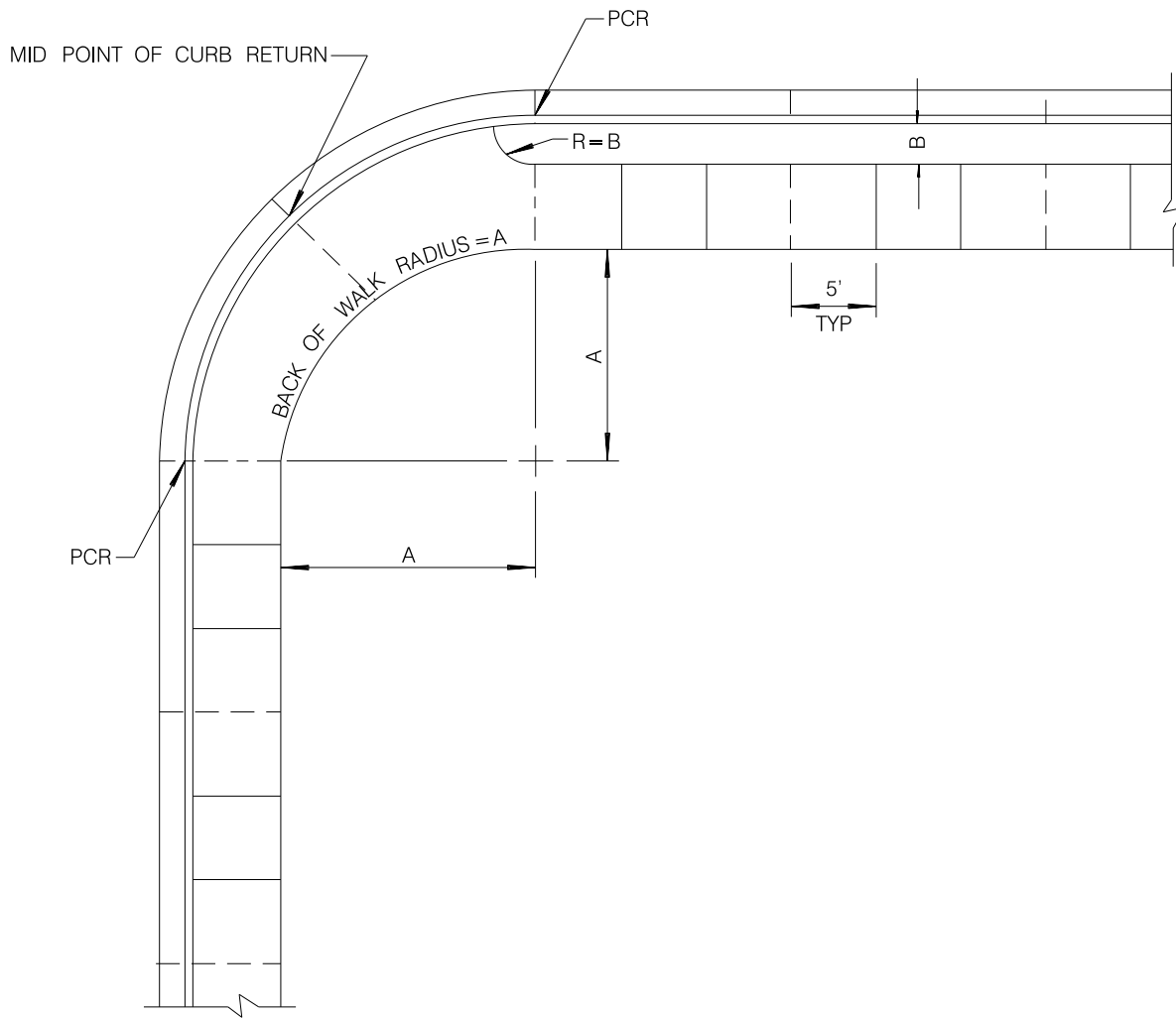
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING		RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL		J.P. CASEY	12/489	TRENCH RESURFACING FOR ASPHALT CONCRETE SURFACED STREETS		<i>CAJung</i>	2/19/16
UPDATED	KA	J. NAGELVOORT	01/12				
UPDATED	KA	J. NAGELVOORT	4/13			COORDINATOR	R.C.E. 56523
UPDATED	BB	J. NAGELVOORT	1/14			DRAWING	SDG-107
UPDATED	LS	J. NAGELVOORT	02/16			NUMBER	



NOTES


1. EXISTING CONCRETE PAVEMENT SHALL BE REMOVED. CONCRETE PAVEMENT RESTORATION SHALL EXTEND TO THE FULL WIDTH OF THE CONCRETE PANEL (BETWEEN COLD JOINTS OR COLD JOINT TO EDGE OF GUTTER) AROUND THE PERIMETER OF THE EXCAVATION. FOR CONCRETE PAVEMENT WITH EXISTING TRENCH CUT PATCHING, CONCRETE PAVEMENT RESTORATION SHALL INCLUDE, AS PART OF THE RESTORATION, THE EXISTING TRENCH CUT PATCHES IF THOSE PATCHES ARE WITHIN 4 FEET OF THE CONCRETE PANEL TO BE REPLACED.
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" FOR ALLEYS, 7" FOR LOCAL THROUGH FOUR LANE COLLECTOR STREETS AND 9" THICK FOR ALL MAJOR OR GREATER STREET CLASSIFICATIONS.
4. 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 1" GREATER THAN REQUIRED BY NOTE 3 ABOVE.
5. 560-C-3250 CONCRETE TREATED WITH A MINIMUM 2% CALCIUM CHLORIDE SOLUTION IN ACCORDANCE WITH 201-1 OR 650-CW-4000 (WO CC) CONCRETE MAY BE OPENED TO TRAFFIC 3 DAYS AFTER IT IS PLACED. 650-CW-4000 CONCRETE TREATED IN SAME MANNER (WCC) MAY BE OPENED TO TRAFFIC 24 HOURS AFTER IT IS PLACED. CONCRETE SPECIFIED BY ALTERNATE CLASS OR OTHERWISE CONTAINING FLY ASH IS NOT ALLOWED.
6. IN FOUR-LANE MAJOR OR GREATER STREETS, AN APPROVED SET ACCELERATING ADMIXTURE SUCH AS CALCIUM CHLORIDE, SHALL BE USED IN THE CONCRETE.

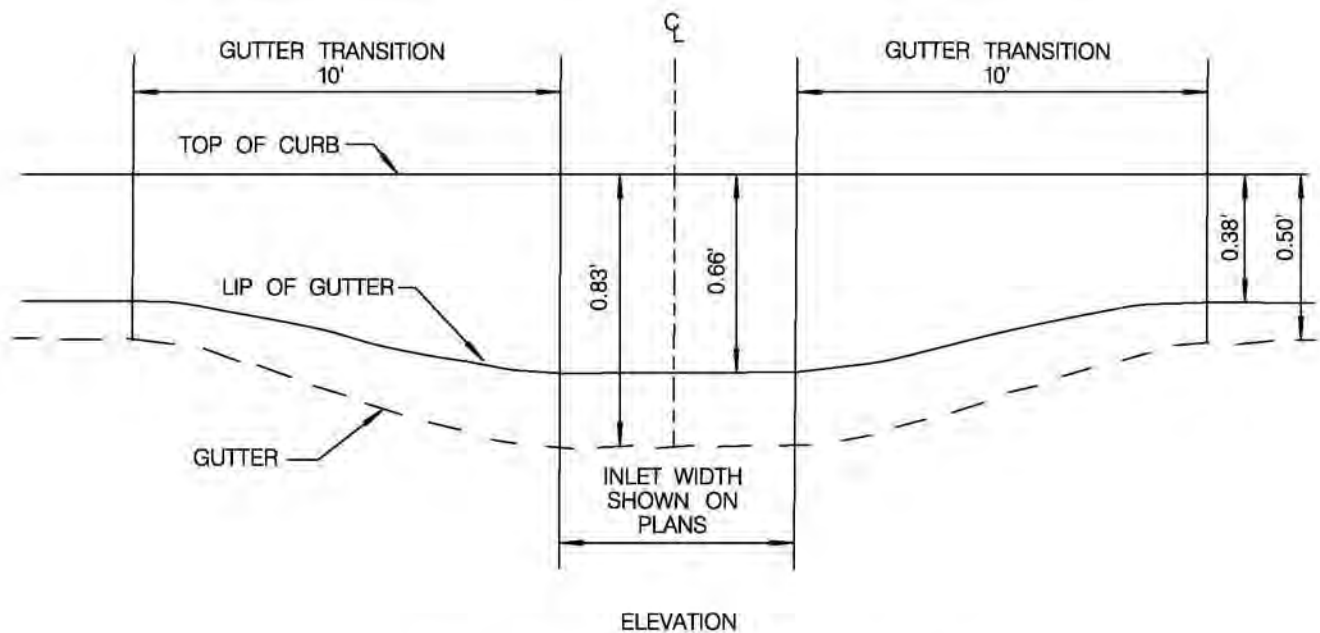
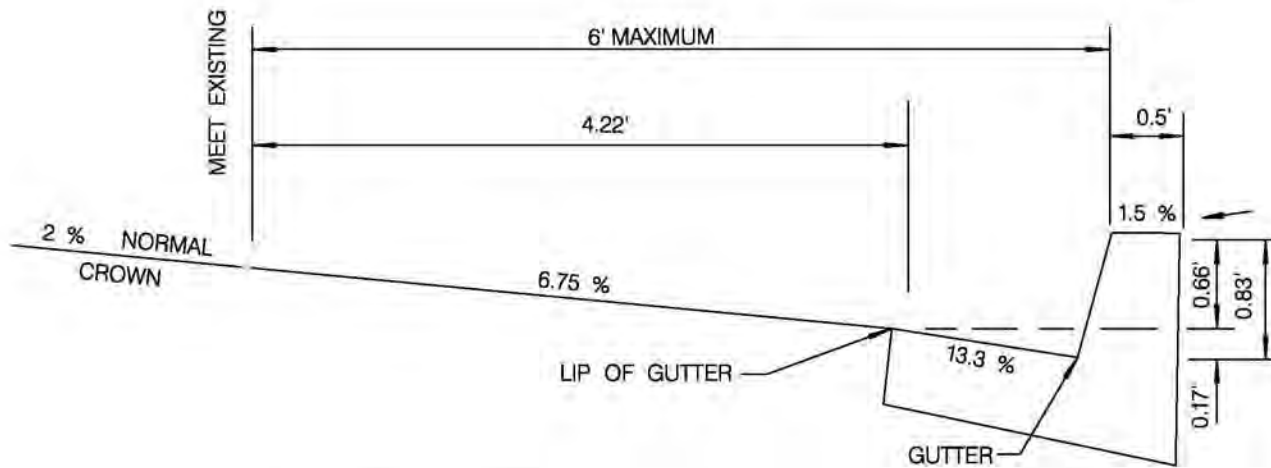
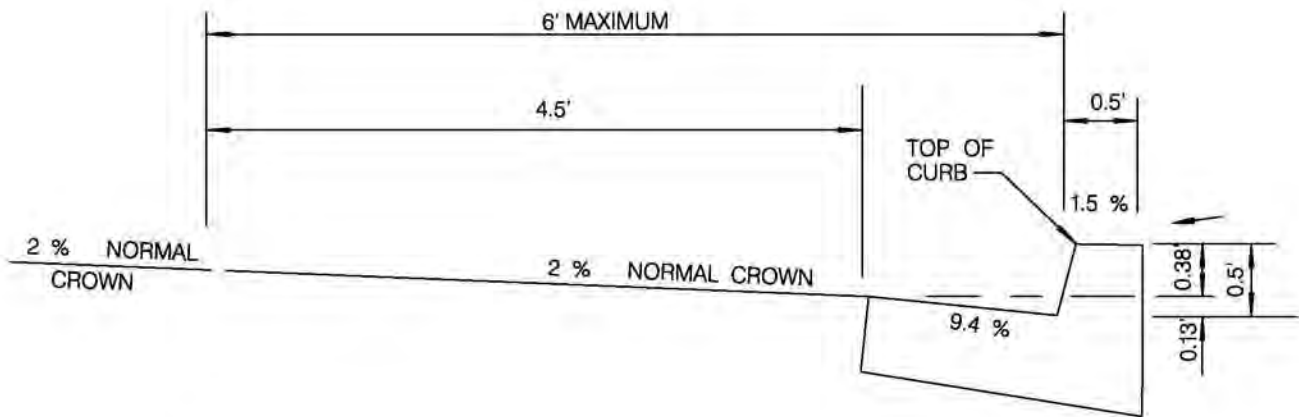
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL		J. CASEY	01/89		<i>Chung</i> 3/23/15	
UPDATED	KA	J. NAGELVOORT	01/12	TRENCH RESURFACING FOR PCC SURFACED STREETS	COORDINATOR	R.C.E. 56523 DATE
UPDATED	BB	J. NAGELVOORT	01/14		DRAWING	SDG-108
UPDATED	BB	J. NAGELVOORT	03/15		NUMBER	



NOTES

1. EXPANSION JOINTS PER G-10 -- — AT CURB RETURNS, ADJACENT TO STRUCTURES AND AT 45' INTERVALS, SEE G-10.
2. WEAKENED PLANE JOINTS — — AT MID POINT OF CURB RETURN, WHEN REQUIRED, AND AT 15' INTERVALS FROM PCR'S ABSENT A CURB RAMP, SEE G-10.
3. TOOLED JOINTS ——— 1/4" GROOVES WITH 1/4" RADIUS EDGES AT 5' INTERVALS.
4. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK SCORING (GROOVES) PATTERN SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

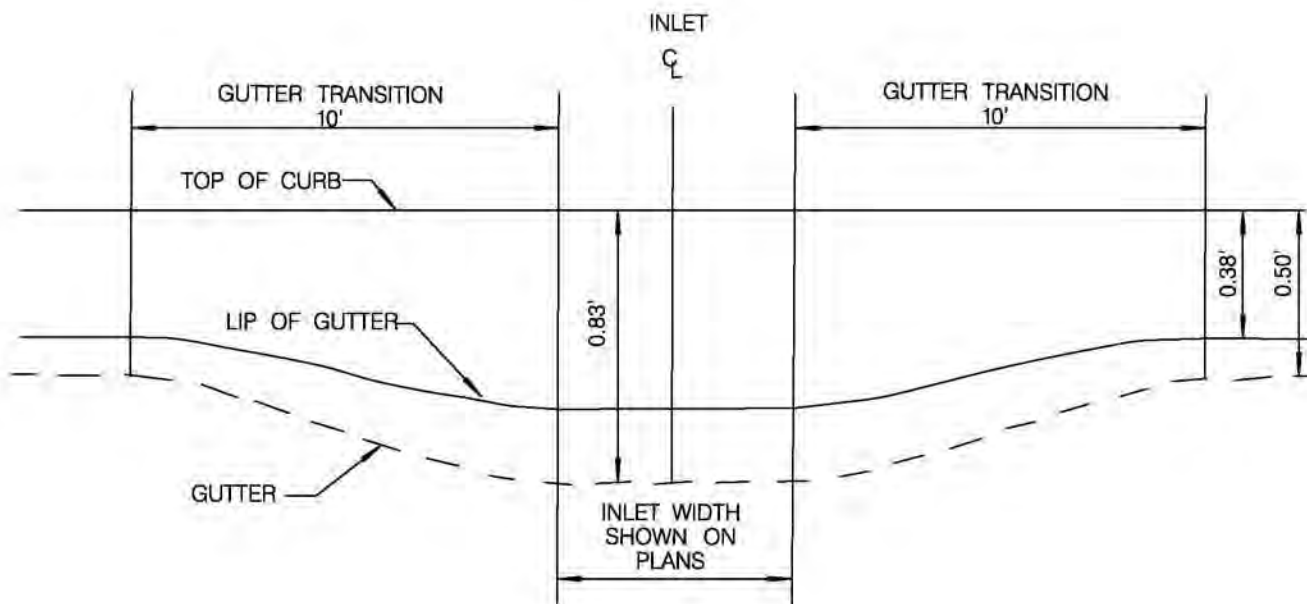
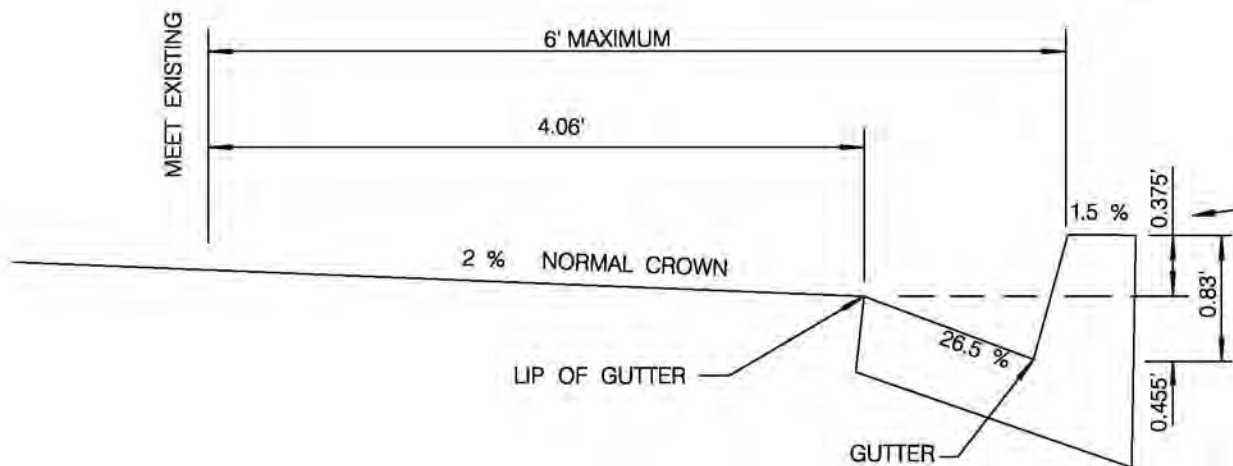
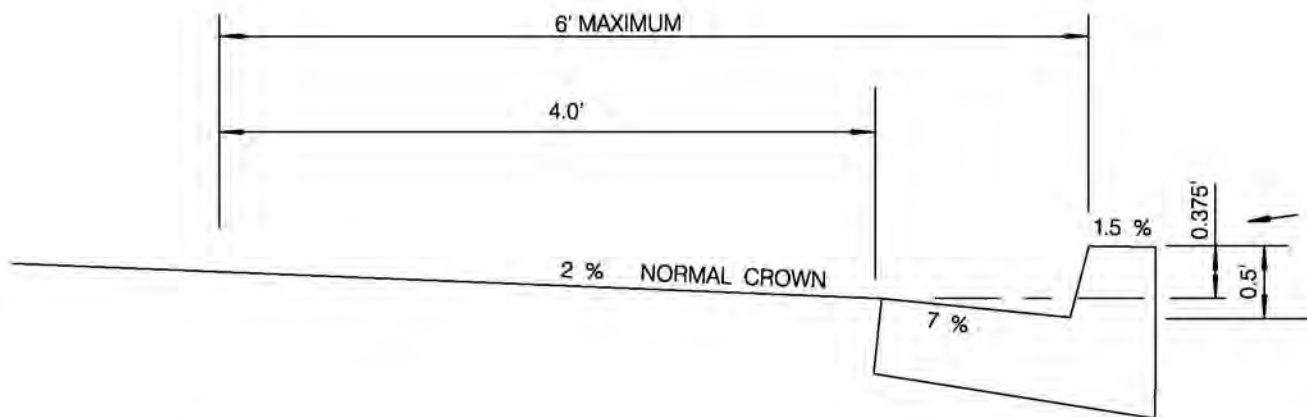
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	10/15	SIDEWALK JOINT LOCATIONS	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDG-109



G CURB PROFILE - INLET TRANSITION

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		J. CASEY	11/88		
UPDATED	KA	J. NAGELVOORT	01/12	INLET TRANSITION PROFILE	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
					DRAWING NUMBER
					SDG-110



ELEVATION

H CURB PROFILE - INLET TRANSITION

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL		J. CASEY	11/88
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

INLET TRANSITION PROFILE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

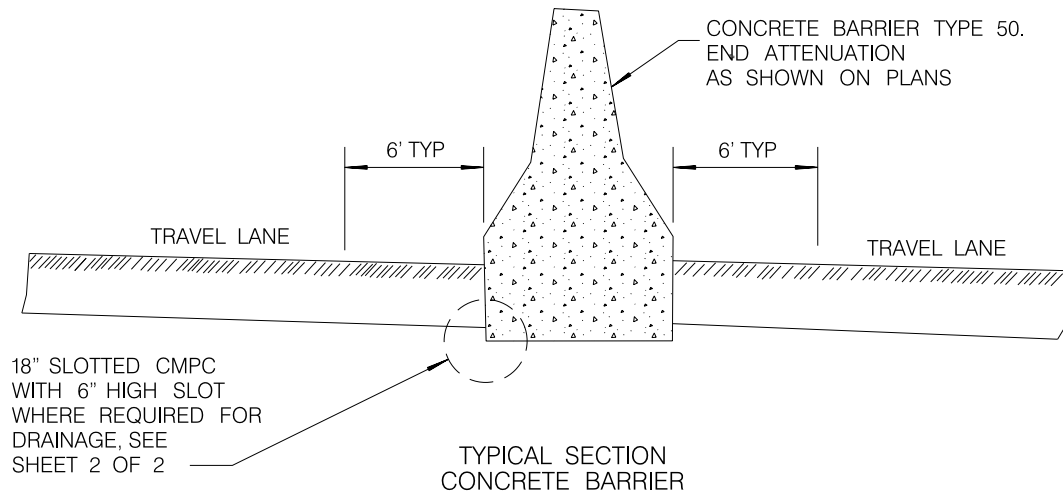
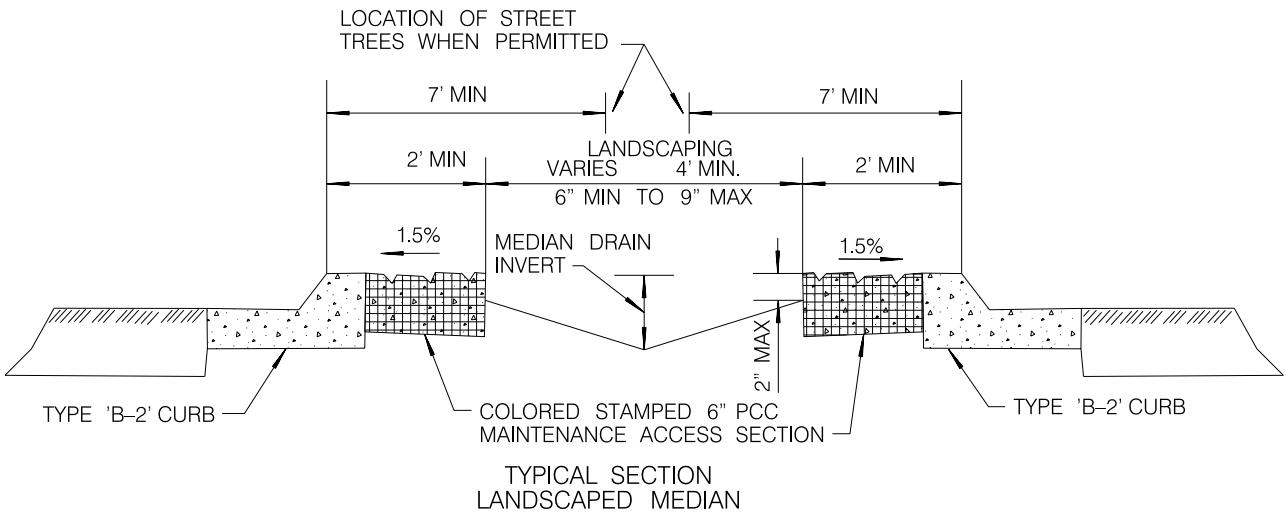
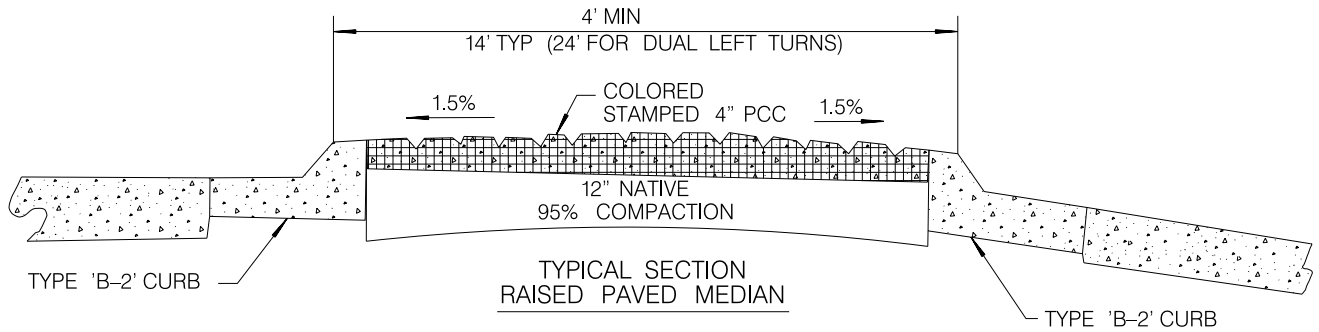
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDG-110



NOTES:

1. CONCRETE SHALL BE 520-C-2500.
2. COLOR & PATTERN OF COLORED STAMPED CONCRETE SHALL BE SHOWN ON PLANS.
3. CONCRETE COLOR SHALL BE INTEGRATED THROUGHOUT.
4. SEE SDG-109 AND G-10 FOR JOINT DETAILS.

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL		J. CASEY	11/88
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

RAISED CENTER MEDIAN

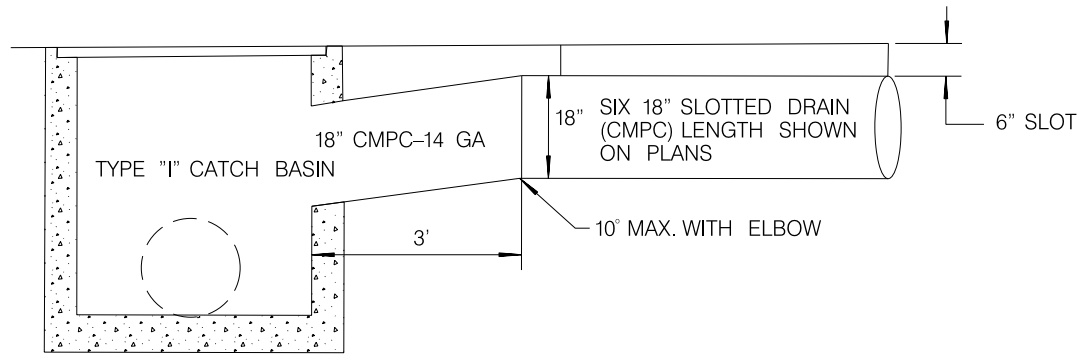
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

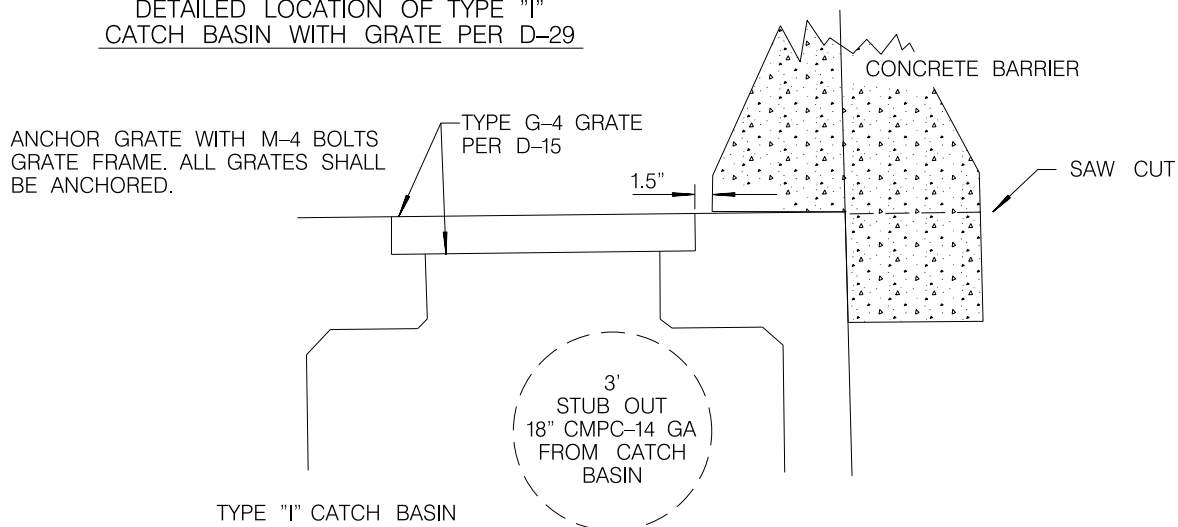
2/25/16
DATE

DRAWING
NUMBER

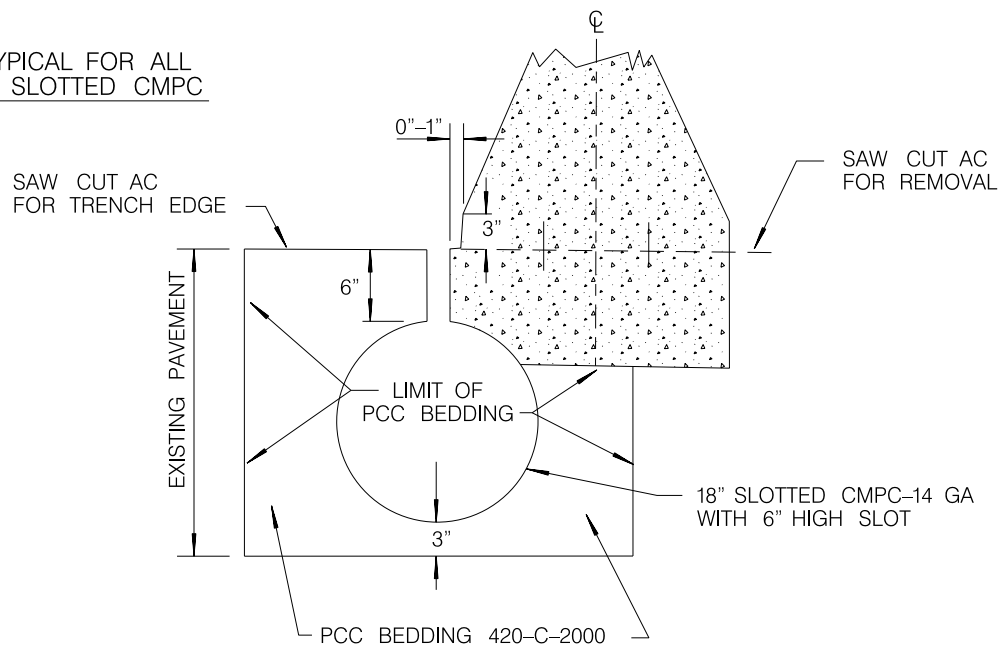
SDG-112



DETAILED LOCATION OF TYPE "I"
CATCH BASIN WITH GRATE PER D-29



TYPICAL FOR ALL
18" SLOTTED CMPC



SHEET 2 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL		J. CASEY	11/88
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

RAISED CENTER MEDIAN

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chungpa
COORDINATOR R.C.E. 56523

2/25/16
DATE

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 FROM THE 12" MATERIAL LOCATED IMMEDIATELY BELOW THE FIRST LAYER OF SUBBASE, BASE OR PAVEMENT. THIS 12" 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" 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 MODULES OF RUPTURE (MOR) OF 600.
5. NEW PAVEMENT, LESS THAN 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 DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		M. ROLLINGER	05/92		
NOTES		G. PARKINSON	02/95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	 1/31/2012 COORDINATOR R.C.E. 65271 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
					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	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)	CTB (IN)	PCC (IN)	CTB (IN)	A.C. (IN)
CUL-DE-SAC	200	5.0	40.0 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 DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  1/31/2012
ORIGINAL		M.ROLLINGER	05/92		
NOTES		G. PARKINSON	02/95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	COORDINATOR R.C.E. 65271 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
					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	30.0 TO 39.9	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		3.0	9.5	7.5	—	9.0
COLLECTOR (COMM.\IND.)	5000	9.5		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)
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	
CUL-DE-SAC	200	5.0	20.0 TO 29.9	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		3.0	11.5	7.5	—	10.0
COLLECTOR (COMM.\IND.)	5000	9.5		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	8.5	5.0	17.5
EXPRESSWAY	100000	13.0		6.5	20.0	10.0	5.0	18.5

SHEET 3 OF 4

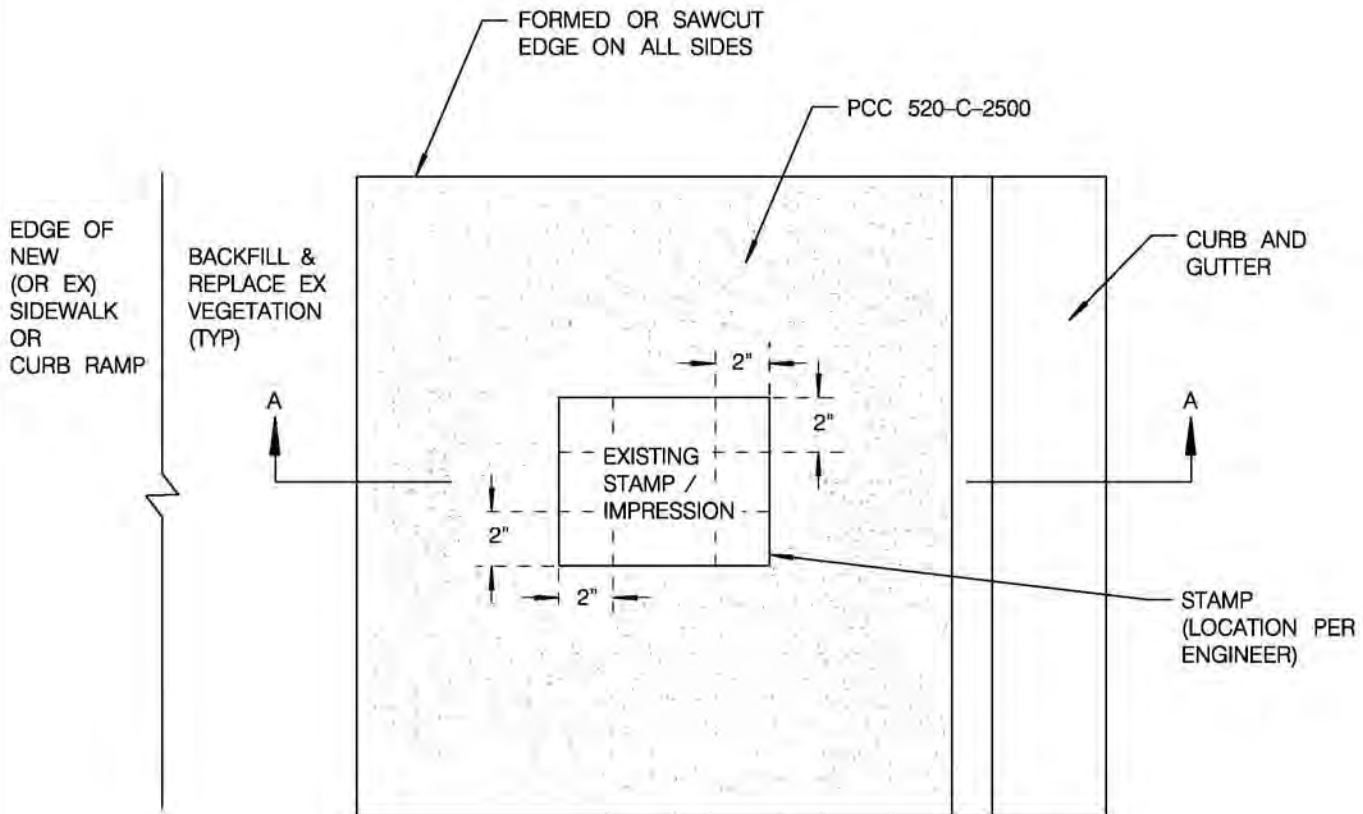
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  1/31/2012
ORIGINAL		M.ROLLINGER	05/92		
NOTES		G. PARKINSON	02/95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	COORDINATOR R.C.E. 65271 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
					DRAWING 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)	
CUL-DE-SAC	200	5.0	10.0 TO 19.9	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		3.5	12.5	8.0	—	11.0
COLLECTOR (COMM.\IND.)	5000	9.5		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

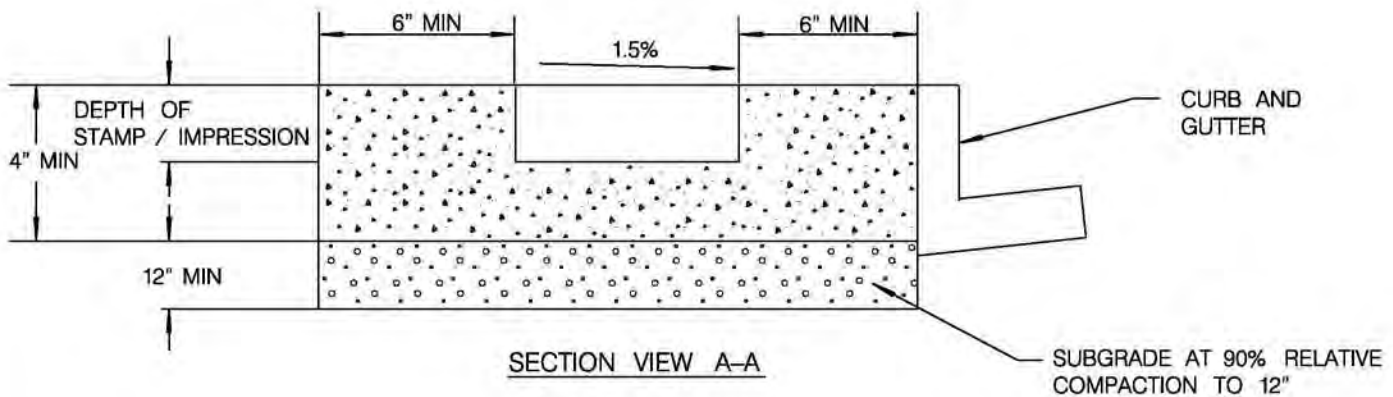
STREET CLASSIFICATION	MAX ADT	MAX TRAFFIC INDEX	"R" VALUE	STANDARD SECTIONS		CONCRETE M.O.R. 600 MIN		FULL DEPTH
				A.C. (IN)	CTB (IN)	PCC (IN)	CTB (IN)	A.C. (IN)
CUL-DE-SAC	200	5.0	0.0 TO 9.9	3.0	8.0	7.0	—	8.5
LOCAL (L.V.R.)	700	5.5		3.0	9.5	7.5	—	9.0
LOCAL (RES.)	1200	6.0		3.0	10.5	7.5	—	9.5
LOCAL (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		3.5	14.5	8.0	—	12.5
COLLECTOR (COMM.\IND.)	5000	9.5		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 DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  1/31/2012
ORIGINAL		M.ROLLINGER	05/92		
NOTES		G. PARKINSON	02/95	PAVEMENT DESIGN STANDARDS SCHEDULE "J"	COORDINATOR R.C.E. 65271 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
					DRAWING NUMBER SDG-113



PLAN VIEW



SECTION VIEW A-A

NOTES:

1. ALL STAMP / IMPRESSION (STREET NAME, CONTRACTOR, NAME AND / OR DATE) 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 OR SYMBOL.

REVISION	BY	APPROVED	DATE
ORIGINAL	NZ	J. SHOAF	8/00
DETAIL	SM	A. OSKOU	12/03
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**EXISTING HISTORICAL STAMP OR
IMPRESSION PLACEMENT**

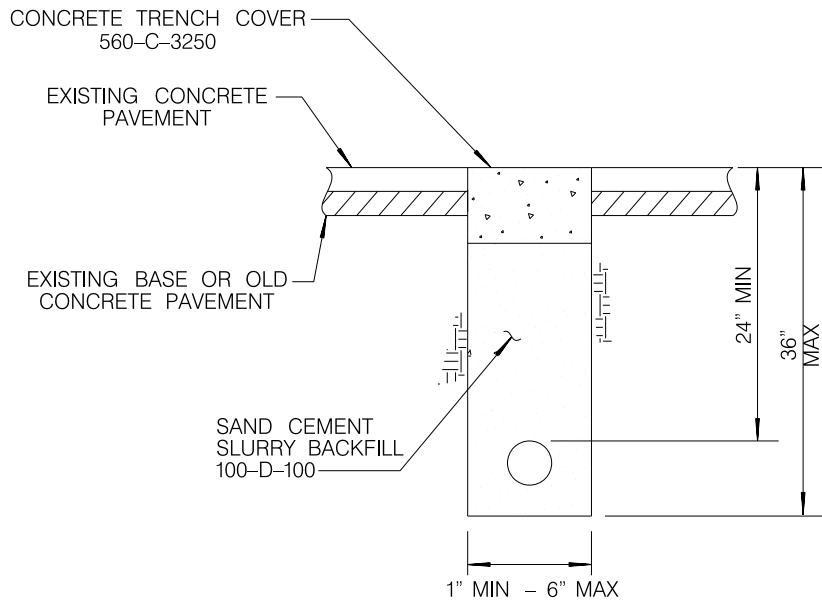
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadli 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER


SDG-115

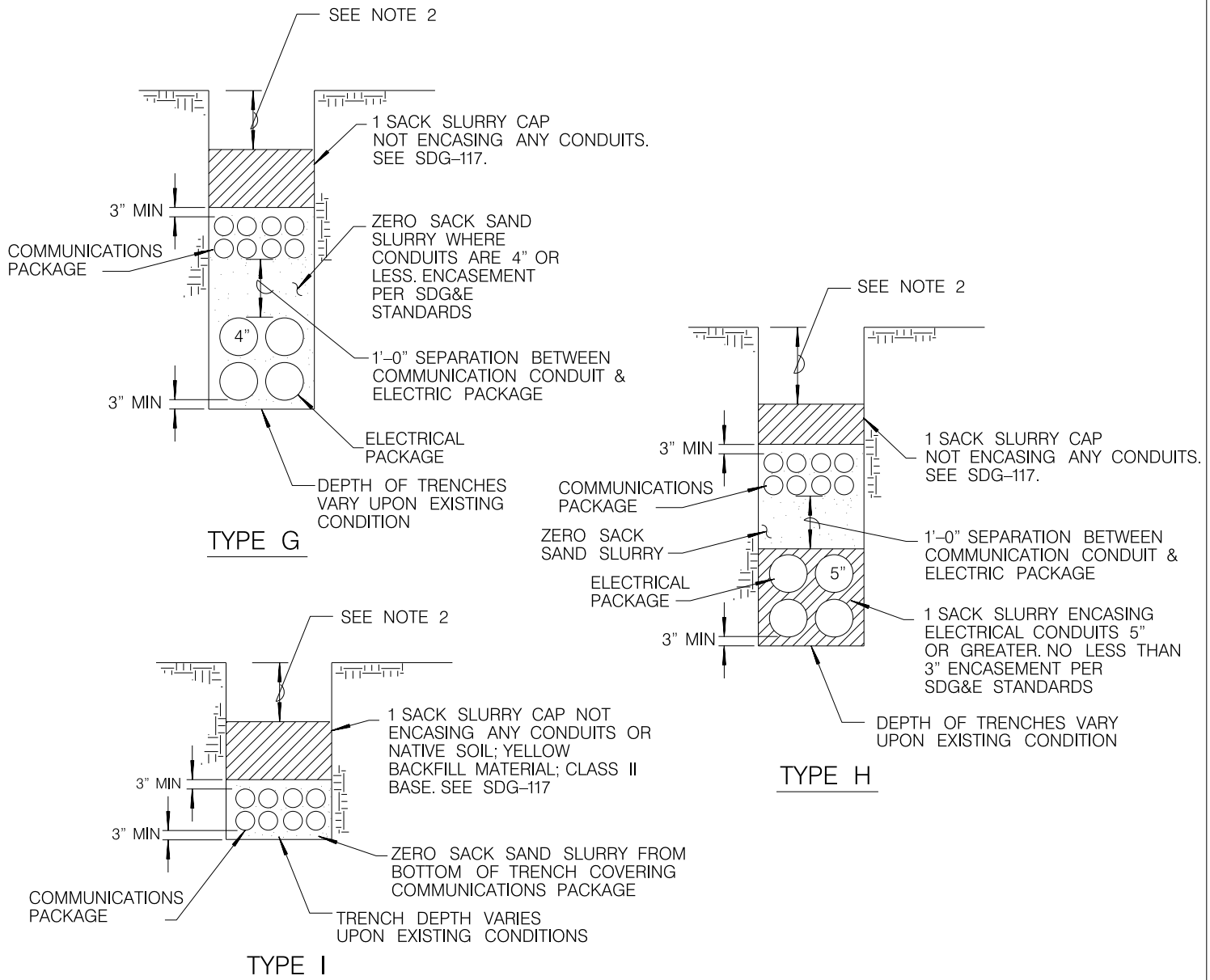
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		BAHMANIAN	04/86		 2/25/16
UPDATED	KA	J. NAGELVOORT	01/12	NARROW TRENCH RESURFACING FOR ASPHALT CONCRETE SURFACE STREETS	COORDINATOR  R.C.E. 56523 DATE
UPDATED	KA	J. NAGELVOORT	04/13		
UPDATED	KA	J. NAGELVOORT	01/14		
UPDATED	AA	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDG-117



NOTES:


1. CEMENT SLURRY BACKFILL SHALL BE THOROUGHLY CONSOLIDATED, HAVE A MAXIMUM SLUMP OF 4 INCHES, AND MAY CONTAIN 30% MAXIMUM 3/8" ROCK.
2. CONCRETE SHALL BE PLACED AND FINISHED IN ACCORDANCE WITH 306-6. CONCRETE MAY BE PLACED IMMEDIATELY FOLLOWING SLURRY BACKFILL.
3. CONCRETE TRENCH COVER SHALL BE A MINIMUM OF 5 1/2" THICK IN ALLEY OR LOCAL RESIDENTIAL STREETS AND 7" THICK IN ALL OTHER STREETS. SEE NOTE #5 IN SDG-108 FOR CONCRETE CLASS OPTIONS AND CURING REQUIREMENTS.
4. EXISTING PORTLAND CEMENT CONCRETE PAVEMENT WILL REQUIRE SAWCUTTING.
5. FOR ELECTRICAL SUPPLY CABLES, SEE CALIFORNIA PUBLIC UTILITY COMMISSION GENERAL ORDER NO. 128, RULE 33.4 CLEARANCES AND DEPTHS.
6. FOR DRY UTILITIES (ELECTRICAL, COMMUNICATION, GAS, ETC.) SEE SDG-119.

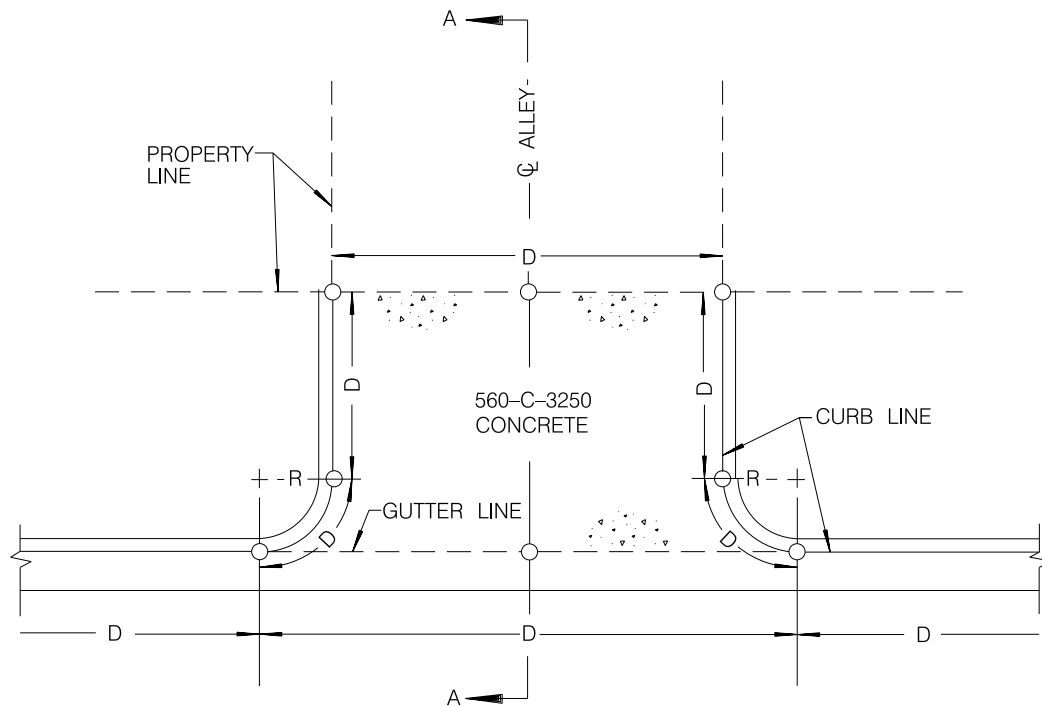
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		BAHMANIAN	04/86		
TITLE BLOCK		A. OSKOUI	12/06	NARROW TRENCH RESURFACING FOR PCC SURFACED STREETS	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	08/13		DRAWING NUMBER SDG-118
UPDATED	AB	J. NAGELVOORT	02/16		



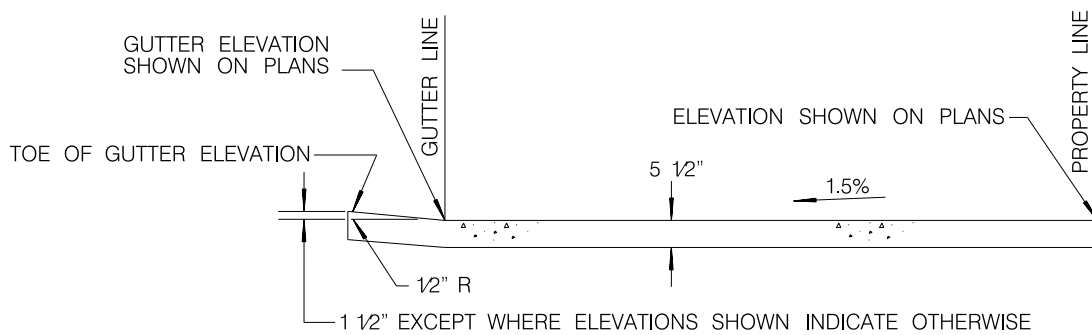
NOTES:

1. FOR TRENCHES GREATER THAN 6", AND LESS THAN 7'-0" IN WIDTH
2. RESURFACING PER SDG-107 TYPE 1 & SDG-108
3. ANY CITY UTILITY CROSSING THE TRENCH LINE SHOULD NOT BE ENCASED IN SLURRY, IF ENCOUNTERED IT SHOULD BE SLEEVED WITH PVC.
4. WARNING TAPE SHALL BE INSTALLED ABOVE THE CONDUITS PER SDM-105.
5. CEMENT SLURRY BACKFILL SHALL BE THOROUGHLY CONSOLIDATED, HAVE A MAXIMUM SLUMP OF 4 INCHES. FLY ASH MEETING THE REQUIREMENTS OF 201-1.2.5.3 MAY BE ADDED (NOT AS A SUBSTITUTE) TO THE MINIMUM CEMENT REQUIREMENTS. SLURRY COMBINED GRADING SHALL MEET REQUIREMENTS OF 201-1.3.2 GRADING D.
6. BALL DROP TEST PER ASTM D 6024 SHALL BE PERFORMED ON SLURRY AND ACHIEVE A MAXIMUM INDENTATION DIAMETER OF 3 INCHES PRIOR TO PLACEMENT OF ASPHALT CONCRETE. SLURRY PLACED IN NARROW TRENCHES WHERE BALL DROP TEST CANNOT BE PERFORMED SHALL BE CURED A MINIMUM OF 48 HOURS PRIOR TO PLACEMENT OF ASPHALT CONCRETE.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	BB	J. NAGELVOORT	07/15		
UPDATED	LA	J. NAGELVOORT	07/15	TRENCH TYPES G, H & I BACKFILL FOR DRY UTILITY	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	JN	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDG-119



PLAN

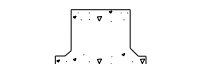


SECTION A-A

NOTES

1. CURB RAMPS SHALL BE INSTALLED AS SHOWN ON THE PLANS.
2. D= DISTANCE SHOWN ON PLANS.
3. R= RADIUS SHOWN ON PLANS 3' MINIMUM.
4. O= ELEVATIONS SHOWN ON PLANS (TOP OF CURB AND GUTTER ELEV.).
5. — — — = 12" EXPANSION JOINTS.
6. CONSTRUCTION OF ALLEY APRON INCLUDES THE ADJACENT 6" CURB.
7. REFER TO CURB RAMP DETAIL, SDG-137.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

ALLEY APRON

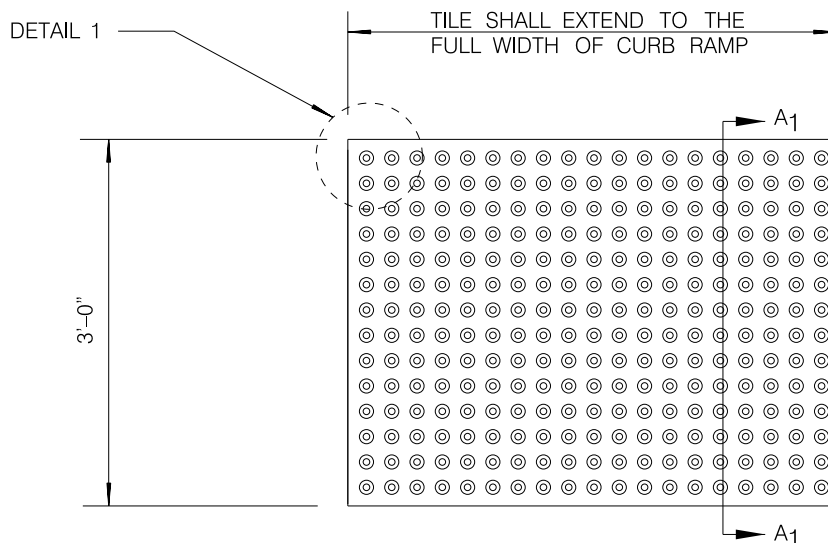
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CAHingra
COORDINATOR R.C.E. 56523

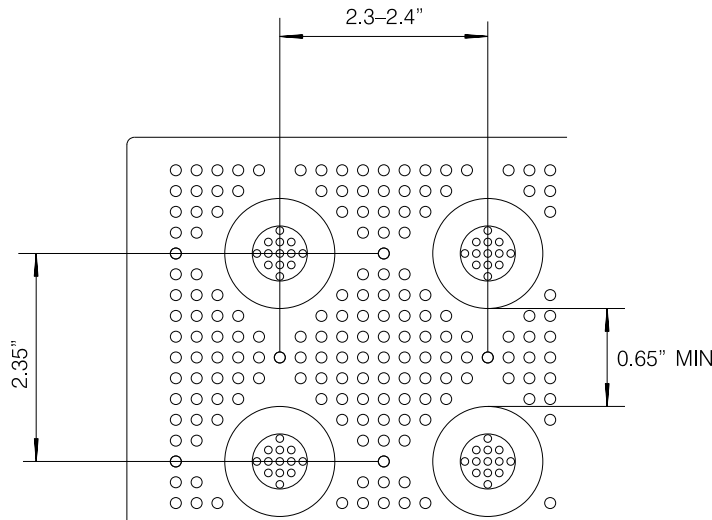
2/25/16
DATE

DRAWING
NUMBER

SDG-120



PLAN - TILE



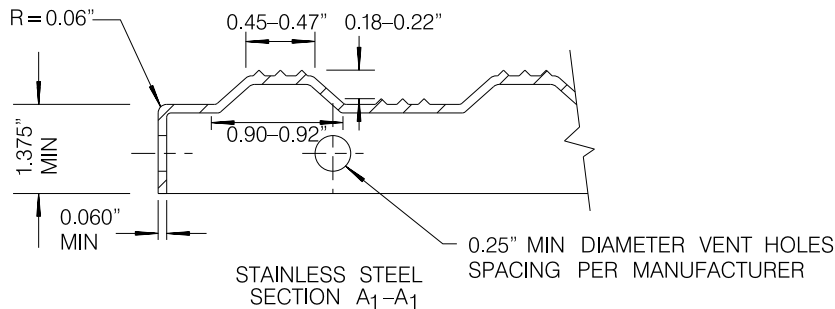
DETAIL 1

NOTES:

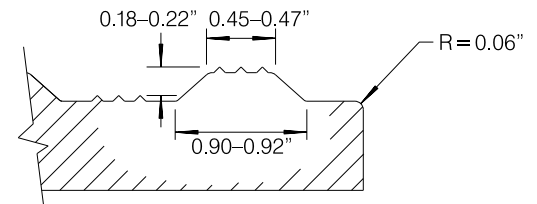
1. THE DETECTABLE WARNING TILE SHALL BE SLIP RESISTANT AND CONSIST OF AN INLINE PATTERN OF RAISED TRUNCATED DOMES.
2. COLOR: THE DETECTABLE WARNING TILE SHALL BE YELLOW CONFORMING TO FEDERAL STANDARDS 595C TABLE IV, COLOR NO. 33538.
3. MATERIAL: STAINLESS STEEL IS THE REQUIRED MATERIAL FOR THE DETECTABLE WARNING TILE. THE TYPE OF MATERIAL SELECTED SHALL BE INDICATED ON THE CURB RAMP DRAWINGS.

EXCEPTION: CAST-IN-PLACE DETECTABLE WARNING TILE OF COMPOSITE MATERIAL MAY BE USED ON RESIDENTIAL AREAS ONLY. WHEN RESIDENTIAL AREAS ARE WITHIN THE BOUNDARY OF A MIX-USE OR OTHER NON-RESIDENTIAL ZONES, STAINLESS STEEL IS REQUIRED AT CURB RAMP.

4. DETECTABLE WARNING TILE PRODUCTS SHALL BE PER THE CITY'S APPROVED MATERIALS LIST.



STAINLESS STEEL
SECTION A1-A1




COMPOSITE
SECTION A1-A1

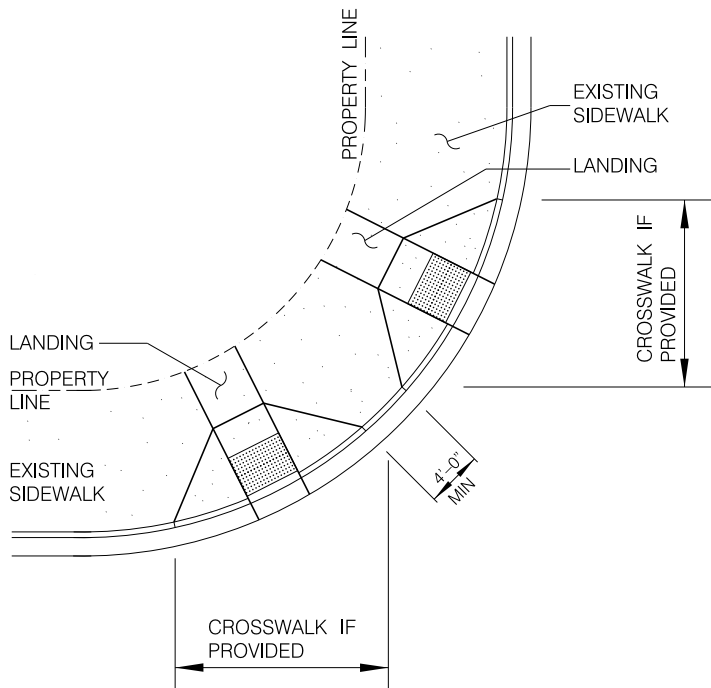
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING		RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	FC	A. OSKOUJ	1203	DETECTABLE WARNING TILES		 COORDINATOR R.C.E. 56523 DATE 2/29/16
UPDATE	FC	A. OSKOUJ	1206			
UPDATE	FC	A. OSKOUJ	0207			
UPDATE	FC	A. OSKOUJ	1208			
UPDATE	FC	J. NAGELVOORT	02/16			
						DRAWING NUMBER SDG-130

NOTES:

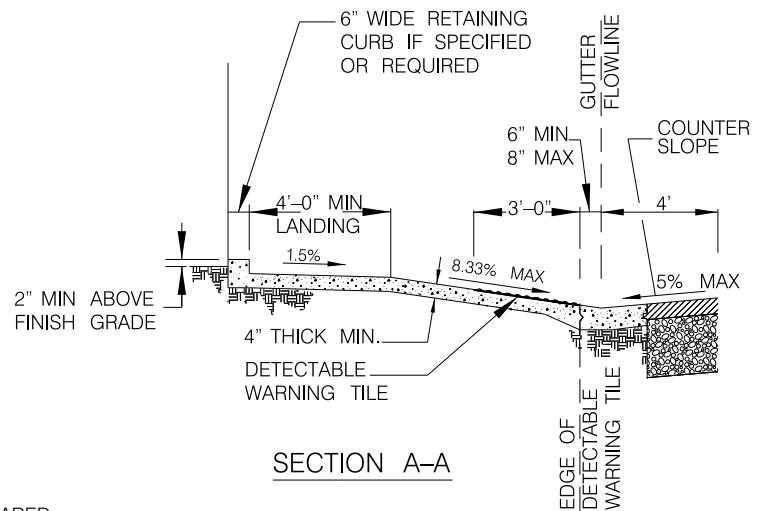
1. TWO CURB RAMPS ARE REQUIRED AT EACH SIDEWALK CORNER FOR NEW CONSTRUCTION OF ENTIRE INTERSECTION, EACH CURB RAMP SHALL CONNECT THE PEDESTRIAN ACCESS ROUTE AT EACH PEDESTRIAN STREET CROSSING. IN ALTERATIONS WHERE EXISTING PHYSICAL CONSTRAINTS PREVENT TWO CURB RAMPS FROM BEING INSTALLED AT A STREET CORNER, A SINGLE PEDESTRIAN CURB RAMP IS PERMITTED. SEE DETAIL A AND B ON SDG-132.
2. OPPOSING CURB RAMPS AT A SINGLE CROSSING SHALL LINE UP. ALIGN THE CURB RAMP WITH THE CROSSWALK SO THERE IS A STRAIGHT PATH OF TRAVEL FROM THE TOP OF THE RAMP TO THE CURB RAMP ON THE OTHER SIDE, TO THE MAXIMUM EXTENT FEASIBLE.
3. PULL BOXES, MANHOLES, VAULTS, AND OTHER UTILITIES SHALL BE RELOCATED OR INCORPORATED ONTO THE CURB RAMP AREA PROVIDED THAT THE ACCESS COVER IS STABLE, FIRM, SLIP RESISTANT, AND FLUSH OR ADJUSTED TO GRADE. COORDINATE THE WORK WITH THE ENGINEER
4. UTILITY POLES MAY BE INCORPORATED INTO THE FLARES OF THE CURB RAMP PROVIDED THAT THE REQUIRED ACCESSIBLE ROUTE WIDTH IS COMPLIANT.
5. THE RUNNING SLOPE OF THE CURB RAMP SHALL BE 5% MINIMUM AND 8.33% MAXIMUM. 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 RAMP LENGTH SHALL BE EXTENDED TO 15 LINEAR FEET TO CATCH THE REQUIRED SLOPE EVEN IF THE REQUIRED SLOPE IS NOT ACHIEVED. COORDINATE WITH THE ENGINEER PRIOR TO DEMOLITION OR CONSTRUCTION.
6. GRADE BREAKS AT THE TOP AND BOTTOM OF THE RAMPS AND CURB RAMPS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. GRADE BREAKS SHALL NOT BE PERMITTED ON THE SURFACE OF RAMP RUNS AND TURNING SPACES. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.
7. PROVIDE A 1/4" DEEP TOOLED JOINT WITH 1/4" RADIUS EDGES AS SHOWN ON DRAWINGS.
8. INSTALL A 1/4" EXPANSION JOINT FILLER BETWEEN THE NEW CURB RAMP GUTTER AND THE EXISTING SIDEWALK.
9. PONDING IS NOT ALLOWED WITHIN THE CURB RAMP LIMITS, AND THE DRAINAGE PATTERN SHALL NOT BE ALTERED.
10. THE ADJUSTMENT OF THE CROSS SLOPE AT THE RAMP OPENING SHALL NOT CAUSE GUTTER TRICKLE FLOW TO SPILL ONTO TRAVELLED LANES OR PONDING ANYWHERE.
11. TRANSITIONS FROM RAMPS TO WALKS AND SIDEWALK GUTTER OR STREET SURFACE SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. PAVEMENT AT THE STREET SURFACE SHALL BE MILLED TO ACHIEVE FLUSH CONDITION.
12. THE REMOVAL OF EXISTING PAVEMENT, CONCRETE CURB, GUTTER, SIDEWALK, AND EXISTING CURB RAMP FOR THE INSTALLATION OF A NEW CURB RAMP SHALL COMPLY WITH SDG-156.
13. DIAGONAL OR CORNER TYPE CURB RAMPS WITH RETURNED CURBS OR OTHER WELL-DEFINED EDGES SHALL HAVE THE EDGES PARALLEL TO THE DIRECTION OF PEDESTRIAN FLOW. DIAGONAL CURB RAMPS WITH FLARED SIDES SHALL HAVE A SEGMENT OF CURB 24" LONG MINIMUM LOCATED ON EACH SIDE OF THE CURB RAMP AND WITHIN THE MARKED CROSSING.
14. DIAGONAL CURB RAMPS SHALL HAVE A CLEAR 4' X 4' MINIMUM TURNING SPACE BEYOND THE BOTTOM GRADE BREAK WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE ACTIVE TRAFFIC LANES OF THE ROADWAY (VEHICULAR AND BIKE LANES).
15. CURB RAMP AND FORM WORK SLOPES SHALL BE CHECKED WITH A DIGITAL LEVEL OF AN APPROPRIATE LENGTH. NO PORTION OF A RAMP RUN SHALL EXCEED THE MAXIMUM SLOPE REQUIREMENT.
16. THE COUNTER SLOPE WITHIN 4' OF THE CURB RAMP SHALL BE 5% MAXIMUM. IN ALTERATIONS IF THE COUNTER SLOPE OF 5% MAXIMUM CANNOT BE ACHIEVED, THEN ADJUST THE SLOPE OR ELEVATION OF THE RAMP SO THE COMBINED COUNTER SLOPE AND RAMP SLOPE DOES NOT EXCEEDS 13.3%.
17. THE SLOPE OF THE RAMP SHALL BE UNIFORM ALONG EACH RAMP RUN.
18. THE CROSS SLOPE SHALL BE MEASURED PERPENDICULAR TO THE PATH OF TRAVEL.
19. ANY DEVIATION FROM THESE PROVISIONS REQUIRES PRIOR APPROVAL FROM THE ENGINEER.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	SS	A. OSKOUJ	12/03		
UPDATE	FC	A. OSKOUJ	12/06	GENERAL CURB RAMP NOTES	 2/29/16 COORDINATOR R.C.E. 56523 DATE
UPDATE	FC	A. OSKOUJ	12/08		
UPDATE	KA	J. NAGELVOORT	01/12		DRAWING NUMBER SDG-131
UPDATE	FC	J. NAGELVOORT	02/16		

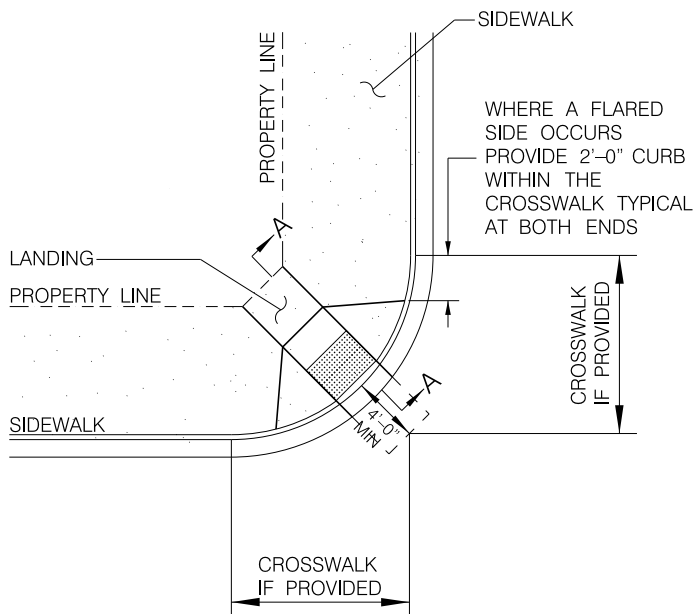
LEGEND: TOOLED JOINT



DETAIL A
TWO CURB RAMP
CORNER INSTALLATION



SECTION A-A



DETAIL B
TYPICAL ONE CURB RAMP
CORNER INSTALLATION

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

GENERAL CURB RAMP NOTES & SUPPLEMENTAL DETAILS

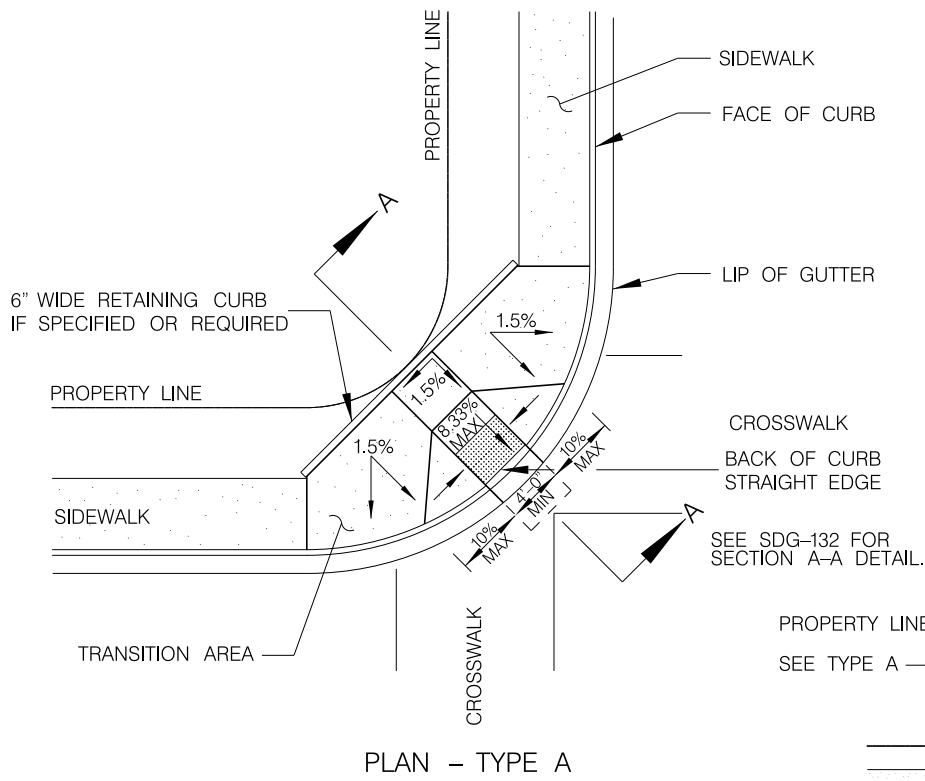
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CDungar
COORDINATOR R.C.E. 56523

2/29/16
DATE

DRAWING
NUMBER

SDG-132

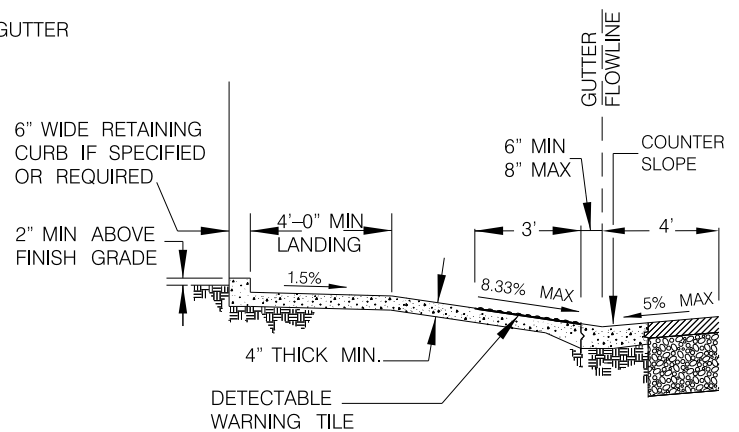
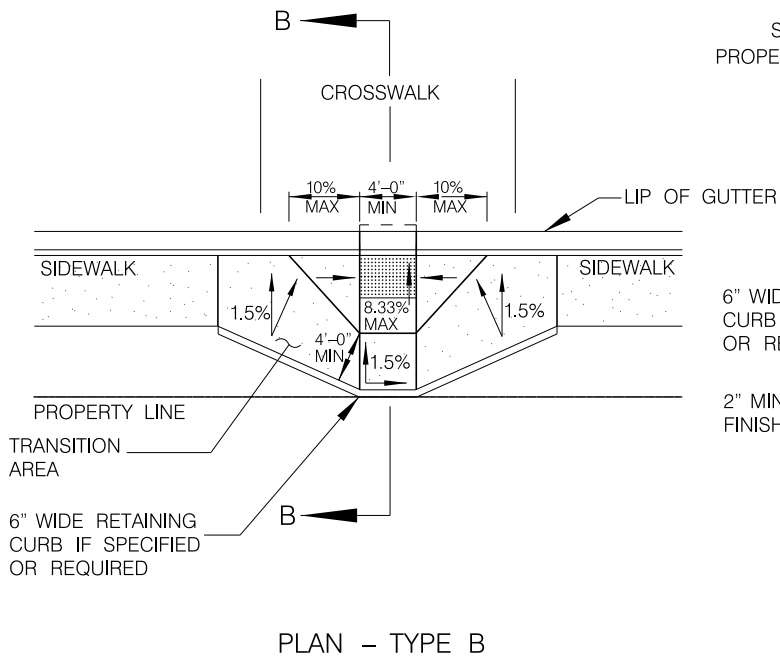
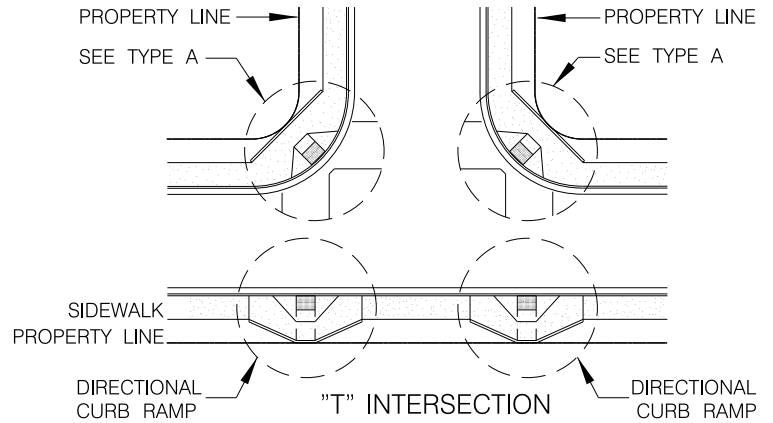


NOTES:

1. 6" WIDE RETAINING CURB MAY BE OMITTED IF THE GROUND SURFACE WILL BE AT THE SAME ELEVATION AS THE CURB RAMP SURFACE.

LEGEND:

TOOLED JOINT



REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

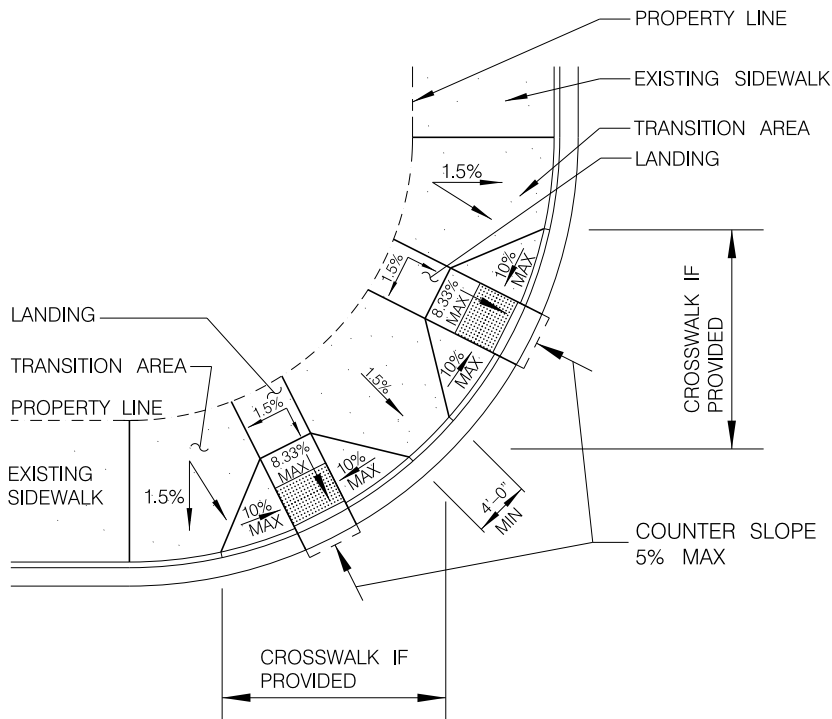
CURB RAMPS - TYPE A AND B

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chingee 2/29/16
COORDINATOR R.C.E. 56523 DATE

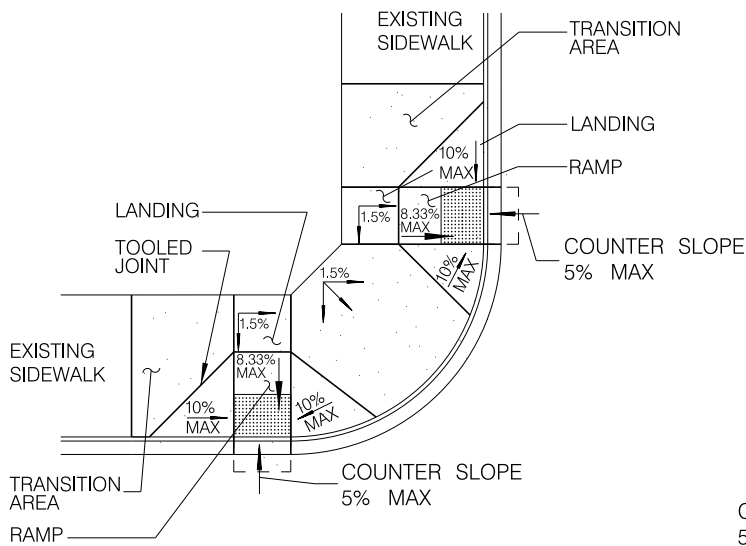
DRAWING
NUMBER

SDG-133

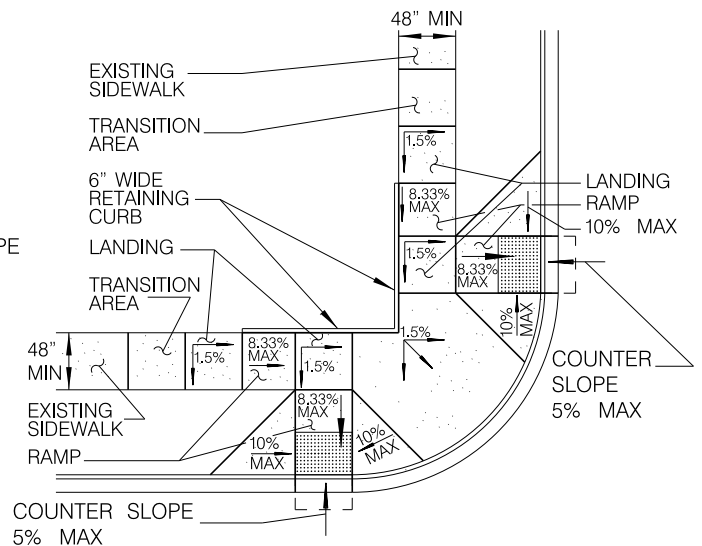


LEGEND:
TOOLED JOINT

TWO CURB RAMPS CORNER



TWO CURB RAMPS CORNER



CURB RAMPS ADJACENT TO NON-CONTIGUOUS SIDEWALK < 10' ROW

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

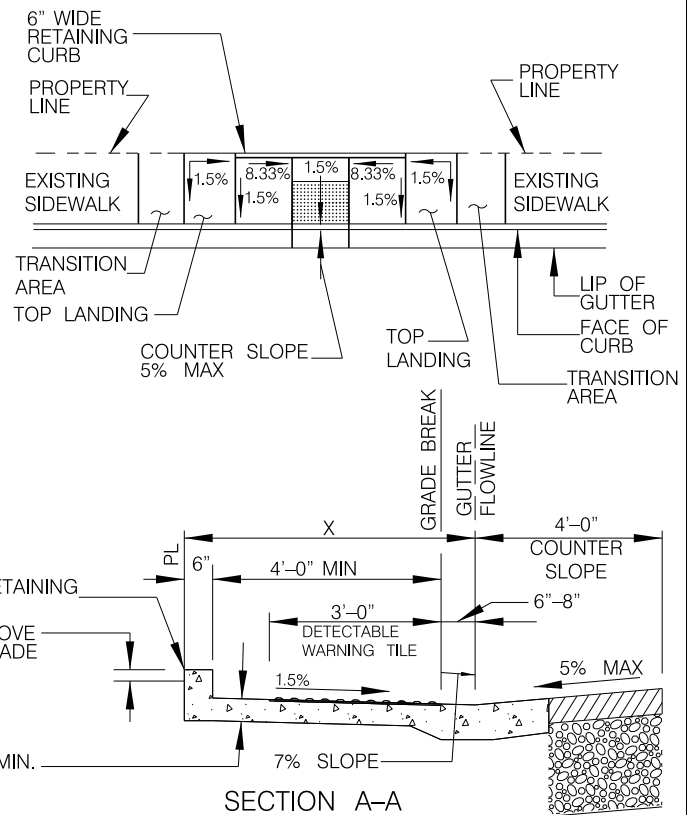
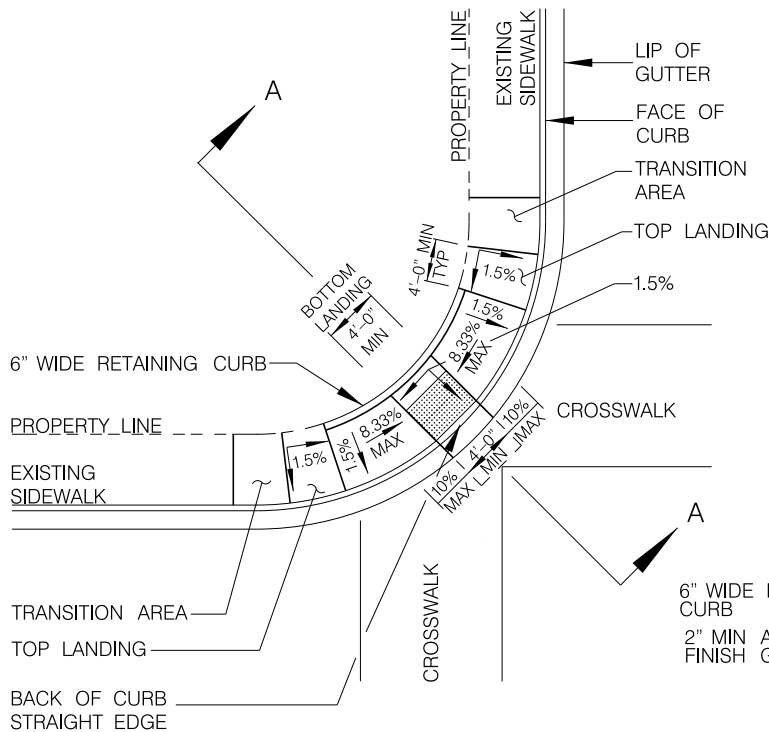
CITY OF SAN DIEGO – STANDARD DRAWING

DUAL CURB RAMPS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chungpa 2/29/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDG-134**

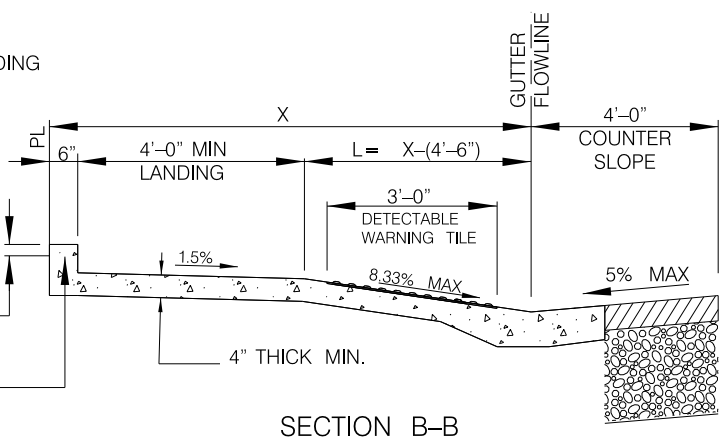
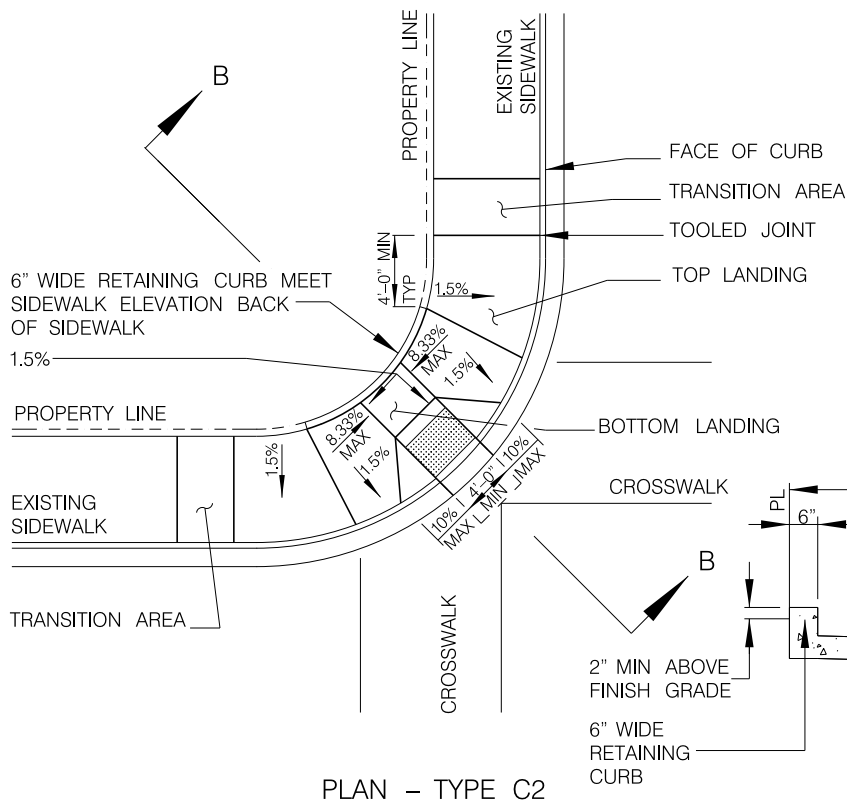


NOTES:

1. TYPE C1 CURB RAMP SHALL ONLY BE USED WHERE INADEQUATE RIGHT OF WAY EXISTS. TYPE C1 SHALL BE USED WHEN $X < 8'$ AND ONLY WITH PRIOR APPROVAL FROM THE ENGINEER. X = DISTANCE FROM FACE OF CURB TO PROPERTY LINE.
2. GRADE BREAK AT THE TOP AND BOTTOM OF RAMP RUNS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN.

LEGEND:

TOOLED JOINT



REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

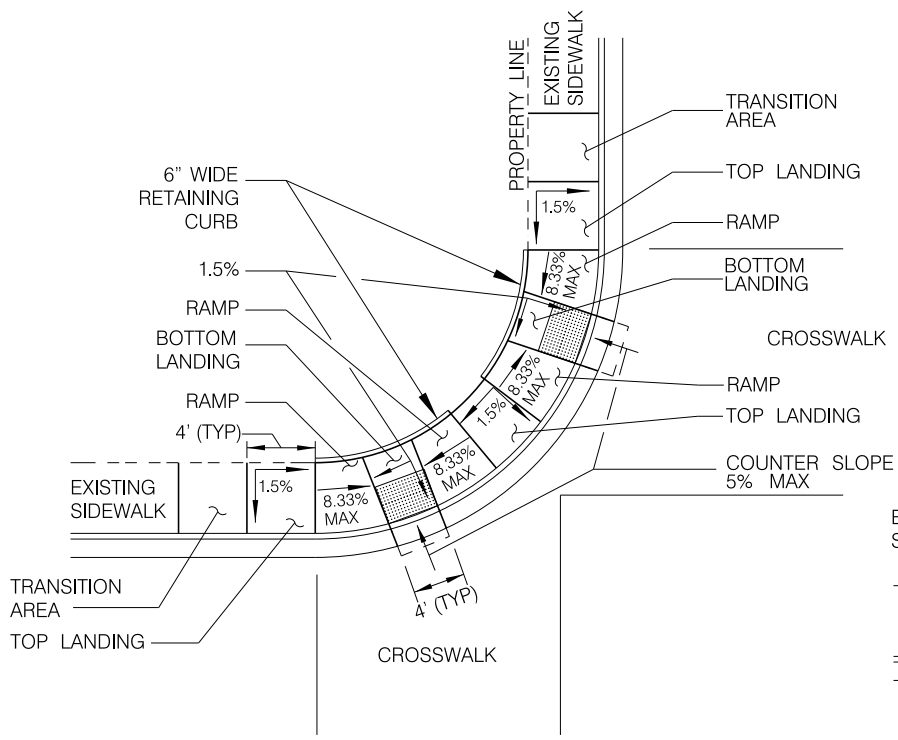
CURB RAMPS - TYPE C1 AND C2

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung 2/29/16
COORDINATOR R.C.E. 56523 DATE

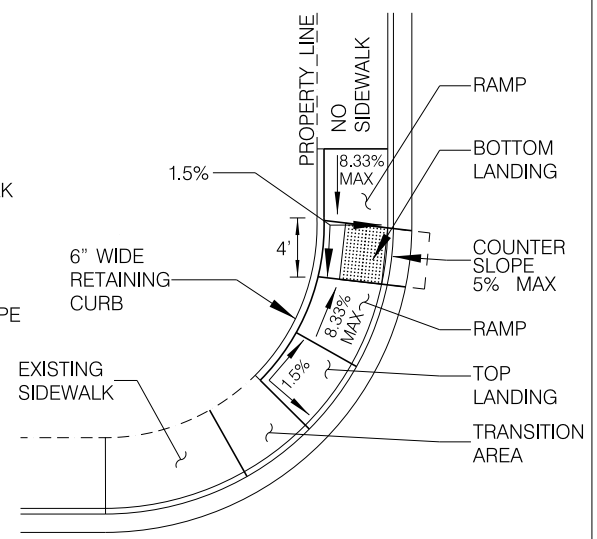
DRAWING
NUMBER

SDG-135

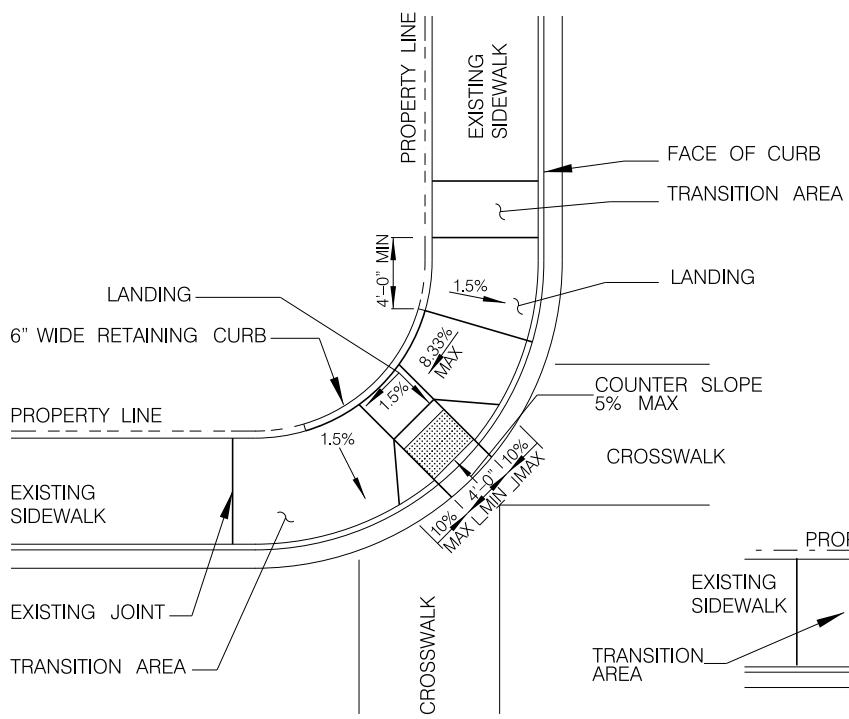


DOUBLE TYPE C1

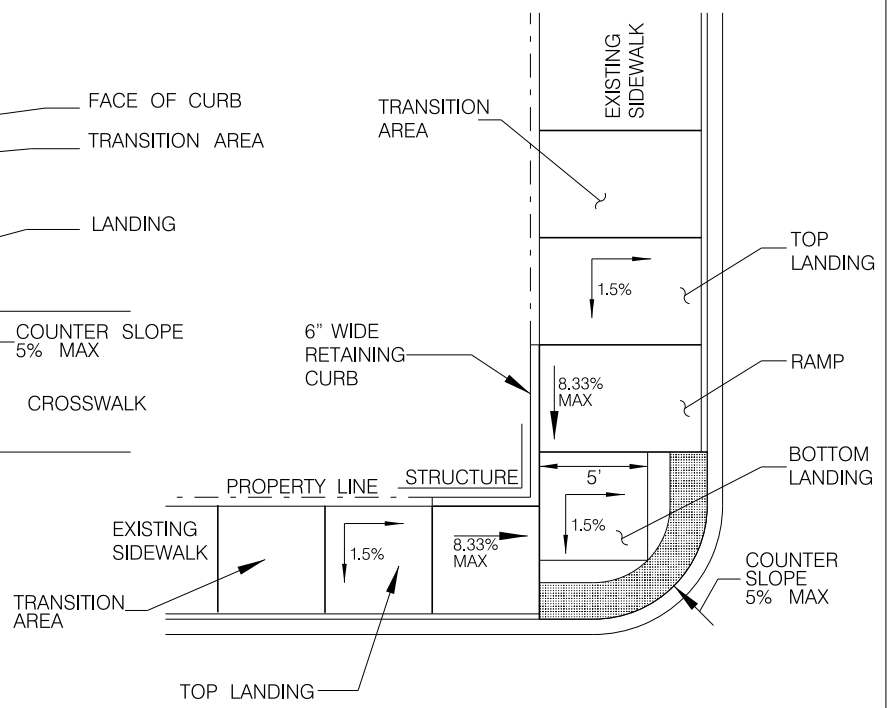
LEGEND:
 TOOLED JOINT



PLAN - TYPE C1 (MODIFIED)



TYPE A/C2 COMBINATION



TYPE C1 (CORNER WITH BUILDING OR STRUCTURE)

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

CURB RAMPS - TYPE C1 AND C2

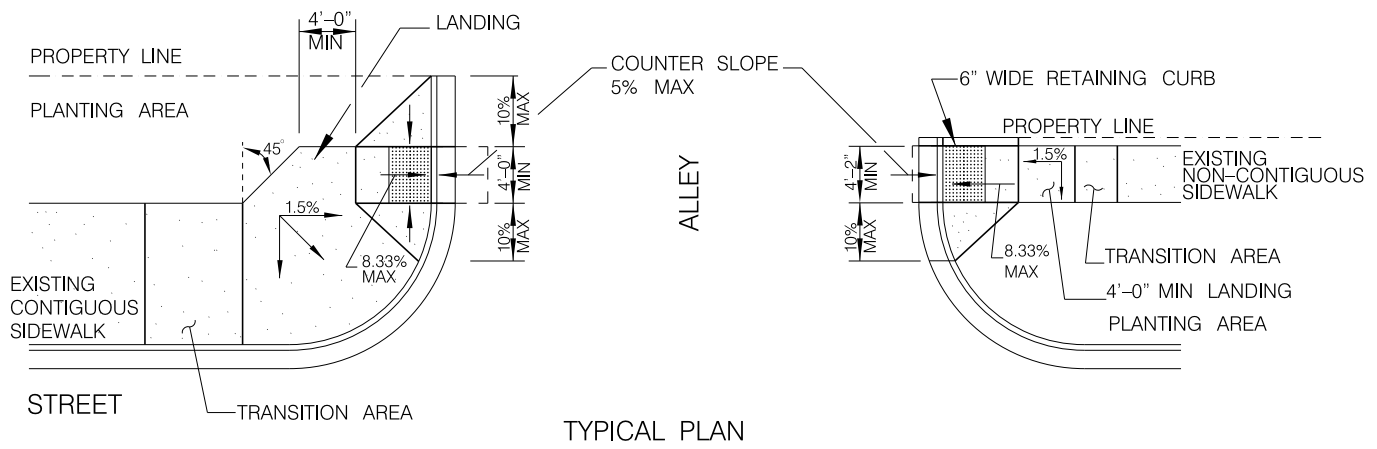
MORE DETAILS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

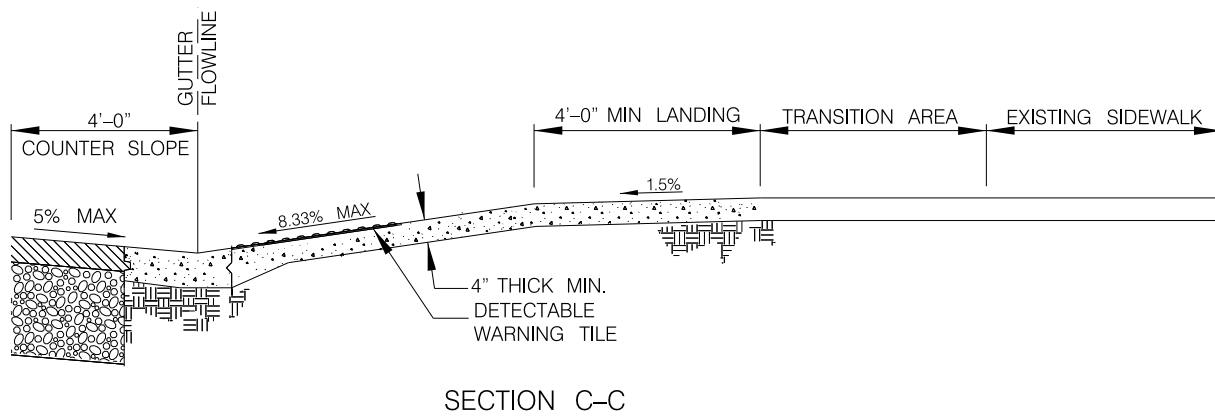
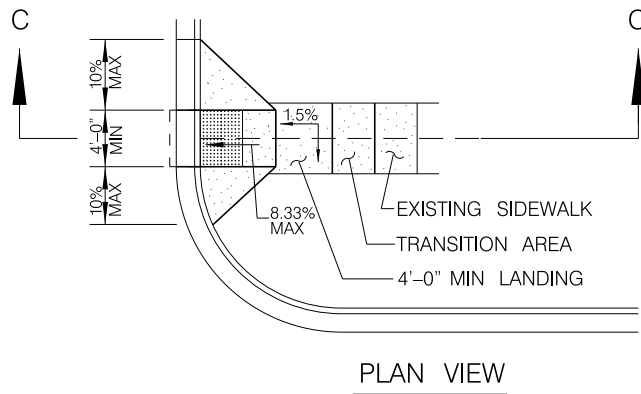
2/29/16

COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDG-136**



LEGEND:	
	TOOLED JOINT



REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

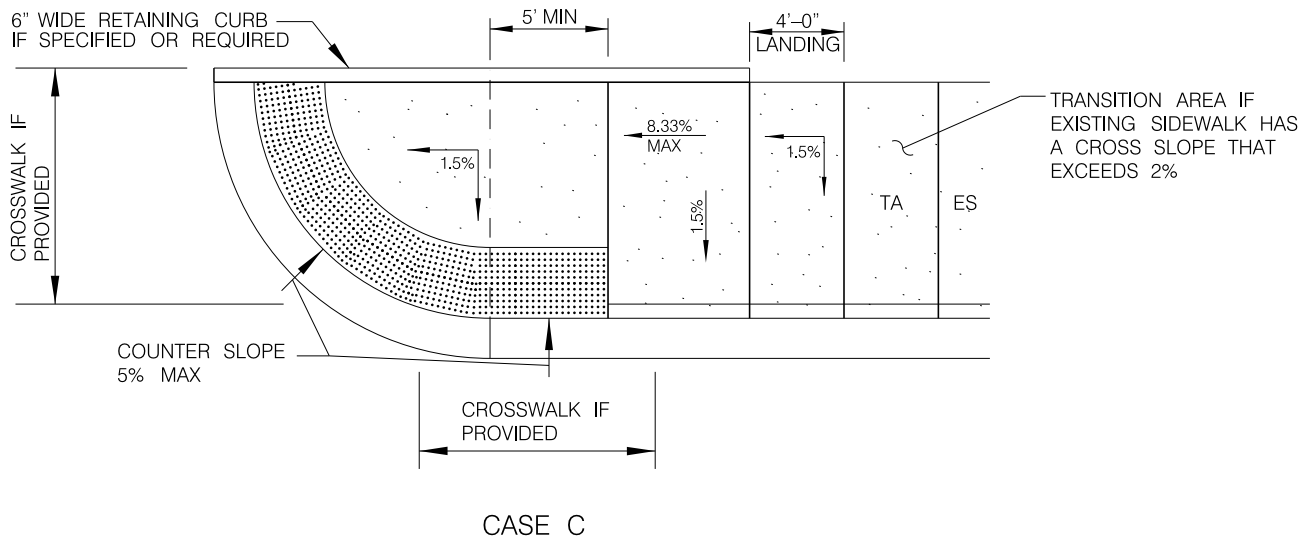
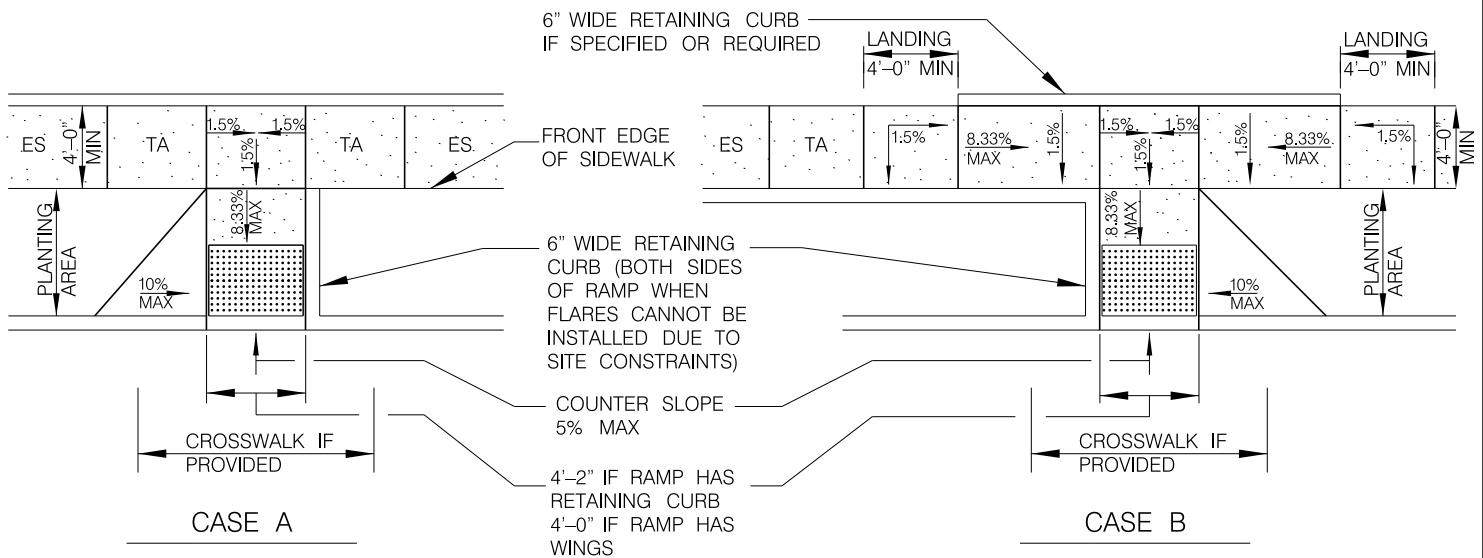
CITY OF SAN DIEGO – STANDARD DRAWING

CURB RAMP - TYPE D

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

COORDINATOR R.C.E. 56523 DATE 2/29/16

DRAWING
NUMBER **SDG-137**



NOTES:

1. CASE A THROUGH C MAY BE USED ONLY WITH APPROVAL OF THE ENGINEER.
2. ABBREVIATIONS:
ES-EXISTING SIDEWALK
TA-TRANSITION AREA

LEGEND:

TOOLED JOINT

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

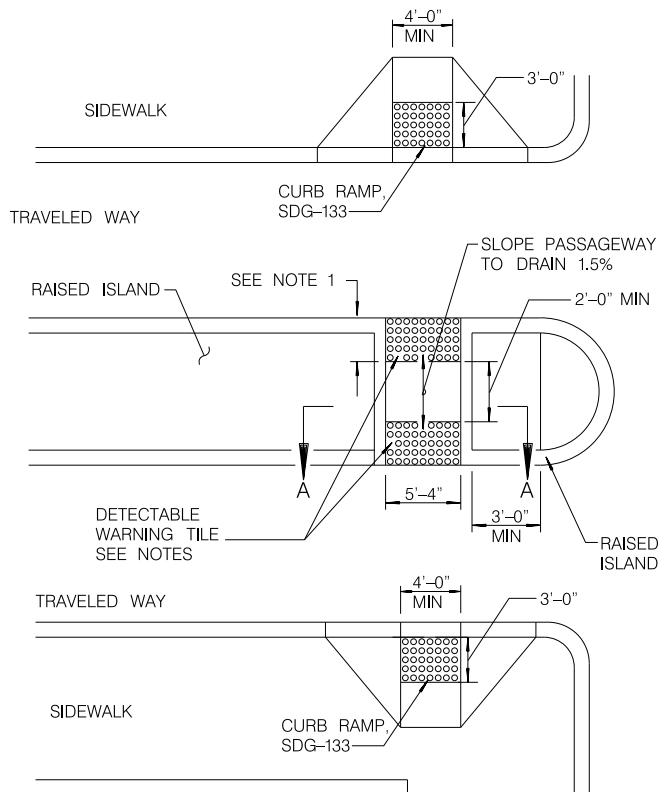
CITY OF SAN DIEGO - STANDARD DRAWING

GENERAL CURB RAMPS

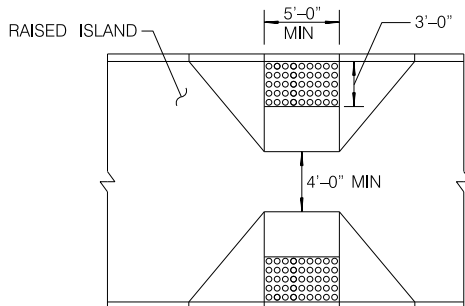
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chungara 2/29/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDG-138**



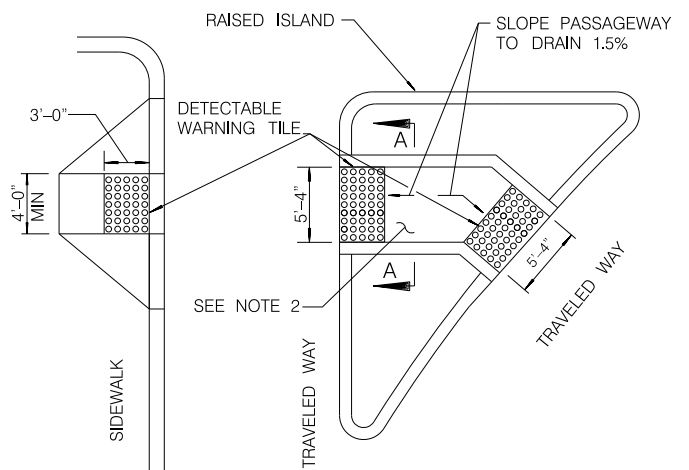
STRAIGHT PASSAGEWAY



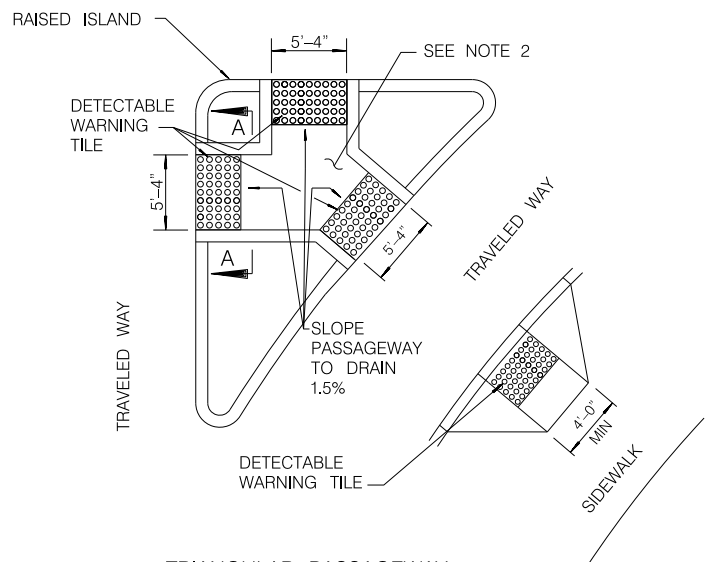
**CURB RAMP AT ISLAND
PER SDG-133**

NOTES:

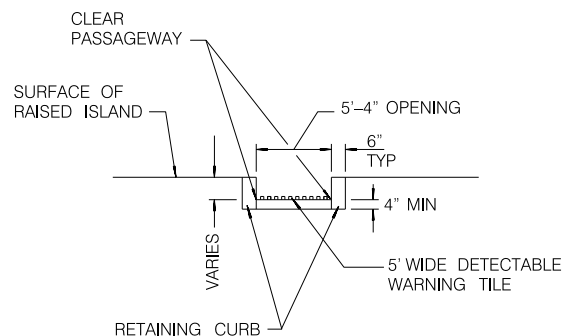
1. WHERE THE ISLAND OR CUT-THROUGH LENGTH IS 8 FT OR MORE, THE DETECTABLE WARNINGS SHALL BE 36 INCHES IN DEPTH EXTENDING THE FULL WIDTH OF THE PEDESTRIAN PATH OR CUT-THROUGH, LESS 2 INCHES MAXIMUM ON EACH SIDE.
2. WHERE THE ISLAND OR CUT-THROUGH LENGTH IS LESS THAN 8 FT, THE DETECTABLE WARNINGS SHALL BE 24 INCHES. IF THE ISLAND IS LESS THAN 6 FT, DETECTABLE WARNINGS ARE NOT REQUIRED.
3. DETECTABLE WARNINGS SHALL BE PLACED AT THE EDGES OF THE PEDESTRIAN ISLAND OR CUT-THROUGH MEDIAN, EXCEPT FOR RAISED ISLANDS WHERE THE PLACEMENT SHALL COMPLY WITH THE REQUIREMENTS OF THE CURB RAMPS.



ANGULAR PASSAGEWAY



TRIANGULAR PASSAGEWAY



SECTION A-A

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

ISLAND AND PASSAGEWAY DETAILS

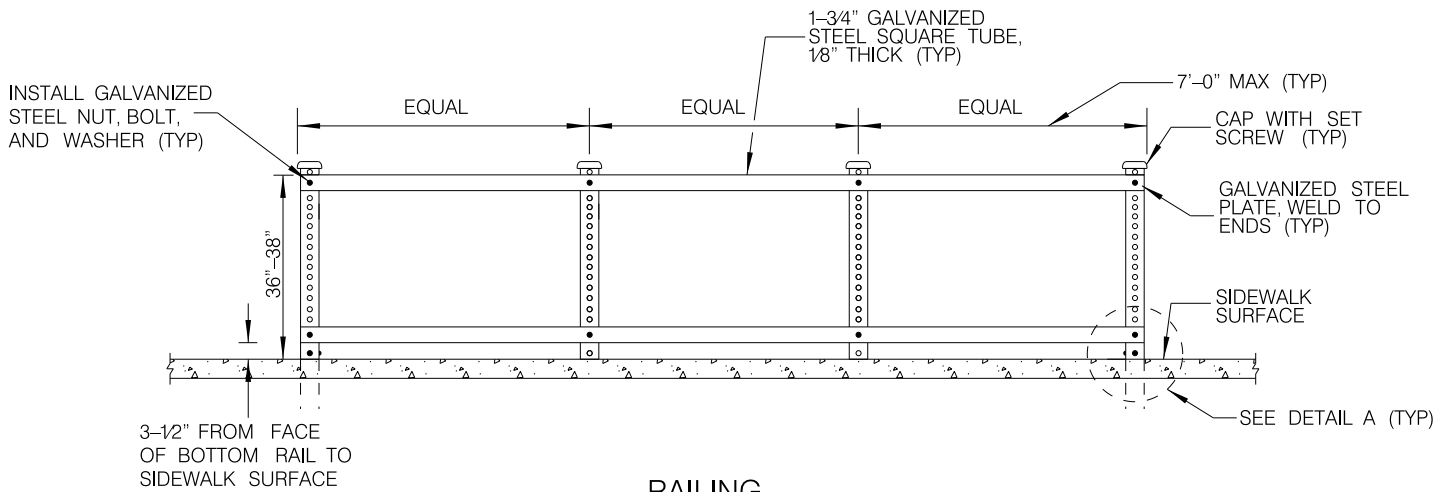
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

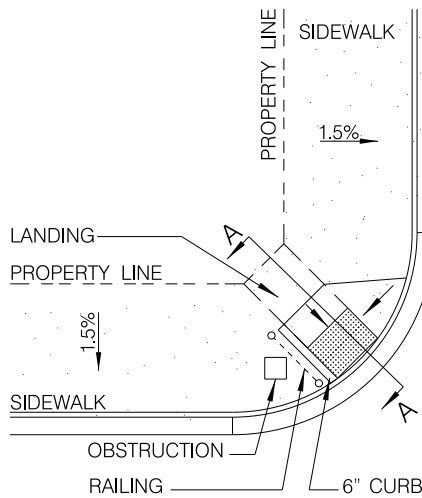
2/29/16
DATE

DRAWING
NUMBER

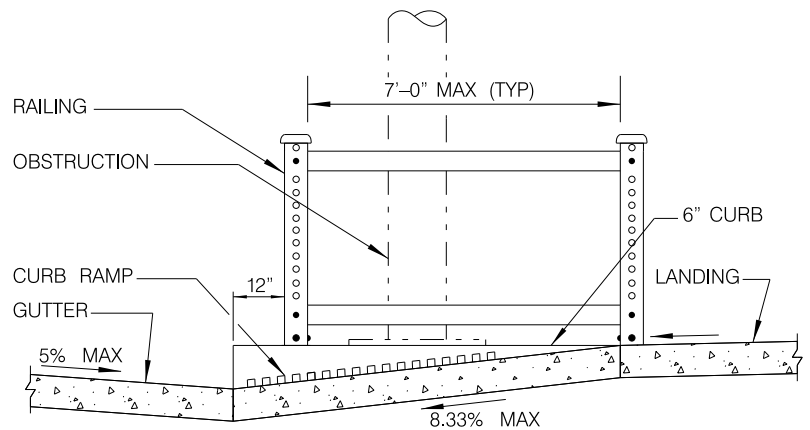
SDG-139



RAILING



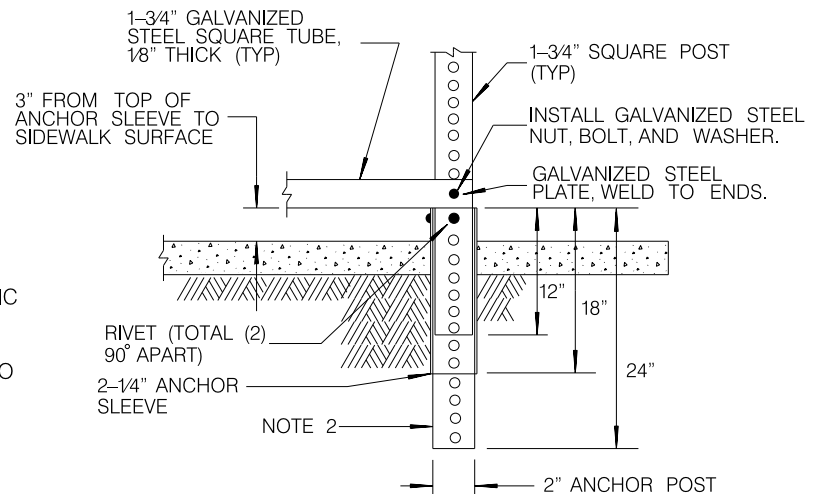
RAILING FOR CURB RAMP WITH OBSTRUCTION



SECTION A-A

NOTES:

1. POSTS TO BE SET 12" BEHIND THE FACE OF CURB.
2. IN EXISTING SIDEWALK AREA SET POSTS INTO 4" CORE BORING.
3. POSTS SHALL BE WRAPPED IN 6 MIL VISQUEEN PLASTIC PRIOR TO POURING CONCRETE OR GROUTING.
4. HORIZONTAL 1-3/4" GALVANIZED STEEL SQUARE POST TO BE MOUNTED ON THE SIDE OF THE BREAK-AWAY POSTS, OPPOSITE TO THE RAMP.



DETAIL A

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

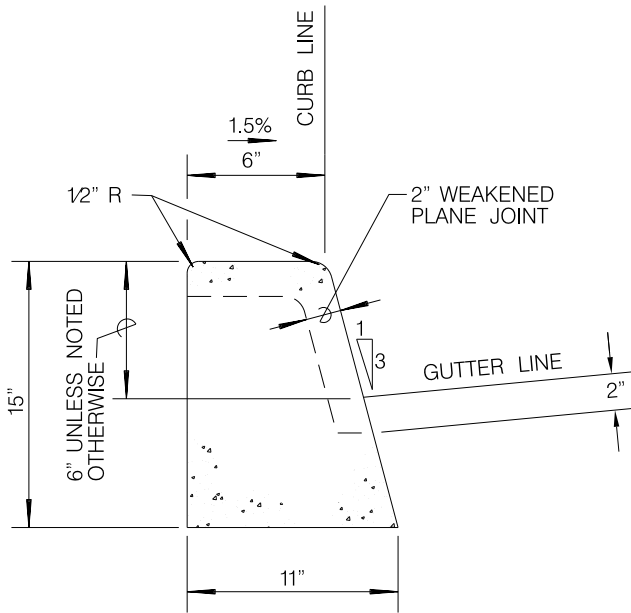
CURB RAMP BARRICADE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

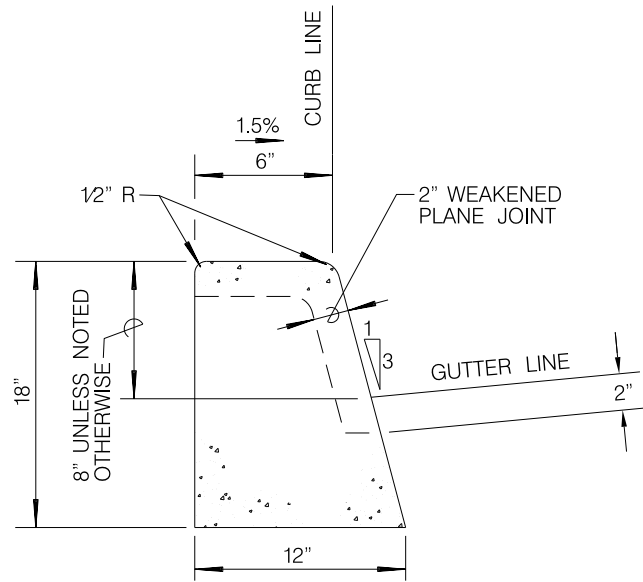
CA Dunge 2/29/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

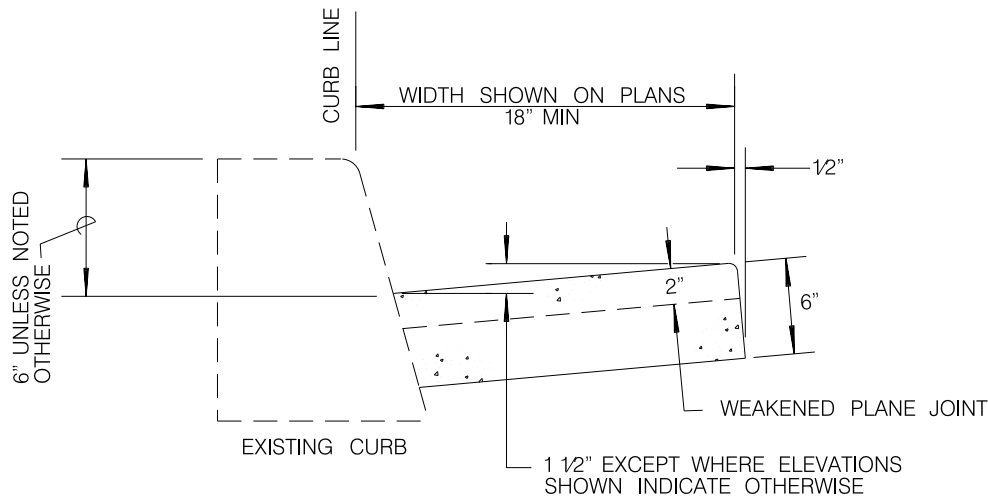
SDG-140



6" CURB
AREA=0.89 SQ FT



8" CURB
AREA=1.09 SQ FT



GUTTER

NOTES:

1. CONCRETE SHALL BE 520-C-2500.
2. SEE SDG-109 AND G-10 FOR JOINT DETAILS.
3. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND / OR DATE) SHALL BE PRESERVED PER SDG-115.

LEGEND ON PLANS

6" CURB

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

CURB AND GUTTER - SEPARATE

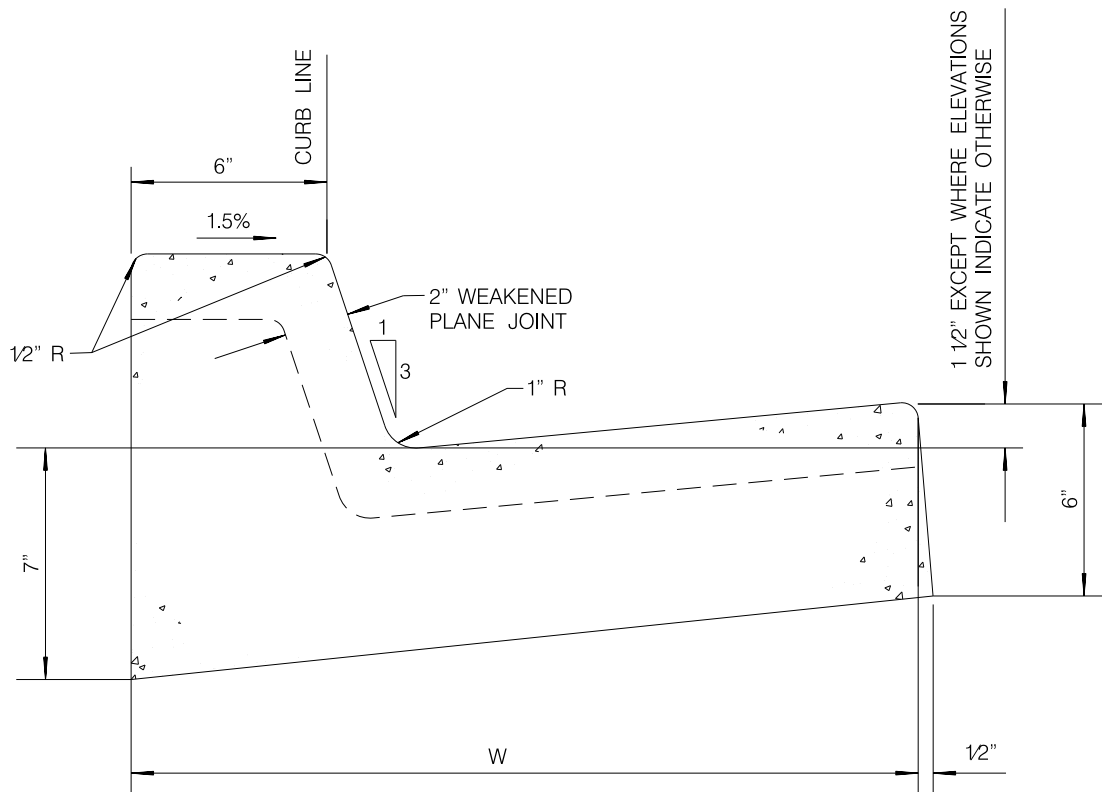
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDG-150



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

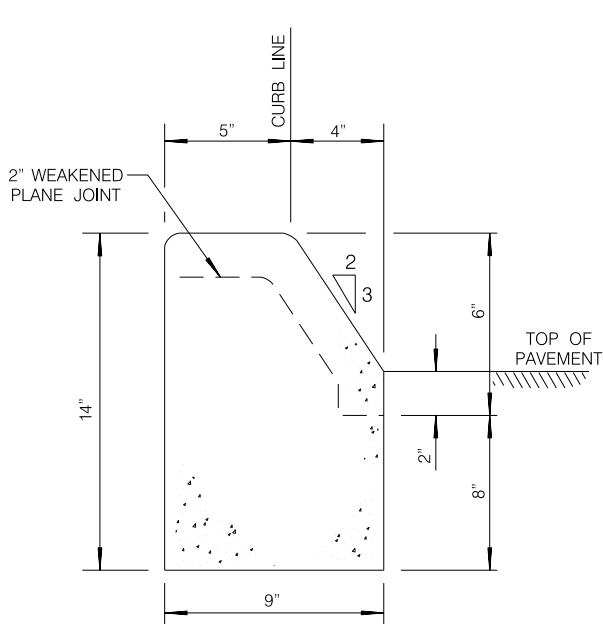
* WITH 6" CURB FACE

NOTES:

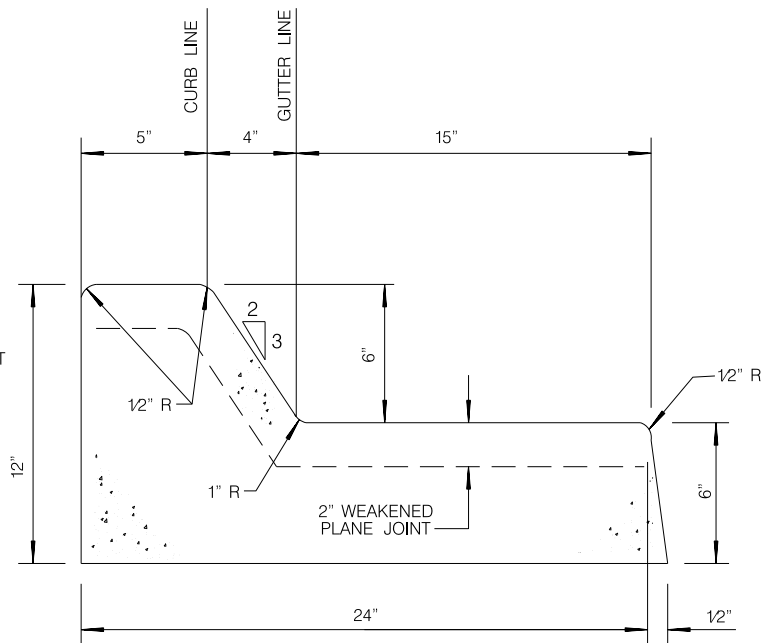
1. CONCRETE SHALL BE 520-C-2500.
2. SEE JOINT DETAIL DRAWING SDG-109 AND G-10.
3. ON THE SIDE OF OF SUPER ELEVATED CURVES THE GUTTER SHALL BE SLOPED TO MATCH CROSS SECTION GRADE OF THE ROADWAY.
4. PLACE EXPANSION JOINTS AT CURB RETURNS ADJACENT TO STRUCTURES AND AT NO GREATER THAN 45' INTERVALS.
5. PLACE WEAKENED PLANE JOINTS AT DRIVEWAYS AND AT 15' INTERVALS FROM POINT OF CURB RETURN.
6. ALL HISTORICAL STAMPS / IMPRESSIONS SHALL BE PRESERVED PER SDG-115.

LEGEND ON PLANS

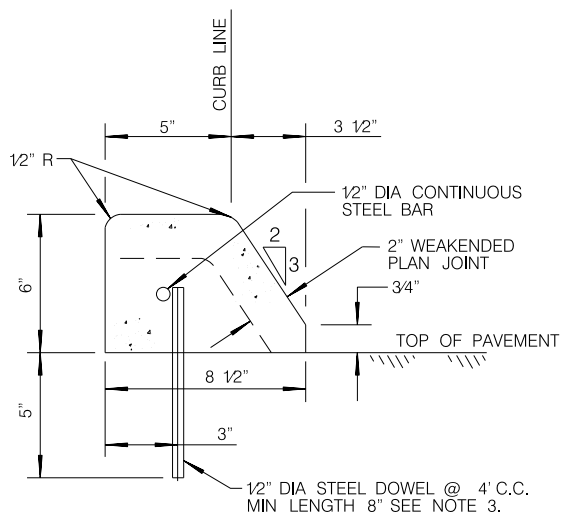
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	10/15	CURB AND GUTTER - COMBINED	 COORDINATOR R.C.E. 56523 DATE 2/25/16
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDG-151



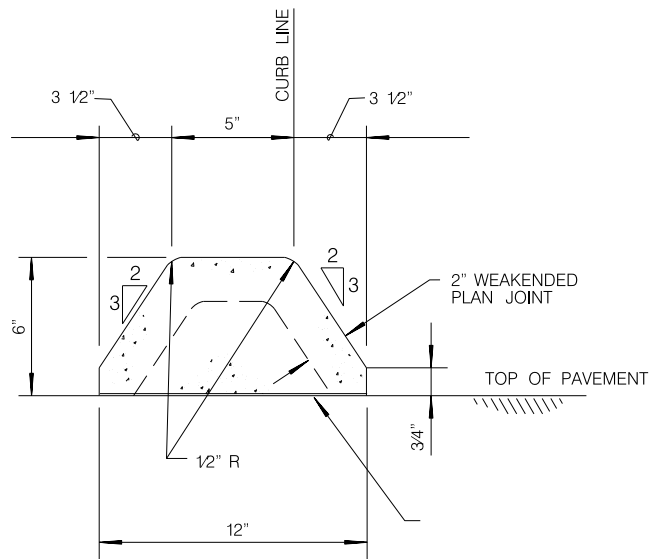
B-1
AREA=0.79 SQ FT



B-2
AREA=1.29 SQ FT



B-3
AREA=0.29 SQ FT



B-4
AREA=0.35 SQ FT

NOTES:

1. CONCRETE SHALL BE 520-C-2500.
2. SEE JOINT DETAIL DRAWINGS SDG-109 AND G-10.
3. EXTRUDED TYPE B-3 CURB SHALL BE ANCHORED TO EXISTING PAVEMENT.
4. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND / OR DATE) SHALL BE PRESERVED PER SDG-115.

LEGEND ON PLANS

TYPE B-2 CURB AND GUTTER

TYPE B-1, B-3, B-4 CURB

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

CURB AND GUTTER - MEDIANS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

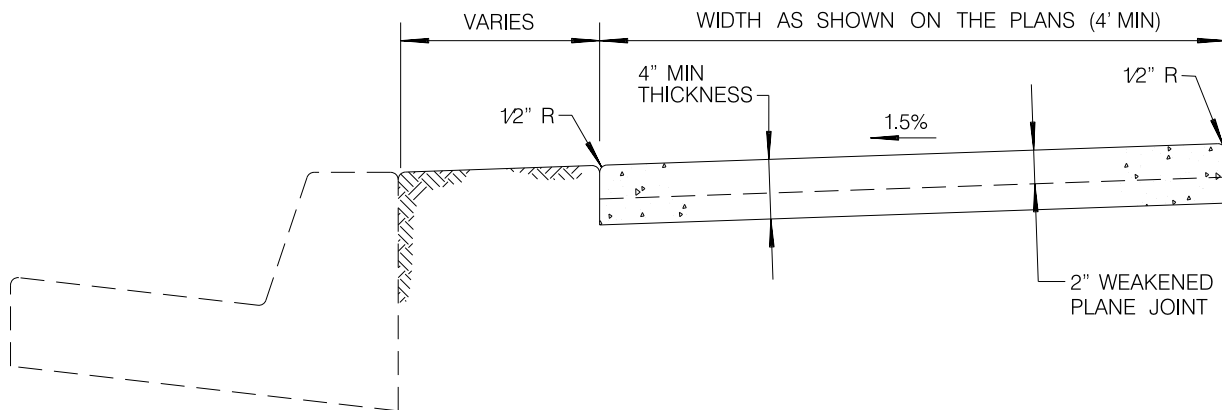
Chung

COORDINATOR R.C.E. 56523

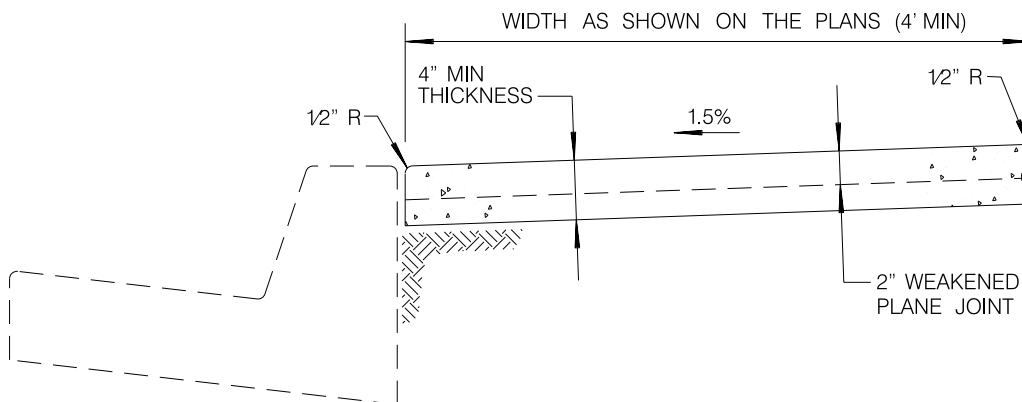
2/25/16
DATE

DRAWING
NUMBER

SDG-154



NON-CONTIGUOUS



CONTIGUOUS

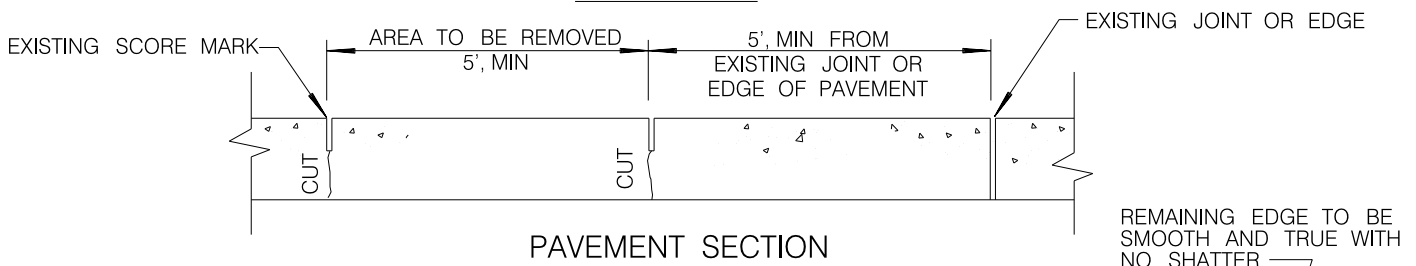
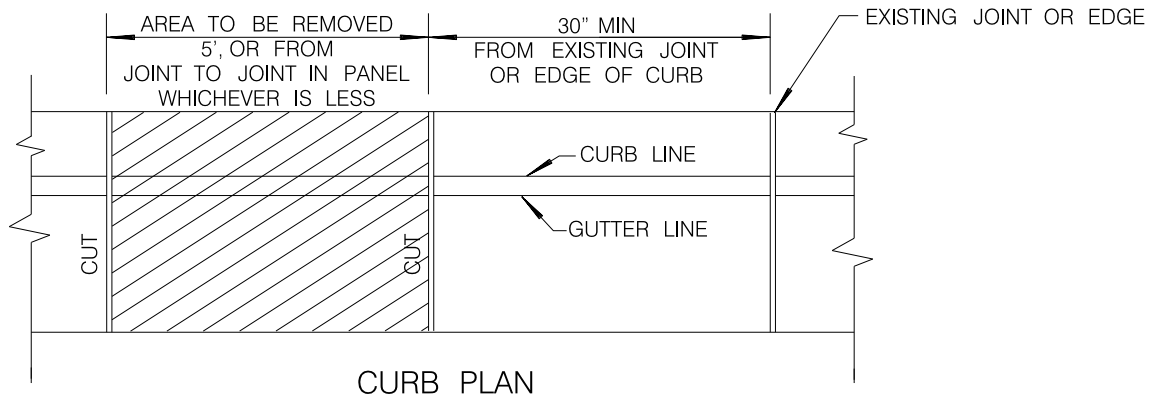
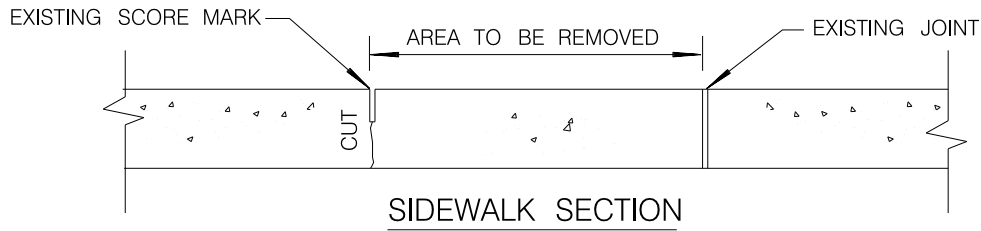
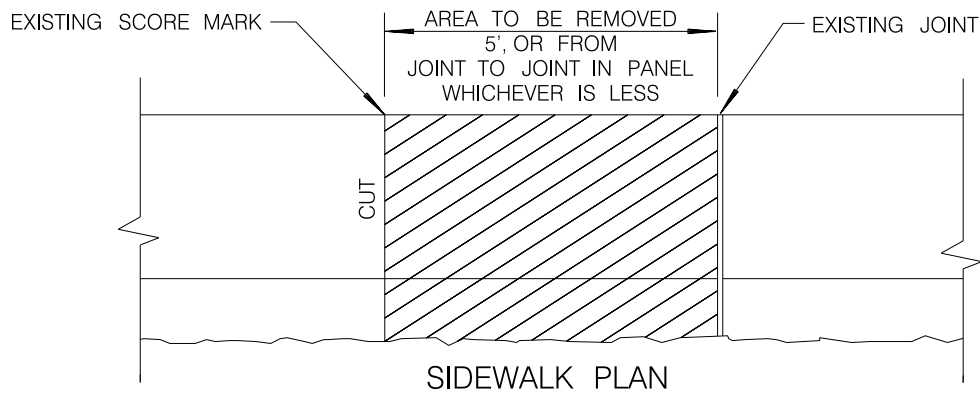
NOTES:

1. CONCRETE SHALL BE 520-C-2500.
2. SEE JOINT DETAIL DRAWINGS SDG-109 AND G-10.
3. SIDEWALK SHALL MAINTAIN A MINIMUM CLEAR WIDTH OF 4' OF TRAVEL FROM ANY OBSTRUCTION.
4. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND/OR DATE) SHALL BE PRESERVED PER SDG-115.
5. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

LEGEND ON PLANS

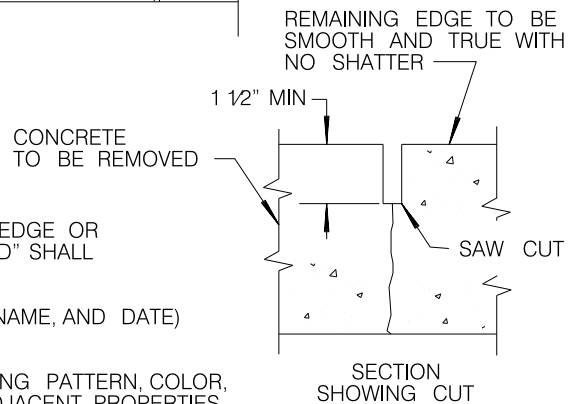


REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		<i>Chung</i> 2/25/16
UPDATED	RB	J. NAGELVOORT	10/15	SIDEWALK - TYPICAL SECTIONS	COORDINATOR R.C.E. 56523 DATE
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDG-155



NOTES:

1. SIDEWALK CROSS SLOPE SHALL BE 1.5%.
2. 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.
3. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.
4. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.



REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

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

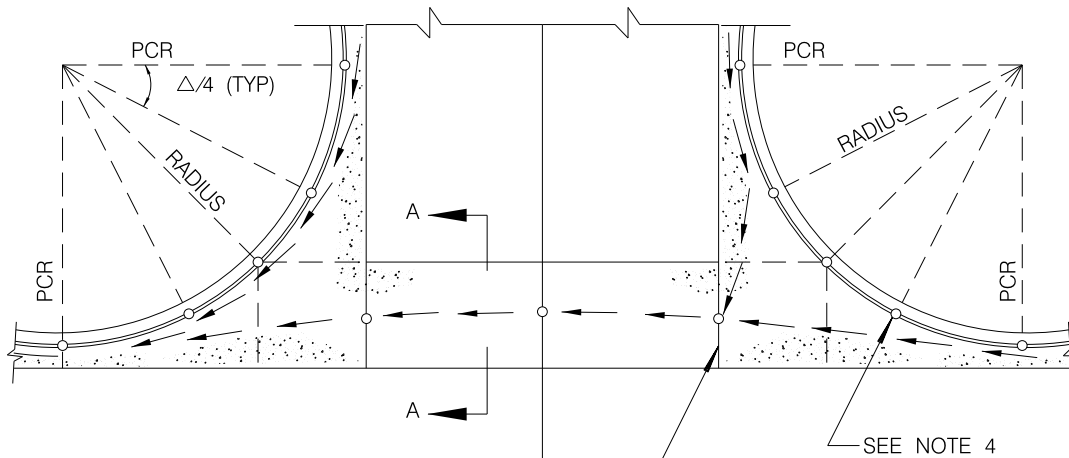
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CAJunge
COORDINATOR R.C.E. 56523

2/25/16
DATE

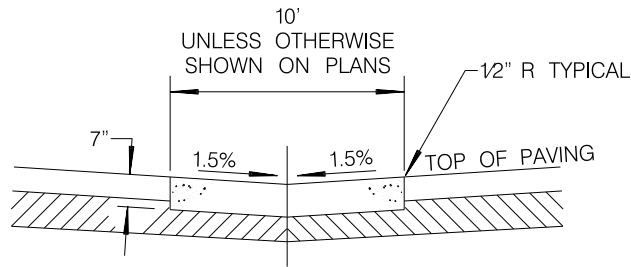
DRAWING
NUMBER

SDG-156



PLAN

CONTACT JOINTS PER
G-10 WHEN SEPARATE
POURS ARE MADE

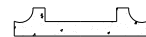


SECTION A-A

NOTES:

1. CONCRETE SHALL BE 560-C-3250.
2. — — — — WEAKENED PLANE JOINTS.
3. ← ← TYPICAL FLOWLINES.
4. o = ELEVATIONS TO BE SHOWN ON PLANS.
5. RETURN SEGMENTS TO BE 7" THICK.
6. CURB BETWEEN POINT OF CURB RETURNS (PCR) SHALL BE A MONOLITHIC POUR WITH THE CROSS GUTTER.
7. IN ALL CASES SUBGRADE SHALL BE COMPACTED TO 95% MIN RELATIVE COMPACTION TO A DEPTH OF 12"
8. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

CROSS GUTTER

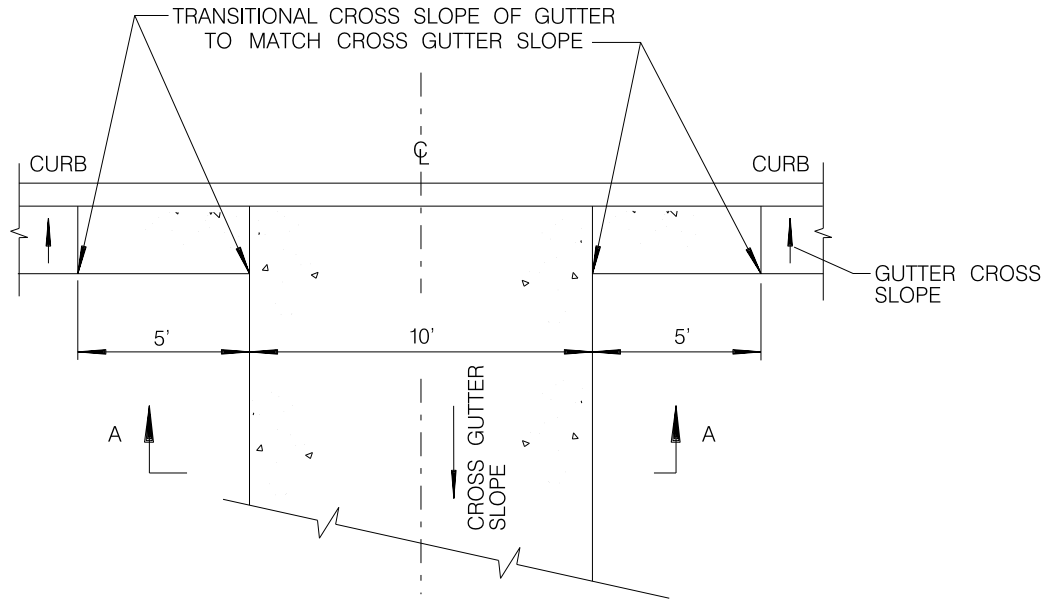
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

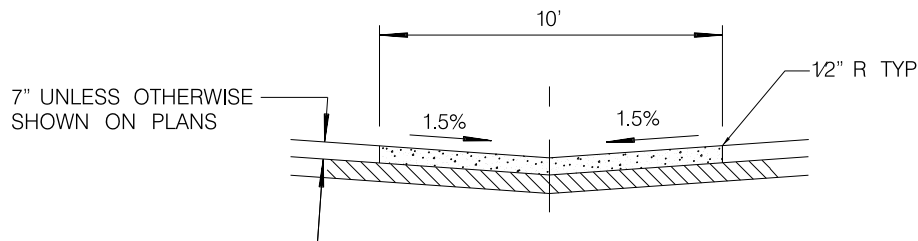
2/25/16
DATE

DRAWING
NUMBER

SDG-157



PLAN




SECTION A-A

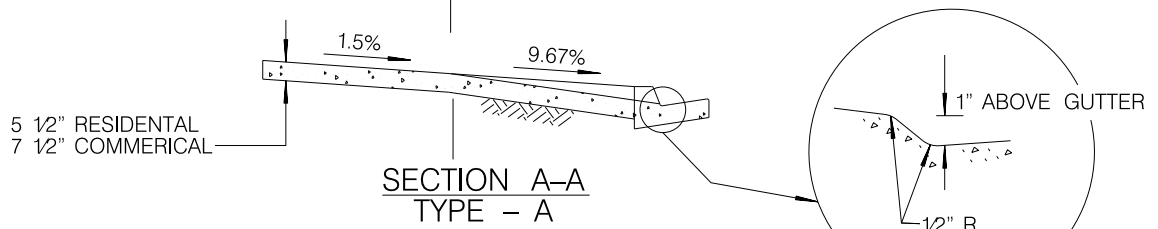
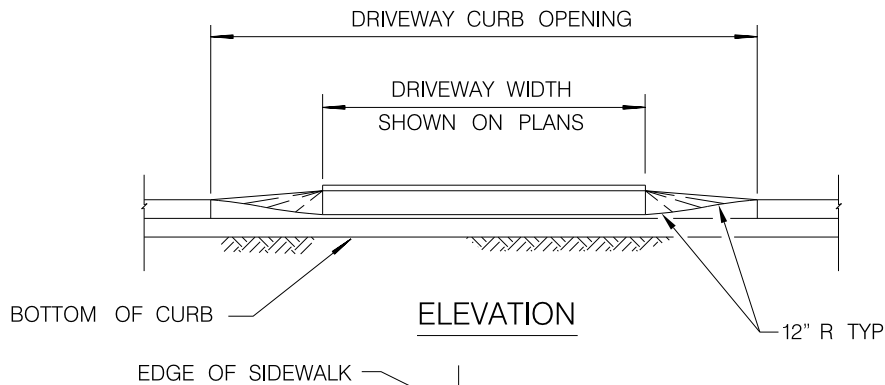
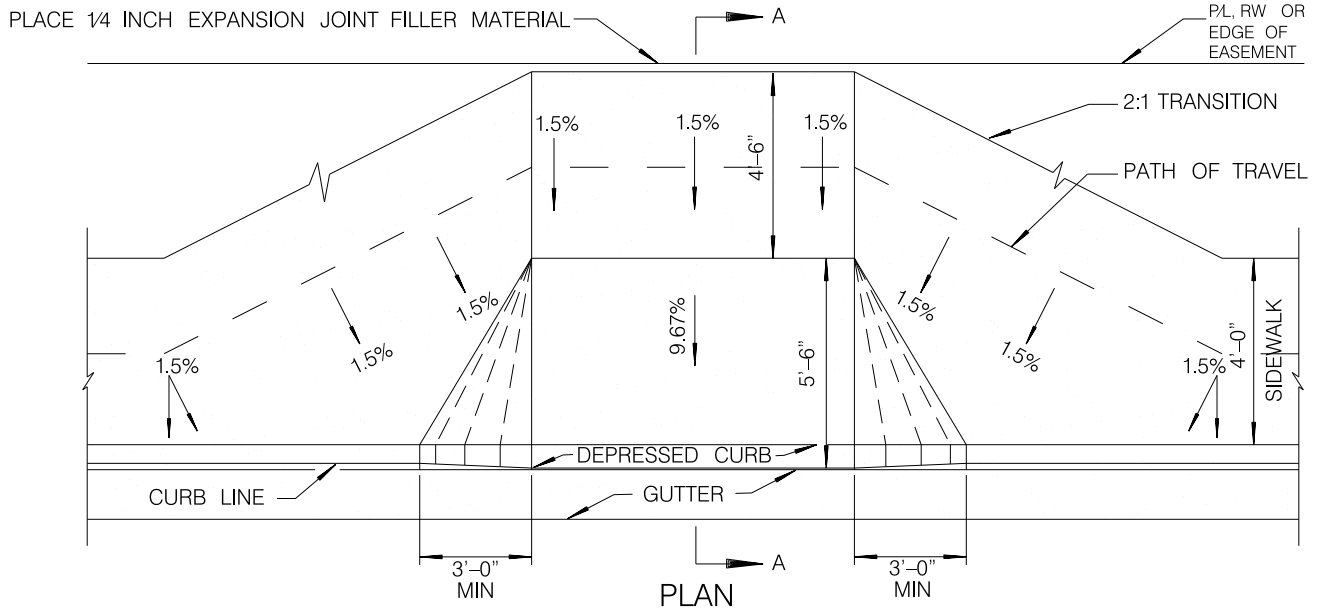
NOTES:

1. CROSS GUTTER TO BE CONSTRUCTED WHERE THE DRAINAGE IS CARRIED ACROSS STREET.
2. MINIMUM ALLOWABLE CROSS GUTTER SLOPE IS 0.5%.
3. CONCRETE SHALL BE 560-C-3250.
4. IN ALL CASES SUBGRADE SHALL BE COMPACTED TO 95% MIN RELATIVE COMPACTION TO A DEPTH OF 12".
5. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	HM	J. NAGELVOORT	02/16	MID-BLOCK CROSS GUTTER	 COORDINATOR R.C.E. 56523
					2/25/16 DATE
					DRAWING NUMBER
					SDG-158

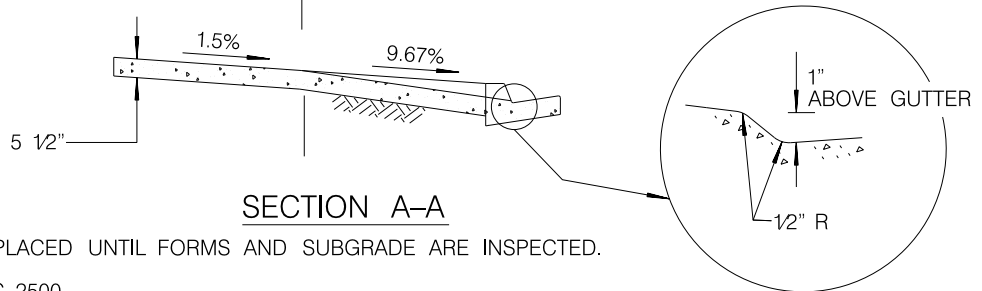
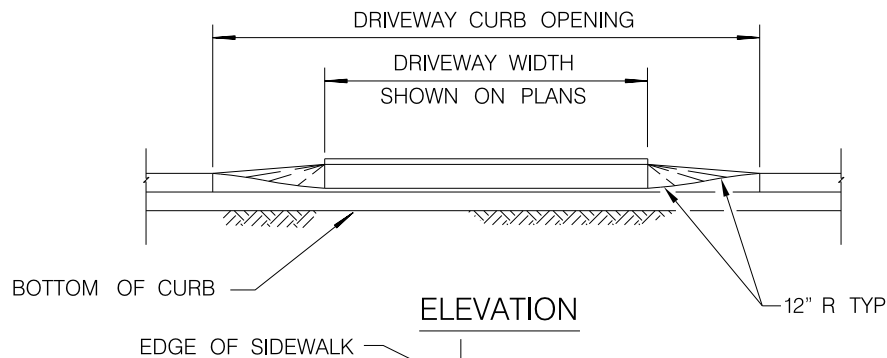
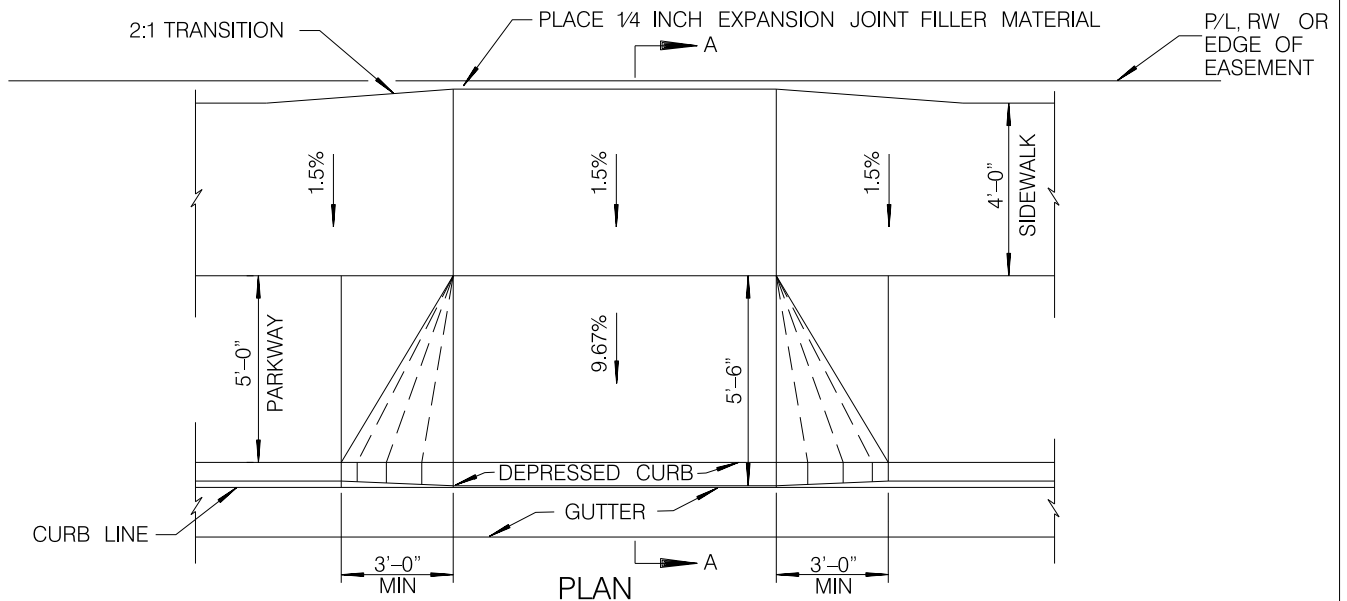


NOTES:

1. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED.
2. CONCRETE SHALL BE 520-C-2500 FOR RESIDENTIAL USE; 560-C-3250 FOR COMMERCIAL USE.
3. SEE STANDARD DRAWINGS SDG-164 AND G-15 FOR WIDTH AND LOCATION REQUIREMENTS.
4. SEE SDG-151 AND G-10 FOR CURB AND JOINT DETAILS.
5. DRIVEWAY SHALL BE CONTINUOUS POUR FROM BACK OF CURB TO PROPERTY LINE.
6. METER BOXES SHALL NOT BE LOCATED WITHIN DRIVEWAY.
7. DRIVEWAY IN EXCESS OF 150' IN LENGTH FROM CURB FACE SHALL HAVE 7 1/2" MINIMUM CONCRETE THICKNESS.
8. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.
9. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	FC	J. NAGELVOORT	10/15	CONCRETE DRIVEWAY (CONTIGUOUS SIDEWALK)	 COORDINATOR R.C.E. 56523
UPDATED	FC	J. NAGELVOORT	2/16		
					2/23/16 DATE
					DRAWING NUMBER SDG-159



NOTES:

1. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED.
2. CONCRETE SHALL BE 520-C-2500.
3. SEE STANDARD DRAWINGS SDG-164 AND G-15 FOR WIDTH AND LOCATION REQUIREMENTS.
4. SEE SDG-151 AND G-10 FOR CURB AND JOINT DETAILS.
5. DRIVEWAY SHALL BE CONTINUOUS POUR FROM BACK OF CURB TO PROPERTY LINE.
6. METER BOXES SHALL NOT BE LOCATED WITHIN DRIVEWAY.
7. DRIVEWAY IN EXCESS OF 150' IN LENGTH FROM CURB FACE SHALL HAVE 7" MINIMUM CONCRETE THICKNESS.
8. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, DATE) SHALL BE PRESERVED PER SDG-115.
9. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	BD	J. NAGELVOORT	10/15
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**CONCRETE DRIVEWAY
(NON-CONTIGUOUS SIDEWALK)**

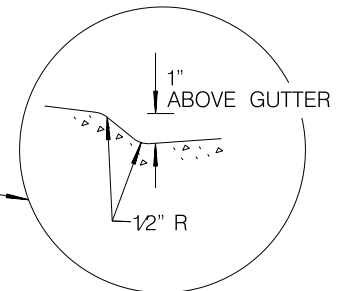
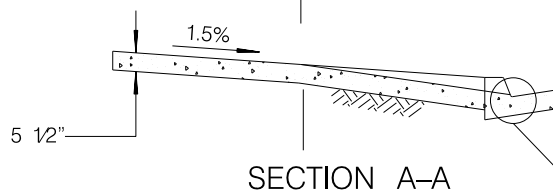
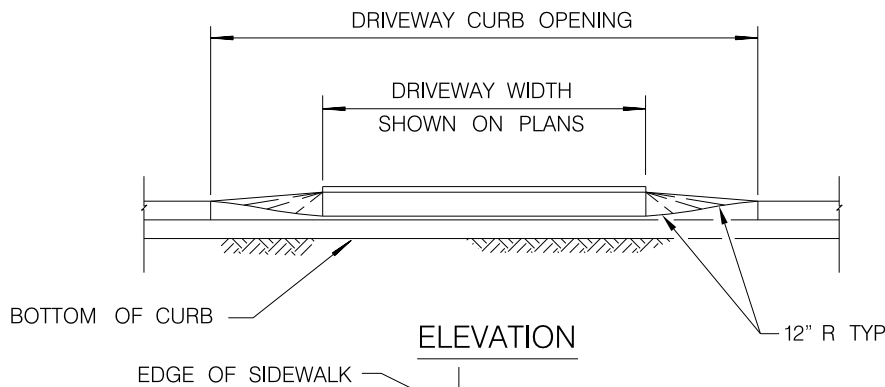
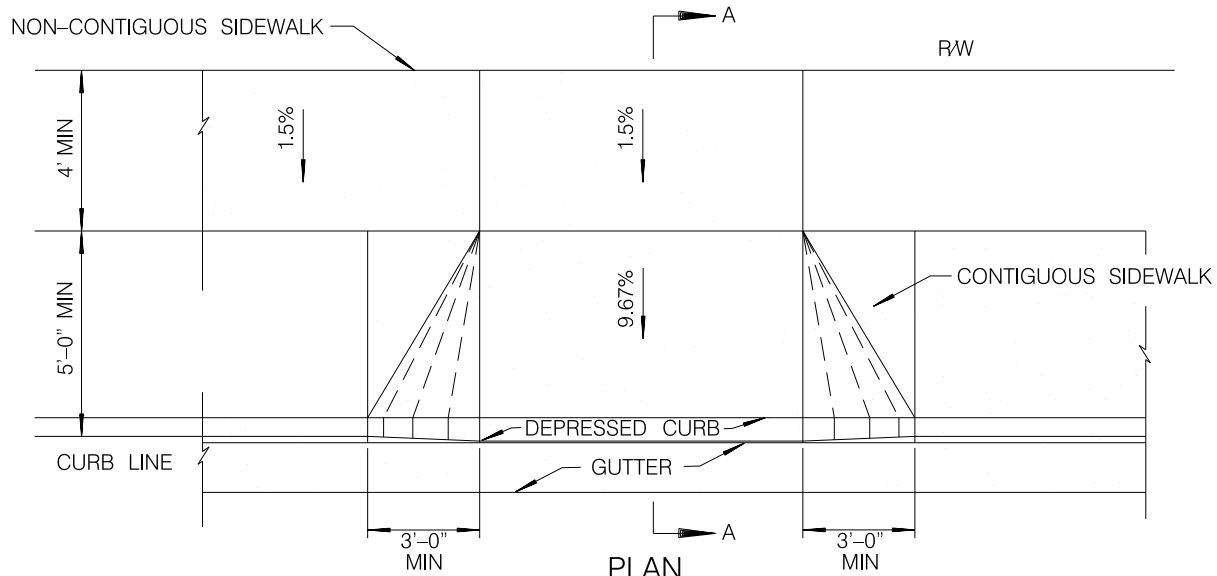
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Jung
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDG-160



NOTES:

1. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED.
2. CONCRETE SHALL BE 520-C-2500.
3. SEE STANDARD DRAWING SDG-164 FOR WIDTH AND LOCATION REQUIREMENTS.
4. DRIVEWAY RAMP TO EXTEND TO 10' FROM CURB FACE OR TO PROPERTY LINE WHICHEVER IS LESS. (FOR COMMERCIAL DRIVEWAYS ONLY)
5. SEE SDG-151 AND G-10 FOR CURB AND JOINT DETAILS.
6. METER BOXES SHALL NOT BE LOCATED WITHIN DRIVEWAY.
7. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.
8. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ADJACENT PROPERTIES.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

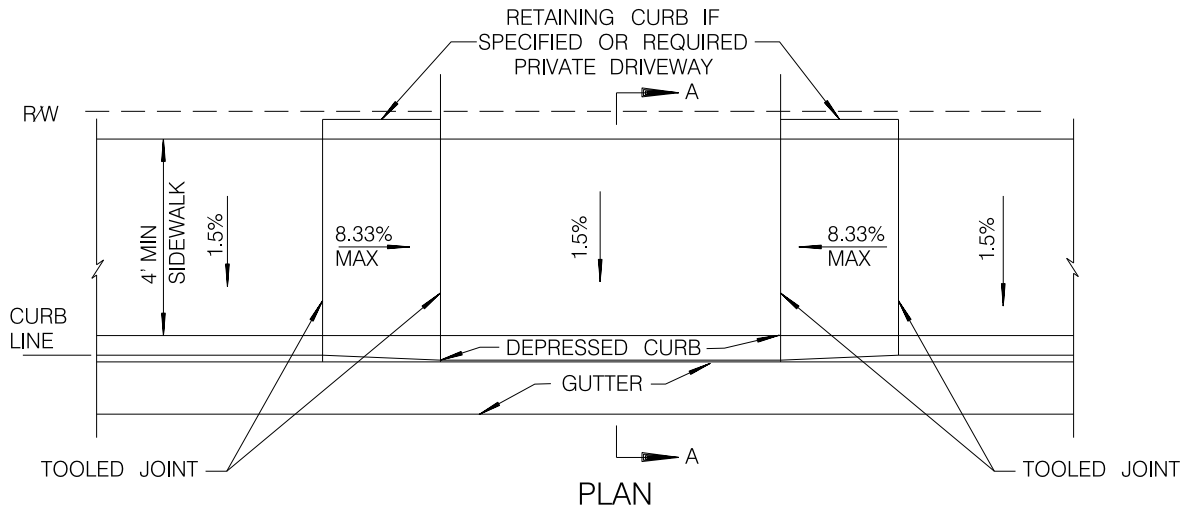
**RESIDENTIAL
CONCRETE DRIVEWAY
(PARKWAY LESS THAN 10' IN DEPTH)**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

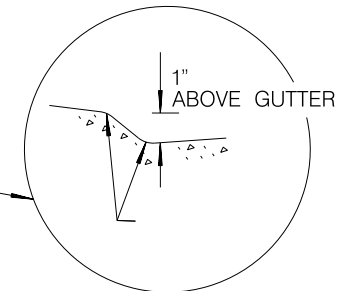
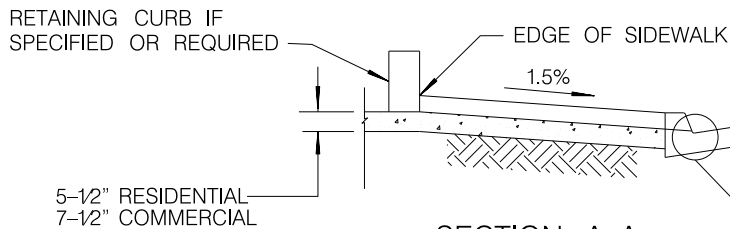
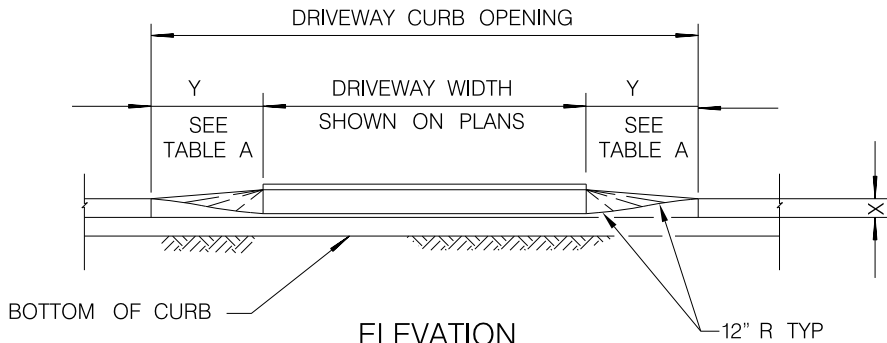
CA Dunge 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

SDG-161



PLAN



NOTES:

1. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED.
2. CONCRETE SHALL BE 520-C-2500 FOR RESIDENTIAL USE; 560-C-3250 FOR COMMERCIAL USE.
3. SEE STANDARD DRAWING SDG-164 FOR WIDTH AND LOCATION REQUIREMENTS.
4. SEE SDG-151 AND G-10 FOR CURB AND JOINT DETAILS.
5. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.
6. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**CONCRETE DRIVEWAY
(FOR CONFINED RIGHT-OF-WAY)**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

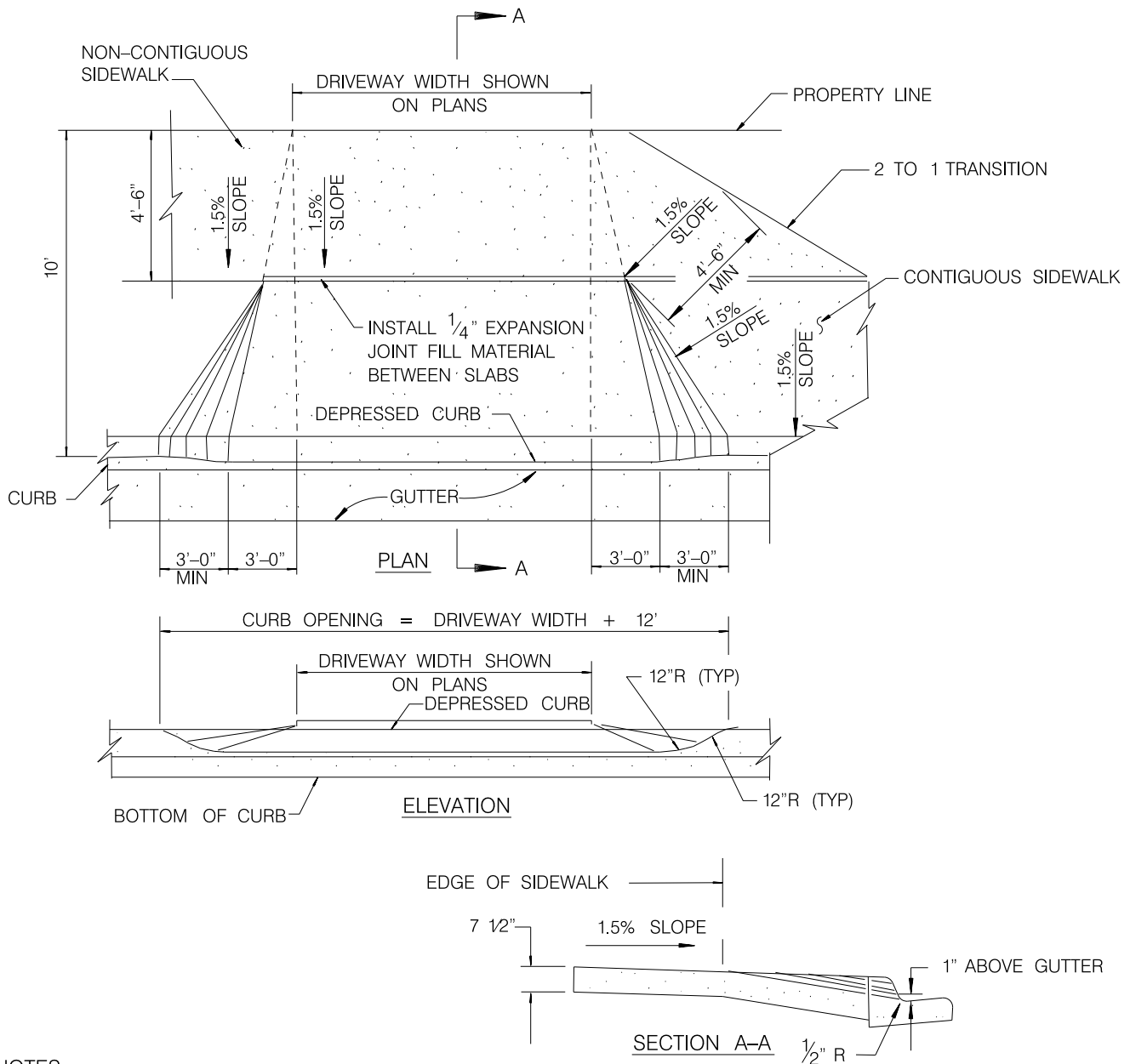
CA Bungea
COORDINATOR

R.C.E. 56523

2/23/16
DATE

DRAWING
NUMBER

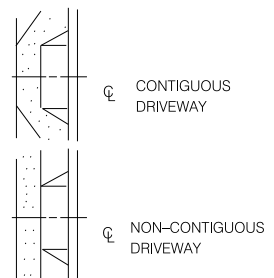
SDG-162



NOTES:

1. CONCRETE SHALL NOT BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED AND APPROVED BY THE RESIDENT ENGINEER.
2. CONCRETE SHALL BE 560-C-3250.
3. SEE STANDARD DRAWING SDG-164 FOR WIDTH AND LOCATION REQUIREMENTS.
4. SEE SDG-151 AND G-10 FOR CURB AND JOINT DETAILS.
5. METER BOXES SHALL NOT BE LOCATED WITHIN DRIVEWAY. SEE WS-03.
6. DRIVEWAY IN EXCESS OF 150' IN LENGTH FROM CURB FACE SHALL BE A MINIMUM OF 7" PCC.
7. DRIVEWAY SHALL BE CONTINUOUS POUR FROM BACK OF CURB TO PROPERTY LINE.
8. ALL HISTORICAL STAMPS / IMPRESSIONS (STREET NAME, CONTRACTOR NAME, AND DATE) SHALL BE PRESERVED PER SDG-115.
9. FOR DESIGNATED URBANIZED COMMUNITIES, SIDEWALK DESIGN (SCORING PATTERN, COLOR, TEXTURE) SHALL BE IN CONFORMANCE WITH HISTORIC DESIGN ON ADJACENT PROPERTIES.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	SM	M.V.R	5/92
NOTES	SM	A. OSKOU	12/03 & 8/06
UPDATE	FC	A. OSKOU	12/06
REPLACED SDG-114	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	10/15
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

COMMERCIAL CONCRETE DRIVEWAY

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

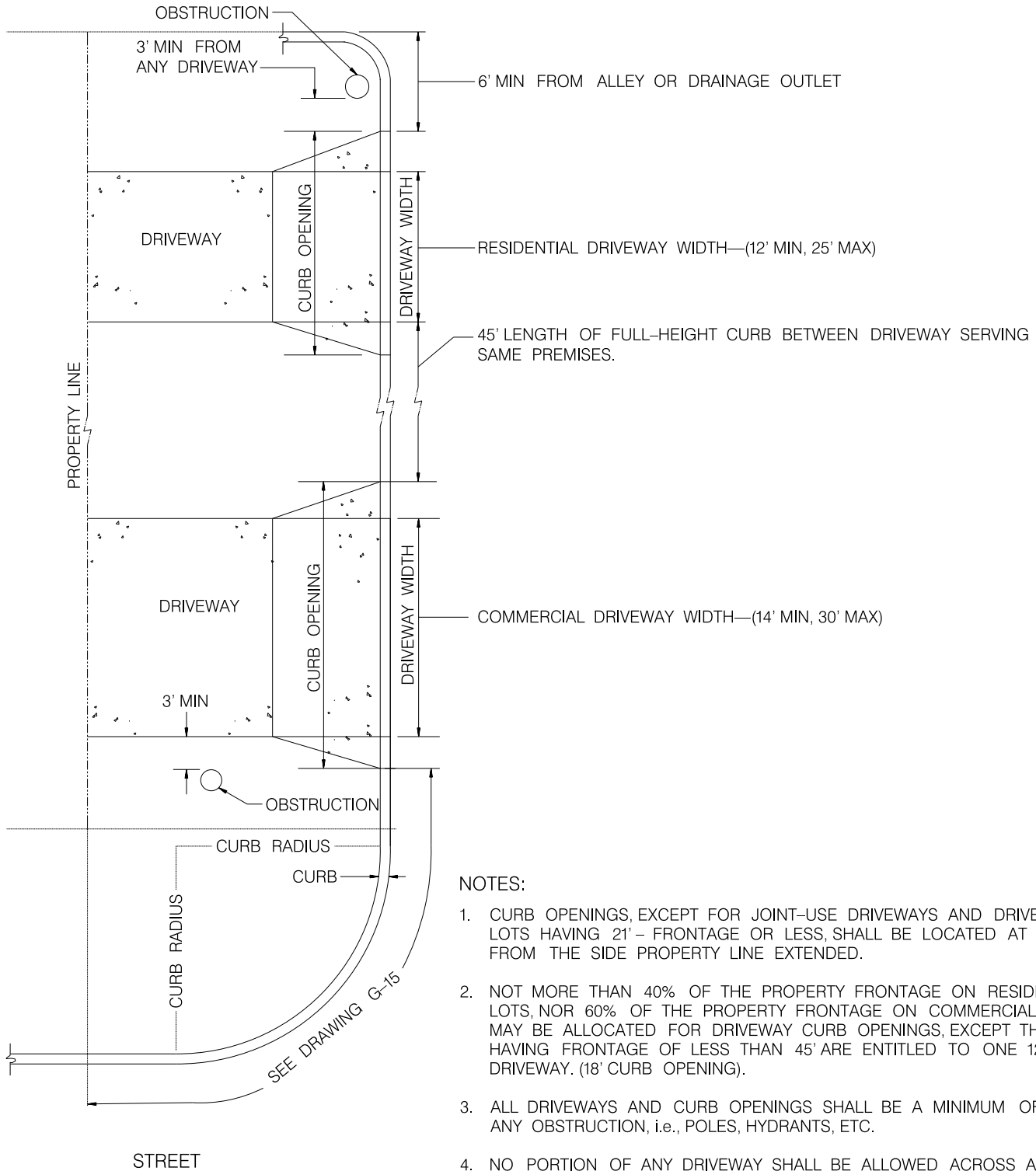
CA Dungee
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDG-163

ALLEY



NOTES:

1. CURB OPENINGS, EXCEPT FOR JOINT-USE DRIVEWAYS AND DRIVEWAYS ON LOTS HAVING 21' – FRONTAGE OR LESS, SHALL BE LOCATED AT LEAST 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 45' ARE ENTITLED TO ONE 12' DRIVEWAY. (18' CURB OPENING).
3. ALL DRIVEWAYS AND CURB OPENINGS SHALL BE A MINIMUM OF 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 OF THE PROPERTY, 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 CITY.

REVISION	BY	APPROVED	DATE
*ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	AB	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

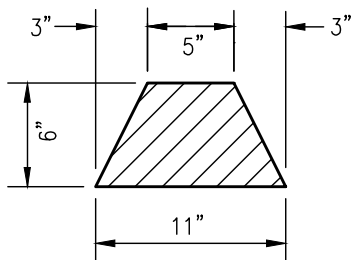
**DRIVEWAY LOCATION
AND WIDTH REQUIREMENTS**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

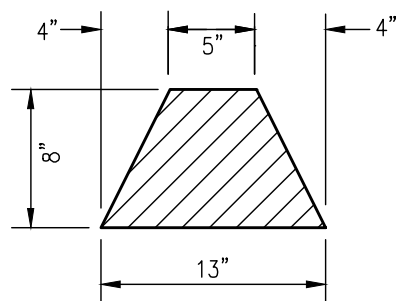
Chung 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

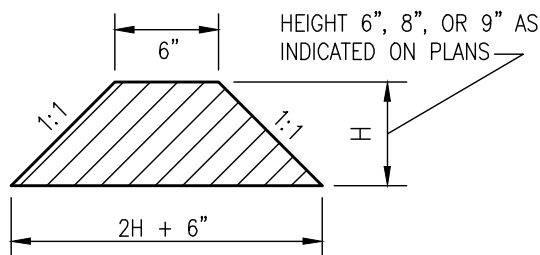
SDG-164



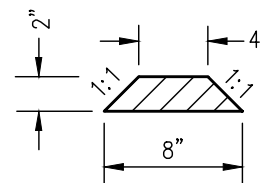
TYPE A



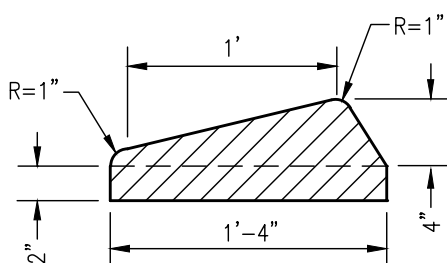
TYPE B



TYPE C

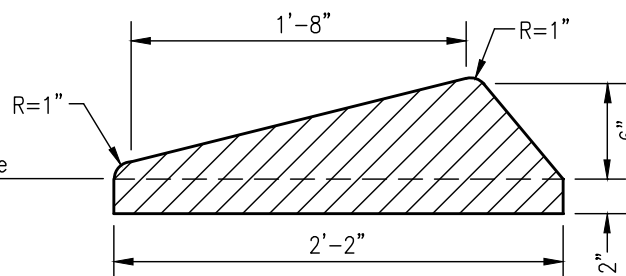


TYPE D

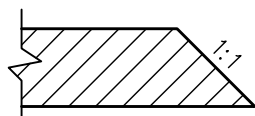


TYPE E
(MOUNTABLE DIKE)

Level Line



TYPE F
(MOUNTABLE DIKE)



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

ALL TYPES - SIDE VIEW

NOTES:

1. DIKES SHALL BE PLACED ON A 2" SECTION OF A.C. SURFACING, EXTENDING THROUGHOUT THE WIDTH OF THE DIKE.
2. PG-70-10 GRADE ASPHALT TO BE USED FOR ALL DIKES.
3. SHAPE AND COMPACT DIKES 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	0.0250 TON
B	0.0375 TON
C-6"	0.0375 TON
C-8"	0.0583 TON
C-9"	0.0702 TON
D	0.0062 TON
E	0.0407 TON
F	0.0623 TON

LEGEND ON PLANS

REVISION	BY	APPROVED	DATE
ORIGINAL		KERCHEVAL	12/75
ADD METRIC		T. STANTON	03/03
REFORMATTED		T. STANTON	04/06
UPDATED	MR	MR/CV	11/11

SAN DIEGO REGIONAL STANDARD DRAWING

DIKES - ASPHALT CONCRETE

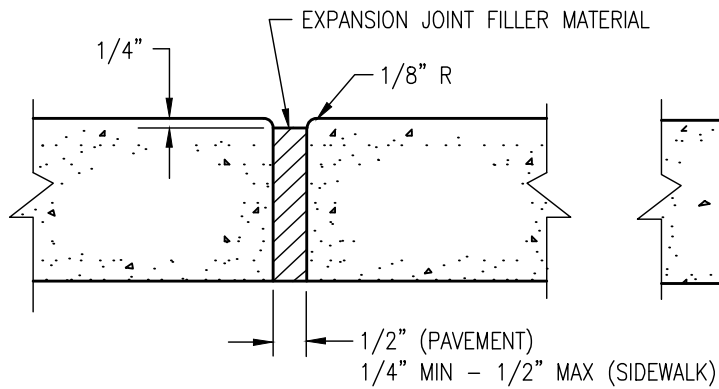
RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

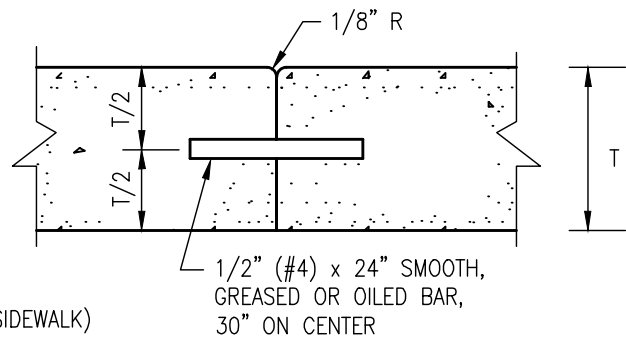
CHAIRPERSON R.C.E. 19246 DATE

DRAWING
NUMBER

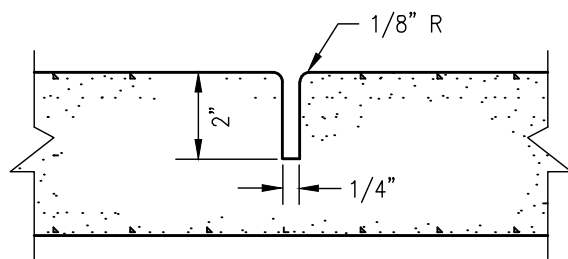
G-5



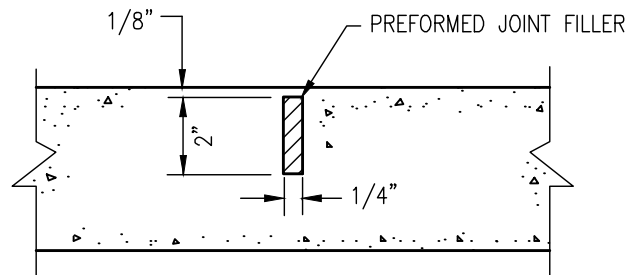
EXPANSION JOINT



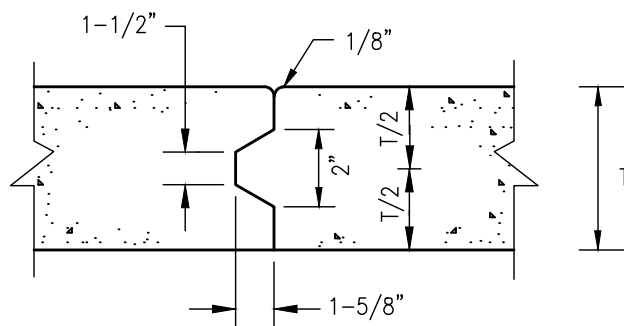
CONTACT JOINT



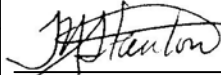
WEAKENED PLANE JOINT
CURB AND SIDEWALK

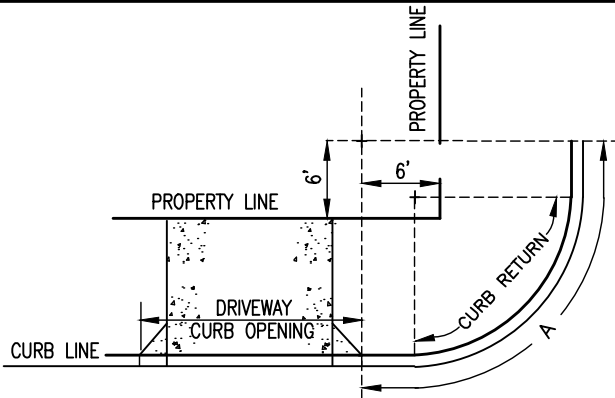


WEAKENED PLANE JOINT
GUTTER AND CONCRETE PAVEMENT



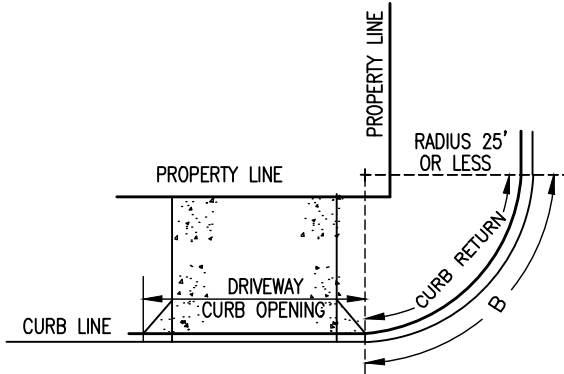
KEYED JOINT

REVISION	BY	APPROVED	DATE	SAN DIEGO REGIONAL STANDARD DRAWING CONCRETE JOINT DETAILS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		PARKINSON	02/95		 7/26/2012 CHAIRPERSON R.C.E. 19246 DATE
ADD METRIC		T. STANTON	03/03		
REFORMATTED		T. STANTON	04/06		
UPDATED	CV	MR/CV	11/11		
					DRAWING NUMBER G-10



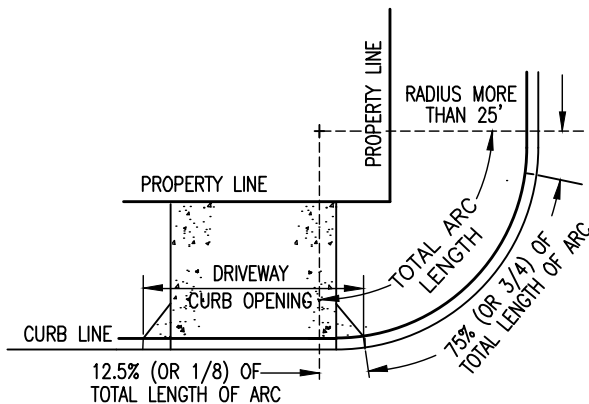
REQUIREMENT 1

NO PORTION OF ANY CURB OPENING SHALL BE PERMITTED WITHIN 6' OF THE INTERSECTION OF THE PROLONGED PROPERTY LINES AND THE CURB SHOWN BY ARC A.



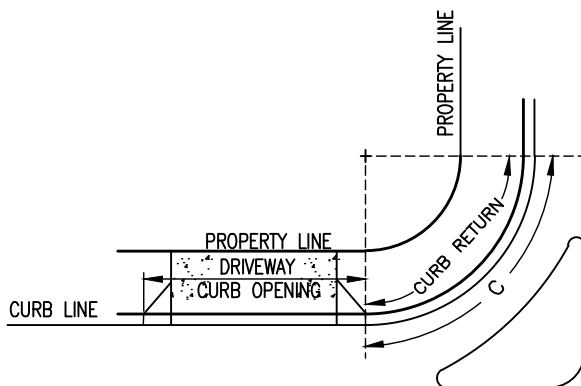
REQUIREMENT 2

NO PORTION OF ANY CURB OPENING SHALL BE PERMITTED IN THE CURB RETURN WHERE THE RADIUS OF CURB IS 25' OR LESS, AS SHOWN BY ARC B.



REQUIREMENT 3

ON ALL CURB RETURNS WHERE THE RADIUS IS MORE THAN 25', CURB OPENINGS MAY ENCROACH UPON EACH END OF THE RETURN A DISTANCE EQUAL TO 12.5% (OR 1/8) OF THE TOTAL LENGTH OF THE ARC ON THE CURB RETURN, THUS LEAVING AT LEAST 75% (OR 3/4) 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
UPDATED	MR	MR/CV	02/12

SAN DIEGO REGIONAL STANDARD DRAWING

DRIVEWAY LOCATION - ADJACENT TO CURB RETURNS AND STREET LINES

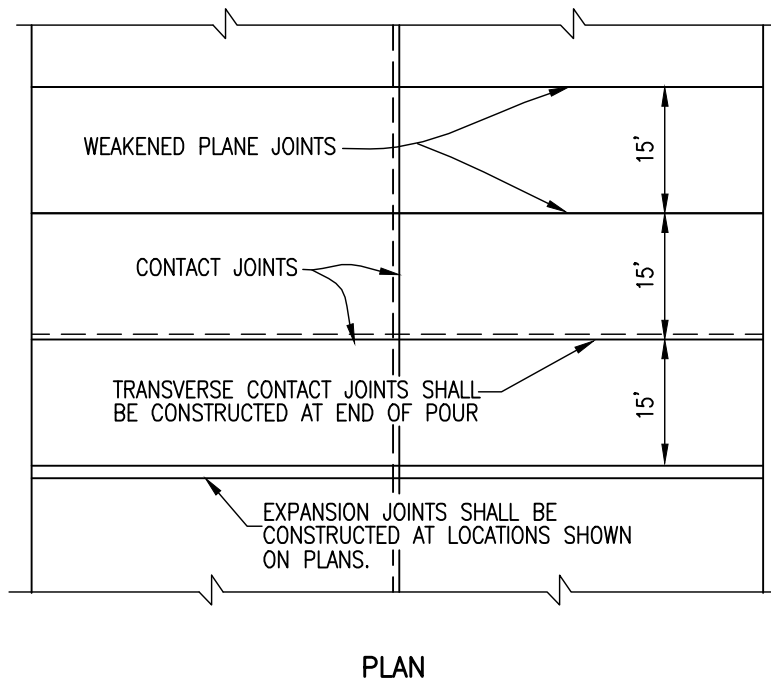
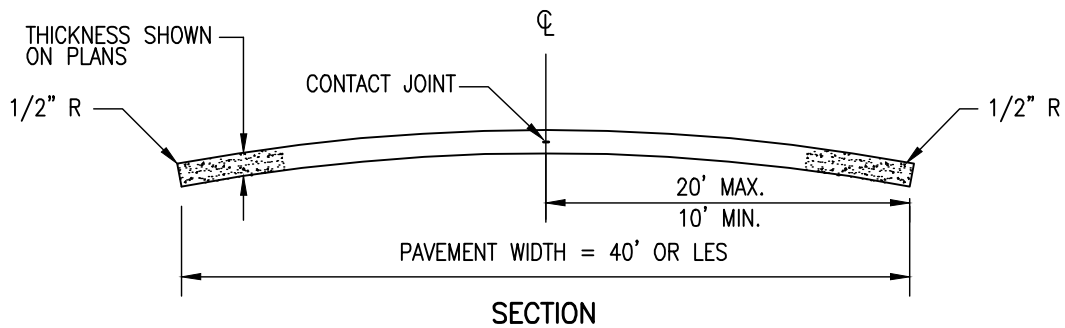
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

CHAIRPERSON R.C.E. 19246 DATE

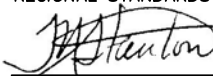
DRAWING
NUMBER

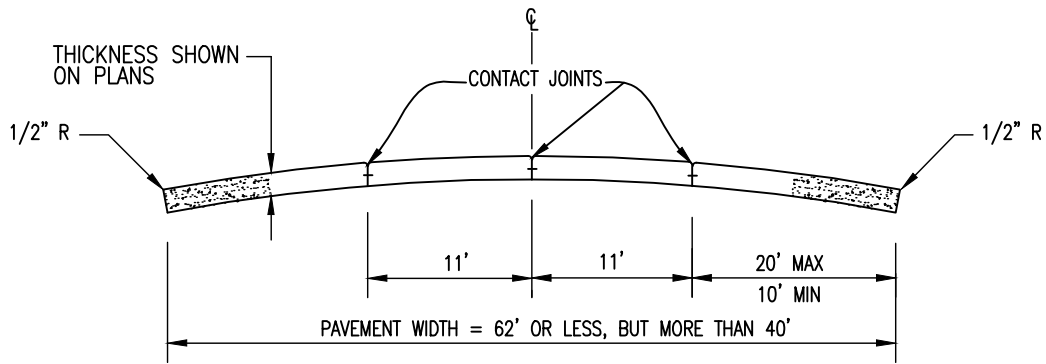
G-15



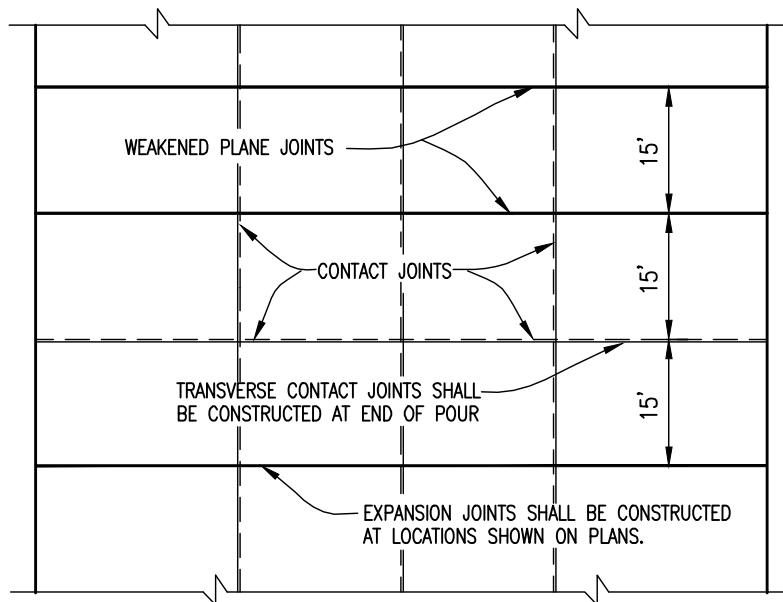
NOTES:

1. CONCRETE SHALL BE 560-C-3250.
2. SEE STANDARD DRAWING G-10 FOR JOINT DETAILS.
3. ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.

REVISION	BY	APPROVED	DATE	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		KERCHEVAL	12/75	CONCRETE PAVEMENT WIDTH 40' OR LESS			7/26/2012
ADD METRIC		T. STANTON	03/03				
REVIEWED		T. STANTON	04/06				
UPDATED	MR	MR/CV	03/12				
						CHAIRPERSON R.C.E. 19246	DATE
						DRAWING NUMBER	G-18



SECTION



PLAN

NOTES:

1. CONCRETE SHALL BE 560-C-3250.
2. SEE STANDARD DRAWING G-10 FOR JOINT DETAILS.
3. ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.

REVISION	BY	APPROVED	DATE
ORIGINAL		KERCHEVAL	12/75
ADD METRIC		T. STANTON	03/03
REVIEWED		T. STANTON	04/06
UPDATED	MR	MR/CV	03/12

SAN DIEGO REGIONAL STANDARD DRAWING

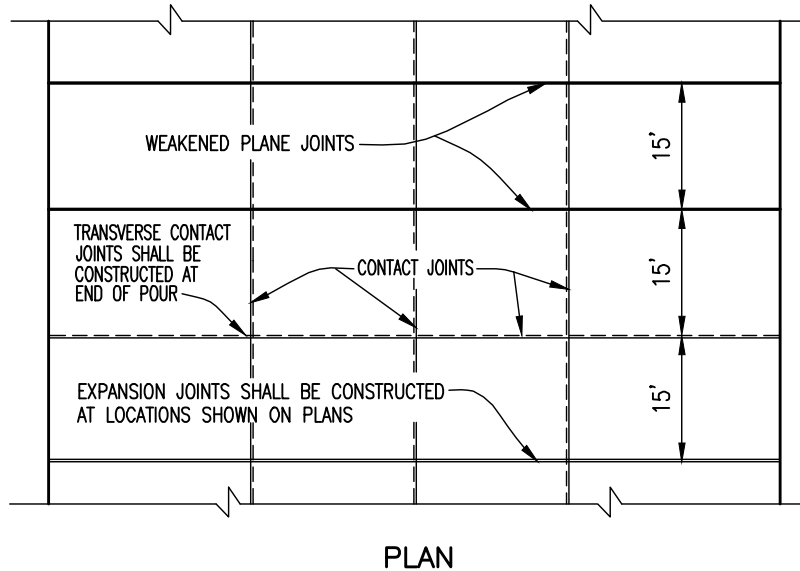
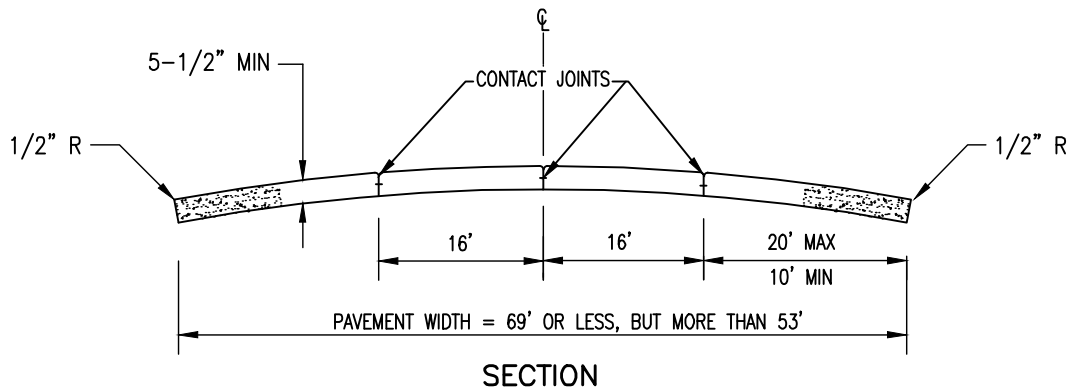
CONCRETE PAVEMENT
WIDTH 40' TO 62'

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012

CHAIRPERSON R.C.E. 19246 DATE

DRAWING
NUMBER **G-19**



NOTES:

1. CONCRETE SHALL BE 560-C-3250.
2. SEE STANDARD DRAWING G-10 FOR JOINT DETAILS.
3. ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.

REVISION	BY	APPROVED	DATE
ORIGINAL		KERCHEVAL	12/75
ADD METRIC		T. STANTON	03/03
REVIEWED		T. STANTON	04/06
UPDATED	MR	MR/CV	03/12

SAN DIEGO REGIONAL STANDARD DRAWING

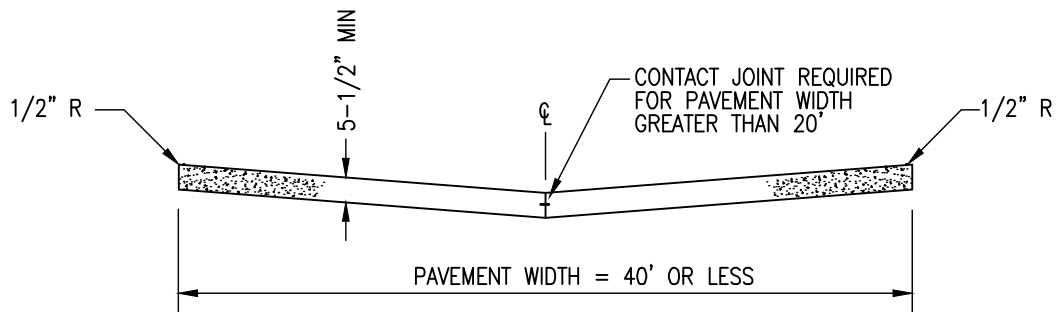
CONCRETE PAVEMENT, ALLEY SECTION WIDTH 53' TO 69'

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

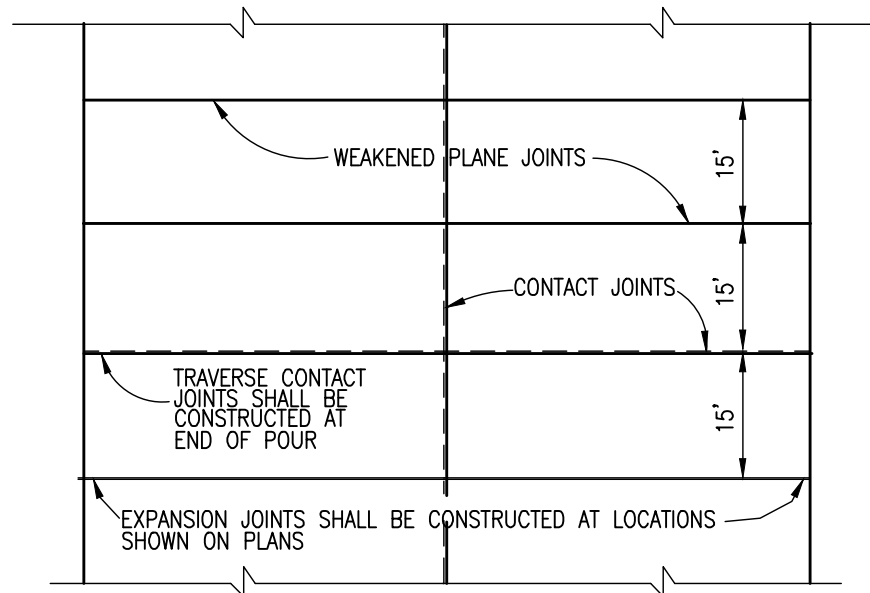
T. Stanton 7/26/2012

CHAIRPERSON R.C.E. 19246 DATE

DRAWING
NUMBER **G-20**



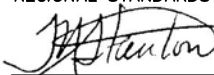
SECTION

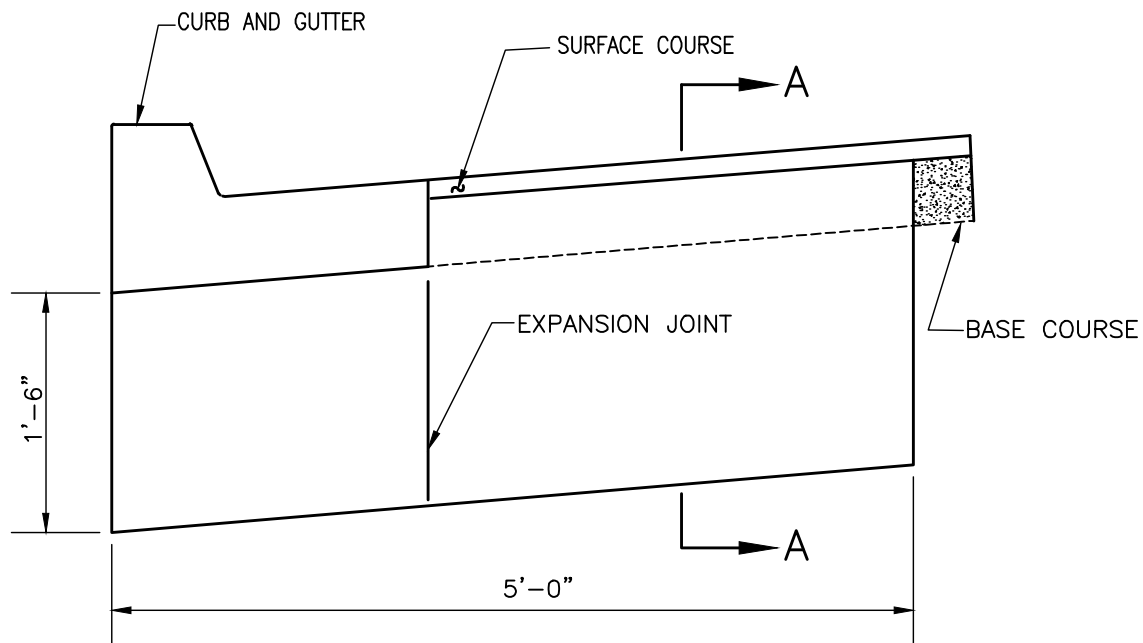


PLAN

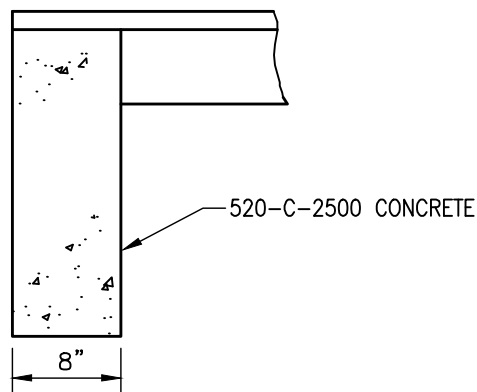
NOTES:

1. CONCRETE SHALL BE 560-C-3250.
2. SEE STANDARD DRAWING G-10 FOR JOINT DETAILS.
3. ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.

REVISION	BY	APPROVED	DATE	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		KERCHEVAL	12/75	CONCRETE PAVEMENT ALLEY SECTION, WIDTH 40' OR LESS		 7/26/2012	CHAIRPERSON R.C.E. 19246 DATE
ADD METRIC		T. STANTON	03/03				
REVIEWED		T. STANTON	04/06				
UPDATED	MR	MR/CV	03/12				
						DRAWING NUMBER	G-21



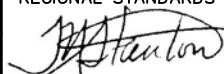
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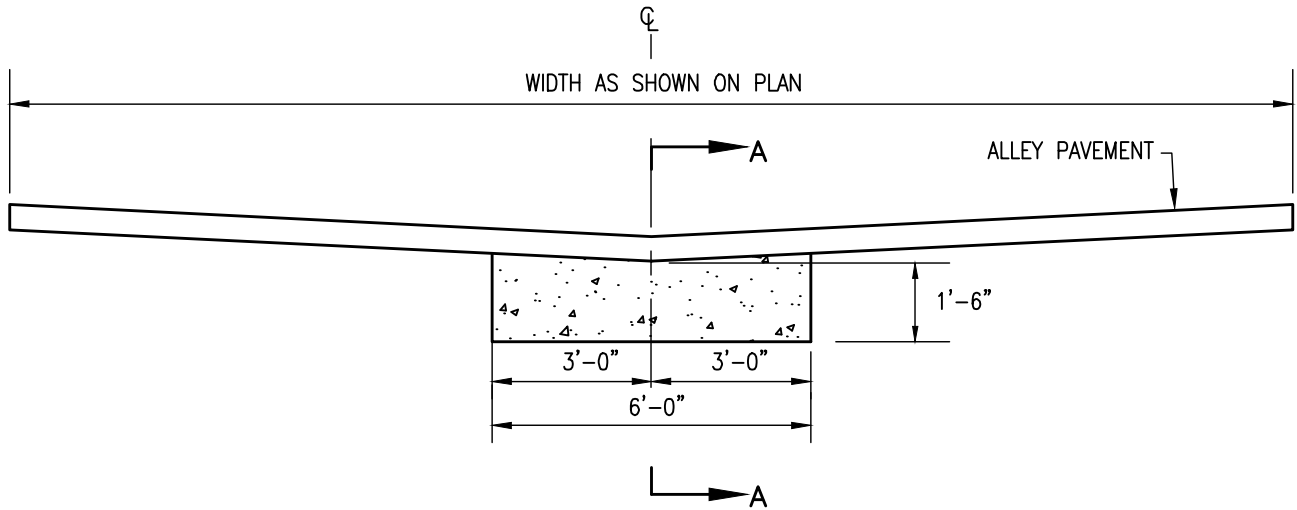


SECTION A-A

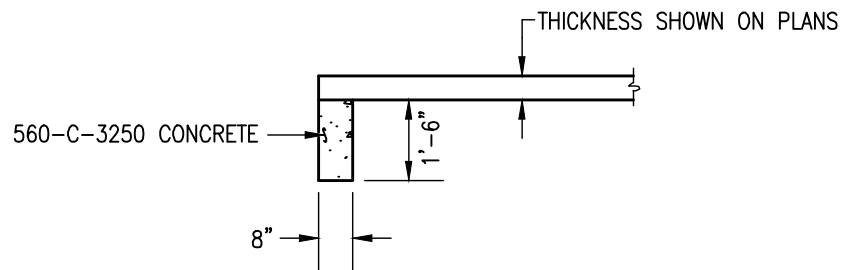
LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		KERCHEVAL	12/75		 7/26/2012
ADD METRIC		T. STANTON	03/03	CHAIRPERSON R.C.E. 19246 DATE	
REVIEWED		T. STANTON	04/06		
UPDATED	MR	MR/CV	03/12		
				CUTOFF WALL AT END OF PAVEMENT	DRAWING NUMBER
					G-22

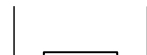


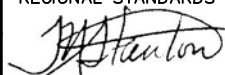
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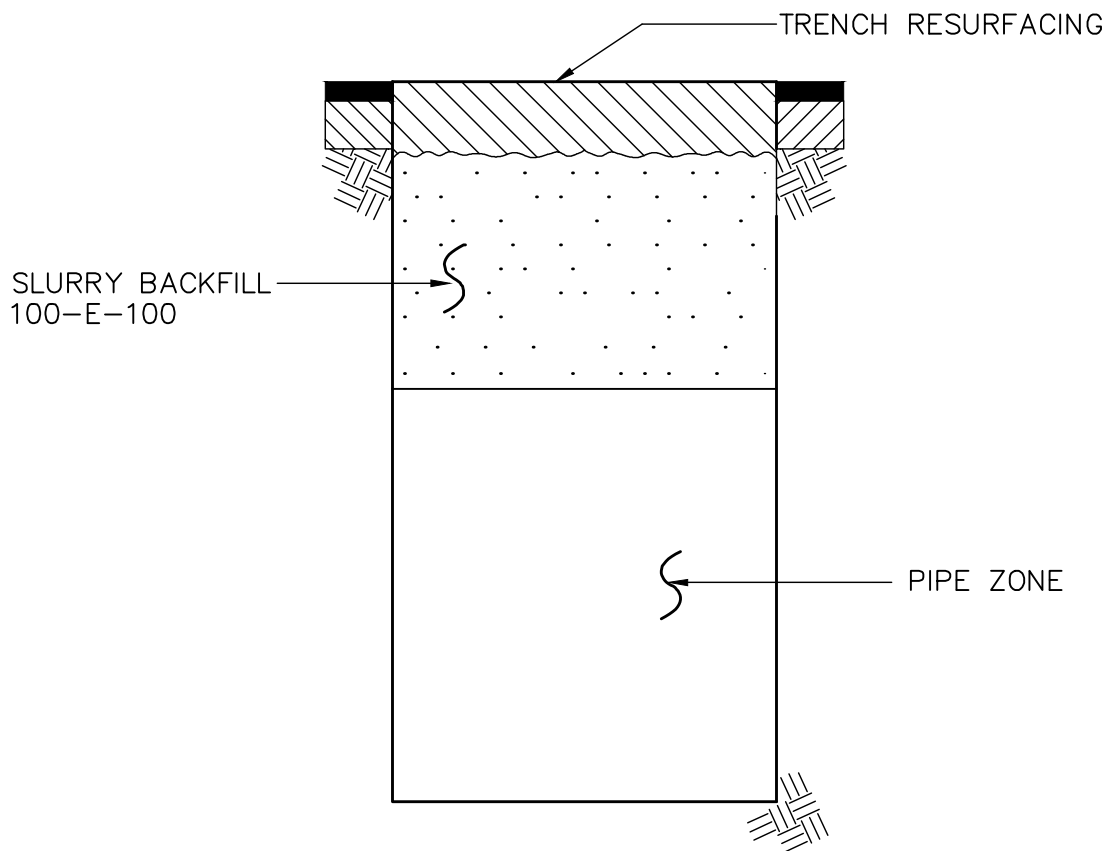


SECTION A-A

LEGEND ON PLANS




REVISION	BY	APPROVED	DATE	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		KERCHEVAL	12/75			 7/26/2012 CHAIRPERSON R.C.E. 19246 DATE	
ADD METRIC		T. STANTON	03/03				
REVIEWED		T. STANTON	04/06				
UPDATED	MR	MR/CV	03/12				
				CUTOFF WALL AT END OF ALLEY PAVEMENT		DRAWING NUMBER G-23	

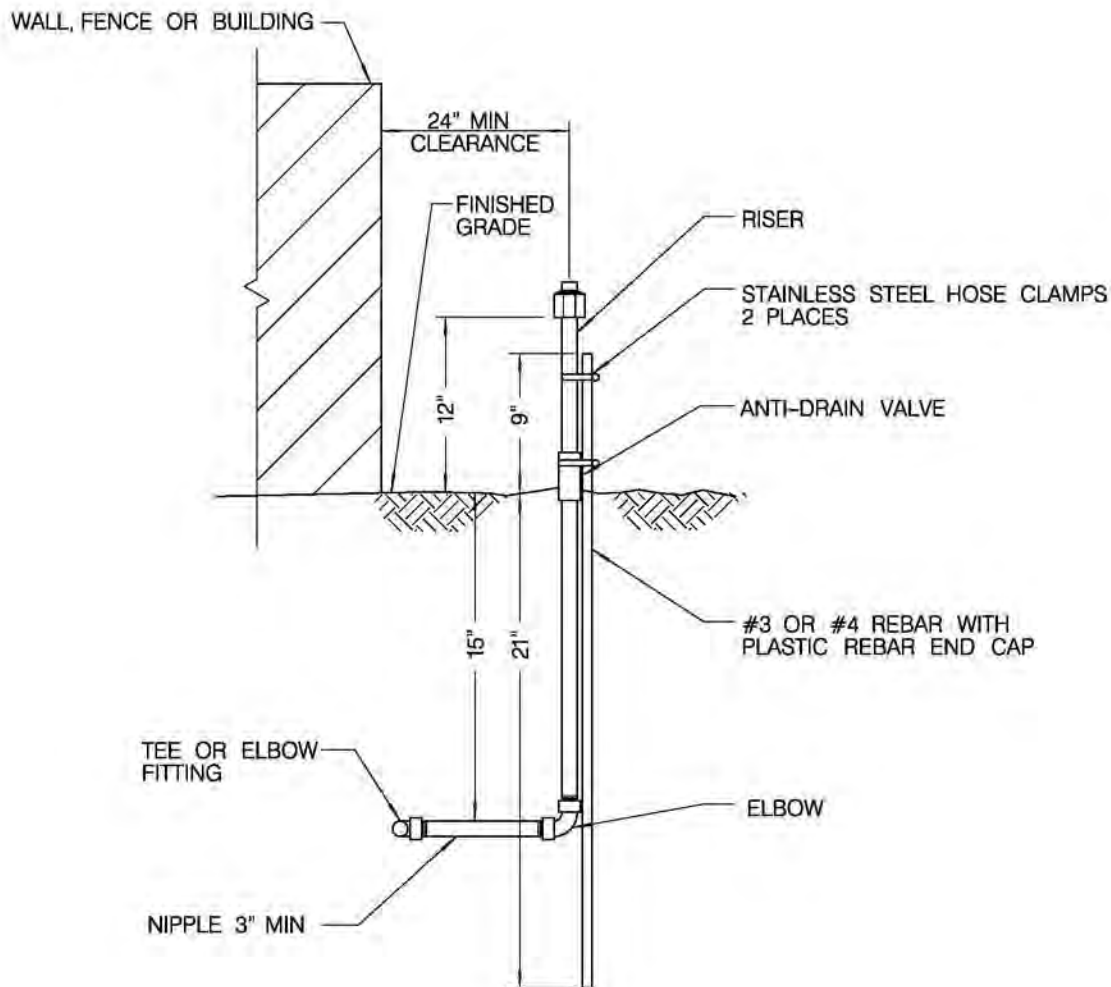


NOTES

1. TRENCH RESURFACING SHALL BE DONE ACCORDING TO AGENCY'S REQUIREMENTS.
2. THE SAND USED FOR THE SLURRY BACKFILL SHALL MEET THE REQUIREMENTS (SUBSECTION 200-1.5.3) LISTED IN THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. SLURRY SHALL CURE FOR SEVEN DAYS 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	<div>RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE</div> <div> 7/26/2012</div> <div>CHAIRPERSON R.C.E. 19246 DATE</div>
ORIGINAL		PARKINSON	09/88		
ADD METRIC		T. STANTON	03/03	SLURRY BACKFILL	<div>DRAWING NUMBER</div> <div>G-36</div>
REVIEWED		T. STANTON	04/06		
UPDATED	MR	MR/CV	03/12		

CHAPTER 5
SPRINKLER
IRRIGATION
SYSTEMS



NOTES:

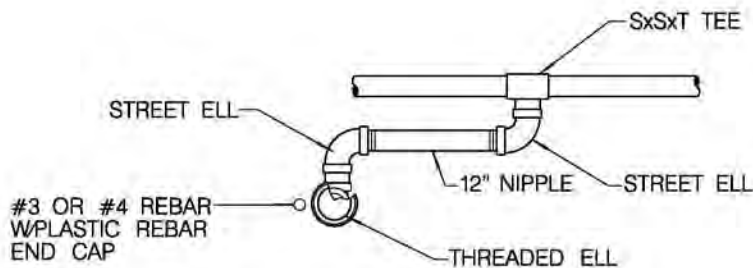
1. FITTINGS SHALL BE PVC SCH 40.
2. NIPPLES AND RISERS SHALL BE PVC SCH 80.
3. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.
4. CLOSE NIPPLES SHALL NOT BE USED.
5. NO FIXED RISERS IN RIGHT-OF-WAY OR WITHIN 10' OF VEHICULAR OR PEDESTRIAN TRAFFIC.
6. ANTI-DRAIN VALVES SHALL BE INSTALLED UNDER ALL HEADS.

LEGEND ON PLANS

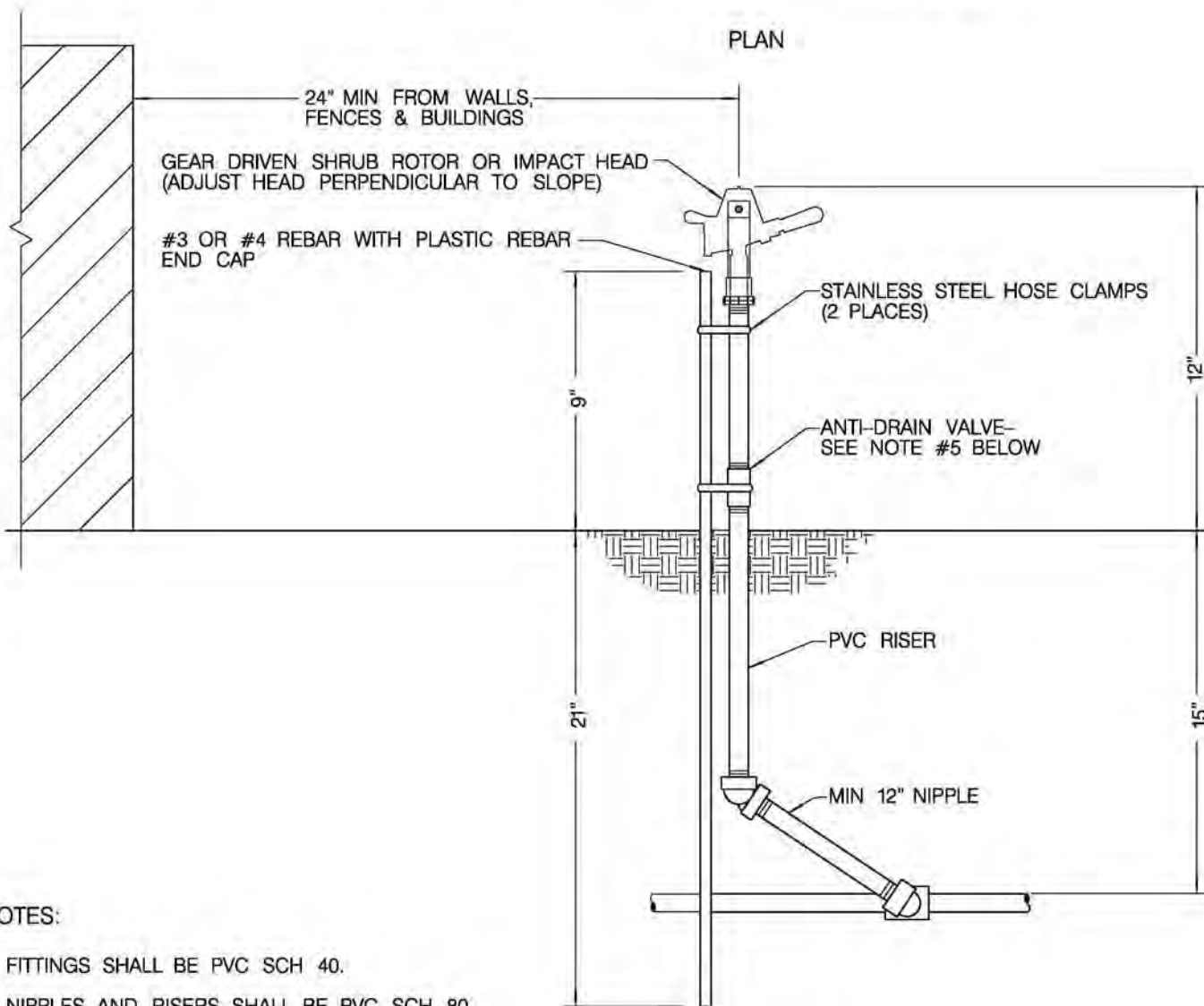
SHOW A NUMBER TO INDICATE TYPE HEAD



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	RH	J. NAGELVOORT	01/12		
				SHRUB SPRAY HEAD ON FIXED RISER	<i>H. Hadli</i> 1/31/2012
					COORDINATOR R.C.E. 66271 DATE
					DRAWING
					NUMBER SDI-101



PLAN



ELEVATION

NOTES:

1. FITTINGS SHALL BE PVC SCH 40.
2. NIPPLES AND RISERS SHALL BE PVC SCH 80.
3. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.
4. CLOSE NIPPLES SHALL NOT BE USED.
5. ANTI-DRAIN VALVES SHALL BE INSTALLED UNDER OR IN ALL HEADS.
6. NO FIXED RISERS ALLOWED IN RIGHT-OF-WAY OR WITHIN 10' OF VEHICULAR OR PEDESTRIAN TRAFFIC.

LEGEND ON PLANS

SHOW A NUMBER TO INDICATE HEAD TYPE



REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**ROTOR OR IMPACT HEAD
ON FIXED RISER**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

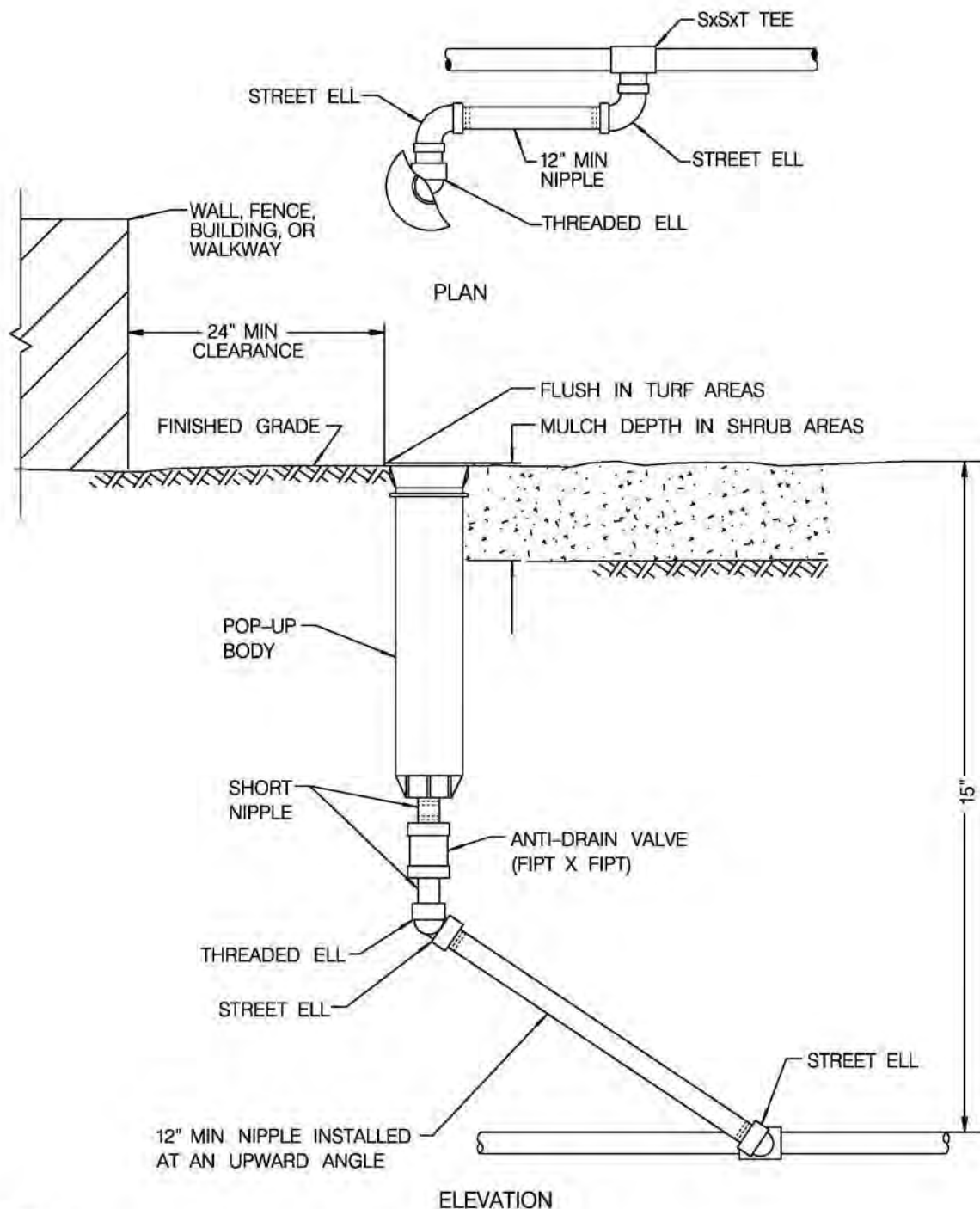
H. Krali

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDI-102



NOTES:

1. FITTINGS SHALL BE PVC SCH 40.
2. NIPPLES AND RISERS SHALL BE PVC SCH 80.
3. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.
4. CLOSE NIPPLES SHALL NOT BE USED.
5. ANTI-DRAIN VALVES SHALL BE INSTALLED UNDER OR IN ALL HEADS.
6. LATERAL DEPTH SHALL BE 18" WHEN 12" POP-UP BODIES ARE USED.

LEGEND ON PLANS

SHOW A NUMBER TO
INDICATE TYPE HEAD



REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**ROTOR, SPRAY, OR BUBBLER
POP-UP HEAD**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

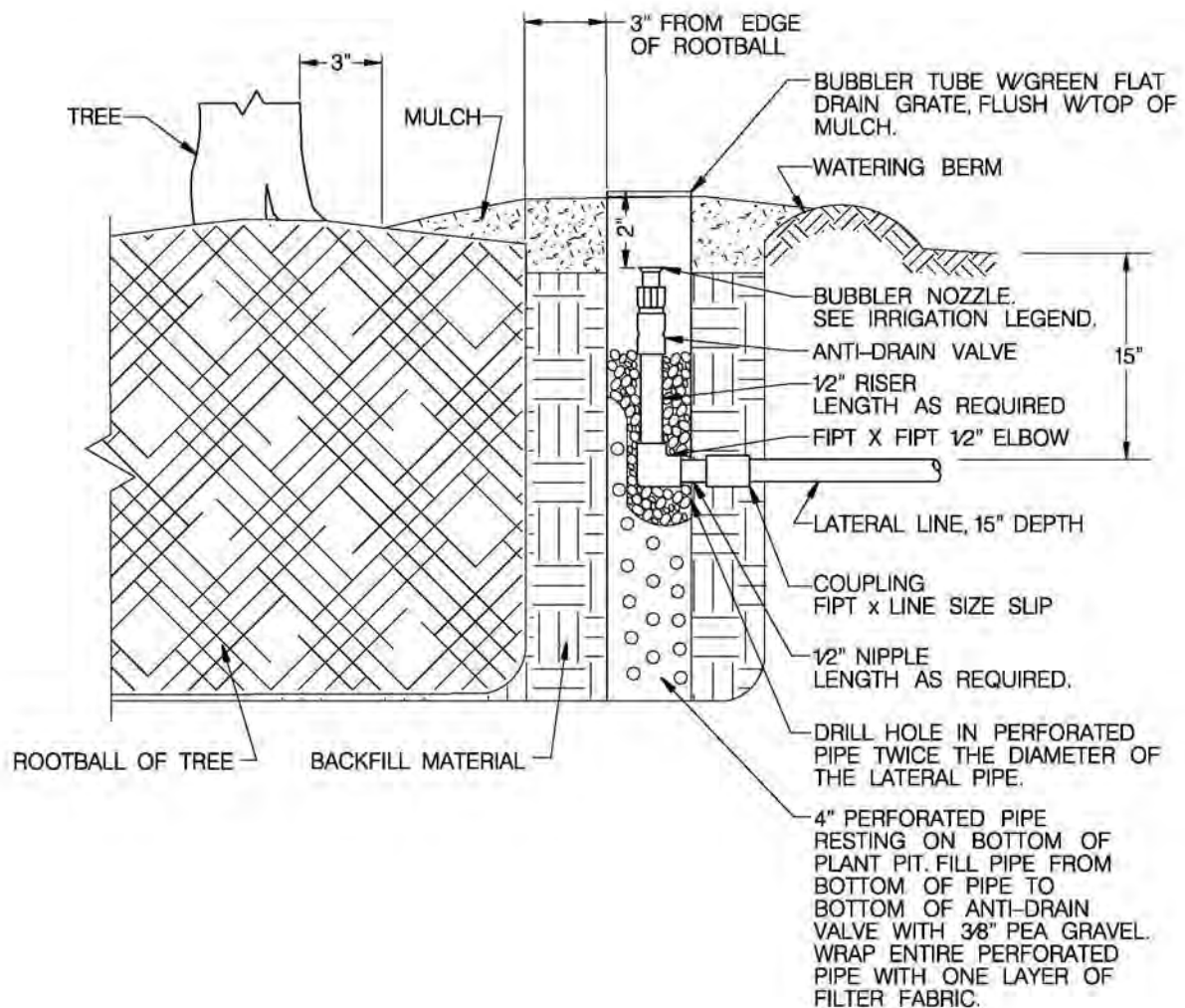
H. Kralic

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDI-103

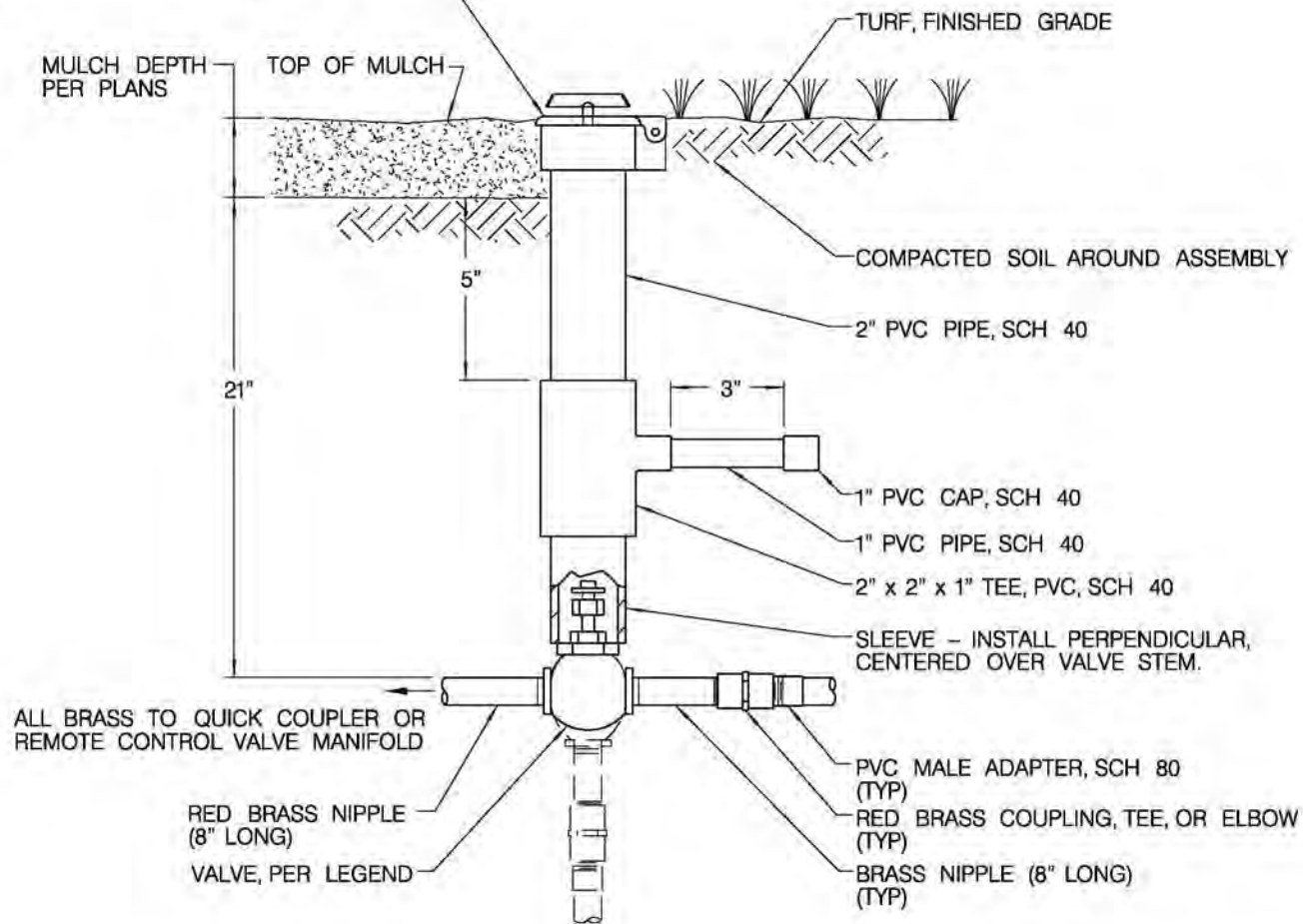


NOTES:

1. FOR BUBBLER LOCATION, REFER TO TREE PLANTING AND STAKING DRAWING.
2. EACH TREE SHALL HAVE A 2" POP-UP HEAD WITH BUBBLER NOZZLE PER SDI-103, AND A FIXED BUBBLER NOZZLE IN A PERFORATED PIPE.
3. NIPPLES AND RISERS SHALL BE PVC SCH 80.
4. FITTINGS SHALL BE PVC SCH 40.
5. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.
6. CLOSE NIPPLES SHALL NOT BE USED.
7. ANTI-DRAIN VALVES SHALL BE INSTALLED UNDER ALL HEADS.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	RH	J. NAGELVOORT	01/12		
				TREE BUBBLER TUBE	<i>H. Hadli</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDI-104

HINGED LOCKING BRASS CAP,
SOLVENT WELDED TO SLEEVE
(SHOWN WITH CAP KEY)



NOTES:

1. GLOBE VALVES SHALL BE FURNISHED WITH A STANDARD BRONZE CROSS HANDLE, CENTERED IN PIPE SLEEVE.
2. VALVES SHALL BE INSTALLED WITHIN 12" OF HARDSCAPE.
3. 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 FINISHED GRADE IN TURF AREAS AND ABOVE FINISHED GRADE IN SHRUB AREAS, PER DEPTH OF MULCH.
6. PROVIDE APPROPRIATE LOCKING CAP KEY AND VALVE KEY TO OPERATE VALVE AT DEPTH.
7. LOCATE OUTSIDE OF TURF WHEN POSSIBLE.
8. TEFLON TAPE SHALL BE USED ON ALL THREADED CONNECTIONS.
9. WHEN INSTALLED AS MAINLINE ISOLATION VALVE, NIPPLES AND FITTINGS MAY BE SCH 80 PVC.

LEGEND



GV

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

ISOLATION GLOBE VALVE 2" AND SMALLER

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

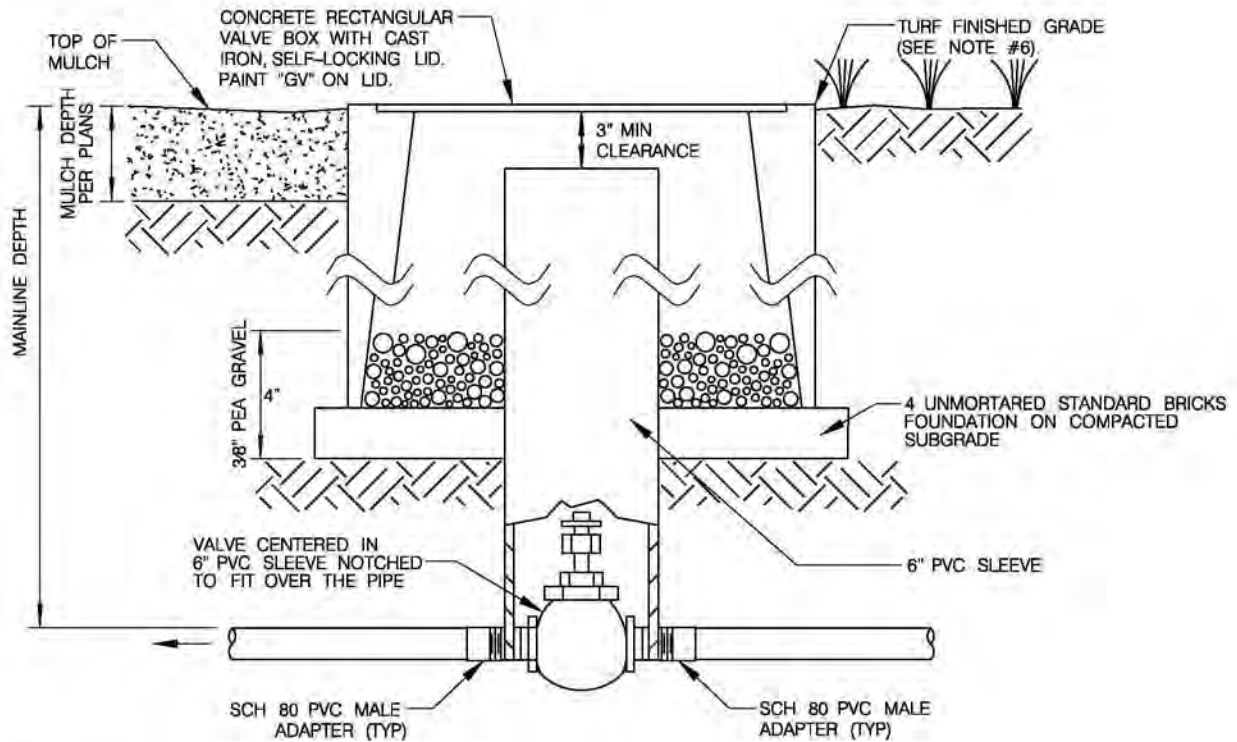
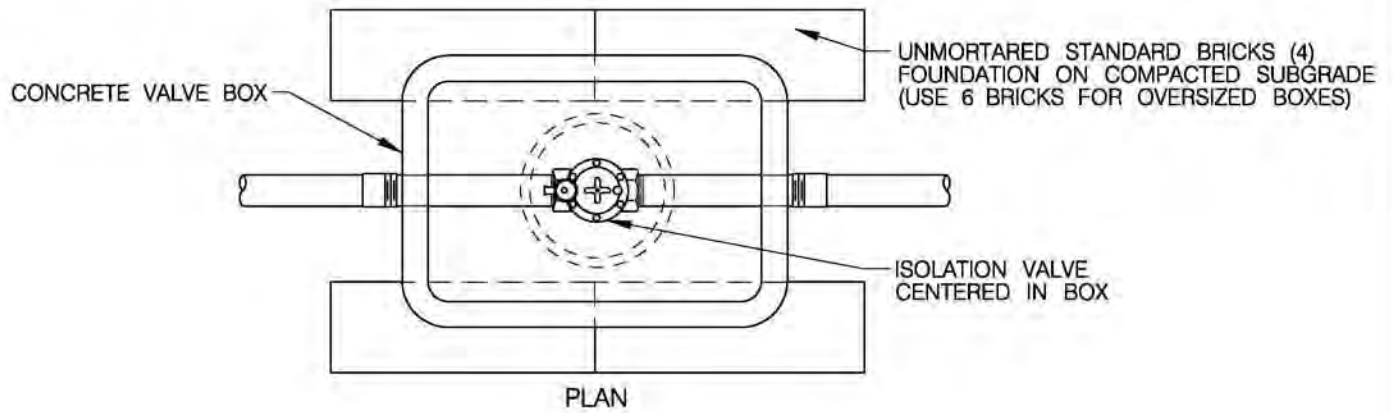
H. Hadli

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDI-106



NOTES

1. GLOBE VALVES SHALL BE FURNISHED WITH A STANDARD BRONZE CROSS HANDLE, CENTERED IN PIPE SLEEVE.
2. VALVE SHALL BE INSTALLED WITHIN 12" OF HARDSCAPE.
3. GLOBE VALVES SHALL BE FURNISHED WITH A REMOVABLE BONNET AND PACKING GLAND NUT.
4. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.
5. VALVE BOX SHALL BE MOUNTED FLUSH WITH FINISH GRADE IN TURF AREAS AND PER MULCH DEPTH IN SHRUB AREAS.
6. LOCATE OUTSIDE OF TURF WHEN POSSIBLE.
7. GATE VALVE SHALL BE USED ONLY ON LOOPED MAINLINE.
8. VALVE BOX SHALL BE SET PERPENDICULAR TO HARDSCAPE.
9. PROVIDE TWO VALVE KEYS TO OPERATE VALVE AT DEPTH.

LEGEND ON PLANS



GATE VALVE GLOBE VALVE

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

ISOLATION GLOBE/GATE VALVE 2 1/2" AND LARGER

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

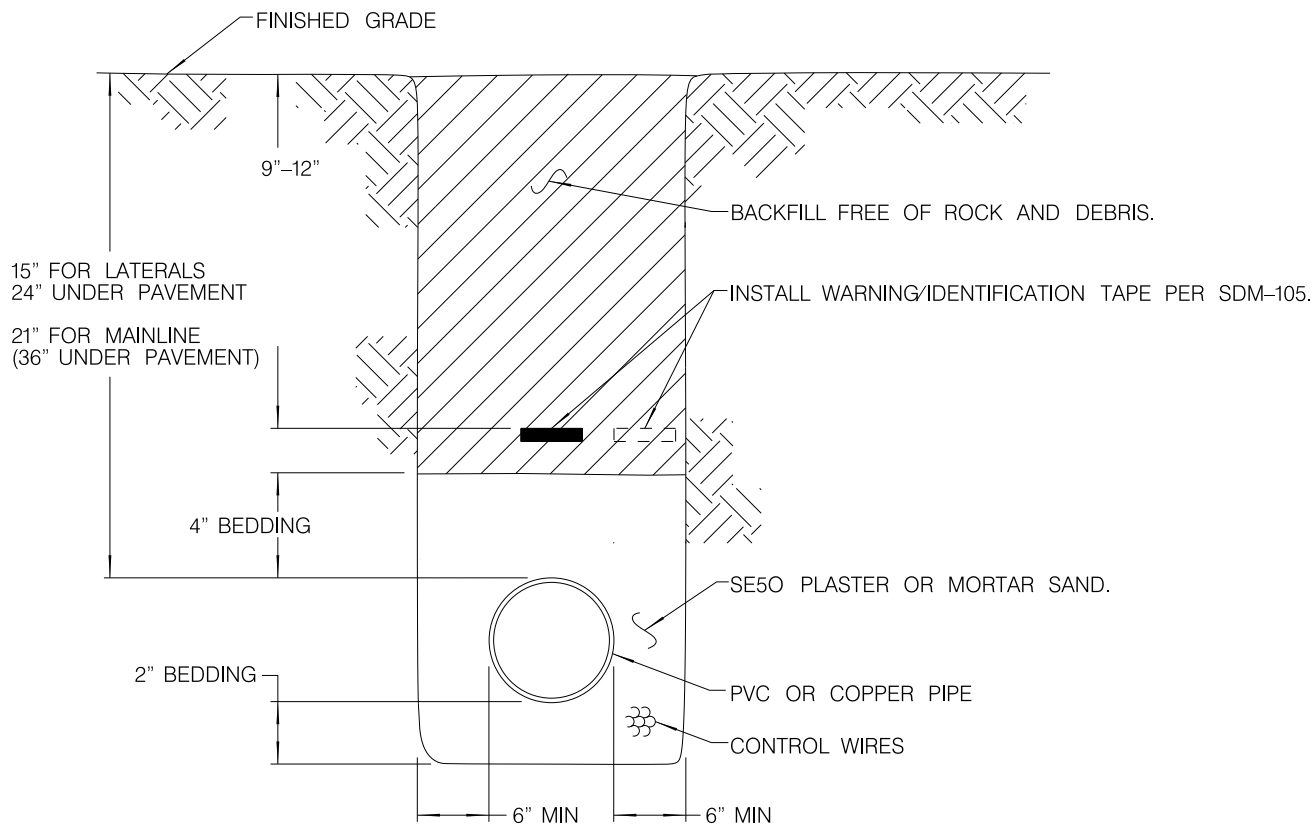
H. Hadli

1/31/2012

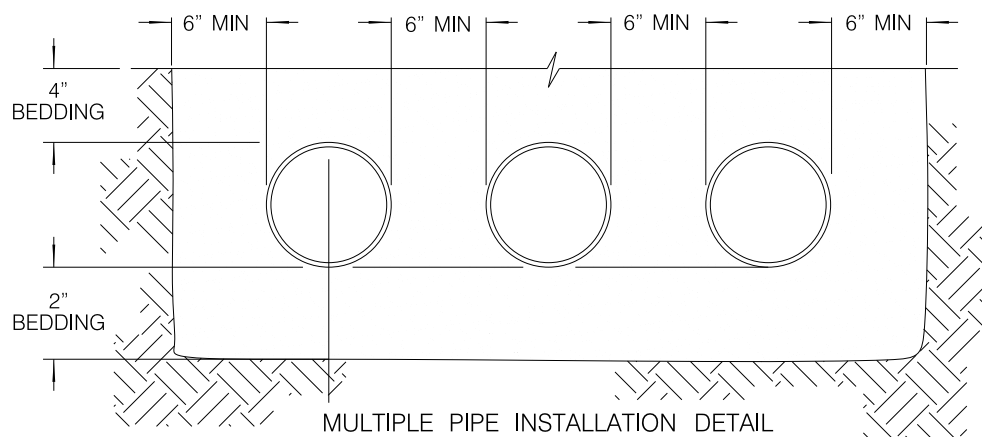
COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDI-107



MAINLINE TRENCH



MULTIPLE PIPE INSTALLATION DETAIL

NOTES:

1. BACKFILL MATERIAL SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 90% MINIMUM.
2. PIPE SHALL LAY FREE IN THE TRENCH WITH NO INDUCED STRAIN AND WITH SUFFICIENT ALLOWANCE FOR EXPANSION AND CONTRACTION.
3. PVC PIPE UNDER PAVEMENT SHALL BE INSTALLED IN A SCH 40 PVC SLEEVE TWICE THE DIAMETER OF THE PIPE (2" MINIMUM SIZE) AND EXTEND 12" MINIMUM BEYOND THE EDGE OF PAVEMENT.
4. THE LETTER "W" SHALL BE STAMPED OR CHISELED ON THE IMPROVEMENT (CURB/SIDEWALK) DIRECTLY ABOVE THE PRESSURE PIPELINE SLEEVE.
5. NO PVC PRESSURE PIPELINE SHALL BE INSTALLED WITHIN 3' OF ANY UTILITY, UNLESS OTHERWISE SPECIFIED.

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**IRRIGATION TRENCH PVC
OR COPPER PIPE**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

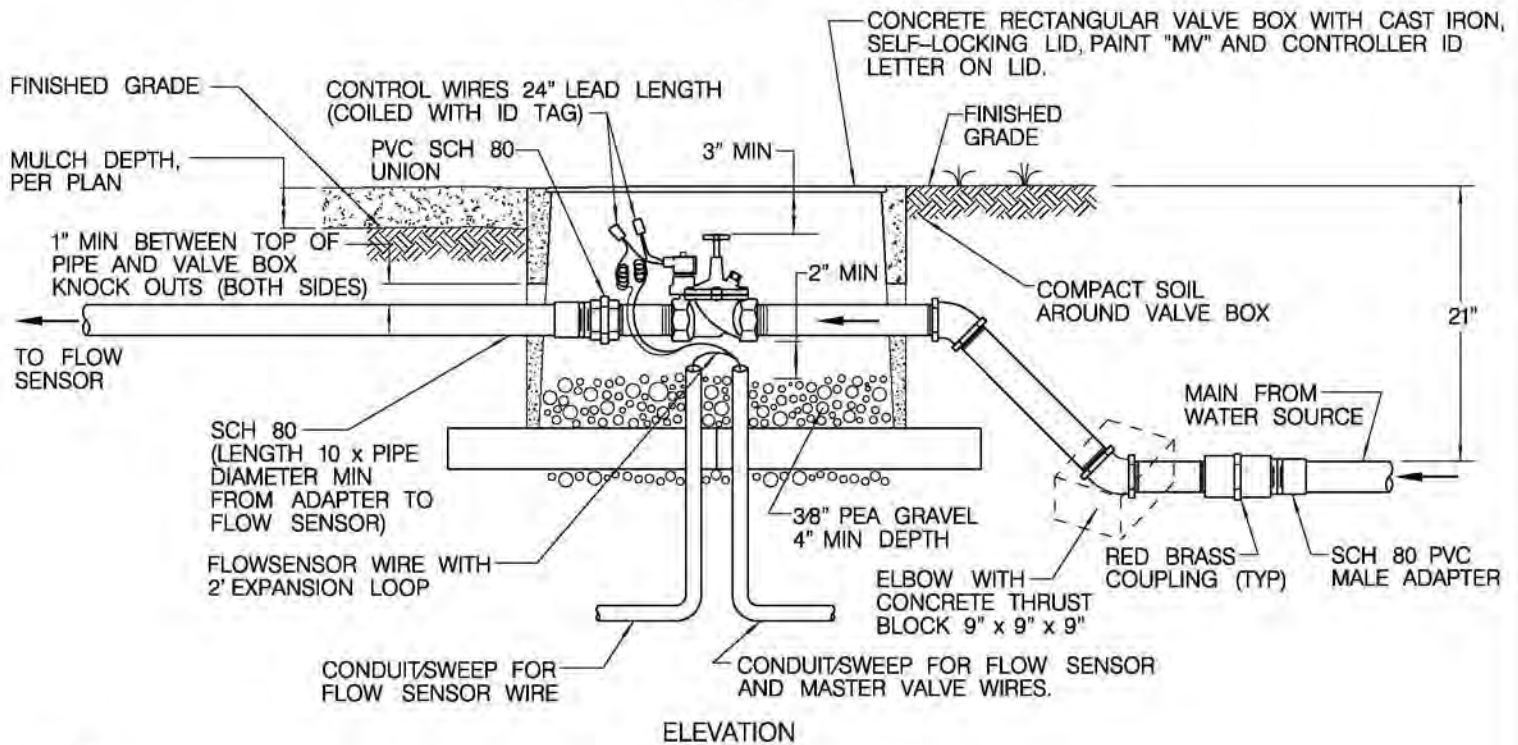
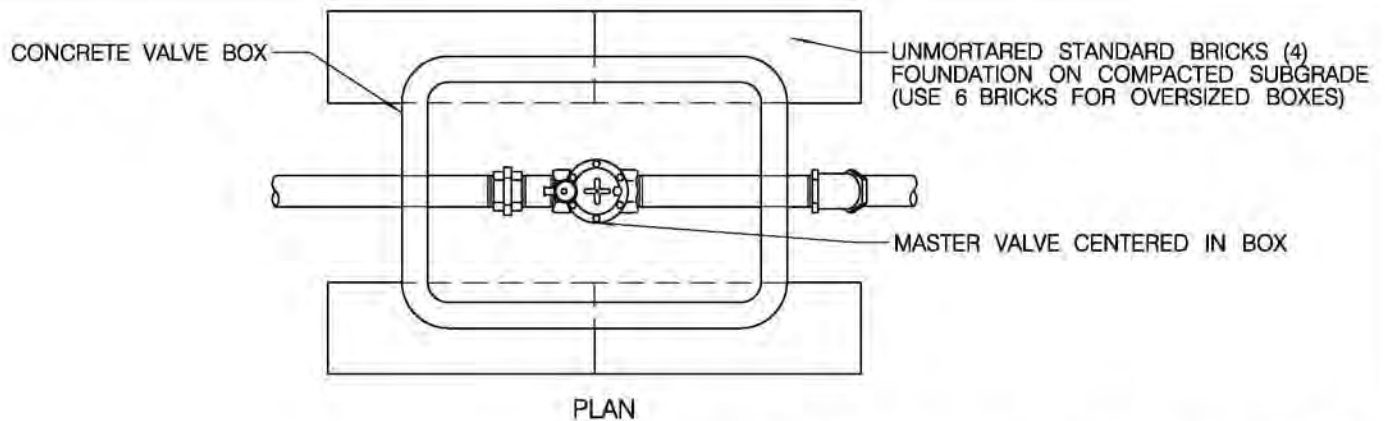
Chung
COORDINATOR

R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDI-110



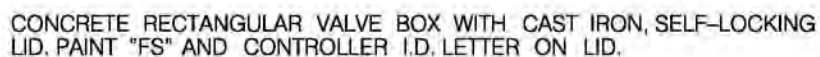
NOTES:

1. SPLICING SHALL BE MADE IN VALVE BOXES AND PULL BOXES ONLY. SEE STANDARD DRAWING SDI-115 FOR SPLICE /SOLDERING NOTES.
2. SPLICES SHALL BE SOLDERED WITH A PROPERLY SET MECHANICAL SPLICE CONNECTOR, ENTIRELY ENCLOSED IN SELF-CURING RESIN AND SHALL BE COMPLETELY WATER-PROOF.
3. SEAL CONDUIT OPENINGS WITH ELECTRICAL CONDUIT SEALANT AS APPROVED BY THE ENGINEER.
4. PVC CONDUIT SHALL BE 1" MINIMUM.
5. VALVE /CONTROLLER IDENTIFICATION SHALL BE LABELED OUTSIDE ON THE VALVE BOX LID AND TAGGED INSIDE THE BOX ON THE VALVE.
6. KNOCK OUTS SHALL NOT BE ENLARGED.
7. INSTALL ONLY ONE VALVE PER BOX.
8. VALVE BOXES SHALL BE SET PERPENDICULAR TO HARDSCAPE, 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.
9. CLOSE NIPPLES SHALL NOT BE USED.
10. NIPPLES, ELBOWS, AND FITTINGS SHALL BE THREADED RED BRASS, FROM COUPLING THROUGH THE MASTER VALVE. PIPE AND FITTINGS DOWNSTREAM SHALL BE SCH 80 PVC.
11. TEFLON TAPE SHALL BE USED ON THREADED CONNECTOR.

LEGEND ON PLANS

▼ MV

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	RH	J. NAGELVOORT	01/12		
				MASTER VALVE	<i>H. Hadli</i> 1/31/2012
					COORDINATOR R.C.E. 66271 DATE
					DRAWING
					NUMBER SDI-111



1. SPICES SHALL BE SOLDERED WITH A PROPERLY SET MECHANICAL SPICE CONNECTOR, ENTIRELY ENCLOSED IN SELF-CURING RESIN AND SHALL BE COMPLETELY WATER-PROOF.
2. SEAL CONDUIT OPENINGS WITH ELECTRICAL SEALANT.
3. KNOCK OUTS SHALL NOT BE ENLARGED.
4. INSTALL ONLY ONE FLOW SENSOR PER BOX.
5. VALVE BOXES SHALL BE SET PERPENDICULAR TO HARDSCAPE PER MULCH DEPTH IN SHRUB / GROUND COVER AREAS. IF NECESSARY TO BE SET IN TURF, VALVE BOXES SHALL BE SET FLUSH WITH FINISHED GRADE.

LEGEND ON PLANS

ⓕ FS

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

FLOW SENSOR

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Al. Haski

1/31/2012

COORDINATOR	R.C.E. 65271	DATE
-------------	--------------	------

DRAWING
NUMBER

SDI-112

CONCRETE VALVE BOX WITH LOCKING TOP AS APPROVED BY THE ENGINEER

UNMORTARED STANDARD BRICKS (4) FOUNDATION ON COMPACTED SUBGRADE (USE 6 BRICKS FOR OVERSIZED BOXES)

VALVE CENTERED IN BOX

PLAN

CONCRETE RECTANGULAR VALVE BOX WITH HINGED CAST IRON, SELF-LOCKING, LID. IMPRINTED W/RCV AND CONTROLLER ID LETTER ON LID.

FINISHED GRADE
MULCH DEPTH, PER PLAN

CONTROL WIRES 24" LEAD LENGTH (COILED WITH VALVE ID TAG)

3" MIN

FINISHED GRADE (TURF)

SIDEWALK OR MOW CURB

1" MIN CLEARANCE BETWEEN TOP OF PIPE AND VALVE BOX KNOCK OUTS (BOTH SIDES)

15" PVC PIPE AND ELBOW, SCH 40

COMPACT SOIL AROUND VALVE BOX

NIPPLE, ELBOW AND RISER FROM MANIFOLD TEE OR ELBOW, AS SHOWN /NOTED ON SDI-126 UNLESS OTHERWISE SPECIFIED.

PVC UNION, NIPPLES, AND ELBOW, SCH 80

RED BRASS FROM ISOLATION VALVE

ELEVATION

NOTES:

1. SPlicing SHALL BE MADE IN VALVE BOXES AND PULL BOXES ONLY. SEE SDI-115 FOR SPlice /SOLDERING NOTES.
2. SPlices SHALL BE SOLDERED WITH A PROPERLY SET MECHANICAL SPlice CONNECTOR, ENTIRELY ENCLOSED IN SELF-CURING RESIN AND SHALL BE COMPLETELY WATER-PROOF.
3. KNOCK OUTS SHALL NOT BE ENLARGED.
4. INSTALL ONLY ONE VALVE PER BOX.
5. VALVE BOXES SHALL BE SET PERPENDICULAR TO HARDSCAPE, ABOVE FINISHED GRADE IN SHRUB / GROUND COVER AREAS, PER MULCH DEPTH. IF NECESSARY TO BE SET IN TURF, VALVE BOXES SHALL BE SET FLUSH WITH FINISHED GRADE.
6. CLOSE NIPPLES SHALL NOT BE USED.
7. NIPPLES, ELBOWS, AND FITTINGS SHALL BE THREADED RED BRASS FROM ISOLATION VALVE THROUGH THE VALVE, UNLESS OTHERWISE SPECIFIED.
8. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS

LEGEND ON PLANS

▼ RCV

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

REMOTE CONTROL VALVE

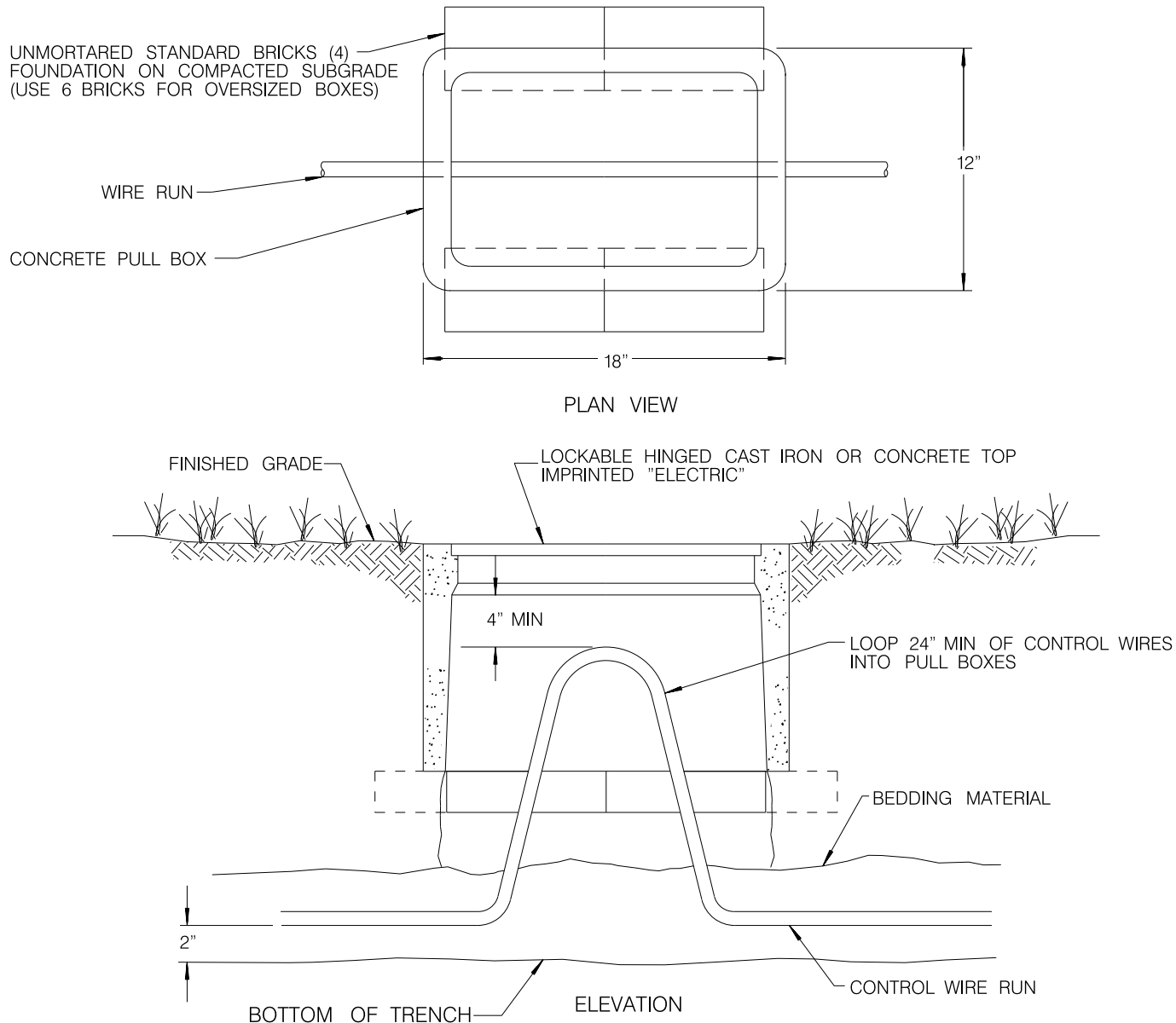
RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

CA Bungea
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

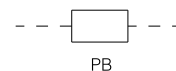
SDI-114



NOTES:

1. INSTALL PULL BOXES AS SHOWN ON PLANS AND AT EACH END OF PIPE SLEEVES RUNNING UNDER PAVEMENT.
2. PULL BOX COVER SHALL BE PERMANENTLY MARKED "ELECTRIC".
3. CONDUCTORS FOR EACH CONTROLLER CLOCK SHALL BE HARNESSSED SEPARATELY AND AT SUFFICIENT INTERVALS TO MAINTAIN A DEFINITE BUNDLE.
4. SPLICES SHALL ONLY BE MADE IN PULL BOXES, WITH A PROPERLY SET MECHANICAL SPLICE CONNECTOR, SOLDERED WITH METALLIC ALLOY, ENTIRELY ENCLOSED IN SELF-CURING RESIN AND SHALL BE COMPLETELY WATER-PROOF.
5. SPARE WIRE ENDS SHALL BE INSULATED IN THE SAME MANNER AS WIRE SPLICES.
6. MINIMUM SIZE PULL BOX SHALL BE AS SHOWN ABOVE. LARGER BOXES MAY BE NECESSARY TO MEET 4" CLEARANCE REQUIRED.
7. NO SPLICES SHALL BE PERMITTED ON WIRE RUNS OF LESS THAN 300'.
8. THE LETTER "E" SHALL BE STAMPED OR CHISELED ON THE IMPROVEMENT (CURB-SIDEWALK) DIRECTLY ABOVE THE CONTROL WIRE.
9. BEDDING MATERIAL SHALL BE SE 50 PLASTER OR MORTAR SAND.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12
UPDATED	JW	J. NAGELVOORT	02/16

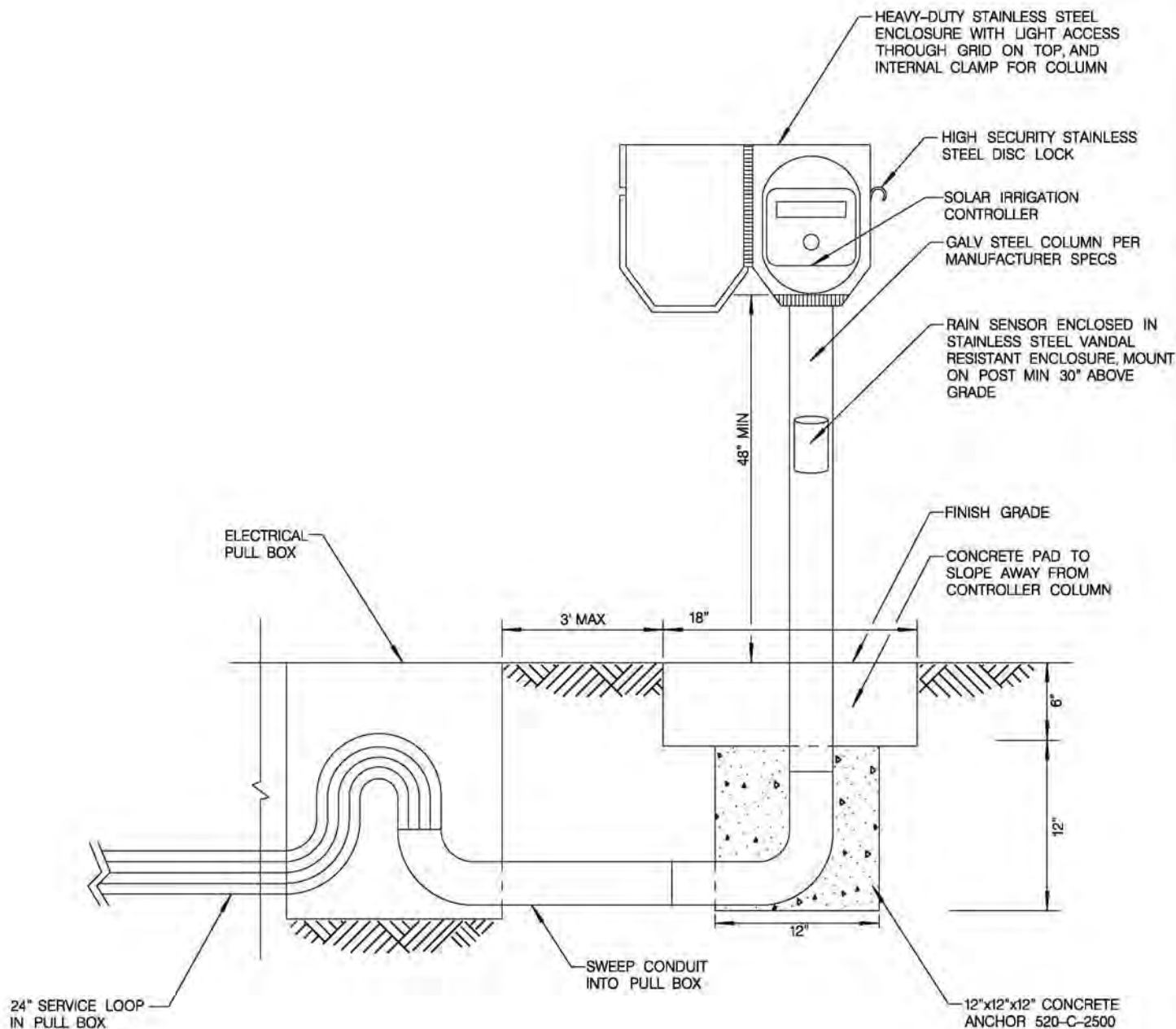
CITY OF SAN DIEGO – STANDARD DRAWING

**ELECTRICAL PULL BOX
FOR DIRECT BURIAL CONTROL WIRES
AND SPLICING NOTES**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

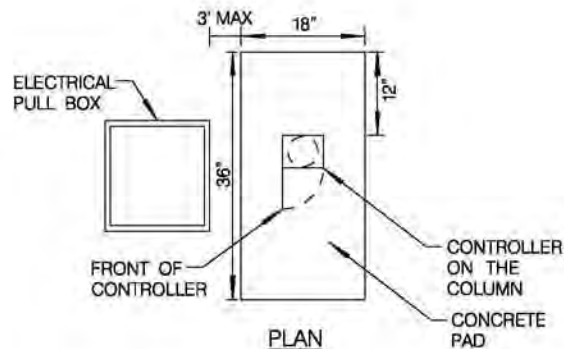
Chung 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDI-115**

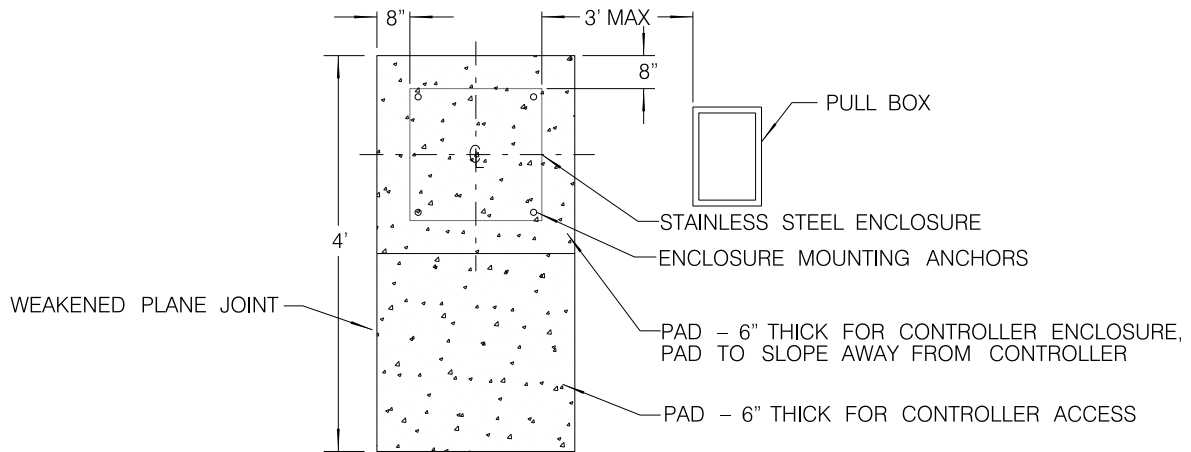


NOTES:

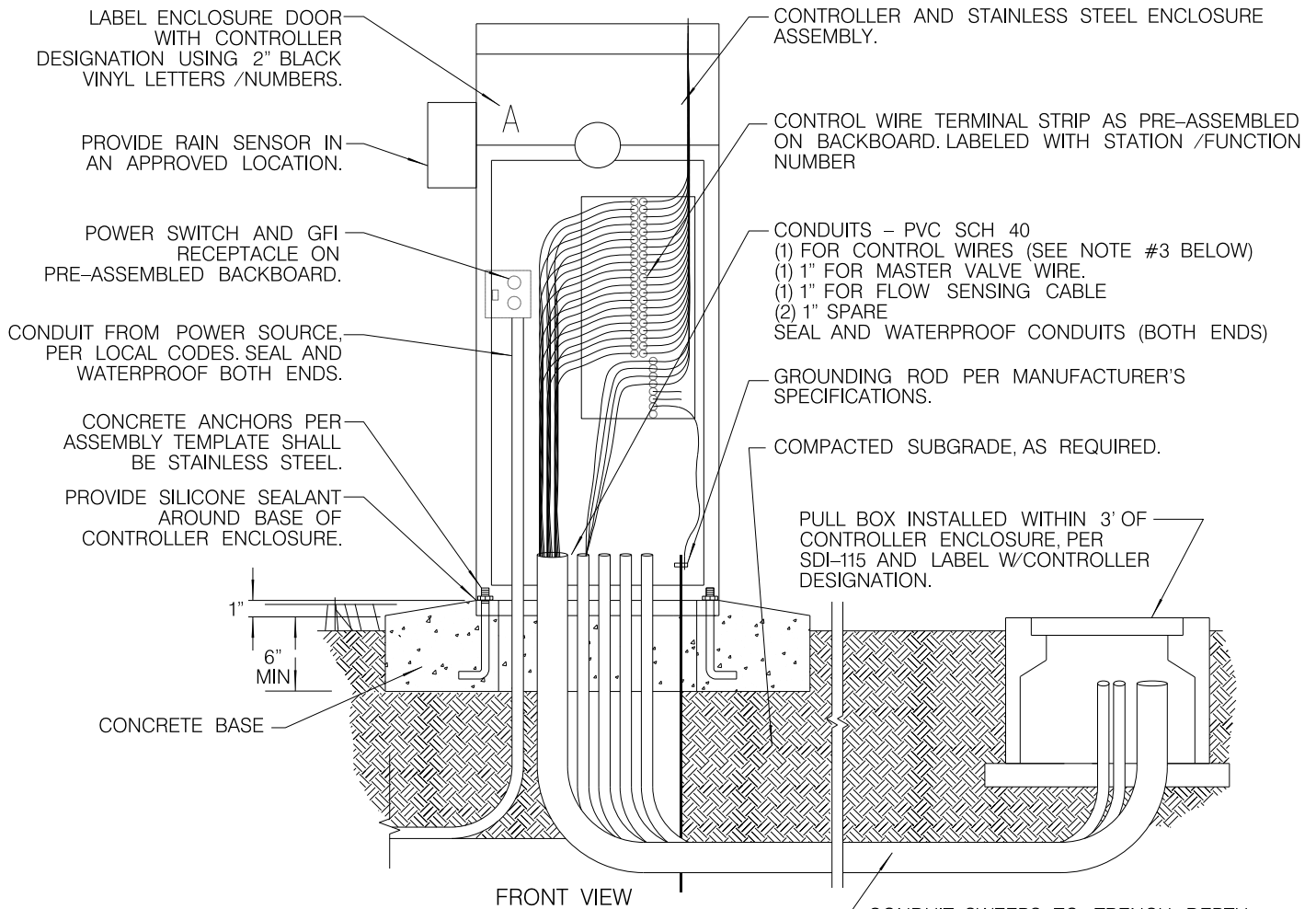
1. PROVIDE SOLENOID ADAPTOR TO SUPPORT SOLAR CLOCK FUNCTION ON VALVE.
2. MAXIMUM RUN OF CONTROL WIRE TO REMOTE CONTROL VALVE (RCV) IS 1500' UNLESS OTHERWISE SPECIFIED.
3. SEAL CONDUIT OPENINGS WITH ELECTRICAL SEALANT.



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
				SOLAR IRRIGATION CONTROLLER	<i>H. Hadali</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDI-116



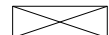
PLAN VIEW (FOR CONCRETE PAD)



NOTES:

1. ALL CONTROLLER ASSEMBLIES AND OPTIONS SHALL BE COMPLETELY PRE-ASSEMBLED IN A STAINLESS STEEL ENCLOSURE.
2. CONTROL WIRE CONDUIT SHALL BE TWICE THE DIAMETER OF THE WIRE BUNDLE, 2" MINIMUM.
3. PROVIDE SEPARATE CIRCUIT BREAKER FOR CONTROLLER(S) AT ELECTRICAL CONTROL PANEL AND LABEL.
4. SEAL CONDUIT OPENINGS WITH ELECTRICAL SEALANT, AS APPROVED BY THE ENGINEER.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

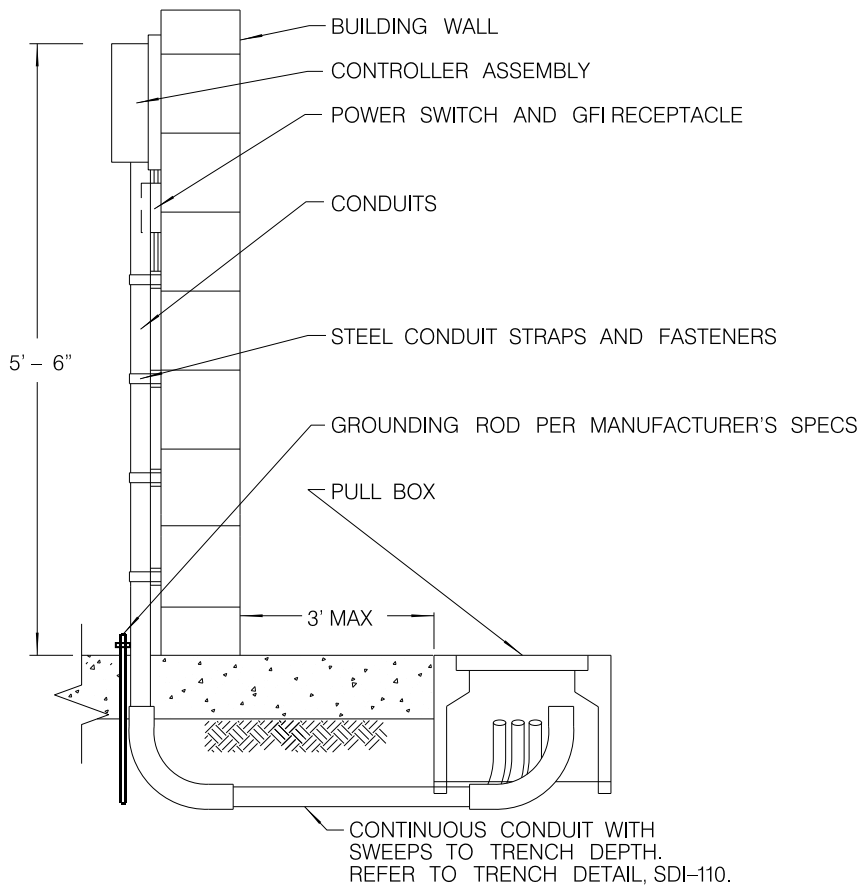
CITY OF SAN DIEGO - STANDARD DRAWING

**AUTOMATIC IRRIGATION CONTROLLER
PEDESTAL MOUNTED**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CAHingee 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDI-117**



SIDE VIEW

LABEL ENCLOSURE DOOR WITH CONTROLLER DESIGNATION USING 2" BLACK VINYL LETTERS/NUMBERS.

BUILDING WALL

CONTROLLER

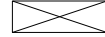
POWER SOURCE CONDUIT
POWER SWITCH AND GFI RECEPTACLE

CONDUITS - PVC SCH 40
SEAL CONDUITS AT BOTH ENDS
(1) FOR CONTROL WIRES.
SEE NOTE #1 BELOW.
(1) 1" FOR MASTER VALVE WIRE.
(1) 1" FOR FLOW SENSING CABLE.
(2) 1" SPARE.

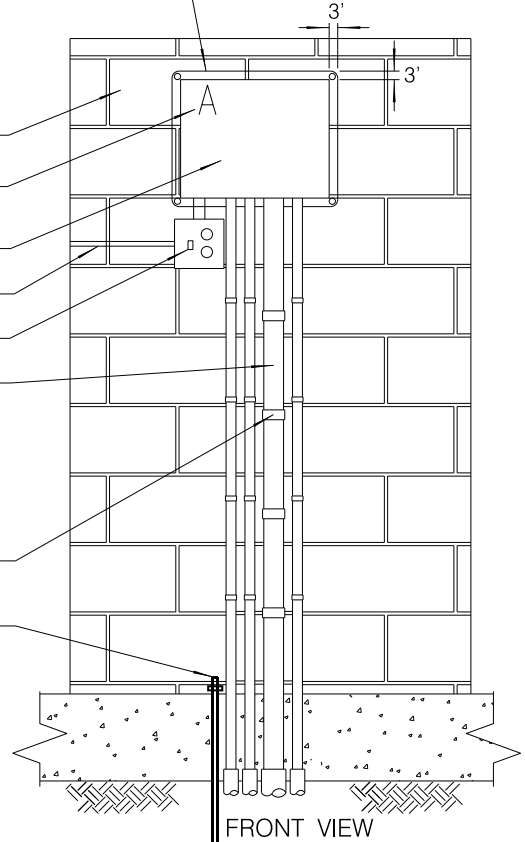
STEEL CONDUIT STRAPS AND FASTENERS,
4 PER CONDUIT.

GROUNDING ROD
PER MANUFACTURER SPECS

LEGEND ON PLANS



PRE ASSEMBLED STAINLESS
STEEL BACK BOARD MOUNTED
PER MANUFACTURERS
RECOMMENDATIONS



FRONT VIEW

NOTES:

1. CONTROL WIRE CONDUIT SHALL BE TWICE THE DIAMETER OF THE WIRE BUNDLE, 2" MINIMUM.
2. PROVIDE SEPARATE CIRCUIT BREAKERS FOR CONTROLLER(S) AT ELECTRICAL CONTROL PANEL, AND LABEL.
3. PROVIDE RAIN SENSOR AND INSTALL IN AN APPROVED LOCATION.

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

**AUTOMATIC IRRIGATION CONTROLLER
INDOOR WALL MOUNTED**

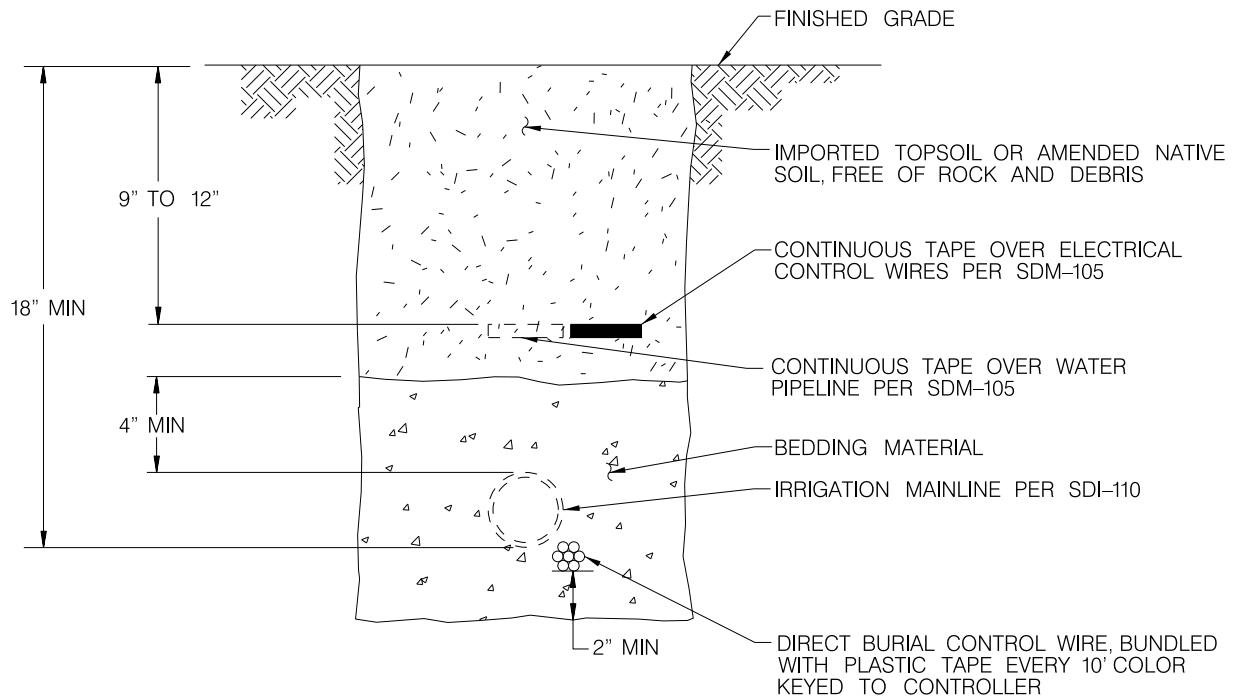
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CRBunger
COORDINATOR

2/25/16
R.C.E. 56623 DATE

DRAWING
NUMBER

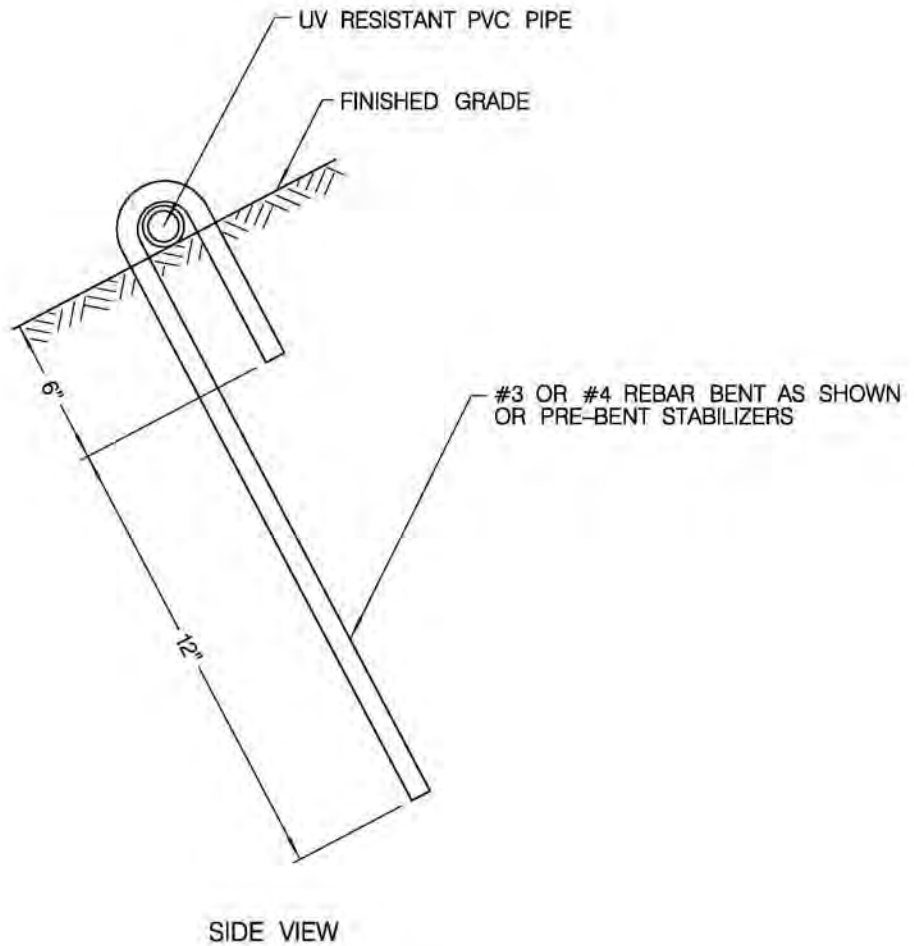
SDI-118



NOTES:

- BEDDING MATERIAL SHALL BE SE 50 PLASTER OR MORTAR SAND.
- WIRES WHICH RUN UNDER PAVED AREAS SHALL BE INSTALLED IN PVC PIPE SLEEVES TWICE THE DIAMETER OF THE WIRE BUNDLE (2" MINIMUM SIZE), EXTENDING 12" MINIMUM BEYOND EDGE OF PAVEMENT. INSTALL ELECTRICAL PULL BOX AT EACH END OF PIPE SLEEVES PER SDI-115.
- THE LETTER E SHALL BE STAMPED OR CHISELED ON THE IMPROVEMENT(CURB-SIDEWALK) DIRECTLY ABOVE THE CONTROL WIRE /CABLE.
- WHEN CONTROL WIRING CANNOT BE INSTALLED IN A PIPE TRENCH, IT SHALL BE INSTALLED A MINIMUM 18" BELOW FINISH GRADE BUNDLED WITH PLASTIC TAPE.

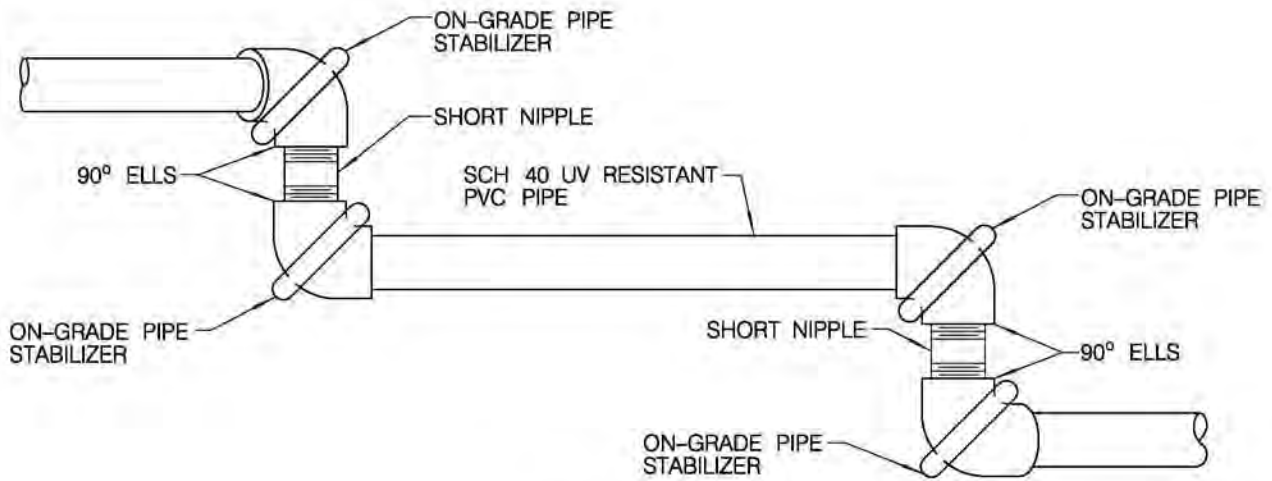
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	RH	J. NAGELVOORT	01/12		
UPDATED	JW	J. NAGELVOORT	08/15	CONTROL WIRE INSTALLATION	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	AR	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDI-119



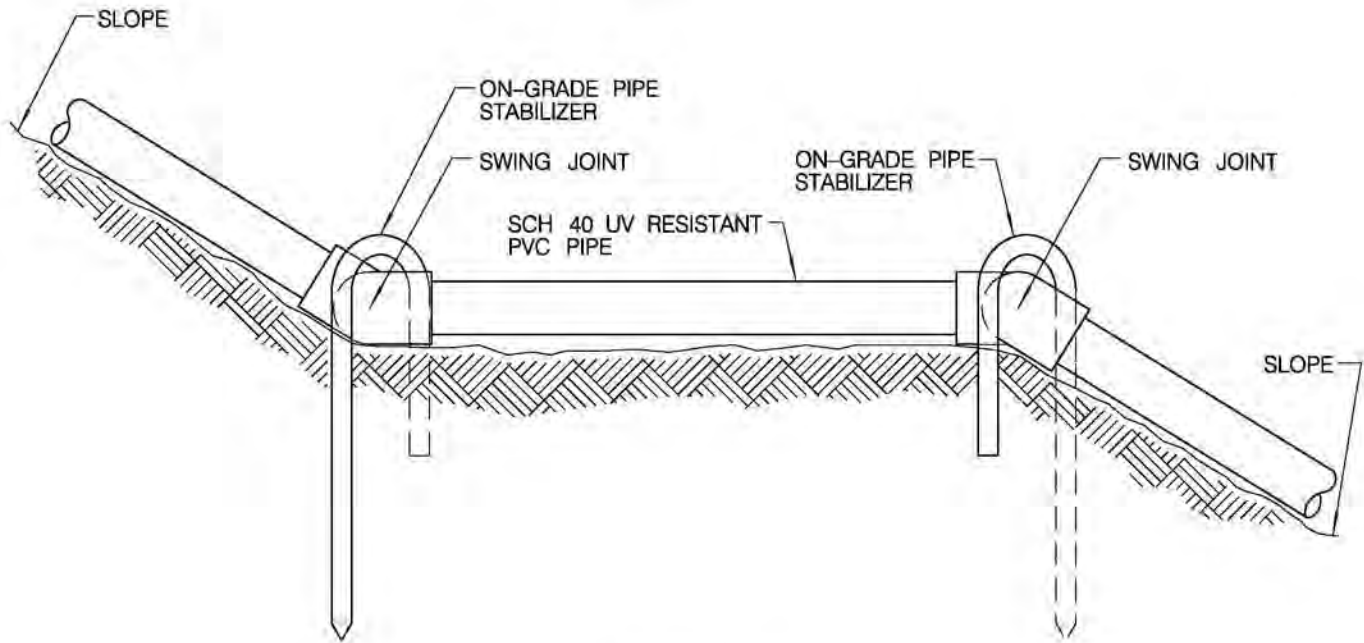
NOTE:

STABILIZERS SHALL BE PLACED NO GREATER THAN 10' APART, AT EACH RISER AND AT ALL FITTINGS.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	RH	J. NAGELVOORT	01/12		
				ON-GRADE PIPE STABILIZATION TEMPORARY INSTALLATION	<i>H. Hadi</i> 1/31/2012
					COORDINATOR R.C.E. 66271 DATE
					DRAWING
					NUMBER SDI-120



PLAN

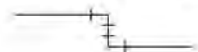


ELEVATION

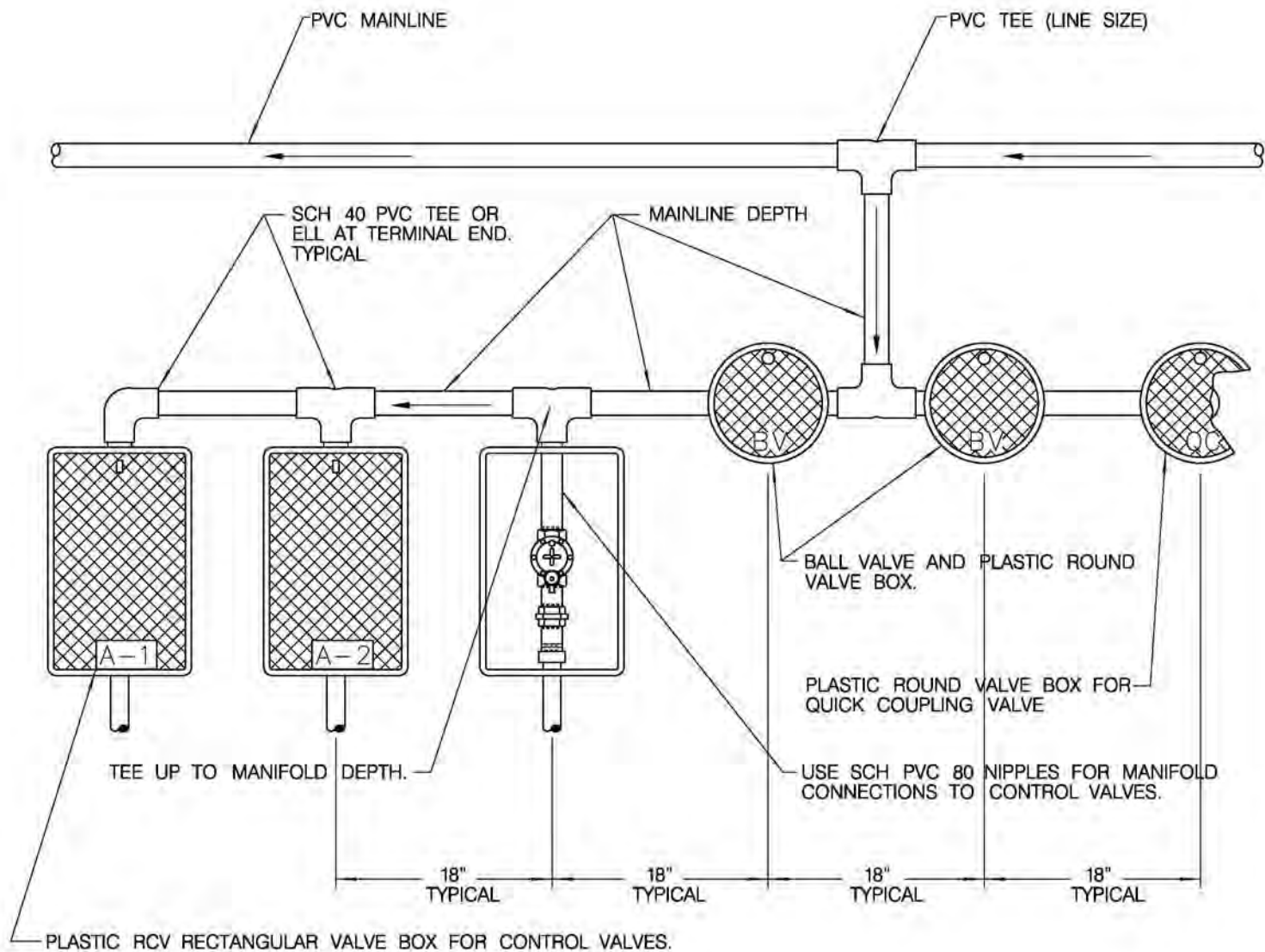
NOTE:

SWING JOINTS SHALL BE USED AT EACH CHANGE OF GRADE.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadji</i> COORDINATOR R.C.E. 66271 DATE 1/31/2012
ORIGINAL*	RH	J. NAGELVOORT	01/12		
				SWING JOINT AND PIPE INSTALLATION ON SLOPES ABOVE GROUND PIPE INSTALLATIONS	DRAWING NUMBER SDI-123



NOTES:

1. PVC PIPE USED IN MANIFOLD ASSEMBLIES SHALL BE THE SAME CLASS AS SPECIFIED FOR THE MAINLINE.
2. VALVE BOXES SHALL BE HEAT BRANDED WITH CONTROLLER AND VALVE IDENTIFICATION.

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**REMOTE CONTROL VALVE MANIFOLD
ASSEMBLY WITH PVC PIPE
(TEMPORARY SYSTEMS)**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

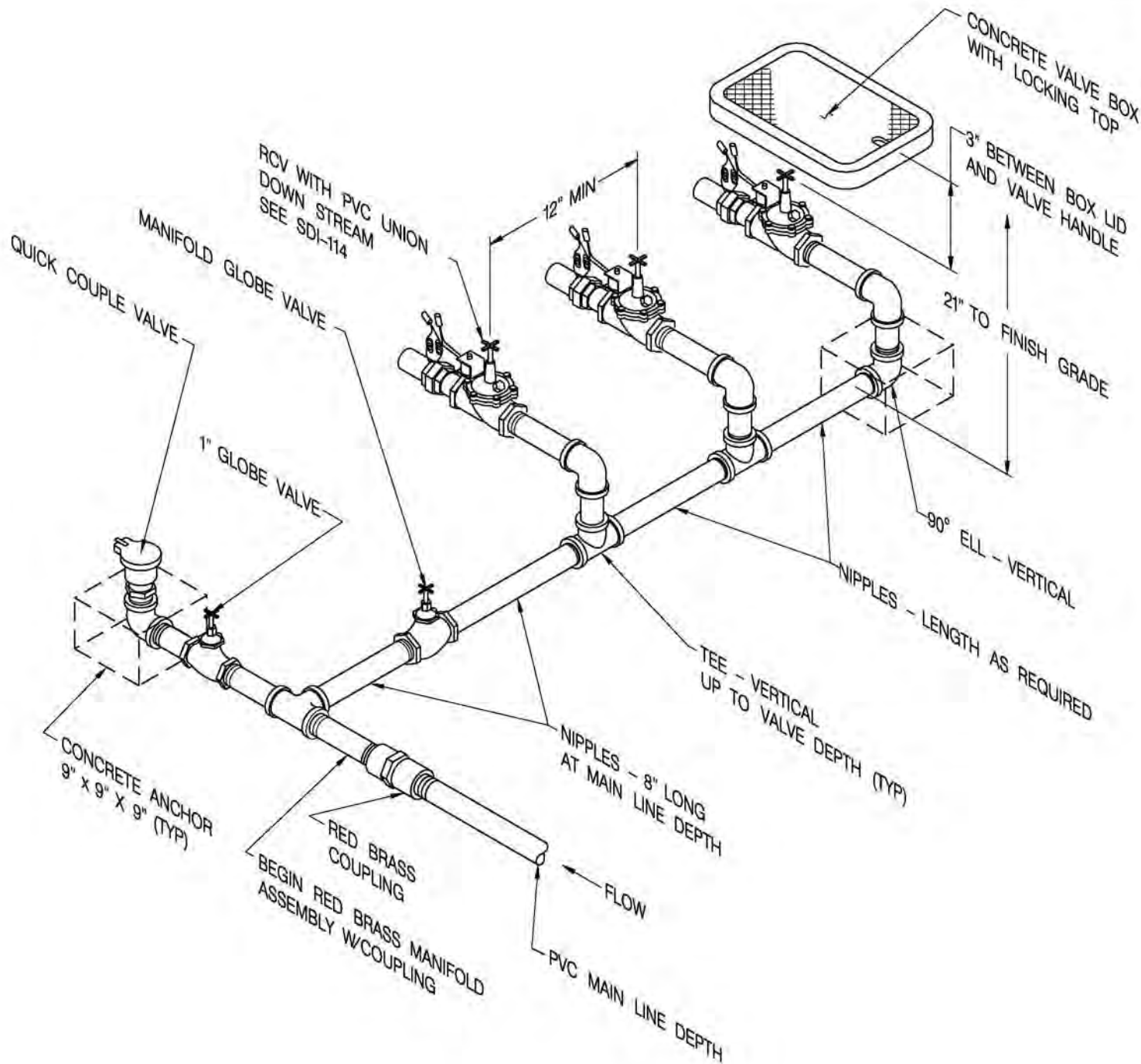
[Signature]

1/31/2012

COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDI-125



NOTES:

1. ALL PIPES, NIPPLES, AND FITTINGS AFTER MALE ADAPTER SHALL BE RED BRASS.
2. VALVE AND CONTROLLER IDENTIFICATION SHALL BE LABELED OUTSIDE ON THE VALVE BOX LID AND TAGGED INSIDE THE BOX ON THE VALVE.
3. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**REMOTE CONTROL VALVE
MANIFOLD ASSEMBLY WITH BRASS PIPE**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

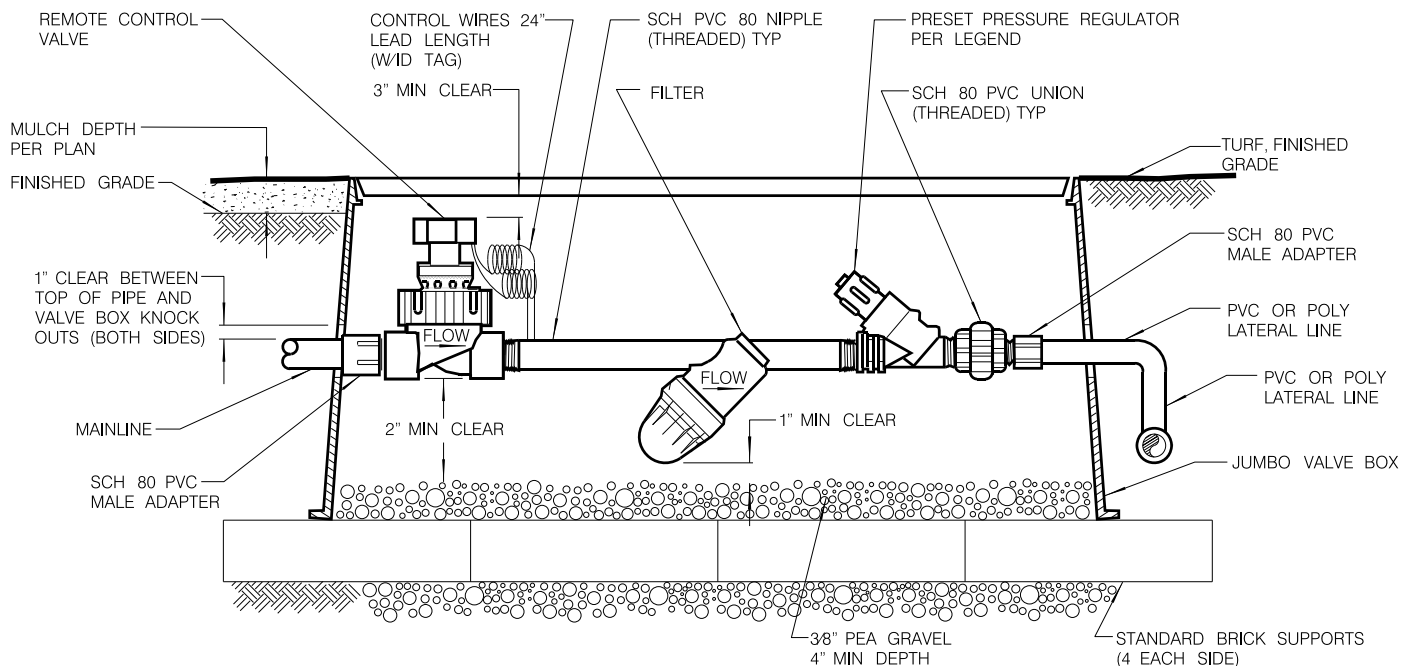
H. Hadali

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDI-126



ELEVATION

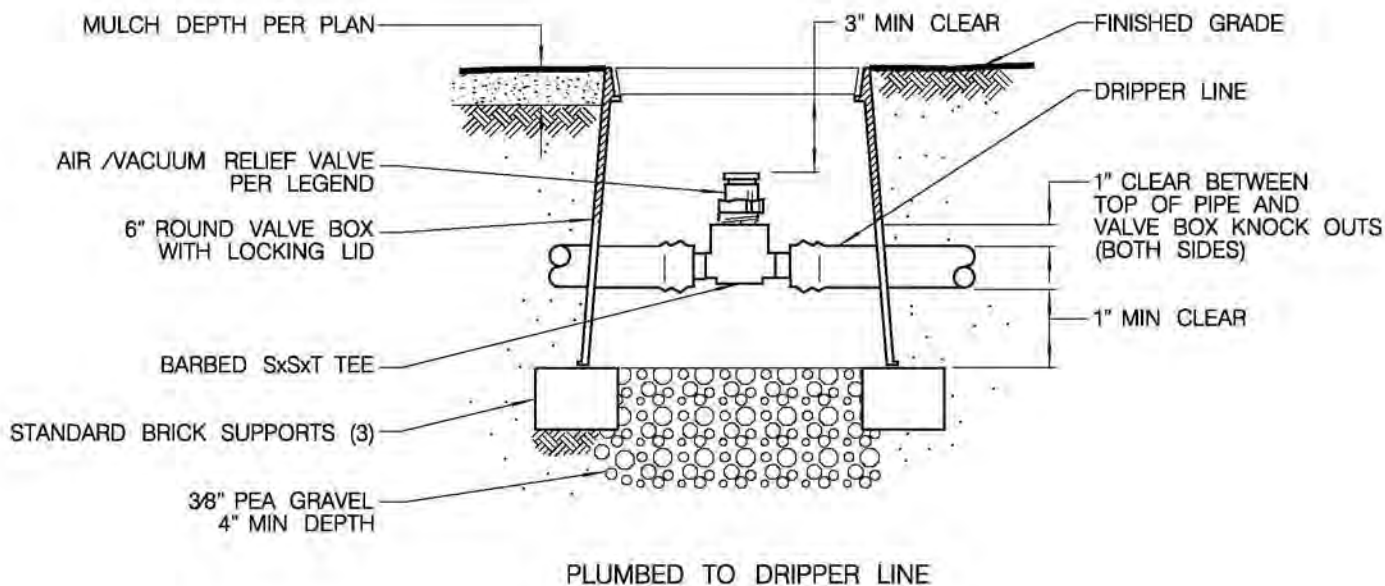
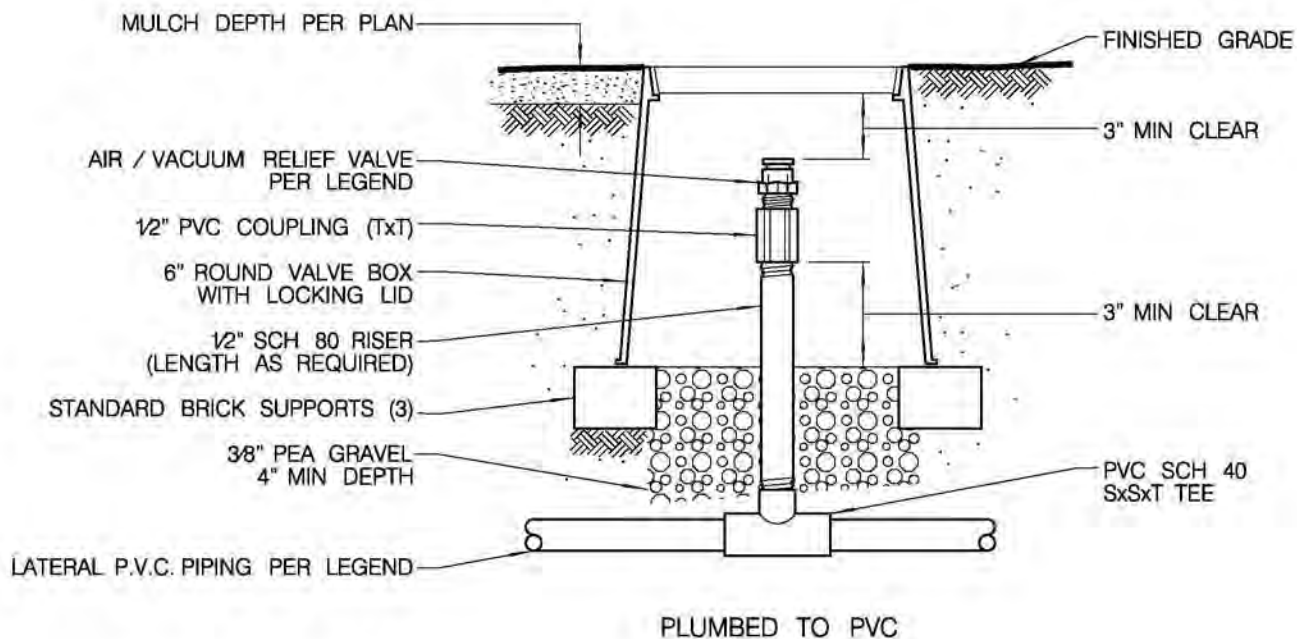
NOTES:

1. WIRE SPlicing SHALL BE MADE IN VALVE BOXES AND PULL BOXES ONLY. SEE SDI-115 FOR SPLICE / SOLDERING NOTES.
2. SPARE WIRES TERMINATING IN VALVE BOXES SHALL HAVE THEIR ENDS INSULATED, THE SAME AS FOR A SPLICE.
3. WHEN TWO OR MORE VALVES ARE INSTALLED IN THE SAME LOCATION, SEE REMOTE CONTROL VALVE MANIFOLD ASSEMBLY, SDI-125 AND SDI-126.
4. VALVE / CONTROLLER IDENTIFICATION SHALL BE PERMANENTLY LABELED EXTERNALLY ON THE VALVE BOX AND INTERNALLY, WITH A PERMANENT IDENTIFICATION TAG ATTACHED TO THE VALVE.
5. KNOCK OUTS SHALL NOT BE ENLARGED UNLESS APPROVED BY THE ENGINEER.
6. INSTALL ONLY ONE VALVE ASSEMBLY PER BOX.
7. VALVE BOXES SHALL BE SET PERPENDICULAR TO HARDSCAPE, A MAXIMUM 12 INCHES FROM EDGE OF HARDSCAPE, 2\"
8. CLOSE NIPPLES SHALL NOT BE USED.
9. FILTER SHALL BE INSTALLED TO ALLOW FOR MAINTENANCE ACCESS.
10. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	RH	J. NAGELVOORT	01/12		
UPDATED	RB	J. NAGELVOORT	02/16	REMOTE CONTROL VALVE DRIP IRRIGATION	 COORDINATOR R.C.E. 56523 2/25/16 DATE
					DRAWING NUMBER SDI-127



NOTES:

1. INSTALL AIR /VACUUM RELIEF VALVE AT HIGH POINT(S) IN VALVE CIRCUIT.
2. HEAT-BRAND VALVE BOX LID "AR".
3. VALVE SHALL BE CENTERED IN BOX.
4. TEFLON TAPE SHALL BE USED ON THREADED CONNECTIONS.

LEGEND ON PLANS

(A)

REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

AIR / VACUUM RELIEF VALVE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

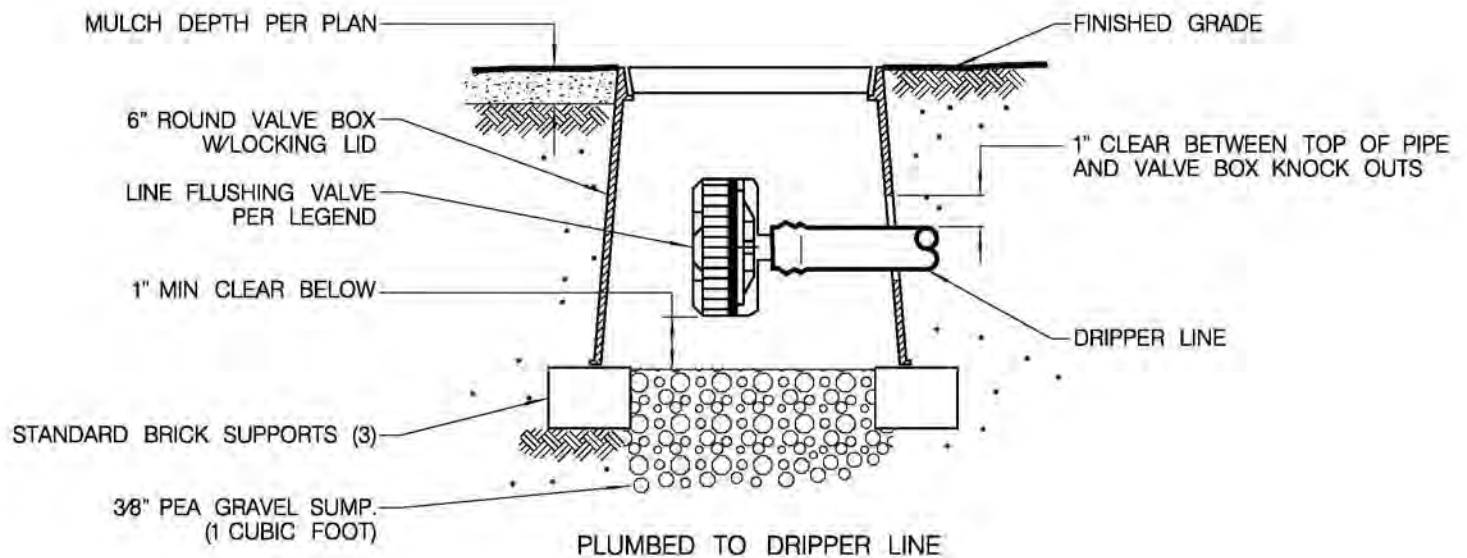
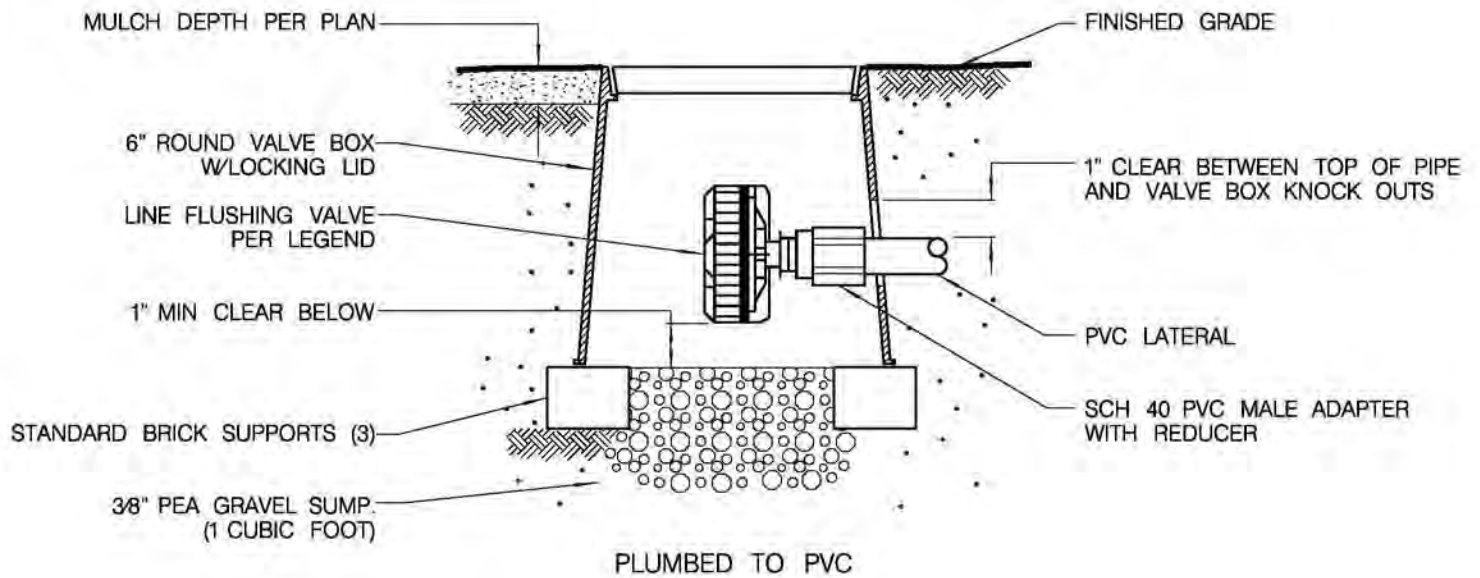
H. Hadli

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDI-128



NOTES:

1. INSTALL FLUSH VALVE(S) AT THE LOWEST POINTS IN THE VALVE CIRCUIT
2. HEAT BRAND VALVE BOX LIDS "FV".
3. VALVE SHALL BE CENTERED IN BOX.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL*	RH	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**DRIP IRRIGATION
FLUSH VALVE (AUTOMATIC)**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadli

1/31/2012

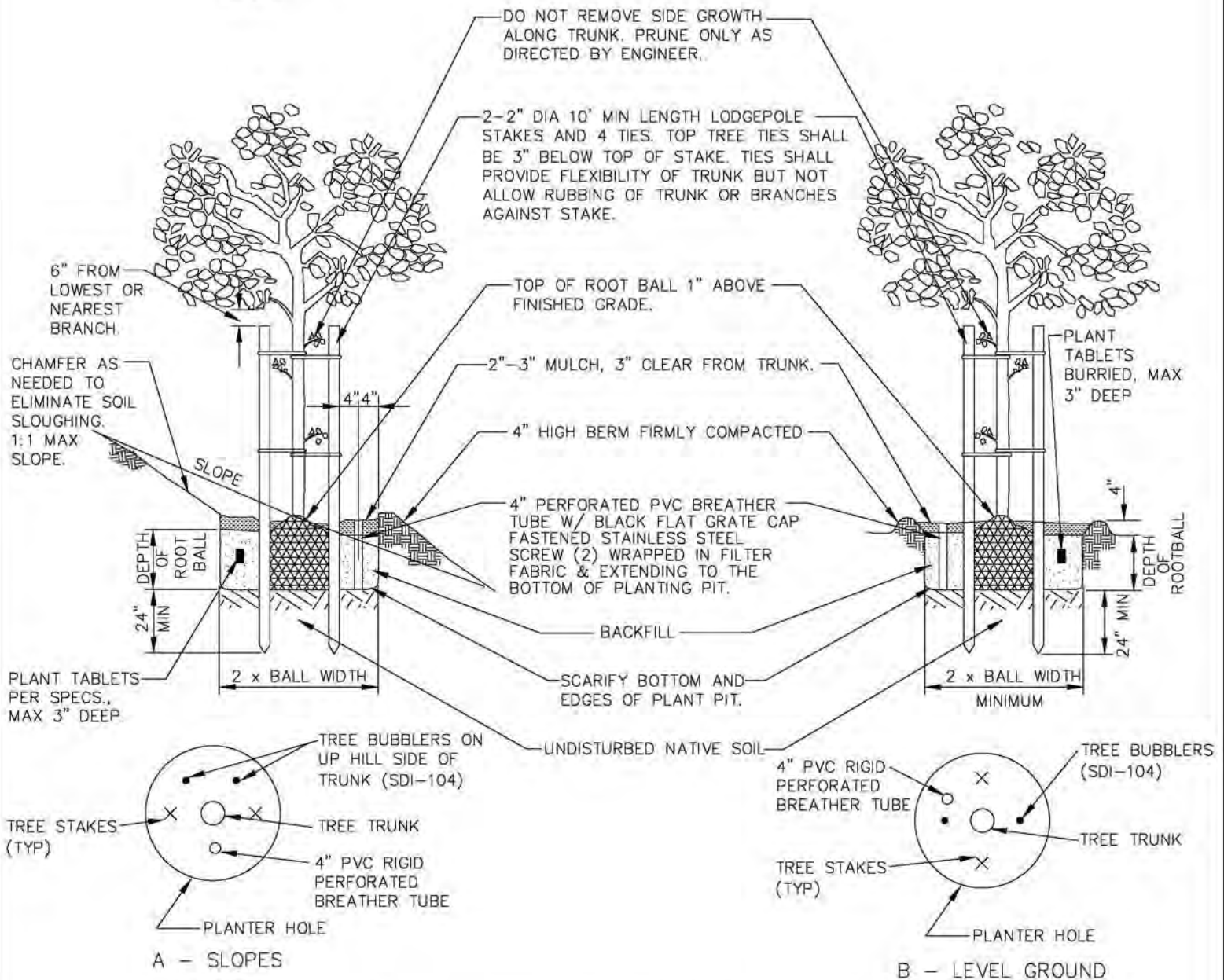
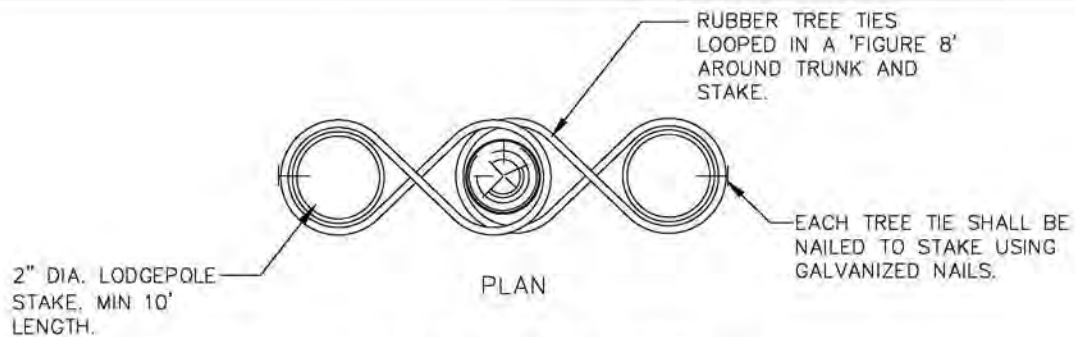
COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDI-129

CHAPTER 6

LANDSCAPING



NOTES

1. DOUBLE STAKE 15 GAL. AND LARGER TREES. SINGLE STAKE TREES SMALLER THAN 15 GAL.
2. FOR SINGLE STAKED TREES, PLACE STAKE ON WINDWARD SIDE OF TREE.
3. LOCATE STAKES OUTSIDE OF ROOTBALL.
4. PROVIDE MINIMUM DISTANCE FROM OTHER OBJECTS AS FOLLOWS:
20' TRAFFIC SIGNALS, 12' STREET LIGHTS, 10' FIRE HYDRANTS, SEWER LINES AND SDG&E FOR PAD MOUNTED EQUIPMENT, AND 5' UNDERGROUND SDG&E ELECTRIC AND GAS LINES.

REVISION	BY	APPROVED	DATE
ORIGINAL*	SG	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

TREE PLANTING AND STAKING

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadli

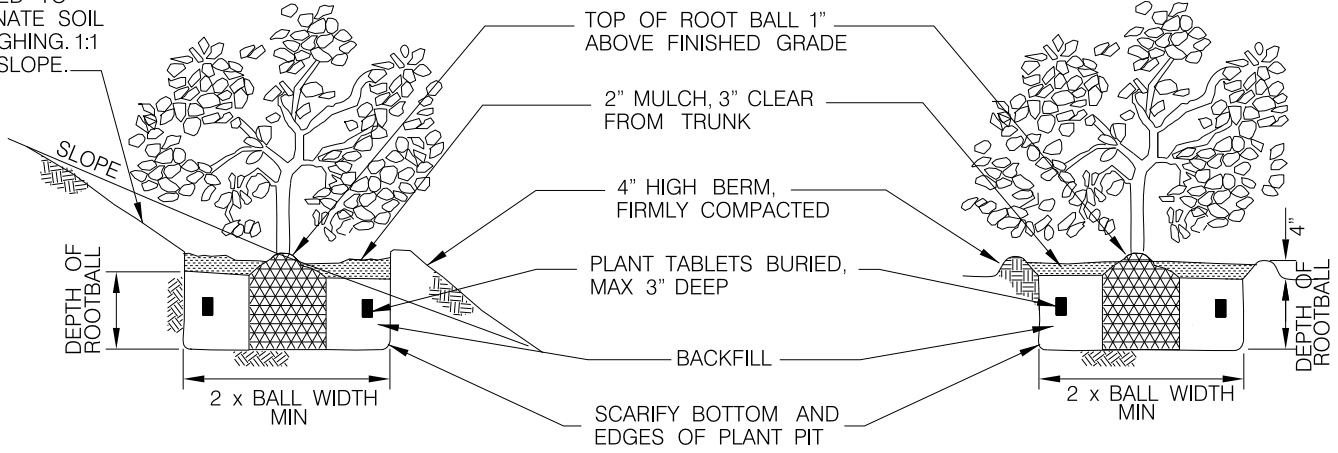
1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

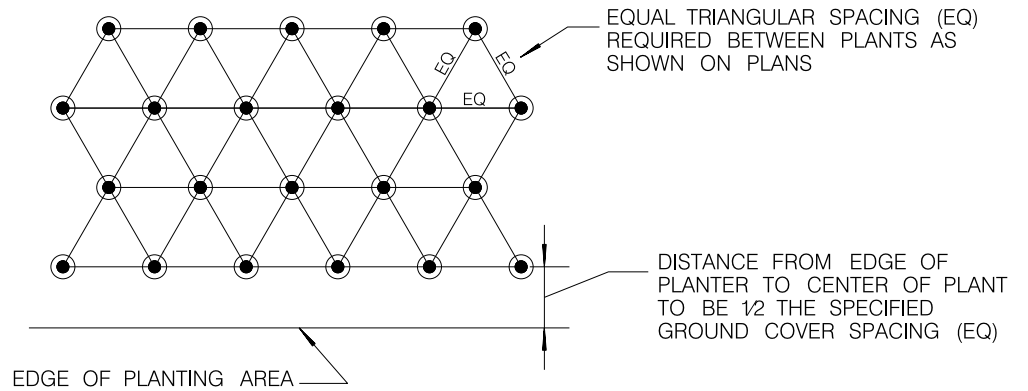
SDL-101

CHAMFER AS
NEEDED TO
ELIMINATE SOIL
SLOUGHING. 1:1
MAX SLOPE.



SHRUB PLANTING – SLOPES

SHRUB PLANTING – LEVEL GROUND



GROUND COVER SPACING

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

SHRUB PLANTING/GROUND COVER SPACING

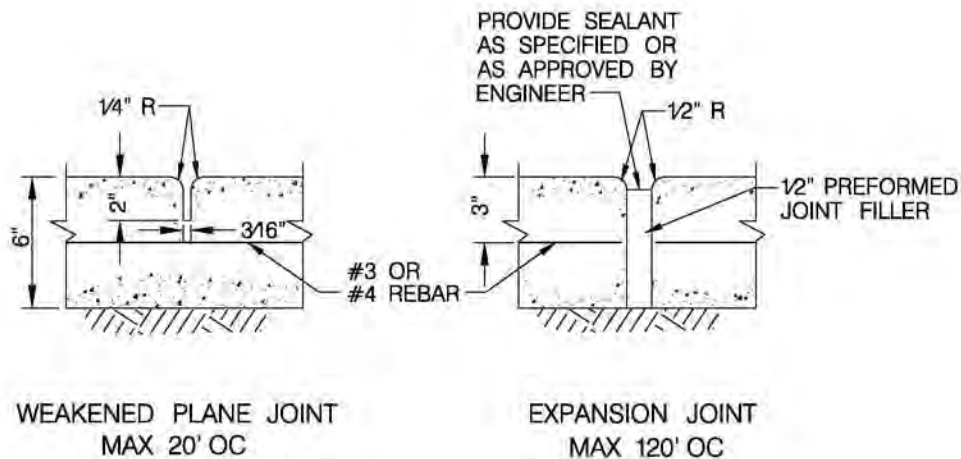
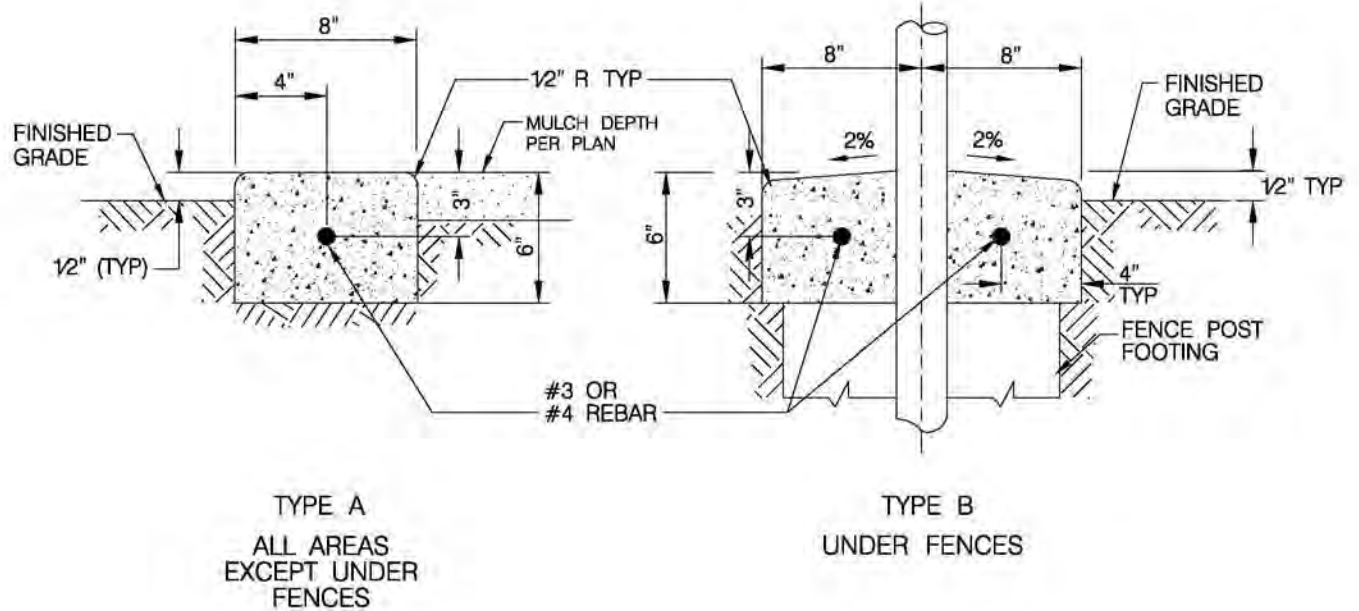
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Dunga
COORDINATOR R.C.E. 56523

2/25/16
DATE


DRAWING
NUMBER

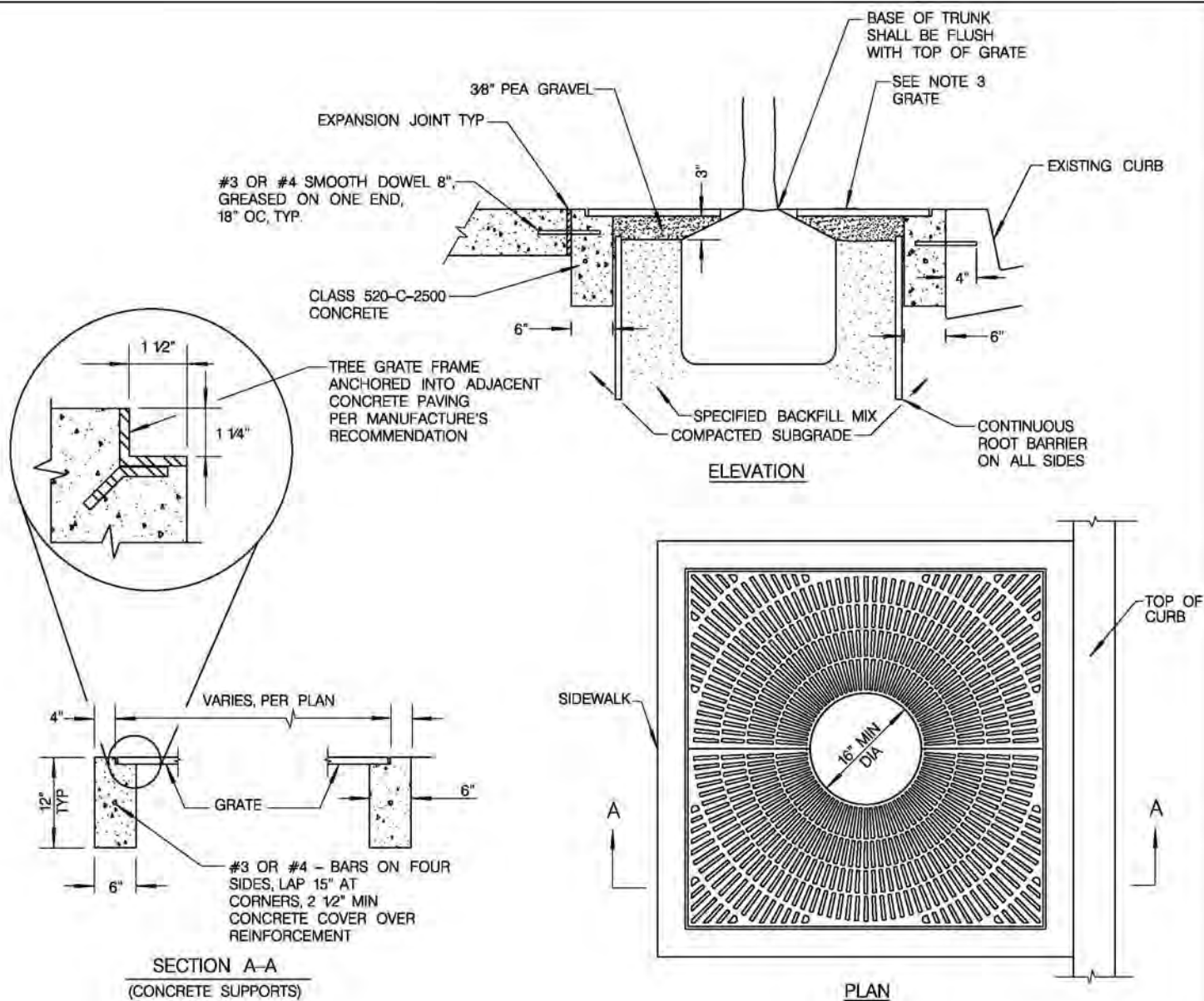
SDL-102



NOTES

1. REBAR SHALL BE CONTINUOUS WITH 12" OVERLAP WHERE SPLICED.
2. CONCRETE SHALL BE CLASS 520-C-2500 AND SAME COLOR AS ADJACENT CONCRETE AND HAVE A SMOOTH TROWEL FINISH.
3. INSTALL WEAKENED PLANE JOINTS AT EACH FENCE POST.
4. INSTALL EXPANSION JOINTS WHERE THE MOWING STRIP ABUTS CONCRETE IMPROVEMENT AND AT LOCATION APPROVED BY ENGINEER.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
				CONCRETE MOWING STRIP	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
					DRAWING
					NUMBER
					SDL-103



NOTES:

1. CONCRETE TO BE REMOVED FOR EACH TREE PLANTING SHALL BE SAW CUT FULL DEPTH.
2. BOLTS, NUTS AND WASHERS SHALL BE GRADE 316 STAINLESS STEEL. GRATE FRAME SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION. ALL GRATES SHALL BE REMOVABLE & FASTENERS SHALL BE ACCESSIBLE TO MAINTENANCE.
3. GRATES SHALL BE MINIMUM 40 SQUARE FEET IN SIZE, AND 2 SEPARATE PIECES, UNLESS OTHERWISE SPECIFIED ON THE PLANS. SLOT OPENINGS IN GRATE DESIGN SHALL HAVE 3/8" MAXIMUM WIDTH. GRATE DESIGNS AND INSTALLATION SHALL BE IN ACCORDANCE WITH CURRENT ADA STANDARDS AND THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE, WITH A MINIMUM UNIFORM LIVE LOAD OF 250 POUNDS PER SQUARE FOOT IN SIDEWALKS.
4. IMMEDIATE NOTIFICATION SHALL BE GIVEN TO THE ENGINEER OF ANY BELOW GRADE IMPROVEMENTS ENCOUNTERED.
5. SET GRATE IN FRAME PRIOR TO PLACEMENT OF PAVEMENT. ANY WARPED OR NON-FLUSH FITTING GRATES SHALL BE REPLACED.
6. TREE SHALL BE CENTERED IN GRATE OPENING. GRATES SHALL HAVE A PERMANENT SLIP RESISTANT FINISH.
7. ADJACENT SIDEWALK SHALL HAVE A MINIMUM CLEARANCE WIDTH OF 4' FROM THE EDGE OF GRATE.
8. GRATE SHALL BE UNIFORM WITH ADJACENT GRADE.
9. PROVIDE MINIMUM DISTANCE FROM OTHER OBJECTS AS FOLLOWS: 12' STREET LIGHTS, 10' FIRE HYDRANTS, 10' SEWER LINES, AND 20' TRAFFIC SIGNALS.
10. SUBMIT GRATE DESIGN FOR APPROVAL.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

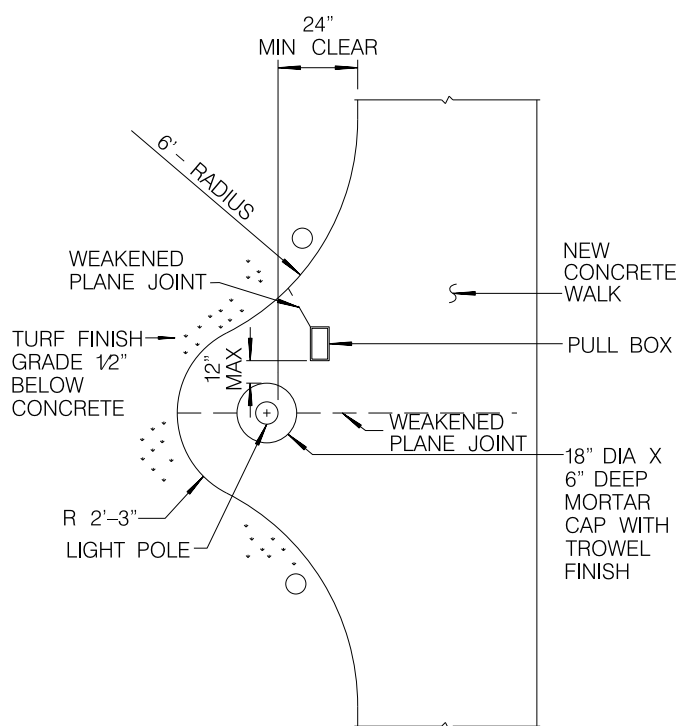
TREE GRATE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

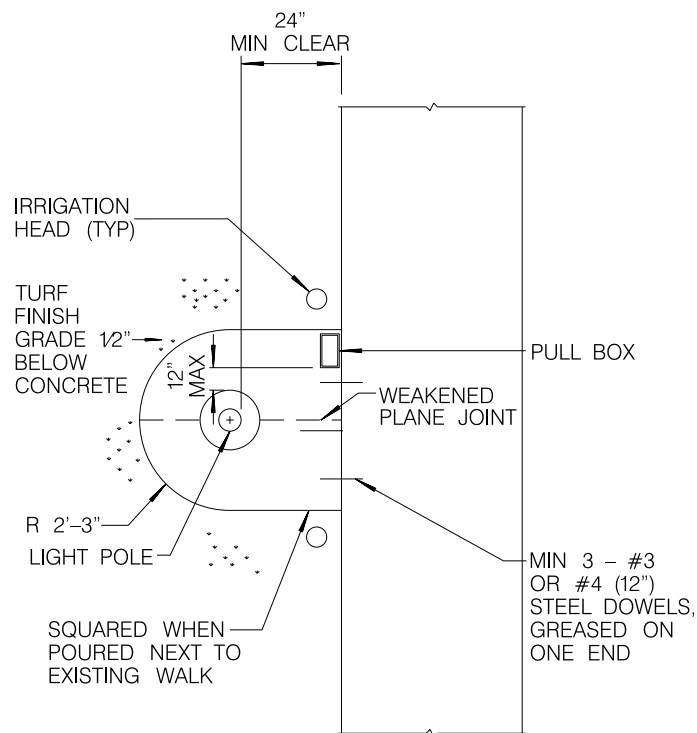
H. Hadli 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDL-104



A – MONOLITHIC CONCRETE PLACEMENT



B – PAD WHEN ADJACENT TO EXISTING CONCRETE

NOTES:

1. USE MONOLITHIC PLACEMENT FOR NEW CONSTRUCTION.
2. POLE PADS SHALL DRAIN AT 1.5% MINIMUM IN SAME DIRECTION AS SIDEWALK.
3. CONCRETE PAD SHALL BE THE SAME AS SPECIFIED FOR SIDEWALK.
4. LOCATE LIGHT POLES OUTSIDE OF TURF AREAS AND AWAY FROM TREES AS APPROVED BY THE ENGINEER UNLESS SPECIFIED OTHERWISE.
5. PULL BOX WITH BOLT-DOWN LID MINIMUM 6" FROM ALL EDGES (POLYMER EDGED BOX WITH BRICK FOUNDATION).
6. IRRIGATION HEAD SHALL BE CLEAR OF CONCRETE WALK OR PAD PER SECTION 801-5.5.2 OF THE WHITEBOOK.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	KC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

LIGHT POLE PAD IN TURF AREAS

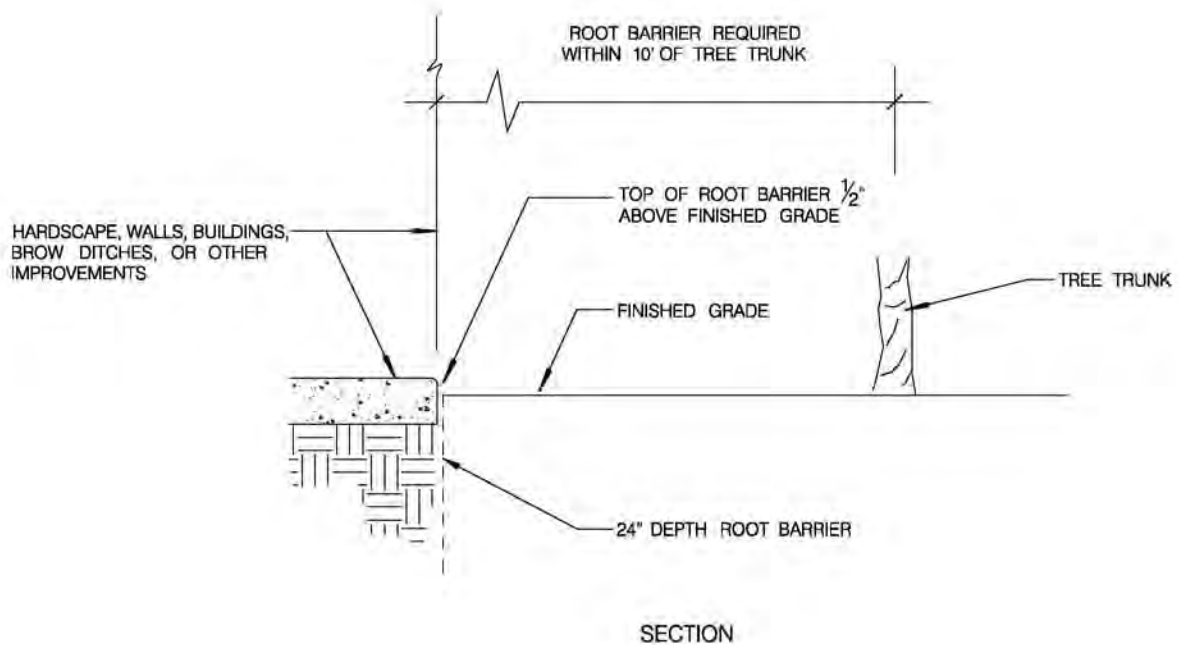
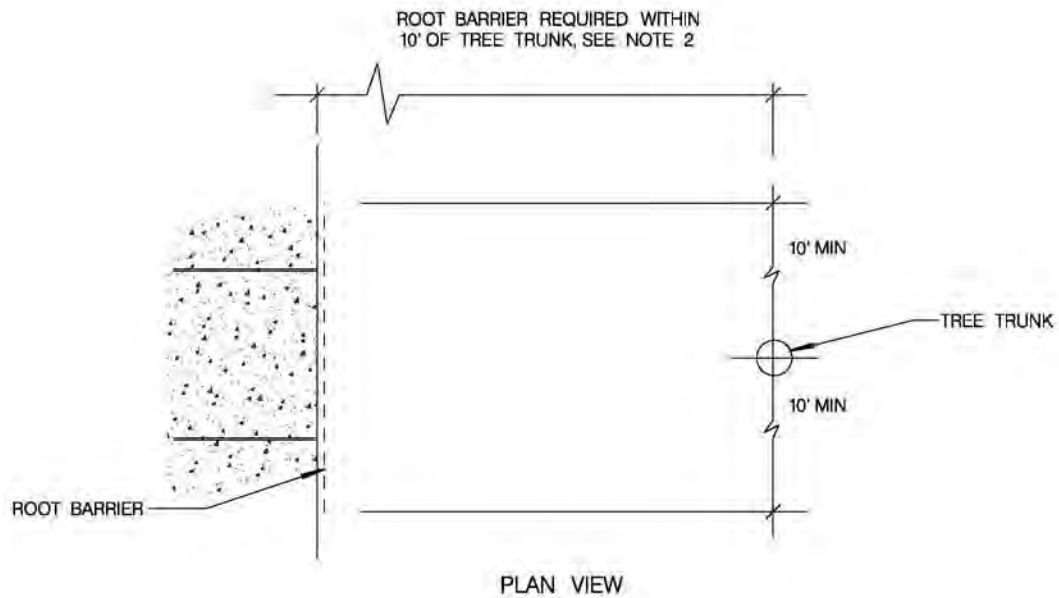
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CRDunger
COORDINATOR

2/25/16
DATE

DRAWING
NUMBER

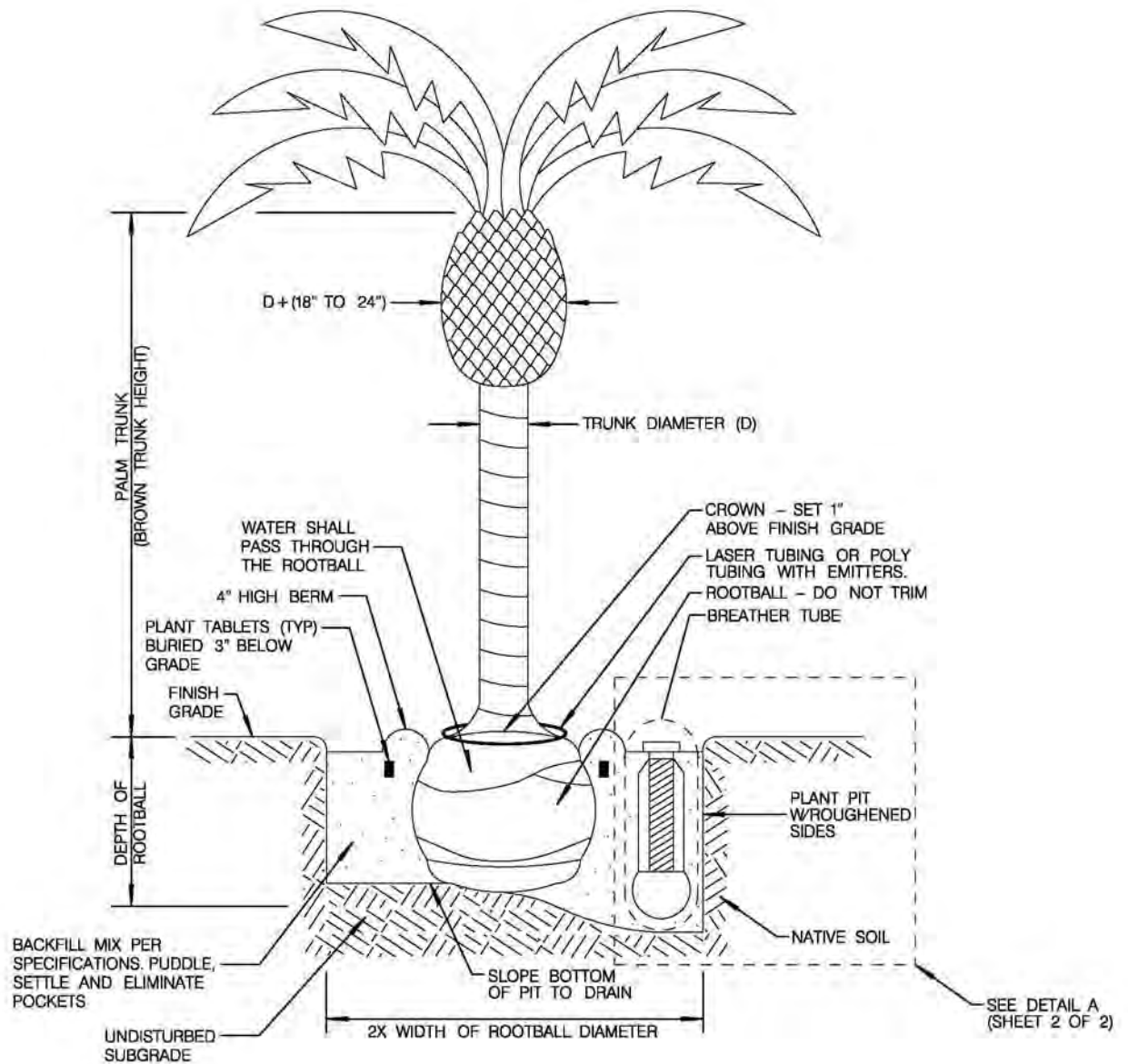
SDL-105



NOTE:

1. ROOT BARRIER SHALL BE INSTALLED ADJACENT TO THE IMPROVEMENT AND NOT AROUND THE ROOTBALL.
2. ROOT BARRIER REQUIRED WHEN TREE TRUNK IS WITHIN 10' OF HARDSCAPE, WALLS, BUILDINGS, BROW DITCHES, OR OTHER IMPROVEMENTS.
3. FOR ROOT BARRIER INSTALLATION WITH THE TREE GRATES SEE SDL-104.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
				ROOT CONTROL BARRIER	<i>H. Haddi</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDL-106

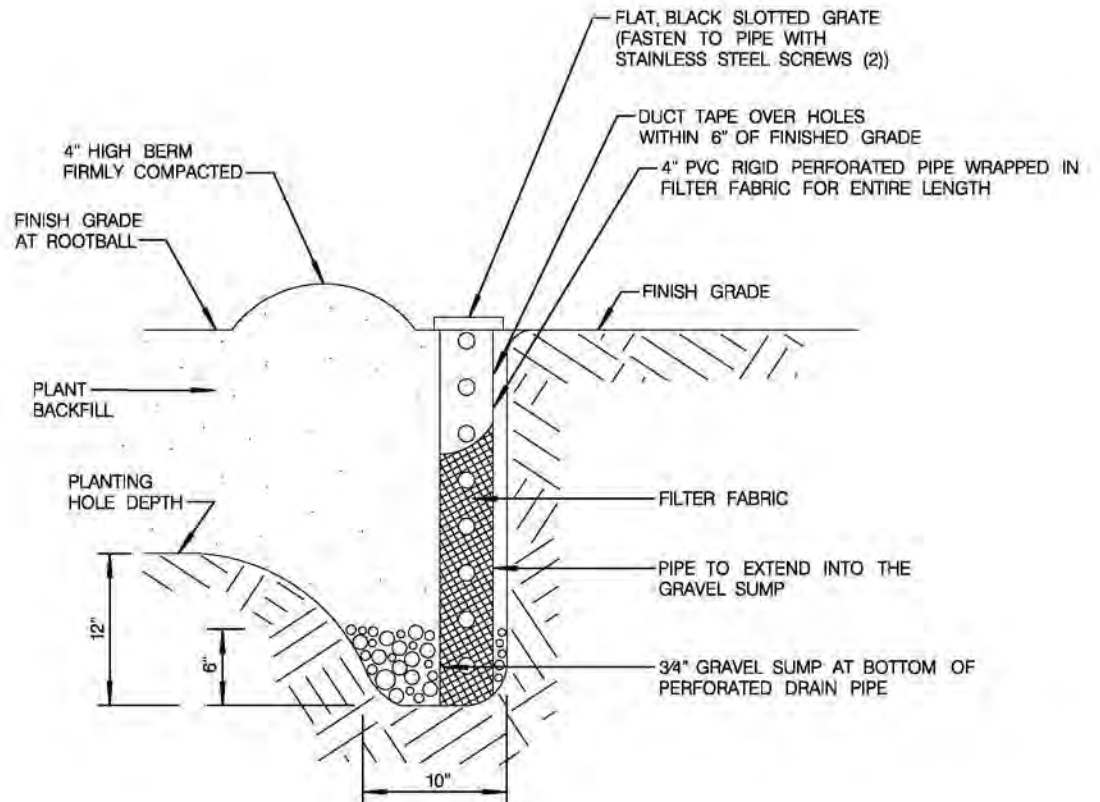


NOTES:

1. TIE PALM FRONDS TOGETHER WITH BIODEGRADABLE SISAL TWINE. TWINE SHALL BE REMOVED AFTER 90 DAYS OF TRANSPLANTING UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. PALM TRUNKS SHALL BE SKINNED, TRIMMED, AND VERTICAL.
3. STEM DIAMETER REQUIREMENT APPLIES ONLY TO PHOENIX SPECIES.

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
				PALM TREE PLANTING	<i>H. Kadi</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDL-107



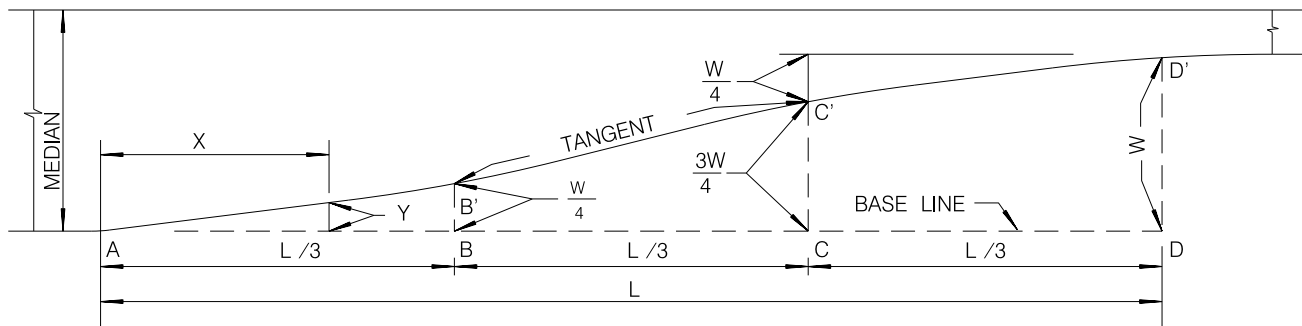
DETAIL - A
BREATHER TUBE

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadji</i> 1/31/2012 COORDINATOR R.C.E. 65271 DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
				PALM TREE PLANTING	DRAWING NUMBER SDL-107

CHAPTER 7

MISCELLANEOUS



$$Y = 2.25 W \left(\frac{X}{L} \right)^2$$

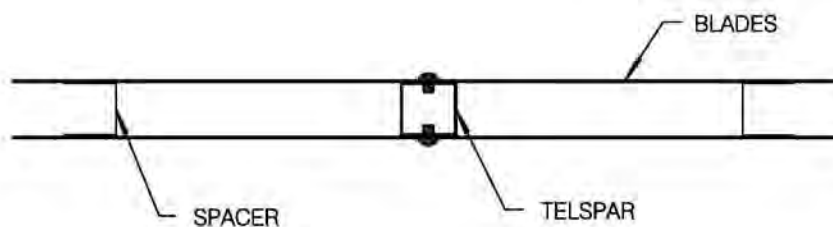
L = LENGTH OF TRANSITION
W = MAXIMUM OFFSET DISTANCE
X = DISTANCE ALONG BASELINE
Y = OFFSET FROM BASELINE

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	CITY OF SAN DIEGO – STANDARD DRAWING		RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL	JQ	G. PARKINSON	2/95			<i>Chung</i>	
UPDATED	KA	J. NAGELVOORT	02/16	LEFT TURN MEDIAN TRANSITION		COORDINATOR	2/25/16 DATE
						R.C.E. 56523	
						DRAWING	SDM-101
						NUMBER	



NOTES

1. LETTER STYLE: FUTURA BOLD CONDENSED
2. LETTER SIZE: 6" 5" 2 1/2"
3. CITY SEAL: 4"
4. BACKGROUND: TYPE IV PRISMATIC SHEETING
5. ELECTRO CUT BLUE OVER WHITE
6. .065 ALUMINUM
7. MOUNTED TO TELSPAR WITH 3/8" DRIVE RIVETS
8. 4" TALL BY 1 1/4" SQ. CHANNEL SPACER HELD WITH VHB 4950 TAPE
9. 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 DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>[Signature]</i> 1/31/2012 COORDINATOR R.C.E. 65271 DATE
ORIGINAL		J. CASEY	11/8/88		
UPDATED	KA	J. NAGELVOORT	01/12	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 TELES PAR 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 TELES PAR 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 SHALL BE PERPENDICULAR TO TOP BOTTOM EDGES. EDGES SHALL BE FREE OF SHARP BURRS. EACH BLADE SHALL BE DRILLED WITH TWO 7/16" HOLES, ONE AT TOP AND 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 SHALL 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 SHALL 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" TELES PAR EXTENSION WITH A 3/8" DRIVE RIVET. EACH STREET NAME SHALL BE MOUNTED BACK TO BACK WITH THE TELES PAR 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" TELES PAR POST AND FASTENED WITH A DRIVE RIVET.

SHEET 2 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  1/31/2012
ORIGINAL		J. CASEY	11/88		
UPDATED	KA	J. NAGELVOORT	01/12	STREET NAME SIGN	COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER
					SDM-102

STREET NAME SIGN STANDARDS

SUFFIX AND PREFIX ABBREVIATIONS:

AVENUE	AVE
STREET	ST
COURT	CT
DRIVE	DR
ROAD	RD
BOULDEVARD	BLVD
TERRACE	TER
MOUNTAIN	MTN
MOUNT	MT
POINT	PT
CAMINITO	CMTO
CAMINO	CAM
RANCHO	RCHO

SPELL OUT "FIRST AVE THROUGH TWELFTH AVE"

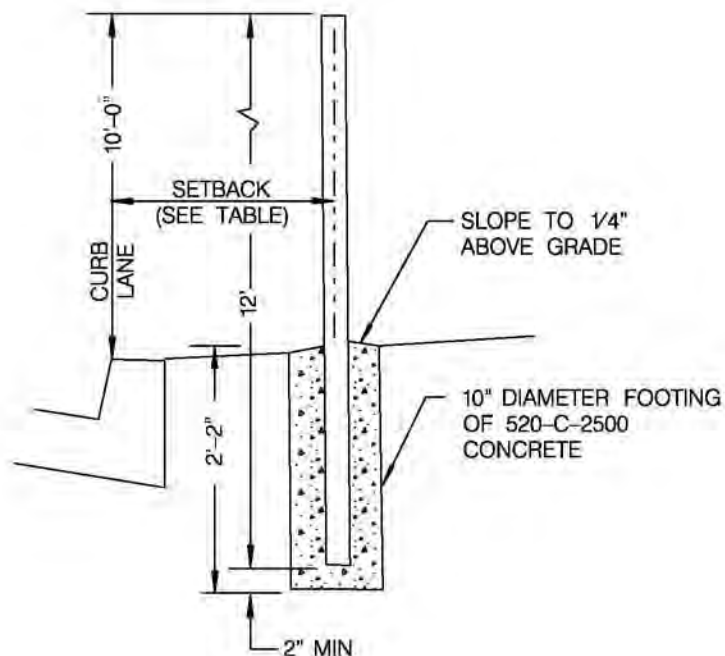
THEN: 13TH ST – 14TH ST ETC.

NOTE:
FOR A COMPLETE LIST OF SUFFIX AND PREFIX ABBREVIATIONS REFER
TO THE OFFICIAL USPS ABBREVIATION.

SHEET 3 OF 4

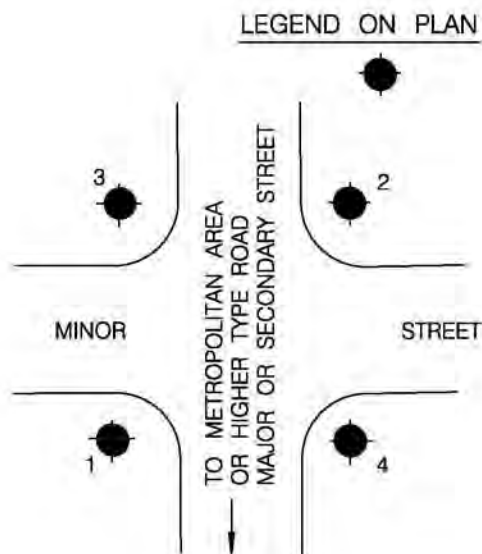
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  1/31/2012
ORIGINAL	XX	J.P. CASEY	11/88		
REV. - 1	TH		7/00	STREET NAME SIGN	COORDINATOR R.C.E. 66271 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
					DRAWING NUMBER SDM-102

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

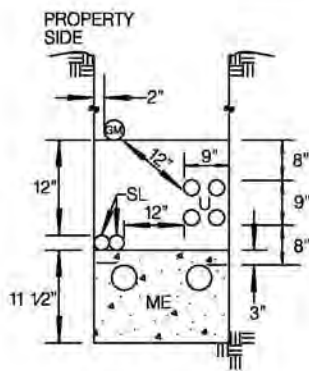


STREET NAME SIGN LOCATION

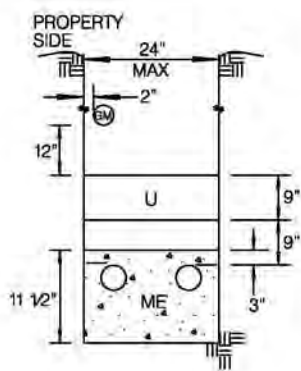
(NUMBERS INDICATE PRIORITY OF LOCATION SELECTION WHEN THERE IS A CONFLICT WITH OTHER IMPROVEMENTS)

SHEET 4 OF 4

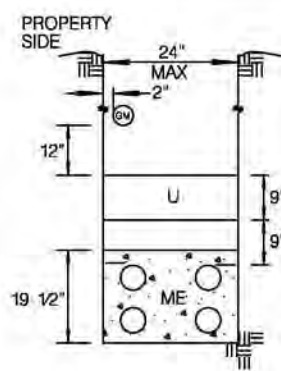
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ORIGINAL		J.P. CASEY	1/88		
REV. - 1	TH		7/00	STREET NAME SIGN	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
UPDATED	KA	J. NAGELVOORT	01/12		
					DRAWING NUMBER SDM-102



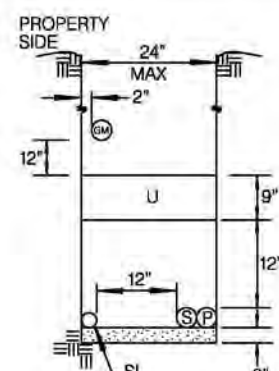
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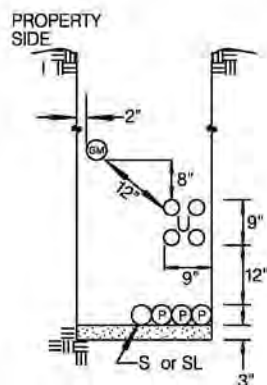
TYPE B



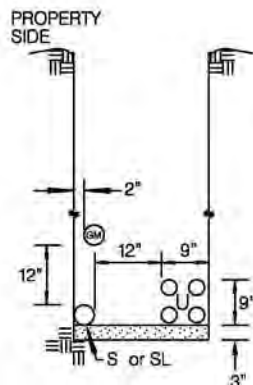
TYPE C



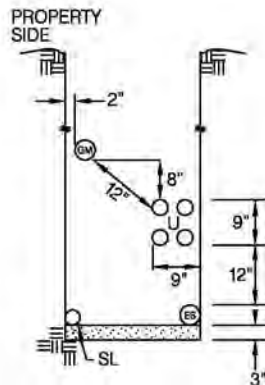
TYPE D



TYPE E



TYPE F



TYPE G
SERVICE TRENCH
ON
PUBLIC PROPERTY

	LEGEND	MINIMUM COVER
GM	GAS MAIN	30"
GS	GAS SERVICE	30"
P	PRIMARY ELECTRIC	42"
S	SECONDARY ELECTRIC	30"
ES	ELECTRIC SERVICE	30"
ME	MULTIPLE ELECTRIC (P, S OR ES IN SPACERS) CONCRETE ENCASED	24"
SL	STREET LIGHT (NOT SERIES)	30"
U	CATV	24"
	TELCO	24"

NOTES

- ALL DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED.
- THE LOCATION OF UTILITIES AS SHOWN BY THE STANDARD DRAWING SHALL IN NO WAY VIOLATE EXISTING CODES OR REGULATIONS APPLICABLE TO INDIVIDUAL UTILITIES.
- INSTALLATION OF SEWER OR WATER UTILITIES ARE NOT PERMITTED IN THE JOINT TRENCHES SHOWN ABOVE.
- MINIMUM DEPTH OF GAS PIPE MAY, SUBJECT TO GAS COMPANY INSPECTORS APPROVAL, BE REDUCED TO 24" WHERE NECESSARY TO CLEAR STRUCTURE CROSSINGS.
- DEPTH AND WIDTH OF TRENCH VARIES.
- CATV MAIN OR TRUNK LINE CONDUIT REQUIRED ALONG ALL STREETS, EXCEPT CUL-DE-SAC STREETS LESS THAN 1000' IN LENGTH WHICH MAY BE SERVED BY FEEDER LINES ONLY.
- CATV 1 1/2" FEEDER CONDUIT SHALL RUN ACROSS STREETS WITH EACH POWER SERVICE LINE AND CAPPED AT EDGE OF SIDEWALK.
- ALL CATV TERMINALS AND CONDUITS SHALL BE TERMINATED AT GENERALLY ACCEPTED LOCATIONS AND MARKED. A MAP SHALL BE FILED WITH THE CITY SHOWING THE LOCATIONS OF THE CATV SYSTEM.
- IN NO CASE SHALL CATV CONDUITS BE PLACED WITHIN 12" OF GAS LINES, ALSO CONDUITS SHALL NOT BE PLACED DIRECTLY OVER GAS LINES.
- CATV CONDUIT MAY BE PLACED WITH THE TELCO CONDUIT PROVIDED THE TELCO MINIMUM DEPTH IS HELD.
- TRAFFIC SIGNAL CONDUIT SHALL BE PLACED WHERE STREET LIGHT CONDUIT IS SHOWN.

REVISION	BY	APPROVED	DATE
ORIGINAL*	BY	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

JOINT TRENCH LOCATIONS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadli

1/31/2012

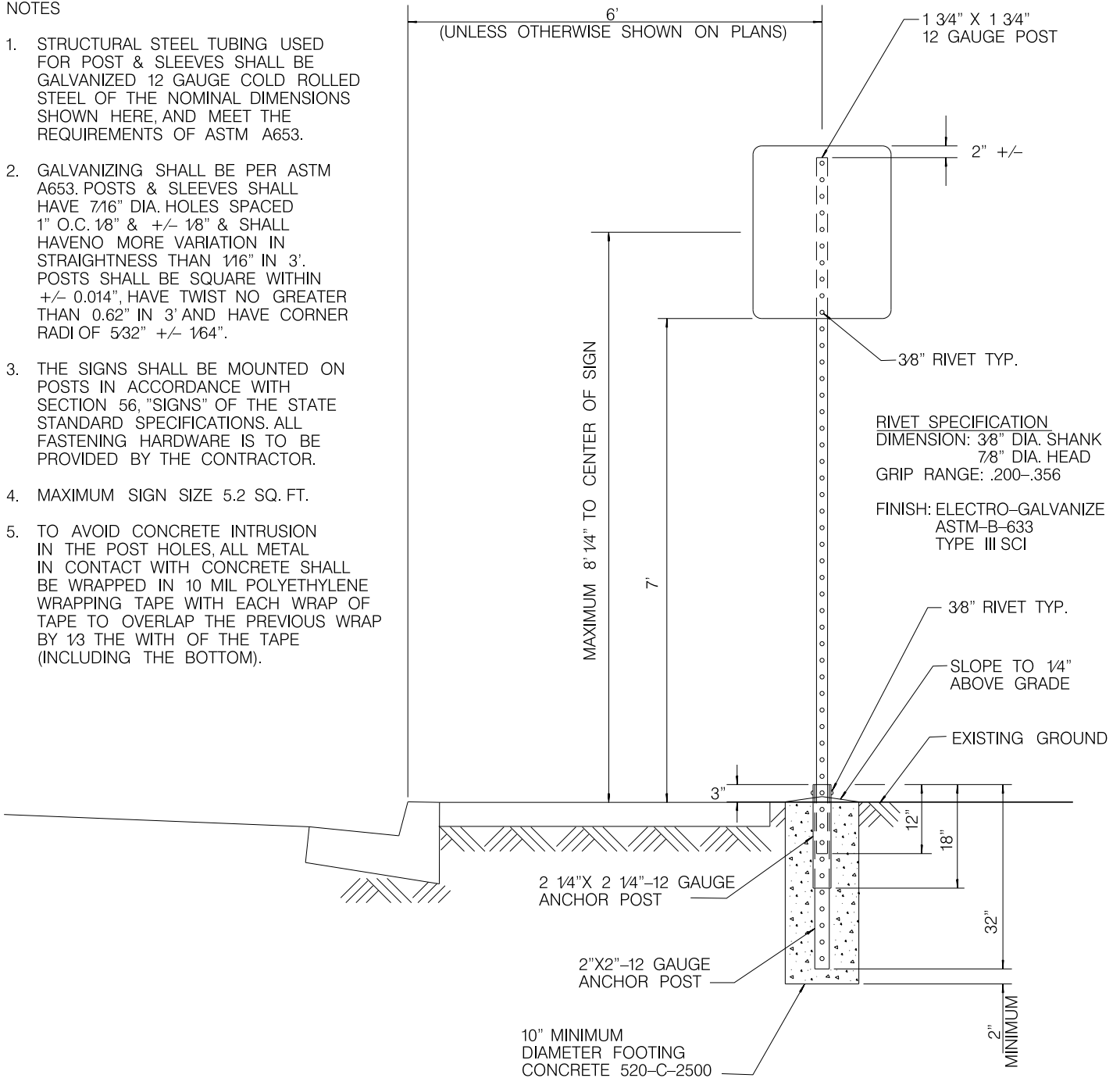
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDM-103

NOTES

1. STRUCTURAL STEEL TUBING USED FOR POST & SLEEVES SHALL BE GALVANIZED 12 GAUGE COLD ROLLED STEEL OF THE NOMINAL DIMENSIONS SHOWN HERE, AND MEET THE REQUIREMENTS OF ASTM A653.
2. GALVANIZING SHALL BE PER ASTM A653. POSTS & SLEEVES SHALL HAVE 7/16" DIA. HOLES SPACED 1" O.C. 1/8" & +/- 1/8" & SHALL HAVE NO MORE VARIATION IN STRAIGHTNESS THAN 1/16" IN 3'. POSTS SHALL BE SQUARE WITHIN +/- 0.014", HAVE TWIST NO GREATER THAN 0.62" IN 3' AND HAVE CORNER RADI OF 5/32" +/- 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.
5. TO AVOID CONCRETE INTRUSION IN THE POST HOLES, ALL METAL IN CONTACT WITH CONCRETE SHALL BE WRAPPED IN 10 MIL POLYETHYLENE WRAPPING TAPE WITH EACH WRAP OF TAPE TO OVERLAP THE PREVIOUS WRAP BY 1/3 THE WITH OF THE TAPE (INCLUDING THE BOTTOM).



REVISION	BY	APPROVED	DATE
ORIGINAL	BB	J. NAGELVOORT	05/15
UPDATED	MM	J. NAGELVOORT	08/15
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

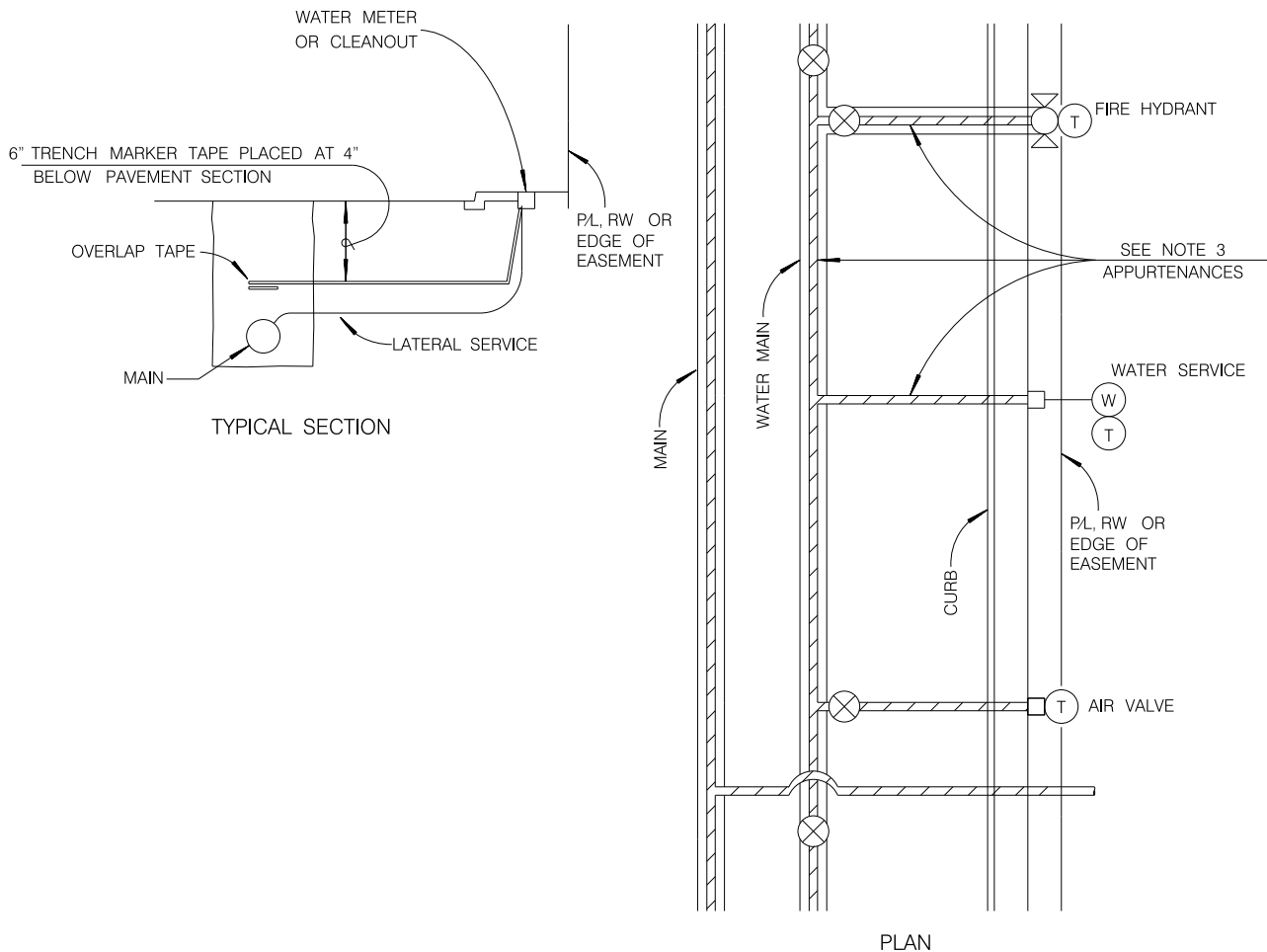
BREAK-AWAY SIGN POST

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung 2/25/16
COORDINATOR R.C.E.56523 DATE

DRAWING
NUMBER

SDM-104



NOTES:

1. TRENCH MARKER TAPE SHALL BE 6" WIDE AND CONSIST OF A MINIMUM 5.0 MIL, FIVE-PLY 100% VIRGIN POLYETHYLENE WHICH IS ACID, ALKALINE, AND CORROSION RESISTANT. ELONGATION PROPERTIES AND TENSILE STRENGTH OF NOT LESS THAN 7,800 PSI SHALL BE IN ACCORDANCE WITH ASTM D882-80A. THE TRENCH MARKER TAPE FOR WATER LINES SHALL HAVE A MINIMUM 20 GAUGE SOLID ALUMINUM FOIL CORE, ADHERED TO A 2.55 MIL POLYETHYLENE BACKING.
2. TAPE SHALL BE INSTALLED ABOVE THE PIPE AS SPECIFIED AND RUN CONTINUOUSLY ALONG THE LENGTH OF THE PIPE AND ALL RELATED APPURTENANCES.
 - A. BLUE WITH "CAUTION POTABLE WATER LINE BURIED BELOW" FOR WATER MAINLINES AND OVER PIPE SLEEVES.
 - B. PURPLE WITH "CAUTION RECYCLED/RECLAIMED WATER LINE BURIED BELOW" FOR RECYCLED WATER AND IRRIGATION MAINLINES.
 - C. RED WITH "CAUTION ELECTRIC LINE BURIED BELOW" FOR ELECTRICAL LINES, INCLUDING, BUT NOT LIMITED TO, 110/220V POWER TO IRRIGATION CONTROLLERS AND PUMPS, TRAFFIC SIGNALS AND STREETLIGHTS, COMMUNICATION CABLES AND IRRIGATION DIRECT BURIAL CONTROL WIRES TO REMOTE CONTROL VALVES.
 - D. GREEN WITH "CAUTION SEWER LINE BURIED BELOW" FOR SEWER MAINLINES AND OVER PIPE SLEEVES.
 - E. GREEN WITH "CAUTION STORM DRAIN LINE BURIED BELOW" FOR STORM DRAIN MAINLINES AND OVER PIPE SLEEVES.
3. ELECTRICALLY BOND WATER SERVICE TAPE AND WATER MAIN TAPE TOGETHER. TAPE SHALL EXTEND WITHIN METER BOX ITSELF TO ALLOW MARKOUT BY CONTINUITY TESTER.

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	BB	J. NAGELVOORT	06/15
UPDATED	BD	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**WARNING / IDENTIFICATION
TAPE INSTALLATION**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

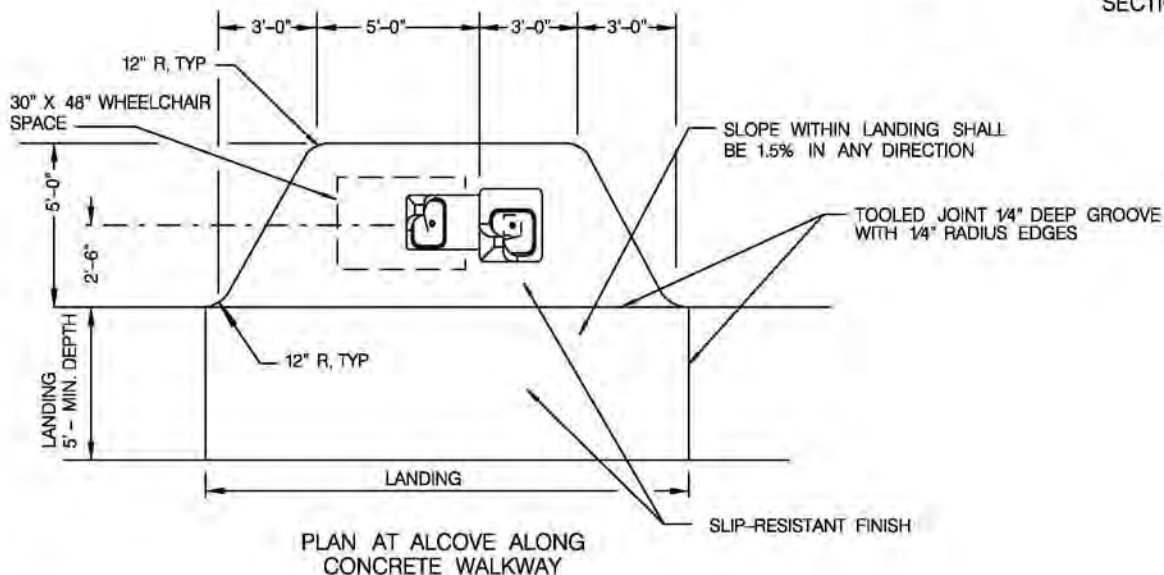
CA Bungea
COORDINATOR

2/25/16
R.C.E. 56523 DATE


DRAWING
NUMBER

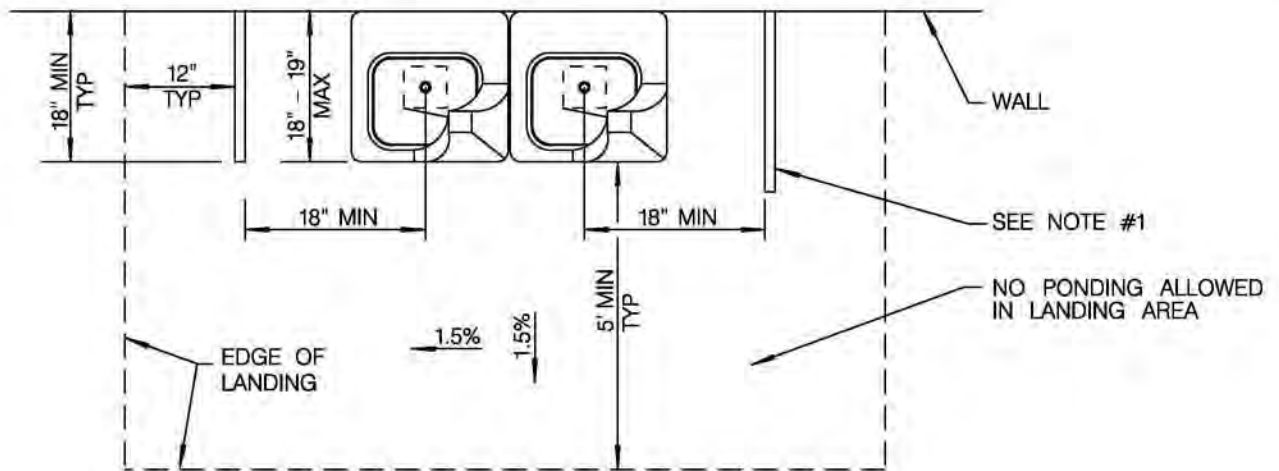
SDM-105

- 1 DUAL - HEIGHT DRINKING FOUNTAIN AS APPROVED BY THE CITY ENGINEER.
- 2 12" X 4" LOOP ANCHORS AND 12" 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 12" X 16" CONCRETE YARD BOX WITH HINGED LOCKING TOP (BROOKS NO. 3HL OR EQUAL) SET ON RED BRICK FOUNDATION.
- 5 4" X 40' PERFORATED PLASTIC UNDERDRAIN PIPE, ENCASED IN 3/4" CRUSHED ROCK.
- 6 1" GATE VALVE WITH RED BRASS CROSS HANDLE AND UNION.
- 7 2" DIA PIPE SLEEVE WITH RED BRASS LOCK CAP.
- 8 RIGID COPPER PIPE FROM GATE VALVE TO FOUNTAIN ASSEMBLY CONNECTION.
- 9 6" THICK CONCRETE PAVEMENT.

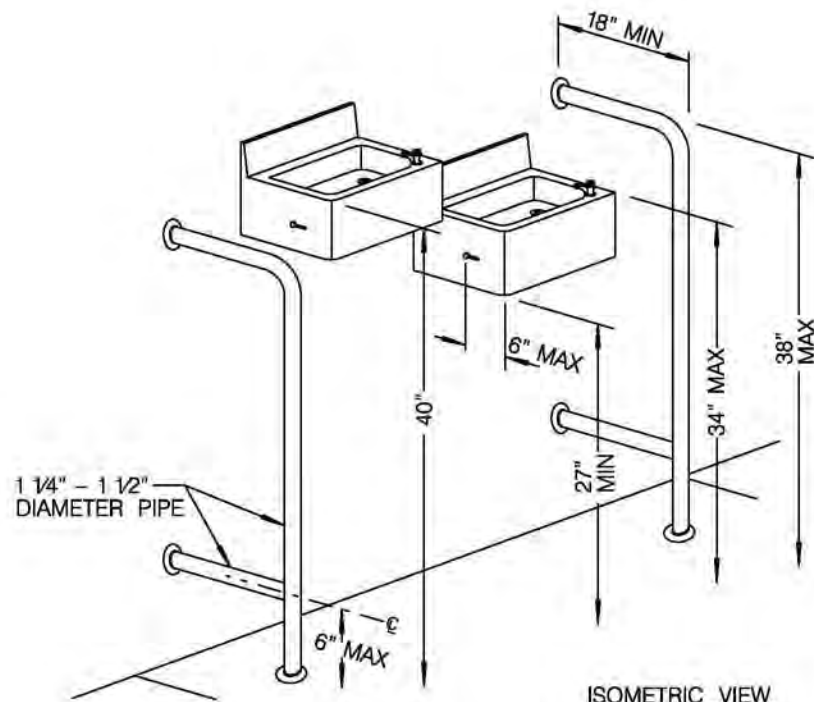


1. INSTALL DRINKING FOUNTAINS SO THAT RIGHT HAND SIDE FACES PREVAILING WIND.
2. HAND FORM A CONCRETE BOWL AT BOTTOM OF YARD BOX TO FACILITATE SAND CLEAN OUT.
3. PERFORATED DRAIN PIPE AND TRENCH SHALL DRAIN AWAY FROM FOUNTAIN.
4. USE RED BRASS BUSHING REDUCERS TO ADAPT TO FEED PIPE.
5. LOCATE DRINKING FOUNTAINS IN AN ALCOVE OR AT AREAS OUTSIDE THE PATH-OF-TRAVEL OTHERWISE PROVIDE PROTECTIVE RAILING PER SDM-108.
6. NO WATER PONDING IS ALLOWED IN LANDING AND ALCOVE AREAS.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	SM	A. OSKOJI	1203		 1/31/2012
UPDATE	FC	A. OSKOJI	1206	DUAL HEIGHT DRINKING FOUNTAIN (NEW CONSTRUCTION)	COORDINATOR R.C.E. 65271 DATE
UPDATE	FC	A. OSKOJI	1208		
UPDATE	KA	J. NAGELVOORT	01/12		
					DRAWING NUMBER SDM-107



PLAN



ISOMETRIC VIEW

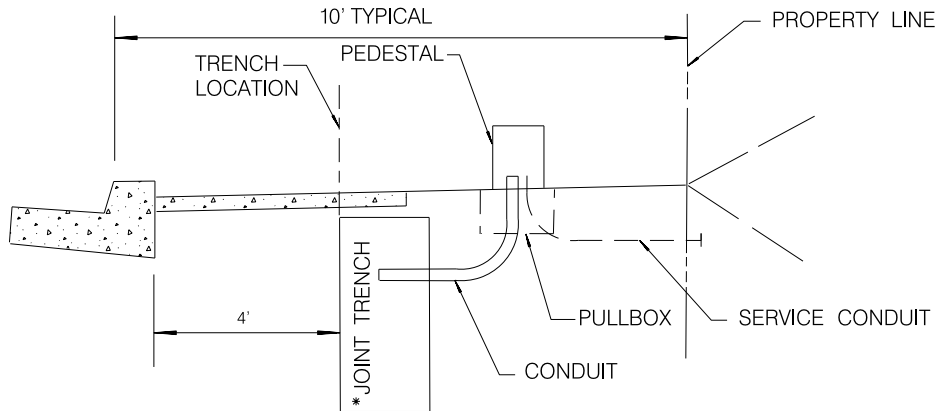
NOTES:

1. 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.
2. 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.
3. THE LANDING SHALL BE PAVED WITH A SOLID AND STABLE MATERIAL WITH A SLIP-RESISTANT FINISH.

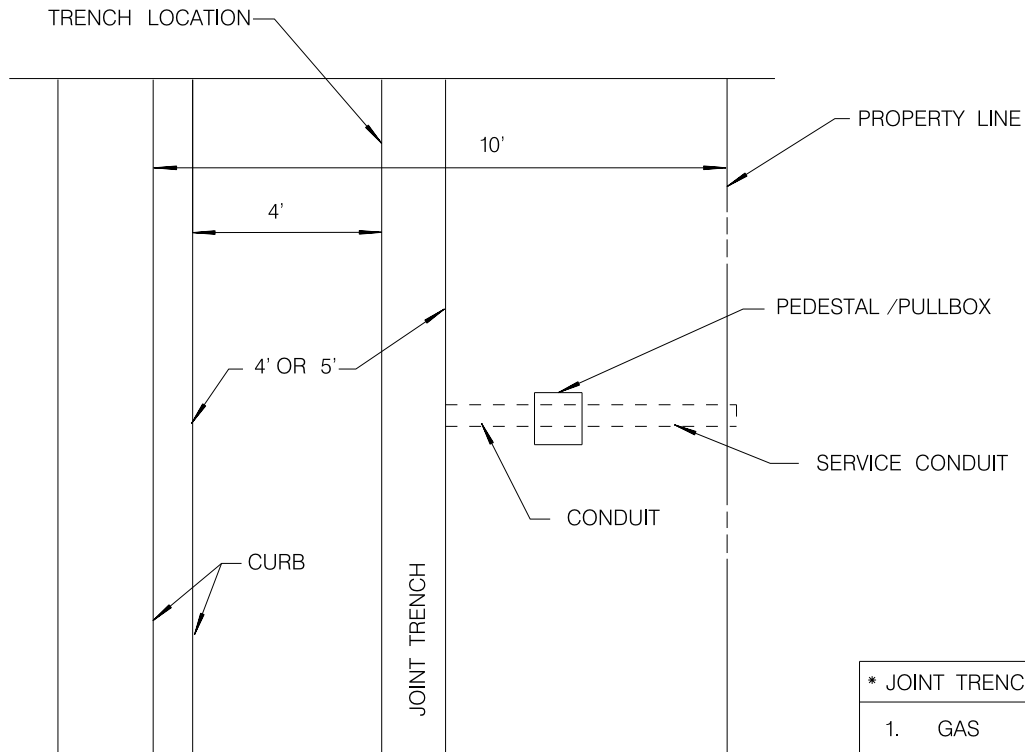
LEGEND ON PLANS



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	SS	A. OSKOUI	12/03		
UPDATE	FC	A. OSKOUI	12/06	DUAL HEIGHT DRINKING FOUNTAIN NON-ALCOVE (FOR EXISTING STRUCTURES)	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
UPDATE	FC	A. OSKOUI	12/08		
UPDATE	KA	J. NAGELVOORT	01/12		
					DRAWING NUMBER SDM-108



SECTION VIEW



PLAN VIEW

* JOINT TRENCH
1. GAS
2. STREET LIGHTS
3. UNDERGROUND ELECTRIC
4. TELEPHONE
5. CATV

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	8/86
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

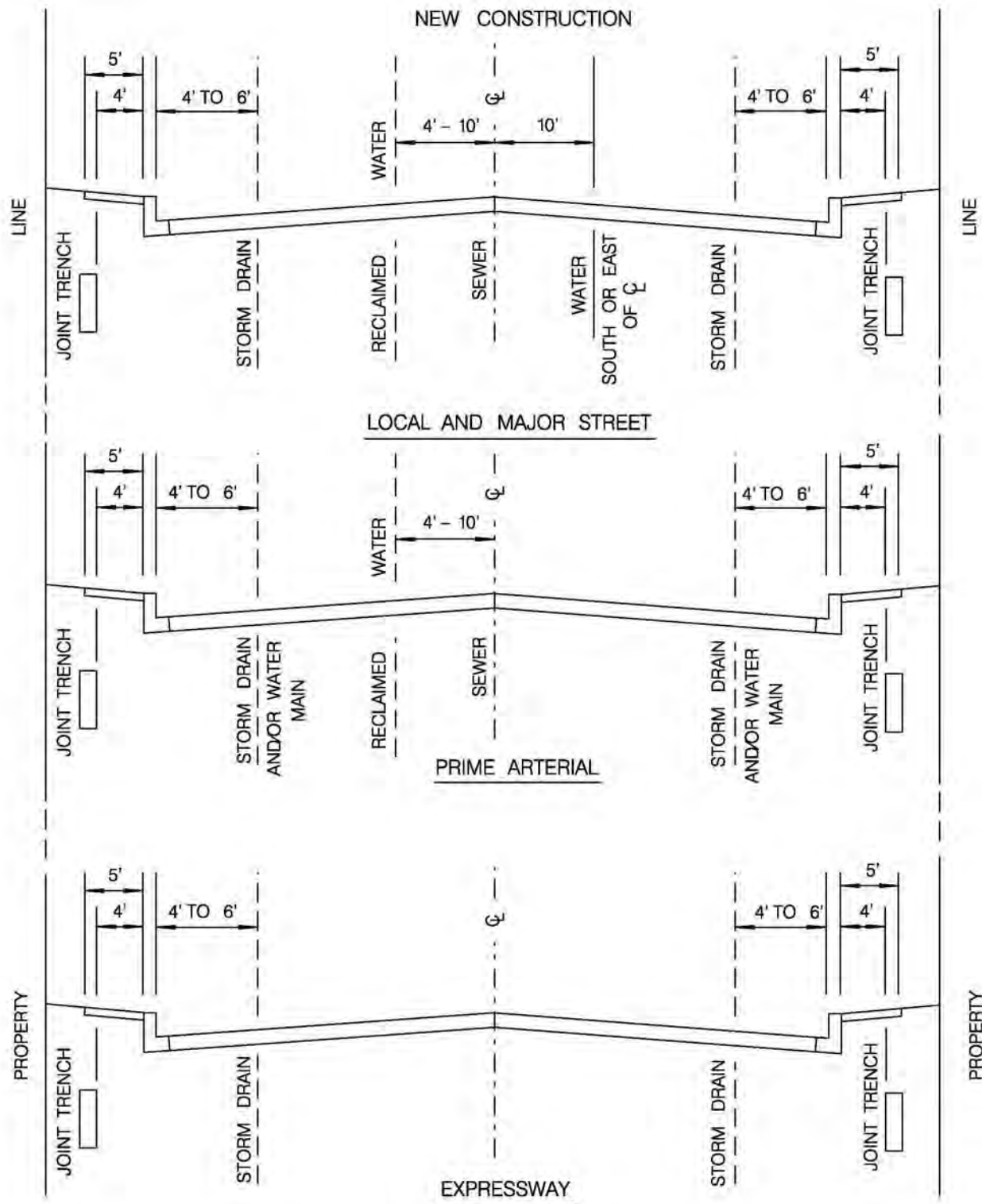
**UNDERGROUND TYPICAL LOCATION
(NEW CONSTRUCTION)**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CAHingee 2/25/16
COORDINATOR R.C.E. 56523 DATE

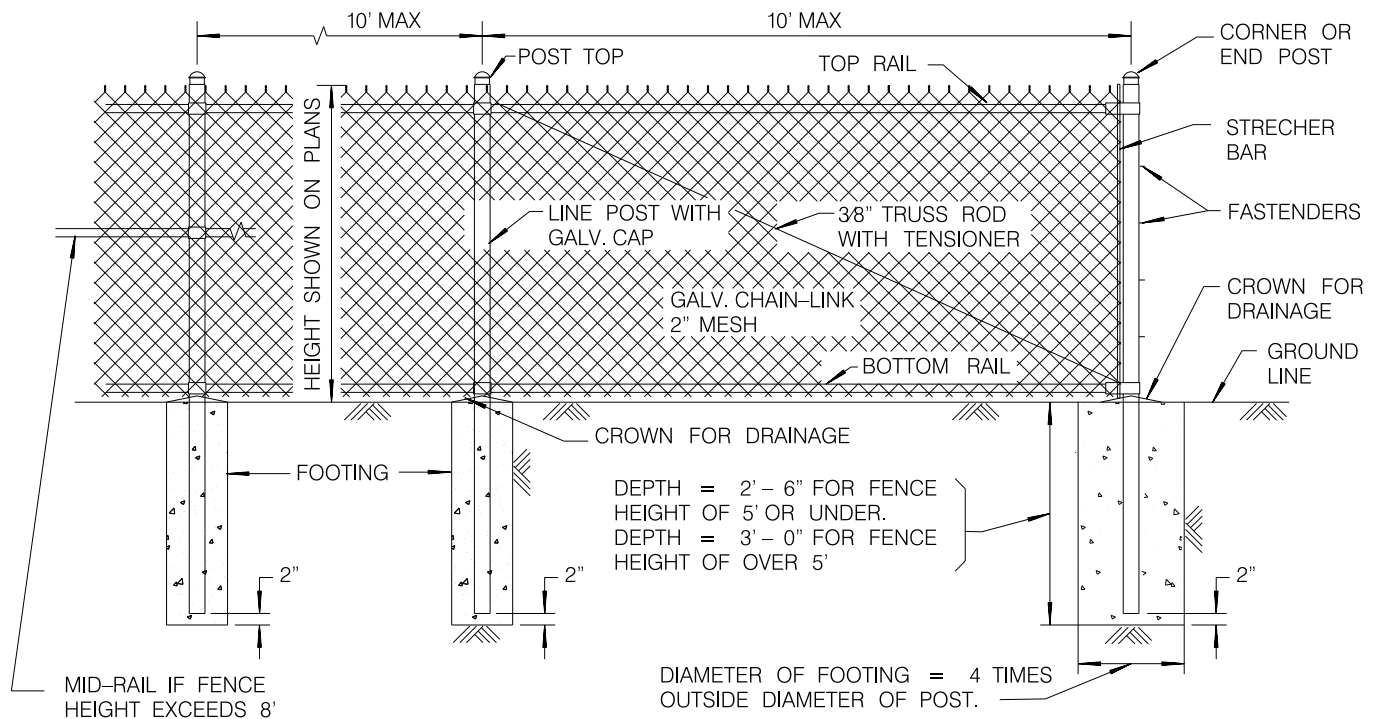
DRAWING
NUMBER

SDM-109



- NOTES:
1. AT CATCH BASIN LOCATIONS, JOINT TRENCH SHALL BE 7' MINIMUM FROM BACK OF CURB TO INSIDE WALL OF TRENCH.
 2. SEWER AND RECLAIMED WATER MAINS AND LATERALS SHALL BE DESIGNED TO CROSS UNDER POTABLE WATER MAINS WITH A MINIMUM VERTICAL SEPARATION OF 12".
 3. SEWER AND RECLAIMED WATER MAINS SHALL MAINTAIN A 10' MINIMUM HORIZONTAL SEPARATION FROM ANY POTABLE WATER.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> 1/31/2012
ORIGINAL		J. CASEY	09/86		
UPDATE	KA	J. NAGELVOORT	01/12	UTILITY LOCATIONS IN LOCAL AND MAJOR STREETS, PRIME ARTERIALS AND EXPRESSWAYS	COORDINATOR R.C.E. 65271 DATE
					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 OR CALLED FOR IN THE SPECIAL PROVISIONS:
A. BARBED WIRE
B. EXTENSION ARM
3. CHAIN LINK FENCE SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION UNLESS SPECIFICALLY NOTED ON THIS DRAWING.
4. 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 SHALL MATCH FABRIC).
5. CHAIN LINK FABRIC SHALL HAVE KNUCKLED FINISH ON TOP EDGE.
6. SEE M-20 FOR ADDITIONAL DETAILS.

LEGEND ON PLANS

—X—O—X—X—X—O—X—

REVISION	BY	APPROVED	DATE
ORIGINAL		J.P. CASEY	06/92
UPDATE	KA	J. NAGELVOORT	01/12
UPDATE	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

VINYL COATED CHAIN LINK FENCE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

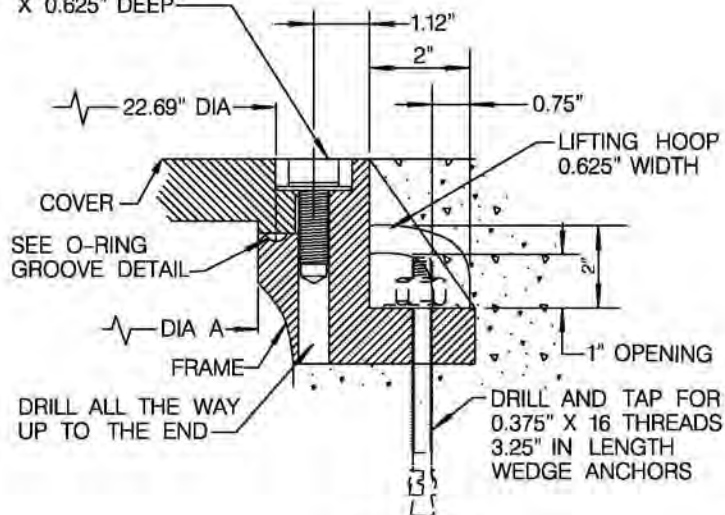
Chung
COORDINATOR R.C.E. 56523

2/25/16
DATE

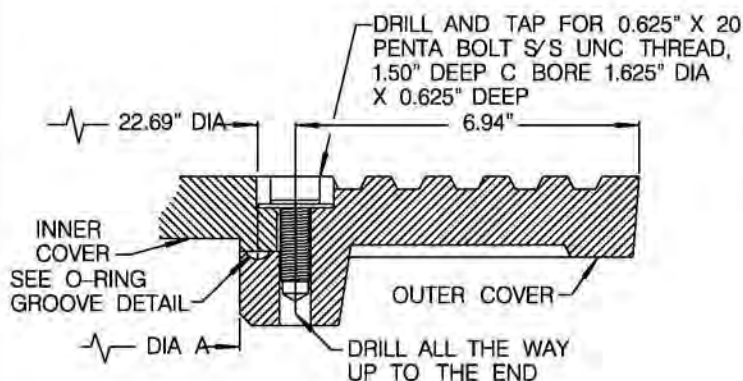
DRAWING
NUMBER

SDM-112

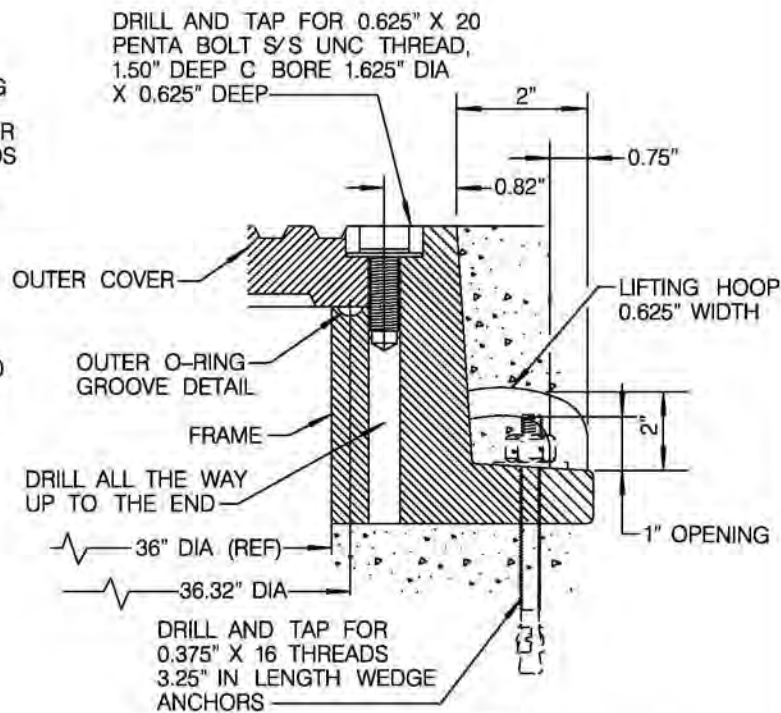
DRILL AND TAP FOR 0.625" X 20
PENTA BOLT S/S UNC THREAD,
1.50" DEEP C BORE 1.625" DIA
X 0.625" DEEP



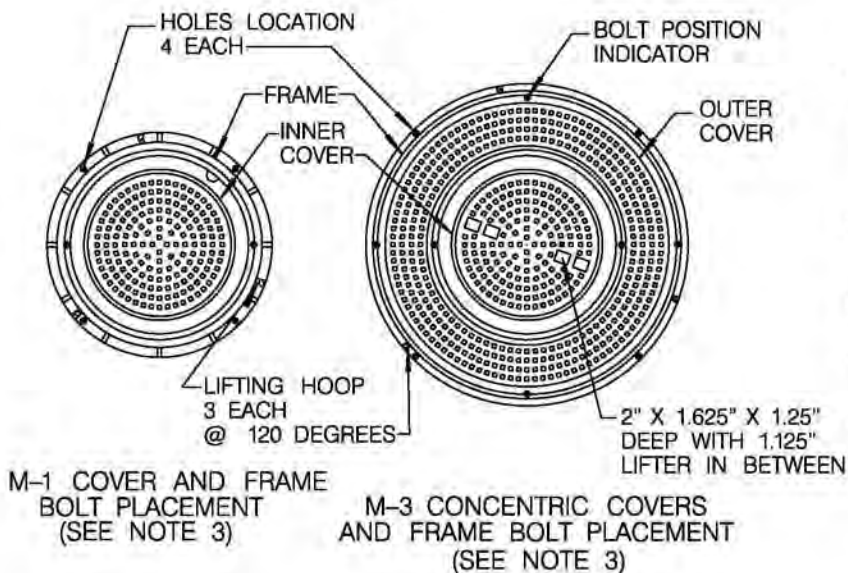
M-1 DETAIL
COVER TO FRAME



M-3A DETAIL:
INNER COVER TO OUTER COVER



M-3B DETAIL:
OUTER COVER TO FRAME



NOTES:

- 0.625" X 20 PENTA BOLT S/S UNC THREAD, 316 STAINLESS STEEL SOCKET HEAD CAP SCREW AND 1.50" OD X 0.687" ID 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		A. OSKOUI	12/03
UPDATE	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

MANHOLE COVER - LOCKING DEVICE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

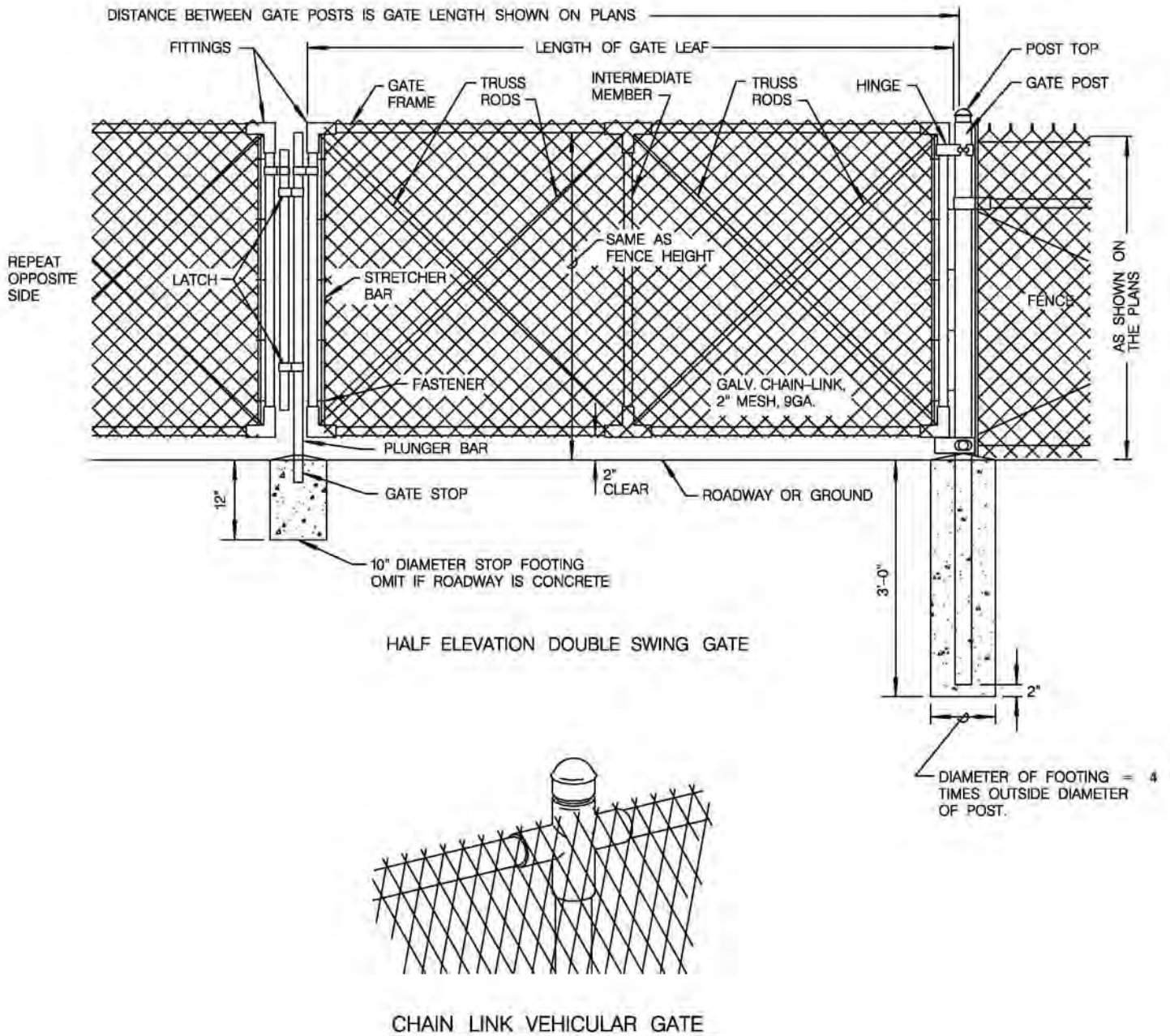
H. Hadli

1/31/2012

COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDM-113



NOTES:

1. ALL FOOTINGS SHALL BE 520-C-2500 CONCRETE.
2. EXTENSION POST SHALL BE FURNISHED AND INSTALLED ONLY WHEN SHOWN ON THE PLANS OR CALLED FOR IN THE SPECIAL PROVISIONS:
3. CHAIN LINK FENCE SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION UNLESS SPECIFICALLY NOTED ON THE DRAWING.
4. CHAIN LINK FABRIC SHALL HAVE KNUCKLED FINISH ON TOP EDGE.

LEGEND ON PLANS



SHEET 1 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL	SM	A. OSKOUI	12/03
UPDATE	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

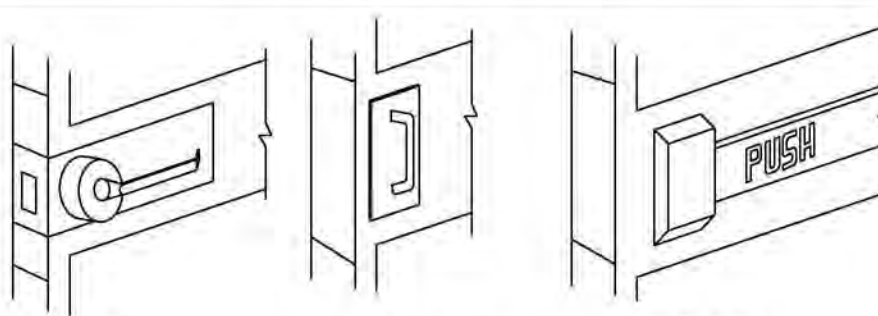
CHAIN LINK GATE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadi 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDM-114

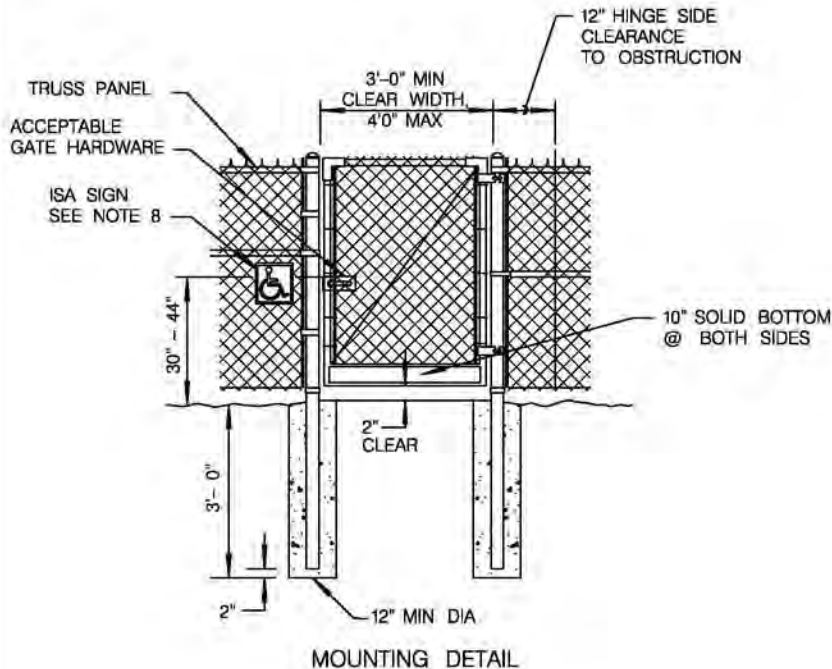


LEVER

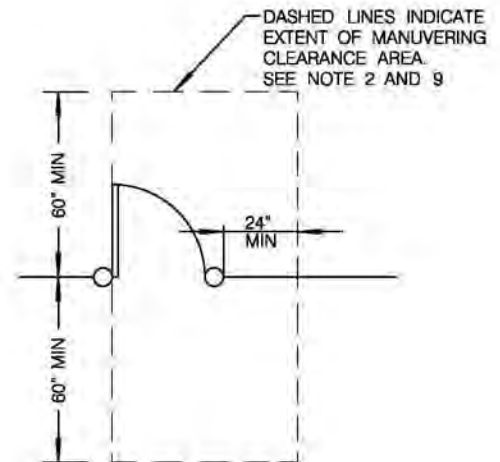
PUSH / PULL

PANIC BAR

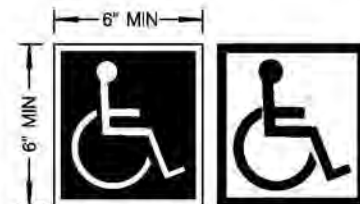
ACCEPTABLE GATE HARDWARE



MOUNTING DETAIL



LEVEL MANEUVERING CLEARANCE



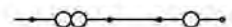
INTERNATIONAL SYMBOL OF ACCESSIBILITY SIGN (ISA)

CHAIN LINK PEDESTRIAN GATE

NOTES

1. GATES THAT ARE ACCESSIBLE TO AND USABLE BY PERSONS WITH DISABILITIES SHALL BE PROVIDED WITH AT 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 TO PREVENT WATER FROM ACCUMULATING 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' 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 ACCEPTED 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 DOOR.
9. LANDING & APPROACH SPACE SHALL COMPLY WITH CURRENT CBC TITLE 24 AND ADA /ADAS.

LEGEND ON PLANS



SHEET 2 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL	SM	A. OSKOUI	12/03
ORIGINAL	FC	A. OSKOUI	12/06
UPDATE	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

CHAIN LINK GATE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

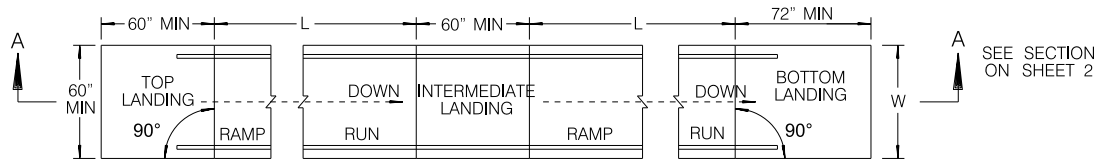
H. Hadli

1/31/2012

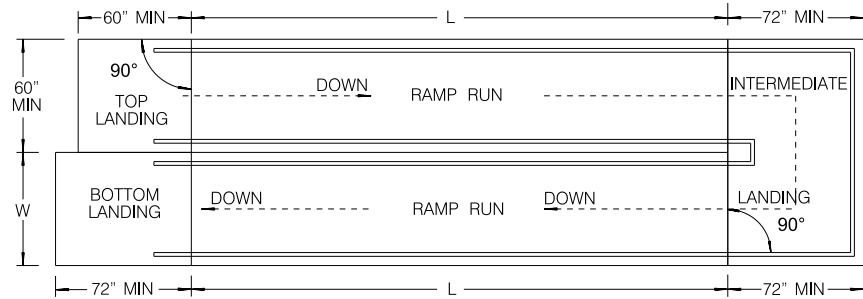
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

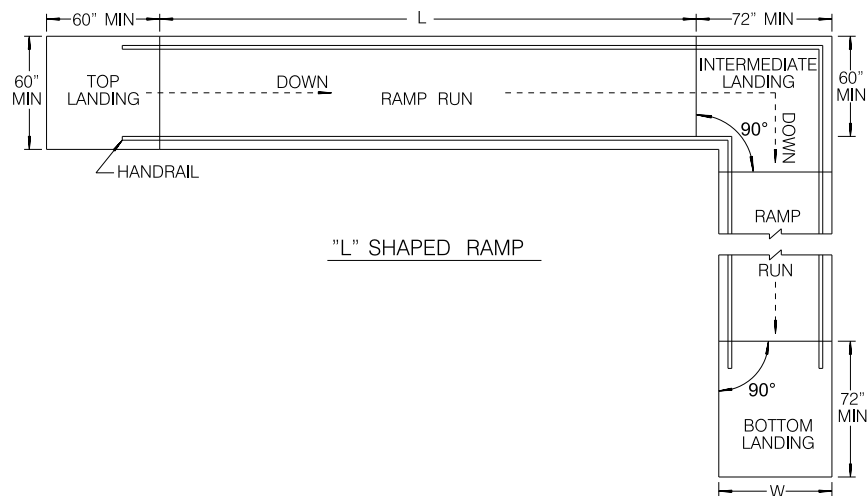
SDM-114



STRAIGHT RUN RAMP



"U" SHAPED RAMP



"L" SHAPED RAMP

LENGTH OF EACH SEGMENT OF RAMP RUN


MAX SLOPE	MAXIMUM LENGTH OF EACH RAMP SEGMENT (L)	MAXIMUM RISE BETWEEN LANDINGS
1:13 (7.69%)	32.5'	30"
1:14 (7.14%)	35'	30"
1:15 (6.67%)	37.5'	30"
1:16 (6.25%)	40'	30"
1:17 (5.88%)	42.5'	30"
1:18 (5.55%)	45'	30"
1:19 (5.26%)	47.5'	30"

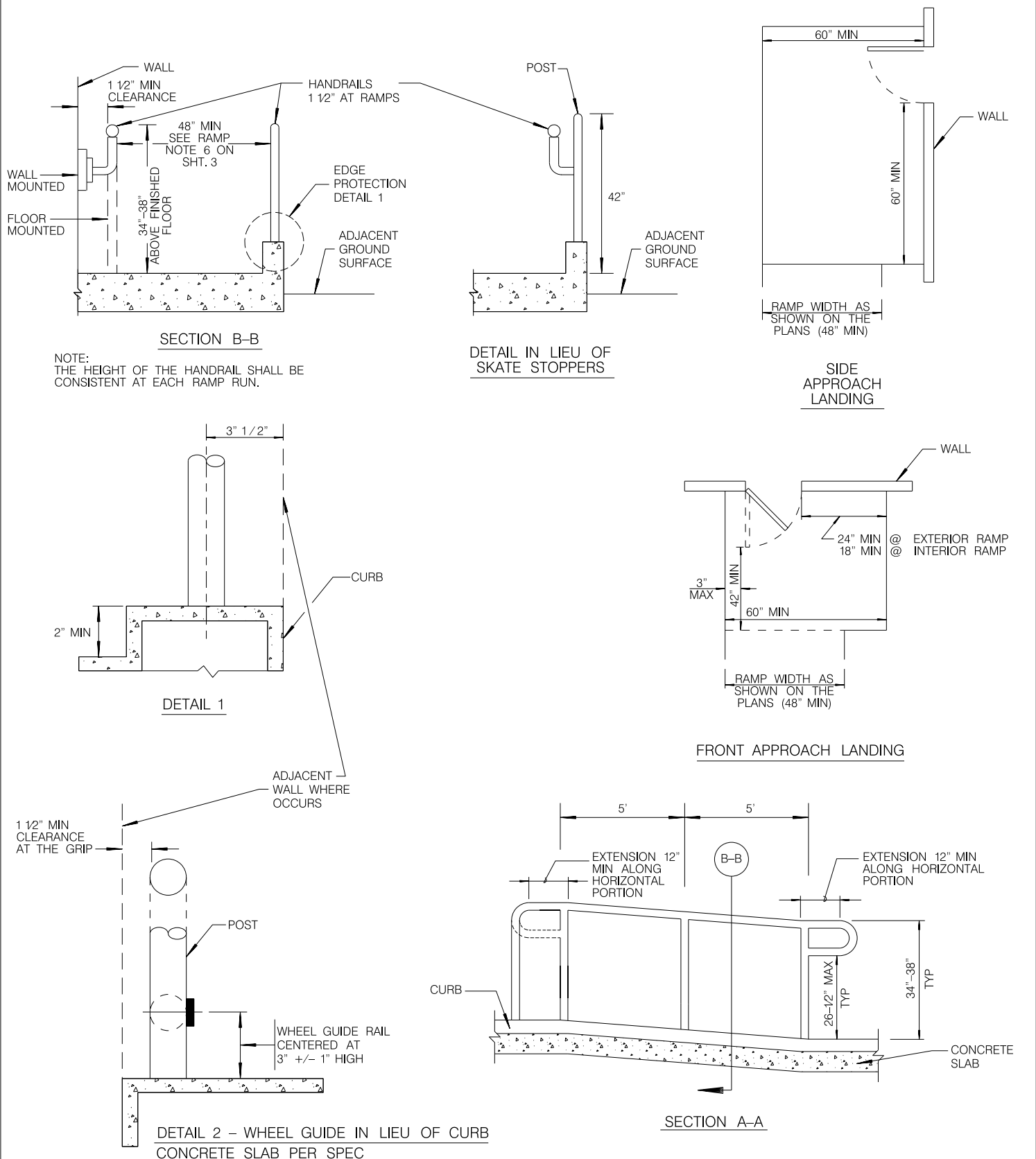
NOTES:

1. (W) THE WIDTH OF THE RAMPS THAT ARE PART OF THE MEAN OF EGRESS WILL ALSO HAVE TO MEET THE ADDITIONAL CODE REQUIREMENTS.
2. THE WIDTH AT THE BOTTOM LANDING SHALL BE AS WIDE AS THE RAMP.
3. SPECIFY THE LEAST POSSIBLE SLOPE BELOW THE MAXIMUM TO PROVIDE A CONSTRUCTION TOLERANCE AND TO OFFER BETTER USABILITY.

SEE ADDITIONAL NOTES ON SHEET 3

SHEET 1 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	SM	A. OSKOU	12/03		
UPDATE	FC	A. OSKOU	12/06	PEDESTRIAN RAMP AND PROTECTIVE RAILING	 COORDINATOR R.C.E. 56523 DATE 2/25/16
UPDATE	KA	J. NAGELVOORT	01/12		
UPDATE	FC	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDM-115



SHEET 2 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL	SM	A. OSKOU	12/03
UPDATE	FC	A. OSKOU	12/06
UPDATE	KA	J. NAGELVOORT	01/12
UPDATE	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

PEDESTRIAN RAMP AND PROTECTIVE RAILING

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chungpa 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

SDM-115

RAMP:

1. ANY WALKING SURFACE THAT IS PART OF AN ACCESSIBLE ROUTE WITH THE SLOPE GREATER THAN 5% SHALL BE CONSIDERED A PEDESTRIAN RAMP AND MUST COMPLY WITH THE PEDESTRIAN RAMP STANDARDS.
2. THE LEAST POSSIBLE SLOPE SHALL BE USED WITHOUT EXCEEDING 7.7%, PER CITY OF SAN DIEGO ACCESS MEMO.
3. THE RUNNING SLOPE SHALL BE UNIFORM ALONG EACH RAMP SEGMENT.
4. CROSS SLOPE SHALL NOT EXCEED 1.5%.
5. LANDINGS SHALL HAVE A 1.5% SLOPE IN BOTH DIRECTIONS.
6. WALKING SURFACE MUST BE STABLE, FIRM, AND SLIP RESISTANT. CONCRETE SHALL HAVE A MEDIUM BROOM TRANSVERSE FINISH.
7. LANDINGS MUST BE DESIGNED TO PREVENT PONDING.
8. WHERE THE CHANGE OF SLOPE OCCURS, GRADE BREAKS MUST BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUNS TO PREVENT CROSS SLOPE ISSUES.


HANDRAIL:

1. HANDRAILS ARE REQUIRED ON BOTH SIDES OF A PEDESTRIAN RAMP.

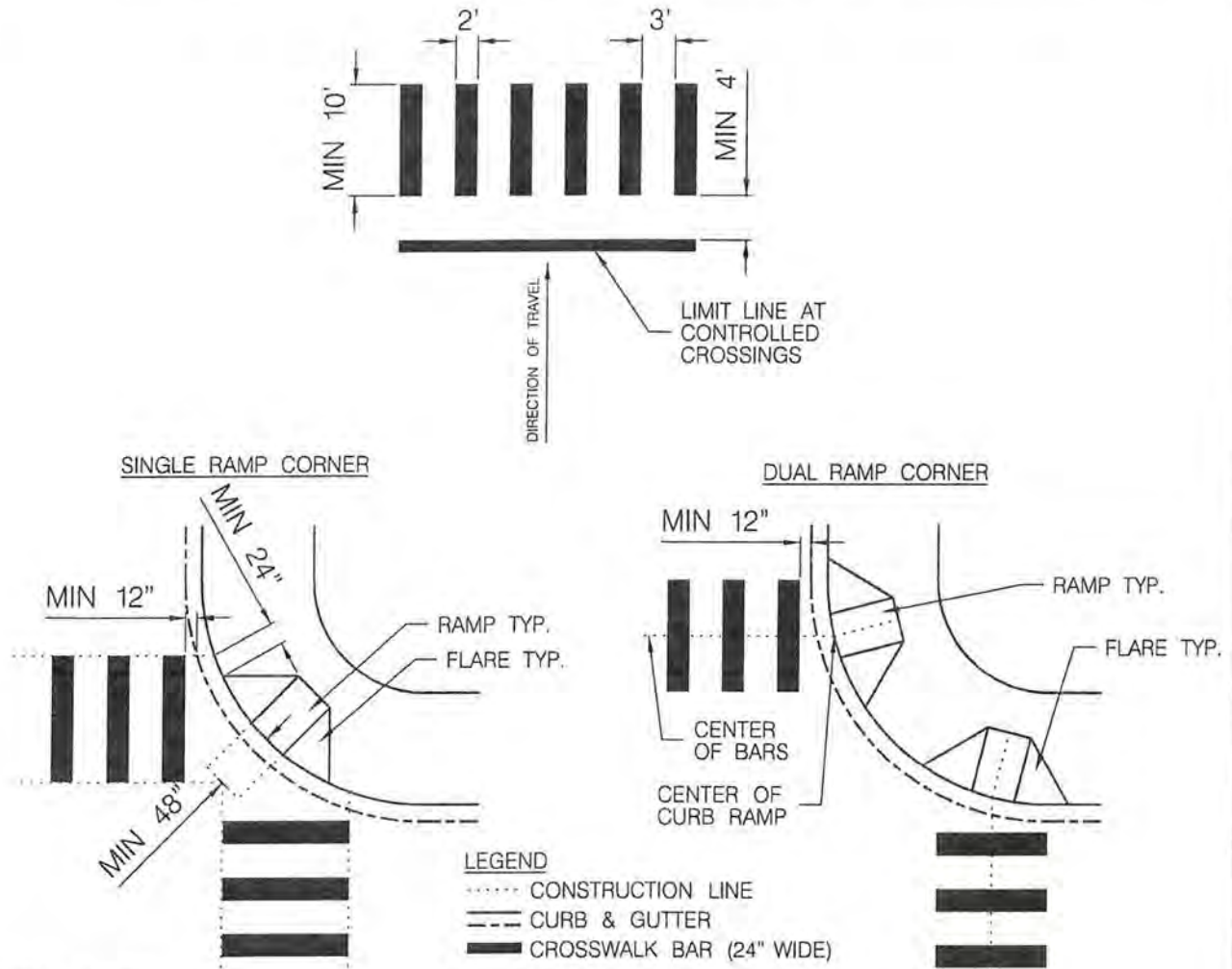
EXCEPTIONS:

- a. RAMPS AT EXTERIOR DOOR LANDINGS THAT RISE LESS THAN 6 INCHES OR HAVE LESS THAN 72 INCHES LENGTH. HOWEVER, LEVEL LANDINGS SHALL BE PROVIDED AT THE TOP AND BOTTOM.
 - b. RAMPS IMMEDIATELY ADJACENT TO SEATING IN ASSEMBLY AREAS.
2. HANDRAILS SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE RAMP RUN PLUS THE EXTENSION.
 3. INSIDE HANDRAILS AT "U" SHAPED AND "L" SHAPED RAMPS SHALL BE CONTINUOUS.
 4. HANDRAILS SHALL EXTEND 12 INCHES MINIMUM BEYOND THE TOP, INTERMEDIATE AND BOTTOM OF EACH RAMP SEGMENT IN THE DIRECTION OF THE RAMP RUN, THE HANDRAIL EXTENSION SHALL BE PARALLEL TO THE LANDING SURFACE.
 5. HANDRAIL EXTENSION SHALL NOT EXTEND INTO THE REQUIRED WIDTH OF AN ADJACENT ROUTE OF TRAVEL. IN EXISTING FACILITIES WHERE THE ENCROACHMENT OF THE EXTENSION IN THE DIRECTION OF THE RAMP CREATES A HAZARD, THE EXTENSION SHALL BE BENT 90 DEGREES TO THE RUN OF THE RAMP.
 6. END OF HANDRAIL EXTENSION SHALL BE TURNED TO THE WALL, FLOOR OR POST.
 7. END OF HANDRAIL EXTENSION SHALL BE TURNED TO THE FLOOR WHEN EXTENSION IS PROTRUDING PERPENDICULAR INTO PATH OF TRAVEL.
 8. TOP GRIPPING SURFACE OF THE HANDRAIL SHALL BE UNIFORM IN HEIGHT. THE GRIPPING SURFACE SHALL BE CONTINUOUS AND SMOOTH (NO SHARP CORNERS).
 9. THE GRIPPING PORTION SHALL BE 4 INCHES MIN TO 6-1/4 INCHES MAX PERIMETER DIMENSION, 1-1/4 INCHES TO 2-1/4 INCHES IN CROSS SECTIONAL NOMINAL DIMENSION OR SHAPED WITH EQUIVALENT GRIPPING SURFACE.
 10. DESIGN AND SHOP DRAWINGS SHALL BE APPROVED BY THE CITY ENGINEER AND ACCESS COMPLIANCE OFFICER PRIOR TO FABRICATION.
 11. ADJACENT WALL OR OTHER SURFACES SHALL BE FREE OF ANY SHARP OR ABRASIVE ELEMENT (SMOOTH FINISH).
 12. A GUARDRAIL 42 INCHES ABOVE FINISHED FLOOR SHALL BE INSTALLED ALONG OPEN EDGES OF THE RAMP AND LANDINGS THAT ARE 30 INCHES OR MORE IN HEIGHT FROM THE ADJACENT GROUND SURFACE AND THE RAMP IS NOT BOUNDED BY A WALL OR FENCE. SEE SDM-118.
 13. PROVIDE A CONTINUOUS GUIDE CURB OR GUIDE RAIL IF POSTS ARE INSTALLED ON THE RAMP SURFACE OR IF THE FINISH SURFACE IS GREATER THAN 4 INCHES HIGHER THAN THE ADJACENT GROUND SURFACE.
 14. FOR HANDRAIL AND GUARDRAIL MATERIAL, FINISHES AND ADDITIONAL DETAILS, SEE RELATED DETAIL DRAWINGS.

SHEET 3 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	PEDESTRIAN RAMP AND PROTECTIVE RAILING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE 	2/25/16 DATE
ORIGINAL	SM	A. OSKQUI	12/03				
UPDATE	FC	A. OSKQUI	12/06			COORDINATOR	R.C.E. 56523
UPDATE	KA	J. NAGELVOORT	01/12			DRAWING	SDM-115
UPDATE	FC	J. NAGELVOORT	02/16			NUMBER	


TYPICAL CONTINENTAL CROSSWALK MARKINGS



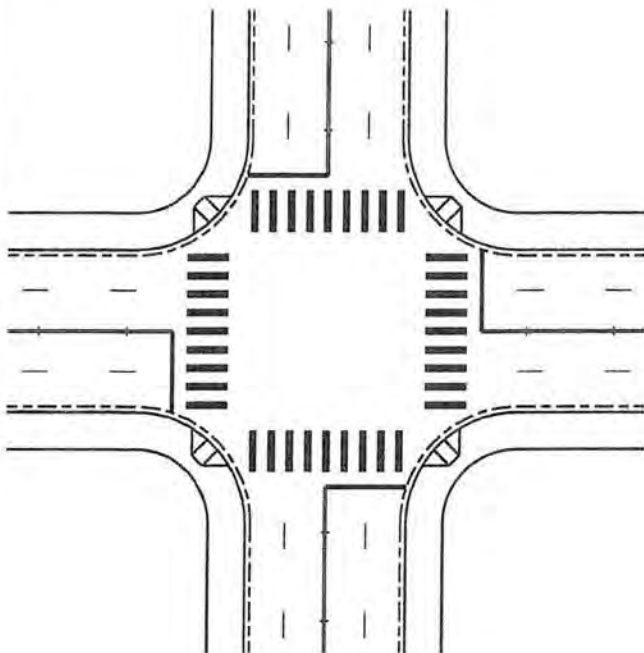
GENERAL NOTES:

1. ALL MARKED CROSSWALKS SHALL HAVE CONTINENTAL MARKINGS UNLESS APPROVED OTHERWISE.
2. MARKED CROSSWALK LOCATIONS CONSISTING OF BRICK PAVERS OR OTHER DECORATIVE PAVING SHALL BE PROVIDED WITH A LIMIT LINE ONLY.
3. SIGNALIZED INTERSECTIONS SHALL BE PROVIDED WITH A MARKED CROSSWALK ACROSS EACH LEG WHERE PEDESTRIANS ARE PERMITTED TO CROSS.
4. CONTINENTAL CROSSWALK MARKINGS SHALL BE ALIGNED PARALLEL TO THE DIRECTION OF VEHICULAR TRAVEL.
5. LIMIT LINES SHALL BE INSTALLED A MINIMUM OF 4 FEET IN ADVANCE OF MARKED CROSSWALKS FOR THE APPROACH LANES AT ALL CONTROLLED CROSSINGS.
6. MARKED CROSSWALKS SHOULD BE A MINIMUM OF 10 FEET IN WIDTH. PLACEMENT OF CONTINENTAL CROSSWALKS SHALL COMPLY WITH ACCESSIBILITY REGULATIONS PER THE MOST RECENT VERSION OF AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS.
7. THE CROSSWALK BETWEEN A DUAL RAMP CORNER AND A SINGLE RAMP CORNER SHALL BE AT LEAST 10 FEET WIDE AND SATISFY THE MINIMUM OF 2 FEET BEYOND THE FLARE REQUIREMENT FOR THE SINGLE RAMP.
8. CONTINENTAL CROSSWALK BARS SHALL BE UNIFORM WITHIN THE SAME CROSSING. NO PARTIAL BARS SHALL BE INSTALLED.
9. A CROSSWALK BAR SHALL BE CENTERED IN THE CENTER OF THE CROSSING.
10. CROSSWALK MARKINGS SHALL BE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA-MUTCD) RETROREFLECTIVITY COMPLIANT AND SKID RESISTANT.

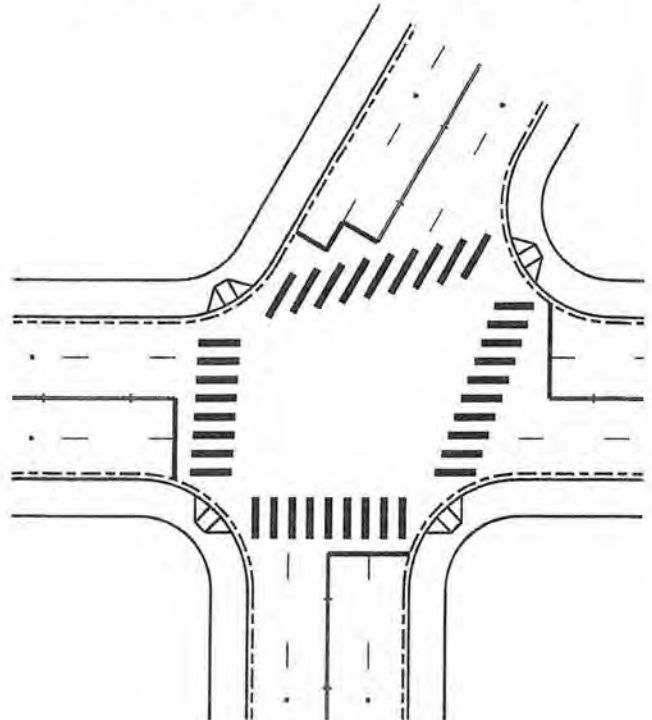
SHEET 1 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	<small>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</small>  <small>COORDINATOR</small> <small>2/5/2015</small> <small>P.E. 56523</small> <small>DATE</small>
ORIGINAL	JF	J. NAGELVOORT	02/15		
				CONTINENTAL CROSSWALK MARKINGS LAYOUT AND NOTES	<small>DRAWING NUMBER</small> SDM-116

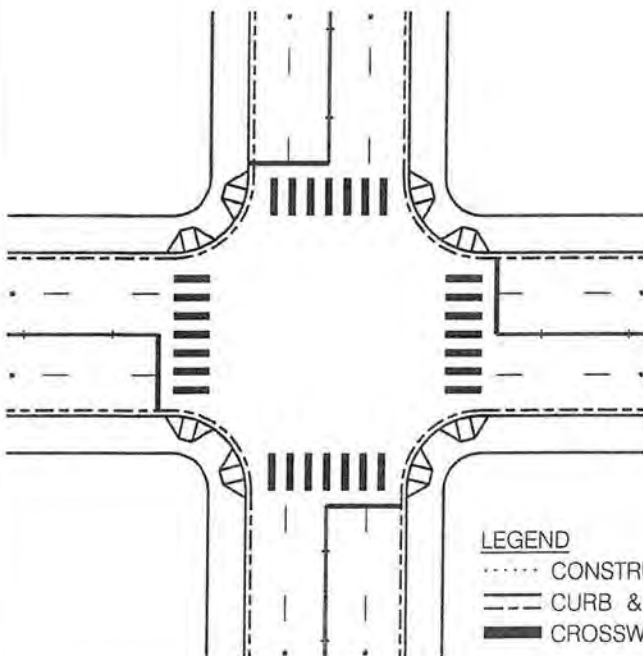
CASE 1 – SINGLE RAMP ORTHOGONAL



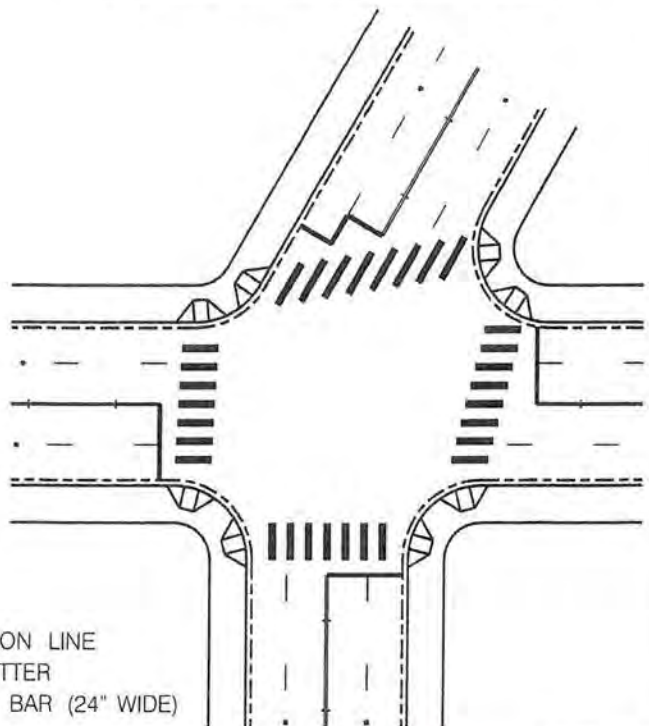
CASE 2 – SINGLE RAMP SKEWED



CASE 3 – DUAL RAMP ORTHOGONAL



CASE 4 – DUAL RAMP SKEWED



LEGEND

- CONSTRUCTION LINE
- CURB & GUTTER
- CROSSWALK BAR (24" WIDE)

SHEET 2 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL	JF	J. NAGELVOORT	02/15

CITY OF SAN DIEGO – STANDARD DRAWING

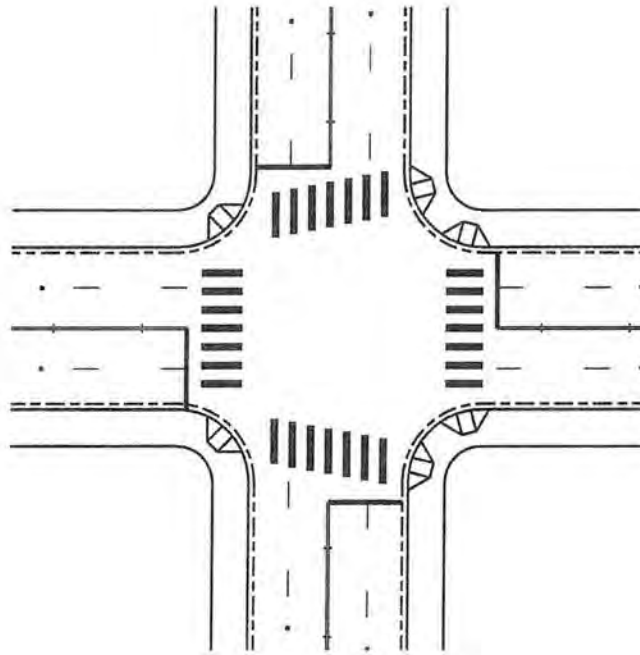
CONTINENTAL CROSSWALK
MARKINGS LAYOUT AND NOTES

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

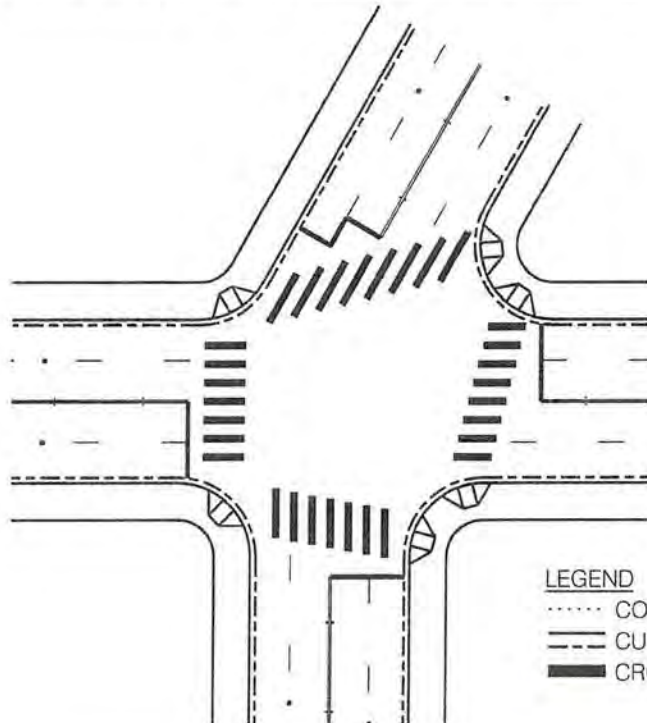
C.R. King 2/5/2015
COORDINATOR C.E. 56523 DATE

DRAWING
NUMBER **SDM-116**

CASE 5 – DUAL AND SINGLE RAMP ORTHOGONAL



CASE 6 – DUAL AND SINGLE RAMP SKEWED



LEGEND

- CONSTRUCTION LINE
- CURB & GUTTER
- █ CROSSWALK BAR (24" WIDE)

SHEET 3 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL	JF	J. NAGELVOORT	02/15

CITY OF SAN DIEGO – STANDARD DRAWING

CONTINENTAL CROSSWALK MARKINGS LAYOUT AND NOTES

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Brugia 2/5/2015
COORDINATOR FILE 58523 DATE

DRAWING
NUMBER

SDM-116

PARKING REQUIREMENTS:

1. WHERE PARKING IS PROVIDED ON EACH FACILITY (LOT OR STRUCTURE), ACCESSIBLE PARKING SPACES SHALL BE PROVIDED.
2. PARKING SPACES USED EXCLUSIVELY FOR BUSES, TRUCKS, OTHER DELIVERY VEHICLES, OR VEHICULAR IMPOUND SHALL NOT BE REQUIRED TO COMPLY WITH THE PARKING RATIO PROVIDED THAT LOTS ACCESSED BY THE PUBLIC ARE PROVIDED WITH A PASSENGER LOADING ZONE COMPLYING WITH PASSENGER LOADING ZONE STANDARDS. SEE SDM-117 SHEET 8.


MINIMUM REQUIRED PARKING RATIO FOR ACCESSIBLE PARKING SPACES

TOTAL NUMBER OF PARKING SPACES PROVIDED IN PARKING FACILITY	MINIMUM NUMBER OF REQUIRED ACCESSIBLE PARKING SPACES
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
501-1,000	2% OF TOTAL
1,001 AND OVER	20, PLUS 1 FOR EACH 100, OR FRACTION THEREOF, OVER 1000

EXCEPTIONS:


- A. 10% OF THE TOTAL NUMBER OF PARKING SPACES AT OUTPATIENT UNITS AND FACILITIES SHALL BE ACCESSIBLE.
 - B. 20% OF THE TOTAL NUMBER OF PARKING SPACES AT UNITS AND FACILITIES SPECIALIZING IN TREATMENT OR SERVICES FOR PERSONS WITH MOBILITY IMPAIRMENTS SHALL BE ACCESSIBLE.
 - C. THE REQUIRED PARKING RATIO FOR ACCESSIBLE PARKING STALLS IS PROVIDED FOR EACH PARKING LOT ON THE SITE.
 - D. AT LEAST ONE VAN PARKING SPACE IS REQUIRED FOR EVERY 6 OR FRACTION OF SIX PARKING SPACES.
 - E. IN BUILDINGS OR FACILITIES WITH MULTIPLE ACCESSIBLE ENTRANCES WITH ADJACENT PARKING SPACES SHALL BE DISPERSED AND LOCATED CLOSEST TO THE ACCESSIBLE ENTRANCES. A VAN ACCESSIBLE SPACE SHALL BE PROVIDED AT EACH LOCATION.
3. VERTICAL CLEARANCE – PARKING SPACES FOR VANS AND ACCESS AISLE AND VEHICULAR ROUTES SERVING THEM SHALL PROVIDE A VERTICAL CLEARANCE OF 98" MINIMUM.
 4. THE SURFACE OF THE ENTIRE AREA OF THE ACCESSIBLE PARKING SPACE(S) AND ACCESS AISLE(S) SHALL HAVE A SLOPE OF 1.5% IN ANY DIRECTION.
 - A. GUTTERS AND SWALES SHALL NOT BE INCLUDED IN THE OVERALL DIMENSIONS OF THE ACCESSIBLE PARKING SPACES AND ACCESS AISLES, UNLESS SLOPE AND CROSS SLOPE IS 2% MAXIMUM.
 - B. THE SURFACE SLOPE OF THE AREA IMMEDIATELY SURROUNDING THE ACCESSIBLE PARKING SPACE SHALL BE 1.5% FOR A WIDTH OF 4'-0".
 - C. ADEQUATE DRAINAGE SHALL BE PROVIDED SO THAT WATER DOES NOT ACCUMULATE WITHIN THE ACCESSIBLE PARKING SPACE AND ACCESS AISLE.
 - D. THE GUTTER SLOPE AT THE OPENING OF THE CURB RAMPS SERVING THE ACCESS AISLES SHALL BE 1.5%.

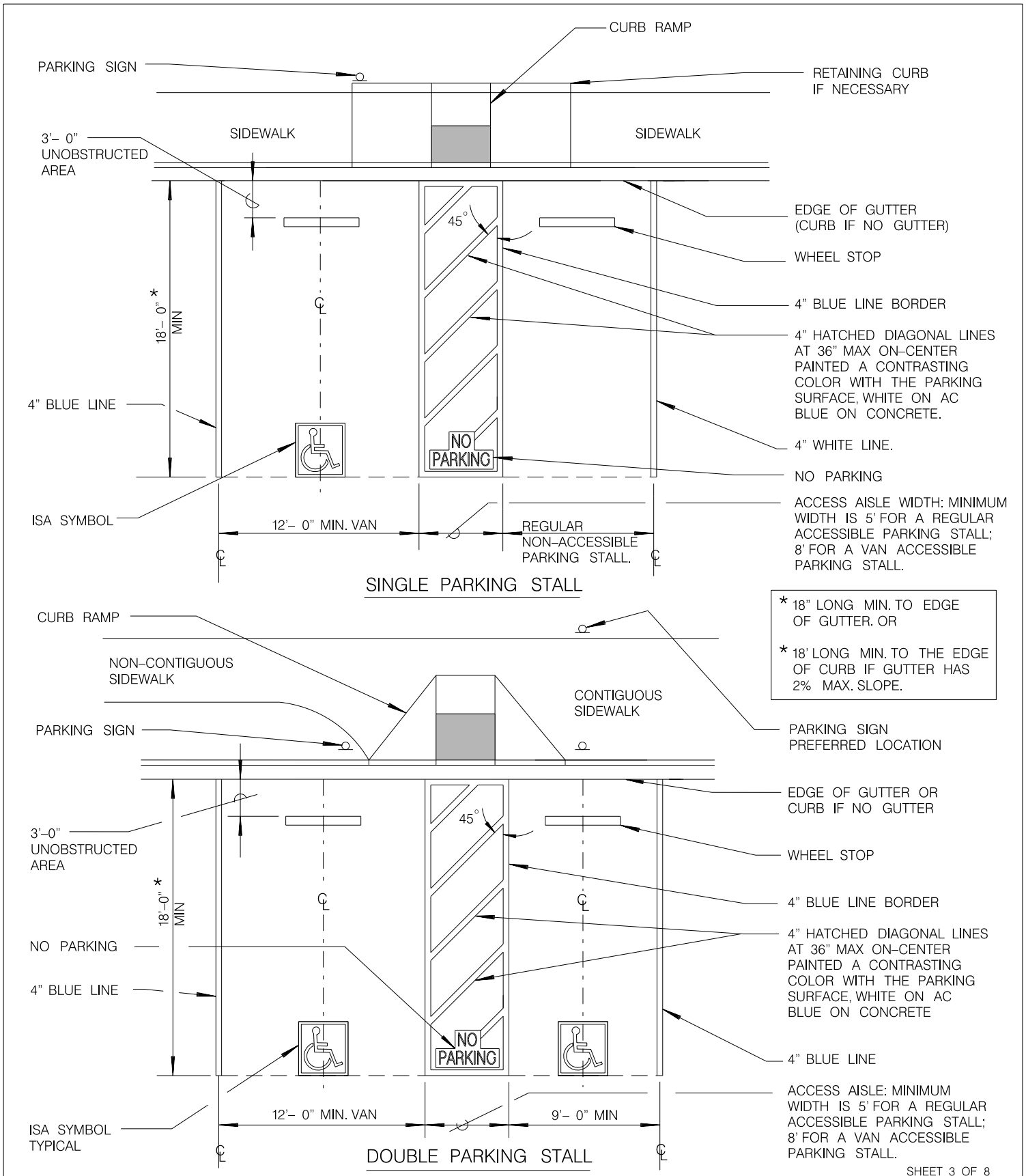
SHEET 1 OF 8

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR R.C.E. 56523 DATE 2/25/16
ORIGINAL	FC	A. OSKOU	12/06		
UPDATED	KA	J. NAGELVOORT	01/12		
UPDATED	FC	J. NAGELVOORT	02/16		
				ACCESSIBLE PARKING NOTES	DRAWING NUMBER SDM-117

5. ACCESS AISLES (LOADING AND UNLOADING AREAS) SHALL BE PROVIDED FOR SINGLE AND DOUBLE ACCESSIBLE PARKING SPACES.
 - A. THE ACCESS AISLE SHALL BE CONNECTED TO AN ACCESSIBLE ROUTE.
 - B. FOR REGULAR ACCESSIBLE SPACE, THE ACCESS AISLE SHALL BE ON EITHER SIDE OF THE VEHICLE WHEN THE VEHICLE IS GOING FORWARD INTO THE PARKING SPACE.
 - C. FOR VAN SPACE, THE ACCESS AISLE SHALL BE PLACED ON THE SIDE OPPOSITE THE DRIVER'S SIDE WHEN THE VEHICLE IS GOING FORWARD INTO THE PARKING SPACE (i.e. PASSENGER SIDE OF THE VEHICLE).
 - D. THE CURB RAMP MAY NOT ENCROACH INTO THE REQUIRED DIMENSIONS FOR THE ACCESSIBLE PARKING SPACE AND ACCESS AISLE.
 - E. CURB RAMPS SERVING THE ACCESS AISLES SHALL COMPLY WITH THE APPROPRIATE CURB RAMP STANDARDS.
6. IN EACH PARKING AREA, A WHEEL STOP SHALL BE PROVIDED TO PREVENT VEHICLES FROM OBSTRUCTING THE REQUIRED CLEAR WIDTH OF ADJACENT ACCESSIBLE ROUTES.
7. EACH ACCESSIBLE PARKING SPACE SHALL BE LOCATED SO THAT PERSONS WITH DISABILITIES ARE NOT COMPELLED TO WHEEL OR WALK BEHIND PARKING SPACES OTHER THAN THEIR OWN.
8. SIGNAGE:
 - A. PAVEMENT PARKING SIGNS SUCH AS THE INTERNATIONAL SYMBOL OF ACCESSIBILITY (ISA) AND "NO PARKING" AT THE ACCESS AISLES SHALL BE PLACED SO THAT THEY ARE VISIBLE TO TRAFFIC ENFORCEMENT OFFICIALS WHEN THE VEHICLE IS PARKED PROPERLY. SEE DETAIL ON SDM-117 SHEET 4.
 - B. WHEN POSTED IN A PATH OF TRAVEL, THE SIGN SHALL BE MOUNTED 80 INCHES PER SDM-104. IF INSTALLED ON A WALL, THE SIGN MAY BE CENTERED ON THE WALL AT THE INTERIOR END OF THE PARKING SPACE 5 FT ABOVE GRADE. IF SIGN IS INSTALLED WITHIN THE CIRCULATION AREAS, INSTALL 80 INCHES ABOVE FINISH FLOOR.
 - C. A TOW AWAY SIGN SHALL BE INSTALLED AND VISIBLE AT EACH ENTRANCE TO THE OFF STREET PARKING FACILITY OR IMMEDIATELY ADJACENT TO THE ACCESSIBLE PARKING SPACE.
9. IF THE ACCESSIBLE ROUTE CROSSES OR ADJOINS THE VEHICULAR WAY AND THE WALKING SURFACE IS NOT SEPARATED BY CURBS, RAILINGS, OR OTHER ELEMENTS BETWEEN THE PEDESTRIAN AREAS AND VEHICULAR AREAS, THE BOUNDARY BETWEEN THE AREAS SHALL BE DEFINED BY A 36 INCH WIDE DETECTABLE WARNING TILES. DETECTABLE WARNING TILES SHALL BE PER SDG-130.
10. PASSENGER LOADING ZONE:
 - A. WHERE PROVIDED, AT LEAST ONE ACCESSIBLE PASSENGER LOADING ZONE SHALL BE ACCESSIBLE.
 - B. AN ACCESSIBLE PASSENGER LOADING ZONE SHALL BE PROVIDED IN EVERY CONTINUOUS 100 LINEAR FEET OF LOADING SPACE, OR FRACTION THEREOF.
 - C. VEHICLE PULL-UP SPACE – PASSENGER LOADING ZONES SHALL PROVIDE A VEHICULAR PULL-UP SPACE 96 INCHES WIDE MINIMUM AND 20'-0" LONG MINIMUM.
 - D. ACCESS AISLE – PASSENGER LOADING ZONES SHALL BE PROVIDED WITH ACCESS AISLES ADJACENT TO THE VEHICLE PULL-UP SPACE. ACCESS AISLES SHALL CONNECT DIRECTLY TO AN ACCESSIBLE ROUTE AND SHALL NOT OVERLAP THE VEHICULAR WAY.
 - E. ACCESS AISLES SHALL BE MARKED AS REQUIRED FOR ALL ACCESS AISLES FOR ACCESSIBLE PARKING SPACES.
 - F. PASSENGER LOADING ZONES SHALL BE IDENTIFIED BY A REFLECTORIZED SIGN POSTED IMMEDIATELY ADJACENT TO AND VISIBLE FROM THE PASSENGER DROP-OFF AND LOADING ZONE STATING "PASSENGER LOADING ZONE ONLY". WHEN LOCATED IN A PATH OF TRAVEL, THE SIGN SHALL BE MOUNTED PER SDM-104.
 - G. VEHICLE PULL-UP SPACES AND ACCESS AISLES SERVING THEM SHALL BE AT THE SAME LEVEL AS THE VEHICLE PULL-UP SPACES THEY SERVE. ANY CHANGES IN ELEVATION SHALL BE SERVED BY A CURB RAMP(S).
 - H. VEHICLE PULL-UP SPACE AND ACCESS AISLE SLOPES SHALL BE 1.5% IN ANY DIRECTION. ADEQUATE DRAINAGE SHALL BE PROVIDED SO THAT WATER DOES NOT POND IN THE ACCESS AISLE.
 - I. A MINIMUM OF 114 INCHES VERTICAL CLEARANCE SHALL BE PROVIDED AT ACCESSIBLE PASSENGER DROP-OFF AND LOADING ZONES AND ALONG AT LEAST ONE VEHICLE ACCESS ROUTE TO SUCH AREAS FROM SITE ENTRANCE(S) AND EXIT(S).
 - J. PARKING FACILITIES THAT PROVIDE VALET PARKING SERVICES SHALL PROVIDE AT LEAST ONE ACCESSIBLE PASSENGER LOADING ZONE.

SHEET 2 OF 8

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	FC	A. OSKQUI	12/06		
UPDATED	KA	J. NAGELVOORT	01/12	ACCESSIBLE PARKING NOTES	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	FC	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDM-117



* 18" LONG MIN. TO EDGE OF GUTTER. OR

* 18" LONG MIN. TO THE EDGE OF CURB IF GUTTER HAS 2% MAX. SLOPE.

SHEET 3 OF 8

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	A. OSKQUI	1206
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

OFF-STREET ACCESSIBLE PARKING

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung

COORDINATOR R.C.E. 56523

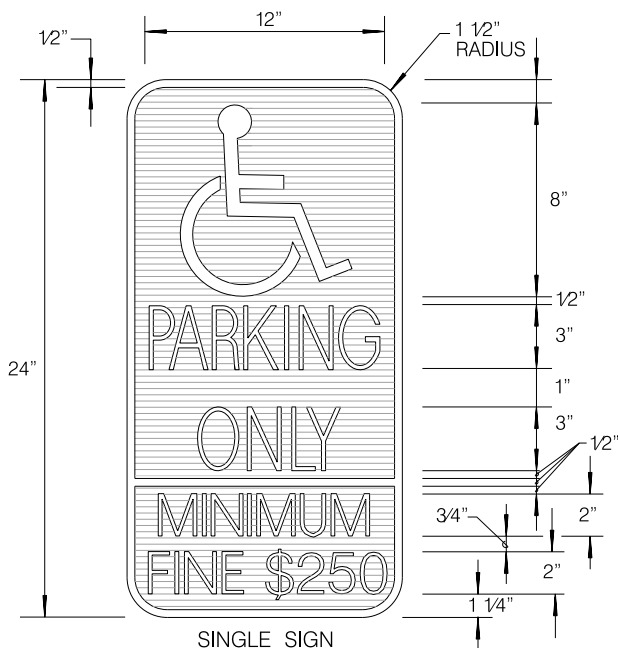
2/25/16
DATE

DRAWING
NUMBER

SDM-117

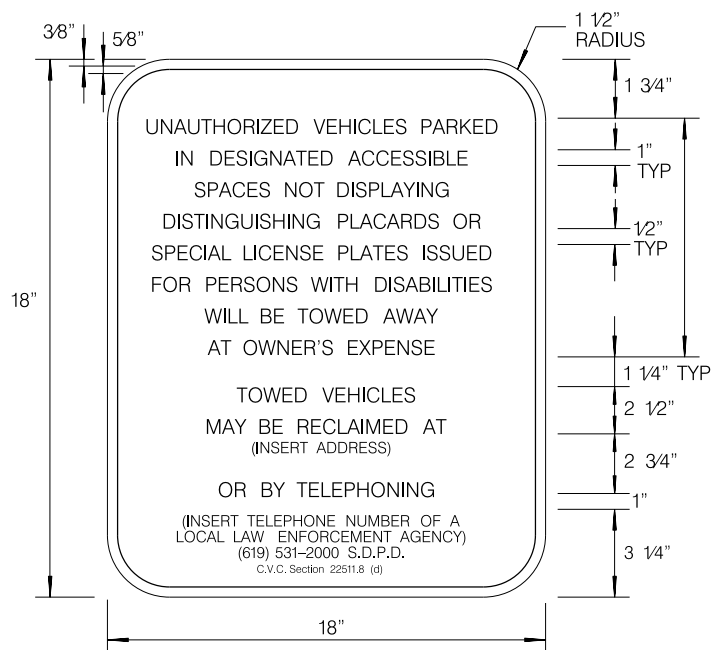


MULTIPLE SIGNS



SINGLE SIGN

PARKING SIGNS



TOW-AWAY SIGN

NOTES:

1. SIGN POST: SEE SDM-104 FOR "BREAK-AWAY SIGN POST".
2. SIGNS SHALL BE CONSTRUCTED ON MINIMUM 1/16 INCH THICK ALUMINUM.
3. COLORS:

PARKING SIGNS:
BACKGROUND - BLUE (RETROREFLECTIVE)
BORDER, TEXT, AND SYMBOL - WHITE (RETROREFLECTIVE)

TOW AWAY SIGN:
BACKGROUND - WHITE (RETROREFLECTIVE)
BORDER AND LEGEND - BLACK

4. FONTS: SAN SERIF CLEARVIEW.

SHEET 5 OF 8

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

OFF-STREET ACCESSIBLE PARKING SIGNS

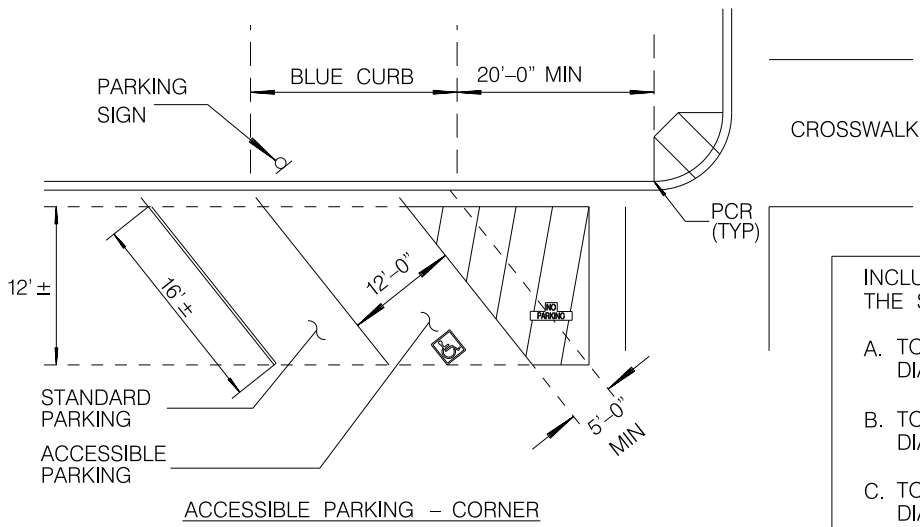
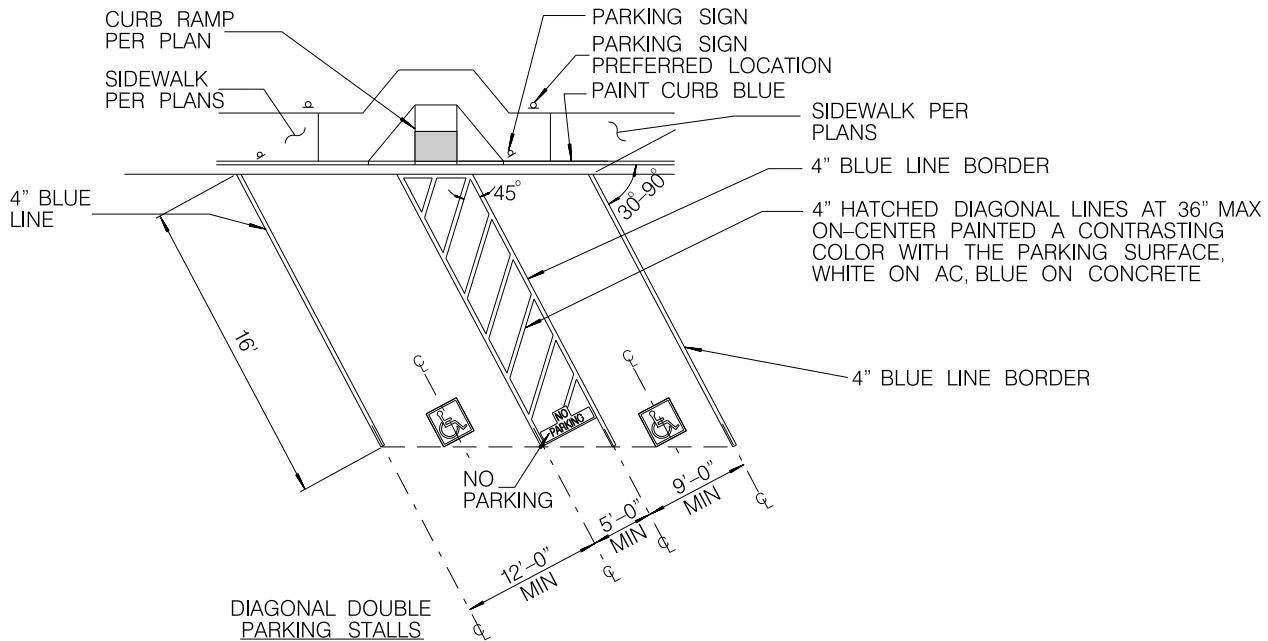
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CR Junga
COORDINATOR

2/25/16
R.C.E. 56523 DATE

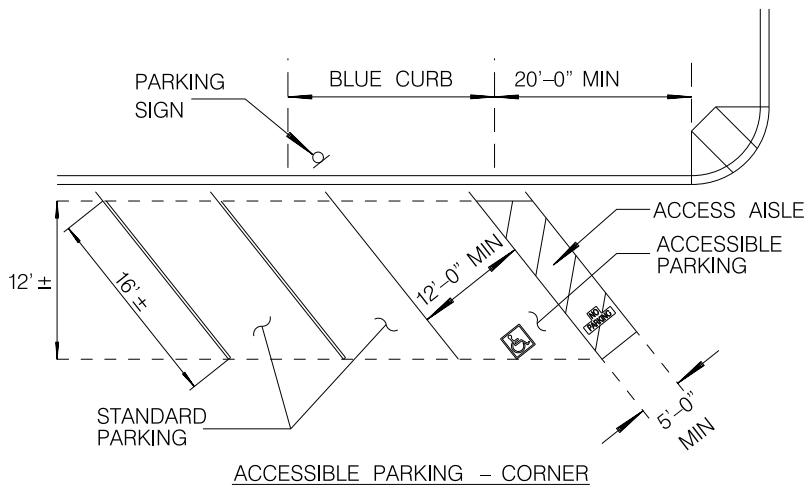
DRAWING
NUMBER

SDM-117



INCLUDE THE FOLLOWING INFORMATION ON THE STRIPING/PLAN DETAIL:

- A. TOTAL NUMBER OF EXISTING ON-STREET DIAGONAL PARKING SPACES
- B. TOTAL NUMBER OF EXISTING ON-STREET DIAGONAL ACCESSIBLE PARKING SPACES
- C. TOTAL NUMBER OF NEW ON-STREET DIAGONAL PARKING SPACES
- D. TOTAL NUMBER OF NEW ON-STREET DIAGONAL ACCESSIBLE PARKING SPACES



SHEET 6 OF 8

REVISION	BY	APPROVED	DATE
ORIGINAL	FC	A. OSKQUI	12/06
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

ON STREET ACCESSIBLE PARKING

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

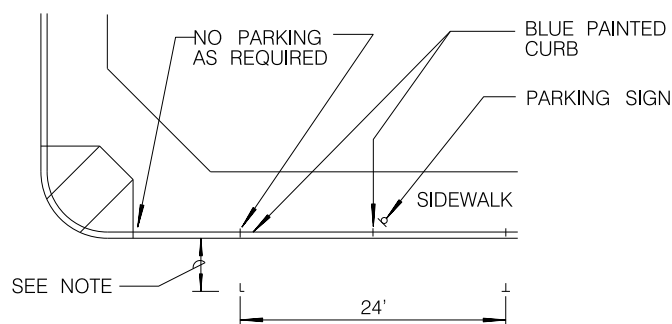
Chung


COORDINATOR R.C.E. 56523

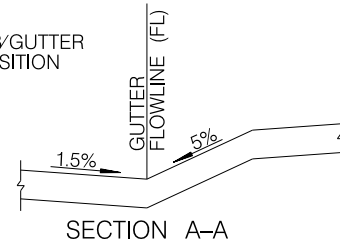
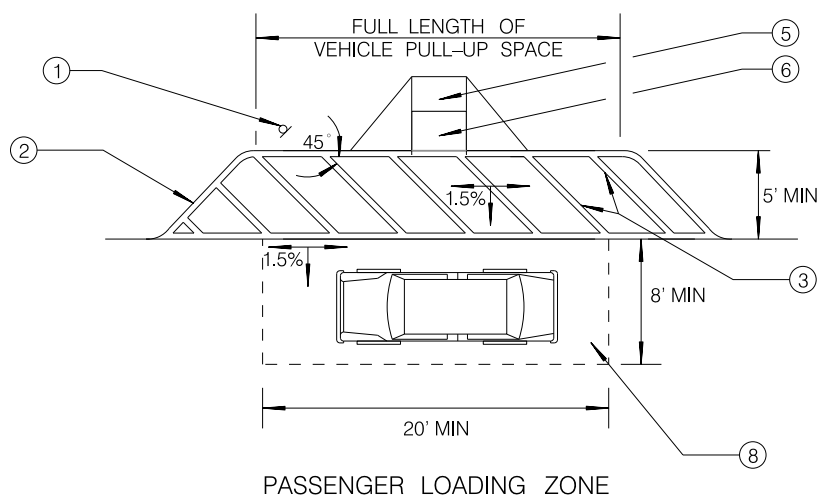
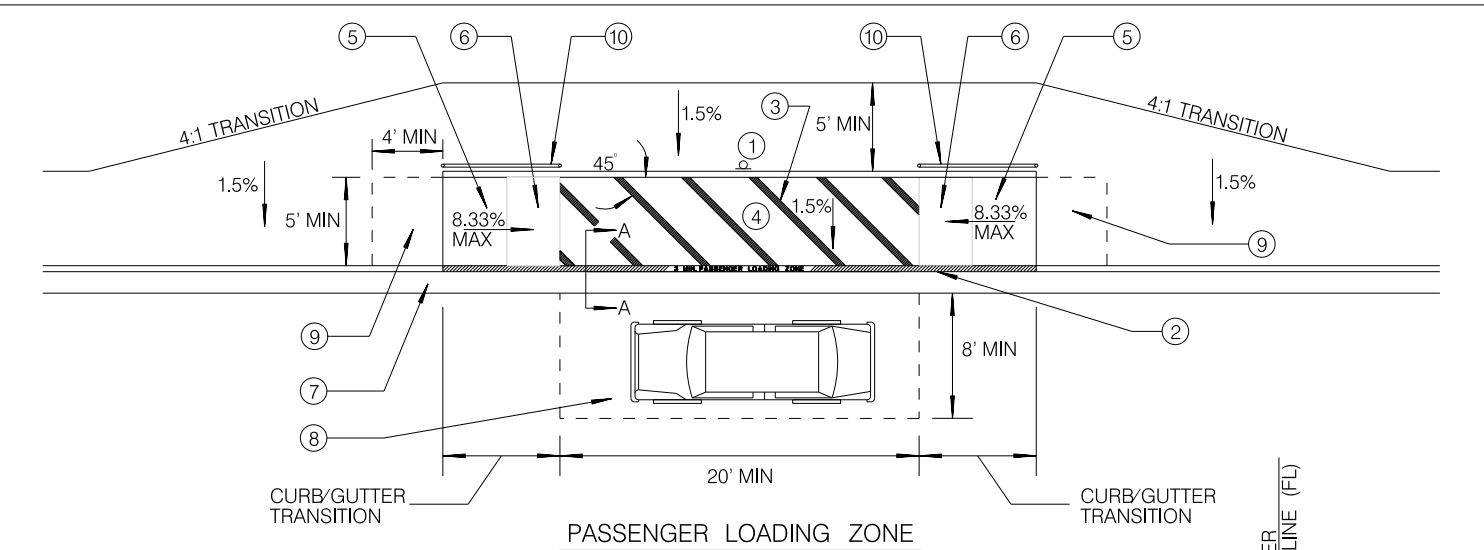
2/25/16
DATE

DRAWING
NUMBER

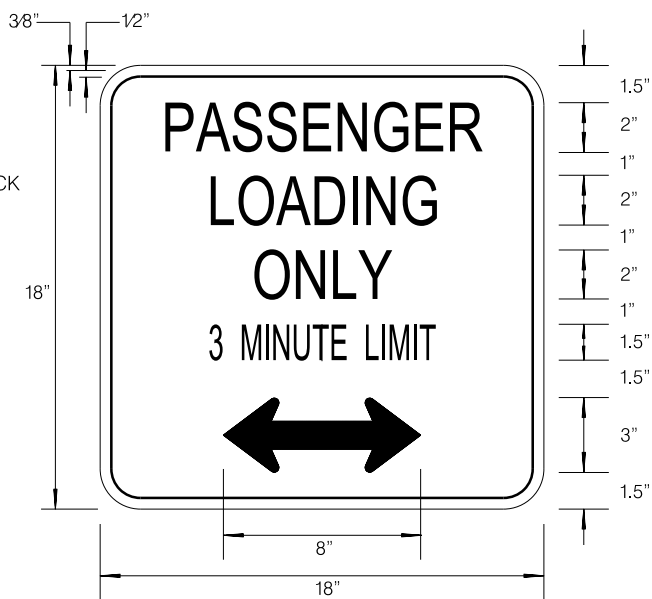
SDM-117



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	<div>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</div> <div>2/25/16</div> <div>COORDINATORR.C.E. 56523DATE</div>
ORIGINAL	FC	A. OSKOWI	12/06		
UPDATED	FC	J. NAGELVOORT	02/16		
				ON STREET ACCESSIBLE PARKING	<div>DRAWING NUMBER</div> <div>SDM-117</div>



- ① ACCESSIBLE PASSENGER LOADING ZONE SIGN (18 INCH X 18 INCH – BLACK LETTERING ON WHITE BACKGROUND)
- ② 6 INCH WHITE PAINTED CURB AND CURB FACE (STENCILED WITH 4 INCH BLACK GOTHIC SCRIPT, 3 INCH MIN "PASSENGER LOADING ZONE")
- ③ 4 INCH WIDTH WHITE STRIPING @ 36 INCHES O.C. & 45 DEGREES TO CURB FACE
- ④ STRIPED AREA SLOPES 1.5% MAX TO GUTTER FL
- ⑤ CURB RAMP
- ⑥ TRUNCATED DOMES PER SDG-130
- ⑦ 5% MAX SLOPE TO GUTTER FL (PER SDG-137) WITH MIN 6 FT TRANSITION TO STANDARD GUTTER. HOLD CL-FL ELEVATION DIFFERENCE CONSTANT (EDGE OF PAVEMENT TO VARY)
- ⑧ VEHICLE PULL UP SPACE 20 FT X 8 FT. SLOPES NOT TO EXCEED 1.5% MAX.
- ⑨ 4 FT X 5 FT ADA LANDING
- ⑩ RAILING PER SDG-140.
- ⑪ ALL DEVIATION FROM THIS STANDARD MAY BE ALLOWED PROVIDED THE DESIGN AND/OR DOCUMENTATION WAS REVIEWED BY THE CITY REPRESENTATIVE.

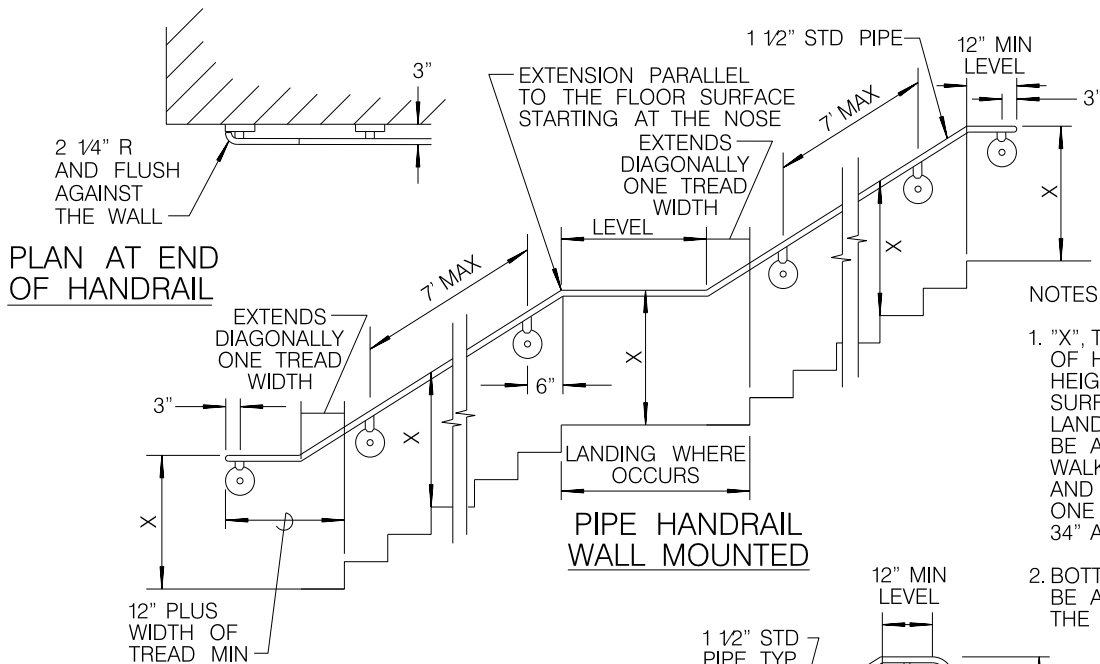


SEE ADDITIONAL NOTES ON SDM-117 SHEET 2 SHEET 8 OF 8

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	FC	J. NAGELVOORT	02/16

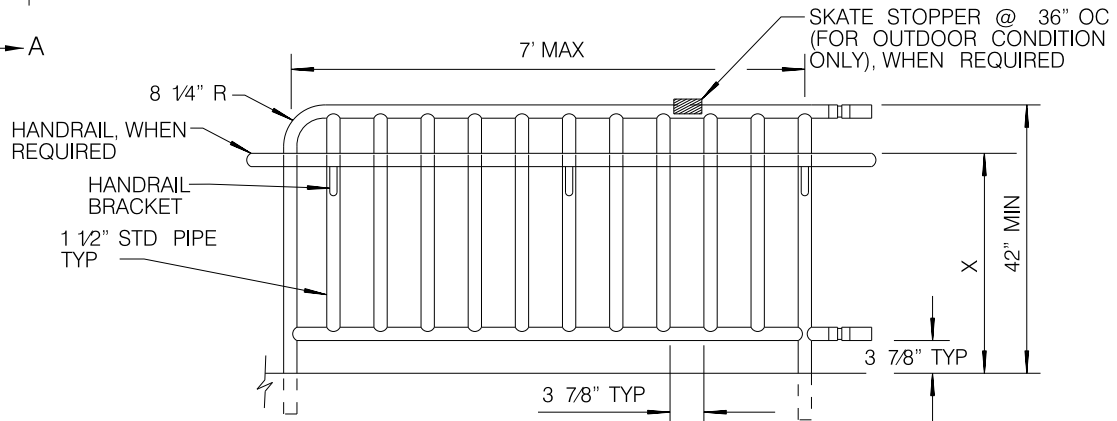
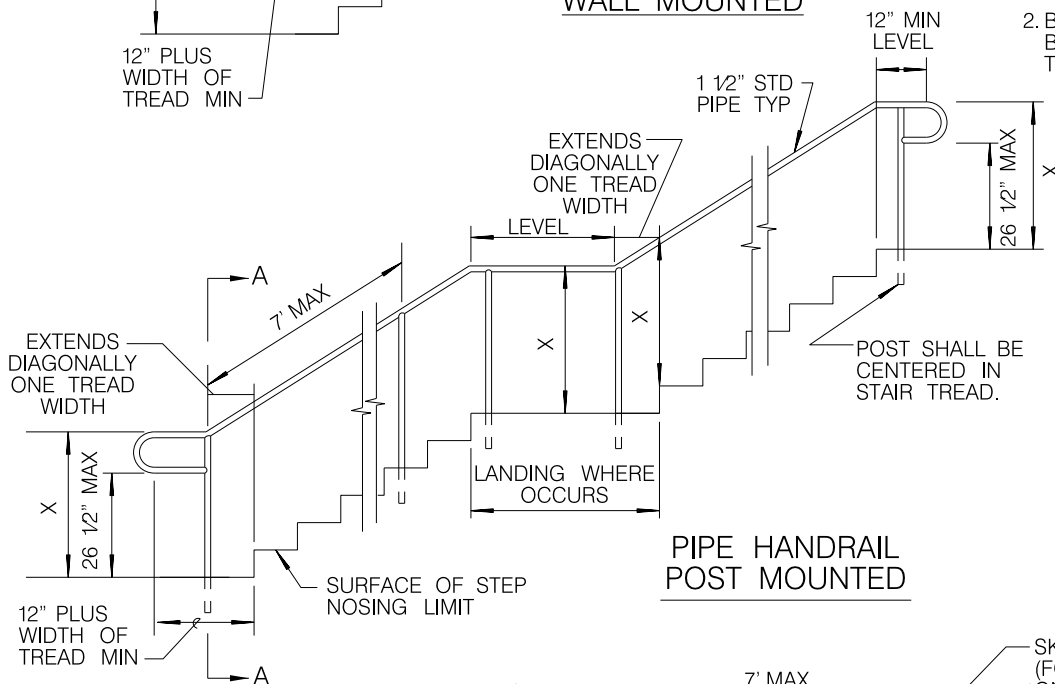
CITY OF SAN DIEGO – STANDARD DRAWING	
ACCESSIBLE PASSENGER DROP-OFF AND LOADING ZONE	

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
<i>CAvinger</i>	2/25/16
COORDINATOR R.C.E. 56523	DATE
DRAWING NUMBER	SDM-117



NOTES:

1. "X", THE TOP OF GRIPPING SURFACE OF HANDRAILS SHALL BE THE SAME HEIGHT VERTICALLY ABOVE WALKING SURFACES, STAIR NOSINGS, AND LANDING SURFACES. HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE WALKING SURFACES, STAIR NOSINGS, AND LANDING SURFACES. SPECIFY ONE HEIGHT DIMENSION BETWEEN 34" AND 38".
2. BOTTOM AND TOP LANDINGS SHALL BE AS WIDE AS THE WIDTH OF THE STAIR, 48" MINIMUM.



SHEET 1 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL*	BB	J. NAGELVOORT	01/12
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

**PEDESTRIAN PROTECTIVE RAILING
& STAIR HANDRAIL**

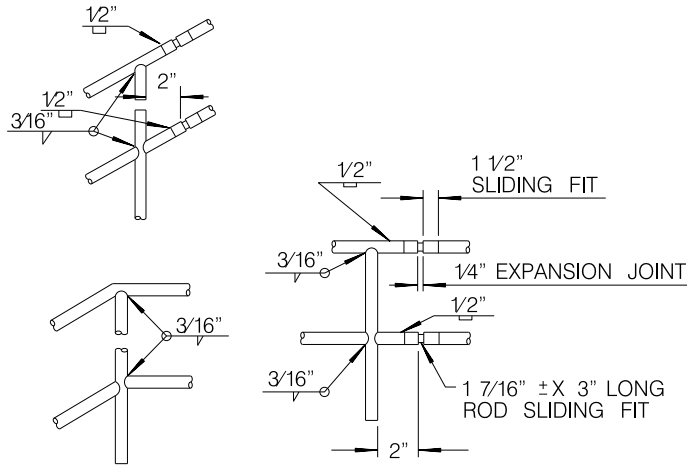
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

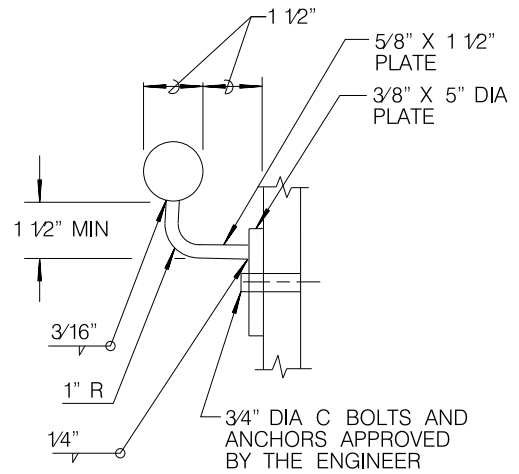
2/25/16
DATE

DRAWING
NUMBER

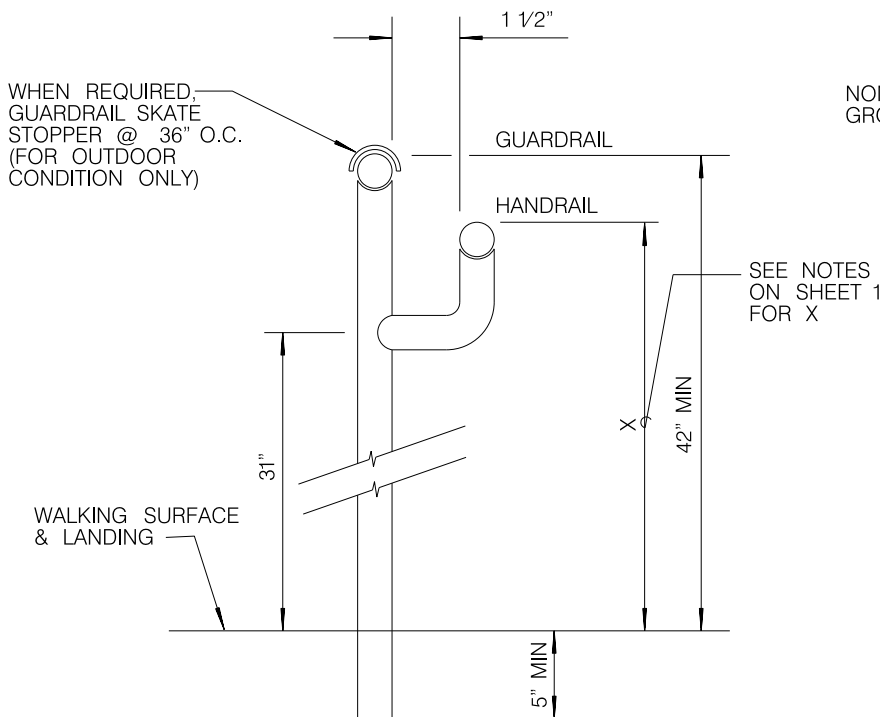
SDM-118



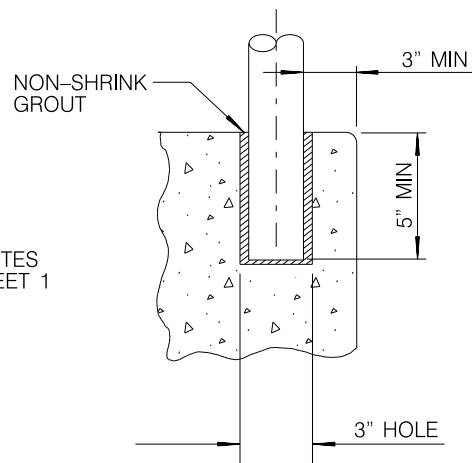
WELDING DETAILS



HANDRAIL BRACKET

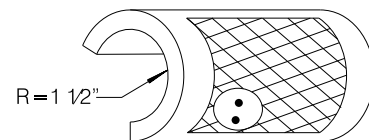


PIPE GUARDRAIL



MOUNTING DETAIL*

*POST SHALL BE GROUTED IN PLACE USING NON-SHRINK GROUT.



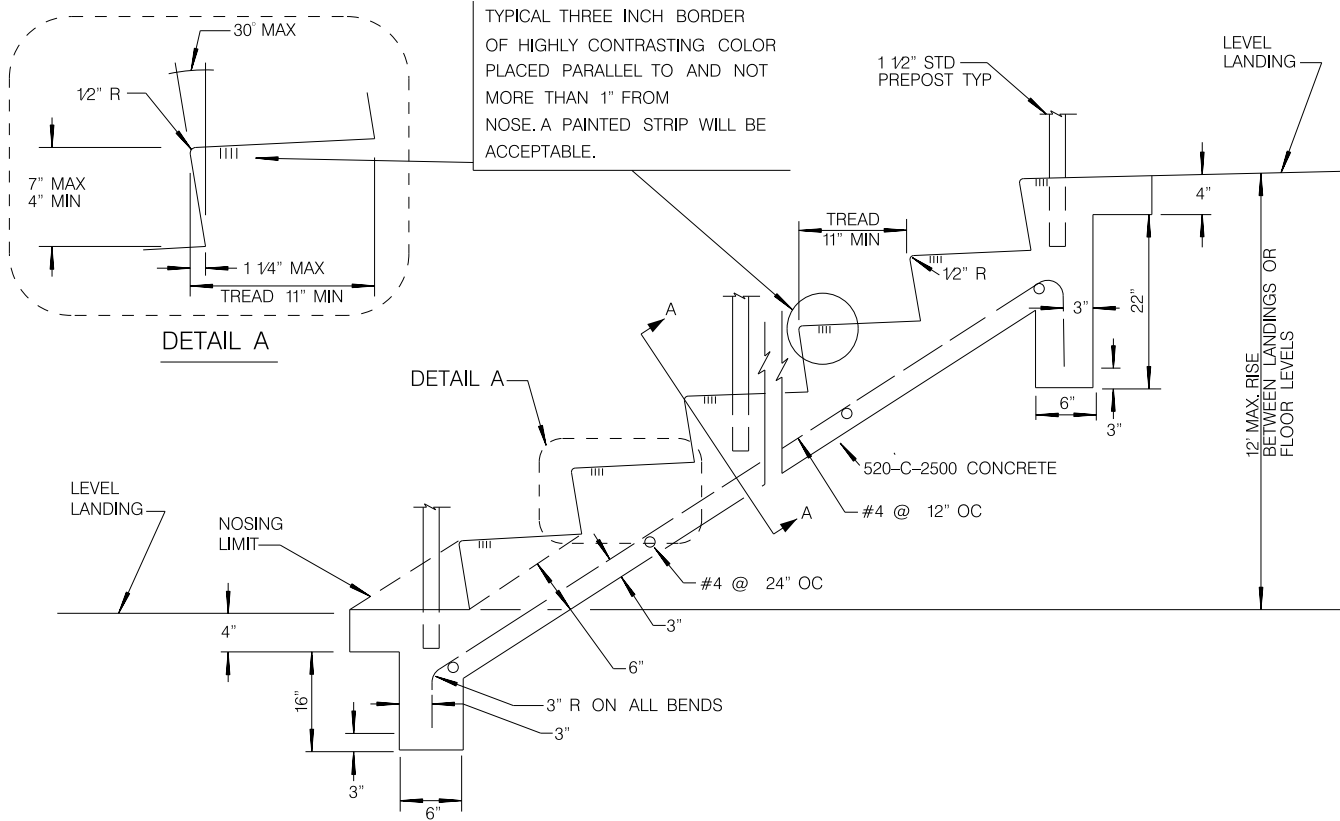
**ALUMINUM GUARDRAIL
SKATE STOPPER**

RAILING NOTES

1. 1/4" EXPANSION JOINTS @ 16' ON CENTER.
2. WELD AND GRIND SMOOTH ALL CONNECTIONS.
3. ALL RAILING TO BE HOT DIP GALVANIZED AFTER FABICATION.
4. PIPE SHALL BE SEAMLESS STEEL ASTM A53 GRADE B.
5. INSTALL HANDRAILS ON BOTH SIDES.
6. STAIRS AND LANDINGS THAT ARE OPEN ON ONE OR BOTH SIDES AND MORE THAN 30" ABOVE THE ADJACENT GROUND SHALL BE PROVIDED WITH GUARDRAIL.

SHEET 2 OF 3

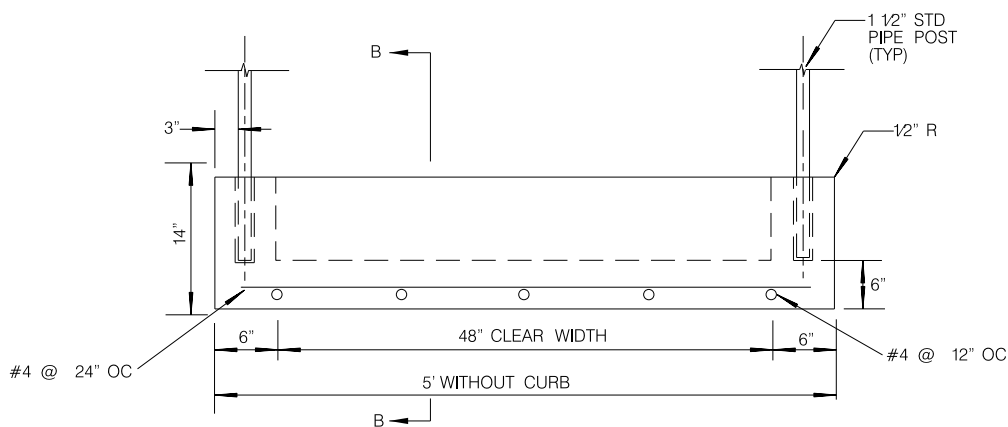
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
UPDATE	KA	J. NAGELVOORT	01/12		
UPDATE	FC	J. NAGELVOORT	02/16	PEDESTRIAN PROTECTIVE RAILING & STAIR HANDRAIL	 COORDINATOR R.C.E. 56523
					2/25/16 DATE
					DRAWING NUMBER
					SDM-118



SECTION B-B

NOTES

1. BROOM FINISH ON TREADS, TROWEL FINISH ON ALL OTHER EXPOSED SURFACES.
2. 1/4" PER 1' SLOPE ON TREADS FOR DRAINAGE.



SECTION A-A
CONCRETE STEPS

SHEET 3 OF 3

REVISION	BY	APPROVED	DATE
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	FC	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**PEDESTRIAN PROTECTIVE RAILING
& STAIR HANDRAIL**

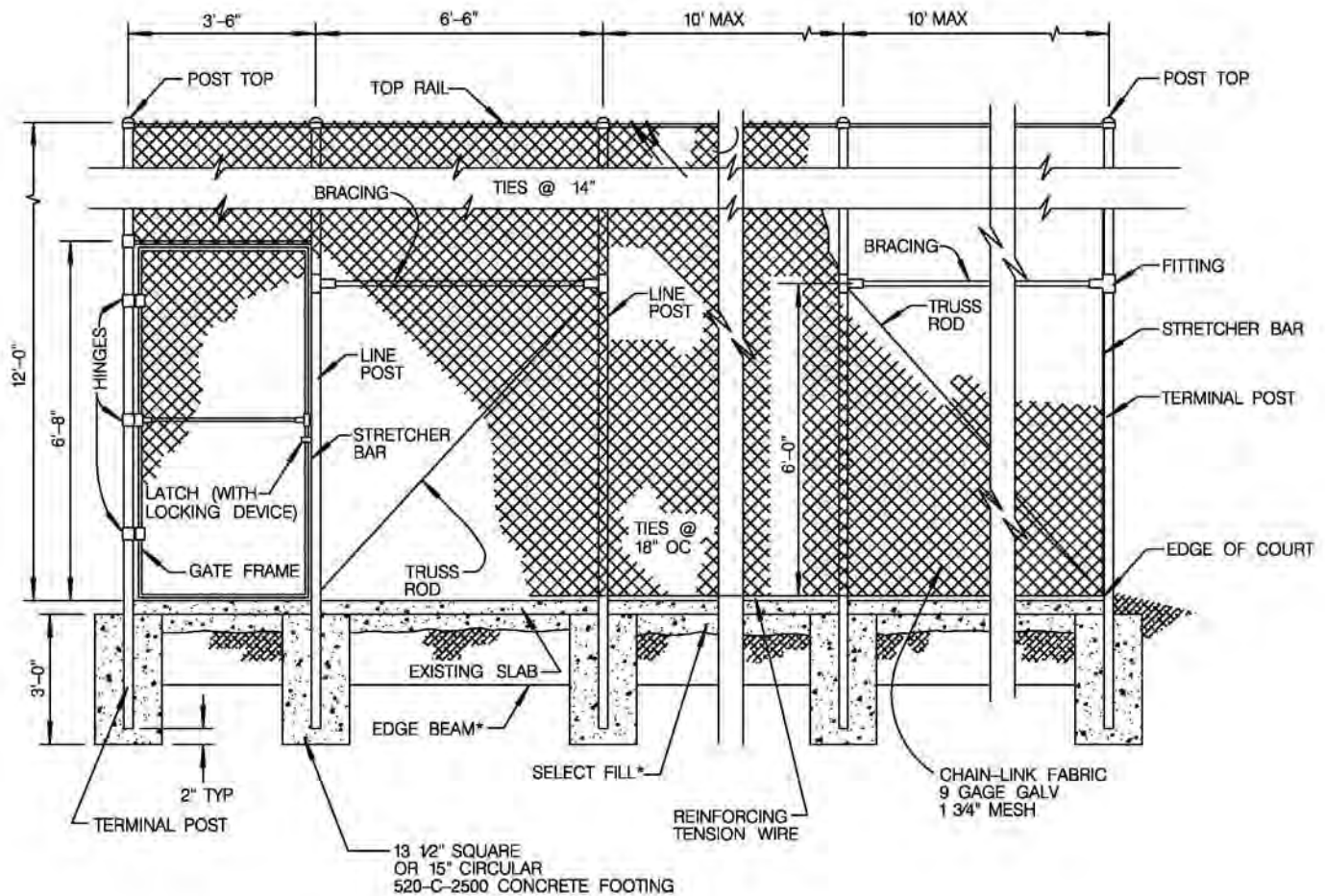
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDM-118



* FOR EDGE, BEAM, SLAB, AND SELECT FILL DETAILS, SEE PLANS.

ELEVATION

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

NOTE:

1. CHAIN LINK FABRIC SHALL BE ERECTED ON THE INTERIOR SIDE OF THE COURTS.
2. CHAIN LINK FABRIC SHALL HAVE KNUCKLED FINISH ON TOP EDGE.

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*	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

TENNIS COURT FENCE CHAIN LINK

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

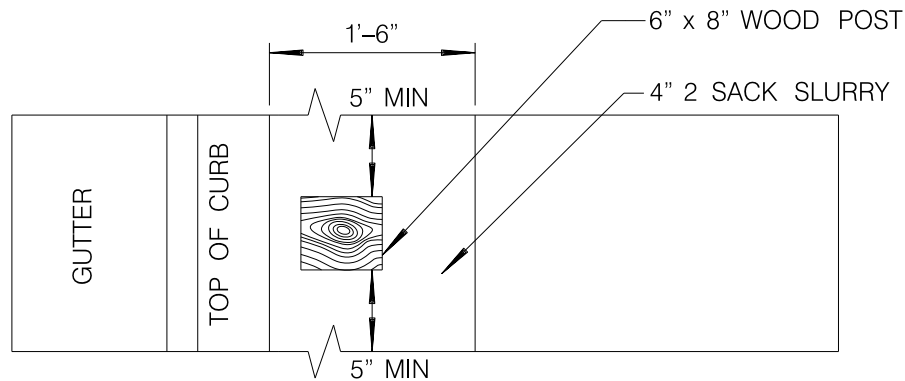
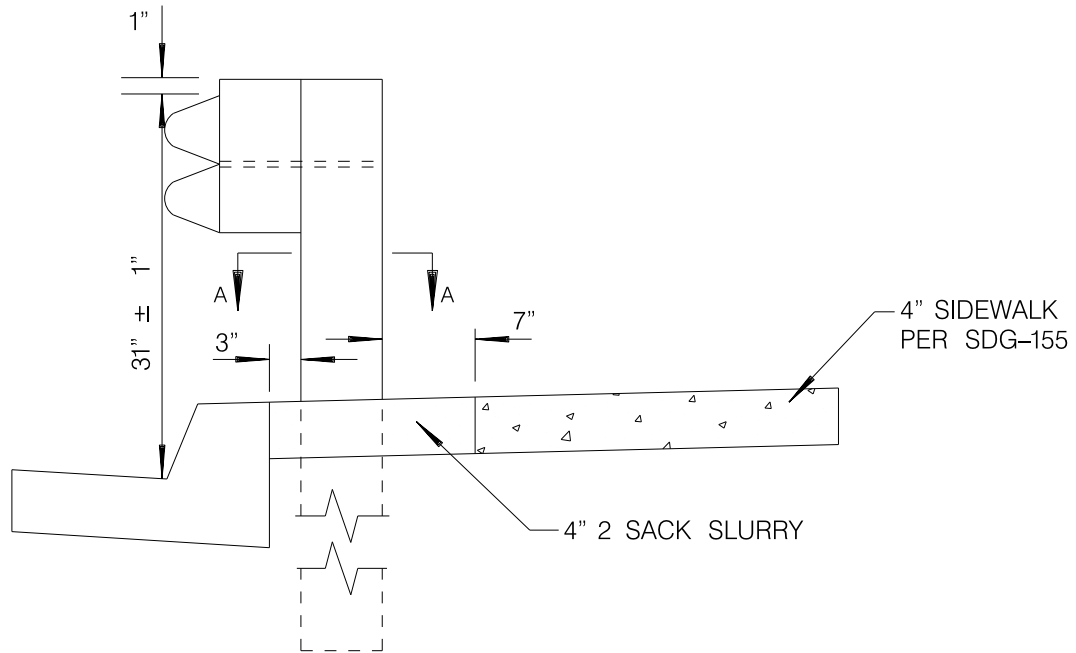
H. Haddi

1/31/2012

COORDINATOR R.C.E. 85271 DATE

DRAWING
NUMBER


SDM-119

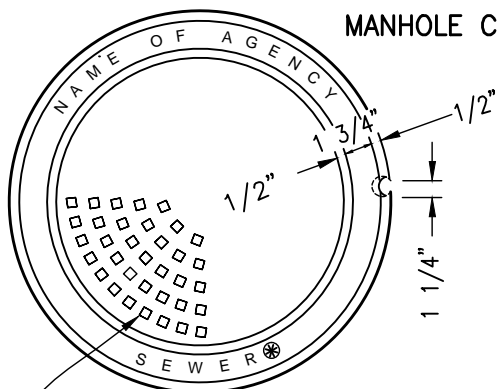
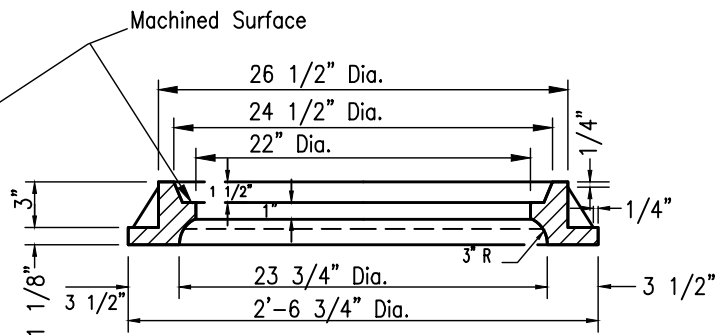
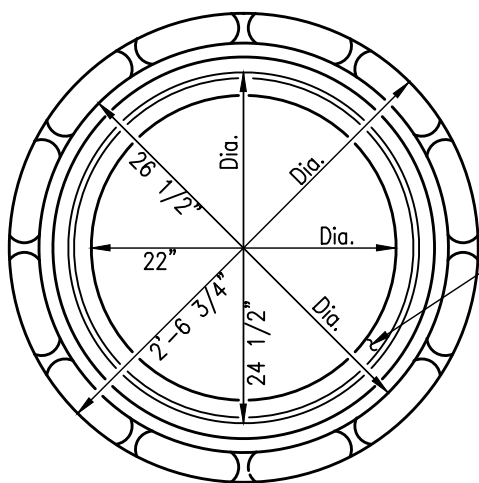


POST KNOCKOUT PLAN DETAIL
SECTION A-A

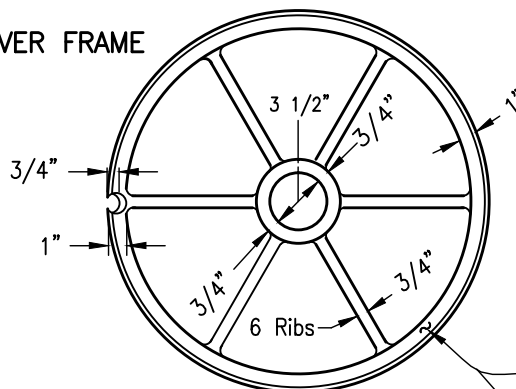
NOTES:

1. THIS STANDARD DRAWING SHALL BE USED WHEN GUARDRAIL IS INSTALLED ADJACENT TO CURB, GUTTER, AND SIDEWALK. THE POST KNOCKOUT DETAIL DOES NOT APPLY WHEN GUARDRAIL IS INSTALLED IN A PARKWAY.
2. SEE CALTRANS STANDARD PLANS FOR ADDITIONAL GUARDRAIL DETAILS.

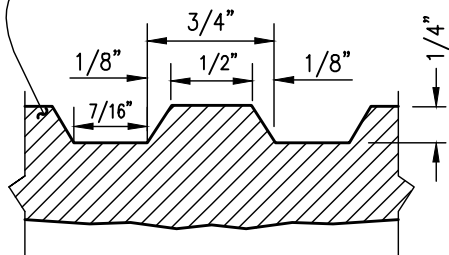
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATE	KA	J. NAGELVOORT	08/13	GUARDRAIL	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATE	AR	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDM-130



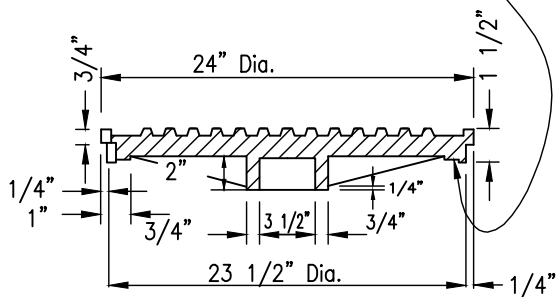
MANHOLE COVER FRAME



Machined Surface



DETAIL



NOTES

1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 35B.
2. Weights: Frame 166 lbs - 193 lbs.
Cover 147 lbs - 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.

MANHOLE COVER



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
Delete Metric		D. Gerschoffer	05/12

SAN DIEGO REGIONAL STANDARD DRAWING

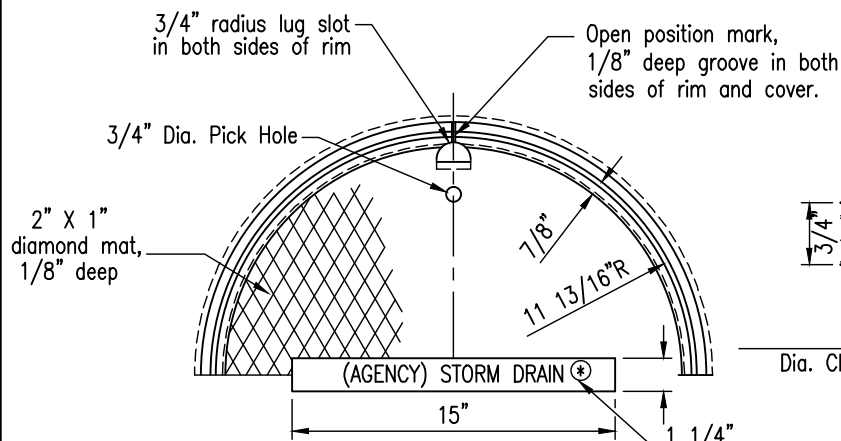
24" MANHOLE FRAME AND COVER HEAVY DUTY

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

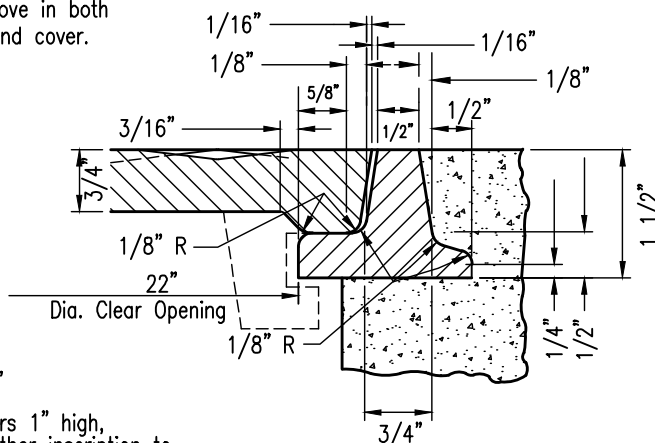
DRAWING
NUMBER

M-1

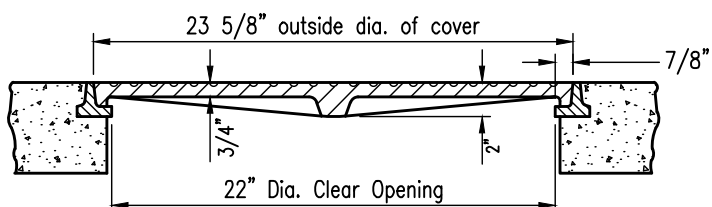


TOP OF FRAME & COVER

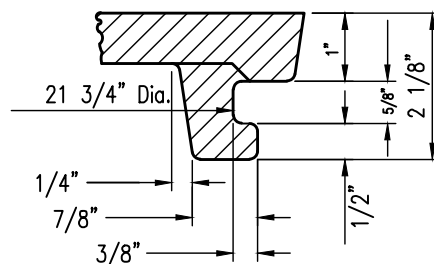
Letters 1" high,
no other inscription to
appear on exposed surfaces.



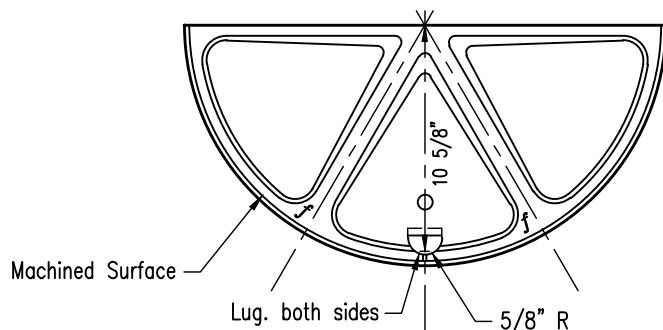
SECTION THROUGH RIM



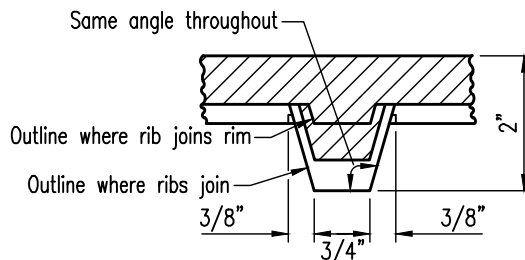
SECTION THROUGH FRAME & COVER



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 29 lbs - 33 lbs.
Cover 95 lbs. - 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
Delete Metric		D. Gerschoffer	05/12

SAN DIEGO REGIONAL STANDARD DRAWING

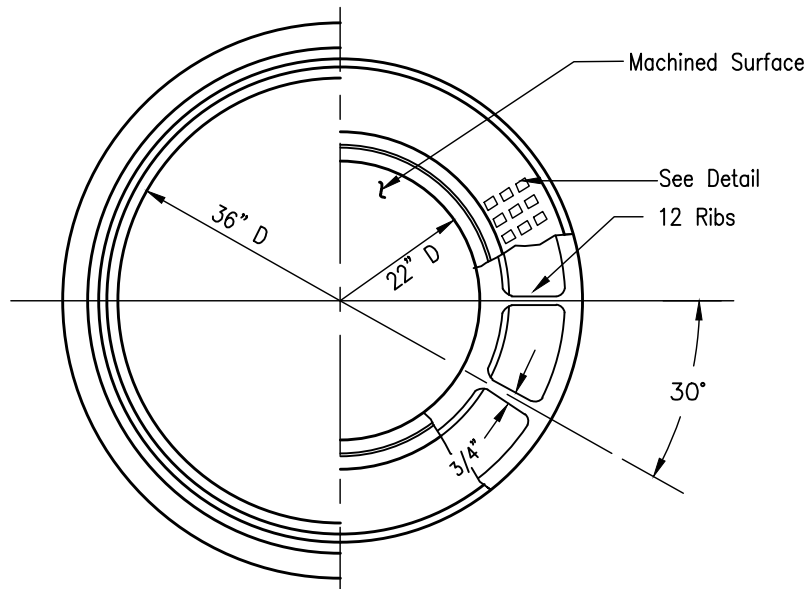
24" MANHOLE FRAME AND COVER LIGHT DUTY

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

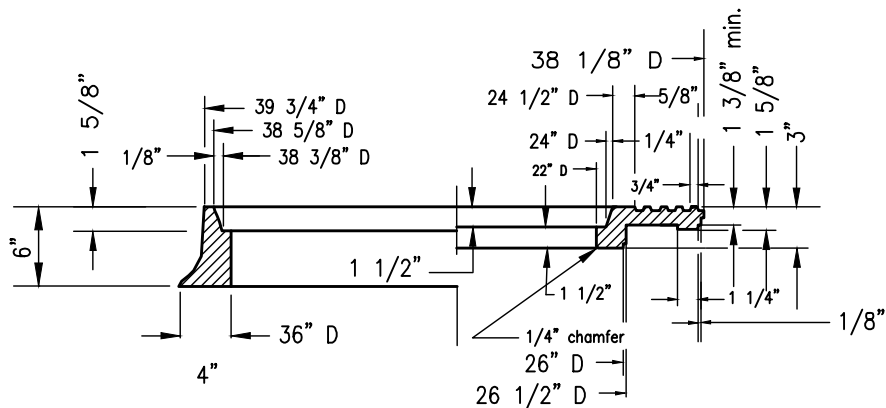
T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

M-2



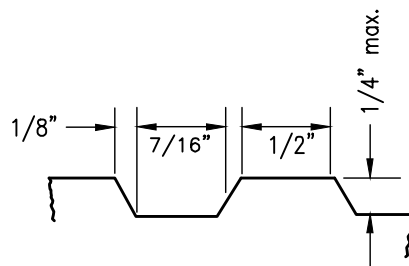
HALF PLAN FRAME & COVER



HALF SECTION FRAME & COVER

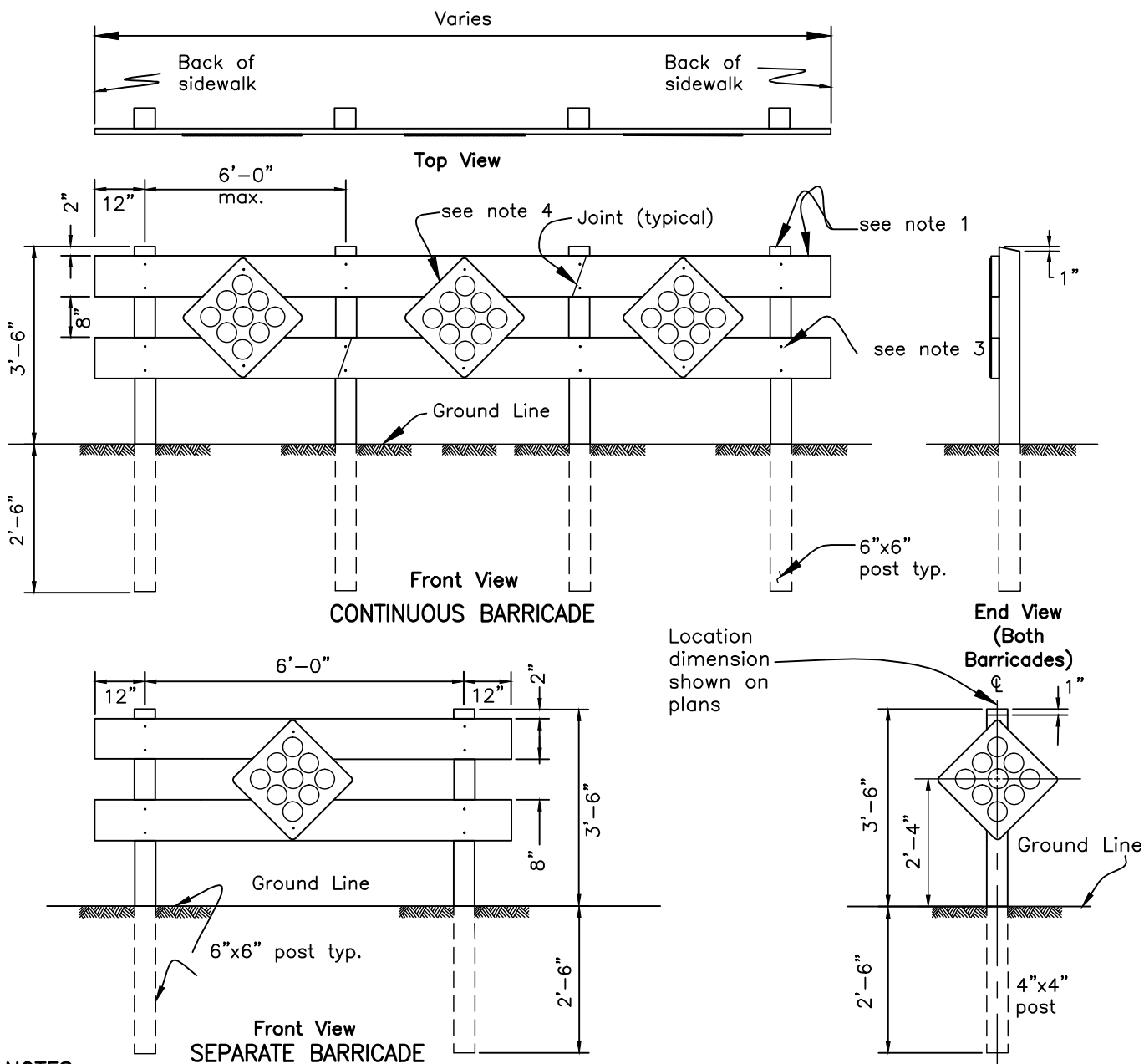
NOTES

1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 35B.
2. Weights: Frame 314 lbs - 363 lbs.
Outer Cover 285 lbs - 330 lbs.
Inner Cover 147 lbs - 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	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75	36" MANHOLE FRAME AND TWO CONCENTRIC COVERS HEAVY DUTY		 7/26/2012 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03			
Reviewed		T. Stanton	04/06			
Delete Metric		D. Gerschoffer	05/12			
						DRAWING NUMBER M-3




NOTES

- Posts to be structural grade redwood or pressure treated (with wood preservative) Douglas Fir, surfaced four sides; cross pieces to be 2"x8" select grade Douglas Fir, surfaced four sides.
- All exposed portions of barricades shall be painted with two coats of white exterior enamel over prime coat.
- Connections shall be made with 3/8" x 6" galvanized lag screws with one (1) washer each.
- Reflector sign fasteners to be 3/8" x 1 1/2" galvanized lag screws.
- Reflector signs - California Type N. Size 18" x 18" - Yellow with nine (9) 3 1/4" reflectors (center mount).
 - 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.
 - Sign material shall be aluminum alloy 6061-T6 or 5052-H38, aluminum thickness 0.063".
- 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
Delete Metric		D. Gerschoffer	05/12

SAN DIEGO REGIONAL STANDARD DRAWING

GUARD POST AND BARRICADE

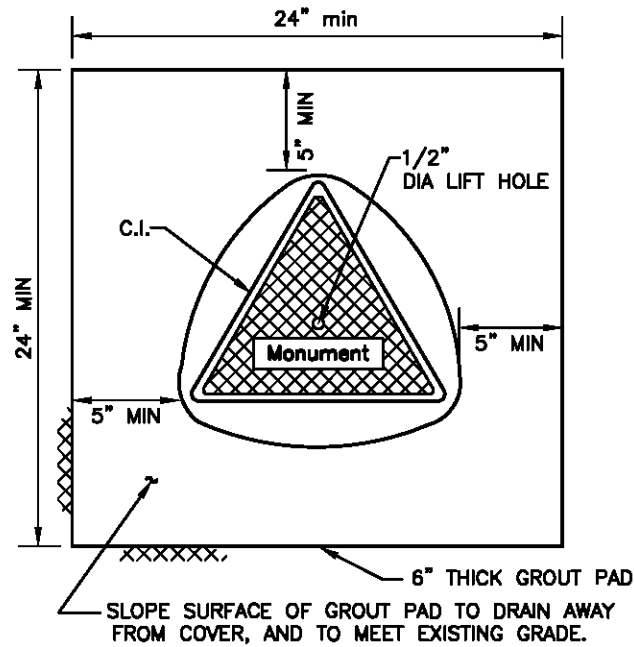
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

 7/26/2012

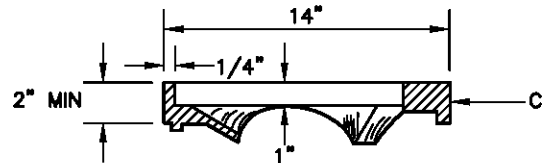
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

M-9



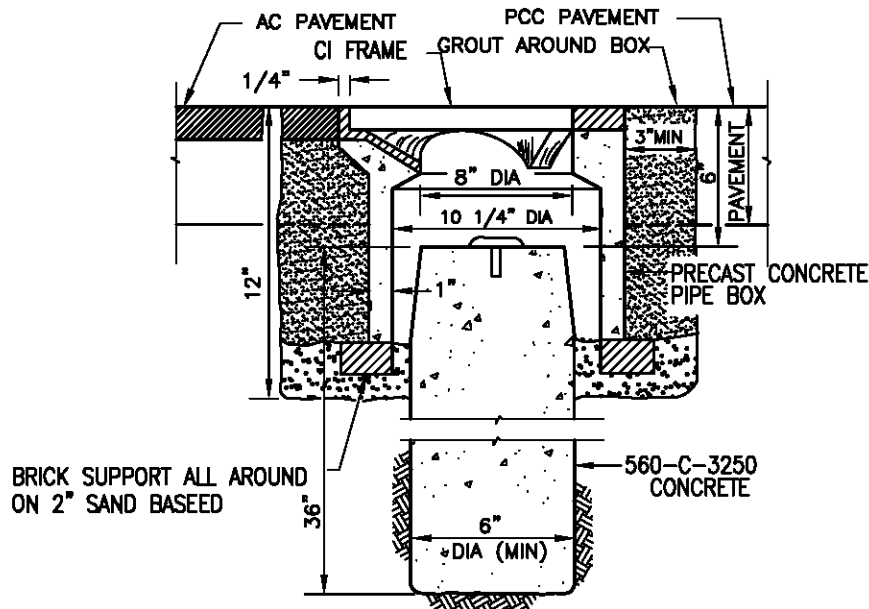
PLAN-IN UNPAVED AREA



RISER RING

ALTERATION LOCATION OF MONUMENT. TIE DISTANCES SHOWN ON FINAL SUB-DIVISION MAP IF ALTERNATE LOCATION IS USED

LOCATION OF STREET SURVEY MONUMENT



TYPICAL MONUMENT SECTION IN PAVED AREA

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
Add Metric		T. Stanton	03/03
Reviewed		T. Stanton	04/06
Delete Metric		D. Gerschoffer	05/12
Note 4 Rev		D. Gerschoffer	02/14

SAN DIEGO REGIONAL STANDARD DRAWING

STREET SURVEY MONUMENT

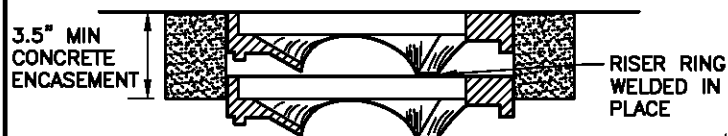
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

T. Stanton 7/26/2015

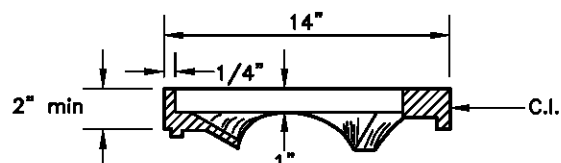
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER

M-10

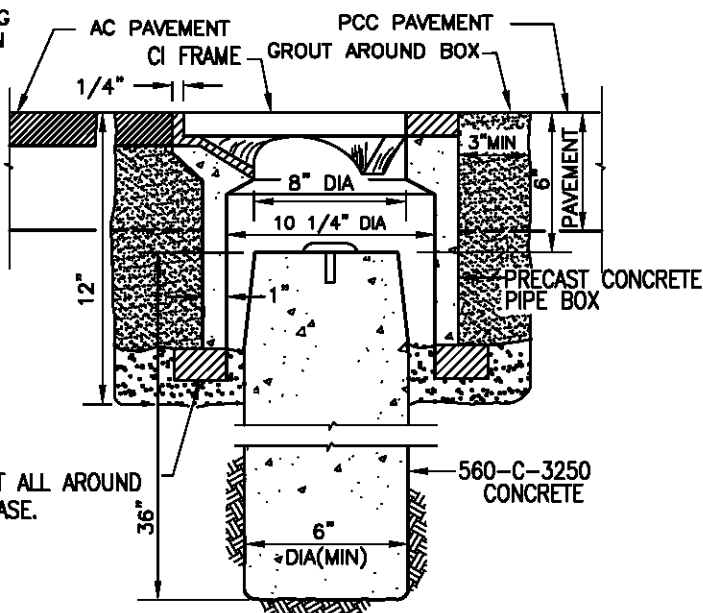


RISER RING WELDED TO EXISTING RING

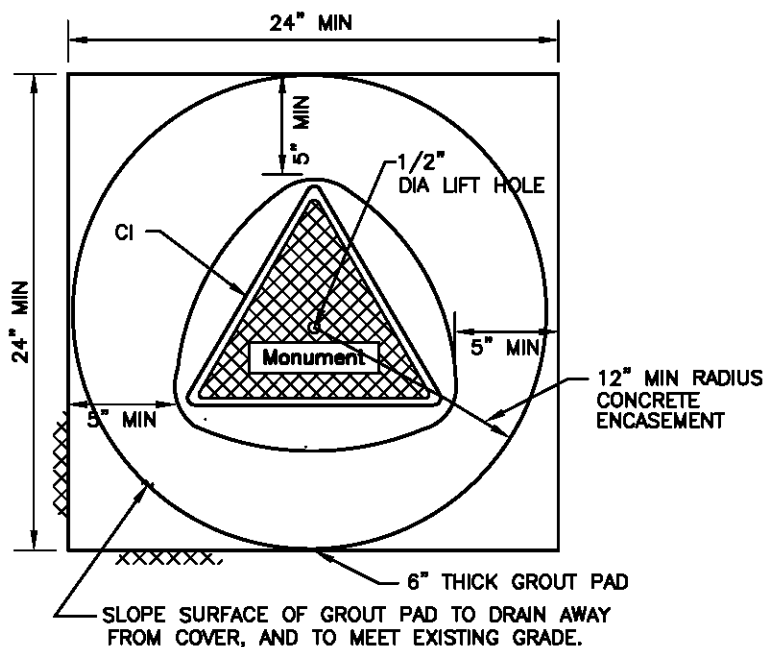


RISER RING

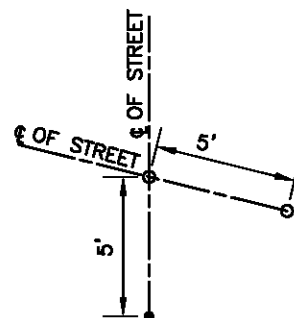
BRICK SUPPORT ALL AROUND ON 2" SAND BASE.



TYPICAL MONUMENT SECTION IN PAVED AREA



PLAN-IN UNPAVED AREA



ALTERATION LOCATION OF MONUMENT. TIE DISTANCES SHOWN ON FINAL SUB-DIVISION MAP IF ALTERNATE LOCATION IS USED.

LOCATION OF STREET SURVEY MONUMENT

Revision	By	Approved	Date
ORIGINAL		Kercheval	12/75
New Dwg		T. Stanton	07/15

SAN DIEGO REGIONAL STANDARD DRAWING

STREET SURVEY MONUMENT OVERLAY ADJUSTMENT


RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

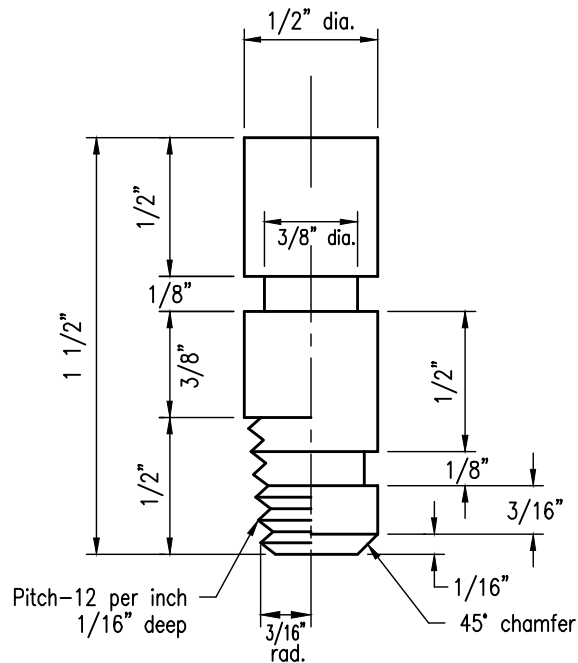
T. Stanton 7/26/2015
Chairperson R.C.E. 19246 Date

DRAWING NUMBER **M-10A**

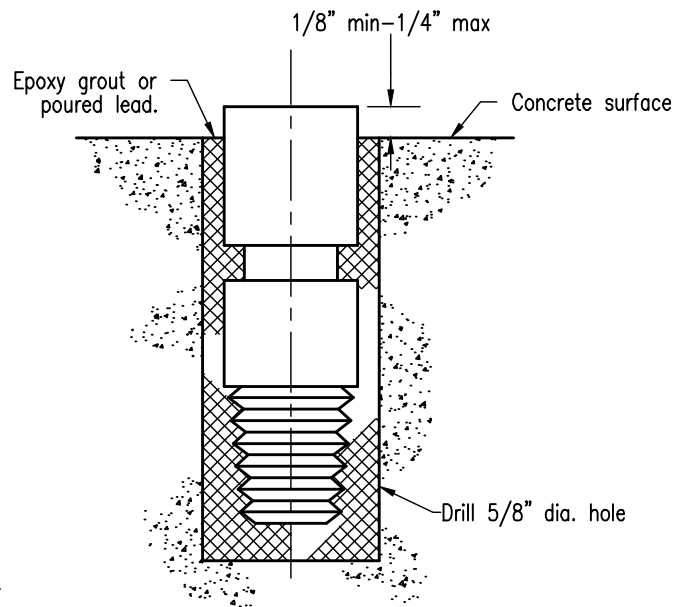
NOTES

1. COVER AND FRAME TO BE CAST INTEGRALLY WITH PIPE BOX.
2. MONUMENT BASE MAY BE CAST IN PLACE OR PRECAST.
3. FORM AND TAPER EXPOSED UPPER 6" OF CAST-IN-PLACE BASE TO A TOP DIAMETER OF 5". (PRECAST BASE SHALL BE SAN BACKFILLED)
4. MONUMENT MARKER SHALL BE A DOMED BRASS, 3" IN DIAMETER.
5. MONUMENT LOCATION:
 - A) SET ON ALL CENTERLINE INTERSECTIONS UNLESS ACTUAL LOCATION IS MODIFIED BY THE AGENCY AND SHOWN IN MODIFIED LOCATION ON MAP. WHEN CENTERLINE INTERSECTION IS IMPRACTICAL, OFFSET 5' ON CENTERLINE OF MAJOR STREET, (SEE DETAIL AT RIGHT). IF NEITHER CENTERLINE CAN BE OCCUPIED, TWO MONUMENTS WILL BE SET IN LINE AROUND THE FRONT ON THE PERIMETER OF A 10' DIAMETER CIRCLE, WHOSE CENTER IS THE POINT.
 - B) SET ON CENTERLINE AT INTERVALS NOT EXCEEDING 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 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 300' FROM THE POINT ON WHICH THE DELETED MONUMENT WOULD HAVE BEEN PLACED.
 - I) FOR RAISING STREET SURVEY MONUMENT TO FINISH GRADE, RISER RING IS TO BE WELDED TO EXISTING RING AND BROUGHT TO SURFACE. ENCASE RISER RING IN FAST SETTING CONCRETE WITH A MINIMUM OF 3.5" THICKNESS. CONCRETE MUST OBTAIN 1600 PSI BEFORE TRAFFIC USE, AND HAVE A MINIMUM STRENGTH OF 3250 PSI.

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	STREET SURVEY MONUMENT NOTES	 7/26/2015 Chairperson R.C.E. 19246 Date
Reviewed		T. Stanton	04/06		
Delete Metric		D. Gerschoffer	05/12		
Note 4 Rev		D. Gerschoffer	02/14		
				DRAWING NUMBER	M-10B



TYPE-A TYPE-B
ELEVATION

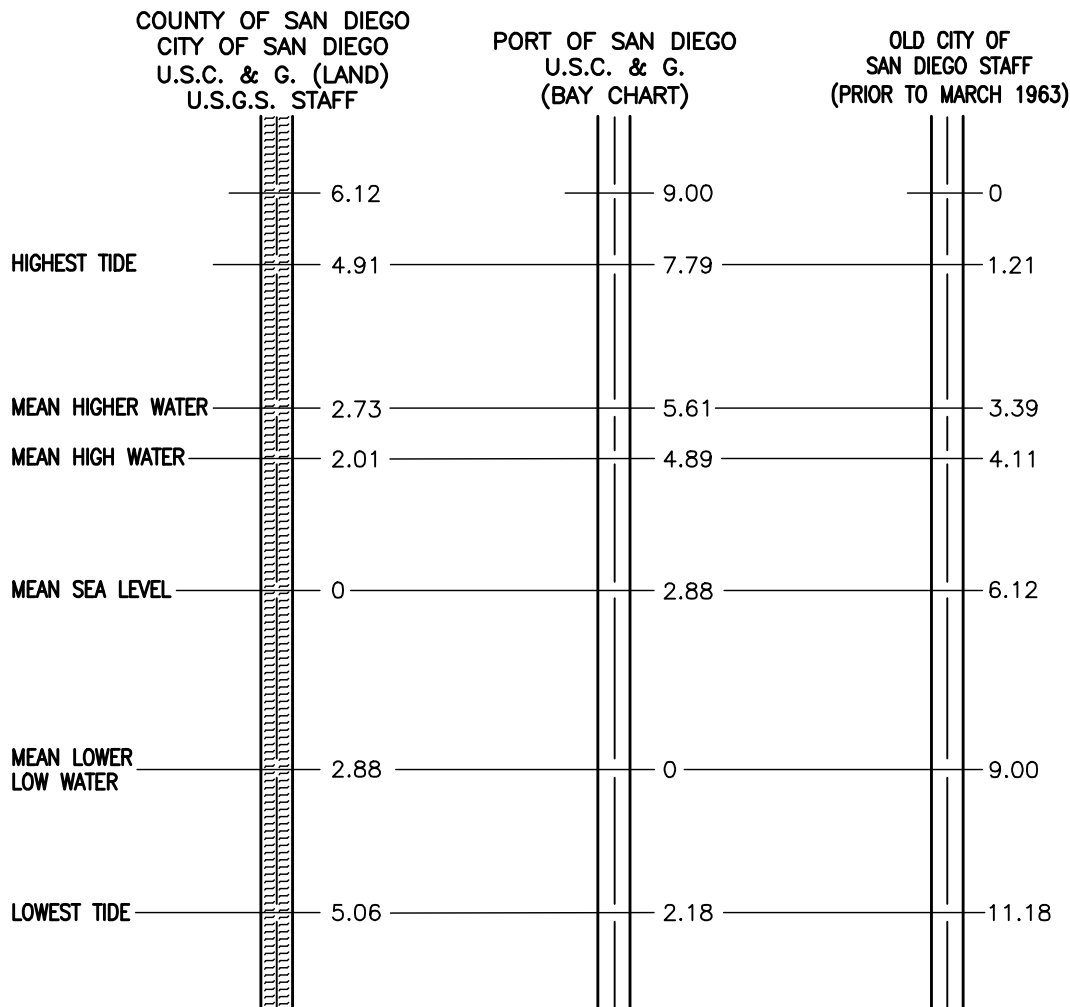


INSTALLATION IN EXISTING CONCRETE
(Typical for Type A or B)

NOTES

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

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
ORIGINAL		Kercheval	12/75	BENCH MARK - BRASS PLUG	
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06		
Delete Metric		D. Gerschoffer	05/12		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				 7/26/2012 Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER M-11	

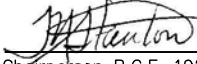


LEGEND

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 1929".

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING DATUMS	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		 7/26/2012 Chairperson R.C.E. 19246 Date
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06		
Delete Metric		D. Gerschoffer	05/12		
					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 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 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, 18" long, set flush with the surface.

LEGEND

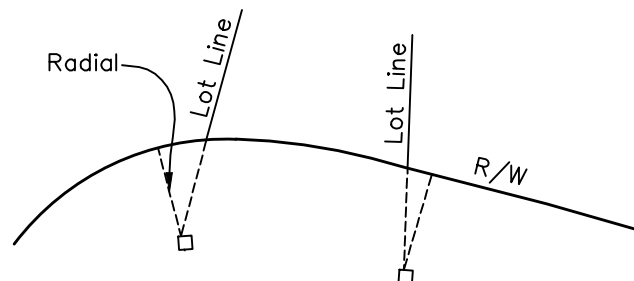
- Fd 2" Iron Pipe Marked RCE XXXX or per Map XXX unless otherwise noted
- ▲ Fd Street Survey Monument Stamped RCE XXXX or LS XXXX
- ◎ Set 2" x 24" Iron Pipe Marked RCE XXXX or LS XXXX
- Set Lead and Disc Stamped RCE XXXX or LS XXXX
- Set ½" x 18" Iron Pipe Marked RCE XXXX or LS XXXX
- △ Set Street Survey Monument Stamped RCE XXXX or LS XXXX per Standard Drawing M-10

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


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

Unless otherwise shown on this map:

1. All lot corners except as described below will be monumented by a ½" by 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	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Kercheval	12/75		SURVEY MONUMENTS	 7/26/2012
Add Metric		T. Stanton	03/03	Chairperson R.C.E. 19246		Date
Reviewed		T. Stanton	04/06			
Delete Metric		D. Gerschoffer	05/12			
					DRAWING NUMBER	
					M-13	

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

WEIGHT

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

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

AREA

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

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

VOLUME

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

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

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
 1000000
 1000
 100
 10

PREFIX
 mega
 kilo
 hecto
 deka

METRIC PREFIX


MULTIPLE
 1/10
 1/100
 1/1000
 1/1000000

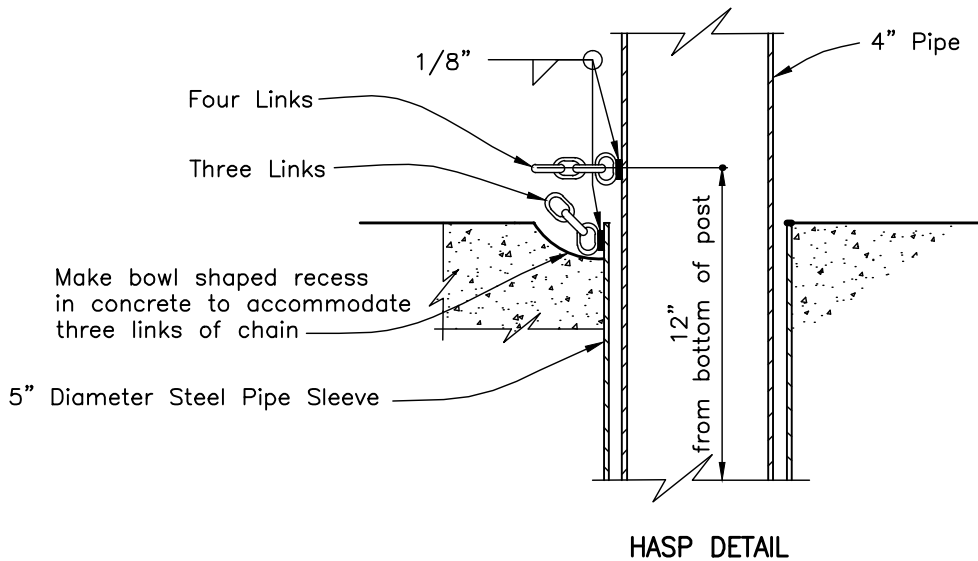
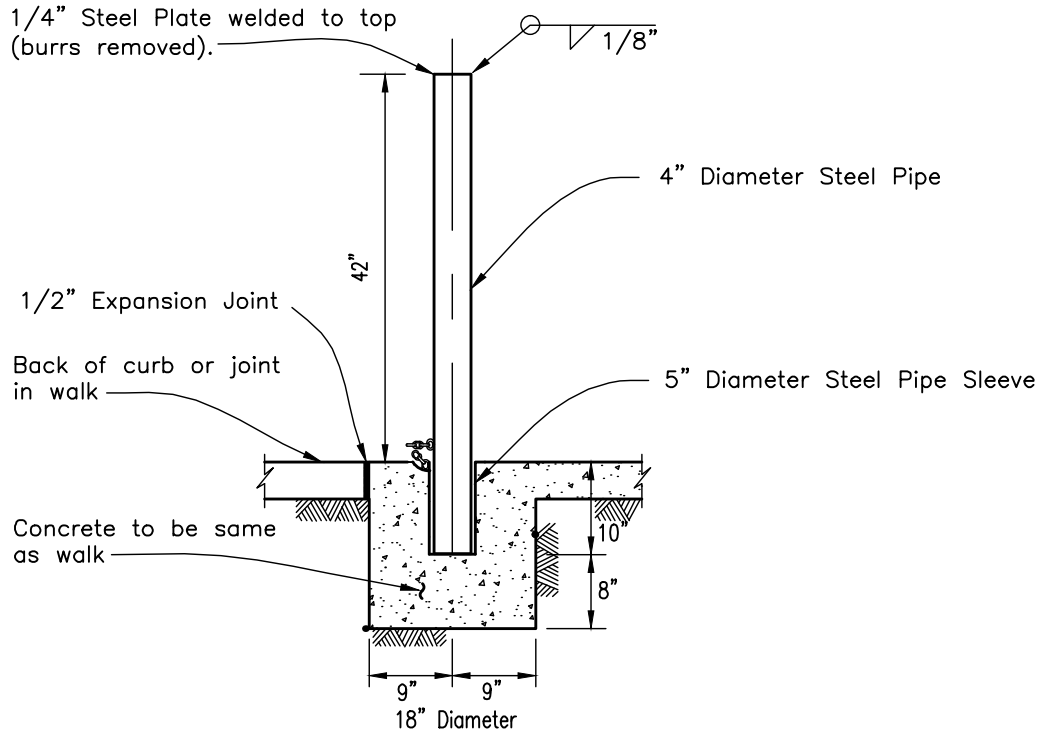
PREFIX
 deci
 centi
 milli
 micro

TEMPERATURE

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

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

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	
ORIGINAL		Kercheval	12/75	METRIC EQUIVALENTS	
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06		
Edited		T. Stanton	08/09		
Delete Metric		D. Gerschoffer	05/12		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				 7/26/2012 Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER M-14	




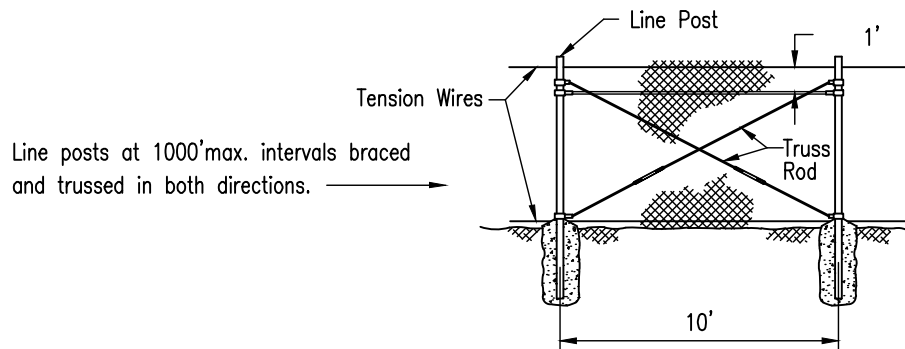
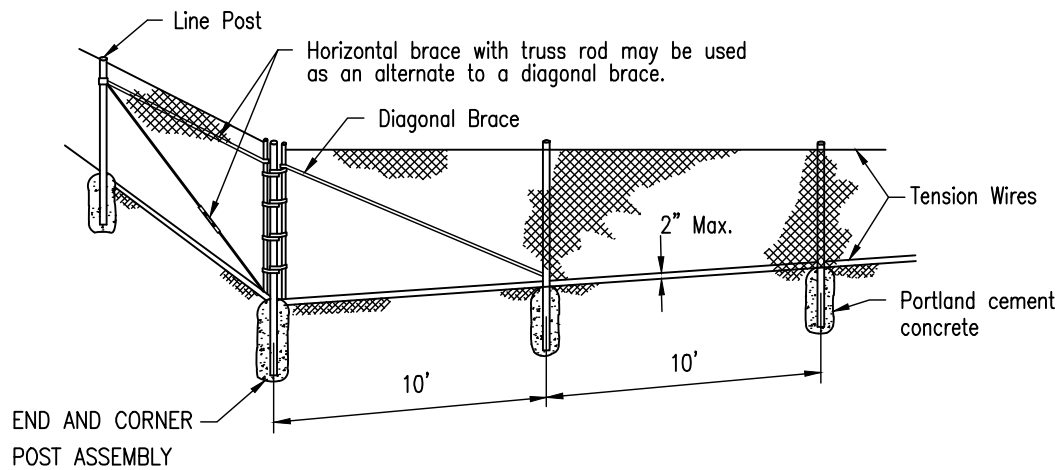
NOTES

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

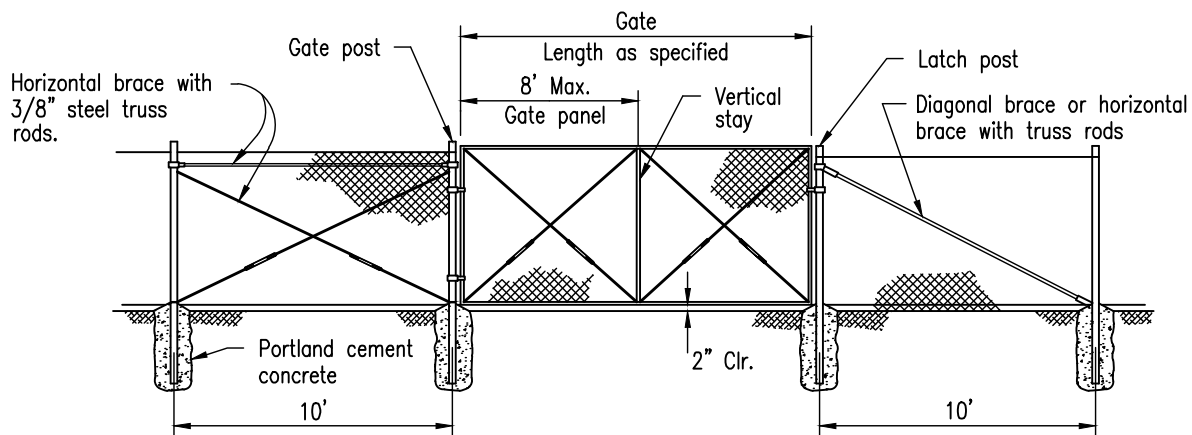
LEGEND ON PLANS



Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Solomon	7/79	DEMOUNTABLE POST		
Add Metric		T. Stanton	03/03			
Reviewed		T. Stanton	04/06			
Delete Metric		D. Gerschoffer	05/12			
						 7/26/2012 Chairperson R.C.E. 19246 Date
						DRAWING NUMBER M-16

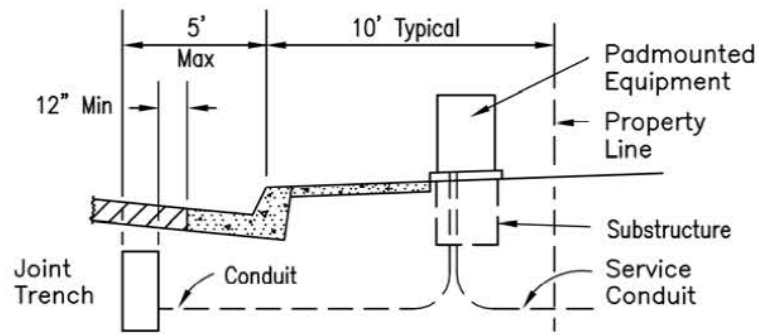


LINE POST BRACING

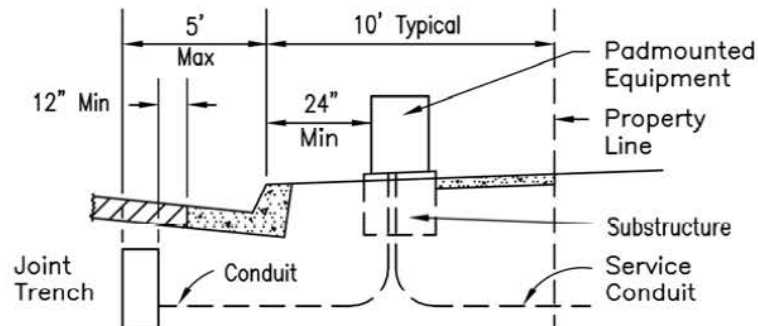


GATE ASSEMBLY

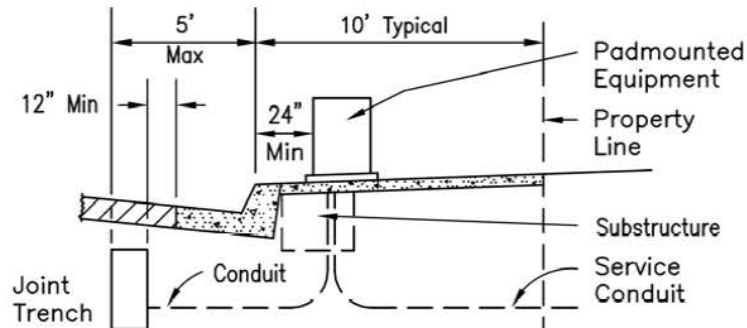
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
ORIGINAL		Bahmanian	4/86				
Add Metric		T. Stanton	03/03	CHAIN LINK FENCE DETAILS		 7/26/2012	
Reviewed		T. Stanton	04/06			Chairperson R.C.E. 19246 Date	
Delete Metric		D. Gerschoffer	05/12			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 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
Delete Metric		D. Gerschoffer	05/12

SAN DIEGO REGIONAL STANDARD DRAWING

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

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

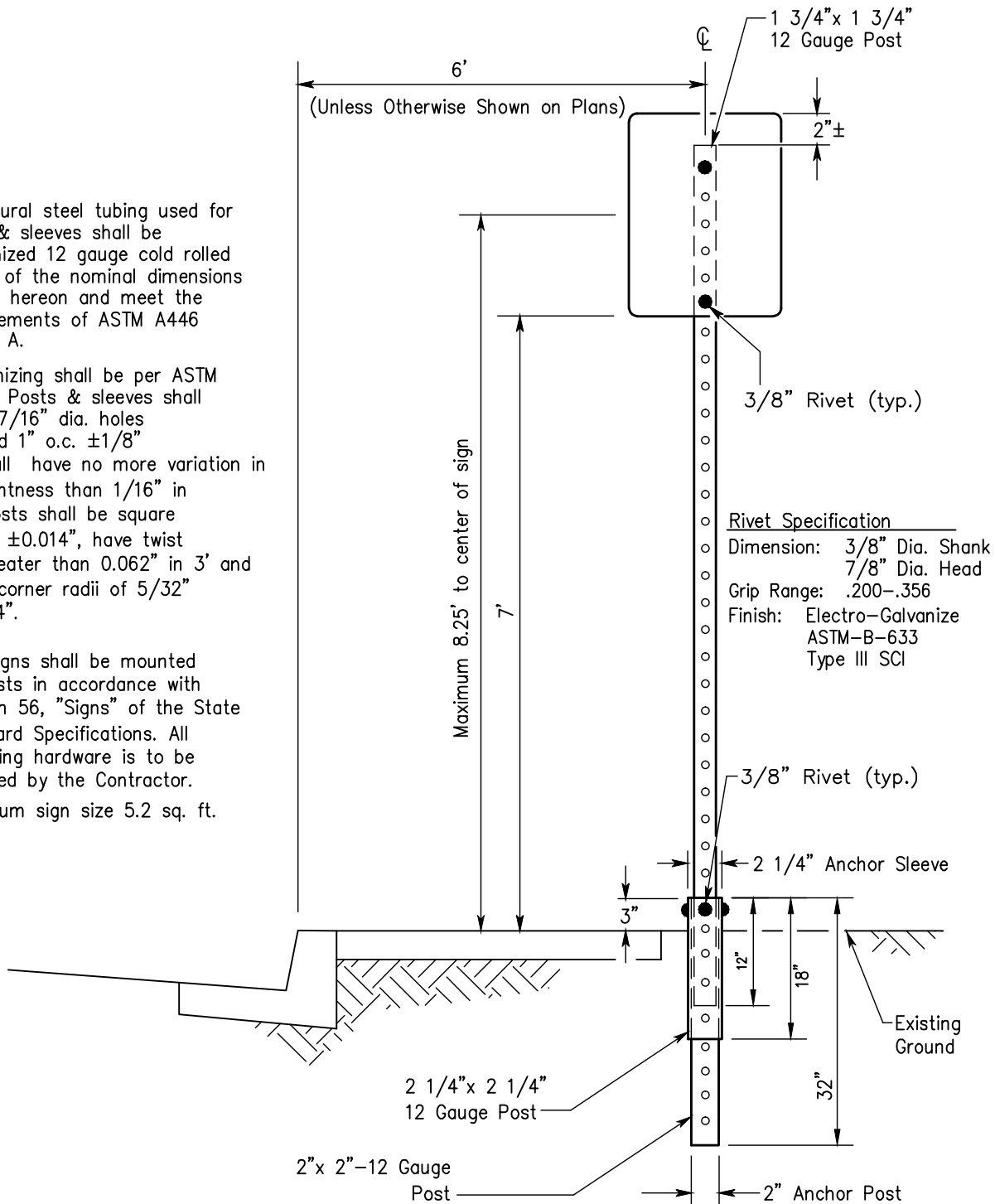
T. Stanton 7/26/2012
Chairperson R.C.E. 19246 Date

DRAWING
NUMBER **M-21**

FOR DRAWING M-15 SEE DRAWING SDM-103

NOTES

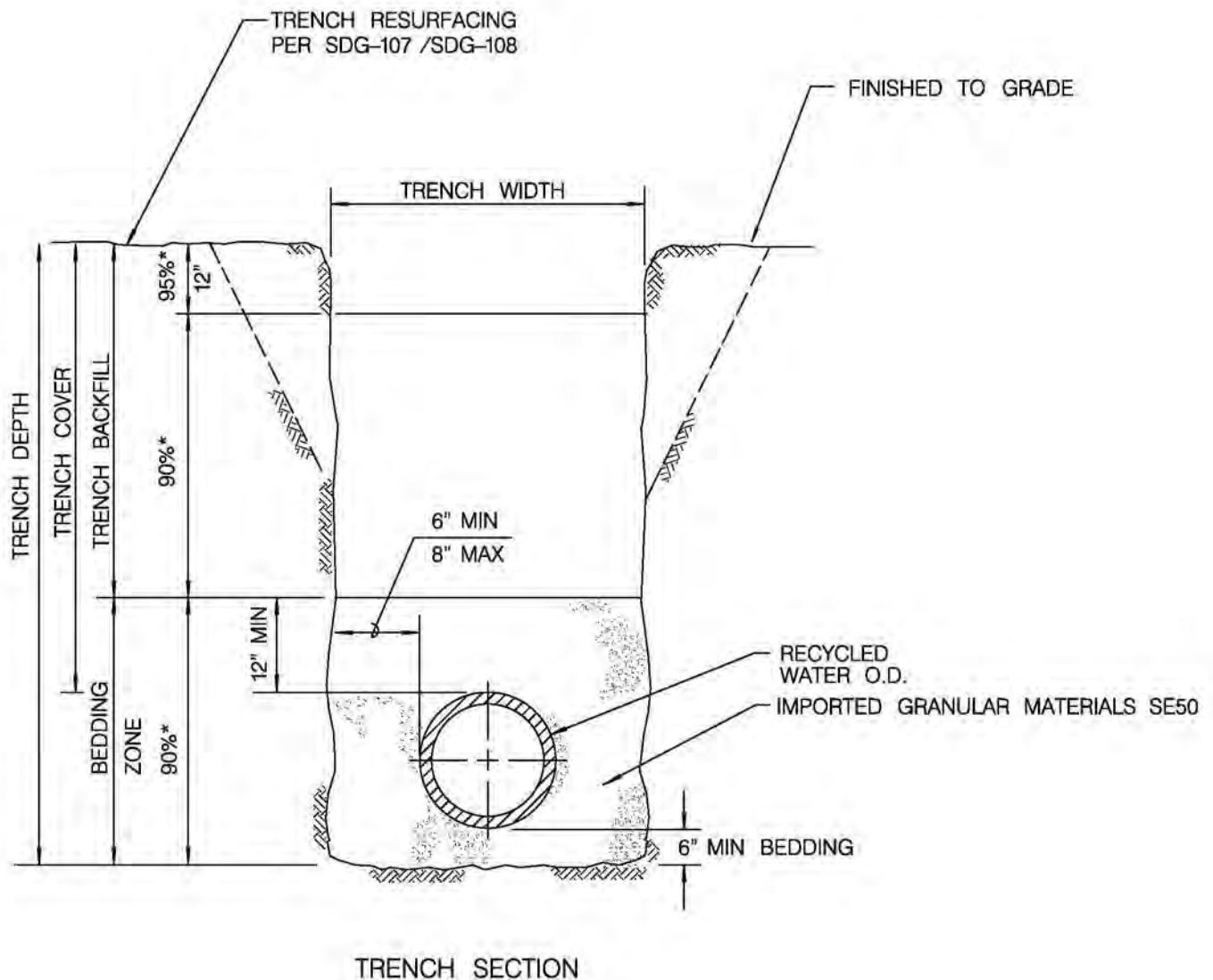
1. Structural steel tubing used for post & sleeves shall be galvanized 12 gauge cold rolled steel, of the nominal dimensions shown hereon and meet the requirements of ASTM A446 Grade A.
2. Galvanizing shall be per ASTM A525. Posts & sleeves shall have 7/16" dia. holes spaced 1" o.c. $\pm 1/8$ " & shall have no more variation in straightness than 1/16" in 3'. Posts shall be square within ± 0.014 ", have twist no greater than 0.062" in 3' and have corner radii of 5/32" $\pm 1/64$ ".
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	SAN DIEGO REGIONAL STANDARD DRAWING	
ORIGINAL		G.Parkinson	2/95	BREAK-AWAY SIGN POST	
Add Metric		T. Stanton	03/03		
Reviewed		T. Stanton	04/06		
Delete Metric		D. Gerschoffer	05/12		
				RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE	
				 7/26/2012 Chairperson R.C.E. 19246 Date	
				DRAWING NUMBER M-45	

CHAPTER 8

*RECYCLED
WATER
SYSTEMS*



NOTES:

1. (*) INDICATES MINIMUM RELATIVE COMPACTION. IT SHALL BE 95% MIN IN THE TOP FOOT.
2. MINIMUM COVER: 4' FOR RECYCLED WATER MAIN.
3. RECYCLE WATER PIPE SHALL BE PURPLE COLOR CODED INTEGRALLY STAMPED OR MARKED AS "CAUTION - RECYCLED WATER - DO NOT DRINK".
4. WARNING / IDENTIFICATION METAL TAPE SHALL BE PLACED AT 4' BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.
5. THE TERM RECLAIMED WATER IS THE SAME AS THE TERM RECYCLED WATER.
6. 1' SAND CUSHION OR A 6" MINIMUM SAND CUSHION WITH 1" NEOPRENE PAD SHALL BE PLACED FOR ALL CROSSINGS UTILITIES WHEN VERTICAL CLEARANCE IS 1' OR LESS. THE NEOPRENE PAD SHALL BE PLACED ON THE MOST FRAGILE UTILITY.

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**PIPE BEDDING AND TRENCH
BACKFILL FOR RECYCLED
WATER MAINS**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature]

1/31/2012



COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDRW-101

SHEET 1 OF 2

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	SIZE x 2" BRONZE SERVICE SADDLE (DOUBLE STRAP)	⑥	2" BRONZE ANGLE METER STOP WITH LOCKWING
②	RECYCLED WATER MAIN	⑦	WATER METER FURNISHED AND INSTALLED BY THE CITY
③	2" BRONZE CORPORATION STOP	⑧	METER BOX WITH LID, 17"x 30"
④	2" x REQUIRED LENGTH COPPER PIPE TYPE "K" SOFT/RIGID OR UNLESS OTHERWISE SPECIFIED.	⑨	CUSTOMER SHUT-OFF VALVE (LOCKABLE)
⑤	3/8" ROCK, 4" TO 6" DEEP		

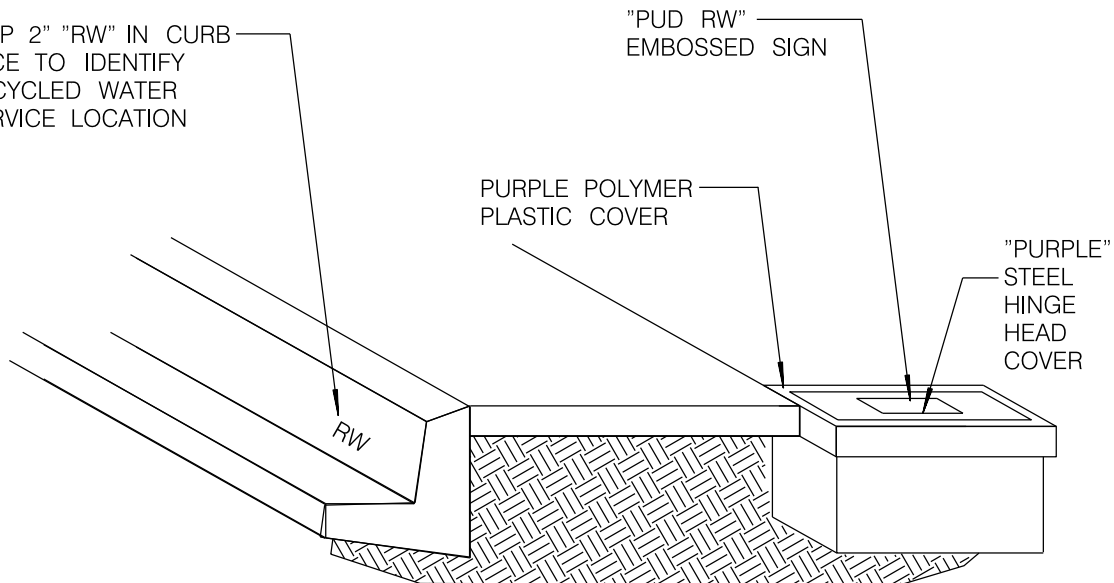
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
ORIGINAL	KA	J. NAGELVOORT	08/13	2" RECYCLED WATER SERVICE INSTALLATION AND MARKING	 5/29/13 COORDINATOR R.C.E. 56523 DATE
					DRAWING
					NUMBER
					SDRW-102

CHIP 2" "RW" IN CURB
FACE TO IDENTIFY
RECYCLED WATER
SERVICE LOCATION

"PUD RW"
EMBOSSSED SIGN

PURPLE POLYMER
PLASTIC COVER

"PURPLE"
STEEL
HINGE
HEAD
COVER

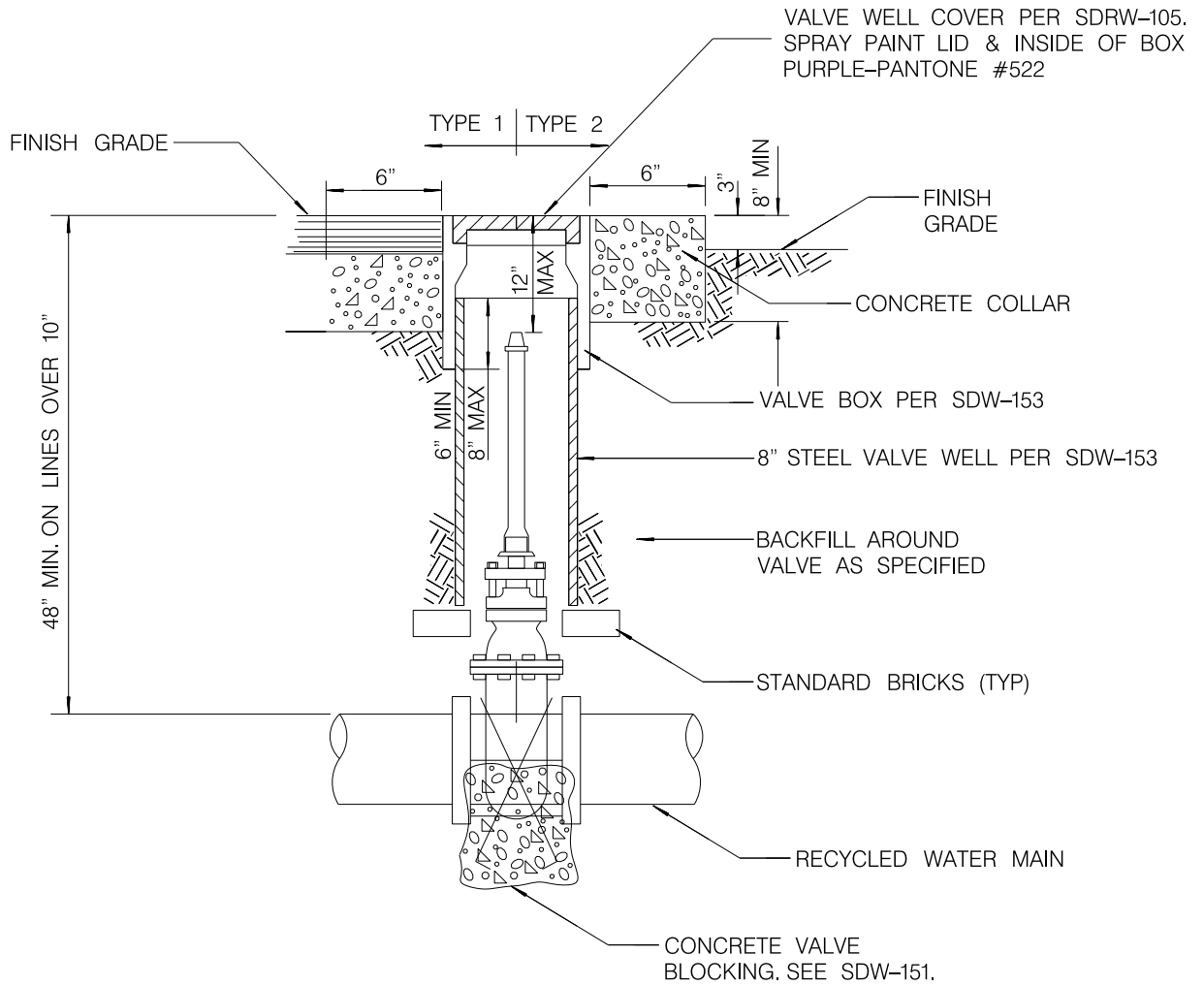


NOTES:

1. FOR ALL RECYCLED WATER SERVICE READING LID OF METER BOX SHALL BE PAINTED WITH PURPLE PANTONE #522 FOR ALL RECYCLED WATER SERVICE.
2. METER AND VALVES SHALL BE LABELED OR TAGGED TO INDICATE RECYCLED WATER.

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL	KA	A. OSKOUJ	01/12		<i>A. Osjouj</i>	
ORIGINAL	KA	J. NAGELVOORT	08/13	2" RECYCLED WATER SERVICE INSTALLATION AND MARKING	COORDINATOR	R.C.E. 56523 DATE 08/29/13
					DRAWING	SDRW-102
					NUMBER	



NOTES:

1. PROVIDE HEXAGON TYPE VALVE STEM EXTENSION IF DEPTH TO VALVE NUT EXCEEDS 2'. SEE SDRW-106.
2. USE FOR H10 LOADING OR LESS.
3. TYPE 1 INSTALLATION APPLIES TO VALVES WITHIN ROADWAYS.
TYPE 2 INSTALLATION APPLIES TO VALVES OUTSIDE ROADWAYS.

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
ORIGINAL	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**RECYCLED WATER VALVE
AND VALVE BOX (LIGHT DUTY)**

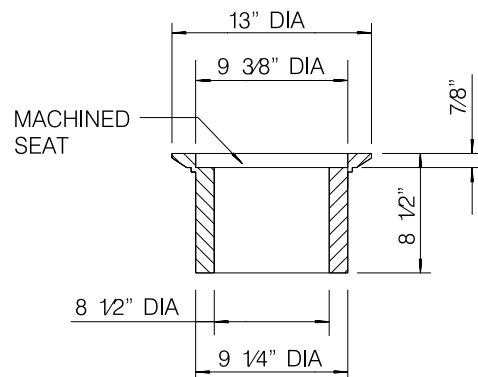
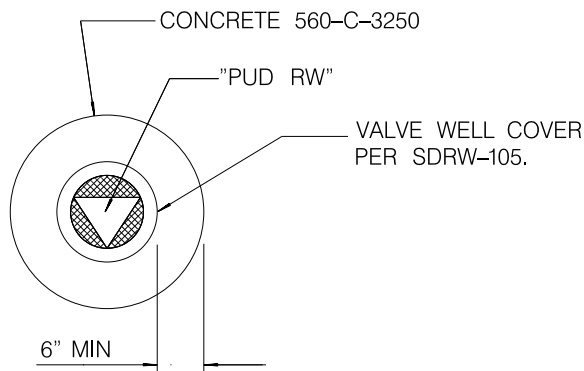
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Bungea
COORDINATOR R.C.E. 56523

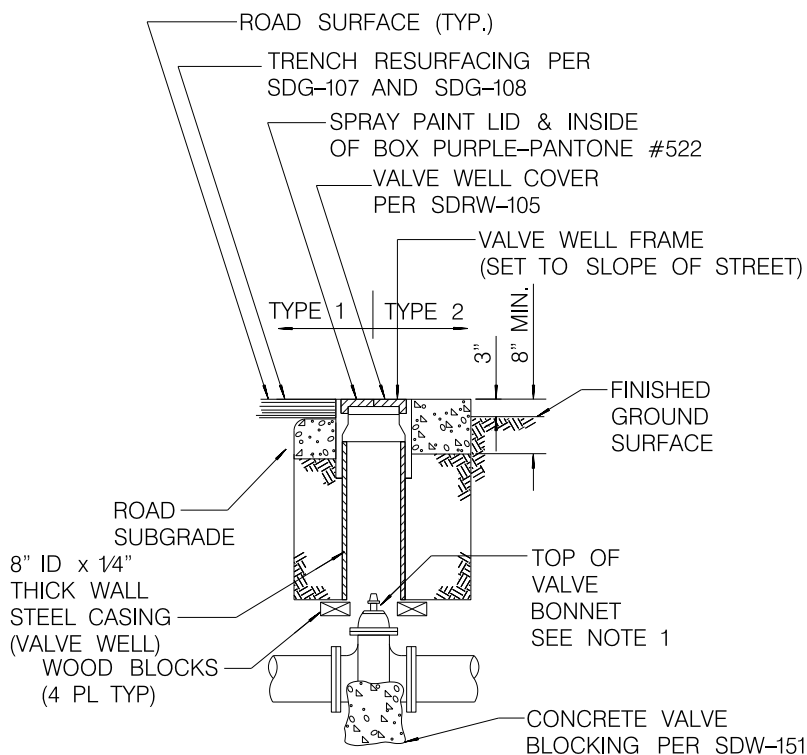
2/25/16
DATE

DRAWING
NUMBER

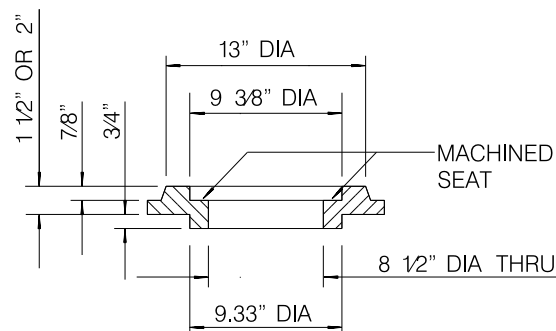
SDRW-103



CAST IRON VALVE
WELL FRAME



VALVE WELL & FRAME
FOR NEW INSTALLATIONS



CAST IRON RISER RING
FOR RETROFITTING AND
OVERLAY PROJECTS

NOTES:

1. PROVIDE RECYCLED WATER VALVE KEY EXTENSION FOR ALL VALVES.
2. THE SURFACE OF THE VALVE WELL COVER SHALL MATCH THE STREET CROSS SLOPE AND PROFILE.
3. VALVE BOX AND COVER BASED ON SOUTH BAY FOUNDRY #1208N OR APPROVED EQUAL.
4. TYPE 1 INSTALLATION APPLIES TO VALVES WITHIN ROADWAYS.
TYPE 2 INSTALLATION APPLIES TO VALVES OUTSIDE ROADWAYS.
5. SEE SDRW-106 FOR VALVE STEM EXTENSION.

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
ORIGINAL	KA	J. NAGELVOORT	08/13
ORIGINAL	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**RECYCLED WATER VALVE
AND VALVE BOX (HEAVY DUTY)**

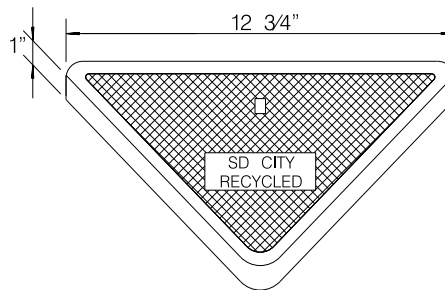
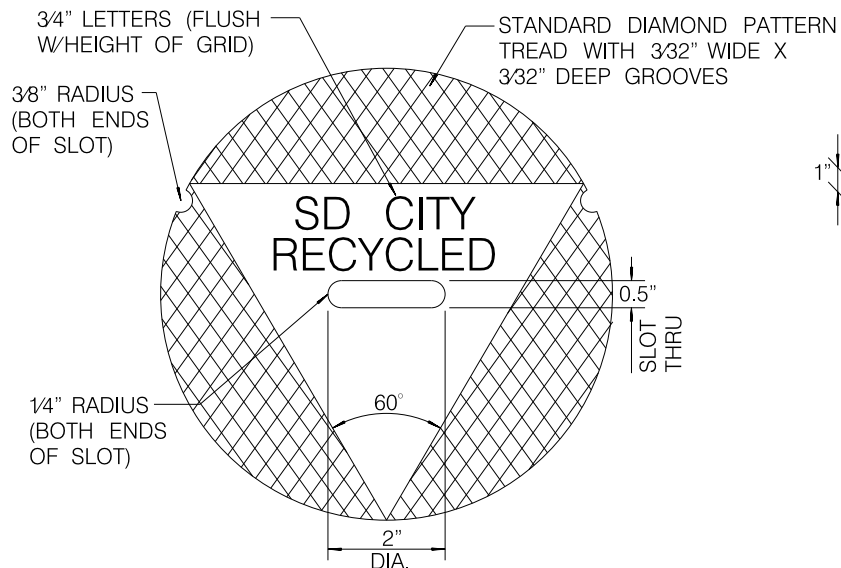
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

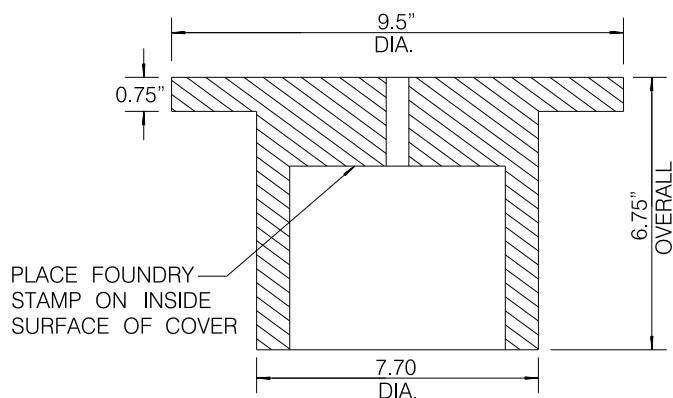
2/25/16
DATE

DRAWING
NUMBER

SDRW-104

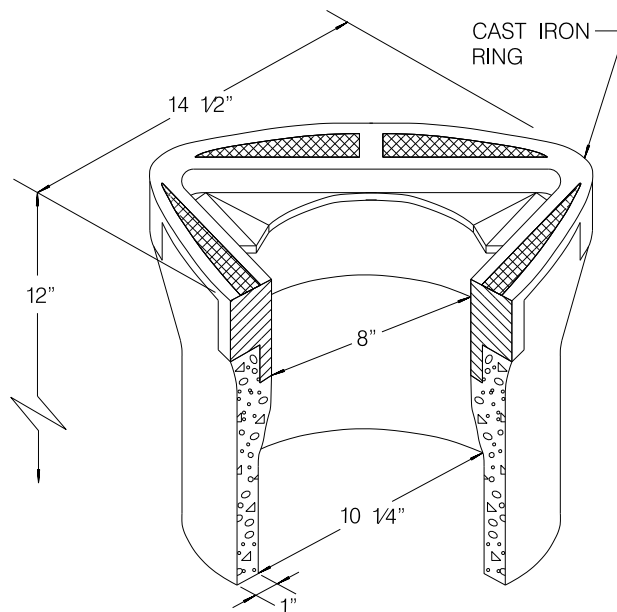


CAST IRON COVER
WEIGHT = 15 lb



CAST IRON VALVE WELL COVER
WEIGHT = 20 lb MIN

DETAIL 1



V4-T BOX
WEIGHT = 60 lb

DETAIL 2

NOTE

COVER SHALL BE COLORED PURPLE W/RED DOT

REVISION	BY	APPROVED	DATE
ORIGINAL	BB	J. NAGELVOORT	01/12
ORIGINAL	BB	J. NAGELVOORT	08/13

CITY OF SAN DIEGO – STANDARD DRAWING

RECYCLED WATER VALVE WELL COVER

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

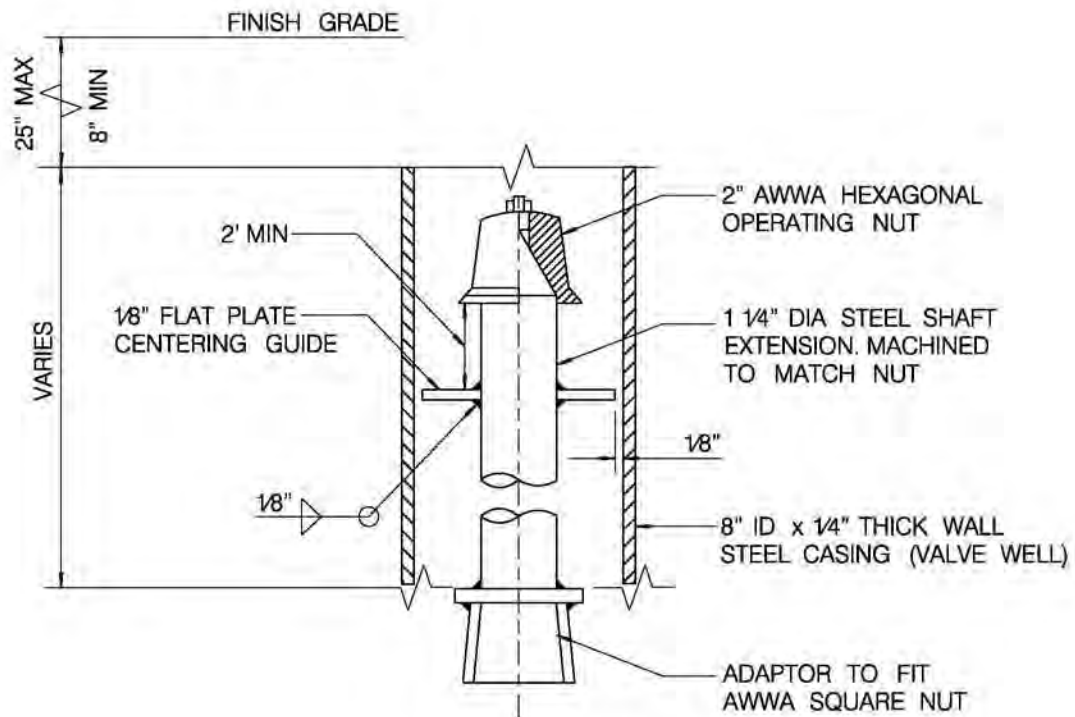
Chung

6/23/14

COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

SDRW-105



REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

RECYCLED WATER VALVE KEY EXTENSION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

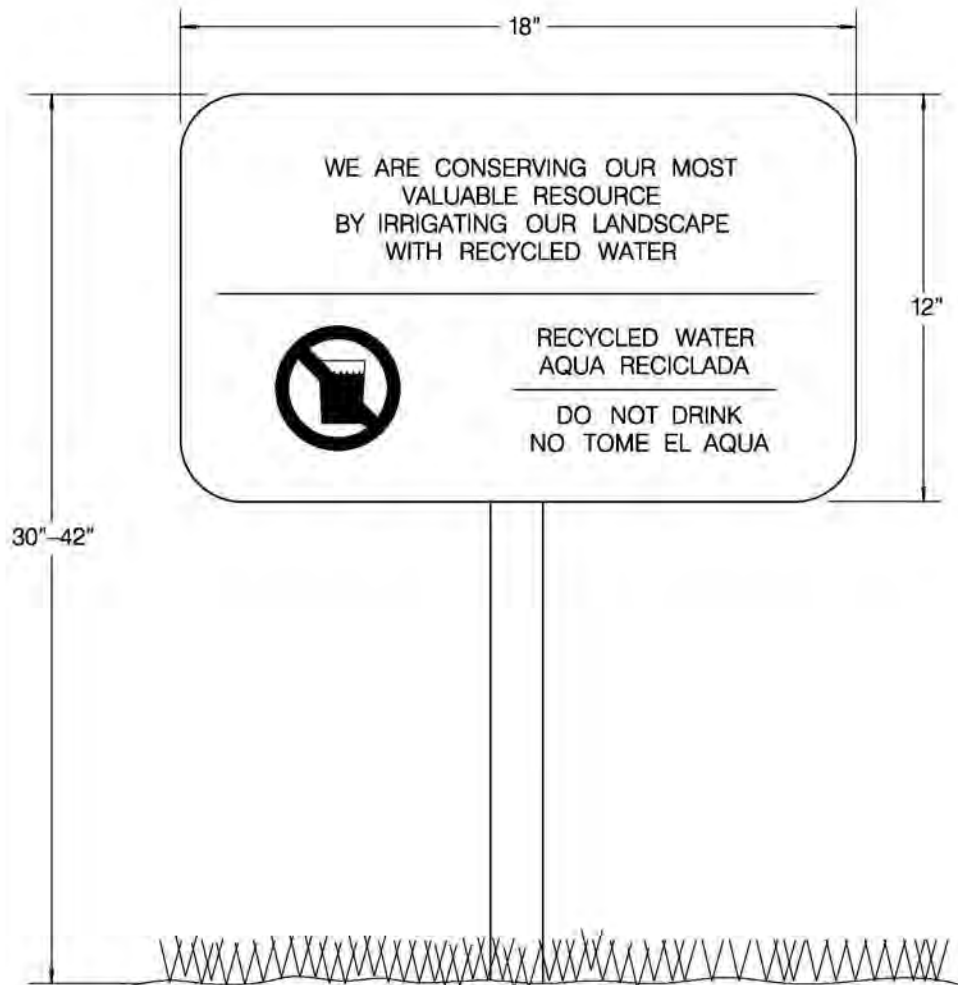
H. Hadli

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDRW-106



RECYCLED WATER IRRIGATION ADVISORY SIGN

SHEET 1 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> 1/31/2012 COORDINATOR R.C.E. 66271 DATE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				RECYCLED WATER SIGNS	DRAWING NUMBER SDRW-108



SIZE: 4" HIGH x 8" WIDE
 COLORS:
 BACKGROUND: WHITE
 LETTERS: PANTONE 522 PURPLE
 CIRCLE/SLASH: DARK RED OVER WATER GLASS
 WATER GLASS: PANTONE 522 PURPLE
 1/4" WIDE BORDER: PANTONE 522 PURPLE
 HOLES: 1/8" AT CORNERS

RECYCLED WATER PROCESS SIGN

SHEET 2 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL	KA	J. NAGELVOORT	01/12		<i>J. Nagelvoort</i>	1/31/2012
				RECYCLED WATER SIGNS	COORDINATOR	R.C.E. 65271
					DATE	
					DRAWING	SDRW-108
					NUMBER	



SIZE: 4" HIGH x 8" WIDE

COLORS:

BACKGROUND: WHITE
 LETTERS: PANTONE 522 PURPLE
 CIRCLE/SLASH: DARK RED WATER TAP
 WATER TAP: PANTONE 522 PURPLE
 1/4" WIDE BORDER: PANTONE 522 PURPLE
 HOLES: 1/8" AT CORNERS

RECYCLED WATER SIGN FOR IRRIGATION

SHEET 3 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				RECYCLED WATER SIGNS	<i>H. Hadi</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDRW-108



SIZE:

4" HIGH x 8" WIDE

COLORS:

BACKGROUND:

WHITE

LETTERS:

PANTONE 522 PURPLE

CIRCLE/SLASH:

DARK RED OVER WATER GLASS

WATER GLASS:

PANTONE 522 PURPLE

1/4" WIDE BORDER:

PANTONE 522 PURPLE

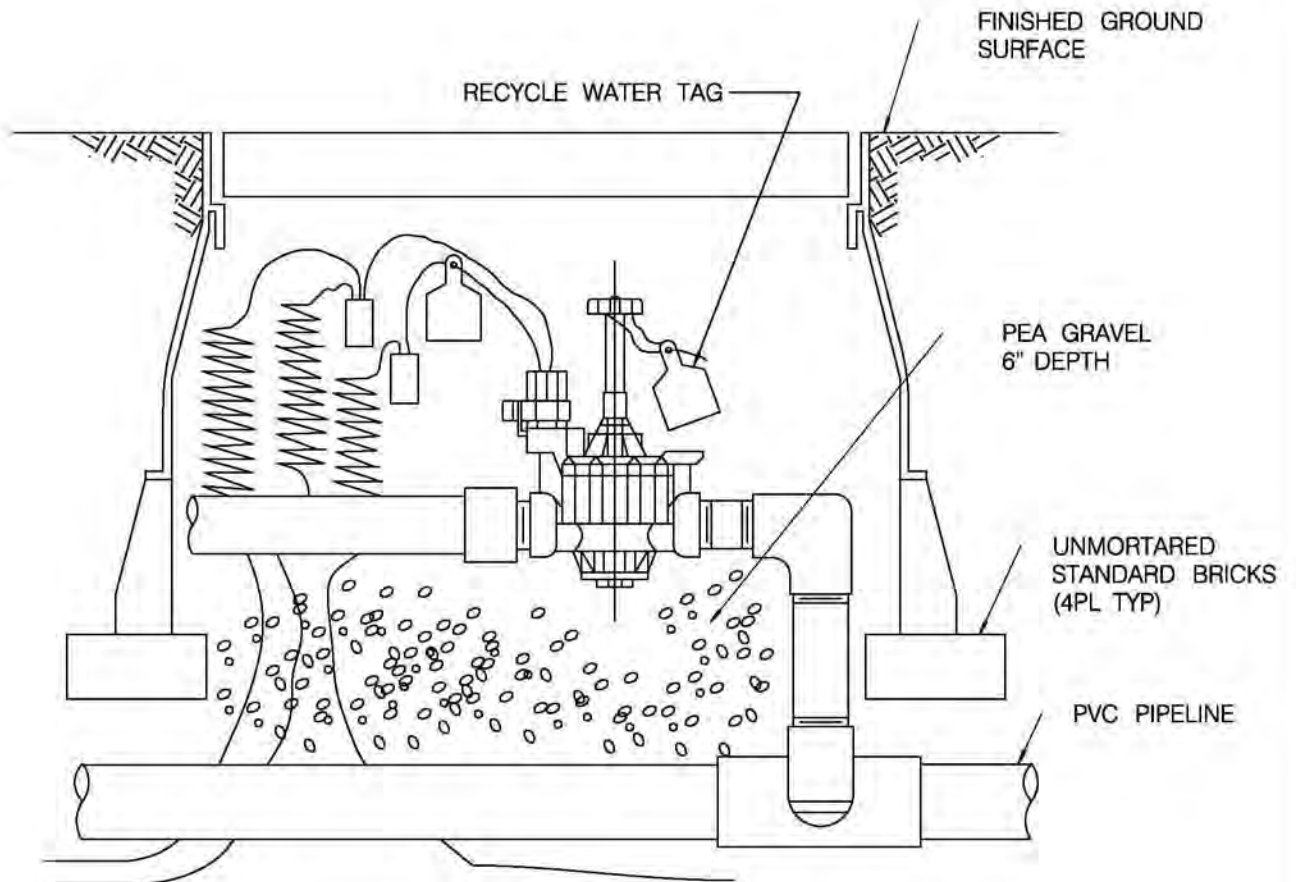
HOLES:

1/8" AT CORNERS

RECYCLED WATER SIGN FOR TOILET & URINAL FLUSHING

SHEET 4 OF 4

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				RECYCLED WATER SIGNS	<i>H. Hadli</i> 1/31/2012
					COORDINATOR R.C.E. 65271 DATE
					DRAWING
					NUMBER SDRW-108

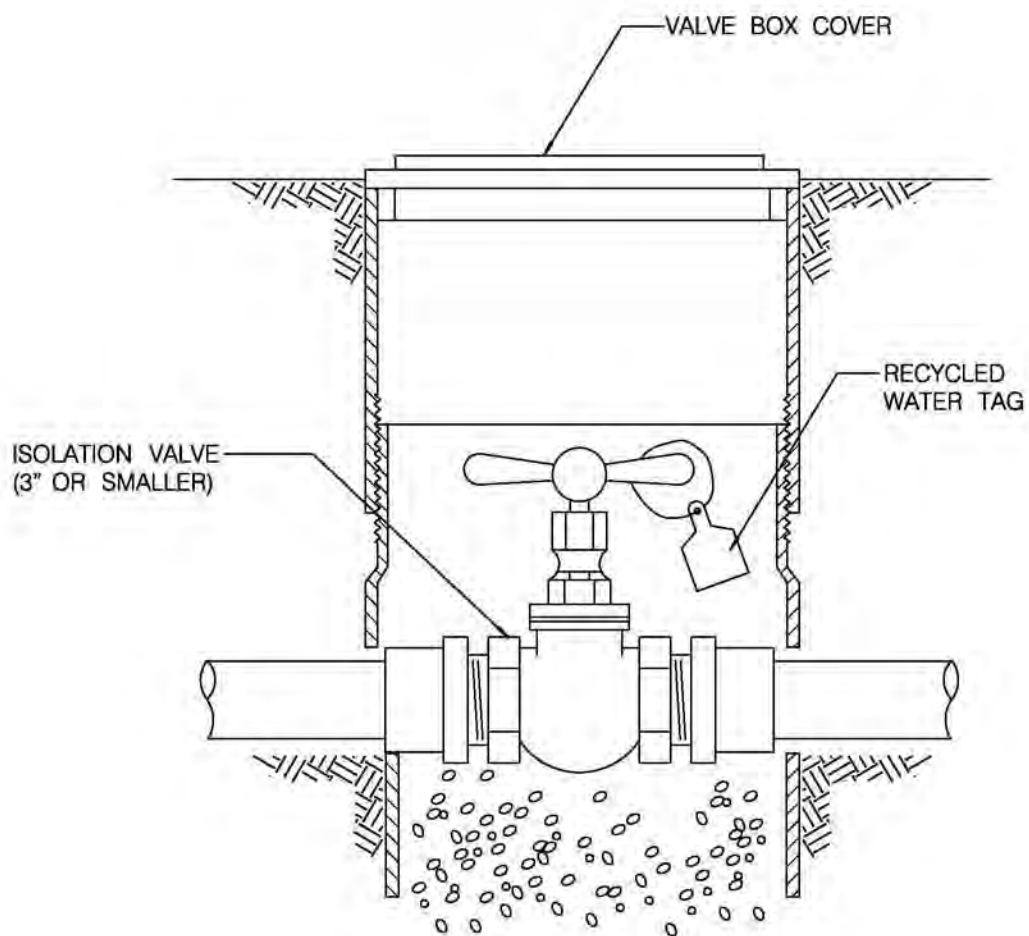


NOTES:

1. RECYCLE WATER IRRIGATION VALVE BOX COVER
SHALL BE COLOR CODED PANTONE #522

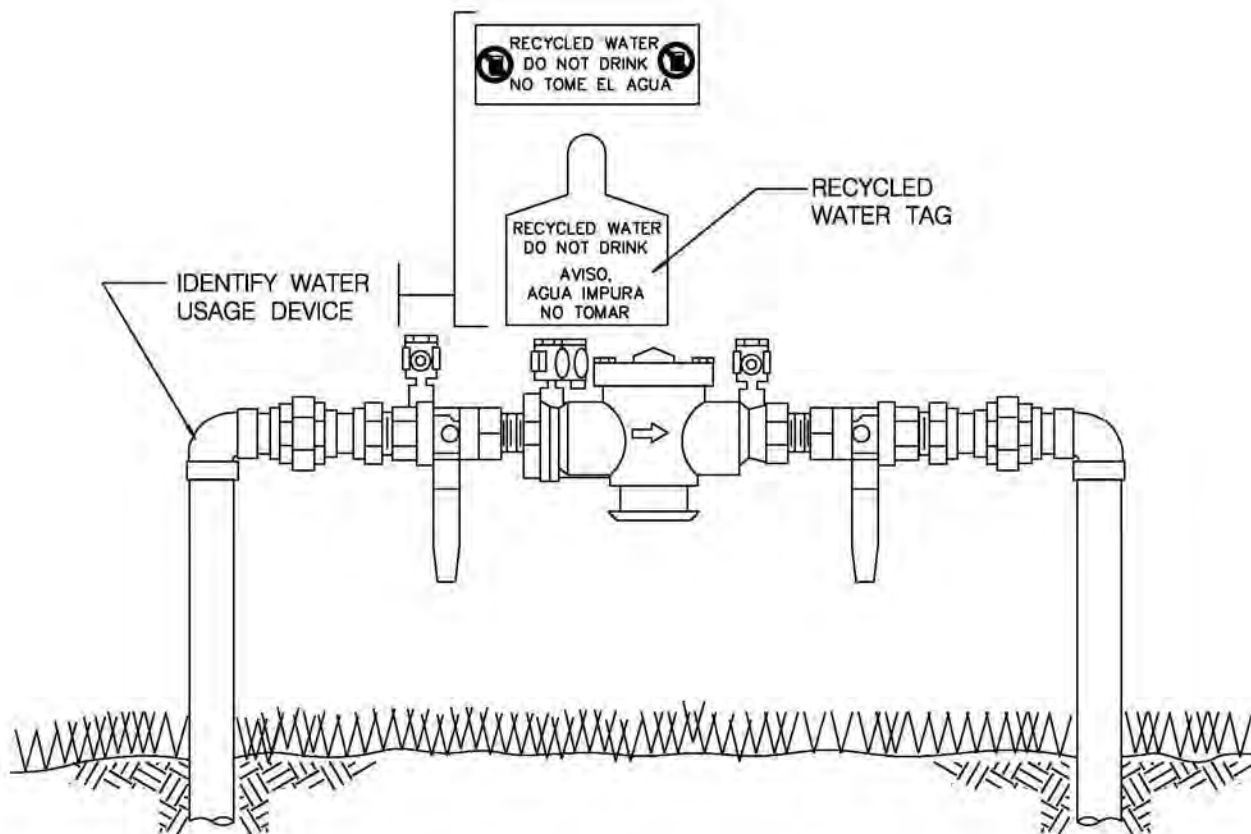
2. TEFLON SHALL BE USED ON THREADED CONNECTIONS

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> 1/31/2012 COORDINATOR R.C.E. 65271 DATE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				SIGN / TAG FOR RECYCLED WATER IRRIGATION REMOTE CONTROL VALVE	DRAWING NUMBER SDRW-109



NOTE:
RECYCLE WATER IRRIGATION VALVE BOX COVER

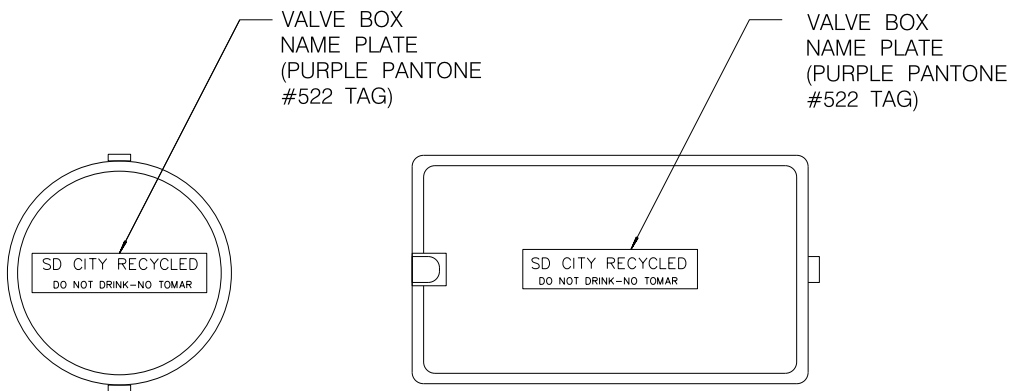
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadji</i> COORDINATOR R.C.E. 66271 DATE 1/31/2012
ORIGINAL	KA	J. NAGELVOORT	01/12		
				SIGN / TAG FOR RECYCLED WATER IRRIGATION VALVE	DRAWING NUMBER SDRW-110



NOTE:

ALL RECYCLED METERS, AIR/VACUUM RELIEF VALVES, VALVES, PRESSURE REDUCING VALVES, PUMPS, PUMP CONTROL VALVES, ETC., SHALL BE TAGGED OR LABELED INDICATING THAT THE DEVICES ARE ON RECYCLED WATER SYSTEM AND COLOR CODED PANTONE #522. 12" MINIMUM CLEARANCE BETWEEN GROUND AND WATER CONTROL DEVICES.

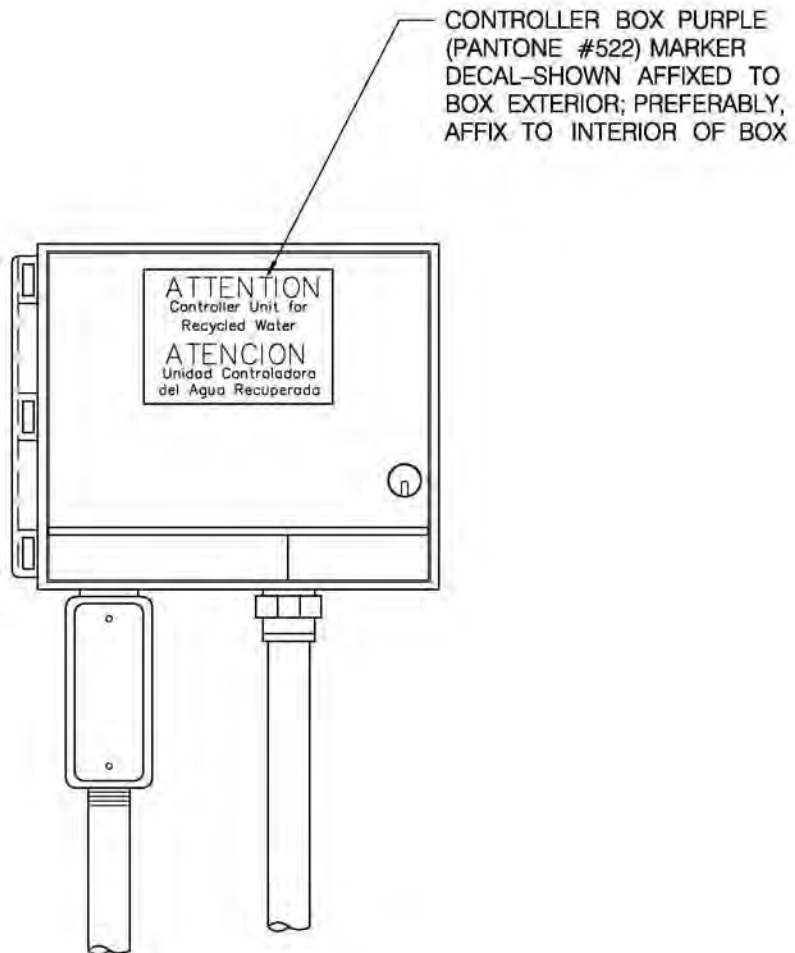
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> COORDINATOR R.C.E. 66271 DATE 1/31/2012
ORIGINAL	KA	J. NAGELVOORT	01/12		
				SIGN / TAG FOR IDENTIFICATION OF RECYCLED WATER CONTROL DEVICES	DRAWING NUMBER SDRW-111



NOTE:

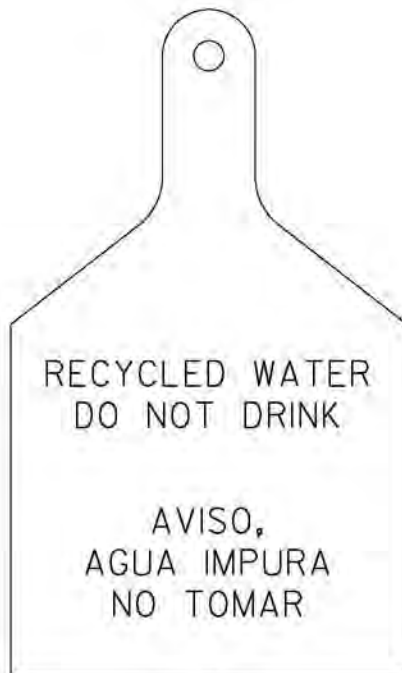
ALL RECYCLED WATER IRRIGATION BOX COVERS AND LIDS SHALL BE
COLOR CODED PANTONE #522

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>Chung</i> 6/23/2014 COORDINATOR R.C.E. 56523 DATE
ORIGINAL	KA	J. NAGELVOORT	01/12		
UPDATE	KA	J. NAGELVOORT	09/13	SIGN / TAG FOR RECYCLED WATER IRRIGATION BOX COVER / LID	DRAWING NUMBER SDRW-112



NOTES:
 RECYCLED WATER IRRIGATION SYSTEM CONTROLLER BOX SHALL BE
 COLOR CODED PANTONE #522

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> 1/31/2012 COORDINATOR R.C.E. 66271 DATE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				SIGN / TAG FOR RECYCLED WATER AUTOMATIC IRRIGATION CONTROLLER	DRAWING NUMBER SDRW-113



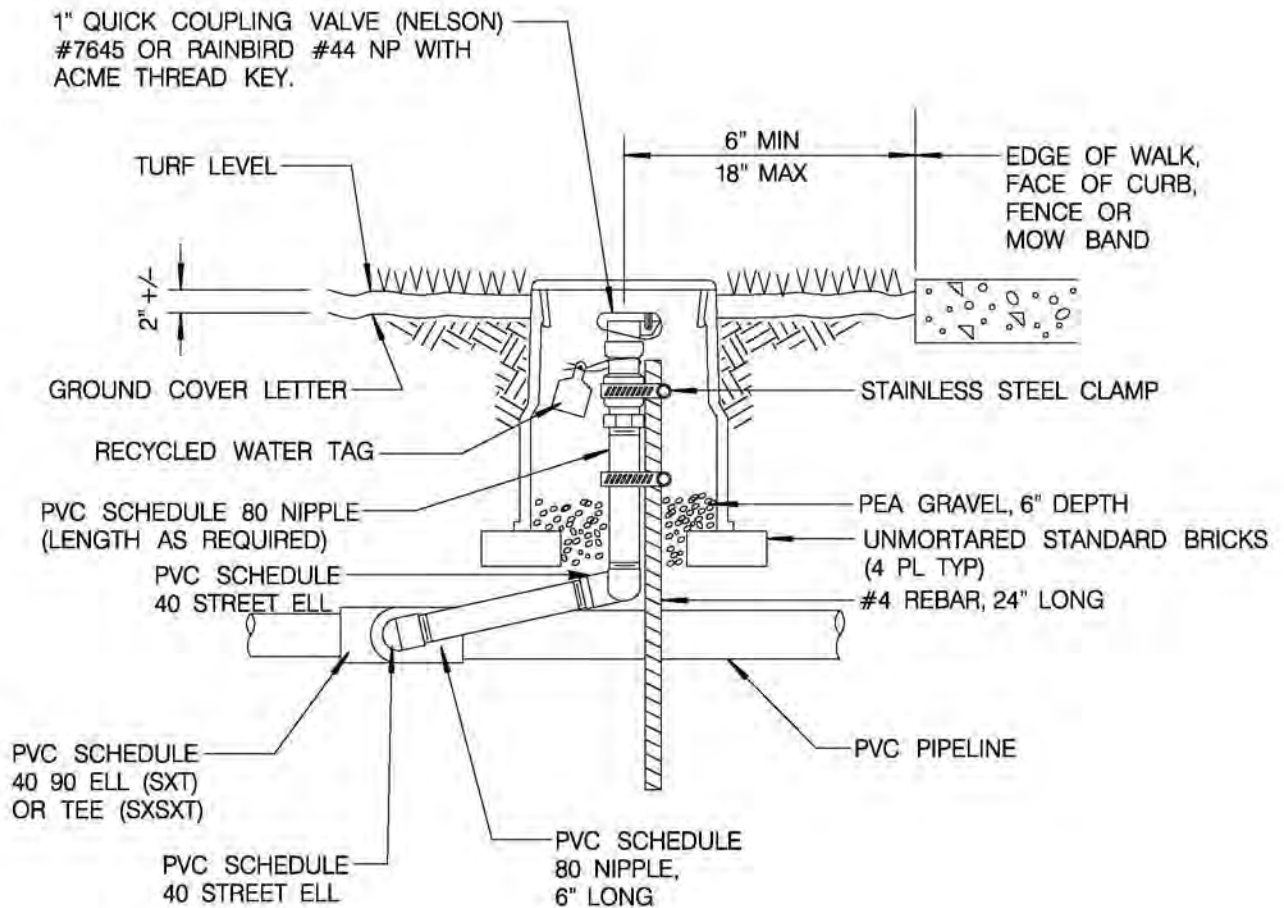
FRONT



BACK

SAMPLE WARINING TAG. BACKGROUND PURPLE (PANTONE #522)
WITH BLACK LETTERING.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				RECYCLED WATER TAG	<i>H. Hadli</i> 1/31/2012
					COORDINATOR R.C.E. 66271 DATE
					DRAWING
					NUMBER SDRW-114



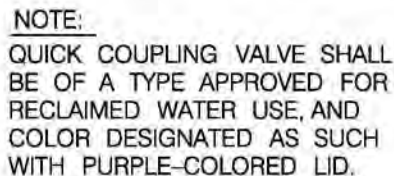
NOTE:

1. NEW CONSTRUCTION – ALL QUICK COUPLING VALVES SHALL HAVE NON-POTABLE LOCKING PURPLE THERMOPLASTIC RUBBER COVERS.
2. RETROFITS – REPLACE ALL EXISTING QUICK COUPLING VALVES WITH NON-POTABLE LOCKING PURPLE THERMOPLASTIC RUBBER COVERS.
3. TEFLON SHALL BE USED ON THREADED CONNECTIONS.

TYPE A (#4 ROD)

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				RECYCLED WATER QUICK COUPLING VALVE	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
					DRAWING NUMBER SDRW-115

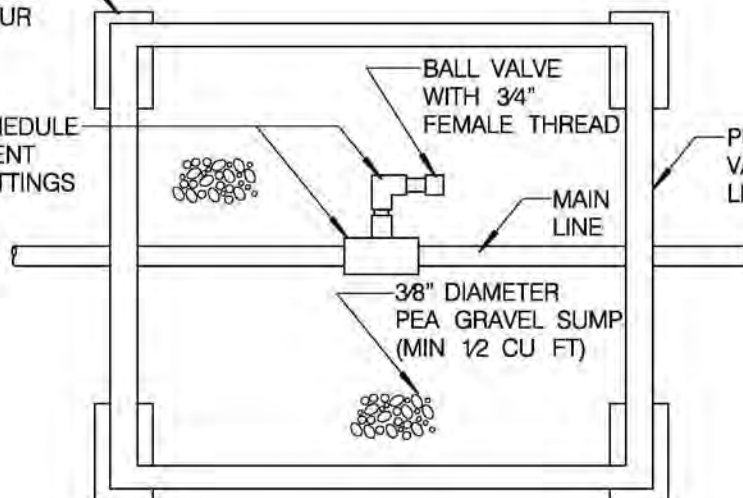


- TYPE B (KICK BLOCK)

SDRW-115

BRICK SUPPORTS ON
COMPACTED UNDISTURBED
SUBGRADE (MIN OF FOUR
PER BOX)

PVC SCHEDULE
40 SOLVENT
WELD FITTINGS



BALL VALVE
WITH 3/4"
FEMALE THREAD

PURPLE COLOR
VALVE BOX AND
LID

MAIN
LINE

3/8" DIAMETER
PEA GRAVEL SUMP
(MIN 1/2 CU FT)

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

CROSS CONNECTION CONTROL TEST STATION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

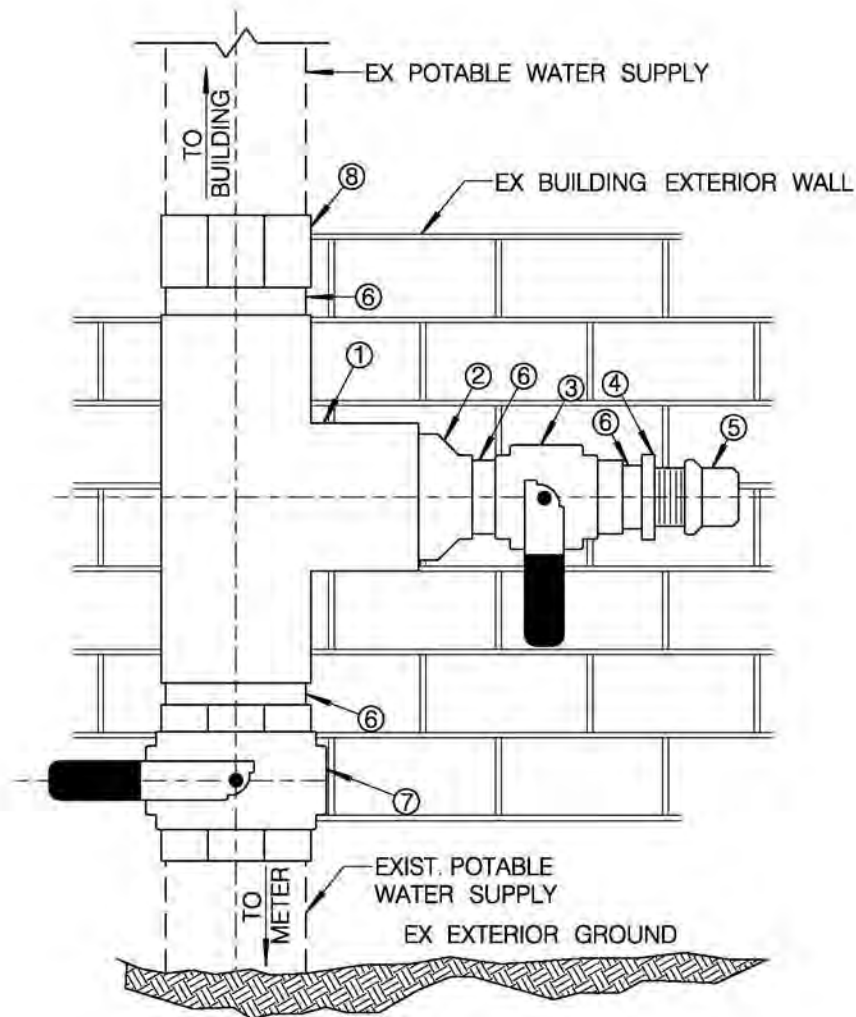
H. Hadli

1/31/2012

COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDRW-116



NOTES:

- ①-TEE SIZE TO MATCH EXISTING PIPE
- ②-REDUCER TO 2" DIAMETER PIPE, IF TEE IS LARGER THAN 2" DIAMETER
INCREASER TO 2" DIAMETER PIPE, IF TEE IS SMALLER THAN 2" DIAMETER
- ③-2" BRASS BALL VALVE
- ④-1 1/2" FIRE HOSE CONNECTION, MIN. 4" HORIZ.
CLEARANCE 6" TO 14" ABOVE EXISTING GROUND
- ⑤-1 1/2" CAP
- ⑥- MISCELLANEOUS NIPPLES AS REQUIRED
- ⑦-INSTALL BRASS BALL VALVE SIZE TO MATCH EXIST PIPE
- ⑧-INSTALL UNION SIZE TO MATCH EXISTING PIPE

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	A. OSKOUI	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**THRESHOLD
BYPASS PIPING**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

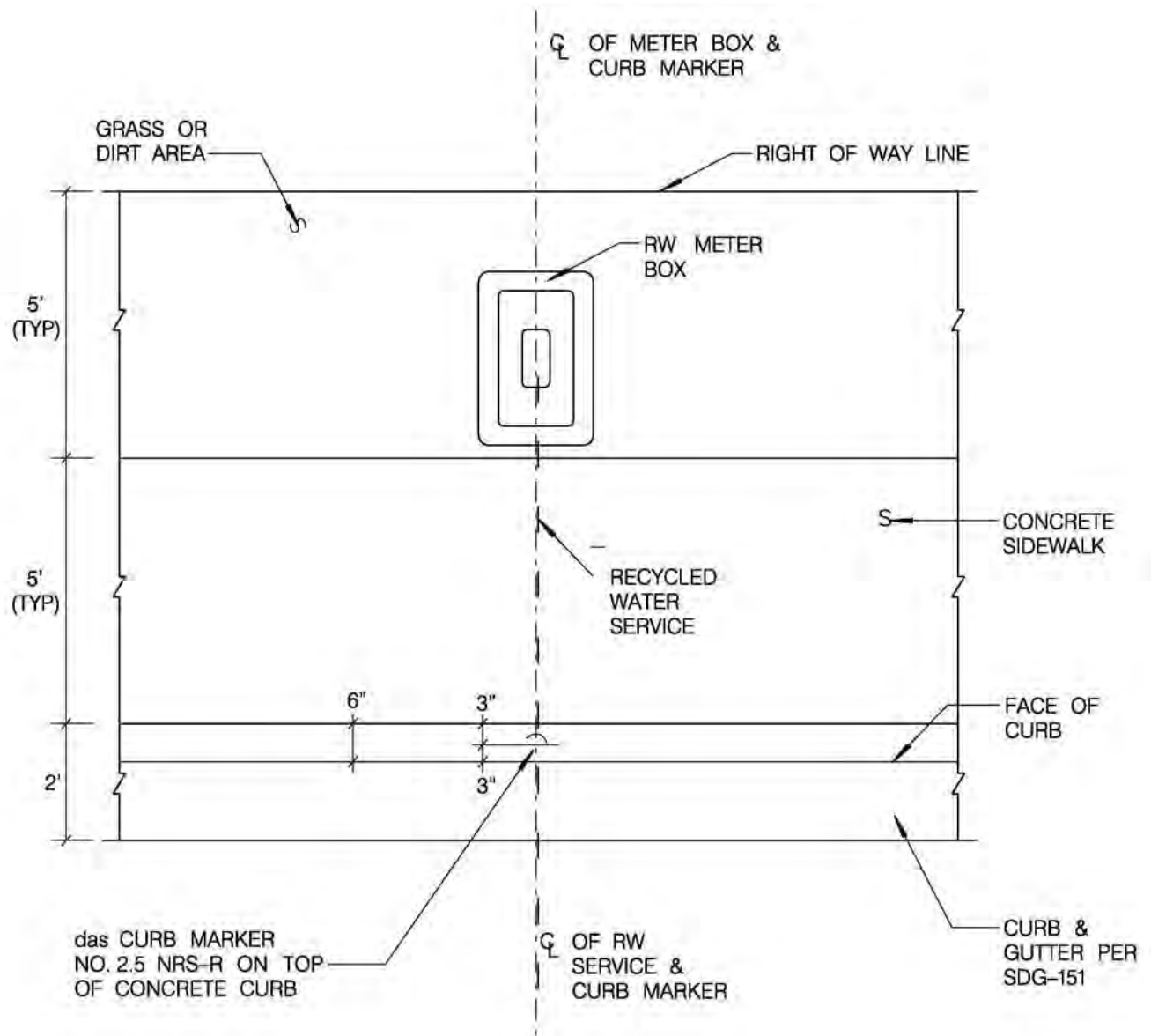
H. Hadji

1/31/2012

COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDRW-120



REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

TYPICAL CURB MARKER INSTALLATION LOCATION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadali

1/31/2012

COORDINATOR R.C.E. 66271 DATE

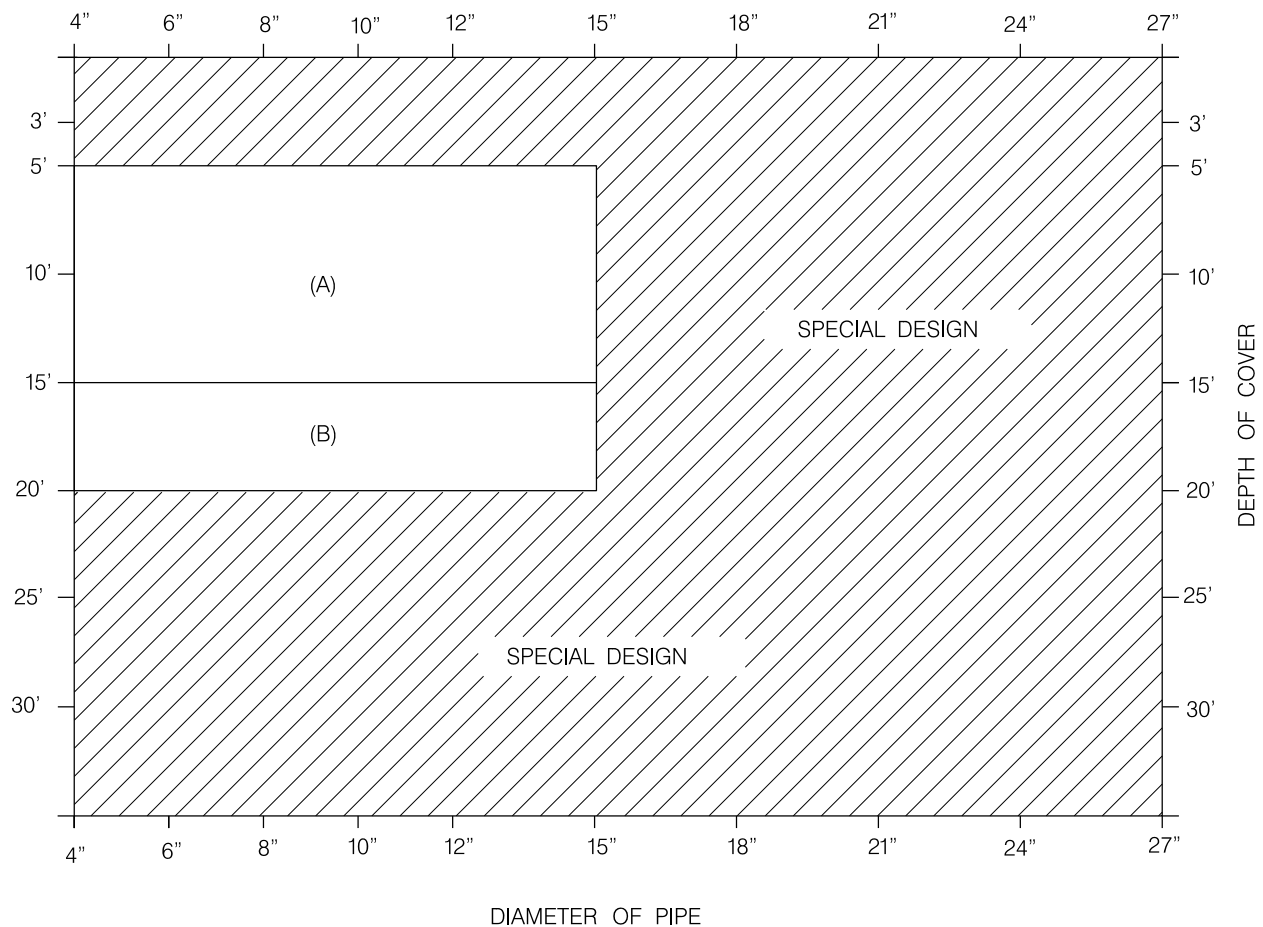
DRAWING
NUMBER

SDRW-121

CHAPTER 9

SEWER

SYSTEM

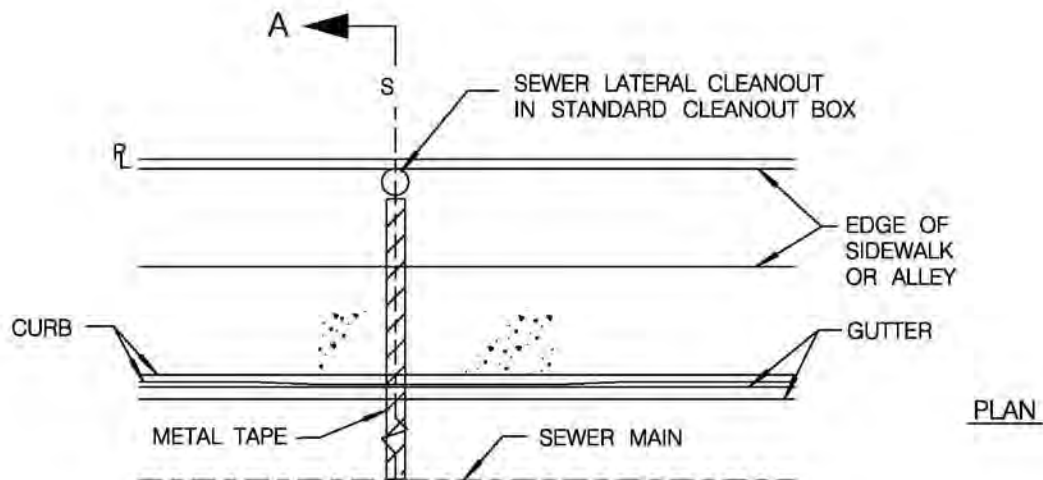
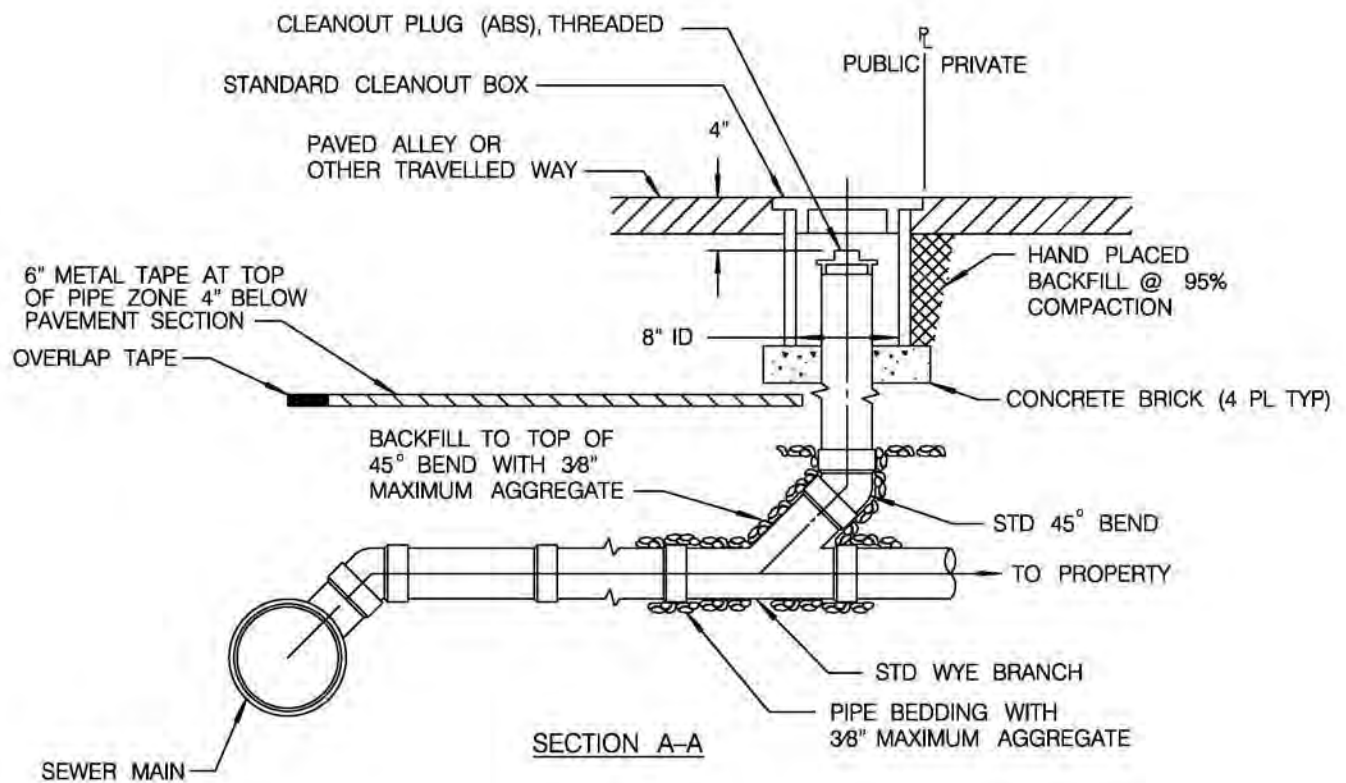


- (A) SDR - 35 OR PIPE STIFFNESS OF 46 PSI PER ASTM D2412
- (B) SDR - 35 IF SOIL REPORT SUBSTANTIATES THE ASSUMPTIONS IN NOTE 1, OTHERWISE USE SDR-26, IN LIEU OF THE SOIL REPORT

NOTE:

- 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.
- STANDARD DESIGN ASSUMPTION: $K_b = .110$, $D_L = 1.0$, $E' = 750$ psi
 $W_c = \text{PRISM LOAD @ } W = 125 \text{ LB/FT}^3$
- SEE PIPE BEDDING AND TRENCH BACKFILL DRAWING.
- 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	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>CMunger</i>	13014 COORDINATOR R.C.E. 56523 DATE
ORIGINAL		J. MUELLER	6-15-83			
UPDATED		J. CASEY	8-26-86	PERMISSIBLE DEPTH OF COVER FOR PVC PIPE	DRAWING NUMBER	SDS-101
UPDATED		J. CASEY	11-8-88			
UPDATED	KA	J. NAGELVOORT	01/12			
UPDATED	KA	J. NAGELVOORT	01/14			



NOTES:

1. RISER AND CLEANOUT PLUG SHALL BE SAME DIAMETER AS SEWER LATERAL.
2. CLEANOUT SHALL BE PLACED INSIDE A STANDARD CLEANOUT BOX WITH CAST IRON LID MARKED "CLEANOUT" OR EQUAL.
3. INSTALL METAL TAPE ON TOP OF NON-METALLIC SEWER PIPE
4. LATERALS ARE NOT ALLOWED IN DRIVEWAYS.

REVISION	BY	APPROVED	DATE
ORIGINAL	SS	A. OSKOUI	12/03
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**SEWER LATERAL CLEANOUT
(IN PAVED ALLEY, SIDEWALK, OR
OTHER AREAS SUBJECT TO TRAFFIC)**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

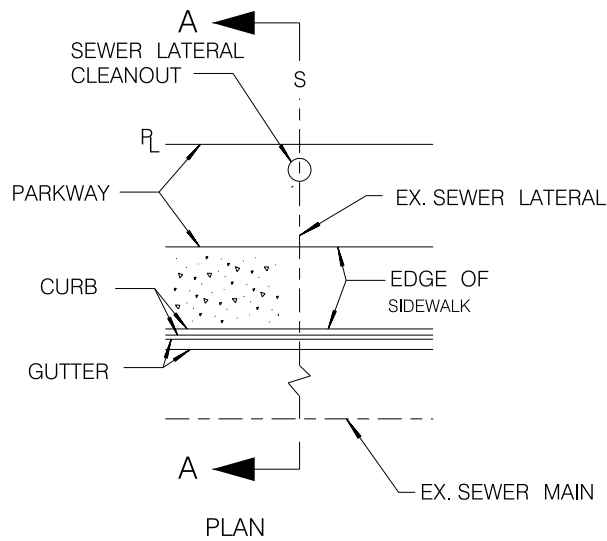
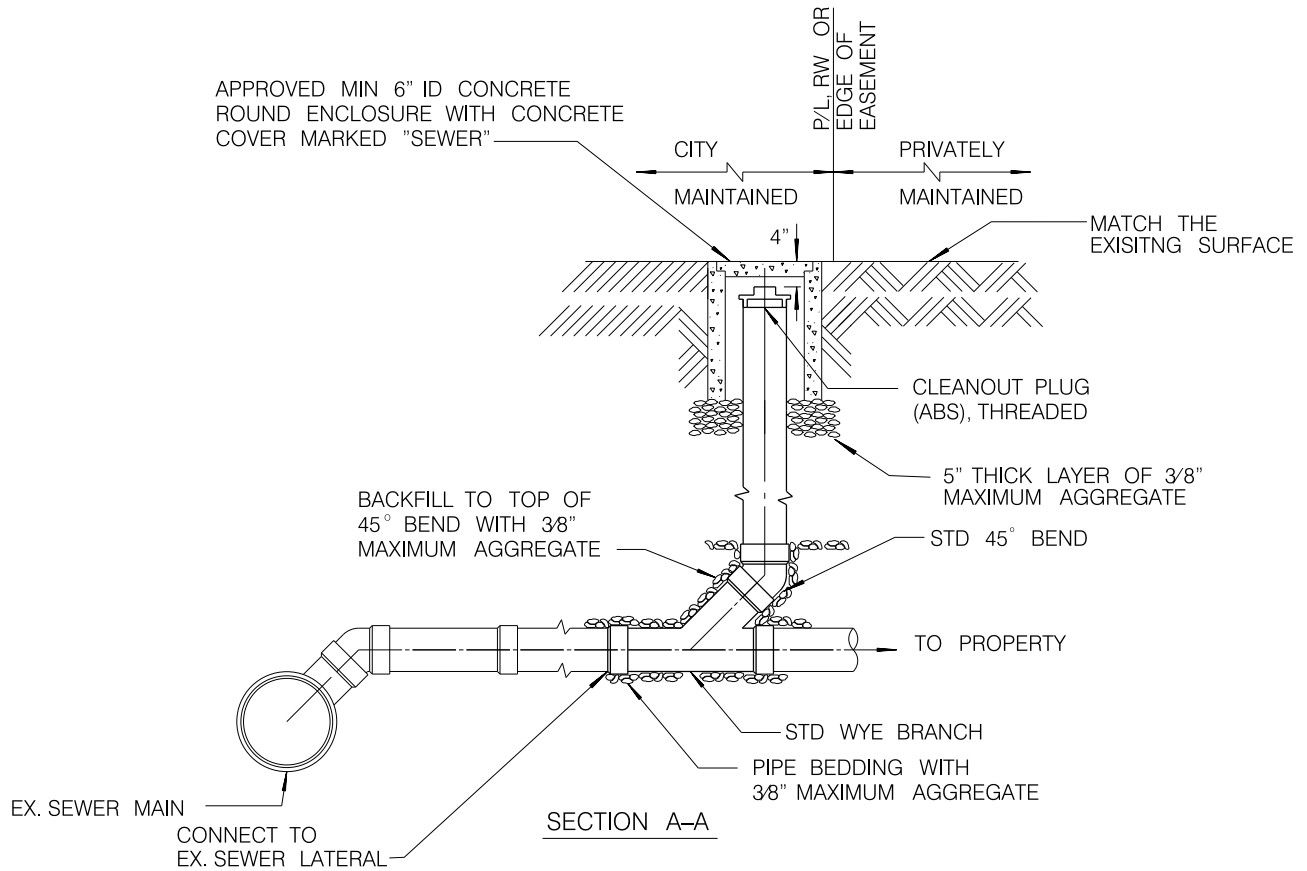
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDS-102



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	SS	A. OSKOUJ	12/03
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	BB	J. NAGELVOORT	07/15

CITY OF SAN DIEGO – STANDARD DRAWING

SEWER LATERAL CLEANOUT

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

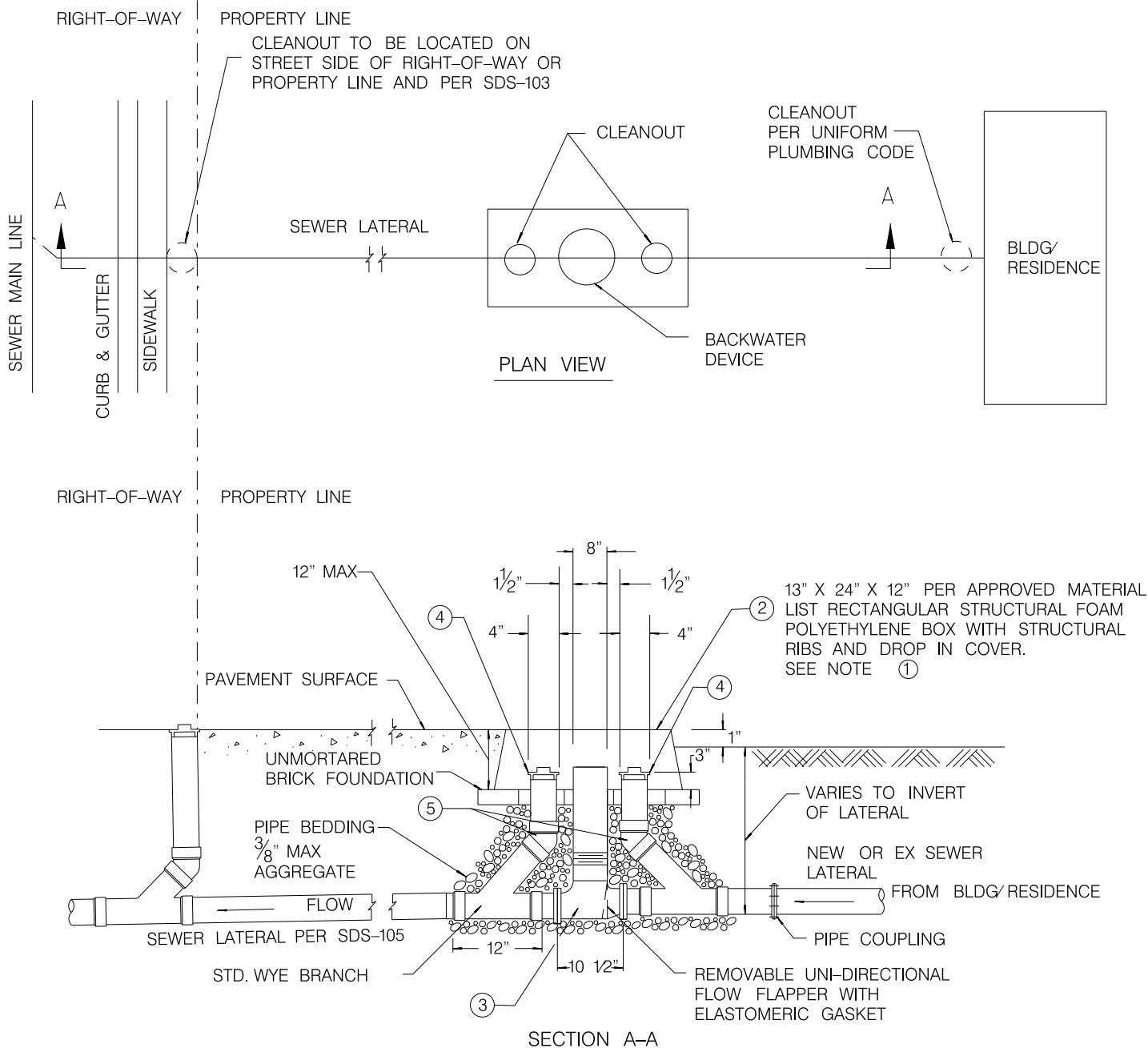
Chung
COORDINATOR

R.C.E. 56523

7/21/15
DATE

DRAWING
NUMBER


SDS-103

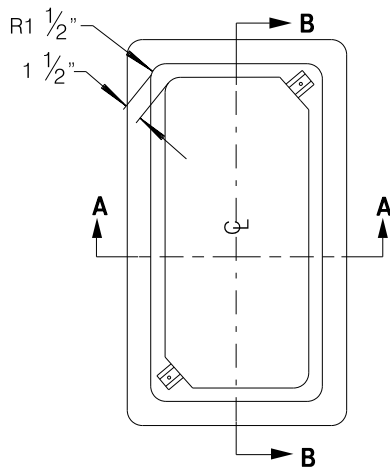


NOTES:

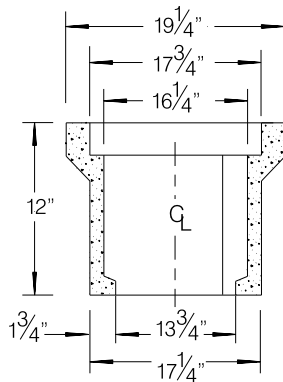
- ① WHEN BACKWATER DEVICE IS INSTALLED IN THE DRIVEWAY, SEE SHEET 2
- ② INSTALL VALVE BOX SO THAT IT IS FLUSH WITH PAVEMENT SURFACE OR 1" ABOVE FINISH GRADE (SOIL SURFACE).
- ③ PVC BACKWATER DEVICE AND ATTACHED PARTS SHALL BE PER THE CALIFORNIA PLUMBING CODE (CPC).
- ④ CLEANOUT PLUG (ABS) THREADED.
- ⑤ STANDARD 45° BEND.
- ⑥ THE BACKWATER DEVICE SHALL BE LOCATED AS CLOSE TO THE STRUCTURE AS REASONABLY POSSIBLE TO MINIMIZE THE DEPTH OF THE BACKWATER DEVICE.

SHEET 1 OF 2

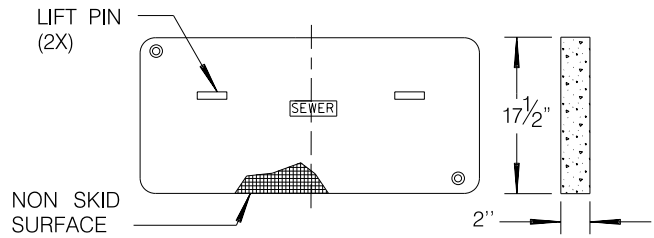
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
DETAIL	CS	A. OSKUI	12/03		
UPDATED	KA	J. NAGELVOORT	01/12	4" BACKWATER DEVICE	 COORDINATOR R.C.E. 56523
UPDATED	BB	J. NAGELVOORT	07/14		
UPDATED	HM	J. NAGELVOORT	02/16		
					DATE 2/25/16 DRAWING NUMBER SDS-104



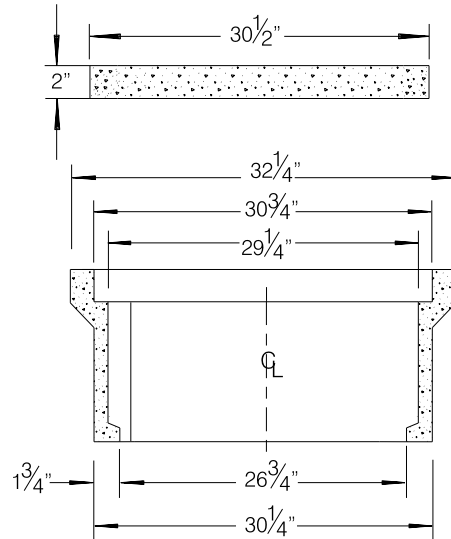
TOP VIEW



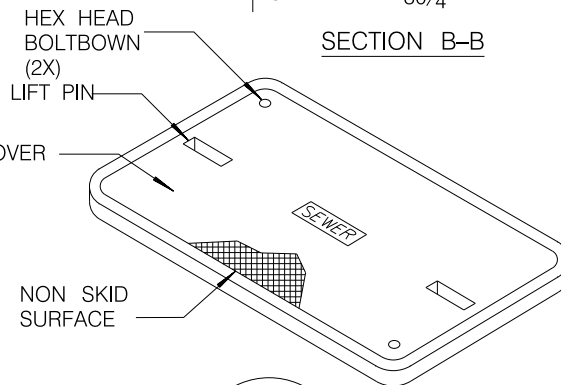
SECTION A-A



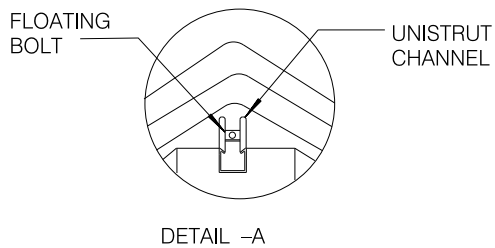
POLYMER CONCRETE COVER



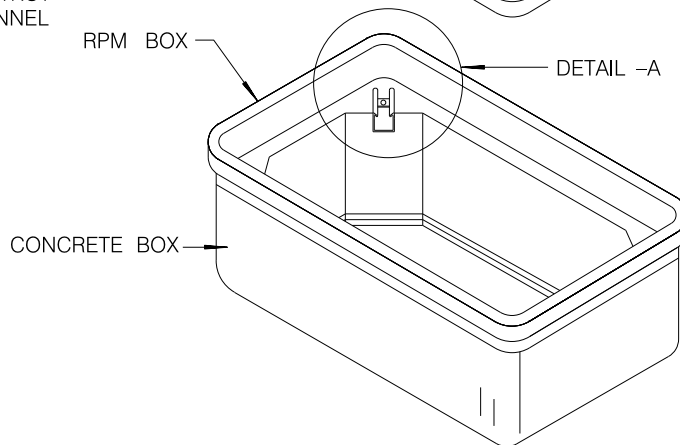
SECTION B-B



POLYMER CONCRETE COVER



DETAIL -A




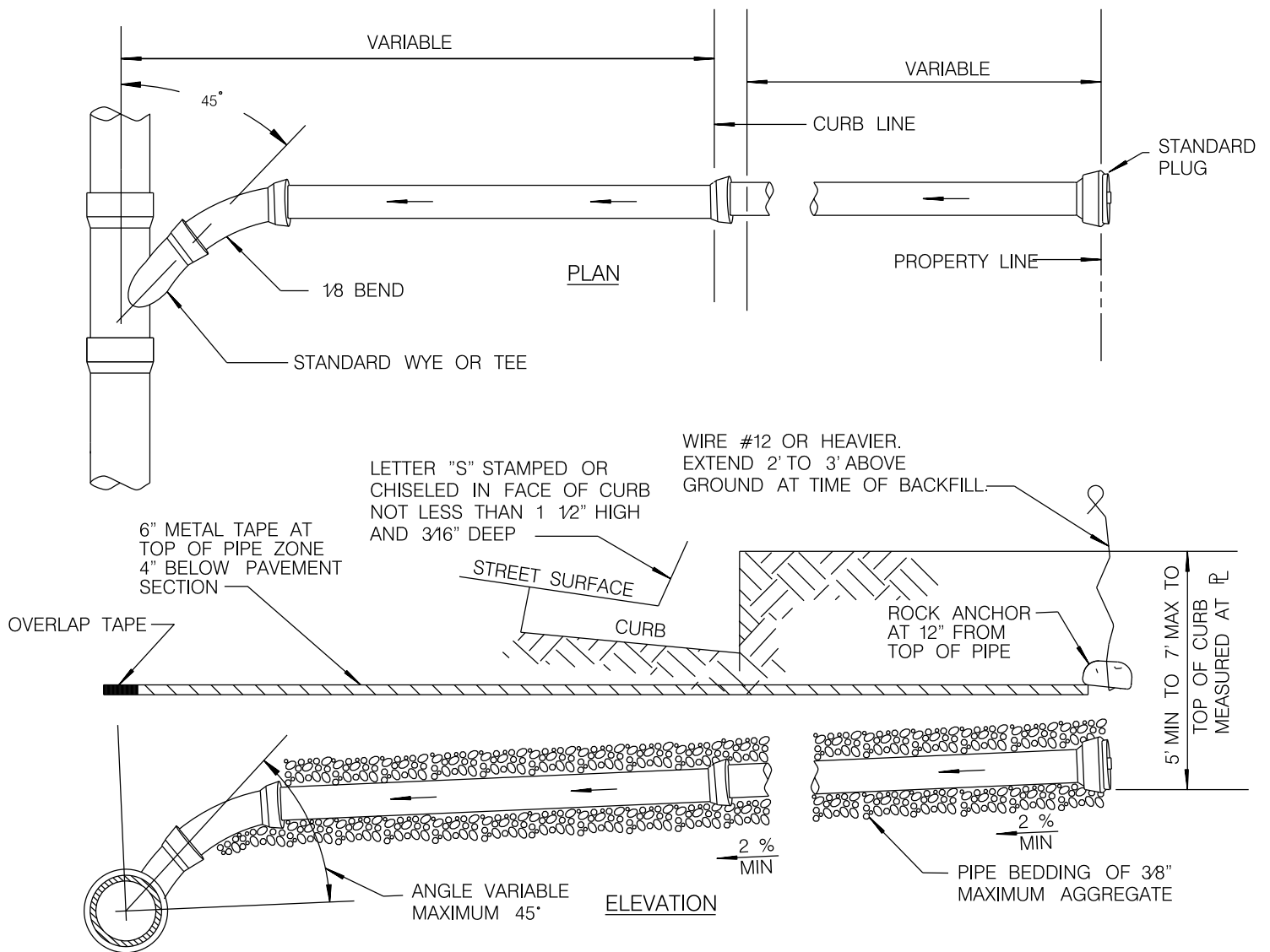
CONCRETE BOX

NOTE:

1. THE BOX & COVER IS 10K LOAD RATED.

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
DETAIL	SS	A. OSKQUI	1203		
UPDATED	KA	J. NAGELVOORT	01/12	4" BACKWATER DEVICE	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	BB	J. NAGELVOORT	07/14		
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDS-104

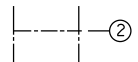


NOTES

1. IN NO CASE SHALL A LATERAL CONNECT TO THE SEWER MAIN DIRECTLY ON TOP OF THE PIPE.
2. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
3. LATERAL SHALL EXTEND TO PROPERTY LINE UNLESS SHOWN OTHERWISE ON PLANS
4. DO NOT TAP HOLE AND INSERT LATERAL PIPE DIRECTLY INTO MAIN. ALL CONNECTIONS SHALL BE MADE USING A SADDLE OR WYE CUT IN.
5. SEWER LATERAL SHALL HAVE 6" METAL TAPE WITH GREEN LETTERING INDICATING "SEWER" INSTALLED ABOVE THE ALIGNMENT OF THE NON-METALLIC PIPE FROM SEWER MAIN TO PROPERTY LINE.

DETAIL SHOWING THE MANNER OF CONNECTING OPPOSITE LATERALS TO A SEWER MAIN. TWO CONNECTIONS SHALL NOT BE MADE IN THE SAME LENGTH OF PIPE.

LEGENDS ON PLANS



REVISION	BY	APPROVED	DATE
DETAIL	JP	A. OSKOU	12/03
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

HOUSE CONNECTION (SEWER LATERAL)

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chapman

COORDINATOR R.C.E.

12/9/13

DATE

DRAWING
NUMBER

SDS-105

TRENCH RESURFACING
PER SDG-107 AND
SDG-108

ROAD SURFACE

MANHOLE FRAME AND
COVER SEE M-3.

GRADE RING
OR RISER

SHAFT

B

LEVEL

SECTION A-A

10" MIN

LEVEL

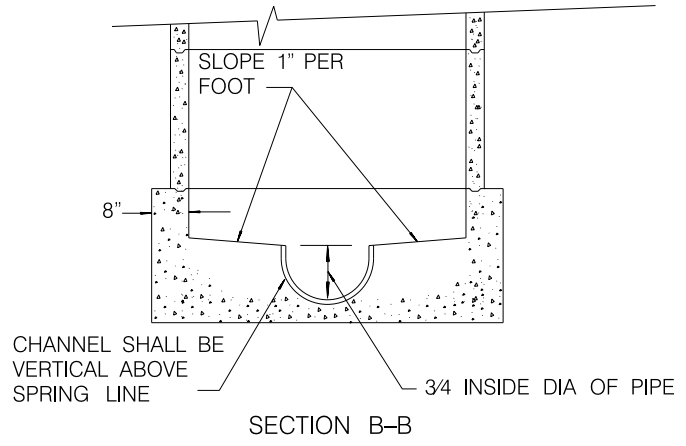
4" MIN

VARIABLE

3'-0"

3'-0"

18" MAX



NOTES:

- MANHOLE FRAME AND ALL JOINTS SHALL BE SET IN CLASS "C" MORTAR.
- ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C478.
- VERTICAL WALL OF CONE SHALL BE ON THE UPSTREAM SIDE OF THE MANHOLE.
- CONCRETE BASE SHALL BE 560-C-3250.
- APPROVED WATER STOP REQUIRED FOR PLASTIC PIPE CONNECTORS.
- PRECAST SECTIONS SHALL BE USED WITHIN DIMENSION "A" AS REQUIRED, IN ORDER OF PREFERENCE LISTED:
 - CONE (NOTCHED FOR PIPE IF DIMENSION "A" IS LESS THAN 3'.)
 - 6" TO 18" OF 3' DIAMETER GRADE RINGS AND/OR RISERS.
 - 5' DIAMETER SHAFT VARIABLE HEIGHT.
- FLEXIBLE PIPE JOINTS SHALL BE REQUIRED WITHIN 12" OF INSIDE FACE OF MANHOLE, EXCEPT FOR PLASTIC PIPE.
- ALL PATCHING WITHIN MANHOLE BASE SHALL BE EPOXY MORTAR.
- PRIOR APPROVAL OF PRECAST BASE IS REQUIRED BY THE ENGINEER.
- MANHOLES SERVING 18" 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.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
DETAIL	SS	A. OSKQUI	12/03
UPDATE	KA	J. NAGELVOORT	01/12
UPDATE	GB	J. NAGELVOORT	07/15
UPDATE	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

MANHOLE 5' X 3' DIAMETER

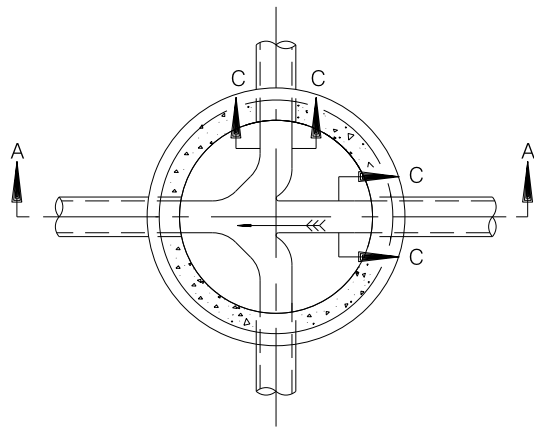
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung
COORDINATOR R.C.E. 56523

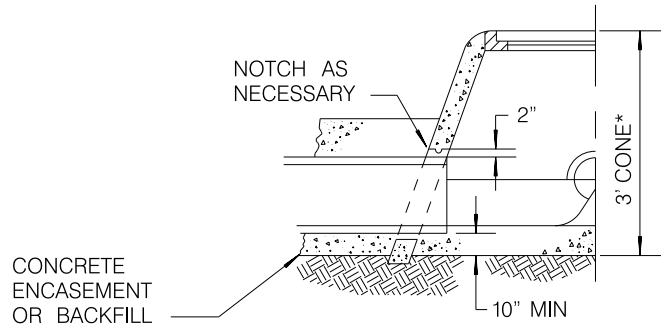
2/25/16
DATE

DRAWING
NUMBER

SDS-106

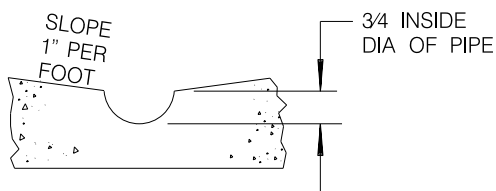


SECTION B-B

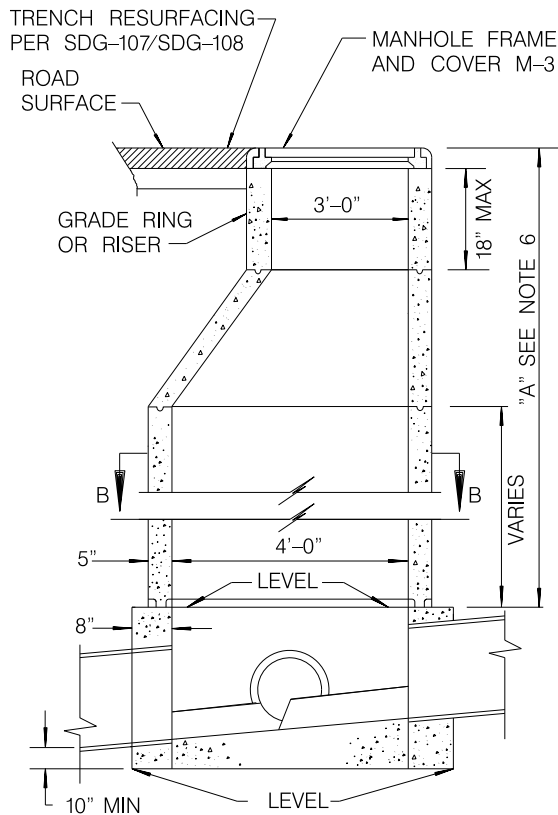


* EITHER CONCENTRIC OR ECCENTRIC CONE MAY BE USED

HALF SECTION SHALLOW MANHOLE



SECTION C-C



SECTION A-A

NOTES

- ALL RISER JOINTS SHALL BE EPOXY MORTARED.
- ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C478.
- VERTICAL WALL OF CONE SHALL BE ON THE UPSTREAM SIDE OF THE MANHOLE.
- CONCRETE BASE SHALL BE 560-C-3250.
- APPROVED WATER STOP REQUIRED FOR PLASTIC PIPE CONNECTIONS.
- PRECAST SECTIONS SHALL BE USED WITHIN DIMENSION "A" AS REQUIRED, IN ORDER OF PREFERENCE LISTED:
 - CONE (NOTCHED FOR PIPE IF DIMENSION "A" IS LESS THAN 3').
 - 3" TO 18" OF 3' GRADE RINGS AND RISERS.
 - 4' DIAMETER SHAFT VARIABLE HEIGHT.
- FLEXIBLE PIPE JOINTS SHALL BE REQUIRED WITHIN 12" OF INSIDE FACE OF MANHOLE, EXCEPT FOR PLASTIC PIPE.
- ALL PATCHING WITHIN MANHOLE BASE SHALL BE EPOXY MORTAR.
- PRIOR APPROVAL OF PRECAST BASE IS REQUIRED BY THE ENGINEER.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
DETAIL	JP	A. OSKOU	12/03
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	GB	J. NAGELVOORT	07/15

CITY OF SAN DIEGO – STANDARD DRAWING

MANHOLE 4' X 3' DIAMETER (FOR 15" MAXIMUM DIAMETER PIPE)

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

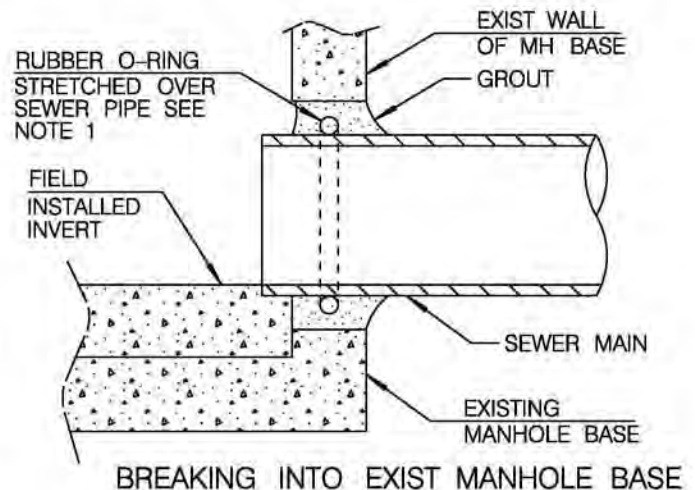
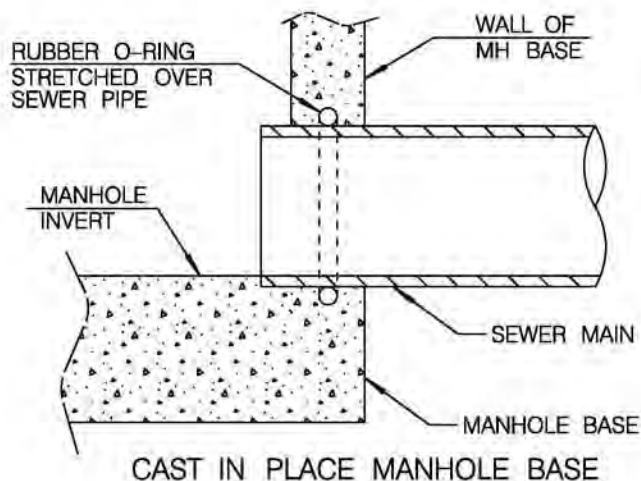
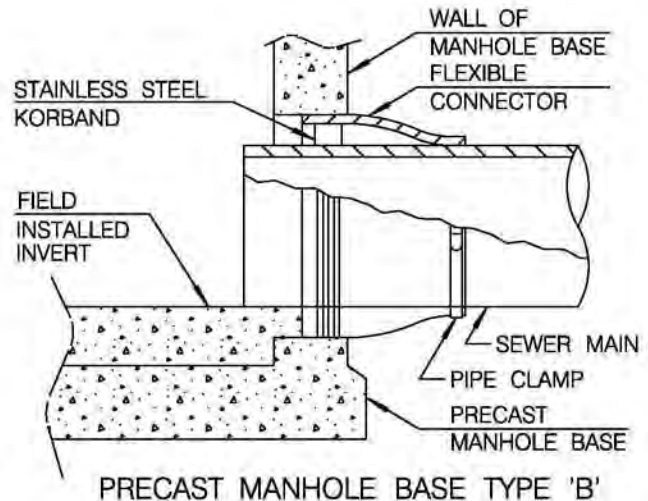
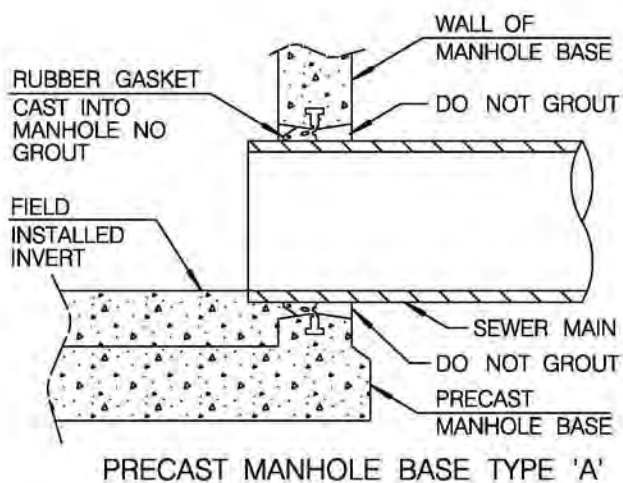
Chungpa
COORDINATOR

R.C.E. 56523

7/21/15
DATE

DRAWING
NUMBER

SDS-107



NOTES:

- 1) A RUBBER O-RING OR A FLEXIBLE CONNECTOR (AS SHOWN IN PRECAST MANHOLE BASE TYPE 'B') SHALL BE USED WHEN BREAKING INTO EXISTING MANHOLE
- 2) FOR MANHOLES REQUIRING COATING AND LINING, SEE SM-07

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

MANHOLE PIPE CONNECTORS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

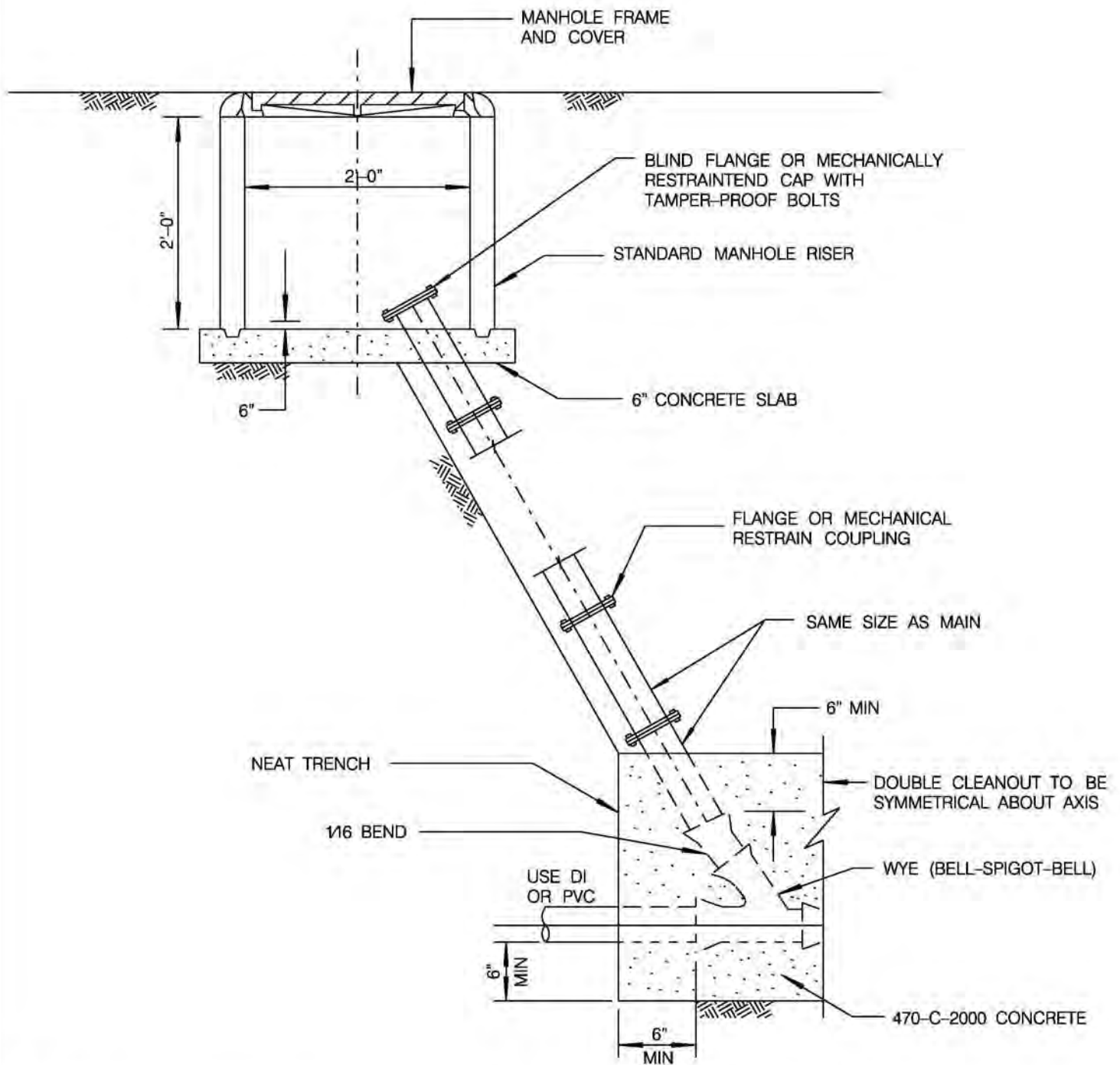
H. Hadji

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

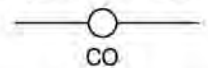
SDS-108



NOTES

1. SIMILAR POLYVINLYL CHLORIDE COMPONENTS MAY BE USED IN ACCORDANCE WITH ASTM STANDARD SPECIFICATION D2241 AND D3139.
2. CONCRETE SLAB SHALL BE 560-C-3250.
3. USE HEAVY DUTY MANHOLE FRAME AND COVER, M-1, IN AREAS SUBJECT TO VEHICULAR TRAFFIC; USE LIGHT DUTY MANHOLE FRAME AND COVER, M-2, IN ALL OTHER LOCATIONS.
4. MINIMUM PIPE PRESSURE CLASS 200.

LEGEND ON PLANS



CO

REVISION	BY	APPROVED	DATE
DETAIL	JP	A. OSKOUI	12/03
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

CLEANOUT - SEWER FORCE MAIN

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

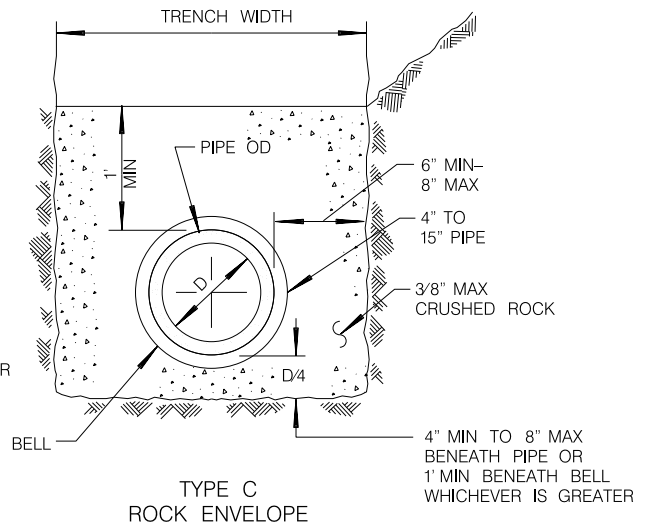
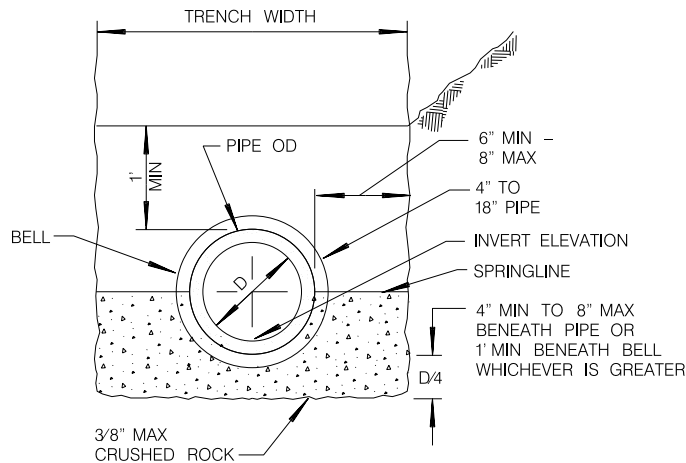
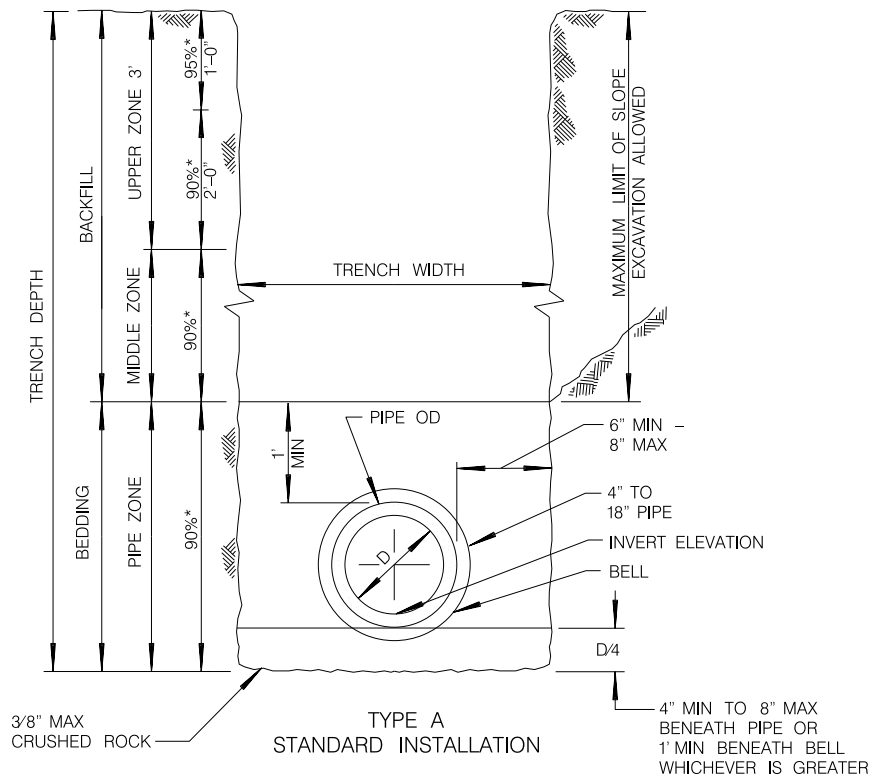
H. Hadli

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDS-109



NOTES

1. FOR TRENCH RESURFACING IN IMPROVED STREETS, SEE STANDARD DRAWINGS SDG-107 AND SDG-108.
2. (*) INDICATES MINIMUM RELATIVE COMPACTION.
3. MINIMUM DEPTH OF COVER FROM THE TOP OF PIPE TO FINISH GRADE FOR PVC SDR 35 SEWER MAIN SHALL BE 5'. FOR SHALLOWER DEPTH, SPECIAL DESIGN IS REQUIRED. SEE SDS-101.
4. SEE TYPE A INSTALLATION FOR DETAILS NOT SHOWN FOR TYPES B AND C.
5. FOR PIPE SIZE ENCASEMENT LARGER THAN 15", MAXIMUM SIDE WALL CLEARANCE SHALL BE 12" OR AS SHOWN ON THE PLANS.
6. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.
7. 1' SAND CUSHION OR A 6" MINIMUM SAND CUSHION WITH 1" NEOPRENE PAD SHALL BE PLACED FOR CROSSINGS UTILITIES WHEN VERTICAL CLEARANCE IS 1' OR LESS. THE NEOPRENE PAD SHALL BE PLACED ON THE MOST FRAGILE UTILITY.

REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOU	12/06
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

PIPE BEDDING AND TRENCH BACKFILL FOR SEWERS

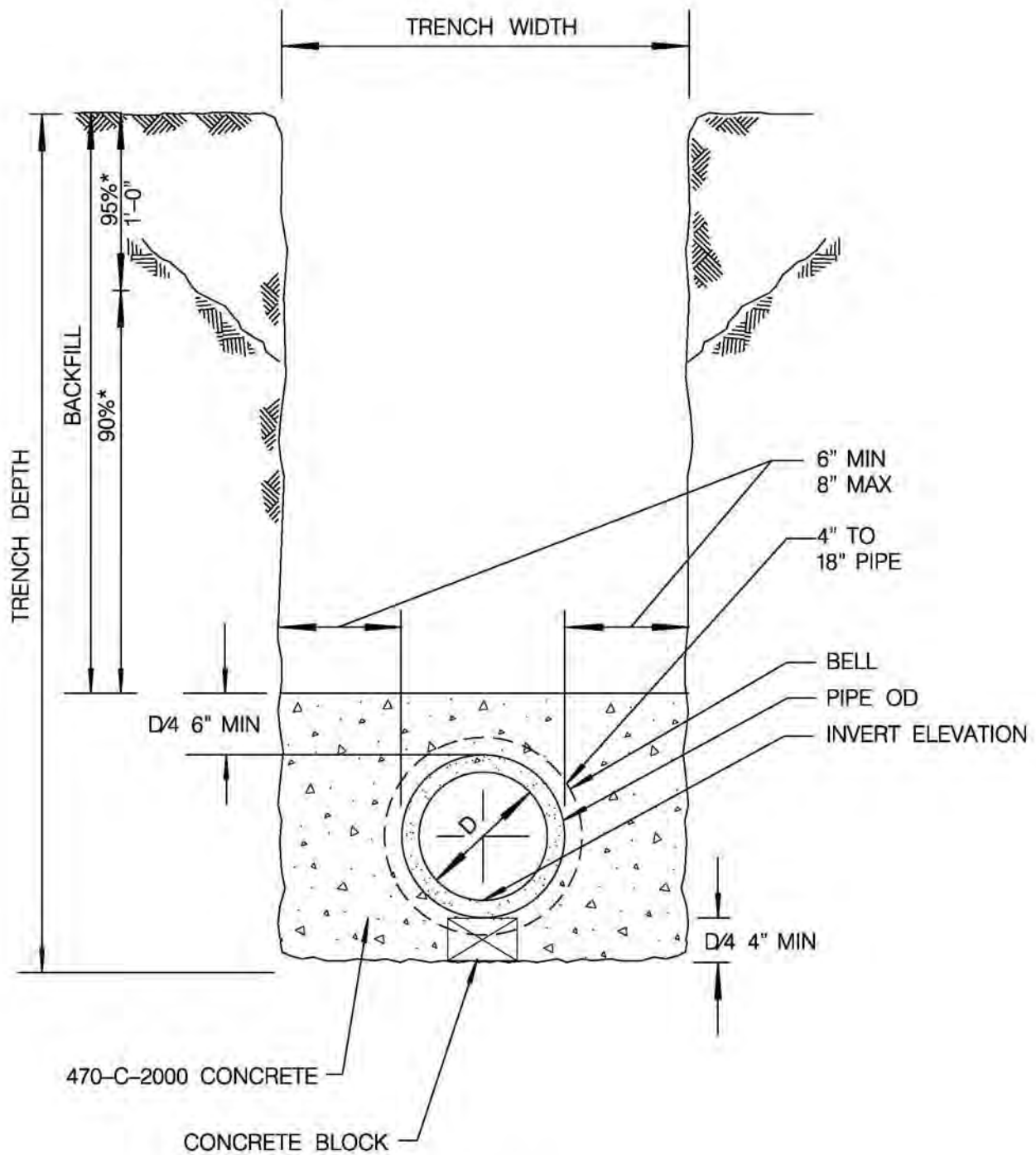
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Bringer
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDS-110

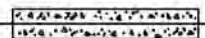


SECTION

NOTES

1. ENCASE PIPE TO THE NEAREST FLEXIBLE JOINT.
2. FOR TRENCH RESURFACING IN IMPROVED STREETS, SEE SDG-107 AND SDG-108.
3. CONCRETE ENCASUREMENT SHALL BE USED FOR RIGID PIPE ONLY.
4. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW PAVEMENT SECTION.
5. (*) INDICATES MINIMUM RELATIVE COMPLETION.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOJI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

CONCRETE ENCASUREMENT

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

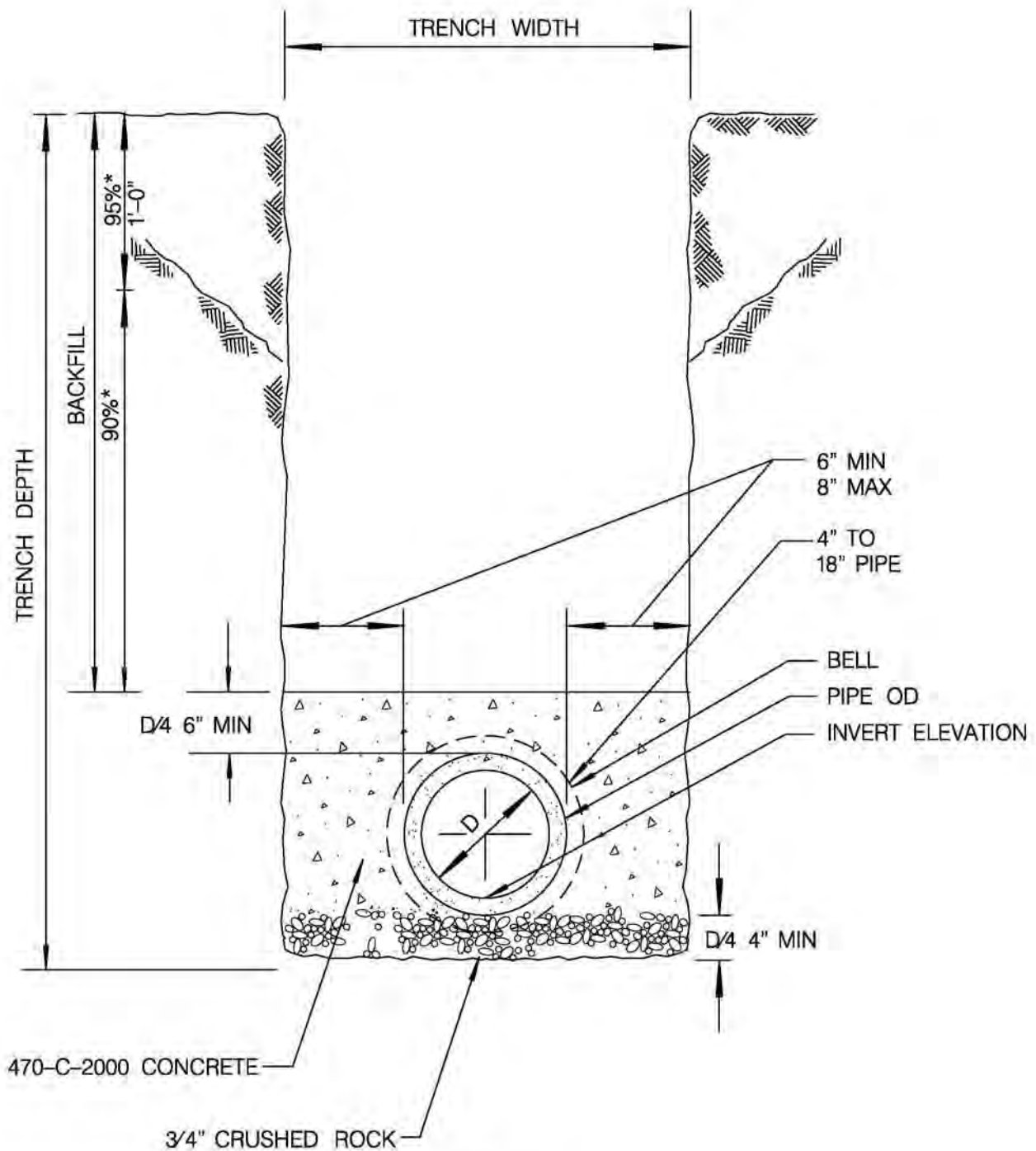
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDS-112



SECTION

NOTE

1. FOR TRENCHING IN IMPROVED STREETS SEE SDG-107 AND SDG-108.
2. CONCRETE BACKFILL FOR PVC PIPE CAN BE USED ABOVE THE PIPE BEDDING ZONE.
3. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW PAVEMENT SECTION.
4. (*) INDICATES MINIMUM RELATIVE COMPACTION.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOUI	1206
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

CONCRETE BACKFILL

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

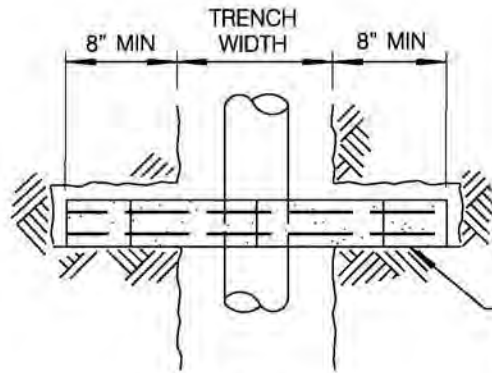
H. Hadli

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDS-113

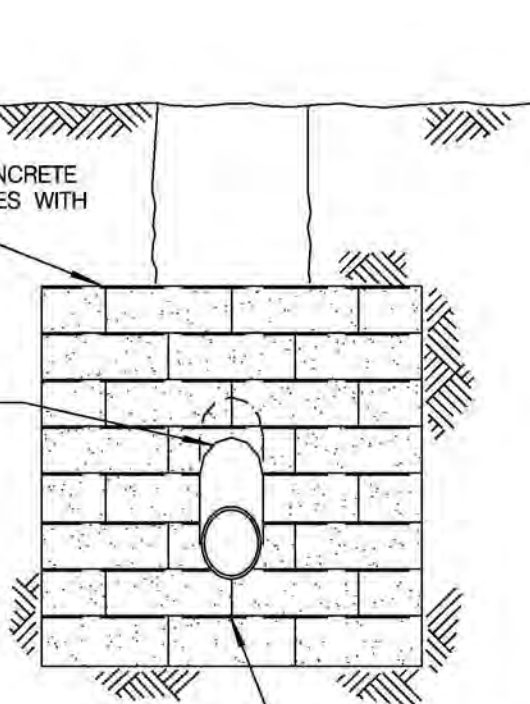


BLOCKS TO BE LAID TIGHTLY AS POSSIBLE TO DOWNSTREAM SIDE OF NOTCH

PLAN

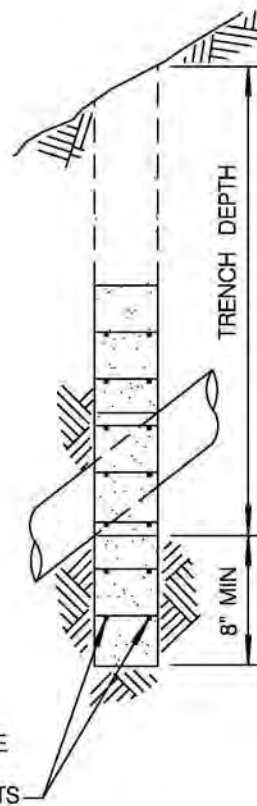
8" X 8" X 16" CONCRETE BLOCK, FILL CORES WITH GROUT

1/2" EXPANSION JOINT MATERIAL OR JUTE AROUND PIPE



#9 WIRE LADDER TYPE REINFORCEMENT IN ALL HORIZONTAL JOINTS

FRONT ELEVATION



SIDE ELEVATION

NOTE

PIPE PROTECTION CAN ONLY BE USED ABOVE THE PIPE BEDDING ZONE FOR PVC PIPE

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

CONCRETE ANCHOR

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

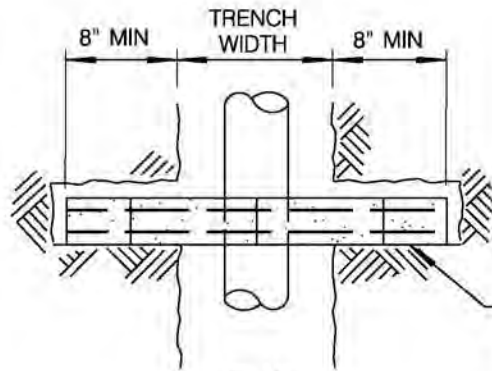
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDS-114

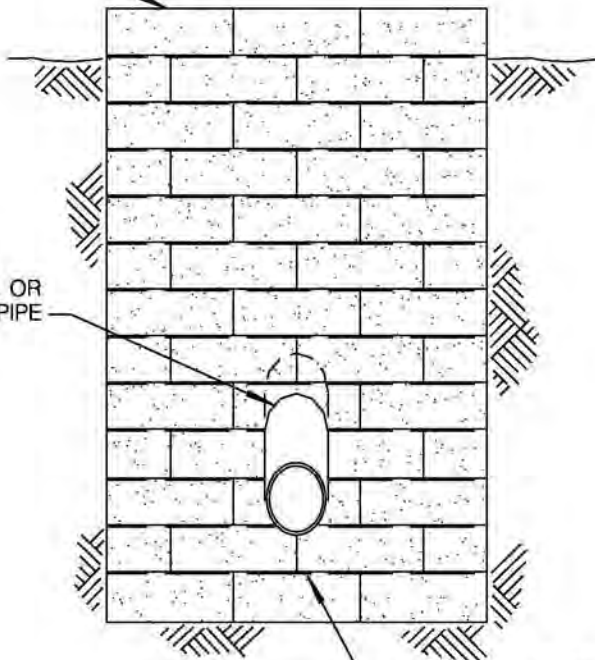


PLAN

BLOCKS TO BE LAID TIGHTLY AS POSSIBLE TO DOWNSTREAM SIDE OF NOTCH

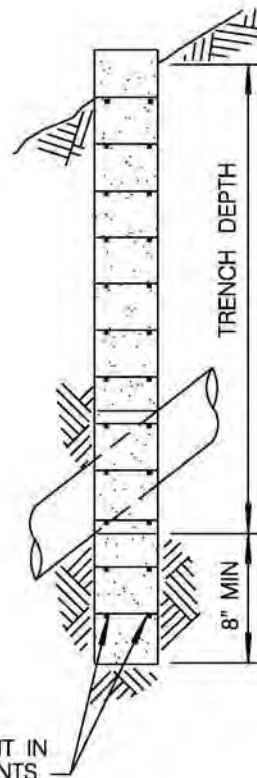
8" X 8" X 16" CONCRETE BLOCK, FILL CORES WITH GROUT

1/2" EXPANSION JOINT MATERIAL OR JUTE AROUND PIPE



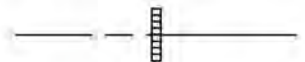
FRONT ELEVATION

#9 WIRE LADDER TYPE REINFORCEMENT IN ALL HORIZONTAL JOINTS



SIDE ELEVATION

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

CUTOFF WALL

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

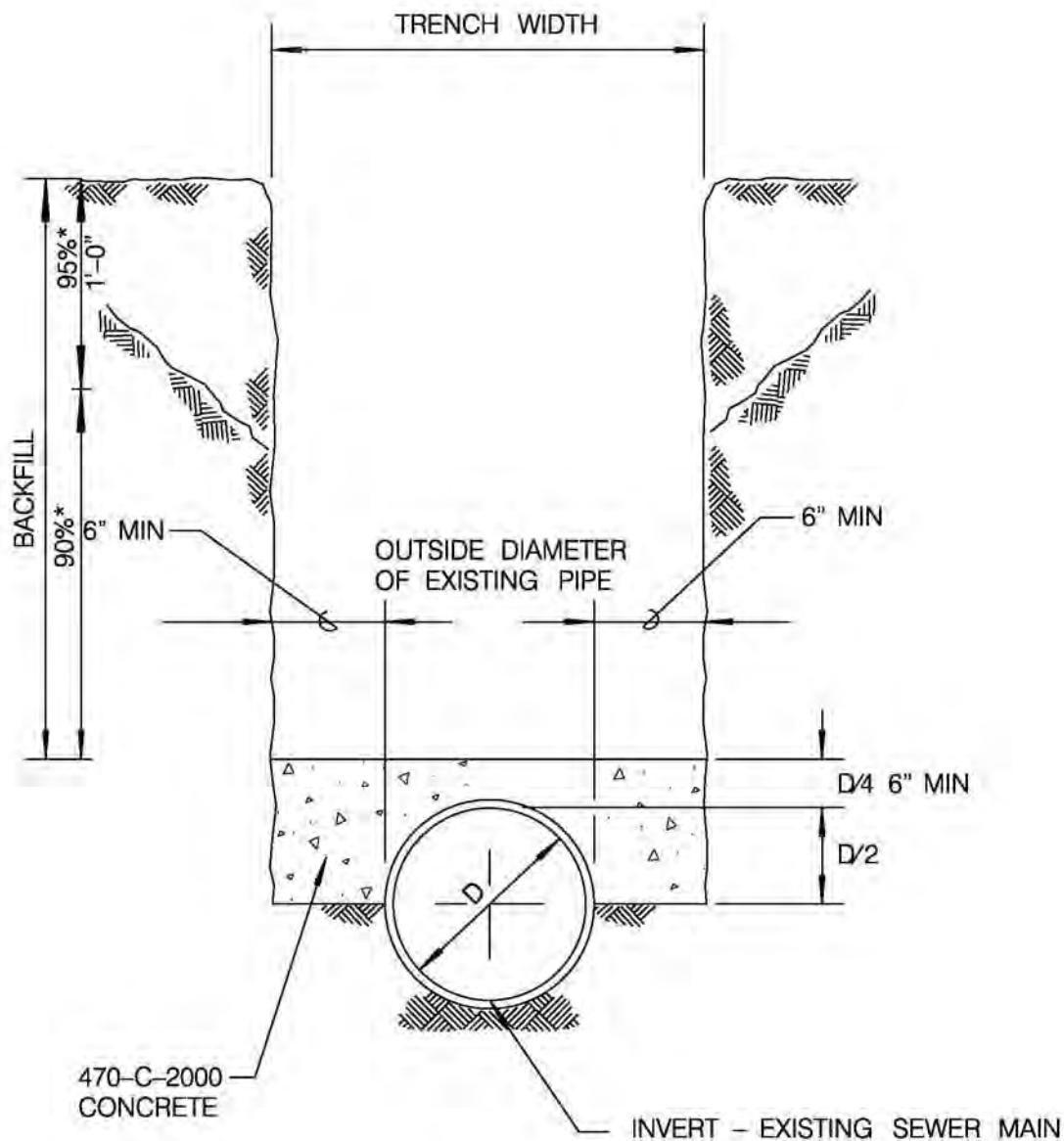
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDS-115



SECTION

NOTES:

1. FOR EXISTING PVC PIPE, IT SHALL BE COVERED WITH TAR PAPER, POLYURETHANE BAGGIE OR RUBBER MAT PRIOR TO POURING CONCRETE.
2. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW PAVEMENT SECTION.
3. (*) INDICATES MINIMUM RELATIVE COMPACTION

REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOUI	12/06
UPDATE	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

CONCRETE PROTECTION FOR EXISTING SEWER PIPE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

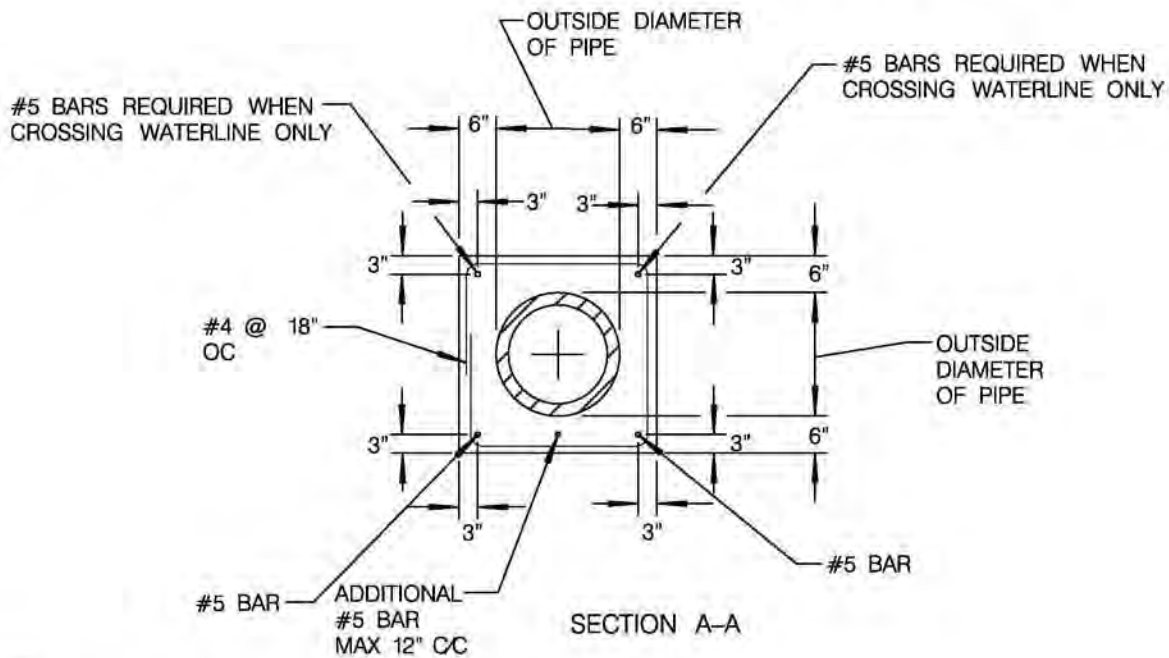
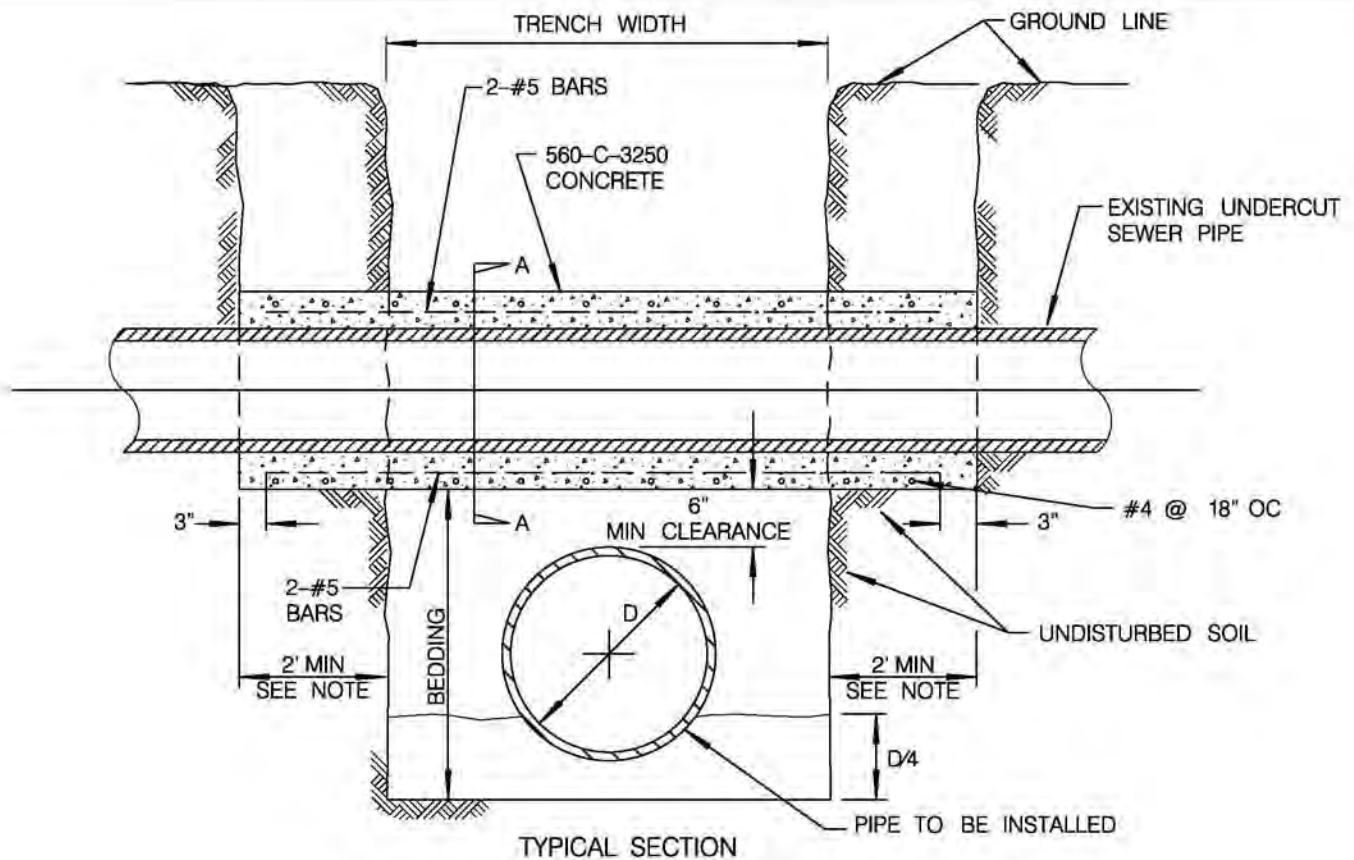
H. Hadi

1/31/2012

COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDS-116



NOTES

1. FOR WATER LINE CONSTRUCTION, ENCASEMENT SHALL EXTEND TO FIRST JOINT BEYOND 2' AT BOTH SIDES OF TRENCH OR TO A DISTANCE OF 4', WHICHEVER IS LESS.
2. WHERE CONNECTING TO FLEXIBLE PIPE, JOIN USING TWO COUPLINGS WITH A SHORT PIPE SPOOL (TYPICAL).
3. NO ENCASEMENT IS REQUIRED WHERE THE TRENCH WIDTH IS 24" OR LESS.
4. FOR EXISTING PVC PIPE, IT SHALL BE COVERED WITH TAR PAPER, POLYURETHANE BAGGIE OR RUBBER MAT PRIOR TO POURING CONCRETE.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	RA	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

CONCRETE SUPPORT FOR UNDERCUT SEWER PIPE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

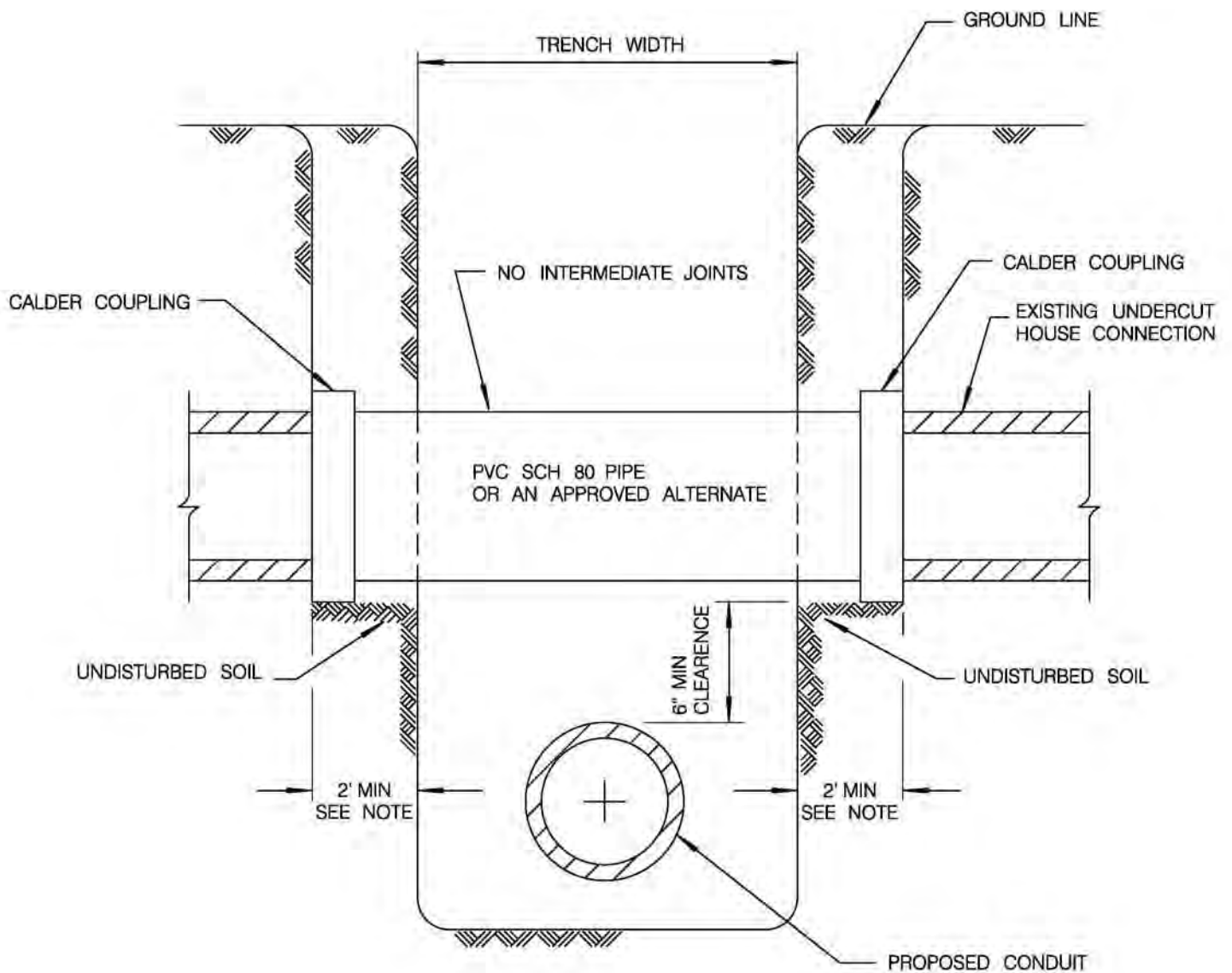
H. Hadi

1/31/2012

COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDS-117

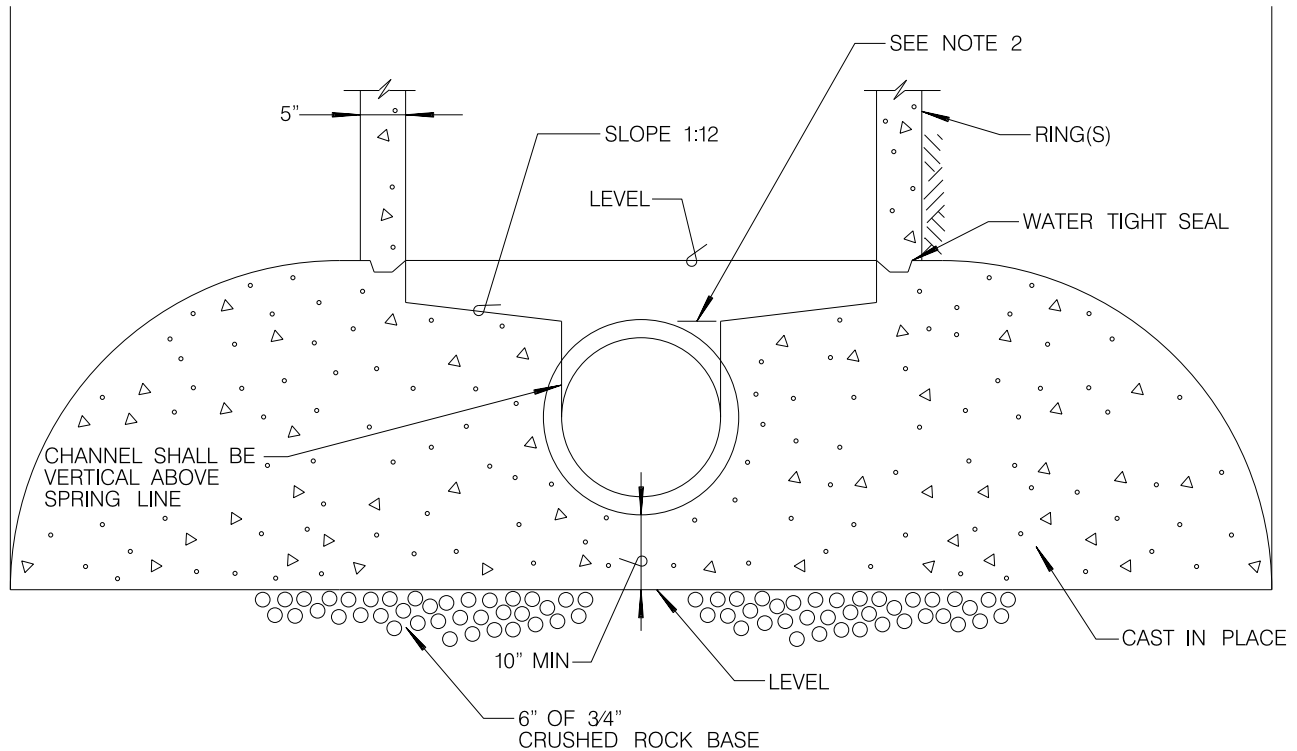


SECTION

NOTE:

FOR WATER LINE CONSTRUCTION, PIPE REPAIR SHALL EXTEND TO FIRST JOINT BEYOND 2' AT BOTH SIDES OF TRENCH OR TO A DISTANCE OF 4', WHICHEVER IS LESS.

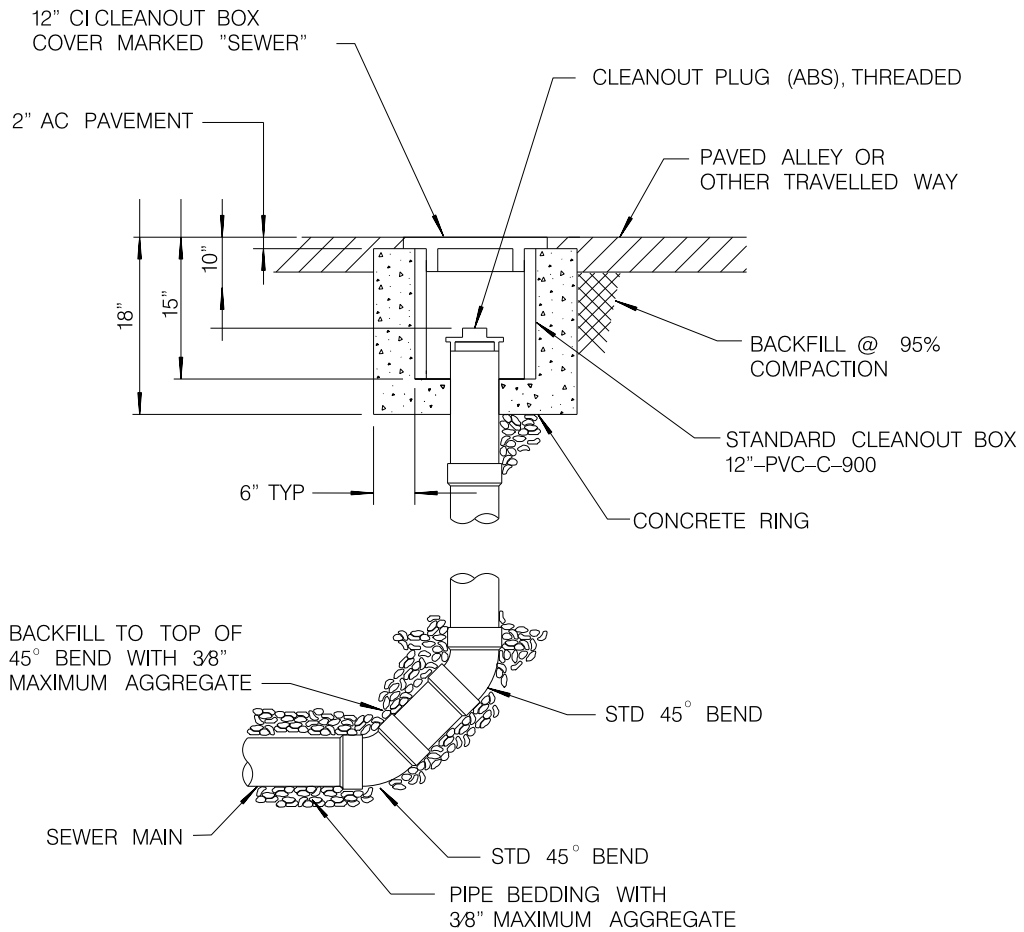
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> 1/31/2012 COORDINATOR R.C.E. 66271 DATE
ORIGINAL	RA	A. OSKQUI	12/06		
UPDATED	KA	J. NAGELVOORT	01/12	HOUSE CONNECTION SEWER REPAIR	DRAWING NUMBER SDS-118



NOTES:

1. MANHOLE BASES FOR MAINS 18" AND LARGER SHALL BE COATED PER SM-07.
2. LOWEST POINT ON SHELF SHALL BE EVEN WITH TOP OF PIPE.
3. CAST IN PLACE MANHOLE BASES CAST WITH 560-C-3250 SHALL BE CURED A MINIMUM OF THREE DAYS PRIOR TO STACKING MANHOLE. BASES CAST WITH 660-CW-4000 (WITHOUT CALCIUM CHLORIDE (CC)) OR WITH 560-C-3250 TREATED WITH A MINIMUM OF 2% CC SOLUTION IN ACCORDANCE WITH 201-1 SHALL BE CURED A MINIMUM OF 24 HOURS. THESE CURING REQUIREMENTS APPLY TO MANHOLES WITH A MAXIMUM HEIGHT OF 25'. SHORTER CURING TIMES, DEEPER INSTALLATIONS, AND ALTERNATE CONCRETE MIX DESIGNS REQUIRE ENGINEER'S PRIOR APPROVAL.
4. CONCRETE SPECIFIED BY ALTERNATE CLASS OR OTHERWISE CONTAINING FLY ASH IS NOT ALLOWED FOR USE IN CAST IN PLACE MANHOLES.
5. CONCRETE MIX DESIGNS CONTAINING ACCELERATING ADMIXTURES OTHER THAN CC REQUIRE A BREAK HISTORY AND ENGINEER'S APPROVAL.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	HM	J. NAGELVOORT	02/16	SEWER MANHOLE BASE	 COORDINATOR R.C.E. 56523 2/25/16 DATE
					DRAWING NUMBER SDS-120

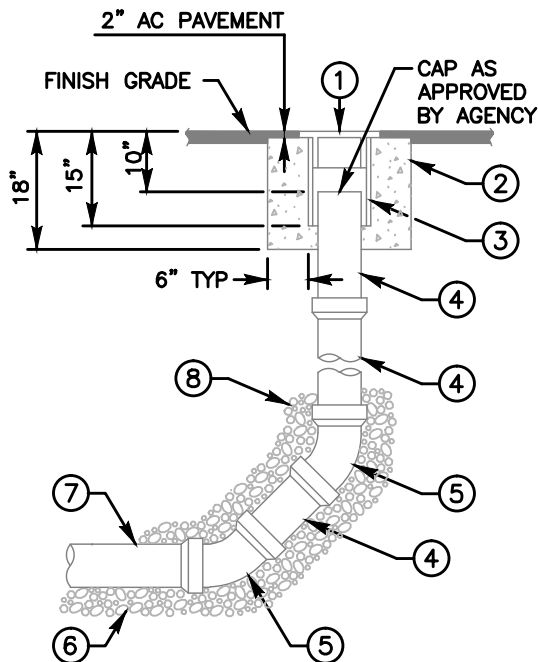


NOTES:

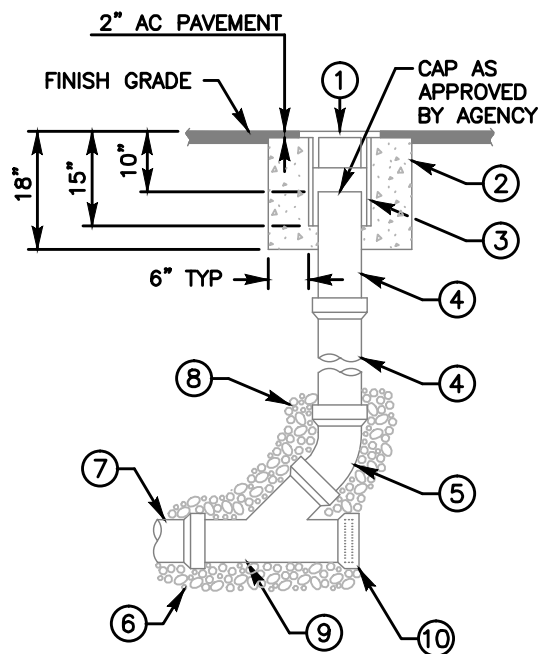
1. REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE.
2. CLEANOUTS TO BE INSTALLED AT THE END OF MAINS WHERE INDICATED ON THE PLANS.
3. CLEANOUT PIPE TO BE SAME SIZE AND MATERIAL AS SEWER (MAX DIA. 8")
4. BACKFILL TO TOP OF 45° BEND WITH 3/8" CRUSHED ROCK.
5. LATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST.

LEGEND ON PLANS

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL	BB	J. NAGELVOORT	05/15		<i>Chung</i>	
UPDATED	BB	J. NAGELVOORT	07/15	SEWER MAIN CLEANOUT	COORDINATOR	R.C.E. 56523
						DATE
					DRAWING	SDS-121
					NUMBER	



TYPE A
MAINS FOR 6" AND 8"




TYPE B
SEWER LATERAL
CLEANOUT

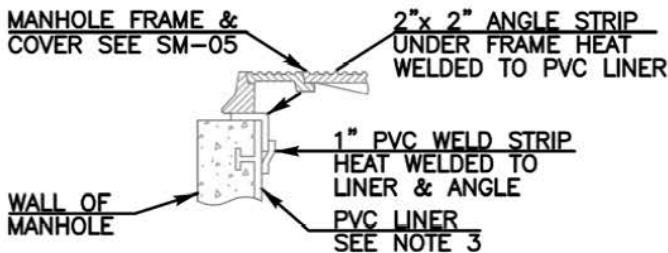
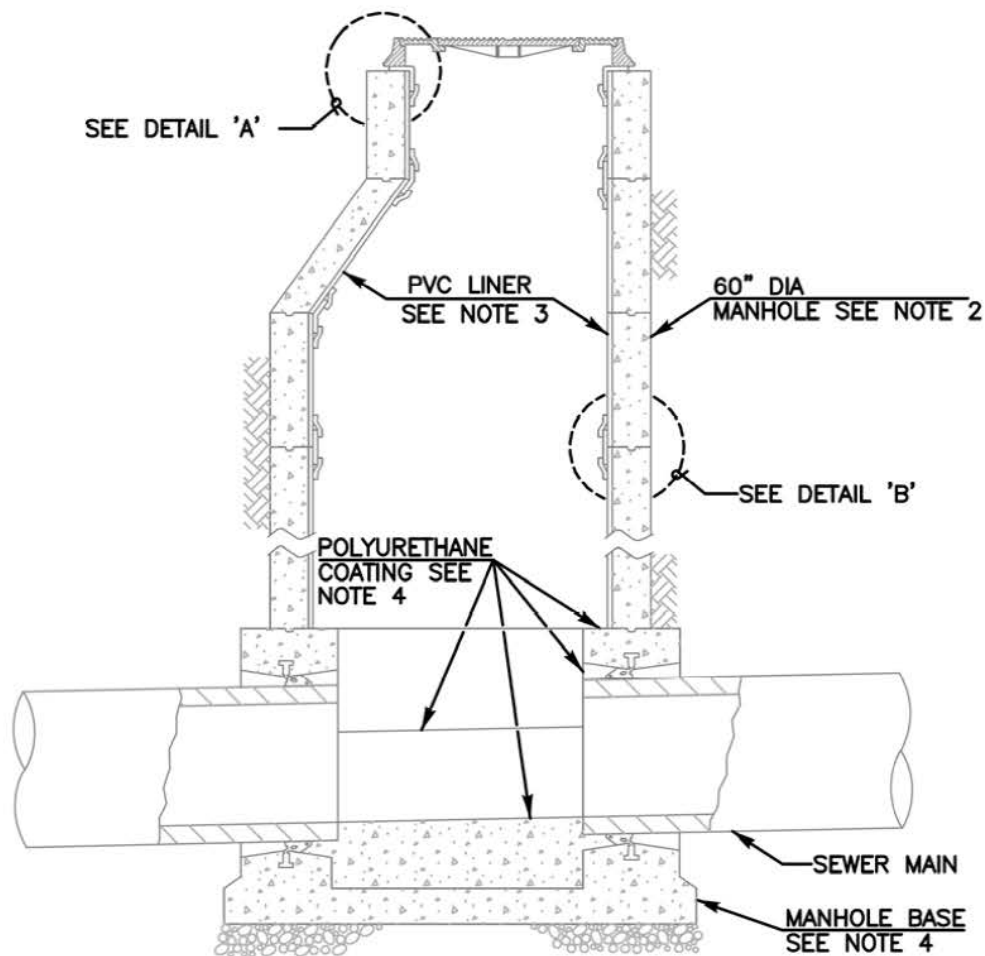
NOTES:

- 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 8"
- 4) BACKFILL TO TOP OF 45° BEND WITH 3/4" CRUSHED ROCK
- 5) MATERIALS SHALL BE SELECTED FROM THE AGENCY'S APPROVED MATERIALS LIST

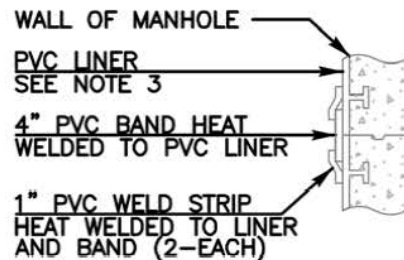
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LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	12" CI CLEANOUT BOX COVER MARKED 'SEWER' AND AGENCY NAME AS REQUIRED	⑤	45° ELBOW
②	CONCRETE RING	⑥	3/4" CRUSHED ROCK PIPE BEDDING
③	12" PVC, C-900 x 15" LONG (CLEANOUT BOX)	⑦	SEWER MAIN
④	SIZE x REQUIRED LENGTH PVC PIPE	⑧	3/4" CRUSHED ROCK SEE NOTE 4
		⑨	STANDARD WYE BRANCH
		⑩	INSTALL PLUG AND CONCRETE LUG

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING SEWER CLEANOUT	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  7/26/2012 Chairperson R.C.E. 19246 Date
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced S-03		J. Tomasulo	03/05		
Delete Metric	MR	B. KNOLL	03/11		
					DRAWING NUMBER SC-01



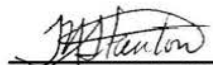
DETAIL "A" MANHOLE
FRAME & COVER



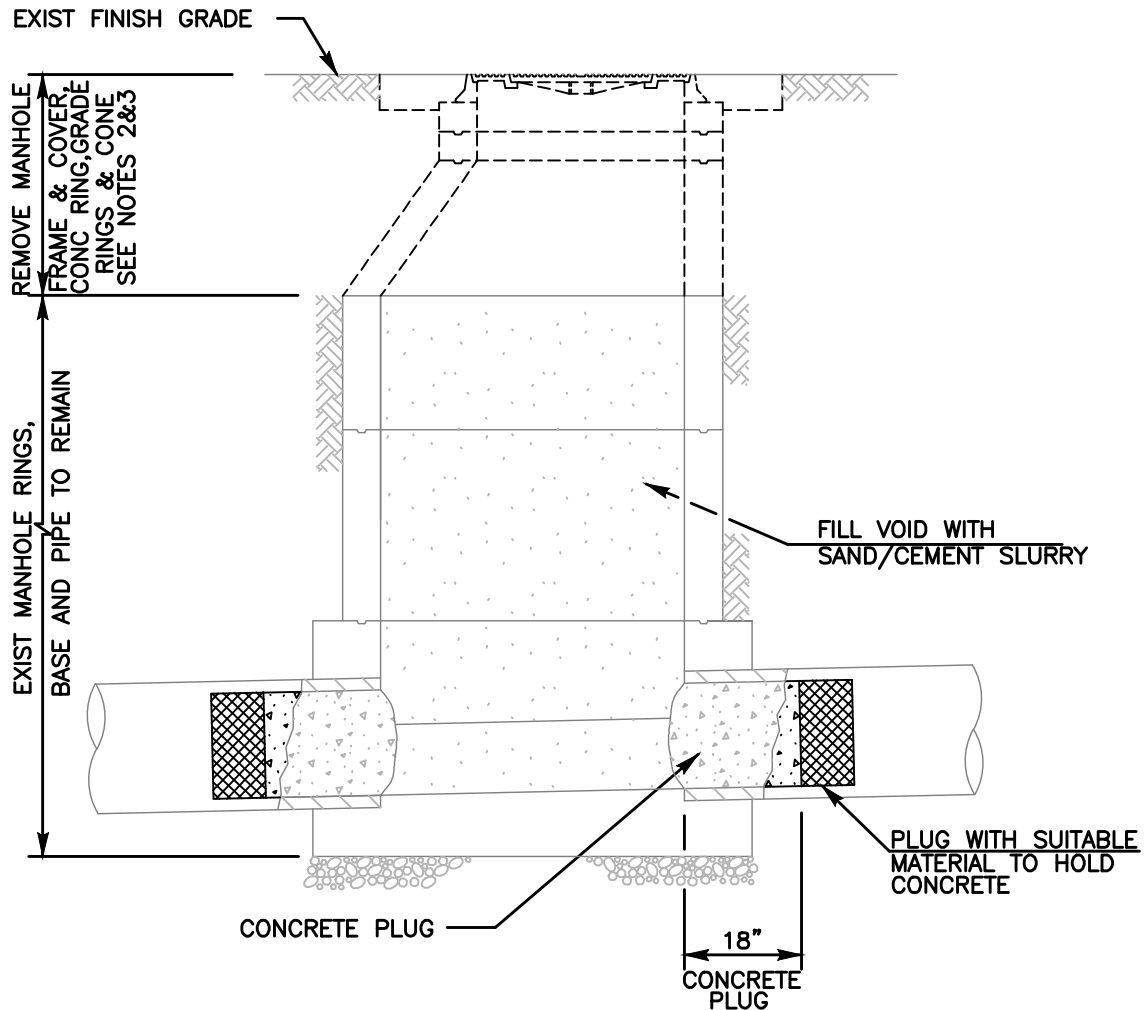
DETAIL "B" MANHOLE
JOINT SECTIONS

NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) MANHOLES FOR SEWER MAINS 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		
Add Metric		T. Stanton	03/03	MANHOLE COATING AND LINING SYSTEM	 7/26/2012 Chairperson R.C.E. 19246 Date
Replaced S-02		J. Tomasulo	03/05		
Delete Metric	MR	B. KNOLL	03/11		
					DRAWING NUMBER SM-07

FOR DRAWING SM-05 SEE DRAWINGS M-1 THRU M-3



NOTES:

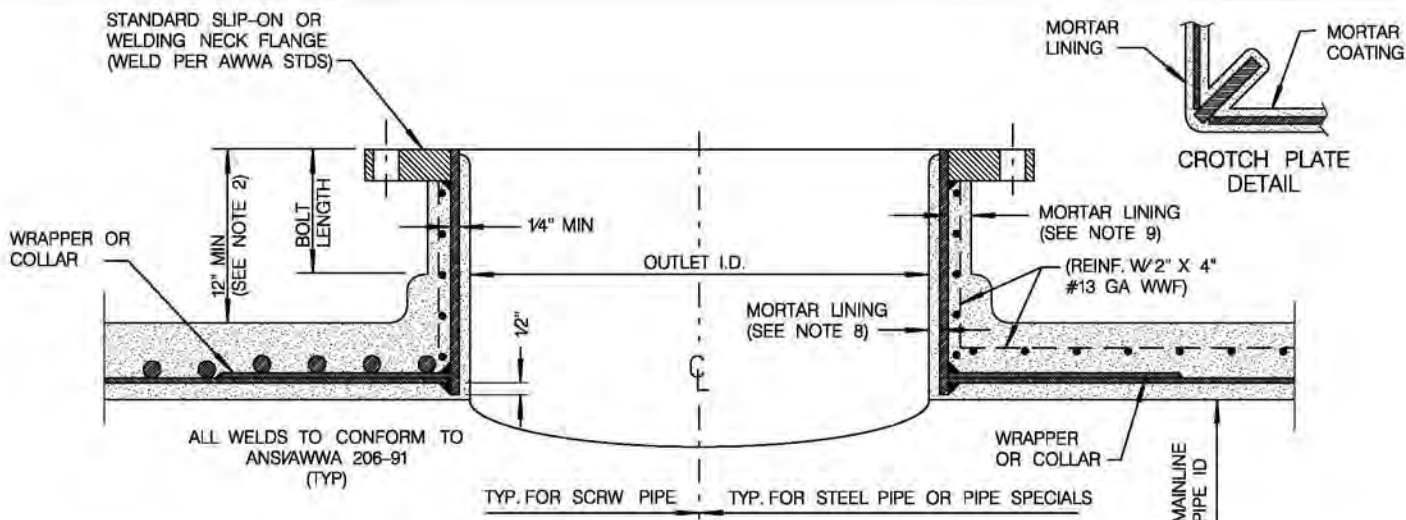
- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) ALL SALVAGED MATERIAL BECOMES PROPERTY OF AGENCY OF JURISDICTION
- 3) BACKFILL PER AGENCY'S REQUIREMENT
- 4) FOR CUTTING & PLUGGING ABANDONED SEWER MAINS SEE WP-03

LEGEND ON PLANS

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	EXISTING MANHOLE ABANDONMENT	<i>T. Stanton</i> 7/26/2012
Replaced S-02		J. Tomasulo	03/05		Chairperson R.C.E. 19246 Date
Delete Metric	MR	B. KNOLL	03/11		
					DRAWING NUMBER SM-08

CHAPTER 10

WATER SYSTEMS



OUTLET REINFORCING

RATIO OF OUTLET ID TO PIPE ID	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 OD 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" 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 PLANS OR SUBMITTED FOR APPROVAL.
- NOZZLE FABRICATION DETAILS ARE TYPICAL FOR ALL SIZES OF OUTLETS.
- REPEAT NOTE 1 FOR 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" FOR 8" ID AND LESS
1/2" FOR 10" ID 16" ID
3/4" FOR 18" ID AND GREATER
- COATING THICKNESS FOR OUTLETS SHALL BE:
3/4" FOR 16" ID AND LESS
1 1/4" FOR 18" ID 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, COLLARS, WRAPPER AND CROTCH PLATE DESIGN SHALL CONFORM TO M-11, LATEST STEEL PIPE-GUIDE FOR DESIGN AND INSTALLATION EDITION.

REVISION	BY	APPROVED	DATE
ORIGINAL		H. HORN	5-6-80
		J. CASEY	6-3-83
		J. CASEY	8-23-86
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

TYPICAL OUTLET FOR SCRW PIPE STEEL PIPE AND PIPE SPECIALS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

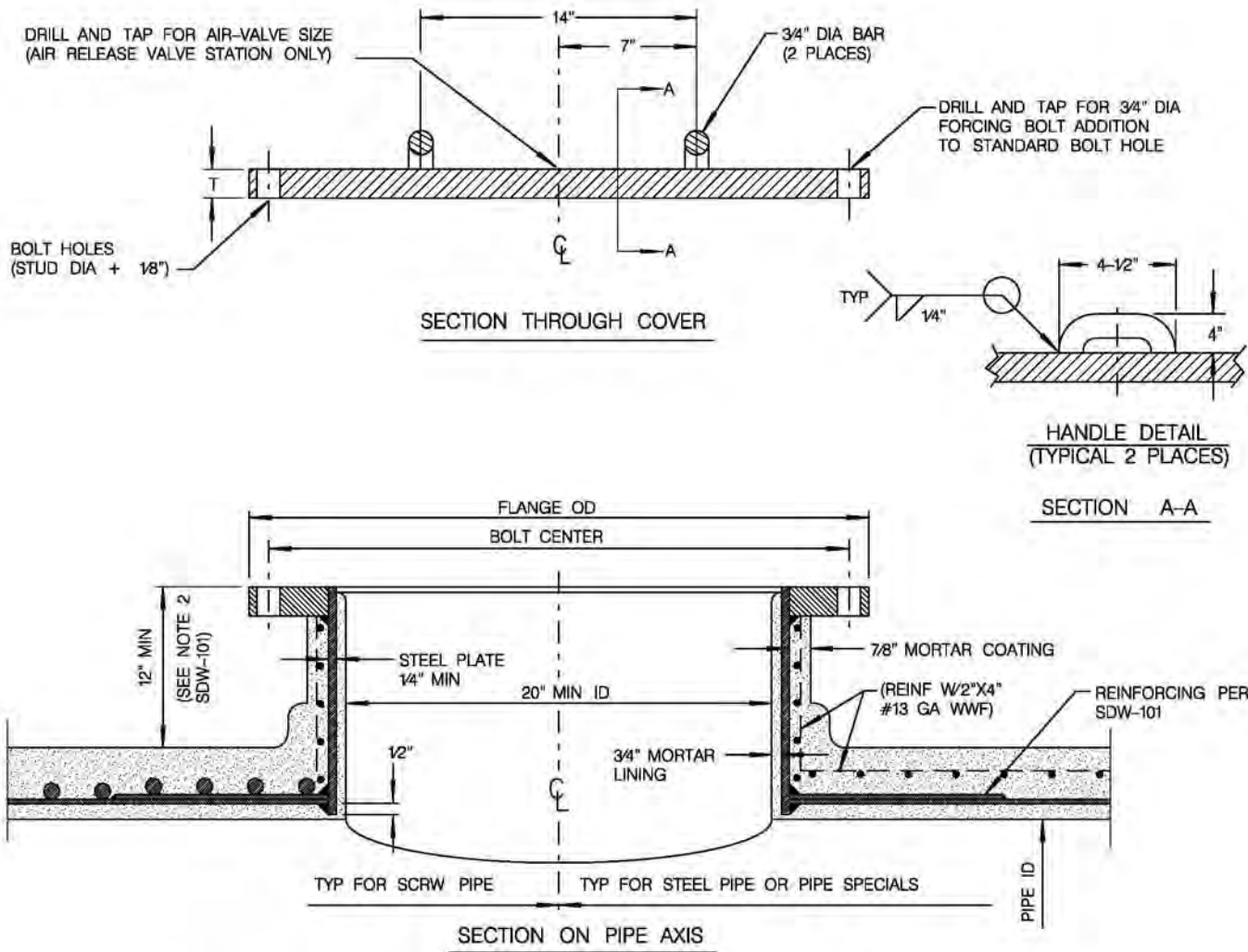
H. H. H. H.

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-101



TYPE	PRESSURE RANGE (PSI)	FLANGE		BOLT CENTER	NO. OF BOLTS	STUD DIA. & LENGTH	THICKNESS (T)
		ID	OD				
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"	1-1/16"
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 DC

- 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 MANUFACTURE'S STANDARDS.
 2. DETAILS OF MANHOLES ON PIPELINES LESS THAN 24" 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	5-6-80
		J. CASEY	6-3-83
		J. CASEY	8-23-86
UPDATED	KA	J. NAGELVOORT	01/12

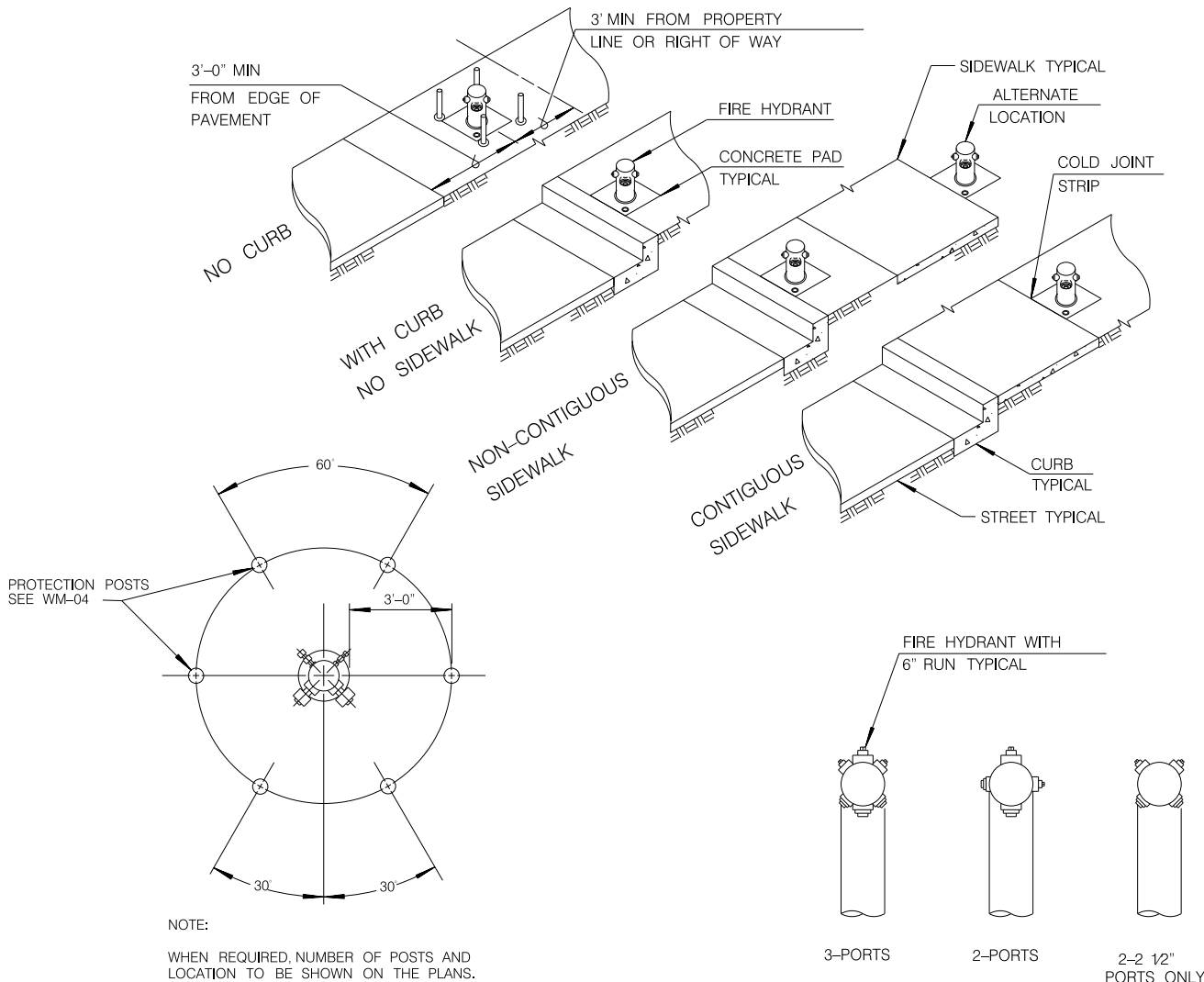
CITY OF SAN DIEGO - STANDARD DRAWING

ACCESS MANHOLE

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

H. Horn 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER **SDW-103**



PROTECTION POSTS


PORT ORIENTATION

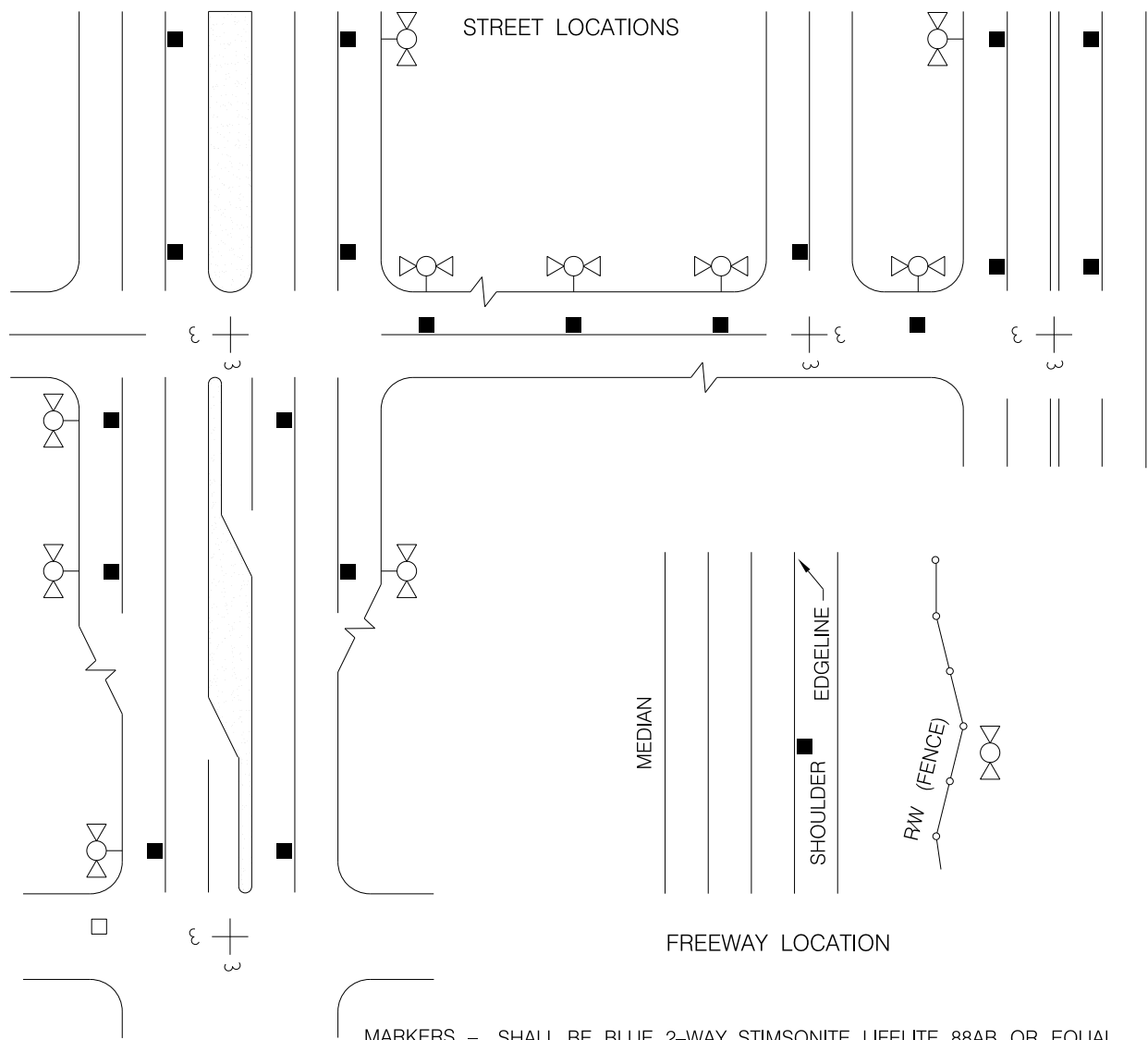
FIRE HYDRANT LOCATIONS AND PORT ORIENTATION

NOTES:

- 1) LOCATE FIRE HYDRANT AS SHOWN ABOVE OR AS DIRECTED BY THE ENGINEER.
- 2) FIRE HYDRANTS SHALL BE INSTALLED WITH THE LARGEST PORT PERPENDICULAR TO THE STREET.
- 3) IF THE CONCRETE SLAB IS TO BE INSTALLED ADJACENT TO A CONCRETE CURB OR SIDEWALK, A COLD JOINT STRIP SHALL BE INSTALLED.
- 4) CONCRETE APRON SHALL BE REQUIRED WHERE THE FIRE HYDRANT IS INSTALLED IN AN UNPAVED LOCATION. THE APRON SHALL BE 4" THICK 520-C-2500 CONCRETE.
- 5) WHEN DISTANCE FROM THE FIRE HYDRANT TO THE TOP OR TOE OF THE SLOPE OR WALLS IS LESS THAN 2', SPECIAL HYDRANT INSTALLATION DETAIL SHALL BE SHOWN ON THE PLANS.
- 6) THE DISTANCE FROM THE FACE OF THE CURB TO THE CENTERLINE OF THE FIRE HYDRANT SHALL BE 2 1/2' MINIMUM.

SHEET 2 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	08/13	FIRE HYDRANT INSTALLATION	 COORDINATOR R.C.E. 56523
UPDATED	HM	J. NAGELVOORT	02/16		
					2/25/16 DATE
					DRAWING NUMBER SDW-104



MARKERS – SHALL BE BLUE 2-WAY STIMSONITE LIFELITE 88AB OR EQUAL.

ADHESIVE – AN AMPLE AMOUNT OF 2 (A&B) EPOXY OR EQUAL.


SURFACES – CLEAN AND DRY TO INSTALLATION PER MANUFACTURER'S RECOMMENDATIONS.
INSTALL MARKERS WITH REFLECTIVE SURFACES FACING ONCOMING VEHICLES AND OFFSET 2" FROM LANE LINES TOWARD FIRE HYDRANT.

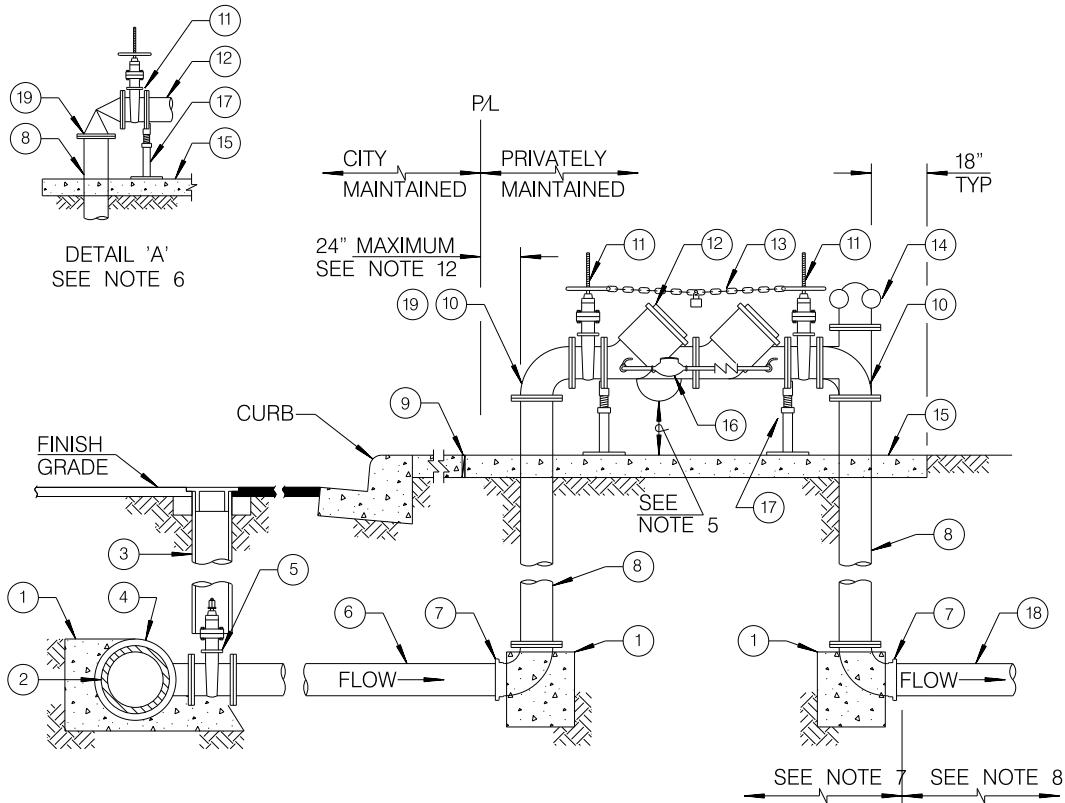
FIRE HYDRANT MARKERS

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 SHALL 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 6" FROM CENTERLINE OR EXISTING MARKERS.

SHEET 3 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	08/13	FIRE HYDRANT INSTALLATION	 COORDINATOR R.C.E. 56523 2/25/16 DATE
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDW-104

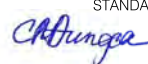


RP FS ———— ⊗
LEGEND ON PLANS

SEE NOTES ON SHEET 2

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
(1)	CONCRETE THRUST BLOCK SEE SDW-151	(12)	APPROVED REDUCED PRESSURE DETECTOR ASSEMBLY (RPDA) SEE NOTE 3
(2)	WATER MAIN	(13)	CHAIN WITH KNOX LOCK SEE NOTE 3, SHEET 2 OF 2
(3)	GATE WELL WITH CAP SEE SDW-153	(14)	FLANGED TEE WITH "FDC" SEE NOTE 3, SHEET 2 OF 2
(4)	SIZE x SIZE MJ/FLG x FLG TEE	(15)	CONCRETE SLAB MINIMUM 4" THICK x 36" WIDE x AS REQUIRED
(5)	FLG x MJ/FLG RWGV	(16)	3/4" BYPASS, METER & RP ASSEMBLY
(6)	C-900 PVC PIPE	(17)	ADJUSTABLE VALVE SUPPORT
(7)	MJ x FLG 90° BEND	(18)	PVC OR DI PIPE SEE NOTE 8, SHEET 2 OF 2
(8)	FLANGED DUCTILE IRON PIPE	(19)	FLANGED ANGLE PRESSURE REDUCING VALVE SEE NOTE 6, SHEET 2 OF 2
(9)	COLD JOINT STRIP		
(10)	FLANGED 90° BEND, SEE NOTE 6, SHEET 2 OF 2		
(11)	FLANGED OS&Y RWGV WITH HAND WHEEL		

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	8/13	BACKFLOW PREVENTER FOR 4" AND LARGER FIRE SERVICE	 COORDINATOR R.C.E. 56523 DATE 2/24/16
UPDATED	FG	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDW-105


NOTES:

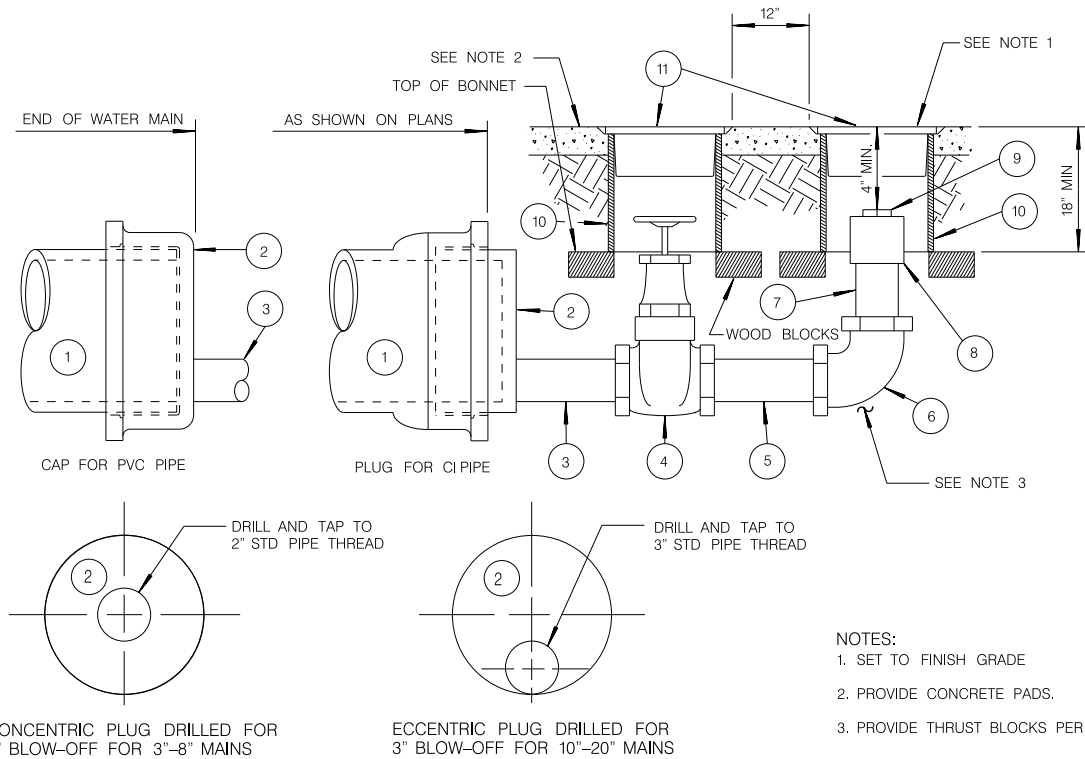
- 1) INSTALL WARNING / IDENTIFICATION TAPE PER SDM-105.
- 2) LOCATE BACKFLOW PREVENTION ASSEMBLY IN SUCH A MANNER THAT WILL ALLOW THE DEVICE TO BE READILY ACCESSIBLE FOR INSPECTION, REPAIR, AND USE.
- 3) TAMPER SWITCH, AUTOMATIC RESET, CHAIN WITH KNOX LOCK, AND FIRE DEPARTMENT CONNECTION ("FDC") SHALL BE AS REQUIRED BY THE FIRE DEPARTMENT.
- 4) BALL VALVE TEST COCKS AND DETECTOR ASSEMBLY SHALL BE PROVIDED AND LOCATED PER THE MANUFACTURES RECOMMENDATIONS AND CITY STANDARDS.
- 5) INSTALL FIRE SERVICES SO THAT THE DISTANCE BETWEEN THE BOTTOM OF THE RELIEF DIAPHRAGM AND THE CONCRETE SLAB OR FINISH GRADE IS 12" MINIMUM AND 24" MAXIMUM.
- 6) INSTALL A PRESSURE REDUCING VALVE UPSTREAM OF THE FIRST 90 BEND WHEN SYSTEM STATIC PRESSURE EXCEEDS 150 PSI OR WHEN RECOMMENDED BY THE BACKFLOW MANUFACTURER.
- 7) INSTALL PIPE AND RELATED APPURTENANCES IN THIS AREA PER THE CITY REQUIREMENTS.
- 8) INSTALL PIPE AND RELATED APPURTENANCES IN THIS AREA AS REQUIRED BY THE FIRE DEPARTMENT.
- 9) ABOVE GROUND APPURTENANCES SHALL BE PAINTED AND IDENTIFIED AS CALLED FOR BY THE FIRE DEPARTMENT.
- 10) TESTING SHALL BE CONDUCTED AS REQUIRED BY THE PUBLIC UTILITIES DEPARTMENT CROSS CONNECTION CONTROL UNIT.
- 11) CONNECTIONS TO STEEL MAINS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS.
- 12) ANY OTHER LOCATION OF FIRE SERVICE BACKFLOW, AS SHOWN ON SHEET 1, MUST BE DETERMINED AND APPROVED BY PUBLIC UTILITIES DEPARTMENT, CROSS CONNECTION CONTROL UNIT.



LEGEND ON PLANS

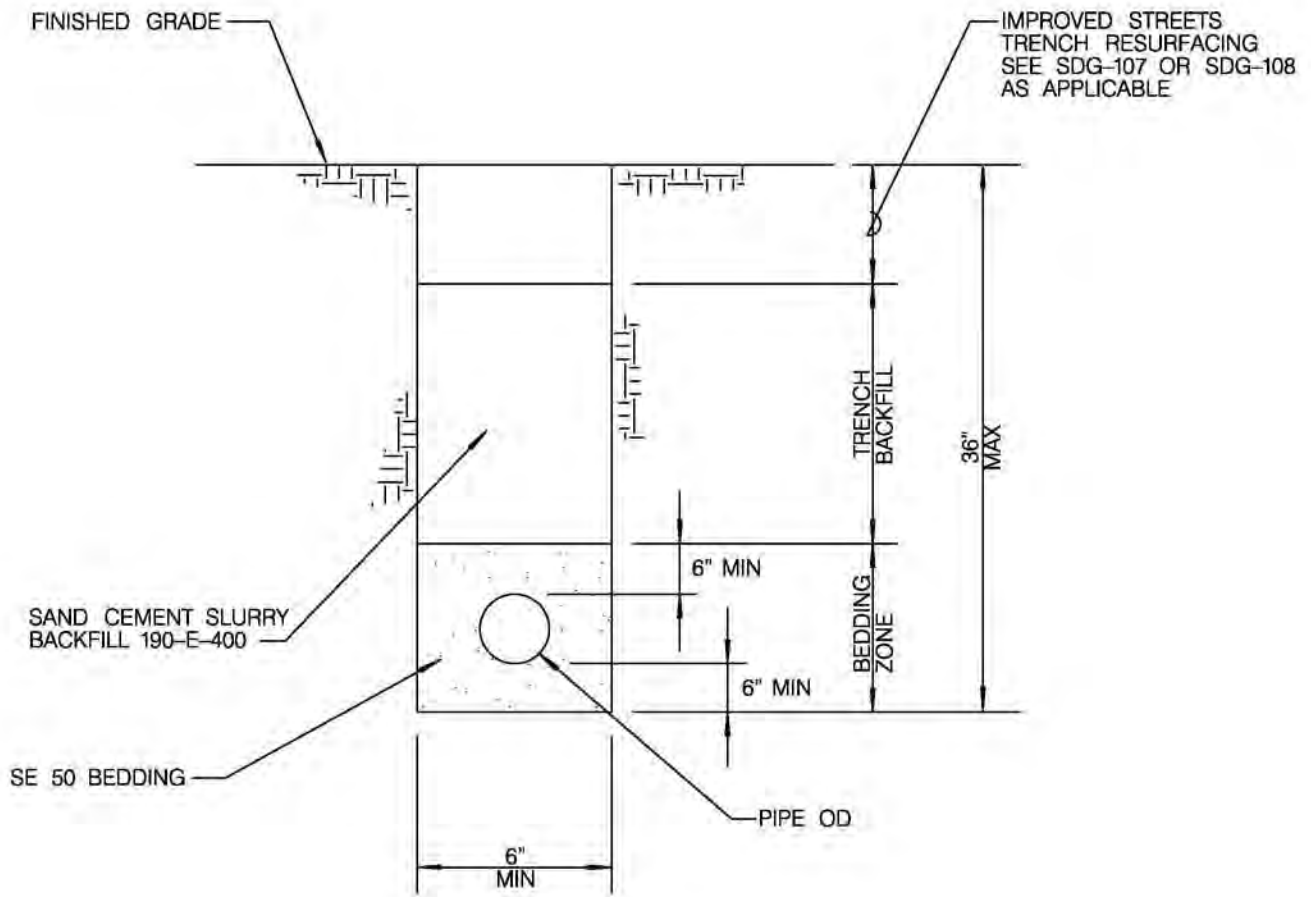
SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	8/13	BACKFLOW PREVENTER FOR 4" AND LARGER FIRE SERVICE	 COORDINATOR R.C.E. 56523 DATE <u>2/24/16</u>
UPDATED	FG	J. NAGELVOORT	7/15		
UPDATED	AR	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDW-105



SCHEDULE			
ITEM		SIZE AND DESCRIPTION	
1	WATER MAIN	3" - 8" INCL.	10" - 20" INCL.
2	CAST IRON PLUG OR CAP	MAIN SIZE X 2"	MAIN SIZE X 3"
3	BRASS NIPPLE	2" X 8"	3" X 8"
4	BRONZE GATE VALVE WITH BRONZE WHEEL-SCREW ENDS	2"	3"
5	BRASS NIPPLE	AS NEEDED	AS NEEDED
6	BRASS 90° EL	2"	3"
7	BRASS RISER	2" X VARIABLE TO GRADE MINUS 4"	3" X VARIABLE TO GRADE MINUS 4"
8	BRASS COUPLING THREAD	2"	3"
9	BRASS PLUG	2"	3"
10	STEEL CASING FOR GATE VALVE AND RISER	8" X VARIABLE TO GRADE MINUS 3/4"	8" X VARIABLE TO GRADE MINUS 3/4"
11	GATE WELL CAP AND CAN SEE SDW-153	8"	8"

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		J. MUELLER	3-3-83		
NOTES	SM	A. OSKOU	12-03	BLOW-OFF ASSEMBLIES AT THE END OF PVC AND CAST IRON MAINS	 COORDINATOR R.C.E. 56523 2/25/16 DATE
NOTES	JS	A. OSKOU	12-06		
UPDATED	KA	J. NAGELVOORT	12/12		
UPDATED	RB	J. NAGELVOORT	10/15		
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDW-106

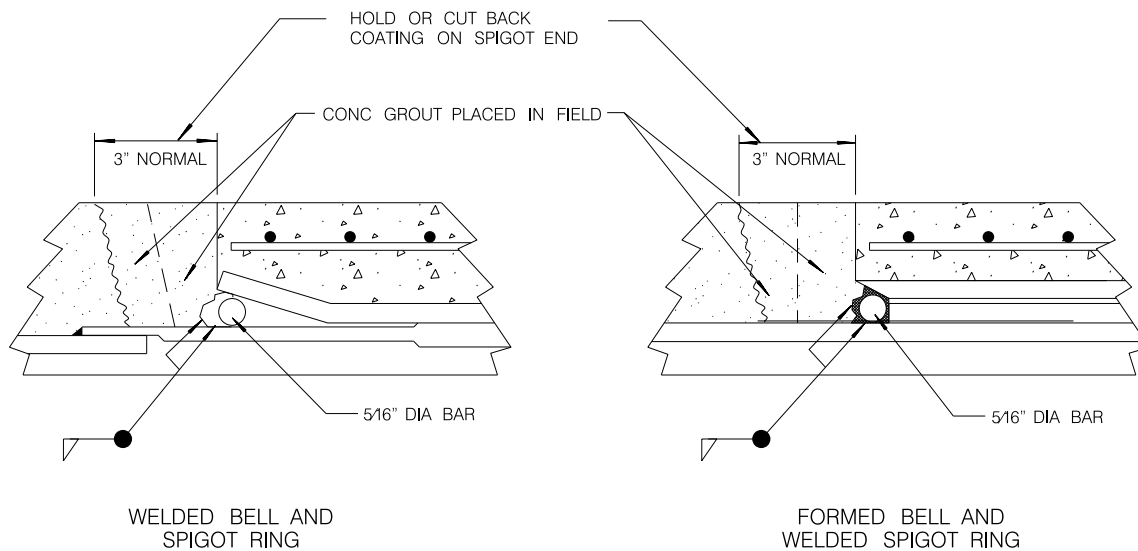


TRENCH SECTION

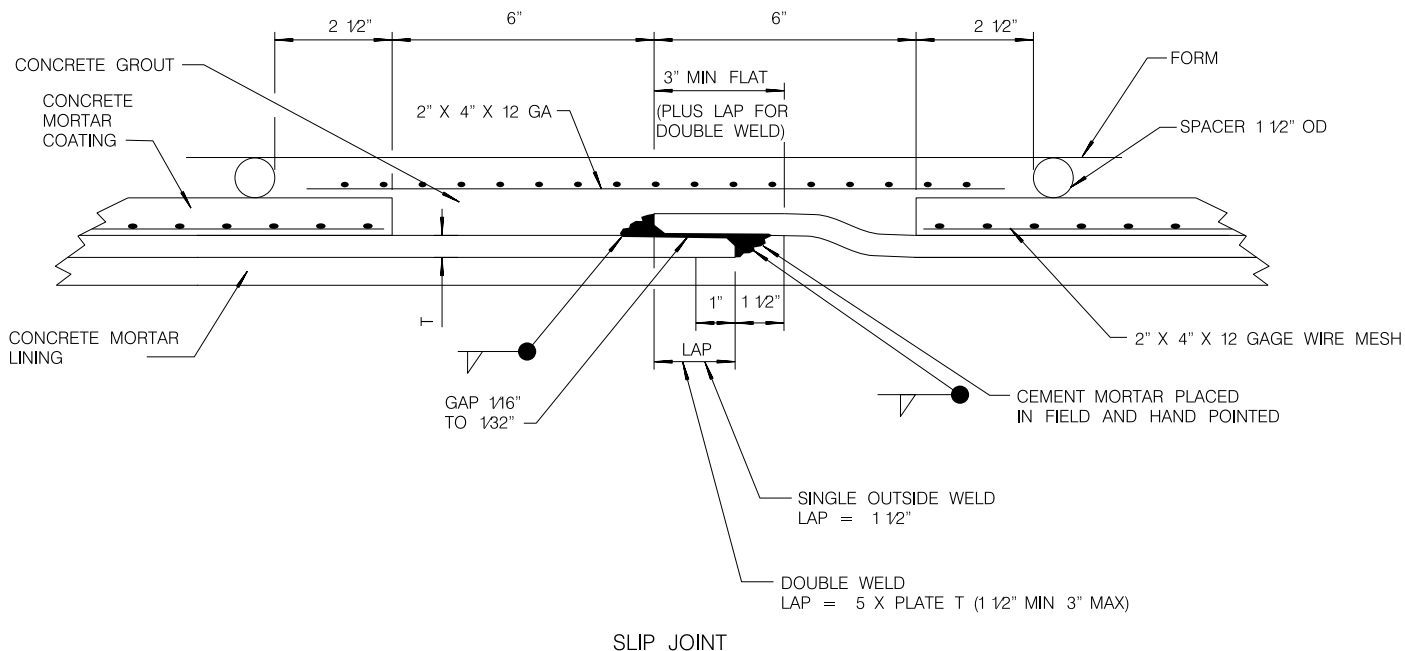
NOTES:

1. THE PROPOSED WATER SERVICE SHALL BE SECURED IN CENTER OF THE TRENCH.
2. SAND CEMENT SLURRY BACKFILL SHALL BE THOROUGHLY CONSOLIDATED TO ENCASE CONDUITS. TAMPERS OR VIBRATORS SHALL BE USED.
3. EXISTING PAVEMENT WILL NOT REQUIRE SAW CUTTING WHEN USING ROCKWHEEL FOR EXCAVATION EXCEPT WHEN THE EXISTING PAVEMENT IS CONCRETE AND TRENCH FINISH IS CONCRETE.
4. CUTS SHALL BE PARALLEL OR PERPENDICULAR TO STREET CENTERLINE, WHEN PRACTICAL.
5. IN MAJOR OR PRIME ARTERIAL STREETS, ON APPROVAL SET ACCELERATING ADMIXTURE, SUCH AS CALCIUM CHLORIDE, MAY BE USED ONLY WITH PRIOR APPROVAL OF THE ENGINEER OTHERWISE THE CONTRACTOR SHALL PROTECT THE TRENCH WITH THE APPROVAL OF THE ENGINEER.
6. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE 4" BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> COORDINATOR R.C.E. 66271 DATE 1/31/2012
ORIGINAL	KA	J. NAGELVOORT	01/12		
				NARROW TRENCH FOR 1" & 2" WATER SERVICES	DRAWING NUMBER SDW-107

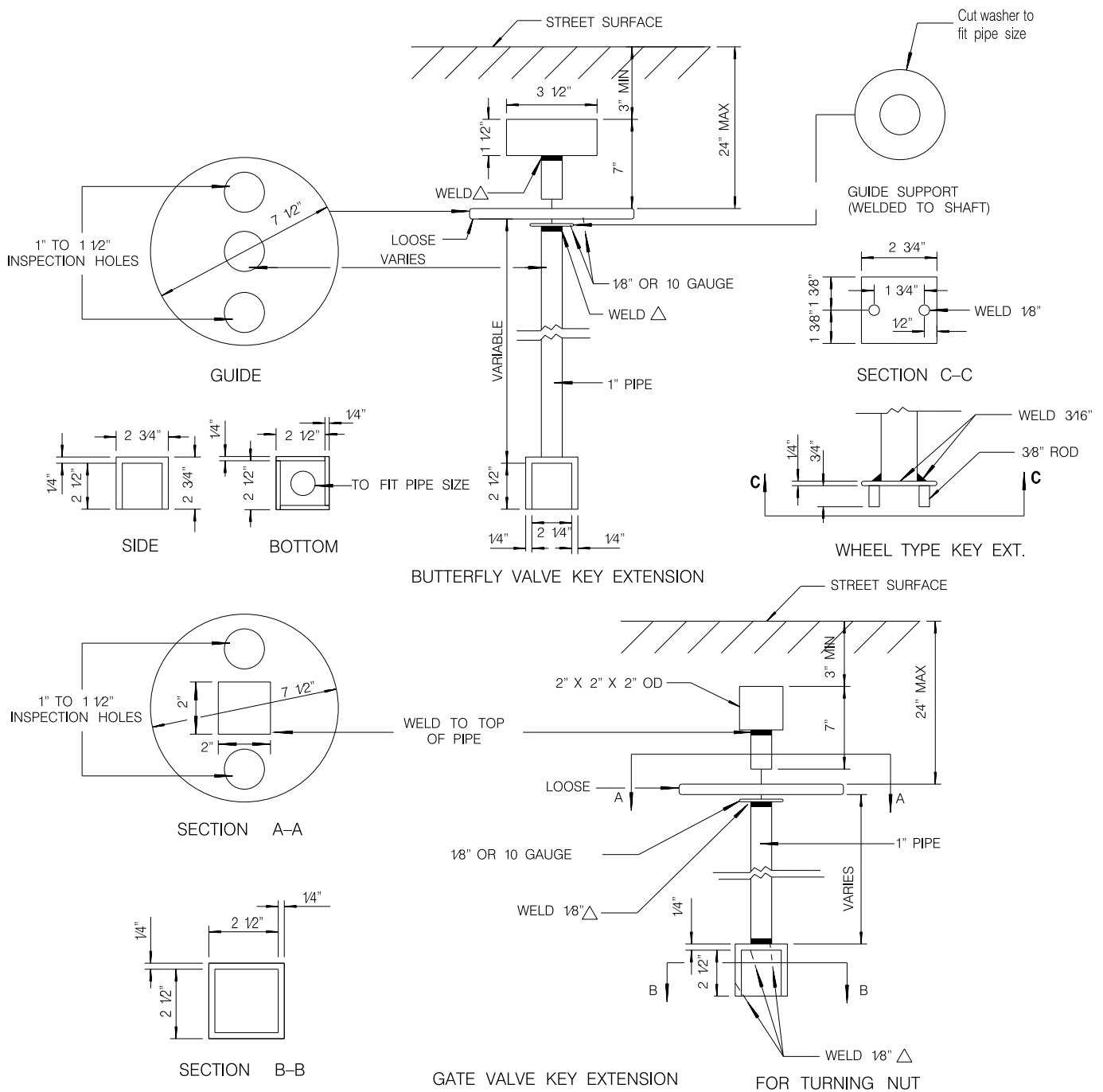


NOTE:
SEE SDW-111 FOR FULL DETAILS OF ABOVE JOINTS

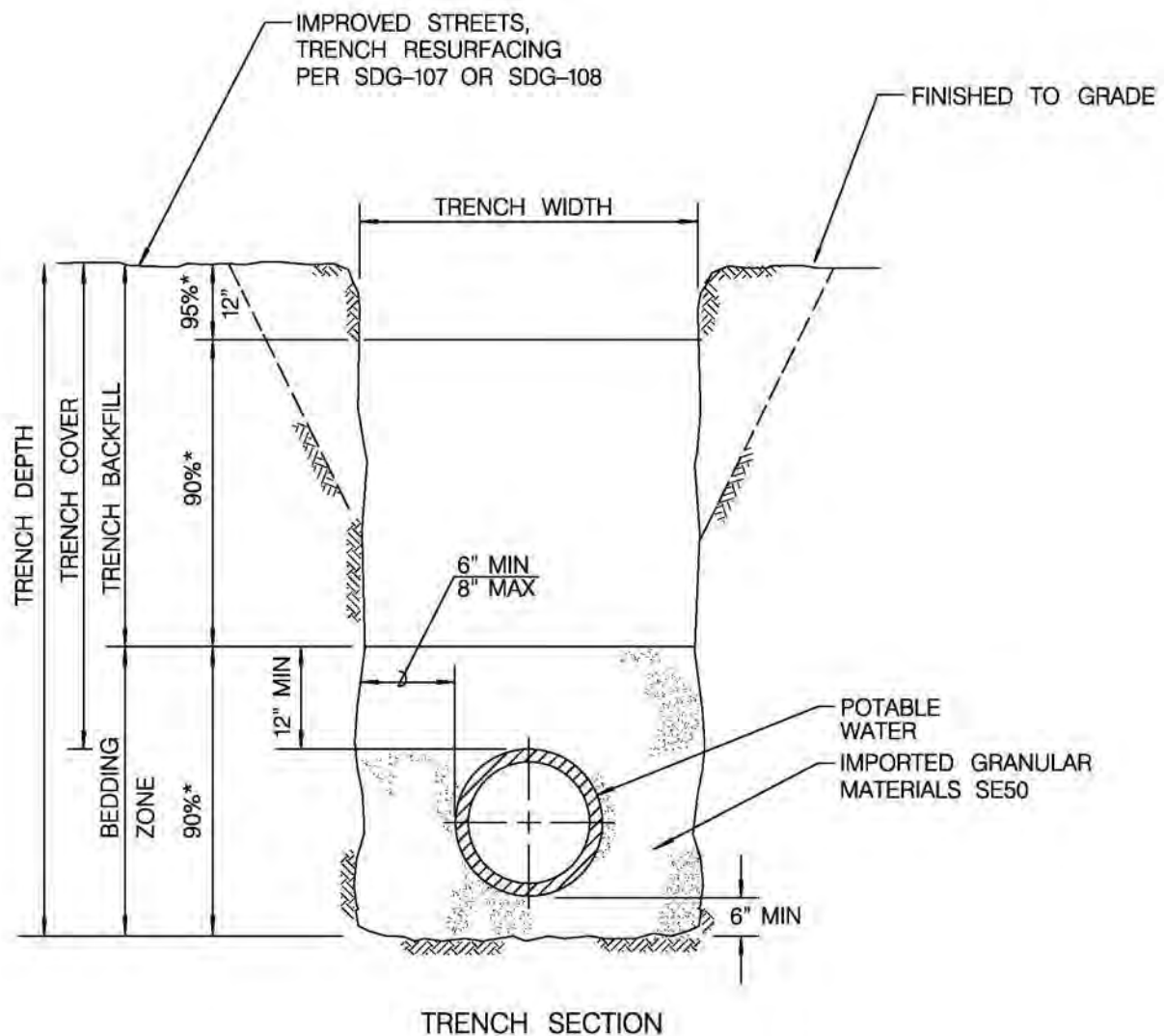


NOTE:
ALL WELDS TO CONFORM TO ASNI/AWWA C206 - 91

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		H. HORN	5–6–80		<div> COORDINATOR R.C.E. 56523</div> <div>2/25/16 DATE</div>
		J. CASEY	6–3–83		
UPDATED	KA	J. NAGELVOORT	01/12		
UPDATED	AR	J. NAGELVOORT	10/15		
UPDATED	HM	J. NAGELVOORT	02/16		
FIELD WELDED JOINTS					DRAWING NUMBER SDW-108



REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE		
		J.P. CASEY	6-3-83		<div> 2/25/16</div>		
NOTES	AO	A. OSKOUI	12/03	VALVE KEY EXTENSIONS	COORDINATOR	R.C.E. 56523	DATE
NOTES	JS	A. OSKOUI	12/06				
UPDATED	KA	J. NAGELVOORT	01/12				
UPDATED	AR	J. NAGELVOORT	02/16				
					DRAWING NUMBER SDW-109		



NOTES:

1. (*) INDICATES MINIMUM RELATIVE COMPACTION.
2. MINIMUM COVER: 3' FOR DISTRIBUTION MAINS; 5' FOR TRANSMISSION MAINS.
3. 6" METAL TAPE SHALL BE INSTALLED ABOVE PIPE: 4" BELOW TRENCH CAP AND 12" BELOW FINISH GRADE IN UNIMPROVED STREETS.
4. 1' SAND CUSHION OR A 6" MINIMUM SAND CUSHION WITH 1" NEOPRENE PAD SHALL BE PLACED FOR ALL CROSSINGS UTILITIES WHEN VERTICAL CLEARANCE IS 1' OR LESS. THE NEOPRENE PAD SHALL BE PLACED ON THE MOST FRAGILE UTILITY.
5. FOR MAINS LARGER THAN 16", TRENCH WIDTH SHALL BE AS SHOWN ON THE PLANS.

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

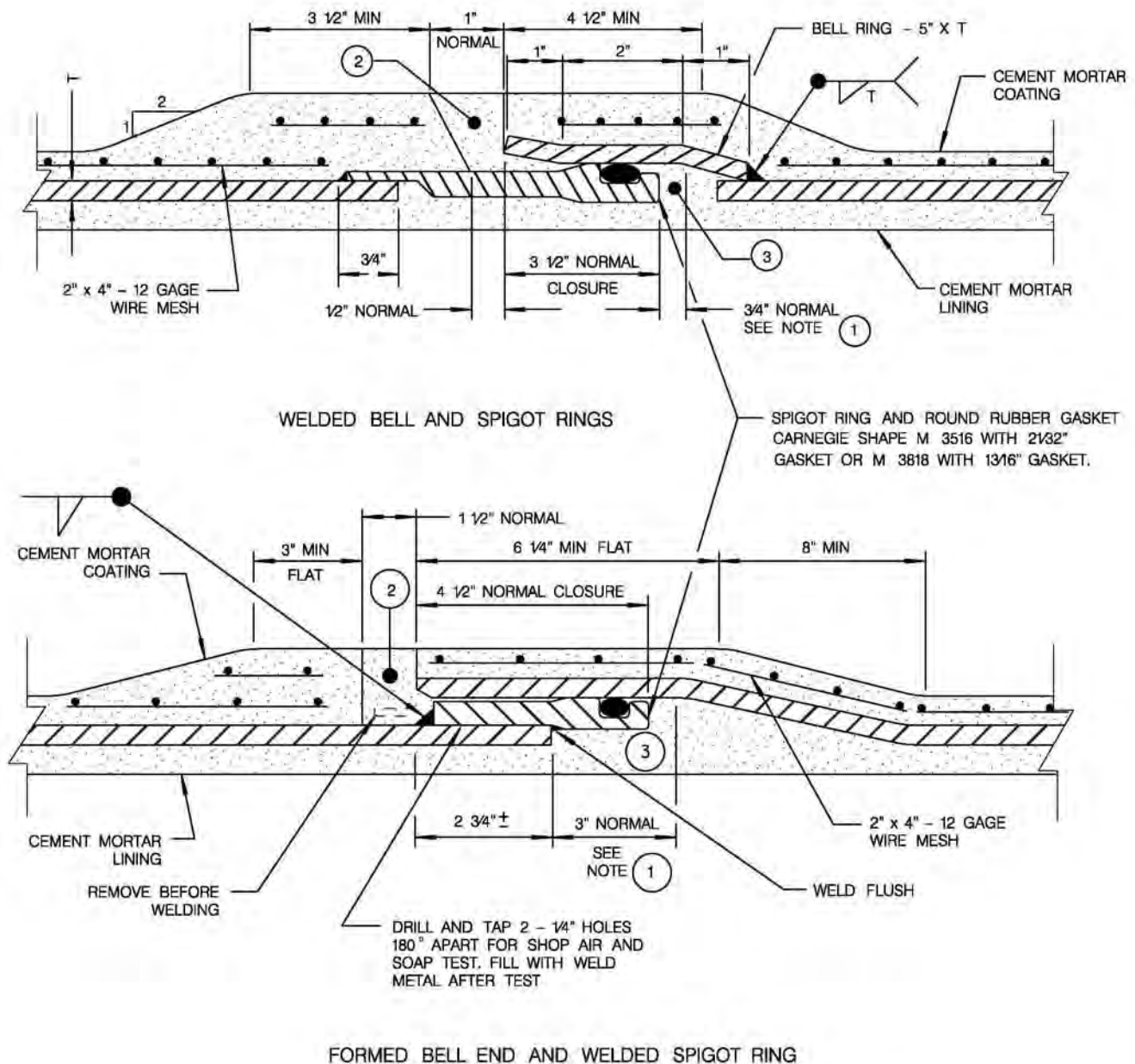
**PIPE BEDDING AND TRENCH
BACKFILL FOR POTABLE
WATER MAINS**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadli 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-110



ITEMS CALL OUT:

- 1 MAXIMUM FIELD DEFLECTION IN A JOINT IS 38" PULL AND 38" 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 1/32" TO 1/16" ON THE DIAMETER.
- 5 ALL WELDS TO CONFORM TO ANSI/AWWA C206 - 91.

REVISION	BY	APPROVED	DATE
ORIGINAL		H. HORN	5-6-80
		J. CASEY	5-3-83
NOTES	SM	A. OSKOUI	12/06
NOTES	JS	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

SPIGOT RING & GASKET JOINT FOR WELDED STEEL PIPE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

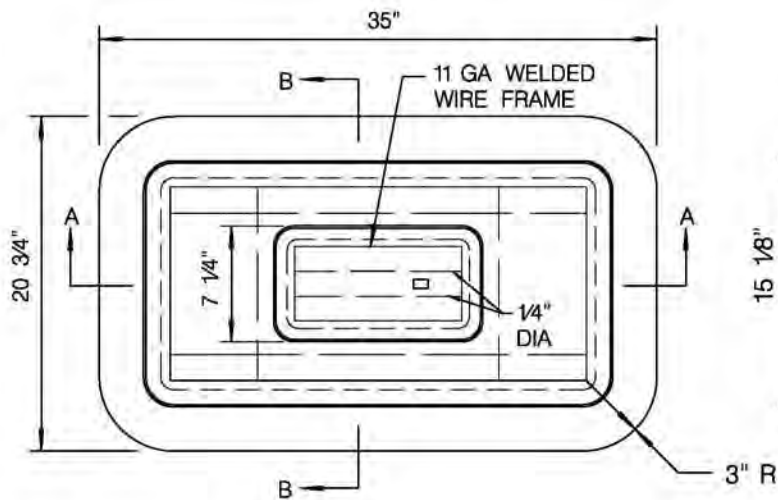
H. Hadi

1/31/2012

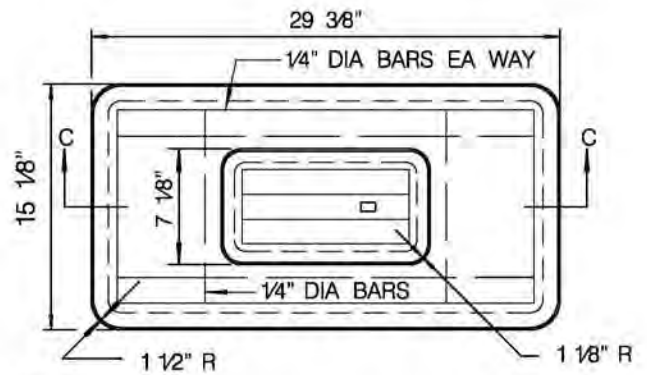
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

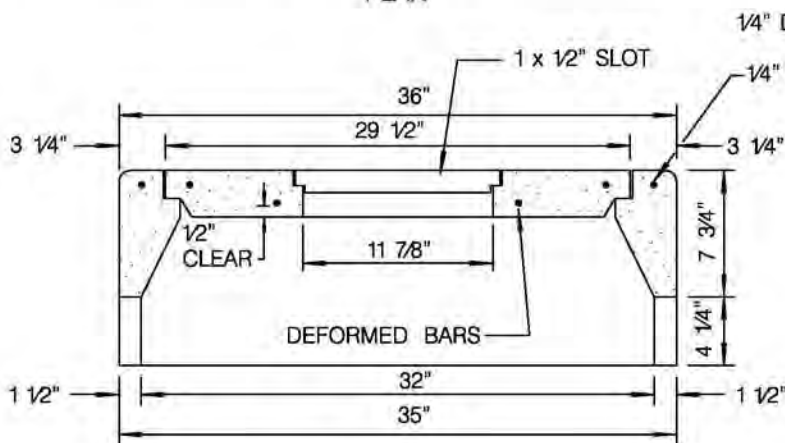
SDW-111



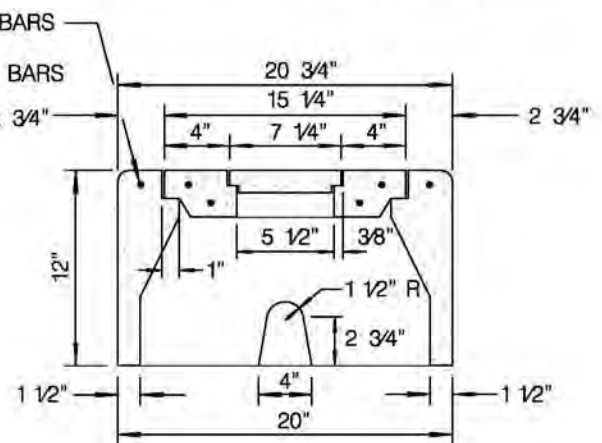
PLAN



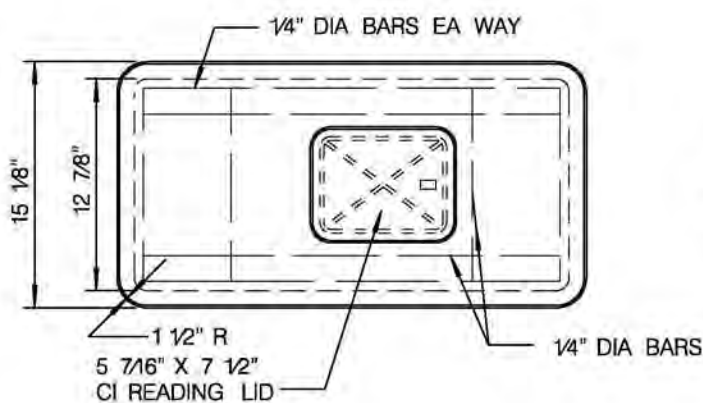
COVER W/CONC READING LID



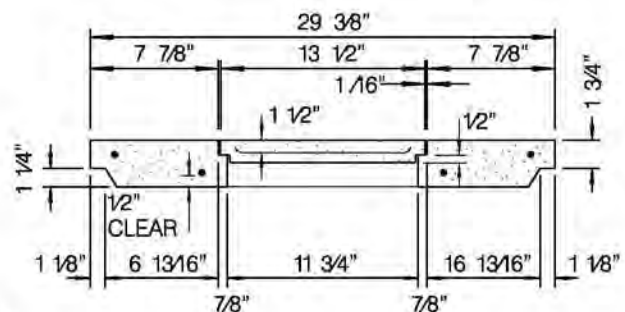
SECTION A-A



SECTION B-B



COVER W /CI READING LID



SECTION C-C

NOTE:

UNLESS OTHERWISE INDICATED ON THE PLANS OR SPECIFIED IN SPECIAL PROVISIONS, COVERS WITH CONCRETE READING LID SHALL BE USED.

REVISION	BY	APPROVED	DATE
ORIGINAL	XX	H. HOM	5-6-80
		J. CASEY	6-3-83
UPDATED	KA	J. NAGELVOORT	01/12

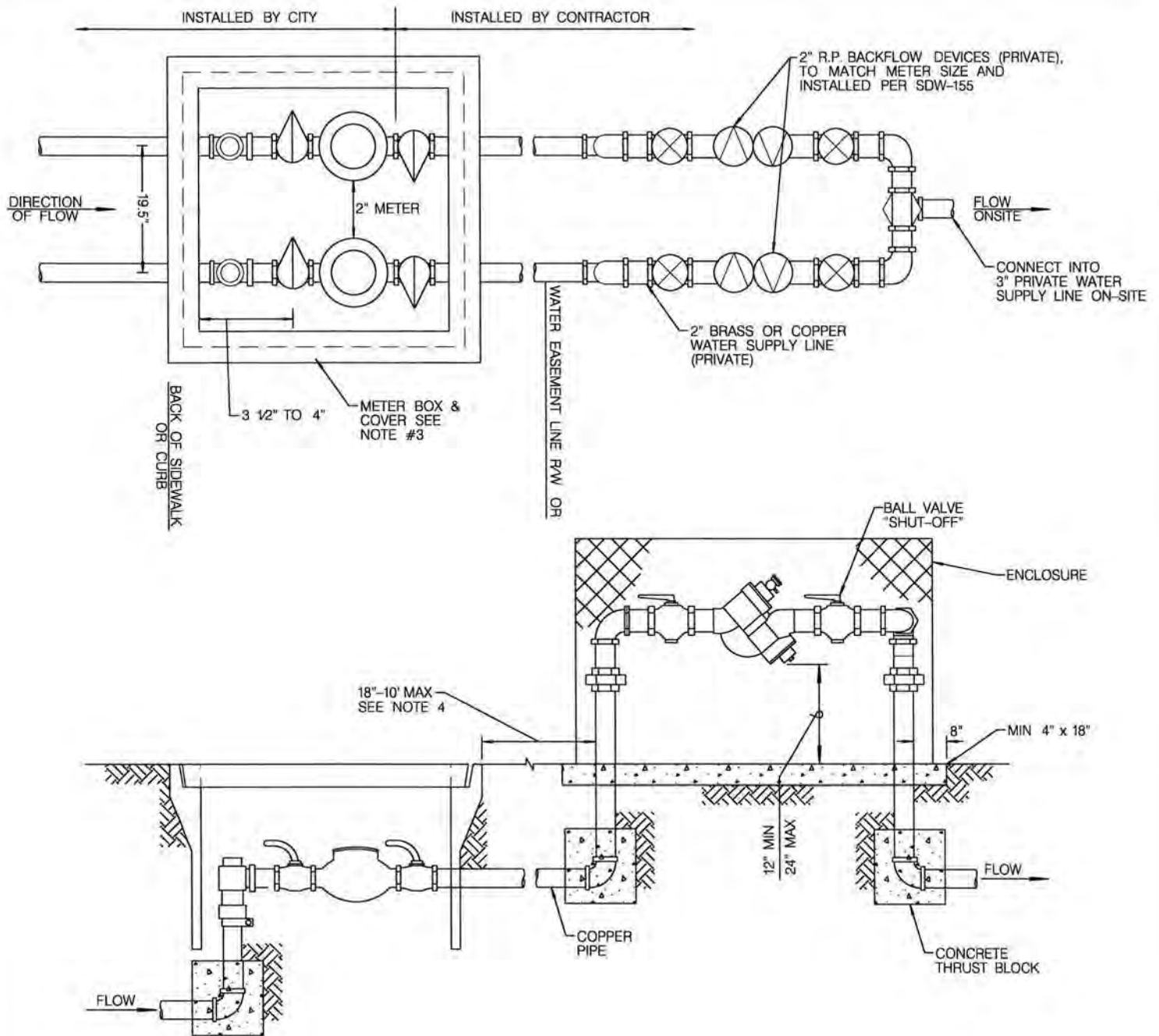
CITY OF SAN DIEGO - STANDARD DRAWING

**CONCRETE WATER METER BOX
FOR 1 1/2" OR 2" WATER METER**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Haddi 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER **SDW-113**



NOTES:

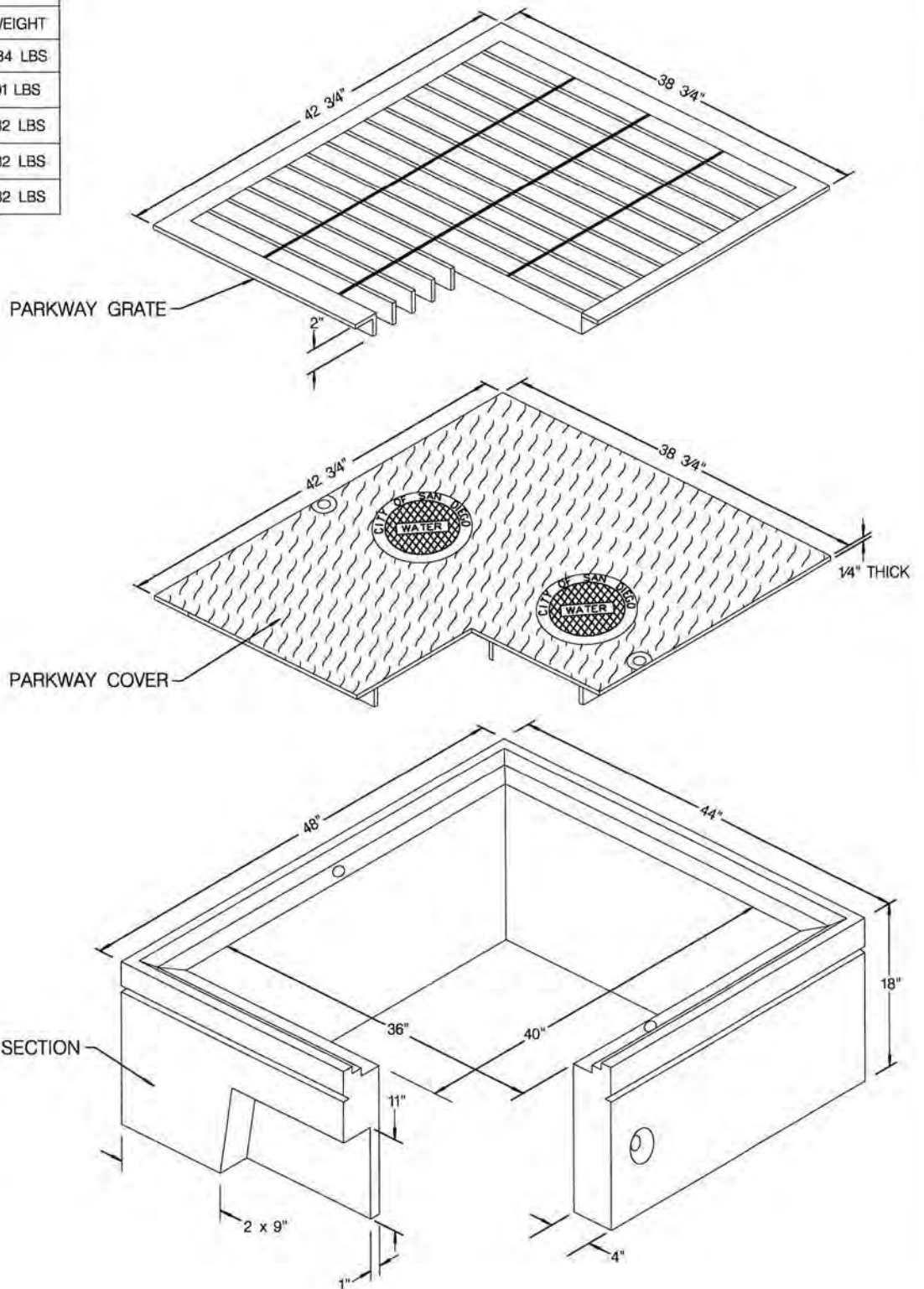
1. ANY BACKFLOW PROTECTING A SERVICE USED FOR HUMAN CONSUMPTION SHALL BE LEAD FREE
2. ALL METER/BACKFLOW INSTALLATIONS SHALL BE APPROVED BY PUBLIC UTILITIES DEPARTMENT
3. SERVICE CONNECTIONS ON WATER MAIN SHALL BE 30" APART
4. INSTALL A CASING INCASED IN CONCRETE WHEN THE DISTANCE BETWEEN THE METER BOX AND THE RISER TO THE BFD EXCEEDS 18". NO CONNECTIONS OF ANY KIND PERMITTED IN THIS AREA.
5. SEE SDW-155 FOR ADDITIONAL INFORMATION

2-2" METER AND 2" BACKFLOW INSTALLATION WITH SERVICE AND COFFER BOX

SHEET 1 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING		RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL	KA	J. NAGELVOORT	03/13			<i>[Signature]</i>	301/13
				2" METER, BACKFLOW AND COFFER BOX		COORDINATOR	R.C.E. 65271
						DATE	
						DRAWING	SDW-114
						NUMBER	

CONFIGURATION BLOCK		
DESCRIPTIONS	HEIGHT	WEIGHT
METER BOX	18"	884 LBS
PARKWAY COVER STEEL	2"	191 LBS
PARKWAY COVER STEEL GALVANIZED	2"	182 LBS
PARKWAY COVER STEEL W/HOLES	2"	182 LBS
PARKWAY GRATE	2"	182 LBS



NOTE:

1. CONCRETE BASE: 5000 PSI

36" x 40" METER BOX PARKWAY

SHEET 2 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	03/13

CITY OF SAN DIEGO – STANDARD DRAWING

2" METER, BACKFLOW AND COFFER BOX

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

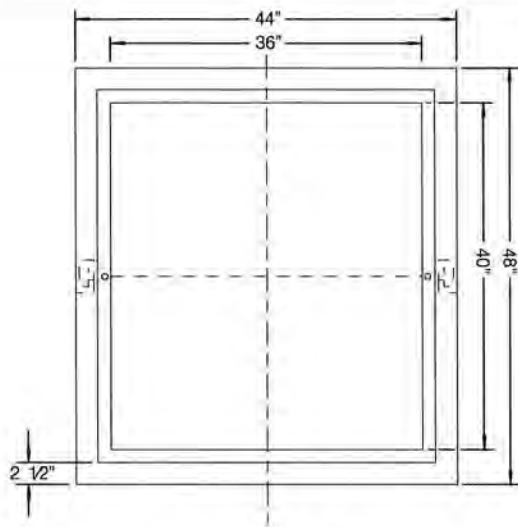
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3/01/13

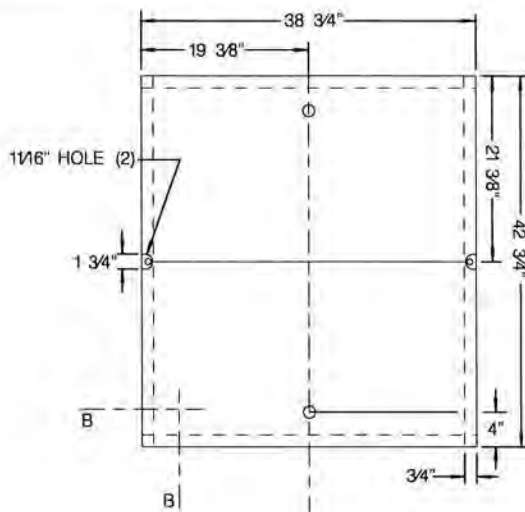
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-114

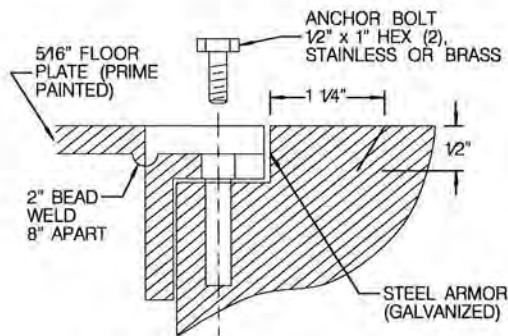
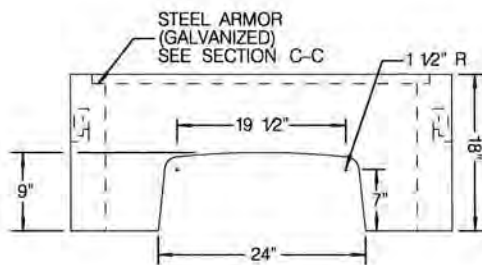


BOX - TOP VIEW

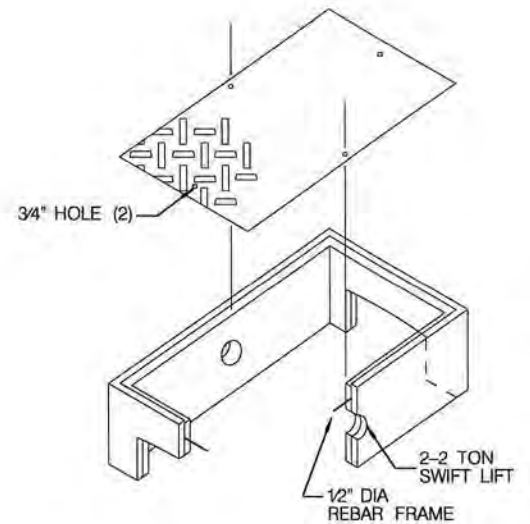


COVER - TOP VIEW

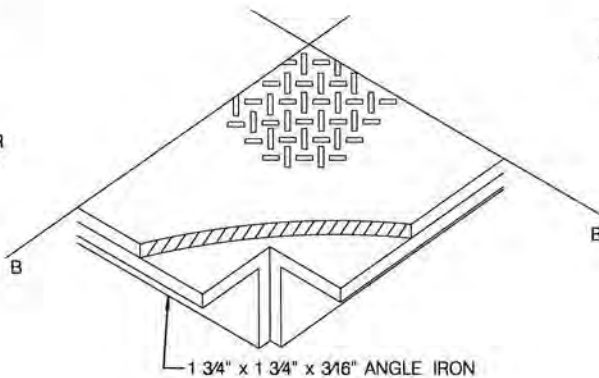
BOX - END VIEW



CROSS-SECTION: COVER,
BOX & ANCHOR



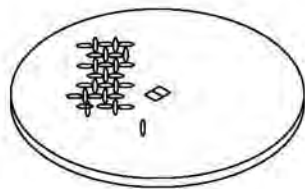
REBAR FRAME



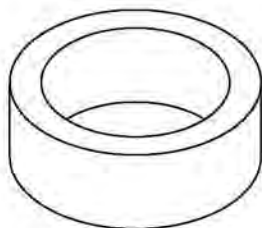
SECTION B-B OF COVER

SHEET 3 OF 3

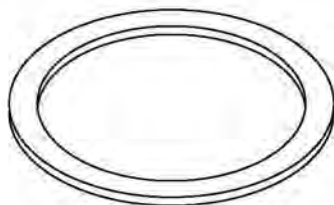
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>Ed. Hualde</i> COORDINATOR R.C.E. 65271	3/01/13 DATE
ORIGINAL	KA	J. NAGELVOORT	03/13			
				2" METER, BACKFLOW AND COFFER BOX	DRAWING NUMBER	SDW-114



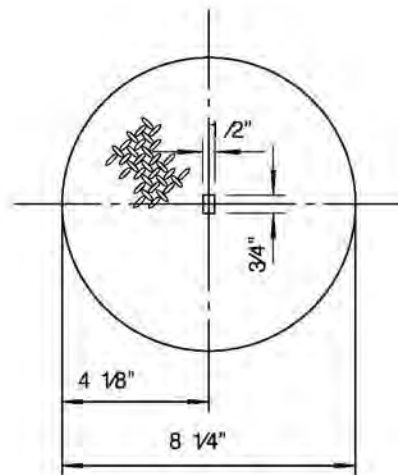
WELD TOP OF CAP TO PIPE



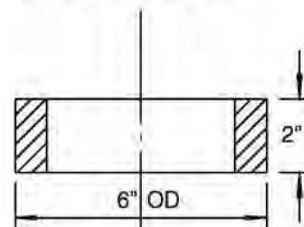
WELD PLATE RING TO UNDERSIDE OF COVER



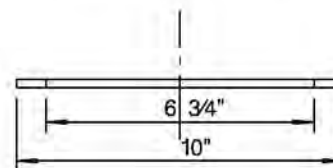
WELD CHAIN TO INSIDE OF CAP'S PIPE AND TO UNDERSIDE OF COVER



1/4" FLOOR PLATE

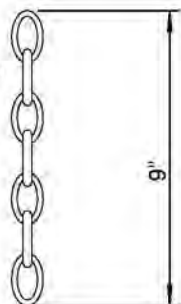


3/16" STEEL PIPE

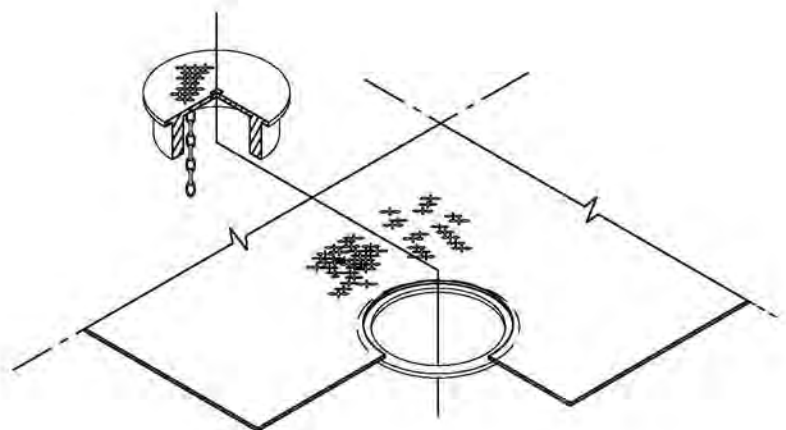


1/8" STEEL PLATE RING

HOT DIPPED GALVANIZED STEEL CHAIN



1/4" X 9" CHAIN



COVER (TYP)

NOTES:

1. 8 1/4" 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	XX	T. MUELLER	2-4-86
		J. CASEY	8-22-86
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

READ HOLE CAP & CHAIN DETAIL (FOR METAL METER VAULT COVERS)

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

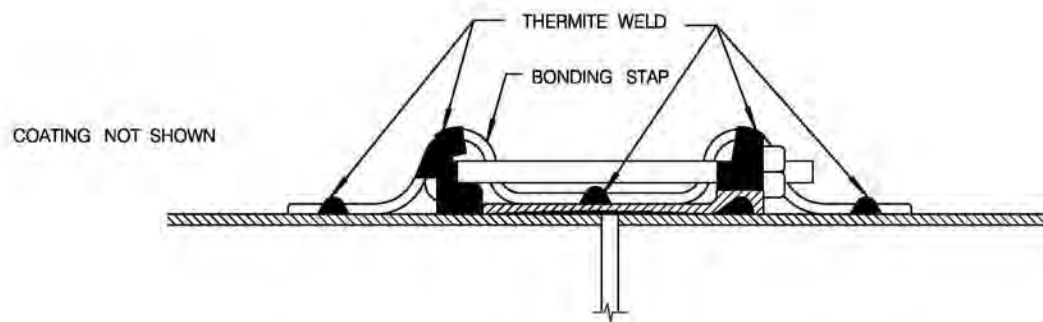
H. Krali

1/31/2012

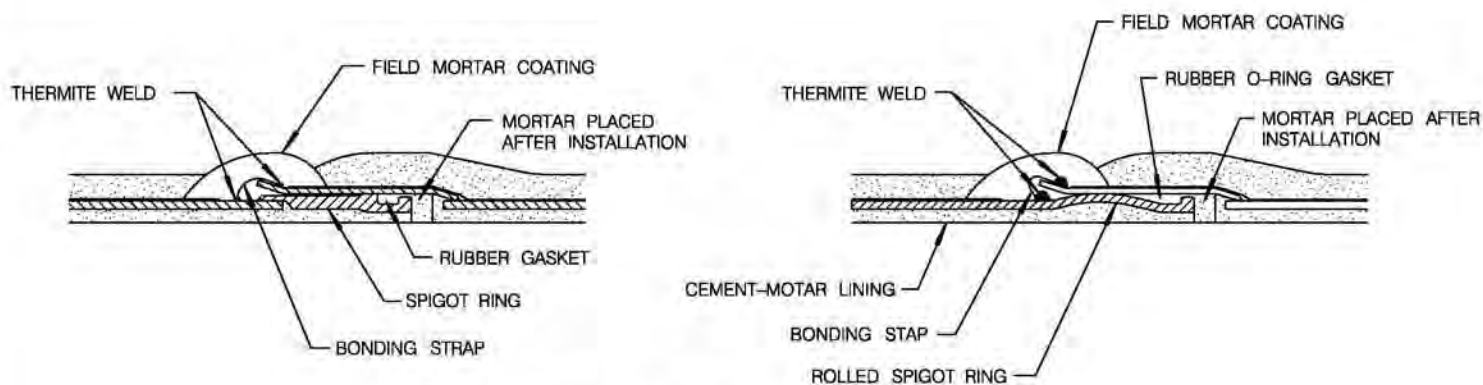
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

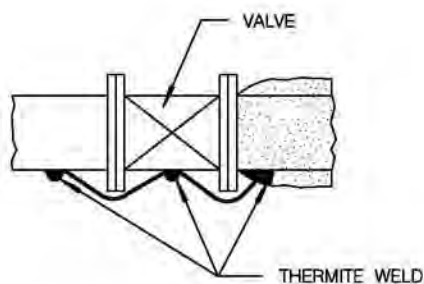
SDW-115



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 APPROXIMATELY 2" 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. CASEY	8-22-86
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**BONDING STRAP FOR
STEEL AND SCRW PIPE**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

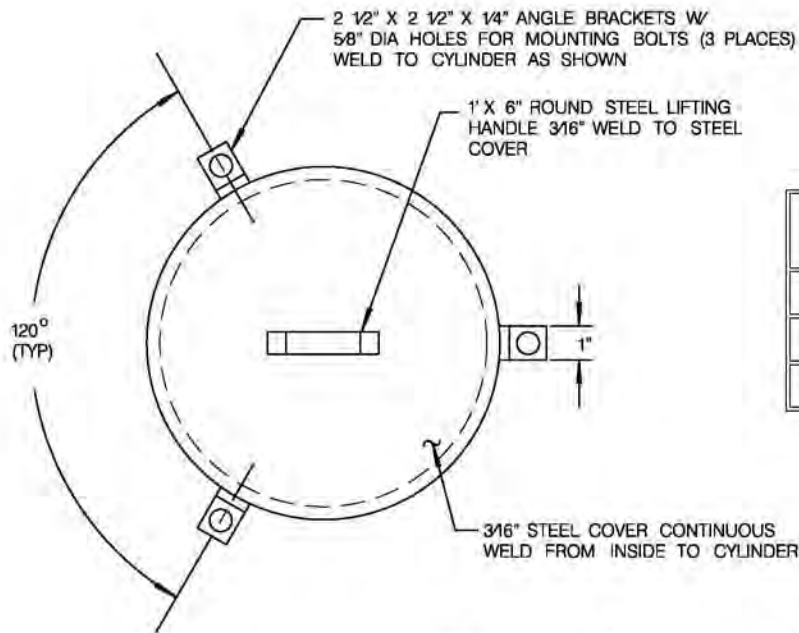
H. Hadi

1/31/2012

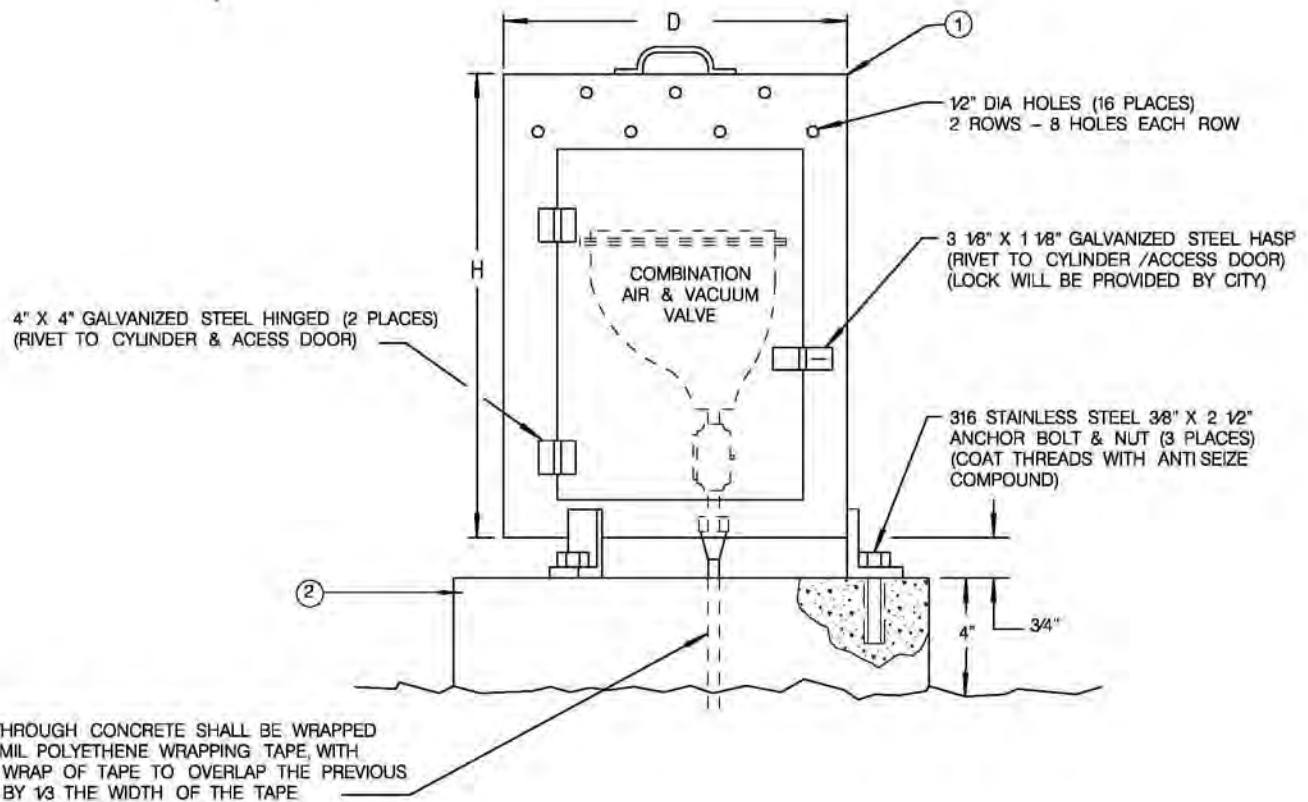
COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

SDW-116



VALVE SIZE	D	H
1" & 2"	16"	24"
4"	24"	30"
6"	30"	36"

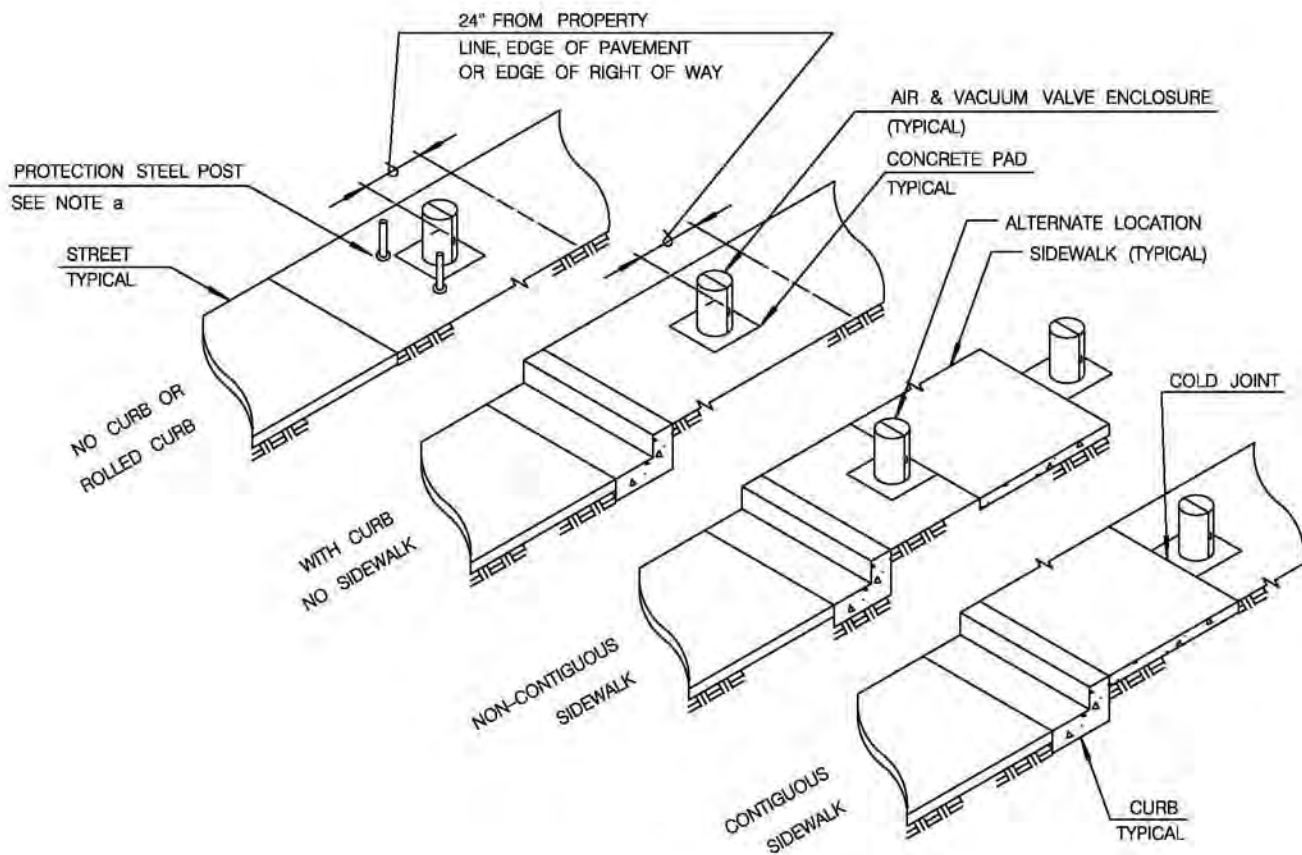


ITEMS CALL OUT:

- ① 316" 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.
- ③ D AND H CHANGES ONLY WITH APPROVAL OF THE CITY ENGINEER.

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL		M. ROLLINGER	5-20-92		
NOTES	JS	A. OSKOUI	12/06	AIR AND VACUUM VALVE ENCLOSURE & LOCATION	 1/31/2012 COORDINATOR R.C.E. 65271 DATE
UPDATED	KA	J. NAGELVOORT	01/12		
					DRAWING NUMBER SDW-117

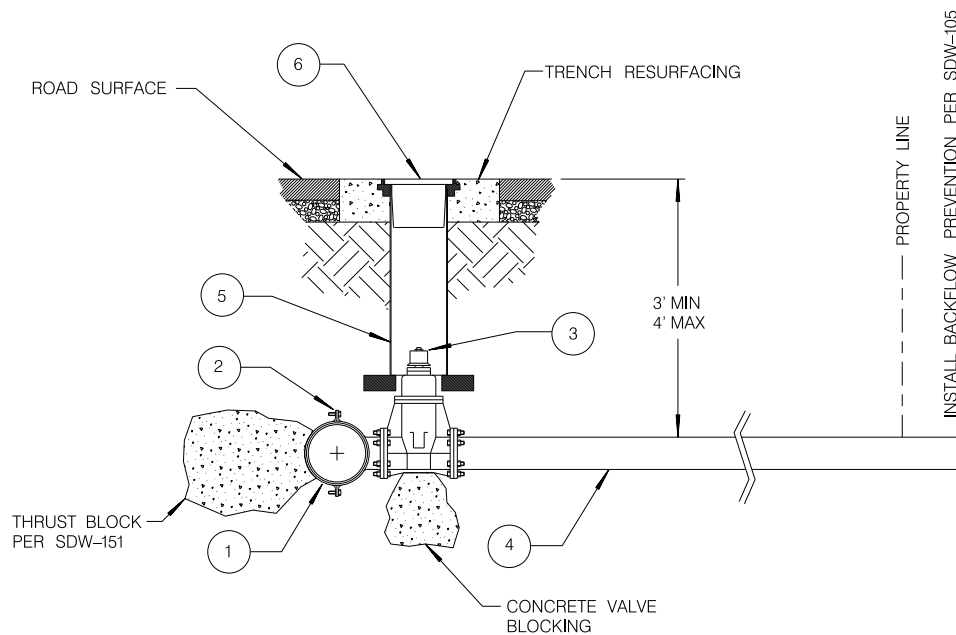


NOTES:

- a.) PROTECTION POSTS SHALL BE INSTALLED AS CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER PER WM-04.
- b.) AIR & VACUUM VALVES & APPURTENANCES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN THE SPECIFICATIONS.

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE COORDINATOR R.C.E. 65271 DATE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				AIR AND VACUUM VALVE ENCLOSURE & LOCATION	1/31/2012
				DRAWING NUMBER	SDW-117



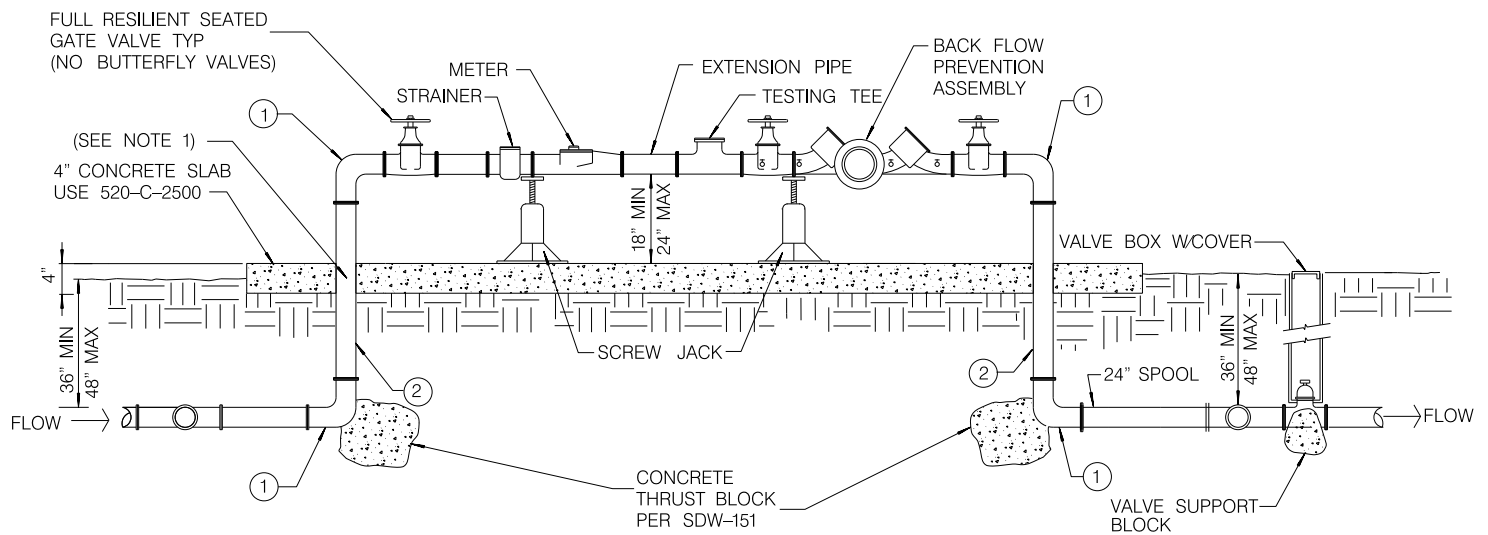
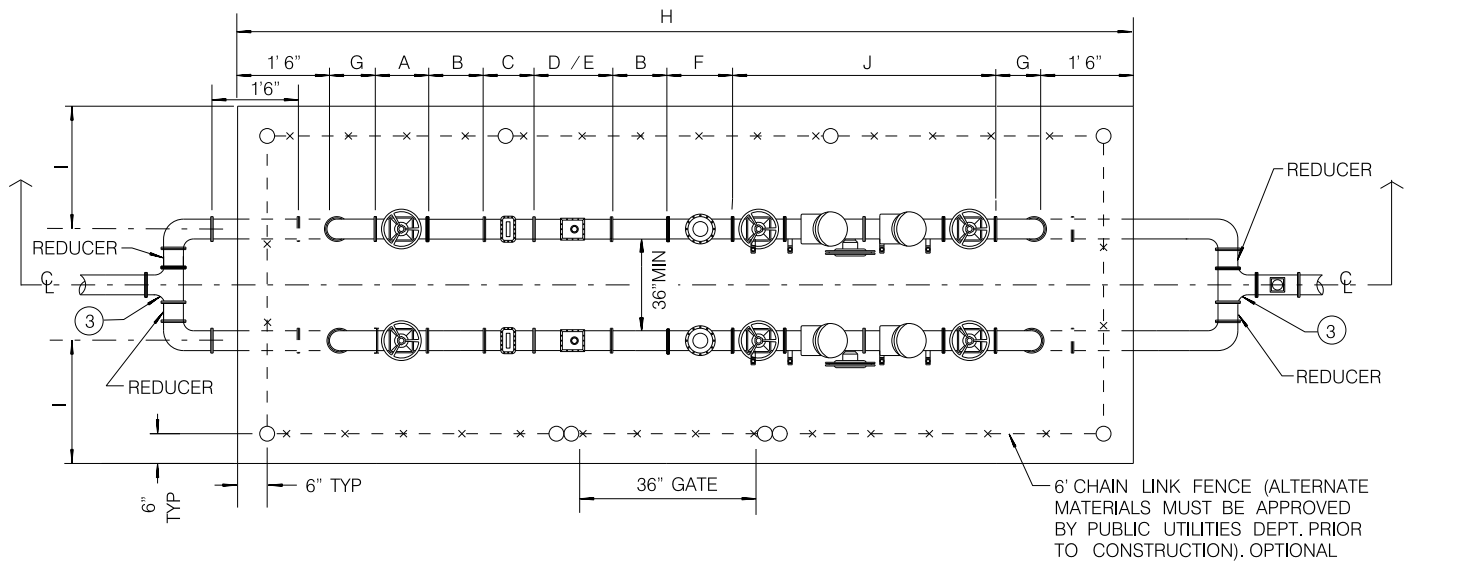
ITEMS CALL OUT:

- 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" MINIMUM DIAMETER). SEE NOTE #1.
- 4 4" OR LARGER DIAMETER OF PIPE (DUCTILE IRON OR PVC PER APPROVED MATERIALS LIST).
- 5 VALVE WELL PER SDW-153.
- 6 VALVE WELL COVER PER SDW-153.

NOTES:

1. FOR SMALLER FIRE SERVICE REQUIREMENTS, USE REDUCER AT PROPERTY LINE.
2. FOR CORROSION CONTROL REQUIREMENTS, SEE PUBLIC UTILITIES DEPARTMENT DESIGN GUIDE.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE		
ORIGINAL	BB	OSKUI	10/09		FIRE SERVICE CONNECTION & ASSEMBLY		2/25/16
NOTES	AO	F. BELOCK	4/96	COORDINATOR			
NOTES	JS	A. OSKUI	12/06				
UPDATED	KA	J. NAGELVOORT	01/12				
UPDATED	KA	J. NAGELVOORT	12/12				
UPDATED	HM	J. NAGELVOORT	02/16				
					DRAWING NUMBER	SDW-118	




NOT TO SCALE

ITEMS CALL OUT:

- 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 SHALL BE EQUAL TO THE DIAMETER OF THE SUPPLY PIPE.

SEE DIMENSIONS AND NOTES ON SHEET 2

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	JC				
REVISION	BM	A. OSKOU	1203	DUAL ABOVE GROUND METER WITH CITY BACKFLOW PREVENTER	 COORDINATOR R.C.E. 56523 2/25/16 DATE
NOTES	JS	A. OSKOU	1206		
UPDATED	KA	J. NAGELVOORT	01/12		
UPDATED	FG	J. NAGELVOORT	02/16		
				DRAWING NUMBER	SDW-119

LETTER CODE	METER SIZE					
	PART DESCRIPTION	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' - 6"	2' - 0"	2' - 6"
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"

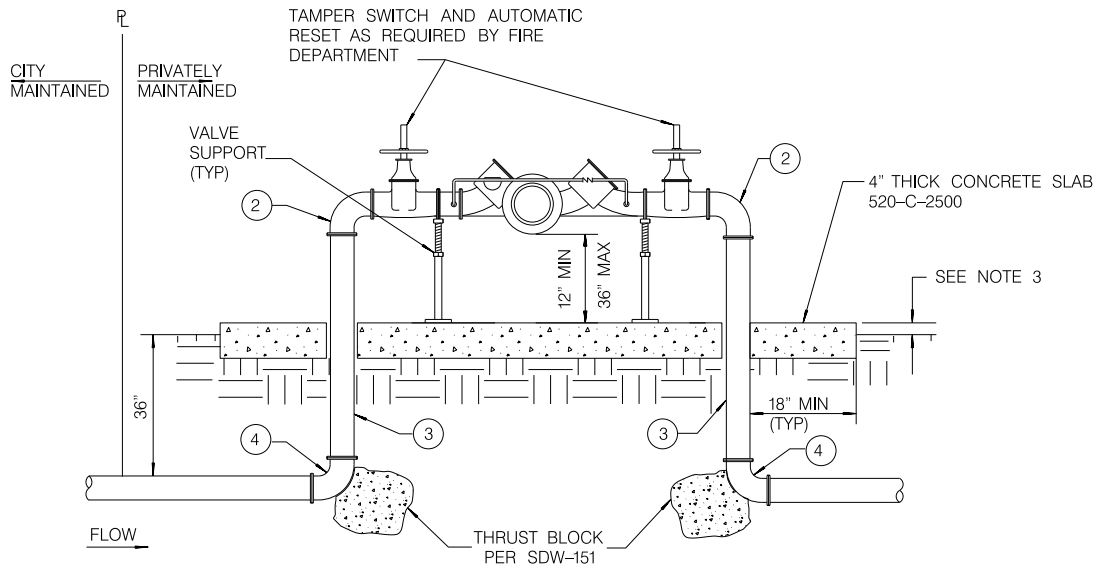
* INDIVIDUAL DIMENSIONS MAY VARY PER MANUFACTURER OVERALL
DIMENSIONS INCREASE WITH USE OF THESE COMPONENTS

NOTES:

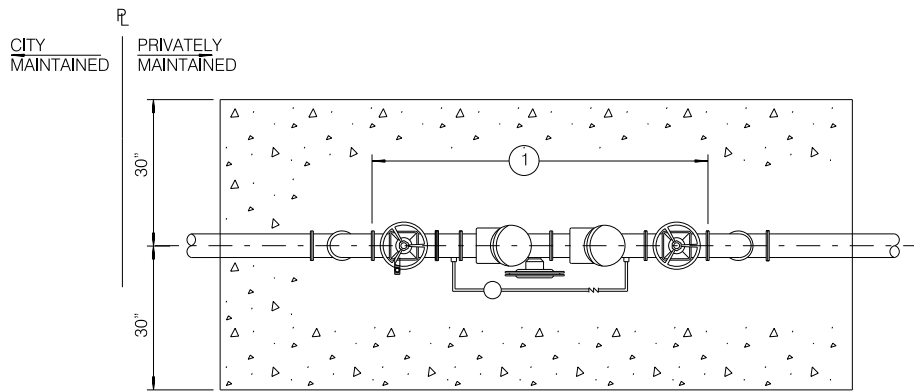
1. ALL BURIED DUCTILE IRON PIPE, FITTINGS, VALVES AND APPURTENANCES SHALL BE COATED WITH A DIELECTRIC COATING. A LIQUID EPOXY COATING SYSTEM PER AWWA C-210 AT 24 MILS MINIMUM DRY FILM THICKNESS (MDFT), OR A COLD APPLIED THREE-PART SYSTEM PETROLEUM WAX TAPE PER AWWA C-217, OR A 100% POLYURETHANE COATING OF 24 MILS (MDFT) SUITABLE.
2. ANY CHANGES SHALL HAVE PUBLIC UTILITIES DEPARTMENT APPROVAL.
3. PIPING SHALL 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.
6. CONTACT CORROSION CONTROL SECTION FOR CORROSION REQUIREMENTS.
7. ALL METAL IN CONTACT WITH CONCRETE SHALL BE POLYETHYLENE WRAPPED USING 2" WIDE PLASTIC BACKED ADHESIVE TAPE 8 MILS THICK WITH 12" OVERLAP.
8. BACKFLOW SHALL BE INSTALLED IMMEDIATELY DOWNSTREAM FROM METER UNLESS APPROVED BY THE CITY CROSS-CONNECTION SPECIALIST.
9. BACKFLOW PREVENTERS SHALL BE REDUCED PRESSURE PRINCIPLE (RP) ASSEMBLY. (INSTALLED ABOVE GRADE AS CLOSE TO METER AS POSSIBLE) BACKFLOW LOCATION MUST BE APPROVED BY THE CROSS-CONNECTION CONTROL SECTION OF THE PUBLIC UTILITIES DEPARTMENT.

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	JC				
REVISION	BM	A. OSKQUI	12/03	DUAL ABOVE GROUND METER WITH CITY BACKFLOW PREVENTER	 COORDINATOR R.C.E. 56523
NOTES	JS	A. OSKQUI	12/06		
UPDATED	KA	J. NAGELVOORT	01/12		DRAWING NUMBER SDW-119
UPDATED	FG	J. NAGELVOORT	02/16		



ELEVATION



PLAN

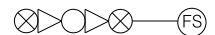
NOTES:

- 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 BACK FLOW TESTER PRIOR TO BACKFLOW PREVENTER ASSEMBLY'S ACCEPTANCE.
- ALL PIPE BELOW GRADE SHALL BE WRAPPED AS REQUIRED BY THE SPECIFICATIONS.
- CONCRETE PAD SHALL BE 2" ABOVE GRADE UNLESS INSTALLED IN LAWN AREA WHERE IT WILL BE AT 1" ABOVE GRADE. SLOPE TO DRAIN.
- VALVE SUPPORTS AS REQUIRED BY SPECIFICATIONS.
- LOCATION SHALL BE APPROVED BY PUBLIC UTILITIES DEPARTMENT, WATER OPERATIONS DIVISION, METER/BACKFLOW GROUP AND SHOWN ON PLANS.

ITEMS CALL OUT:

- REDUCED PRESSURE PRINCIPLE DETECTION ASSEMBLY SHALL BE INCLUDED IN THE LATEST EDITION OF THE "APPROVED FOR SERVICE ISOLATION CALIFORNIA PUBLIC WATER SYSTEM" ISSUED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES, OFFICE OF DRINKING WATER.
- 90° FLANGED CAST IRON OR DUCTILE IRON ELBOW (TYP).
- FLANGED DUCTILE IRON SPOOL. BOTH ENDS SHALL BE FLANGED (UNI-FLANGE SHALL NOT BE USED).
- 90° DUCTILE IRON FLANGED ELBOW.

LEGEND ON PLANS



REVISION	BY	APPROVED	DATE
ORIGINAL	LC	J. NAVARRO	600
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

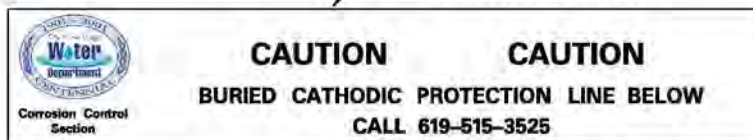
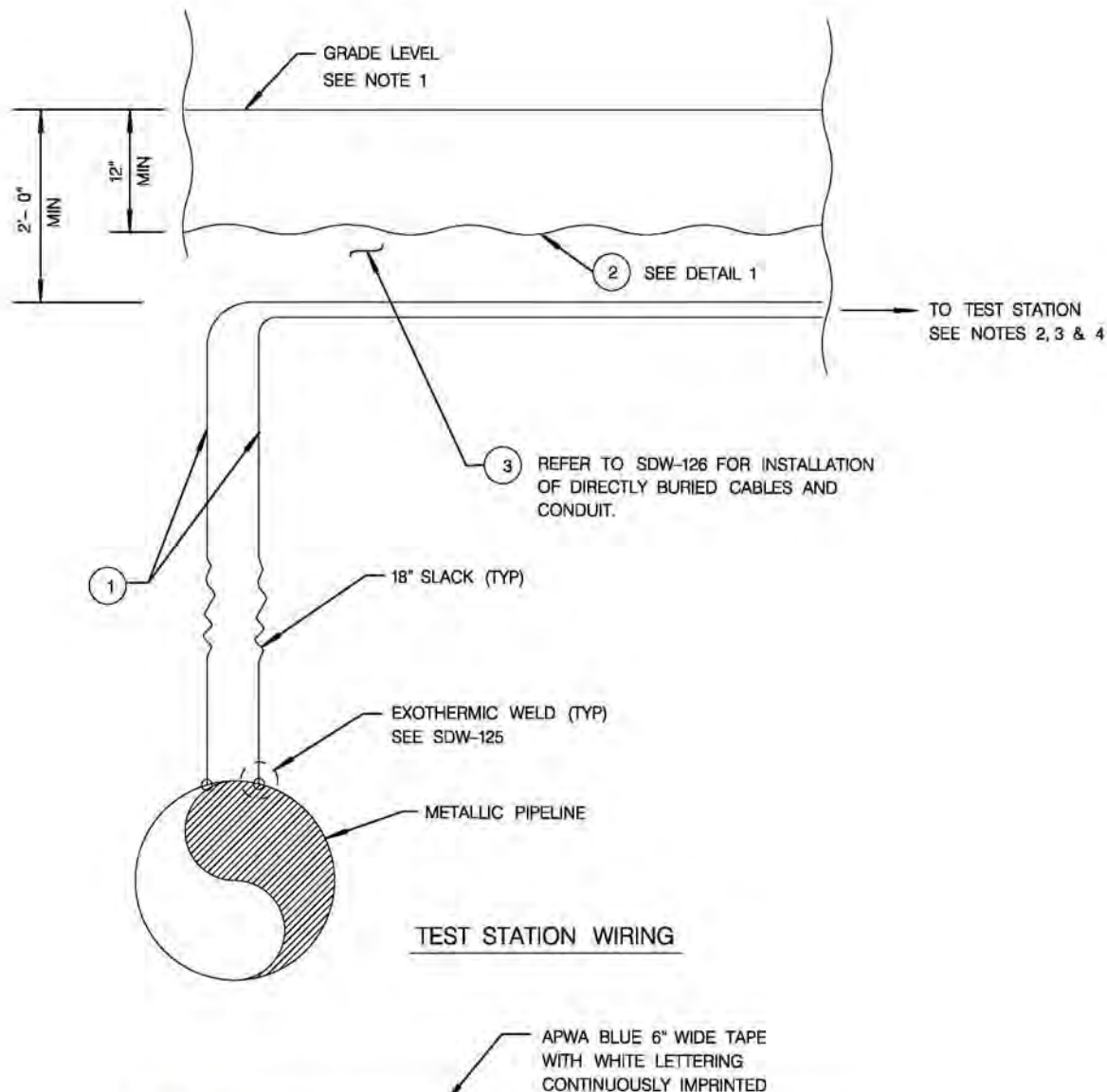
**BACKFLOW PREVENTER REDUCED
PRESSURE PRINCIPLE DETECTOR ASSEMBLY
FOR FIRE SERVICE 3" AND LARGER**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

Chung 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER

SDW-120




DETAIL 1
BURIED TAPE

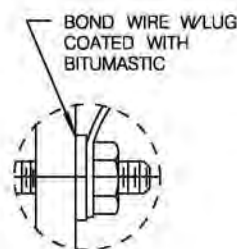
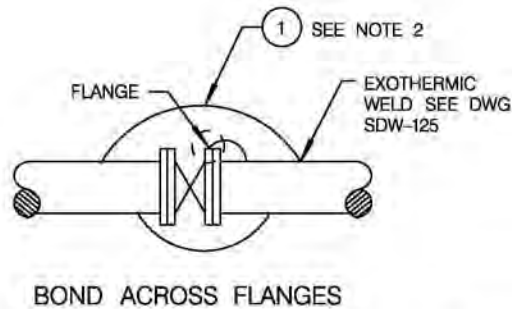
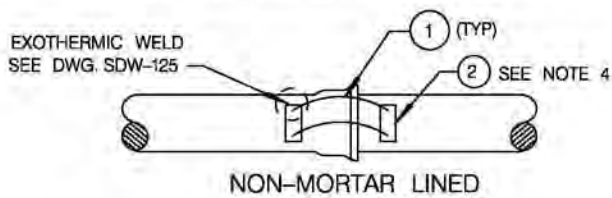
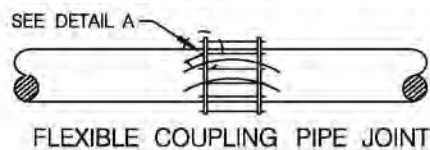
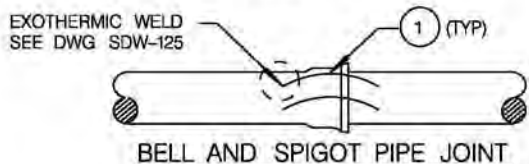
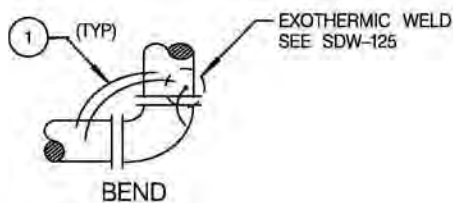
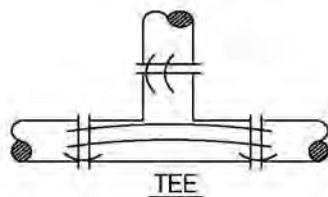
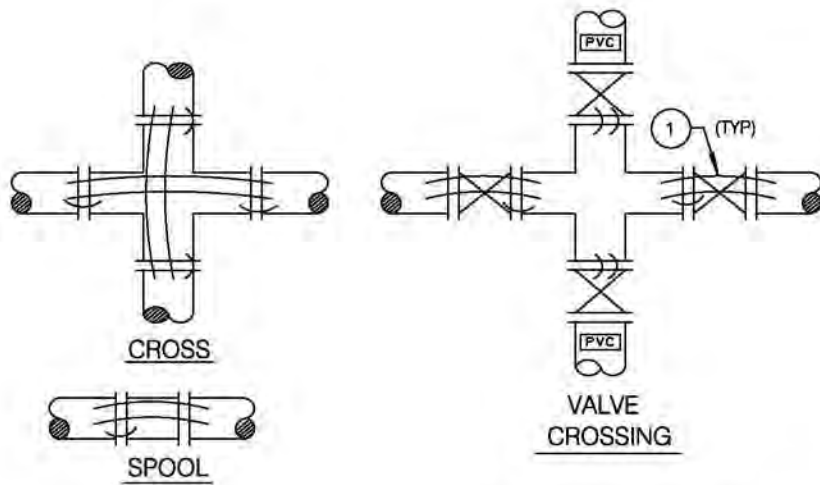
NOTES:

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.

ITEMS CALL OUT:

- 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 WILL SECTION 200-1.5.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE		
ORIGINAL	BM	A. OSKOUI	1203			1/31/2012	
NOTES	BM	A. OSKOUI	1206	AT-GRADE CATHODIC PROTECTION TEST STATION INSTALLATION FOR ROADWAYS	COORDINATOR	R.C.E. 65271	DATE
UPDATED	KA	J. NAGELVOORT	01'12				
					DRAWING	SDW-121	
					NUMBER		



WIRE CONNECTION TO
FLANGE BOLT
SEE NOTE 5

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

ITEM CALL OUT:

- 1 BOND CABLE: AWG #6 STRANDED ASTM B8 COPPER ASTM B3 INSULATED ASTM D1248 TYPE 1, CLASS C, GRADE 5.
- 2 STEEL PLATE: 1/8" THICK. WELD TO THE PIPE.

REVISION	BY	APPROVED	DATE
ORIGINAL	BM	A. OSKOUI	12/03
NOTES	BM	A. OSKOUI	12/06
UPDATE	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

JOINT BONDING OF NON-WELDED PIPE JOINTS & FITTINGS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

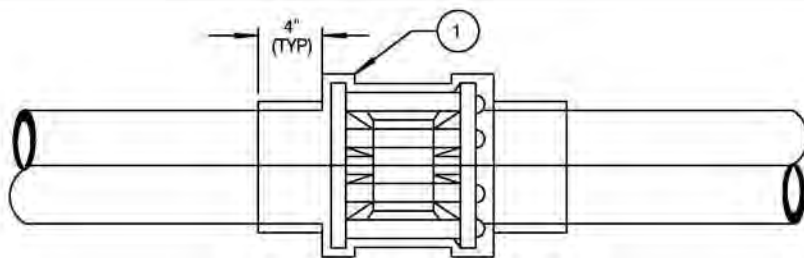
H. Hadali

1/31/2012

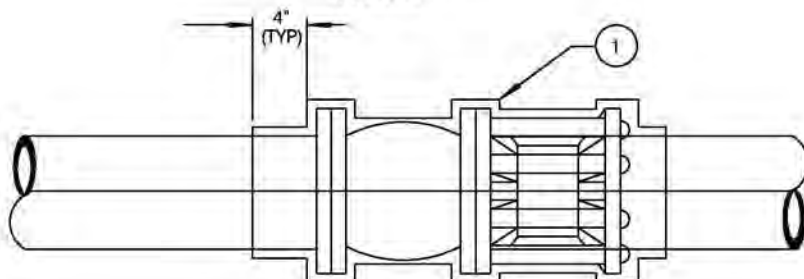
COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

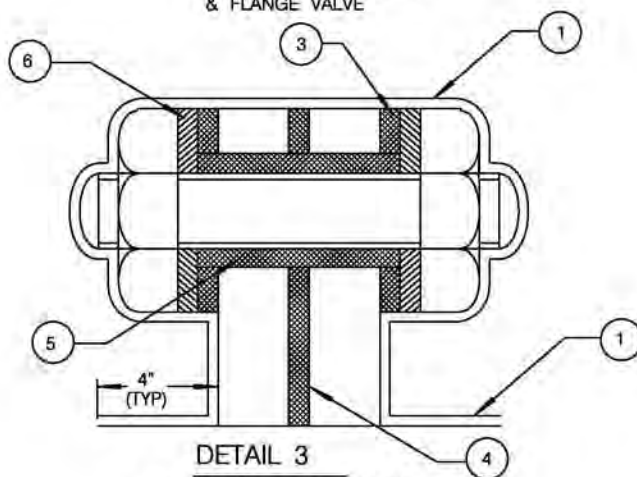
SDW-122



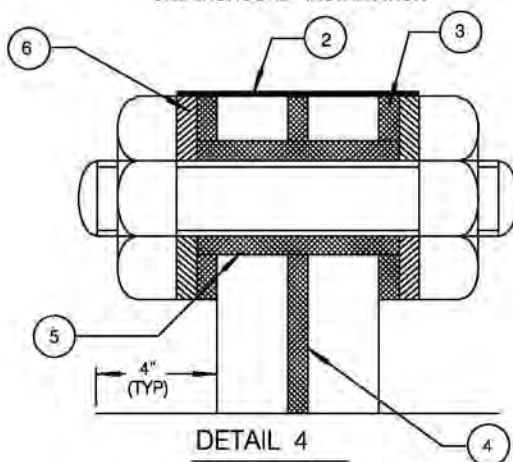
DETAIL 1
MECHANICAL
COUPLING



DETAIL 2
MECHANICAL COUPLING
& FLANGE VALVE



DETAIL 3
INSULATING FLANGE JOINTS,
UNDERGROUND INSTALLATION



DETAIL 4
INSULATING FLANGE JOINTS,
ABOVE-GROUND INSTALLATION

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 PETROLATUM 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.

ITEMS CALL OUT:

- 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.

REVISION	BY	APPROVED	DATE
ORIGINAL	BM	A. OSKQUI	12/03
NOTES	BM	A. OSKQUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

INSULATING FLANGE AND MECHANICAL JOINTS EXTERNAL PROTECTION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

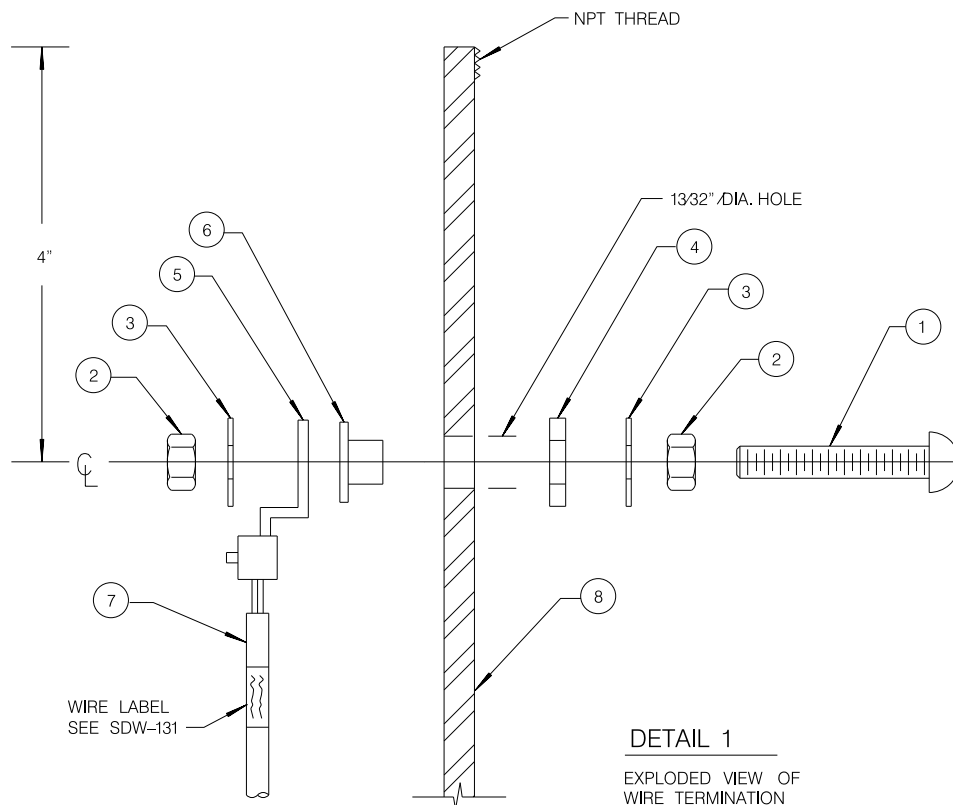
J. Nagelvoort

1/31/2012

COORDINATOR R.C.E. 66271 DATE

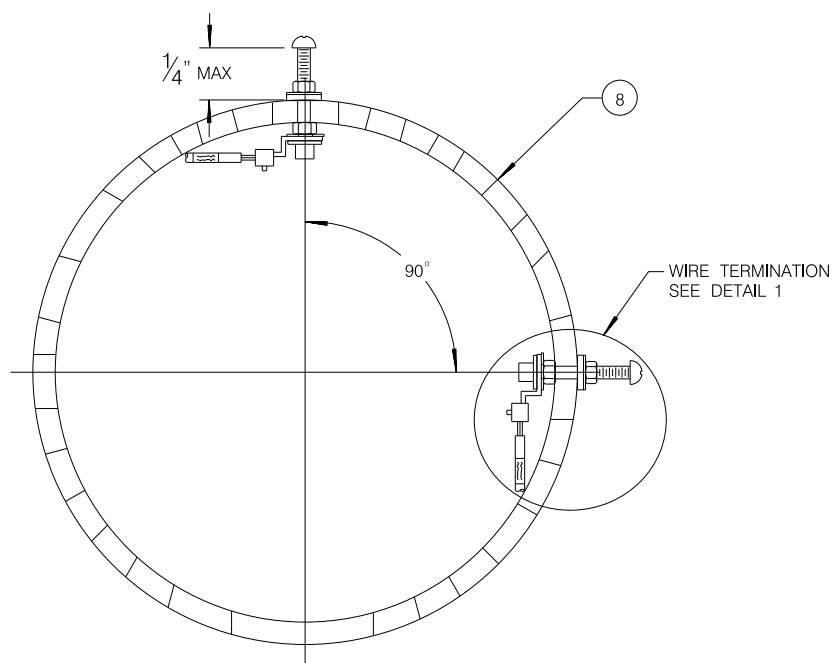
DRAWING
NUMBER

SDW-123



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 PER SDW-131.

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

REVISION	BY	APPROVED	DATE
ORIGINAL		A. OSKQUI	12/03
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

**POST - MOUNTED TEST STATION
WIRE TERMINATION DETAIL**

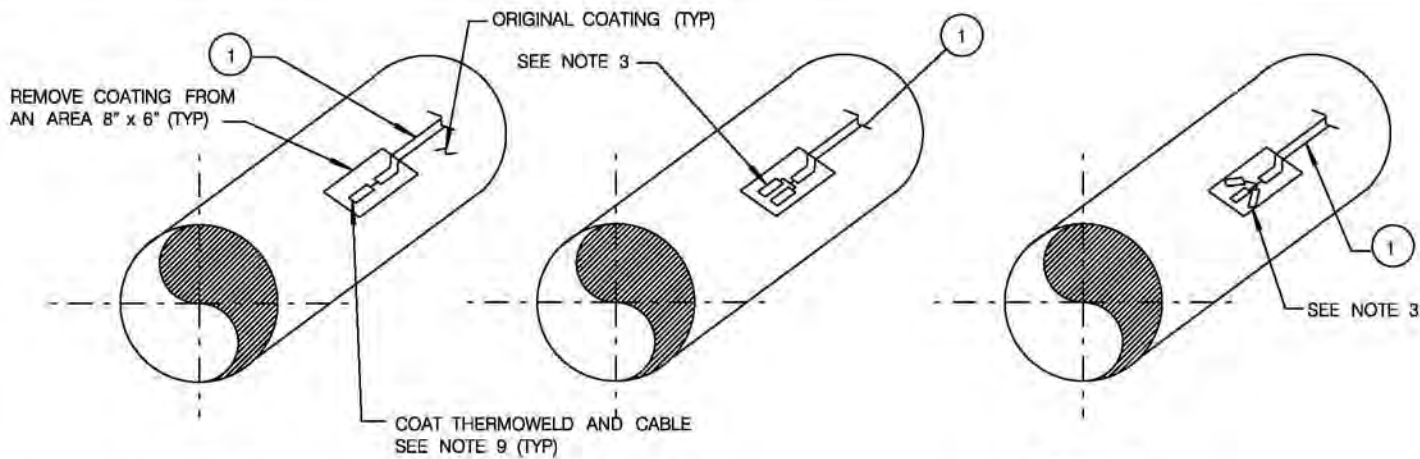
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Bringer
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDW-124



DETAIL 1

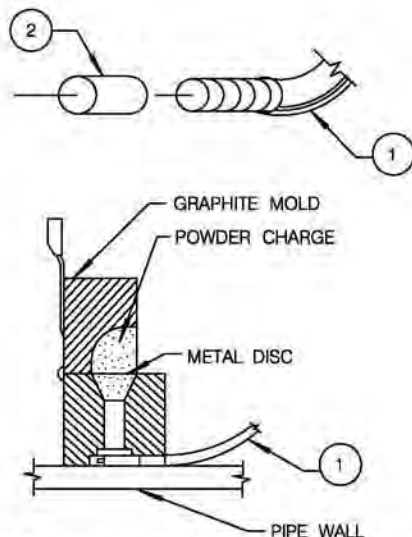
TYPICAL CONNECTIONS OF NO.6 AWG CABLE AND SMALLER CABLES

DETAIL 2

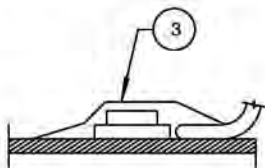
TYPICAL CONNECTIONS OF NO.4 AWG CABLE

DETAIL 3

TYPICAL CONNECTIONS OF NO.2 AWG CABLE AND LARGER CABLES



EXOTHERMIC CONNECTION DETAIL



EXOTHERMIC CONNECTION SECTION

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.

ITEMS CALL OUT:

- 1 CABLE: AWG SIZE, ASTM B388
ASTM D-1248, TYP 1, CLASS C, GR.5 INSULATION
- 2 SLEEVE: ADAPTER
- 3 APPROVED PRIMER & WELD CAP OR MORTAR OVER WELD LOCATION

CABLE STRAND DETAILS			
CABLE 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
UPDATED	KA	J. NAGELVOORT	01/12

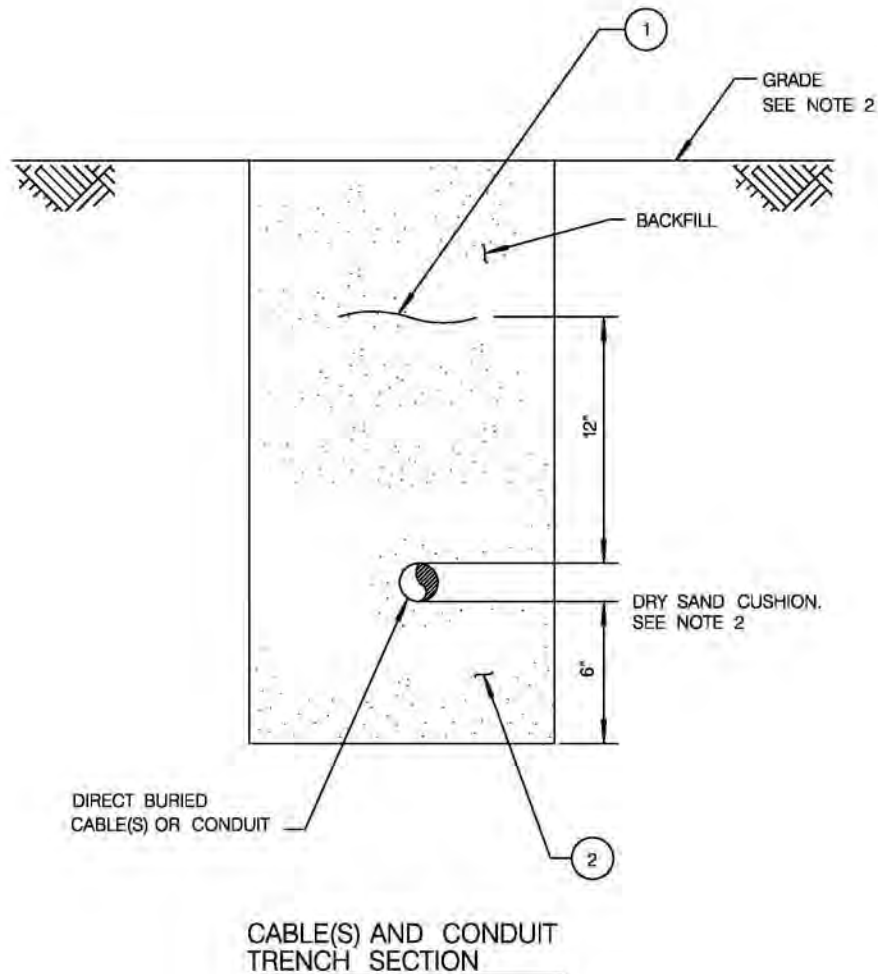
CITY OF SAN DIEGO - STANDARD DRAWING

**EXOTHERMIC WELDING OF CABLES
AND COATING OF WELDING**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadali 1/31/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER **SDW-125**



NOTES:

1. MATERIAL:
 - 1 POLYETHYLENE WARNING TAPE, REFER TO DETAIL 1 ON SDW-121.
 - 2 SAND: 50 SIEVE COMPLIES WITH 200-1.5
2. IN PAVED, CITY-OWNED ROADWAYS, THE REPAIR OF THE ROAD SURFACE SHALL BE PER APPLICABLE SDG-117 OR SDG-118. IN STATE HIGHWAYS, CONFORM TO APPLICABLE CALTRANS STANDARDS.
3. CLEAN SHARP STONES AND RUBBLE FROM THE BOTTOM OF DITCH.

REVISION	BY	APPROVED	DATE
ORIGINAL	BM	A. OSKOUI	1203
NOTES	BM	A. OSKOUI	1203
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**INSTALLATION OF DIRECTLY BURIED
CABLES OR CONDUIT**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

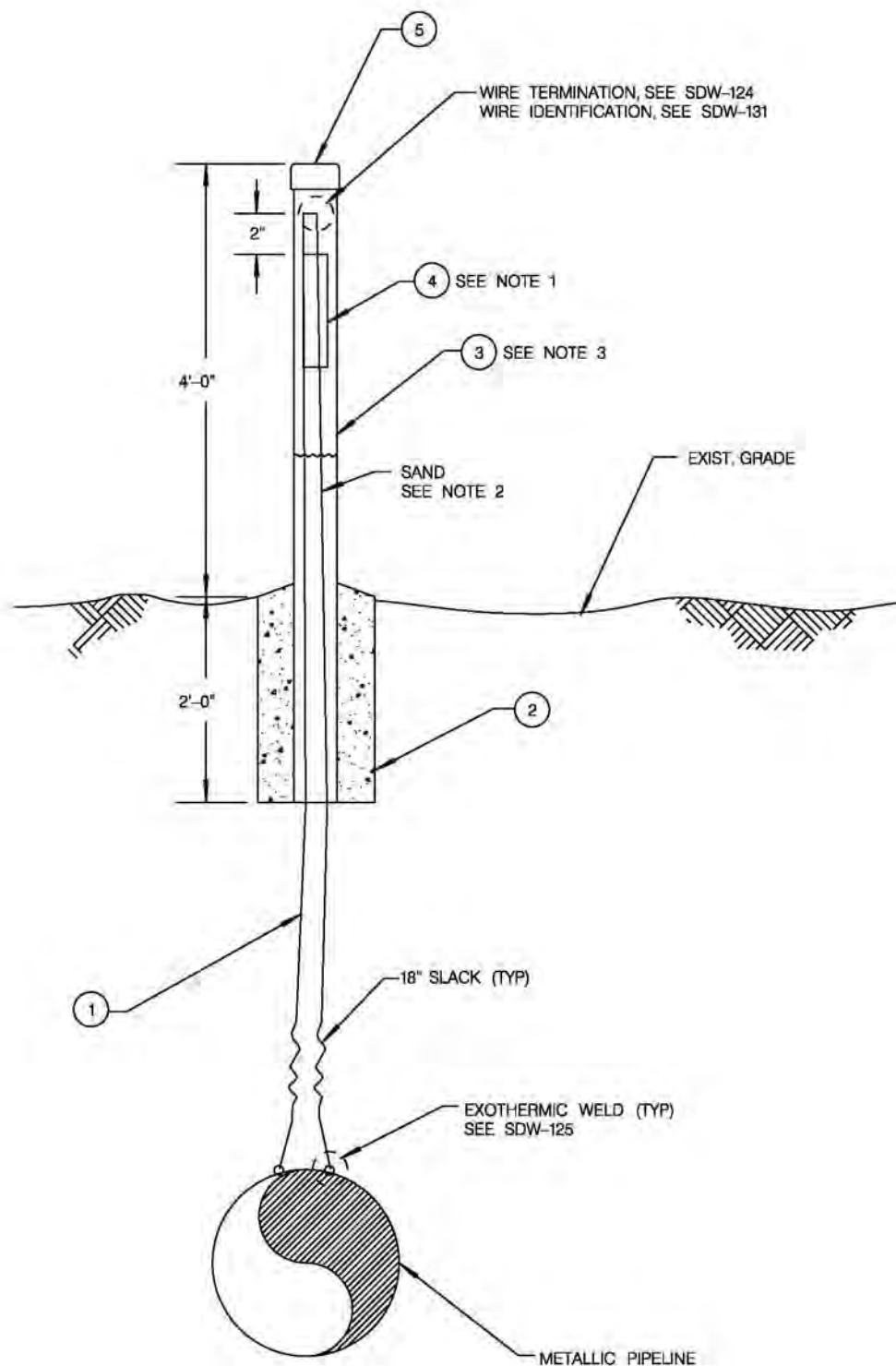
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-126



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 TRAFFIC.

ITEM CALL OUT:

- 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.

POST-MOUNTED TEST STATION

REVISION	BY	APPROVED	DATE
ORIGINAL	BM	A. OSKOUI	12/03
NOTES	BM	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**ABOVE GRADE CATHODIC PROTECTION
TEST STATION INSTALLATION
FOR UNDEVELOPED AREAS**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

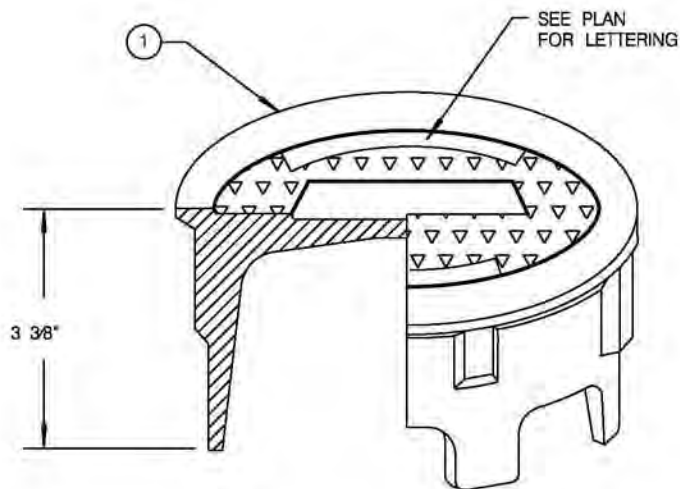
H. Hadali

1/31/2012

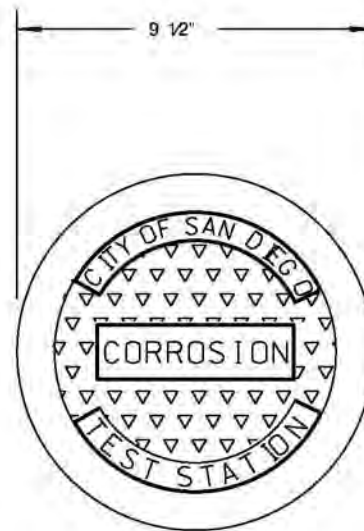
COORDINATOR R.C.E. 66271 DATE

DRAWING
NUMBER

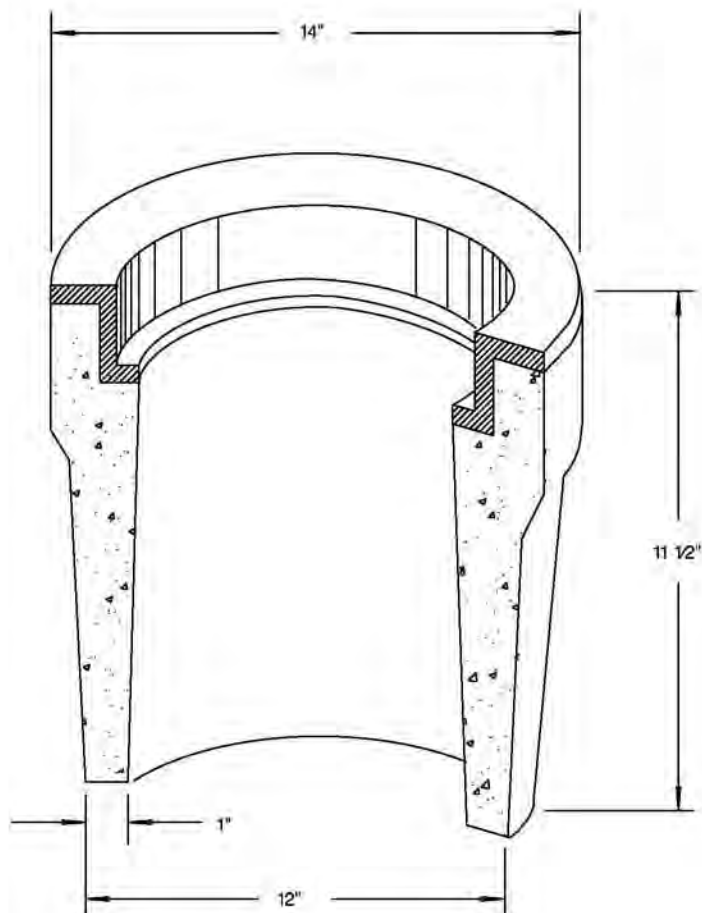
SDW-127



TEST BOX COVER ISOMETRIC



TEST BOX COVER PLAN



TEST BOX ISOMETRIC SECTION

NOTES:

1. COVER WEIGHT: 12 LB.
2. BODY WEIGHT: 58 LB.
3. THE COVER SHALL HAVE CASTED MARKING IN 1/2" HIGH RAISED LETTERS.

ITEM CALL OUT:

- 1 COVER: ASTM A 48 CLASS 30.

REVISION	BY	APPROVED	DATE
ORIGINAL	BM	A. OSKOUI	12/03
NOTES		A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

**AT - GRADE
CONCRETE TEST BOX**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

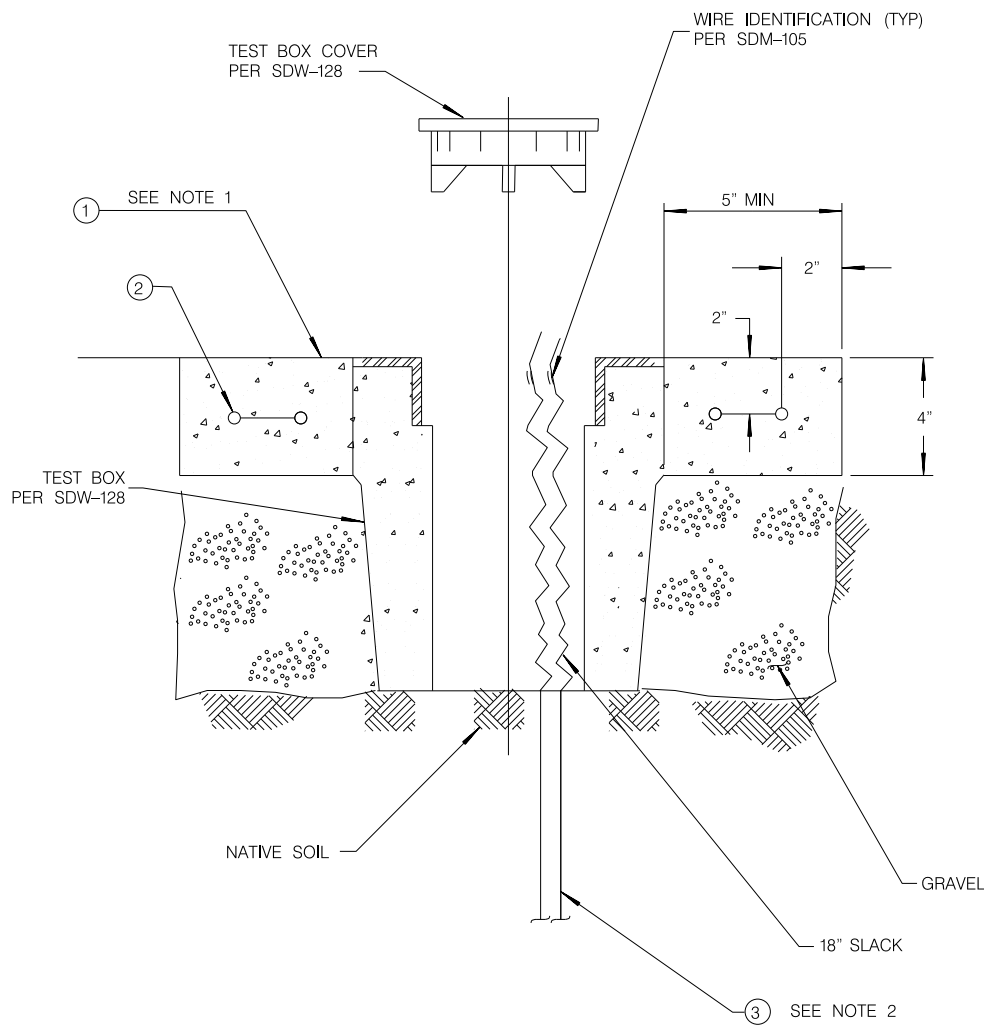
H. Hadi

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-128



NOTES:

1. SLOPE CONCRETE PAD AWAY FROM COVER.
2. FOR CONTINUATION OF CABLES, REFER TO SDW-127 OR SDW-130, AS APPLICABLE.

ITEMS CALL OUT:

- 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

REVISION	BY	APPROVED	DATE
ORIGINAL		A. OSKQUI	1203
UPDATE	KA	J. NAGELVOORT	01/12
UPDATE	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**AT - GRADE CATHODIC
PROTECTION TEST STATION
WIRING DIAGRAM FOR ROADWAYS**

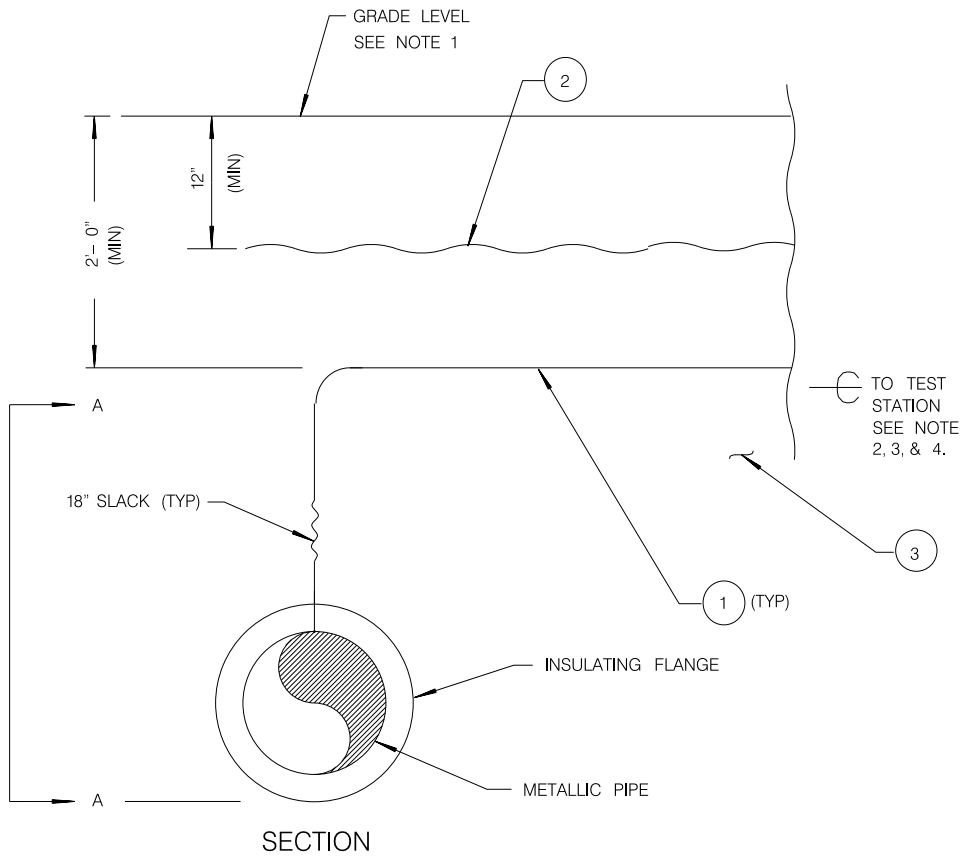
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CA Bunge
COORDINATOR R.C.E. 56523

2/25/16
DATE

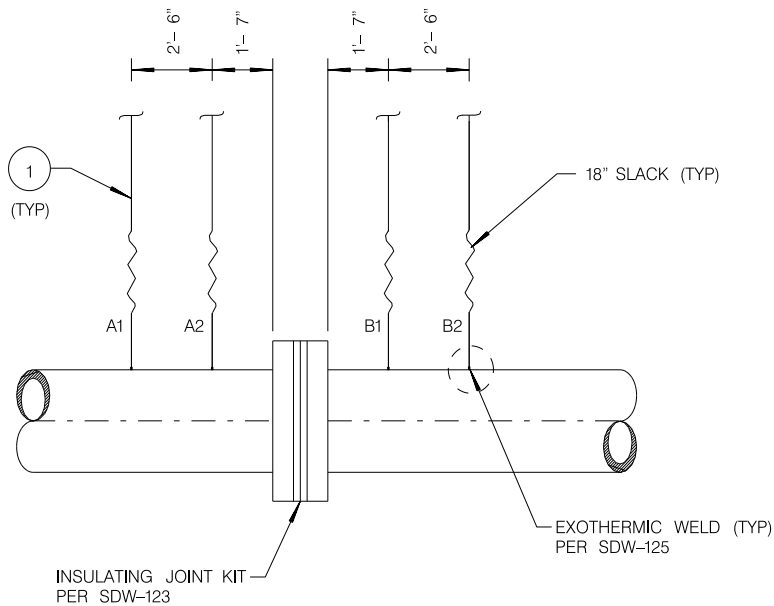
DRAWING
NUMBER

SDW-129



NOTES:

1. IN PAVED, CITY OWNED ROADWAYS, THE REPAIR OF THE ROAD SURFACE SHALL BE PER APPLICABLE STANDARD DRAWINGS. 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. USE APPLICABLE TEST STATION DRAWING FOR UNDEVELOPED AREAS



ELEVATION A - A

ITEM CALL OUT:

- 1 CABLE: AWG #2
COPPER ASTM B3,
STRANDED ASTM B8,
INSULATED PER
ASTM D1248, TYPE 1
CLASS C, GRADE 5.
- 2 POLYETHYLENE WARNING
TAPE PER SDW-121.
- 3 SAND: 50 SIEVE

REVISION	BY	APPROVED	DATE
ORIGINAL		A. OSKOUJ	12/03
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/15

CITY OF SAN DIEGO - STANDARD DRAWING

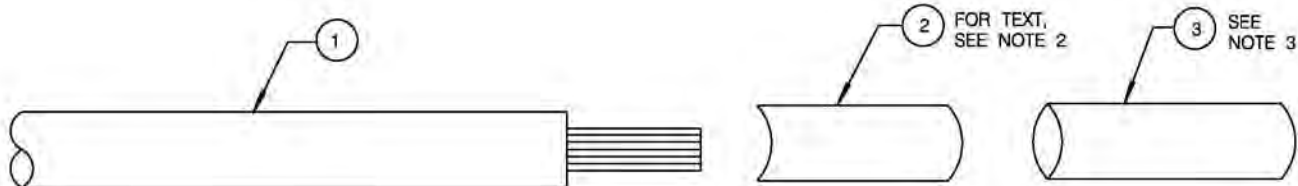
INSULATING FLANGE FOUR - WIRE TEST STATION INSTALLATION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

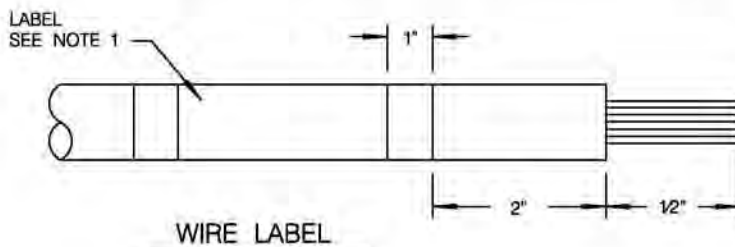
Chung
COORDINATOR R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER **SDW-130**



WIRE LABEL DETAIL STATION



WIRE LABEL

CPTS# (CATHODIC PROTECTION TEST STATION NUMBERING)

CPTS#1, 2, 3,N

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 (WO 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

TYPE OF INSTALLATION

2WTS - 2-WIRE TEST STATION
 EXAMPLE: CPTS#1, 2WTS, 180+00, 30, OTAY 2, CSTL

4WIJTS - 4-WIRE INSULATING JOINT TEST STATION
 EXAMPLE: CPTS#2, 4WIJTS, 180+00, 30, OTAY 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, OTAY 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, TROJAN, RCCP
 NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS

CTS - CURRENT TEST STATION
 EXAMPLE: CPTS#10, CTS, 180+00, 200 FT., OTAY 2, CSTL
 NORTH OR SOUTH OR EAST OR WEST FOR WIRE TAGS

CSGTS - CASING TEST STATION
 EXAMPLE: CPTS#12, CSGTS, 180+00, 30, OTAY 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, OTAY 2, CSTL, 180+00, CPTS#6 FOR STRUCTURE WIRE

BSTA - BOND STATION
 EXAMPLE: CPTS#18, BSTA, 30, OTAY 2, CSTL, 180+00;
 54, OTAY 3, SCRW, 65+20

FXSTA - FOREIGN CROSSING STATION
 EXAMPLE: CPTS#4, FXSTA, 30, OTAY 2, CSTL, 180+00; 24 SDGE

NOTES:

- CABLES SHALL BE TAGGED USING TIMES ROMAN 10 POINT FONT.
- TEXT SHALL BE PRESENTED IN THE FOLLOWING ORDER:
 - CPTS#
 - TYPE OF INSTALLATION
 - STATIONING
 - FACILITY NAME
 - PIPE MATERIAL
 - WIRE DIRECTIONAL ORIENTATION
 - NORTH
 - SOUTH
 - EAST
 - WEST
- PLACE SLEEVE AFTER ATTACHMENT OF LABEL TO CABLE.

ITEM CALL OUT:

- CABLE: AWG ASTM B8 & B3
- LABEL: FILE FOLDER, SELF ADHESIVE WHITE 2 3/4" X 3 7/16".
- SLEEVE: HEAT SHRINK, ADHESIVE LINED POLYOLEFIN, CLEAR THIN WALL TUBING.

REVISION	BY	APPROVED	DATE
ORIGINAL		A. OSKOUI	12/03
NOTES	BM	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

WIRE IDENTIFICATION

RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE

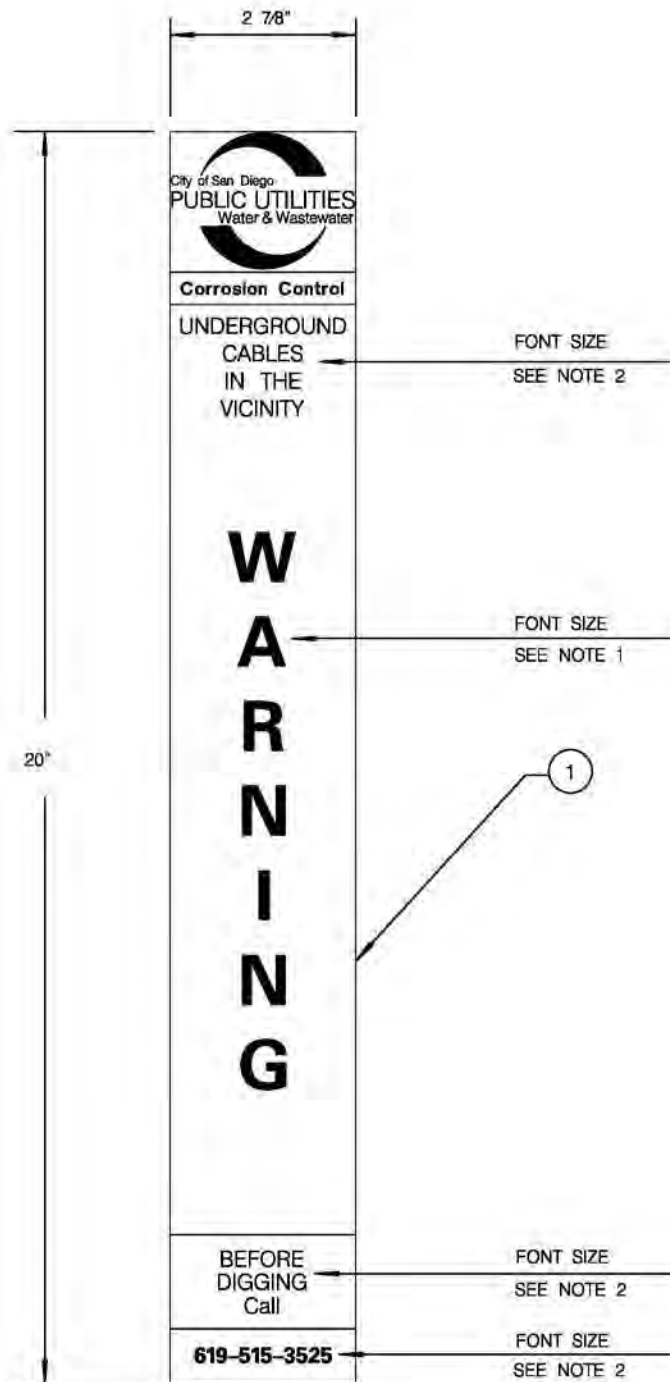
H. Hadali

1/31/2012

COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-131



NOTES:

1. 1" TEXT BOLD
2. 1/4" TEXT BOLD

ITEM CALL OUT:

- 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

REVISION	BY	APPROVED	DATE
ORIGINAL	BM	A. OSKOUI	12/03
NOTES	BM	A. OSKOUI	12/06
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**POST - MOUNTED CATHODIC
PROTECTION WARNING DECAL**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. Hadji

1/31/2012

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	1203
NOTES	BM	A. OSKOUI	1206
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO - STANDARD DRAWING

SYMBOLS CATHODIC PROTECTION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

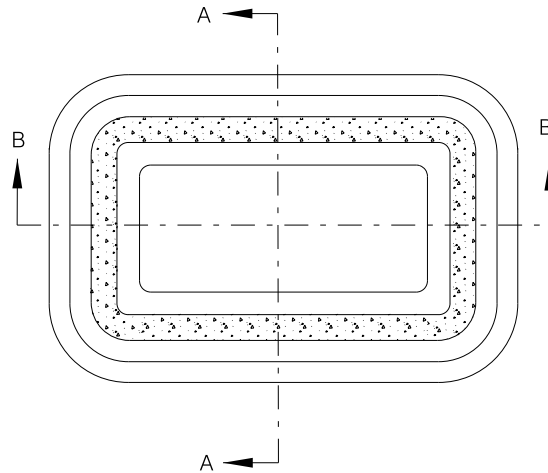
H. Kadi

1/31/2012

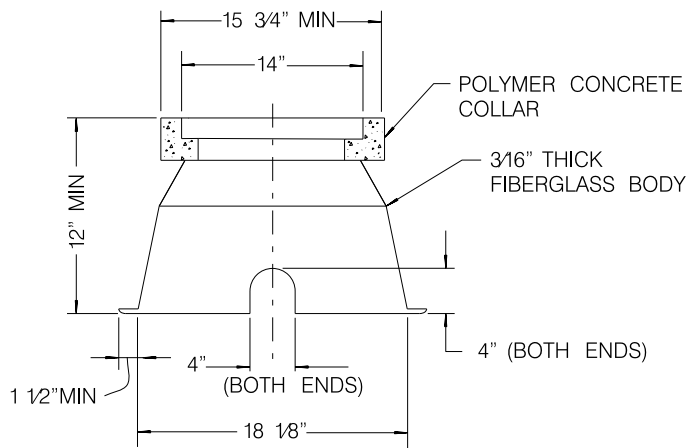
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

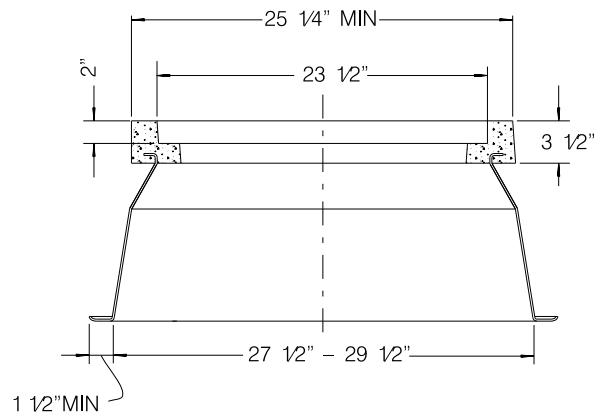
SDW-133



PLAN VIEW



SECTION A-A



SECTION B-B

NOTES:

1. METER BOX COLLAR AND COVER SHALL BE OF POLYMER CONCRETE REINFORCED WITH CONTINUOUS LAYERS OF WOVEN FIBERGLASS.
2. BOX AND COVER SHALL WITHSTAND AASHTO H-20 (ASTM C857).
3. FOR COVER DETAIL WITH DROP IN READER LID, SEE SDW-136.
4. SEE SDW-137 FOR INSTALLATION PROCEDURE.

REVISION	BY	APPROVED	DATE
ORIGINAL	SS	A. OSKOU	12/03
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**POLYMER CONCRETE WATER
METER BOX FOR 1" WATER SERVICE**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

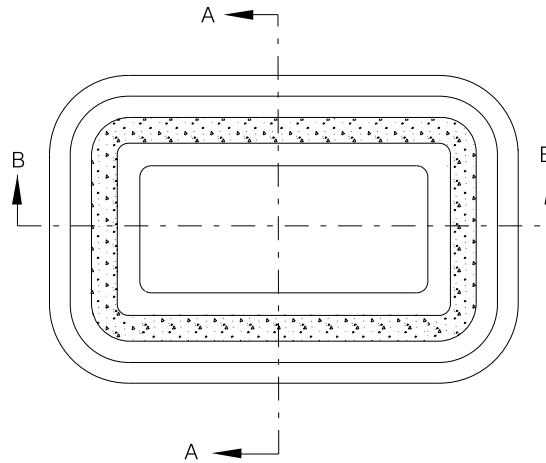
Chingor
COORDINATOR

R.C.E. 56523

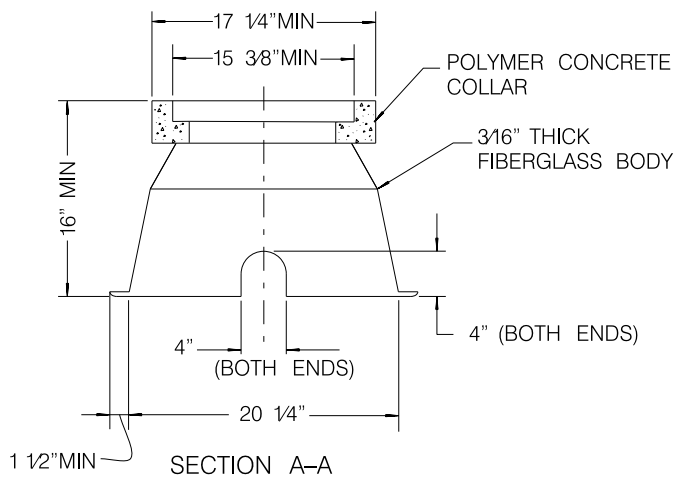
2/25/16
DATE

DRAWING
NUMBER

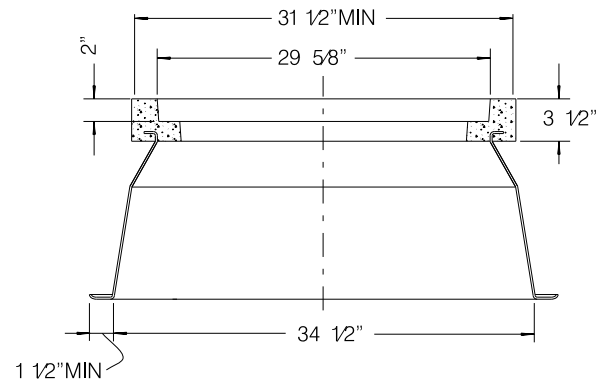
SDW-134



PLAN VIEW



SECTION A-A



SECTION B-B

NOTES

1. METER BOX COLLAR AND COVER SHALL BE OF POLYMER CONCRETE REINFORCED WITH CONTINUOUS LAYERS OF WOVEN FIBERGLASS.
2. BOX AND COVER SHALL WITHSTAND AASHTO H-20 (ASTM C857).
3. FOR COVER DETAIL WITH READER LID, SEE SDW-136.
4. SEE SDW-137 FOR INSTALLATION PROCEDURE.

REVISION	BY	APPROVED	DATE
ORIGINAL	SS	A. OSKQUI	1203
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

POLYMER CONCRETE WATER METER BOX FOR 2" WATER SERVICE

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

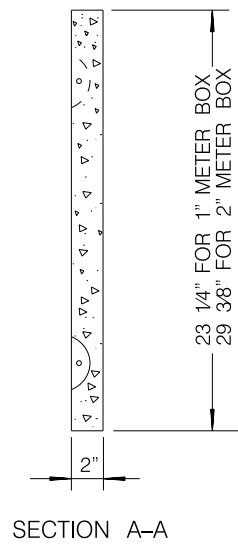
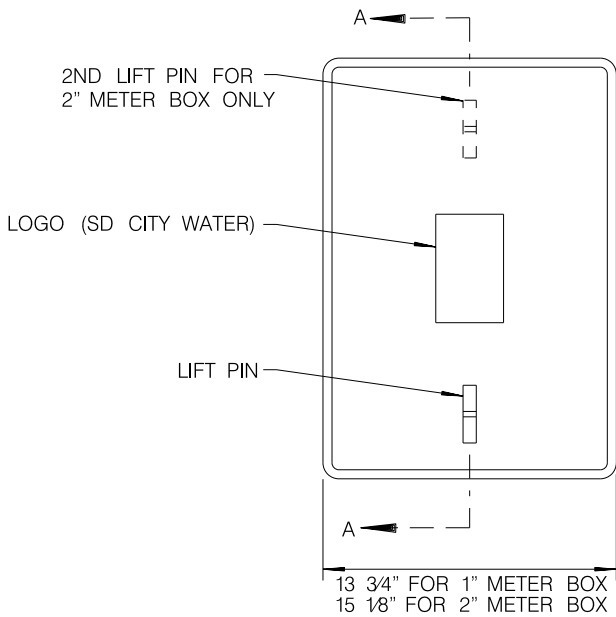
CRDinger
COORDINATOR

R.C.E. 56523

2/25/16
DATE

DRAWING
NUMBER

SDW-135




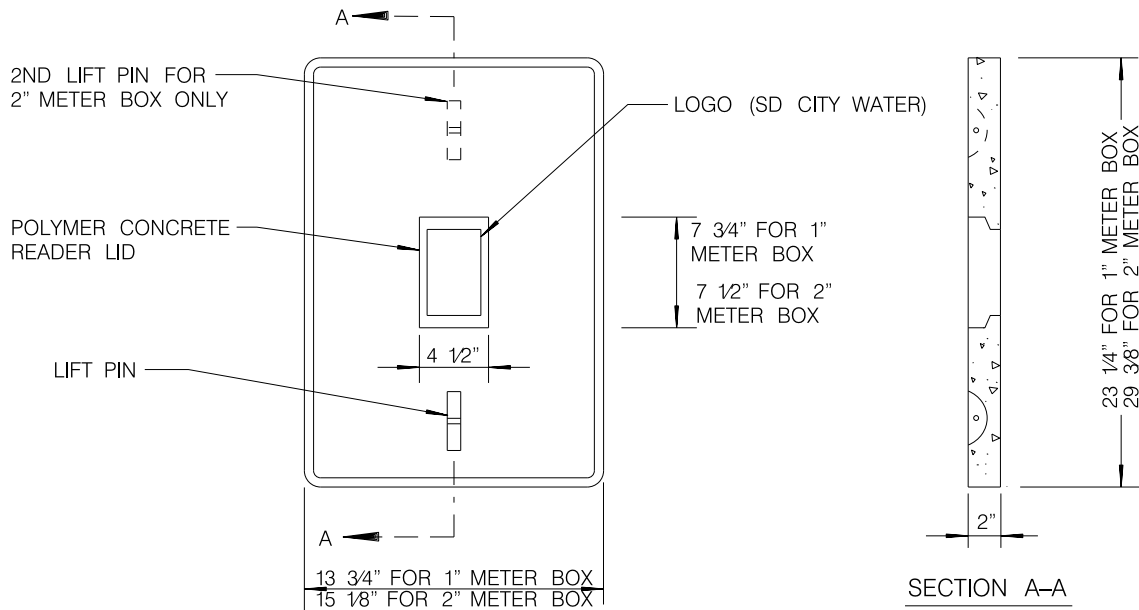
SOLID COVER FOR TRAVELED WAY

NOTES:

1. LID SHALL WITHSTAND AASHTO H-20 (ASTM 857).
2. LID SHALL HAVE NON-SKID SURFACE.

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  6/23/2014
ORIGINAL	SS	A. OSKQUI	12/03		
UPDATED	KA	J. NAGELVOORT	01/12	METER BOX POLYMER CONCRETE COVER	COORDINATOR R.C.E. 56523 DATE
UPDATED	BB	J. NAGELVOORT	06/14		
				DRAWING NUMBER	SDW-136




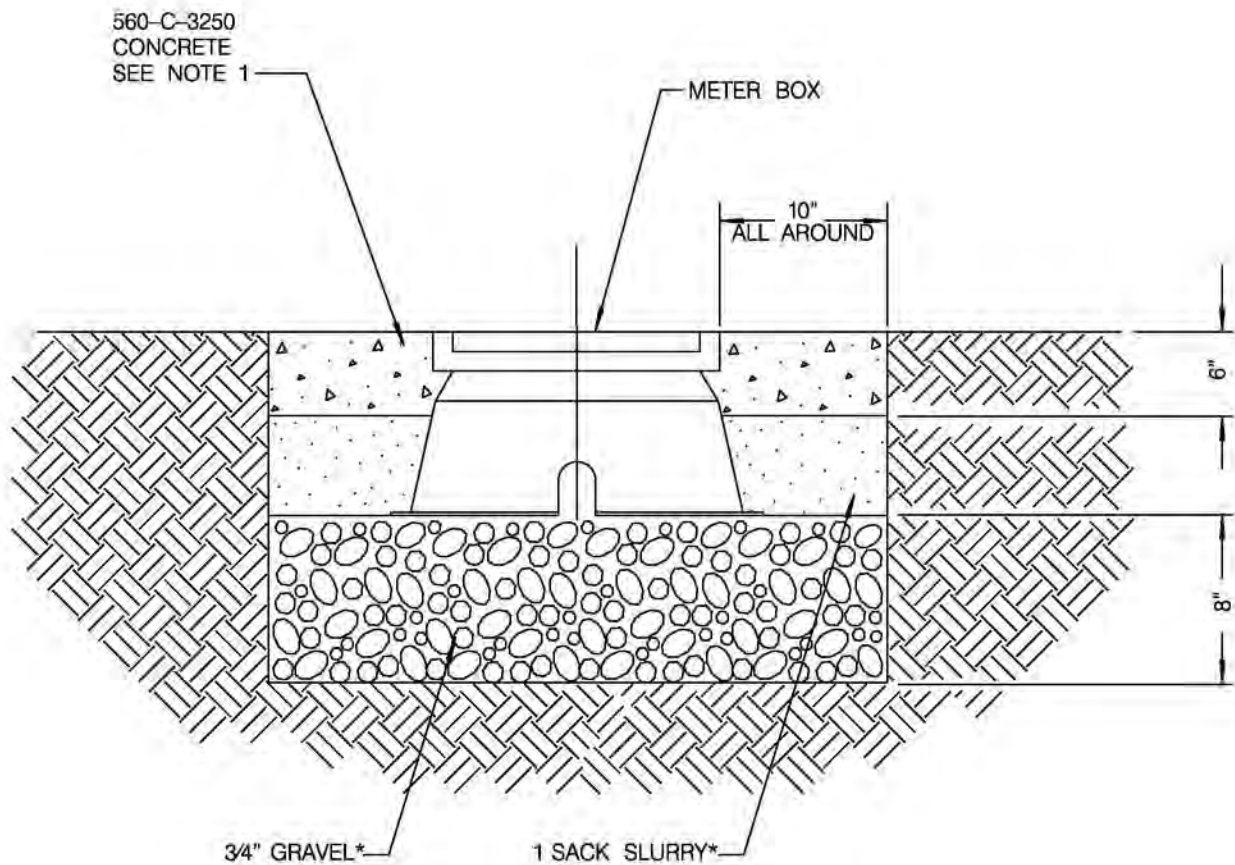
DROP IN COVER (OUTSIDE TRAVELLED WAY)

NOTES:

1. LID SHALL WITHSTAND AASHTO H-10 (ASTM C857-85).
2. LID SHALL HAVE NON-SKID SURFACE.
3. IF LID IS MANUFACTURED BY CDR, READER SHALL BE 6" X 9".

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE  COORDINATOR R.C.E. 56523 DATE 6/23/2014
ORIGINAL	SS	A. OSKOUI	12/03		
UPDATED	KA	J. NAGELVOORT	01/12	METER BOX POLYMER CONCRETE COVER	DRAWING NUMBER SDW-136
UPDATED	BB	J. NAGELVOORT	06/14		



NOTES:

1. REFER TO SDG-107 NOTE 3 FOR CURING REQUIREMENTS.
2. THIS DRAWING SHALL BE USED IN AREAS SUBJECT TO HEAVY TRAFFIC INCLUDING DRIVEWAYS, PARKING LOTS AND ALLEYS.
3. (*) FOR METER BOX OUTSIDE TRAVEL WAY, USE SAND SE 30.

REVISION	BY	APPROVED	DATE
ORIGINAL	SS	A. OSKOUI	12/03
UPDATED	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**TRAFFIC RATED COVER AND
METER BOX INSTALLATION**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

[Signature]

1/31/2012

COORDINATOR R.C.E. 65271 DATE

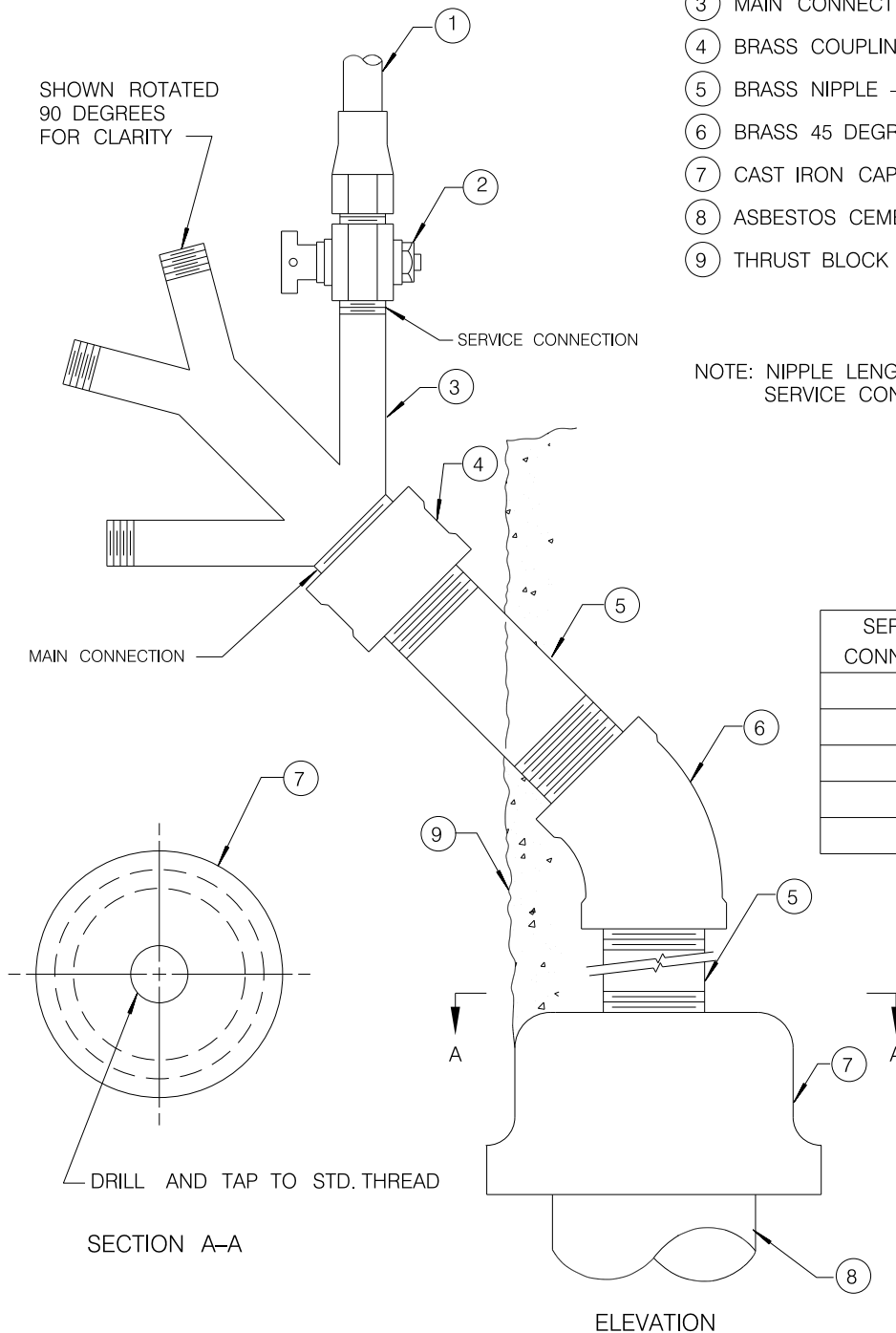
DRAWING
NUMBER

SDW-137

ITEMS CALL OUT:

- ① 1" WATER SERVICE
- ② 1" CURB STOP
- ③ MAIN CONNECTION X MULTIPLE BRANCH CONNECTION
- ④ BRASS COUPLING OR 45 DEGREE ELBOW
- ⑤ BRASS NIPPLE - 4" MIN. LENGTH
- ⑥ BRASS 45 DEGREE ELBOW
- ⑦ CAST IRON CAP
- ⑧ ASBESTOS CEMENT PIPE
- ⑨ THRUST BLOCK PER SDW-151

NOTE: NIPPLE LENGTHS TO BE SUFFICIENT TO ALLOW SERVICE CONNECTION TO CLEAR THRUST BLOCK.



REVISION	BY	APPROVED	DATE
ORIGINAL	JS	A. OSKQUI	1206
UPDATED	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

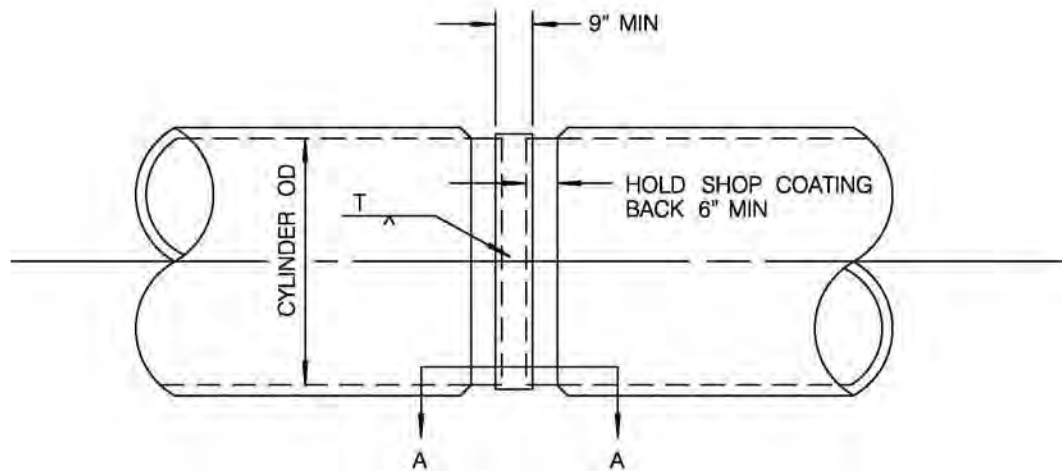
CITY OF SAN DIEGO - STANDARD DRAWING

MULTIPLE SERVICE ASSEMBLY DEAD END MAIN

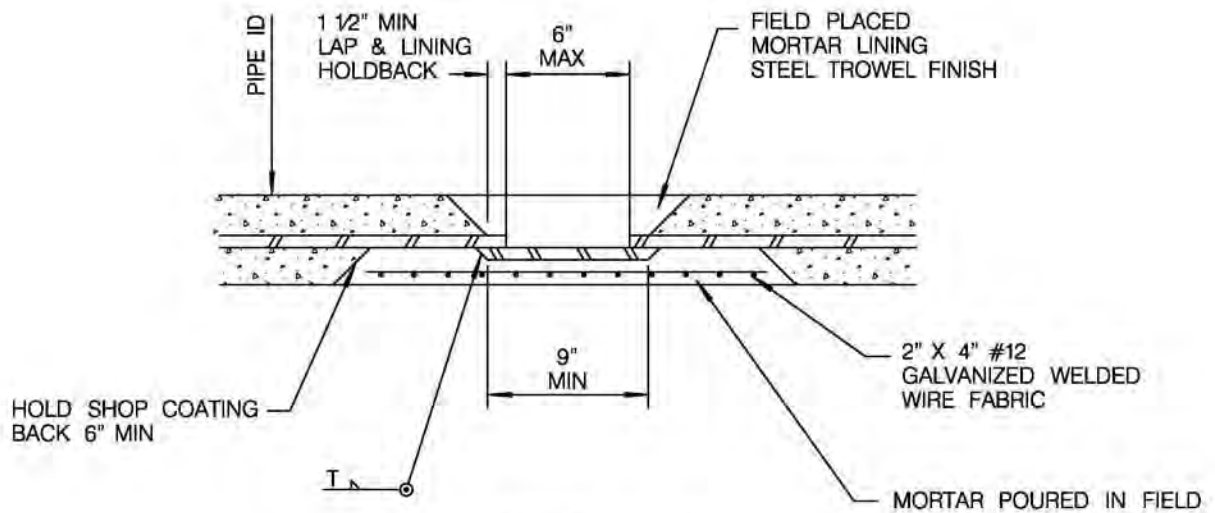
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CRDingee 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDW-138**



ELEVATION



SECTION A - A

NOTES:

CONTRACTOR SHALL PROVIDE HANDHOLES AS REQUIRED TO COMPLETE THE WORK

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadi</i> 1/31/2012 COORDINATOR R.C.E. 65271 DATE
ORIGINAL	JS	A. OSKOUJ	1206		
UPDATED	KA	J. NAGELVOORT	01/12	SPLIT BUTT STRAP	DRAWING NUMBER SDW-139

CITY MAINTAINED PRIVATELY MAINTAINED

WET UTILITY ROOM (WUR)
(SEE NOTE 1 ON SHEET 2)

ACCESS
DOORS OR
GATE WITH
KNOX BOX

(STREET LEVEL)

METER BOX &
ASSEMBLY PER
SDW- 149,150

CITY
VALVE

FIRE SERVICE
CONNECTION &
ASSEMBLY
PER SDW-118

WATER SERVICE
CONNECTION
PER SDW-149,
SDW-150

PROPERTY
SIDE
ISOLATION
VALVE

POLYETHYLENE FOAM TYP

12" MIN
24" MAX

FLOW

BUILDING BASEMENT

CITY MAIN

SHEET 1 OF 2

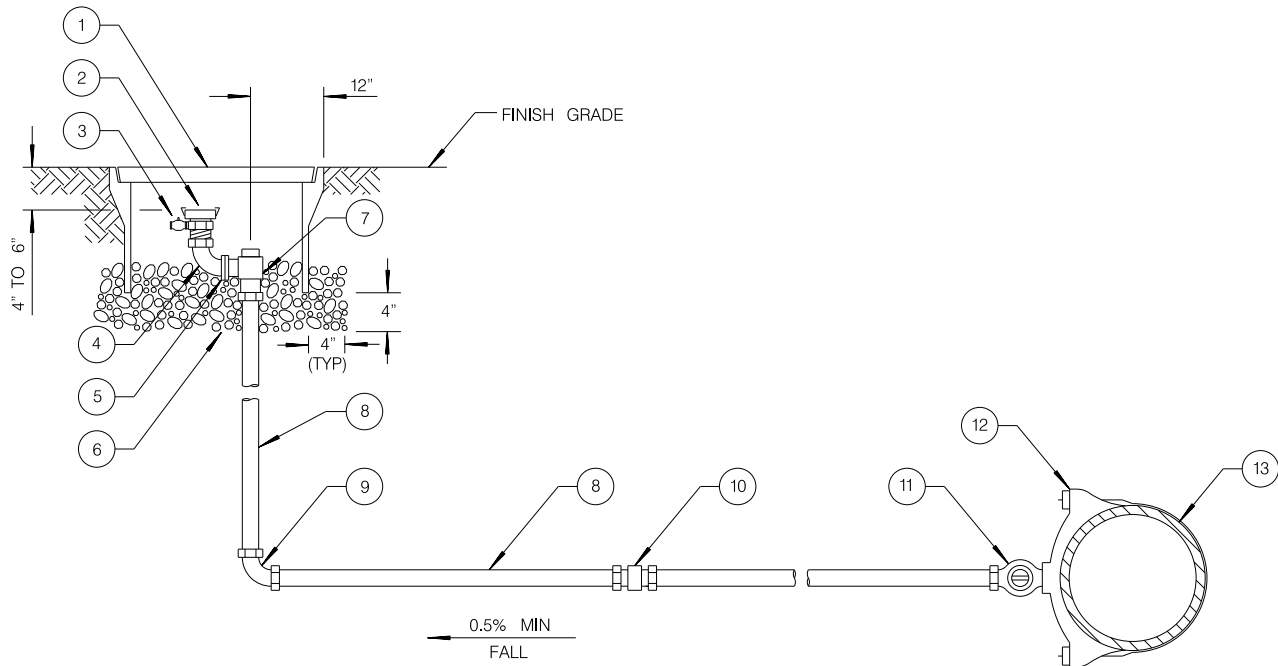
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	CONCRETE THRUST BLOCK. SEE SDW-151	⑥	APPROVED RPDA
②	90° DUCTILE IRON FLANGE ELBOW	⑦	FLANGED OS&Y RWGV WITH HAND WHEEL
③	FLANGED DUCTILE IRON PIPE (PROPERLY SUPPORTED OR RESTRAINED)	⑧	BRASS OR COPPER PIPE (PROPERLY SUPPORTED OR RESTRAINED)
④	12" FLANGED DUCTILE IRON SPOOL	⑨	UNIONS
⑤	APPROVED BACKFLOW ASSEMBLY WITH FLEX COUPLER CONNECTORS FOR SEISMIC REQUIREMENTS	⑩	APPROVED RP (ALL Y-STRAINERS OR PRV TO BE INSTALLED DOWNSTREAM OF BACKFLOW ASSEMBLY)
REVISION	BY	APPROVED	DATE
ORIGINAL	BB	J. NAGELVOORT	10/14
UPDATED	FG	J. NAGELVOORT	07/15
CITY OF SAN DIEGO - STANDARD DRAWING			
BACKFLOW PREVENTERS WET UTILITY ROOM INSTALLATION			RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
			<i>CA Bungea</i> 7/21/15
			COORDINATOR R.C.E. 56523 DATE
			DRAWING NUMBER SDW-141

NOTES:

1. CITY WATER METERS INSTALLED WITHIN WET UTILITY ROOM (WUR), REFER TO SDW-157 FOR SEPARATION OF MAINTENANCE RESPONSIBILITIES.
2. THE WUR MUST BE APPROVED BY THE PUBLIC UTILITIES & DEVELOPMENT SERVICES DEPARTMENTS.
3. THE WUR APPLIES ONLY TO BUILDINGS BUILT AT THE PROPERTY LINE WITH ZERO SETBACK.
4. IN UTILIZING THE WUR OPTION, THE BUILDING OWNER AGREES TO REQUIREMENTS OF SDW-141.
5. PROVIDE ACCESS INTO THE WUR BY STORING KEYS WITHIN A KNOX KEY BOX.
6. WUR's MAY CONTAIN BACKFLOW PREVENTION EQUIPMENT OR CITY WATER METERS (EASEMENT REQUIRED).
7. THE WUR MUST BE DESIGNED AT STREET LEVEL, ADJACENT TO EXTERIOR WALL OF THE BUILDING, AND ALLOW ACCESS FROM STREET LEVEL THROUGH THIS EXTERIOR WALL.
8. ACCESS DOORS OR GATES MUST PROVIDE DRAINAGE FOR FULL DISCHARGES AWAY FROM THE BUILDING.
9. A CONCRETE FLOOR PLAN WITH FLOOR DRAINS MUST PROVIDE DRAINAGE FOR INTERMEDIATE DISCHARGES.
10. MOISTURE BARRIERS SHALL BE APPLIED TO ALL EXPOSED AREAS WITHIN THE WUR TO PREVENT DAMAGE.
11. PROVIDE ADEQUATE CLEARANCE AROUND THE EQUIPMENT TO ALLOW FOR TESTING AND MAINTENANCE.
12. THE WUR MUST BE FIRE RATED FOR ONE HOUR PER THE FIRE & RESCUE DEPARTMENT.
13. IDENTIFY THE TYPE OF EQUIPMENT CONTAINED WITHIN THE WUR WITH APPROPRAITE SIGNAGE.
14. TO PURCHASE A KEY BOX CONTACT THE KNOX COMPANY (800) 552-5669 AND PROVIDE THE PUBLIC UTILITIES DEPARTMENT, SYSTEM CODE: SS-01-0503-05-14.
15. KNOX KEY BOX TO BE INSTALLED ADJACENT TO THE WUR ENTRANCE WITHIN 4 – 6 FEET.
16. ONCE THE KNOX BOX IS INSTALLED, NOTIFY THE PUBLIC UTILITIES DEPARTMENT, CROSS CONNECTION CONTROL UNIT TO LOCK THE KEY BOX.

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE		
ORIGINAL	BB	J. NAGELVOORT	10/14		<div> COORDINATOR R.C.E. 56523 7/21/15 DATE</div>		
UPDATED	FG	J. NAGELVOORT	07/15	BACKFLOW PREVENTERS WET UTILITY ROOM INSTALLATION			
				DRAWING NUMBER	SDW-141		



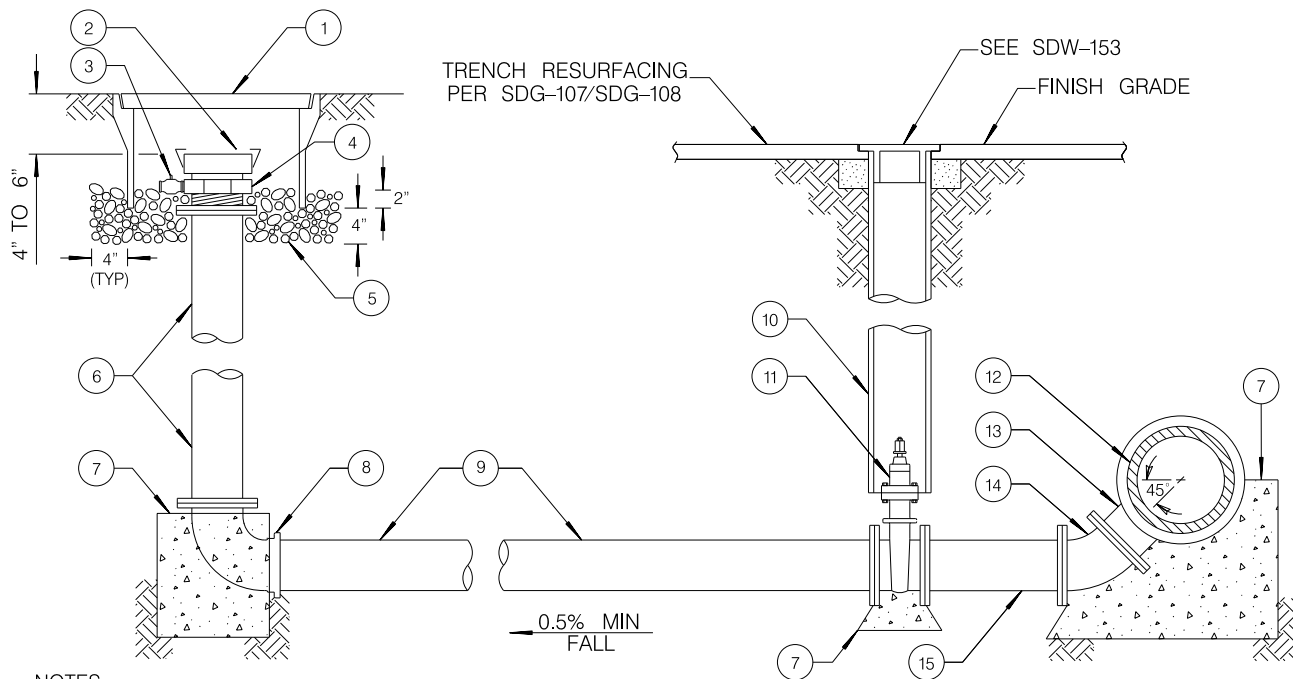
NOTES:

1. SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB OR FINISH GRADE
2. LOCATE METER BOX PER WS-03
3. INSTALL WARNING / IDENTIFICATION TAPE PER SDM-105
4. BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS
5. ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
6. CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE PET COCK
7. FOR BLOW OFF AT END OF MAIN, SEE SDW-106.

2"
LEGEND ON PLANS

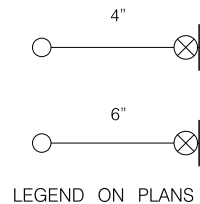
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	POLYMER METER BOX WITH LID 17" x 30", SEE NOTE 2	7	2" BRONZE COMP x FLG ANGLE METER STOP WITH LOCK WING
2	2" CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 7	8	2" x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT
3	1/4" PRESSURE PET COCK	9	90° ELL (NO SWEAT JOINTS ALLOWED)
4	2" 90° BRONZE MIPT x FIPT ELL	10	2" BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
5	2" OVAL METER FLANGE FLG x FIPT, WITH GASKET	11	BRONZE CORPORATION STOP (INSTALL WITH KEY ON SIDE AND OPEN TAP)
6	3/8" ROCK 4" TO 6" DEEP	12	SIZE x 2" SERVICE SADDLE
		13	WATER MAIN

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	HM	J. NAGELVOORT	02/16	2" BLOW-OFF INSTALLATION	COORDINATOR <i>CAJung</i> R.C.E. 56523
					DATE 2/25/16
					DRAWING NUMBER
					SDW-143




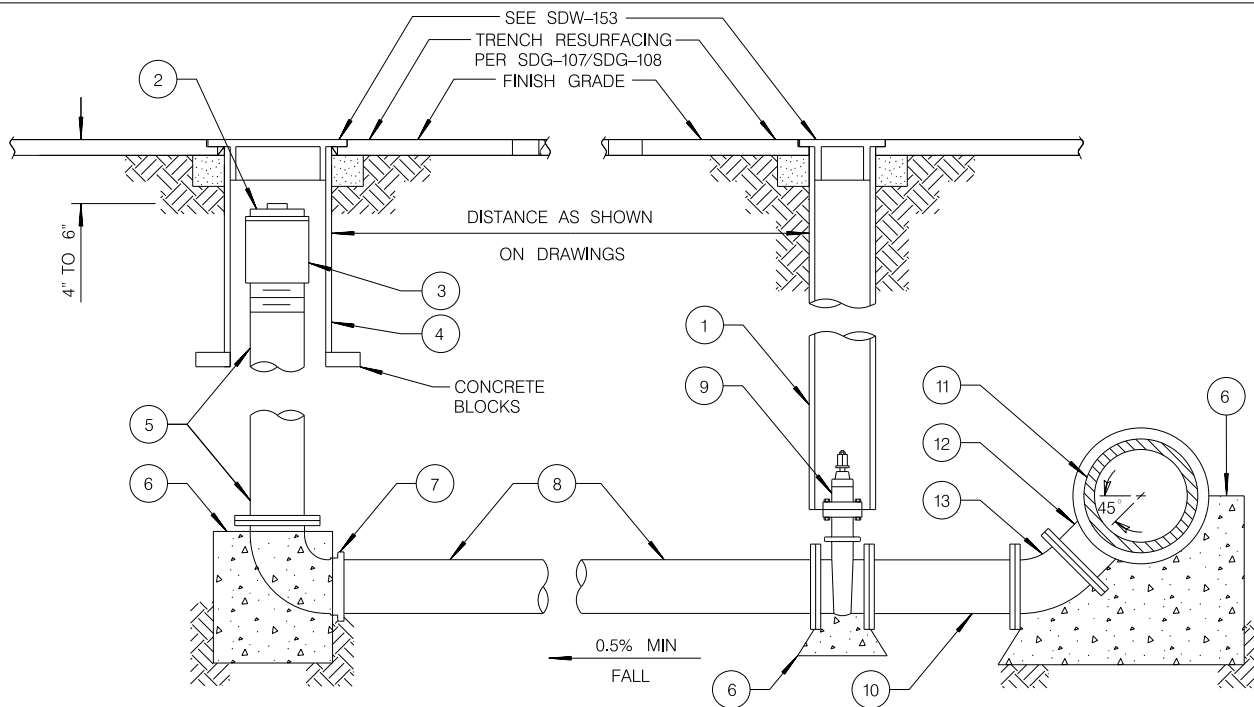
NOTES:

- 1) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB OR FINISH GRADE
- 2) LOCATE METER BOX PER WS-03
- 3) INSTALL WARNING / IDENTIFICATION TAPE PER SDM-105
- 4) FOR BLOW-OFF INSTALLATION AT END OF MAIN SEE SDW-146.
- 5) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS
- 6) 45° BEND SHALL BE USED FOR MAINS UP TO 30". 90° BEND SHALL BE USED FOR MAINS IN EXCESS OF 30" AS DIRECTED BY THE ENGINEER
- 7) CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE PET COCK



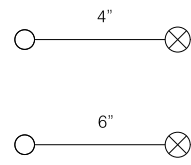
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	POLYMER METER BOX WITH LID 17" x 30", SEE NOTE 2	8	4" OR 6" FLG x MJPO 90° BEND
2	4" OR 6" CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 7	9	USE DUCTILE IRON OR PVC C900
3	1/4" PRESSURE PET COCK	10	VALVE WELL FRAME AND COVER (SEE SDW-153)
4	4" OR 6" FLANGED COMPANION x FIPT	11	4" OR 6" FLG x MJFLG RWGV
5	3/8" ROCK 4" TO 6" DEEP	12	WATER MAIN
6	4" OR 6" FLG DI PIPE x REQUIRED LENGTH (MAXIMUM OF 2 SPOOLS)	13	SIZE x 4" OR 6" MJFLG x FLG TEE
7	CONCRETE THRUST BLOCK SEE SDW-151	14	4" OR 6" FLANGED 45° BEND
		15	4" OR 6" FLANGED 45° BEND
		16	4" OR 6" x 24" FLG DISPOOL

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING 4" & 6" BLOW-OFF INSTALLATION TYPE A	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR R.C.E. 56523 2/25/16 DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	12/12		
UPDATED	AR	J. NAGELVOORT	10/15		
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDW-144



NOTES:

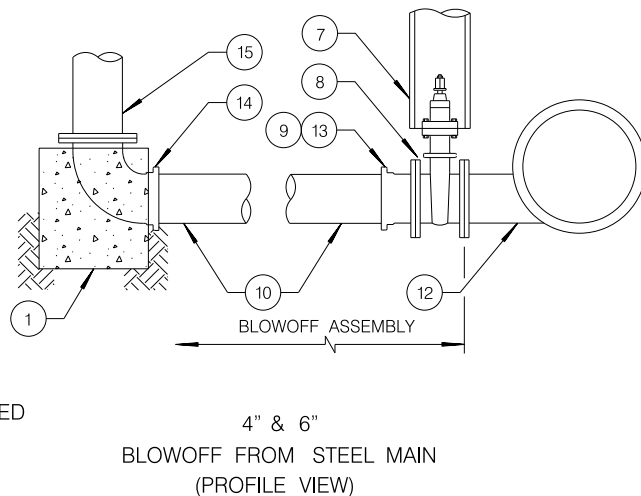
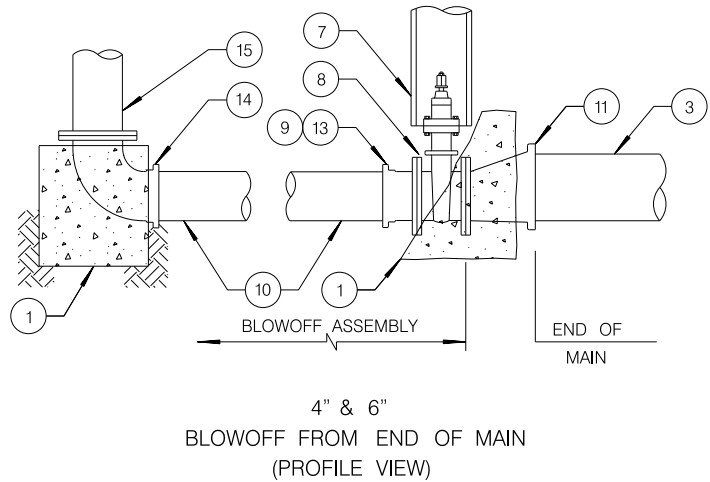
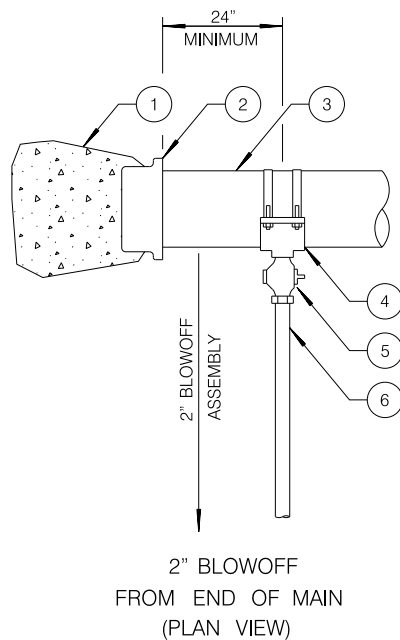
- 1) FOR BLOW-OFF INSTALLATION AT END OF MAIN SEE SDW-106 AND SDW-146
- 2) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS
- 3) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 4) 45° BEND SHALL BE USED FOR MAINS UP TO 30". 90° BEND SHALL BE USED FOR MAINS IN EXCESS OF 30" AS DIRECTED BY THE ENGINEER



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	GATE WELL WITH CAP SEE SDW-153	8	DUCTILE IRON OR C-900 PVC
2	GALVANIZED IRON PLUG	9	4" OR 6" FLG x MJ /FLG RWGV
3	GALVANIZED IRON COUPLING, THREADED	10	4" OR 6" x 24" FLG DISPOOL
4	10" STEEL GATE WELL WITH CAP	11	WATER MAIN
5	4" OR 6" FLG DI PIPE x REQUIRED LENGTH (MAXIMUM OF 2 SPOOLS)	12	SIZE x 4" OR 6 MJ /FLG x FLG TEE
6	CONCRETE THRUST BLOCK SEE SDW-151	13	4" OR 6" FLANGED 45° BEND, SEE NOTE 4
7	FLANGE x FLANGE x 90° BEND		


REVISION	BY	APPROVED	DATE	<p>CITY OF SAN DIEGO – STANDARD DRAWING</p> <p>4" & 6" BLOW-OFF INSTALLATION IN STREET TYPE B</p>	<p>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</p> <p><i>CR Jung</i> 2/25/16 COORDINATOR R.C.E. 56523 DATE</p> <p>DRAWING NUMBER SDW-145</p>
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	12/12		
UPDATED	AR	J. NAGELVOORT	02/16		

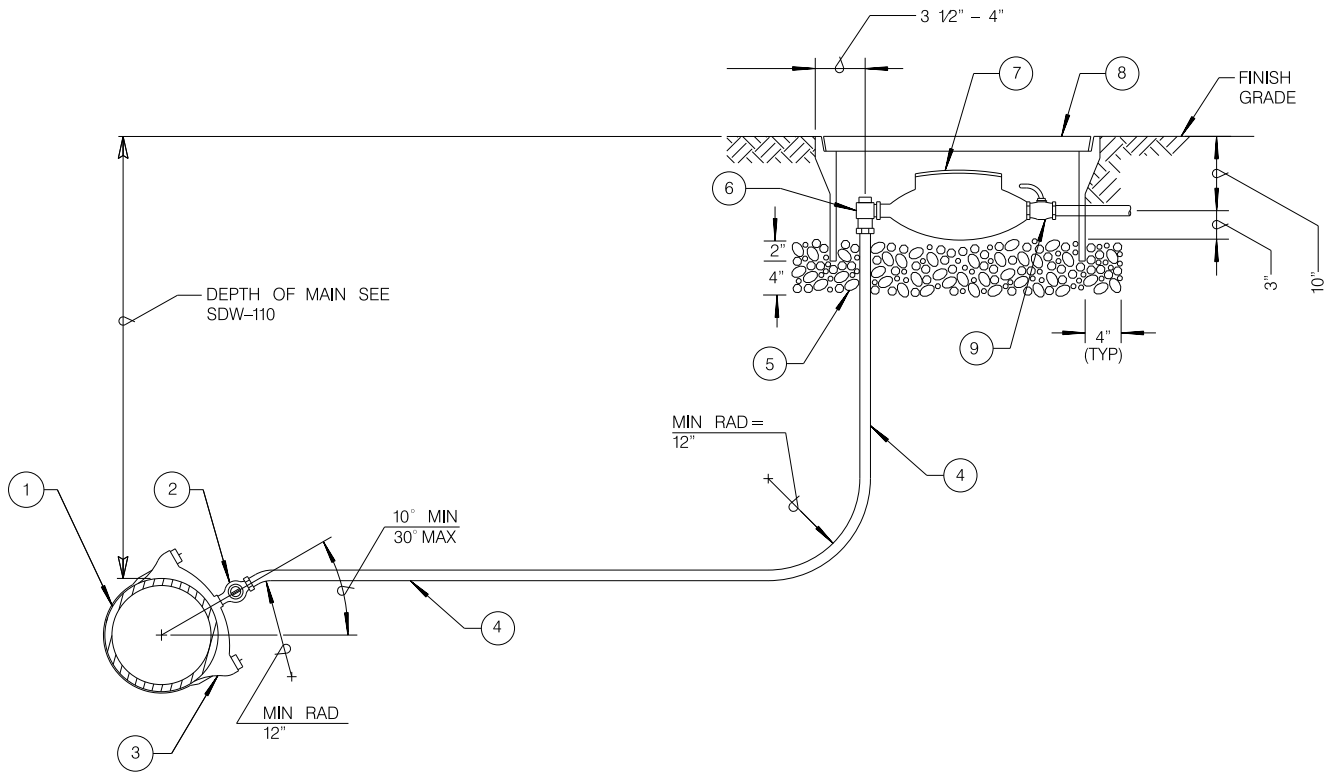


NOTES:

- 1) BLOW-OFF ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS.
- 2) FOR 2" BLOW-OFFS ON STEEL MAINS USE WELD ON COUPLINGS. ON DUCTILE IRON MAINS USE DUCTILE IRON.
- 3) SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED) FOR END OF MAIN DETAIL SEE SDW-106.

ITEM NO		SIZE AND DESCRIPTION		ITEM NO		SIZE AND DESCRIPTION	
1		CONCRETE THRUST BLOCKS SEE SDW-151		8		FLG x MJPO/FLG RWGV	
2		DI END CAP		9		FLG x MJPO ADAPTER (IF REQUIRED)	
3		WATER MAIN		10		C-900 PVC PIPE	
4		BRONZE SERVICE CLAMP (DOUBLE STRAP). SIZE x 2" SERVICE SADDLE		11		FLG x MJPO ECCENTRIC DI REDUCER	
5		2" BRONZE MIPT x COMP CORPORATION STOP		12		MAIN SIZE x BLOWOFF SIZE FLANGE MANUFACTURED STEEL TANGENTIAL OUTLET	
6		2" x REQ'D LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT		13		FLG x MJPO BEND (IF REQUIRED)	
7		GATE WELL WITH CAP SEE SDW-153 & SDW-154		14		FLG x MJPO 90° BEND	
				15		FLG DI PIPE x REQUIRED LENGTH (MAXIMUM OF 2 SPOOLS)	

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR R.C.E. 56523 2/25/16 DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	AR	J. NAGELVOORT	02/16		
				BLOW-OFF INSTALLATION FROM END OF MAIN & FROM STEEL MAIN	DRAWING NUMBER SDW-146




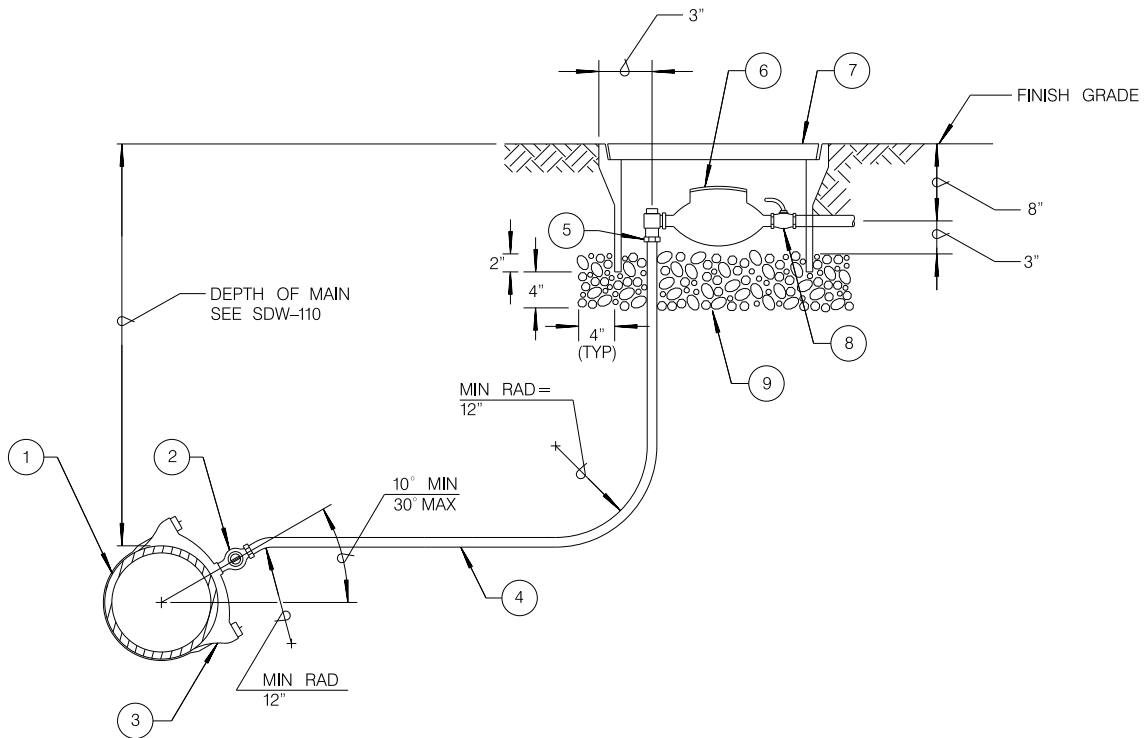
NOTES:

- 1) INSTALL CORPORATION STOP WITH KEY IN THE SIDE POSITION
- 2) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB, OR FINISH GRADE
- 3) LOCATE METER BOX PER WS-03
- 4) INSTALL WARNING / IDENTIFICATION TAPE PER SDM-105
- 5) ONLY APPROVED BRASS MECHANICAL COUPLING DEVICES ALLOWED FOR TYPE K COPPER PIPE
- 6) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 7) TOP TAPS NOT PERMITTED.

W 2" |
LEGEND ON PLANS

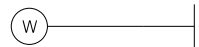
ITEM NO		SIZE AND DESCRIPTION		ITEM NO	SIZE AND DESCRIPTION	
①		WATER MAIN		⑥	2" BRONZE ANGLE METER STOP WITH LOCKWING	
②		2" BRONZE CORPORATION STOP		⑦	WATER METER FURNISHED AND INSTALLED BY THE CITY	
③		SIZE x 2" BRONZE SERVICE SADDLE DOUBLE STRAP		⑧	METER BOX WITH LID, #6: 35"x 21"	
④		2" x REQUIRED LENGTH COPPER PIPE TYPE "K" SOFT/RIGID		⑨	CUSTOMER SHUT-OFF VALVE (LOCKABLE) FURNISH AND INSTALLED BY THE CITY	
⑤		38" ROCK, 4" TO 6" DEEP				

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	2/13		
UPDATED	KA	J. NAGELVOORT	3/13		
UPDATED	HM	J. NAGELVOORT	02/16		
2" WATER SERVICE INSTALLATION					 2/25/16 COORDINATOR R.C.E. 56523 DATE
					DRAWING NUMBER SDW-149



NOTES:

- 1) INSTALL CORPORATION STOP WITH KEY IN THE SIDE POSITION
- 2) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB, OR FINISH GRADE
- 3) LOCATE METER BOX PER WS-03
- 4) INSTALL WARNING / IDENTIFICATION TAPE PER SDM-105
- 5) ONLY APPROVED BRASS MECHANICAL COUPLING DEVICES ALLOWED FOR TYPE K COPPER PIPE.
- 6) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
- 7) BRONZE PIPE SADDLES ARE REQUIRED FOR ALL TAPS INTO POLYVINYL CHLORIDE (PVC) WATER MAIN. TOP TAPS ARE NOT PERMITTED.



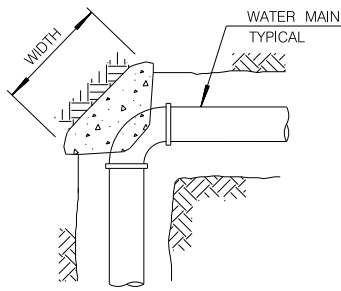
LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	WATER MAIN	6	WATER METER FURNISHED & INSTALLED BY THE CITY
2	1" BRONZE CORPORATION STOP	7	METER BOX WITH LID, #37: 28" x 18"
3	SIZE x 1" BRONZE SERVICE SADDLE DOUBLE STRAP	8	CUSTOMER SHUT-OFF VALVE (LOCKABLE) FURNISHED AND INSTALLED BY THE CITY
4	USE COPPER TUBING TYPE (K) SOFT FOR 1" SERVICES ONLY. NO INTERMEDIATE JOINTS PERMITTED WITHIN THE FIRST 60' FROM THE MAIN FOR LENGTHS LONGER THAN 60 FEET USE FLARE JOINT UNION OR LOK-PAC FITTINGS WITH LOCKING CLAMP AND STAINLESS STEEL BOLT ONLY. NO SWEAT JOINTS ARE ALLOWED	9	3/8" ROCK, 4" TO 6" DEEP
5	BRONZE ANGLE METER STOP WITH LOCKWING DEVICE AND METER COUPLING ATTACHED. "FURNISH AND INSTALL BRONZE PROPERTY VALVE. USE SPACER FOR METER"		

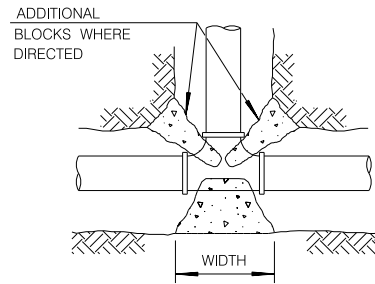
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	03/13		
UPDATED	HM	J. NAGELVOORT	02/16		
				1" WATER SERVICE INSTALLATION	COORDINATOR
					R.C.E. 56523
					DATE
					DRAWING
					NUMBER

2/25/16

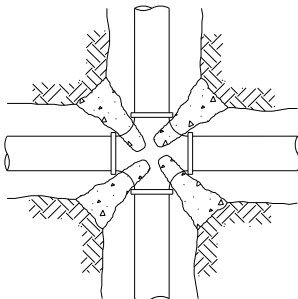
SDW-150



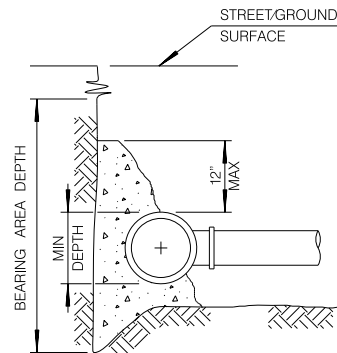
BEND



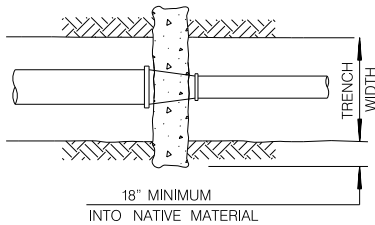
TEE PLAN



CROSS

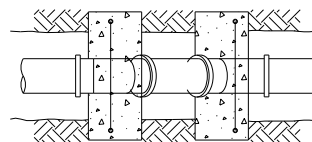


TEE ELEVATION

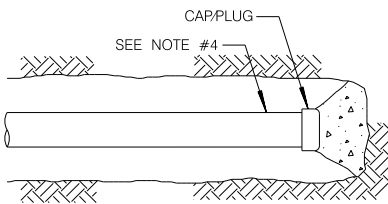


REDUCER

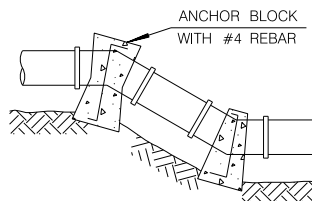
SEE NOTE
1 BELOW



VERT BENDS PLAN



END CAP



VERT BENDS ELEVATION

NOTES:

- 1) THE ANCHOR BLOCKS ON VERTICAL BENDS REQUIRE ENGINEER APPROVAL.
- 2) A MINIMUM OF 6" OF CONCRETE SHALL BE POURED ON WETTED UNDISTURBED OR COMPACTED SOIL BENEATH EACH INSTALLATION.
- 3) TEE SHALL BE CONCRETE BLOCKED A MINIMUM OF 6" ON ALL THREE SIDES.
- 4) USE 12" - 18" LENGTH OF PIPE BETWEEN THE END CAP AND THE LAST JOINT AS A BOND BREAKER ON DEAD END BLOCKING.

SHEET 1 OF 3

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	HM	J. NAGELVOORT	02/16

CITY OF SAN DIEGO - STANDARD DRAWING

CONCRETE THRUST AND ANCHOR BLOCK INSTALLATIONS

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CRDingor
COORDINATOR

2/25/16
R.C.E. 56523 DATE

DRAWING
NUMBER

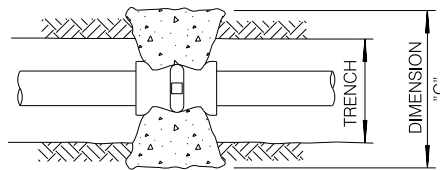
SDW-151

VALVE SUPPORT BLOCK

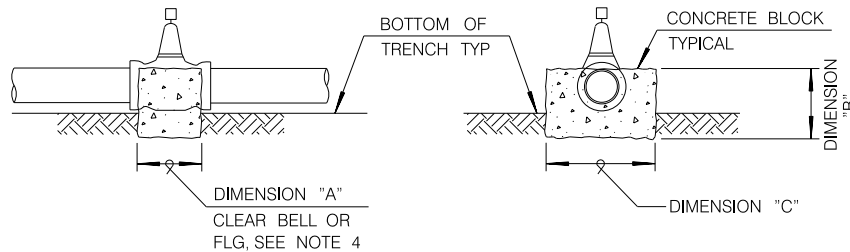
VALVE SIZE	DIMENSION "A"	DIMENSION "B"
4"	12"	12"
6"	12"	12"
8"	13"	14"
10"	14"	16"
12"	15"	18"
DIMENSION "C" = TRENCH WIDTH PLUS TWO TIMES THE PIPE DIAMETER		

THRUST AND ANCHOR BLOCKS

MINIMUM BEARING AREA IN SQUARE FOOT (SQUARE METERS) SEE NOTE 2				
MAIN SIZE	TEES	90° BEND	45° BEND	22 ¹ / ₂ ° BEND
4"	4	5	3	1.5
6"	8	10	5	2.5
8"	12	16	9	4.5
10"	17	24	13	6.5
12"	24	33	19	9.5



VALVE SUPPORT PLAN

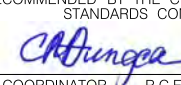


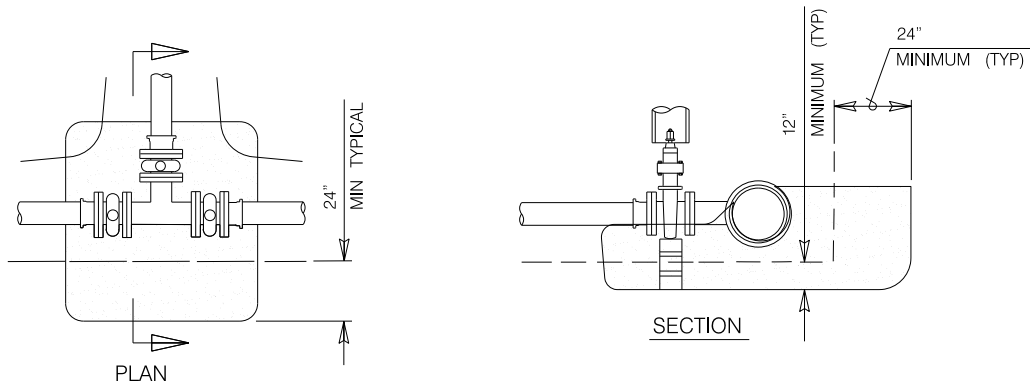
VALVE SUPPORT ELEVATION

NOTES:

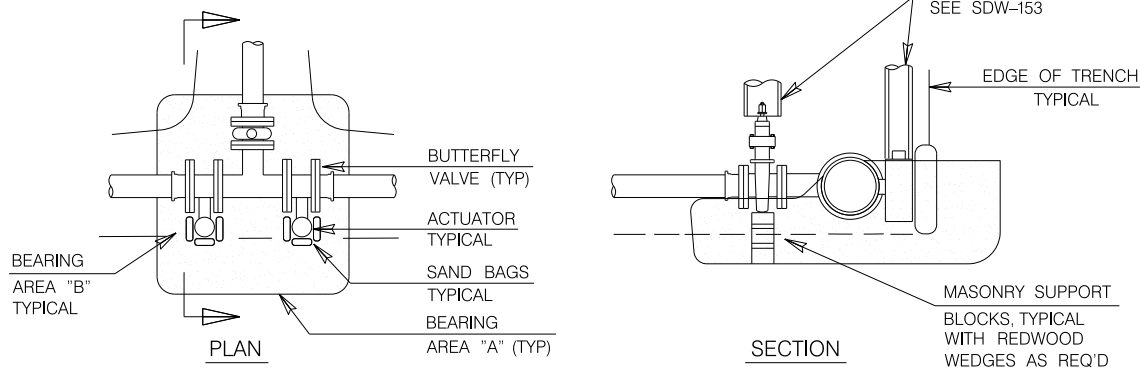
- 1) BEARING AREA BASED ON SOIL BEARING VALUE OF 1500 PSF AND 225 PSI LINE PRESSURE AND A MINIMUM OF 36" COVER:
FOR BEARING= 1000 PSF, 1.5 x AREA SHOWN
FOR BEARING= 500 PSF, 3.0 x AREA SHOWN
- 2) ENGINEER SHALL DETERMINE SIZES, REFER TO SPECIFICATIONS FOR THRUST AND ANCHOR BLOCK SIZING.
- 3) THRUST BLOCKS SHALL BE CENTERED ON THE FITTING SO THAT THE BEARING AREA IS EXACTLY OPPOSITE THE RESULTANT DIRECTION OF THRUST.
- 4) CONCRETE SHALL BE PLACED SO THAT FITTINGS AND VALVES WILL BE ACCESSABLE FOR REPAIR OR REPLACEMENT.

SHEET 2 OF 3

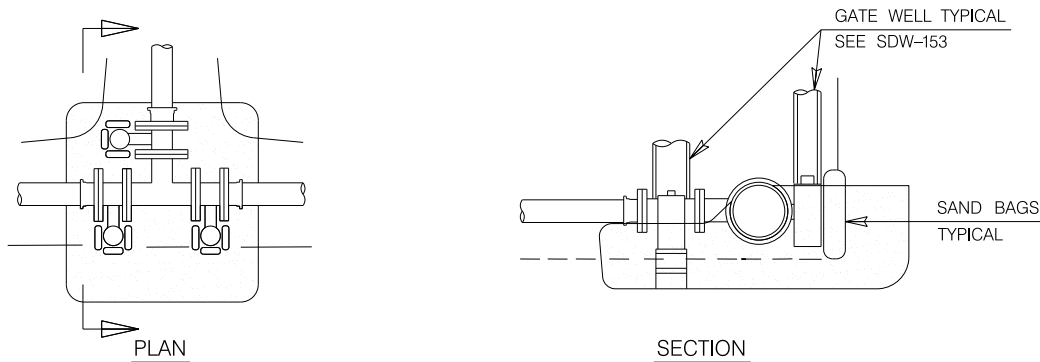
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	<div>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</div> <div> COORDINATOR R.C.E. 56523</div> <div>2/25/16 DATE</div>
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	HM	J. NAGELVOORT	02/16		
				CONCRETE THRUST AND ANCHOR BLOCK INSTALLATIONS	<div>DRAWING NUMBER</div> <div>SDW-151</div>



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 SPECIFICATIONS.

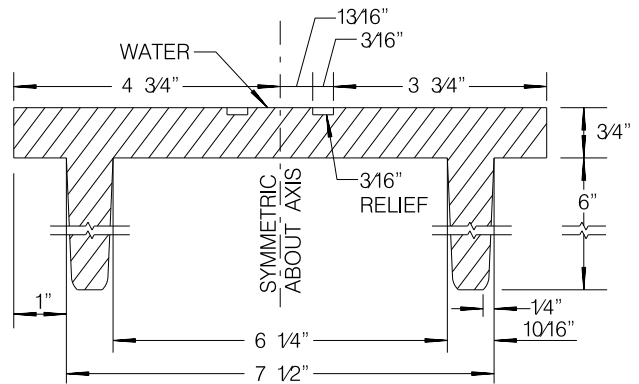
SHEET 3 OF 3

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	HM	J. NAGELVOORT	02/16	CONCRETE THRUST AND ANCHOR BLOCK INSTALLATIONS	 COORDINATOR R.C.E. 56523 2/25/16 DATE
					DRAWING
					NUMBER
					SDW-151



POTABLE
WATER

GATE WELL LID



CAST IRON VALVE WELL CAP DETAIL

INSIDE GATE WELL LID PAINTED IDENTIFICATION MARKING

COLOR	GATE WELL AND LIDS USED FOR:
RED	NORMALLY CLOSED SYSTEM VALVES (NCV)
WHITE	RESILIENT WEDGE GATE VALVES
YELLOW	BUTTERFLY VALVES

GATE WELL LID TOP COLOR & CONDITION

VALVE CONDITION	BUTTERFLY VALVE	GATE VALVE
PERMANENTLY CLOSED	RED	RED
TEMPORARILY CLOSED	YELLOW W/RED DOT	WHITE W/RED DOT
PERMANENTLY OPEN	YELLOW	WHITE

NOTES:

- 1) GATE WELL LIDS SHALL BE CAST IRON WITH "CITY OF SAN DIEGO" AND THE WORD "WATER" FOR USE WITH POTABLE WATER SYSTEMS AND "RECYCLED" FOR USE WITH RECYCLED WATER SYSTEMS. LIDS SHALL INCLUDE A 1" LIFTING SLOT

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	RB	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

GATE WELL IDENTIFICATION

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

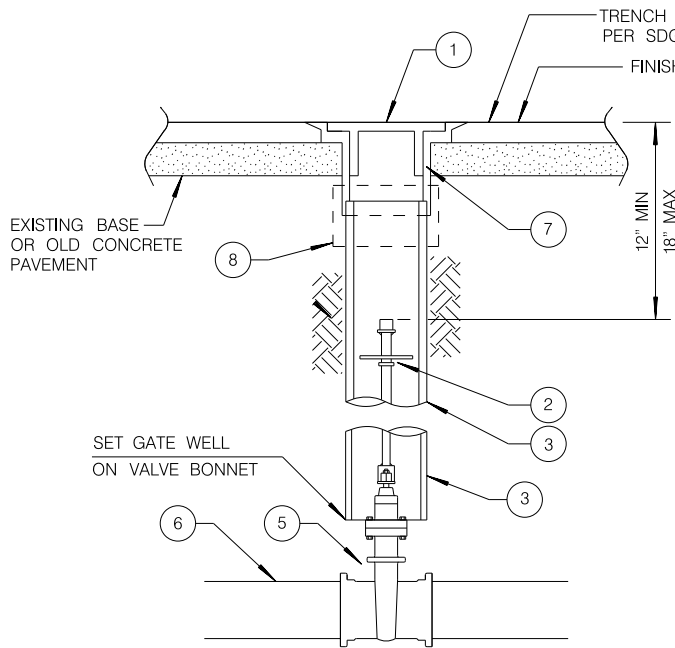
CR Junga
COORDINATOR

2/25/16

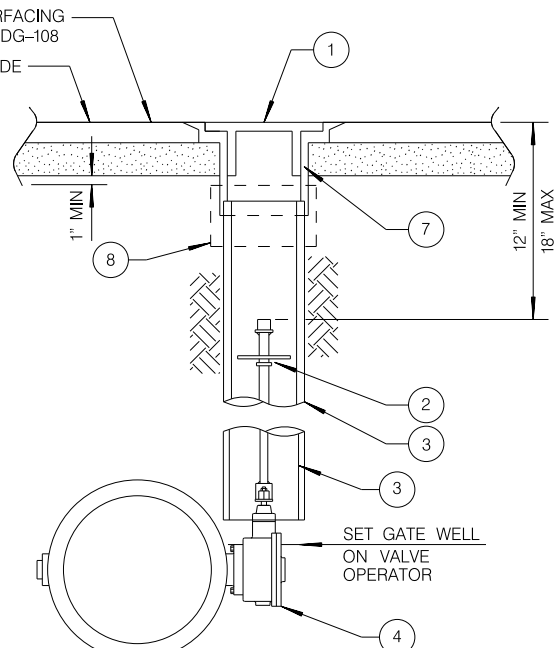
R.C.E. 56523 DATE

DRAWING
NUMBER

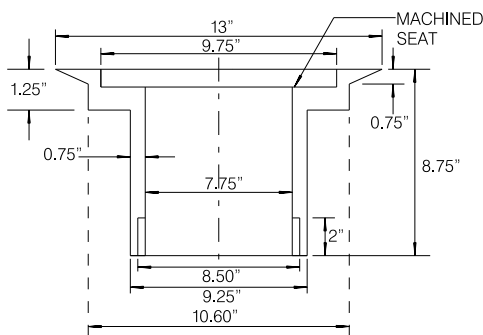
SDW-152



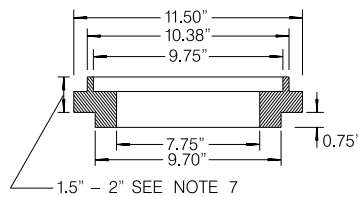
GATE WELL (GATE VALVES)



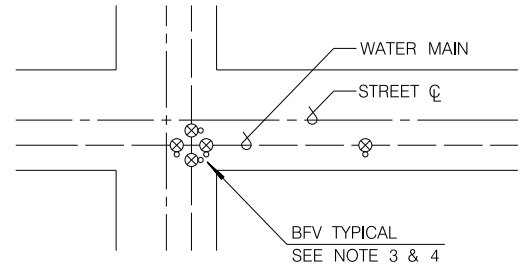
GATE WELL (BUTTERFLY VALVES)



CAST IRON VALVE WELL FRAME



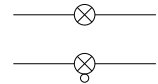
CAST IRON RISER RING



BFV OPERATOR POSITION

NOTES:

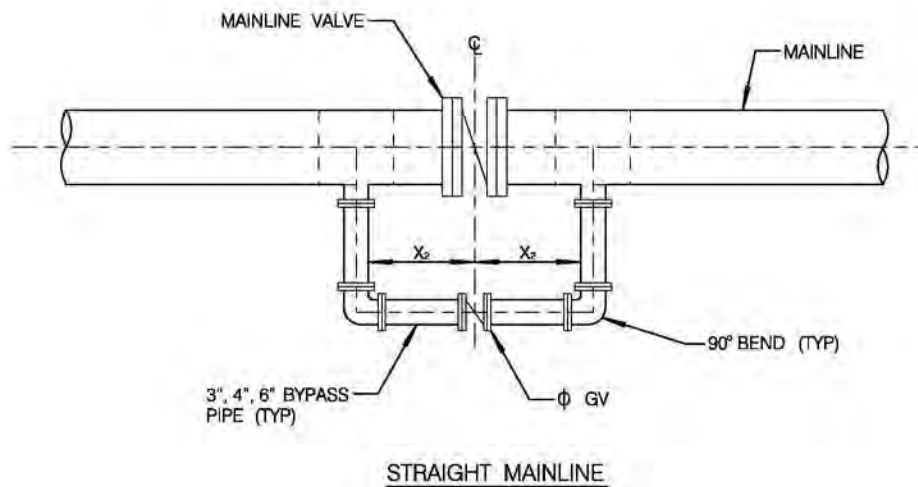
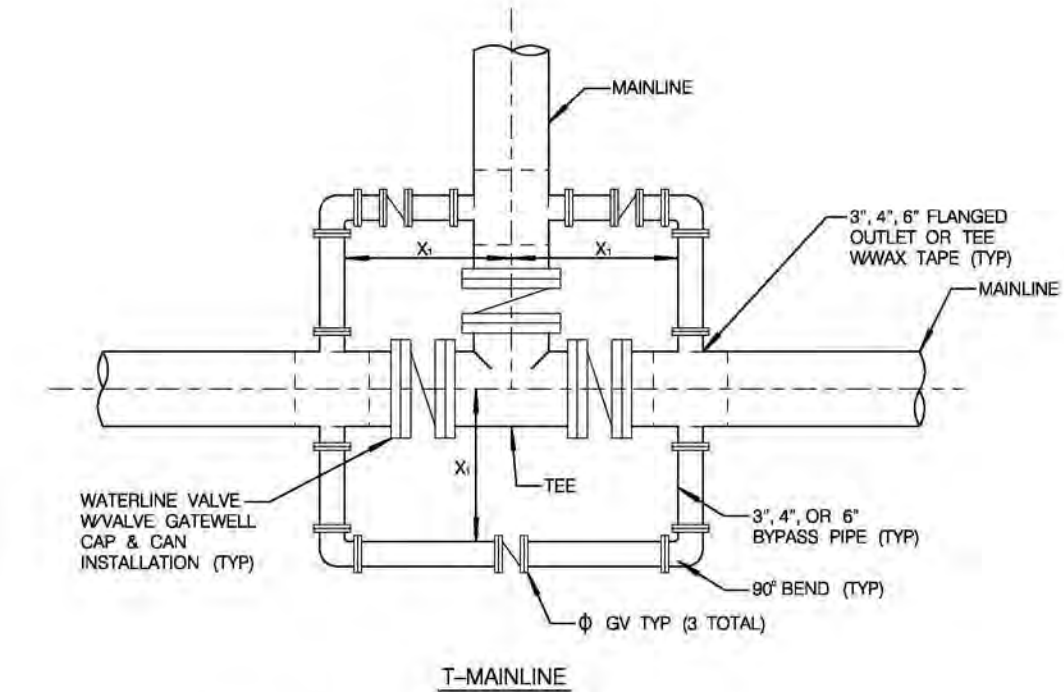
- 1) VALVES DEEPER THAN 6' REQUIRE A VALVE STEM EXTENSION
- 2) EXTENSION STEMS SHALL NOT BE ATTACHED/BOLTED TO OPERATING NUT
- 3) GATE WELL AND CAP SHALL BE SET SO THAT NO MORE THAN TWO 1" ADJUSTMENT RINGS ARE USED
- 4) BFV OPERATORS TO BE LOCATED TO THE CURBLINE SIDE OF WATER MAIN
- 5) BFV'S INSTALLED AT CROSSES OR TEES REQUIRE A FLANGED DUCTILE IRON SPOOL TO BE INSTALLED BETWEEN THE FITTING AND VALVE IN ACCORDANCE WITH THE SPECIFICATIONS
- 6) FOR 8" C-900 PIPE CASING, INSTALL CAST IRON RISER VALVE WELL FRAME
- 7) CAST IRON RISER RING HEIGHT TO MATCH OVERLAY THICKNESS NO MORE THAN TWO (2) RINGS ARE USED.



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	GATE WELL WITH CAP PER SDW-152	⑤	RESILIENT WEDGE GATE VALVE
②	VALVE STEM EXTENSION SEE NOTES 1 & 2	⑥	WATER MAIN
③	8" OD x 18" STEEL CASING x REQUIRED LENGTH (OPTIONAL 8" C 900 x LENGTH).	⑦	VALVE WELL FRAME SET TO SLOPE OF STREET
④	BUTTERFLY VALVE	⑧	CALDER COUPLING (FOR PVC WELL)

REVISION	BY	APPROVED	DATE	<p>CITY OF SAN DIEGO – STANDARD DRAWING</p> <p>GATE WELL CAP & CAN INSTALLATION FOR VALVES 4" AND LARGER</p>	<p>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</p> <p><i>CA Bringer</i> 2/25/16 COORDINATOR R.C.E. 56523 DATE</p> <p>DRAWING NUMBER SDW-153</p>
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	12/12		
UPDATED	KA	J. NAGELVOORT	5/13		
UPDATED	HM	J. NAGELVOORT	02/16		



NOTES:

1. BYPASS SHALL BE SAME CLASS AS MAINLINE PIPE.
2. THE VALVE SHALL BE THE SAME SIZE AS THE BYPASS PIPE.
3. SEE THE APPROVED WORKING DRAWINGS FOR X_1 AND X_2 .

MAIN SIZE	BYPASS SIZE
16" TRANSMISSION	3"
> 16" AND ≤ 36"	4"
> 36"	6"

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	KA	J. NAGELVOORT	12/12

CITY OF SAN DIEGO – STANDARD DRAWING

WATER VALVE BYPASS DETAILS FOR MAINLINES 16" AND LARGER

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

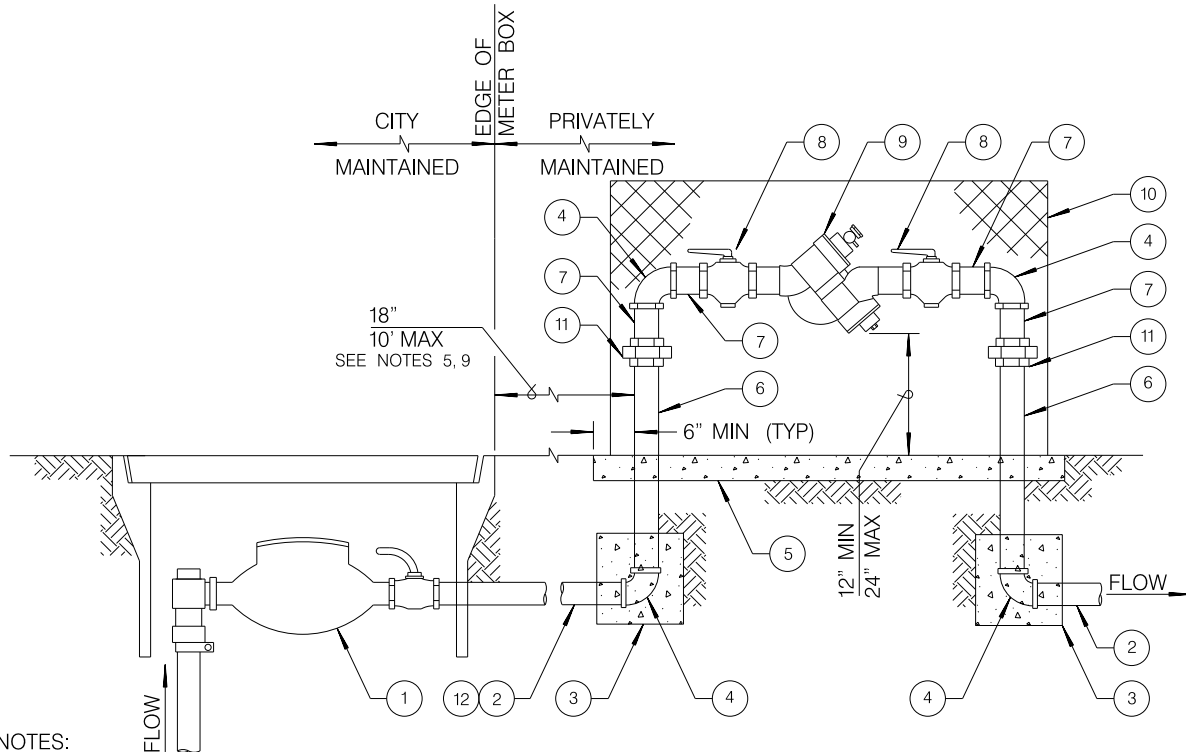
H. Krali

12/17/2012

COORDINATOR R.C.E. 65271 DATE

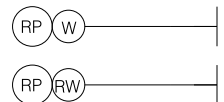
DRAWING
NUMBER

SDW-154



NOTES:

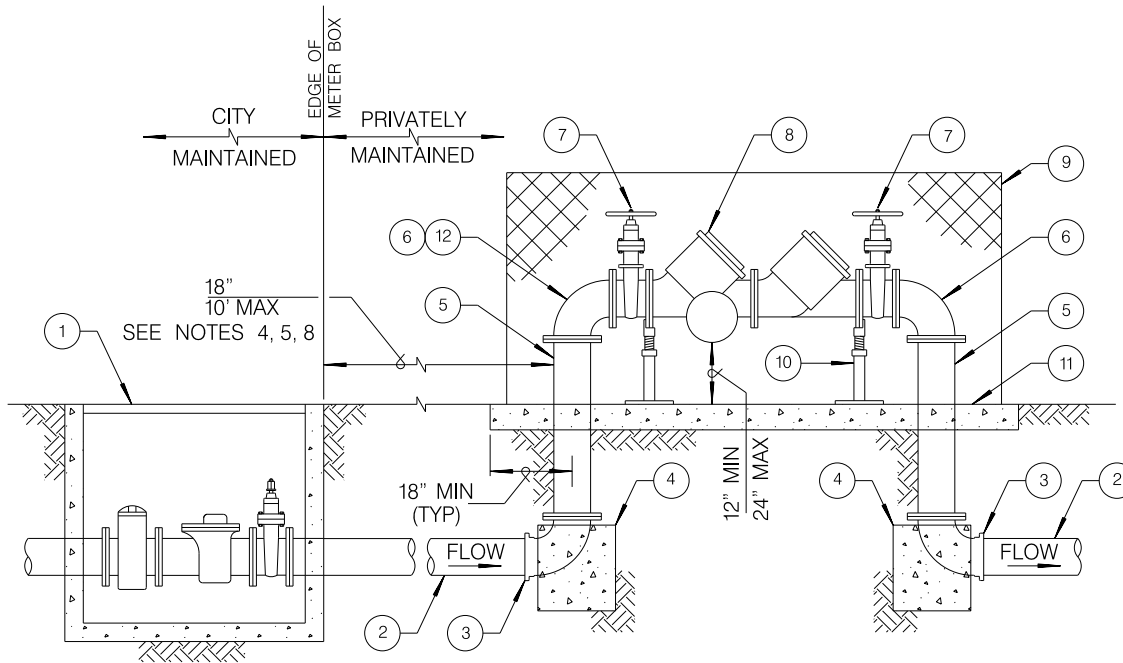
- 1) INSTALL WARNING/IDENTIFICATION TAPE PER SDM-105.
- 2) LOCATE BACKFLOW PREVENTION ASSEMBLY IN SUCH A MANNER THAT WILL ALLOW THE ASSEMBLY TO BE READILY ACCESSIBLE FOR INSPECTION AND REPAIR.
- 3) STRAINERS SHALL NOT BE INSTALLED PRIOR TO THE FIRST SHUT-OFF VALVE.
- 4) ALL ABOVE GROUND PIPING, UNIONS, ELBOWS, & NIPPLES SHALL BE SOLDERED COPPER OR THREADED BRASS.
- 5) INSTALL A CASING ENCASED IN CONCRETE WHEN THE DISTANCE BETWEEN THE METER BOX AND THE RISER TO THE ASSEMBLY EXCEEDS 18", REQUIRES APPROVAL.
- 6) INSTALL A PRESSURE REDUCING VALVE UPSTREAM OF THE FIRST 90 DEGREE ELL WHEN SYSTEM PRESSURE EXCEEDS 150 PSI.
- 7) TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SPECIFICATIONS PRIOR TO ACCEPTANCE.
- 8) BACKFLOW PREVENTION ASSEMBLY & APPURTENANCES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS.
- 9) PUBLIC UTILITIES DEPARTMENT, CROSS CONNECTION CONTROL UNIT MUST APPROVE LOCATION. SHOW ON PLANS.
- 10) ALL RISER ELBOWS AND UNDERGROUND PIPING SHALL BE TYPE (L) OR (M) COPPER, OR RED BRASS.



LEGEND ON PLANS

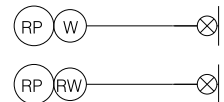
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	METER BOX & METER ASSEMBLY PER SDW-149 & SDW-150	8	BALL VALVE "SHUT-OFF"
2	SCHEDULE 80 PVC, RED BRASS OR COPPER PIPE	9	APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY SIZED TO MATCH METER
3	CONCRETE THRUST BLOCK PER SDW-151	10	ENCLOSURE SHALL BE INSTALLED LEVEL AND PLUMB. ENCLOSURE IS REQUIRED.
4	90 DEGREE BRASS ELL SEE NOTES 4 & 6	11	UNIONS SEE NOTE 4
5	CONCRETE SLAB, MINIMUM 4" THICK x 18" WIDE	12	PRESSURE REDUCING VALVE SEE NOTES 4 & 6
6	BRASS OR COPPER PIPE SEE NOTE 4		
7	3" LONG NIPPLE SEE NOTE 4		

REVISION	BY	APPROVED	DATE	<p>CITY OF SAN DIEGO – STANDARD DRAWING</p> <p>BACKFLOW PREVENTER FOR 3/4" TO 2" METERED SERVICE</p>	<p>RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE</p> <p><i>Chung</i> 2/24/16 COORDINATOR R.C.E. 56523 DATE</p> <p>DRAWING NUMBER SDW-155</p>
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	12/12		
UPDATED	FG	J. NAGELVOORT	08/15		
UPDATED	FG	J. NAGELVOORT	02/16		




NOTES:

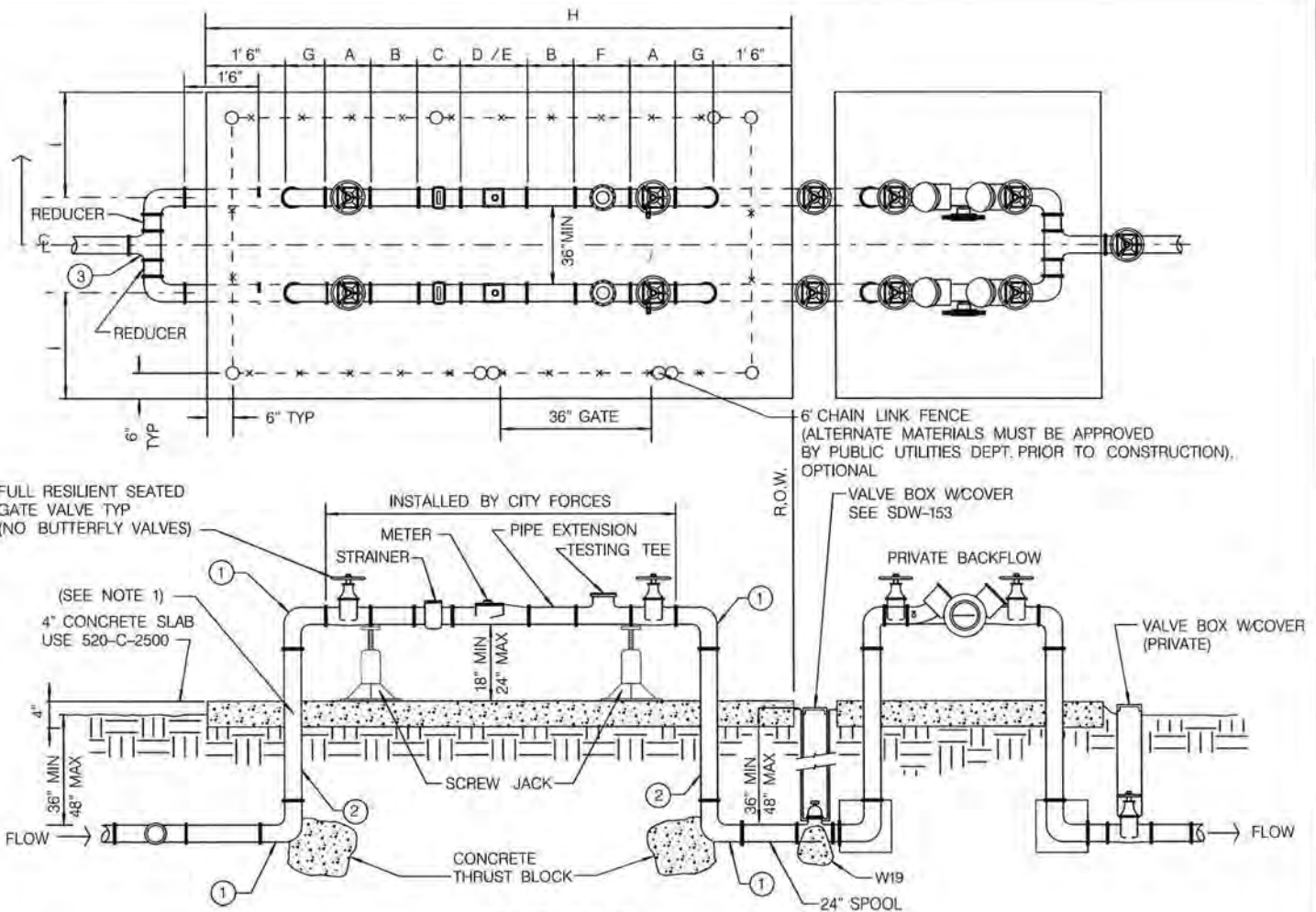
- 1) INSTALL WARNING/IDENTIFICATION TAPE PER SDM-105.
- 2) LOCATE BACKFLOW PREVENTION ASSEMBLY IN SUCH A MANNER THAT WILL ALLOW THE ASSEMBLY TO BE READILY ACCESSIBLE FOR INSPECTION AND REPAIR
- 3) STRAINERS SHALL NOT BE INSTALLED PRIOR TO THE FIRST SHUT-OFF VALVE
- 4) INSTALL A CASING ENCASED IN CONCRETE WHEN THE DISTANCE BETWEEN THE METER BOX AND THE RISER TO THE ASSEMBLY EXCEEDS 18", REQUIRES APPROVAL.
- 5) INSTALL A PRESSURE REDUCING VALVE UPSTREAM OF THE BACKFLOW ASSEMBLY WHEN SYSTEM PRESSURE EXCEEDS 150 PSI.
- 6) TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SPECIFICATIONS PRIOR TO ACCEPTANCE
- 7) BACKFLOW PREVENTION ASSEMBLY & APPURTENANCES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS
- 8) PUBLIC UTILITIES DEPARTMENT CROSS CONNECTION CONTROL UNIT MUST APPROVE LOCATION AS SHOWN ON PLANS.



LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	METER VAULT & METER ASSEMBLY PER WS-04	8	APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY
2	MINIMAL SCHEDULE 80 PVC OR DUCTILE IRON PIPE	9	SIZED TO MATCH METER
3	FLG x FLG OR MJPO x FLG 90 DEGREE BEND	10	ENCLOSURE SHALL BE INSTALLED LEVEL AND PLUMB.
4	CONCRETE THRUST BLOCK PER SDW-151	11	ENCLOSURE IS REQUIRED.
5	FLANGED DUCTILE IRON PIPE	12	ADJUSTABLE VALVE SUPPORT
6	FLANGED 90 DEGREE BEND, SEE NOTE 5		CONCRETE SLAB, MINIMUM 4" THICK x 36" WIDE
7	FLANGED RESILIENT WEDGE GATE VALVE		FLANGED ANGLE PRESSURE REDUCING VALVE SEE NOTE 5

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	FG	J. NAGELVOORT	08/15		
UPDATED	FG	J. NAGELVOORT	02/16		
				BACKFLOW PREVENTER FOR 3" AND LARGER METERED SERVICE	COORDINATOR  R.C.E. 56523
					2/24/16 DATE
					DRAWING NUMBER SDW-156



NOT TO SCALE

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 MINIMUM 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 SHALL HAVE PUBLIC UTILITIES DEPARTMENT APPROVAL.
3. PIPING SHALL BE SYMMETRICAL TO SLAB CENTERLINE.
4. SUPPLY PIPE IS ONE COMMERCIAL SIZE LARGER THAN PROPOSED METER.
5. CONCRETE SLAB AND FENCE SHALL BE INSTALLED BY CONTRACTOR.
6. CONTACT CORROSION CONTROL SECTION FOR CORROSION REQUIREMENTS.
7. ALL METAL IN CONTACT WITH CONCRETE SHALL BE POLYETHYLENE WRAPPED USING 2" WIDE PLASTIC BACKED ADHESIVE TAPE 8 MILS THICK WITH 12" OVERLAP.
8. BACKFLOW SHALL BE INSTALLED IMMEDIATELY DOWNSTREAM FROM METER UNLESS APPROVED BY THE CITY CROSS-CONNECTION SPECIALIST.
9. BACKFLOW PREVENTERS SHALL BE REDUCED PRESSURE PRINCIPLE (RP) ASSEMBLY. (INSTALLED ABOVE GRADE AS CLOSE TO METER AS POSSIBLE) BACKFLOW LOCATION MUST BE APPROVED BY THE CROSS-CONNECTION CONTROL SECTION OF THE PUBLIC UTILITIES DEPT.

ITEMS CALL OUT:

- 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 SHALL BE EQUAL TO THE DIAMETER OF THE SUPPLY PIPE.

SHEET 1 OF 2

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	12/12

CITY OF SAN DIEGO - STANDARD DRAWING

DUAL ABOVE GROUND METER WITH PRIVATE BACKFLOW

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

H. H. H. H. 12/17/2012
COORDINATOR R.C.E. 65271 DATE

DRAWING
NUMBER

SDW-157

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 *					
I	SLAB TO C/L PIPE	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"

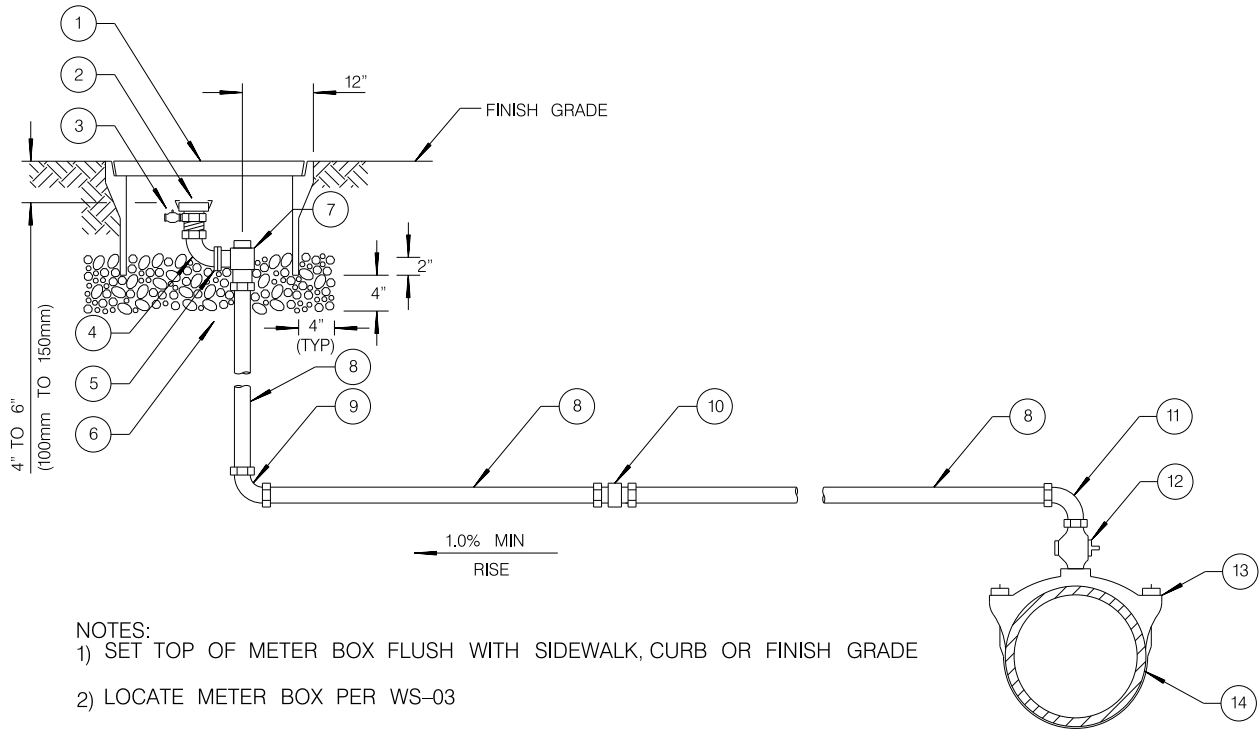
* NOTES:

INDIVIDUAL DIMENSIONS MAY VARY PER MANUFACTURER OVERALL
DIMENSIONS INCREASE WITH USE OF THESE COMPONENTS

DIMENSION CHART FOR METER ASSEMBLIES

SHEET 2 OF 2

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO - STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	12/12		 COORDINATOR
				DUAL ABOVE GROUND METER WITH PRIVATE BACKFLOW	12/17/2012 R.C.E. 65271 DATE
					DRAWING
					NUMBER
					SDW-157

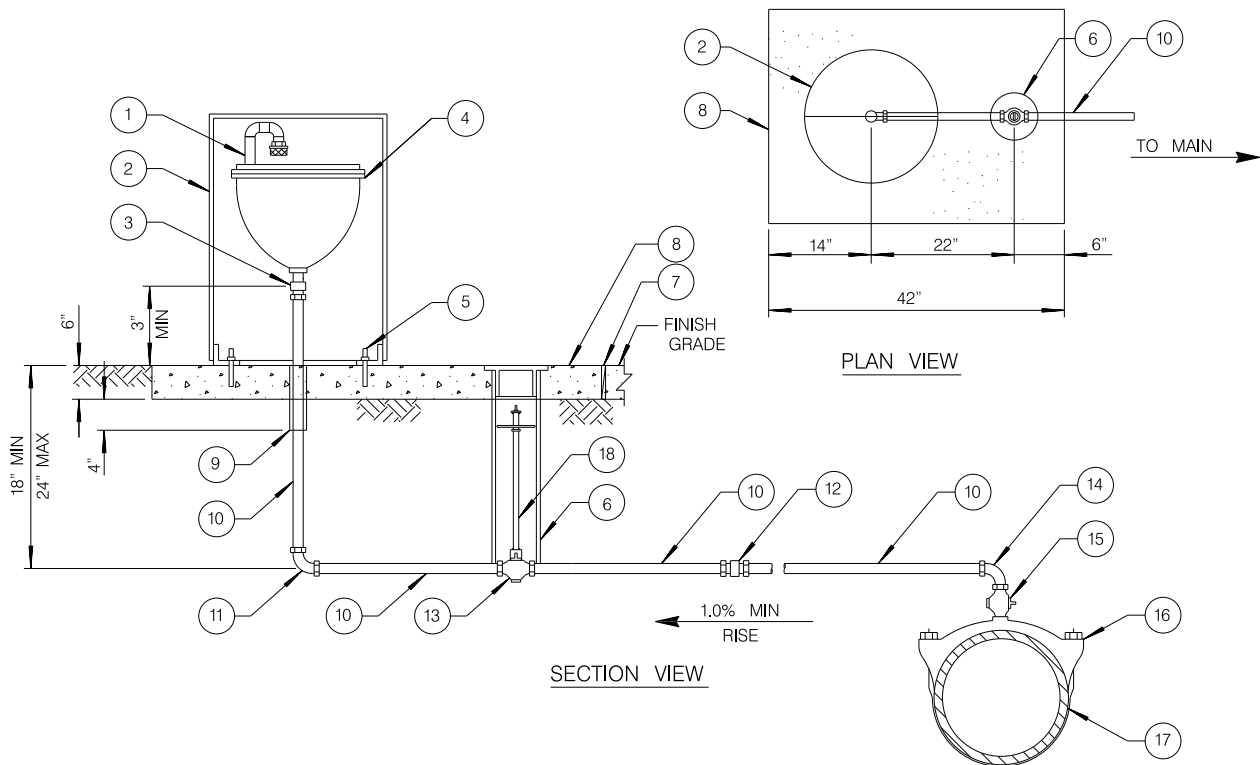


- NOTES:
- 1) SET TOP OF METER BOX FLUSH WITH SIDEWALK, CURB OR FINISH GRADE
 - 2) LOCATE METER BOX PER WS-03
 - 3) INSTALL WARNING/IDENTIFICATION TAPE PER SDM-105
 - 4) MANUAL AIR VALVE INSTALLATION AT END OF MAIN TO BE SADDLED 24" FROM END CAP
 - 5) MANUAL AIR VALVE ASSEMBLIES INSTALLED FOR THE USE OF RECYCLED WATER SHALL BE IDENTIFIED AS DESCRIBED IN SPECIFICATIONS
 - 6) ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED)
 - 7) CAM & GROOVE ADAPTER SHALL BE DRILLED AND TAPPED AS REQUIRED FOR THE PRESSURE RELEASE PET COCK

2"
LEGEND ON PLANS

ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	POLYMER METER BOX WITH LID 17" x 30", SEE NOTE 2	7	2" BRONZE COMP x FLG ANGLE METER STOP WITH LOCK WING
2	2" CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 7	8	2" x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT
3	1/4" PRESSURE PET COCK	9	2" 90° BRONZE COMPRESSION ELL
4	2" 90° BRONZE MIPT x FIPT ELL	10	2" BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
5	2" OVAL METER FLANGE FLG x FIPT, WITH GASKET	11	2" 90° BRONZE FIPT x COMP ELL
6	3/8" ROCK 4" TO 6" DEEP	12	2" BRONZE MIPT x MIPT CORPORATION STOP
		13	SIZE x 2" SERVICE SADDLE
		14	WATER MAIN

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL*	KA	J. NAGELVOORT	01/12		 COORDINATOR R.C.E. 56523	2/25/16 DATE
UPDATED	AR	J. NAGELVOORT	10/15			
UPDATED	HM	J. NAGELVOORT	02/16			
				2" MANUAL AIR VALVE	DRAWING NUMBER	
					SDW-158	



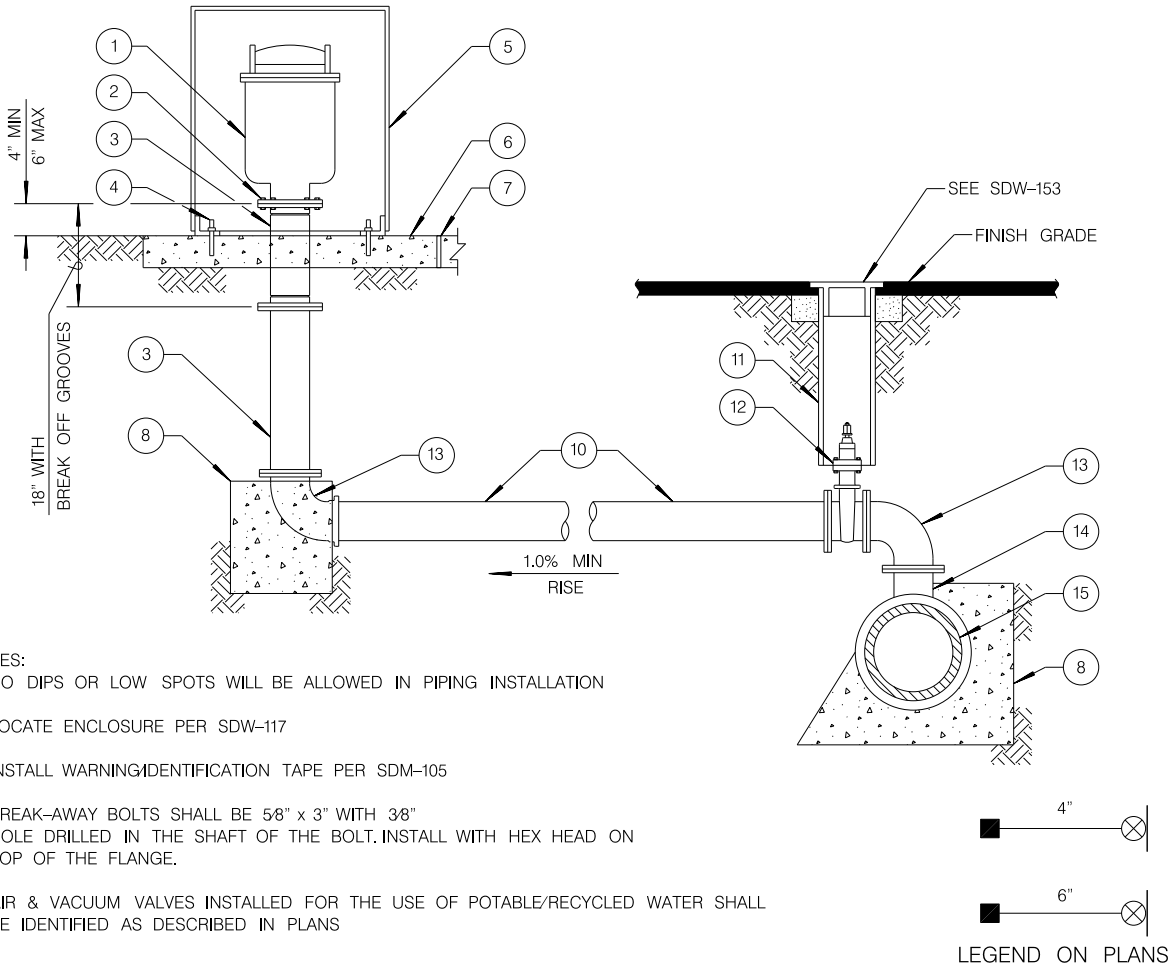
NOTES:

1. NO DIPS OR LOW SPOTS WILL BE ALLOWED IN INSTALLATION.
2. LOCATE ENCLOSURE PER SDW-117.
3. INSTALL WARNING/IDENTIFICATION TAPE PER SDM-105.
4. AIR & VACUUM INSTALLED FOR THE USE OF POTABLE/RECYCLED WATER SHALL BE SHOWN ON THE PLANS.
5. ON STEEL MAINS USE WELD ON COUPLINGS, ON DUCTILE IRON MAINS USE DUCTILE IRON SERVICE SADDLES (INSULATING BUSHINGS ARE REQUIRED).


2"
LEGEND ON PLANS

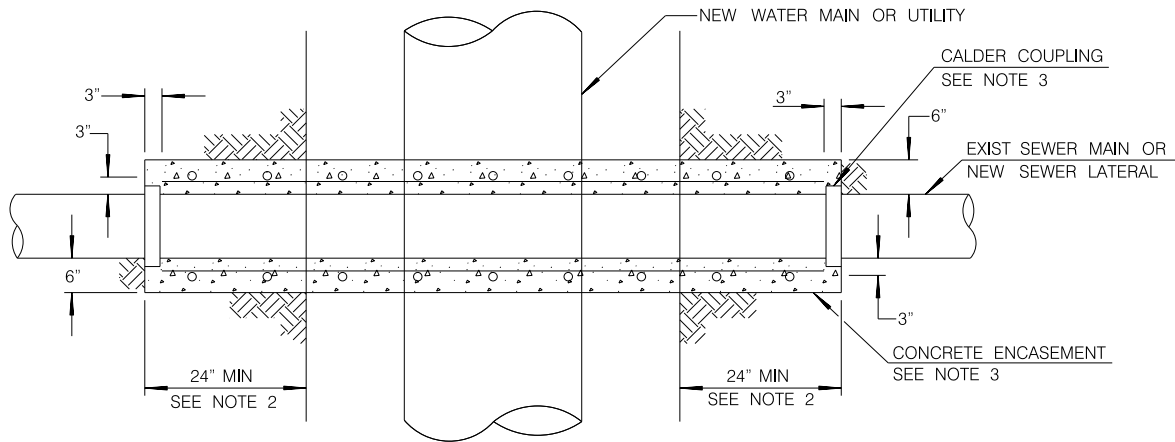
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	2" PVC SCH 80 CLOSE NIPPLE & 2-SCH 80 STREET ELLS& INSECT SCREEN	9	2" X 12" BLACK FOAM SLEEVE
2	APPROVED VALVE ENCLOSURE	10	COPPER TUBING
3	2" MIPT X COMPRESSION ADAPTER	11	90° ELL (NO SWEAT, NO GLUED JOINTS ALLOWED)
4	2" AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE	12	2" BRONZE COMPRESSION COUPLING COPPER TO COPPER (IF REQUIRED)
5	1/2" X 3" STAINLESS STEEL DROP-IN ANCHORS (3 EA @120° APART)	13	2" COMP BALL VALVE W/TEE HEAD
6	8", 3/8" STEEL GATE CASING WELL WITH CAP	14	2" 90° BRONZE FIPT X COMP ELL
7	COLD JOINT STRIP	15	2" BRONZE MIPT X MIPT CORPORATION STOP
8	3'-6" X 2'-6" X 6" THICK CONCRETE SLAB	16	SIZE X 2" SERVICE SADDLE
		17	WATER MAIN
		18	VALVE STEM EXTENSION

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE	
ORIGINAL*	KA	J. NAGELVOORT	01/12			2/25/16
UPDATED	KA	J. NAGELVOORT	09/13	2" AUTOMATIC COMBINATION AIR RELEASE & AIR/ VACUUM VALVE INSTALLATIONS	COORDINATOR	R.C.E. 56523
UPDATED	BB	J. NAGELVOORT	09/14			DATE
UPDATED	AR	J. NAGELVOORT	11/15			
UPDATED	HM	J. NAGELVOORT	02/16			
					DRAWING NUMBER	SDW-159

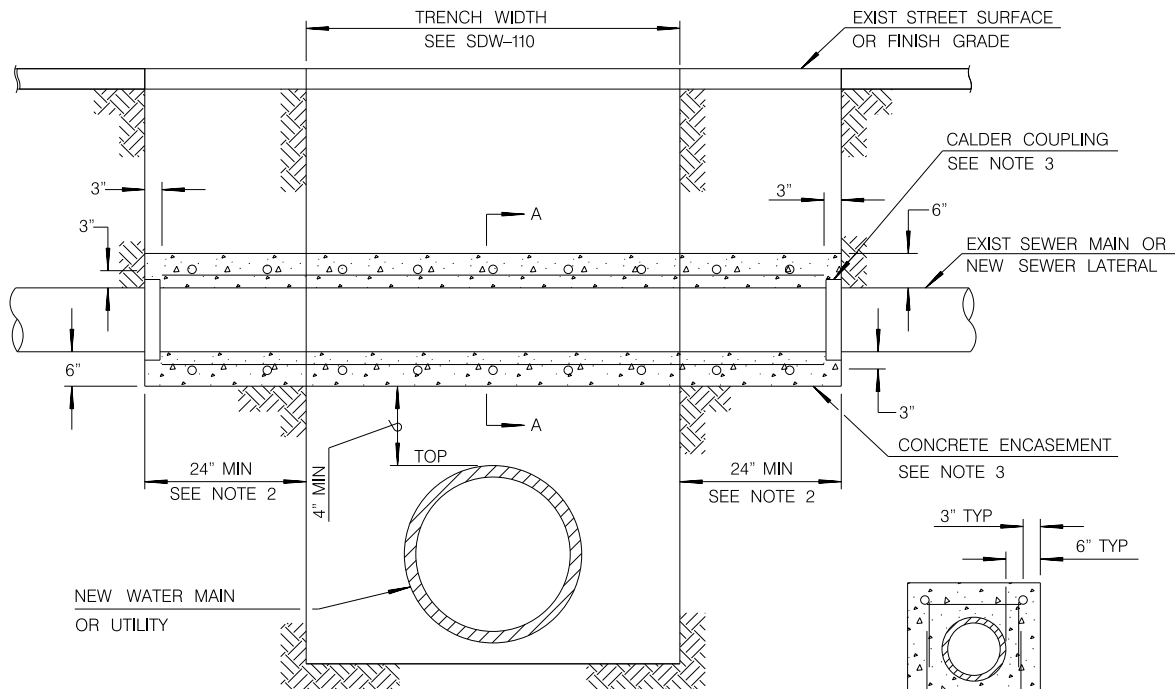


ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
1	4" OR 6" AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE ASSEMBLY	10	4" OR 6" C-900 PVC PIPE
2	BREAK-AWAY BOLTS, SEE NOTE 4	11	GATE WELL WITH CAP PER SDW-153
3	4" OR 6" FLANGED 8-BOLT DUCTILE IRON PIPE x REQ'D LENGTH (MAX OF 2 SPOOLS)	12	4" OR 6" FLG x MJ /FLG RWGV
4	5/8" x 3" STAINLESS STEEL DROP-IN ANCHORS (3 EA @ 120" APART)	13	4" OR 6" FLANGE 90° BEND
5	VALVE ENCLOSURE	15	SIZE x 4" OR 6" MJ /FLG x FLG TEE
6	42" x 42" x 6" THICK CONCRETE SLAB	16	WATER MAIN
7	COLD JOINT STRIP		
8	CONCRETE THRUST/ANCHOR BLOCK		
9	4" OR 6" FLG x MJ/PO 90° BEND		

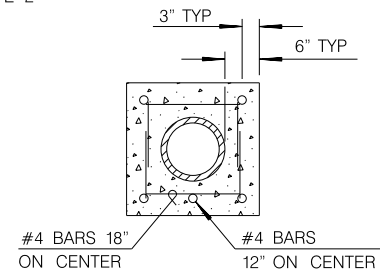
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING 4" & 6" AUTOMATIC COMBINATION AIR RELEASE & AIR/VACUUM VALVE INSTALLATIONS	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE  COORDINATOR R.C.E. 56523 2/25/16 DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	12/12		
UPDATED	AR	J. NAGELVOORT	11/15		
UPDATED	HM	J. NAGELVOORT	02/16		
					DRAWING NUMBER SDW-160



PLAN



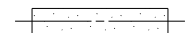
ELEVATION



ENCASEMENT SECTION A-A

NOTES:

- 1) REFER TO SPECIFICATIONS FOR PROTECTION OF EXISTING FACILITIES
- 2) ENCASEMENT SHALL EXTEND TO FIRST JOINT BEYOND BOTH SIDES OF TRENCH [24" MIN 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 OTHER STANDARD DRAWINGS.



LEGEND ON PLANS

REVISION	BY	APPROVED	DATE
ORIGINAL*	KA	J. NAGELVOORT	01/12
UPDATED	AR	J. NAGELVOORT	02/16

CITY OF SAN DIEGO – STANDARD DRAWING

**PIPE SUPPORT FOR UNDERCUT
SEWER MAINS OR SEWER LATERALS**

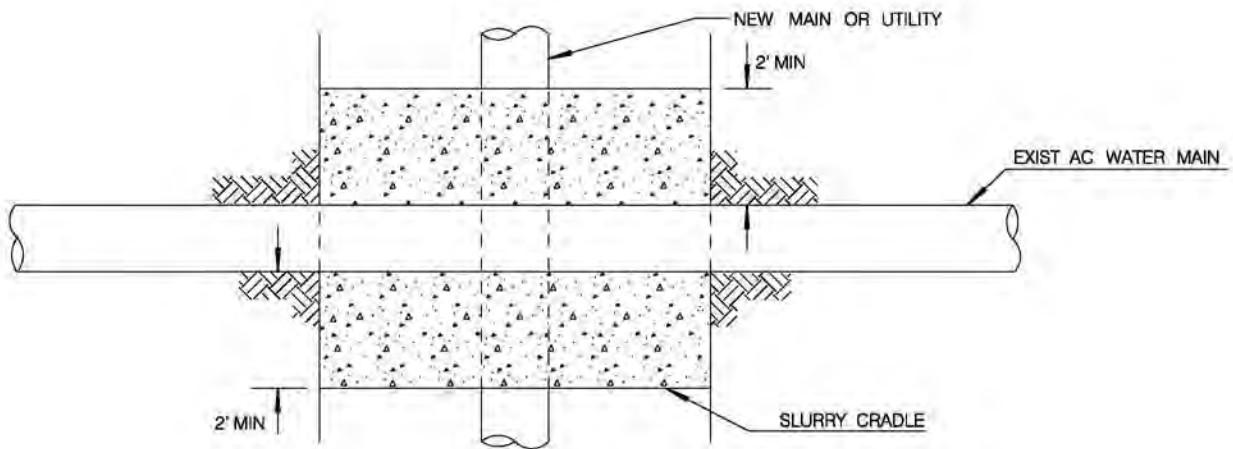
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

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COORDINATOR R.C.E. 56523

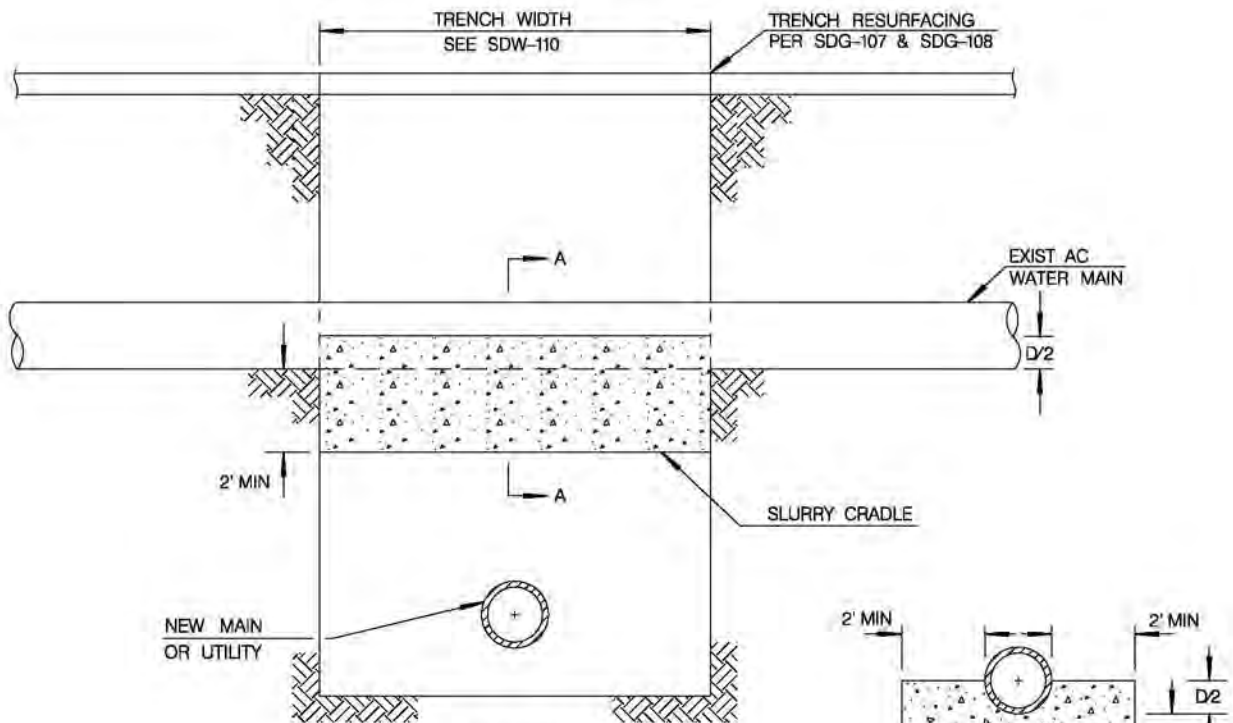
2/25/16
DATE

DRAWING
NUMBER

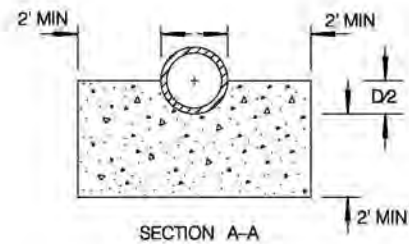
SDW-161



PLAN



ELEVATION



SECTION A-A

NOTES:

- 1) SLURRY SHALL BE CONTROLLED LOW STRENGTH MATERIAL CLSM (100-E-100)
- 2) SLURRY SHALL BE PLACED ON FIRMLY COMPACTED BACKFILL

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12

CITY OF SAN DIEGO – STANDARD DRAWING

**PIPE SUPPORT FOR UNDERCUT
AC WATER MAIN**

RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

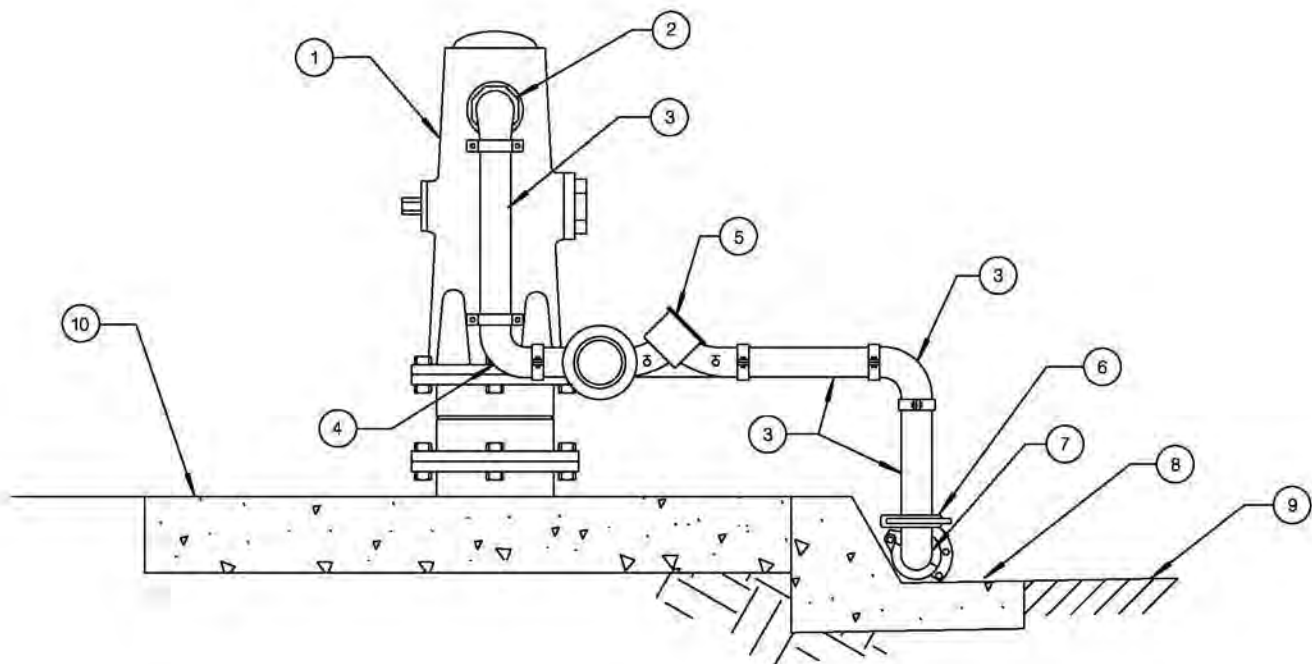
H. Hadli

1/31/2012

COORDINATOR R.C.E. 65271 DATE

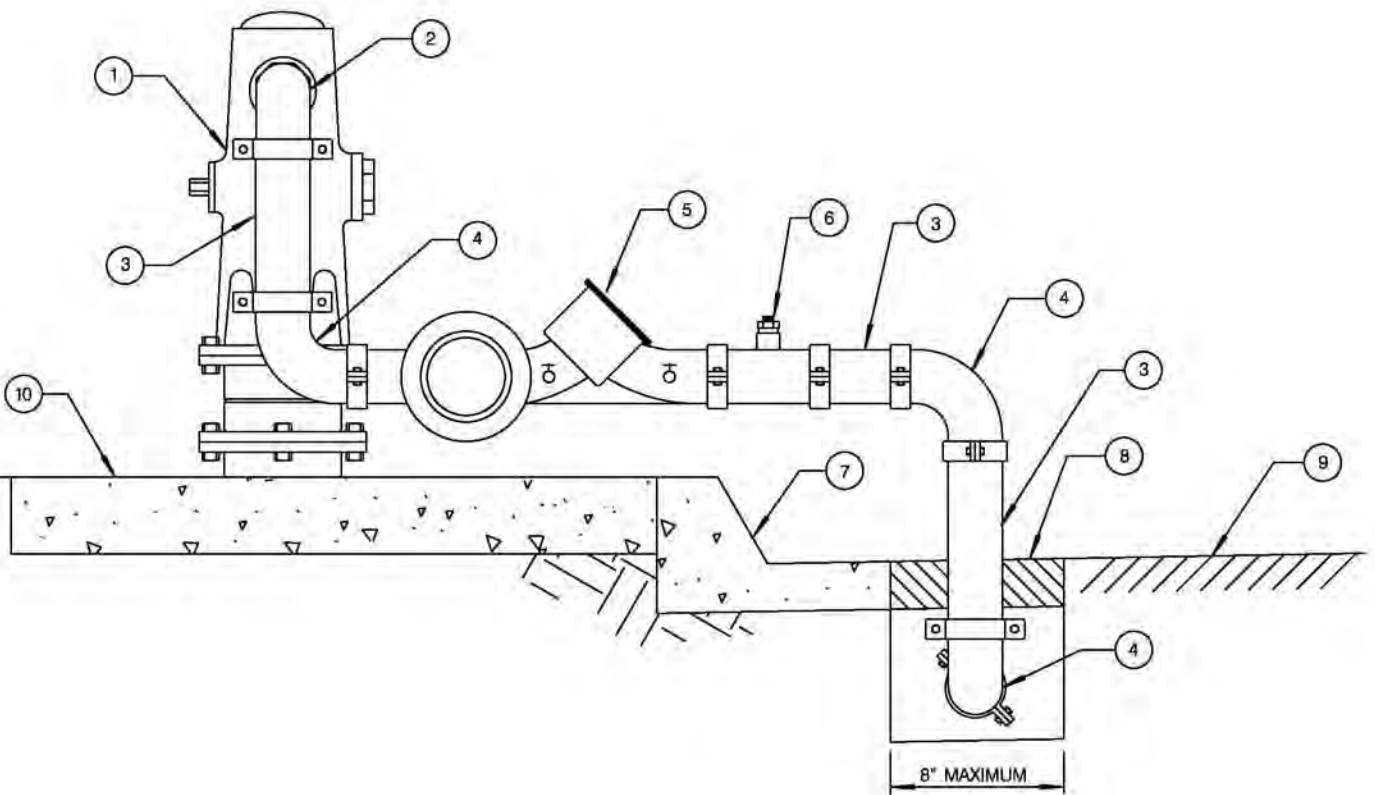
DRAWING
NUMBER

SDW-162



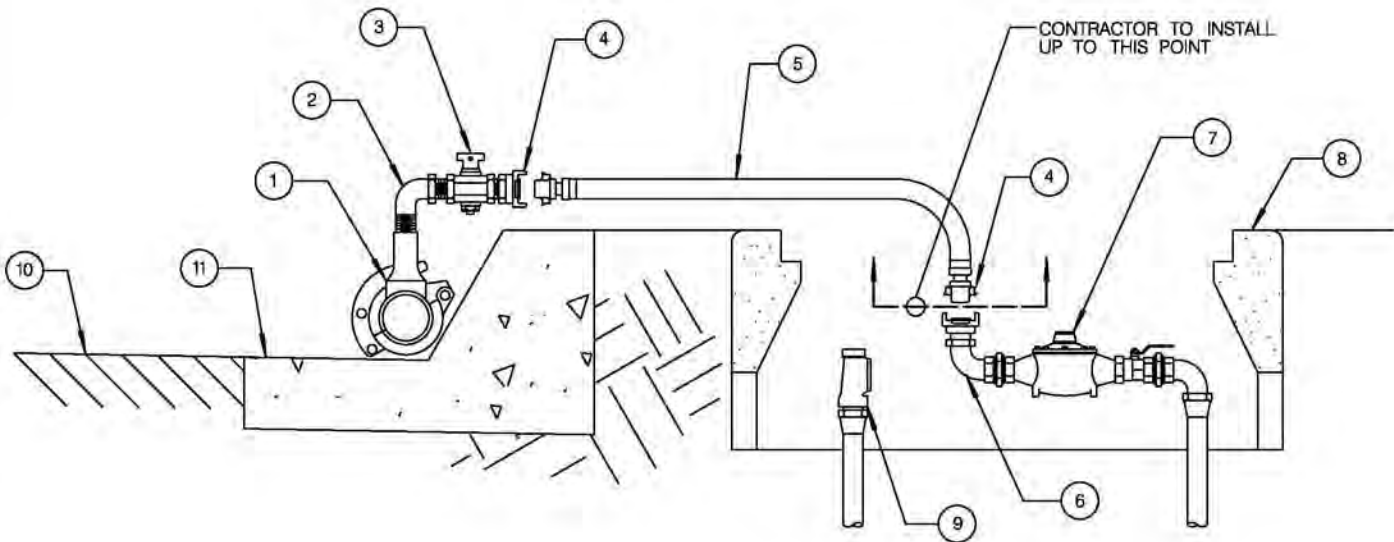
- | | |
|---|--|
| <p>① EXISTING 2-PART FIRE HYDRANT</p> <p>② 2 1/2" PORT TO 2" ADAPTER ELBOW W/THREADED FITTING</p> <p>③ 2" PIPE (GROOVED)</p> <p>④ 2" 90° ELBOW W/THREADED JOINT FITTINGS</p> <p>⑤ 2" BACKFLOW PREVENTER (ONE WAY CHECK VALVE) W/THREADED JOINT FITTINGS</p> <p>⑥ SNAP-JOINT COUPLING (2-GROOVE)</p> | <p>⑦ 2" TEE/90° ELBOW W/ SNAP-JOINT COUPLING(S) (2-GROOVE) W/DIRECTIONAL SHUT OFF VALVE(S) (NOT SHOWN)</p> <p>⑧ EXISTING CURB & GUTTER</p> <p>⑨ EXISTING ROADWAY</p> <p>⑩ EXISTING CONCRETE PAD/SIDEWALK</p> |
|---|--|

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadi</i> COORDINATOR R.C.E. 65271 DATE 12/17/2012
ORIGINAL	KA	J. NAGELVOORT	01/12		
UPDATED	KA	J. NAGELVOORT	12/12	2" FIRE HYDRANT HIGHLINING CONNECTION	DRAWING NUMBER SDW-170



- | | | | |
|---|--|---|---|
| ① | EXISTING 3-PORT FIRE HYDRANT | ⑥ | 4" SHUTOFF VALVE
W/THREADED JOINT FITTINGS |
| ② | PORT ADAPTER ELBOW
W/THREADED JOINT FITTING | ⑦ | EXISTING CURB & GUTTER |
| ③ | PIPE (GROOVED) | ⑧ | SAW CUT ROADWAY, TRENCH,
BACKFILL AND TEMPORARY
ASPHALT SURFACE |
| ④ | 90° ELBOW W/THREADED
JOINT FITTINGS | ⑨ | EXISTING ROADWAY |
| ⑤ | 4" BACKFLOW PREVENTER
W/THREADED JOINT FITTINGS | ⑩ | EXISTING CONCRETE PAD/SIDEWALK |

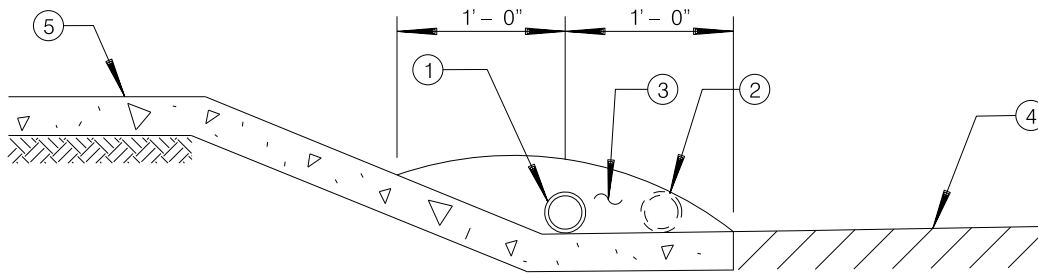
REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE <i>H. Hadli</i> 1/31/2012 COORDINATOR R.C.E. 66271 DATE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				4" FIRE HYDRANT HIGHLINING CONNECTION	DRAWING NUMBER SDW-171



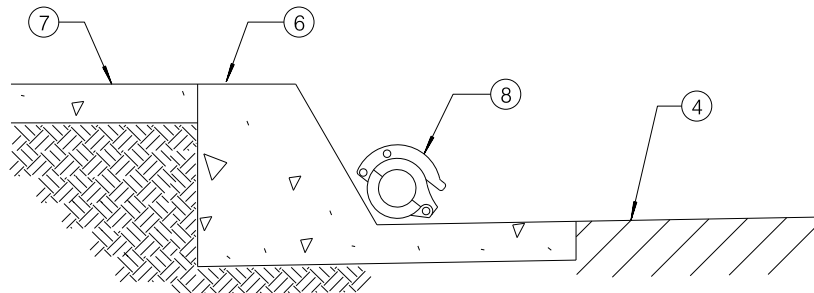
- ① GROOVED 2"x2"x1" TEE W/SNAP-JOINT COUPLING (2-GROOVE)
- ② 1" 90° ELBOW W/THREADED JOINT FITTINGS
- ③ 1" SHUTOFF VALVE W/THREADED JOINT FITTINGS
- ④ 1" PIPE TO HOSE ADAPTER
- ⑤ 1" CONNECTION HOSE

- ⑥ 1" 90° ELBOW TO METER THREADS (ADAPTERS MAY BE REQUIRED)
- ⑦ EXISTING WATER METER
- ⑧ EXISTING WATER METER BOX
- ⑨ EXISTING SERVICE CONNECTION FROM WATER MAIN
- ⑩ EXISTING ROADWAY
- ⑪ EXISTING CURB & GUTTER

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	KA	J. NAGELVOORT	01/12		
				RESIDENTIAL USER HIGHLINING CONNECTION	 COORDINATOR R.C.E. 65271 DATE 1/31/2012
					DRAWING NUMBER SDW-172



DRIVEWAY HIGHLINING CROSSING



CURB AND GUTTER HIGHLINING RUN

- | | | | |
|---|------------------------------|---|--|
| ① | HIGHLINE PIPING | ⑤ | EXISTING DRIVEWAY |
| ② | DRAIN PIPING | ⑥ | EXISTING CURB & GUTTER |
| ③ | TEMPORARY ASPHALT (COLD MIX) | ⑦ | EXISTING SIDEWALK |
| ④ | EXISTING ROADWAY | ⑧ | HIGHLINE PIPING AND SNAP COUPLING (2 GROOVE) |

NOTES:

1. THE SLOPE OF THE TEMPORARY ASPHALT OVER DRIVEWAYS SHALL BE FIRM, STABLE, SMOOTH AND SLOPED TO HAVE A GRADUAL TRANSITION TO THE STREET. THE RUNNING SLOPE SHALL NOT EXCEED 8.33%. THE CROSS SLOPE SHALL MATCH THE EXISTING GUTTER SLOPE.
2. THE MINIMUM ASPHALT COVER ON HIGHLINE PIPE SHALL BE 1 INCH.
3. SIDEWALK CROSSING MAY BE ROUTED ABOVE GROUND AND COVERED WITH ADA COMPLIANT CABLE COVER AND RAMP.

REVISION	BY	APPROVED	DATE
ORIGINAL	KA	J. NAGELVOORT	01/12
UPDATED	JB	J. NAGELVOORT	02/16

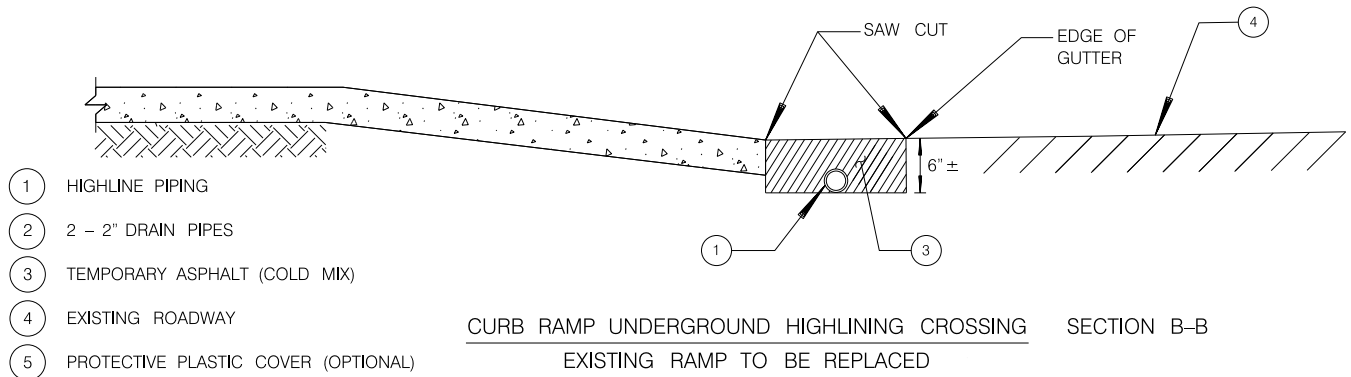
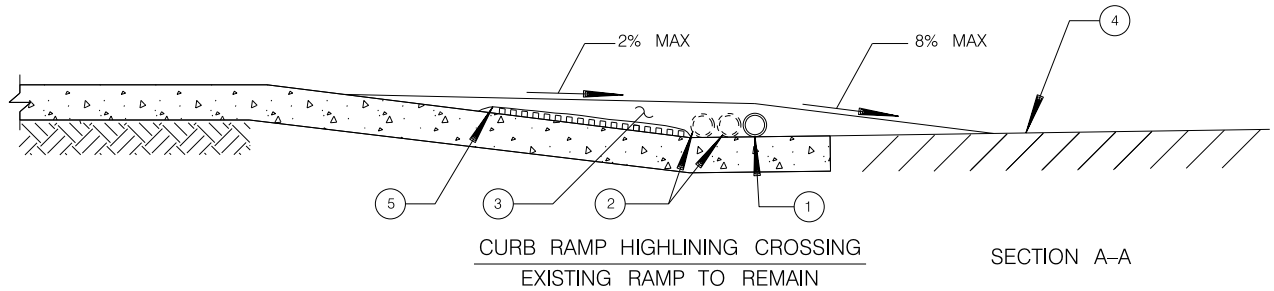
CITY OF SAN DIEGO – STANDARD DRAWING

**HIGHLINING CROSSING & RUN
AT DRIVEWAYS AND CURBS**

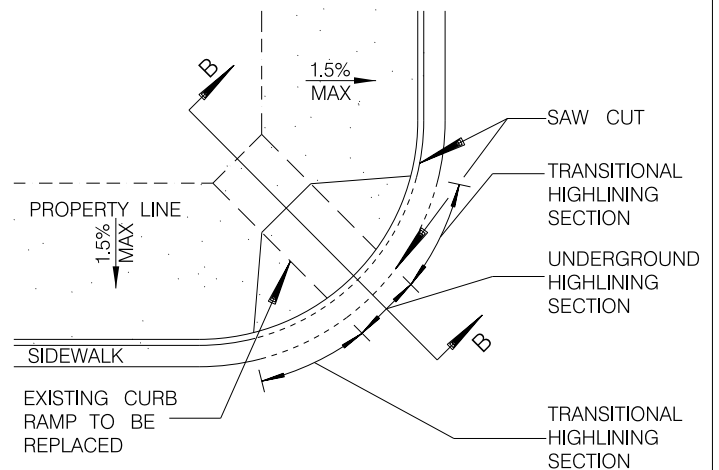
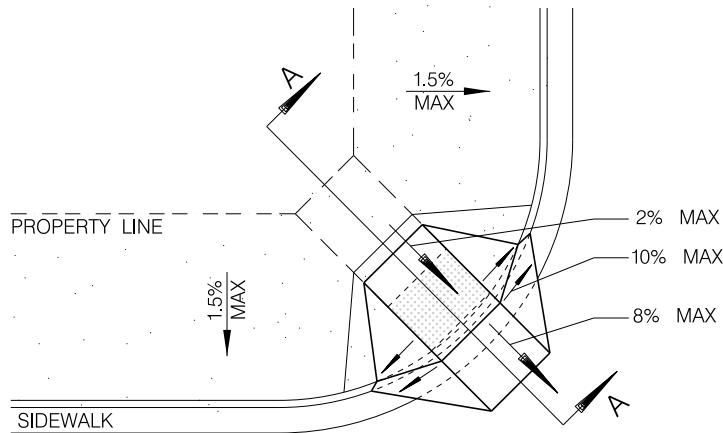
RECOMMENDED BY THE CITY OF SAN DIEGO
STANDARDS COMMITTEE

CAHingee 2/25/16
COORDINATOR R.C.E. 56523 DATE

DRAWING
NUMBER **SDW-173**



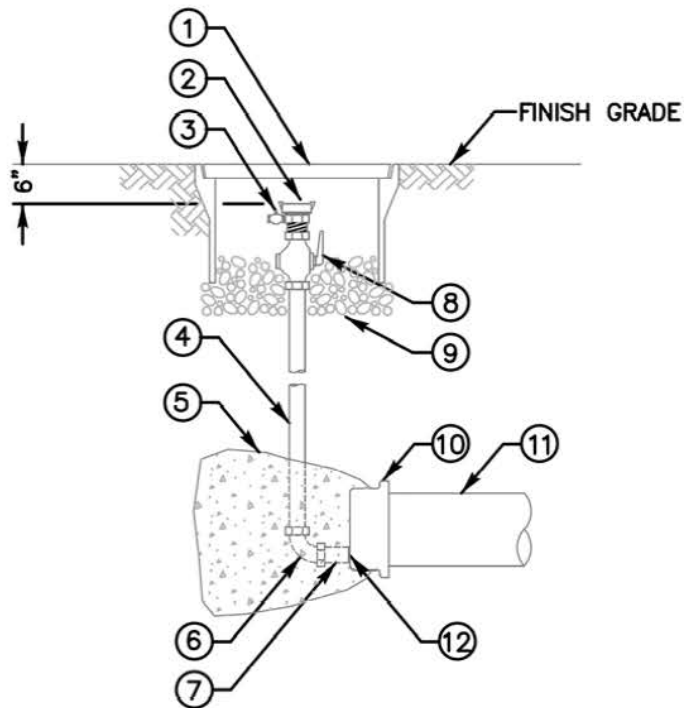
- ① HIGHLINE PIPING
- ② 2 - 2" DRAIN PIPES
- ③ TEMPORARY ASPHALT (COLD MIX)
- ④ EXISTING ROADWAY
- ⑤ PROTECTIVE PLASTIC COVER (OPTIONAL)



NOTES:

1. THE SLOPE OF THE TEMPORARY ASPHALT OVER CURB RAMPS AND OTHER ACCESSIBLE ROUTES (SIDEWALKS, WALKWAYS, ETC.) SHALL BE FIRM, STABLE, SMOOTH AND SLOPED TO HAVE A GRADUAL TRANSITION TO THE STREET. THE FINISH CONNECTION AT THE CURB RAMPS, OTHER ACCESSIBLE ROUTES AND ROAD SURFACES SHALL BE FLUSH. THE RUNNING SLOPE SHALL BE AS SHOWN ON THE DRAWING ABOVE AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%, WITH NO EXCEPTIONS.
2. THE MINIMUM ASPHALT COVER ON HIGHLINE PIPE SHALL BE 2 INCHES.
3. CURB RAMP UNDERGROUND HIGHLINING CROSSING TO BE USED ONLY WHEN EXISTING CURB RAMP IS BEING REPLACED.
4. COUPLINGS SHALL NOT BE LOCATED IN FRONT OF THE CURB RAMP.
5. HIGHLINE CROSSING THE SIDEWALK ABOVE GROUND SHALL BE COVERED WITH ADA COMPLIANT CABLE COVER AND RAMP.

REVISION	BY	APPROVED	DATE	CITY OF SAN DIEGO – STANDARD DRAWING	RECOMMENDED BY THE CITY OF SAN DIEGO STANDARDS COMMITTEE
ORIGINAL	JB	J. NAGELVOORT	02/16		
				HIGHLINING CROSSING & RUN AT CURB RAMPS	 COORDINATOR R.C.E. 56523
					2/23/16 DATE
					DRAWING NUMBER SDW-174



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) SET TOP OF METER BOX 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

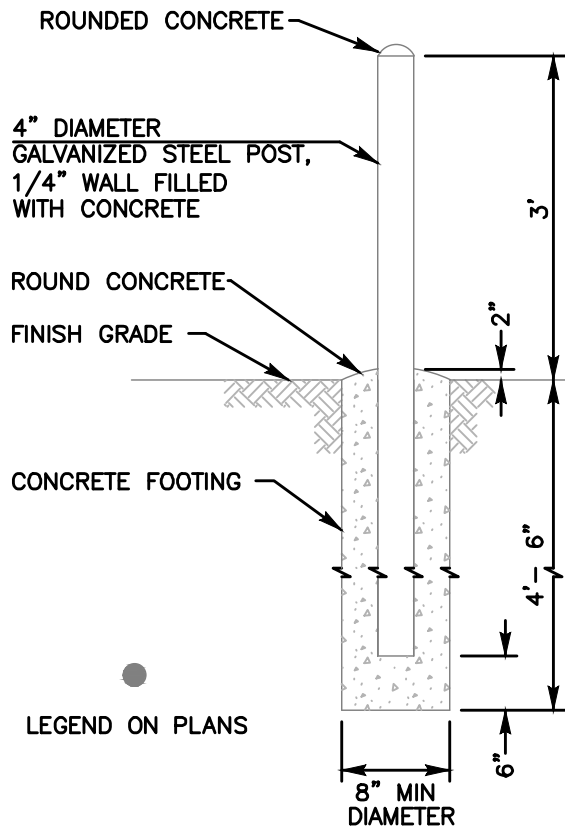
TEMP 2"

 LEGEND ON PLANS

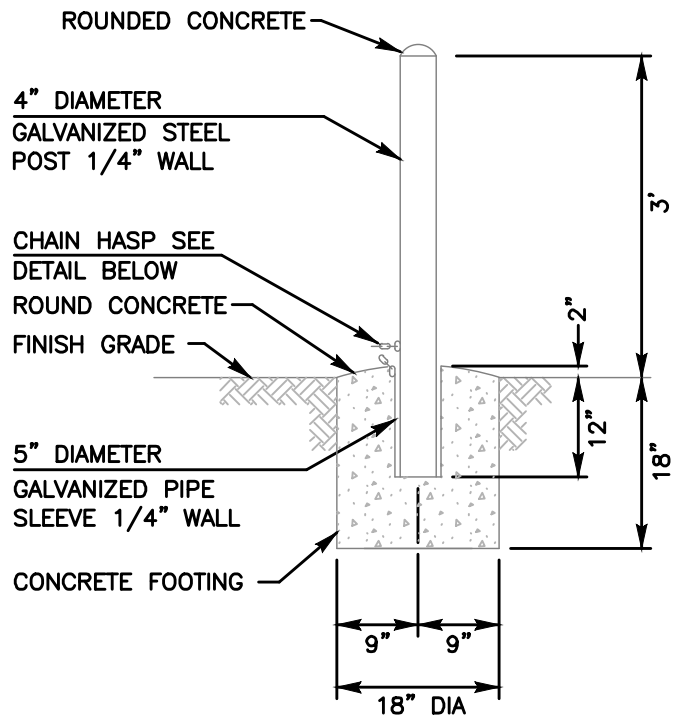
ITEM NO	SIZE AND DESCRIPTION	ITEM NO	SIZE AND DESCRIPTION
①	POLYMER METER BOX WITH LID 17" x 30"	⑥	2" 90° BRONZE IRON PIPE THREAD BY COMPRESSION ELL
②	2" CAM & GROOVE ADAPTER x MIPT WITH LOCKING DUST CAP, SEE NOTE 5	⑦	2" CLOSE NIPPLE IPT
③	1/4" PRESSURE PET COCK	⑧	2" COMPRESSION x FIPT BALL VALVE WITH HANDLE
④	2" x REQUIRED LENGTH COPPER PIPE TYPE "K" RIGID OR SOFT	⑨	3/8" ROCK 6" DEEP
⑤	CONCRETE THRUST BLOCK SEE WT-01	⑩	DI END CAP WITH 2.5" FIPT OUTLET
		⑪	WATER MAIN
		⑫	NYLON DIELECTRIC BUSHING (2.5" x 2")

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING TEMPORARY 2" BLOW-OFF INSTALLATION	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE Chairperson R.C.E. 19246 Date 7/26/2012
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03		
Replaced W-07		J. Tomasulo	10/04		
Delete Metric	MR	B. KNOLL	03/11		
					DRAWING NUMBER WB-05

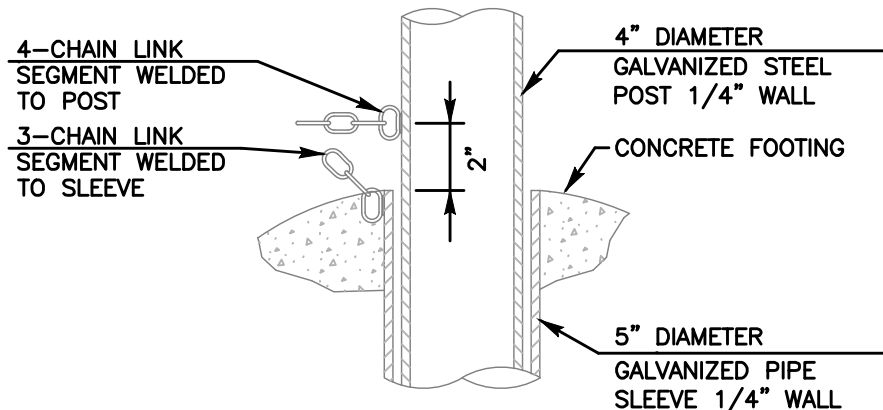
FOR DRAWING WT-01 SEE DRAWING SDW-151



PROTECTION POST
TYPE "A"



DEMOUNTABLE PROTECTION POST
TYPE "B"

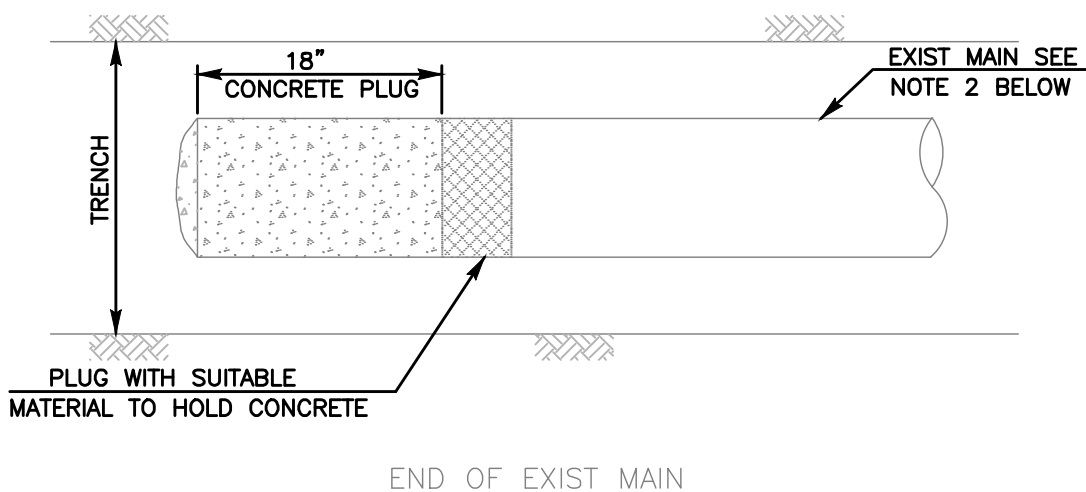
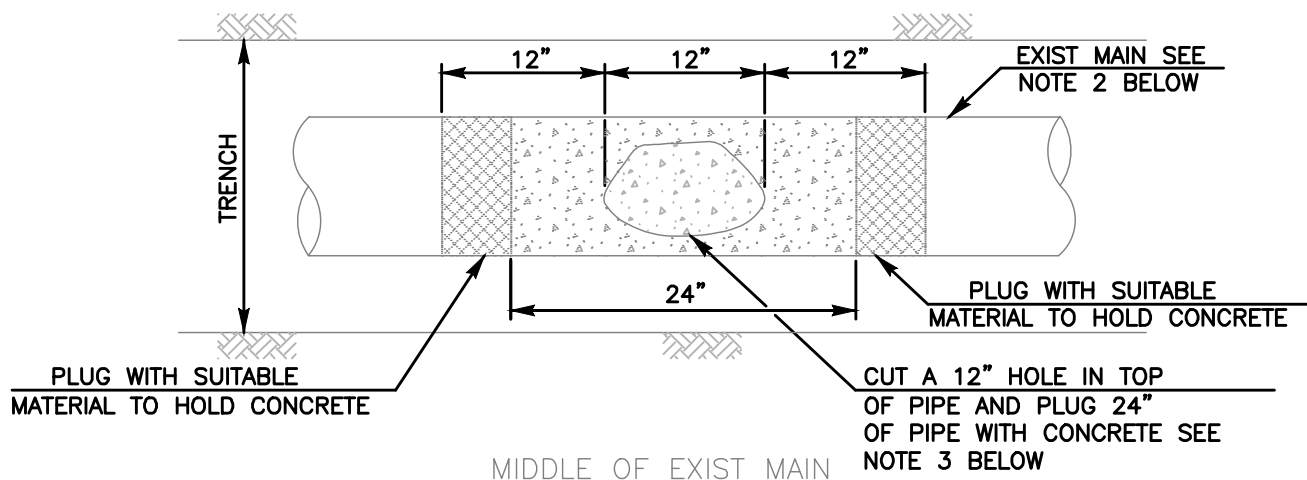


CHAIN HASP DETAIL

NOTES:

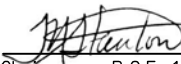
- 1) TYPE "A" AND TYPE "B" PROTECTION POSTS SHALL BE INSTALLED WHERE INDICATED ON THE APPROVED PLANS OR AS DIRECTED BY THE ENGINEER. SDG&E REQUIREMENTS DICTATE IN AREAS OF SDG&E EQUIPMENT
- 2) CHAIN TO BE 1/4" PROOF COIL CHAIN GALVANIZED STEEL. WELD 4-LINK SEGMENT TO POST AND 3-LINK SEGMENT TO SLEEVE
- 3) TYPE "A" AND TYPE "B" PROTECTION POSTS SHALL BE COATED USING SAFETY YELLOW IN ACCORDANCE WITH AGENCY'S STANDARDS

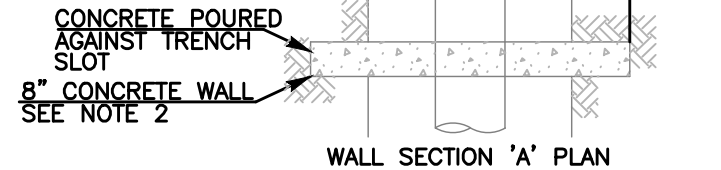
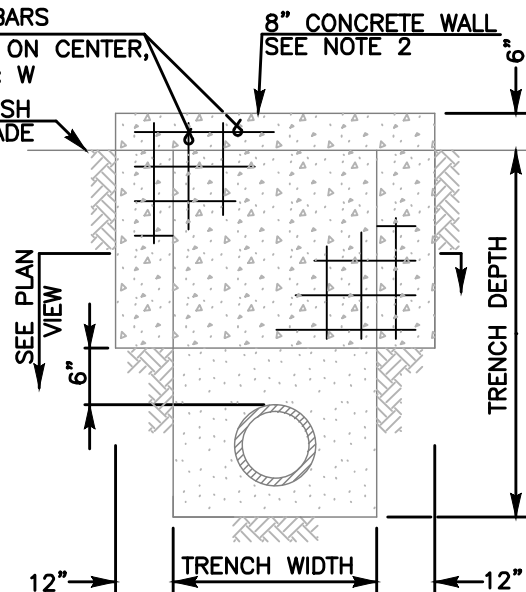
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	PROTECTION POST INSTALLATION	 7/26/2012 Chairperson R.C.E. 19246 Date
Replaced W-16		J. Tomasulo	10/04		
Delete Metric	MR	B. KNOLL	03/11		
					DRAWING NUMBER WM-04




NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) WATER AND RECYCLED WATER MAINS AND SEWER LATERALS 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 200' OR AS DIRECTED BY THE ENGINEER
- 4) EXISTING MAINS 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

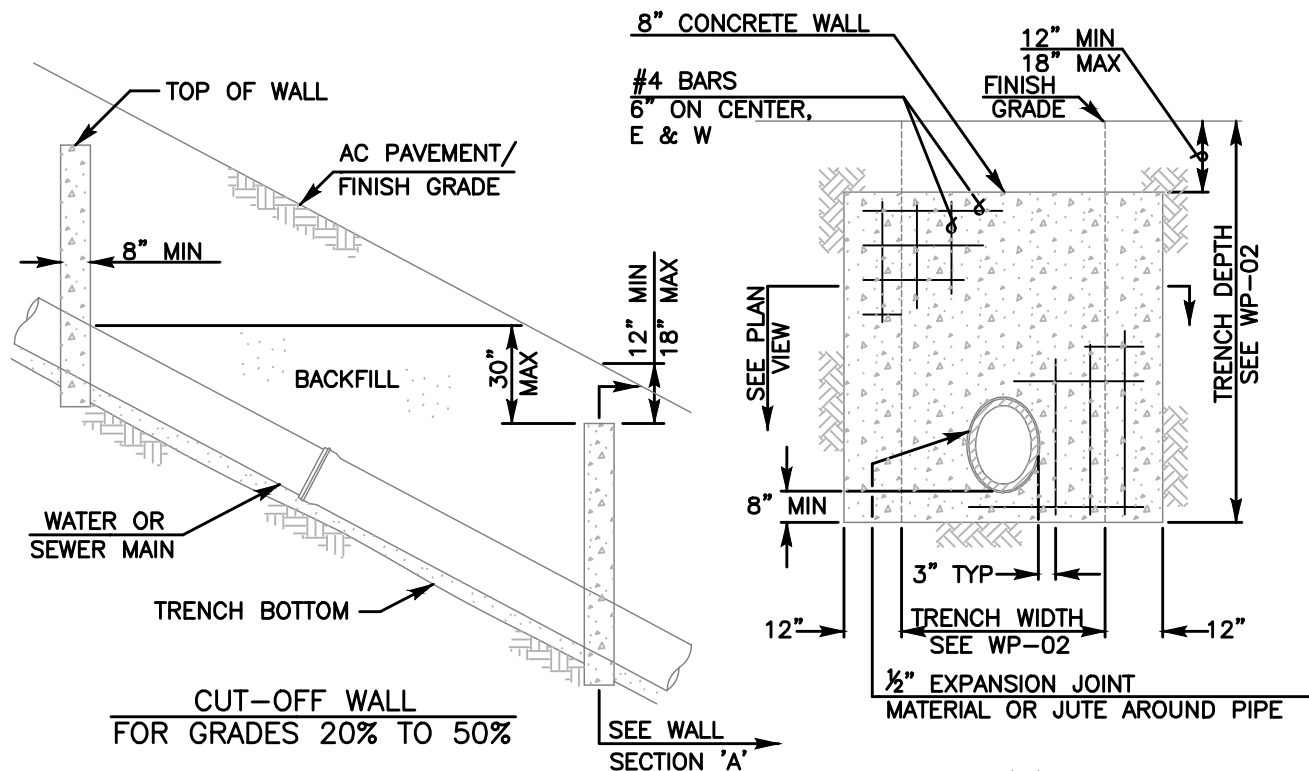
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING CUTTING AND PLUGGING ABANDONED WATER, RECYCLED WATER AND SEWER MAINS		RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		J. Tomasulo	10/04			 7/26/2012 Chairperson R.C.E. 19246 Date
Delete Metric	MR	B. KNOLL	03/11			DRAWING NUMBER WP-03



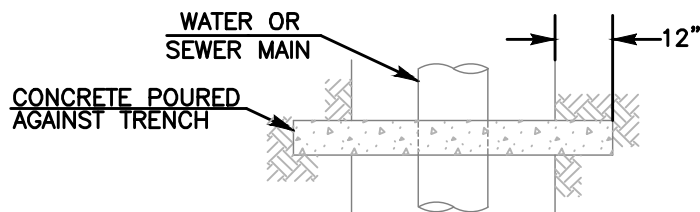
- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
 - 2) THE DETAILS SHOWN REPRESENT THE MINIMUM REQUIRED. THE ENGINEER OF WORK IS REQUIRED TO PROVIDE A SUBMITTAL TO THE AGENCY OF JURISDICTION FOR REVIEW AND APPROVAL BY THE AGENCY'S ENGINEER PRIOR TO INSTALLATION
 - 3) WALLS SHALL BE REINFORCED CONCRETE OR 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) 4" GUNITE BLANKET WITH 6" SQUARE x 10 GAGE WIRE FABRIC AT THE ENGINEERS DISCRETION
- 

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		
Delete Metric	MR	B. KNOLL	03/11	SLOPE PROTECTION INSTALLATIONS	 7/26/2012 Chairperson R.C.E. 19246 Date
					DRAWING NUMBER WP-05



WALL SECTION 'A' ELEVATION




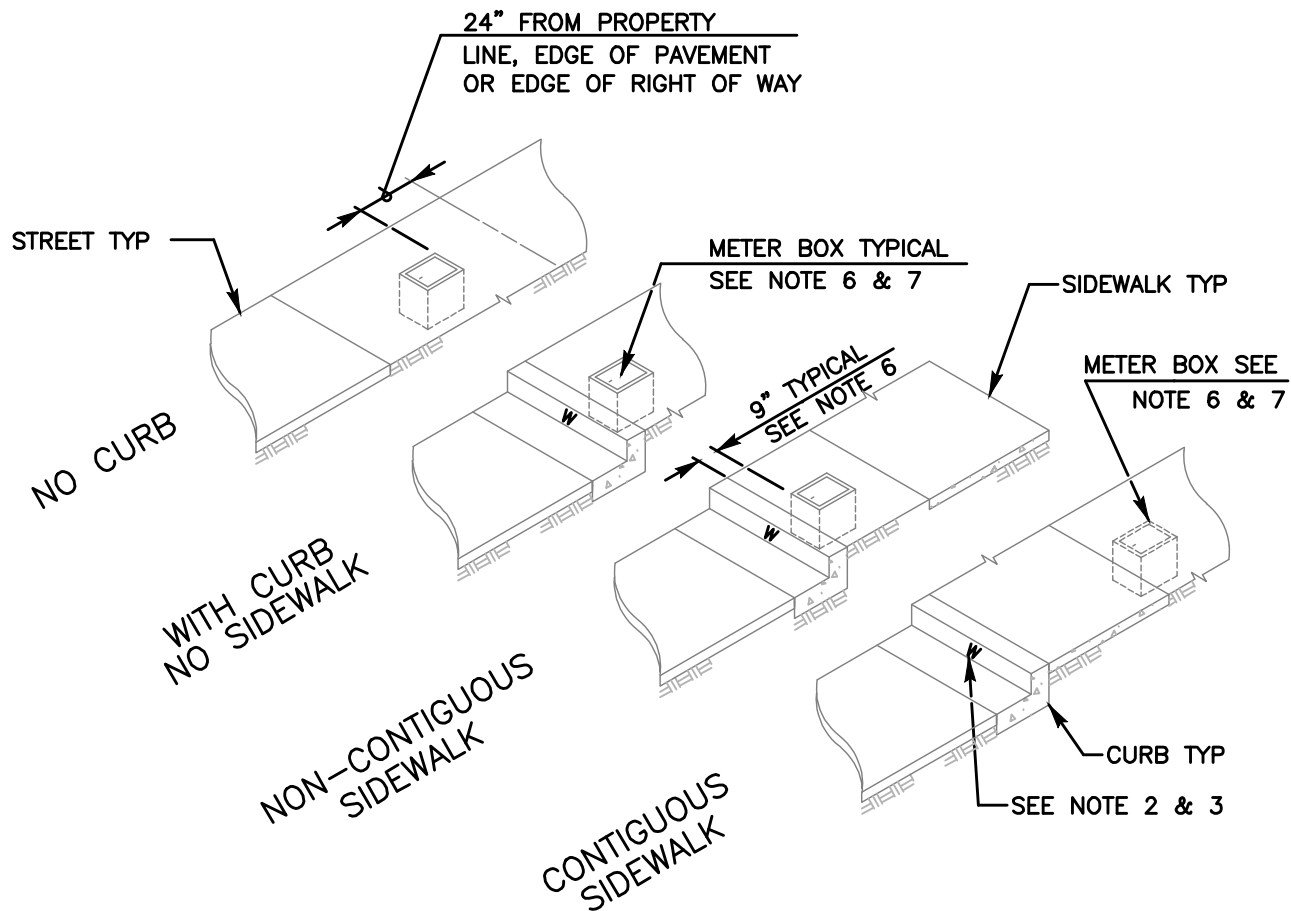
WALL SECTION 'A' PLAN

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 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

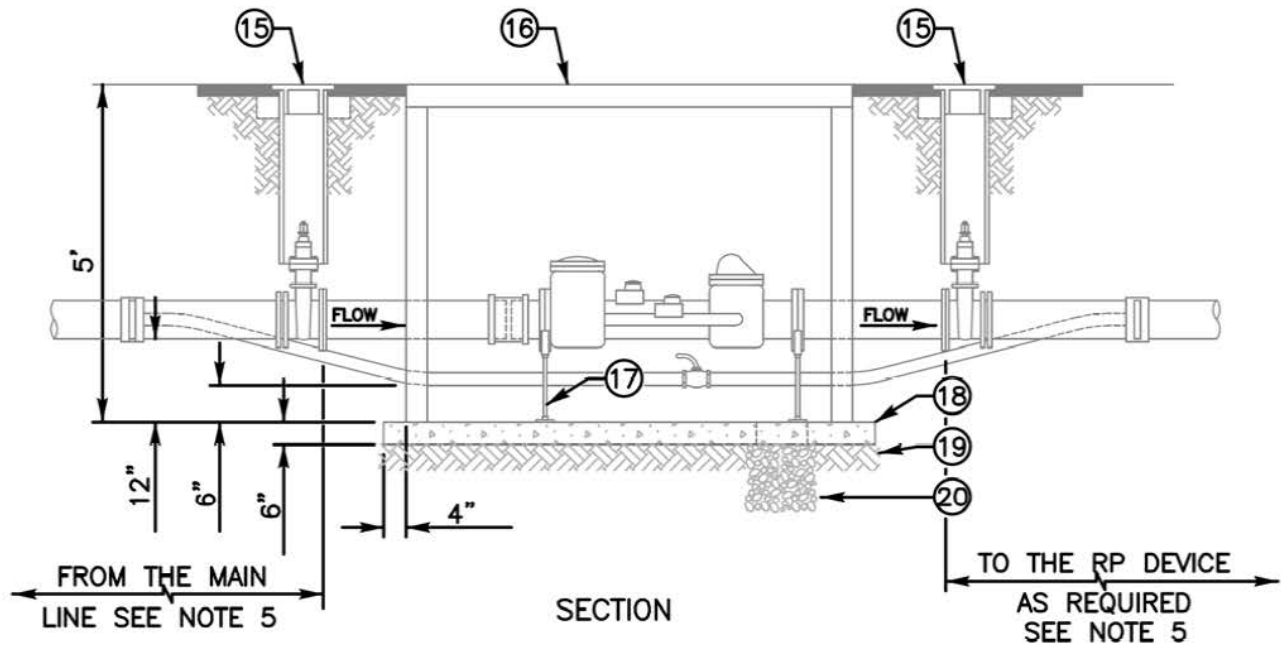
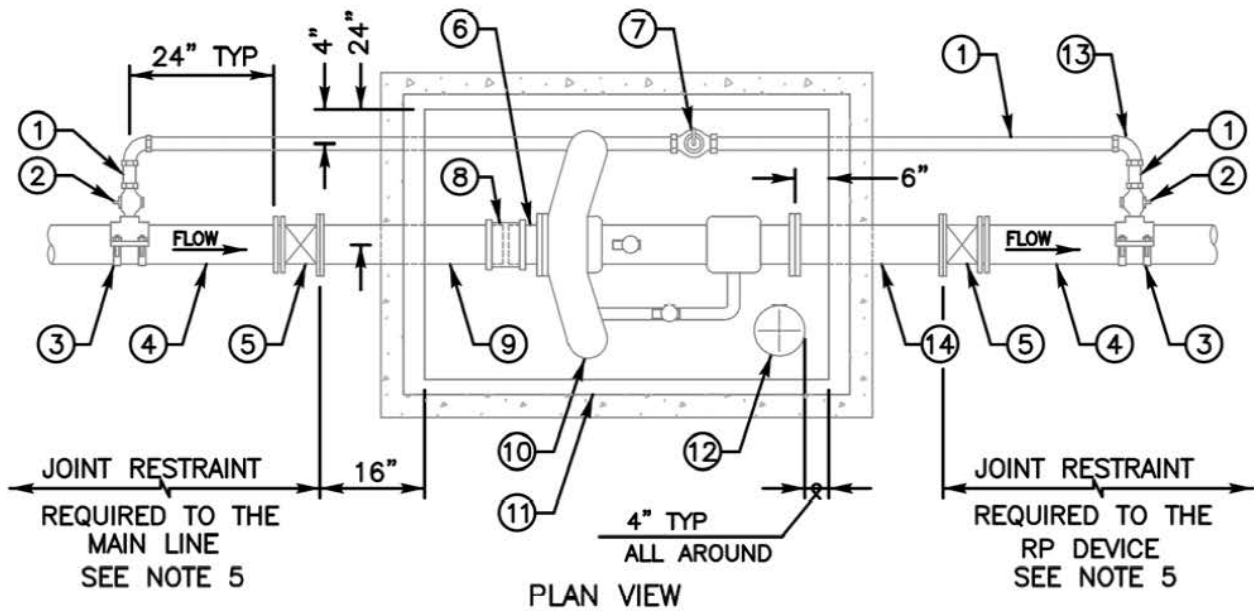
Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		J. Tomasulo	10/04		
Delete Metric	MR	B. KNOLL	03/11	CUT-OFF WALL INSTALLATION IN TRAVELED AREAS	 Chairperson R.C.E. 19246 Date 7/26/2012
					DRAWING NUMBER WP-07



NOTES:

- 1) REFER TO AGENCY SPECIFICATIONS WHERE APPLICABLE
- 2) STAMP OR CHISEL A 2" HIGH 'W' IN CURB FACE TO IDENTIFY POTABLE WATER SERVICE LOCATION
- 3) STAMP OR CHISEL A 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 9" BETWEEN BOXES
- 6) METER BOX SHALL BE INSTALLED 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	SAN DIEGO REGIONAL STANDARD DRAWING	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		Kercheval	12/75		
Add Metric		T. Stanton	03/03	METER BOX LOCATIONS FOR WATER AND RECYCLED WATER APPURTENANCES	 7/26/2012 Chairperson R.C.E. 19246 Date
Replaced W-15		J. Tomasulo	10/04		
Delete Metric	MR	B. KNOLL	03/11		
					DRAWING NUMBER WS-03



(INDICATE SIZE)



LEGEND ON PLANS

FOR MATERIAL DESCRIPTIONS AND NOTES SEE WS-04 (2 OF 2)

Revision	By	Approved	Date
ORIGINAL		J. Tomasulo	10/04
Delete Metric	MR	B. KNOLL	03/11

SAN DIEGO REGIONAL STANDARD DRAWING

4" OR 6" FIRELINE/MASTER METER
INSTALLATION

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

M. Stanton 7/26/2012
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)

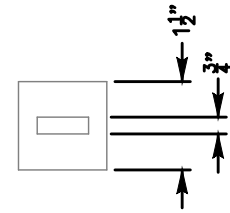
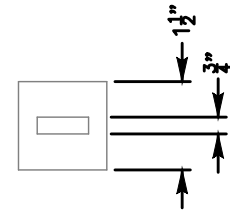
NOTES:

- 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) 8" OR 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) 4" METER REQUIRES A 48" x 60" VAULT 6" METER REQUIRES A 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	2" x REQUIRED LENGTH TYPE "K" COPPER PIPE	⑪	FRP VAULT WITH HINGED ACCESS DOOR, SEE NOTE 7
②	2" BRONZE CORPORATION STOP	⑫	12" DIAMETER x 6" LONG PVC PIPE
③	LINE SIZE x 2" SERVICE SADDLE	⑬	2" 90° COMPRESSION ELL (TYPICAL)
④	4" OR 6" PVC PIPE	⑭	LINE SIZE x 24" LONG FLANGED DUCTILE-IRON SPOOL
⑤	4" OR 6" FLG x MJ RWGV MECHANICALLY RESTRAINED, SEE NOTE 5	⑮	8" GATE WELL. SEE WV-01 & WV-02
⑥	LINE SIZE x 6" LONG FLG x PE DUCTILE-IRON SPOOL	⑯	HINGED VAULT ACCESS DOOR
⑦	2" COMPRESSION, LOCKABLE BALL VALVE	⑰	ADJUSTABLE PIPE SUPPORT (TYPICAL)
⑧	4" OR 6" FLEXIBLE COUPLING	⑱	6" CLASS "B" CONCRETE FLOOR WITH #3 BARS @ 12" C.C.
⑨	LINE SIZE x 30" LONG FLG x PE DUCTILE-IRON SPOOL	⑲	6" DG BASE COMPACTED TO 90%
⑩	4" OR 6" FIRELINE METER SEE NOTE 6	⑳	12" DIAMETER x 12" DEEP, ¾" GRAVEL SUMP, SEE NOTE 8

Revision	By	Approved	Date	SAN DIEGO REGIONAL STANDARD DRAWING 4" OR 6" FIRELINE/MASTER METER INSTALLATION	RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
ORIGINAL		J. Tomasulo	10/04		
Delete Metric	MR	B. KNOLL	03/11		 7/26/2012 Chairperson R.C.E. 19246 Date
					DRAWING NUMBER WS-04 (2 OF 2)

FOR DRAWINGS WV-01 AND WV-02 USE DRAWING SDW-153.



DRAWING NUMBER WV-05



Public Works Department

**PROJECT IMPLEMENTATION DIVISION
STANDARDS & CONTRACT
DOCUMENTS SECTION**

525 B STREET STE. 750
SAN DIEGO, CA 92101

DOCUMENT NUMBER: PWPI070116-03