



CITY OF  
**HAYWARD**  
HEART OF THE BAY

DEPARTMENT OF PUBLIC WORKS

# **STANDARD DETAILS**

# **2014**



# STANDARD DETAILS 2014

Last updated: September 12, 2014

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-- END --



## STANDARD DETAILS 2013

### NORMAL SEQUENCE OF OPERATIONS

The following will be the normal sequence of operations for construction of a roadway in the City of Hayward. Each operation will follow only the applicable that precedes it on this list and then only after specific permission of the City Engineer.

1. Clearing and grubbing
2. Common excavation or backfill to grading plane to within 6" of subgrade
3. Install utilities and jumpers
4. Test utility trenches for compaction
5. Preliminary tests of sewers and water lines – unofficial, including bacteriological test
6. Compact subgrade
7. Compaction test on subgrade (written certification with seal by licensed engineer)
8. Grade check of subgrade (written certification with seal by licensed civil engineer or surveyor)
9. Place, grade, and compact aggregate subbase
10. Place forms for curb and gutters (cut-sheets required)
11. Grade check on curb and gutter forms (written certification with seal by licensed civil engineer or surveyor)
12. Place concrete for curbs and gutters
13. Place "back-up" material or concrete sidewalk and driveways against back of curbs
14. Complete placing of aggregate subbase
15. Compaction tests on AS (written certification with seal by licensed engineer)
16. Grade check of AS (written certification with seal by licensed civil engineer or surveyor)
17. Place, grade, and compact concrete base
18. Compaction tests on AB (written certification with seal by licensed engineer)
19. Grade check of AB (written certification with seal by licensed civil engineer or surveyor)
20. Final video, air, and deflection tests on sewers and water pressure tests on water line.
21. Remove jumper and blow off, and perform bacteriological test of water lines
22. Install water services and meter boxes to the proper positions and put water line in service
23. Apply asphalt prime coat
24. Place first lift of asphalt concrete - (written certification with seal by licensed engineer – compaction must be not less than 95 percent relative compaction and , if less than 95 percent, AC must be removed)
25. Blue-top first AC lift
26. Place asphalt tack coat between AC lifts
27. Place second lift of AC (written certification with seal by licensed engineer – compaction must be not less than 95 percent relative compaction and; if less than 95 percent, AC must be removed)
28. Apply asphalt seal coat
29. Raise all utility structures to grade and install monuments
30. Clean storm and sanitary sewers
31. Install street name signs, traffic control signs, and barricades
32. Completion of "punch list" items
33. Final "walk-thru" inspection (Engineer's Final Report, including "As-Built" and Soils Engineers Final Report)
34. Acceptance of Project

In the event of any conflict, the following order will prevail: 1) Special Provisions (City Contract only), 2) Project Plans, 3) City Standard Details, 4) State Standard Plans and 5) State Standard Specifications.

MORAD FAKHRAI  
Director of Public Works –  
Engineering and Transportation

A	Area	Culv	Culvert	H	Hub
AB	All Bell	CY	Cubic Yard		Height
	Aggregate Base	DC	Direct Current	HARD	Hayward Area Recreation & Park District <sup>2</sup>
Ac	Acre	Deg	Degree		
AC	Asphalt Concrete	Det	Detail	HE	Hub End
	Alternating Current	Dia	Diameter	Hor	Horizontal
ACB	Air Circuit Breaker	DIP	Ductile Iron Pipe	HP	Horsepower
ACFCWCD	Alameda County Flood Control & Water Conservation District	DO	Ditto		High Pressure
<sup>2</sup>		DR	Drive		Hub and Tack <sup>2</sup>
		D/W	Driveway	H&T	
ACP	Asbestos Cement Pipe	Dwg	Drawing <sup>2</sup>	HW	Headwall
ACWD	Alameda County Water District	e	External Distance (Vertical Curves)	Hyd	Hydrant
		E	East	ID	Inside Diameter
Amp	Ampere	Ea	Each	In	Inches
AS	Aggregate Subbase	EBMUD	East Bay Municipal Utility District	Inst	Install
Ave	Avenue			Inv	Invert
AWG	American Wire Gauge			IPS	Iron Pipe Size
B	Bell	EC	End Curve	JB	Junction Box
BC	Begin Curve	Ecc	Eccentric	JP	Joint Pole
BCW	Bare Copper Wire	EF	Each Face	Jt	Joint
Bldg	Building	Elev	Elevation	KW	Kilowatt
Blk	Block	EII	Elbow	KWH	Kilowatt Hour
Blvd	Boulevard	Emb	Embankment	L	Length
BM	Benchmark	Enc	Encase	Lb	Pound
BO	Blowoff	Engr	Engineer	Ld	Lead
Br	Brass	EP	Edge of Pavement	LF	Linear Foot
Brz	Bronze	ES	Edge of Shoulder	L/G	Lip of Gutter
BV	Butterfly Valve	EVC	End of Vertical Curve	Lin	Linear
BVC	Begin Vertical Curve			Ln	Lane
B/W	Back of Sidewalk	EW	Each Way	Lt	Left
C	Conduit	Exc	Excavate	Matl	Material
CC	Center to Center	Exist	Existing	Max	Maximum
CCG	Concrete Curb & Gutter	Exp Jt	Expansion Joint	MB	Mail Box
		F	Flange	Mfr	Manufacturer <sup>2</sup>
CFM	Cubic Feet Per Minute	FB	Field Book	MG	Million Gallons
ChV	Check Valve	FG	Finished Grade	MGD	Million Gallons per Day
CIP	Cast Iron Pipe	FH	Fire Hydrant	MH	Manhole
Circ	Circumference	Fin	Finish	Mi	Mile
CL	Cement Lined	FI	Floor	Min	Minimum
CLF	Chain Link Fence	FL	Flowline	MJ	Mechanical Joint
Clkg	Caulking	Flgd	Flanged	MK	Mark
CMP	Corrugated Metal Pipe	F/C	Face of Curb	ML	Monument Line
CO	Clean Out	FM	Force Main	Mod	Modify
Concen	Concentric	Fnd	Foundation		Model
Conn	Connect	Ft	Foot	<sup>2</sup> Mon	Monument
Const	Construct	Ftg	Footing	<sup>2</sup> MP	Marker Post (Facility)
Cont	Continue	Furn	Furnish	MSLD	Mean Sea Level Datum
Cop	Copper	Ga	Gauge	N	North
Cor	Corner	Gal	Gallon		Neutral (elect.)
Corp	Corporation	Galv	Galvanized	Nip	Nipple
Cov	Cover	GB	Grade Break	No	Number
Csg	Casing	Gnd	Ground	Nom	Nominal
Ct	Court	GP	Galvanized Pipe	NRS	Non Rising Stem
CTB	Cement Treated Base	GPM	Gallons Per Minute	N&S	Nail and Shiner
Cu	Cubic	Gr	Grade	NTS	Not to Scale
		GV	Gate Valve	NWS	Normal Water Surface

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	
<sup>2</sup>	6/22/11	AL	DRAWN BY: HGM	DATE: 04/22/08
<sup>1</sup>	6/16/10	HGM	CHECKED BY: JF	SCALE: NTS
REV	DATE	BY	APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>
			CITY ENGINEER	DIR. PUBLIC WORKS

## STANDARD ABBREVIATIONS

DWG. NO.	<b>SD-100</b>
FILED	
SHT.	<b>1 of 2</b>

OC	△	On center (Center to Center)	Rwd	Redwood
OCB		Oil Circuit Breaker	S	Slope
OD		Outside Diameter		Spigot
OLSD		Oro Loma Sanitary District		South
OS&Y		Outside Screw & Yoke		Survey
Oz		Ounce	SD	Storm Drain
PB		Pacific Bell (Telephone)	Sec	Second
		Pull Box	Serv	Service
Pb		Polybutylene	Sht	Sheet
Pc		Piece	Spec	Special
PC	△	Point of Curvature	SPRR	Southern Pacific Railroad △
PCC		Portland Cement Concrete	Sq	Square
		Point of Compound Curve	SS	Sanitary Sewer
PCR		Point of Curb Return	St	Street
PE		Plain End	Sta	Station
Pe		Polyethylene	Std	Standard
Ped		Pedestrian	Stm	Steamer
Pg		Page	Str	Structure
PG&E		Pacific Gas & Electric Co.	S/W	Sidewalk
PI		Point of Intersection	SWI	Storm Water Inlet
Pkwy		Parkway	T	Tangent Distance
P/L		Property Line	Tap	Tapping
Pl		Place	TB	Thrust Block
PM		Parking Meter (Post)	TBM	Temporary Bench Mark
POVC		Point on Vertical Curve	TC,T/C	Top of Curb
PP		Power Pole	Terr	Terrace
PRC		Point of Reversed Curve	T&G	Tongue & Groove
Proj		Project	TP	Telephone Pole
Prop		Proposed	Tr	Tract
Psi		Pounds per Square Inch	Tub	Tubing
Psf		Pounds per Square Foot	Typ	Typical
PT	△	Point of Tangency	UPRR	Union Pacific Railroad △
PVCP		Polyvinyl Chloride Pipe	USC&GS	U S Coast & Geodetic Survey
PVI	△	Point of Vertical Intersection	USD	Union Sanitary District
Pvmt		Pavement	USGS	U S Geological Survey
R		Radius	V	Volt
Rad		Radial		Volume
RCB		Reinforced Concrete Box	Var	Varies
RCP		Reinforced Concrete Pipe	VC	Vertical Curve
Rd		Road	VCP	Vitrified Clay Pipe
Red		Reducer	Vert	Vertical
Ref		Reference	W	Watts
Reinf		Reinforce		West
Reqd		Required	WH	Weephole
Rev		Revised	WIP	Wrought Iron Pipe
RPM		Revolutions Per Minute	WM	Water Main
RR		Railroad		Water Meter
Rt		Right	WSP	Welded Steel Pipe
R/W		Right of Way	Wt	Weight
			Yd	Yard

		 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD</b>  <b>ABBREVIATIONS</b>	DWG. NO. <b>SD-100</b>
△	2/16/11	AL	DRAWN BY: HGM      DATE: 04/22/08		FILED
△	6/16/10	HGM	CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i>		
REV	DATE	BY	CITY ENGINEER      DIR. PUBLIC WORKS		SHT. <b>2</b> OF <b>2</b>

# GENERAL

<p>I American Standard Beam</p> <p>&amp; or <math>\&amp;cent;</math> And</p> <p>L Angle (Structural)</p> <p>@ At</p> <p><math>\text{C}</math> Centerline</p> <p><math>\text{C}</math> Circuit</p> <p>[ Channel (Structural)</p> <p>o Degree</p> <p><math>\Delta</math> Delta or Central Angle</p> <p><math>\phi</math> Diameter or Phase</p> <p>" Ditto, Inches, or Second (Angular)</p> <p>' Feet, Minutes (Angular)</p> <p>- Minus</p> <p># Number or Pound</p>	<p>d Penny</p> <p><math>\text{R}</math> Plate</p> <p>/ Per</p> <p>% Percent</p> <p>+ Plus</p> <p><math>\pm</math> Approximate</p> <p>S4S Surfaced Four Sides</p> <p>T Tee (Structural)</p> <p>W Wide Flanged Beam (Structural)</p> <p>X By (as in 2 x 4)</p> <p><math>\Omega</math> Ohm</p> <p>H Design Hydraulic Elevation</p> <p><math>\nabla</math> (Date)</p> <p><math>\nabla</math> Existing Water Table</p>
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# PLAN

PROJECT IMPROVEMENTS	EXISTING	DESCRIPTION
		Storm Drain
		Sanitary Sewer
		Water Main
		Gas Line
		Cable Television Conduit
		Telephone or Telegraph Conduit
		Fiber Optic Conduit
		Power or electrical conduit
		Casing
		Gate Valve
		Reducer
		Tee
		Cross

<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.				<b>STANDARD STREET &amp; UTILITY CONST. DRAWING SYMBOLS</b>				DWG. NO. <b>SD-101</b>	
DRAWN BY: TGM		DATE: 02/20/14		CHECKED BY: JF		SCALE: NTS			
APPROVED BY:		APPROVED:				FILED			
REV	DATE	BY	ASSISTANT CITY ENGINEER	DIR. PUBLIC WORKS - E&T	SHT. <b>1</b> OF <b>5</b>				

# PLAN

PROJECT IMPROVEMENTS	EXISTING	DESCRIPTION
		Blow Off
		Water Cap or Plug
		Water Meter
		Bend
		Fire Hydrant Assembly
		Storm Water Inlet
		Manhole
		Sewer Riser
		Sewer Plug
		Curb, Gutter and Sidewalk
		Monument
		Benchmark
		Guy and Anchor
		Barricade or Guard Rail
		Wire Fence (Barb-Wire, Hog Wire, etc.)
		Board Fence
		Chain Link Fence
		Gate
		Railroad Track

		 <b>CITY OF</b> <b>HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD</b> <b>STREET &amp; UTILITY</b> <b>CONST. DRAWING</b> <b>SYMBOLS</b>	DWG. NO. <b>SD-101</b>
		DRAWN BY: HGM      DATE: 02/20/14 CHECKED BY: JF      SCALE: NTS DESIGNED BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i> ASSISTANT CITY ENGINEER      DIR. PUBLIC WORKS - E&T		FILED SHT. <b>2</b> OF <b>5</b>
REV	DATE	BY		

# PLAN

PROJECT IMPROVEMENTS	EXISTING	DESCRIPTION
	<p style="text-align: center;">Size &amp; Type</p>	<p>Tree or Shrubs</p> <p>Power Pole</p> <p>Telephone Pole</p> <p>Joint Pole</p> <p>Facility Marker Post</p> <p>Post, Pole or Standard</p> <p>Parking Meter</p> <p>Street Sign</p> <p>Traffic Sign</p> <p>Electrolier</p> <p>Traffic Signal (General)</p>
		<p>Cut or Fill Slope</p> <p>Centerline of Ditch (arrow indicates direction of flow)</p> <p>Contour</p> <p>Intermittent Water Course</p>
		<p>Project right of way line</p> <p>All property or right of way lines (on date topography was plotted if different than proposed)</p> <p>Work or slope easement line</p> <p>Survey line and angle point</p> <p>Centerline</p> <p>BC, EC, or PCR</p> <p>City Limit Line</p>

DRAWN BY: HGM	DATE: 07/15/08	
CHECKED BY: JF	SCALE: NTS	
APPD. BY:	APPROVED:	
REV	DATE	BY
		CITY ENGINEER
		DIR. PUBLIC WORKS

## STANDARD STREET & UTILITY CONST. DRAWING SYMBOLS

DWG. NO.	<b>SD-101</b>
FILED	
SHT.	<b>3 OF 5</b>

# PROFILE

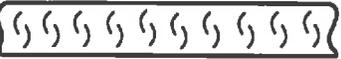
PROJECT IMPROVEMENTS	EXISTING	DESCRIPTION
		Finished Grade
		Water Line or Sanitary Sewer
		Storm Drain
		Casing
		Pipe Crossing Construction
		Reducer
		Gate Valve
		Tee or Cross
		Sewer Manhole Note: Invert elevations shown are theoretical extensions of pipe inverts to centerline of structure
		Storm Water inlet Note: Invert elevations shown are theoretical extensions of pipe invert to centerline of structure
		Riser Note: Station and invert elevation  are at intersection of centerline of branch and invert of wye

	6/18/10	HGM	 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.
	03/31/10	AL	
REV	DATE	BY	
DRAWN BY: HGM		DATE: 05/02/08	
CHECKED BY: JF		SCALE: NTS	
APPD. BY:			
CITY ENGINEER		DIR. PUBLIC WORKS	

## STANDARD STREET & UTILITY CONST. DRAWING SYMBOLS

DWG. NO.	<b>SD-101</b>
FILED	
SHT.	<b>4 OF 5</b>

# PROFILE

PROJECT IMPROVEMENTS	EXISTING	DESCRIPTION
		Portland Cement Concrete
		Asphalt Concrete
		Aggregate Base
		Aggregate Sub-Base
		Sand/Quarry Fines
		Top Soil
		Earth Surface

				<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			
				DRAWN BY: HGM      DATE: 05/02/08			
				CHECKED BY: JF      SCALE: NTS			
				APPD. BY: 			
				CITY ENGINEER      DIR. PUBLIC WORKS			

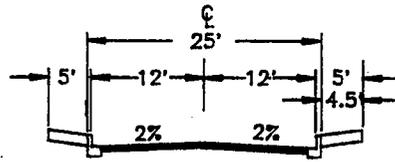
## STANDARD STREET & UTILITY CONSTRUCTION DRAWING SYMBOLS

DWG. NO.	<b>SD-101</b>
FILED	
SHT. <b>5</b> OF <b>5</b>	

# STANDARD STREETS

NO PARKING ON EITHER SIDE  
WITH APPROPRIATE POSTING OF SIGNS.

IF PRIVATE SIDEWALK REQUIRED THEN  
4.5' S/W ADJACENT TO CURB  
OR 4' S/W MEANDERING NEARBY  
25' P.U.E. REQUIRED  
6' P.U.E. MAY BE REQUIRED  
BEHIND SIDEWALK



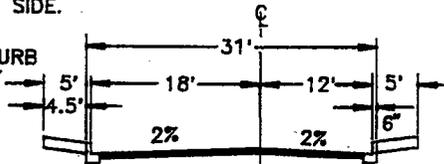
25' RESIDENTIAL- PRIVATE STREET

GENERAL P.U.E. NOTE:

WHENEVER A 4.5' SIDEWALK IS NEXT TO CURB STREET LIGHT POLES AND UTILITY POLES MUST BE PLACED BEHIND THE SIDEWALK IN P.U.E. OTHERWISE SIDEWALK INCREASED TO 5.5' AND RIGHT OF WAY INCREASED BY 2'.

PARKING ON ONE SIDE ONLY, NO PARKING  
SHALL BE POSTED ON OPPOSITE SIDE.

IF PRIVATE SIDEWALK REQUIRED  
THEN, 4.5' S/W ADJACENT TO CURB  
OR 4' S/W MEANDERING NEARBY  
31' P.U.E. REQUIRED  
6' P.U.E. MAY BE REQUIRED  
BEHIND SIDEWALK

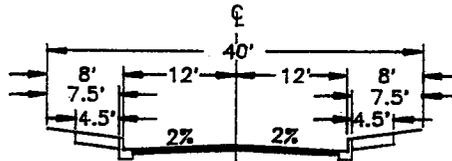


31' RESIDENTIAL - PRIVATE STREET

NO PARKING ON EITHER SIDE WITH  
APPROPRIATE POSTING OF SIGNS.

SIDEWALK MAY BE ELIMINATED  
OR LIMITED TO ONE SIDE

6' P.U.E. REQUIRED  
BEHIND SIDEWALK

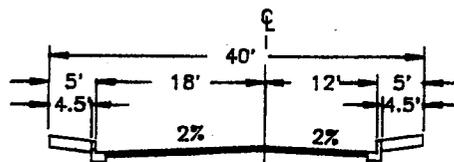


40' RESIDENTIAL - PUBLIC STREET  
(NO PARKING)

NOTE:

THIS 24' CURB TO CURB STREET SECTION IS TO BE UTILIZED ONLY FOR VERY SPECIAL SITUATIONS SUCH AS HILLSIDE AREAS WHEREBY GRADING AND RETAINING WALLS CAN BE MINIMIZED AND PROVIDED SUFFICIENT OFF STREET PARKING CAN BE ACCOMMODATED.

PARKING ON  
ONE SIDE ONLY  
SIDEWALK MAY BE ELIMINATED  
OR LIMITED TO ONE SIDE  
6' P.U.E. REQUIRED  
BEHIND SIDEWALK



40' RESIDENTIAL - PUBLIC STREET  
(ONE SIDE PARKING)

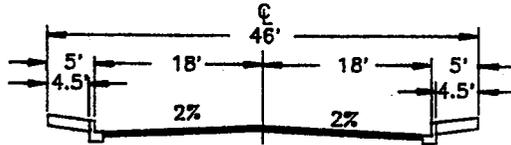
NOTE:

THIS 30' CURB TO CURB STREET SECTION ALSO IS TO BE UTILIZED ONLY FOR VERY SPECIAL SITUATIONS SUCH AS HILLSIDE AREAS WHEREBY GRADING AND RETAINING WALLS CAN BE MINIMIZED PROVIDED SUFFICIENT OFF STREET PARKING CAN BE ACCOMMODATED.

CITY OF HAYWARD ENGINEERING DIVISION			<b>STANDARD STREET SECTIONS</b>	DWG. NO. <b>SD-102</b>
DRAWN BY: F. M.		DATE MARCH, 1993		FILED
CHECKED BY: H.B.D.		SCALE: 1" = 20'		
APPD. BY: <i>Rad</i>		APPROVED: <i>Radson</i>		SHT. <b>1</b> OF <b>4</b>
REV	DATE	BY	CITY ENGINEER	

# STANDARD STREETS

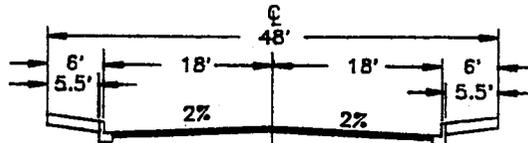
6' P.U.E. REQUIRED  
BEHIND SIDEWALK



46' RESIDENTIAL - PUBLIC STREET  
(MINIMUM STANDARD WITH P.U.E.)

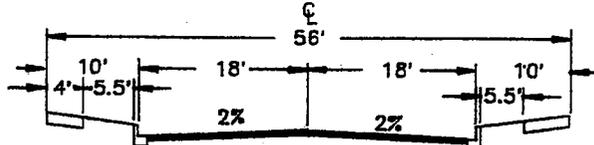
**NOTE:**  
THIS STANDARD  
MAY ONLY BE USED  
WHERE NO UTILITIES  
ARE LOCATED IN  
THE SIDEWALK AREA

NO P.U.E. REQUIRED  
BEHIND SIDEWALK



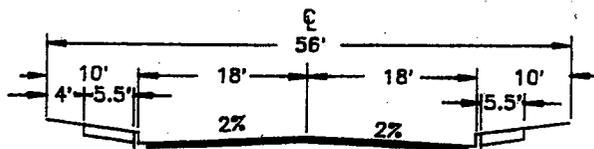
48' RESIDENTIAL - PUBLIC STREET  
(MINIMUM STANDARD WITHOUT P.U.E.)

6' P.U.E. REQUIRED  
BEHIND SIDEWALK



56' RESIDENTIAL - PUBLIC STREET  
(STANDARD WITH PLANTER STRIP)

NO P.U.E. REQUIRED  
BEHIND SIDEWALK



56' RESIDENTIAL - PUBLIC STREET  
(STANDARD WITHOUT PLANTER STRIP)

**NOTE:**  
USE OF THIS STANDARD  
IS INTENDED TO ACHIEVE  
COMPATIBILITY WHEN  
RECONSTRUCTING OR  
COMPLETING CONSTRUCTION  
OF AN EXISTING STREET  
BUILT PREDOMINANTLY  
WITH THIS CROSS-SECTION.

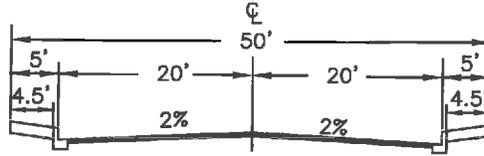
CITY OF HAYWARD ENGINEERING DIVISION			<h2 style="margin: 0;">STANDARD STREET SECTIONS</h2>		DWG. NO. <b>SD-102</b>	
					FILED	
REV	DATE	BY	DRAWN BY: F. M. CHECKED BY: <b>H.S.D.</b> APPD. BY: <i>DAB</i>	DATE: MARCH, 1993 SCALE: 1" = 20' APPROVED: <i>[Signature]</i>	SHI. <b>2 of 4</b>	
			CITY ENGINEER		DIR. PUBLIC WORKS	

**GENERAL COLLECTOR NOTE:**

CITY ENGINEER WILL MAKE A SPECIFIC DETERMINATION ON WHICH STREETS ARE TO BE CONSTRUCTED AS A MINOR OR MAJOR COLLECTOR.

6' PUE REQUIRED BEHIND SIDEWALK

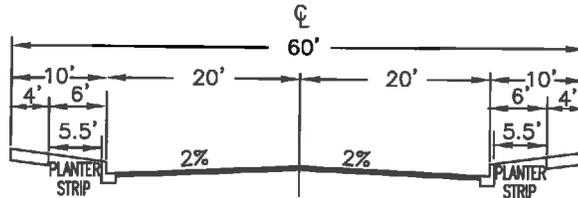
**COLLECTOR STREETS**



THIS STANDARD MAY BE USED ONLY WHERE SPACE IS RESTRICTED OR TO MATCH EXISTING CONDITIONS

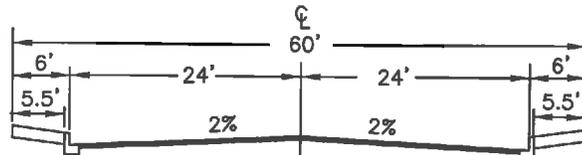
50' RESIDENTIAL – PUBLIC STREET (MINOR COLLECTOR)

6' P.U.E. REQUIRED BEHIND SIDEWALK



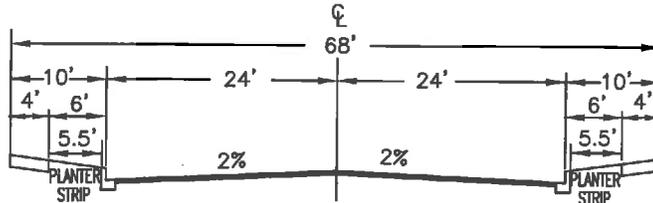
60' RESIDENTIAL – PUBLIC STREET (MINOR COLLECTOR WITH PLANTER STRIP)

6' P.U.E. REQUIRED BEHIND SIDEWALK



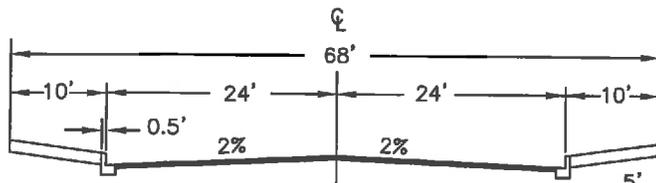
60' INDUSTRIAL – PUBLIC STREET (MAJOR COLLECTOR)

6' P.U.E. REQUIRED BEHIND SIDEWALK



68' RESIDENTIAL – PUBLIC STREET (MAJOR COLLECTOR WITH PLANTER STRIP)

6' P.U.E. REQUIRED BEHIND SIDEWALK



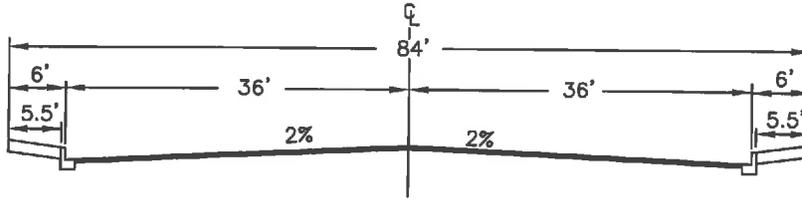
5' x 5' TREE WELLS

68' COMMERCIAL – PUBLIC STREET (MAJOR COLLECTOR)

			<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>	<p><b>STANDARD STREET SECTIONS</b></p>	DWG. NO. <b>SD-102</b>
REV	DATE	BY			<p>DRAWN BY: FM      DATE: 02/04/11</p> <p>CHECKED BY: JF      SCALE: NTS</p> <p>APPD. BY: <i>[Signature]</i>      APPROVED</p> <p>CITY ENGINEER      DIR. PUBLIC WORKS</p>
					SHT. <b>3</b> OF <b>4</b>

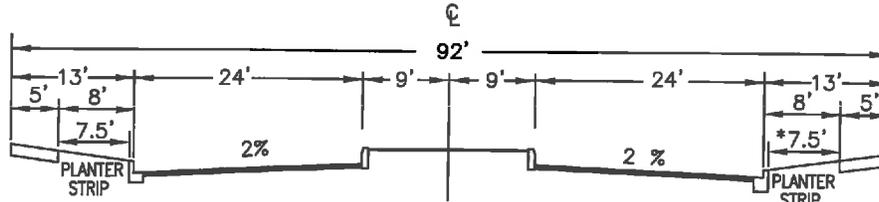
# ARTERIAL STREETS

6' P.U.E. REQUIRED  
BEHIND SIDEWALK



84' INDUSTRIAL- PUBLIC STREET  
(ARTERIAL)

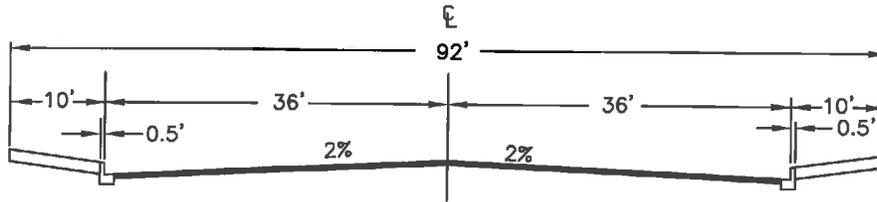
6' P.U.E. REQUIRED  
BEHIND SIDEWALK



92' RESIDENTIAL- PUBLIC STREET  
(MINOR ARTERIAL WITH MEDIAN & PLANTER STRIP)

\* = 7.5' PREFERRED,  
5.5' MINIMUM

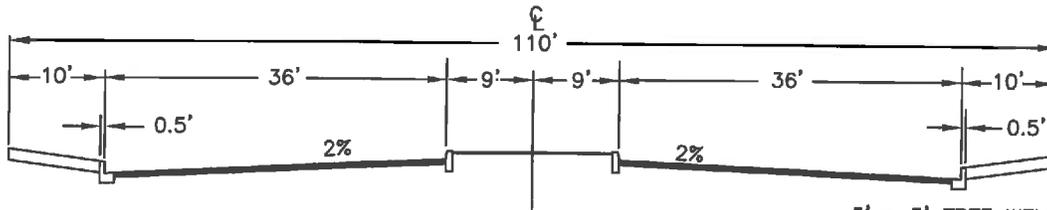
6' P.U.E. REQUIRED  
BEHIND SIDEWALK



92' COMMERCIAL-PUBLIC STREET  
(ARTERIAL)

5' x 5' TREE WELLS

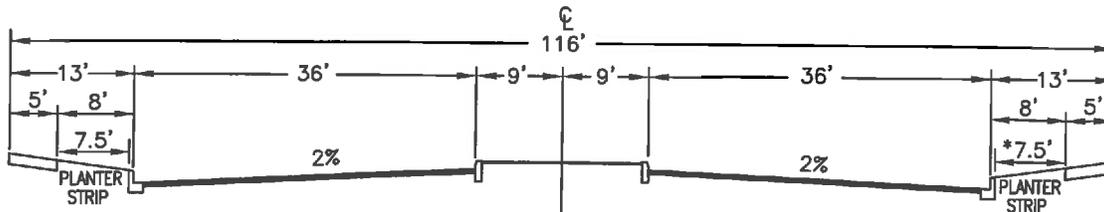
6' P.U.E.  
REQUIRED  
BEHIND  
SIDEWALK



110' COMMERCIAL-PUBLIC STREET  
(ARTERIAL WITH MEDIAN)

5' x 5' TREE WELLS

6' P.U.E.  
REQUIRED  
BEHIND  
SIDEWALK



116' PUBLIC STREET  
(ARTERIAL WITH MEDIAN & PLANTER STRIP)

\* = 7.5' PREFERRED,  
5.5' MINIMUM

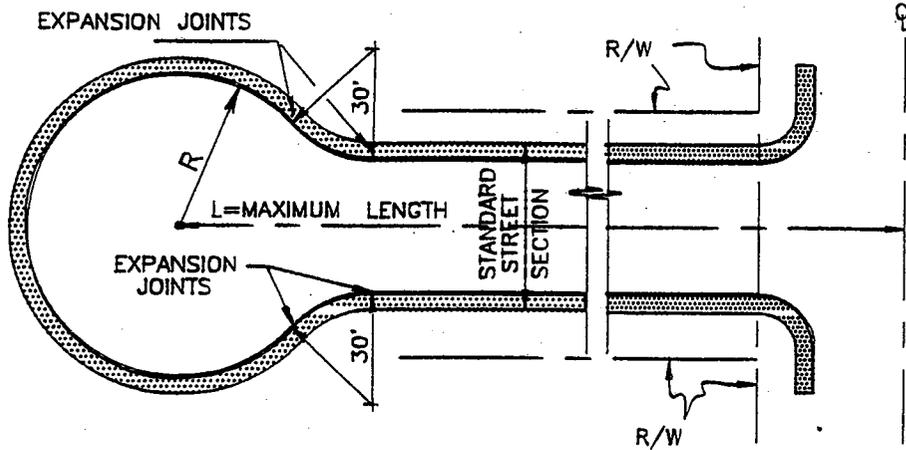
			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.
			DRAWN BY: FM      DATE 02/04/11 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS
REV	DATE	BY	

## STANDARD STREET SECTIONS

DWG. NO. **SD-102**

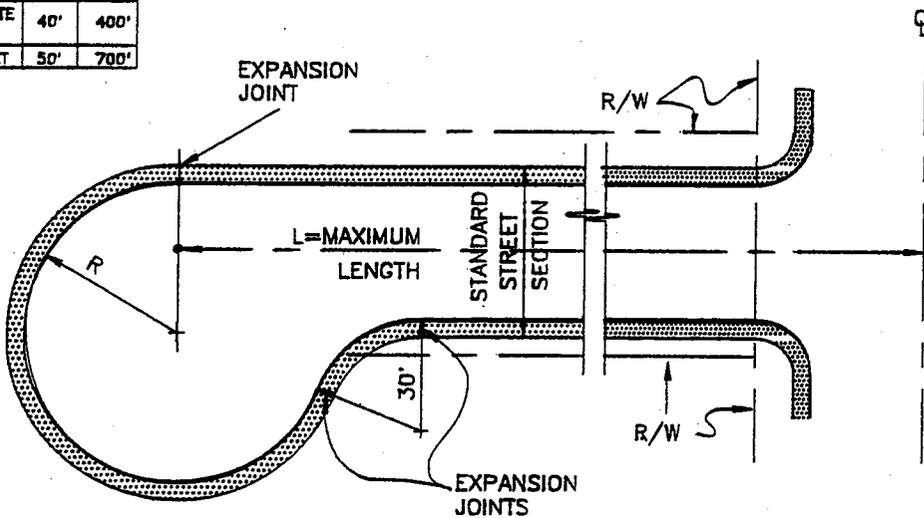
FILED

SHT. **4** OF **4**



### CONCENTRIC

TYPE	R	L
LOCAL RESIDENTIAL—PRIVATE OR PUBLIC STREET	40'	400'
INDUSTRIAL—PUBLIC STREET	50'	700'



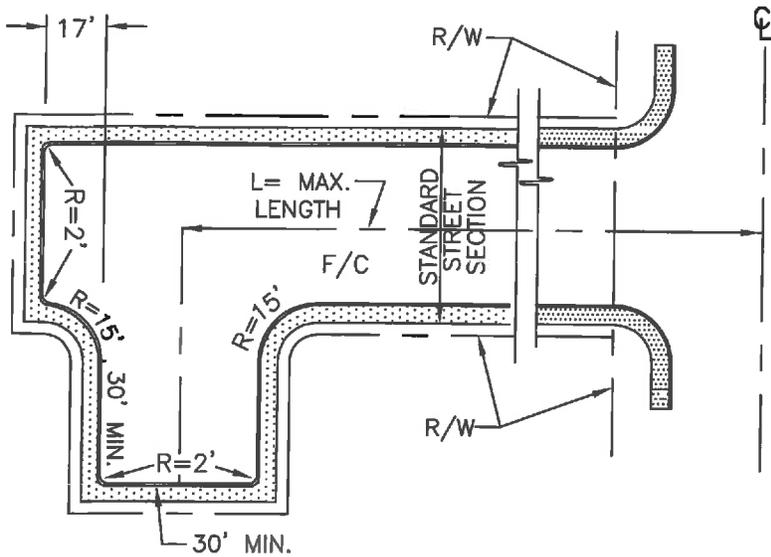
### ECCENTRIC

**NOTE:**

1. A CUL-DE-SAC IS REQUIRED IF "L" EXCEEDS 150 FEET UNLESS WAIVED BY THE FIRE CHIEF.
2. THE ECCENTRIC CUL-DE-SAC OR A MIRROR IMAGE TO THE RIGHT MAY BE UTILIZED AS TERRAIN AND LOT CONFIGURATION NEEDS DICTATE.

**GENERAL NOTE:**  
ALL CONSTRUCTION SHALL CONFORM TO SD-107 & SD-108

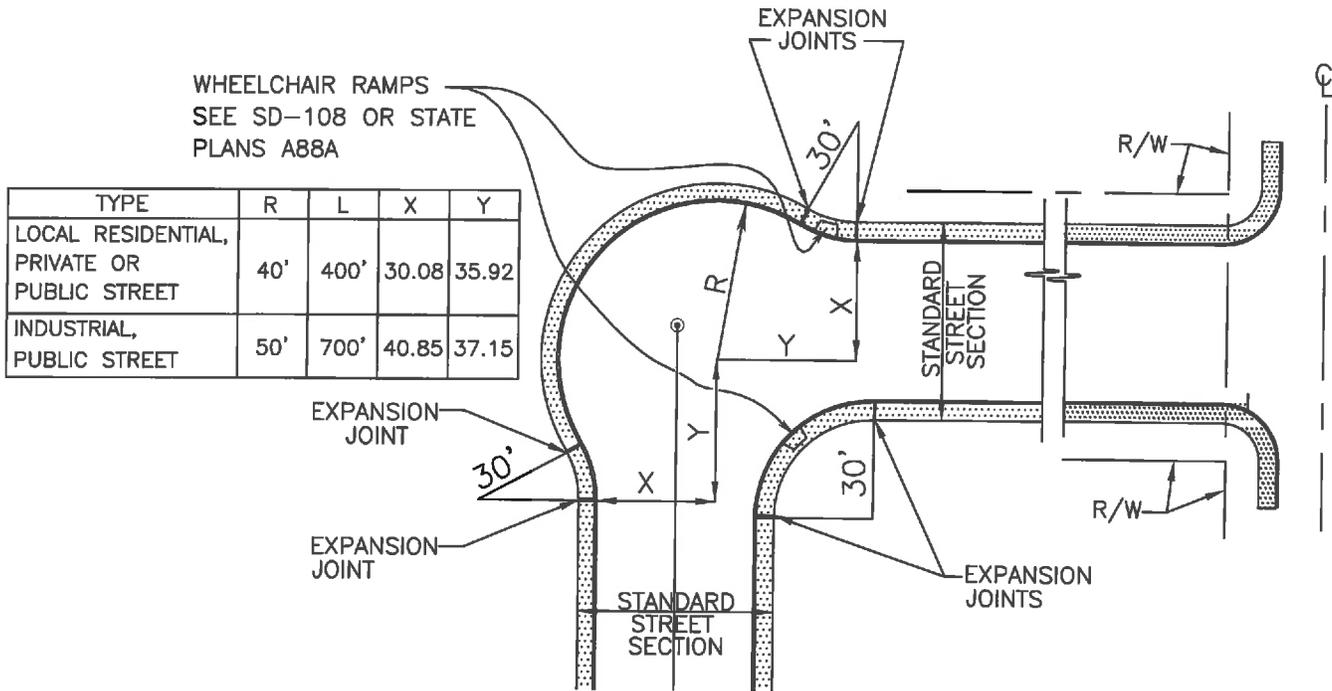
CITY OF HAYWARD ENGINEERING DIVISION			<b>STANDARD CUL-DE-SAC AND RIGHT ANGLE BEND</b>		DWG. NO. <b>SD-103</b>
					FILED
REV	DATE	BY	APPROVED	DIR. PUBLIC WORKS	SHT. 1 OF 2
			<i>T.M.</i>	<i>[Signature]</i>	
			<i>PAB</i>	<i>[Signature]</i>	
			CITY ENGINEER	DIR. PUBLIC WORKS	
			DATE MARCH, 1993	SCALE: NONE	
			DRAWN BY: F.M.		



**NOTES:**

1. THIS ALTERNATIVE OR A MIRROR IMAGE TO THE RIGHT IS TO BE UTILIZED ONLY FOR VERY SPECIAL SITUATIONS SUCH AS HILLSIDE AREAS WHEREBY GRADING AND RETAINING WALLS CAN BE MINIMIZED OR WHERE LOT CONFIGURATION SUPPORTS ITS USE. THE USE OF THIS ALTERNATIVE IS SUBJECT TO THE DISCRETION OF THE FIRE CHIEF AND THE CITY ENGINEER.
2. "NO PARKING" SIGNS SHALL BE POSTED AS DIRECTED BY THE CITY ENGINEER.

**HAMMERHEAD CUL-DE-SAC**



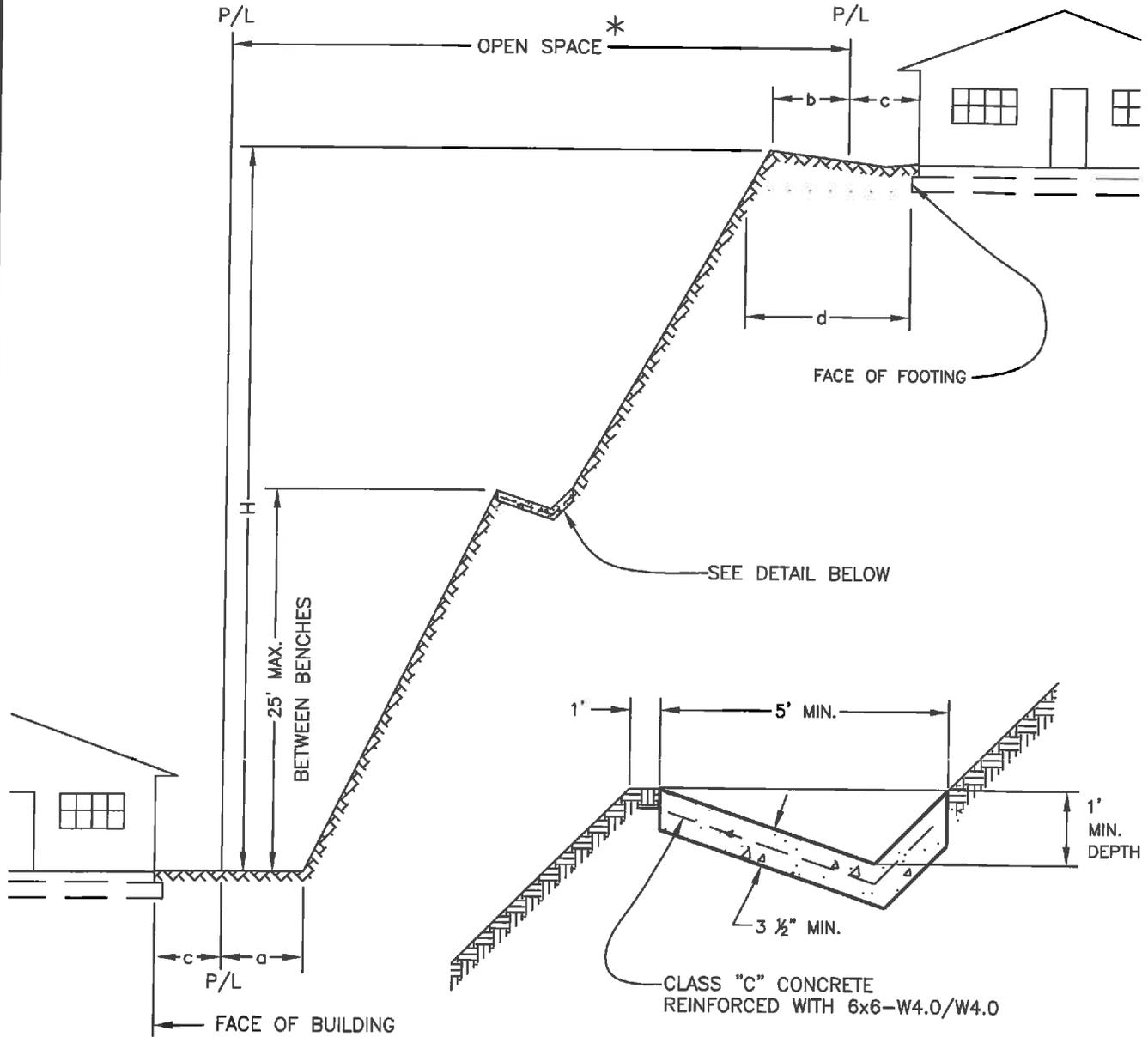
**RIGHT ANGLE BEND**

**GENERAL NOTE:** ALL CONSTRUCTION SHALL CONFORM TO SD-107 & SD-108.

<p><b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b></p>			<p><b>STANDARD CUL-DE-SAC AND RIGHT ANGLE BEND</b></p>	DWG. NO. <b>SD-103</b>
				FILED
REV	DATE	BY	<p>DRAWN BY: FM      DATE 02/11/11</p> <p>CHECKED BY: JF      SCALE NTP</p> <p>APPD. BY: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS</p>	SHT. <b>2</b> OF <b>2</b>

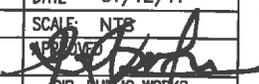
### MINIMUM SETBACKS

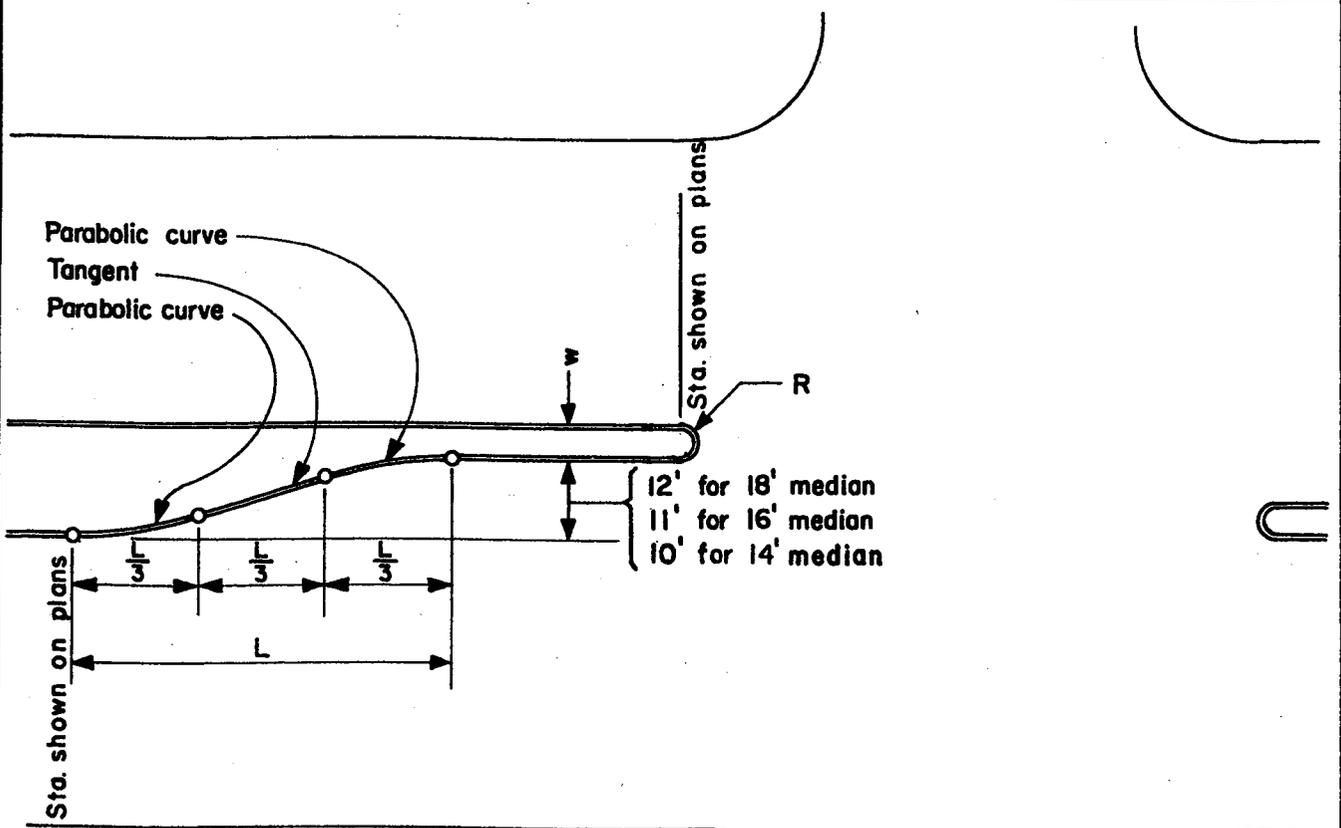
H IN FEET	a	b	c	d
0-10	3'	2'	per zoning ordinance	5'
11-25	(H/2)'	3'		7'
26 AND OVER	13'	3'		10'



### DETAIL

\* THE OPEN SPACE AREA SHALL BE MAINTAINED BY THE HOMEOWNERS' ASSOCIATION OR THE CITY OF HAYWARD AS DIRECTED BY THE CITY COUNCIL.

 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD BUILDING SETBACK &amp; SLOPE TERRACES</b>		DWG. NO. <b>SD-104</b>	
DRAWN BY: FM      DATE: 01/12/11					FILED	
CHECKED BY: JF      SCALE: NTS					SHT. <b>1</b> OF <b>1</b>	
APPD. BY: _____ CITY ENGINEER      DIR. PUBLIC WORKS						



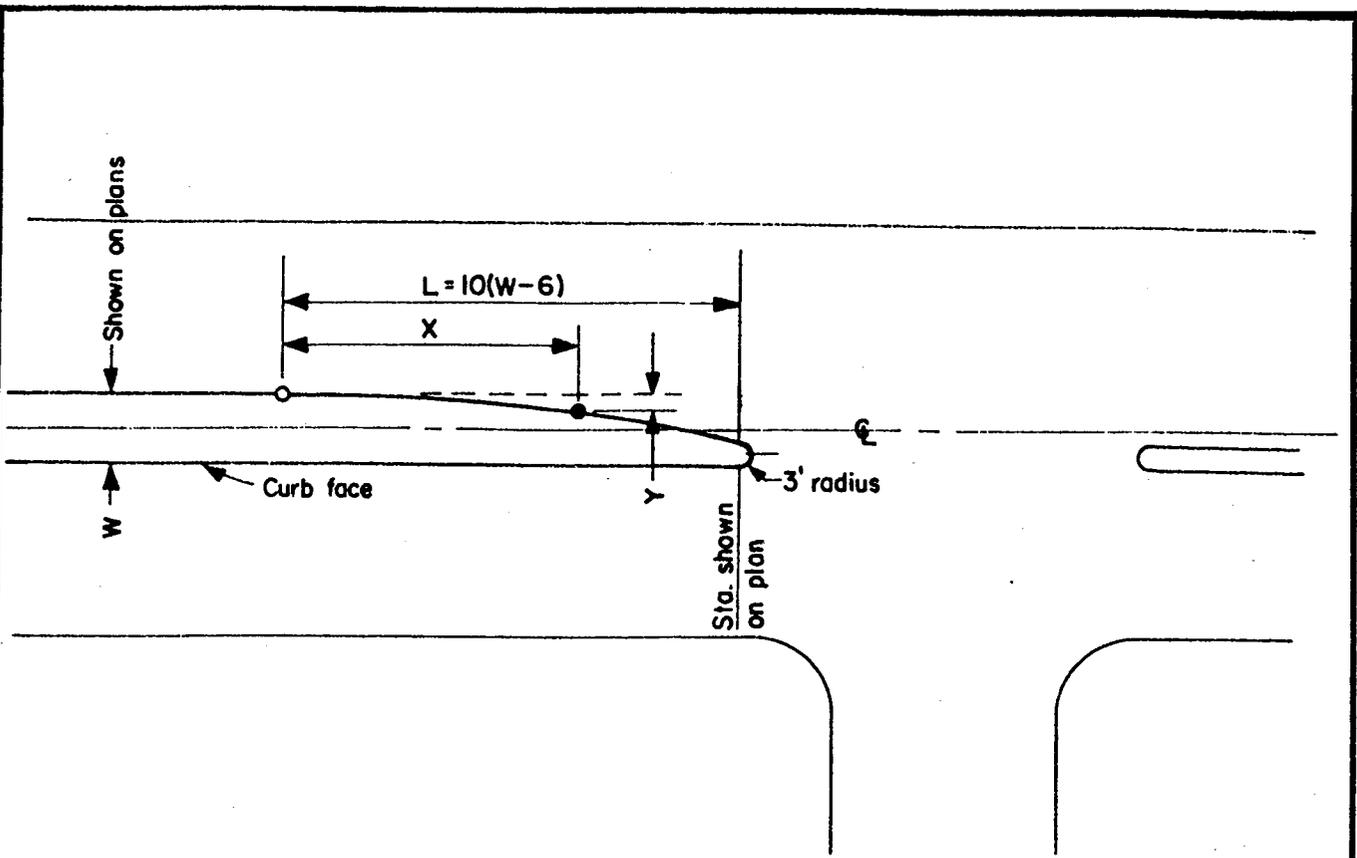
L = Length of taper			Offset distance for lane width of		
60	90	120	10'	11'	12'
Distance from beginning of taper			10'	11'	12'
5	7.5	10	.16	.17	.19
10	15.0	20	.62	.69	.75
15	22.5	30	1.41	1.55	1.69
20	30.0	40	2.50	2.75	3.00
30	45.0	60	5.00	5.50	6.00
40	60.0	80	7.50	8.25	9.00
45	67.5	90	8.59	9.45	10.31
50	75.0	100	9.38	10.31	11.25
55	82.5	110	9.84	10.83	11.81
60	90.0	120	10.00	11.00	12.00

Median Width	w	R
14'	4'	2.0'
16'	5'	2.5'
18'	6'	3.0'

**NOTES:**

1. Offsets are measured from a base line which is the curb line extended.
2. Distance along the base line is measured from the point of tangency at the beginning of taper.
3. Taper length shall be 120' unless otherwise directed by the Engineer or shown on the plans.

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>		<b>STANDARD MEDIAN TAPERS</b>		DWG. NO. SD-105	
			DRAWN BY: FAP	DATE: 7-1-66			FILED <b>6-15-93</b>	
			CHECKED BY: —	SCALE: None	SHT. <u>  </u> OF <u>  </u>			
			APPD. BY: <i>[Signature]</i>	APPROVED				
REV.	DATE	BY	CITY ENGR.	DIR. PUBLIC WORKS				



$$Y = \frac{(W-6) X^2}{L^2}$$

1:10 FLARE OFFSETS

16' Median L = 100'	X	0	10	20	30	40	50	60	70	80	90	100		
	Y	0.00	0.10	0.40	0.90	1.60	2.50	3.60	4.90	6.40	8.10	10.00		
18' Median L = 120'	X	0	10	20	30	40	50	60	70	80	90	100	110	120
	Y	0.00	0.08	0.33	0.75	1.33	2.08	3.00	4.08	5.33	6.75	8.33	10.10	12.00
14' Median L = 80'	X	0	10	20	30	40	50	60	70	80				
	Y	0.00	0.13	0.50	1.13	2.00	3.13	4.50	6.13	8.00				

NOTES:

1. All offsets are measured from a base line which is the curb line extended.
2. Distance along the base line is measured from the point of tangency at the beginning of the flare.

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>				<b>STANDARD MEDIAN FLARES</b>				DWG. NO. SD-106	
			DRAWN BY: FAP		DATE: 7-1-66						FILED <b>6-15-93</b>	
			CHECKED BY: _____		SCALE: None		APPROVED		SHT. 1 of 1			
REV.	DATE	BY	APPD. BY: _____ CITY ENGR.		DIR. PUBLIC WORKS							

THESE SPECIAL PROVISIONS SHALL GOVERN OVER THE STANDARD SPECIFICATIONS FOR CONCRETE CURB, GUTTER, SIDEWALK DRIVEWAY, AND FLARE CONSTRUCTION

1. Where there is existing concrete to be removed, it shall be cut with a concrete saw to a minimum depth of 1½ inches to lines determined by the City Engineer unless removal can be made to a cold or expansion joint. Curbs, gutters, and sidewalks shall be removed from the entire section.
2. In sidewalk area, Class 2 aggregate subbase shall be placed on a smoothly graded, firm, unyielding plane. The top 6" of subgrade and the aggregate subbase shall be compacted to not less than 90 percent relative density. Sand, gravel, or other fluid material shall not be used.
3. The top 6" of subgrade and aggregate subbase under curb, gutter, and driveways shall be compacted to not less than 95 percent relative density.
4. <sup>2</sup> Where new concrete is to be placed against existing concrete and at construction (cold) joints in new concrete, the two shall be joined by dowels with #3 bars per lengths and depths as shown in SD-108, 108A or 109, @ 3'-0" O.C. maximum, or as directed by the City Engineer. The holes shall be drilled into the existing concrete such that dowels fit snugly into the drilled holes.
5. Expansion joints shall be the bituminous fiber type, ½" in thickness, in one pre-molded, full depth piece. The full depth, width, and shape of the expansion joints shall be spaced a maximum of 50' apart. Expansion joints shall be installed at all structures, curb returns, and driveways. Expansion joint material shall be cast into fresh concrete. "Cut-in" expansion joints will not be accepted.
6. Weakened plane joints shall be constructed to a minimum depth of ¼ of concrete thickness with a scoring tool, which will leave the corners rounded. Weakened plane joints spacing shall not exceed 10' unless otherwise directed by the City Engineer. Saw cut scores will not be accepted.
7. Concrete shall be Class "B" (five-sack mix) maximum 4" slump. Concrete shall contain one pound Lampblack or equivalent liquid color per cubic yard.
8. Score marks shall conform to existing adjacent patterns, or shall be placed as directed by the City Engineer. Score marks, expansion joints, and weakened plane joints shall be straight and true.
1. Finished concrete shall be treated with a transparent curing compound at the rate of 200 square feet per gallon in a criss-cross pattern, or water cured, as directed by the City Engineer.
10. Approved forms shall be used for all concrete work unless an extrusion machine is permitted. Forms shall be smooth, rigid, and full dimension. The lower rear edge of the front face form of curbs shall be milled to a 1" radius. Bracing stakes shall be placed at 3' intervals.
11. <sup>2</sup> Curb ramps shall be constructed at all crosswalks, marked or unmarked.
12. Sidewalks and driveways shall receive a light broom finish and shall be broomed transversely to the line of pedestrian traffic. Curb, gutter and valley gutters shall receive a light brush finish with brush strokes parallel to the line of the curb or gutter. Ramp broom finish shall be per SD-108. Skim coated or "sacked" finishes will not be accepted.
13. <sup>1</sup> See SD-113 for pavement tie-in at curb and gutter.

			 <b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>	<b>STANDARD CONCRETE CONSTRUCTION SPECIAL PROVISIONS</b>	DWG. NO. <b>SD-107</b>
2	10/22/10	HGM	DRAWN BY: HGM	DATE 05/12/08	FILED
1	03/30/10	AL	CHECKED BY: JF	SIGNED: <i>[Signature]</i> APPROVED: <i>[Signature]</i>	SHT. <b>1</b> OF <b>2</b>
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	

## CEMENT CONCRETE CLASSES

The Concrete Class A, B, C and D as specified in these City of Hayward Standard Details are defined as follows:

Class A Concrete (6-sack-mix) shall contain not less than 564 pounds of cementitious material per cubic yard.

Class B Concrete (5-sack-mix) shall contain not less than 470 pounds of cementitious material per cubic yard.

Class C Concrete (4-sack-mix) shall contain not less than 376 pounds of cementitious material per cubic yard.

Class D Concrete (7-sack-mix) shall contain not less than 658 pounds of cementitious material per cubic yard.

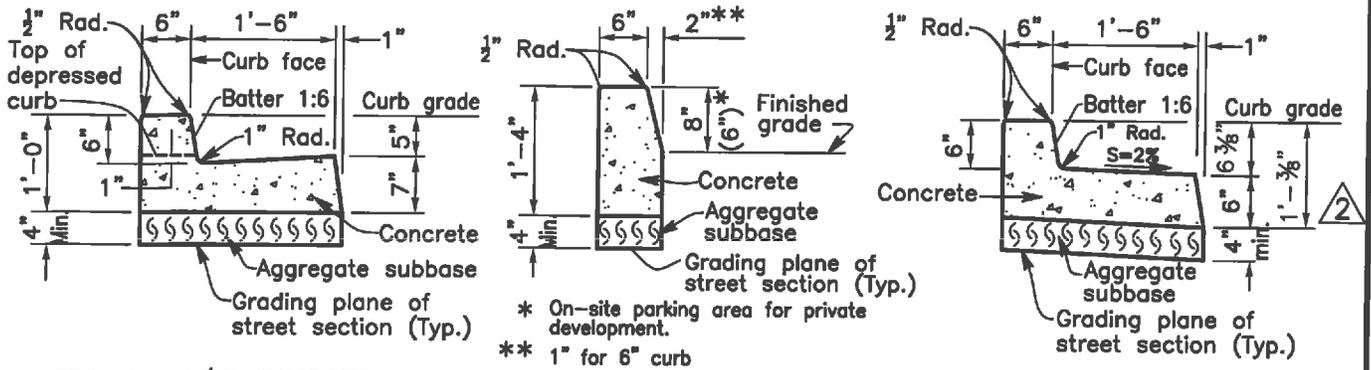
Concrete classes other than those defined above shall conform to the requirements specified in Section 90, "Portland Cement Concrete," of the State Standard Specifications.

The Concrete Class A, B, C and D as specified in these City of Hayward Standard Details, project plans, miscellaneous specifications related to the project, and the special provisions, shall be redefined using the State Standard Specifications for portland cement concrete designations as follows: △ 1

City 2008 Standard Details, Project Plans & Special Provisions		Caltrans 2006 Standard Specifications	
Concrete Class	Min. Cement Content (lb/cy)	Concrete Class	Min. Cement Content (lb/cy)
Class A	564	Class 2	590
Class B	470	Class 3 or Minor Concrete	470 to 550*
Class C	376	Class 4	420
Class D	658	Class 1	675

\* Varies depending on concrete application and as specified by the City Engineer. △ 2

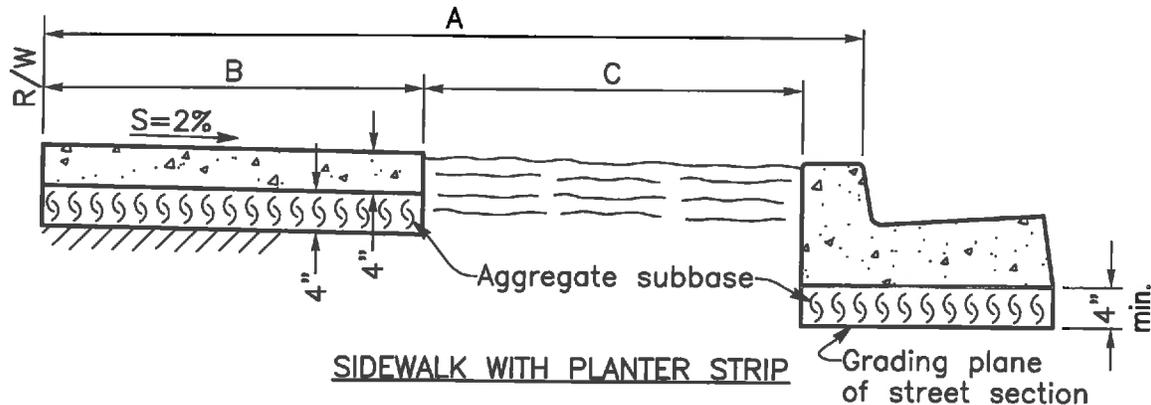
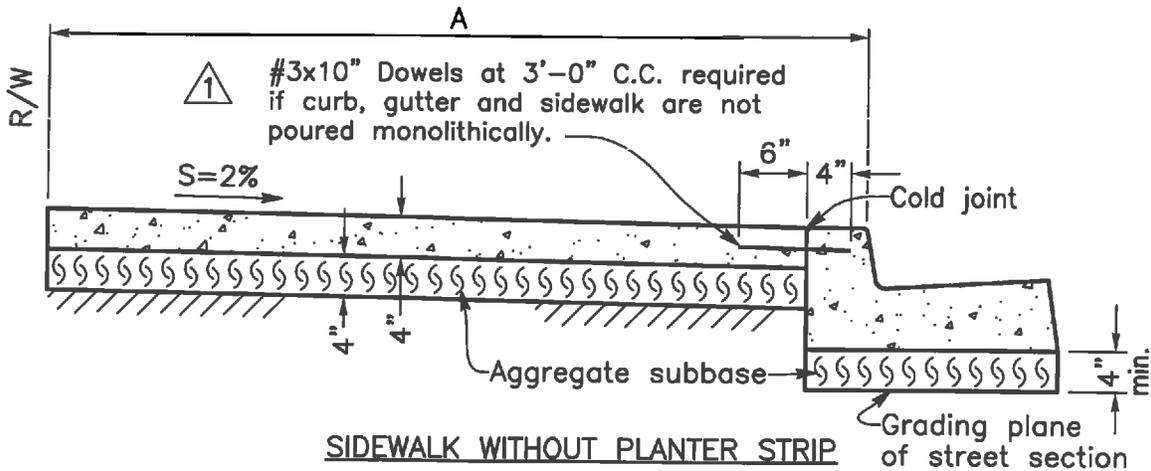
△ 2	12/01/11	HGM	<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD CONCRETE CONSTRUCTION SPECIAL PROVISIONS</b>	DWG. NO.	SD-107
					DRAWN BY: HGM      DATE: 05/12/08 CHECKED BY: JF      SCALE: NTS APPD. BY:	FILED
△ 1	10/22/10	HGM			SHT. <b>2</b> OF <b>2</b>	
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		



**STANDARD/DEPRESSED CURB AND GUTTER**

**STANDARD MEDIAN/ISLAND CURB**

**SPILL CURB AND GUTTER**



**SIDEWALK DIMENSIONS**

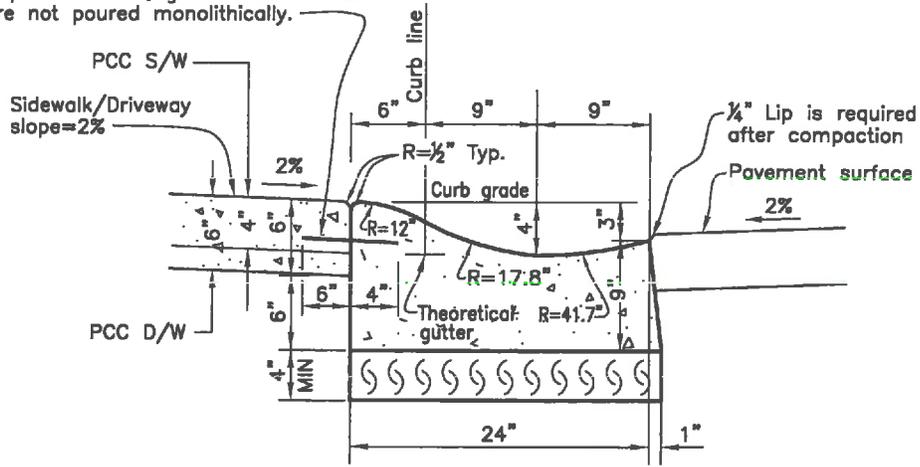
A	5	6	7	8	9	10	10	13
B	4.5	5.5	4	4	4	4	9.5	5
C	0	0	2.5	3.5	4.5	5.5	0	7.5

**NOTES:**

1. Construction shall conform to SD-107.
2. Aggregate subbase under curbs and gutters shall extend to the grading plane of the street section but shall in no case be less than 4".

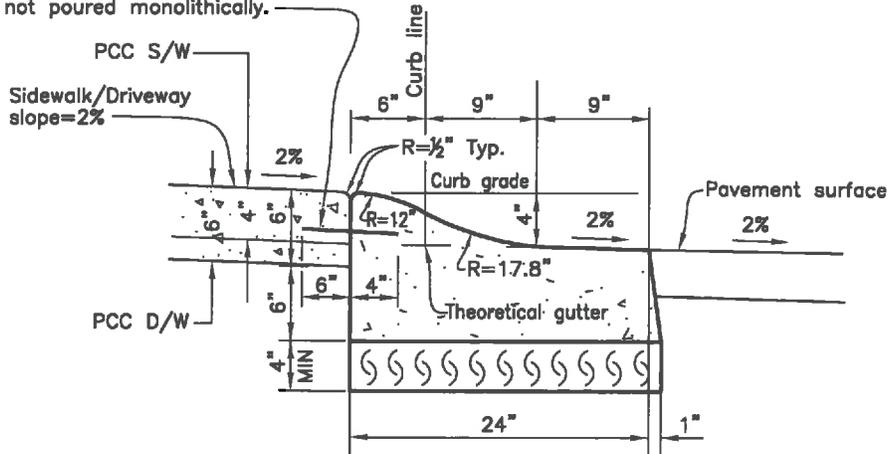
11/01/11 3/31/10 REV DATE BY	JT AL CITY ENGINEER	<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT. DRAWN BY: JT CHECKED BY: JF APPD. BY: [Signature] DATE: 05/08/08 SCALE: MTS DIR. PUBLIC WORKS	<b>STANDARD SIDEWALK, CURB AND GUTTER, ISLAND CURB AND CURB RAMP SECTIONS</b>	DWG. NO. <b>SD-108</b> FILED SHT. <b>1</b> OF <b>6</b>
------------------------------------	---------------------------	--	---	--

#3 x 10" dowels at 3'-0" C.C.,  
required if curb, gutter and sidewalk  
are not poured monolithically.



**ROLLED CURB AND GUTTER**  
(Showing driveway and sidewalk  
constructed adjacent to curb)

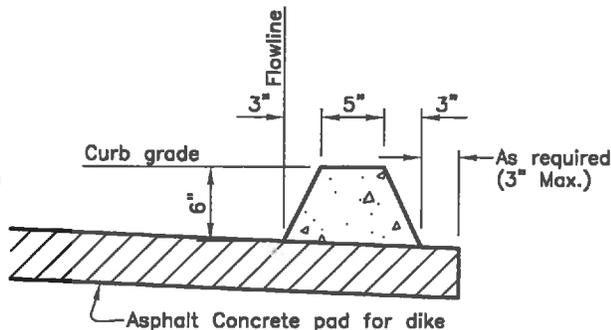
#3 x 10" dowels at 3'-0" C.C.,  
required if curb, gutter and sidewalk  
are not poured monolithically.



**SPILL ROLLED CURB AND GUTTER**  
(Showing driveway and sidewalk  
constructed adjacent to curb)

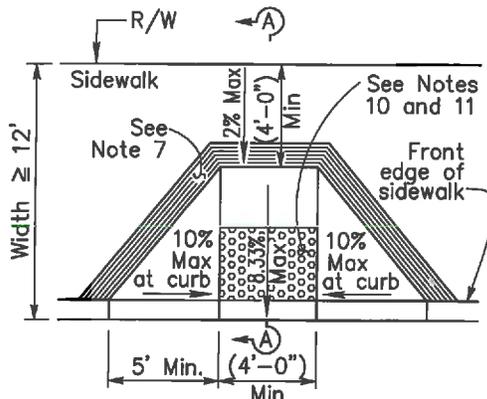
**NOTES:**

1. All grades and widths to be referred to curb grade and curb line.
2. This rolled curb detail shall be utilized only for private developments.

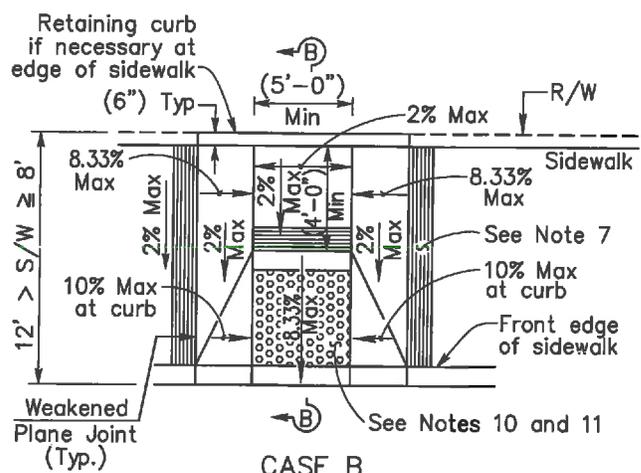


**ASPHALT CONCRETE DIKE**

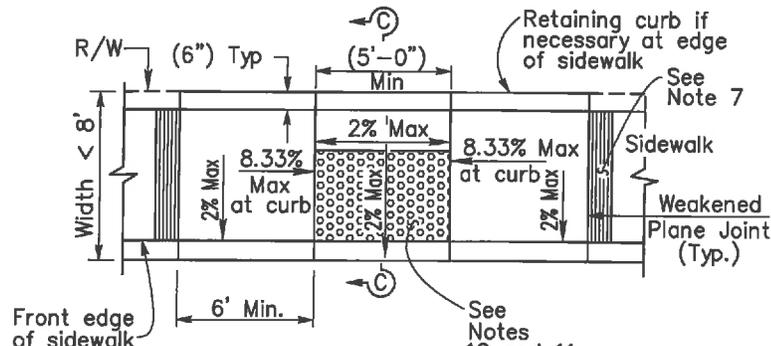
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD SIDEWALK, CURB AND GUTTER, ISLAND CURB AND CURB RAMP SECTIONS</b></p>	DWG. NO. <b>SD-108</b>
<p>DRAWN BY: JT</p>	<p>DATE: 01/30/14</p>	<p>CHECKED BY: JF</p>		<p>SCALE: NTS</p>
<p>APPROVED BY: [Signature]</p>	<p>APPROVED BY: [Signature]</p>	<p>ASSTANT CIVIL ENGINEER</p>	<p>DIR. PUBLIC WORKS - E&amp;T</p>	SHT. <b>2</b> OF <b>6</b>



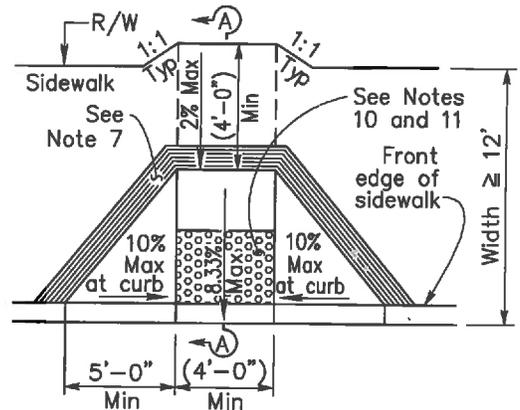
CASE A



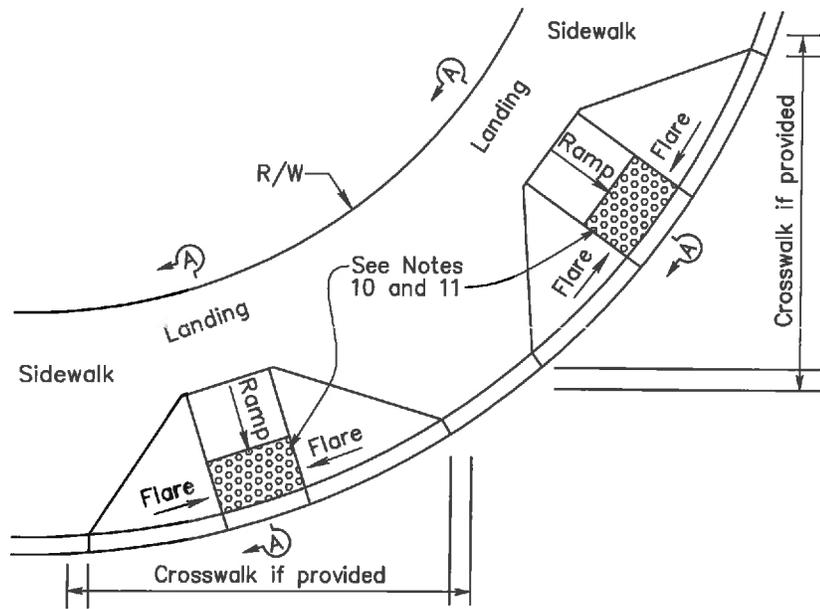
CASE B



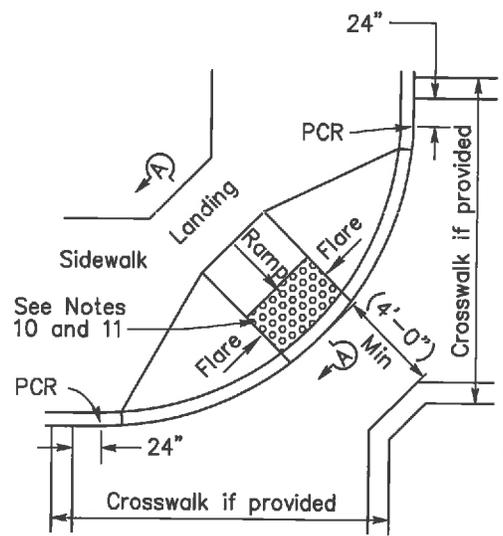
CASE C



CASE D



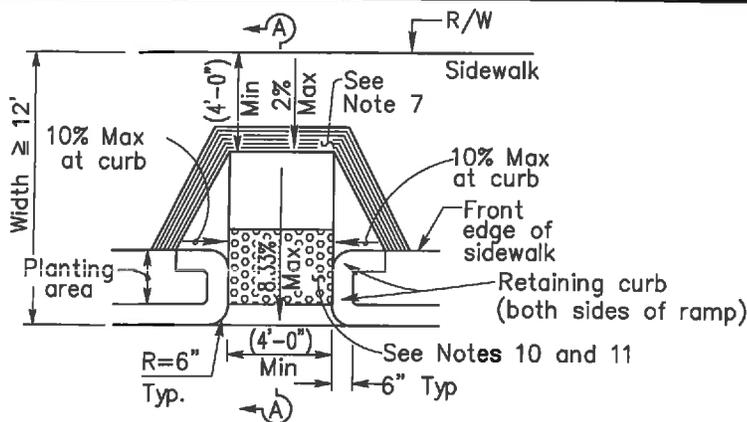
DETAIL A  
See Note 1



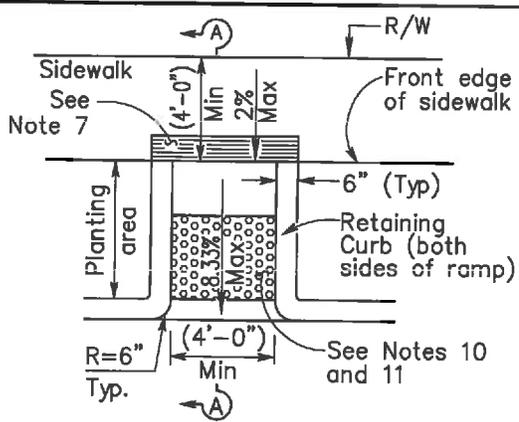
DETAIL B  
TYPICAL ONE-RAMP  
CORNER INSTALLATION  
See Notes 1 and 3

See Sheet 6 of 6 for Notes

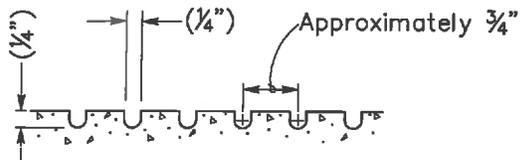
			<p><b>STANDARD SIDEWALK, CURB AND GUTTER, ISLAND CURB AND CURB RAMP SECTIONS</b></p>	<p>DWG. NO. <b>SD-108</b></p>
<p>REV</p>	<p>DATE</p>	<p>BY</p>		<p>FILED</p>
<p>CITY ENGINEER</p>			<p>DIR. PUBLIC WORKS</p>	<p>SHT. <b>3</b> OF <b>6</b></p>



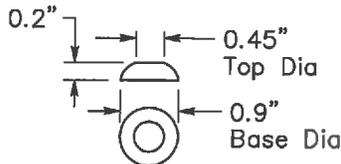
CASE E



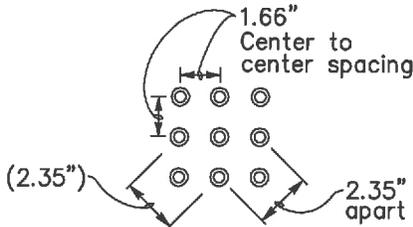
CASE F



GROOVING DETAIL

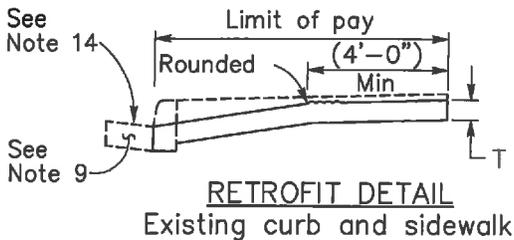


RAISED TRUNCATED DOME



RAISED TRUNCATED DOME PATTERN (IN-LINE) DETECTABLE WARNING SURFACE

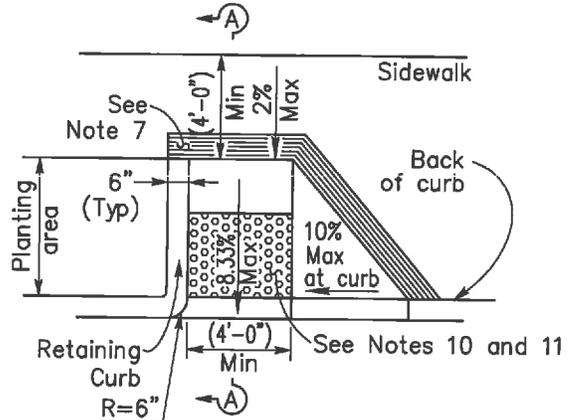
See Note 10



RETROFIT DETAIL

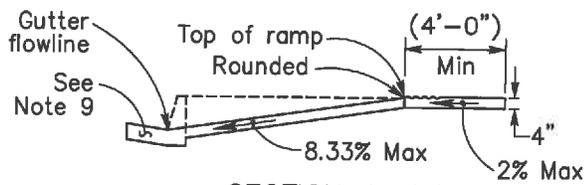
Existing curb and sidewalk

See Sheet 6 of 6 for Notes

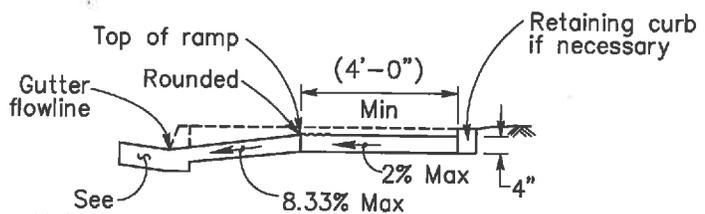


CASE G

See Note 4

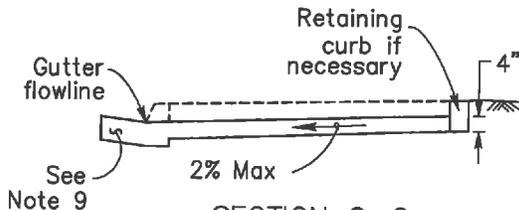


SECTION A-A



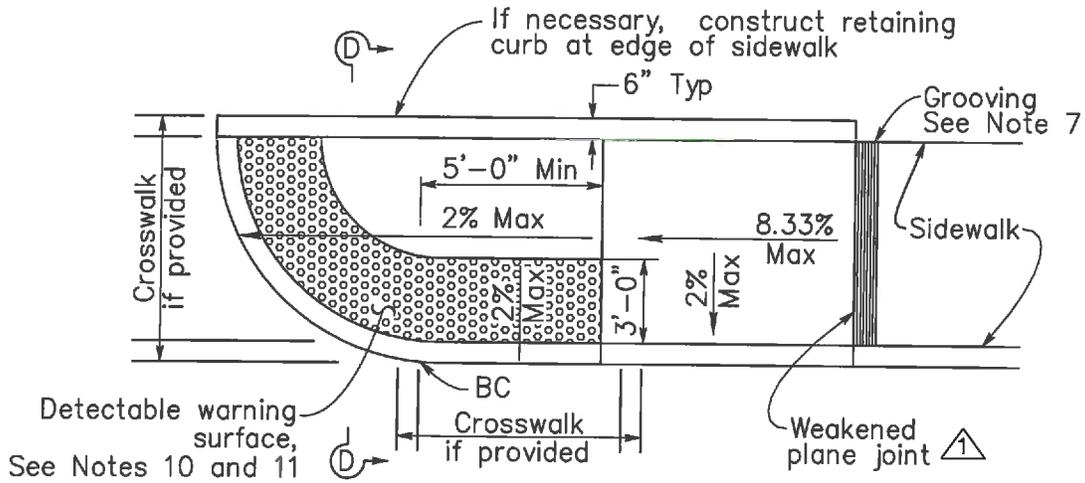
SECTION B-B

Depress entire sidewalk as required

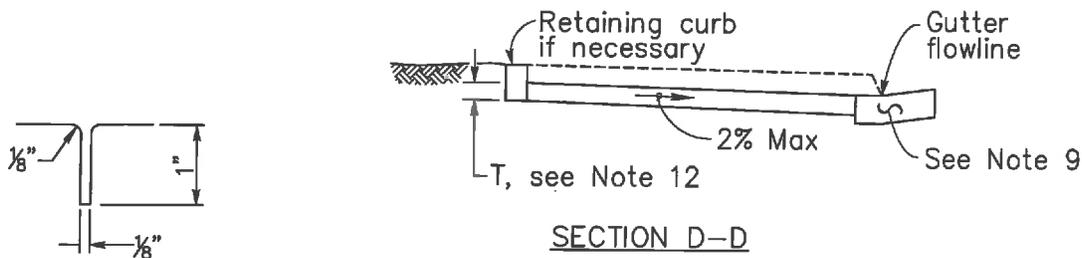


SECTION C-C

					<b>STANDARD SIDEWALK, CURB AND GUTTER, ISLAND CURB AND CURB RAMP SECTIONS</b>		DWG. NO. <b>SD-108</b>	
			DRAWN BY: FM      DATE: 02/14/08				FILED	
			CHECKED BY: JF      SCALE: NTS				SHT. <b>4</b> OF <b>6</b>	
			APPD. BY: [Signature]      APPROVED					
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS				

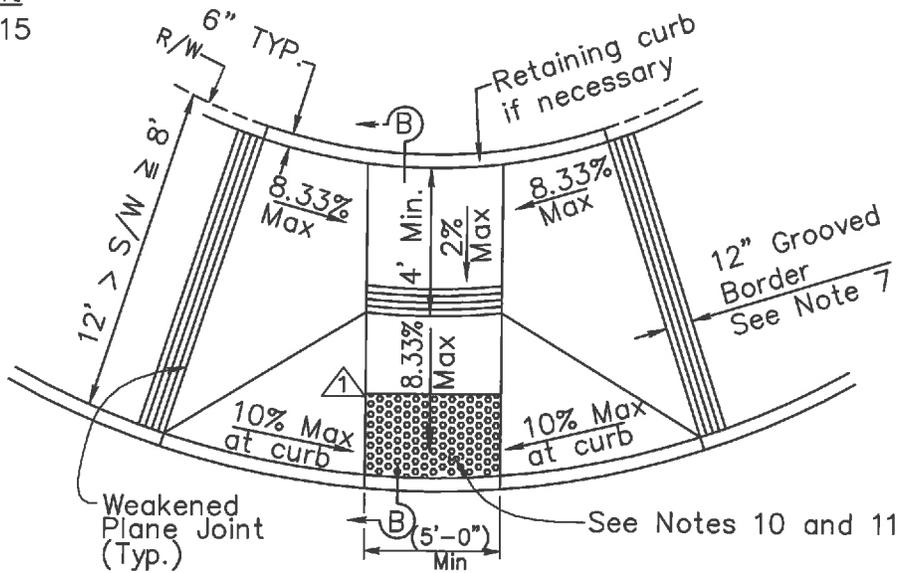


CASE CM CURB RAMP



SECTION D-D

Typical Weakened Plane Joint  
See Note 15



CASE B-2

See Sheet 6 of 6 for Notes

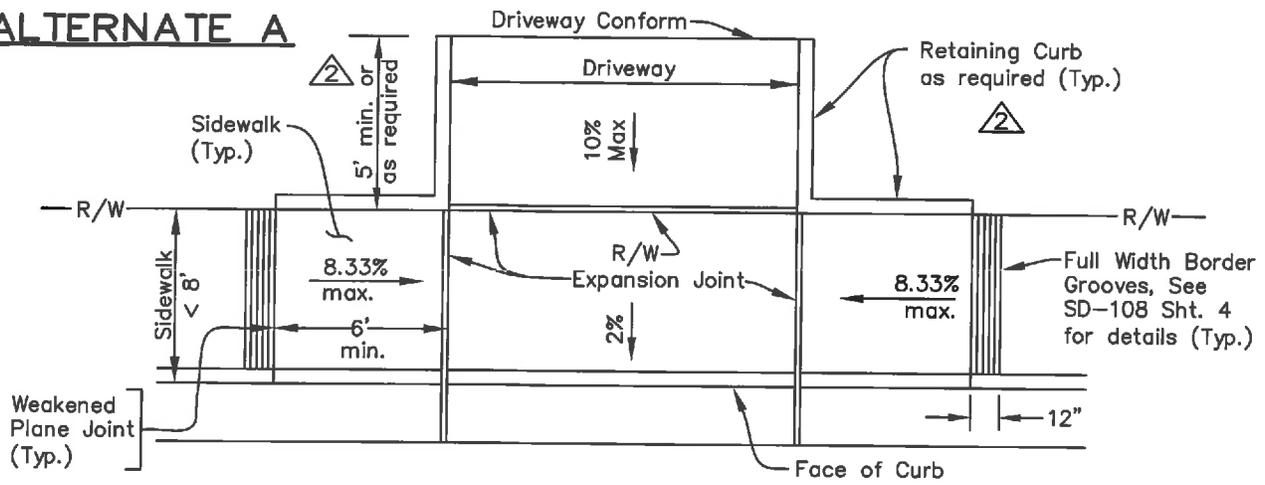
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD SIDEWALK, CURB AND GUTTER, ISLAND CURB AND CURB RAMP SECTIONS</b>	DWG. NO. <b>SD-108</b>
1	1/23/11	SSL	DRAWN BY: JT	DATE: 09/05/08		FILED
REV	DATE	BY	CHECKED BY: JF	SCALE: NTS		SHT. <b>5</b> OF <b>6</b>
			APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>		
			CITY ENGINEER	DIR. PUBLIC WORKS		

NOTES

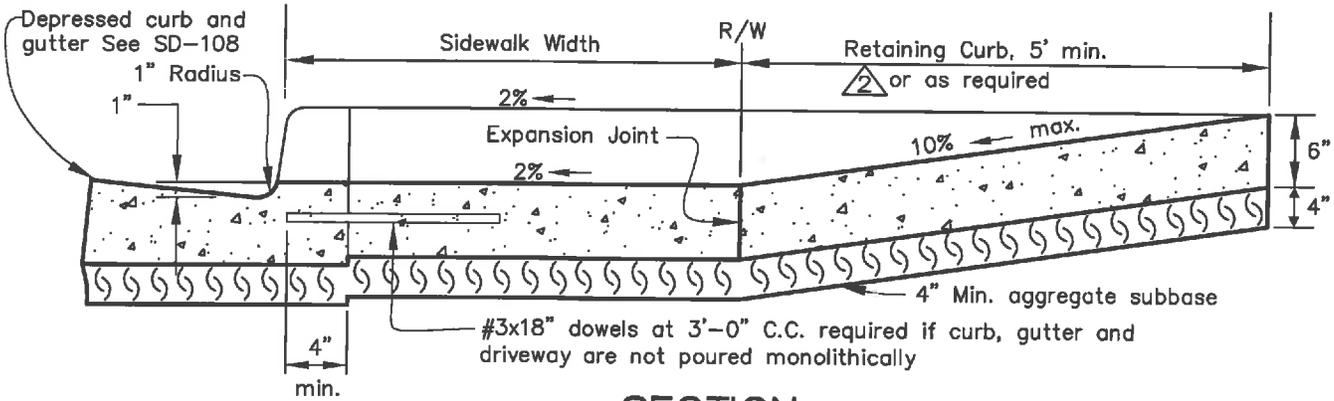
1. As site conditions dictate, CASE A through CASE G curb ramps may be used for corner installations similar to those shown in DETAIL A and DETAIL B. The case of curb ramps used in DETAIL A do not have to be the same. CASE A through CASE G curb ramps also may be used at mid block locations, as site conditions dictate.
2. If distance from curb to back of sidewalk is too short to accommodate ramp and 4'-0" platform (landing) as shown in CASE A, the sidewalk may be depressed longitudinally as in CASE B, or C or may be widened as in CASE D.
3. When ramp is located in center of curb return, crosswalk configuration must be similar to that shown for DETAIL B.
4. As site conditions dictate, the retaining curb side and the flared side of the CASE G ramp shall be constructed in reversed position.
5. If located on a curve, the sides of the ramp need not be parallel, but the minimum width of the ramp shall be 4'-0".
6. Side slope of ramp flares vary uniformly from a maximum of 10% at curb to the conform with longitudinal sidewalk adjacent to top of the ramp, except in CASE C, CASE CM and CASE F.
7. The curb ramp shall be outlined, as shown, with a 12" wide border with 1/4" grooves approximately 3/4" on center. See GROOVING DETAIL.
8. Transitions from ramps and landing to walks, gutters or streets shall be flush and free of abrupt changes.
9. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp and continuous passage to the curb ramp shall not exceed 5 percent within 4'-0" of the top and bottom of the curb ramp.
10. Curb ramps shall have a "Dark Gray" cast-in-place detectable warning surface that extends the full width and 3'-0" depth of the ramp. Detectable warning surfaces shall conform to the details as shown, and the requirements in the Special Provisions.
11. The edge of the detectable warning surface nearest to the street shall be between 6" and 8" from the gutter flowline.
12. Sidewalk and ramp thickness, shall be 4". All new handicap ramp installations shall be constructed on a 4" thick layer of aggregate subbase compacted to 90% relative compaction.
13. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp shall be relocated or adjusted to grade prior to, or in conjunction with curb ramp construction.
14. For retrofit conditions, removal and replacement of curb apron (gutter) will be at the Contractor's option, unless shown on project plans.
- ⚠ 15. Construction shall conform to SD-107.
- ⚠ 16. Contractor shall verify all existing site conditions and if any maximum allowable slope cannot be met due to existing site conditions, contact the Supervising Construction Inspector for direction before proceeding with construction.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD SIDEWALK, CURB AND GUTTER, ISLAND CURB AND CURB RAMP SECTIONS</b>	DWG. NO. <b>SD-108</b>
			DRAWN BY: JT      DATE: 09/05/08 CHECKED BY: JF      SCALE: AS SHOWN APPD. BY: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS		FILED
⚠	3/31/10	AL			SHT. <b>6</b> OF <b>6</b>
REV	DATE	BY			

# ALTERNATE A

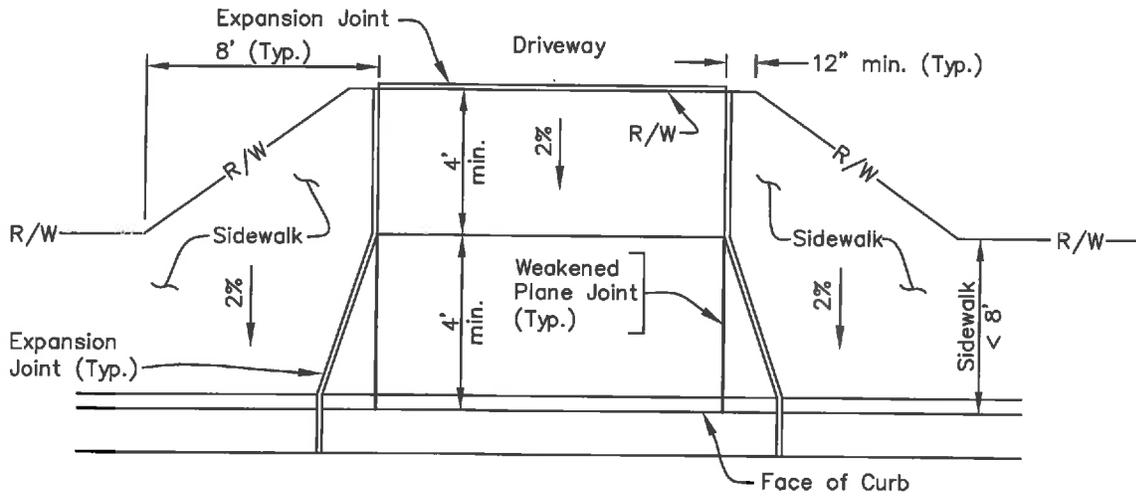


## PLAN



## SECTION

# ALTERNATE B



## PLAN

### NOTES:

1. Construction shall conform to SD-107.
2. See SD-109 & SD-110 for all other applicable driveway details.

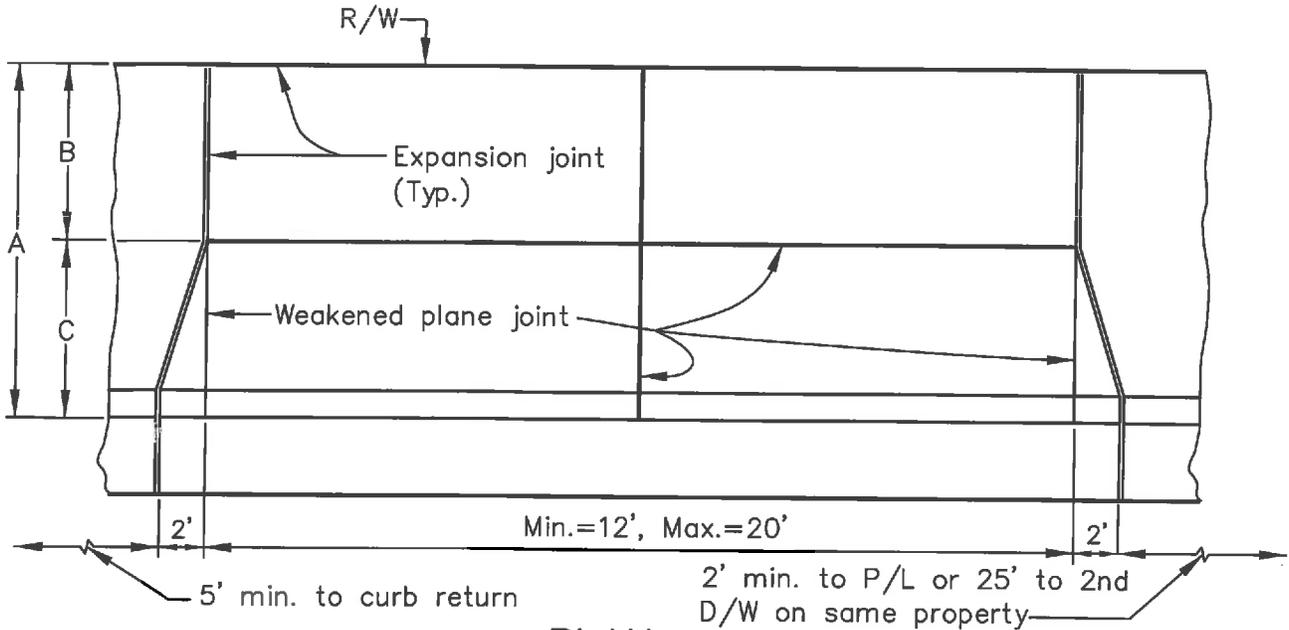
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD DRIVEWAY FOR SIDEWALK &lt; 8'</b>		DWG. NO. <b>SD-108A</b>	
	1/21/11	JT	DRAWN BY: HGM DATE: 09/29/08	SCALE: NTS APPROVED:			FILED	
	3/31/10	AL	CHECKED BY: JF APPD. BY:	 APPROVED:		SHT. <b>1</b> OF <b>1</b>		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS				

**TABLE OF DIMENSIONS**

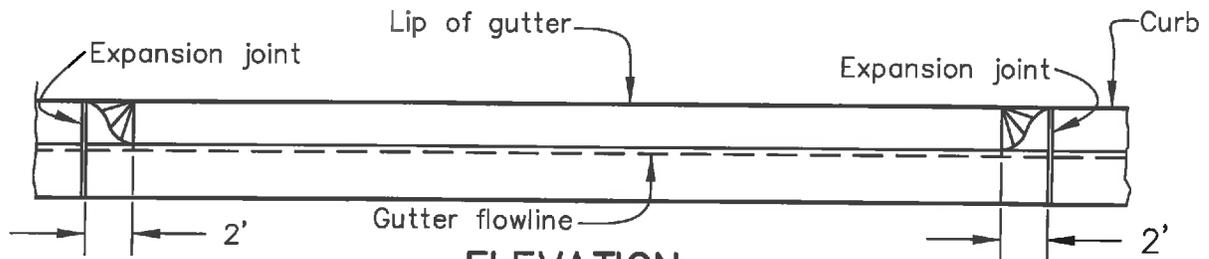
A	5'	6'	7'	8'	9'	10'
B	See Note 2			4'	4'	4'
C	See Note 2			4'	5'	6'

**NOTES:**

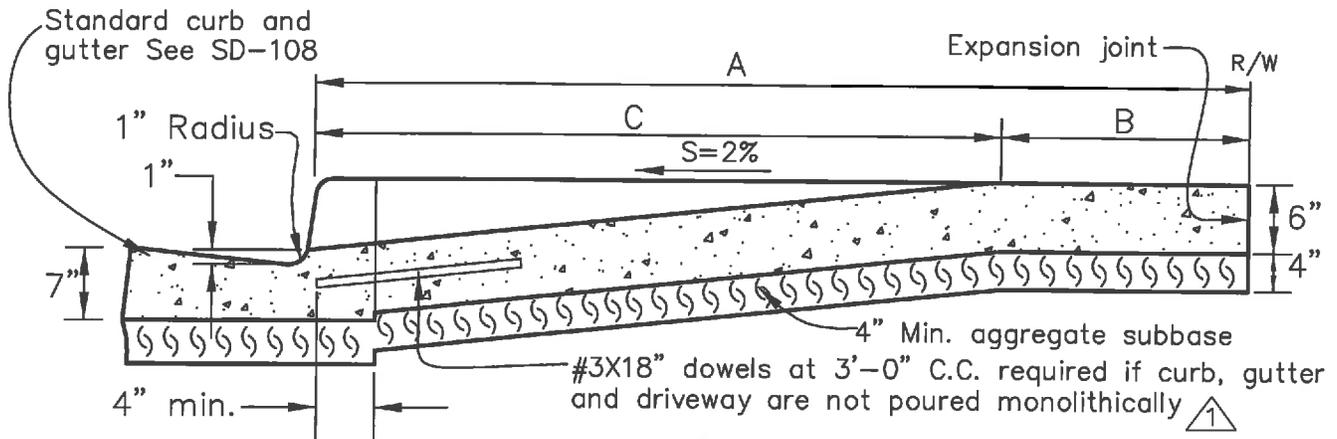
1. Construction shall conform to SD-107.
2. See SD-108A for Plans & Section when dimension "A" is less than 8'.



**PLAN**

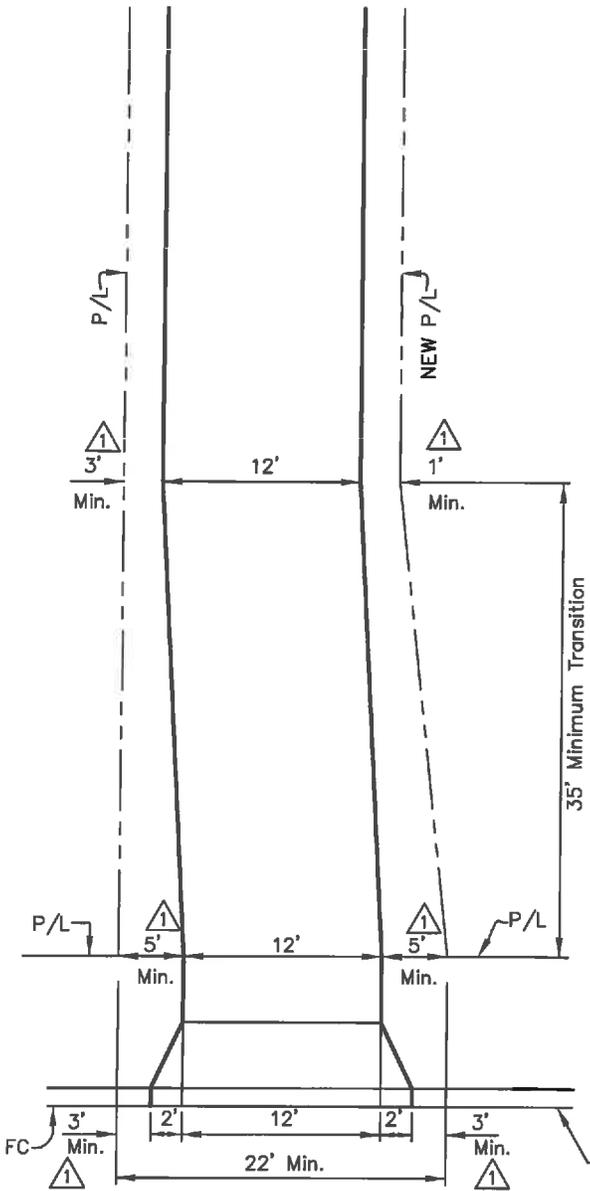


**ELEVATION**

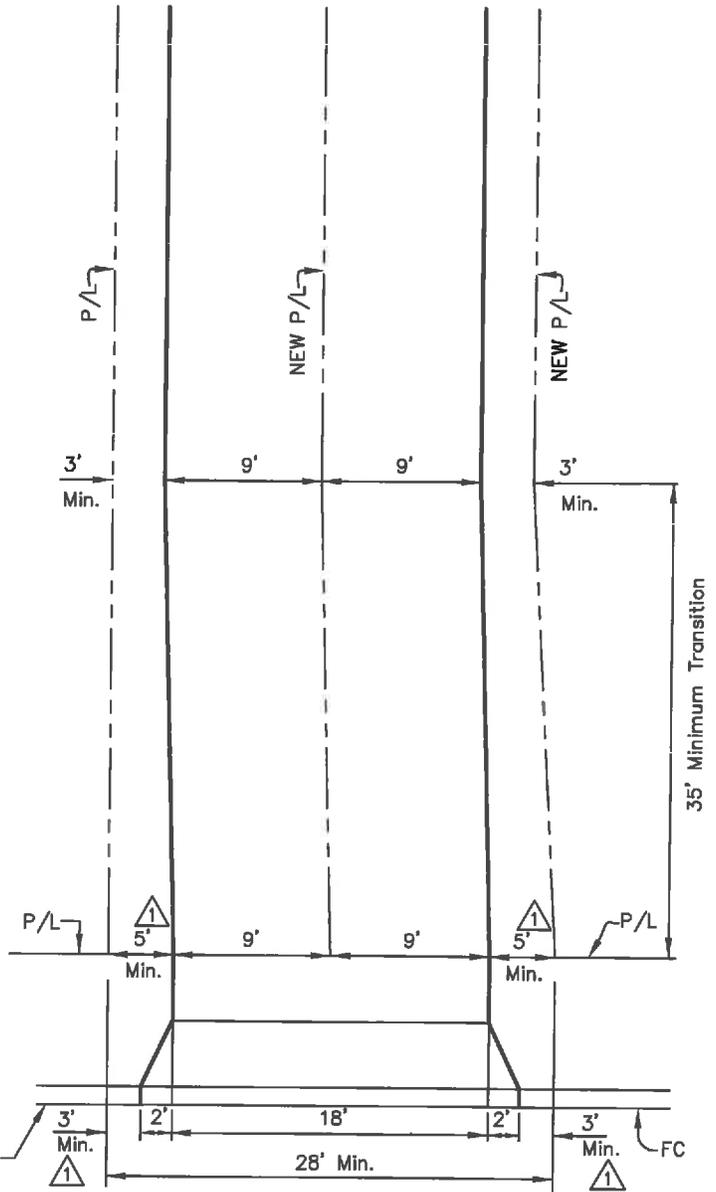


**SECTION**

<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD DRIVEWAY</b></p>		<p>DWG. NO. <b>SD-109</b></p>
<p>DRAWN BY: HGM      DATE: 03/03/09</p>			<p><b>LOCAL &amp; COLLECTOR STREETS</b></p>		<p>FILED</p>
<p>CHECKED BY: JBL      SCALE: N.T.S.</p>			<p><b>NON-COMMERCIAL &amp; NON-INDUSTRIAL</b></p>		<p>SHT. <b>1</b> OF <b>3</b></p>
<p>1</p>	<p>03/30/10</p>	<p>AL</p>	<p>APPD. BY: <i>[Signature]</i></p>	<p>CITY ENGINEER</p>	<p>DIR. PUBLIC WORKS</p>

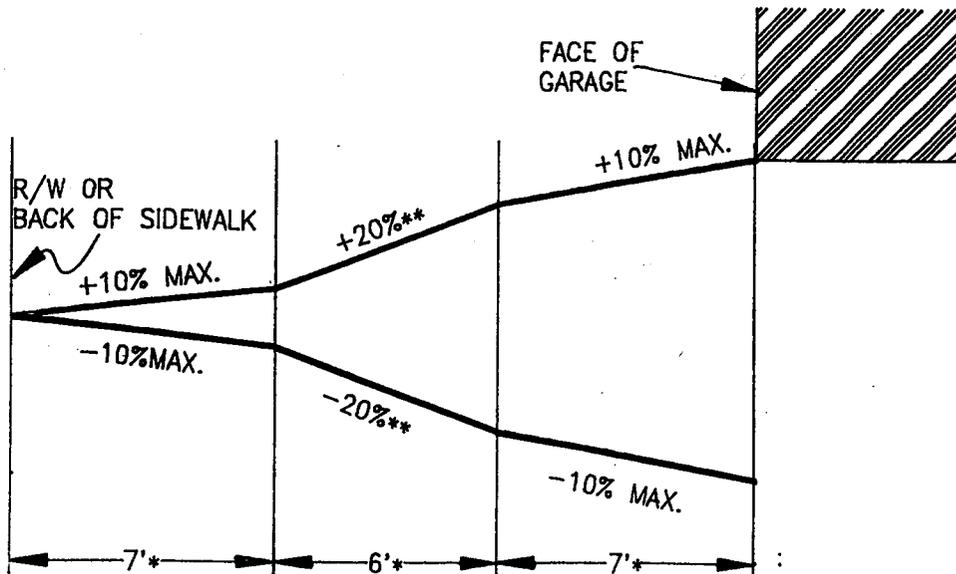


MINIMUM DRIVEWAY WIDTH AND PROPERTY REQUIREMENTS FOR SINGLE FLAG LOT

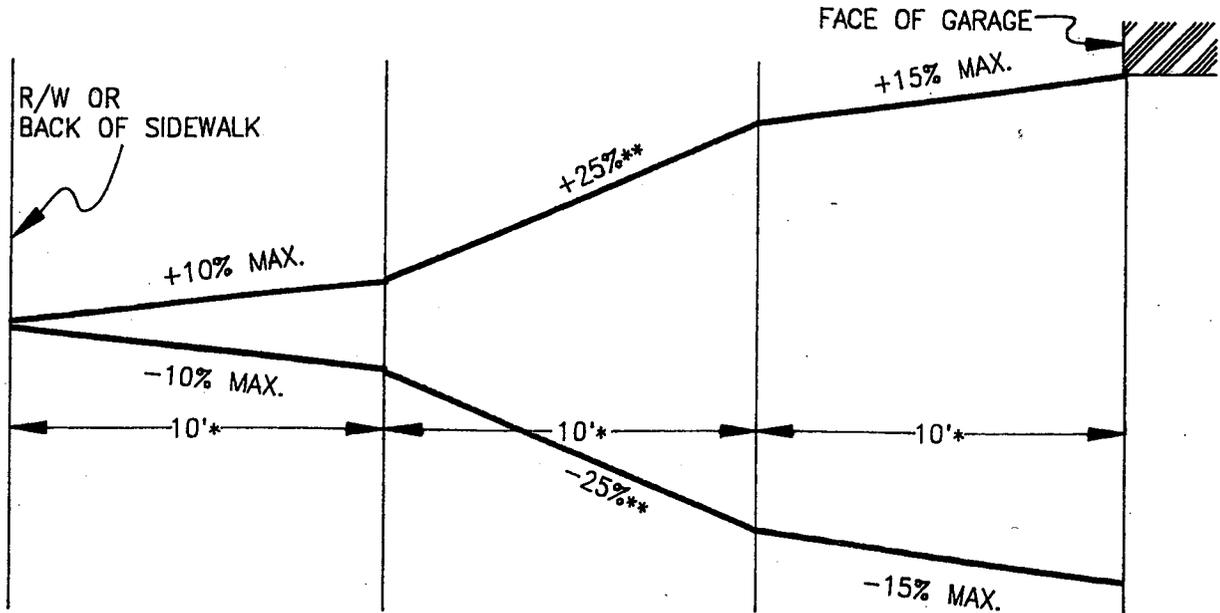


MINIMUM COMMON DRIVEWAY WIDTH AND PROPERTY REQUIREMENTS FOR TWO ADJACENT FLAG LOTS

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD DRIVEWAY</b> <b>LOCAL &amp; COLLECTOR STREETS</b>		DWG. NO. <b>SD-109</b>	
			DRAWN BY: HGM CHECKED BY: JF APPD. BY: <i>[Signature]</i>	DATE: 6/15/10 SCALE: TS			FILED	
△	5/21/11	HGM	CITY ENGINEER		DIR. PUBLIC WORKS		SHT. <b>2</b> OF <b>3</b>	



FOR DRIVEWAYS LESS THAN 30' FROM R/W OR BACK OF WALK TO GARAGE



FOR DRIVEWAYS 30' OR MORE FROM R/W OR BACK OF WALK TO GARAGE

\* MINIMUM DIMENSION

\*\* STEEPER GRADES SUBJECT TO APPROVAL BY THE CITY ENGINEER  
NOTE:

1. IF DRIVEWAY EXCEEDS 100', APPROVAL IS SUBJECT TO ANY CONDITION MANDATED BY THE FIRE MARSHAL.
2. A VERTICAL CURVE ACCEPTABLE TO THE CITY ENGINEER SHALL BE PROVIDED AT ALL GRADE BREAKS.

DRIVEWAY GRADES

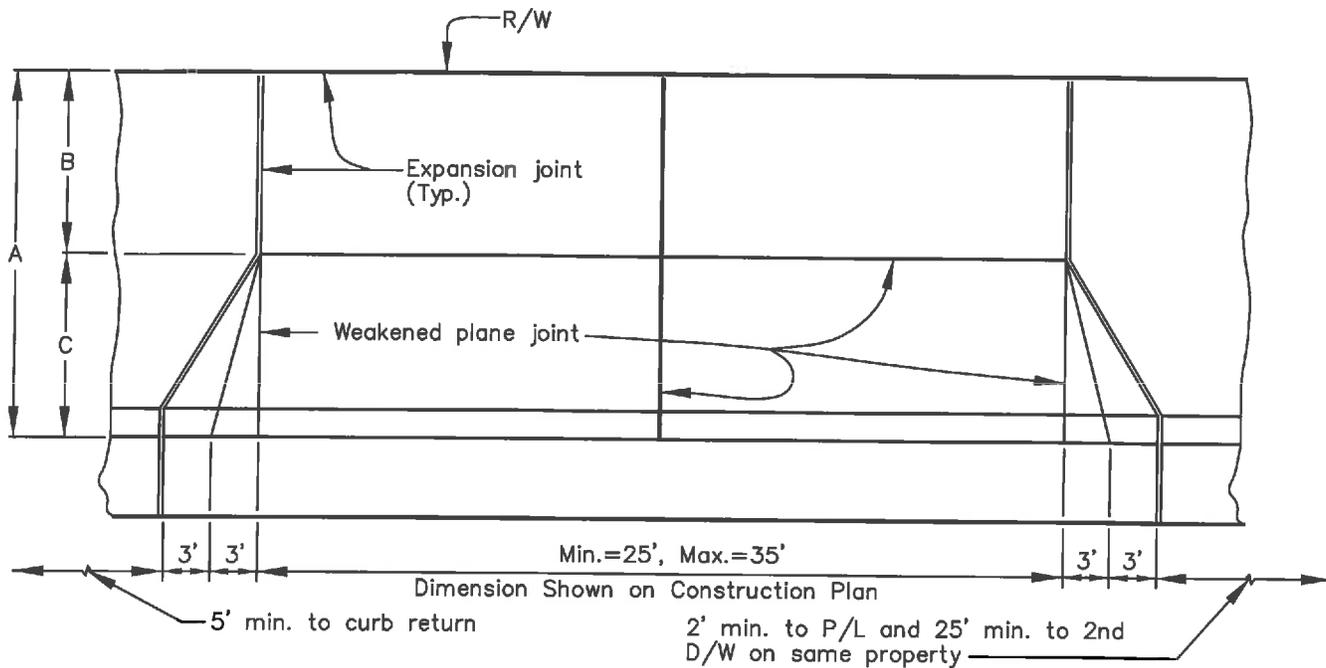
			CITY OF HAYWARD ENGINEERING DIVISION		<b>STANDARD DRIVEWAY LOCAL &amp; COLLECTOR STREETS</b>	DWG. NO. <b>SD-109</b>
			DRAWN BY: F. MORALES	DATE: MARCH, 1993		FILED <b>6-15-93</b>
			CHECKED BY: <i>T.M.</i>	SCALE: NONE		
REV	DATE	BY	APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>		SHT. <b>3</b> OF <b>3</b>
			CITY ENGINEER	DIR. PUBLIC WORKS		

**TABLE OF DIMENSIONS**

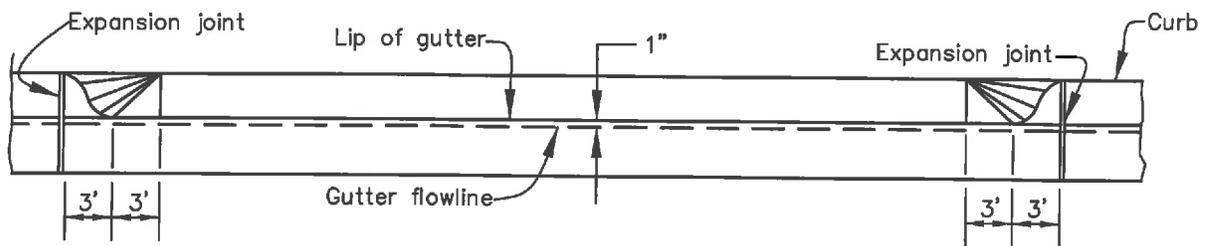
A	5'	6'	7'	8'	9'	10'	13'
B	See Note 2			4'	4'	4'	5'
C	See Note 2			4'	5'	6'	8'

**NOTES:**

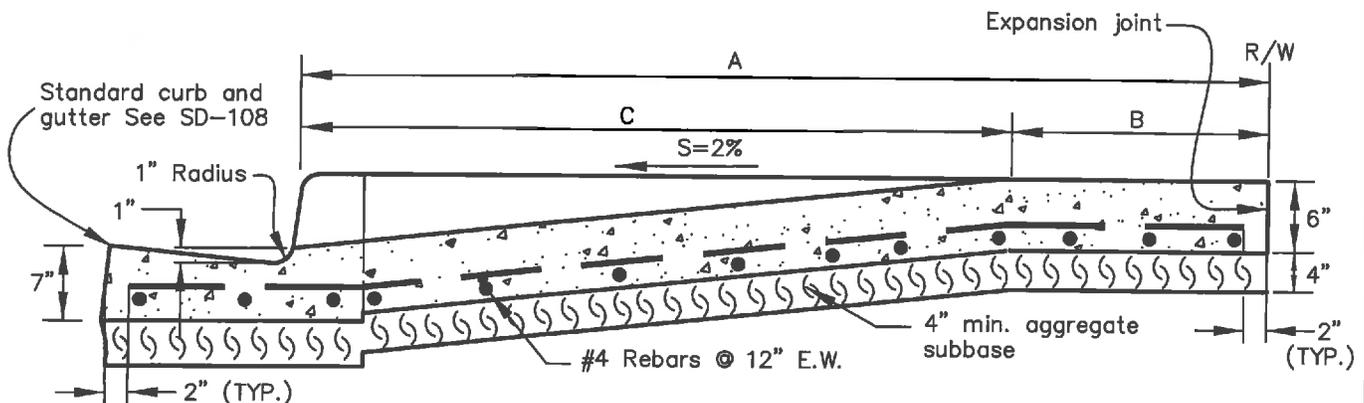
1. Construction shall conform to SD-107.
2. See SD-108A for Plans and Section when "A" is less than 8'



**PLAN**



**ELEVATION**



**SECTION**

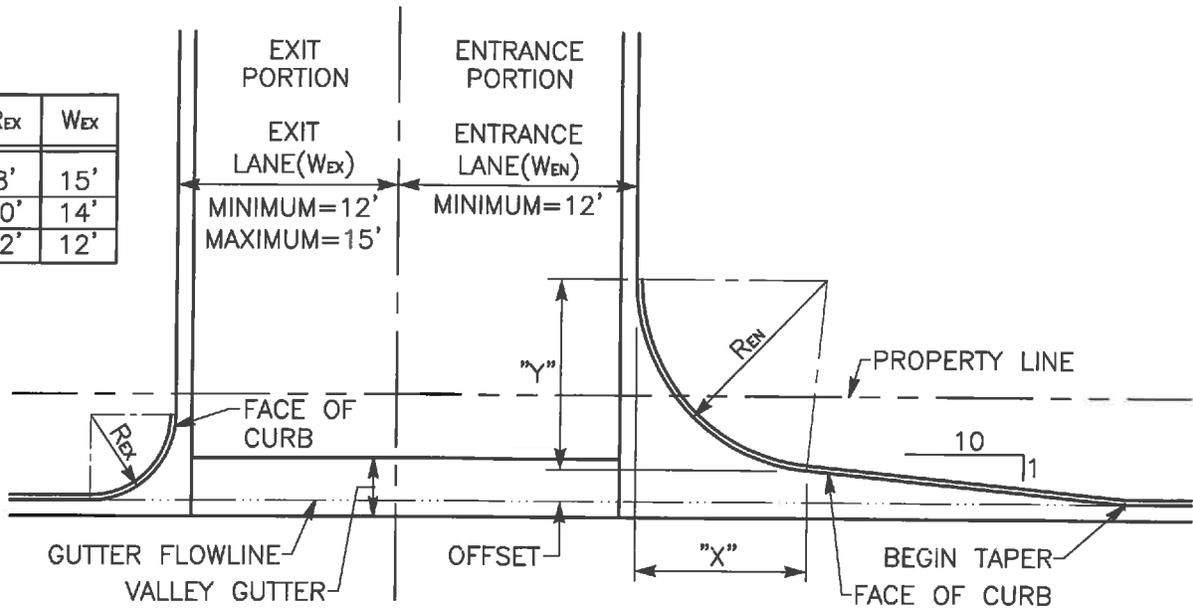
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD DRIVEWAY COMMERCIAL AND INDUSTRIAL STREETS</b></p>	DWG. NO. <b>SD-110</b>	
<p>3/31/10 AL</p>	<p>DRAWN BY: HGM CHECKED BY: JBL APPD. BY: [Signature]</p>	<p>DATE: 03/03/09 SCALE: N/A APPROVED: [Signature]</p>		<p>FILED</p>	
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT. <b>1</b> OF <b>2</b>

TABLE OF W<sub>EN</sub> WITH VARIOUS R<sub>EN</sub> AND OFFSETS

R <sub>EN</sub>	OFFSET					
	1'	2'	3'	4'	5'	6'
	W <sub>EN</sub>					
25'			22'	19'	17'	15'
30'	23'	20'	18'	15'	15'	14'
35'	20'	18'	16'	14'	13'	12'
40'	18'	15'	14'	12'	12'	12'

R <sub>EN</sub>	"X"	"Y"
25'	22.51'	24.88'
30'	27.01'	29.85'
35'	31.52'	34.83'
40'	36.02'	39.80'

R <sub>EX</sub>	W <sub>EX</sub>
8'	15'
10'	14'
12'	12'



**NOTES:**

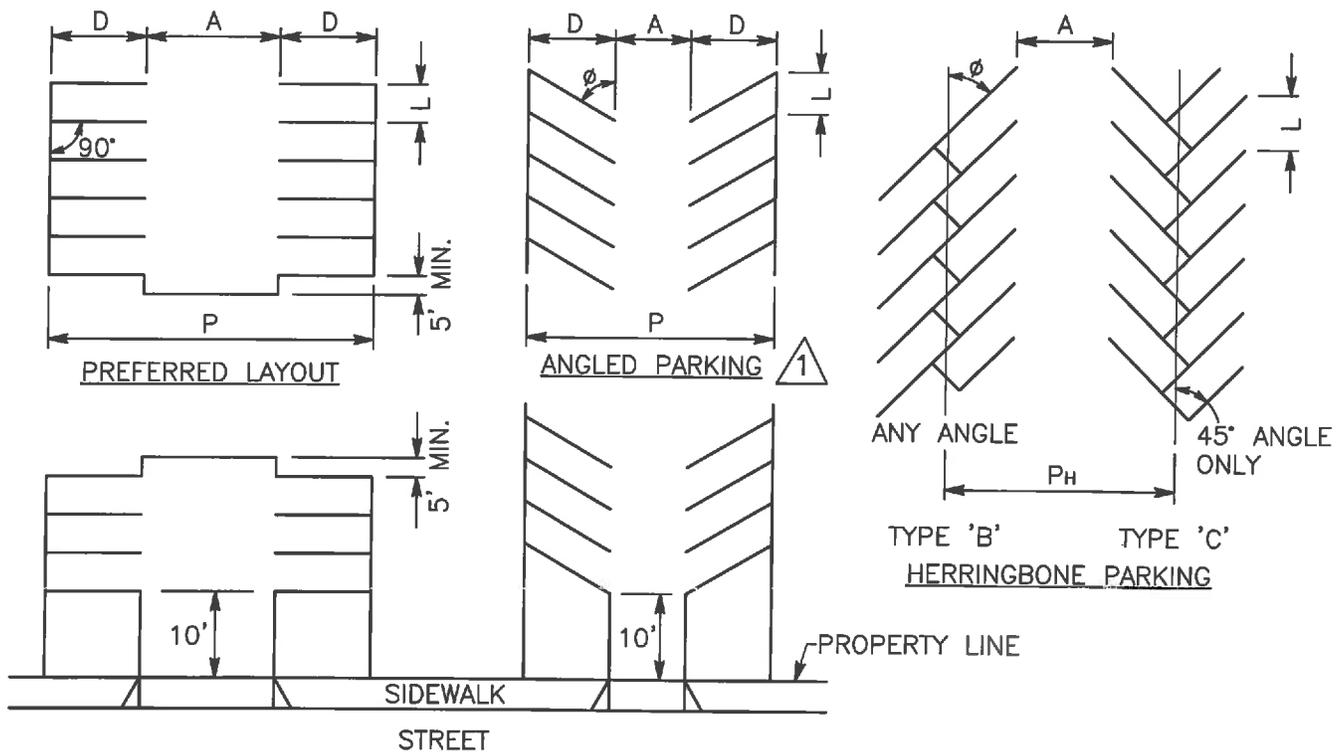
1. THIS ENTRANCE/EXIT IS TO BE UTILIZED FOR COMMERCIAL OR INDUSTRIAL DEVELOPMENT ALONG ARTERIAL OR COLLECTOR STREETS AT THE DISCRETION OF THE CITY ENGINEER.
2. W<sub>EN</sub> SHALL BE MEASURED PARALLEL TO STREET WHERE R<sub>EN</sub> BECOMES TANGENT TO EDGE OF DRIVEWAY.
3. SEE SD-110A FOR VALLEY GUTTER AND APRON DETAIL.
4. SEE SD-108 FOR CURB RAMP.

<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD DRIVEWAY</b> <b>ARTERIAL STREETS</b></p>	DWG. NO.	<b>SD-110</b>	
				FILED		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT.	<b>2 OF 2</b>

DRAWN BY: JT      DATE: 10/14/10  
 CHECKED BY: JF      SCHEMATIC APPROVED  
 APPD. BY: *[Signature]*



	ANGLE DEGREES $\phi$	STALL WIDTH L	STALL DEPTH D	AISLE WIDTH A <sup>(2)</sup>	OVERALL WIDTH	
					P	P <sub>H</sub>
STANDARD CAR	0	23.0	8.0	12.0	28	—
	30	18.0	16.0	12.0	44	37
	45	12.7	18.5	12.0	49	43
	60	10.4	20.0	17.0	57	53
	75	9.3	19.0	23.0	61	59
	90	9.0	19.0	26.0	64	—
		9.5	19.0	25.0	63	—
10.0		19.0	24.0	62	—	
10.5		19.0	22.0	60	—	
COMPACT CAR	45	11.3	15.6	12.0	43.2	40
	60	9.2	17.0	14.5	48.5	45
	75	8.3	16.9	17.5	50.6	50
	90	8.0	15.0	20.0	50.0	—

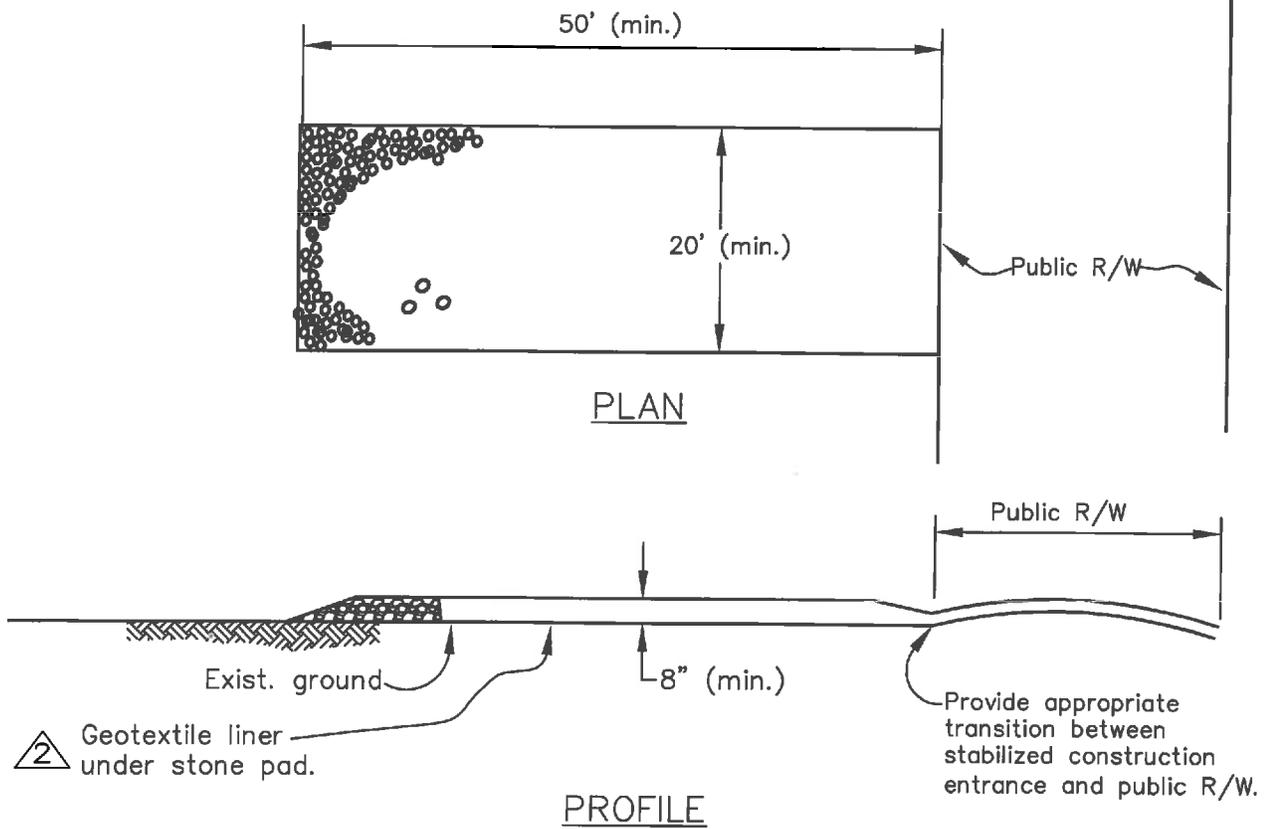


### OFF-STREET PARKING MINIMUM STALL AND AISLE DIMENSIONS <sup>(1)</sup>

**NOTES:**

- (1) ALTERNATE DESIGNS FOR ANGLED PARKING MAY BE USED IF APPROVED BY THE PLANNING DIRECTOR.
- (2) IF THE PARKING ANGLE IS LESS THAN 90°, PARKING AISLE SHALL BE DESIGNED FOR ONE-WAY CIRCULATION.
- (3) PARKING SLOPE: 5% MAXIMUM, 2% MINIMUM OR AS APPROVED BY THE CITY ENGINEER.
- (4) FOR 90° PARKING, 2 FEET OF THE STALL DEPTH MAY BE USED FOR COMPACT VEHICLE OVERHANG; 2 ½ FEET OF <sup>△</sup> STALL DEPTH MAY BE USED FOR STANDARD-SIZED VEHICLE OVERHANG.
- (5) PARKING SPACES FOR THE HANDICAPPED SHALL HAVE MINIMUM 5 FEET WIDE LOADING AREA AT TYPICAL STALL AND 8 FEET WIDE LOADING AREA AT VAN-ACCESSIBLE STALL. <sup>△</sup>

			<p><b>STANDARD OFF-STREET PARKING</b></p>	DWG. NO. <b>SD-110B</b>	
<sup>△</sup> 11/1/11	HGM	DRAWN BY: JT CHECKED BY: JF APPD. BY: [Signature]		DATE: 10/14/10 SCALE: N/A APPROVED: [Signature]	FILED
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT. <b>1</b> OF <b>1</b>



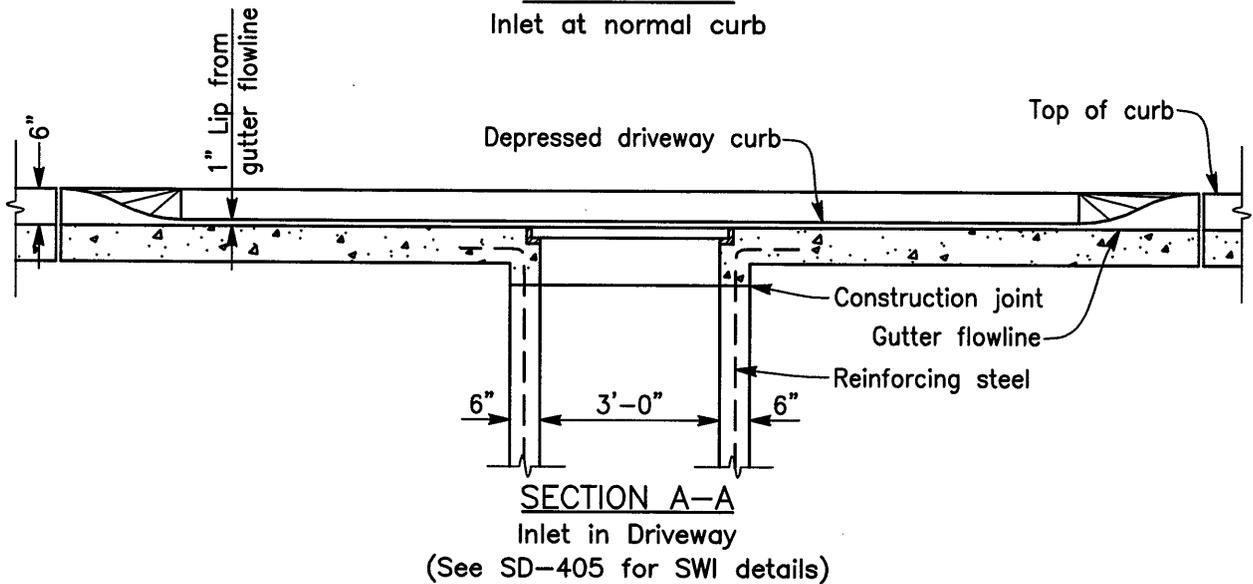
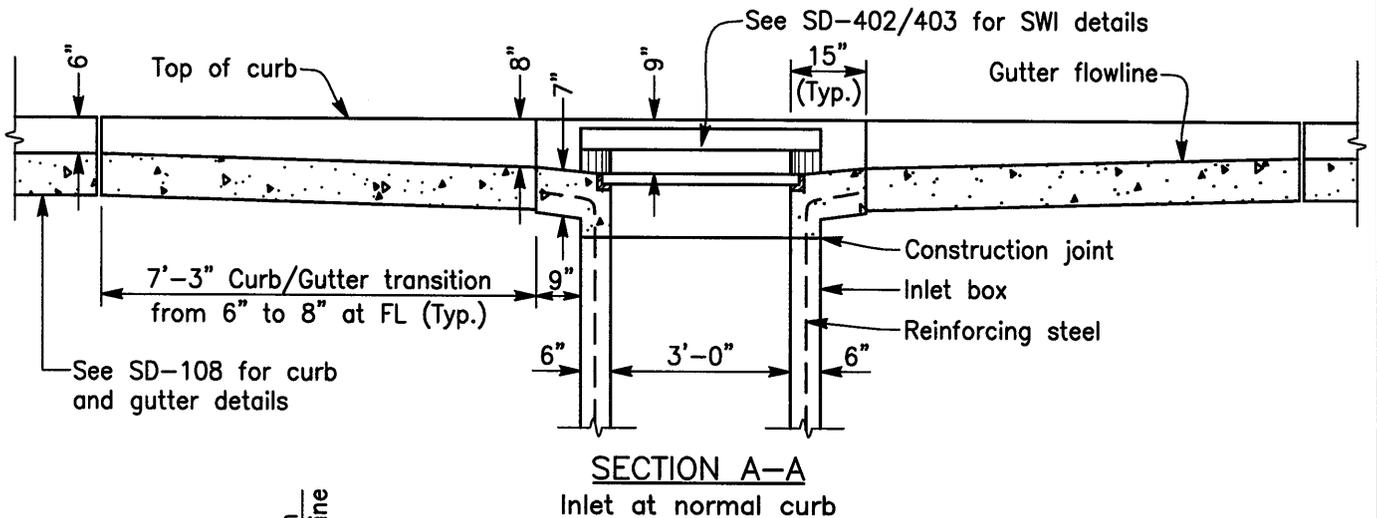
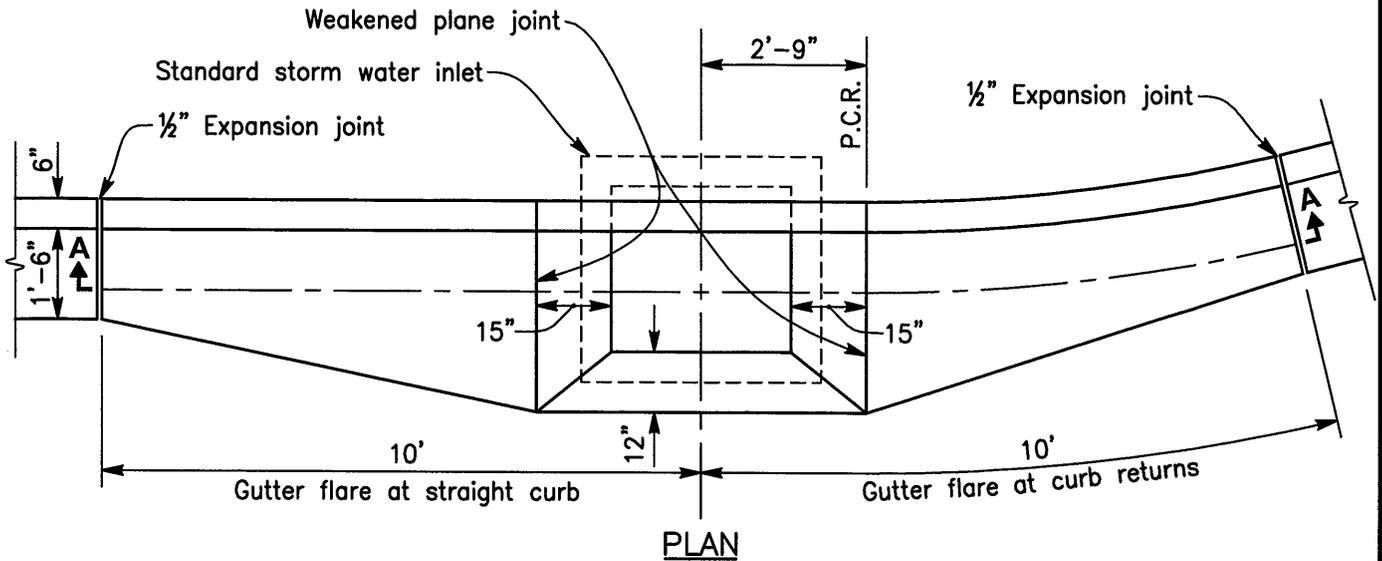
DESIGN AND CONSTRUCTION SPECIFICATIONS

1. The material for construction of the pad shall be 3 to 4 inch fractured stone.
2. The thickness of the pad shall not be less than 8 inches.
3. Place geotextile liner under stone pad.
4. The width of the pad shall not be less than the full width of all points of ingress or egress.
5. The length of the pad shall be as required, but not less than 50 feet.
6. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand, and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way shall be removed immediately.
7. When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch or watercourse through use of sand bags, gravel, board or other approved methods.

	03/30/10	AL	<b>HAYWARD</b> CITY OF PUBLIC WORKS DEPT.	<b>STANDARD          STABILIZED          CONSTRUCTION          ENTRANCE</b>	DWG. NO. <b>SD-111</b>
	DRAWN BY: HGM	DATE: 06/04/08			FILED
	07/10/09	HGM	CHECKED BY: JSF	SCALE: NTS	SHT. <b>1</b> OF <b>1</b>
REV	DATE	BY	APPD. BY:	APPROVED:	
			CITY ENGINEER	DIR. PUBLIC WORKS	

NOTES:

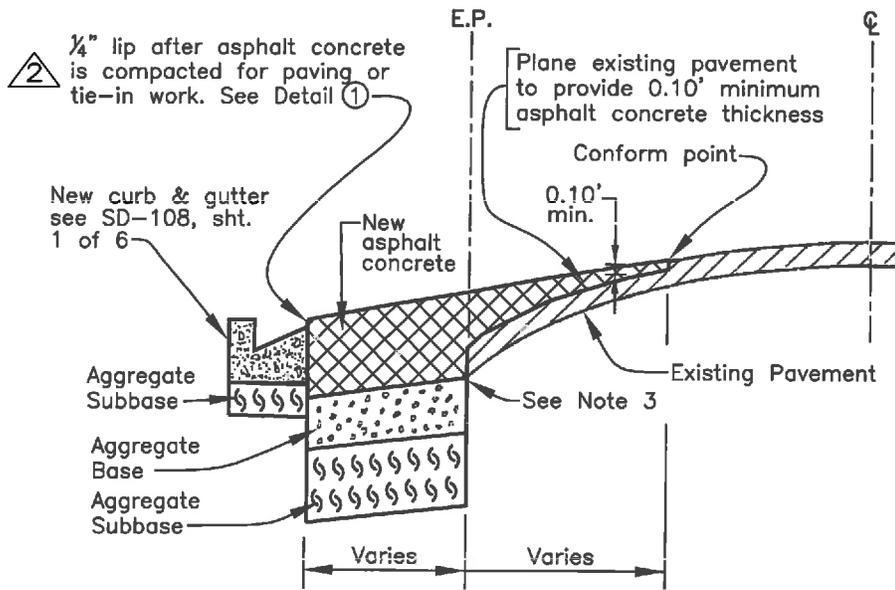
1. Flare section shall be poured monolithic with curb.
2. Construction shall conform to SD-107.



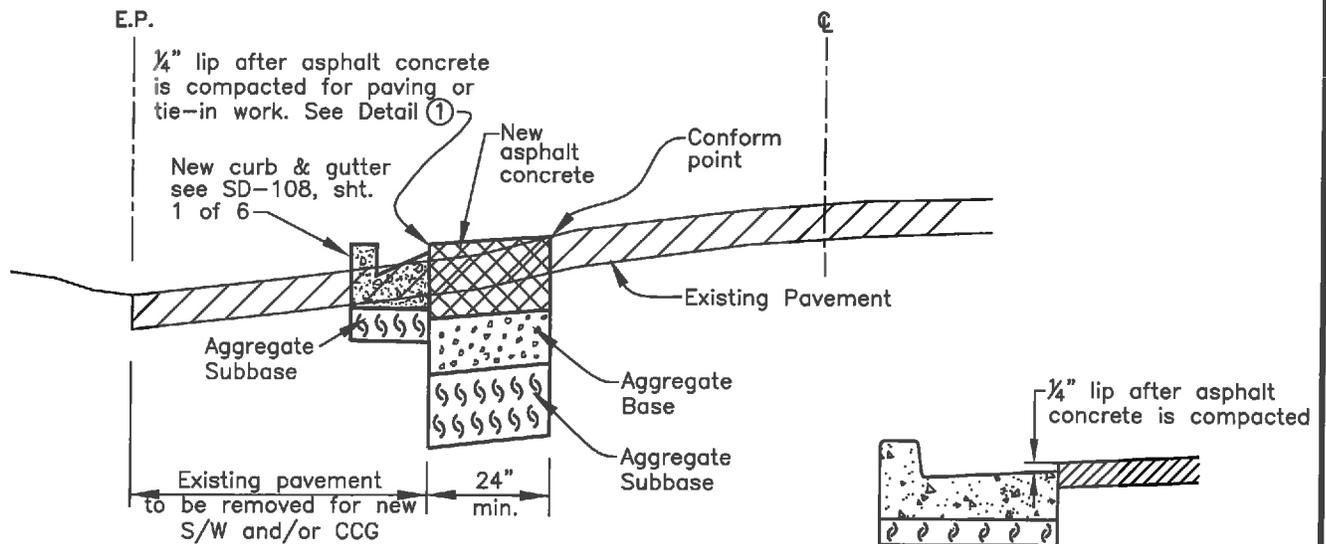
CITY OF HAYWARD ENGINEERING DIVISION		
DRAWN BY: JT	DATE: Mar 4, 2010	
CHECKED BY: JBL	SCALE: NTS	
APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>	
REV	DATE	BY
		CITY ENGINEER
		DIR. PUBLIC WORKS

# STANDARD GUTTER FLARE AT INLET

DWG. NO. <b>SD-112</b>
FILED
SHT. <b>1</b> OF <b>1</b>



**CASE A: TIE-IN PAVEMENT SECTION**



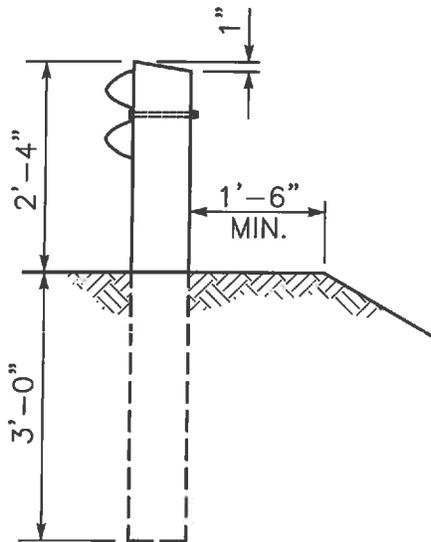
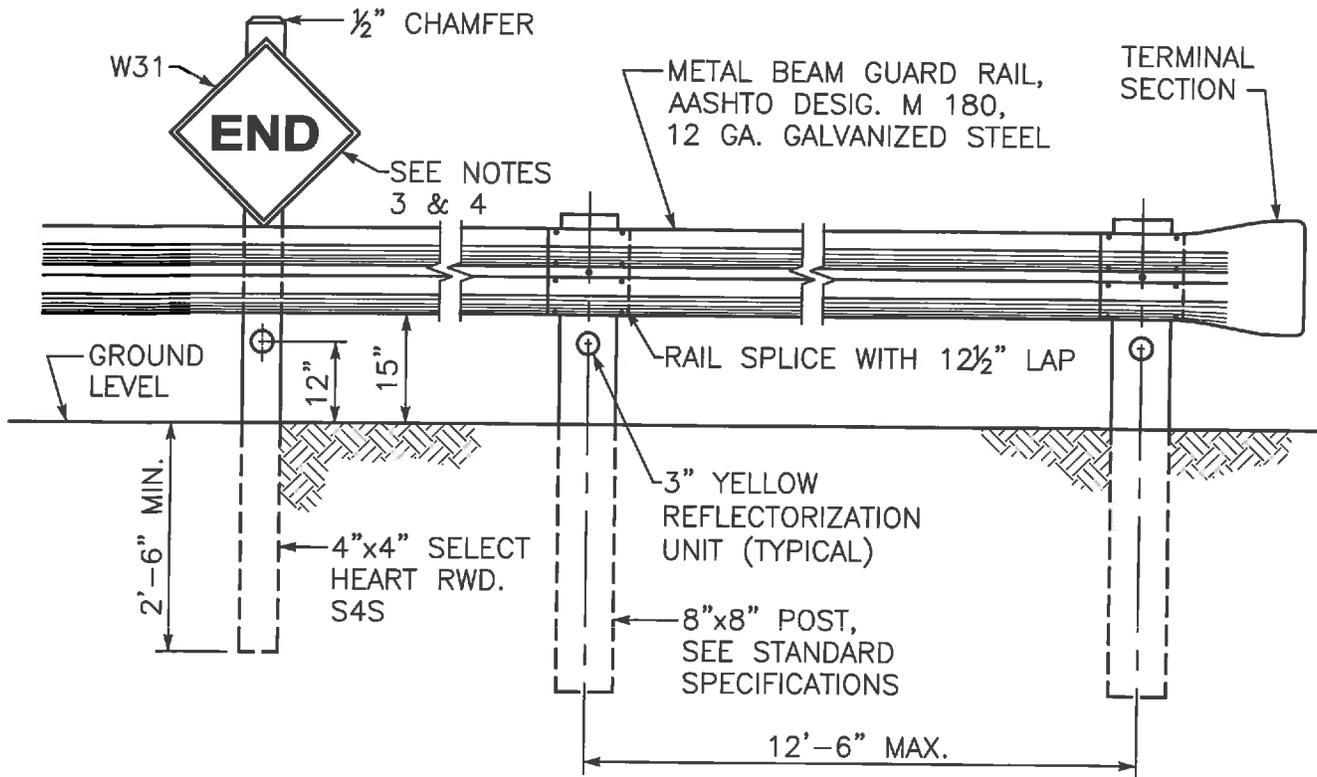
**CASE B: TIE-IN PAVEMENT SECTION**

**1 PAVING DETAIL**

**NOTES:**

1. Tie-in pavement section shall be approved by the City Engineer.
2. Conform point shall be determined by the City Engineer and may occur anywhere between the edge of pavement and the centerline.
3. Tie-in asphalt concrete shall extend to at least the bottom of existing asphalt concrete unless otherwise approved by the City Engineer.
- 1 4. Tie-in pavement section shall be designed according to the R-value and Traffic Index and can be full-depth asphalt concrete.

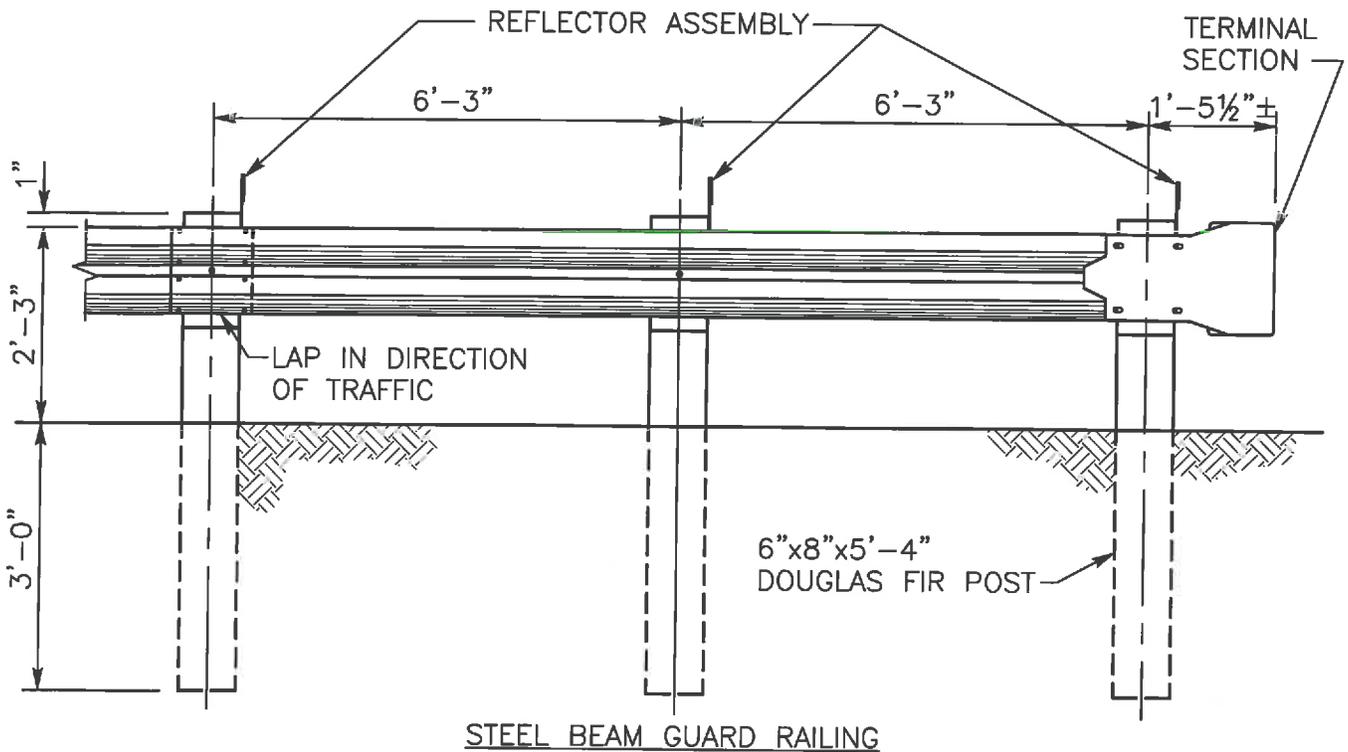
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD</b> <b>TIE-IN PAVEMENT</b>		DWG. NO. <b>SD-113</b>	
10/15/10	JT		DRAWN BY: JT	DATE: 08/05/08			FILED	
03/30/10	AL		CHECKED BY: JF	SCALE: AS SHOWN			SHT. <b>1</b> OF <b>1</b>	
REV	DATE	BY	APPD. BY:					
			CITY ENGINEER	DIR. PUBLIC WORKS				



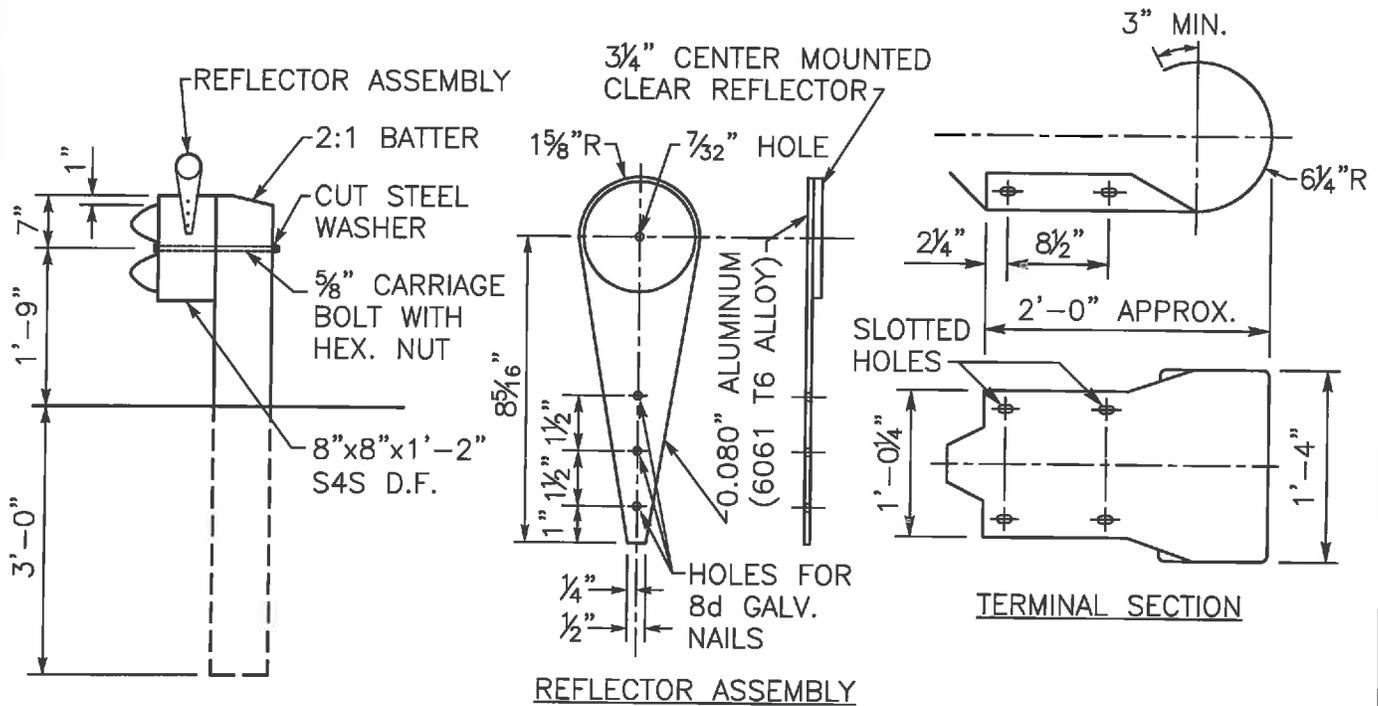
**NOTES:**

1. OVERALL LENGTH OF BARRICADE SHALL BE WITHIN THE STREET R/W AND TERMINAL SECTIONS OF THE BARRICADE SHALL EXTEND TO R/W LINE. CUT AND FIT END SECTIONS AS NECESSARY.
2. A 3" CENTER MOUNT AMBER ACRYLIC PLASTIC REFLECTOR IN AN ALUMINUM BEZEL HOUSING SHALL BE INSTALLED ON EACH POST AS SHOWN.
3. A 24"x24" W31 YELLOW DIAMOND "END" SIGN UTILIZING REFLECTIVE SHEETING SHALL BE MOUNTED ON A 4"x4"x7'-6" REDWOOD POST WITH THE BOTTOM OF THE SIGN ON TOP OF THE GUARD RAIL. THIS SIGN SHALL BE LOCATED AT THE CENTERLINE OF A STREET END.
4. THE SIGN SHALL BE 0.08" THICK, 24"x24" ALUMINUM.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<h2 style="margin: 0;">STANDARD STEEL BEAM BARRICADE</h2>	DWG. NO. <h2 style="margin: 0;">SD-114</h2>
	12/2/11	HGM	DRAWN BY: JT CHECKED BY: JF APPD. BY:	DATE: 10/21/10 SCALE: NTS APPROVED:		FILED
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT. <b>1</b> OF <b>1</b>	



STEEL BEAM GUARD RAILING



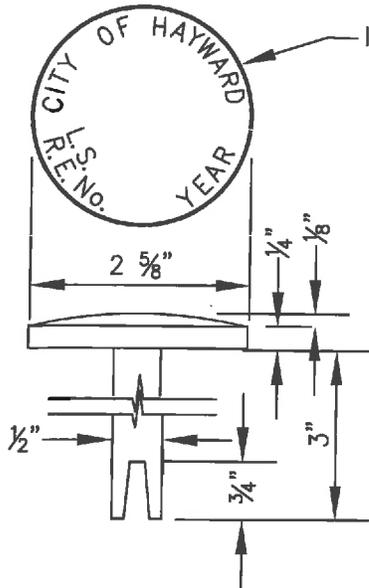
REFLECTOR ASSEMBLY

TERMINAL SECTION

NOTES:

1. GUARD RAIL POSTS SHALL BE CONSTRUCTION GRADE DOUGLAS FIR. DOUGLAS FIR SHALL BE PRESSURE TREATED.
2. THE GUARD RAIL SHALL BE GALVANIZED. SEE STANDARD SPECIFICATIONS.

<p>CITY OF <b>HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD STEEL BEAM GUARD RAIL</b></p>		DWG. NO. <b>SD-115</b>
					FILED
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT. <b>1</b> OF <b>1</b>



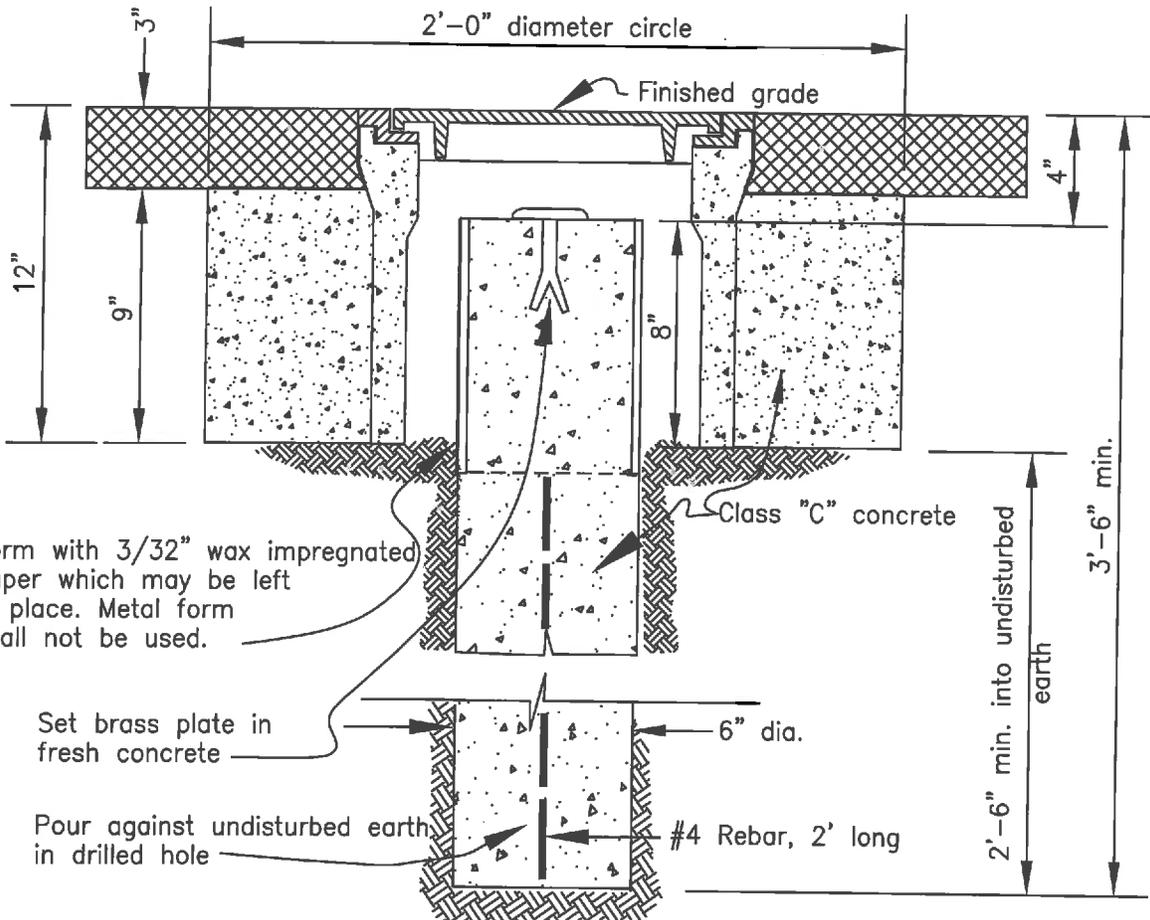
Indented letters as manufactured by:  
 English Bros. Patterns and Foundry  
 2168 American Ave.  
 Hayward, California 94545  
 (510) 783-5700



**NOTES:**

1. R.E. or L.S. No. and year shall be stamped on plate.
2. Monument mark shall be a 1/8" diameter drilled hole or well defined punch mark and cross placed within the clear center area of the plate.
3. See Sht. 3 for monument box detail.

CAST BRASS SURVEY MONUMENT PLATE



Form with 3/32" wax impregnated paper which may be left in place. Metal form shall not be used.

Set brass plate in fresh concrete

Pour against undisturbed earth in drilled hole

STANDARD STREET MONUMENT INSTALLATION

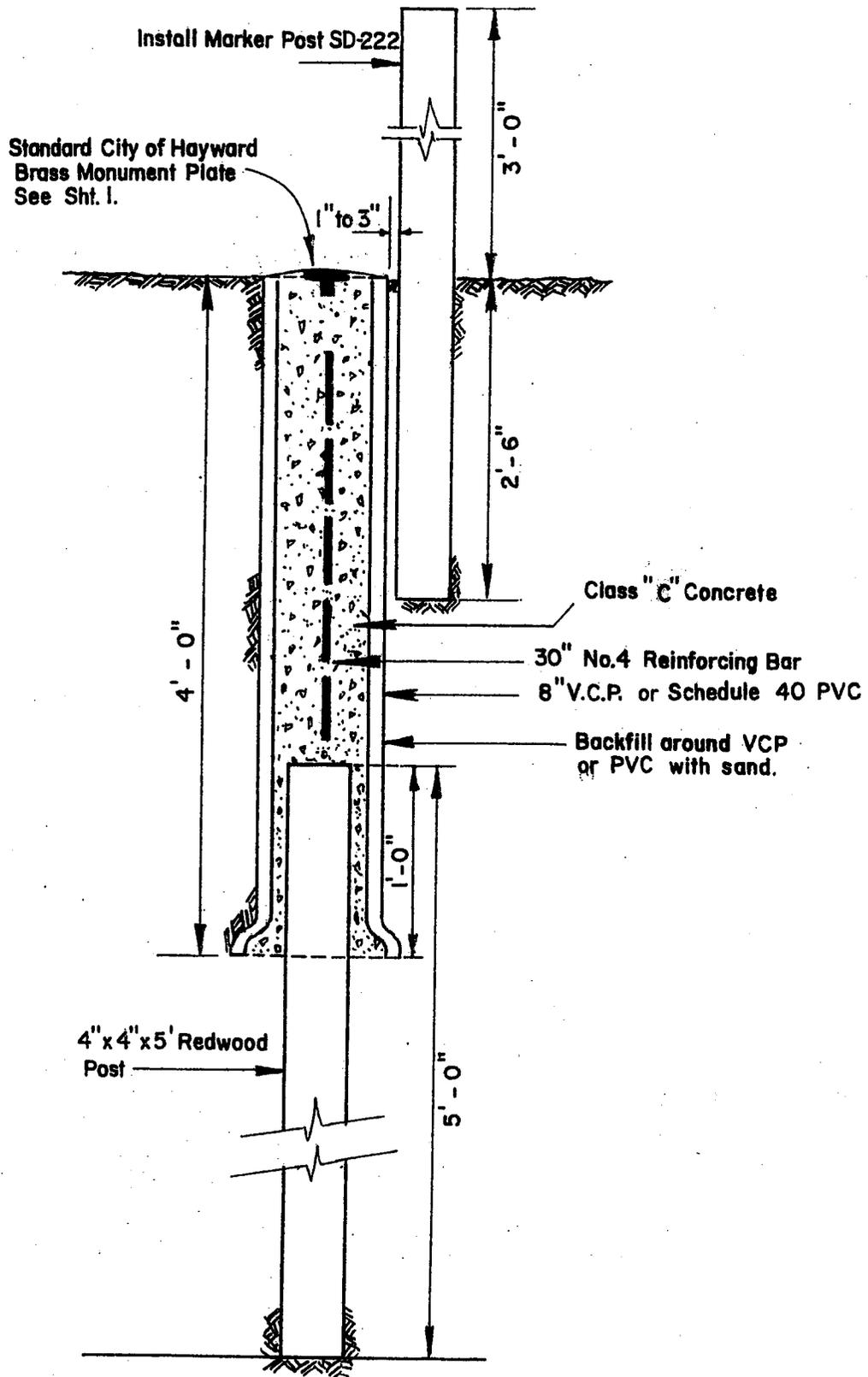
			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	
			DRAWN BY: JT CHECKED BY: JF APPD. BY:	DATE: 12/04/12 SCALE: NONE APPROVED:
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS

**STANDARD MONUMENT**

DWG. NO. **SD-116**

FILED

SHT. **1** OF **4**



**STANDARD MONUMENT INSTALLATION IN MARSH OR UNSTABLE SOIL**

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>		<b>STANDARD MONUMENT</b>		DWG. NO. SD-116	
			DRAWN BY: L.M.F. DATE: April, 1977				FILED <b>9-25-02</b>	
			CHECKED BY: E.A.P. SCALE: None		APPROVED		SHT. <u>2</u> OF <u>4</u>	
REV.	DATE	BY	CITY ENGR.		DIR. PUBLIC WORKS			

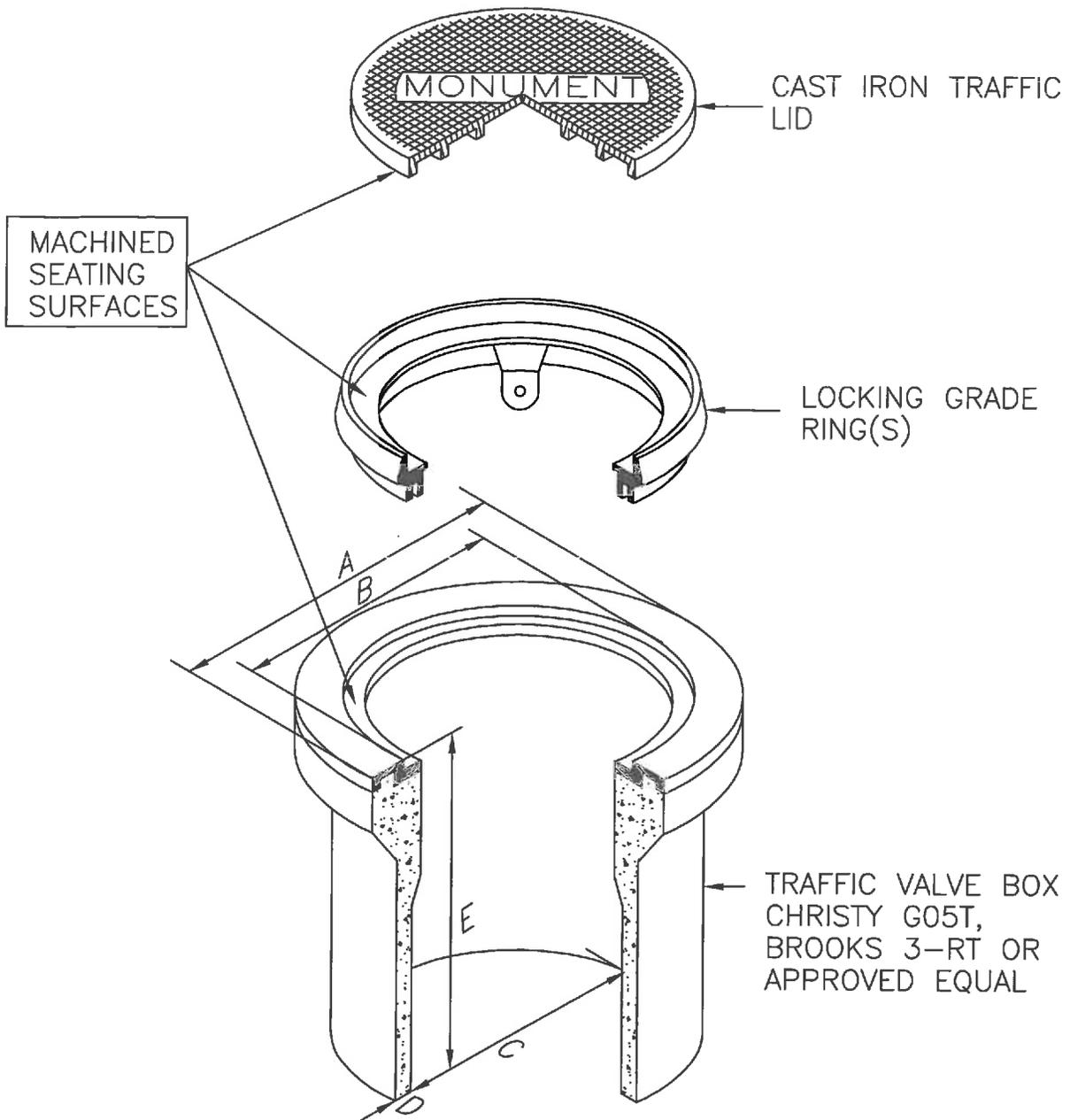


TABLE OF APPROXIMATE DIMENSIONS

TYPE	A	B	C	D	E	APPROX. WT.
CHRISTY G05T	13 <sup>13</sup> / <sub>16</sub> "	11 <sup>3</sup> / <sub>16</sub> "	10 <sup>3</sup> / <sub>8</sub> "	1 <sup>1</sup> / <sub>8</sub> "	12"	72 lbs
BROOKS 3-RT	12 <sup>1</sup> / <sub>2</sub> "	-	10"	2"	12"	66 lbs

STANDARD MONUMENT BOX

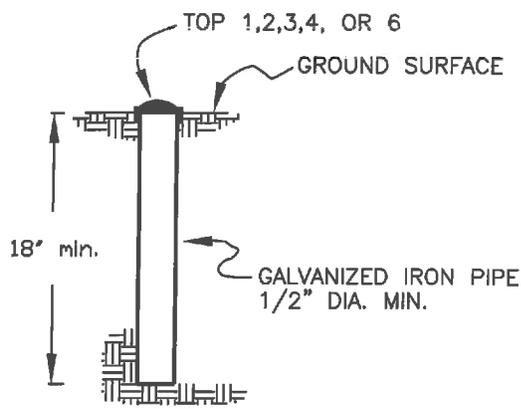
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD MONUMENT</b>	DWG. NO. <b>SD-116</b>
			DRAWN BY: JT      DATE: 12/18/12 CHECKED BY: JF      SCALE: N/S APFD. BY: <i>[Signature]</i> APPROVED:	FILED		
REV	DATE	BY	CITY ENGINEER			SHT. <b>3</b> OF <b>4</b>

TOP

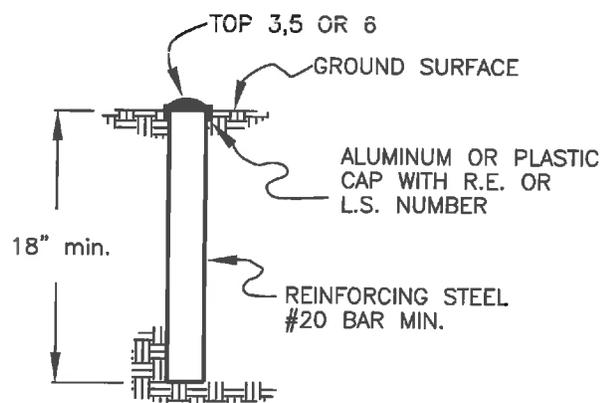
NOTES:

1. REDWOOD PLUG WITH NAIL AND R.E. OR L.S. TAG.
2. LEAD OR CONCRETE PLUG WITH PIN AND R.E. OR L.S. TAG.
3. PLASTIC PLUG WITH R.E. OR L.S. NUMBER.
4. GALVANIZED IRON PIPE CAP STAMPED WITH R.E. OR L.S. NUMBER.
5. PUNCH MARK WITH R.E. OR L.S. TAG ATTACHED.
6. ALUMINUM PLUG WITH R.E. OR L.S. NUMBER.

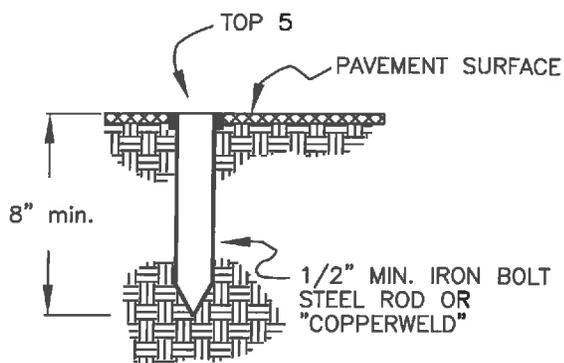
1. A TRACT EXTERIOR BOUNDARY MONUMENT WHICH FALLS WITHIN THE STREET RIGHT-OF WAY SHALL BE A STANDARD STREET MONUMENT (SD-116, SHEET 1 OF 4).
2. MAXIMUM SPACING BETWEEN EXTERIOR BOUNDARY MONUMENT SHALL BE 300 METERS.
3. MONUMENTS SHALL BE SET SO THAT THEY ARE INTERVISIBLE WITH AT LEAST TWO OTHER MONUMENTS.



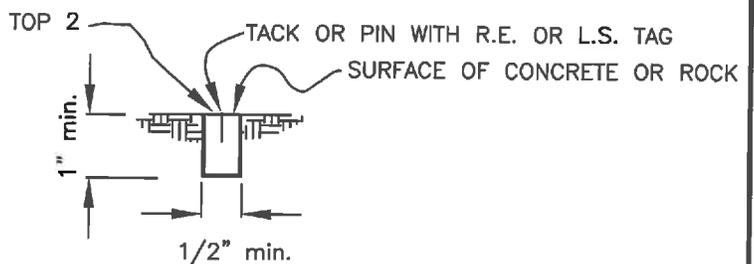
ALTERNATE No.1



ALTERNATE No.2



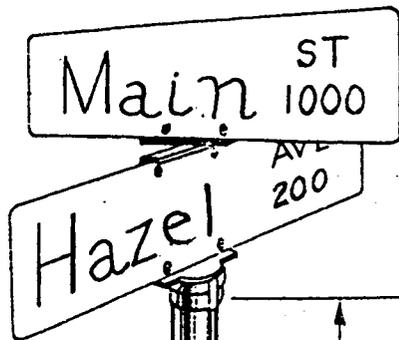
ALTERNATE No.3



ALTERNATE No.4

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<h1>STANDARD MONUMENT</h1>		DWG. NO. <b>SD-116</b>	
			DRAWN BY: JT      DATE: 06/04/93 CHECKED BY: TM      SCALE: NONE APPD. BY: <i>[Signature]</i>				FILED	
REV	DATE	BY	CITY ENGINEER      DIR. PUBLIC WORKS				SHT. <b>4</b> OF <b>4</b>	

# STANDARD STREET NAMES SIGN



Signs, Letters and Brackets shall conform to City of Hayward requirements. see sheets 3 & 4.

2" Std. Galvanized Iron Pipe

9'-0"

Finish grade

Face of curb  
NOTES:

Class "B" Portland Cement Conc.

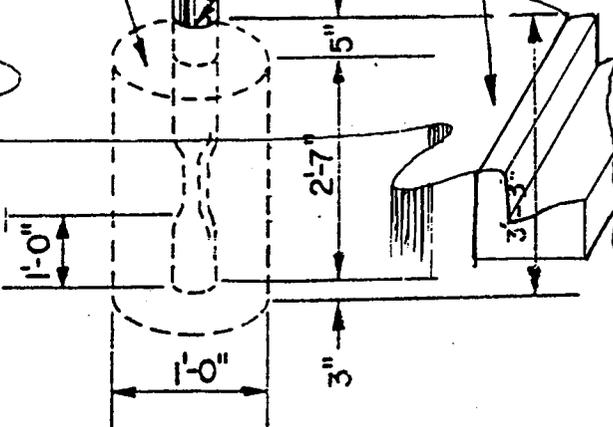
2'-0"

1. Bottom portion of pipe shall be flattened to 1" thick to prevent turning and aid in stability.

2. The location of street name signs shall be as shown on the plans or as directed by the City Engineer

3. Pipe caps required on all sign posts.

4. If a stop sign R1 is mounted on the same pipe below the name sign, the vertical clearance from the bottom of the sign and the sidewalk shall be 7'-0".



<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			
DRAWN BY: F.M.		DATE: 3-31-93	
CHECKED BY: T.M.		SCALE: NONE	
REV.	DATE	BY	APPROVED
△	6-21-02	FM	<i>[Signature]</i>
			<i>[Signature]</i>
			CITY ENGR. DIR. PUBLIC WORKS

## STANDARD STREET SIGNAGE REQUIREMENTS

DWG. NO. SD-117

FILED

SHT. 1 OF 5

# CONSTRUCTION, WARNING, AND REGULATORY SIGN POST

RIVETS WITH WASHERS

STATE OF CALIFORNIA UNIFORM STANDARD  
CONSTRUCTION, WARNING, OR REGULATORY SIGN

**NOTES:**

1. SIGN POST SHALL BE MANUFACTURED BY UNISTRUT CORPORATION. PART NO. 16D12 (1 3/4" x 1 3/4") 14 GA. GALV. POST OR APPROVED EQUAL, POST LENGTH = 10' OR 12', OR AS DIRECTED BY THE CITY ENGINEER.
2. DISTRIBUTION BY ZUMAR INDUSTRIES, INC. 6371 RANDOLPH STREET, LOS ANGELES, CA 90040.
3. GALVANIZED FINISH TO CONFORM TO ASTM A525 G90 COATING.
4. SLEEVE SHALL BE A653 (2 1/4" x 2 1/4" x 12") 12 GA. GALV. STEEL.
5. BASE SHALL BE (2" x 2" x 24") 12 GA. GALV. STEEL.
6. THE LOCATION OF STANDARD SIGNS SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE CITY ENGINEER.

1 3/4" SQUARE PERFORATED GALVANIZED STEEL TUBING, POWDER COATED GREEN

7'-0" MIN.

2'-0"

RIVET ON ADJACENT SIDE  
FINISH GRADE

Q OF POLE

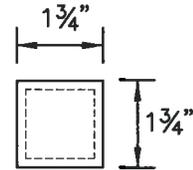
2" SQUARE BASE

2 1/4" SQUARE SLEEVE

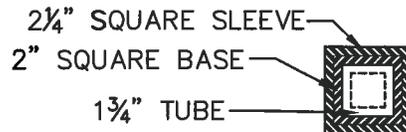
CLASS "B" PORTLAND CEMENT CONCRETE

FACE OF CURB

SECTION A-A



SECTION B-B



3'-2"

1'-0"

3"

10"

22"

24"

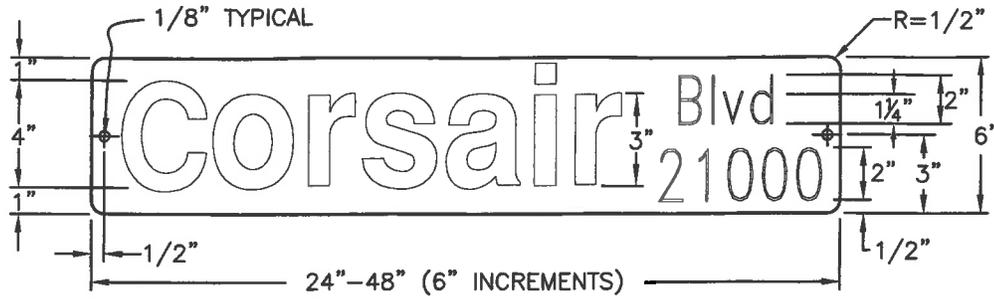
<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		
DRAWN BY: HGM	DATE: 07/14/14	
CHECKED BY: AL	SCALE: NTS	
APPR. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>	
REV	DATE	BY
		CITY ENGINEER
		DIR. PUBLIC WORKS

## STREET SIGNAGE REQUIREMENTS

DWG. NO. **SD-117**

FILED

SHT. **2** OF **5**



TYPICAL ALPHABET STREET NAME PLATE

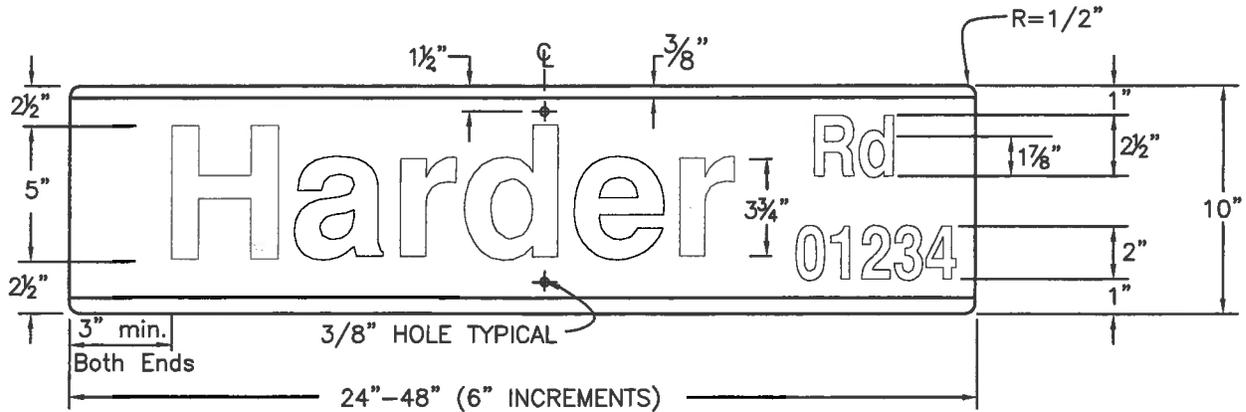
**C Street**

With Suffix

**West C Street**

With Prefix and Suffix

TYPE "A" STREET NAME SIGN FACE DETAIL



TYPICAL ALPHABET STREET NAME PLATE

**C Street**

With Suffix

**West C Street**

With Prefix and Suffix

TYPE "B" STREET NAME SIGN FACE DETAIL

			<p><b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b></p>	<p><b>STANDARD STREET SIGNAGE REQUIREMENTS</b></p>	DWG. NO. <b>SD-117</b>
REV	DATE	BY			<p>DRAWN BY: JT      DATE: 09/06/10          CHECKED BY: AL      SCALE: N/A          APPD. BY: <i>[Signature]</i>          CITY ENGINEER      DIR. PUBLIC WORKS</p>
					SHT. <b>3</b> OF <b>5</b>

## SPECIFICATIONS FOR STREET NAME SIGNS

Street name signs shall be composed of SILVER reflectorized legend on Interstate GREEN reflectorized sheeting background material adhered to an aluminum plate. All signs shall be double-face, except as noted.

Face background shall be Interstate GREEN, engineer grade reflectorized sheeting material, conforming to the STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, "SPECIFICATION FOR REFLECTIVE SHEETING ON ALUMINUM HIGHWAY SIGNS."

Faces shall be adhered to plates using the vacuum applicator method of fabrication.

Borders shall be three-eighths ( $\frac{3}{8}$ ) inch SILVER reflective strips, placed horizontally across top and bottom of face, no margin, running the full length of face.

Corner of plates shall be rounded to one-half ( $\frac{1}{2}$ ) inch radius. Number of holes and hole sizes are as shown on SD-117 Sheet 3 of 5.

Finish sign faces shall be free from blemishes, blisters, cracks, etc. Any signs not complying with these specifications shall be remade by the manufacturer at no additional cost to the City of Hayward.

Type A sign shall be reflectorized SILVER and street names shall be composed of four (4) inch upper case, Series "C", and three (3) inch, Series "C" lower case letters. Suffix's shall be two (2) inch upper case and one and one-fourth ( $1\frac{1}{4}$ ) inch lower case, Series "C". Block numbers shall be two (2) inch, Series "C". Standard abbreviations shall be used. Prefix or suffix of compass direction to these street names shall be four (4) inch upper case letters, except for ALPHABET street names, the prefix of compass direction and street name suffix shall be two (2) inch upper case and one and one-fourth ( $1\frac{1}{4}$ ) inch lower case, Series "C", placed horizontally on left and right center, respectively, as indicated on SD-117 Sheet 3 of 5.

Type B sign shall be reflectorized SILVER and street names shall be composed of five (5) inch upper case, Series "C", and three and three-quarter ( $3\frac{3}{4}$ ) inch, Series "C", lower case letters. Suffix's shall be two and one-half ( $2\frac{1}{2}$ ) inch upper case and one and seven-eighths ( $1\frac{7}{8}$ ) inch lower case, Series "C". Block numbers shall be two (2) inch, Series "C". Standard abbreviations shall be used. Prefix or suffix of compass direction to these street names shall be five (5) inch upper case letters, except for ALPHABET street names, the prefix of compass direction and street name suffix shall be two and one-half ( $2\frac{1}{2}$ ) inch upper case and one and seven-eighths ( $1\frac{7}{8}$ ) inch lower case, Series "C", placed horizontally on left and right center, respectively, as indicated on SD-117 Sheet 3 of 5.

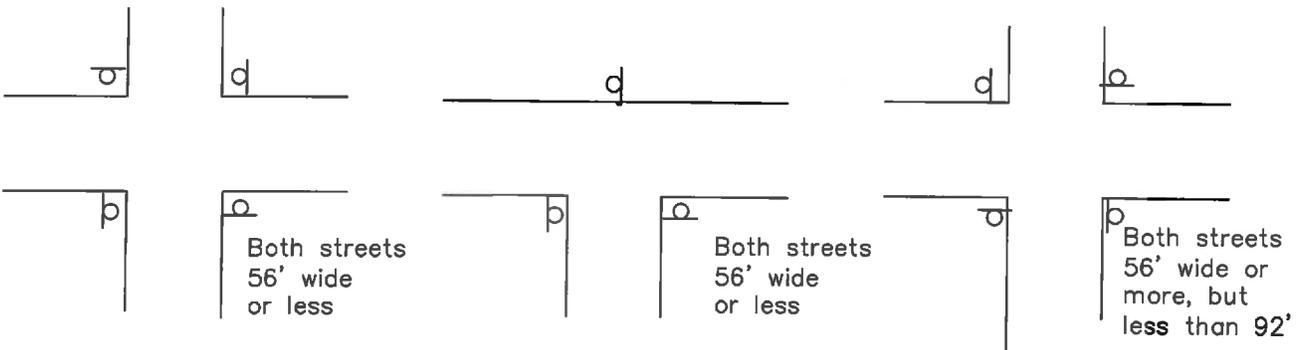
Series "C" letter and number styles and spacing shall be in accordance with United States Federal Highway Specifications Manual.

Plates shall be 0.080 gauge, aluminum alloy, conforming to the State of California Specifications, six (6) inches high (vertical) for Type A signs and ten (10) inches high (vertical) for Type B signs, and no less than twenty-four (24) inches in length. Depending upon the length of the legend, plates may be increased in lengths at six (6) inch increments to a maximum of forty-eight (48) inches. In case of plates which have to exceed the maximum, prior approval must be obtained from the City Engineer, or his representative.

		 <b>CITY OF</b> <b>HAYWARD</b> PUBLIC WORKS DEPT.	<h3 style="margin: 0;">STANDARD STREET SIGNAGE REQUIREMENTS</h3>	DWG. NO. <b>SD-117</b>
		DRAWN BY: JT      DATE: 09/08/10 CHECKED BY: AL      SCALE: NTS APPD. BY: 		FILED
REV	DATE	BY	CITY ENGINEER  DIR. PUBLIC WORKS	SHT. <b>4</b> OF <b>5</b>

**NOTES:**

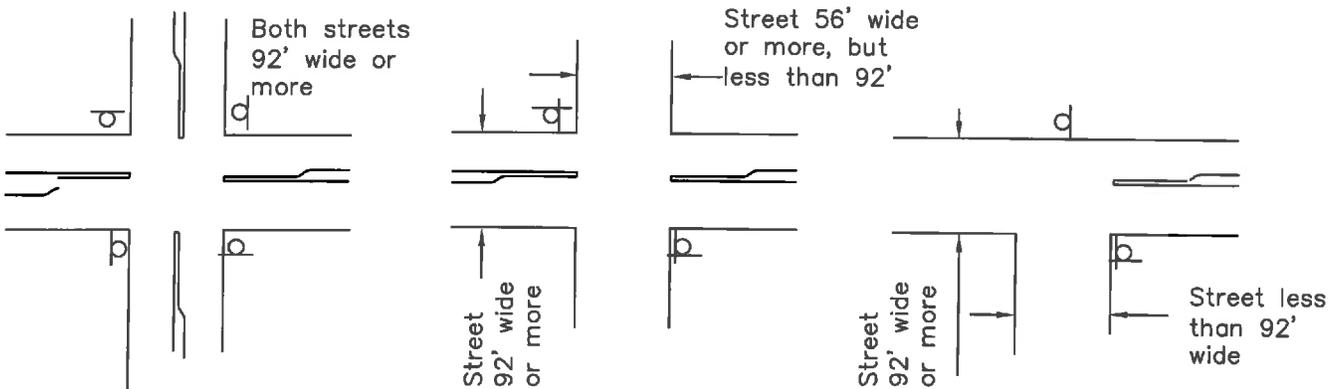
1. Type "A" street name sign shall be installed on all standard streets within the City of Hayward as shown on sketch #1 and #2.
2. Type "B" street name sign shall be installed on all Collector or Arterial streets within the City of Hayward as shown on sketch #3 thru #6 and described as follows:
  - a. When cross street is 56' wide or more but less than 92', sign shall be located at the far side of each approach to the intersection as shown on sketch #3.
  - b. However, when the cross street is 92' wide or more, it should be installed on the near right intersection as shown on sketch #4.
  - c. In most cases, place the street sign on the same post with a stop sign (both signs facing the same direction) refer to sheet 1 of 5, even if a new longer post is required for the stop sign. Type "B" street name signs should never be installed on the near left side of the intersection, and may only be installed on the far left side when the street name to the left is different from the street name to the right.
3. Care should be taken to consolidate these street name signs with stop signs. Do not install an excess amount of posts. When stop signs, luminaire standards, or any other standard sign posts exist, these should be used for the mounting of these street-name signs. Care also should be taken to insure that signs are not mounted in the line of sight of motorist or pedestrian.
4. The following sketches give typical installation examples:



**SKETCH #1**  
(TYPE A SIGN)

**SKETCH #2**  
(TYPE A SIGN)

**SKETCH #3**  
(TYPE B SIGN)

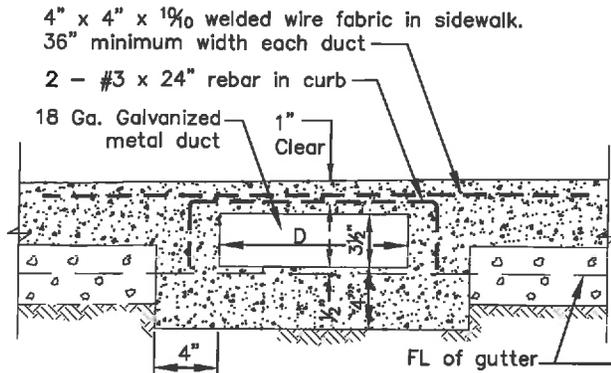


**SKETCH #4**  
(TYPE B SIGN)

**SKETCH #5**  
(TYPE B SIGN)

**SKETCH #6**  
(TYPE B SIGN)

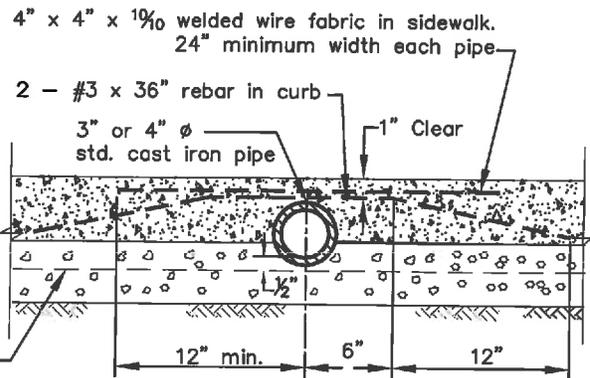
			<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>		<p><b>STANDARD STREET SIGNAGE REQUIREMENTS</b></p>	DWG. NO. <b>SD-117</b>
			DRW BY: JT	DATE: 09/06/10		FILED
			CHKD BY: AL	SC: MTS		
			APPD. BY: [Signature]	APPROVED: [Signature]		SHT. <b>5</b> OF <b>5</b>
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		



**METAL DUCT SECTION**

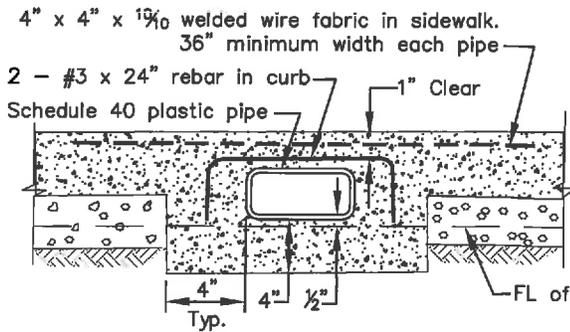
Dimension D	Maximum Capacity
6"	0.57 Cubic feet per second
9"	0.94 Cubic feet per second
12" Max.	1.29 Cubic feet per second

Metal duct form shall be supported from distortion during pour of concrete by filling with sand, temporary support wedged in place or other suitable means. This also applies to plastic pipes.



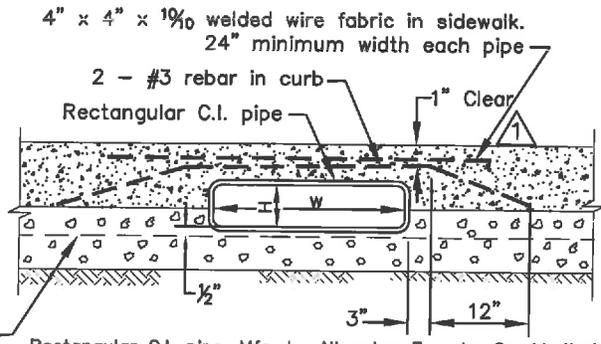
**ROUND CAST IRON PIPE SECTION**

Dia., $\phi$	Maximum Capacity
3"	0.15 Cubic feet per second
4"	0.32 Cubic feet per second



**PLASTIC PIPE SECTION**

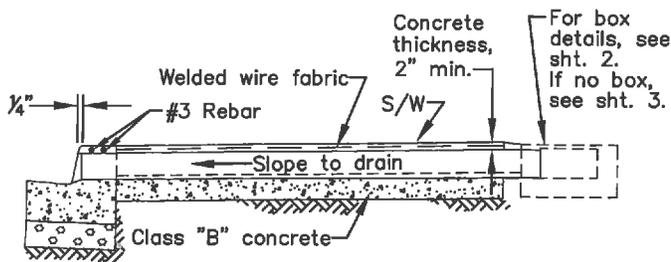
SIZE	MAXIMUM CAPACITY
3" $\phi$	0.15 Cubic feet per second
4" $\phi$	0.32 Cubic feet per second
2 $\frac{7}{8}$ " x 5 $\frac{3}{4}$ "	0.41 Cubic feet per second
3 $\frac{3}{4}$ " x 8 $\frac{1}{4}$ "	0.94 Cubic feet per second



Rectangular C.I. pipe. Mfg. by Alhambra Foundry Co. Limited, Alhambra, Calif. or approved equal.

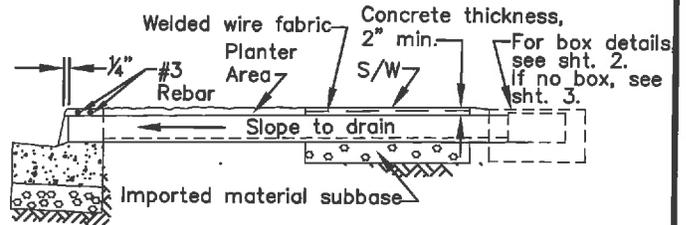
**RECTANGULAR PIPE SECTION**

Dimension		Maximum Capacity
H	W	
3	5	0.37 Cubic ft. per second
4	6	0.70 Cubic ft. per second
3	9	0.75 Cubic ft. per second
3	12.5	1.09 Cubic ft. per second
4	8.5	1.07 Cubic ft. per second
4	14	1.93 Cubic ft. per second



**LONGITUDINAL SECTION**

The concrete base and cover for duct and plastic pipe drains shall extend continuously from property line to back of curb.



**LONGITUDINAL SECTION WITH PLANTER AREA**

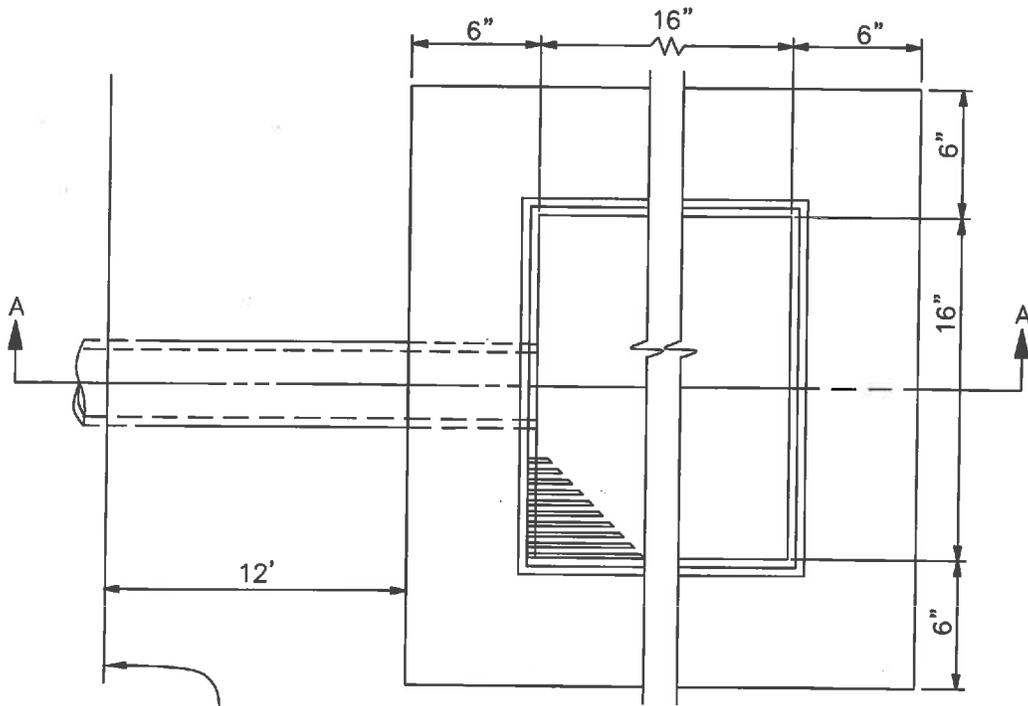
No pipe joints shall be made within the sidewalk or curb.

**GENERAL NOTES:**

- For greater capacity, additional adjacent drains may be installed with the following limitations:
  - Adjacent drains shall be of one type.
  - Minimum distance between drains shall be 4".
- All capacities are based on the following: (a)  $S = \frac{1}{4}$ " to 1' flowing full and (b)  $n = 0.011$  for duct and pipe sections.
- Plastic pipe shall not be used in planter areas unless pipe is encased in concrete as shown on Plastic Pipe Section on this sheet.
- Only gravity flow shall be permitted through curb drains. Pumped discharge through curb drains is not permitted.
- Drain pipe shall not extend through driveway approaches. Drain pipe is allowed only in sidewalk sections.

			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		DWG. NO. <b>SD-118</b>
			DRAWN BY: HGM CHECKED BY: AL APPD. BY:	DATE: 01/04/12 APPROVED:	
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT. <b>1</b> OF <b>5</b>

**STANDARD AREA DRAIN**

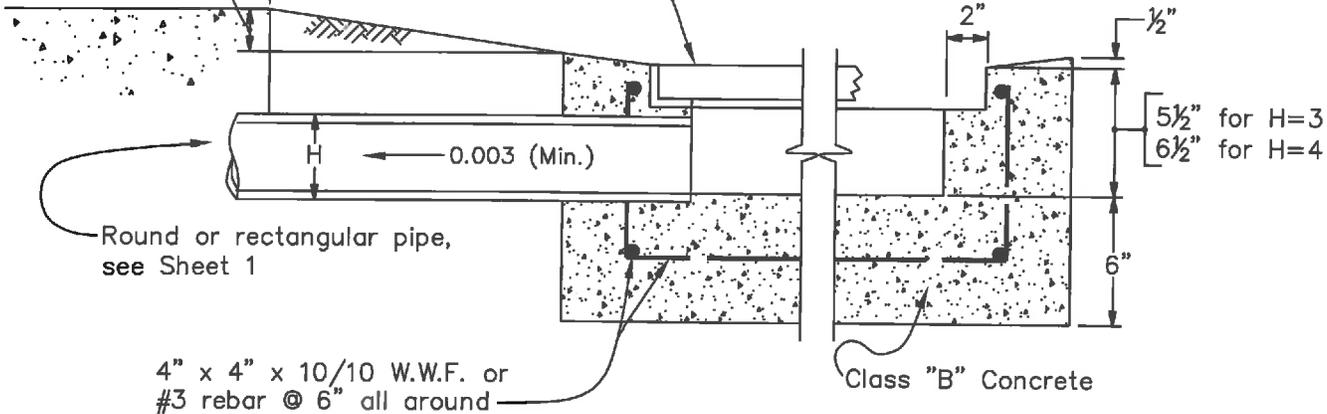


PLAN

Back of sidewalk or P/L

Install frame and grate, Phoenix Iron Works P-4102 or approved equal

1 1/2" for H=3  
1/2" for H=4



Round or rectangular pipe, see Sheet 1

4" x 4" x 10/10 W.W.F. or #3 rebar @ 6" all around

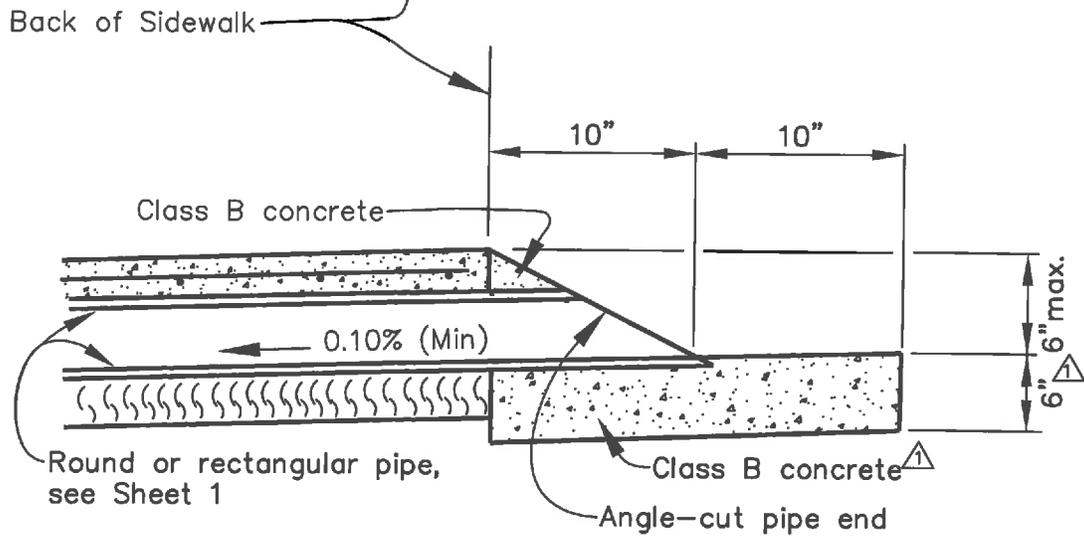
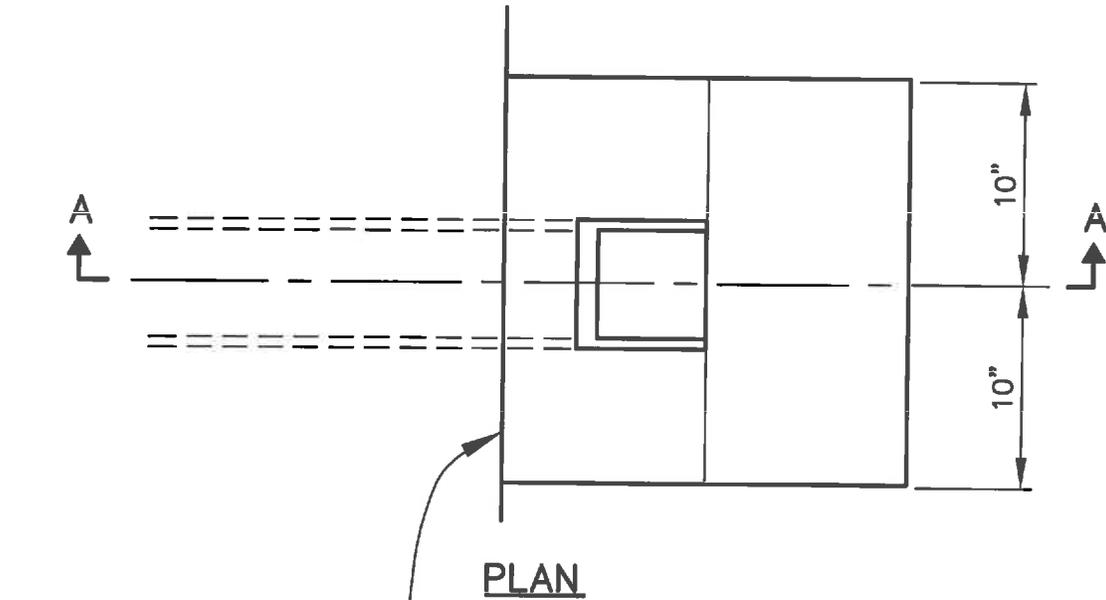
Class "B" Concrete

SECTION A-A

NOTES:

1. Grate capacity = 1 c.f.s. with 2" head unclogged.
2. See sheet 3 for alternate installation without area drain box.
3. Products manufactured by Christy Concrete Products Inc., Brooks Product Inc. or Santa Rosa Cast Products Co. or equal may be utilized if approved by the City Engineer.

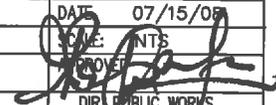
					<h2>STANDARD AREA DRAIN</h2>	DWG. NO. <b>SD-118</b>
			<b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>	FILED		
REV	DATE	BY	DRAWN BY: HGM	DATE: 01/04/12		SHT. <b>2</b> OF <b>5</b>
			CHECKED BY: JF	SCALE: NTS		
			APPD. BY	APPROVED		
			CITY ENGINEER	DIR. PUBLIC WORKS		

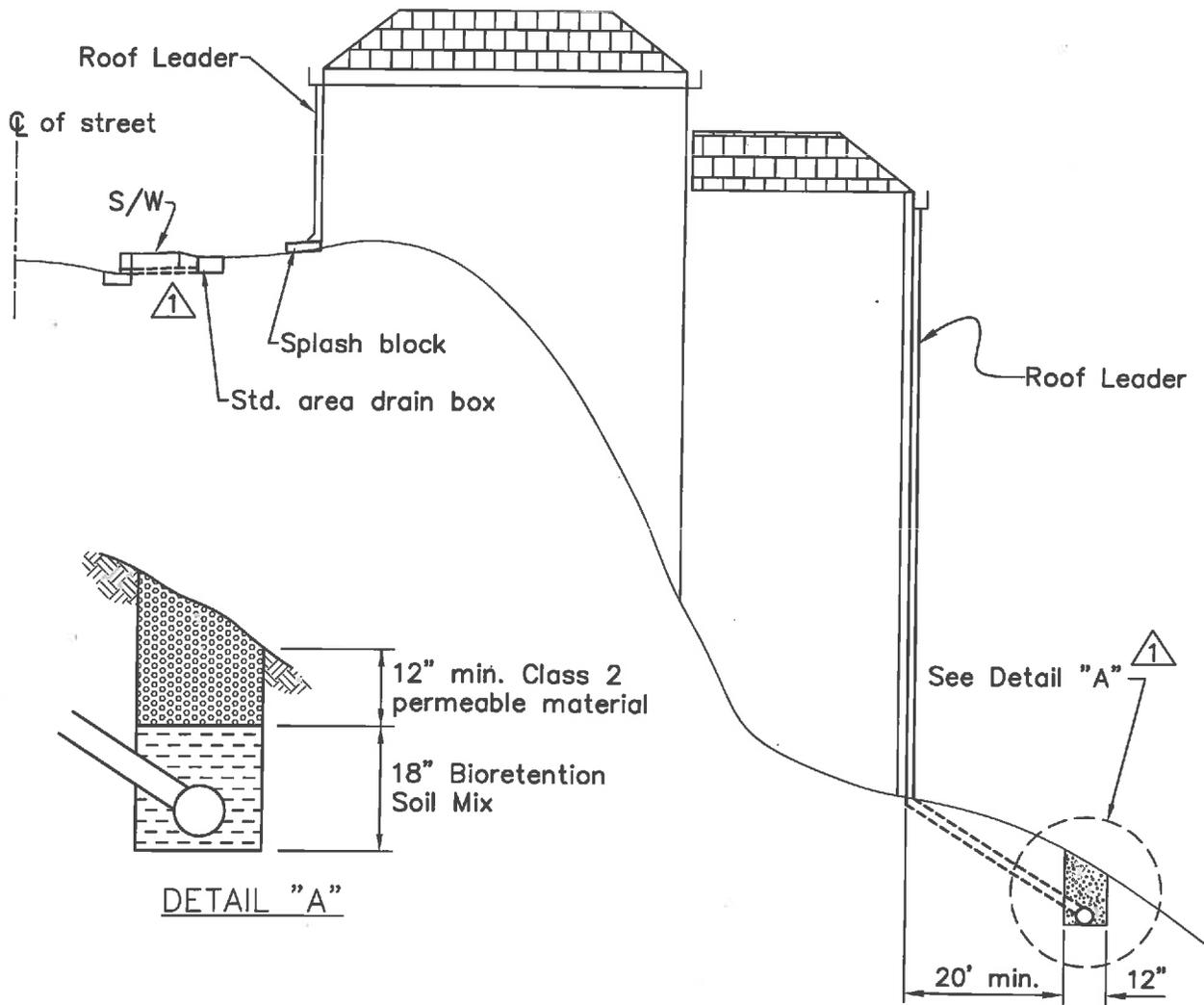


**SECTION A-A**

**NOTES:**

1. This installation to be used only when existing ground is too low for use of area drain box shown on Sheet 2.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD AREA DRAIN</b>	DWG. NO. <b>SD-118</b>
			DRAWN BY: HGM	DATE: 07/15/07		FILED
△	01/04/12	HGM	CHECKED BY: JF	SCALE: NTS		
REV	DATE	BY	APPD. BY			SHT. <b>3</b> OF <b>5</b>
			CITY ENGINEER	DIR. PUBLIC WORKS		

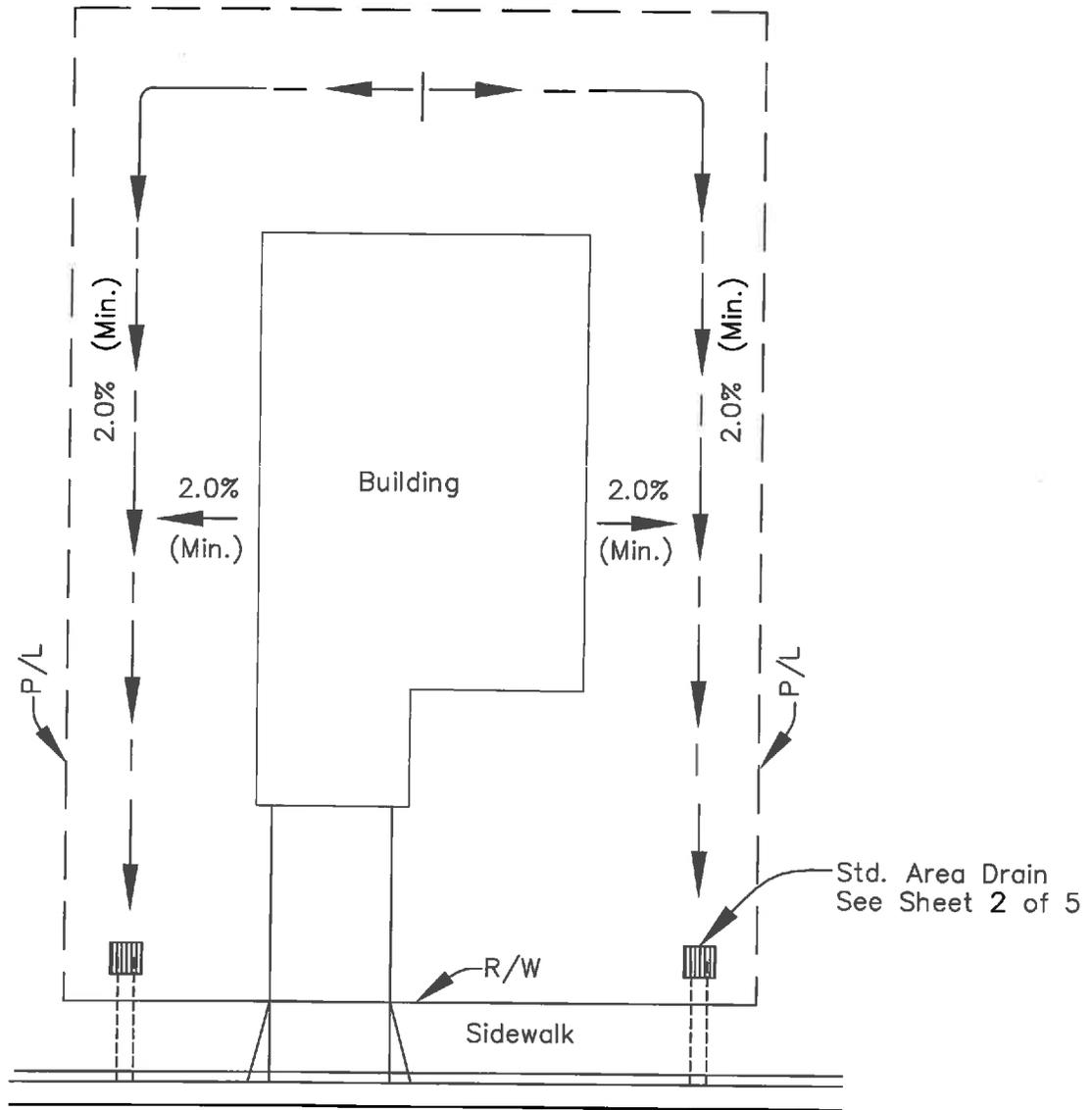


## ROOF LEADER DRAIN

**△ NOTES:**

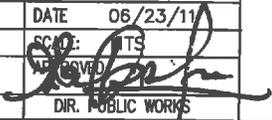
1. All roof leaders must drain to the street or to an existing water course at the rear of the property with an appropriate energy dissipator provided prior to discharge into the water course.
2. The rainwater shall be treated prior to discharge to the street or water course subject to approval of the City Engineer.
3. If a water course is unavailable, a 6" diameter perforated pipe may be installed in a trench backfilled with minimum 12" Class 2 permeable material and 18" Bioretention Soil Mix, designed and approved by a Soils Engineer.
4. Bioretention Soil Mix shall consist of 60–70% sand and 30–40% compost.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<h3 style="margin: 0;">STANDARD AREA DRAIN</h3>	DWG. NO. <h2 style="margin: 0;">SD-118</h2>
			DRAWN BY: HGM      DATE: 07/15/08 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS		FILED
△	01/04/12	HGM			SHT. <b>4</b> OF <b>5</b>



**NOTE:**

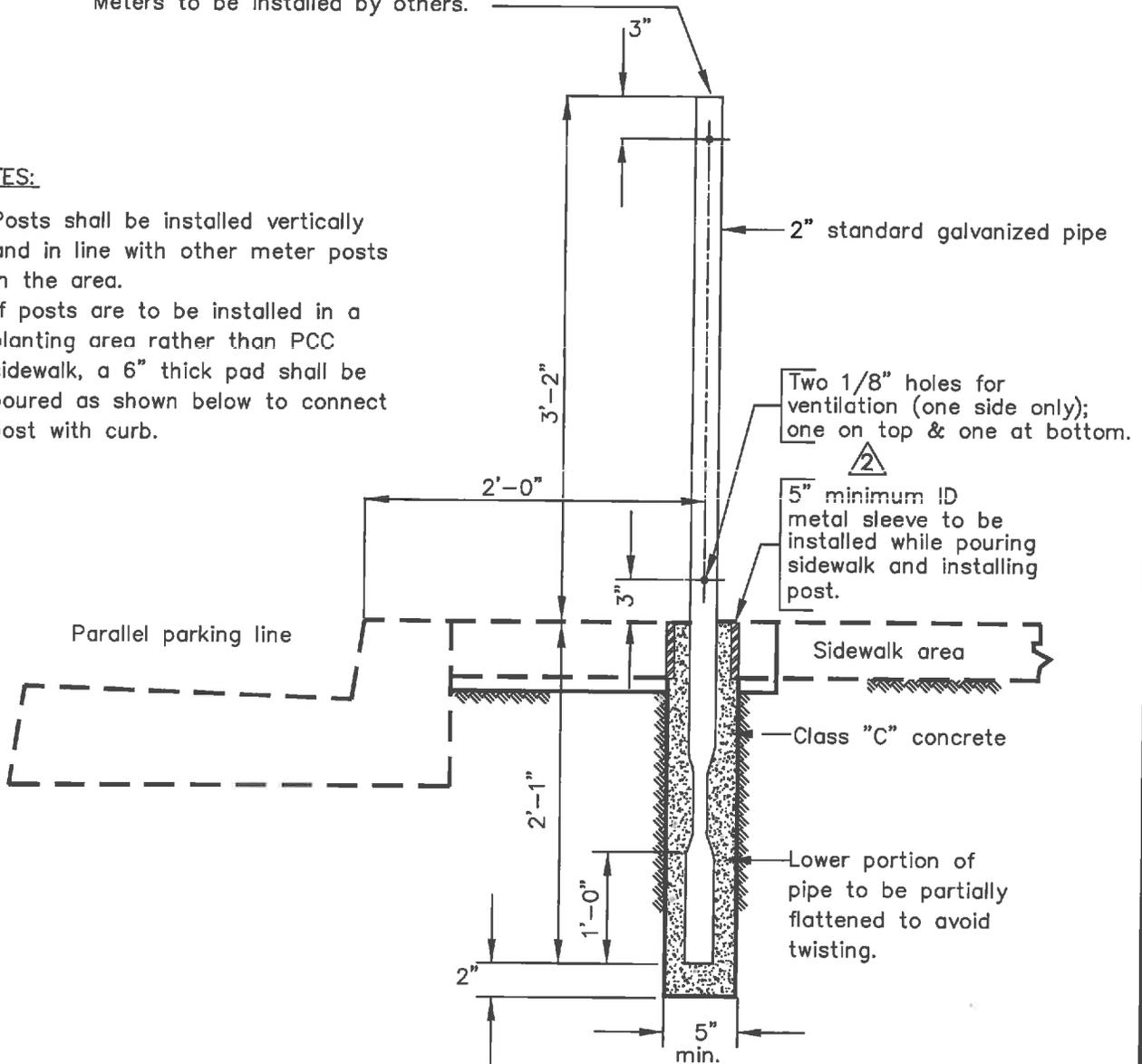
Positive grade away from entire building perimeter shall have a minimum gradient of 2% towards the swale in accordance with Excavation, Grading and Fill of the California Building Code under Sec. 1804A.3 Site Grading. The swale should be continuous from high point to area drain grate or pipe.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<h2>STANDARD AREA DRAINS</h2>		DWG. NO. <b>SD-118</b>	
			DRAWN BY: HGM      DATE: 06/23/11				FILED	
			CHECKED BY: JL      SCALE: 1"=10'-0"					
REV	DATE	BY	APPD. BY: CITY ENGINEER      DIR. PUBLIC WORKS					SHT. <b>5</b> OF <b>5</b>

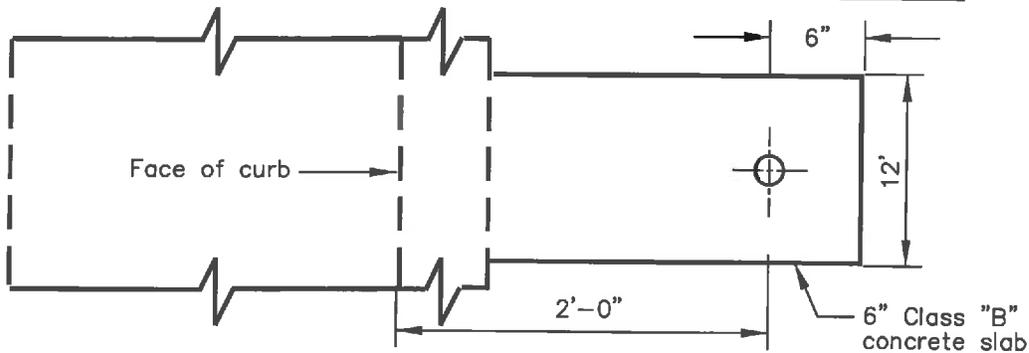
Upper end to be reamed on inside and deburred on outside.  
Meters to be installed by others.

**NOTES:**

1. Posts shall be installed vertically and in line with other meter posts in the area.
2. If posts are to be installed in a planting area rather than PCC sidewalk, a 6" thick pad shall be poured as shown below to connect post with curb.



**TYPICAL SECTION OF POST IN SIDEWALK AREA**

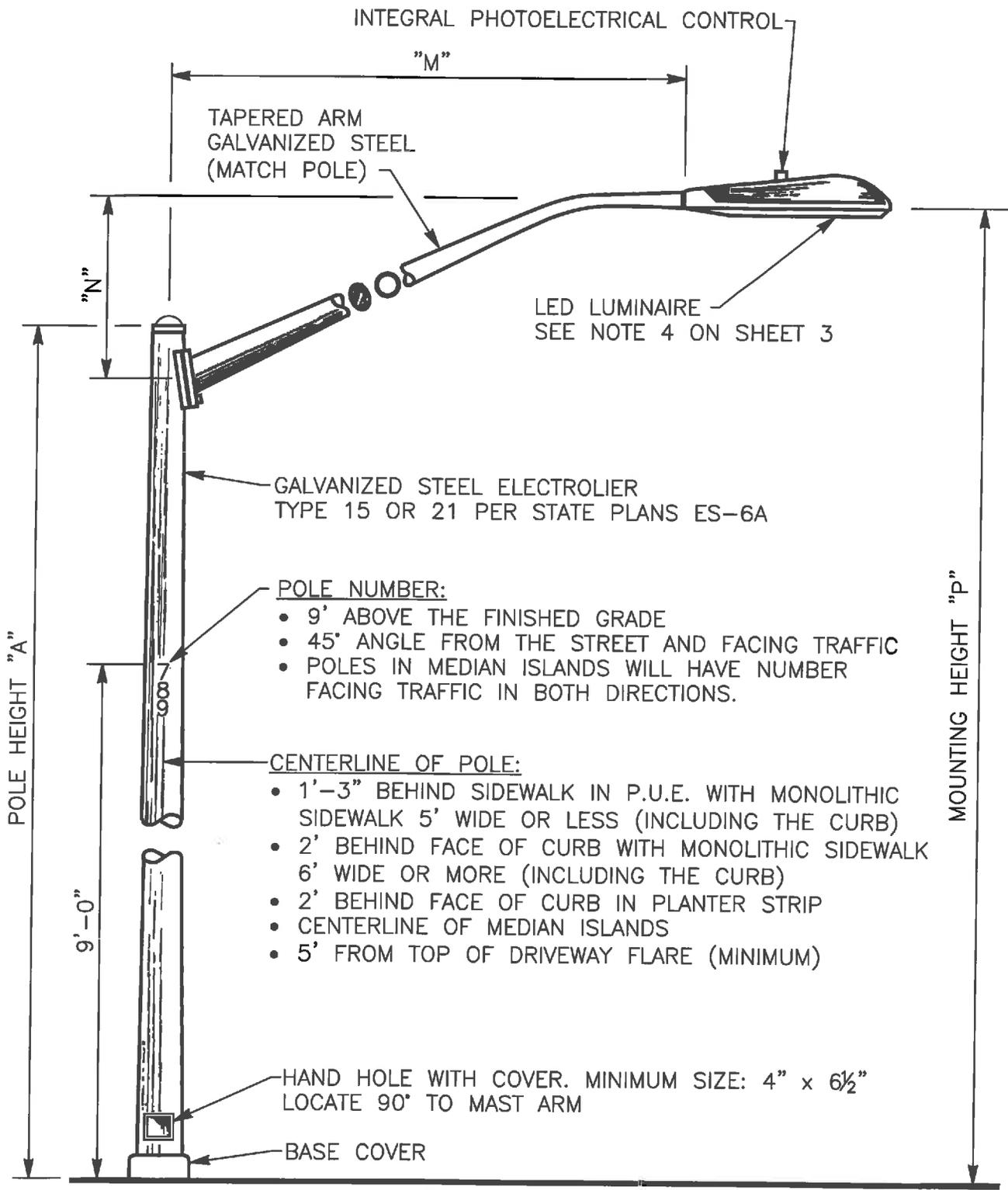


**PLAN VIEW OF POST IN PLANTING AREA**

			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		
			DRAWN BY: HGM CHECKED BY: MHW APPD. BY:	DATE: 08/22/08 SCALE: NTS APPROVED:	
REV: 1 DATE: 6/23/11 BY: AL	REV: 2 DATE: 3/30/10 BY: AL	CITY ENGINEER	DIR. PUBLIC WORKS		

**STANDARD  
PARKING METER  
POST**

DWG. NO.	<b>SD-119</b>
FILED	
SHT.	<b>1 of 1</b>



- POLE NUMBER:**
- 9' ABOVE THE FINISHED GRADE
  - 45° ANGLE FROM THE STREET AND FACING TRAFFIC
  - POLES IN MEDIAN ISLANDS WILL HAVE NUMBER FACING TRAFFIC IN BOTH DIRECTIONS.

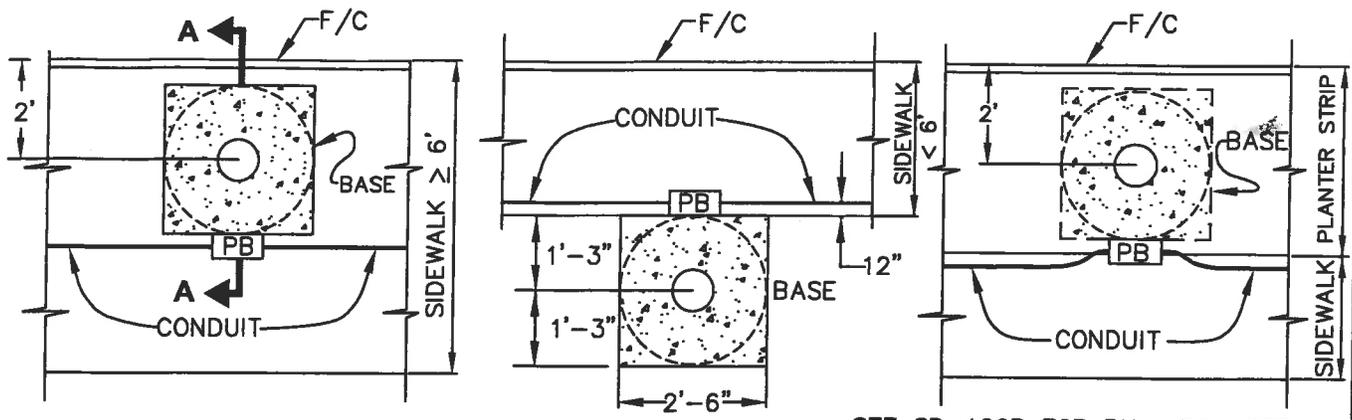
- CENTERLINE OF POLE:**
- 1'-3" BEHIND SIDEWALK IN P.U.E. WITH MONOLITHIC SIDEWALK 5' WIDE OR LESS (INCLUDING THE CURB)
  - 2' BEHIND FACE OF CURB WITH MONOLITHIC SIDEWALK 6' WIDE OR MORE (INCLUDING THE CURB)
  - 2' BEHIND FACE OF CURB IN PLANTER STRIP
  - CENTERLINE OF MEDIAN ISLANDS
  - 5' FROM TOP OF DRIVEWAY FLARE (MINIMUM)

HAND HOLE WITH COVER. MINIMUM SIZE: 4" x 6½"  
LOCATE 90° TO MAST ARM

BASE COVER

ELECTROLIER SHALL BE OF THE TYPE AND SIZE AS SHOWN IN THE TABLE ON SHEET 3 (unless otherwise specified)

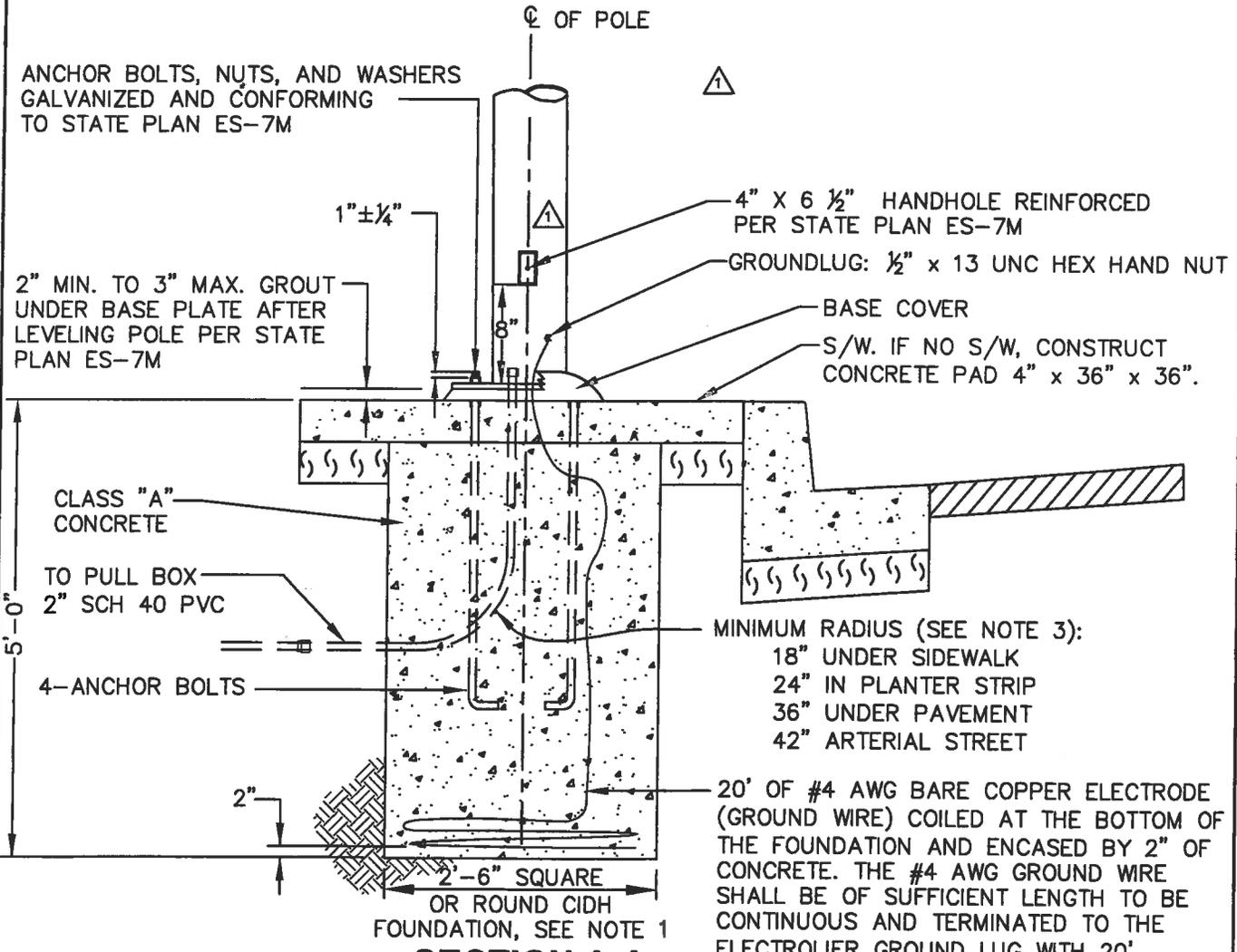
			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD STREET LIGHTING</b>		DWG. NO. <b>SD-120</b>		
			DRAWN BY: JT      DATE: 04/16/13				FILED		
			CHECKED BY: SM      SCALE: NTS					SHT. <b>1</b> OF <b>4</b>	
REV	DATE	BY	APPD. BY CITY ENGINEER			APPROVED DIR. PUBLIC WORKS			



**PLAN VIEW**

SEE SD-120B FOR PULL BOX DETAIL

ANCHOR BOLTS, NUTS, AND WASHERS GALVANIZED AND CONFORMING TO STATE PLAN ES-7M



**SECTION A-A**

**NOTES:**

1. STANDARD STREET LIGHTING POLE, INCLUDING CAST-IN-DRILLED HOLE PILE FOUNDATION, SHALL CONFORM TO STATE PLANS ES-6A, ES-7M, AND ES-7N.
2. CONCRETE SHALL SET AT LEAST 7 DAYS BEFORE POLE IS ERECTED.
3. MINIMUM RADIUS ALSO APPLIES TO PULL BOX STRUCTURES.

		 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD</b>  <b>STREET LIGHTING</b>		DWG. NO. <b>SD-120</b>	
		DRAWN BY: AL CHECKED BY: SM APP. BY: <i>[Signature]</i>	DATE: 08/27/12 SCALE: NTS APPROVED: <i>[Signature]</i>				FILED
1 09/03/14 HGM	REV DATE BY	CITY ENGINEER	DIR. PUBLIC WORKS				SHT. <b>2</b> OF <b>4</b>

## ELECTROLIERS

POLE TYPE	POLE DATA				BASE PLATE DATA				LUMINAIRE ARM
	A Height	Min OD		Wall Thickness	C	D1 Bolt Circle	Thick-ness	Anchor Bolts Size	
		Base	Top						
15	30'	8"	3 <sup>7</sup> / <sub>8</sub> "	0.1196"	12"	12"	1"	1"Øx3'-0"x4"	6' to 8'
21	35'	8 <sup>5</sup> / <sub>8</sub> "	3 <sup>7</sup> / <sub>8</sub> "	0.1196"	12"	12"	1"	1 <sup>1</sup> / <sub>4</sub> "Øx3'-0"x4"	8'

LUMINAIRE ARM DATA					
M Projected Length	N Rise	Min OD At Pole	Nominal Thickness	P	
				Type 15	Type 21
6'-0"	2'-0"±	3 <sup>1</sup> / <sub>4</sub> "	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3 <sup>1</sup> / <sub>2</sub> "	0.1196"	32'-0"±	37'-0"±

### LUMINAIRE REQUIREMENTS

Nominal Color Temperature	4300K, +/-300K
Color Rendering Index (CRI)	70 CRI
Light Distribution	Type 2 & Type 3 Distribution, full cut-off
Luminaire Efficacy	>69 lumens per watt (LPW)
Operating Temperature	°C -20 to +50
IESNA Luminaire Classification	Using TM-15: B3, U1, G3
Lumen Depreciation of LED Light sources	LED module shall deliver 70% of initial lumens, when installed for a minimum of 110,000 hours
Off-state power consumption, max.	0.50
On-state power consumption, max., excluding control device	≤Traditional Application Wattage

### POWER SUPPLY/DRIVER REQUIREMENTS

Operation Voltage	120-277V
Power Factor, min.	0.90
Transient Protection	10kV
Interference	FCC 47 CFR part 15/18, Class A
Driver Output Current Range	350mA-530mA-700mA

### NOTES:

- LED fixture should have a field installable house side shield option to take care of light trespass concerns. This shield should be unobtrusive and not hang below the fixture.
- LED fixture should have power door design with all electrical components mounted on door with quick disconnect for easy access.
- LED fixture should have NEMA twist-lock receptacle that can be rotated and aimed north without the use of any tools.
- LED luminaire type and size to be installed shall be determined by City Traffic Engineer.

 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<h1 style="margin: 0;">STANDARD</h1> <h1 style="margin: 0;">STREET LIGHTING</h1>	DWG. NO. <b>SD-120</b>
				FILED
REV	DATE	BY	DRAWN BY: JT      DATE: 04/16/13 CHECKED BY: SM      SCALE: NTS APPD. BY: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS	SHT. <b>3</b> OF <b>4</b>

DESIGN CRITERIA FOR ROADWAY LIGHTING

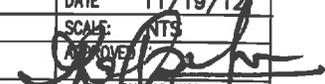
1. AVERAGE MAINTAINED ILLUMINANCE VALUES ( $E_{AVG}$ ) IN FOOTCANDLES (FC)

<u>ROAD AND AREA CLASSIFICATION</u>	<u><math>E_{AVG}</math> (FC)</u>	<u>UNIFORMITY RATIO</u>
<u>ARTERIALS:</u>		
HIGH	1.7	
MEDIUM	1.3	3 TO 1
LOW	0.9	
<u>COLLECTOR:</u>		
HIGH	1.2	
MEDIUM	0.9	4 TO 1
LOW	0.6	
<u>LOCAL:</u>		
HIGH	0.9	
MEDIUM	0.7	6 TO 1
LOW	0.4	

RURAL:

STREETLIGHTS ARE TO BE INSTALLED AT:

1. INTERSECTIONS
2. TRAFFIC CONFLICT LOCATIONS  
(NARROW BRIDGES, R/R CROSSINGS, ETC.)
3. OTHER LOCATIONS AT THE DISCRETION OF THE CITY TRAFFIC ENGINEER.

				<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD STREET LIGHTING</b>	DWG. NO. <b>SD-120</b>
			DRAWN BY: JT      DATE: 11/19/12 CHECKED BY: SM      SCALE: NTS APPD. BY: 			FILED
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		SHT. <b>4</b> OF <b>4</b>

ROOF REFLECTOR SYSTEM

SPRING CITY ELECTRICAL Mfg.Co.  
 Phone (610) 948-4000  
 Fax(610)948-5577  
 HALL & MAIN STREETS  
 P.O.Box Drawer A SPRING CITY, PA 19475

LUMINAIRE SPECIFICATIONS

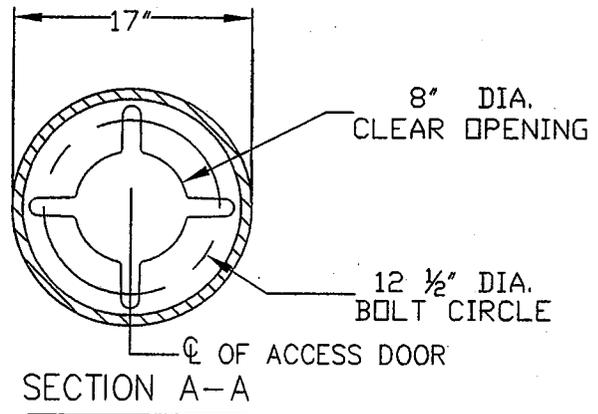
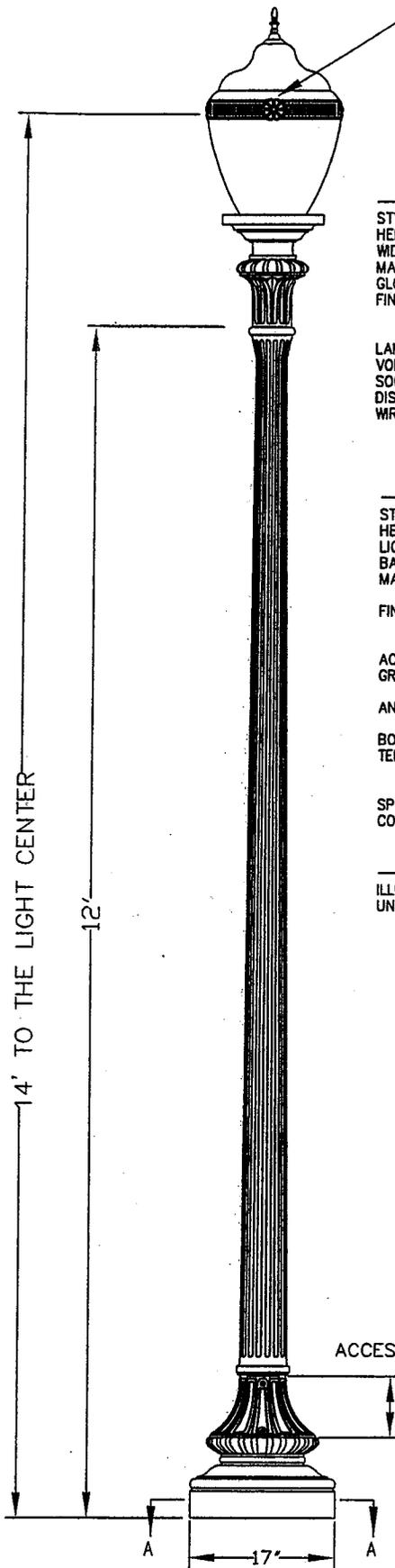
STYLE: WASHINGTON - 199 (2 PIECE) GLOBE WITH PAINTED GOLD-ALUMINUM BAND  
 HEIGHT: 37 3/4"  
 WIDTH: 17 1/8"  
 MATERIAL: CAST ALUMINUM  
 GLOBE: STIPPLED POLYCARBONATE  
 FINISH: PRIME PAINT, SHERWIN WILLIAMS 2 PART RECOATABLE EPOXY PRIMER (B67H5 - PART G AND B67V5 - PART H) THEN FINISH PAINT - CEDAR GREEN  
 LAMPING: 175W MH (METAL HALIDE)  
 VOLTAGE: M/T 120V,240V,208V,277V  
 SOCKET: PORCELAIN MOGUL  
 DISTRIBUTION: ASYMMETRIC TYPE III  
 WIRE TYPE: 18 AWG TYPE TFFN INTEGRAL P.E.C.

LAMP POST SPECIFICATIONS

STYLE: THE WASHINGTON 12P  
 HEIGHT: 12'  
 LIGHT CENTER: 14'  
 BASE: 17" DIAMETER  
 MATERIAL: 1 PIECE, HEAVY WALL CAST ALUMINUM ALLOY SR 319 PER A.S.T.M. B26-80  
 FINISH: PRIME PAINT, SHERWIN WILLIAMS 2 PART RECOATABLE EPOXY PRIMER (B67H5 - PART G AND B67V5 - PART H) THEN FINISH PAINT - CEDAR GREEN  
 ACCESS DOOR: LOCATED IN BASE  
 GROUND STUD PROVISIONS: DRILL AND TAP INSIDE WALL OF BASE OPPOSITE ACCESS DOOR TO ACCOMMODATE A 1/4"-20 GROUND STUD (GROUND STUD SUPPLIED BY OTHERS)  
 ANCHOR BOLTS: (4) 3/4" X 24" + 3" HOOK (FULLY GALVANIZED WITH 1 GALVANIZED NUT AND 1 GALVANIZED WASHER PER BOLT)  
 BOLT PROJECTION: 3" REQUIRED  
 TENON: 3 1/2" DIA. X 3" HIGH  
 3" REQUIRED  
 3 1/2" DIA. X 3" HIGH  
 SPACING: 100' (O.C.)  
 CONFIGURATION: STAGGERED

ILLUMINATION STANDARDS

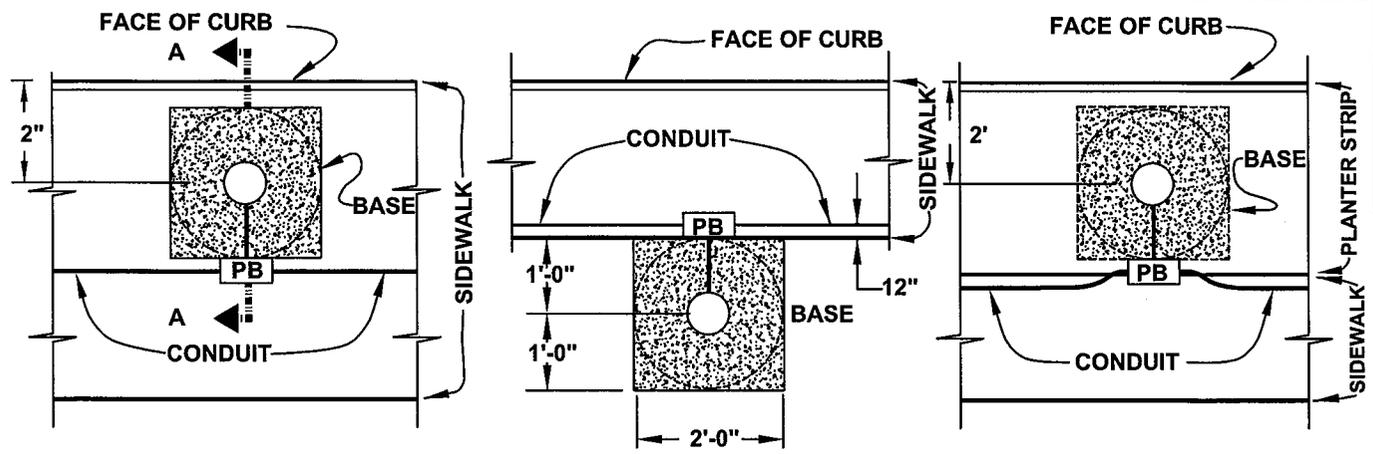
ILLUMINANCE (Fe) = 0.6  
 UNIFORMITY RATIO = 4:1



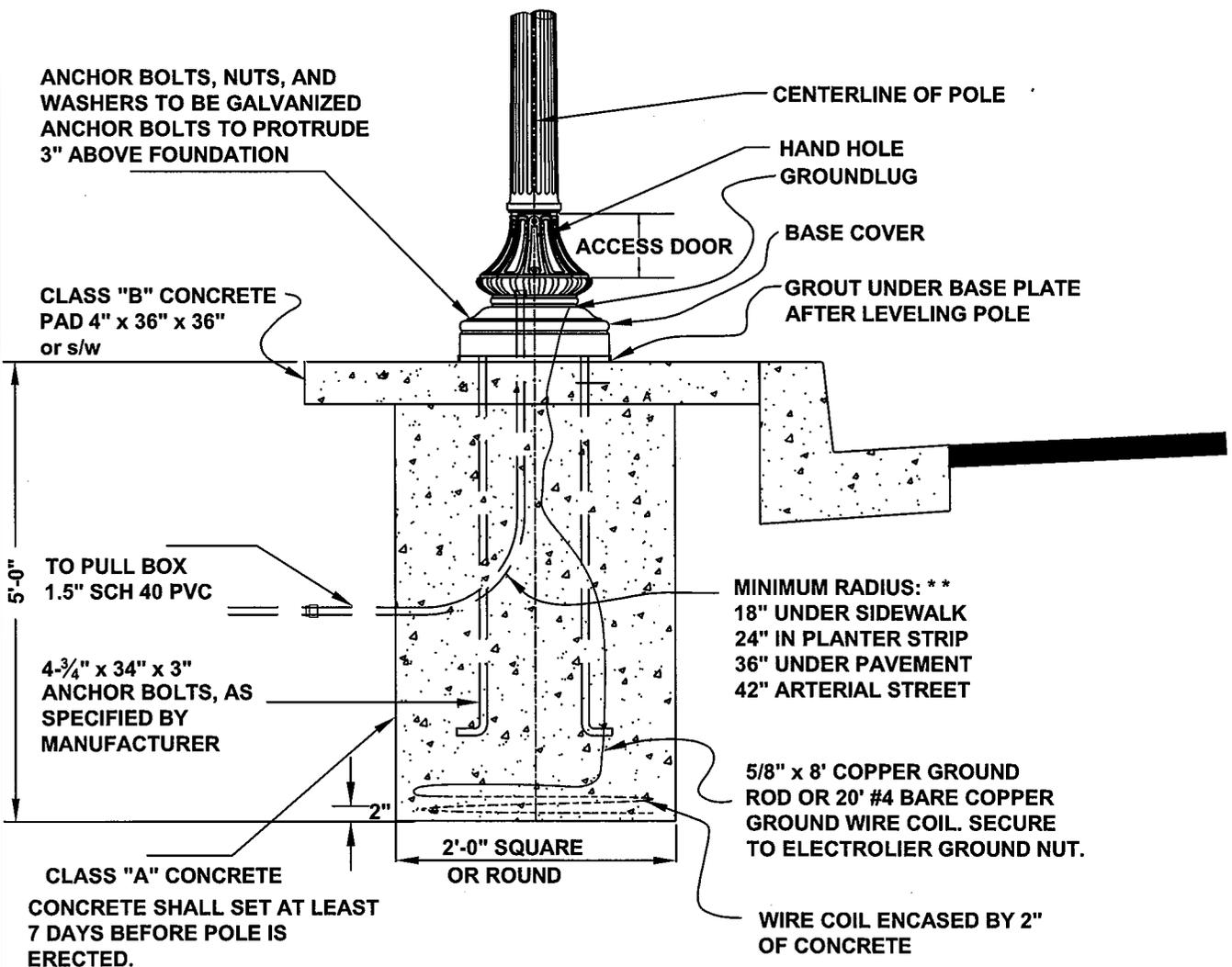
**ONLY FOR DOWNTOWN LIGHTING**

CITY OF HAYWARD ENGINEERING DIVISION			<b>STANDARD                  ORNAMENTAL                  STREET LIGHTING</b>	DWG. NO. <b>SD-120A</b>
				FILED <b>9-25-02</b>
DRAWN BY: FM	DATE: MAY 2002	APPROVED BY: <i>[Signature]</i> CITY ENGINEER		SHT. <b>1</b> OF <b>5</b>
CHECKED BY: NP	SCALE: NTS			APPROVED BY: <i>[Signature]</i> DIR. PUBLIC WORKS
REV	DATE	BY		





**PLAN VIEW**



**SECTION A-A**

\*\* = MINIMUM RADIUS ALSO APPLIES TO PULL BOX STRUCTURES

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>		<b>STANDARD ORNAMENTAL STREET LIGHTING</b>	DWG. NO. <b>SD-120A</b>
			DRAWN BY: HGM	DATE 06/04/08		FILED
			CHECKED BY: MHW	SCALE: NTS		
			APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		SHT. <b>3</b> OF <b>5</b>

ORNAMENTAL LAMP POST SPECIFICATION:

1. Post shall be Spring city Manufacturing Company "Washington" Series or approved equal.
2. The lamp post shall be integrally cast at one piece and shall be cast aluminum per ASTM B26, Alloy 319.
3. The castings shall be true to pattern with 16 flutes of uniform sections. The sections shall be formed by the use of loose pattern pieces to ensure that the flutes have constant dimensions around the circumference of the pole.
4. The post shall be cast tapered as shown below, with no welding or bolting together of structural members of the lamp post.  
     Column at Base    5 IN. (12.7cm) O.D.  
     Column at top    3-1/4IN. (8.26cm) O.D.  
     Base at Base     17 IN. (43.18cm) O.D.
5. The base shall have four (4) one inch wide slots on a 12-1/2 inch (31.75cm) diameter bolt circle.
6. A handhole secured with stainless steel machine screws shall be provided in the base of the lamp post.
7. Each post shall be supplied with four(4) 3/4 inch (19mm) diameter by 24 inch (60.96 cm) long hot dipped galvanized steel anchor bolts with a 3 inch(7.62cm.) hook on one end. Each bolt shall have one galvanized nut and one washer to fasten down the post.
8. Anchor bolts shall be installed according to the template supplied by the manufacturer.
9. The anchor bolts shall protrude three inches above the foundation to allow for clearance for the washers and nuts.
10. All castings shall be prime painted with etching type Zinc Chromate primer.
11. The post shall be manufactured in accordance with the AASHTO "Standard specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals."

**ONLY FOR DOWNTOWN LIGHTING**

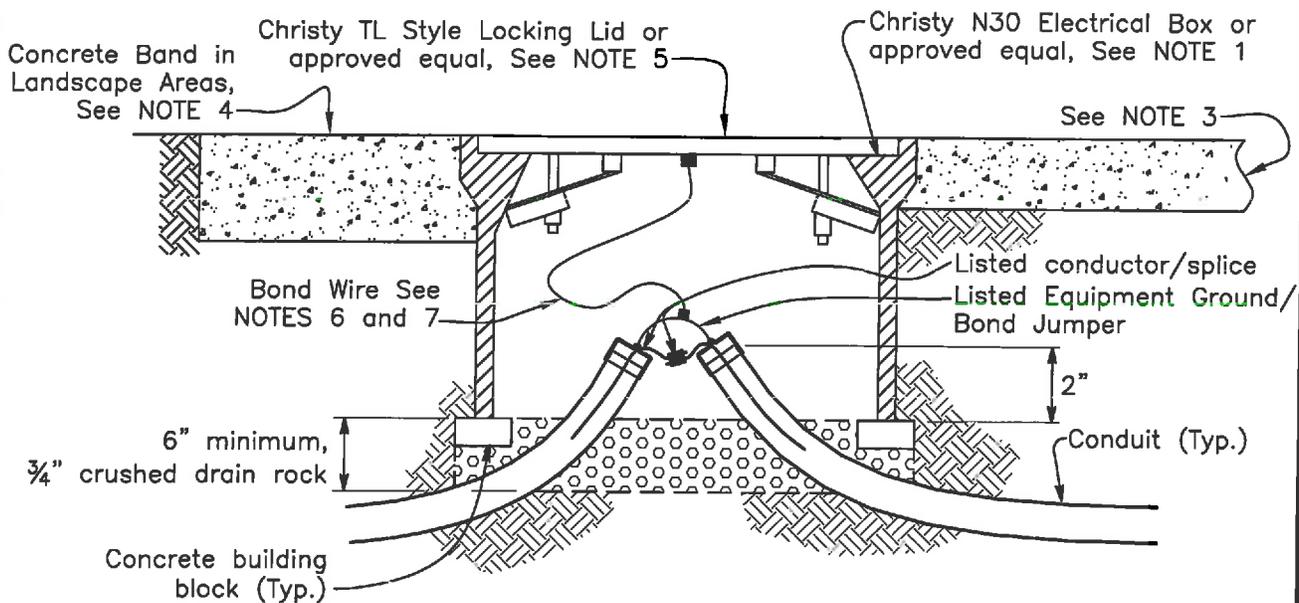
			<b>CITY OF HAYWARD</b> <b>ENGINEERING DIVISION</b>	<b>STANDARD</b> <b>ORNAMENTAL</b> <b>STREET LIGHTING</b>	DWG. NO. <b>SD120A</b>
			DRAWN BY: F.MORALES      DATE MARCH 27, 1997 CHECKED BY: H.B.D.        SCALE: NONE APP. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i>		FILED <b>9-25-02</b>
REV	DATE	BY	CITY ENGINEER              DIR. PUBLIC WORKS		SHT. <b>4</b> OF <b>5</b>

ORNAMENTAL LUMINAIRE SPECIFICATION:

1. Luminaires shall be Spring City Electrical Manufacturing Company "Washington" Series or approved equal.
2. The globe shall be made of polycarbonate and have a glass-like appearance to maintain historic relevance.
3. The casing shall be made of cast aluminum and shall have provisions for an internally mounted photocell to switch the light on and off. The photocell switch shall be supplied by the casing manufacturer.
4. The luminaire shall be fitted with a 175W MH (metal halide) lamp, a downward reflector, and a house-side shield. Ballast shall be multi-tap 120V,208V,240V,277V.
5. Luminaries shall maintain a Type III distribution.
6. Luminaires shall be UL or CSA labeled.
7. The globe shall be fitted with a decorative painted gold aluminum ring and brass finial as specified on sheet 2

**ONLY FOR DOWNTOWN LIGHTING**

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>	<b>STANDARD ORNAMENTAL STREET LIGHTING</b>	DWG. NO. <b>SD120A</b>
			DRAWN BY: F.MORALES      DATE MARCH 27, 1997		
			CHECKED BY: H.B.D.      SCALE: NONE		
			APPROVED BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i>		
REV	DATE	BY	CITY ENGINEER      DIR. PUBLIC WORKS		
					FILED <b>9-25-02</b>
					SHT. <b>5</b> OF <b>5</b>

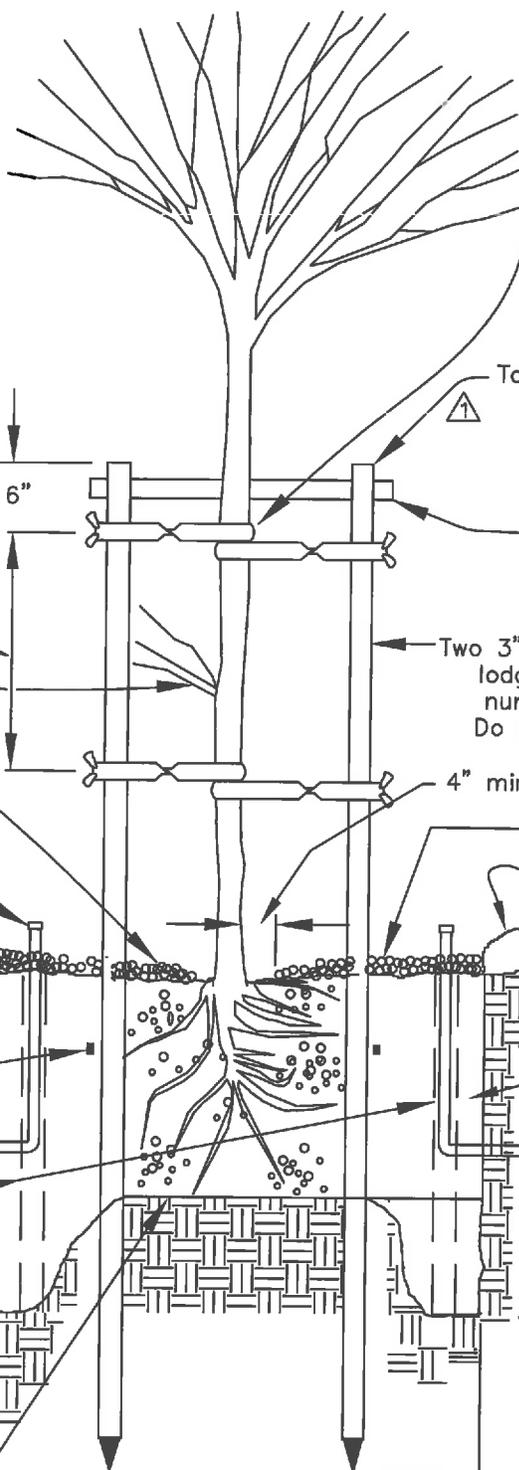
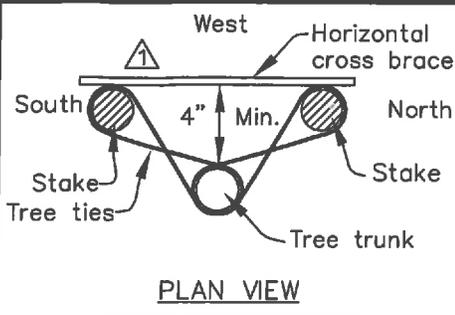


**NOTES:**

1. Boxes shall be Christy N30 Electrical Box or approved equal. Lids shall be Christy TL Style Locking Lids or approved equal, see NOTE 5.
2. If extension is used, it shall be grouted to the pullbox on the inside.
3. Where pullboxes are installed in concrete areas, the box and lid shall be flush with sidewalk surface.
4. Where pullboxes are not installed in concrete areas, a 18" Wide x 6" Thick concrete band shall be placed around the box.
5. Security Bolts shall be keyed for City of Hayward. Lid color shall be Beige or Gray to match the color of the top of box. Lid to be marked COH-SL with 1" high letters on upper right corner of lid.
6. Locking lids shall be bonded to equipment ground conductor. Bond wire shall be the same wire gauge as equipment ground/bond jumper and shall be bonded with listed grounding termination.
7. Bond wire shall be stranded and of sufficient length to allow the lid to be removed and set aside the pull box.
8. Conductors shall have a minimum of 24" and a maximum of 36" total in box slack from conduit end.
9. Dual in-line fuse holder with approved fuse shall be installed in pullbox.
10. Conduit ends shall have 6" to 8" clearance from the bottom of the lid. Extension or deeper boxes shall be used as necessary to maintain this clearance and to provide space for conductors and connections.
11. PVC conduits shall have bell ends.
12. Steel conduits shall have listed bonding bushings.
13. Ends of all conduits shall be sealed with duct seal.

		 <b>CITY OF</b> <b>HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD</b> <b>STREET LIGHTING</b> <b>PULL BOX</b> <b>WITH LOCKING COVER</b>	DWG. NO. <b>SD-120B</b>
		DRAWN BY: <i>HGM</i> DATE: 09/05/14 CHECKED BY: <i>JW</i> SCALE: NTS APPROVED BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i> <small>WALTON ENGINEER      DIR. PUBLIC WORKS</small>		FILED
REV	DATE	BY		SHT. <b>1</b> OF <b>1</b>





Four flexible belt or rubber hose tree ties. Cross ties over before securing onto stakes with galvanized screws

Top of stake to be 2" below the main branching structure of the tree and shall not extend into the main branches.

One 1" x 4" cross brace secured to stakes with galvanized screws.

Two 3" diameter pressure treated lodgepole pine stakes. Remove nursery stakes before staking. Do not place stake in rootball.

4" min. (Typ.)

Minimum 3" organic recycled chipped wood

4" water basin  
Sidewalk

Backfill with clean native soil and soil amendment as necessary. Soil amendment shall be organic compost or as directed by Soils Lab.

Set stakes 12" minimum into undisturbed soil.

Excavate plant pit a minimum of 2x diameter of root ball

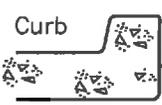
Set lower tie 1/2 distance between top tie and finished grade

Height of stakes as required to hold tree upright & straight

Do not remove low side branches.

Set rootball 2" above finished grade.

2 tree bubblers per tree 1" +/- above wood chips.



Organic fertilizers per Soils Lab.

Two 4" diameter PVC perforated drain pipes with slotted cover, min. 30" deep. Fill in and around pipe with drain rock.

Scarify sides and bottom of plant hole. Lightly score sides and bottom of root ball just prior to planting.

**TREE STAKING**  
**15 GALLON OR 24" BOX TREE**

		 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD STREET TREE PLANTING</b>		DWG. NO. <b>SD-122</b>	
		DRAWN BY: HGM CHECKED BY: MK APPD. BY: <i>[Signature]</i>	DATE: 06/03/08 SCALE: N/S APPROVED: <i>[Signature]</i>	<b>STANDARD STREET TREE PLANTING</b>		FILED	
6/23/11 REV	AL DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	<b>STANDARD STREET TREE PLANTING</b>		SHT. <b>1</b> OF <b>2</b>

STREET TREE PLANTING SPECIFICATIONS:

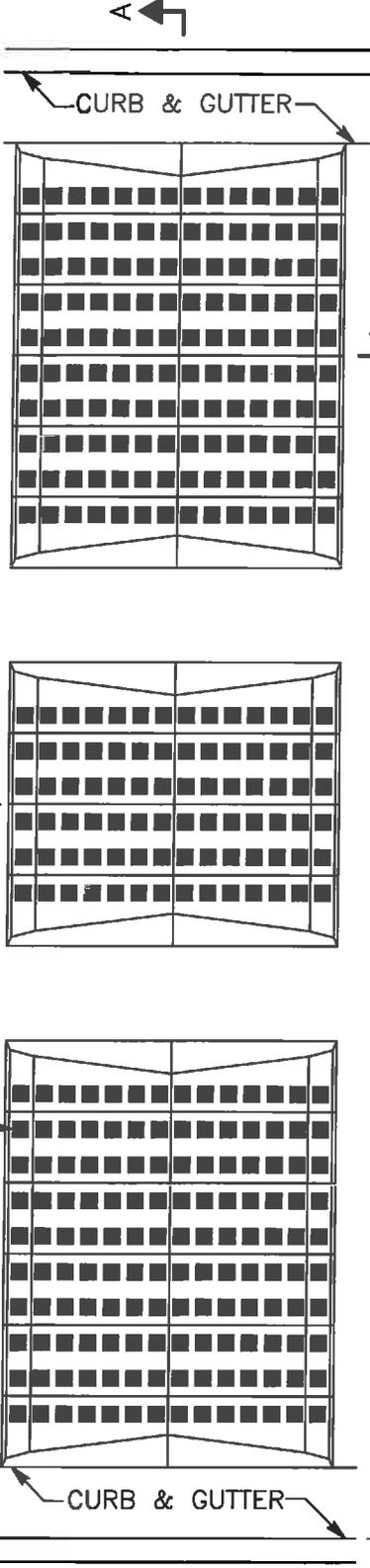
1. Tree shall be healthy, disease and insect-free, well rooted, and properly trained with a straight trunk that can stand upright without support. Tree shall exhibit a central leader, or a main branch that can be trained as a central leader. Branches shall be well-developed and shall be evenly and radially distributed around the trunk. Root ball shall not exhibit kinked or circling roots.
2. Tree shall comply with federal and state laws requiring inspection for plant diseases and pest infestation. Clearance from the county agricultural commissioner, as required by law, shall be obtained before planting trees delivered from outside the county.
3. Prior to planting tree, determine the location of existing or future underground utilities. Locate tree a minimum of 5 feet from lateral service lines and driveways. Locate tree a minimum of 15 feet from a light pole, and a minimum of 30 feet from the face of a traffic signal, or as otherwise specified by the City.
4. Tree pit shall be tested for proper drainage prior to planting tree. Fill pit with water; if water remains after a 24-hour period, auger three 4"-diameter by 3-foot deep holes at the bottom of the tree pit. Backfill with drain rock.
5. Set tree in an upright and plumb position. As much as possible, tree shall be positioned such that dominant branches are parallel to the roadway and are oriented away from potential conflicts.
6. If required by the City, a pressure-compensating bubbler, or drip emitters, shall be provided to each tree.
7. Depending on the planter strip width, or the tree well size and the tree species being planted, a 24" deep root-barrier may be required by the City to be placed between the root-ball and the curb and/or sidewalk. Length of strip barrier or size of the box barrier will be specified by the City.
8. Stakes are to be removed when the tree diameter meets or exceeds the diameter of the stake.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD STREET TREE PLANTING</b>	DWG. NO. <b>SD-122</b>
REV	DATE	BY			DRAWN BY: JT      DATE: 05/13/08 CHECKED BY: MHW      SIGNED: [Signature] APPD. BY: [Signature]      APPROVED: [Signature]
			CITY ENGINEER	DIV. PUBLIC WORKS	SHT. <b>2</b> OF <b>2</b>

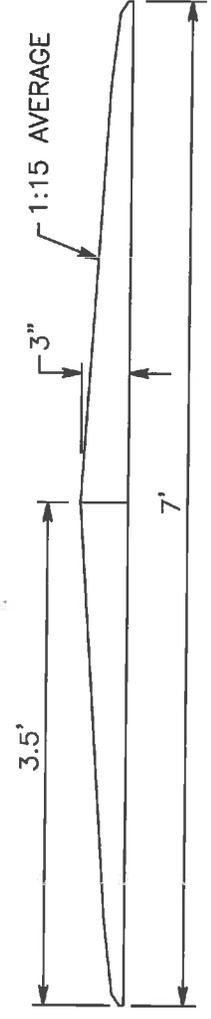
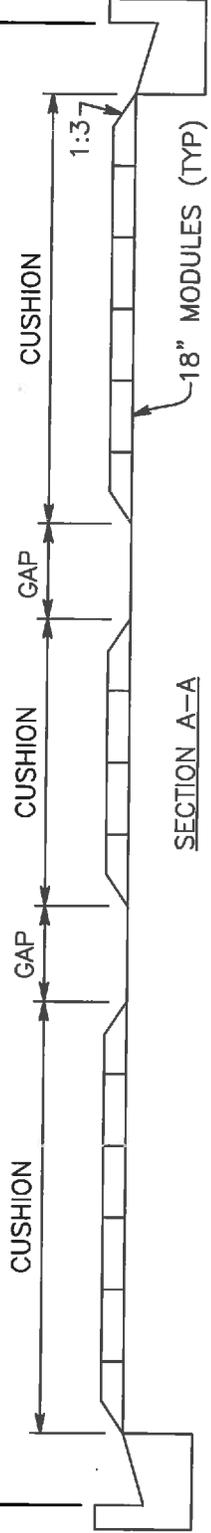
CROSS TRANSITION (TYP)

STREET

YELLOW REFLECTIVE TAPE EMBEDDED INTO RUBBER MODULES



37' OR LESS  
PLAN



SECTION B-B

STREET WIDTH  $\leq$  37'

NOTES:

1. SEE SPEED LUMP LAYOUT TABLE ON SHEET 4.
2. MATERIAL IS COMPRESSION MOLDED 100% RECYCLED RUBBER AND POLYURETHANE COMPOSITE (TRAFFIC LOGIX OR EQUAL.)

**STANDARD  
SPEED LUMP**

DWG. NO. **SD-123**

FILED

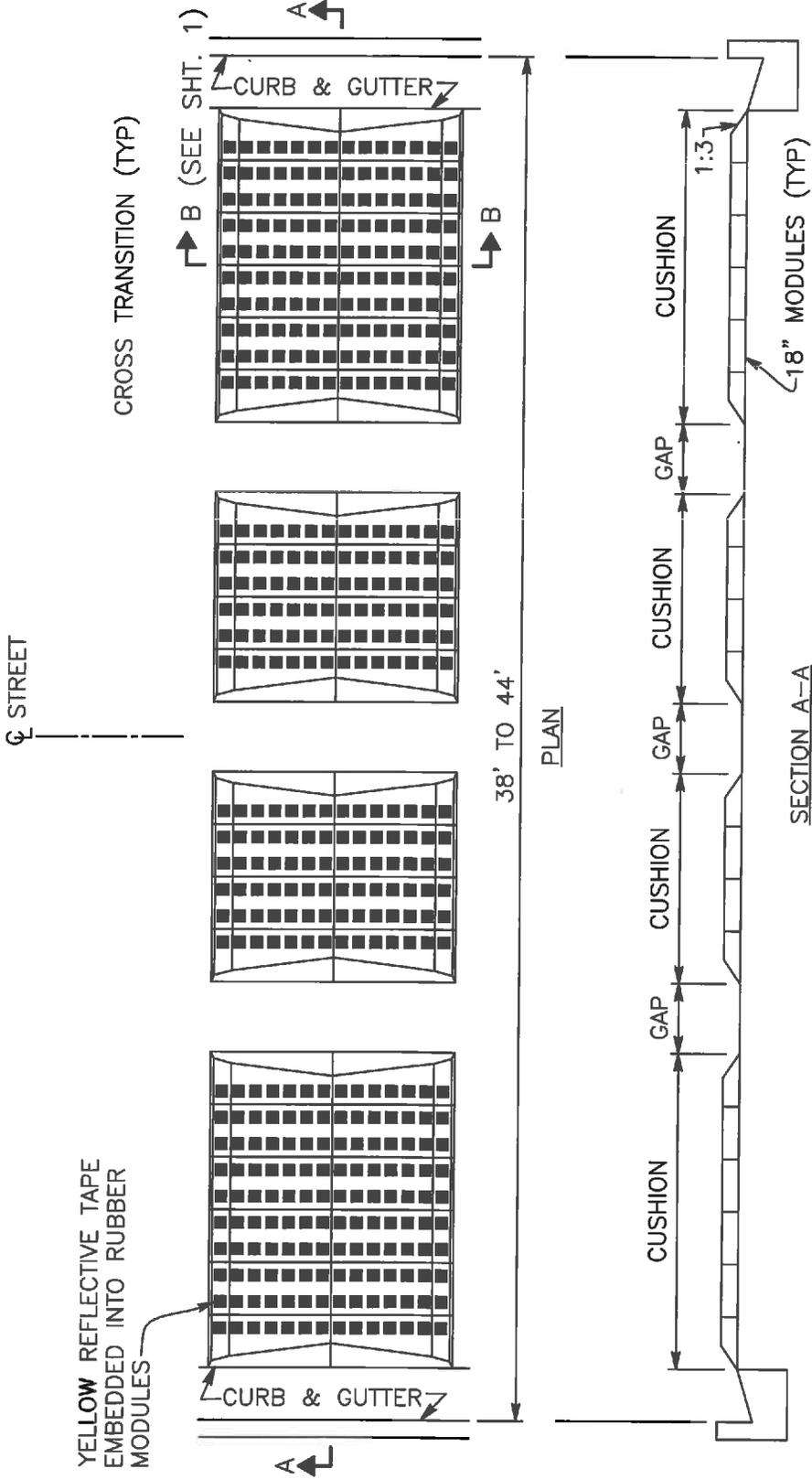
SHT. **1** OF **5**

CITY OF  
**HAYWARD**  
PUBLIC WORKS DEPT.

DRAWN BY: SM DATE: 01/27/12  
CHECKED BY: MH SCALE: NTS  
APPD. BY: [Signature] REVIEWED: [Signature]

CITY ENGINEER DIR. PUBLIC WORKS

REV	DATE	BY



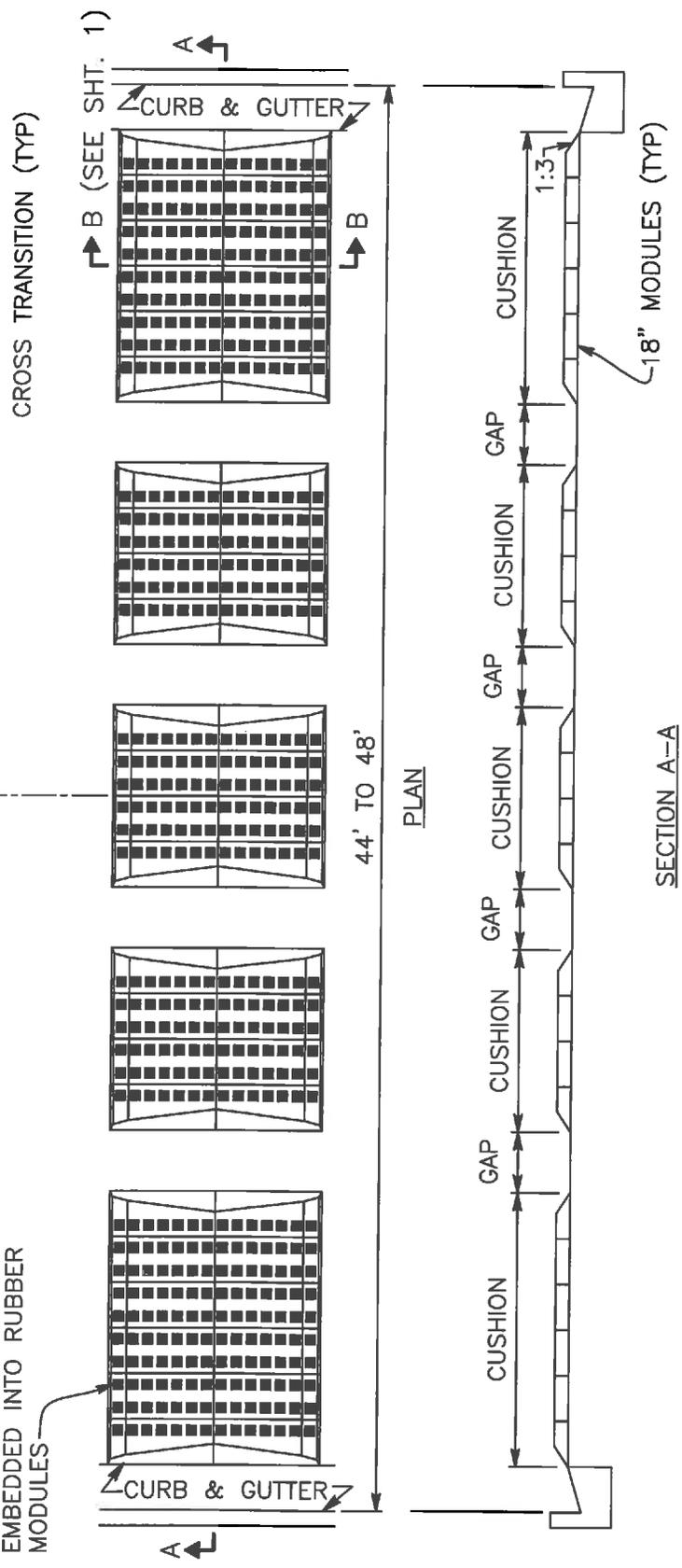
STREET WIDTH OF 38' TO 44'

NOTE: SEE NOTES ON SHEET 1.

 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		
DRAWN BY: SM CHECKED BY: MH APPD. BY: <i>[Signature]</i> CITY ENGINEER	DATE: 01/27/12 SCALE: VTS PROJECT: <i>[Signature]</i> DIV. PUBLIC WORKS	

**STANDARD  
SPEED LUMP**

DWG. NO. <b>SD-123</b>
FILED
SHT. <b>2</b> OF <b>5</b>



STREET WIDTH OF 44' TO 48'

NOTE: SEE NOTES ON SHEET 1.

 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		
DRAWN BY: SM CHECKED BY: MH APPD. BY: <i>[Signature]</i> CITY ENGINEER	DATE: 01/27/12 SCALE: MS APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS	
REV	DATE	BY

**STANDARD  
SPEED LUMP**

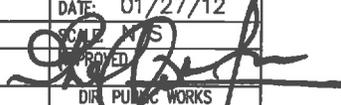
DWG. NO. <b>SD-123</b>
FILED
SHT. <b>3</b> OF <b>5</b>

**SPEED LUMP LAYOUT FOR VARIOUS STREET WIDTHS**

Layout 1	Curb & Gutter	Cushion	Gap	Curb & Gutter	Total Width								
30	1.5	9	1.5	6	1.5	9	1.5	6	1.5	9	1.5	1.5	30
31	1.5	9	2	6	2	9	2	6	2	9	2	1.5	31
32	2	9	2	6	2	9	2	6	2	9	2	2	32
33	1.5	10.5	1.5	6	1.5	10.5	1.5	6	1.5	10.5	1.5	1.5	33
34	1.5	10.5	2	6	2	10.5	2	6	2	10.5	2	1.5	34
35	2	10.5	2	6	2	10.5	2	6	2	10.5	2	2	35
36	1.5	12	1.5	6	1.5	12	1.5	6	1.5	12	1.5	1.5	36
37	1.5	12	2	6	2	12	2	6	2	12	2	1.5	37
Layout 2	Curb & Gutter	Cushion	Gap	Curb & Gutter	Total Width								
38	1.5	9	1.5	6	1.5	9	1.5	6	1.5	9	1.5	1.5	38
39	1.5	9	2	6	2	9	2	6	2	9	2	1.5	39
40	2	9	2	6	2	9	2	6	2	9	2	2	40
41	1.5	10.5	1.5	6	1.5	10.5	1.5	6	1.5	10.5	1.5	1.5	41
42	1.5	10.5	2	6	2	10.5	2	6	2	10.5	2	1.5	42
43	2	10.5	2	6	2	10.5	2	6	2	10.5	2	2	43
44	1.5	12	1.5	6	1.5	12	1.5	6	1.5	12	1.5	1.5	44
Layout 3	Curb & Gutter	Cushion	Gap	Curb & Gutter	Total Width								
45	1.5	9	1.5	6	1.5	9	1.5	6	1.5	9	1.5	1.5	45
46	2	9	1.5	6	1.5	9	1.5	6	1.5	9	1.5	2	46
47	2	9	1.75	6	1.75	9	1.75	6	1.75	9	1.75	2	47
48	1.5	10.5	1.5	6	1.5	10.5	1.5	6	1.5	10.5	1.5	1.5	48

**LAYOUT TABLE**

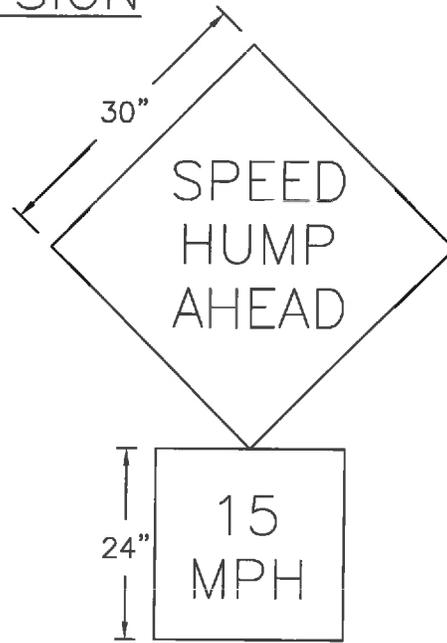
**NOTE:** DIMENSIONS SHOWN ARE BASED ON 18" MODULAR SECTIONS.

REV	DATE	BY	 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD</b> <b>SPEED LUMP</b>	DWG. NO. <b>SD-123</b>
					DRAWN BY: SM      DATE: 01/27/12 CHECKED BY: MH APPD. BY:  CITY ENGINEER      DIR. PUBLIC WORKS
					SHT. <b>4</b> OF <b>5</b>

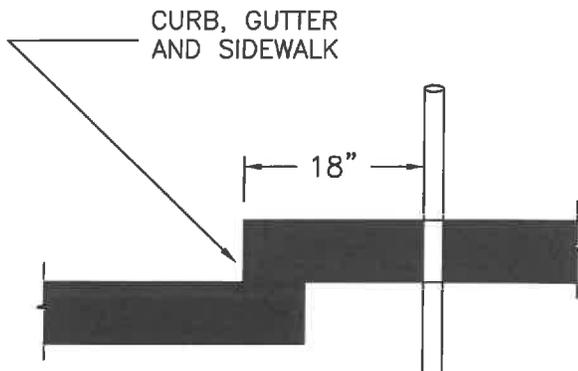
# SPEED LUMP SIGN



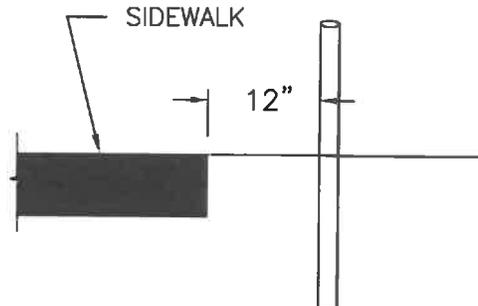
WARNING SIGN AT LUMP



WARNING SIGN IN ADVANCE OF LUMPS



SIGN INSTALLATION  
IN SIDEWALK AREAS

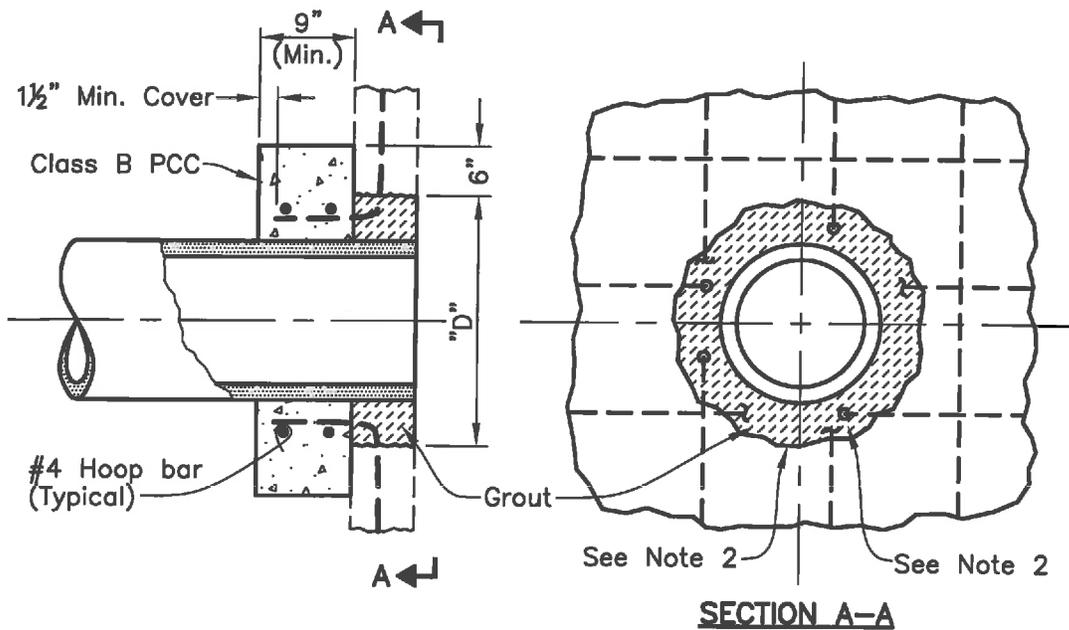


SIGN INSTALLATION  
BEHIND SIDEWALK

NOTES:

1. SIGNS SHALL BE BLACK ON YELLOW.
2. SIGNS SHALL BE INSTALLED TO MAINTAIN A MINIMUM VERTICAL CLEARANCE OF 7 FEET FOR THE SINGLE "HUMP" SIGN, AND 6 FEET FOR THE "HUMPS AHEAD" AND ADVISORY SPEED PLATE SIGNS.
3. SEE SD-117 FOR OTHER STANDARD SIGN INSTALLATION REQUIREMENTS.

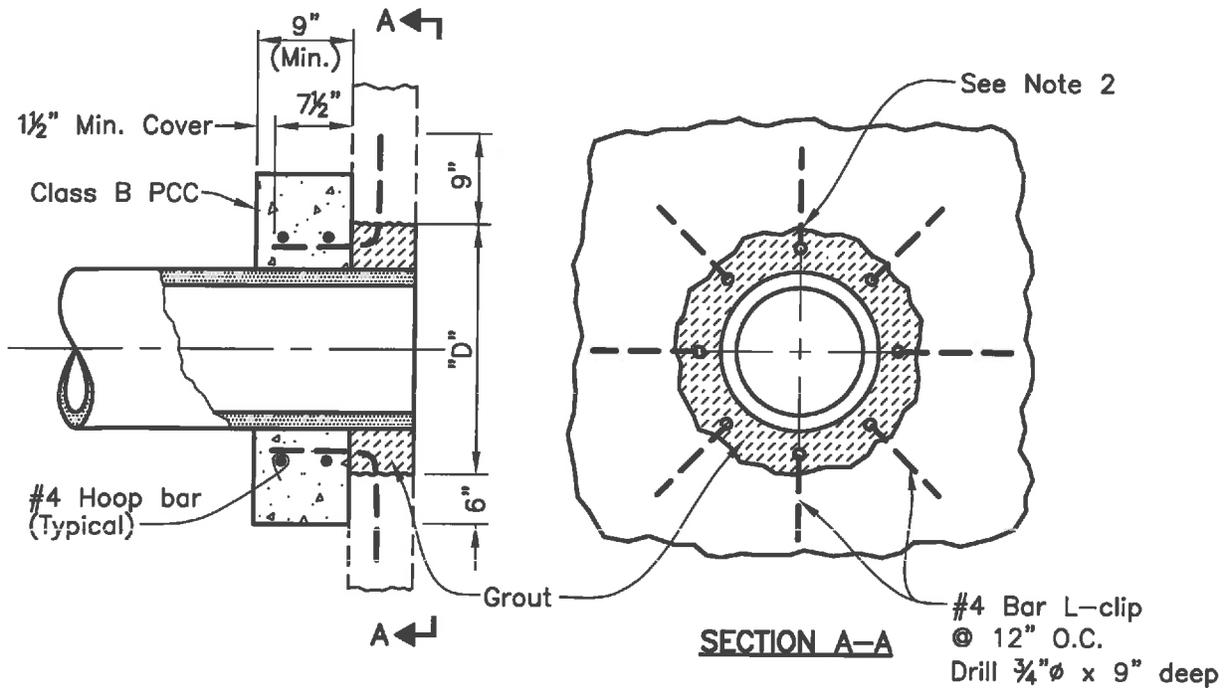
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD SPEED LUMP</b>	DWG. NO. <b>SD-123</b>
DRAWN BY:	SM	DATE:	06/26/06		
CHECKED BY:	MH	SCALE:	NTS		
APPD. BY:		APPROVED:			FILED
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	SHT. <b>5</b> OF <b>5</b>



**NOTES:**

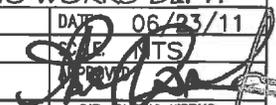
1. The minimum diameter "D" of the opening in the wall shall be defined by the formula  $D = \text{Pipe O.D.} + 6d + 3"$ , where  $d =$  the diameter of the existing wall reinforcing bars.
2. The areas of the planned opening shall be drilled and carefully broken out in order to determine the location of the existing horizontal and vertical reinforcements. The concrete shall be removed in such a manner so as to preclude shattering or spalling of the adjacent wall and damage to the exposed bars. A minimum of 4 bars shall be single cut, as shown in Section A-A, and bent out into the area of the collar, using a minimum bend radius of  $3d$  and a minimum cover of  $1\frac{1}{2}$  inch. The spacing between the upstanding legs of the bent bars shall be approximately equal.
3. All cracks in the opening shall be grouted, using a portland cement paste per Section 51-1.13 of the Caltrans Standard Specifications, and surface cleaned, prior to the placement of the pipe in the opening. The pipe shall be precut so as to be flush with the inside surface of the structure. After positioning the pipe to the required flow line elevation, the pipe shall be grouted in place using coarse pea gravel. The grout shall be cured for at least 3 days, keeping surfaces continually damp, prior to pouring the PCC collar around the pipe. The interior wall surface around the opening shall be finished, using mortar per Section 51-1.135 of the Caltrans Standard Specifications, as required.

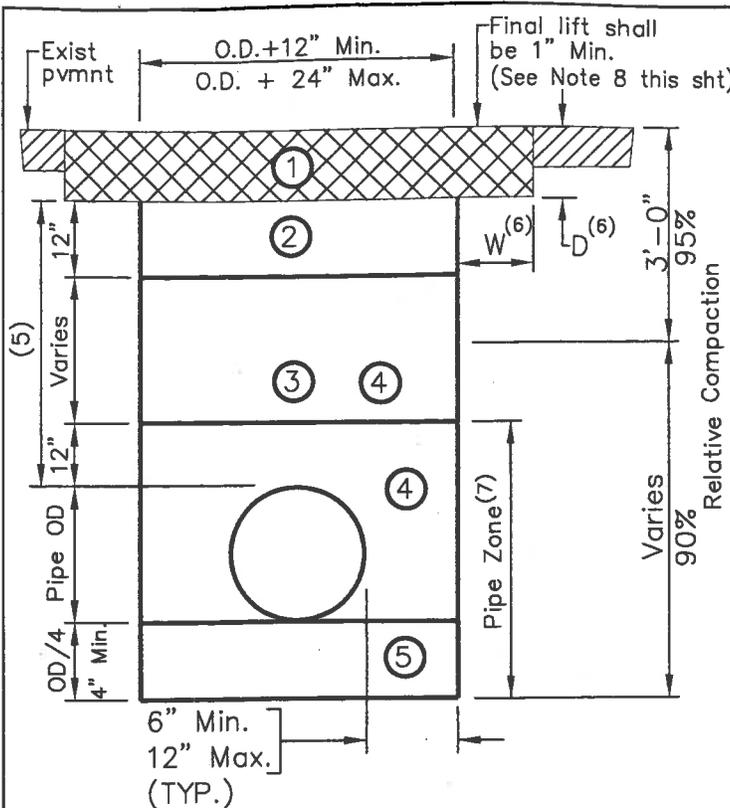
<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD PIPE CONNECTION TO REINFORCED WALL</b>		DWG. NO. <b>SD-124</b>
		DRAWN BY: JT	DATE: 06/23/11		
		CHECKED BY: JF	SCALE: JTS		
		APPD. BY	APPROVED		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	
					SHT. <b>1</b> OF <b>1</b>



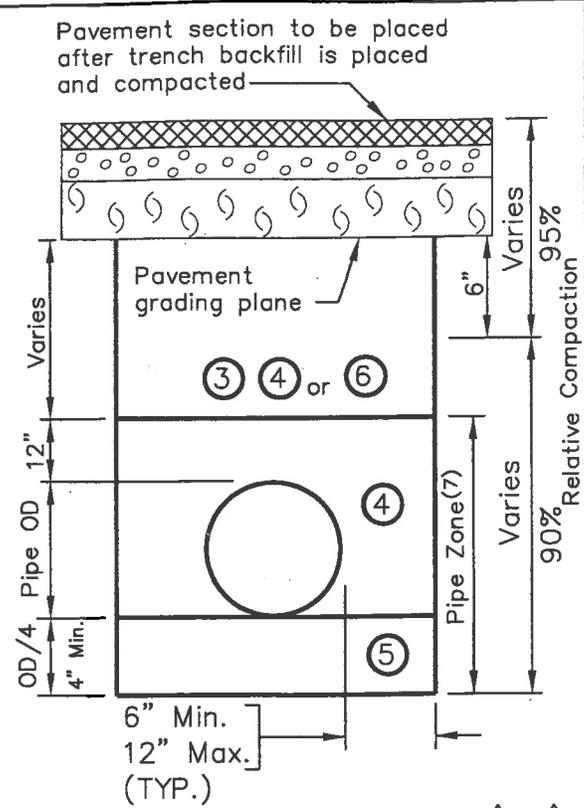
**NOTES:**

1. The diameter "D" of the opening in the wall shall be equal to pipe O.D. plus 6 inches.
2. The pipe opening shall be carefully cut and the concrete removed in such a manner so as to preclude shattering or spalling of the adjacent wall. No. 4 (#4) radial L-clips shall be installed at 12 inches O.C. in the center of the wall thickness shown in Section A-A. The clips shall be grouted in place per Section 51-1.13 of the Caltrans Standard Specifications, or epoxy cemented using material per Section 95-2.01 and installed per Section 95-1.04.
3. The pipe shall be precut so as to be flush with the inside surface of the structure. After positioning of the pipe to the required flow line elevation, the pipe shall be grouted in place using coarse pea gravel grout. The grout shall be cured for at least 3 days, keeping the surfaces continuously damp, prior to pouring the PCC collar around the pipe. The interior wall surface around the opening shall be finished, using mortar per Section 51-1.135 of the Caltrans Standard Specifications, as required.

 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD PIPE CONNECTION TO UNREINFORCED WALL</b>		DWG. NO. <b>SD-124A</b>
DRAWN BY: AL      DATE: 06/23/11					FILED
CHECKED BY: JF			APPD. BY: 		SHT. <b>1</b> OF <b>1</b>
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	



EXISTING STREETS AND  $\triangle 1$   $\triangle 2$   
EXISTING OFF STREET TRAFFIC AREAS



NEW STREETS AND  $\triangle 1$   $\triangle 2$   
NEW OFF STREET TRAFFIC AREAS

BEDDING CLASS AND BACKFILL MATERIALS

BEDDING CLASS	B-1 <sup>(1)</sup>		COMPACTION METHOD
LOAD FACTOR	1.9 <sup>(1)</sup>		
MATERIAL LOCATION	①	Asphalt Concrete (Type A, 1/2" Max., Medium Grading)	Mechanical
	②	Class 2 Aggregate Base	Mechanical
	③	Class 2 Aggregate Subbase <sup>(2)</sup>	Mechanical
	④	Quarry Fines <sup>(2)</sup> or Class 2 Agg. Sub. <sup>(2)</sup>	Mechanical
	⑤	Quarry Fines, Class 2 Agg. Sub. <sup>(2)</sup> or Drain Rock <sup>(3)</sup>	Mechanical
	⑥	Native Material <sup>(4)</sup> or Class 2 Aggregate Subbase	Mechanical

- (1) See Note 1 on sheet 3.
- (2) See Note 2 on sheet 3.
- (3) See Note 3 on sheet 3.
- (4) See Note 4 on sheet 3.
- (5) When this dimension is less than 2'-0", material location ④ govern.
- (6) See Table on sheet 2 for "D" and "W" dimension.  $\triangle 2$  The "D" and "W" dimensions shall be the same on both sides of the trench.
- (7) See Note 12 on sheet 3.  $\triangle 2$
- (8) See SD-126 for pavement mitigation for  $\triangle 3$  streets on moratorium.

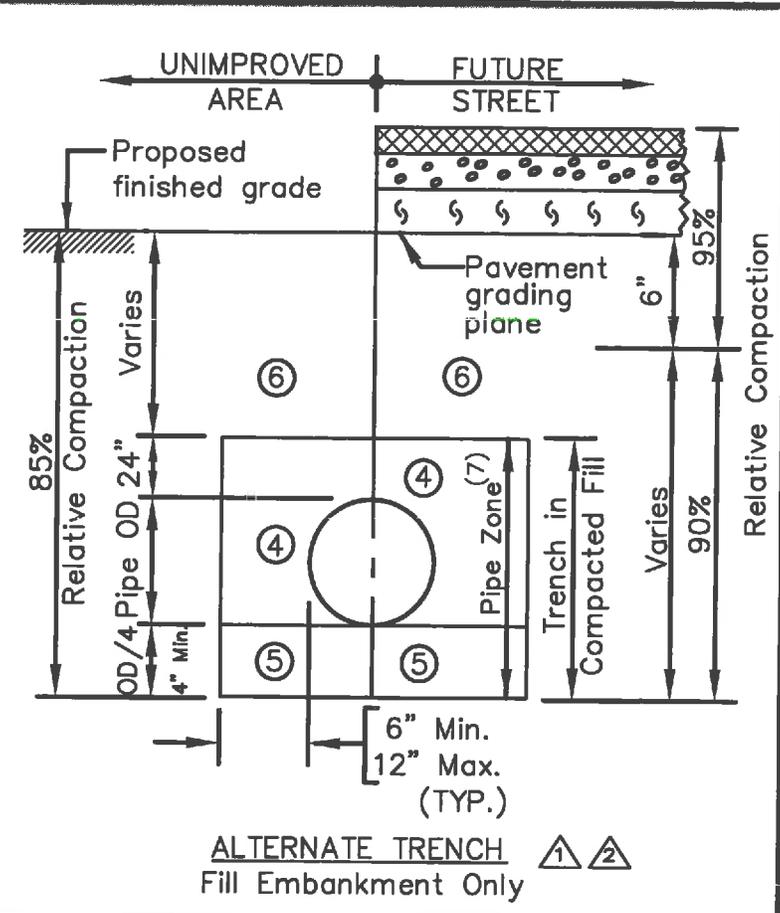
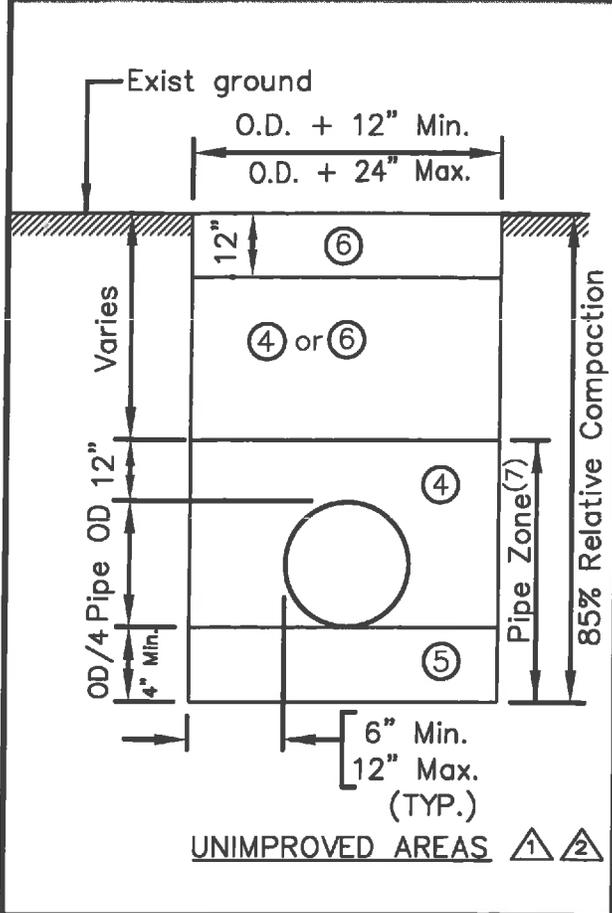
$\triangle 3$  9/30/13 AL  
 $\triangle 2$  2/8/11 TL  
 $\triangle 1$  3/18/10 AL  
 REV DATE BY

**HAYWARD**  
 PUBLIC WORKS DEPT.

DRAWN BY: HGM DATE: 04/25/08  
 CHECKED BY: JSF  
 APPR. BY: *[Signature]*  
 CITY ENGINEER DIR. PUBLIC WORKS

**STANDARD PERMIT AND SUBDIVISION TRENCH SECTIONS**

DWG. NO. **SD-125**  
 FILED  
 SHT. **1** OF **3**



AC PAVEMENT REPLACEMENT REQUIREMENTS

STREET TYPE	Transverse Trench		Longitudinal Trench	
	D	W	D	W
Primary Thoroughfares, Major Streets, Industrial Service Roads	12"	12"	12"	12"
Collector Streets and all Minor Street Bus Routes	12"	12"	8"	12"
Minor Streets	8"	12"	4"	12"
Off Street Traffic Areas	In Kind	0"	In Kind	0"

QUARRY FINES & DRAIN ROCK SPECIFICATIONS

Sieve Sizes	Percentage Passing Sieve	
	Quarry Fines	Drain Rock
1"	100	100
3/4"	95-100	95-100
NO. 4	40-90	0-25
NO. 30	15-40	0-5
NO.200	5-20	0
		DURABILITY 40

**CITY OF HAYWARD**  
PUBLIC WORKS DEPT.

2/8/11 TL  
3/18/10 AL

REV DATE BY

DRAWN BY: HGM DATE: 06/05/08  
CHECKED BY: JSF SCALE: N.T.S.  
APPD. BY: [Signature] PROJECT: [Signature]

CITY ENGINEER [Signature] DIR. PUBLIC WORKS [Signature]

**STANDARD PERMIT AND SUBDIVISION TRENCH SECTIONS**

DWG. NO. **SD-125**

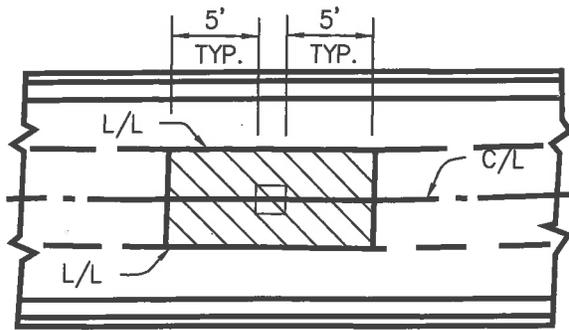
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SHT. **2** OF **3**

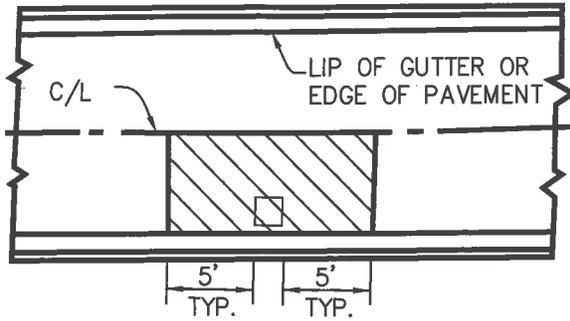
NOTES:

1. Minimum bedding class for all trenches within existing and new street rights-of-way and all existing or new off-street traffic areas (parking lots) shall be class B-1 (load factor 1.9). Load factors and bedding class shall be determined using the American Society of Civil Engineers Manual No. 37, "Design and Construction of Sanitary and Storm Sewer".
2. Sand bedding and sand backfill may only be used when required by the California Public Utilities Commission regulations (gas, electric, telephone and cable television). Wet conditions may require Class 2 Aggregate Base (for rigid conduit only).
3. Drain rock may be used only when wet trench conditions require pumping.
4. Native material used in new streets or new off street traffic areas shall be used only when specifically authorized by the City Engineer and approved by the Soils Engineer. Native material used as backfill material, where allowed, shall contain no rocks or clods greater than 4" in greatest dimension and shall be free of organic material and other deleterious material.
5. Alternate Trench will be allowed only in unimproved areas and in new subdivisions currently under construction.
6. Unimproved areas are those areas outside the street right-of-way which are not intended for future street right-of-way or for future paved areas intended for pedestrian and vehicular traffic. Unimproved areas include existing or proposed landscaped areas.
7. Trench shoring shall conform to Cal OSHA Excavation and Trench Safety Orders.
8. Water jetting of trench is not allowed.
9. Trench widths shall not be changed without the written approval of the City Engineer.
10. Type A Asphalt Concrete, Class 2 Aggregate Base and Class 2 Aggregate Subbase shall conform to the Standard Specifications.
- △ 11. Material in Location ②, ③ and ⑥ shall be placed and compacted in lifts not to exceed 1.0 feet in thickness.
- △ 12. For water main and fire hydrant construction, recycled material shall not be used in the pipe zone.

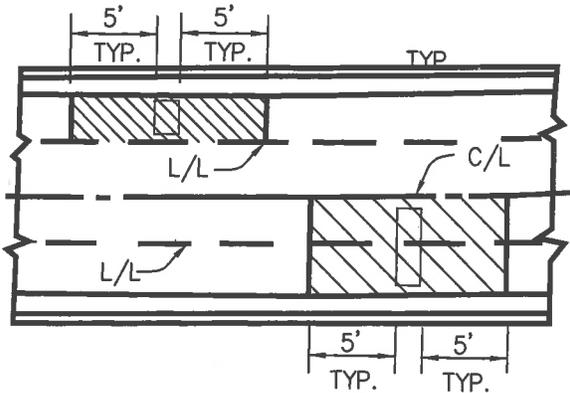
 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD PERMIT AND SUBDIVISION TRENCH SECTIONS</b>	DWG. NO. <b>SD-125</b>
2 2/8/11 TL	DRAWN BY: HGM CHECKED BY: JSF APPD. BY:	DATE: 08/04/08 SCALE: NTS APPROVED:		FILED
1 3/18/10 AL	CITY ENGINEER	DIR. PUBLIC WORKS		SHT. <b>3</b> OF <b>3</b>
REV    DATE    BY				



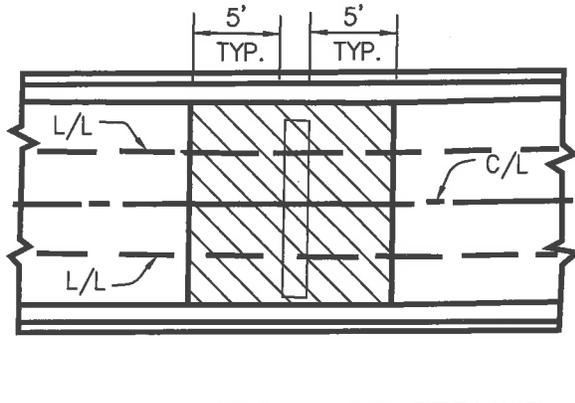
BORE PIT AT CENTERLINE



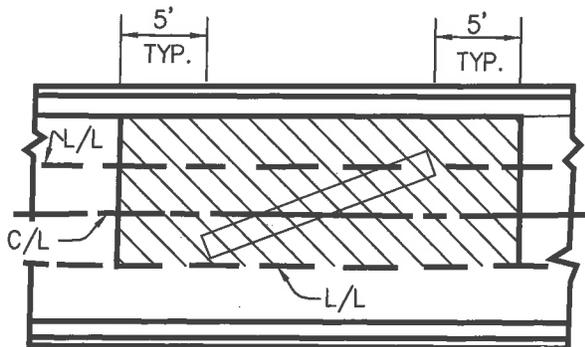
BORE PIT AT TRAVEL LANE



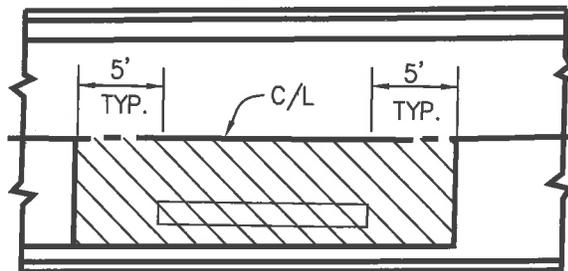
TRENCH BEFORE CENTERLINE



TRENCH ACROSS CENTERLINE



DIAGONAL TRENCH



TRENCH ALONG TRAVEL LANE

**LEGEND**

□ - - - - - BORE PIT

▭ - - - - - UTILITY TRENCH

▨ - - - - - SLURRY OR GRIND & 2" OVERLAY AS DIRECTED BY THE CITY INSPECTOR, DEPENDING ON SMOOTHNESS AND QUALITY OF THE PATCH JOB.

**ABBREVIATIONS**

C/L STREET CENTERLINE

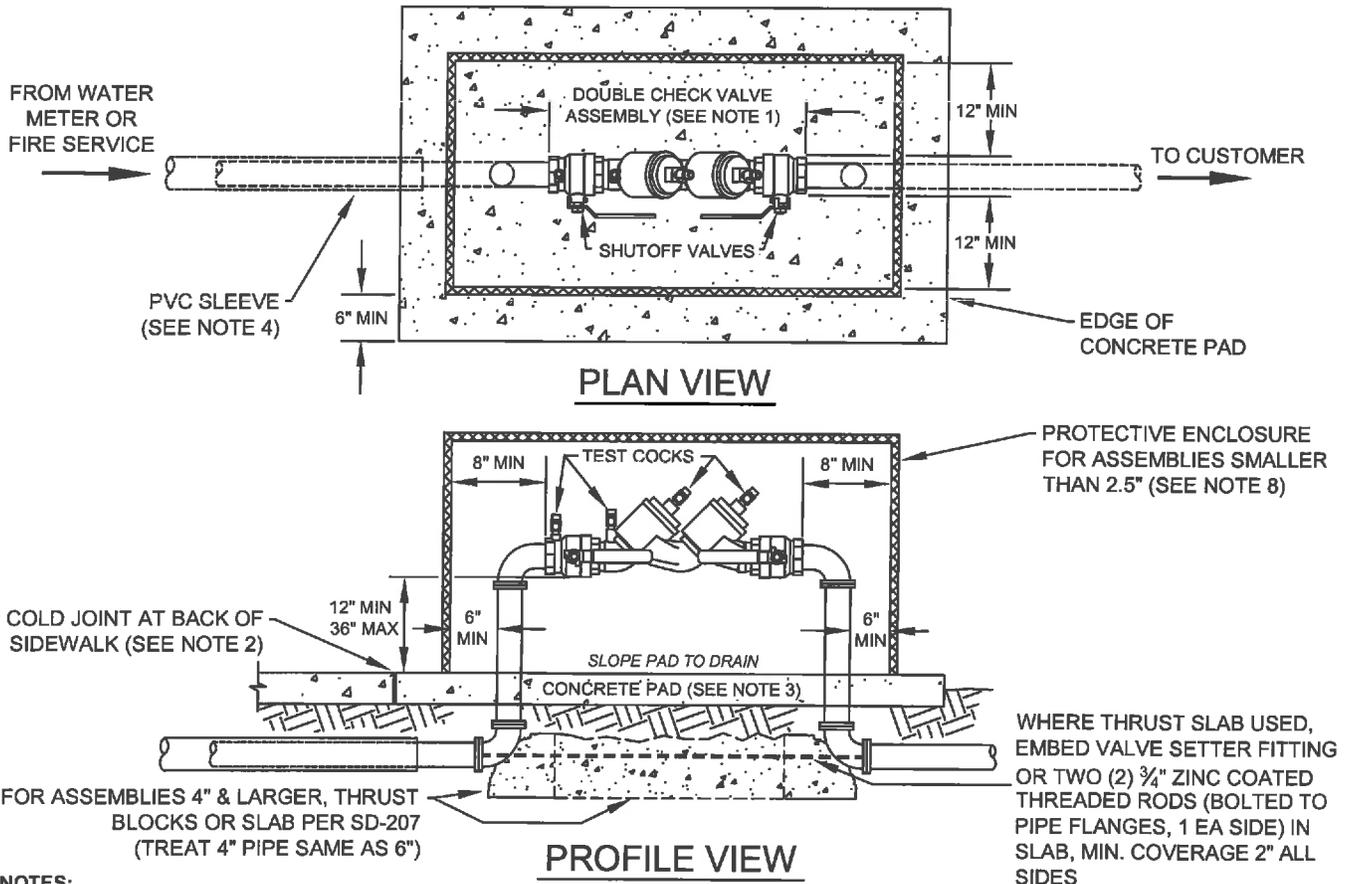
L/L LANE LINE OR EDGE OF PAVEMENT

- NOTES:**
1. SLURRY SEAL SHALL BE POLYMER/LATEX MODIFIED TYPE II FOR RESIDENTIAL STREETS; AND TYPE III FOR COLLECTOR AND ARTERIAL STREETS, MEETING CITY STANDARD SPECIFICATIONS.
  2. HMA SHALL BE 1/2-INCH TYPE A AND SHALL MEET CITY STANDARD SPECIFICATIONS. ADDITIONAL MITIGATION WORK MAY BE REQUIRED BY THE CITY ENGINEER IF NECESSARY TO MAINTAIN THE INTEGRITY OF THE PAVEMENT.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD PAVEMENT MITIGATION FOR STREETS ON MORATORIUM</b>		DWG. NO. <b>SD-126</b>	
			DRAWN BY: HGM CHECKED BY: JL APPD. BY: <i>[Signature]</i> CITY ENGINEER	DATE: 09/20/13 SCALE: NONE APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS	<b>STANDARD PAVEMENT MITIGATION FOR STREETS ON MORATORIUM</b>		FILED	
REV	DATE	BY						

**FOR FIRE SERVICES\* AND WATER SERVICES  
WHERE REQUIRED BY CCR, TITLE 17, § 7604**

\*SEE SD-204 FOR ADDITIONAL REQUIREMENTS ON FIRE SERVICES 3" AND LARGER

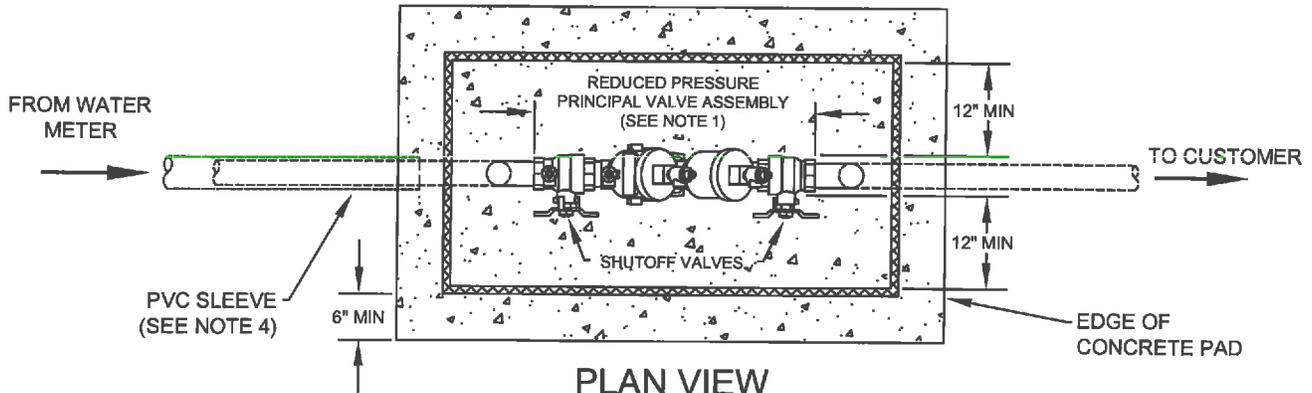


**NOTES:**

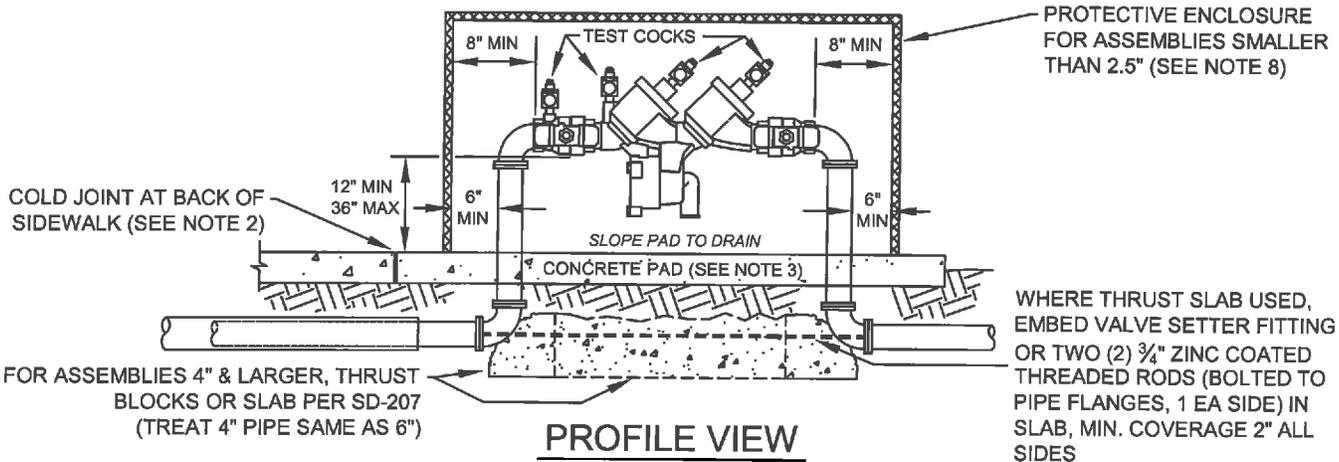
1. ALLOWED BACKFLOW ASSEMBLIES AND THEIR ORIENTATIONS SHALL BE LIMITED TO THOSE SPECIFIED ON THE "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES," BY THE UNIVERSITY OF SOUTHERN CALIFORNIA'S FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, 2010 OR LATEST REVISION.
2. THE BACKFLOW DEVICE SHALL BE LOCATED: (A) A MAXIMUM OF 5' FROM BACK OF SIDEWALK (TYP.); (B) WHERE SCREENING IS REQUIRED, A MAXIMUM OF 30' FROM BACK OF SIDEWALK; OR (C) AT A LOCATION DETERMINED BY THE WATER DISTRIBUTION CROSS CONNECTION PERSONNEL IN THE FIELD.
3. CONCRETE PAD SHALL BE CLASS B CONCRETE, 4" MINIMUM THICKNESS, REINFORCED WITH WELDED WIRE MESH.
4. WHERE SERVICE LINES SMALLER THAN 4" PASS UNDER A SIDEWALK, THEY SHALL BE INSTALLED IN A PVC CASING/SLEEVE AT LEAST 1" LARGER THAN THE SERVICE LINE AND EXTENDS AT LEAST 6" BEYOND THE EDGES OF THE SIDEWALK.
5. METAL PIPES EXPOSED TO SOIL OR CONCRETE SHALL BE COATED WITH 3M SCOTCHWRAP PIPE PRIMER AND WRAPPED WITH 3M SCOTCHWRAP NO. 51 BLACK PVC TAPE (3/4" OVERLAP).
6. THE PORTION OF THE TRENCH FROM BACK OF METER TO THE DEVICE SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION CROSS CONNECTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION.
7. THE TESTING SIDE OF THE DEVICE SHALL HAVE A MINIMUM 24" OF CLEARANCE FROM OBSTRUCTIONS (NON-TRIMABLE LANDSCAPING, BUILDINGS, UTILITIES, ETC.). MULTIPLE BACKFLOW DEVICES SHALL BE SEPARATED BY A MINIMUM OF 18".
8. BACKFLOW ASSEMBLIES SMALLER THAN 2.5" SHALL BE COVERED WITH AN INSULATION BLANKET, MIN R-13, GREEN, WEATHERGUARD OR EQUAL AND PROTECTED BY A LOCKABLE WIRE CAGE ENCLOSURE FASTENED TO THE PAD. THE ENCLOSURE SHALL BE HINGED, POWDER COATED GREEN AND SECURED WITH A DOUBLE-LOCKED GALVANIZED CHAIN SUCH THAT EITHER LOCK CAN RELEASE THE CHAIN. ONE LOCK WILL BE SUPPLIED BY CITY.
9. BACKFLOW ASSEMBLIES 2.5" AND LARGER SHALL BE SECURED BY A DOUBLE-LOCKED, GALVANIZED, STRAIGHT LINK CHAIN THAT LOCKS THE VALVE HANDWHEELS IN THE OPEN POSITION AND EITHER LOCK CAN RELEASE THE CHAIN. ONE LOCK WILL BE SUPPLIED BY CITY. IN AREAS PRONE TO VANDALISM, CITY MAY ADDITIONALLY REQUIRE A LOCKABLE PROTECTIVE ENCLOSURE (SEE NOTE 8).
10. BOLLARDS MAY BE REQUIRED BY CITY TO PROVIDE ADDITIONAL PROTECTION (SEE SD-223 FOR BOLLARD DETAIL).
11. BACKFLOW ASSEMBLIES INSTALLED ON POTABLE WATER SERVICES SHALL BE LEAD FREE.
12. BACKFLOW ASSEMBLIES SHALL BE AT LEAST THE SIZE OF THE WATER METER OR THE WATER SUPPLY LINE ON THE PROPERTY SIZE OF THE METER, WHICHEVER IS LARGER.

<b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>			<b>STANDARD DOUBLE CHECK VALVE ASSEMBLIES</b>	DWC. NO.	SD-201
				FILED	
REV	DATE	BY	DRW BY: RS      DATE: 11/30/12 CHKD BY: AA      SCALE: NTS APPD BY:          APPROVED:	SHT.	1 OF 1
			CITY ENGINEER	DIR. PUBLIC WORKS	

**FOR IRRIGATION AND WATER SERVICES  
WHERE REQUIRED BY CCR, TITLE 17, § 7604**



**PLAN VIEW**

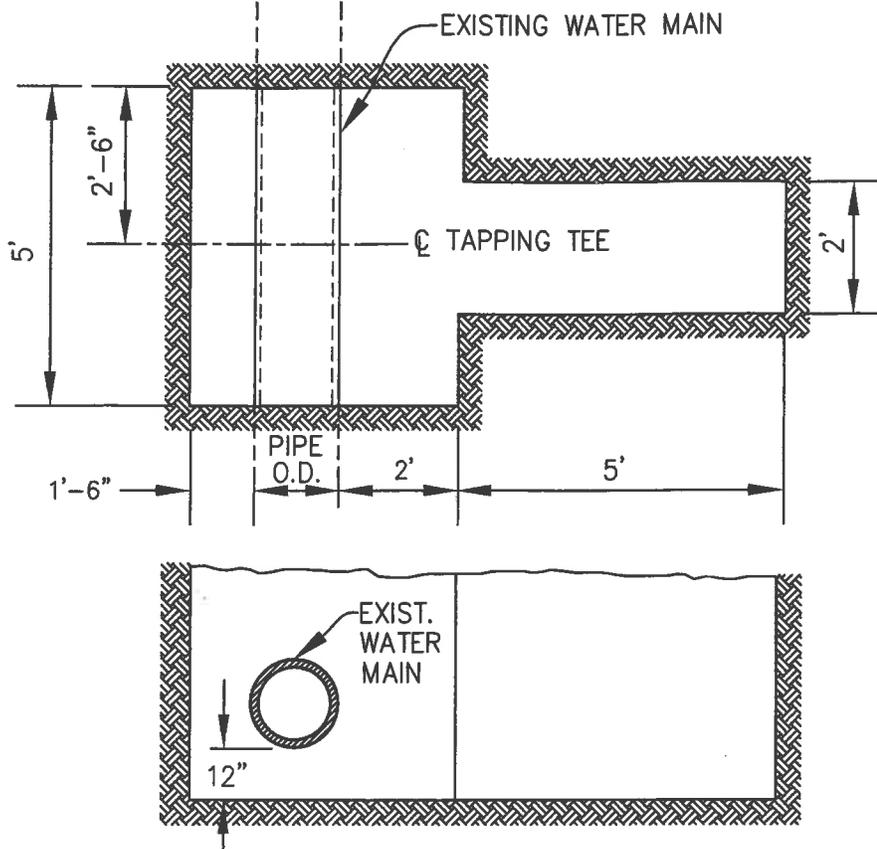


**PROFILE VIEW**

**NOTES:**

1. ALLOWED BACKFLOW ASSEMBLIES AND THEIR ORIENTATIONS SHALL BE LIMITED TO THOSE SPECIFIED ON THE "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES," BY THE UNIVERSITY OF SOUTHERN CALIFORNIA'S FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, 2010 OR LATEST REVISION.
2. THE BACKFLOW DEVICE SHALL BE LOCATED: (A) A MAXIMUM OF 5' FROM BACK OF SIDEWALK (TYP.); (B) WHERE SCREENING IS REQUIRED, A MAXIMUM OF 30" FROM BACK OF SIDEWALK; OR (C) AT A LOCATION DETERMINED BY THE WATER DISTRIBUTION CROSS CONNECTION PERSONNEL IN THE FIELD.
3. CONCRETE PAD SHALL BE CLASS B CONCRETE, 4" MINIMUM THICKNESS, REINFORCED WITH WELDED WIRE MESH.
4. WHERE SERVICE LINES SMALLER THAN 4" PASS UNDER A SIDEWALK, THEY SHALL BE INSTALLED IN A PVC CASING/SLEEVE AT LEAST 1" LARGER THAN THE SERVICE LINE AND EXTENDS AT LEAST 6" BEYOND THE EDGES OF THE SIDEWALK.
5. METAL PIPES EXPOSED TO SOIL OR CONCRETE SHALL BE COATED WITH 3M SCOTCHWRAP PIPE PRIMER AND WRAPPED WITH 3M SCOTCHWRAP NO. 51 BLACK PVC TAPE (¾" OVERLAP).
6. THE PORTION OF THE TRENCH FROM BACK OF METER TO THE DEVICE SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION CROSS CONNECTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION.
7. THE TESTING SIDE OF THE DEVICE SHALL HAVE A MINIMUM 24" OF CLEARANCE FROM OBSTRUCTIONS (NON-TRIMMABLE LANDSCAPING, BUILDINGS, UTILITIES, ETC.). MULTIPLE BACKFLOW DEVICES SHALL BE SEPARATED BY A MINIMUM OF 18".
8. BACKFLOW ASSEMBLIES SMALLER THAN 2.5" SHALL BE COVERED WITH AN INSULATION BLANKET, MIN R-13, GREEN, WEATHERGUARD OR EQUAL AND PROTECTED BY A LOCKABLE WIRE CAGE ENCLOSURE FASTENED TO THE PAD. THE ENCLOSURE SHALL BE HINGED, POWDER COATED GREEN AND SECURED WITH A DOUBLE-LOCKED GALVANIZED CHAIN SUCH THAT EITHER LOCK CAN RELEASE THE CHAIN. ONE LOCK WILL BE SUPPLIED BY CITY.
9. BACKFLOW ASSEMBLIES 2.5" AND LARGER SHALL BE SECURED BY A DOUBLE-LOCKED, GALVANIZED, STRAIGHT LINK CHAIN THAT LOCKS THE VALVE HANDWHEELS IN THE OPEN POSITION AND EITHER LOCK CAN RELEASE THE CHAIN. ONE LOCK WILL BE SUPPLIED BY CITY. IN AREAS PRONE TO VANDALISM, CITY MAY ADDITIONALLY REQUIRE A LOCKABLE PROTECTIVE ENCLOSURE (SEE NOTE 8).
10. BOLLARDS MAY BE REQUIRED BY CITY TO PROVIDE ADDITIONAL PROTECTION (SEE SD-223 FOR BOLLARD DETAIL).
11. BACKFLOW ASSEMBLIES INSTALLED ON POTABLE WATER SERVICES SHALL BE LEAD FREE.
12. BACKFLOW ASSEMBLIES SHALL BE AT LEAST THE SIZE OF THE WATER METER OR THE WATER SUPPLY LINE ON THE PROPERTY SIZE OF THE METER, WHICHEVER IS LARGER.

<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD - REDUCED PRESSURE PRINCIPAL BACKFLOW PREVEN- TION ASSEMBLIES</b>	DWG. NO. <b>SD-202</b>
				FILED
REV	DATE	BY	DRW BY: RS      DATE: 11/30/12 CHKD BY: AA      SCALE: NTS APPD. BY:      APPROVED: CITY ENGINEER      DIR. PUBLIC WORKS	SHT. <b>1</b> OF <b>1</b>



MINIMUM EXCAVATION DIMENSIONS

CASE "A"

FOR WORK BEING DONE UNDER CITY OF HAYWARD CONTRACT

1. City will furnish and install tapping tee and tapping valve and make the Wet tap, at no expense to the Contractor.
2. City will furnish the valve box and cover, at no expense to the Contractor.

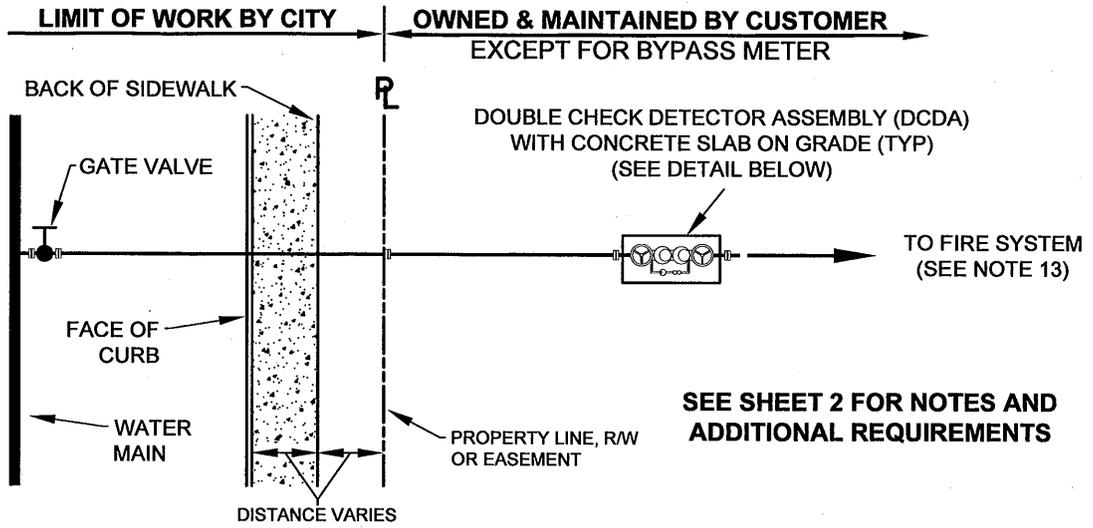
CASE "B"

FOR WORK BEING DONE UNDER CITY OF HAYWARD PERMIT AND /OR SUBDIVISION

1. City will furnish and install tapping tee and tapping valve and make the Wet tap, at Permittee's expense.
2. City will furnish the valve box and cover, at Permittee's expense.

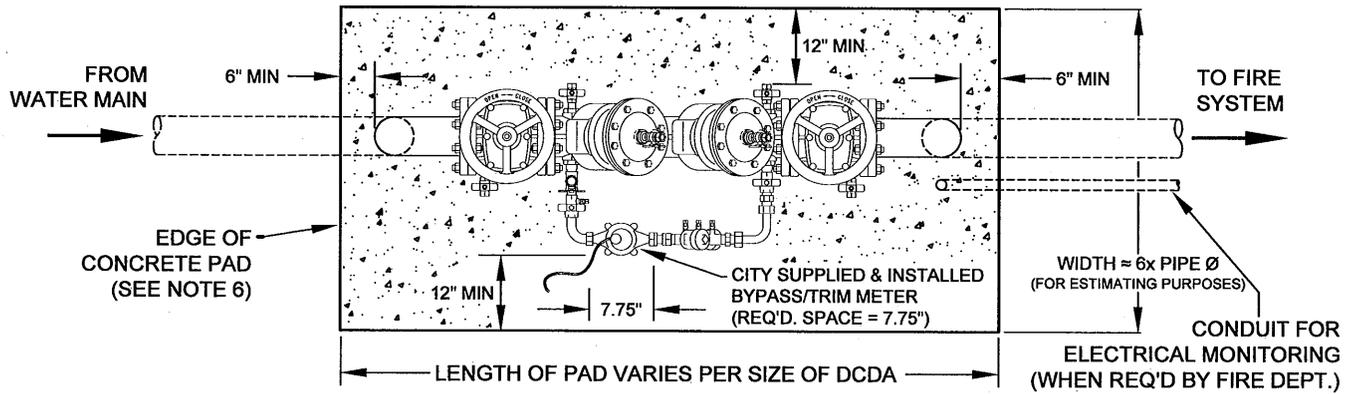
3. Contractor/Permittee shall make the necessary excavation conforming to the above dimensions.
4. Contractor/Permittee shall install thrust blocks, backfill, compact and install valve box per SD-205.
5. Excavation for pipes over 24 inches shall be as shown on the plan or as designated by the Engineer.
6. Centerline of tapping tee shall be a minimum of 3 feet from any existing joint or fitting.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	<b>STANDARD TAPPING TEE AND VALVE INSTALLATION</b>	DWG. NO. <b>SD-203</b>
			DRAWN BY: HGM      DATE 11/30/12 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS		FILED
REV	DATE	BY			SHT. <b>1</b> OF <b>1</b>



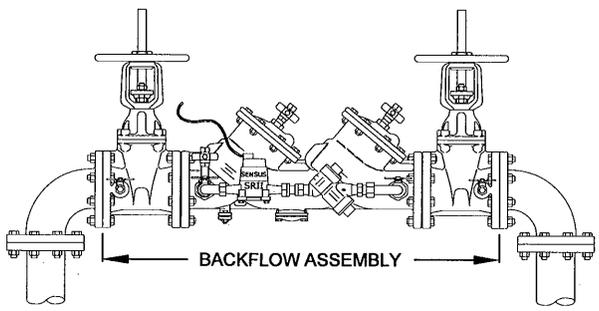
CITY RESPONSIBILITY ENDS AT THE PROPERTY LINE (℞), RIGHT-OF-WAY (R/W) OR EASEMENT, AS APPLICABLE TO THE LOCATION OF THE FIRE SERVICE, WITH THE EXCEPTION OF ANNUAL TESTING. CUSTOMER OWNS AND SHALL MAINTAIN ALL THE COMPONENTS OF THE FIRE SYSTEM WITHIN THE PROPERTY LINES (INCLUDING BUT NOT LIMITED TO, DCDA, PIV, FDC, CAGE, BOLLARDS, CHAINS, LOCKS, ETC.), WITH THE EXCEPTION OF THE CITY'S BYPASS METER.

### FIRE SERVICE SCHEMATIC

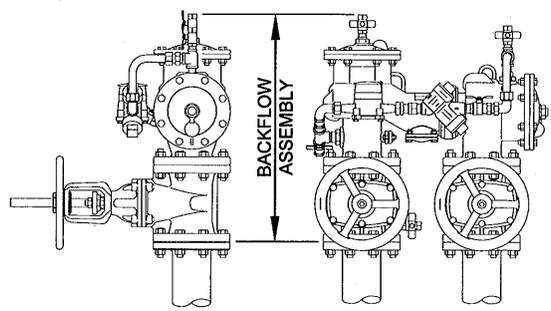


SEE SD-201 FOR ADDITIONAL REQUIREMENTS

### DCDA DETAIL, PLAN VIEW



**TYPICAL DCDA  
PROFILE VIEW**



**CONFIGURABLE DCDA  
PROFILE VIEWS**

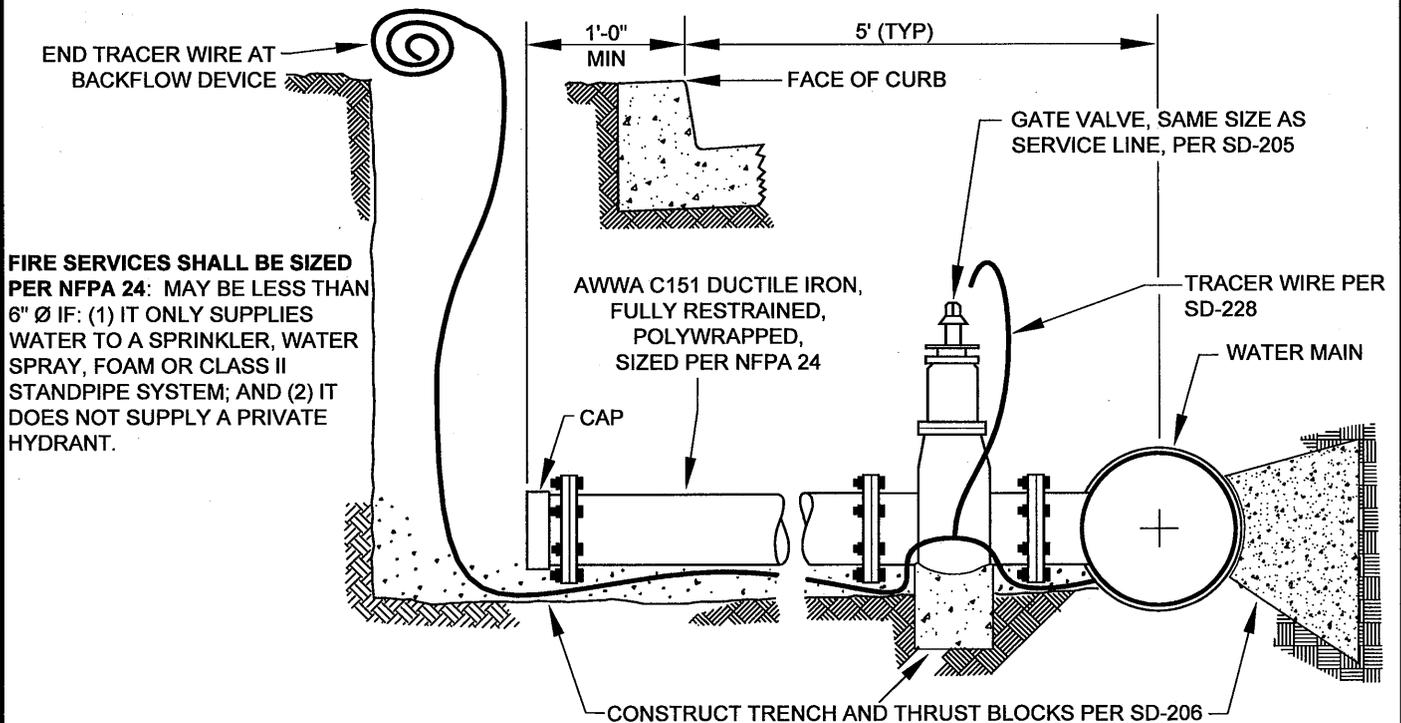
<b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>			
DRW BY:	RS	DATE:	8/10/2011
CHKD BY:		SCALE:	NTS
APPROV BY:		APPROV:	
REV	DATE	BY	CITY ENGINEER / DIR. PUBLIC WORKS

STANDARD  
FIRE SERVICE  
3" AND LARGER

DWG. NO.	<b>SD-204</b>
FILED	
SHT.	<b>1</b> OF <b>2</b>

**NOTES:**

1. BACKFLOW ASSEMBLIES SHALL BE FACTORY ASSEMBLED, WITH THE EXCEPTION OF THE BYPASS METER. ALLOWED DCDA's AND THEIR ORIENTATIONS SHALL BE LIMITED TO THOSE SPECIFIED ON THE "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES," BY THE UNIVERSITY OF SOUTHERN CALIFORNIA'S FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, 2010 OR LATEST REVISION.
2. FIRE SERVICES MAY BE INSTALLED BY A CONTRACTOR AS PART OF A WATER MAIN THAT THE CONTRACTOR IS CONSTRUCTING AFTER CITY HAS APPROVED PLANS DETAILING THE PROPOSED WATER MAIN AND FIRE SERVICES.
3. ALL PLANS DETAILING FIRE SERVICES SHALL BE APPROVED BY CITY PRIOR TO INSTALLATION.
4. ALL FIRE SERVICES TO BE CONNECTED TO EXISTING LIVE WATER MAINS AND ALL BYPASS/TRIM METERS SHALL BE INSTALLED BY WATER DIVISION PERSONNEL ONLY.
5. THE BACKFLOW DEVICE SHALL BE LOCATED: (A) A MAXIMUM OF 5' FROM BACK OF SIDEWALK (TYP); (B) WHERE SCREENING IS REQUIRED, A MAXIMUM OF 30" FROM BACK OF SIDEWALK; OR (C) AT A LOCATION DETERMINED BY THE WATER DISTRIBUTION CROSS CONNECTION PERSONNEL IN THE FIELD.
6. CONCRETE PAD SHALL BE CLASS B CONCRETE, 4" MINIMUM THICKNESS, REINFORCED WITH WELDED WIRE MESH.
7. THE PORTION OF THE TRENCH FROM BACK OF SIDEWALK TO THE DEVICE SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION CROSS CONNECTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION.
8. THE TESTING SIDE OF THE DEVICE SHALL HAVE A MINIMUM 24" OF CLEARANCE FROM OBSTRUCTIONS (NON-TRIMMABLE LANDSCAPING, BUILDINGS, UTILITIES, ETC.). MULTIPLE BACKFLOW DEVICES SHALL BE SEPARATED BY A MINIMUM OF 18".
9. DCDA's SHALL BE SECURED BY A DOUBLE-LOCKED, GALVANIZED, STRAIGHT LINK CHAIN THAT LOCKS THE VALVE HAND-WHEELS OPEN, SUCH THAT EITHER LOCK CAN RELEASE THE CHAIN. ONE LOCK WILL BE SUPPLIED BY CITY. IN AREAS PRONE TO VANDALISM, A LOCKABLE PROTECTIVE ENCLOSURE MAY ALSO BE REQUIRED BY CITY (SEE SD-201).
10. THE BYPASS ASSEMBLY, INCLUDING THE METER, SHALL BE COVERED WITH AN INSULATION BLANKET, MIN R-13.
11. BOLLARDS MAY BE REQUIRED BY CITY FOR ADDITIONAL PROTECTION (SEE SD-223 FOR BOLLARD DETAIL).
12. TOUCHREAD SENSOR OF BYPASS METER SHALL BE MOUNTED TO AND THROUGH THE SIDE OF THE PROTECTIVE ENCLOSURE OR, IF NO ENCLOSURE, ATTACHED TO THE DCDA, AS DETERMINED BY THE WATER DISTRIBUTION PERSONNEL IN THE FIELD. TOUCHREAD SENSOR WIRE SHALL BE NEATLY SECURED TO THE DCDA.
13. POST INDICATOR VALVE (PIV) AND FIRE DEPARTMENT CONNECTION (FDC) SHALL BE CONNECTED TO THE FIRE SYSTEM DOWNSTREAM OF THE DCDA, PER THE FIRE DEPARTMENT'S REQUIREMENTS.
14. BELOW GRADE OR INTERIOR INSTALLATIONS OF BACKFLOW DEVICES WILL ONLY BE CONSIDERED ON A CASE-BY-CASE BASIS AND WHEN SPACE LIMITATIONS PREVENT USE OF AN ABOVE GRADE DEVICE. SUCH INSTALLATIONS MAY REQUIRE THE ADDITION OF A BURIED DETECTOR CHECK VALVE ASSEMBLY INSTALLED BY CITY WATER DISTRIBUTION PERSONNEL.

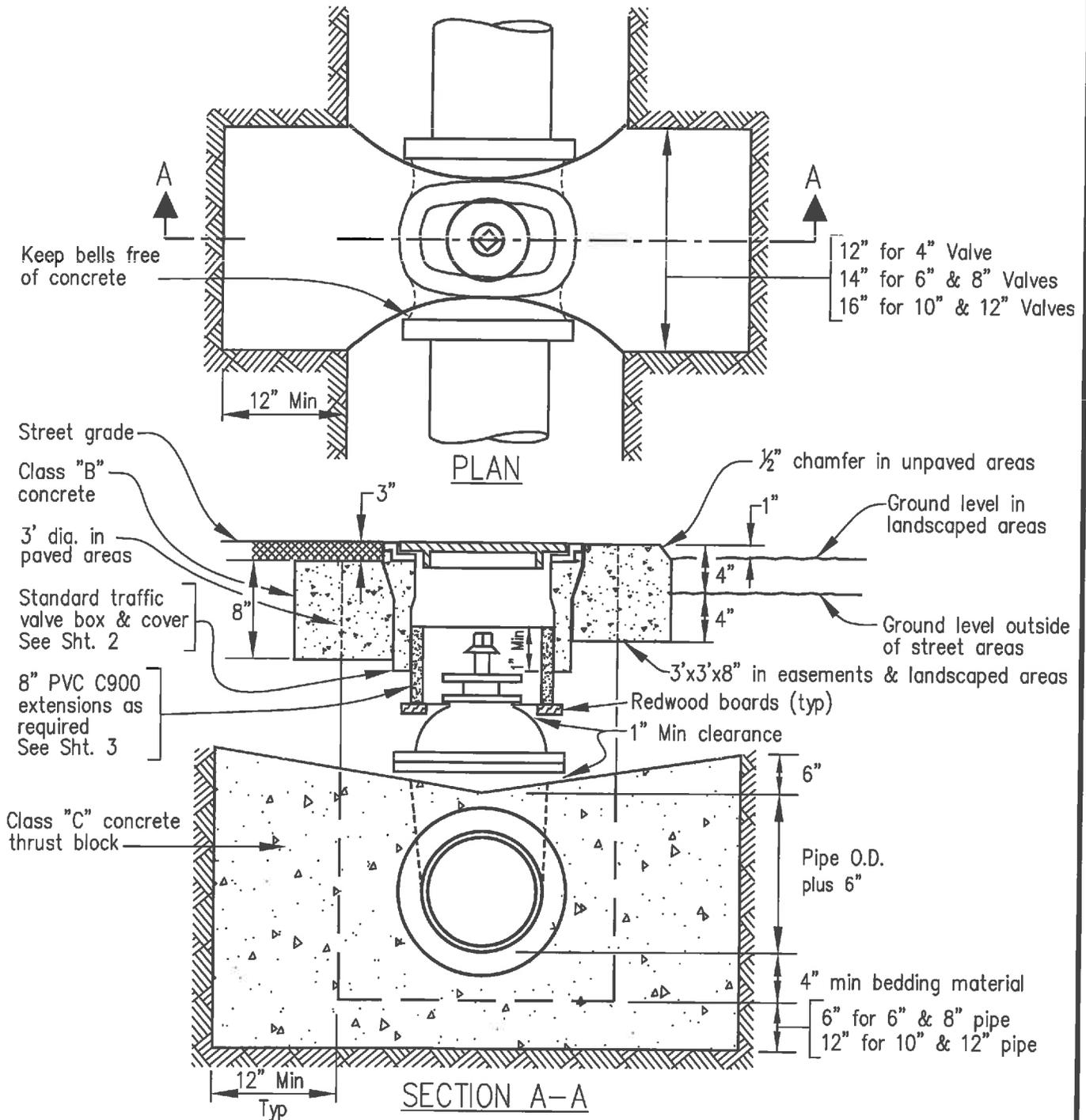


**FIRE SERVICE CONSTRUCTION DETAIL**

			<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>		<p><b>STANDARD</b></p> <p><b>FIRE SERVICE</b></p> <p><b>3" AND LARGER</b></p>		<p>DWG. NO.</p> <p style="font-size: 24pt;"><b>SD-204</b></p>		
			<p>DRW BY: <b>RS</b></p> <p>CHKD BY: <b>AA</b></p> <p>APPROVED: <i>[Signature]</i></p> <p>CITY ENGINEER</p>	<p>DATE: <b>8/10/2011</b></p> <p>SCALE: <b>NTS</b></p> <p>APPROVED: <i>[Signature]</i></p> <p>DIR. PUBLIC WORKS</p>			<p>FILED</p>		
REV	DATE	BY						<p>SHT. <b>2</b> OF <b>2</b></p>	

**NOTES:**

1. Valve box shall be poured on fill compacted by mechanical tamper to 95% relative compaction.
2. Thrust blocks shall be formed with lumber. Forms shall be removed before backfill.
3. Thrust blocks shall be poured against undisturbed soil.
4. Valve box slab shall be formed square 3' x 3' x 8" in easements and landscaped areas.
5. Valve box slab shall be a minimum 3' dia. concentric circle in paved areas.
6. See SD-228 for installation of tracer wire. Tracer wire to be brought to the top of the extension outside of the 8" valve box extension pipe.



			<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>		<p><b>STANDARD VALVE INSTALLATION</b></p>		DWG. NO. <b>SD-205</b>	
			DRAWN BY: FM CHECKED BY: JF APPD. BY:	DATE 11/30/12 SCALE: NTS APPROVED:			FILED	
REV	DATE	BY	CITY ENGINEER		DIR. PUBLIC WORKS		SHT. <b>1</b> OF <b>4</b>	

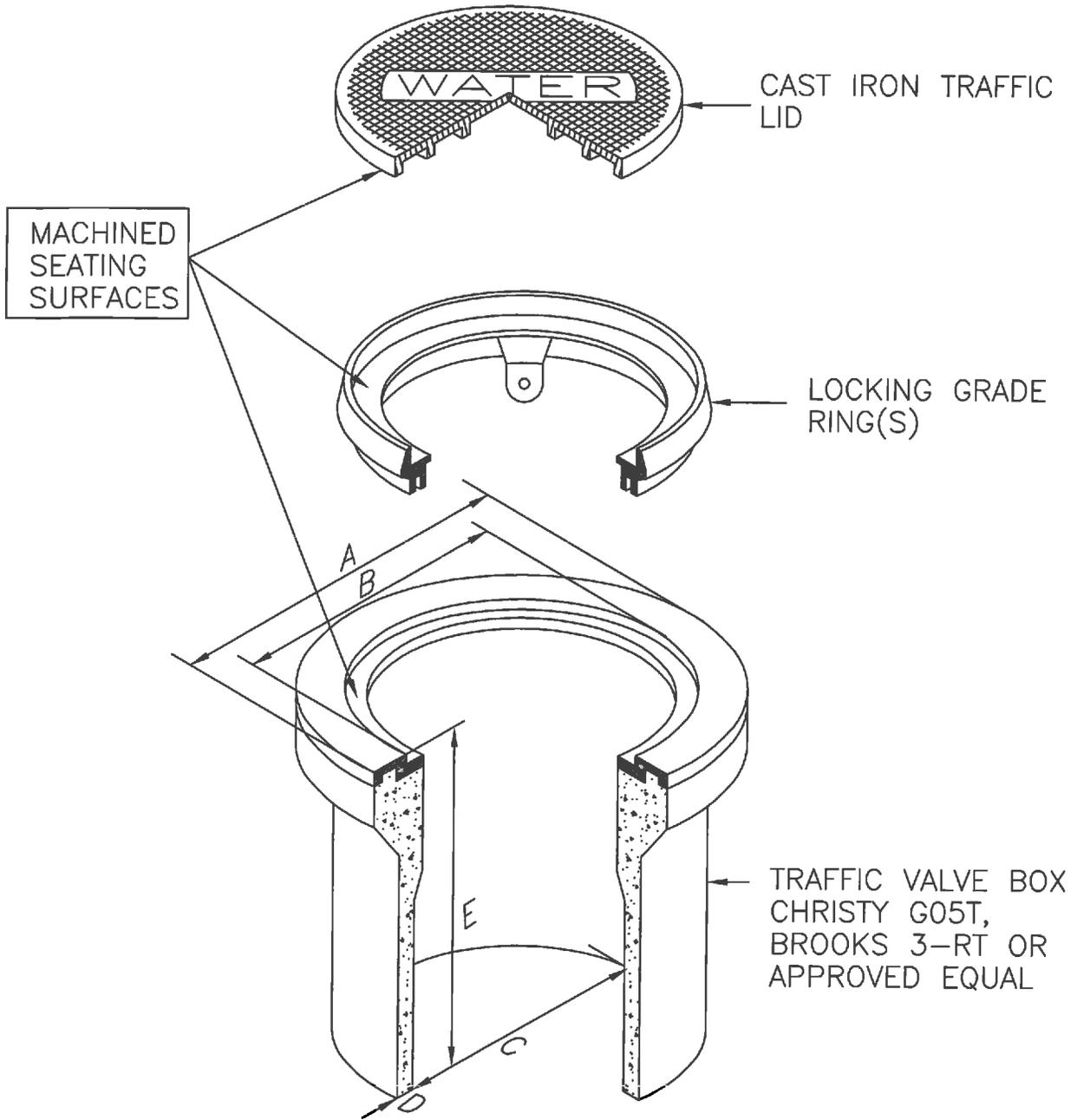
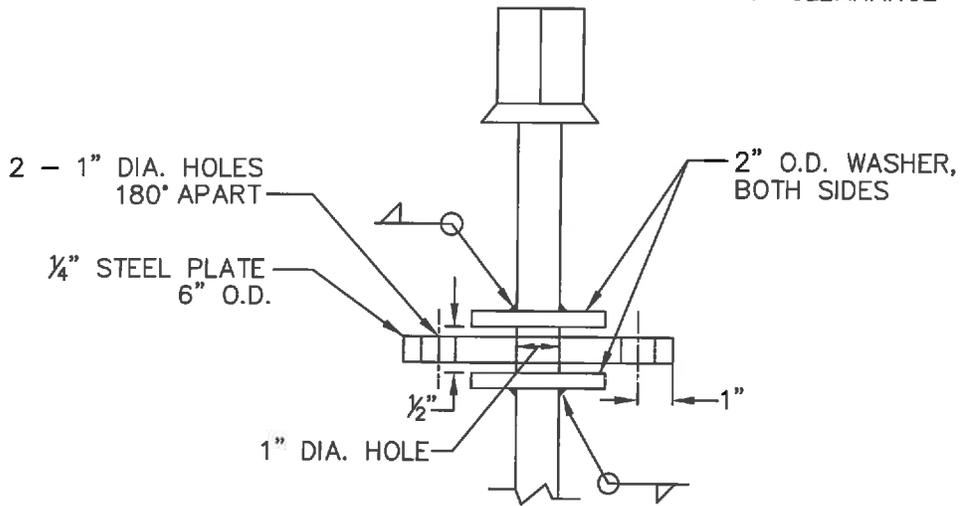
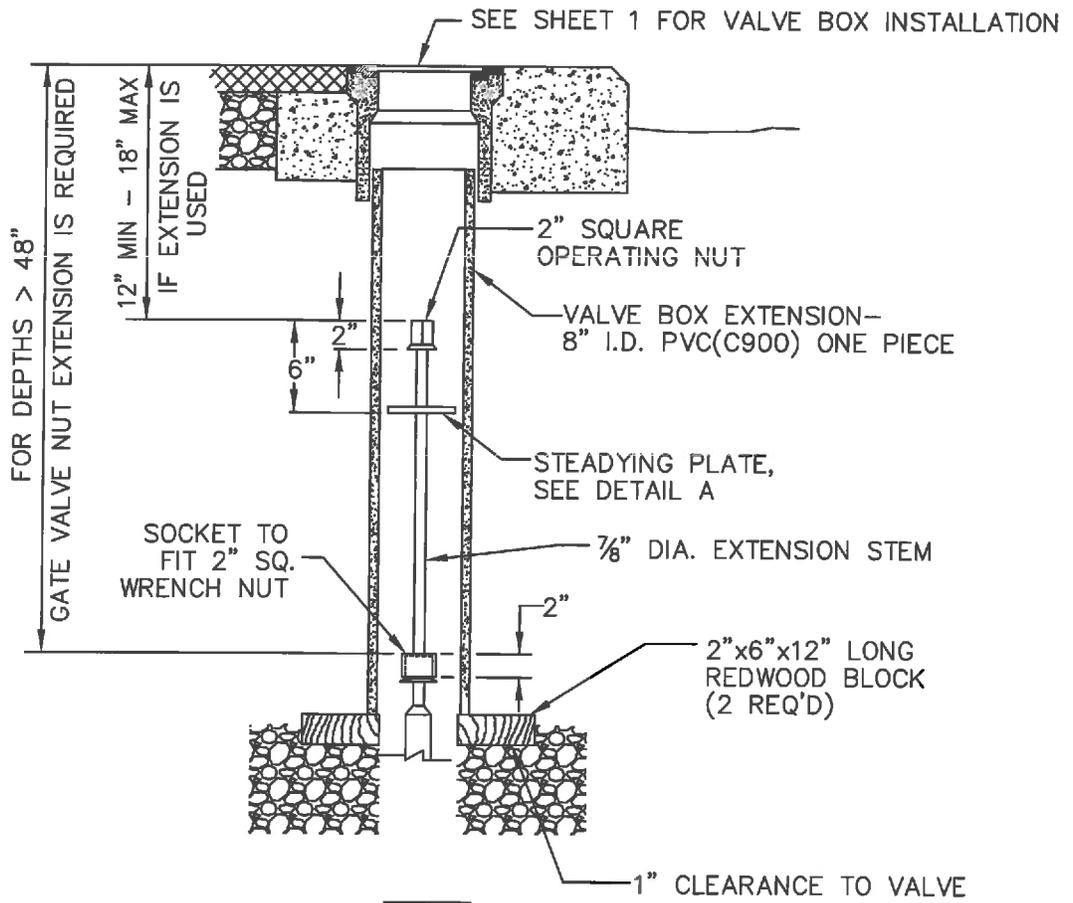


TABLE OF APPROXIMATE DIMENSIONS

TYPE	A	B	C	D	E	APPROX. WT.
CHRISTY G05T	13 $\frac{13}{16}$ "	11 $\frac{3}{16}$ "	10 $\frac{3}{8}$ "	1 $\frac{1}{8}$ "	12"	72 lbs
BROOKS 3-RT	12 $\frac{1}{2}$ "	-	10"	2"	12"	66 lbs

STANDARD VALVE BOX

<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD VALVE INSTALLATION</b></p>	DWG. NO. <b>SD-205</b>
				FILED
REV	DATE	BY	<p>DRAWN BY: JT      DATE: 12/19/12</p> <p>CHECKED BY: JF      SCALE: NTS</p> <p>APPD. BY: <i>[Signature]</i>      APPROVED: <i>[Signature]</i></p> <p>CITY ENGINEER      DIR. PUBLIC WORKS-U &amp; ES</p>	SHT. <b>2</b> OF <b>4</b>



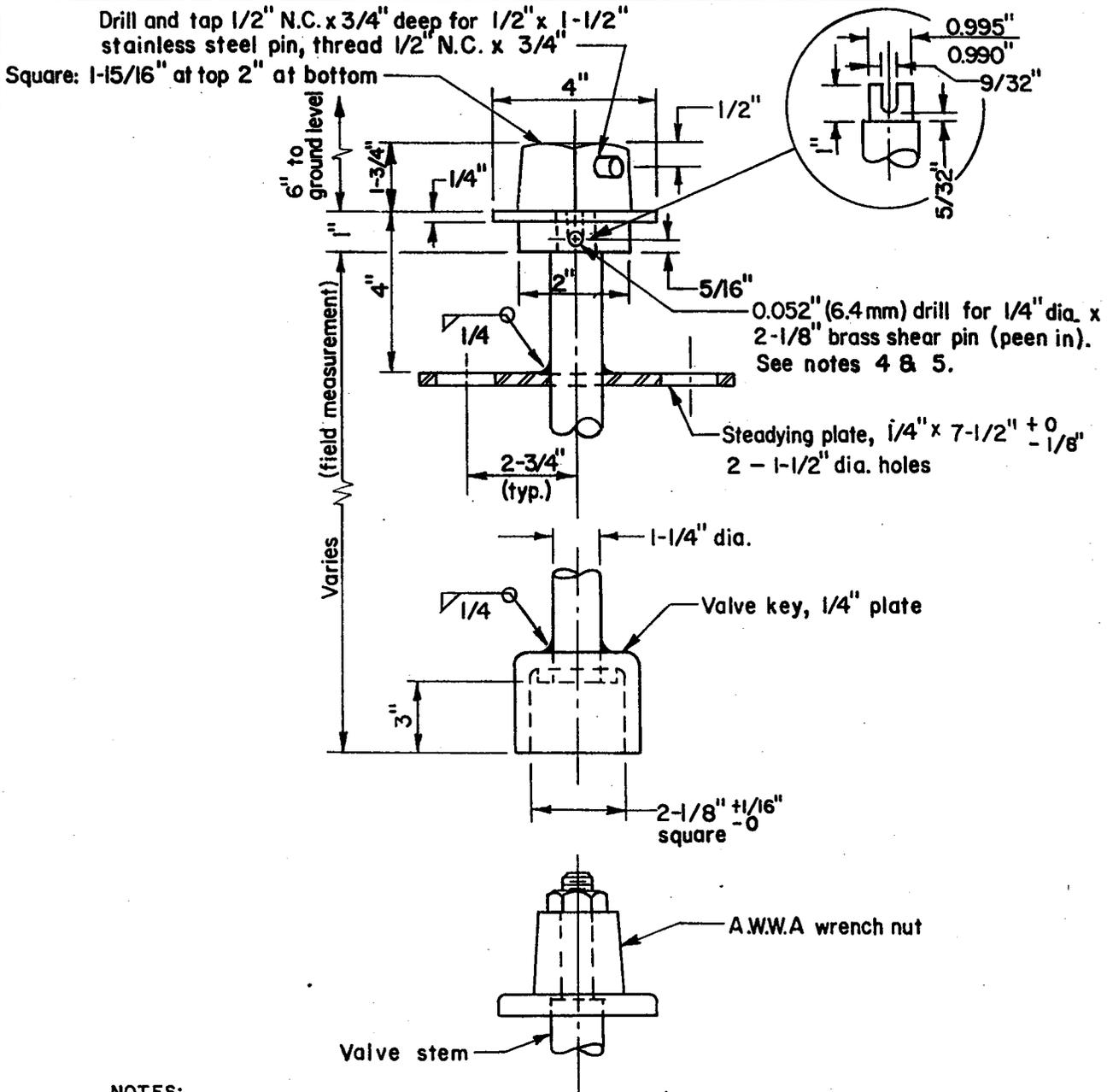
DETAIL A

## STANDARD GATE VALVE SHAFT EXTENSION

**NOTE:**

1. SEE SD-228 FOR INSTALLATION OF TRACER WIRE. TRACER WIRE TO BE BROUGHT TO THE TOP OF THE EXTENSION OUTSIDE OF THE 8" VALVE BOX EXTENSION PIPE.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD VALVE INSTALLATION</b>		DWG. NO. <b>SD-205</b>	
			DRAWN BY: HGM      DATE 01/12/12				FILED	
			CHECKED BY: JF      SCALE: NTS				SHT. <b>3</b> OF <b>4</b>	
REV      DATE      BY			APPD. BY: <i>D. D. [Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS					

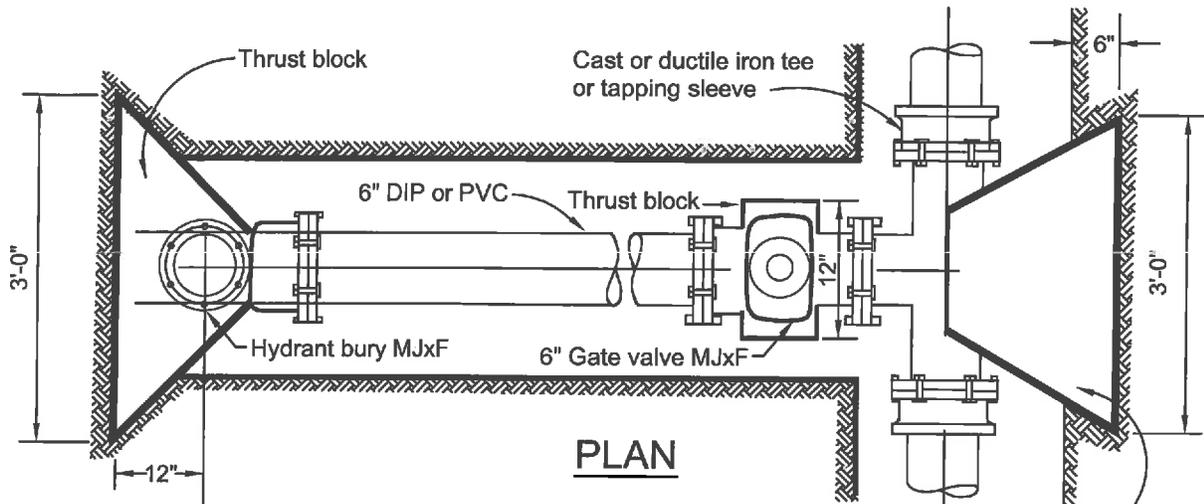


**NOTES:**

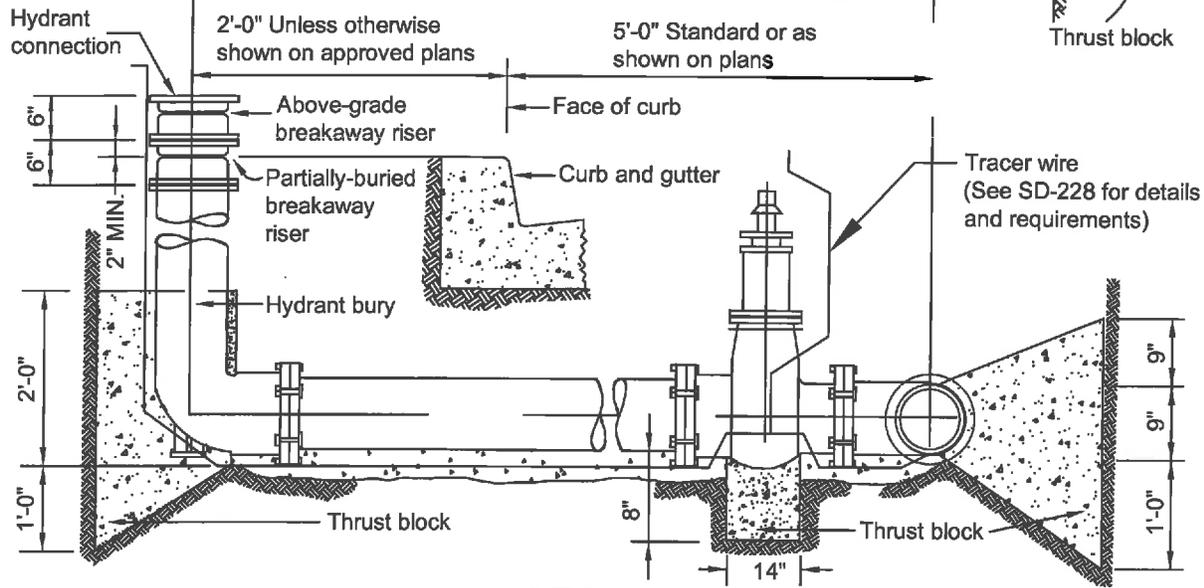
1. Coat entire assembly with mastic.
2. Peen top of shaft to secure 2" A.W.W.A. nut or secure by welding.
3. Replace brass shear pin at valve with stainless steel pin, drive fit.
4. Brass shear pin to be purchased, tested, and installed by City of Hayward. Pin is cut from free cutting brass rod, SAE CDA 360, half hard. Pin is designed to fail between 175 and 200 ft.-lbs. when tested in assembly.
5. Replacement pins must meet above specifications.
6. See sheet 3 for valve box extension.

**STANDARD BUTTERFLY VALVE SHAFT EXTENSION**

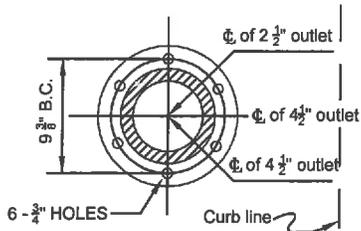
<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD VALVE INSTALLATION</b>		DWG. NO. SD-205	
					FILED <b>6-15-93</b>	
REV.	DATE	BY	DRAWN BY: JWC CHECKED BY: LRL APPD. BY: <i>[Signature]</i> CITY ENGR.	DATE: Nov., 1988 SCALE: None, 1 APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS	SHT. <u>4</u> OF <u>4</u>	



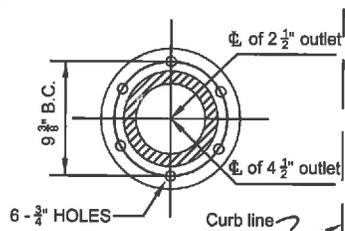
**PLAN**



**SECTION**



**DOUBLE STEAMER**  
1 - 2 1/2", 2 - 4 1/2" OUTLETS

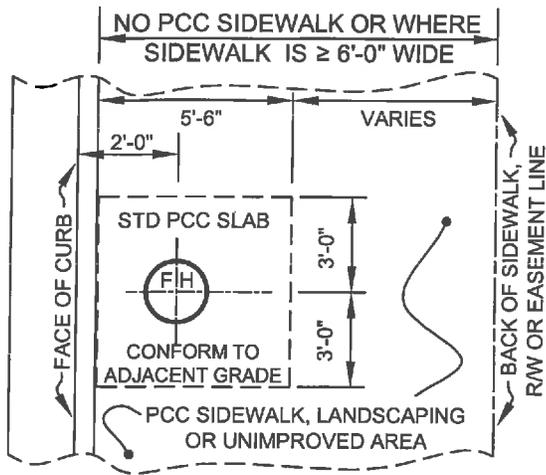


**MODIFIED STEAMER**  
1 - 2 1/2", 1 - 4 1/2" OUTLETS

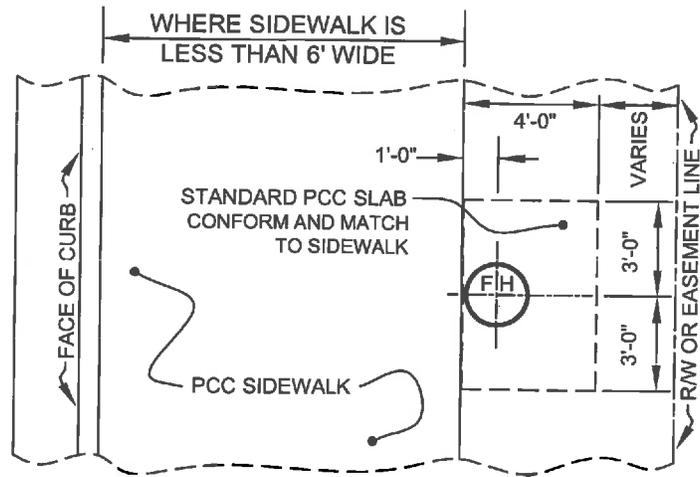
**HYDRANT POSITION ON BURY**  
Bury at 90° to curb face

1. Concrete shall not extend beyond face of bell or joints.
2. Thrust blocks shall be formed with lumber.
3. Thrust blocks shall be poured against undisturbed soil.
4. Class "C" portland cement concrete shall be used.
5. Remove forms before backfill.
6. All below grade DIP shall be polywrapped; above grade shall be painted.
7. Thrust block at the bury can be omitted if all joints are restrained.
8. The center of a hose outlet shall be not less than 18" above final grade.
9. Breakaway bolts shall be used on the breakaway risers.
10. Tracer wire shall be installed from main to hydrant. Tracer wire to be taped to hydrant riser and shall extend 12" above finish grade. Tracer wire shall extend into valve box per SD-228. See SD-228 for wire type.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD</b> <b>HYDRANT</b> <b>INSTALLATION</b>		DWG. NO. <b>SD-206</b>	
			DRW BY: TL/RS CHKD BY: AA APPD. BY:	DATE: 08/01/11 SCALE: NTS APPROVED:			FILED	
REV	DATE	BY	CITY ENGINEER		DIR. PUBLIC WORKS		SHT. <b>1</b> OF <b>2</b>	



WHERE THERE IS NO PCC SIDEWALK OR WHERE SIDEWALK WIDTH IS GREATER THAN OR EQUAL TO 6 FEET, LOCATE HYDRANT 2 FEET FROM BACK OF CURB



WHEN SIDEWALK IS LESS THAN 6 FEET WIDE, LOCATE HYDRANT 1 FOOT FROM BACK OF SIDEWALK

## HYDRANT LOCATION STANDARDS

THE FOLLOWING SHALL APPLY TO THE LOCATION OF FIRE HYDRANTS AND SHALL TAKE PRECEDENCE WHEN IN CONFLICT WITH APPROVED PLANS:

**1. FIRE HYDRANTS SHALL BE INSTALLED AS FOLLOWS:**

- A. ONLY IN LOCATIONS APPROVED BY THE FIRE DEPARTMENT.
- B. WITHIN 5 FEET OF A CURB RETURN, WHERE PRACTICAL. IF THE DISTANCE TO THE NEXT CURB RETURN EXCEEDS THE ALLOWED DISTANCE TO A HYDRANT, AN ADDITIONAL HYDRANT SHALL BE PLACED NEAR THAT CURB RETURN AND AT MID-BLOCK.
- C. AT LEAST 5 FEET AWAY FROM ANY:
  - DRIVEWAY OR WHEELCHAIR RAMP;
  - POLE, LUMINAIRE OR STREET SIGN;
  - BUILDING ENTRY SIDEWALK.
- D. AT LEAST 10 FEET AWAY FROM ANY SEWER MAIN OR LATERAL.
- E. ALIGNED WITH A PROPERTY LINE, WHENEVER POSSIBLE.
- F. AT LEAST 10 FEET FROM ANY EXISTING PARALLEL PARKING SPACE.
- G. WITH PROTECTIVE RETAINING WALLS WHEN SUBJECT TO ENCROACHMENT BY AN ADJACENT SLOPE.
- H. WITHIN A 2-INCH TOLERANCE WHEN INSTALLED AT THE STANDARD 2'-0" DISTANCE FROM CURB FACE.
- I. WITH PROTECTIVE GUARD POSTS WHEN THERE IS NO CURB & GUTTER. SEE SD-223 FOR REQUIREMENTS.
- J. WITH BLUE RAISED REFLECTIVE PAVEMENT MARKERS PER CA MUTCD SECTION 3B.11 AND FIGURE 3B-102(CA).

**2. PCC SIDEWALK SLABS SHALL BE CONSTRUCTED TO MATCH THE SIDEWALK GRADE. SEE SD-107 AND SD-108 FOR REQUIREMENTS.**

**3. NUMBER AND DISTRIBUTION OF FIRE HYDRANTS (PER CITY ORDINANCE 10-14, APPENDIX C, TABLE C105.1) :**

DISTRICT TYPE	MINIMUM FIRE FLOW REQUIRED (GPM) (1)	MIN NUMBER OF HYDRANTS AVAILABLE TO BUILDING	AVERAGE HYDRANT SPACING (FT) (2)	MAX DISTANCE FROM HYDRANT TO ANY POINT ON STREET OR FRONTAGE (FT) (3)	TYPE OF HYDRANT REQUIRED (4)
Residential, Low Density	1,500	1	400	200	Modified Steamer
Residential, Med. Density	3,000	3	400	200	Double Steamer
Residential, High Density	4,500	5	300	150	Double Steamer
Commercial/Industrial	5,000	5	300	150	Double Steamer
Civic (Hospitals, Schools, etc.)	4,000	4	300	150	Double Steamer

**TABLE NOTES:**

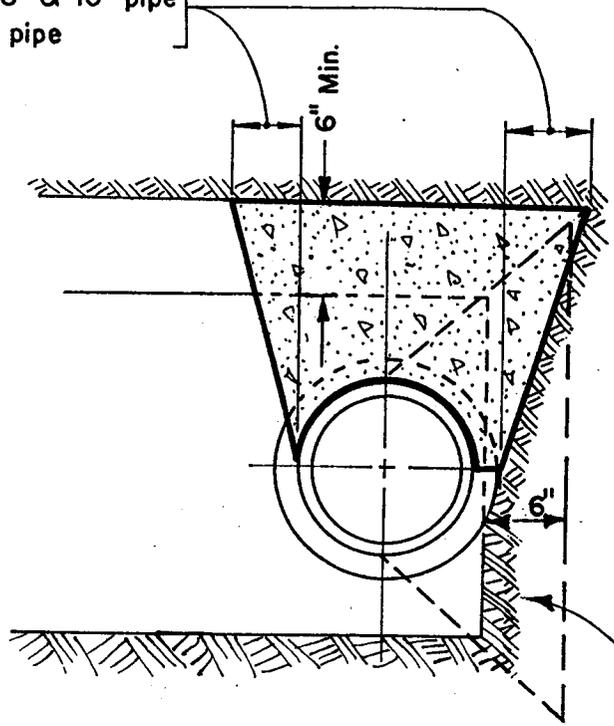
- (1) Fire Flow is calculated at 20 psi residual pressure.
- (2) a. Reduce spacing by 100 feet for dead-end streets or roadways.  
b. Spacing shall average 500 feet on each side where streets are provided with median dividers or arterial streets are provided with four or more traffic lanes.  
c. Where new water mains are extended along streets, where hydrants are not needed for protection of structures or similar fire problems, fire hydrants should be spaced at not less than 1,000 feet to provide for transportation hazards.
- (3) Reduce by 50 feet for dead-end streets or roadways.
- (4) Modified Steamer hydrants shall be Clow Valve Co. Model LB 614 (similar to Model 950), with 1 x 2.5" and 1 x 4.5" outlet. Double Steamer hydrants shall be Clow Valve Co. Model 865, with 1 x 2.5" and 2 x 4.5" outlets.

<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD HYDRANT INSTALLATION</b>	DWG. NO. <b>SD-206</b>
	DRW BY: RS	DATE: 9/30/2011	FILED	
	CHKD BY: AA	SCALE: NTS	SHT. <b>2</b> OF <b>2</b>	
REV	DATE	BY	APPROVED: CITY ENGINEER      DIR. PUBLIC WORKS	

**NOTES:**

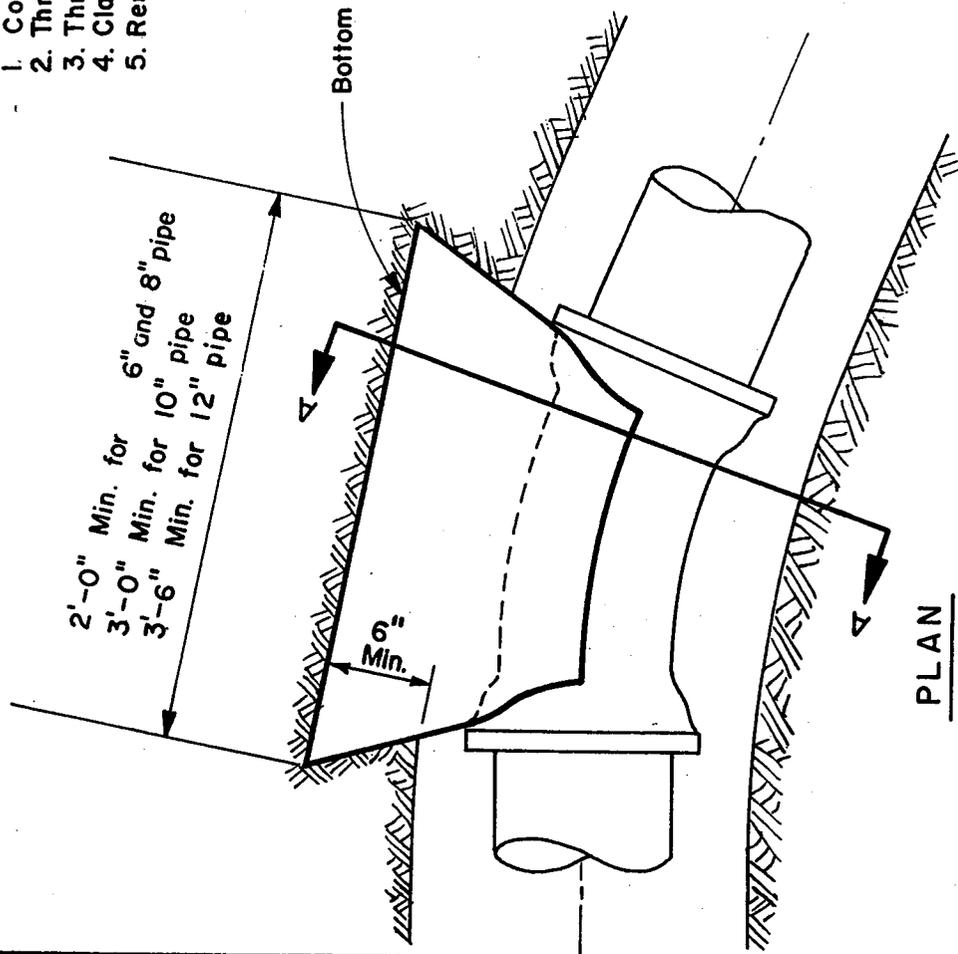
1. Concrete shall not extend beyond face of bell or joints.
2. Thrust blocks shall be formed with lumber.
3. Thrust blocks shall be poured against undisturbed soil.
4. Class "C" portland cement concrete shall be used.
5. Remove forms before backfill.

9" Min. for 6", 8" & 10" pipe  
 12" Min. for 12" pipe



**SECTION A-A**

Bottom of trench for vertical bends



**PLAN**

Thrust block for vertical bends

<b>CITY OF HAYWARD                  ENGINEERING DIVISION</b>			<b>STANDARD THRUST                  BLOCKS FOR                  HORIZONTAL &amp; SAG                  BENDS 22½° OR MORE</b>			DWG. NO. SD-207	
DRAWN BY: FAP      DATE: Mar. 57						FILED 11-1-88	
CHECKED BY: GWS      SCALE: None			APPD. BY: <i>[Signature]</i> APPROVED		SHT. 1 OF 1		
REV.	DATE	BY	CITY ENGR.      DIR. PUBLIC WORKS				

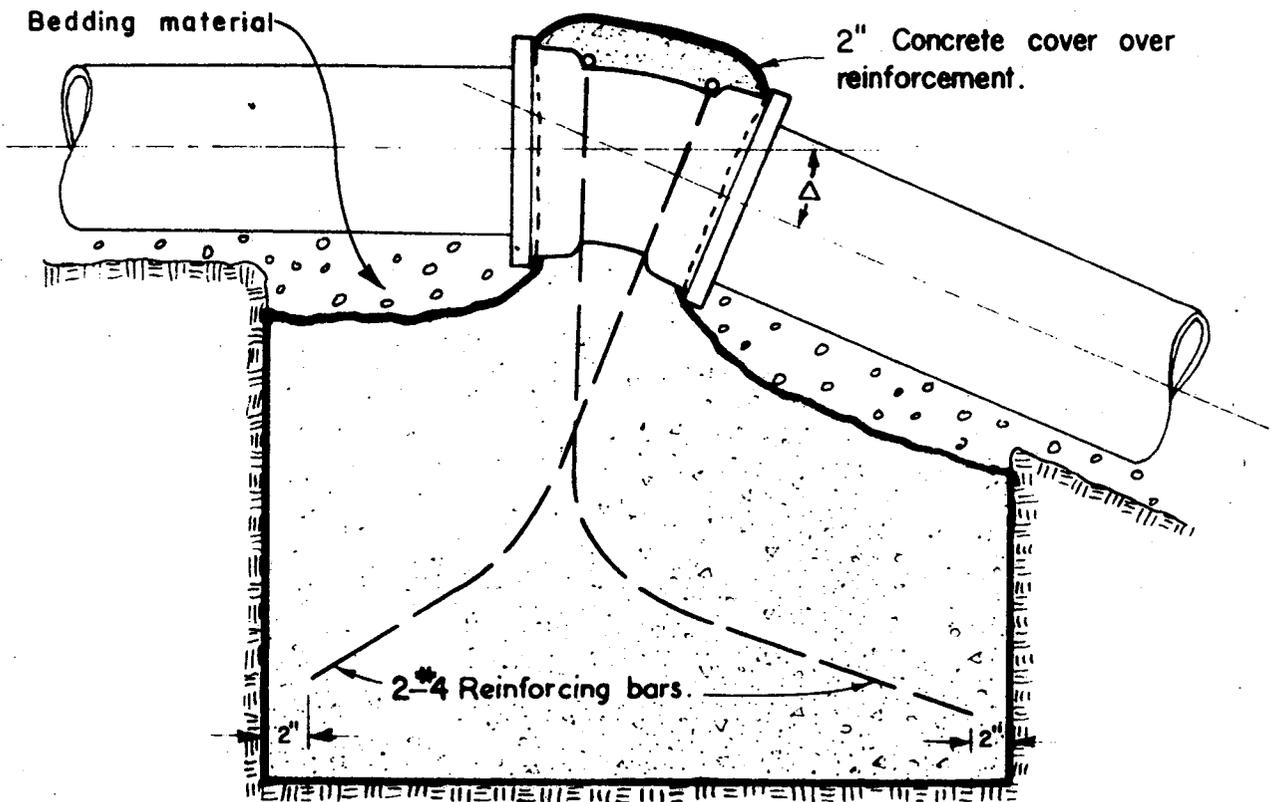
**NOTES:**

1. Thrust block shall be poured against undisturbed soil.
2. Class "C" portland cement concrete shall be used.
3. Concrete shall not extend beyond face of bell or joints.
4. Crest vertical bends shall not exceed 45° without the written approval of the Engineer.

Volume of thrust blocks in Table I calculated from formula

$$V = \frac{2 p A \sin \frac{\Delta}{2}}{4050}$$

Where p = 200 psi and A = area of pipe in sq. in.



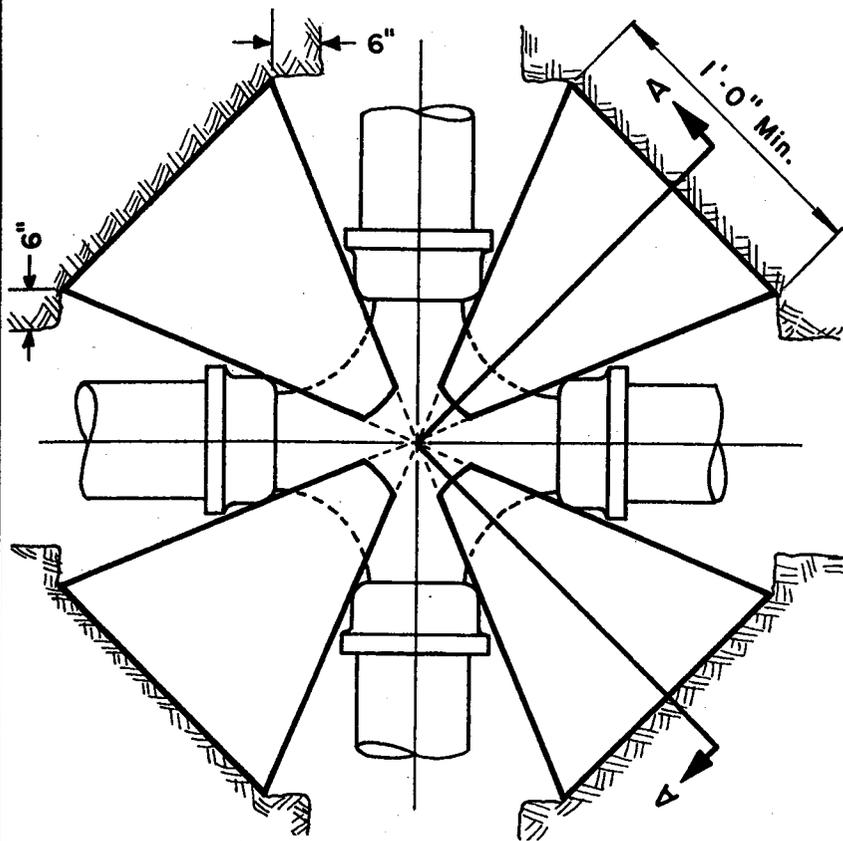
**TOTAL VOLUME OF THRUST BLOCK  
(IN CUBIC YARDS)**

Pipe Size	Vertical	Deflection	Angle (Δ)
	11 <sup>10</sup> / <sub>4</sub>	22 <sup>10</sup> / <sub>2</sub>	45°
6"	0.	0.6	1.1
8"	0.5	1.0	1.9
10"	0.8	1.5	3.0
12"	1.1	2.2	4.3

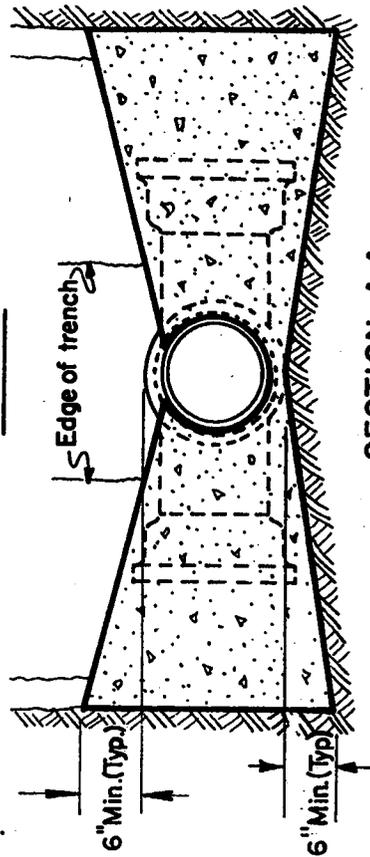
TABLE I

<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD THRUST BLOCK CREST VERTICAL BEND</b>	DRWG. NO. SD-208
DRAWN BY: FAP	DATE: 4-57	CHECKED BY: GWS		SCALE: None
APPROVED: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>	CITY ENGR.	D.R. PUBLIC WORKS	SHT. <u>1</u> OF <u>1</u>
REV.	DATE	BY		





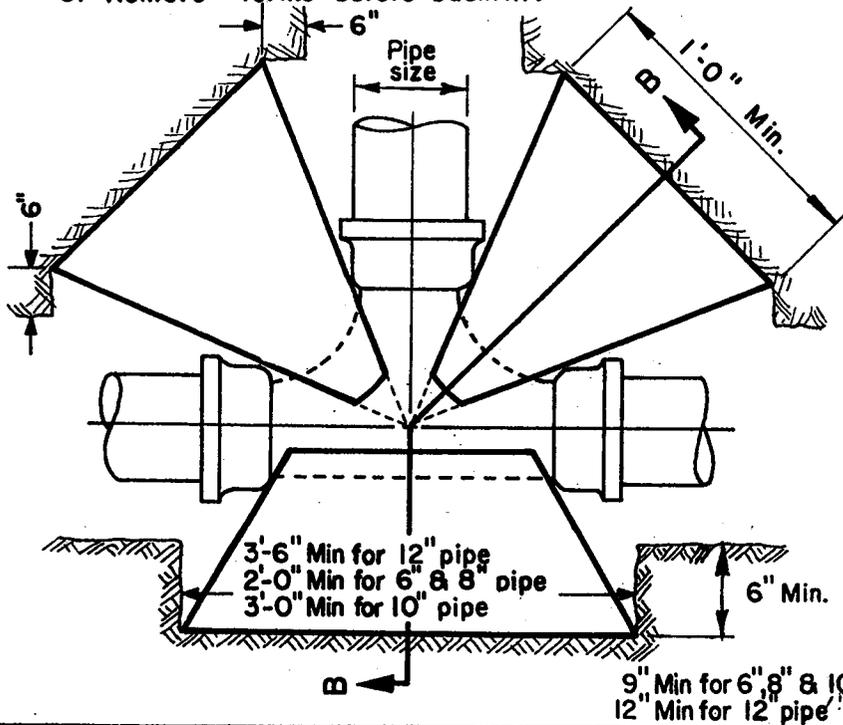
PLAN



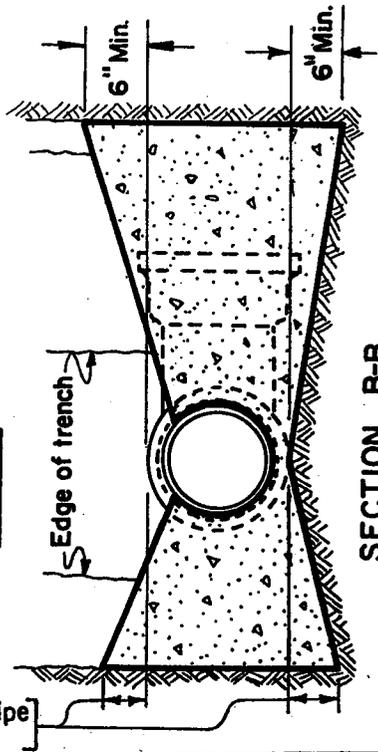
SECTION A-A

**NOTES:**

1. Concrete shall not extend beyond face of bell or joints.
2. Thrust blocks shall be formed with lumber.
3. Thrust blocks shall be poured against undisturbed soil.
4. Class "C" portland cement concrete shall be used.
5. Remove forms before backfill.



PLAN



SECTION B-B

9" Min for 6", 8" & 10" pipe  
12" Min for 12" pipe

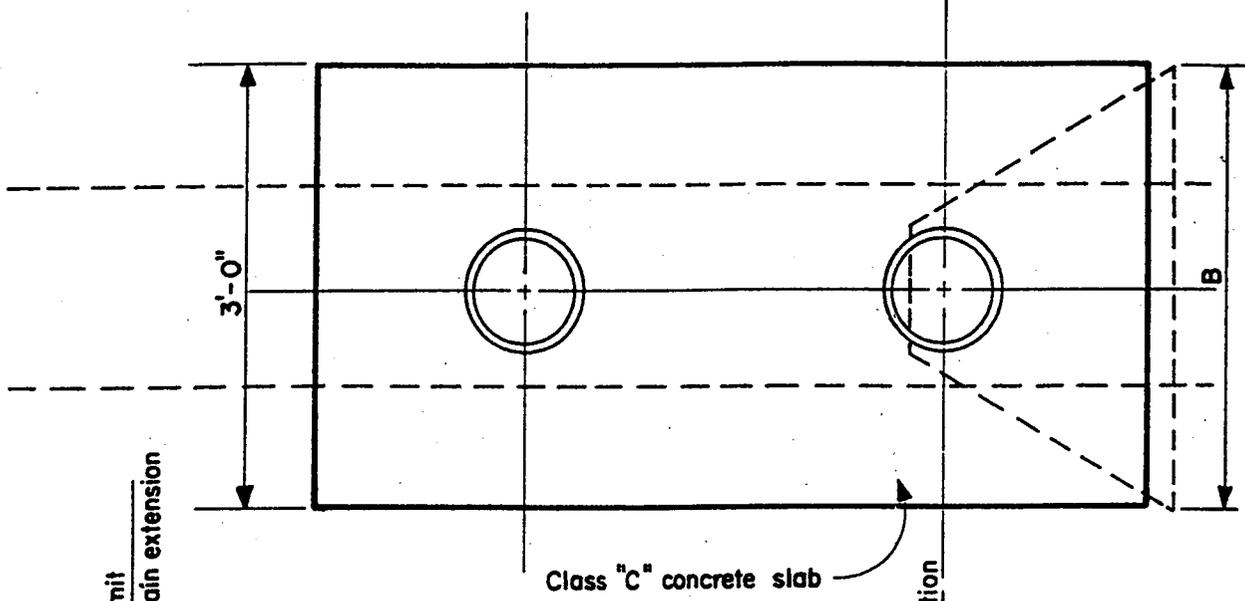
CITY OF HAYWARD ENGINEERING DIVISION			STANDARD THRUST BLOCKS FOR TEES & CROSSES		DWG. NO. SD-210	
DRAWN BY: FAP      DATE: Apr. 57					FILED 6-15-93	
CHECKED BY: GWS      SCALE: None			APPROVED		SHT. 1 OF 1	
APPD. BY: <i>[Signature]</i>			DIR. PUBLIC WORKS			
REV.	DATE	BY				

**NOTES:**

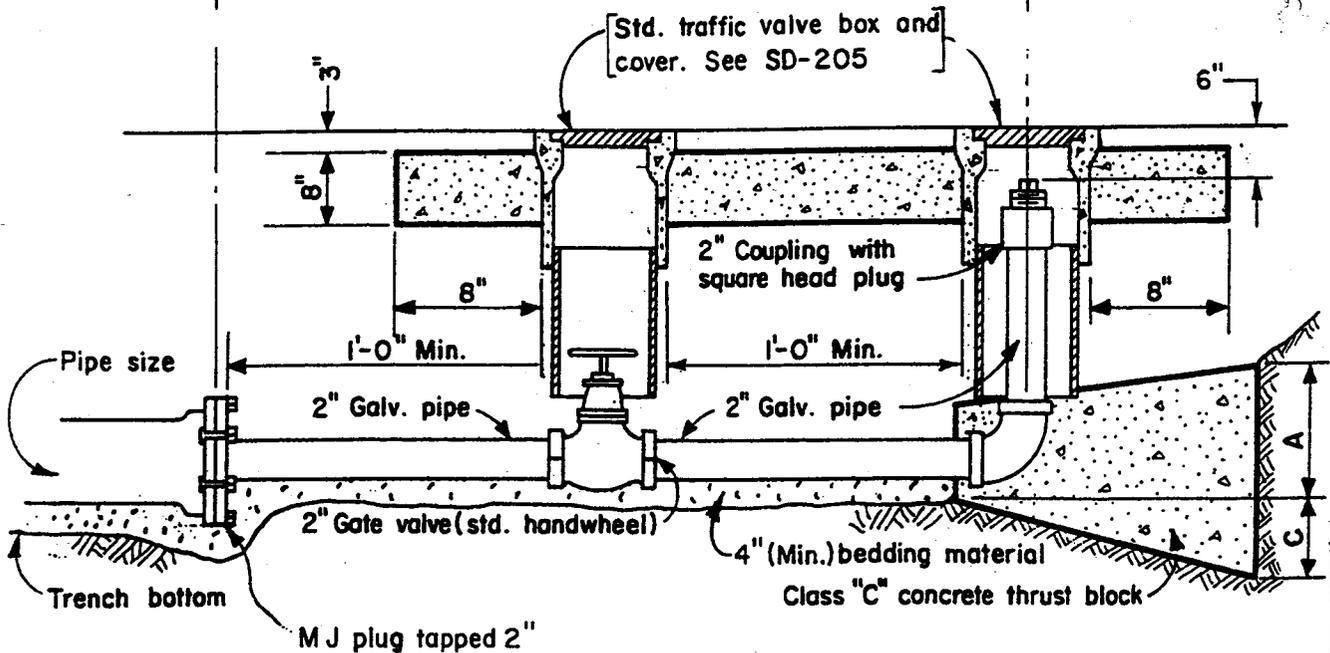
1. Thrust blocks shall be formed with lumber.
2. Thrust blocks shall be poured against undisturbed soil.
3. Remove forms before backfill.

**THRUST BLOCK DIMENSIONS**

Pipe Size	6"	8"	10"	12"
A	2'-0"	2'-0"	3'-0"	3'-0"
B	2'-0"	2'-0"	3'-0"	3'-0"
C	0'-6"	1'-0"	0'-6"	1'-0"



**PLAN**



**ELEVATION**

**CITY OF HAYWARD  
ENGINEERING DIVISION**

DRAWN BY: *K.M.* DATE: SEP 29, 1992

CHECKED BY: *T.M.* SCALE: NONE

APPD. BY: *R.H.B.* APPROVED

CITY ENGR. DIR. PUBLIC WORKS

**STANDARD  
BLOW OFF FOR  
DEAD ENDS**

DWG. NO. **SD-211**

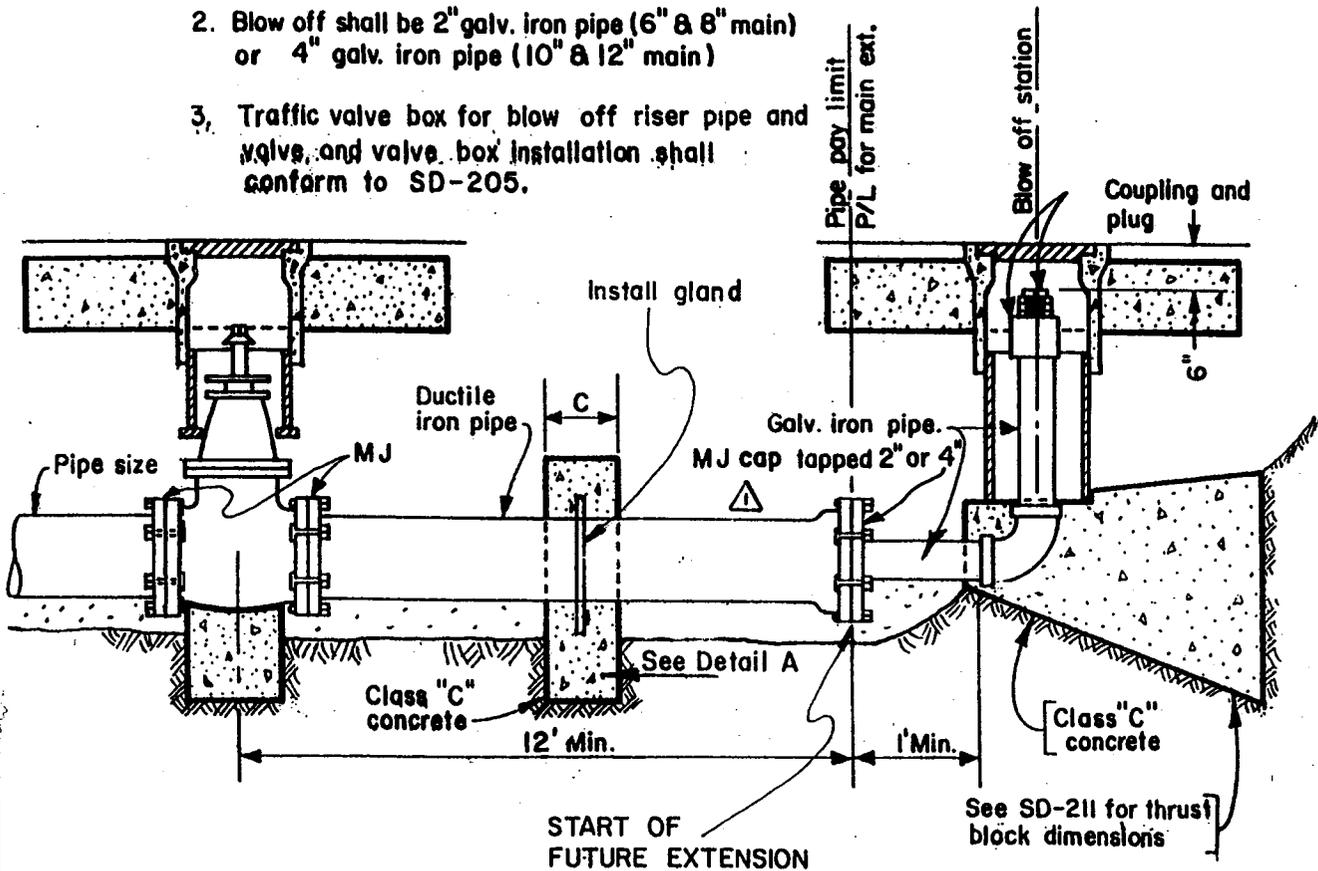
FILED **6-15-93**

SHT. **1** OF **1**

REV. DATE BY

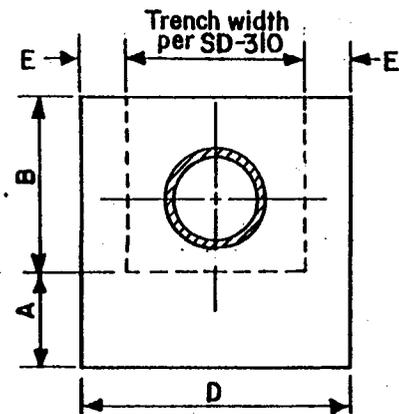
**NOTES:**

1. The future extension stub shall be tested and chlorinated with the rest of the main and blown off through the galvanized iron pipe.
2. Blow off shall be 2" galv. iron pipe (6" & 8" main) or 4" galv. iron pipe (10" & 12" main)
3. Traffic valve box for blow off riser pipe and valve, and valve box installation shall conform to SD-205.



Minimum Dimensions For Collar Thrust Block

Pipe Size	A	B	C	D	E
6"	1'-0"	1'-0"	6"	2'-6"	0'-6"
8"	1'-6"	1'-6"	8"	2'-9"	0'-6"
10"	2'-0"	2'-0"	10"	3'-0"	0'-6"
12"	2'-3"	3'-0"	1'-0"	3'-3"	0'-9"



**NOTES:**

4. Concrete shall not extend beyond face of bell or joints. DETAIL A
5. Thrust blocks shall be formed with lumber.
6. Thrust blocks shall be poured against undisturbed soil.
7. Remove forms before backfill.
8. Polywrap all ductile iron pipe per specification.

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>	<b>STANDARD BLOW OFF FOR FUTURE EXTENSION</b>	DWG. NO. SD-212
	REV.	DATE	BY	APPROVED	FILE: <b>9-25-02</b>
	20-1-02	FM	APPD. BY: <i>ROB</i>		SHT. <u>  </u> OF <u>  </u>
			CITY ENGR.	DIR. PUBLIC WORKS	

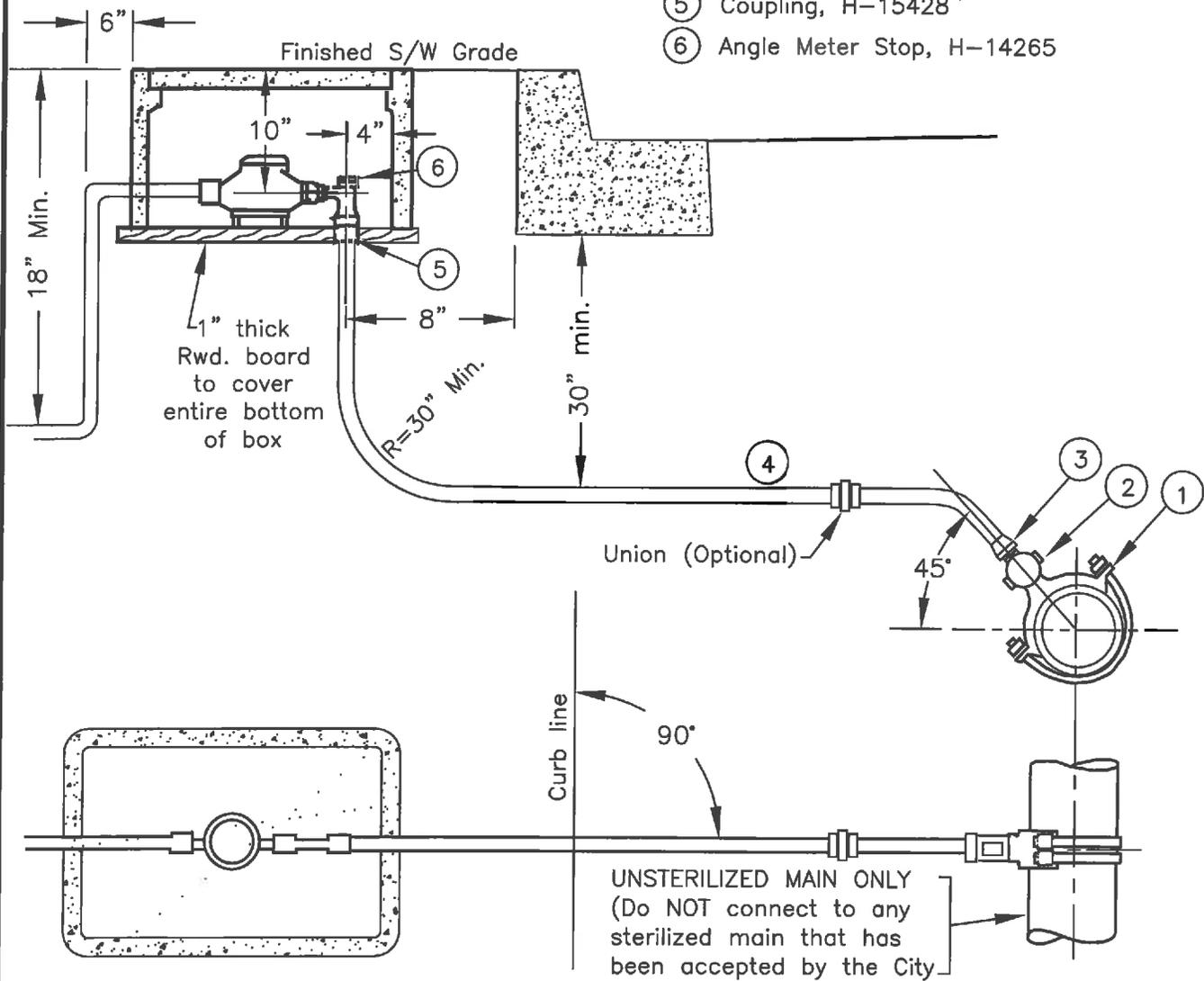
**NOTES:**

1. The water service piping shall be run in a straight line perpendicular to the curb from main to meter location.
2. All connections to copper tubing shall be flared.
3. Water Department only will install meter.
4. Water meter shall be located a minimum of 2' away from top of driveway flare or any other facility.

SADDLES REQUIRED FOR CORPORATION STOP TAP			
WATER MAIN		3/4"	1"
SIZE	TYPE		
4" and larger	DIP	J-979 or H-16102 through H-16116	J-979 or H-16102 through H-16116
	PVC	J-996 or H-13490 through H-13494	J-996 or H-13490 through H-13494

METER SIZE	METER BOX
5/8"	Christy B-09, Brooks No.36 or approved equal
3/4"	
1"	Christy B-16, Brooks No.37 or approved equal

- ① Service Saddle, double strap & all bronze
- ② Corporation Stop, H-10013, 3/4" or 1"
- ③ Coupling, H-15451
- ④ Copper Tubing, Type K, 3/4" or 1"
- ⑤ Coupling, H-15428
- ⑥ Angle Meter Stop, H-14265



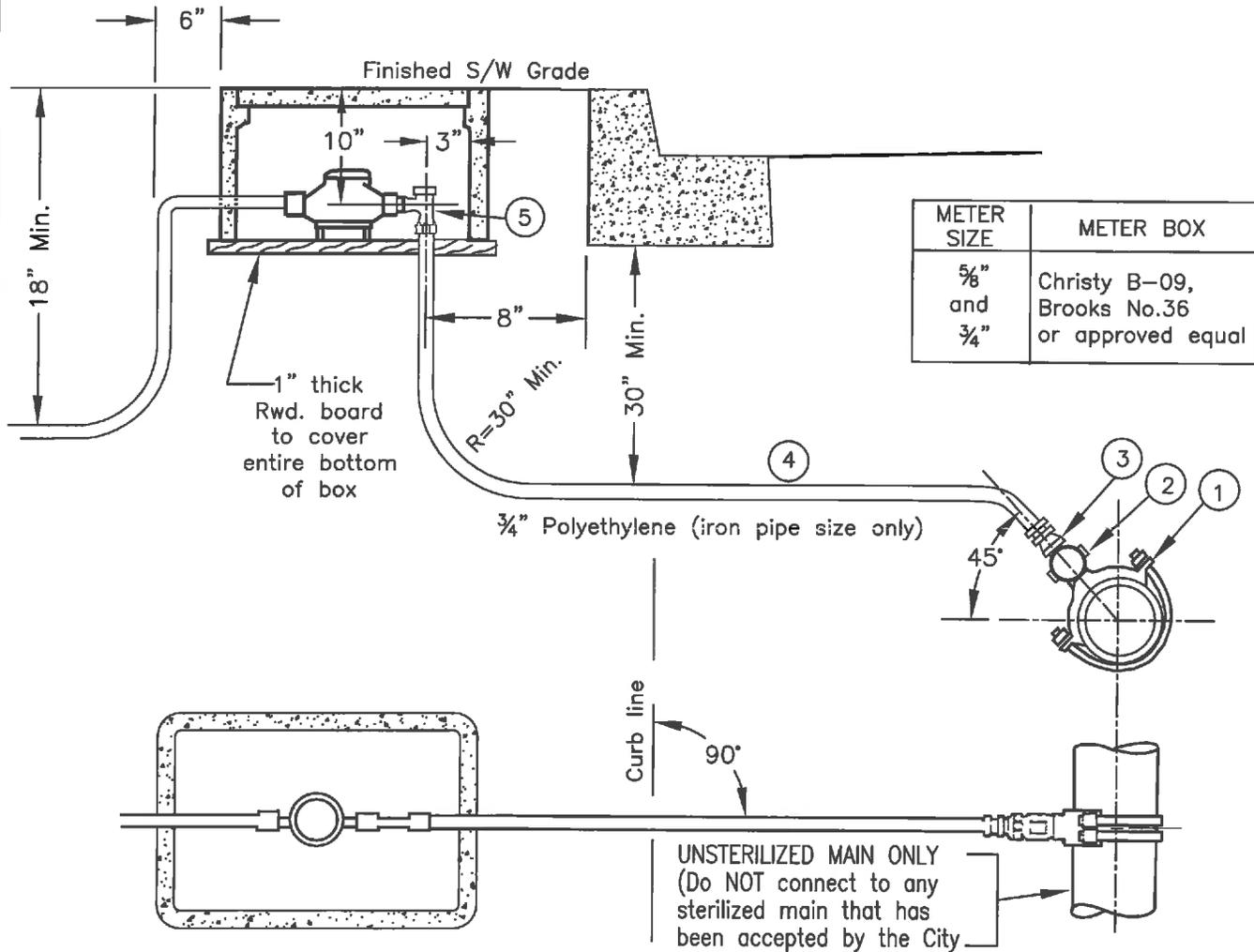
		<b>STANDARD COPPER</b> <b>3/4" &amp; 1" SINGLE WATER</b> <b>SERVICE CONNECTION</b>		DWG. NO. <b>SD-213</b>
DRAWN BY: JT CHECKED BY: JF APPD. BY:	DATE: 11/30/12 SCALE: NTS APPROVED: <i>[Signature]</i>	FILED		SHT. <b>1</b> OF <b>1</b>
REV    DATE    BY	CITY ENGINEER	DIR. PUBLIC WORKS		

**NOTES:**

1. The water service piping shall be run in a straight line perpendicular to the curb from main to meter location.
2. Water Department only will install meter.
3. Tracer wire shall be installed from tap to meter box. Tape wire to tubing at tap location without contact with bronze fittings. Wire shall be copper, type THNN wire size A.W.G. #12.
4. Stainless steel liners shall be used with all compression fittings.
5. Water meter shall be located a minimum of 2' away from top of driveway flare or any other facility.
6. Polyethylene pipe ends shall be trimmed with Mueller H-18017 tool or equal.

WATER MAIN		TAP	CORP. STOP
SIZE	TYPE		
4" and larger	DIP	Saddle: J-979 or H-16102 through H-16116	H-10013
	PVC	Saddle: J-996 or H-13490 through H-13494	

- ① Service Saddle, double strap & all bronze
- ② Corporation Stop, H-10013
- ③ Coupling 3/4" H-15456
- ④ 3/4" Polyethylene tubing
- ⑤ Angle meter stop, H-14266



METER SIZE	METER BOX
5/8" and 3/4"	Christy B-09, Brooks No.36 or approved equal

DRAWN BY: JT CHECKED BY: JF APPD. BY:	DATE: 11/30/12 SCALE: NTS APPROVED:	CITY ENGINEER DIR. PUBLIC WORKS
REV	DATE	BY

**STANDARD PLASTIC**  
**5/8" & 3/4" SINGLE WATER**  
**SERVICE CONNECTION**

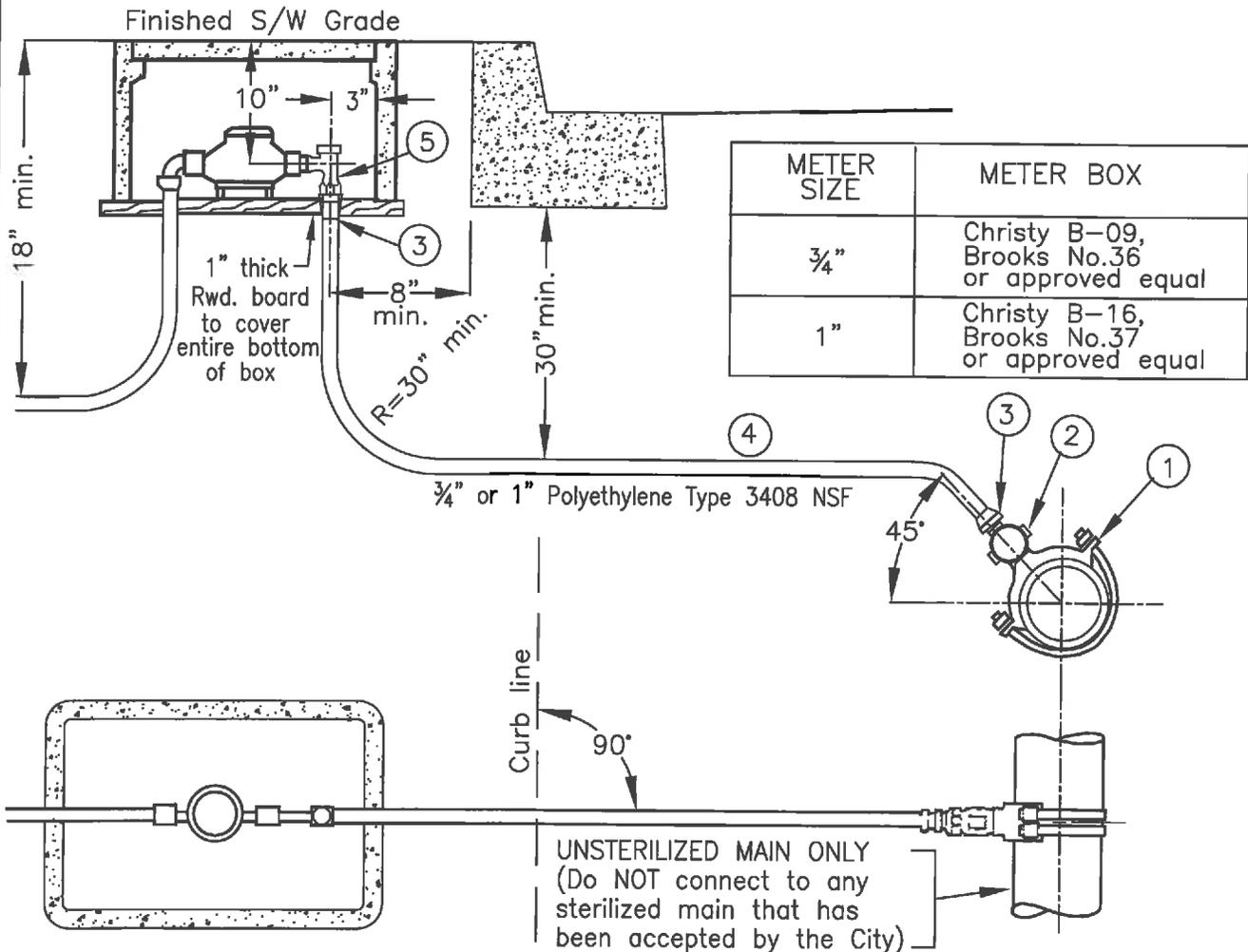
DWG. NO.	<b>SD-214</b>
FILED	
SHT.	<b>1 OF 1</b>

**NOTES:**

1. The water service piping shall be run in a straight line perpendicular to the curb from main to meter location.
2. Water Department only will install meter.
3. Tracer wire shall be installed from tap to meter box. Tape wire to tubing at tap location without contact with bronze fittings. Wire shall be copper, type THNN wire size A.W.G. #12.
4. Polyethylene pipe ends shall be trimmed with Mueller H-18017 tool or equal.
5. Stainless steel liners shall be used with all compression fittings.
6. Water meter shall be located a minimum of 2' away from top of driveway flare or any other facility.

WATER MAIN		TAP	CORP. STOP
SIZE	TYPE		
4" and larger	DIP	Saddle: J-979 or H-16102 through H-16116	H-10013
	PVC	Saddle: J-996 or H-13490 through H-13494	

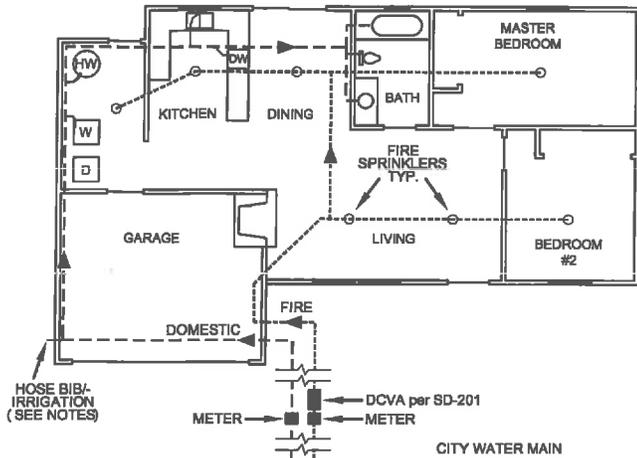
- ① Service Saddle, double strap & all bronze
- ② Corporation Stop, H-10013
- ③ Coupling H-15456
- ④ Polyethylene (iron pipe size) Type 3408 NSF
- ⑤ Angle meter stop, H-14266 with Insta-Tite



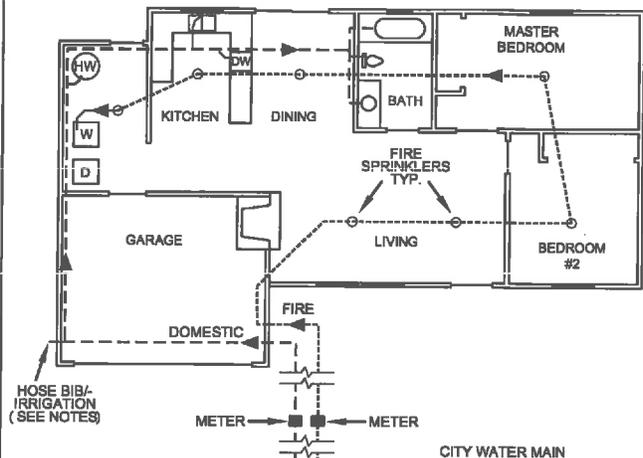
 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD 3/4" &amp; 1" CONSUMER WATER SERVICE CONNECTION PE WITH INSTA-TITE</b>	DWG. NO. <b>SD-215</b>
DRAWN BY: AL      DATE: 11/30/12 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS	FILED SHT. <b>1</b> OF <b>1</b>		

# EXAMPLES OF RESIDENTIAL WATER SERVICES AND FIRE PROTECTION SYSTEMS

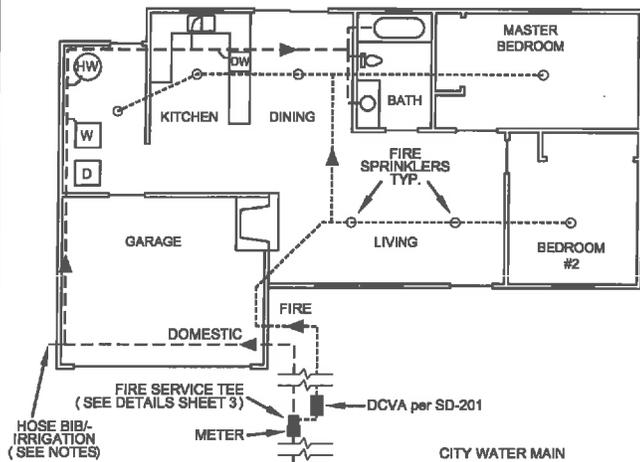
(FOR ILLUSTRATIVE PURPOSES ONLY - LAYOUTS NOT TO BE CONSIDERED AS RECOMMENDED OR APPROVED,  
NOT ALL POSSIBILITIES SHOWN, MAY NOT COMPLY WITH SOME BUILDING CODES)



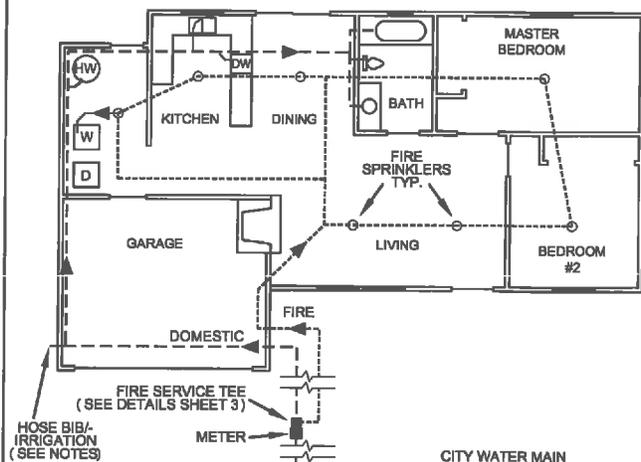
**FIGURE 1A - SEPARATE SERVICES, CLOSED SYSTEM, BRANCHED**



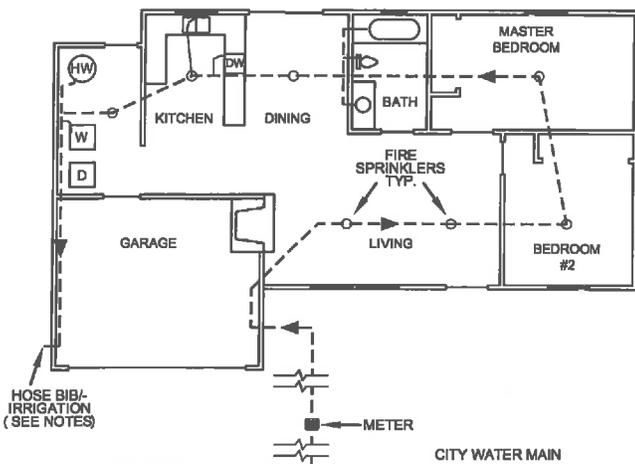
**FIGURE 1B - SEPARATE SERVICES, FLOW-THROUGH SYSTEM, SINGLE-MEANDER**



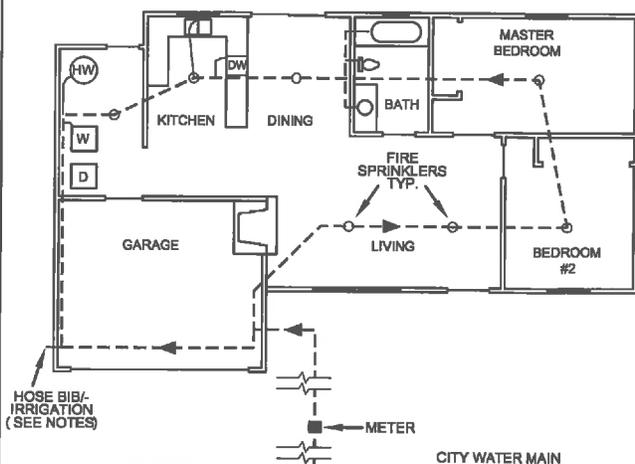
**FIGURE 2A - COMBINED SERVICES, CLOSED SYSTEM, BRANCHED**



**FIGURE 2B - COMBINED SERVICES, FLOW-THROUGH SYSTEM, LOOPED**



**FIGURE 3A - COMBINED SERVICES, MULTI-PURPOSE SYSTEM, SINGLE MEANDER**



**FIGURE 3B - COMBINED SERVICES, MULTI-PURPOSE SYSTEM, LOOPED**

CITY OF  
**HAYWARD**  
PUBLIC WORKS - U&ES

DRW BY: RS DATE: 11/05/2013  
CHK BY: JL SCALE: NTS  
APPROVED: *D. D. Miller*  
CITY ENGINEER DIR. PUBLIC WORKS - U&ES

**STANDARD  
RESIDENTIAL DOMESTIC  
AND FIRE SERVICES  
1", 1.5" & 2"**

DWG. NO.  
**SD-216**

FILED

SHT. **1** OF **3**

**TERMS AND DEFINITIONS**

**1. RESIDENTIAL WATER SERVICES, ONE AND TWO FAMILY, 2" OR SMALLER**

- 1.1. **SEPARATE SERVICES:** THE DOMESTIC SYSTEM AND STAND-ALONE FIRE PROTECTION SYSTEM ARE EACH SUPPLIED BY A SEPARATE SERVICE LINE AND METER. (SEE FIGURES 1A & 1B)
- 1.2. **COMBINED SERVICE:** THE DOMESTIC AND FIRE PROTECTION SYSTEMS SHARE A SINGLE SERVICE LINE AND METER. DOWNSTREAM THE METER, THE LINE MAY SUPPLY A MULTI-PURPOSE SYSTEM OR SPLIT TO SUPPLY SEPARATE DOMESTIC AND STAND-ALONE FIRE PROTECTION SYSTEMS. (SEE FIGURES 2A, 2B, 3A & 3B)

**2. RESIDENTIAL FIRE PROTECTION SYSTEMS**

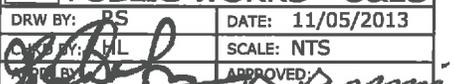
- 2.1. **STAND-ALONE:** SEPARATE AND INDEPENDENT FROM THE DOMESTIC SYSTEM.
  - 2.1.1. **CLOSED:** DOES NOT CONNECT TO ANY DOMESTIC WATER FIXTURES AND CAN ONLY BE DRAINED THROUGH A RELIEF OR DRAIN VALVE. AT A MINIMUM, A DOUBLE CHECK VALVE ASSEMBLY (DCVA) BACKFLOW DEVICE (PER SD-201) IS REQUIRED ON ALL CLOSED SYSTEMS TO PROTECT THE DOMESTIC WATER SUPPLY. (SEE FIGURES 1A & 2A)
  - 2.1.2. **FLOW-THROUGH:** CONNECTS TO ONE OR MORE DOMESTIC WATER FIXTURES SUCH THAT WATER IN THE SYSTEM IS REPLACED UPON USE OF THE FIXTURE(S). FLOW-THROUGH SYSTEMS MUST BE LOOPED OR SINGLE-MEANDER. (SEE FIGURES 1B & 2B)
- 2.2. **MULTI-PURPOSE:** USES THE SAME DISTRIBUTION PIPING WITHIN THE STRUCTURE TO SUPPLY THE DOMESTIC WATER FIXTURES AND FIRE SPRINKLERS. MULTI-PURPOSE SYSTEMS MUST BE LOOPED OR SINGLE-MEANDER, IF ALLOWED. (SEE FIGURES 3A & 3B)

**3. FIRE SPRINKLER PIPING LAYOUTS**

- 3.1. **BRANCHED:** HAS DEAD-ENDS AT SOME SPRINKLER HEADS WHERE WATER COULD STAGNATE. (SEE FIGURES 1A & 2A)
- 3.2. **LOOPED:** HAS NO DEAD-ENDS AND FORMS ONE OR MORE LOOPS SUCH THAT WATER CAN CIRCULATE. (SEE FIGURES 2B & 3B)
- 3.3. **SINGLE-MEANDER:** ALL SPRINKLER HEADS ARE CONNECTED IN SERIES BY A SINGLE PIPING RUN. (SEE FIGURES 1B & 3A)

**NOTES**

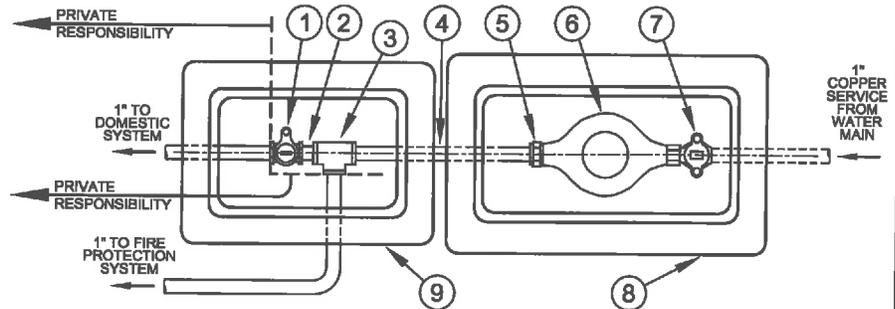
- 1. RESIDENTIAL FIRE PROTECTION SYSTEMS SHALL BE DESIGNED BY A C-16 (FIRE PROTECTION) CALIFORNIA LICENSED CONTRACTOR OR A CALIFORNIA REGISTERED PROFESSIONAL ENGINEER (CIVIL, MECHANICAL, OR FIRE PROTECTION), AND PURSUANT TO THE CITY'S LATEST ADOPTED CALIFORNIA CODES & REGULATIONS INCLUDING, BUT NOT LIMITED TO: FIRE CODE (SEC. 903); CA RESIDENTIAL CODE (SEC. R313); NFPA 13D; CA PLUMBING CODE (SEC. 603.4.16); CA ELECTRICAL CODE (ART. 760); NFPA 72; AND CA HEALTH & SAFETY CODE 13114.7.
- 2. WATER SERVICES, FLOW-THROUGH AND MULTI-PURPOSE SYSTEMS WILL BE REVIEWED BY THE PUBLIC WORKS DEPARTMENT, UTILITIES & ENVIRONMENTAL SERVICES (UTILITIES). FIRE PROTECTION SYSTEMS WILL BE REVIEWED BY THE FIRE DEPARTMENT. FLOW-THROUGH AND MULTIPURPOSE SYSTEMS WILL BE REVIEWED BY BOTH THE BUILDING AND FIRE DEPARTMENTS.
- 3. THE DESIGN WATER PRESSURE FOR ALL FIRE PROTECTION SYSTEMS SHALL BE EITHER A MAXIMUM OF 80 PSI OR THE ACTUAL SUPPLY PRESSURE, WHICHEVER IS LOWER.
- 3. THE FIRE SPRINKLER SYSTEM DEMAND FLOW RATE FOR COMBINED SERVICES THAT DO NOT INCLUDE A BACKFLOW DEVICE SHALL INCLUDE AN ADDITIONAL 5 GPM AT THE POINT WHERE THE SYSTEMS ARE CONNECTED (R313.3.5). IF THE TOTAL DEMAND EXCEEDS 160 GPM, THEN THE USE OF A SEPARATE FIRE SERVICE WILL BE REQUIRED.
- 4. THE DOMESTIC WATER FIXTURE(S) THAT A FLOW-THROUGH SYSTEM SUPPLIES SHALL BE A CLOTHES WASHER, DISHWASHER OR TOILET (ALTERNATE FIXTURES MAY BE PROPOSED). THE NUMBER AND KIND OF FIXTURES REQUIRED WILL DEPEND UPON THE LAYOUT AND SIZE OF THE SYSTEM AND STRUCTURE, AND SHALL BE DETERMINED BY UTILITIES. AT A MINIMUM, THE SYSTEM SHALL SUPPLY ONE FIXTURE PER FLOOR OF THE RESIDENCE.
  - 4.1. FOR A SINGLE-MEANDER LAYOUT, THE SPRINKLER HEAD AT THE DOWNSTREAM END OF THE SYSTEM SHALL SUPPLY A FIXTURE.
  - 4.2. WHERE THE LINE PRESSURE IN THE SPRINKLER SYSTEM IS GREATER THAN 80 PSI, A PRESSURE REDUCING VALVE (PRV) SHALL BE INSTALLED ON THE SUPPLY CONNECTION TO THE WATER FIXTURE(S). THE PRV MUST BE INSTALLED IMMEDIATELY DOWNSTREAM OF THE FIXTURE'S SHUT OFF VALVE AND LEFT EXPOSED, TO ALLOW FOR MAINTENANCE.
- 5. FLOW-THROUGH AND MULTI-PURPOSE SYSTEMS SHALL HAVE LEAD-FREE SPRINKLER HEADS, VALVES AND FITTINGS (CA AB 1953).
- 6. IN MULTI-PURPOSE SYSTEMS, IF A WATER SOFTENER OR FILTRATION DEVICE WILL BE USED THAT MAY RESTRICT FLOW OR REDUCE WATER PRESSURE TO THE FIRE SPRINKLERS, THE DEVICE MUST BE INCLUDED IN THE DESIGN OF THE SYSTEM.
- 7. **SERVICE AND METER SIZING**
  - a) METERS SHALL BE THE SAME SIZE AS THE SERVICE LINE FROM THE WATER MAIN.
  - b) DOMESTIC, IRRIGATION AND FIRE SERVICE LINES SHALL BE THE SAME SIZE OR SMALLER THAN THE METER SIZE.
  - c) MANIFOLDS THAT SUPPLY "GANGED" METERS ARE NOT ALLOWED TO SUPPLY FIRE PROTECTION SYSTEMS.
- 7.1. **DOMESTIC AND IRRIGATION SYSTEMS:** THE SIZE OF THE METER, SUPPLY AND SERVICE LINES SHALL BE SIZED PER 80% OF THE MAXIMUM FLOW RATING OF THE METER. PER AWWA, THE 80% MAX FLOW RATING OF DISPLACEMENT METERS ARE:  
 $\frac{1}{2}$ " = 15 GPM;  $\frac{3}{4}$ " = 25 GPM; 1" = 40 GPM; 1.5" = 80 GPM; 2" = 130 GPM
- 7.2. **MULTIPURPOSE AND SEPARATE FIRE SYSTEMS:** THE SIZE OF THE METER, SUPPLY AND SERVICE LINES SHALL BE SIZED PER THE MAXIMUM INTERMITTENT FLOW RATING OF THE METER. PER AWWA, THE MAX INTERMITTENT FLOW RATING OF DISPLACEMENT METERS ARE:  
 1" = 50 GPM; 1.5" = 100 GPM; 2" = 160 GPM.
- 8. FIRE AND COMBINED SERVICES SHALL CONFORM TO SD-213 FOR 1" SERVICES AND SD-217 FOR 1.5" AND 2" SERVICES EXCEPT AS SPECIFIED HEREIN. OTHERWISE, SERVICE CONNECTIONS 2" AND SMALLER SHALL CONFORM TO STANDARD DETAILS SD-213 THRU SD-215 AND SD-217 THRU SD-219.
- 9. ALL HOSE BIBS AND IRRIGATION SYSTEMS SHALL BE EQUIPPED WITH ATMOSPHERIC VACUUM BREAKERS/ANTI-SIPHON DEVICES.
- 10. **AS A CONDITION OF FINAL APPROVAL,** THE OWNER/DEVELOPER/CONTRACTOR SHALL INSTALL A VALVE SIGN OR TAG AT THE MAIN SHUTOFF VALVE TO THE WATER DISTRIBUTION SYSTEM (ITEM #17 SHEET 3) WITH THE FOLLOWING TEXT: "WARNING, THE WATER SYSTEM FOR THIS HOME SUPPLIES FIRE SPRINKLERS THAT REQUIRE CERTAIN FLOWS AND PRESSURES TO FIGHT A FIRE. DEVICES THAT RESTRICT THE FLOW OR DECREASE THE PRESSURE OR AUTOMATICALLY SHUT OFF THE WATER TO THE FIRE SPRINKLER SYSTEM, SUCH AS WATER SOFTENERS, FILTRATION SYSTEMS AND AUTOMATIC SHUTOFF VALVES, SHALL NOT BE ADDED TO THIS SYSTEM WITHOUT A REVIEW OF THE FIRE SPRINKLER SYSTEM BY A FIRE PROTECTION SPECIALIST. DO NOT REMOVE THIS SIGN." (CA R313.3.7) THE SIGN OR TAG SHALL BE OF MATERIAL SUITABLE FOR WET BURRIAL. MIN. TEXT HEIGHT 0.2 INCHES.

		 <p><b>CITY OF HAYWARD</b> PUBLIC WORKS - U&amp;ES</p>	<p><b>STANDARD RESIDENTIAL DOMESTIC AND FIRE SERVICES</b></p> <p><b>1", 1.5" &amp; 2"</b></p>	<p>DWG. NO. <b>SD-216</b></p>
		<p>DRW BY: PS      DATE: 11/05/2013</p> <p>CHECK BY: JIL      SCALE: NTS</p> <p>APPROVED:       DIR. PUBLIC WORKS - U&amp;ES</p>		FILED
REV	DATE	BY		SHT. <b>2</b> OF <b>3</b>

# FIRE SERVICE TEE DETAILS FOR COMBINED SERVICES

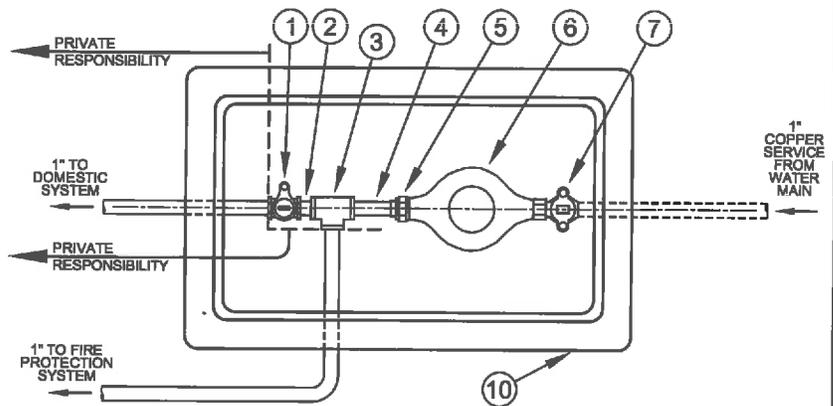
( SOME FITTINGS OR COMPONENTS NEEDED MAY NOT BE SHOWN OR LISTED )

ITEM	DESCRIPTION
1	CURB STOP WITH LOCK WING
2	BRASS NIPPLE
3	BRASS TEE
4	BRASS NIPPLE
5	METER COUPLING
6	WATER METER
7	ANGLE METER STOP WITH LOCK WINGS
8	METER BOX, CHRISTY B16 (OR APPROVED EQUAL)
9	METER BOX, CHRISTY B9 (OR APPROVED EQUAL)
10	METER BOX, CHRISTY N36 (OR APPROVED EQUAL)
11	BRASS METER FLANGE WITH BRASS BOLTS AND NUTS



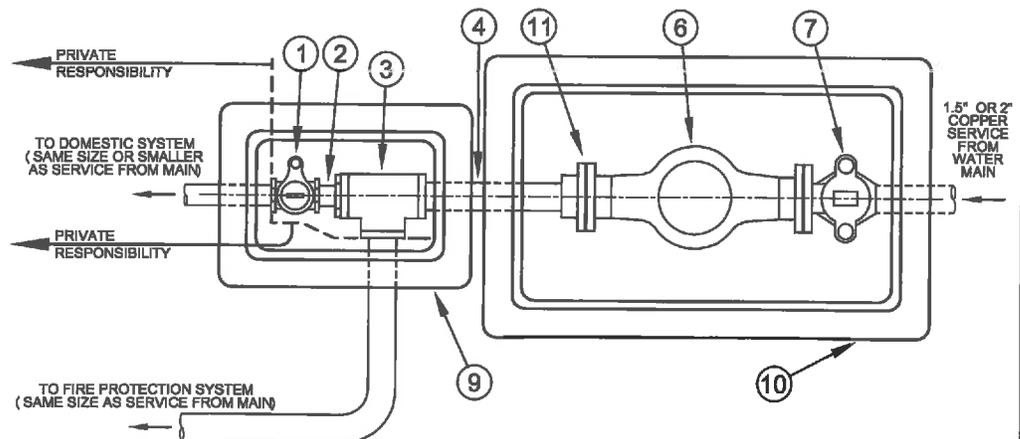
SEE SD-213 FOR ADDITIONAL MATERIALS AND REQUIREMENTS

**DETAIL 1A - 1" FIRE & 1" DOMESTIC SERVICES, DUAL BOX**



SEE SD-213 FOR ADDITIONAL MATERIALS AND REQUIREMENTS

**DETAIL 1B - 1" FIRE & 1" DOMESTIC SERVICES, SINGLE BOX**



SEE SD-217 FOR ADDITIONAL MATERIALS AND REQUIREMENTS

**DETAIL 2 - 1.5" OR 2" FIRE SERVICE & 1" TO 2" DOMESTIC SERVICE, DUAL BOX**

 <b>CITY OF HAYWARD</b> PUBLIC WORKS - U&ES		
DRW BY: RS	DATE: 11/05/2013	
CHKD BY: HL	SCALE: NTS	
APPROVED: <i>[Signature]</i>		
REV	DATE	BY
		CITY ENGINEER
		DIR. PUBLIC WORKS - U&ES

**STANDARD  
RESIDENTIAL DOMESTIC  
AND FIRE SERVICES  
1", 1.5" & 2"**

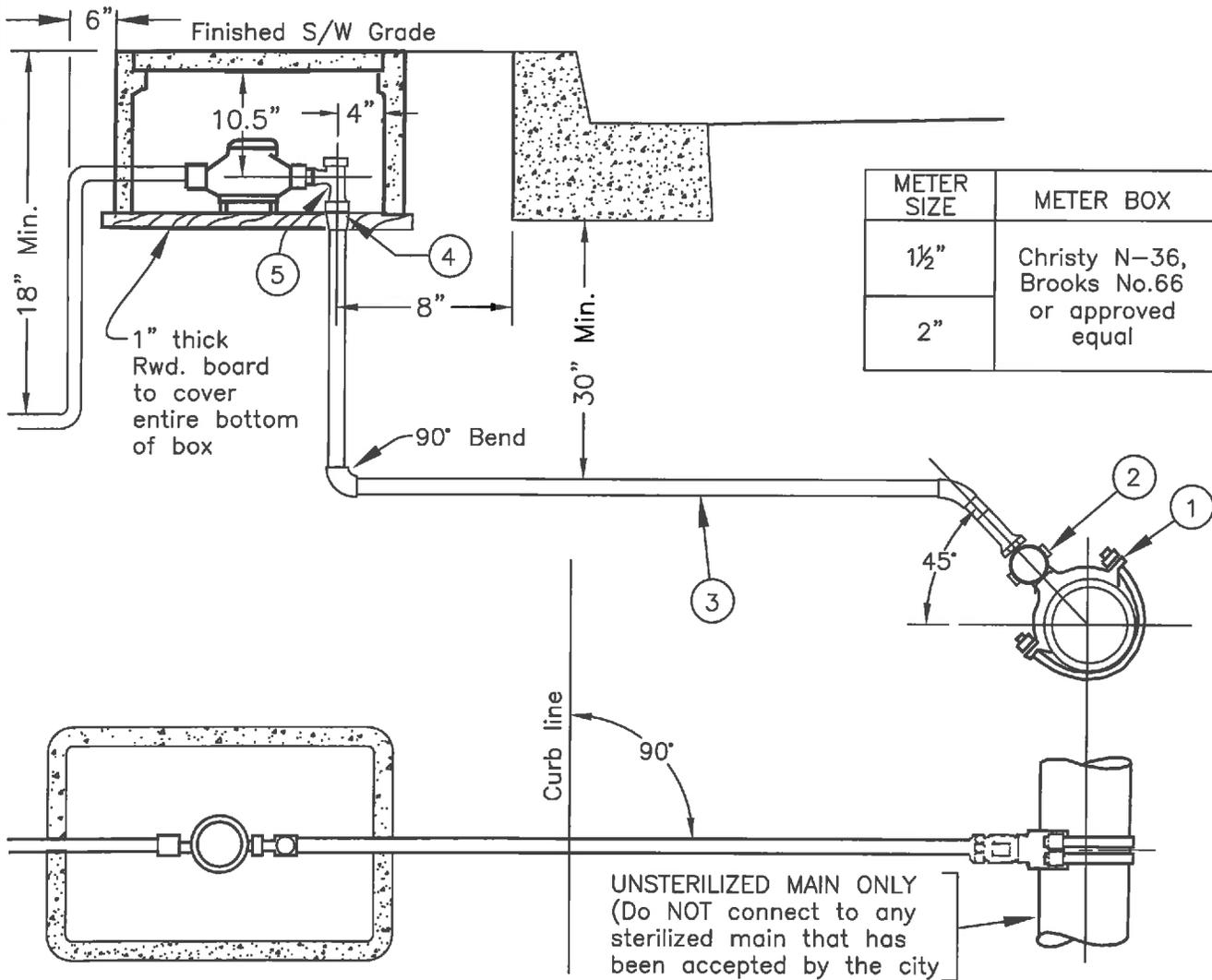
DWG. NO.	<b>SD-216</b>
FILED	
SHT.	<b>3 OF 3</b>

**NOTES:**

1. The water service piping shall be run in a straight line perpendicular to the curb from main to meter location.
2. All connections to copper tubing except 2" shall be flared. 2" copper shall be installed in straight lengths with sweat fittings as required.
3. Water Department only will install meter.
4. Water meter shall be located a minimum of 2' away from top of driveway flare or any other facility.

- ① Service Saddle, double strap and all bronze
- ② Corporation Stop, H-15023
- ③ Copper tubing, Type "K"
- ④ Coupling, H-15428
- ⑤ Flanged angle meter stop, H-14286

SADDLES REQUIRED FOR CORPORATION STOP TAP			
WATER MAIN		1½"	2"
SIZE	TYPE		
4" and larger	DIP	J-979 or H-16102 through H-16116	J-979 or H-16102 through H-16116
	PVC	J-996 or H-13490 through H-13494	J-996 or H-13490 through H-13494



METER SIZE	METER BOX
1½"	Christy N-36, Brooks No.66 or approved equal
2"	

DRAWN BY: JT CHECKED BY: JF APPD. BY:	DATE: 11/30/12 SCALE: NTS APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS	CITY ENGINEER
REV	DATE	BY

**STANDARD  
 WATER SERVICE  
 CONNECTION  
 1½" & 2" COPPER**

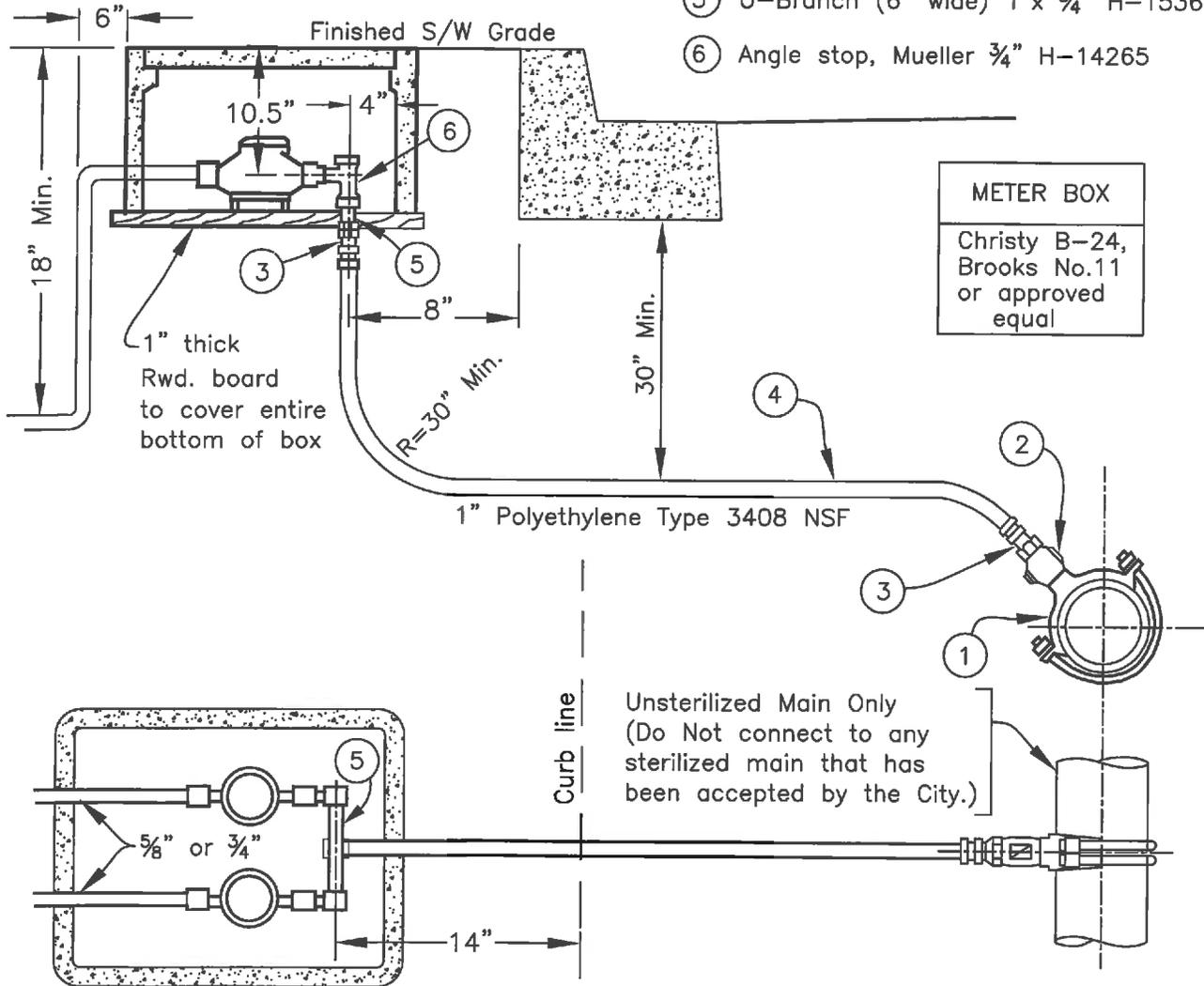
DWG. NO.	<b>SD-217</b>
FILED	
SHT.	<b>1 of 1</b>

**NOTES:**

1. The water service piping shall be run in a straight line perpendicular to the curb.
2. Where meter serves two lots, service and meter box must be centered on common property line.
3. Water Department only will install meter.
4. Tracer wire shall be installed from tap to meter box. Tape wire to tubing at top location without contact with bronze fittings. Wire shall be copper, Type THNN wire size AWG #12.
5. Stainless steel liners shall be used with all compression fittings.
6. Water meter shall be located a minimum of 2' away from top of driveway flare or any other facility.
7. Polyethylene pipe ends shall be trimmed with Mueller H-18017 tool or equal.
8. For use on domestic & irrigation services only. Not for use on fire or combined services.

WATER MAIN		TAP	CORP. STOP
SIZE	TYPE		
4" and larger	DIP	Saddle: J-979 or H-16102 through H-16116	H-10013
	PVC	Saddle: J-996 or H-13490 through H-13494	

- ① Saddle, double strap and all bronze
- ② Corporation stop, 1" H-15456
- ③ Coupling 1" H-15456
- ④ 1" Polyethylene (Iron pipe size only) Type 3408 NSF
- ⑤ U-Branch (6" wide) 1"x 3/4" H-15364
- ⑥ Angle stop, Mueller 3/4" H-14265

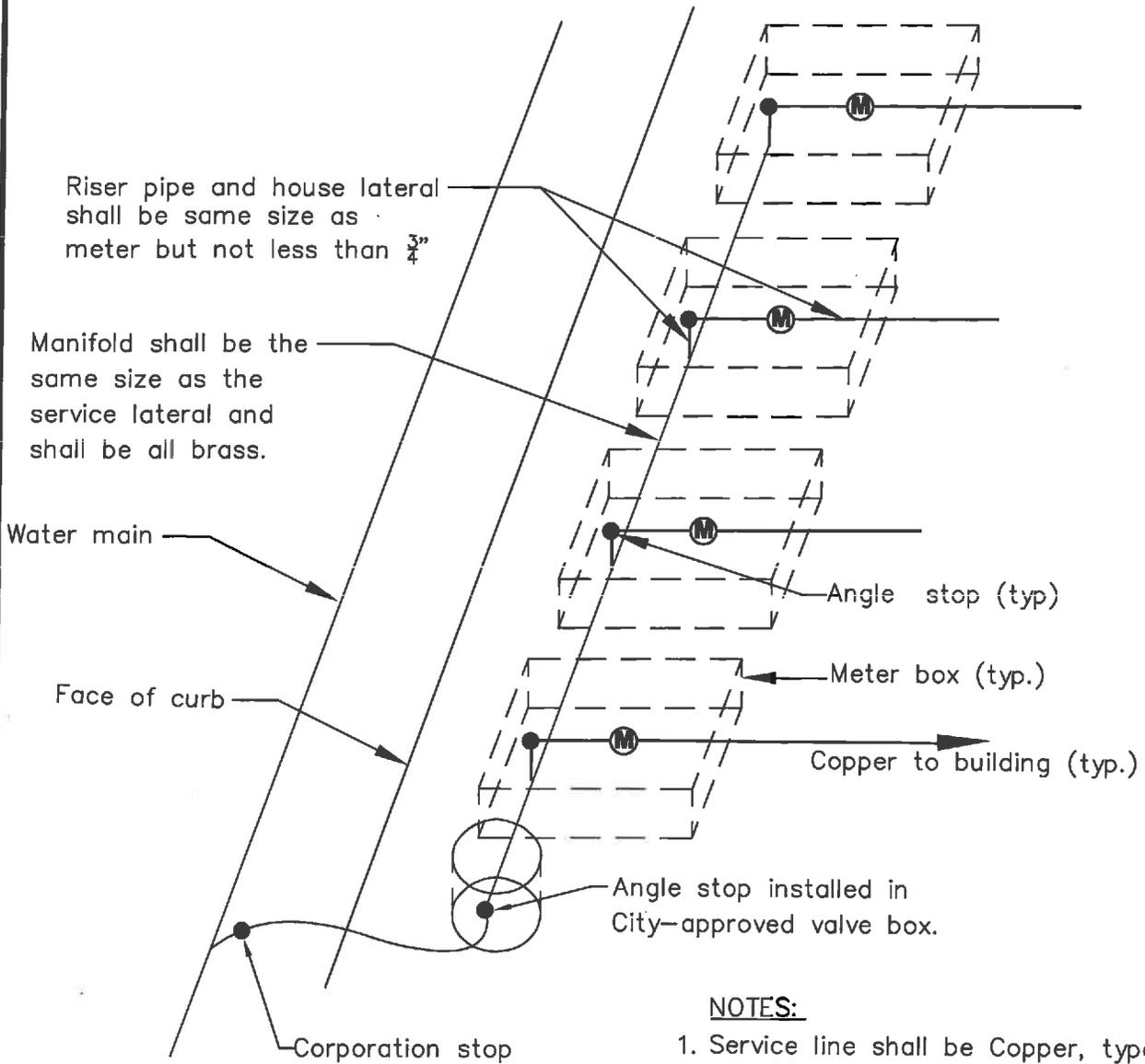


**METER BOX**  
Christy B-24,  
Brooks No.11  
or approved  
equal

Curb line

Unsterilized Main Only  
(Do Not connect to any  
sterilized main that has  
been accepted by the City.)

		<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD PLASTIC DUAL WATER SERVICE CONNECTION</b>		DWG. NO. <b>SD-218</b>	
DRAWN BY: JT		DATE: 11/30/12				FILED	
CHECKED BY: JF		SCALE: NTS				SHT. 1 OF 1	
APPD. BY		APPROVED					
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS			



**NOTES:**

1. Service line shall be Copper, type "K".
2. Manifold installation requires 15" from face of curb to center of angle stop (springline).
3. Water meter shall be located a minimum of 2' clear from top of driveway flare.

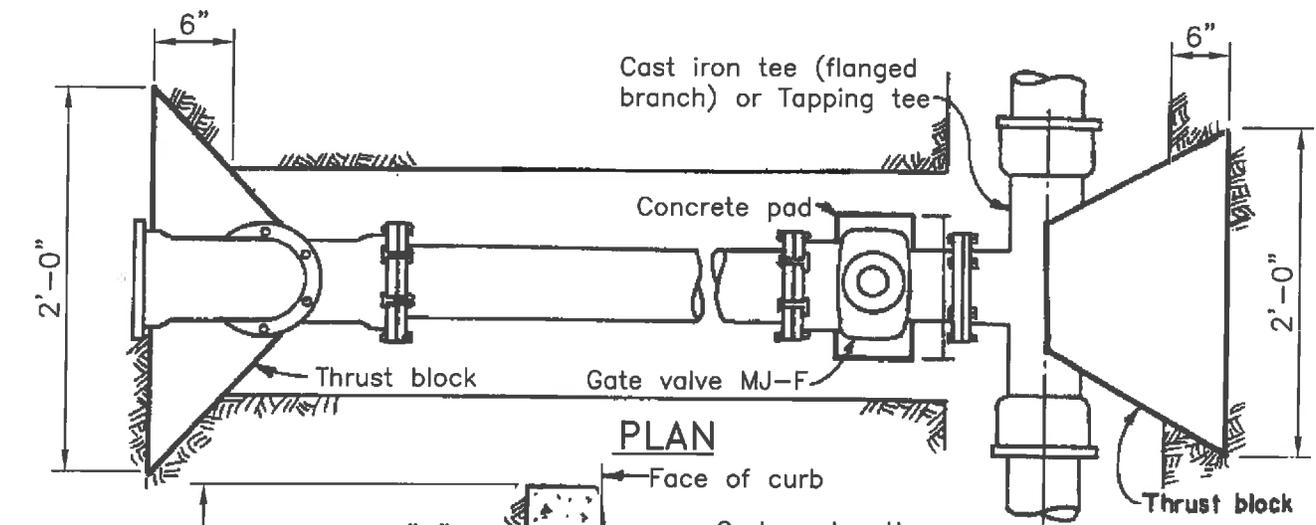
**MANIFOLD VS METER SIZE**

MANIFOLD SIZE	METER SIZE			METER COUNT
	5/8"	3/4"	1"	
2"	8			8
2"	7	1		8
2"	5	2		7
2"	3	3		6
2"	2	4		6
2"		5		5
2"		3	1	4
2"		2	2	4
2"			3	3
1.5"	5			5
1.5"	3	1		4
1.5"	2		1	3
1.5"	1	2		3
1.5"		3		3

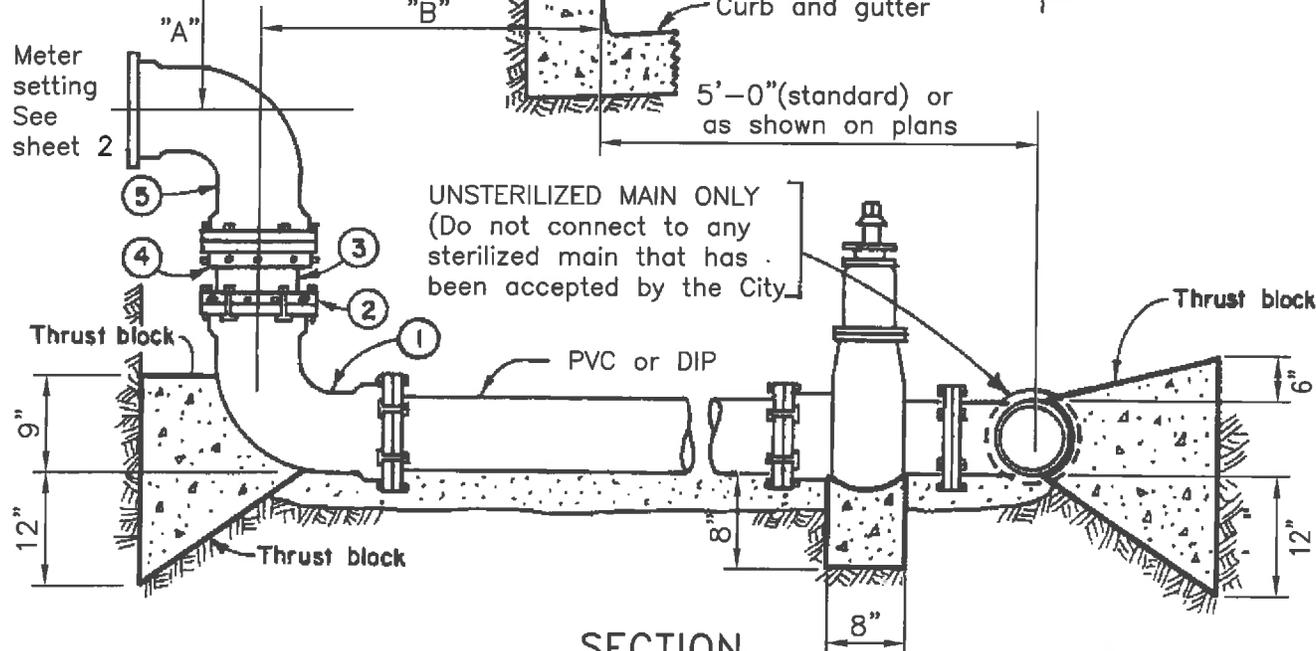
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			
			DRAWN BY: FM CHECKED BY: JF APPD. BY:
REV	DATE	BY	CITY ENGINEER

**STANDARD SERVICE MANIFOLD FOR THREE OR MORE METERS**

DWG. NO.	<b>SD-219</b>
FILED	
SHT.	<b>1 OF 1</b>



**PLAN**



**SECTION**

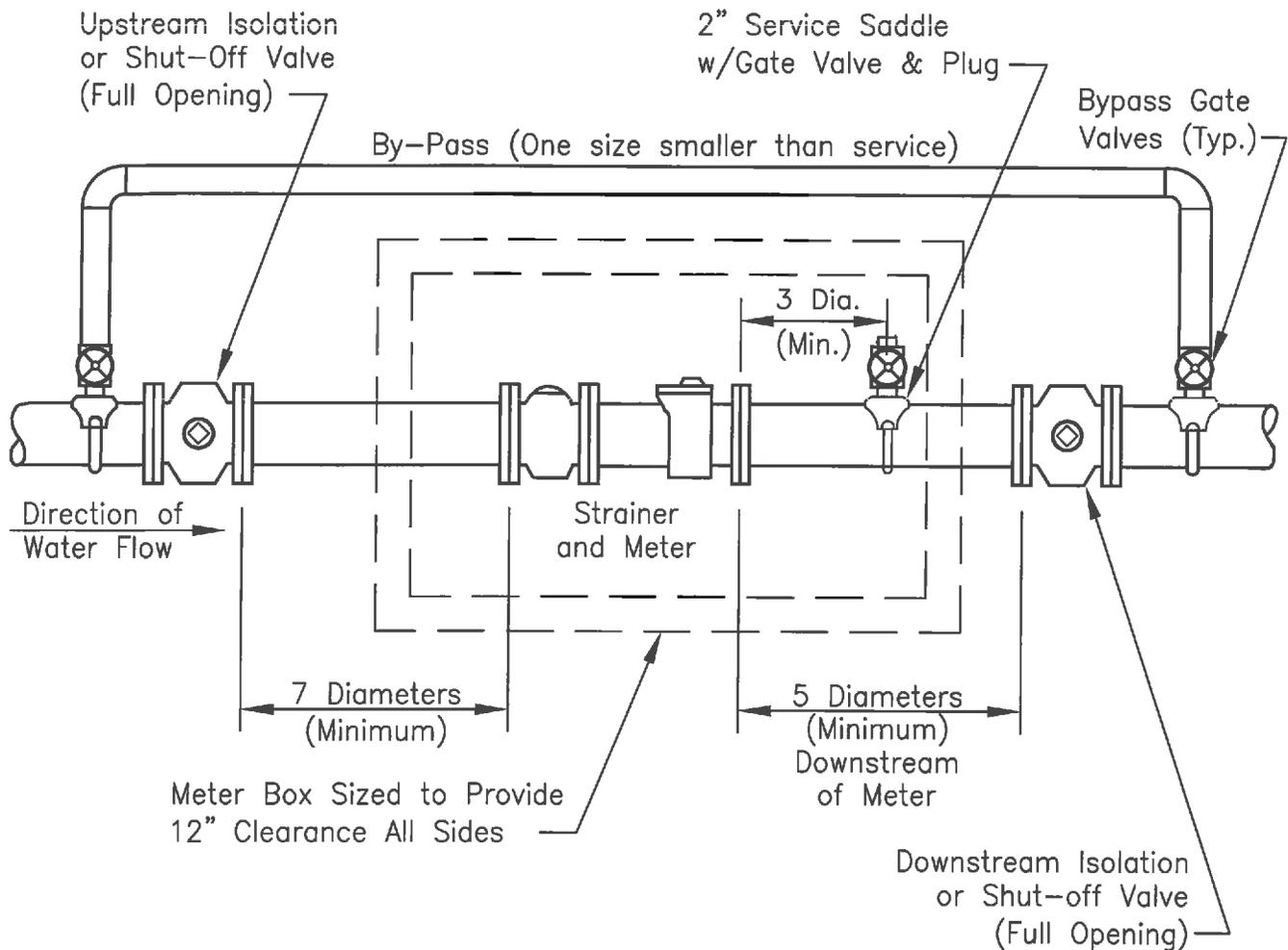
- ① 90° Ell, MJ x MJ
- ② Retainer Gland
- ③ DIP
- ④ Uniface
- ⑤ 90° Ell, F x F

METER SIZE	A	B
3"	17"	14"
4"	19"	14"
6"	24"	14"

**NOTES:**

1. Concrete shall not extend past face of bell or joints.
2. Thrust blocks shall be formed with lumber.
3. Thrust blocks shall be poured against undisturbed soil.
4. Class "C" Portland cement concrete shall be used.
5. Remove forms before backfilling.
6. See SD-228 for installation of tracer wire when PVC is used.

<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD LARGE METER WATER SERVICE</b></p>	DWG. NO. <b>SD-220</b>
DRAWN BY:	FM	DATE		01/29/12
CHECKED BY:	JF	SCALE:	NTS	SHT. <b>1</b> OF <b>2</b>
APPD. BY		APPROVED		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS



PLAN

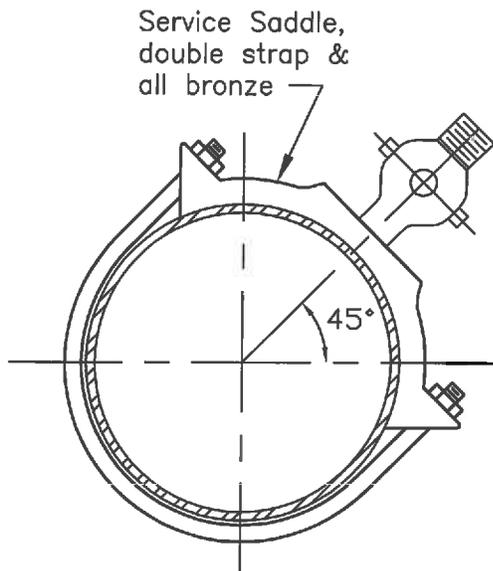
NOTES:

1. Valve boxes shall be installed at all buried valves.
2. Valves less than 4" shall be provided with handwheels. All others shall be furnished with a 2" square nut.

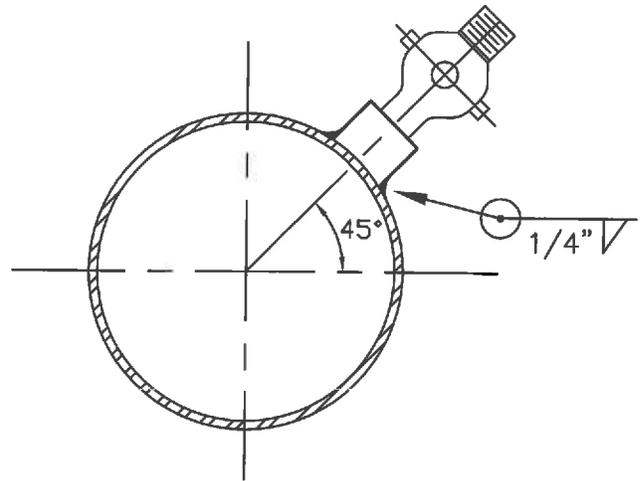
 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			
			DRAWN BY: FM CHECKED BY: JF APPD. BY:
REV	DATE	BY	CITY ENGINEER

**STANDARD  
LARGE METER  
WATER SERVICE**

DWG. NO.	<b>SD-220</b>
FILED	
SHT.	<b>2 OF 2</b>



SERVICE SADDLE  
A.C.P., D.I.P. & P.V.C.

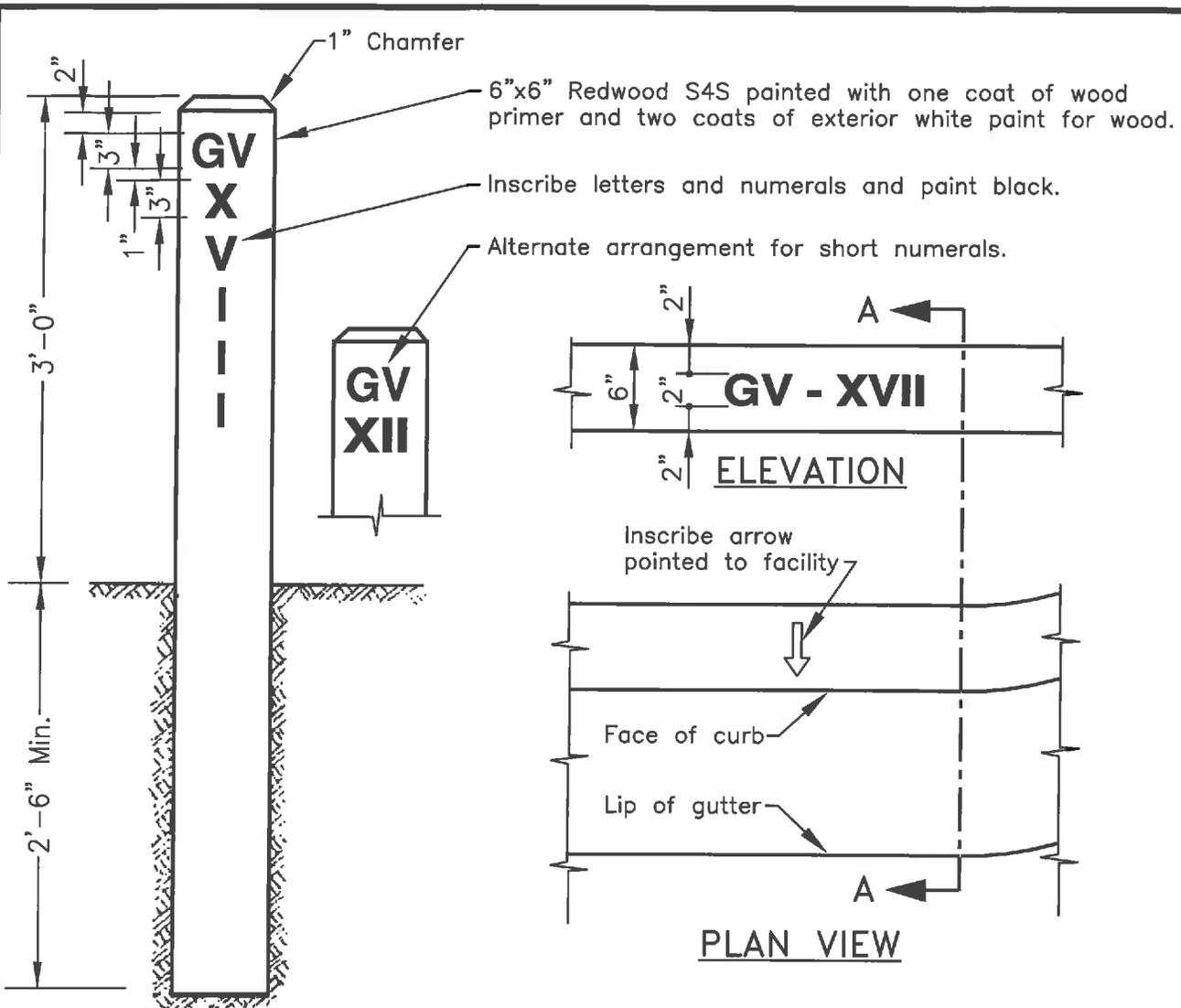


WELDING COUPLING—STEEL MAIN

NOTES:

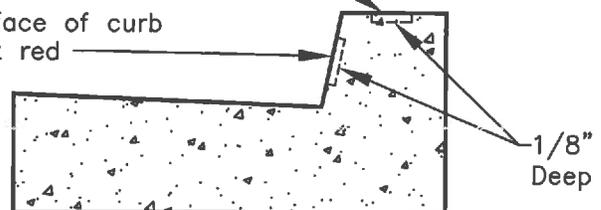
1. All taps on steel mains shall be attached by welded coupling method. Clamp with nylon bushing shall be used on service saddles.
2. Taps shall not be closer than 12" from another tap.
3. Coat welded coupling on steel main with same protective coating as on main, or as specified by the City Engineer.
4. Install service line as shown on SD-213 through SD-219.
5. Service line shall be located 2 feet minimum away from top of driveway flare and 6 feet minimum from sanitary sewer house lateral.
6. A "W" is to be chiseled or stamped and painted red on face of curb at service location.
7. Wet tap shall be made by City Water Distribution Personnel ONLY.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD LARGE MAIN SERVICE CONNECTION</b>		DWG. NO. <b>SD-221</b>	
			DRAWN BY: FM      DATE: 01/19/12 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS	FILED				
REV	DATE	BY				SHT. <b>1</b> OF <b>1</b>		



**MARKER POST**

Inscribe arrow on top of curb by chiseling and paint red  
 Inscribe numerals in face of curb by chiseling and paint red



**SECTION A-A**

**NOTES:**

1. Where permanent curbs exist, references shall be inscribed on top of curb at point nearest to the facility.
2. A marker post shall be erected where there are no permanent curb.
3. Marker posts and their markings shall face the facility.
4. Location of marker posts shall be as directed by the City Engineer.
5. Distance from face of curb or marker post to facility shall be shown in Roman Numerals, to the nearest whole foot.

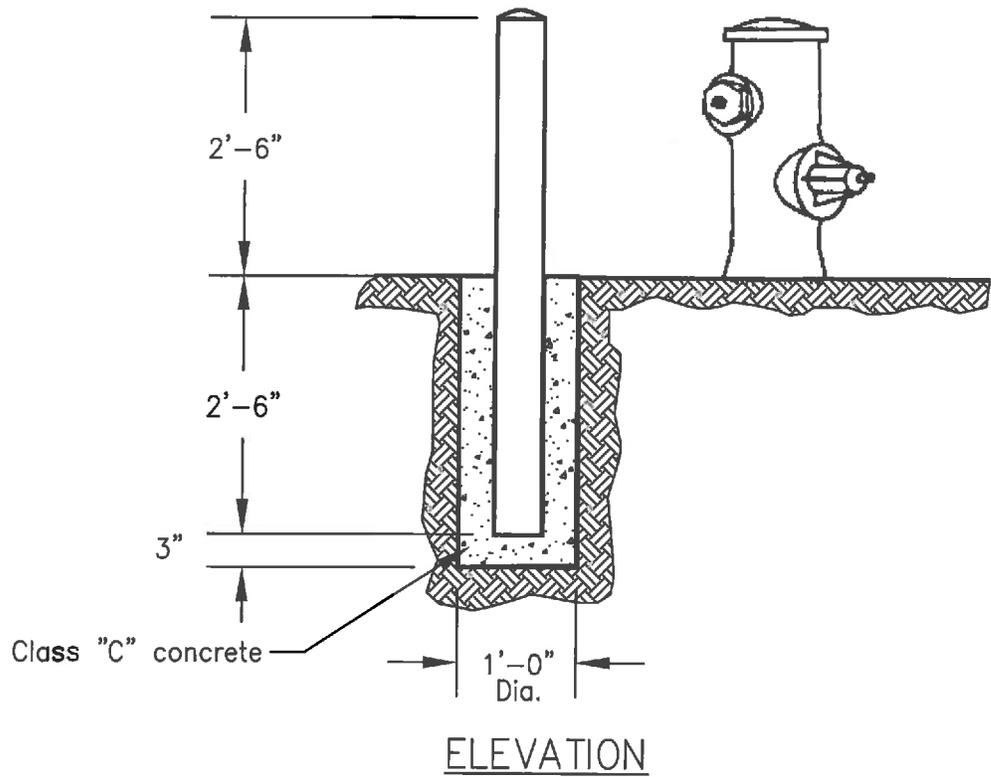
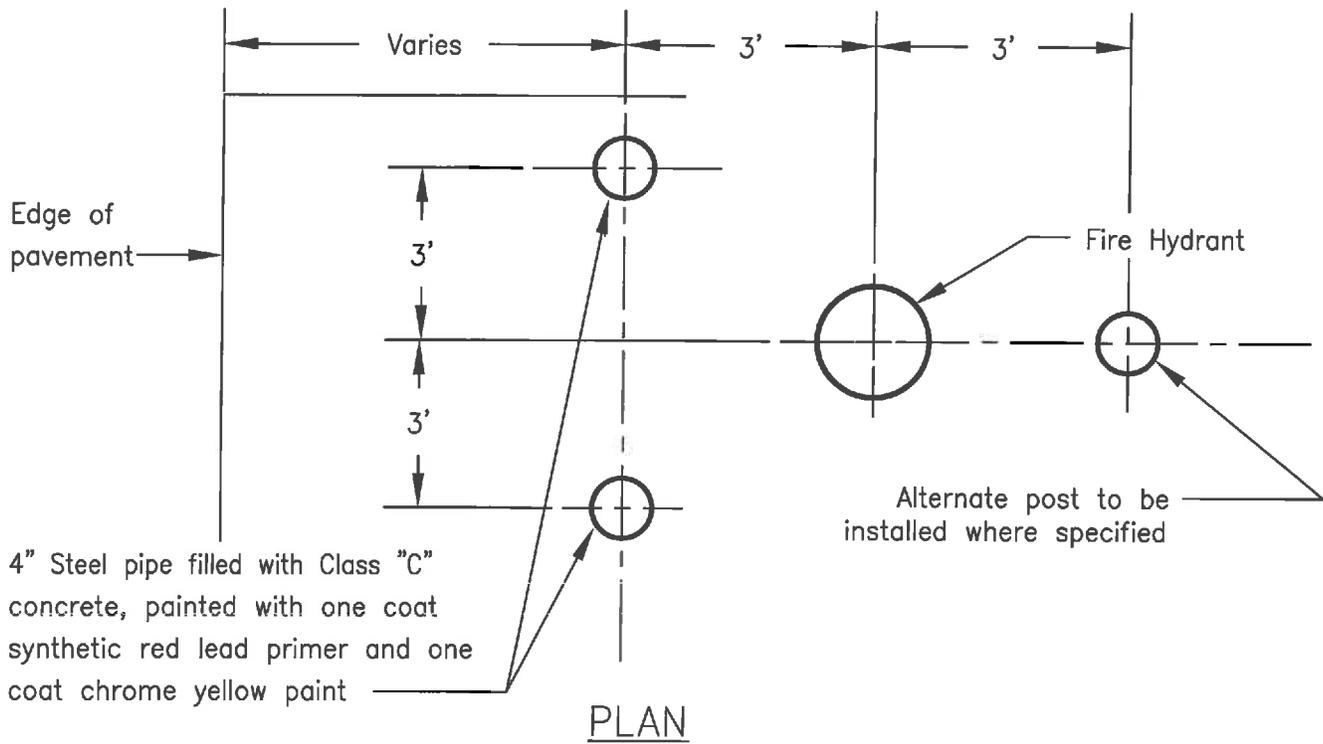
**FACILITY DESIGNATIONS**

AV	Air Valve
BO	Blow Off
BV	Butterfly Valve
CTS	Cathodic Protection Test Station
ETS	Electrolysis Test Station
GV	Gate Valve
MH	Manhole
Mon	Monument
PRS	Pressure Regulating Station

<p>DRAWN BY: FM</p>	<p>DATE: 01/19/12</p>	
<p>CHECKED BY: JF</p>	<p>SCALE: NTS</p>	
<p>APPD. BY</p>	<p>APPROVER</p>	
<p>REV</p>	<p>DATE</p>	<p>BY</p>
		<p>CITY ENGINEER</p>
		<p>DIR. PUBLIC WORKS</p>

**STANDARD FACILITY REFERENCES**

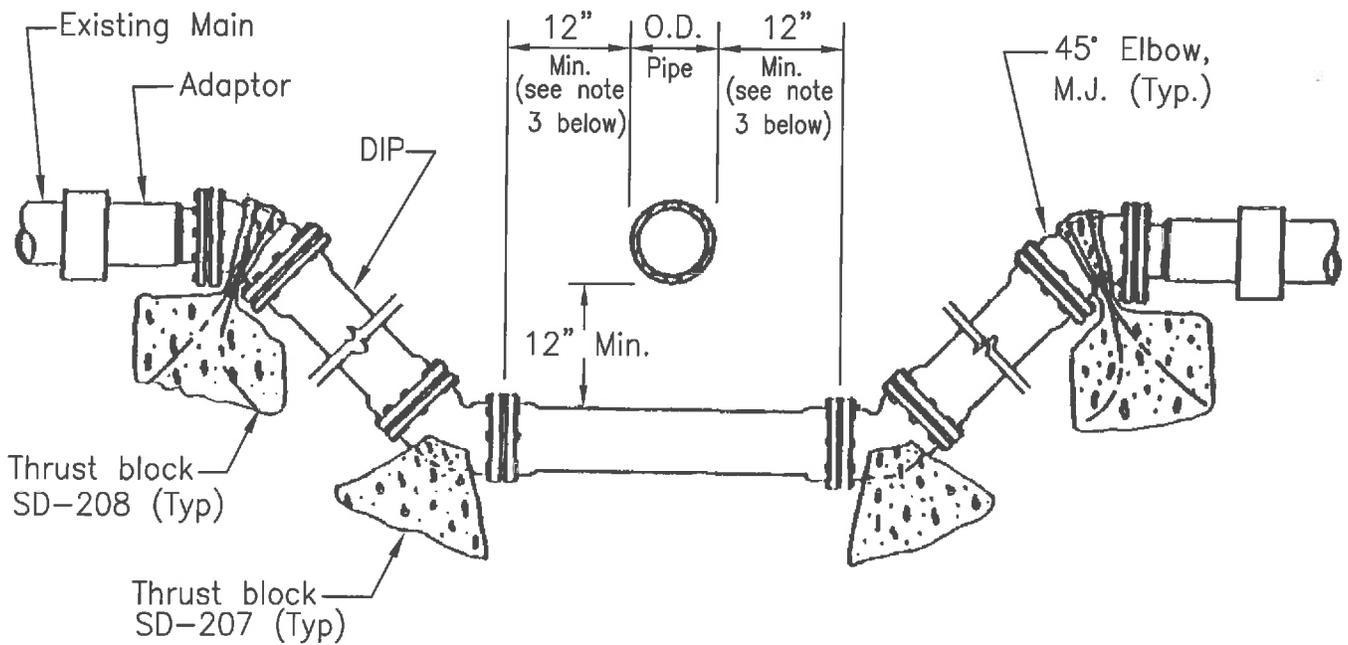
DWG. NO.	<b>SD-222</b>
FILED	
SHT.	<b>1 OF 1</b>



**NOTES:**

This installation shall be used in areas without curb and gutter.

			<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>		<p><b>STANDARD HYDRANT BOLLARD INSTALLATION</b></p>	DWG. NO. <b>SD-223</b>
			DRAWN BY: FM      DATE: 01/19/12 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i>	FILED		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		SHT. <b>1</b> OF <b>1</b>



**NOTES:**

1. All ductile iron pipe shall have a fusion bonded epoxy finish or shall be wrapped with polyethylene sheeting.
2. In lieu of thrust blocks, "Megalug" retainer glands as manufactured by EBAA Iron Inc. or equal may be utilized if properly designed and approved by the City Engineer.
3. This dimension shall be a minimum of 8' if the water main drop is necessary to avoid a pipe conveying sanitary sewer, storm drain, recycled water or hazardous fluids (Title 22 CCR, Div. 4, Ch.16, Art. 4).
4. Maximum depth of water main drop shall not exceed 9' without City Engineer's approval.
5. An inverted drop, or rise, may be used where a drop would exceed 9' depth, with City Engineer's approval. Minimum cover of water main shall be 30 inches.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD DUCTILE IRON DROP</b>	DWG. NO. <b>SD-224</b>
			DRAWN BY: FM	DATE: 11/30/12		FILED
			CHECKED BY: JF	SCALE: NTS		
			APPD. BY	APPROVED		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		SHT. <b>1</b> OF <b>1</b>

PURPOSE:

To provide temporary water for construction and minimum fire protection to new developments prior to and for the activation of a new water system.

TEMPORARY SERVICE METER:

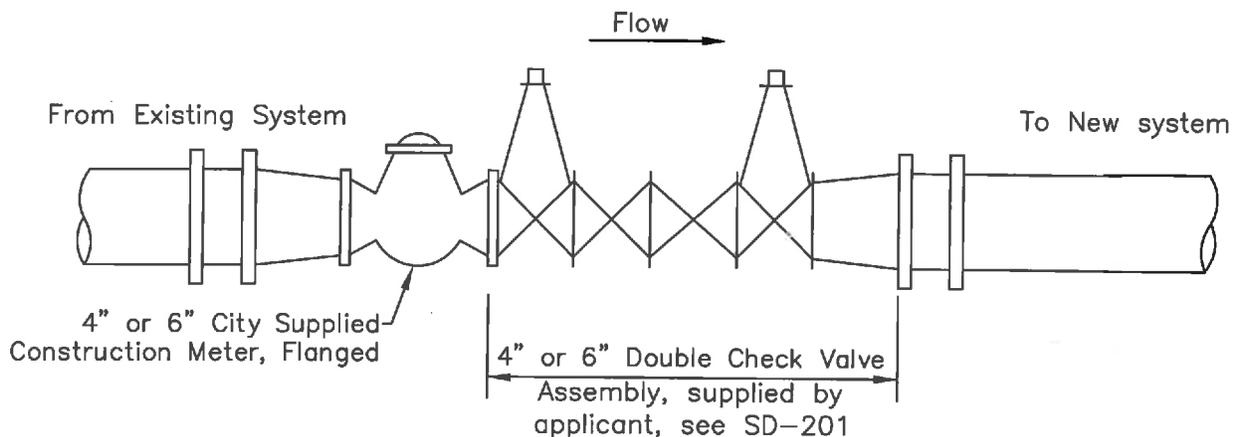
A "TEMPORARY PERMIT FOR WATER USE" shall be obtained when the required deposit is made by the applicant in the Revenue Office at City Hall, First Floor, 777 B Street, (510-583-4632). The construction meter or Hydrant RP Assembly can then be picked up in the Corporation Yard at the Water Distribution Office, 24504 Soto Road, (510-881-7933).

INSTALLATION:

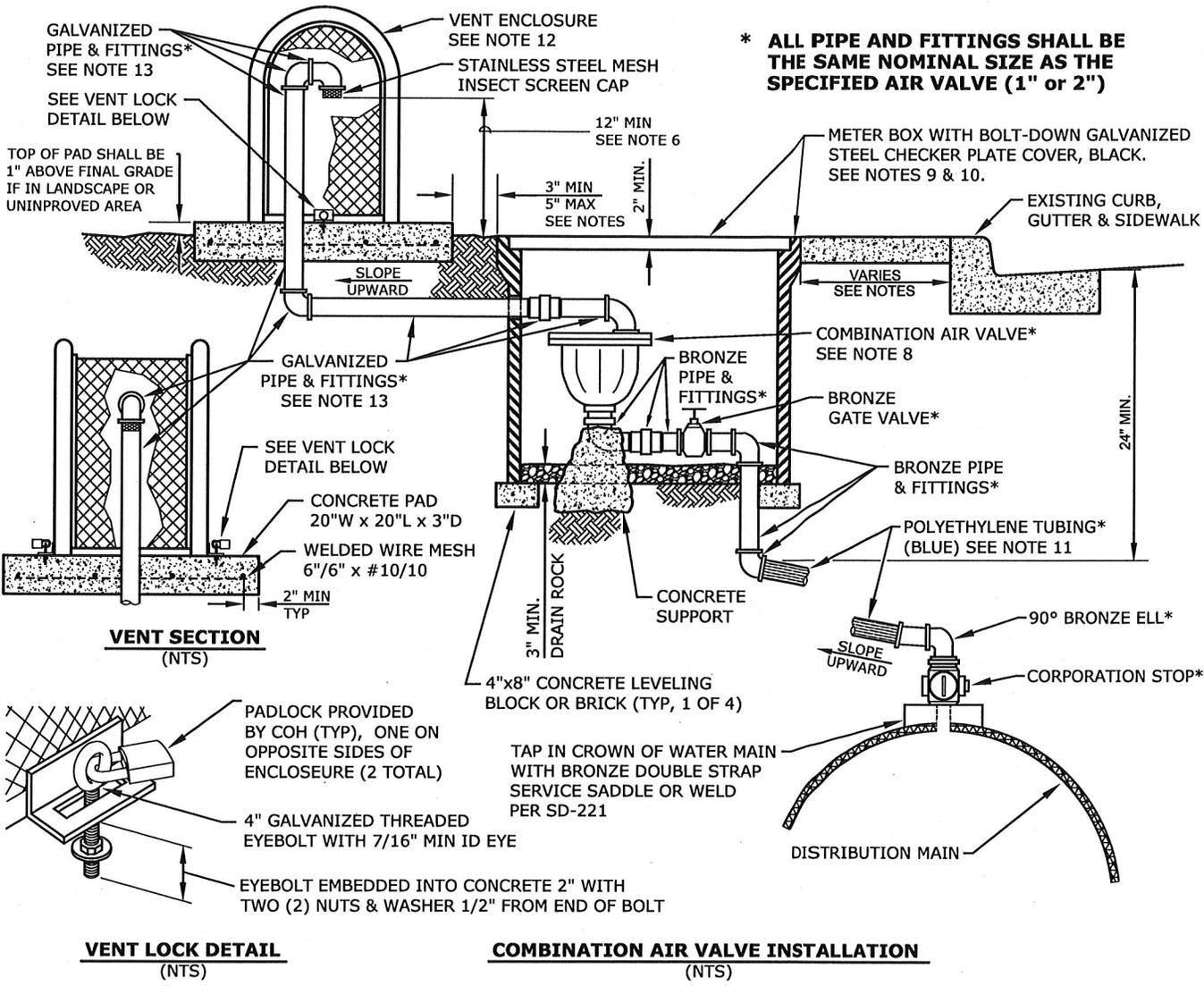
All materials for the temporary service, excluding the City supplied construction meter or Hydrant RP Assembly, shall be supplied by the applicant. The installation shall be made by the applicant except for wet tap to the existing water system. The installation shall be inspected by a City of Hayward construction inspector.

Before providing temporary potable water service, a new water system shall be tested at 200 psi for 1 hour by the applicant and bacteriological tested by the City (typ. 3 workday turnaround).

Hydrant meter assemblies are available in 3/4" or 3" and come with a RP Backflow device attached. Construction meters are available in 4" or 6".



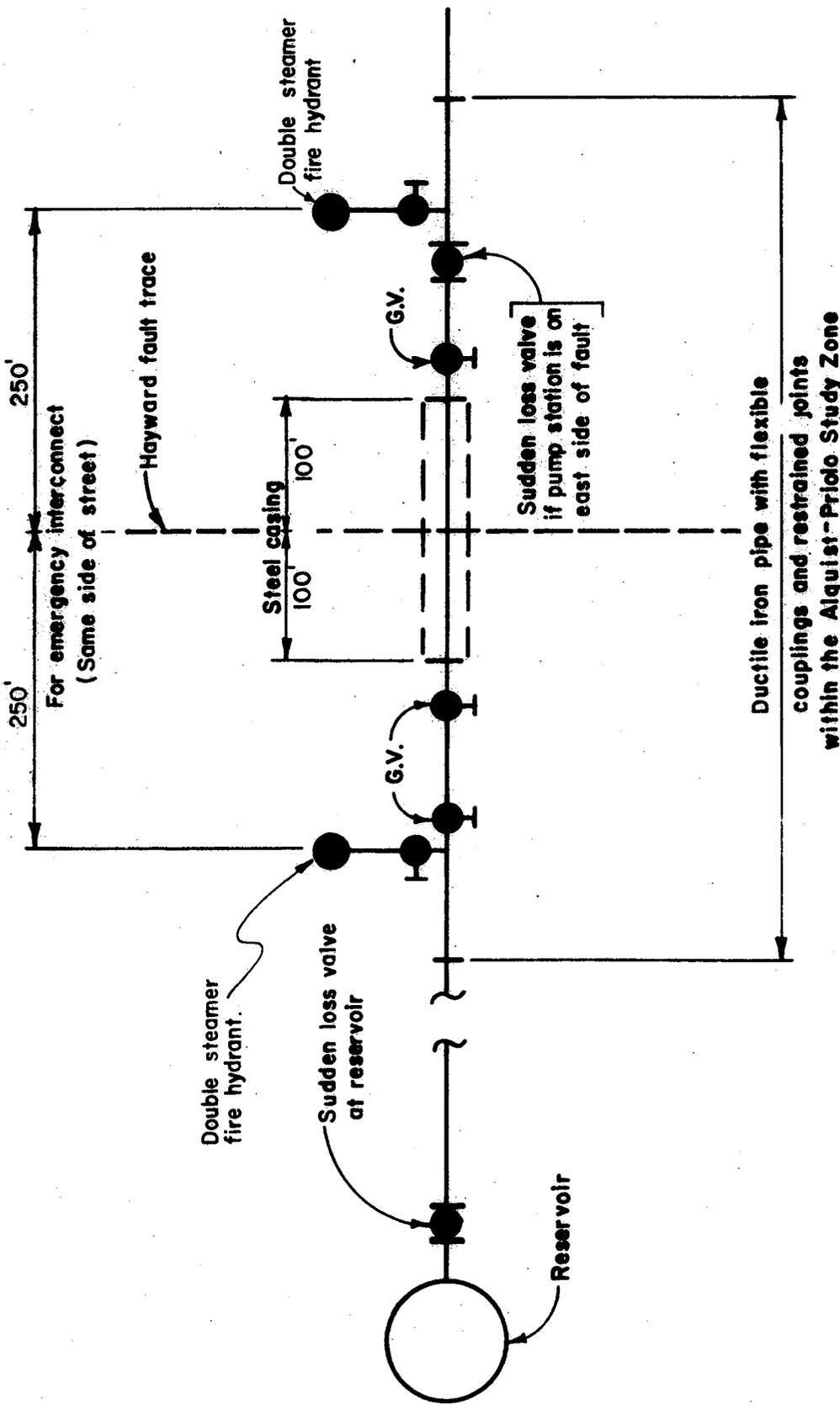
			 <b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>	<b>STANDARD TEMPORARY SERVICE METER &amp; BACKFLOW ASSEMBLY</b>	DWG. NO. <b>SD-225</b>
					CHECKED BY: JF
			DATE: 01/25/12	APPROVED: 	SHT. <b>1</b> OF <b>1</b>
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS	



- NOTES:**
1. ALL AIR VALVE ASSEMBLIES SHALL CONFORM TO AWWA C-512.
  2. ALL PIPING SHALL MAINTAIN AN UPWARD GRADE FROM THE CORPORATION STOP TO THE GROUND SURFACE.
  3. IF AIR VALVE LOCATION IS AT AN INTEGRAL CURB AND SIDEWALK OVER 10 FEET WIDE, INSTALL AIR VALVE AT BACK OF CURB. IF INSTALLED IN FURNISHINGS ZONE OF SIDEWALK, VENT ASSEMBLY SHALL BE INSTALLED PRIOR TO SIDEWALK CONSTRUCTION, CONCRETE PAD SHALL BE OMITTED AND VENT ENCLOSURE SHALL BE ATTACHED TO SIDEWALK.
  4. IF AIR VALVE LOCATION IS IN AN AREA WITHOUT CURBS, INSTALL AT LOCATION AS DIRECTED BY CITY.
  5. WHERE APPROVED OR REQUIRED BY CITY, AIR VALVE AND VENT ASSEMBLY MAY BE INSTALLED UPTO 18 INCHES BEHIND PROPERTY LINE (INSIDE PRIVATE PROPERTY) PROVIDED MINIMUM COVER, SLOPE AND CLEARANCE REQUIREMENTS ARE MAINTAINED.
  6. VENT OUTLET SHALL BE A MINIMUM 1 FOOT ABOVE FINISHED GRADE OR 1 FOOT ABOVE THE CALCULATED 100-YEAR FLOOD WATER LEVEL OR HIGHEST RECORDED WATER LEVEL, WHICHEVER IS HIGHER.
  7. AIR VALVE SHALL BE INSTALLED IN A POSITION SUCH THAT IT MAY BE ROTATED 360° WITHIN THE METER BOX. GATE VALVE SHALL BE INSTALLED IN A POSITION SUCH THAT THERE IS SUFFICIENT CLEARANCE BETWEEN THE HANDWHEEL AND THE BOX FOR EASY OPERATION.
  8. 1" COMBINATION AIR VALVE SHALL BE DeZURIK 143C, CLA-VAL 361-CAV564.3 OR APPROVED EQUAL;  
2" COMBINATION AIR VALVE SHALL BE DeZURIK 145C, CLA-VAL 362-CAV332.3 OR APPROVED EQUAL.
  9. METER BOX SHALL BE CHRISTY N36, BROOKS NO. 66 OR APPROVED EQUAL. MANUFACTURER'S BOX EXTENSIONS SHALL BE USED IF NEEDED.
  10. METER BOX LID SHALL BE INSCRIBED "HWD-AV." WHEN METER BOX IS LOCATED IN A TRAFFIC SUSCEPTIBLE AREA, LID SHALL BE H20 RATED AND BOX SHALL BE CEMENTED IN PER SD-205.
  11. TRACER WIRE SHALL BE INSTALLED FROM THE CORPORATION STOP TO THE GATE VALVE, PER SD-228.
  12. VENT ENCLOSURE SHALL BE BPD1 GS-5 OR APPROVED EQUAL. COLOR SHALL BE DARK GREEN (TYP) OR AS SHOWN ON APPROVED PLANS.
  13. GALVANIZED VENT PIPE WITHIN THE VENT ENCLOSURE SHALL BE COATED WITH TWO COATS OF RUST-OLEUM PAINT COLORED TO MATCH THE ENCLOSURE COLOR. PIPE SURFACE SHALL BE PREPARED PER PAINT MANUFACTURER'S RECOMMENDATIONS.

			DWG. NO.	<b>SD-226</b>
			FILED	
REV	DATE	BY	SHT. <b>1</b> OF <b>1</b>	
CITY ENGINEER			DIR. UTILITIES & ENV SVCS	

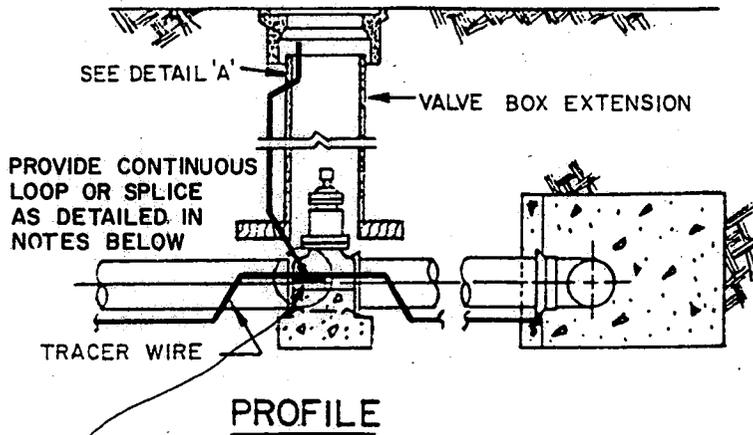
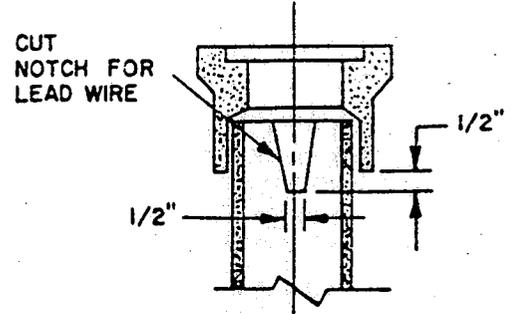
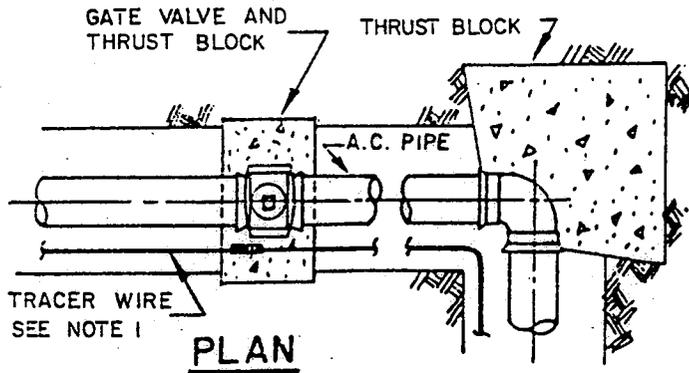
**STANDARD**  
**COMBINATION AIR VALVE**  
**1" & 2"**



**NOTES:**

- 1. SEE FILE DRAWING H-495 FOR LIMITS OF ALQUIST-PRIOLO FAULT STUDY ZONE.
- 2. SUDDEN LOSS VALVES SHALL BE APPROVED BY THE CITY ENGINEER.

REV.	DATE	BY	CITY OF HAYWARD ENGINEERING DIVISION		STANDARD WATER TRANSMISSION MAIN CROSSING AT THE HAYWARD FAULT	DWG. NO. <b>SD-227</b>
			DRAWN BY: <b>RWK</b>	DATE: <b>SEP 29, 1992</b>		FILED <b>6-15-93</b>
			CHECKED BY: <b>T.M.</b>	SCALE: <b>None</b>		SHT. <b>1</b> OF <b>1</b>
			APPD. BY: <b>RAB</b>	APPROVED		
			CITY ENGR.	DIR. PUBLIC WORKS		



See Note 3

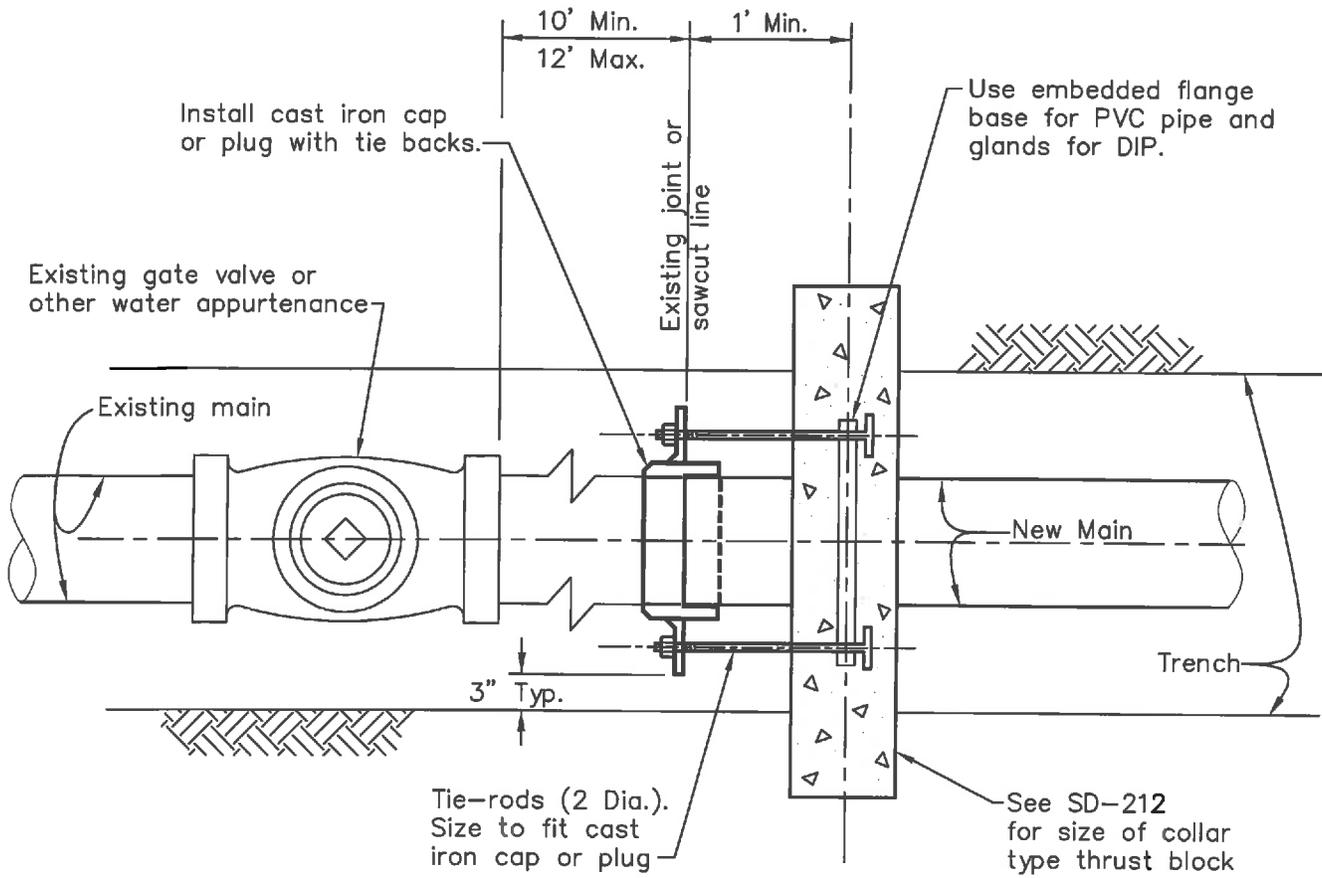
**NOTES**

1. CONTRACTOR SHALL USE CARE TO PREVENT DAMAGE TO TRACER WIRE WHEN PLACING CONCRETE.
2. ALL WIRE SHALL BE COPPER, TYPE THHN WIRE SIZE A. W. G. #12.
3. SPLICES SHALL BE MADE WITH TWO COPPER OR BRASS SPLIT BOLT FASTENER WITHOUT ENCAPSULATION IN EPOXY.
4. TRACER WIRES SHALL BE INTER-CONNECTED AT PIPE TEES AND CROSSES AND VALVES.
5. CONTINUITY TESTS SHALL BE CONDUCTED AS DIRECTED BY THE CITY ENGINEER.
6. TRACER WIRE IS REQUIRED ON ALL NON-METALIC MAIN LINE PIPE AND HYDRANT RUNS.

CITY OF HAYWARD ENGINEERING DIVISION		
DRAWN BY: <i>F.M.</i>	DATE: <i>4-1-93</i>	
CHECKED BY: <i>T.M.</i>	SCALE: NONE	
APPD. BY: <i>LAB</i>	APPROVED <i>Rubain</i>	
REV.	DATE	BY
		CITY ENGR. DIR. PUBLIC WORKS

**TRACER WIRE  
INSTALLATION**

DWG. NO. **SD-228**  
 FILED **6-15-93**  
 SHT. **1** OF **1**



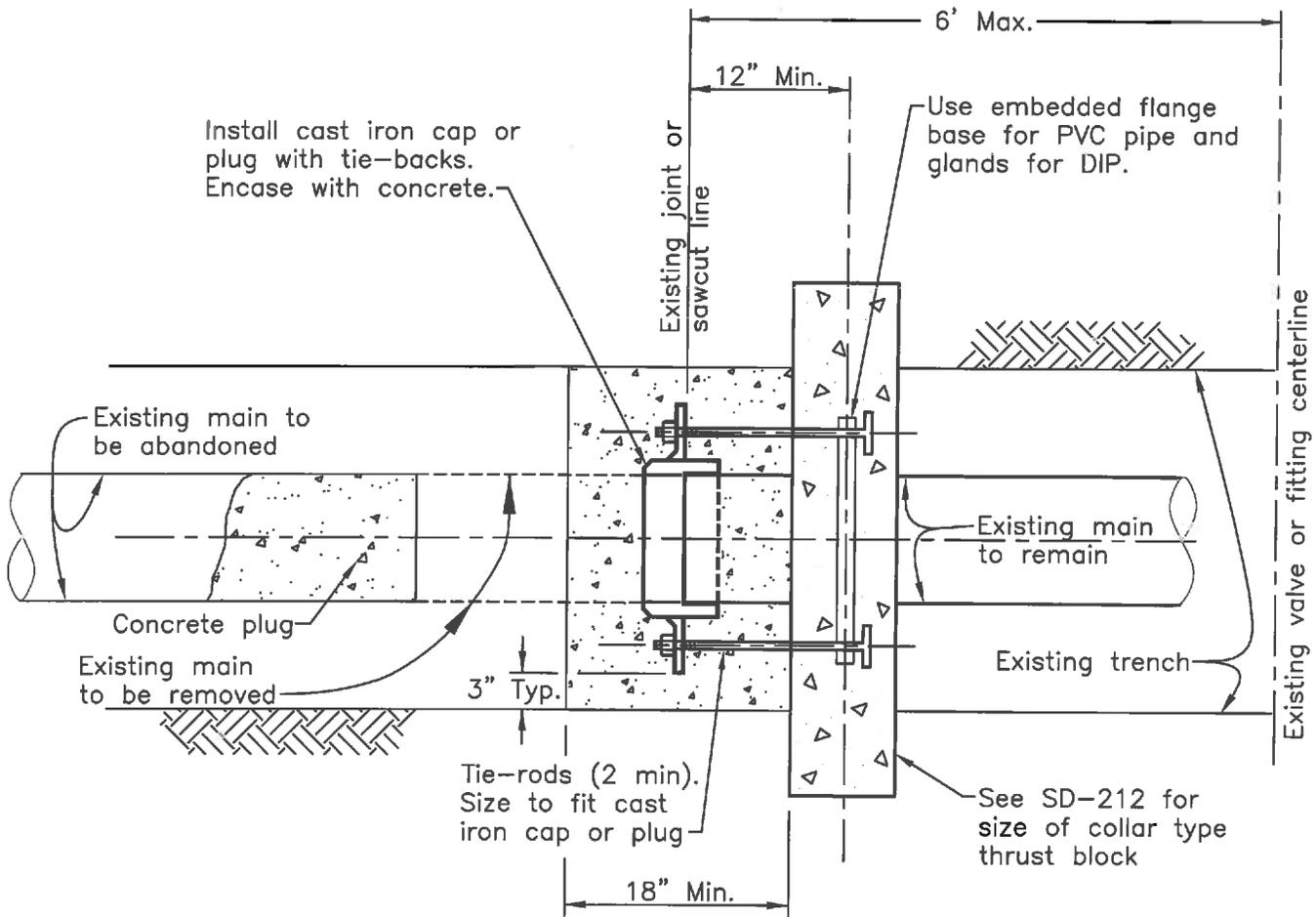
**PLAN**

NOT TO SCALE

**NOTES:**

1. Other methods of testing the new main that do not disturb existing water facilities may be employed only if pre-approved by the City Engineer prior to use. Pressure testing the new main against existing water facilities is not allowed.
2. Standard Detail SD-231 entitled "STANDARD JUMPER PIPE" depicts an approved mechanism for transferring water from the existing main to the new main for pressure and bacteriological testing of the new main. The "cast iron cap or plug" cited above can be modified to accommodate SD-231 for the jumper detail.

				<b>STANDARD COLLAR TYPE THRUST BLOCK FOR NEW WATER MAIN TESTING</b>	DWG. NO. <b>SD-229</b>
		DRAWN BY: FM      DATE: 01/25/12 CHECKED BY: JF      SCALE: NTS APPD. BY: <i>[Signature]</i> CITY ENGINEER      DIR. PUBLIC WORKS	FILED		
REV	DATE	BY			SHT. <b>1</b> OF <b>1</b>

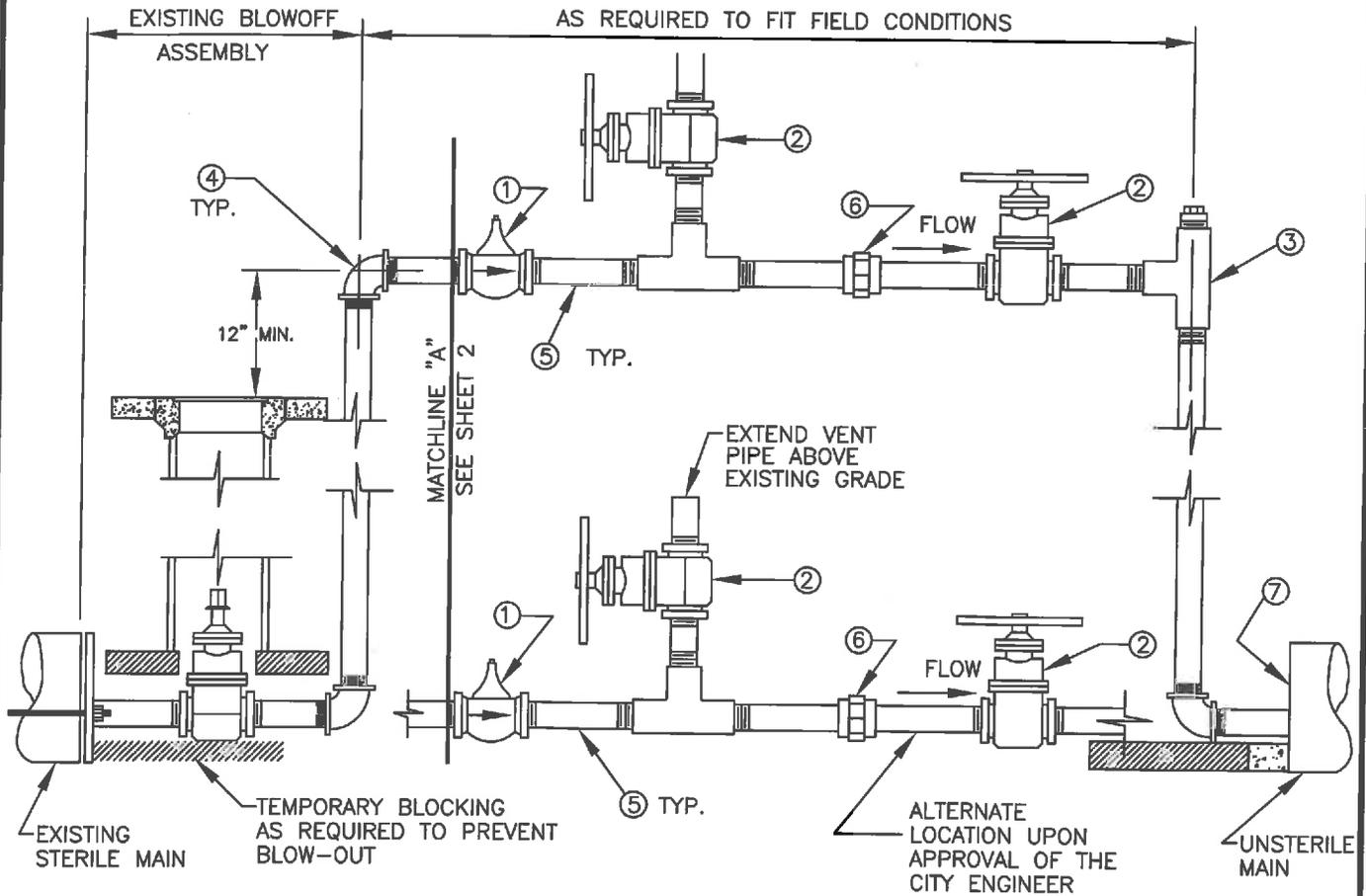


PLAN

**NOTE:**

Other methods of abandonment may be employed only if pre-approved by the City Engineer prior to use.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD COLLAR          TYPE THRUST BLOCK          FOR WATER MAIN          ABANDONMENT</b>	DWG. NO. <b>SD-230</b>
			DRAWN BY: FM	DATE: 08/16/11		FILED
			CHECKED BY: JL	SCALE: NTS		
			APPD. BY	APPROVED		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS		SHT. <b>1</b> OF <b>1</b>

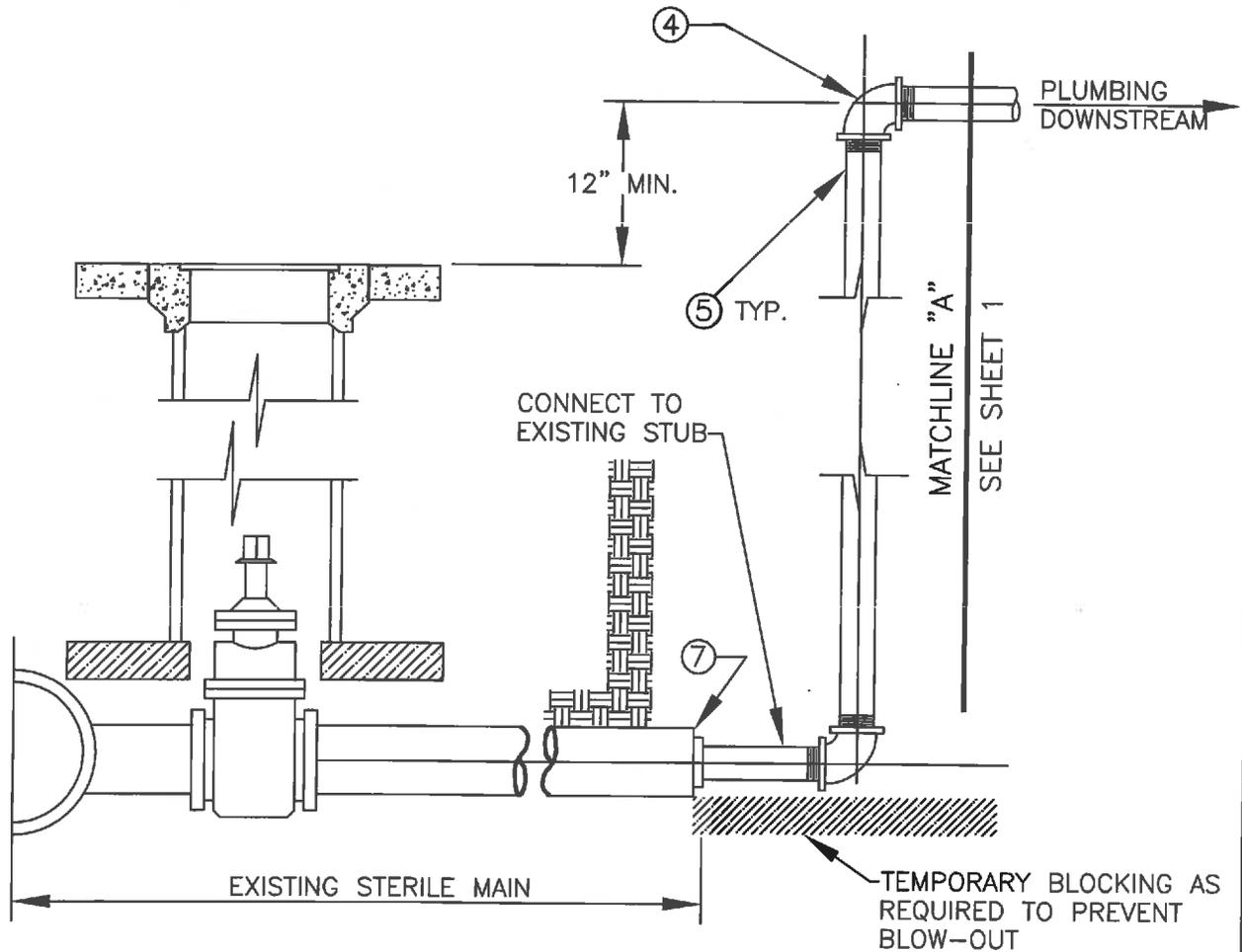


**JUMPER PIPE DETAIL**  
**FROM EXISTING BLOWOFF ASSEMBLY**

			 <b>CITY OF</b> <b>HAYWARD</b> PUBLIC WORKS DEPT.
DRAWN BY: FM		DATE: 01/25/12	
CHECKED BY: JL		SCALE: NTS	
APPD. BY		APPROVED	
REV	DATE	BY	CITY ENGINEER
		DIR. PUBLIC WORKS	

**STANDARD**  
**JUMPER PIPE**

DWG. NO.	<b>SD-231</b>
FILED	
SHT.	<b>1 OF 2</b>



## JUMPER PIPE DETAIL FROM TAPPING AND/OR LINE ASSEMBLY

### NOTES:

ITEM	MATERIAL DESCRIPTION
1	DDCV OR RPP
2	GATE VALVE WITH HANDWHEEL
3	GALVANIZED TEE WITH PLUG
4	90° GALVANIZED ELBOW
5	GALVANIZED PIPE
6	GALVANIZED UNION
7	TAPPED PLUG

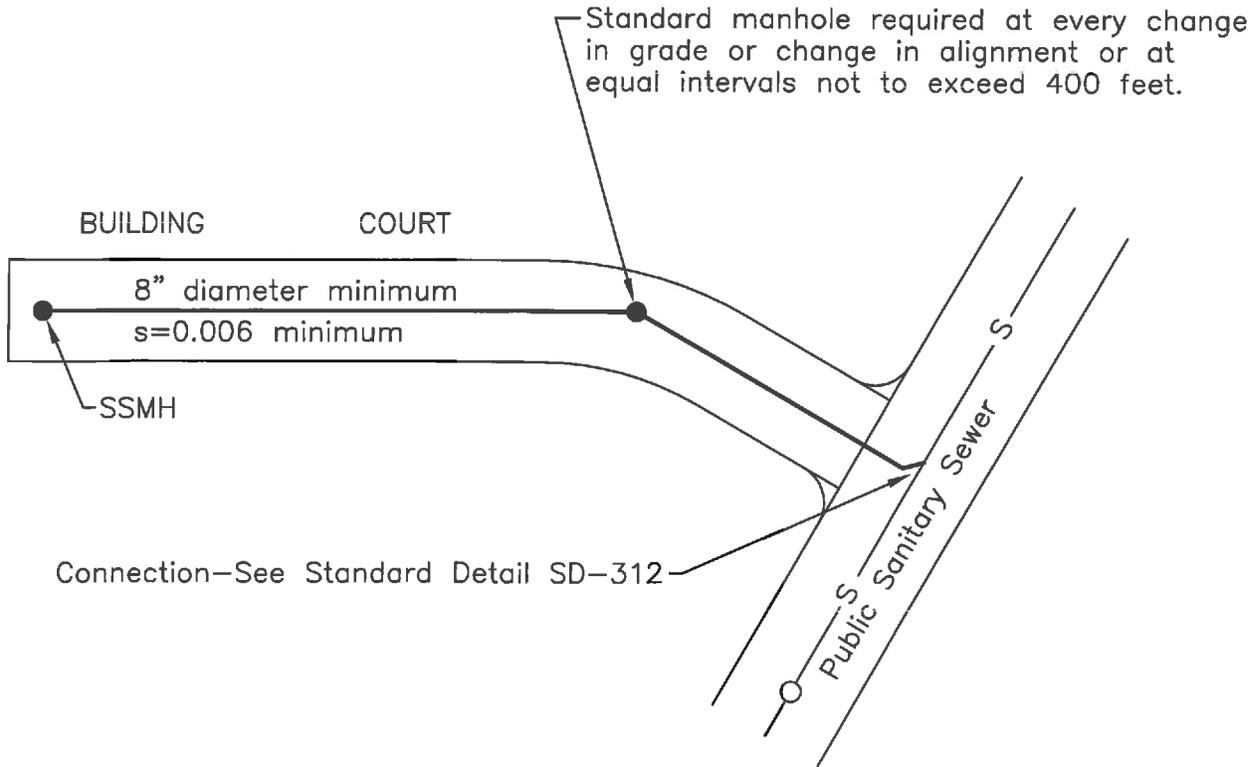
DDCV = DOUBLE DETECTOR CHECK VALVE  
 RPP = REDUCE PRESSURE PRINCIPLE BACKFLOW PREVENTER

- JUMPER PIPE SHALL BE DISINFECTED WITH A MINIMUM 1% SODIUM HYPOCHLORITE SOLUTION PRIOR TO INSTALLATION.
- JUMPER CONSTRUCTION OTHER THAN HEREON SPECIFIED WILL NOT BE ALLOWED WITHOUT PERMISSION OF THE CITY ENGINEER.
- JUMPER SIZE:  
 2" PIPE FOR 10" MAIN OR LESS  
 4" PIPE FOR 12" MAIN
- REPLACEMENT MAIN SHALL BE DISINFECTED AND TESTED PER AWWA STANDARD C651, "DISINFECTING WATER MAINS".

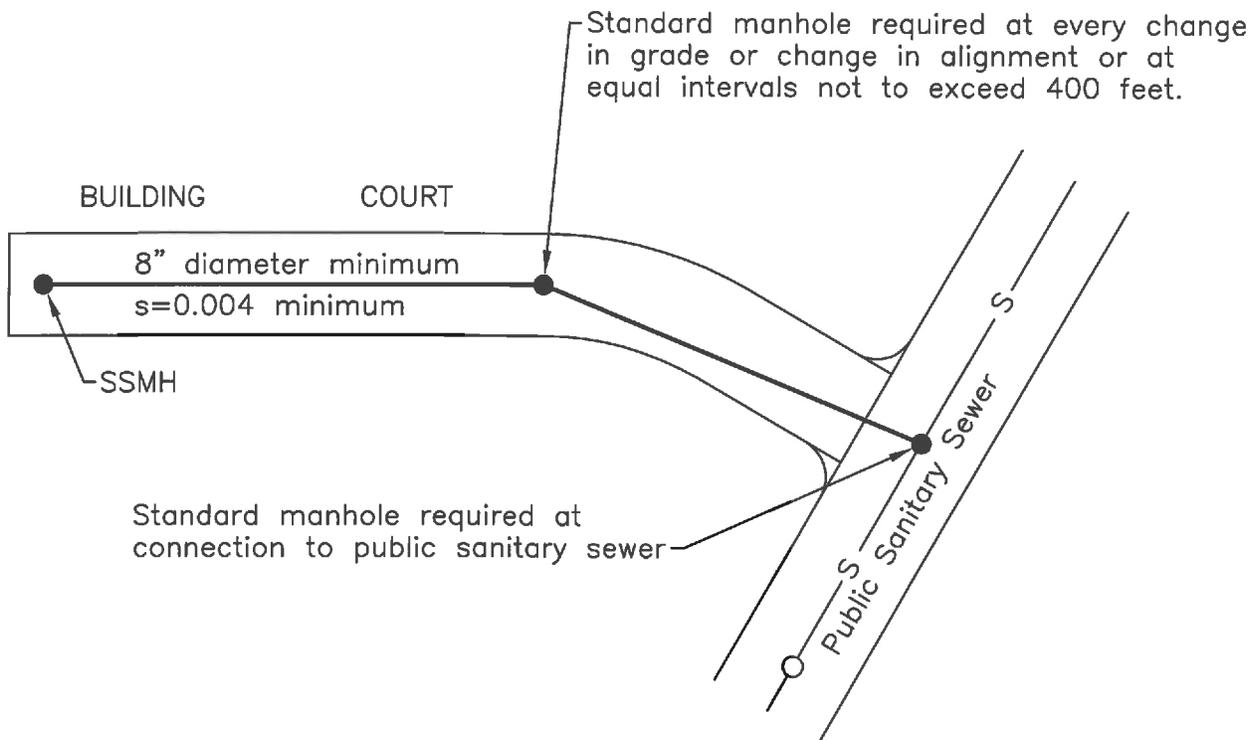
<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			
			DRAWN BY: FM CHECKED BY: JL APPD. BY:
REV	DATE	BY	CITY ENGINEER

## STANDARD JUMPER PIPE

DWG. NO.	<b>SD-231</b>
FILED	
SHT.	<b>2 OF 2</b>



BUILDING COURT MAIN SEWER – 10 or less equivalent dwelling units  
PER HAYWARD MUNICIPAL CODE SEC. 11-3.350

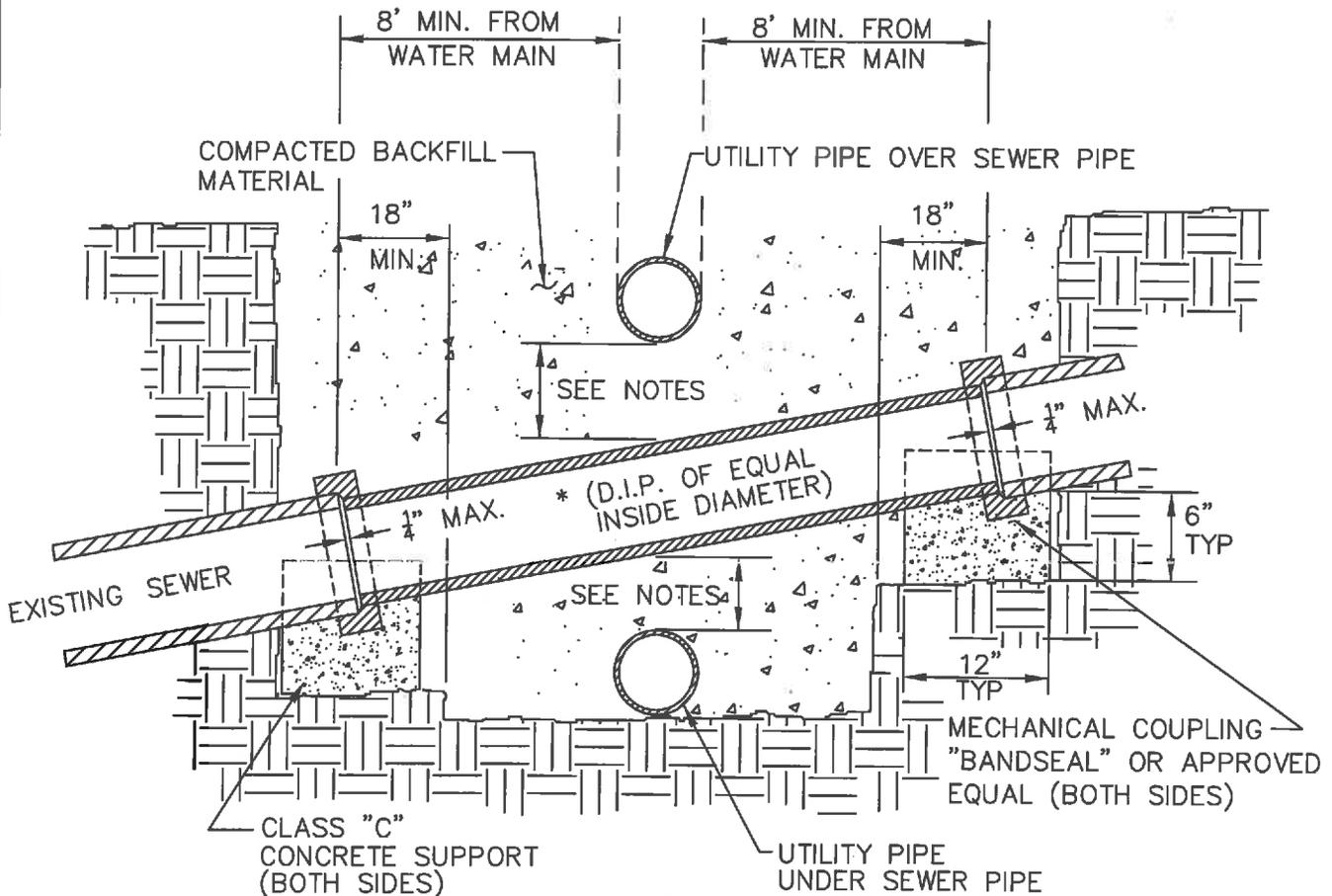


BUILDING COURT MAIN SEWER – More than 10 dwelling units  
PER HAYWARD MUNICIPAL CODE SEC. 11-3.350

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD BUILDING COURT MAIN SEWER</b>		DWG. NO. <b>SD-301</b>	
			DRAWN BY: FM      DATE: 11/30/12 CHECKED BY: JF      SCALE: NONE APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i>				FILED	
REV	DATE	BY	CITY ENGINEER		DIR. PUBLIC WORKS		SHT. <b>1</b> OF <b>1</b>	

WHEN DIP SEWER IS REQUIRED:

1. New Construction:
  - a) Whenever the clearance between the sanitary sewer pipe and any utility pipe (except water main) is 6" or less.
  - b) Whenever the clearance between the sanitary sewer pipe and water main is less than 12". However the clearance shall never be less than 4".
2. Repair or Reconstruction:
  - a) Whenever the clearance above the sanitary sewer pipe to any utility pipe (except water main) is 6" or less.
  - b) Whenever the clearance above the sanitary sewer pipe to the water main is less than 12".
  - c) Whenever any utility pipe located below the sanitary sewer pipe is repaired or re-constructed regardless of the clearance between the pipes.



\* SEWER PIPE WITH AN INSIDE DIAMETER OF 6 INCHES OR MORE SHALL BE REPAIRED WITH POLYETHYLENE LINED DUCTILE IRON WASTEWATER PIPE OR APPROVED EQUAL.

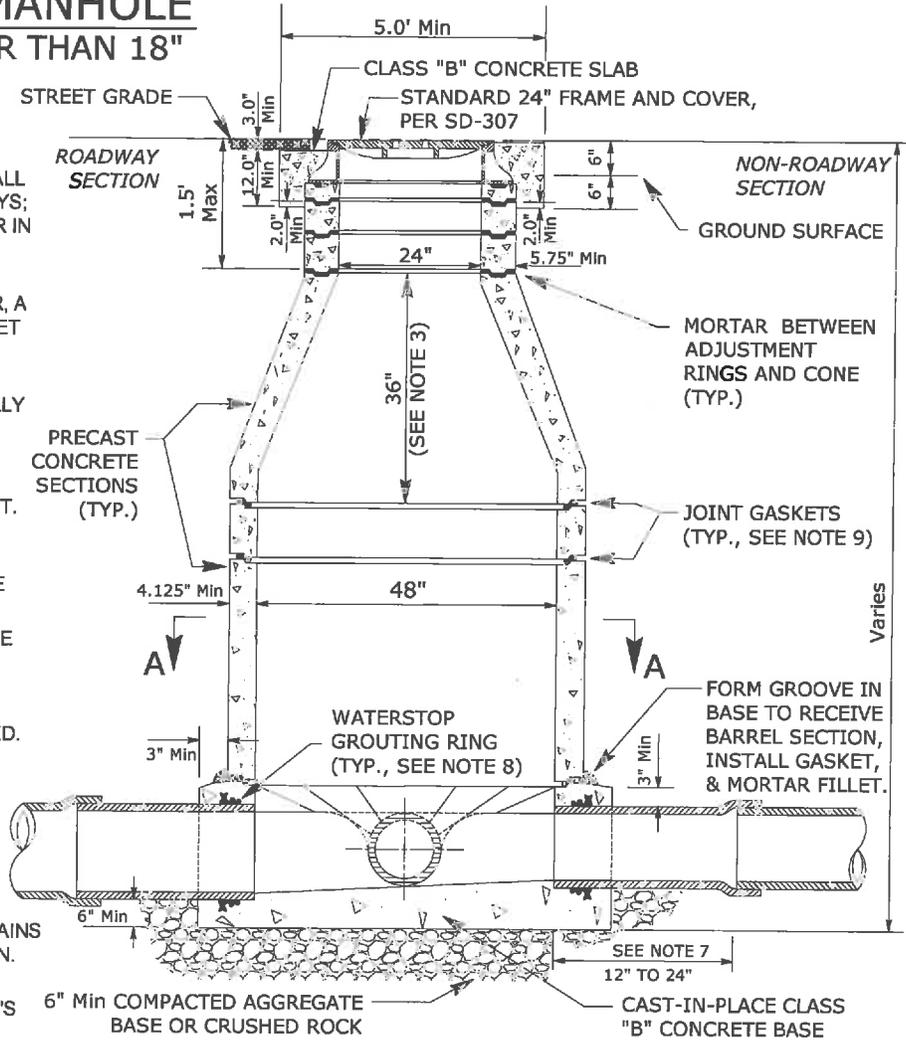
<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.			<b>STANDARD SEWER CONSTRUCTION IN THE VICINITY OF OTHER UTILITIES</b>	DWG. NO. <b>SD-303</b>
DRAWN BY:	HGM	DATE:		01/25/12
CHECKED BY:	JL	SCALE:	NTS	SHT. <b>1</b> OF <b>1</b>
APPD. BY:		APPROVED:		
REV	DATE	BY	CITY ENGINEER	DIR. PUBLIC WORKS

# STANDARD 48" MANHOLE FOR SEWERS SMALLER THAN 18"

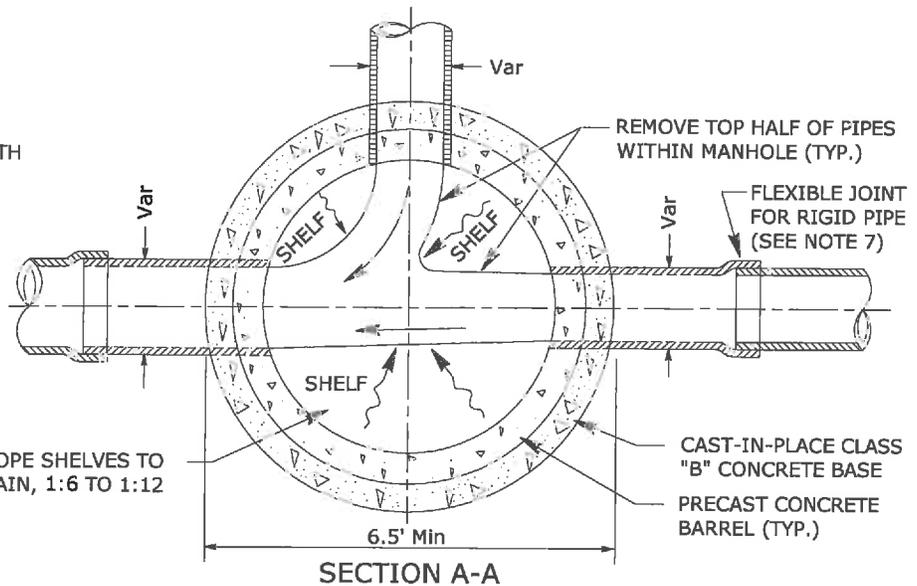
**NOTES:**

1. CONCRETE SLAB AROUND CASTING SHALL BE: A CONCENTRIC CIRCLE IN ROADWAYS; OR SQUARE AND FORMED WITH LUMBER IN EASEMENTS.
2. FOR USE WITH PIPE I.D. LESS THAN 21". FOR PIPES WITH AN I.D. 21" AND LARGER, A 60" MANHOLE SHALL BE USED (SEE SHEET 2 OF 2).
3. PRECAST CONE HEIGHT SHALL BE 3.0' (EXCEPT WHEN OTHERWISE SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER).
4. PRECAST MANHOLE SECTIONS SHALL CONFORM TO ASTM C478 AND SHALL NOT BE CHIPPED OR MODIFIED IN HEIGHT.
5. A MINIMUM OF 6" OF COMPACTED AGGREGATE BASE OR CRUSHED ROCK SHALL BE PLACED UNDER THE MANHOLE BASE.
6. MANHOLE BASE SHALL BE CAST-IN-PLACE CLASS "B" CONCRETE (EXCEPT WHEN ALTERNATIVE DESIGN IS SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER). PRECAST BASES WILL NOT BE PERMITTED.
7. FOR RIGID PIPE ONLY (VCP, DI, ETC.), A FLEXIBLE JOINT OR COUPLING WITH A SHEAR RING SHALL BE LOCATED 12" TO 24" FROM THE MANHOLE. PIPE CONNECTIONS AND COUPLINGS SHALL CONFORM TO SECTION 2.06 OF THE CITY'S "SPECIFICATIONS FOR THE CONSTRUCTION OF SANITARY SEWER MAINS AND APPURTENANCES," LATEST REVISION.
8. WATERSTOP GROUTING RINGS SHALL CONFORM TO SECTION 2.07 OF THE CITY'S ABOVE REFERENCED SPECIFICATIONS.
9. PRECAST MANHOLE SECTIONS SHALL BE JOINED USING PREFORMED PLASTIC GASKETS CONFORMING TO SECTION 2.07 OF THE CITY'S ABOVE REFERENCED SPECIFICATIONS.

WHERE PRECAST JOINTS ARE BELOW OR WITHIN 3' OF GROUNDWATER, THE EXTERIOR OF THE JOINTS SHALL BE FINISHED SMOOTH WITH MORTAR AND, AFTER MORTAR HAS SET, WRAPPED WITH RUB'R-NEK BY K.T. SNYDER CO., OR APPROVED EQUAL.



**ELEVATION SECTION**



**SECTION A-A**

			 <b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>	
DRAWN BY: R.S.		DATE: 05/20/10		
CHECKED BY: J.H./A.A.		SCALE: NTS		
APPD. BY:		APPROVED:		
REV	DATE	BY	CITY ENGINEER	
			DIR. PUBLIC WORKS	

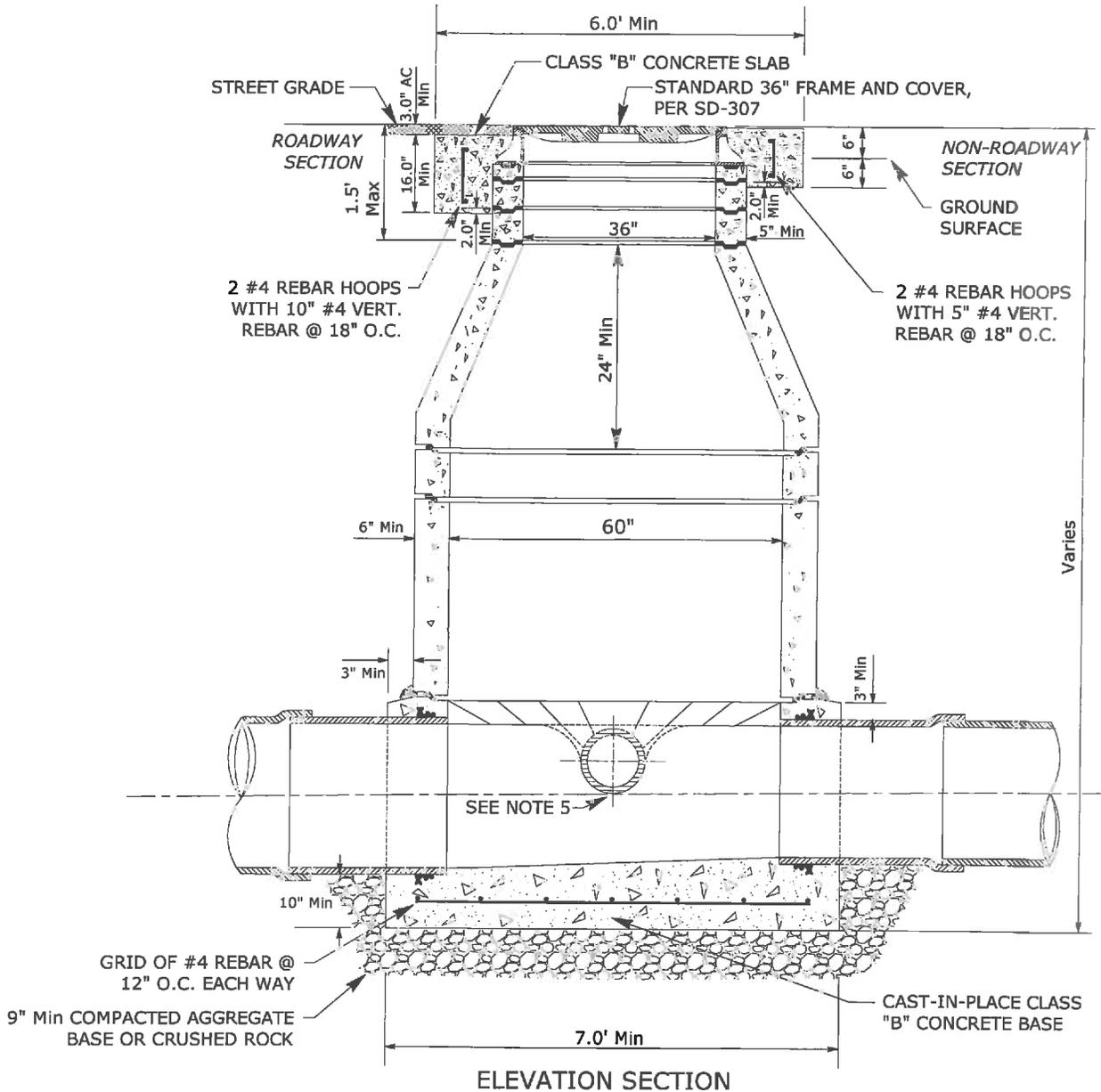
## STANDARD - PRECAST CONCENTRIC SANITARY SEWER MANHOLE

DWG. NO. **SD-304**

FILED

SHT. **1** OF **2**

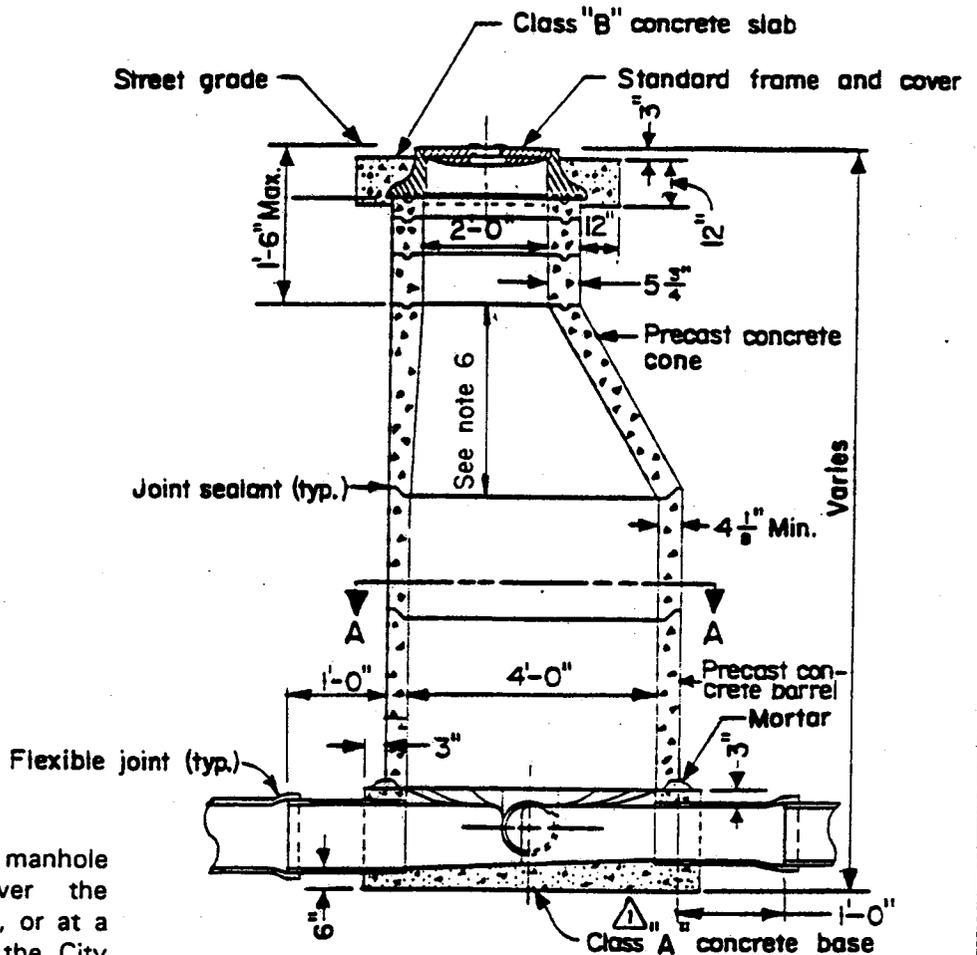
# STANDARD 60" MANHOLE FOR SEWERS 18" AND LARGER



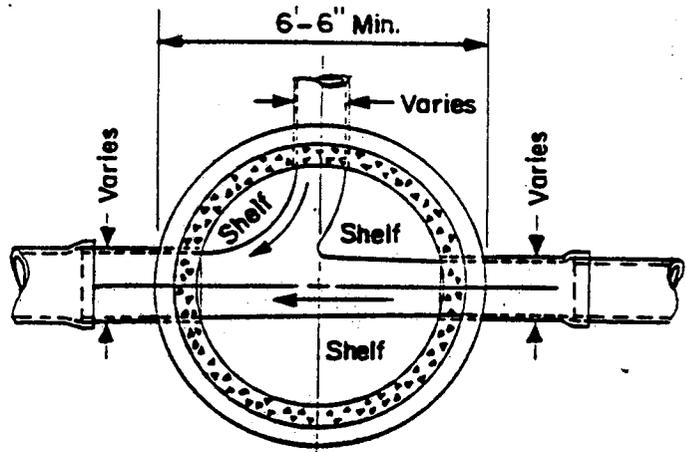
## NOTES:

1. THE NOTES AND TYPICAL DETAILS ON SHEET 1 SHALL APPLY TO 60" MANHOLES UNLESS SPECIFIED OTHERWISE HEREIN.
2. A MINIMUM OF 9" OF COMPACTED AGGREGATE BASE OR CRUSHED ROCK SHALL BE PLACED UNDER THE MANHOLE BASE.
3. MANHOLE BASE SHALL BE CAST-IN-PLACE CLASS "B" CONCRETE REINFORCED WITH A GRID OF #4 REBAR @ 12" O.C., EACH WAY AND WIRE TIED (EXCEPT WHEN ALTERNATIVE DESIGN IS SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER). PRECAST BASES WILL NOT BE PERMITTED.
4. ALL REINFORCING STEEL SHALL BE COVERED BY A MINIMUM 3.0" OF CONCRETE.
5. THE INVERT OF BRANCH PIPES 12" AND SMALLER SHALL INTERSECT THE TRUNK SEWER AT ITS CENTERLINE OR ABOVE, (EXCEPT WHEN INDICATED OTHERWISE ON CITY PROJECT PLANS OR SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER).

 <b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>			<b>STANDARD - PRECAST CONCENTRIC SANITARY SEWER MANHOLE</b>	DWG. NO. <b>SD-304</b>
				FILED
REV	DATE	BY	DRAWN BY: R.S.      DATE: 05/20/10 CHECKED BY: J.H./A.A.      SCALE: NTS. APPD. BY: <i>[Signature]</i> APPROVED: <i>[Signature]</i>	SHT. <b>2</b> OF <b>2</b>
		CITY ENGINEER	DIR. PUBLIC WORKS	



SECTIONAL ELEVATION

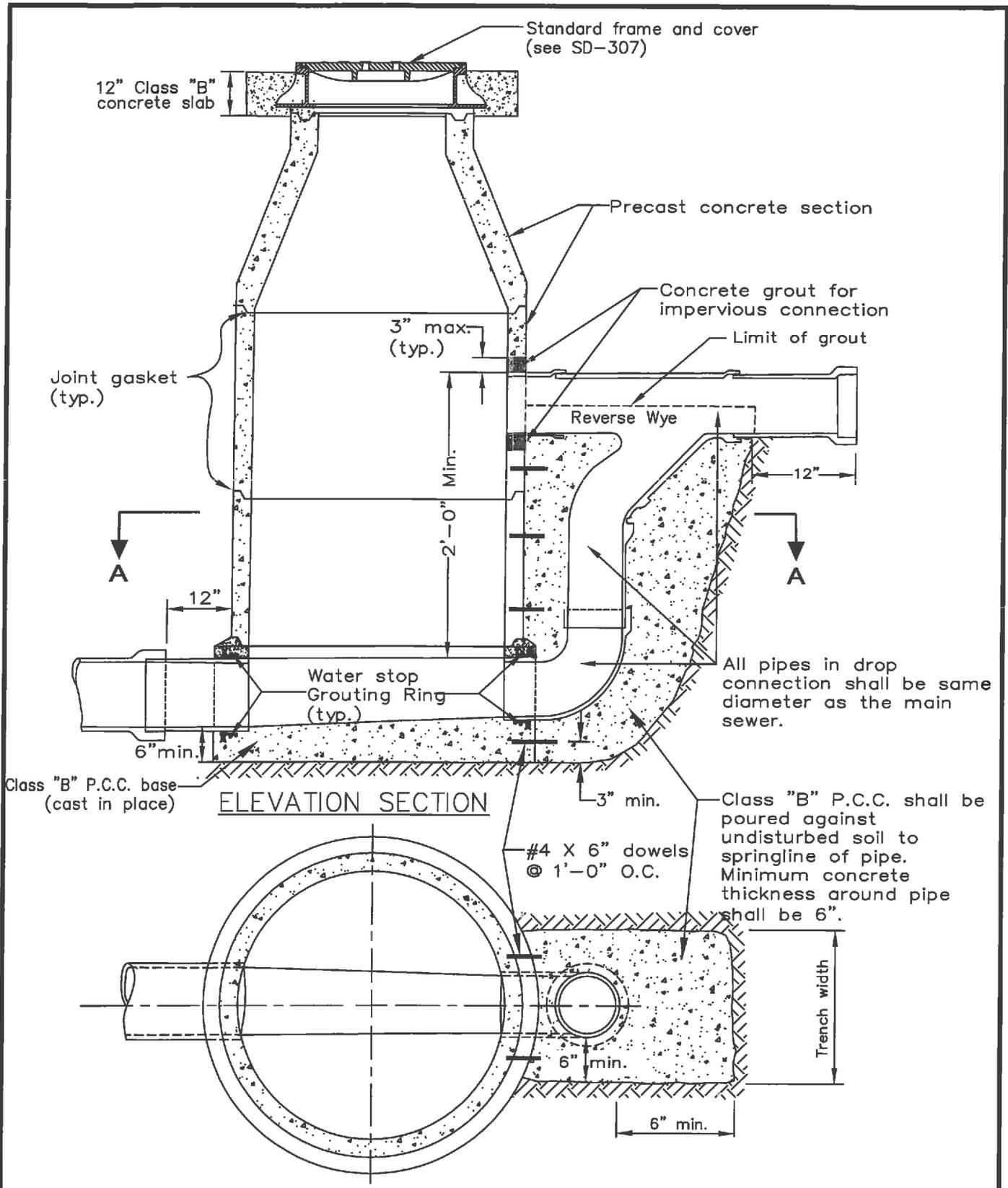


SECTION A-A

NOTES:

1. The vertical wall of the manhole shall be installed over the downstream sewer main, or at a location as directed by the City Engineer.
2. Concrete slab around casting shall be a concentric circle in streets.
3. Concrete slab around casting shall be square and formed with lumber in easements.
4. This MANHOLE MAY BE USED ONLY WHEN SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER.
5. For use with pipe diameter 30" or less.
6. Cone height shall be 3'-0" except when specifically authorized by the City Engineer.
7. Cone shall not be chipped or modified in height.

		<b>CITY OF HAYWARD ENGINEERING DIVISION</b>		<b>STANDARD PRECAST ECCENTRIC SANITARY SEWER MANHOLE</b>		DWG. NO. SD-305	
		DRAWN BY: F.M.	DATE: APRIL 15 1993	<b>APPROVED</b>		FILED 9-25-02	
		CHECKED BY: T.M.	SCALE: NONE			SHT. 1 OF 1	
▲	6-21-02	FM	APPD. BY: <i>LAB</i>	CITY ENGR.	DIR. PUBLIC WORKS		



ELEVATION SECTION

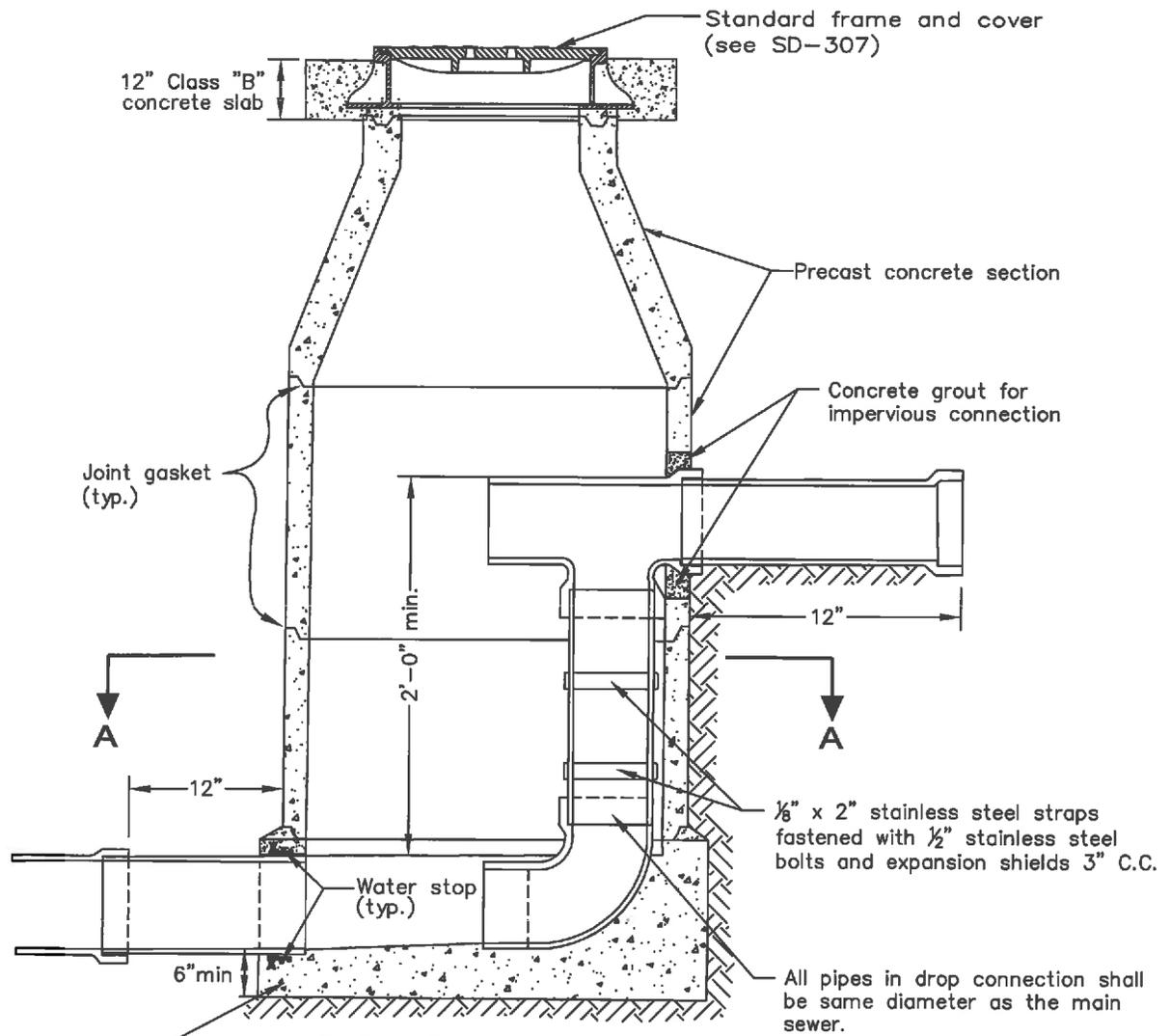
SECTION A-A

- NOTE:**
1. Concrete may be formed in large excavations.
  2. See SD-304 for construction notes.

 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		
DRAWN BY: FM	DATE: 05/24/11	
CHECKED BY: JL	SCALE: NTS	
APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>	
REV	DATE	BY
		CITY ENGINEER
		DIR. PUBLIC WORKS

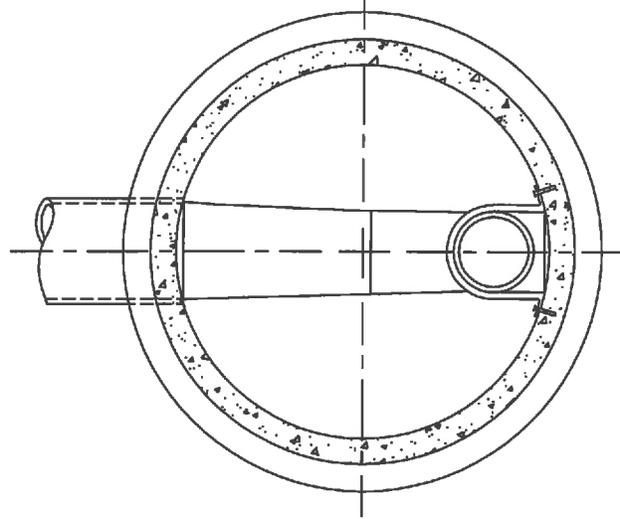
**STANDARD  
SANITARY SEWER  
DROP CONNECTION  
MANHOLE**

DWG. NO. <b>SD-306</b>
FILED
SHT. <b>1</b> OF <b>2</b>



Class "B" P.C.C. base  
(cast in place)

**ELEVATION SECTION**



**SECTION A-A**

**NOTES:**

1. All pipes within the manhole shall be cast iron or D.I.P.
2. This manhole shall be used in seriously unstable soil or in depths in excess of 7' subject to approval by the City Engineer.
3. See SD-304 for construction notes.

			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	
			DRAWN BY: FM	DATE: 05/24/11
CHECKED BY: JL		SCALE: N.T.S.		
APPD. BY	APPROVED			
REV	DATE	BY	CITY ENGINEER	

**STANDARD  
SANITARY SEWER  
DROP CONNECTION**

DWG. NO. <b>SD-306</b>
FILED
SHT. <b>2</b> OF <b>2</b>

# STANDARD 24" MANHOLE COVER AND FRAME

FOR 48" MANHOLES

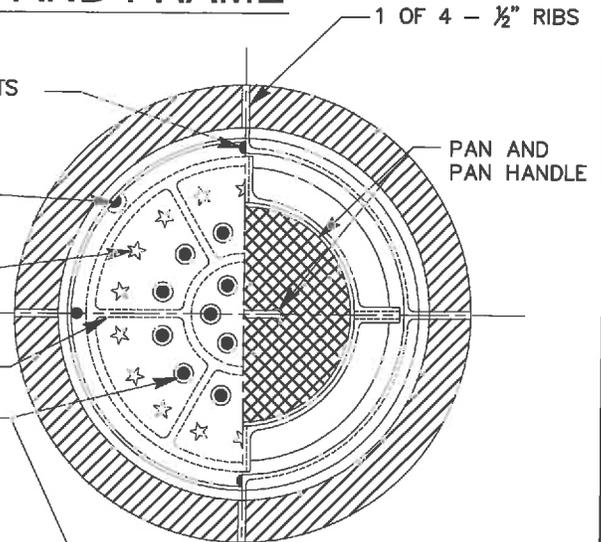
1 OF 4 - 1/2" HEX-HEAD STAINLESS STEEL NC BOLTS  
(REQUIRED ON EASEMENT MANHOLES AND WHEN SPECIFIED, SEE NOTE 5)

1" PICK HOLE

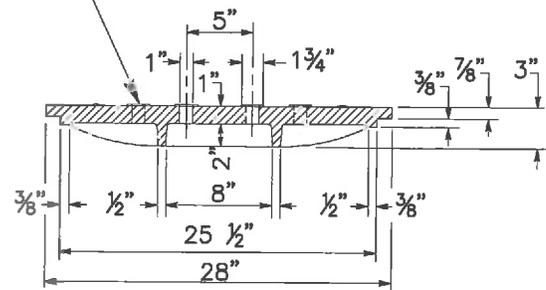
1 OF 18 - 1 3/4" STARS

1 OF 6 - 1/2" RIBS

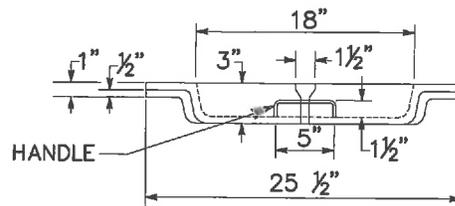
1 OF 18 - 1" Ø VENT HOLES, STORM DRAIN ONLY  
(STORM DRAIN COVERS IN SIDEWALKS OR UNPAVED AREAS, AND ALL SANITARY SEWER COVERS SHALL HAVE NO VENT HOLES)



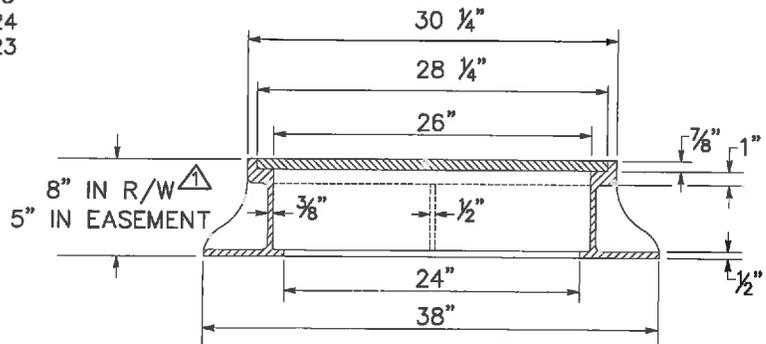
PLAN VIEW



COVER SECTION



PAN SECTION



FRAME SECTION

**NOTES:**

1. FOUNDRY MAY VARY UNDERSTRUCTURE DESIGN AND MINOR VARIATIONS TO THE SPECIFIED DIMENSIONS, SUBJECT TO CITY'S PRIOR REVIEW AND APPROVAL.
2. FRAME AND COVER MATERIAL SHALL BE GRAY CAST IRON, ASTM A-48, CLASS 30.
3. TOLERANCE ON NON-MACHINED SURFACES SHALL BE  $\pm 1/16"$ .
4. ALL HORIZONTAL BEARING AND VERTICAL CONTACT SURFACES SHALL BE MACHINED.
5. WHEN BOLT-DOWN-COVERS ARE REQUIRED OR SPECIFIED, A 1/8-INCH FLAT NEOPRENE GASKET SHALL BE INCLUDED BETWEEN COVER AND FRAME. A RUBBER GASKET INTEGRAL TO THE FRAME OR COVER MAY BE USED INSTEAD OF A FLAT GASKET.
6. 24" MANHOLE COVERS SHALL BE HEAVY DUTY "TYPE B" COVER BY PHOENIX IRON WORKS OF OAKLAND, OR APPROVED EQUAL.
7. PANS, IF SPECIFICALLY REQUIRED FOR SANITARY SEWER MANHOLES, SHALL BE CONSTRUCTED OF PLASTIC, AND SHALL BE "TYPE E" COVER BY PHOENIX IRON WORKS OF OAKLAND, OR APPROVED EQUAL.
8. MANHOLE FRAMES FOR 48" MANHOLES SHALL BE AS SPECIFIED BELOW, BY PHOENIX IRON WORKS OF OAKLAND, OR APPROVED EQUAL:
  - IN R/W, STANDARD P-1015
  - IN R/W, BOLT-DOWN P-1024
  - IN EASEMENT, BOLT-DOWN P-1023

			 <b>CITY OF</b> <b>HAYWARD</b> PUBLIC WORKS DEPT.	
			DRAWN BY: FM	DATE: 05/20/10
	9/13/10	HGM	CHECKED BY: JF	SCALE: NTS
REV	DATE	BY	APPD. BY:	APPROVED:
			CITY ENGINEER	DIR. PUBLIC WORKS

## STANDARD MANHOLE FRAME, COVER AND PAN

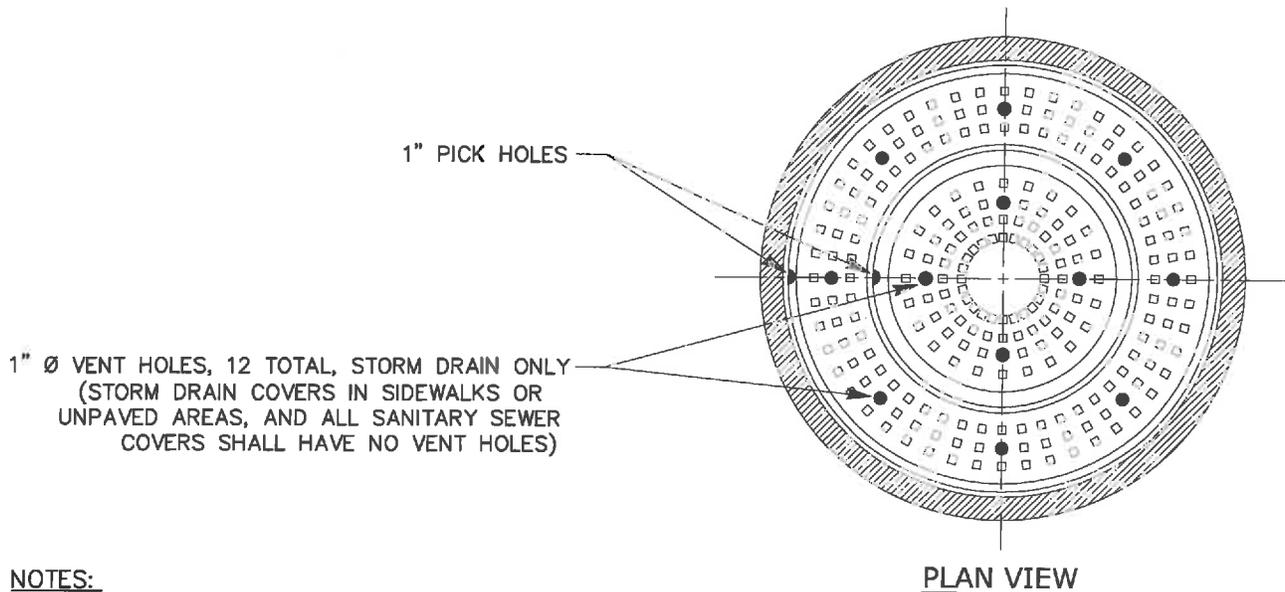
DWG. NO.  
**SD-307**

FILED

SHT. **1** OF **2**

# STANDARD 36" MANHOLE COVER AND FRAME

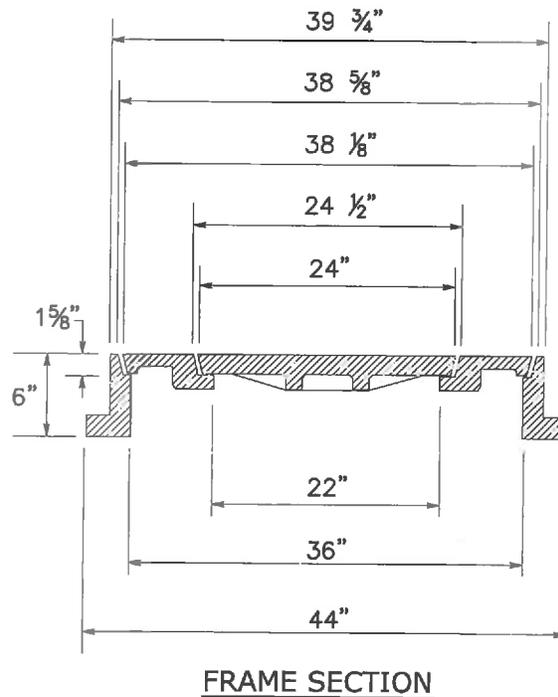
FOR 60" MANHOLES



1" Ø VENT HOLES, 12 TOTAL, STORM DRAIN ONLY  
(STORM DRAIN COVERS IN SIDEWALKS OR UNPAVED AREAS, AND ALL SANITARY SEWER COVERS SHALL HAVE NO VENT HOLES)

**NOTES:**

1. THE GENERAL NOTES AND TYPICAL DETAILS ON SHEET 1 SHALL ALSO APPLY TO 36" MANHOLE COVERS AND FRAMES UNLESS SPECIFIED OTHERWISE HEREIN.
2. 36" MANHOLE COVERS AND FRAMES FOR 60" MANHOLES SHALL BE MODEL "A-1325" BY ALHAMBRA FOUNDRY CO., LTD., OF ALHAMBRA, CA. OR APPROVED EQUAL.

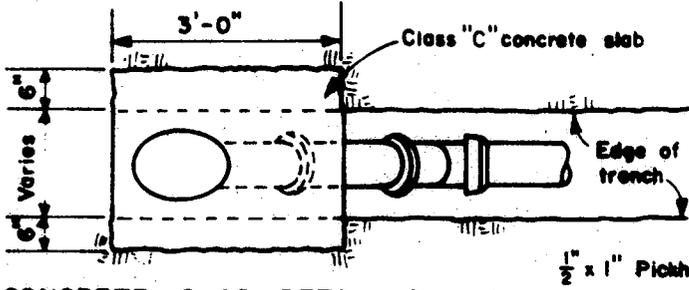


			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	
△	1/26/12	HGM	DRAWN BY: FM	DATE: 5/20/10
△	9/13/10	HGM	CHECKED BY: JF	SCALE: NTS
REV	DATE	BY	APPD. BY:	APPROVED:
			CITY ENGINEER	DIR. PUBLIC WORKS

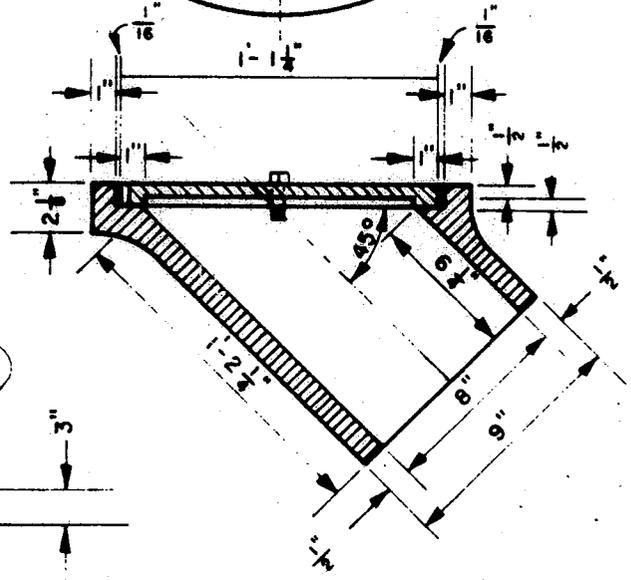
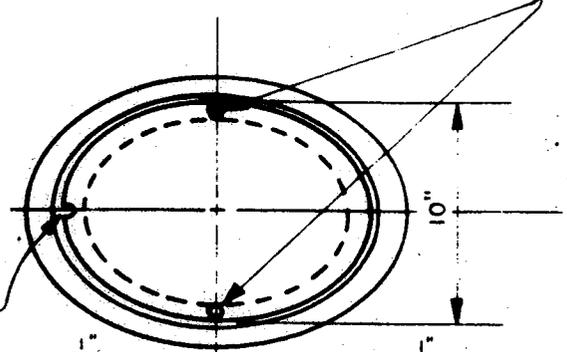
## STANDARD MANHOLE FRAME, COVER AND PAN

DWG. NO.	<b>SD-307</b>
FILED	
SHT.	<b>2 OF 2</b>

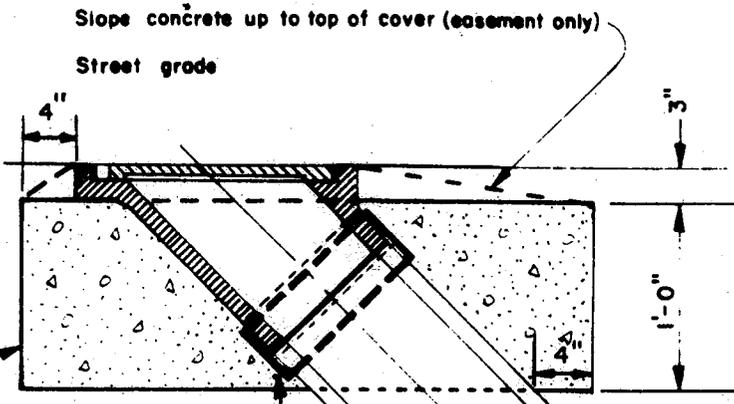
$\frac{3}{8}$ " Dia. x  $1\frac{1}{2}$ " Long course thread brass hex head bolts to be installed when riser is placed in easement.



**CONCRETE SLAB DETAIL - No scale**



**CAST IRON FRAME & COVER DETAIL**



Band seal connection  
See concrete slab detail

Compacted pipe bedding

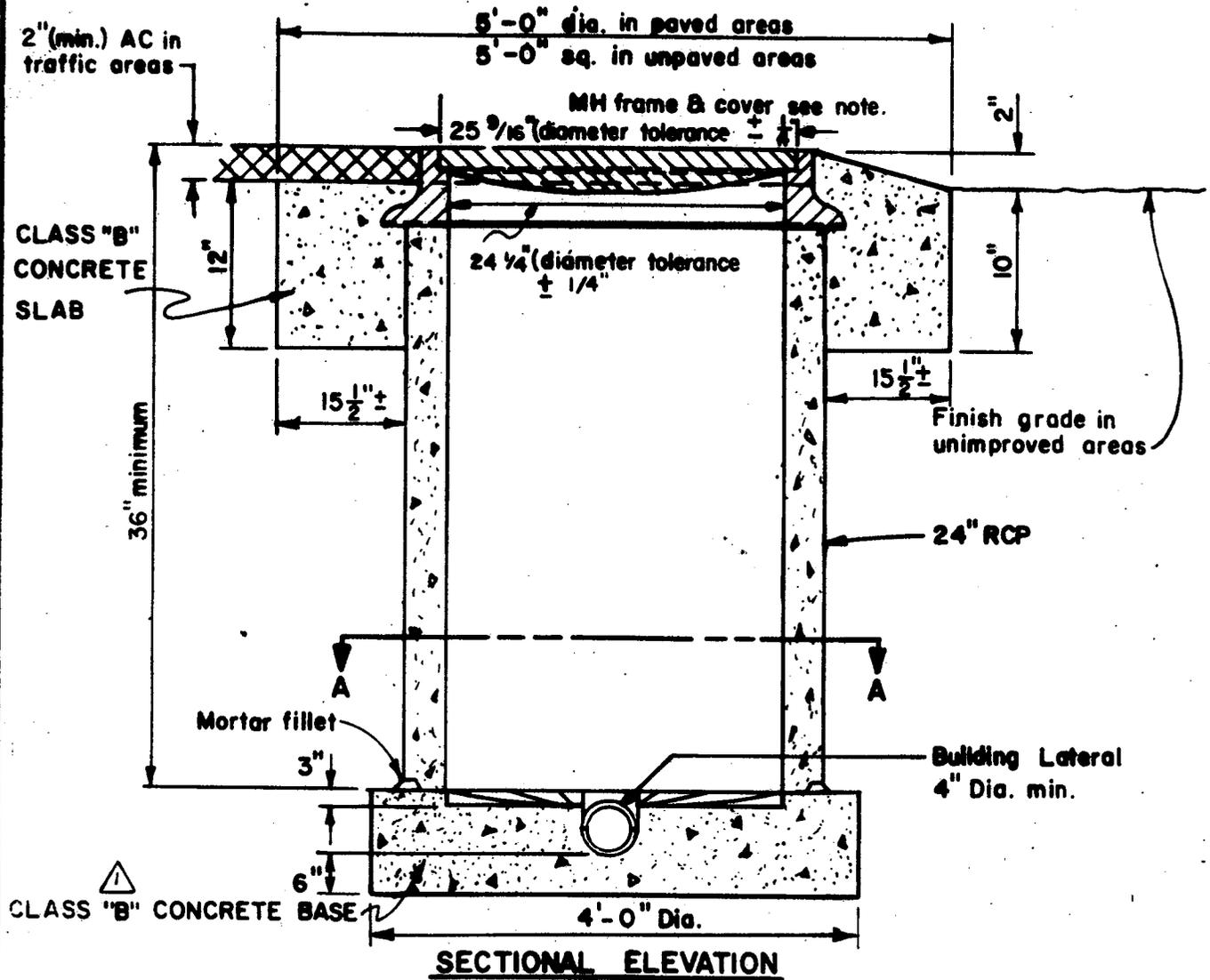
**NOTE:**

1. Concrete slab shall be formed with lumber when constructed in an easement.
2. Riser may be reduced to 8" after the elbow if main is larger than 8".
- 3 **MINIMUM SEWER GRADE**
  - a. 8" Diameter - 0.0033 FT/FT
  - b. 12" Diameter - 0.0020 FT/FT

Riser station - Pipe pay limit  
P/L for main extensions

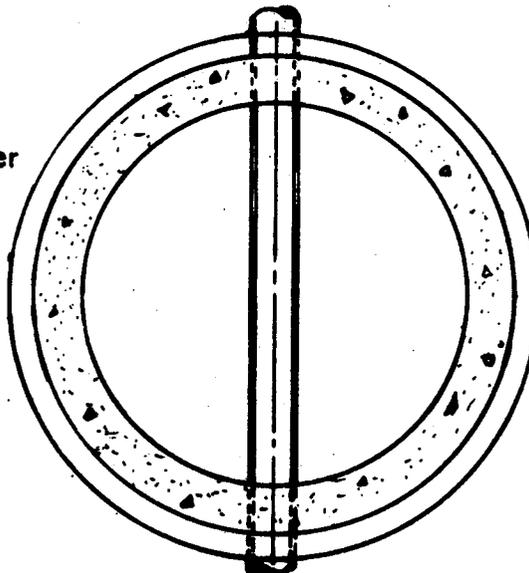
Sanitary sewer pipe

CITY OF HAYWARD ENGINEERING DIVISION			<b>STANDARD SANITARY SEWER RISER &amp; MINIMUM GRADES</b>	DWG. NO. <b>SD-308</b>
DRAWN BY: <i>F.M.</i>		DATE: OCT. 1, 1992		FILE: <b>6-15-93</b>
CHECKED BY: <i>J.M.</i>		SCALE: None		SMT. <b>1 1</b>
APPD. BY: <i>[Signature]</i>		APPROVED: <i>[Signature]</i>		
REV.	DATE	BY		CITY ENGINEER



**NOTE:**

Manhole frame and cover shall be Phoenix Iron Works No. P1090, Neenah Foundry Co. No. R1695 or as approved by the Water Pollution Source Control Inspector.



	6-21-02	FM	<b>CITY OF HAYWARD</b> <b>ENGINEERING DIVISION</b>		<b>STANDARD</b> <b>INDUSTRIAL WASTE</b> <b>MONITORING</b> <b>STRUCTURE</b>	DWG. NO. <b>SD-309</b>
	REV.	DATE	BY	DRAWN BY: <i>P.M.</i> DATE: <i>6-9-93</i> CHECKED BY: <i>T.M.</i> SCALE: <i>NOT</i> APPD. BY: <i>RAB</i>		FILED <b>9-25-02</b>
				CITY ENGR.    DIST. PUBLIC WORKS		SHT. <b>1</b> OF <b>1</b>

**NOTE: THE TESTING SHALL BE IN THE FOLLOWING SEQUENCE:**

**1. Digital Video Disc (DVD) Inspection (All Pipe):**

Contractor shall perform a DVD recorded inspection of all sewer replacement and sewer spot repairs. Such inspection shall be performed by a firm which has been actively performing such services for a minimum of two years. The video camera and recording equipment used shall be suitable for the purpose intended and shall be equipment that is in common use at the present time. A complete and quality to provide a clear, sharp image when played back on a conventional DVD player. The image shall show sufficient detail to determine cracks in the pipe, offset joints, leaking joints, protruding sewer laterals and other flaws in the installation of the sewer main.

All recording shall be done in the presence of the City Engineer. Any recordings not meeting the quality standards stated above will be rejected and the recording process shall be repeated.

After inspection of the DVD by the City Engineer, the Contractor, at his own expense, shall replace or repair any materials or workmanship, which in the opinion of the City Engineer, do not meet the specification requirements. Upon completion of the repairs or replacements, the repairs shall be DVD recorded a second time and the process shall be repeated until the specification requirements are met.

The following defects visible on the DVD recording shall be corrected:

- |  |                               |
|--|-------------------------------|
| 1. Low Spot (3/4" or greater)                  | 5. Dropped/Offset Joint       |
| 2. Joint separations (3/4" or greater opening) | 6. Infiltration               |
| 3. Chips at pipe ends                          | 7. Other obvious deficiencies |
| 4. Cracked or damaged pipe                     |                               |

Digital Video Disc (DVD) and written log of the survey shall become the property of the City of Hayward.

**2. Air Test of Sanitary Sewers: See SD-311, Sheet 2 of 2.**

**3. Deflection Test (PVC Pipe Only):**

Mandrel Testing for Deflection shall be done in the presence of the City Engineer for PVC pipe, at least 30 days after the placement and compaction of all trench backfills, including AC surfacing (temporary or permanent), are completed. Maximum test mandrel diameter shall be ninety five (95%) percent of the inside diameter of the installed pipe.

Any section of pipe that does not permit the mandrel passage will not be accepted and shall be removed from the work site. New pipe shall be reinstalled and rechecked as directed by the City Engineer.

**DEFLECTION AND DVD RECORDING TEST**

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD TEST REQUIREMENT FOR SANITARY SEWER</b>	DWG. NO. <b>SD-311</b>
			DRAWN BY: HGM	DATE: 05/14/08		FILED
			CHECKED BY: MHW	SCALE: NTS		
REV	DATE	BY	APPD. BY	APPROVED		SHT. <b>1</b> OF <b>2</b>
			CITY ENGINEER	DIR. PUBLIC WORKS		

1000  
900  
800  
700  
600  
500  
400  
300  
250  
200  
150  
100

LENGTH OF PIPE TESTED, L, feet

**Example**

Given:  $d = 8"$   
 $L = 450'$

From Nomograph

Test Time "A" = 320  
Test Time "B" = 226.7

Use 226.7 Seconds as the minimum test period.

EXAMPLE

NOTE:

- The duration of the test shall be the period of time for the air pressure to drop from 3.5 P.S.I.G. to 2.5 P.S.I.G. To pass the test, this period shall not be less than the smaller of scales "A" and "B"

15000  
12000  
5000  
4000  
3000  
2000  
1000  
500  
400  
300  
200  
100  
50  
40  
30  
20

TEST TIME - SCALE "A", seconds

1105  
1020  
935  
850  
765  
680  
595  
510  
425  
340  
283.3  
226.7  
170  
113.3

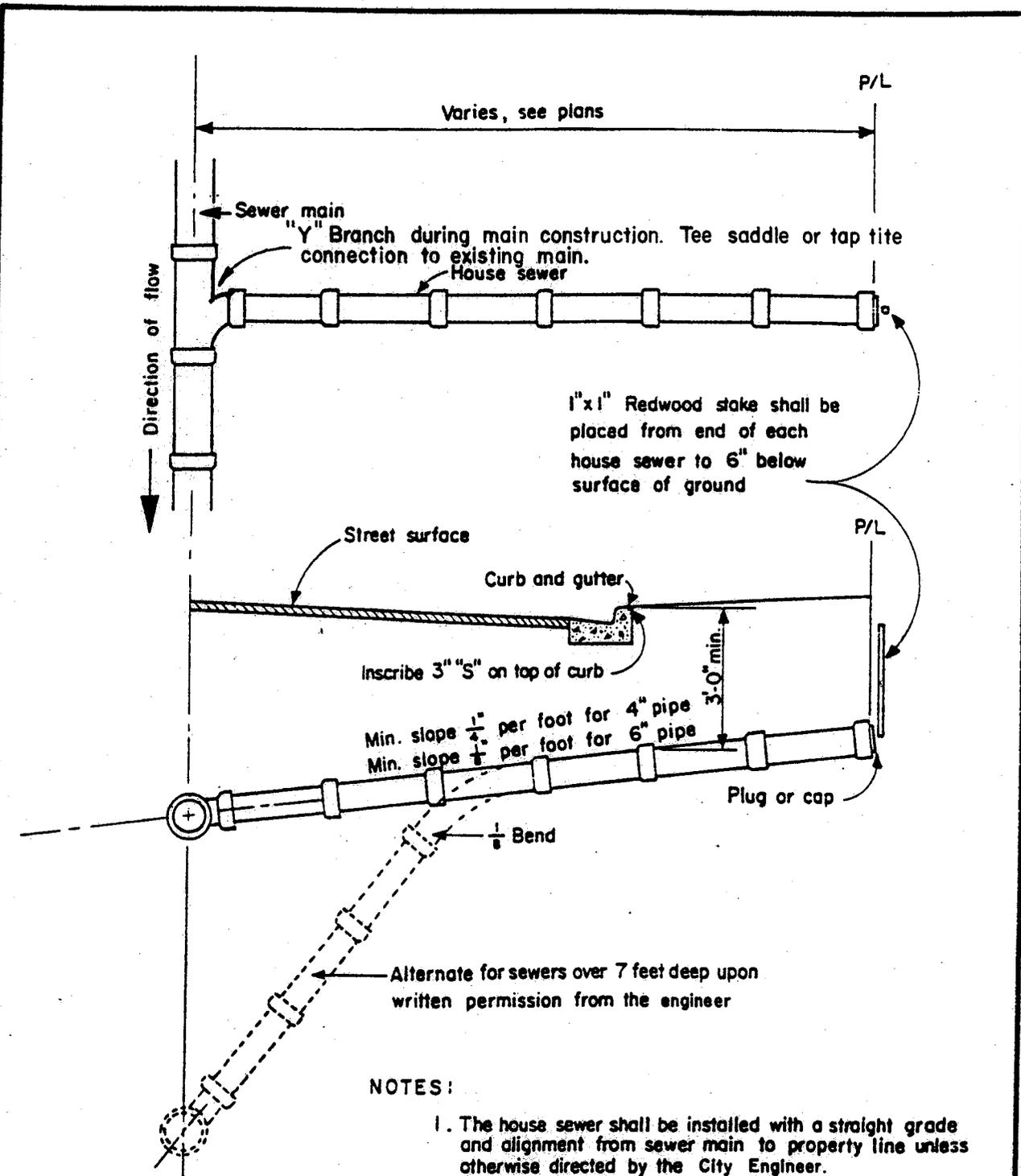
39  
36  
33  
30  
27  
24  
21  
18  
15  
12  
10  
8  
6  
4

TEST TIME - SCALE "B", seconds

PIPE DIAMETER, inches

**TIME REQUIREMENTS FOR AIR TEST OF SANITARY SEWERS**

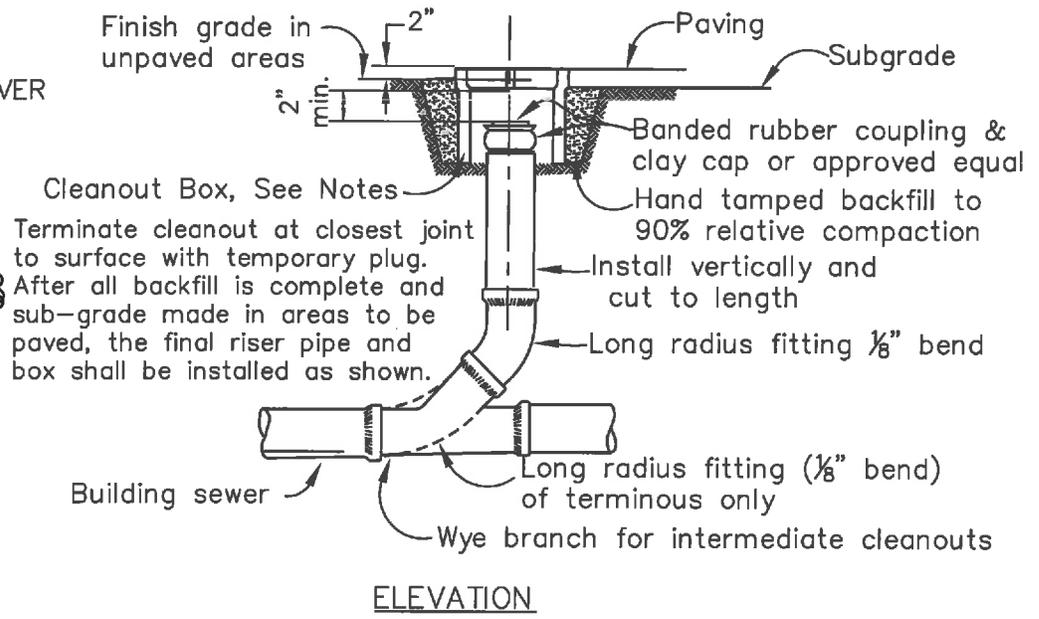
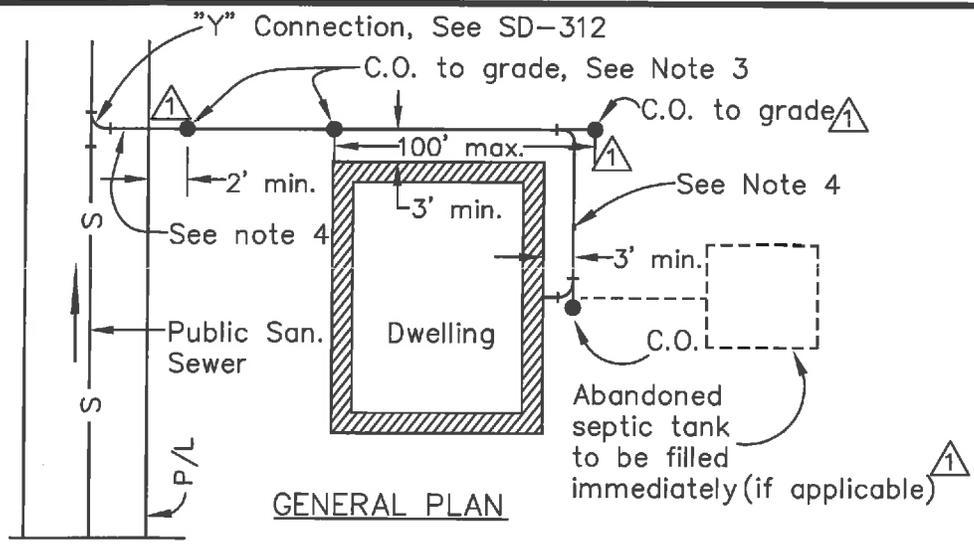
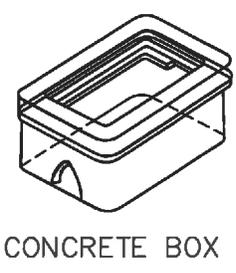
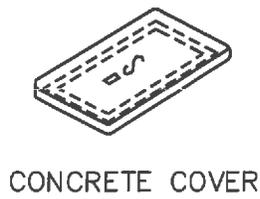
			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>		<b>STANDARD TEST FOR SANITARY SEWER</b>		DWG. NO. <b>SD-311</b>	
			DRAWN BY: <i>R.M.</i> DATE: <i>6-5-93</i>		APPROVED <i>[Signature]</i> DIR. PUBLIC WORKS		FILED <b>6-15-93</b>	
			CHECKED BY: <i>T.M.</i> SCALE: <i>—</i>				SHT. <b>2</b> OF <b>2</b>	
REV.	DATE	BY	APPD. BY: <i>[Signature]</i>					
			CITY ENGR.					



**NOTES:**

1. The house sewer shall be installed with a straight grade and alignment from sewer main to property line unless otherwise directed by the City Engineer.
2. Cleanouts to grade required at house connection and changes in alignment.
3. Tap may be made to sewer only if lateral is at least one size smaller than the main.

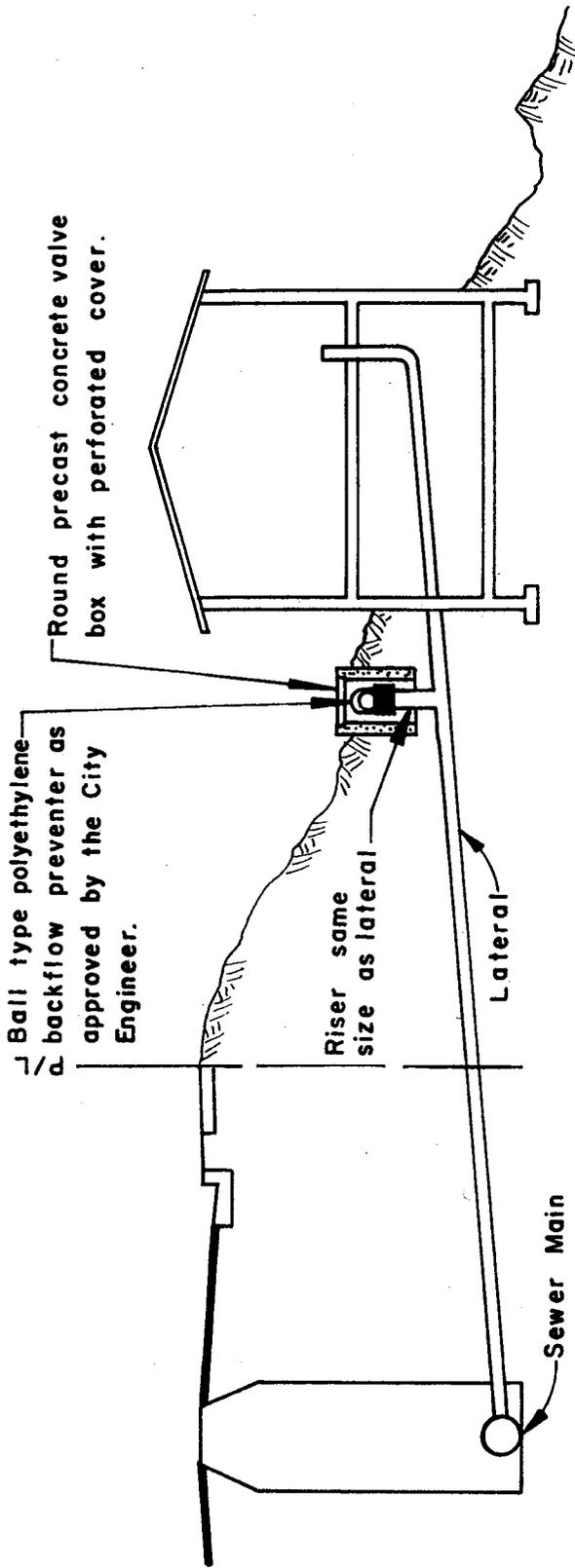
<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD HOUSE SEWER</b>	DWG. NO. <b>SD-312</b>
DRAWN BY:	F.M.	DATE:	OCT. 1, 1992	FILED <b>6-15-93</b>
CHECKED BY:	T.M.	SCALE:	NONE	
APPD. BY:	<i>Lab</i>	APPROVED	<i>Lab</i>	
REV.	DATE	BY	CITY ENGR.	SHT. <b>1</b> OF <b>1</b>
			DIE: PUBLIC WORKS	



**NOTES:**

1. Rectangular box as shown shall be used for cleanouts sealed with caps installed with banded rubber couplings. Circular boxes are permitted for cleanouts sealed in cast iron screwed plugs or other approved top opening caps. Type & manufacturer subject to approval of the City Engineer.
2. Approved rectangular boxes are:  
Christy Concrete Products B3 box with B3D concrete lid or B3C metal lid; Brooks Product, Inc. No. 3. Meter Box with No. 3 heavy duty concrete lid or No. 3 cast iron traffic lid; or approved equal. Concrete lids are acceptable for use in non-vehicular traffic areas while metal lids must be used elsewhere. All lids shall be marked with an "S" or "Sewer".
3. Cleanouts shall not be installed within City Right-Of-Way.
4. Pipe type shall be one of the following:
  - a) PVC SDR 26. Joints shall be bell and spigot type with flexible elastomeric seals.
  - b) High Density Polyethylene (HDPE) SDR 17. Joints shall be fused. Inner wall shall be light in color.
  - c) Extra Strength Vitrified Clay Pipe (VCP).
  - d) Ductile Iron Pipe (DIP). Thickness class shall be Number 51 for four inch pipe and Number 50 for pipe 6 inches and larger. DIP shall be polyethylene lined and seal coated. DIP shall be wrapped with black polyethylene with a minimum thickness of 10 mils. Joints shall be bell and spigot with elastomeric seals.

<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			DWG. NO.	<b>SD-313</b>
			FILED	
REV	DATE	BY	<p><b>STANDARD HOUSE SEWER</b></p>	
DRAWN BY: HGM		DATE: 1/26/12		
CHECKED BY: JL		SCALE: NTS		
APPD. BY		APPROVED		
CITY ENGINEER		DIR. PUBLIC WORKS		



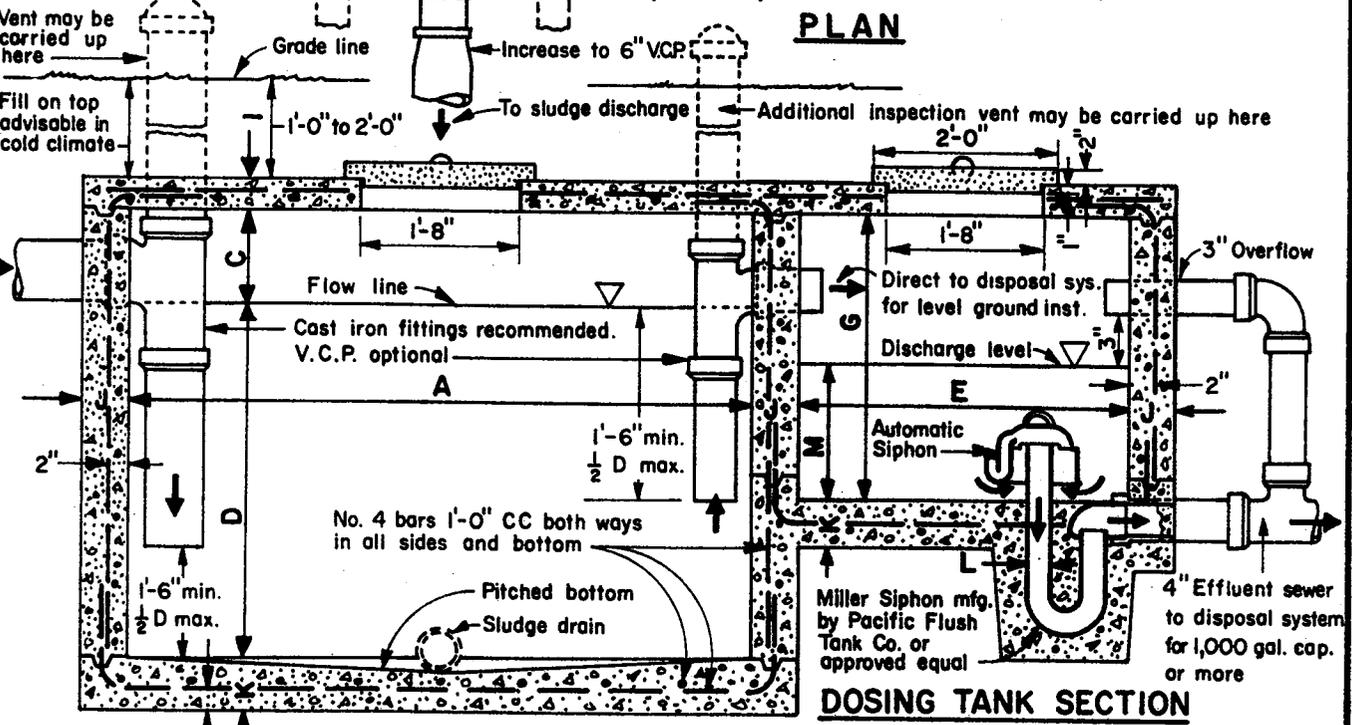
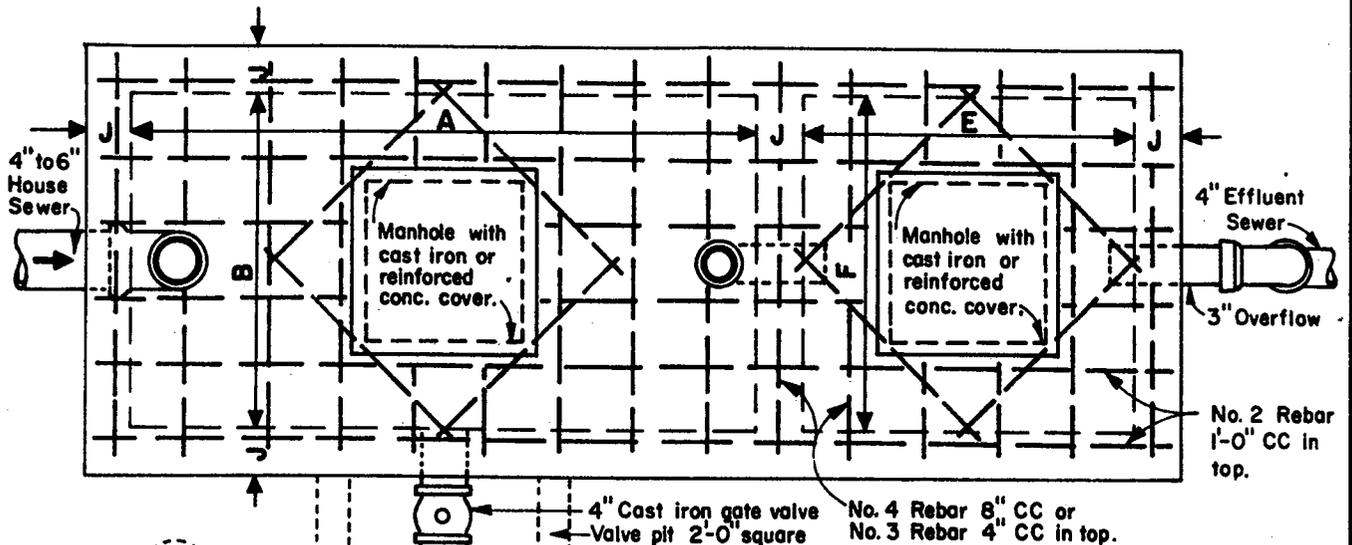
**NOTES:**

1. If the lowest fixture in any building is below the rim elevation of the nearest upstream manhole or riser, a backflow prevention valve shall be installed.
2. The valve shall be installed between the house plumbing and the property line.
3. The top of the valve box shall be a minimum of 2" above adjacent ground. The adjacent ground shall be sloped to drain away from the valve box.
4. The top of the valve box shall be a minimum of 12" below the lowest plumbing fixture in the building.

CITY OF HAYWARD ENGINEERING DIVISION		
DRAWN BY: F.P. & L.P.	DATE: April, 1977	
CHECKED BY: F.A.P.	SCALE: None	
APPD. BY: <i>[Signature]</i>	APPROVED	
REV. DATE BY	CITY ENGR.	DIR. PUBLIC WORKS

# STANDARD BACKFLOW PREVENTER

DWG. NO.	SD-314
FILED	6-15-93
SHT.	1 OF 1



Cap. Gals.	SEPTIC TANK				SIPHON TANK			SIPHON		CONC. THICKNESS		
	A	B	C	D	E	F	G	L	M	J	I	K
450	6'-0"	2'-6"	1'-0"	4'-0"	3'-0"	2'-6"	3'-0"	3"	1'-6"	6"	4"	6"
720	7'-0"	3'-6"	1'-0"	4'-0"	3'-6"	3'-6"	3'-0"	3"	1'-6"	6"	4"	6"
1,000	8'-0"	4'-0"	1'-0"	4'-0"	4'-0"	4'-0"	3'-0"	4"	1'-8"	6"	4"	6"
1,250	9'-0"	4'-6"	1'-0"	4'-3"	4'-6"	4'-6"	3'-0"	4"	1'-8"	7"	5"	6"
1,480	9'-6"	4'-8"	1'-3"	4'-6"	4'-8"	4'-8"	3'-6"	4"	2'-2"	8"	5"	6"
1,720	10'-0"	5'-0"	1'-3"	4'-8"	5'-0"	5'-0"	3'-6"	4"	2'-2"	8"	5"	6"
1,950	10'-6"	5'-3"	1'-3"	4'-9"	5'-3"	5'-3"	3'-6"	4"	2'-2"	9"	5"	6"
2,175	11'-0"	5'-6"	1'-3"	4'-10"	5'-6"	5'-6"	3'-6"	5"	2'-2"	9"	5"	6"
2,400	11'-6"	5'-9"	1'-3"	5'-0"	5'-9"	5'-9"	3'-6"	5"	2'-2"	9"	5"	6"

**CITY OF HAYWARD**  
ENGINEERING DIVISION

DRAWN BY: F.A.P. DATE: 1-25-68

CHECKED BY: T.M. SCALE: None

APPD. BY: [Signature] APPROVED

CITY ENGR. DIR. PUBLIC WORKS

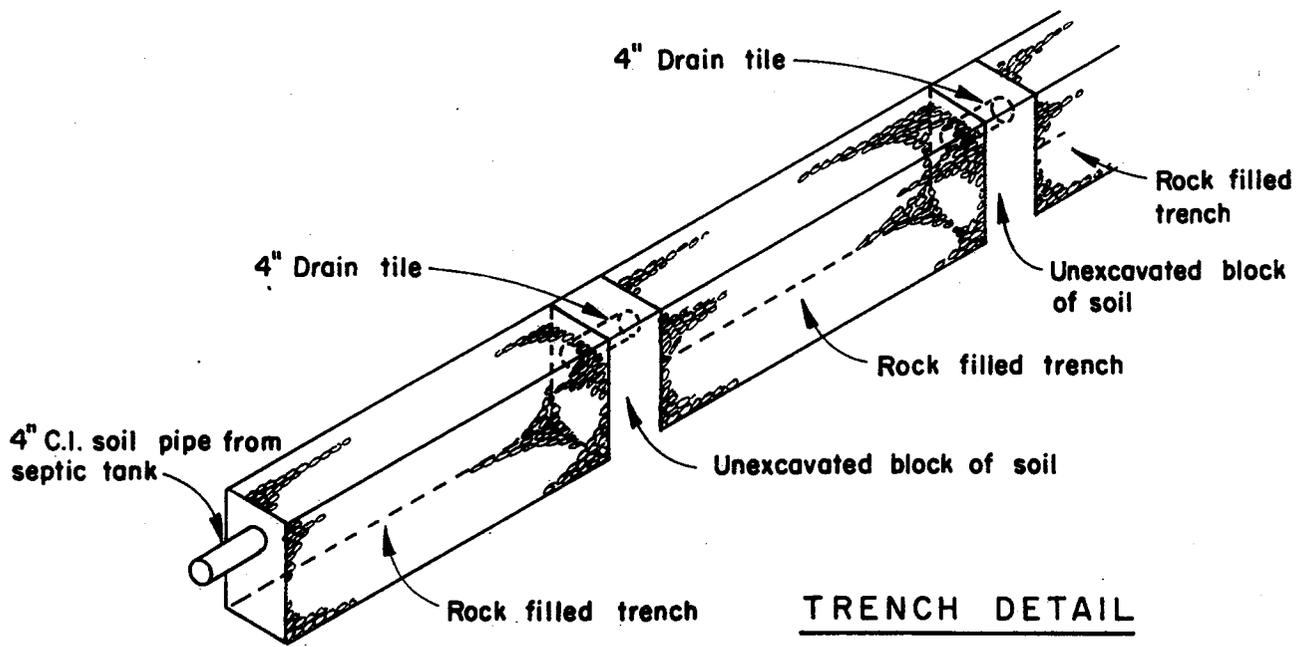
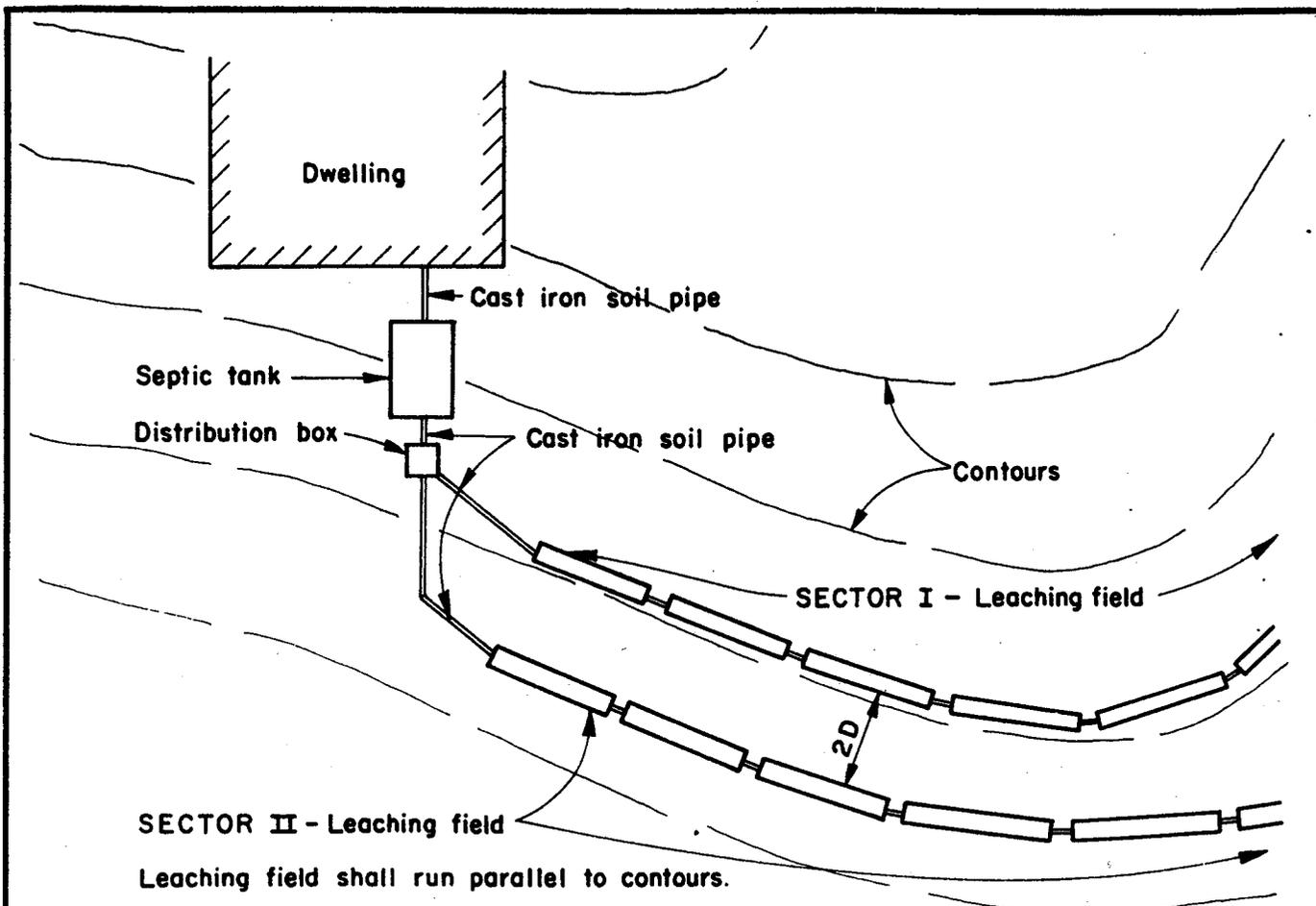
**STANDARD**  
**SEPTIC TANK**

DWG. NO. SD-315

FILED 6-15-93

SHT. 1 OF 3

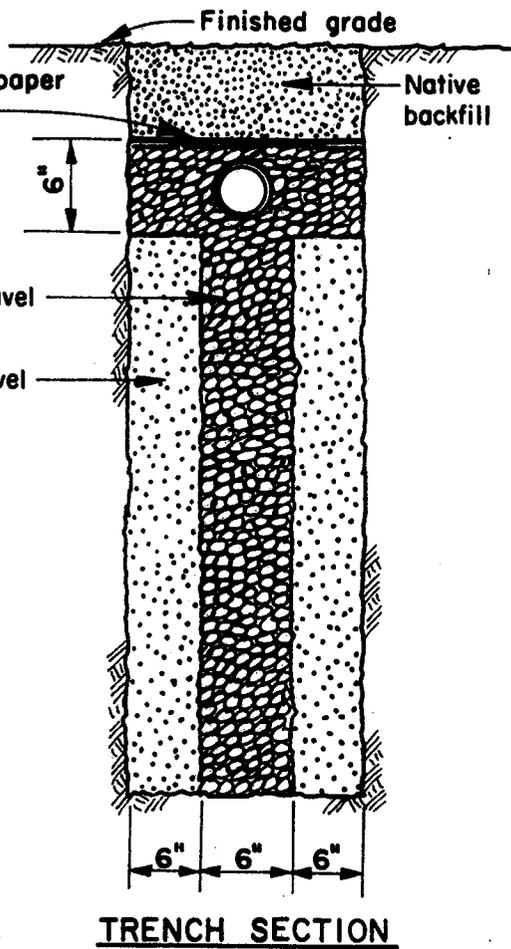
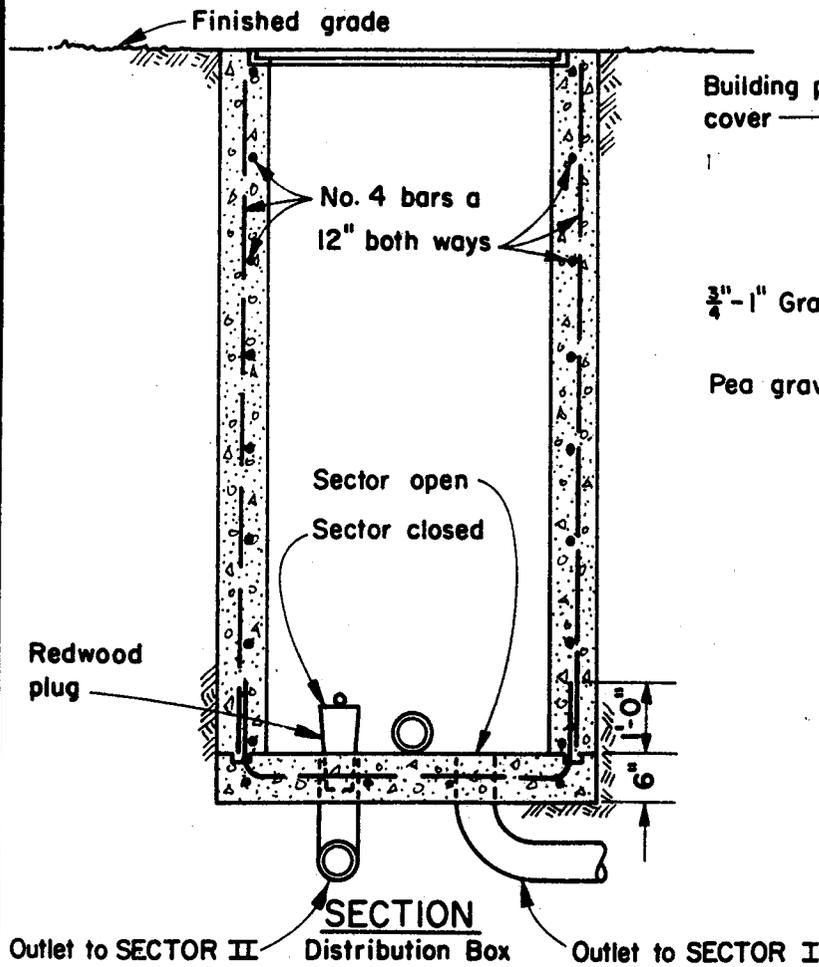
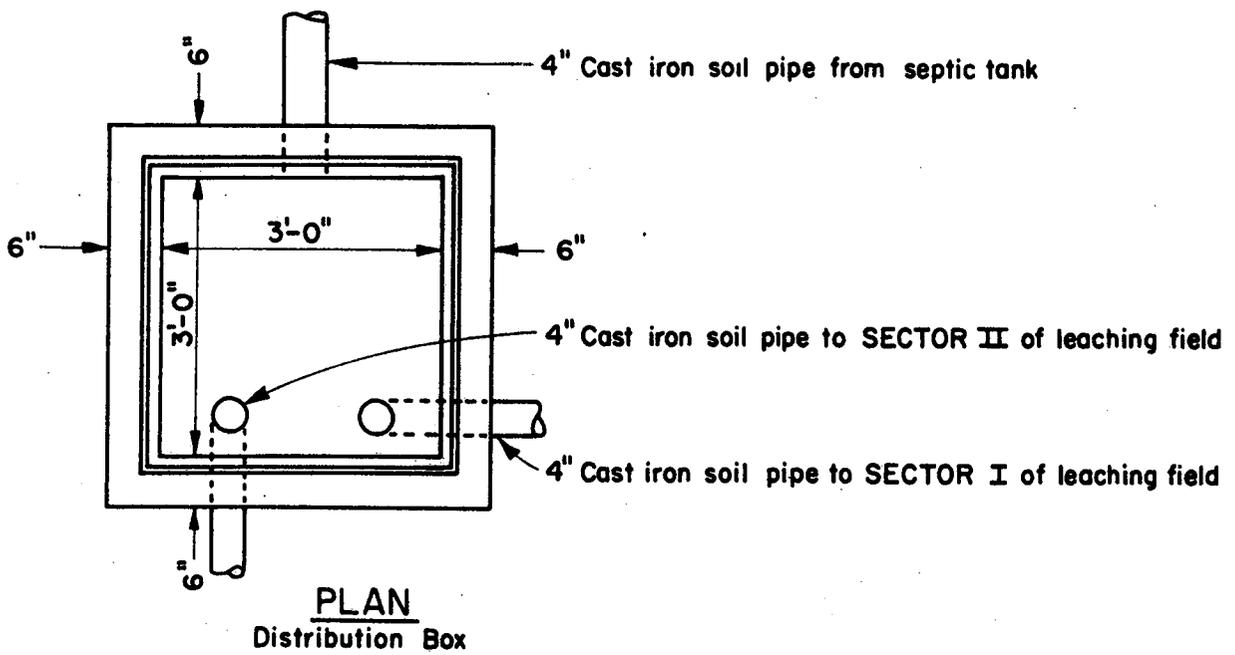
REV.	DATE	BY



<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			
REV.	DATE	BY	
			<b>DRAWN BY: F.A.P.</b>
			<b>DATE: 2-9-68</b>
			<b>CHECKED BY: T.M.</b>
			<b>SCALE: None</b>
			<b>APPR. BY: [Signature]</b>
			<b>APPROVED</b>
			<b>CITY ENGR.</b>
			<b>DIR. PUBLIC WORKS</b>

**STANDARD  
SEPTIC TANK**

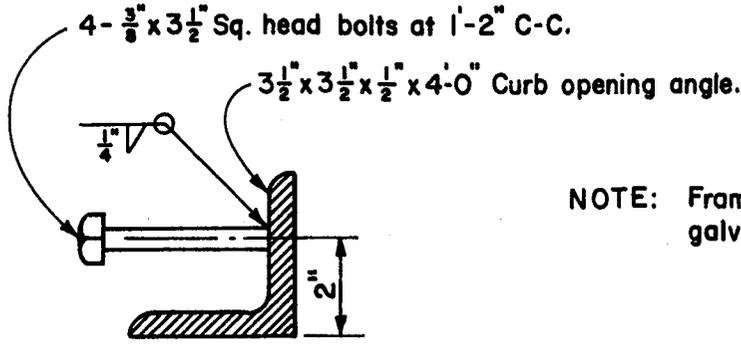
DWG. NO. SD-315
FILED <b>6-15-93</b>
SHT. <b>2</b> OF <b>3</b>



CITY OF HAYWARD ENGINEERING DIVISION			DRAWN BY: F.A.P.		DATE: 2-12-68	
			CHECKED BY: T.M.		SCALE: None	
REV. DATE BY			APPROVED		DIR. PUBLIC WORKS	

STANDARD  
SEPTIC TANK

DWG. NO. SD-315
FILED 6-15-93
SHT. 3 OF 3

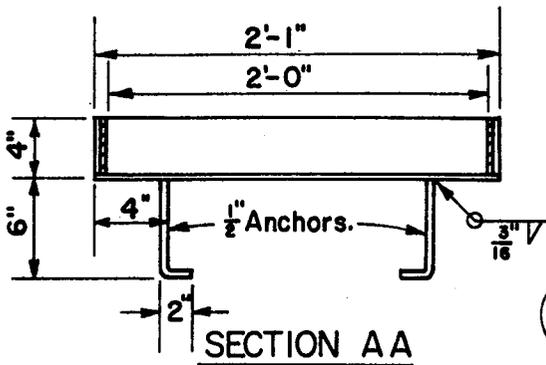


**ANGLE ANCHOR**

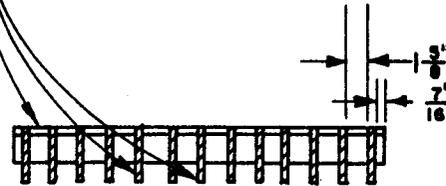
NOTE: Frame, grate and anchor shall be galvanized after fabrication

Cross bars shall be  $\frac{3}{8}$ " diameter and shall be electroforged or resistance welded to bearing bars.

Bearing bars shall be  $3\frac{1}{2} \times \frac{1}{4}$ " bars on  $1\frac{7}{8}$ " centers.

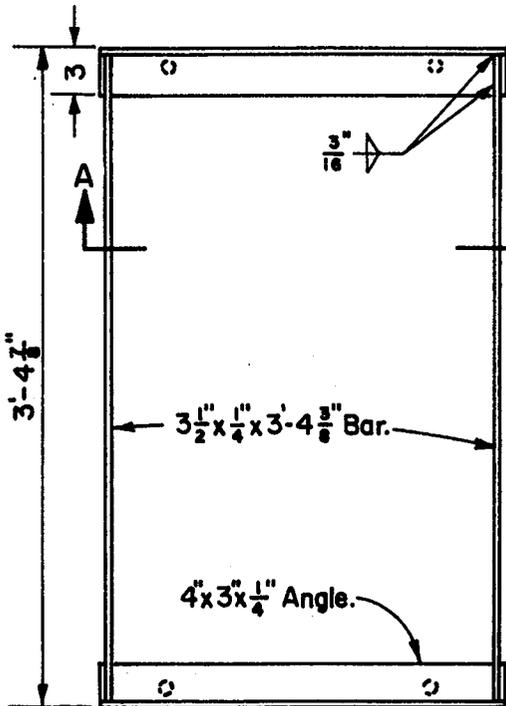


**SECTION AA**

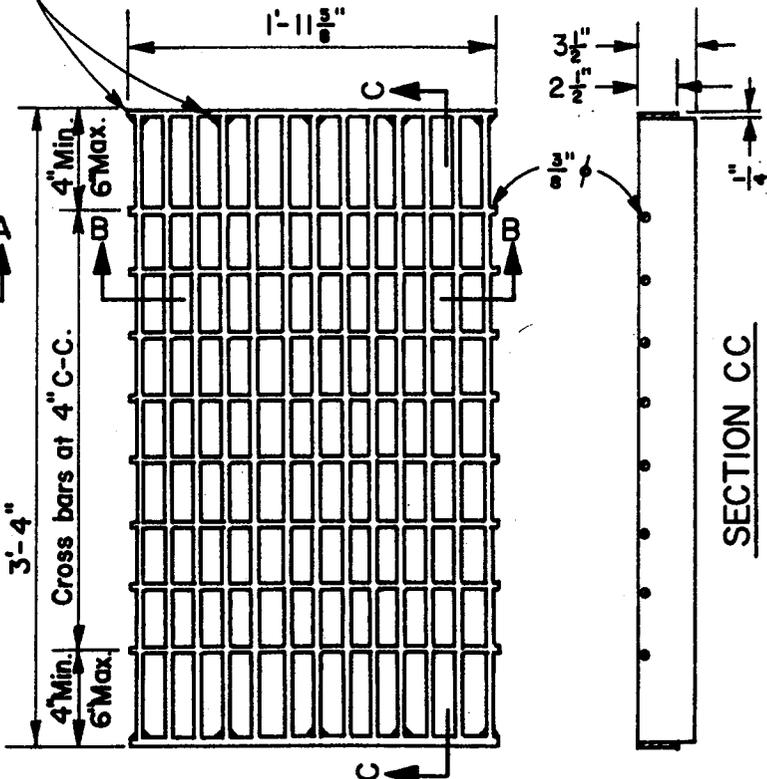


**SECTION BB**

$\frac{3}{16}$ " Fillet weld full depth each side on outside bearing bars and on every third internal bearing bar.



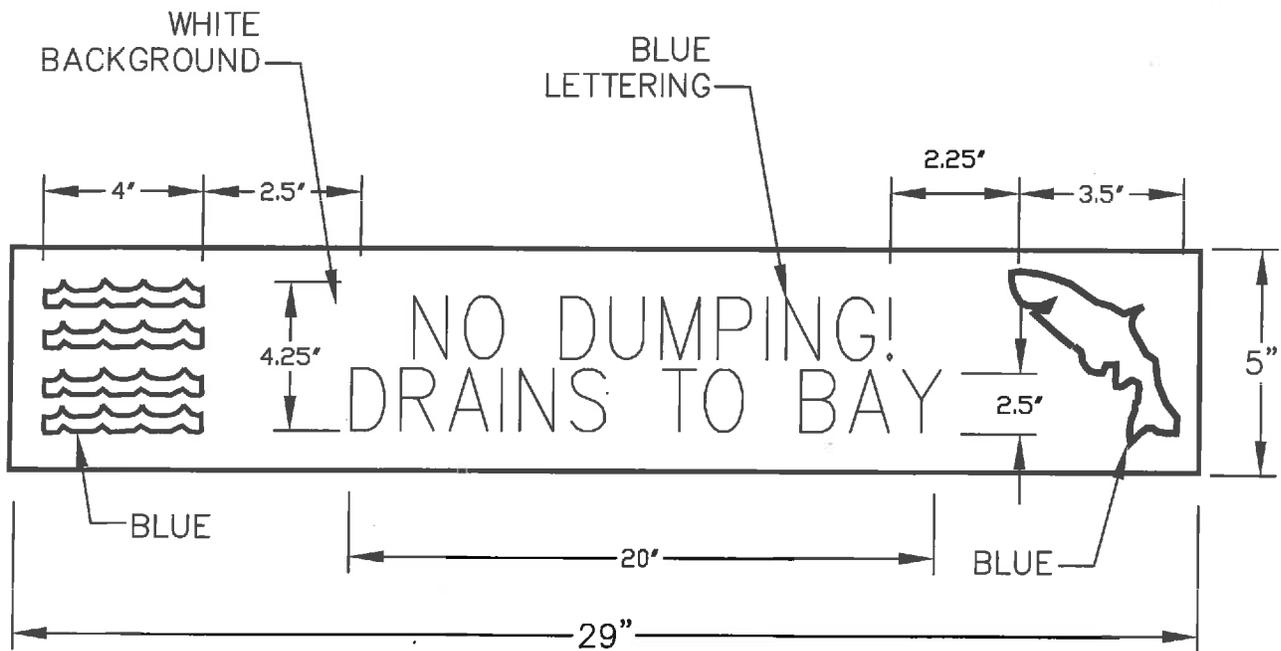
**FRAME**



**GRATE**

**SECTION CC**

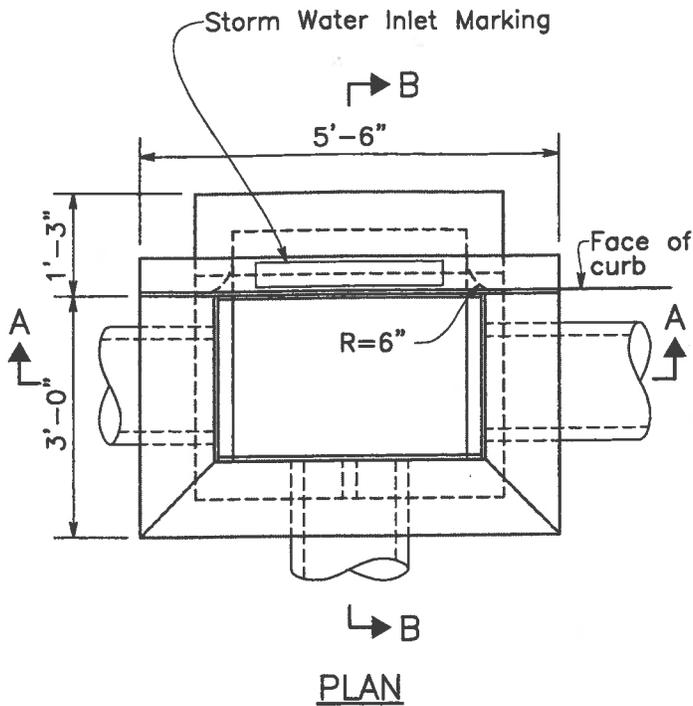
<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD STORM WATER INLET ANCHOR, FRAME AND GRATE</b>			DWG. NO. SD-401	
						FILED 6-15-93	
REV.	DATE	BY	DRAWN BY: F.A.P. CHECKED BY: EH APPD. BY: [Signature] CITY ENGR.	DATE: 11-18-74 SCALE: NONE APPROVED: [Signature] DIR. PUBLIC WORKS	SHT. 1 OF 1		



NOTES:

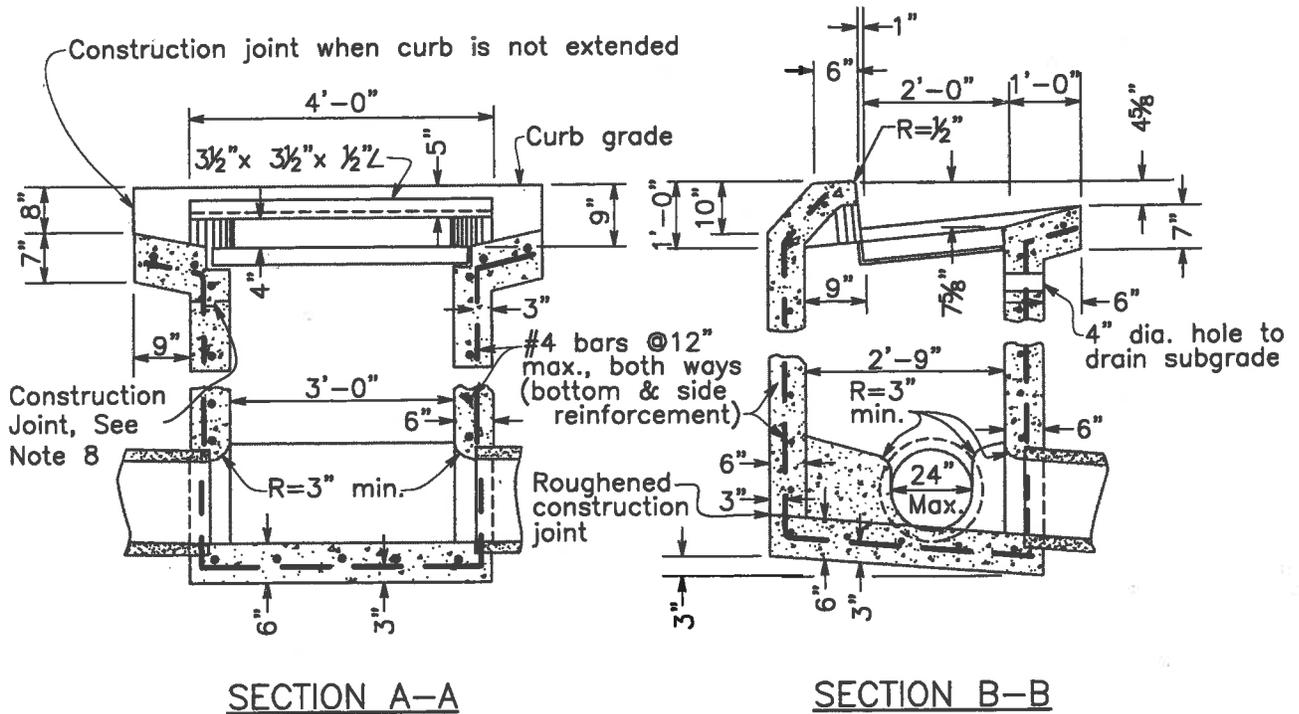
1. New concrete surfaces must be sandblasted to entirely remove the curing compound.
1. This marking shall be applied on top of curb or sidewalk where storm water inlets are located.
1. When there is no curb, apply the marking on the concrete flare or apron.
4. The skid-resistant and retroreflective preformed thermoplastic marking shall be applied to concrete or asphalt by means of heat fusion in accordance with the manufacturer's recommendations. The marking shall be Flint Trading, Inc. PreMark #89182083HS, telephone no. (916) 424-1332, or approved equal.
5. The preformed thermoplastic marking shall be a two layer application consisting of a blue non-beaded base layer with a white beaded stencil top layer.
1. Storm water inlet marking shall be applied to all new and modified stormwater inlets.

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD</b> <b>STORM WATER INLET</b> <b>MARKING</b>		DWG. NO. <b>SD-401A</b>	
			DRAWN BY: FM CHECKED BY: JL APP'D BY: <i>[Signature]</i> CITY ENGINEER	DATE: 04/01/10 SCALE: NONE APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS				
1	4/14/10	AL					FILED	
REV	DATE	BY					SHT. <b>1</b> OF <b>1</b>	

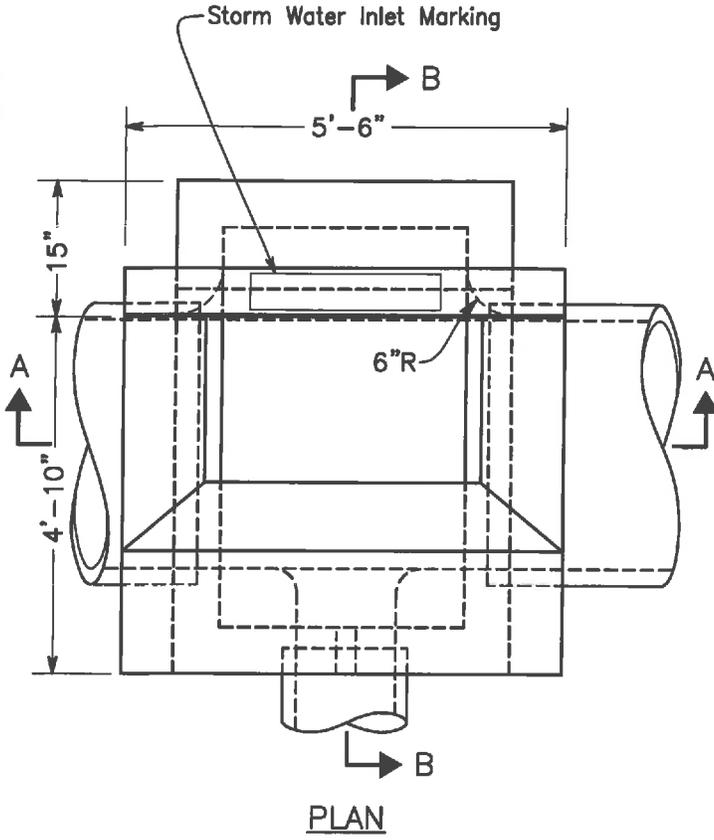


**NOTES:**

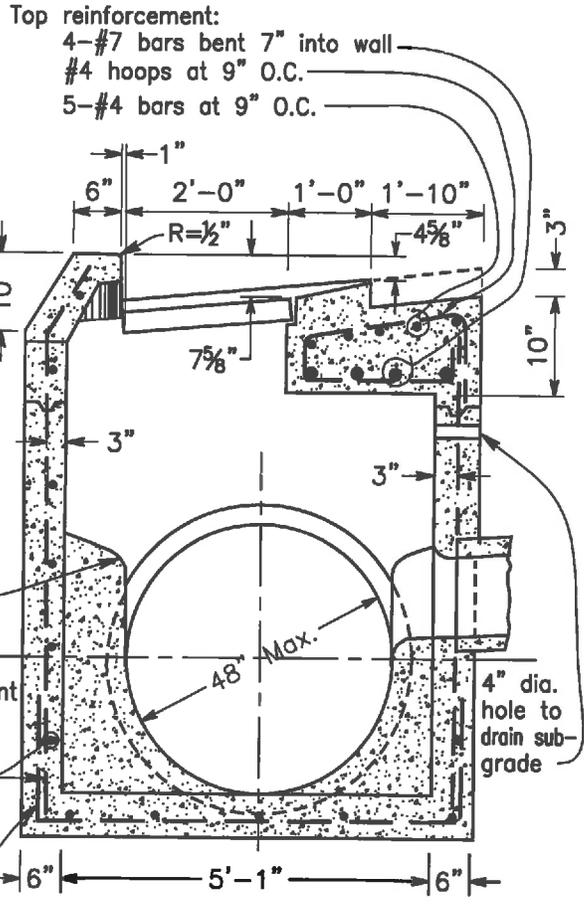
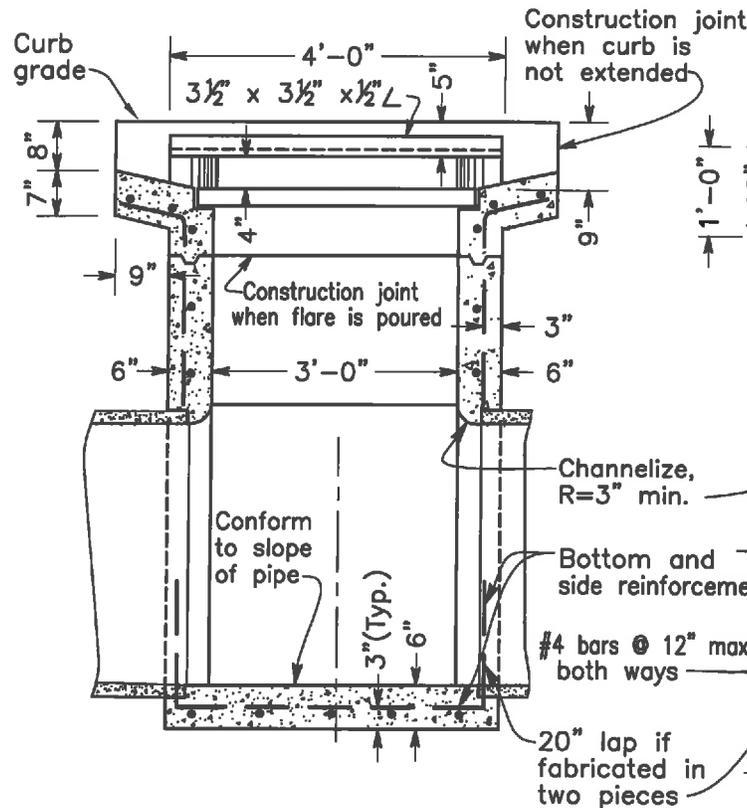
1. See SD-401 for angle anchor, frame and grate details.
2. See SD-401A for Storm Water Inlet Marking details.
3. See SD-112 for gutter flare details.
4. Inlets shall be formed and concrete shall be vibrated in place.
5. Class "B" concrete shall be used.
6. Type "A" inlet shall only be used for pipes 24" and smaller, with centerline of pipe located 0.67' from face of curb.
7. All concrete shall be cast-in-place except where authorized by the City Engineer. Submittal approval required for pre-cast boxes.
8. All rebar lap splices to be 20" min.
9. Install construction joint if top part (apron) is poured monolithically with gutter flare.



			<b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD TYPE "A" STORM WATER INLET</b>		DWG. NO. <b>SD-402</b>	
			DRAWN BY: JT CHECKED BY: JF APP'D. BY:	DATE: 04/02/10 SCALE: N/S APPROVED:				FILED
	9/30/13	AL	CITY ENGINEER		DIR. PUBLIC WORKS		SHT. 1 OF 1	



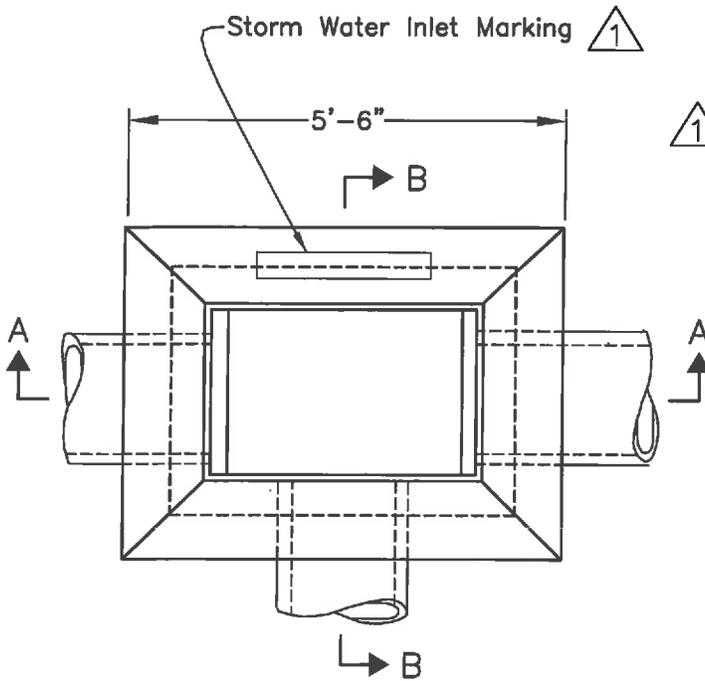
- NOTES:**
1. See SD-401 for angle anchor, frame and grate details.
  2. See SD-112 for gutter flare details.
  3. See SD-401A for Storm Water Inlet Marking details.
  4. Inlet shall be formed and concrete shall be vibrated in place.
  5. Class "B" concrete shall be used.
  6. The channel from springline to invert shall conform to the inside circumference of the pipe.
  7. Channel height shall be 7/8 of the inside diameter of the pipe above the invert.
  8. Type "C" inlet shall be used only for pipes 27" to 48" I.D., located 2' from face of curb.
  9. All concrete shall be cast-in-place except where authorized by the City Engineer. Submittal approval required for precast boxes.
  10. All rebar lap splices to be 20" minimum.



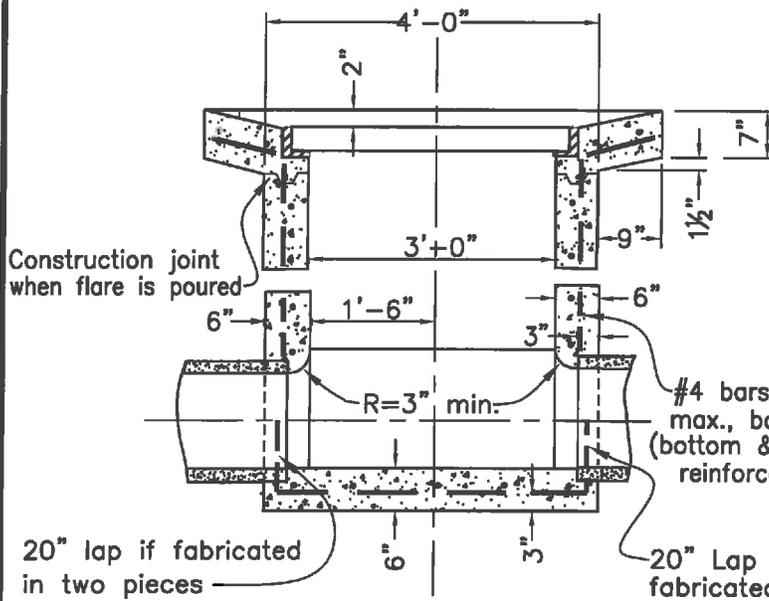
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD TYPE "C" STORM WATER INLET</b></p>	<p>DWG. NO. <b>SD-403</b></p>
<p>DRAWN BY: JT</p>	<p>DATE: 12/05/10</p>	<p>FILED</p>		
<p>CHECKED BY: AL</p>	<p>SCALE: NONE</p>	<p>APPROVED BY: [Signature]</p>	<p>SHT. 1 OF 1</p>	
<p>REV</p>	<p>DATE</p>	<p>BY</p>	<p>CITY ENGINEER</p>	<p>DIV. PUBLIC WORKS</p>

**NOTES:**

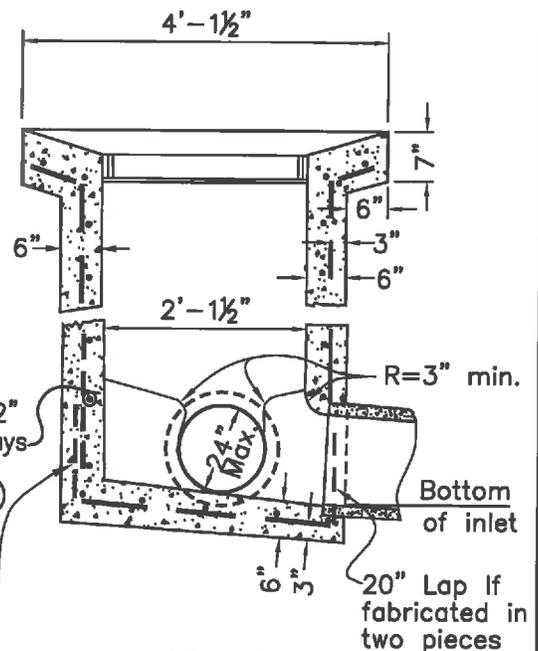
1. See SD-401 for frame and grate details.
2. See SD-112 for gutter flare details.
3. See SD-401A for Storm Water Inlet Marking details.
4. Inlet shall be formed and concrete shall be vibrated in place.
5. Class "B" concrete shall be used.
6. Type "D" inlet shall only be used for a large area drain where required.
7. Use structural details shown on SD-403 for inlets with 27" to 48" pipes.
8. All concrete shall be cast-in-place except where authorized by the City Engineer. Submittal approval required for pre-cast boxes.
9. All rebar lap splices to be 20" minimum.



**PLAN**



**SECTION A-A**

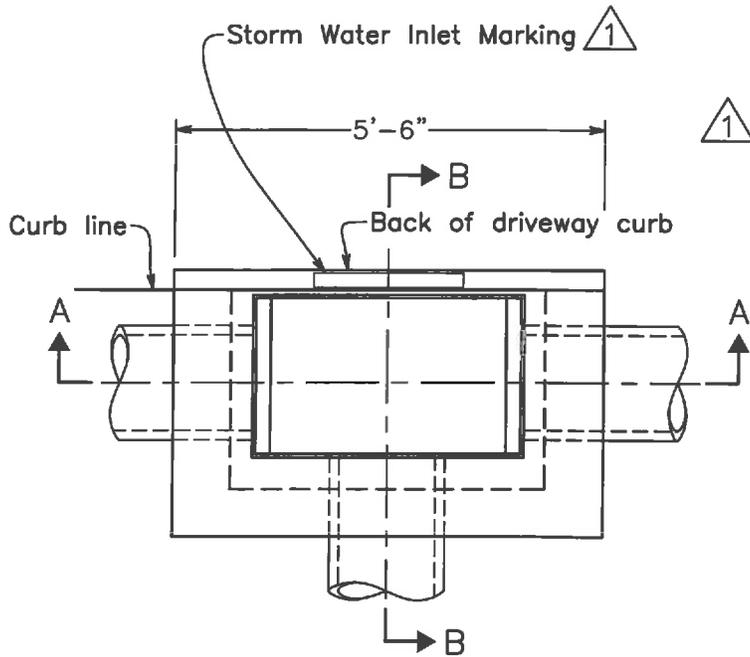


**SECTION B-B**

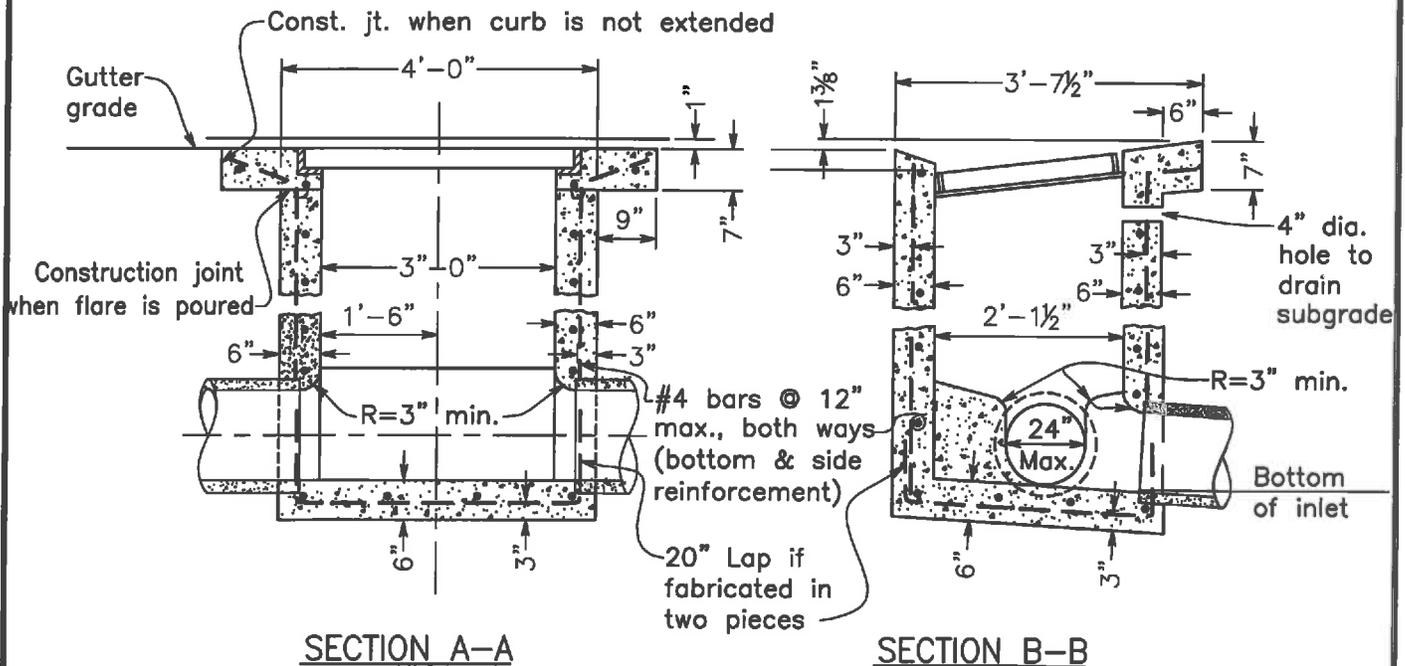
		 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD TYPE "D" STORM WATER INLET</b>		DWG. NO. <b>SD-404</b>	
		DRAWN BY: HGM CHECKED BY: MHW APP'D BY: <i>[Signature]</i> CITY ENGINEER	DATE: 08/28/08 SCALE: NPS APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS	<b>STANDARD TYPE "D" STORM WATER INLET</b>		FILED	
5/14/10 REV DATE BY	AL			<b>STANDARD TYPE "D" STORM WATER INLET</b>		SHT. <b>1</b> OF <b>1</b>	

**NOTES:**

1. See SD-401 for frame and grate details.
2. See SD-112 for gutter flare details.
3. See SD-401A for Storm Water Inlet Marking details.
4. Inlet shall be formed and concrete shall be vibrated in place.
5. Class "B" concrete shall be used.
6. Use structural details shown on SD-403 for inlets with 27" to 48" pipes.
7. Type "E" inlet shall only be used in front of driveways.
8. All concrete shall be cast-in-place except where authorized by the City Engineer. Submittal approval required for precast boxes.
9. All rebar lap splices to be 20" minimum.



**PLAN**



**SECTION A-A**

**SECTION B-B**

		 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.	
		DRAWN BY: JT	DATE: 08/26/08
		CHECKED BY: MW	SCALE: NOT SCALE
		APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>
		CITY ENGINEER	CITY PUBLIC WORKS
△	5/14/10	AL	
REV	DATE	BY	

**STANDARD  
TYPE "E"  
STORM WATER INLET**

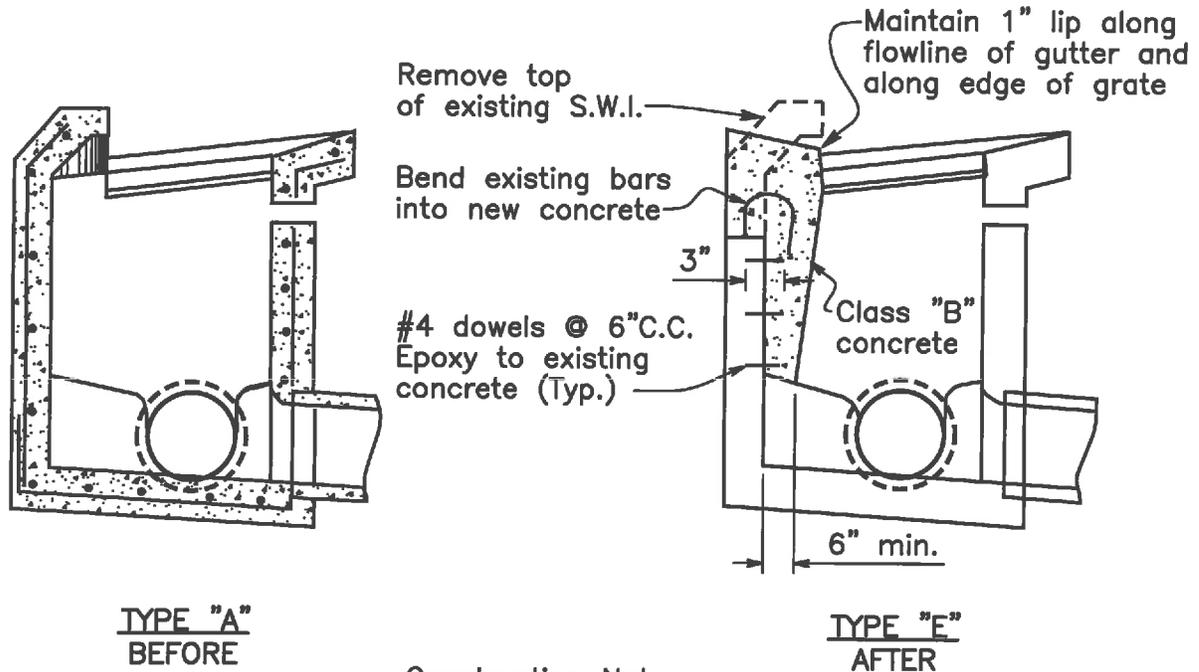
DWG. NO. **SD-405**

FILED

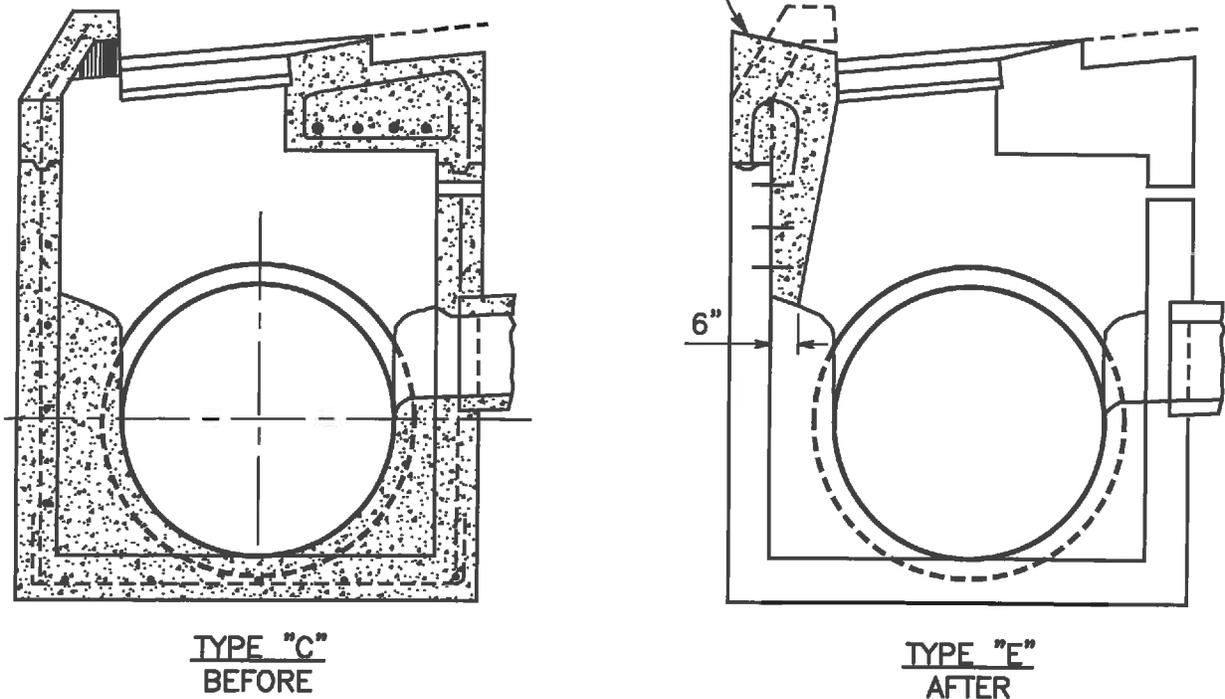
SHT. **1** OF **1**

**NOTES:**

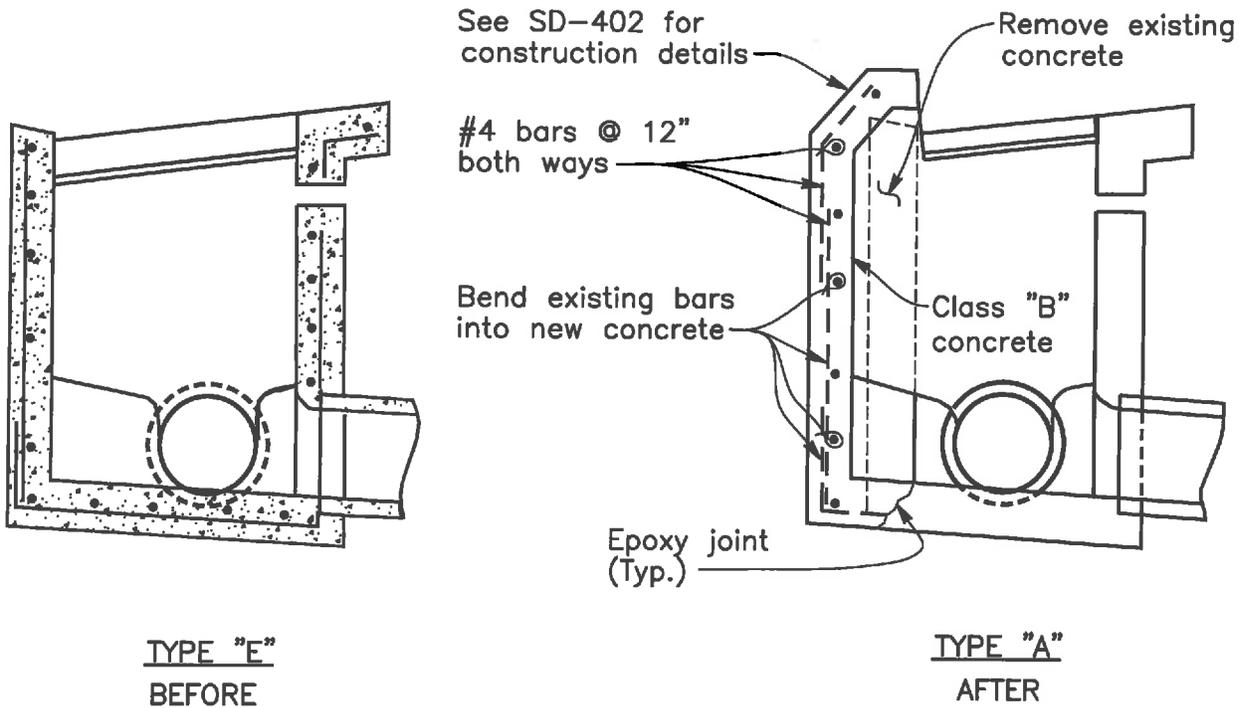
1. Inlet shall be formed and concrete shall be vibrated in place.
2. Class "B" concrete shall be used.
3. See SD-402, SD-403 and SD-405 for construction details.
4. This inlet conversion shall only be permitted when a driveway is required in front of an existing inlet.
5. See SD-401A for required Storm Water Inlet Marking details.



Construction Notes same as above



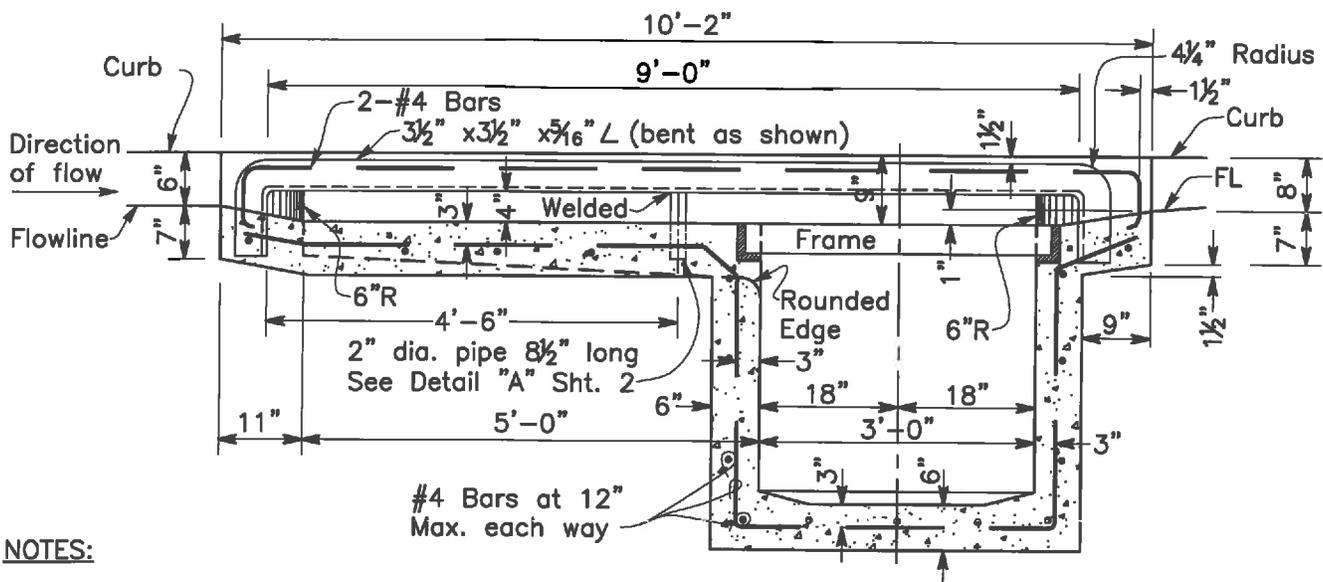
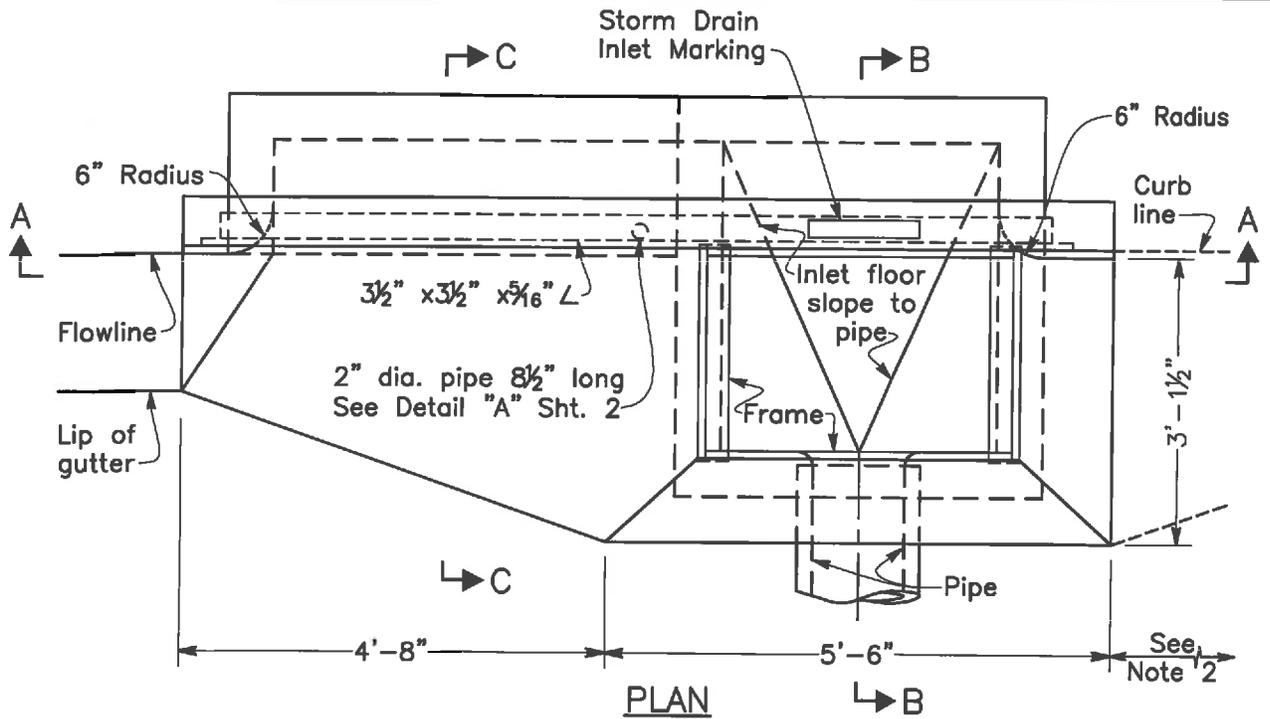
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD CONVERSION</b> <b>TYPE "A" &amp; "C" S.W.I.</b> <b>TO TYPE "E" S.W.I.</b></p>	DWG. NO. <b>SD-406</b>
<p>DRAWN BY: JT</p> <p>CHECKED BY: KSB</p> <p>APPD. BY: <i>[Signature]</i></p> <p>DATE: 02/24/11</p> <p>SCALE: NTS</p> <p>APPROVED: <i>[Signature]</i></p> <p>CITY ENGINEER</p>	<p>DATE: 02/24/11</p> <p>SCALE: NTS</p> <p>APPROVED: <i>[Signature]</i></p> <p>CITY ENGINEER</p>	<p>FILED</p> <p>SHT. <b>1</b> OF <b>1</b></p>		



**NOTES:**

1. All gaps in existing #4 bars shall be bridged with #4 bar.
2. New bars and existing bars shall have a minimum 12" lap.
3. Inlet shall be formed and concrete shall be vibrated in place.
4. Class "B" concrete shall be used.
5. This inlet conversion shall only be permitted when a driveway is abandoned and a curb is constructed.
6. See SD-401A for required Storm Water Inlet Marking details.

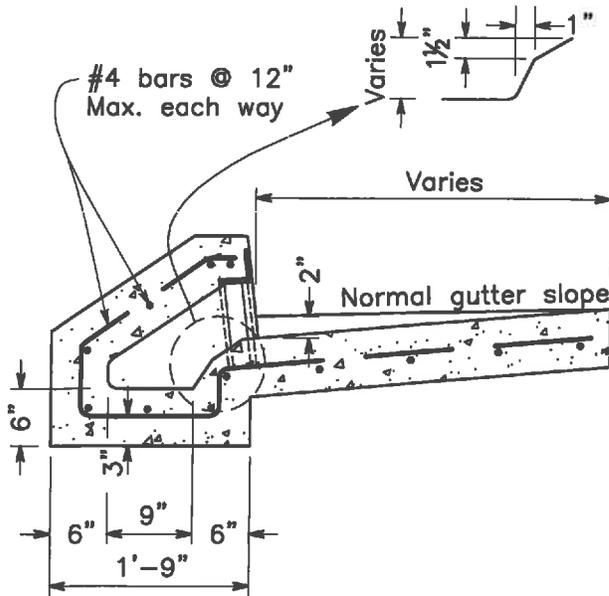
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD CONVERSION</b> <b>TYPE "E" S.W.I. TO</b> <b>TYPE "A" S.W.I.</b>		DWG. NO. <b>SD-407</b>	
			DRAWN BY: JT CHECKED BY: KSB APPD. BY: <i>[Signature]</i> CITY ENGINEER	DATE: 02/24/11 SCALE: 1/8" = 1'-0" APPROVED: <i>[Signature]</i> DIR. PUBLIC WORKS			FILED SHT. <b>1</b> OF <b>1</b>	
REV	DATE	BY						



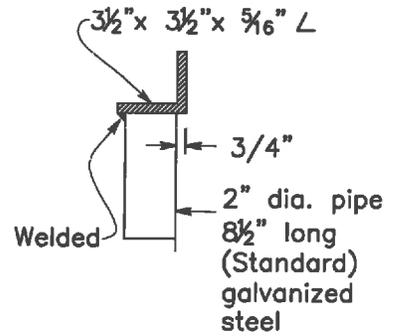
**NOTES:**

1. See SD-401 for angle anchor, frame and grate details.
  2. See SD-112 for gutter flare details.
  3. Inlet shall be formed and concrete shall be vibrated in place.
  4. Class "B" concrete shall be used.
  5. Type "F" inlet may be required by the City Engineer in order to intercept the gutter flow where street grades are excessive.
- (continued on sheet 2)

			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD TYPE "F" STORM WATER INLET</b>		DWG. NO. <b>SD-408</b>	
			DRAWN BY: JT	DATE: 12/05/10				FILED
			CHECKED BY: AL	SCALE: NTS				
			APPD. BY: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>				SHT. <b>1</b> OF <b>2</b>
REV	DATE	BY	CITY ENGINEER		DIR. PUBLIC WORKS			



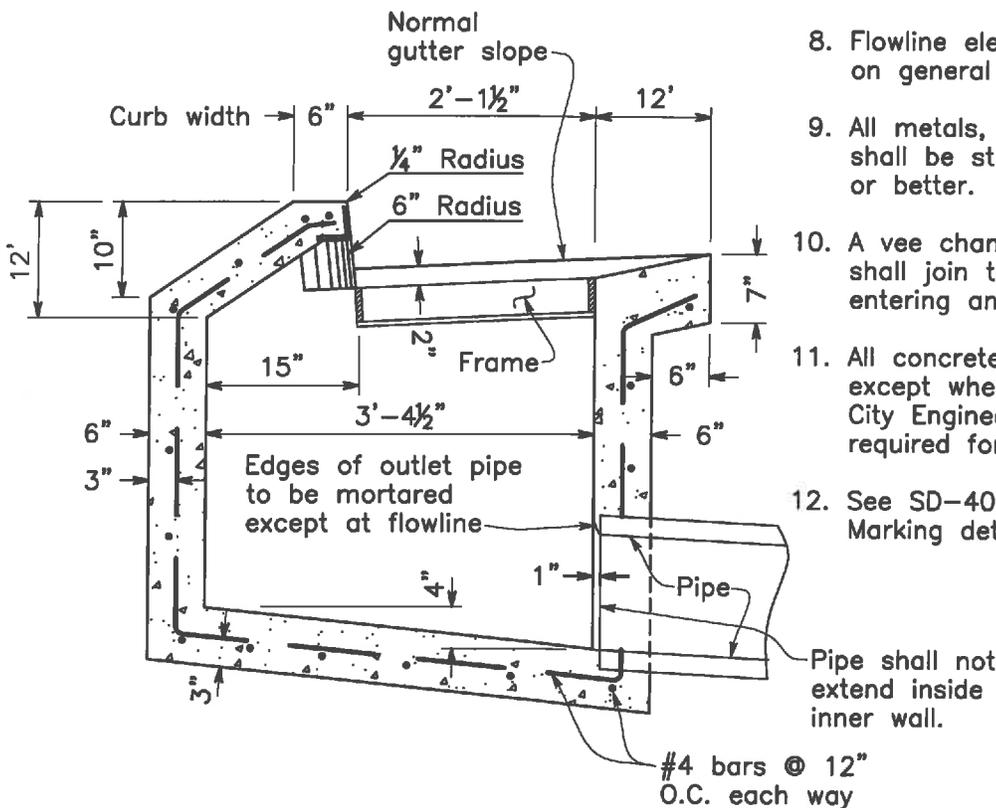
**SECTION C-C**



**DETAIL "A"**

**NOTES:** (continued from sheet 1)

6. The extended curb opening will always be constructed on the upstream side of the inlet.
7. Location and direction of pipes entering or leaving inlet to be shown on general plans.
8. Flowline elevations to be shown on general plans.
9. All metals, except spreaders, shall be structural grade steel or better.
10. A vee channel four inches deep shall join two or more pipes entering an inlet.
11. All concrete shall be cast-in-place except where authorized by the City Engineer. Submittal approval required for pre-cast boxes.
12. See SD-401A for Storm Water Inlet Marking details.

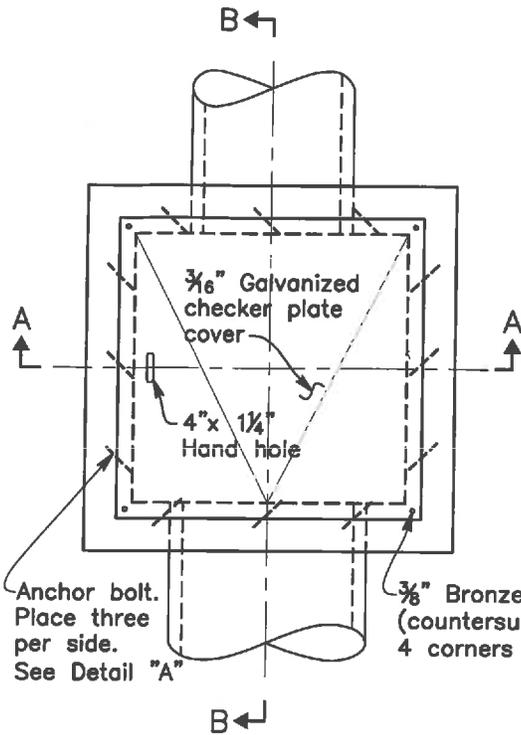


**SECTION B-B**

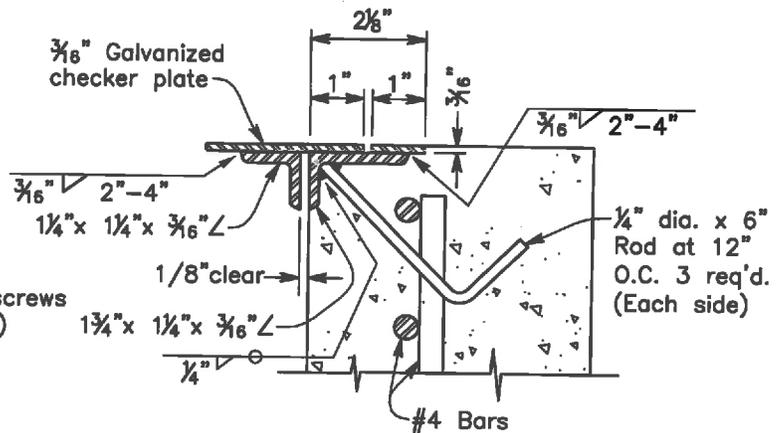
			 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD TYPE "F" STORM WATER INLET</b>		DWG. NO. <b>SD-408</b>		
			DRAWN BY: JT CHECKED BY: AL APPD. BY: <i>VAS</i>	DATE: 12/05/10 SCALE: N/A APPR. BY: <i>[Signature]</i>		FILED		SHT. <b>2</b> OF <b>2</b>	
REV	DATE	BY	CITY ENGINEER		DIR. PUBLIC WORKS				

**NOTES:**

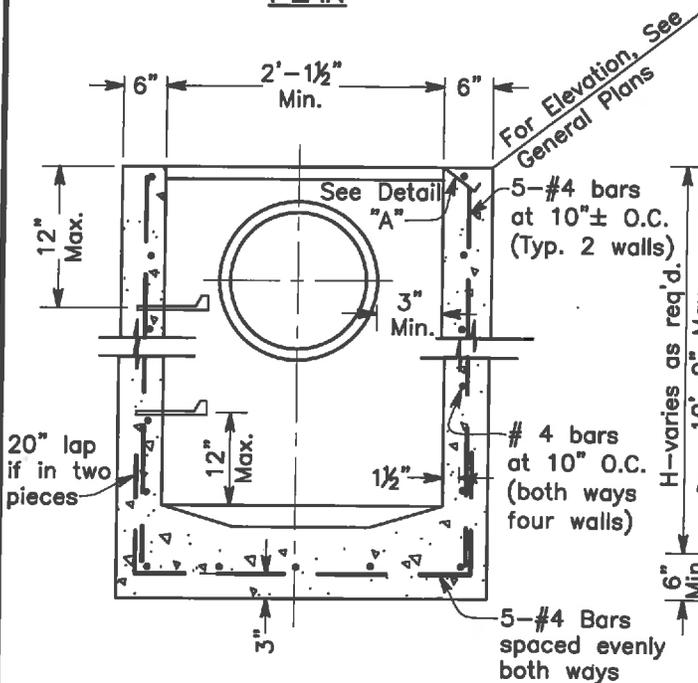
1. Location and direction of pipes entering and leaving the junction box are shown on the General Plans.
2. Omit steps in junction boxes less than 3'-6" deep.
3. For step detail, see SD-410A.
4. All miscellaneous iron and steel to be galvanized after fabrication.
5. For use in non-traffic bearing areas.
6. For pipe depths less than 3', smaller box may be used subject to approval of the City Engineer.
7. Class "B" concrete shall be used.
8. All concrete shall be cast-in-place except where authorized by the City Engineer. Submittal approval required for pre-cast boxes.
9. All rebar lap splices to be 20" minimum.



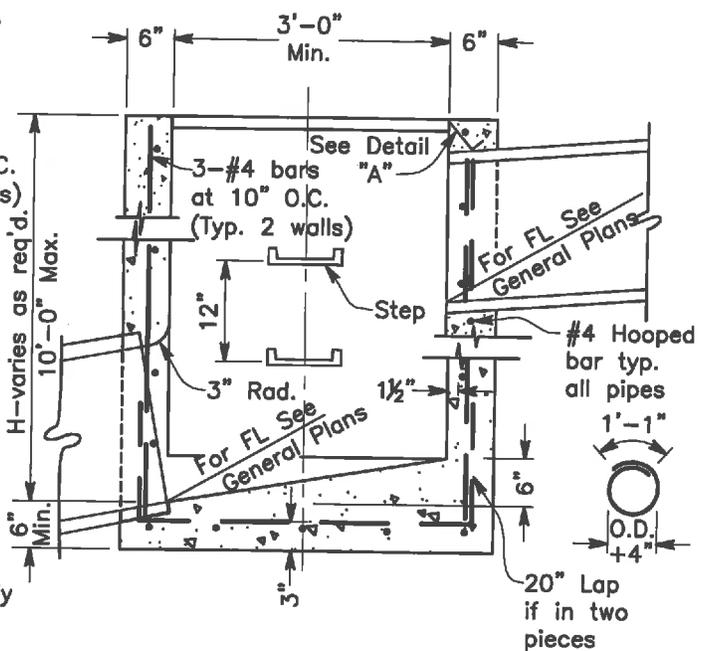
**PLAN**



**DETAIL "A"**



**SECTION A-A**



**SECTION B-B**

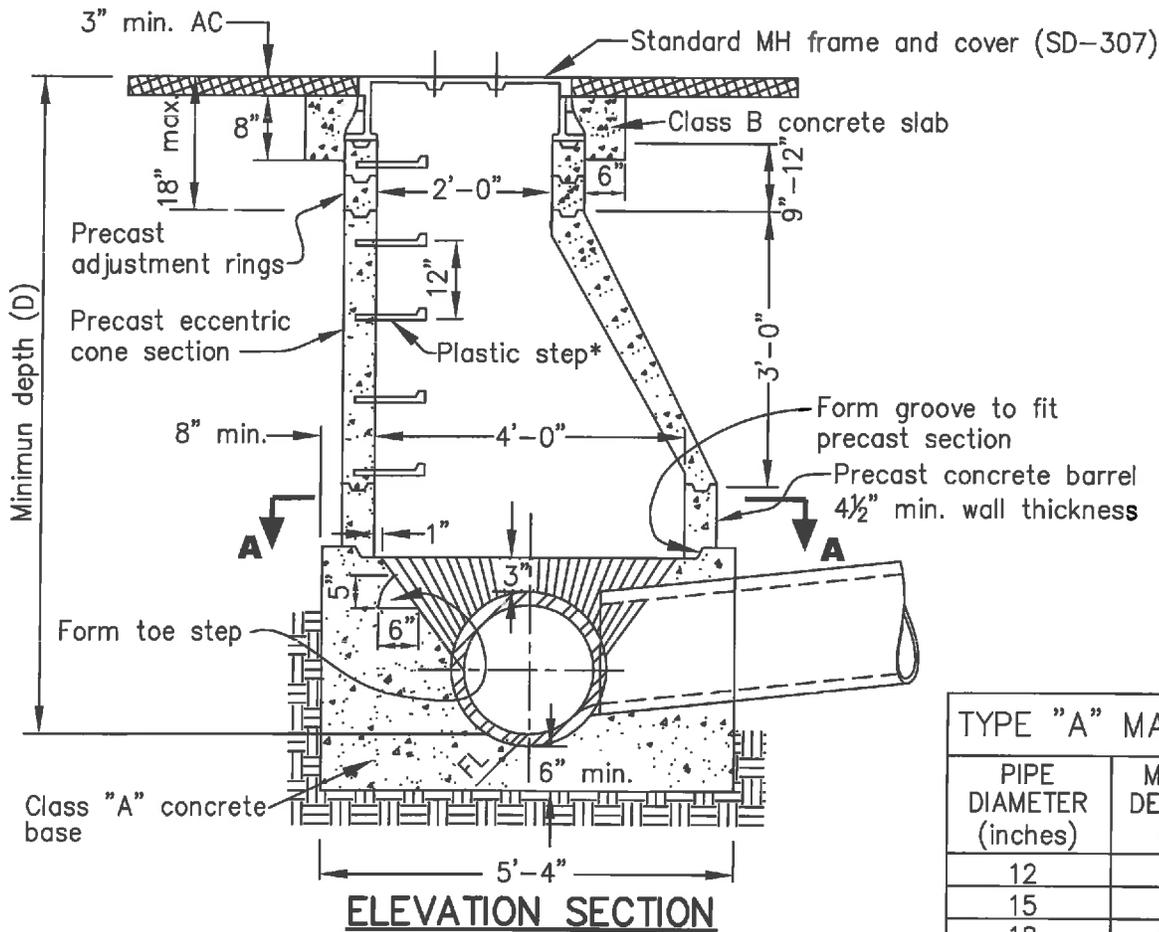
			<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>		
			<p>DRAWN BY: JT</p>	<p>DATE: 11/08/10</p>	
<p>CHECKED BY: AL</p>			<p>SCALE: INTS</p>		
<p>APPD. BY: <i>[Signature]</i></p>			<p>APPROVED: <i>[Signature]</i></p>		
<p>REV</p>	<p>DATE</p>	<p>BY</p>	<p>CITY ENGINEER</p>	<p>DIR. PUBLIC WORKS</p>	

**STANDARD JUNCTION BOX**

DWG. NO. **SD-409**

FILED

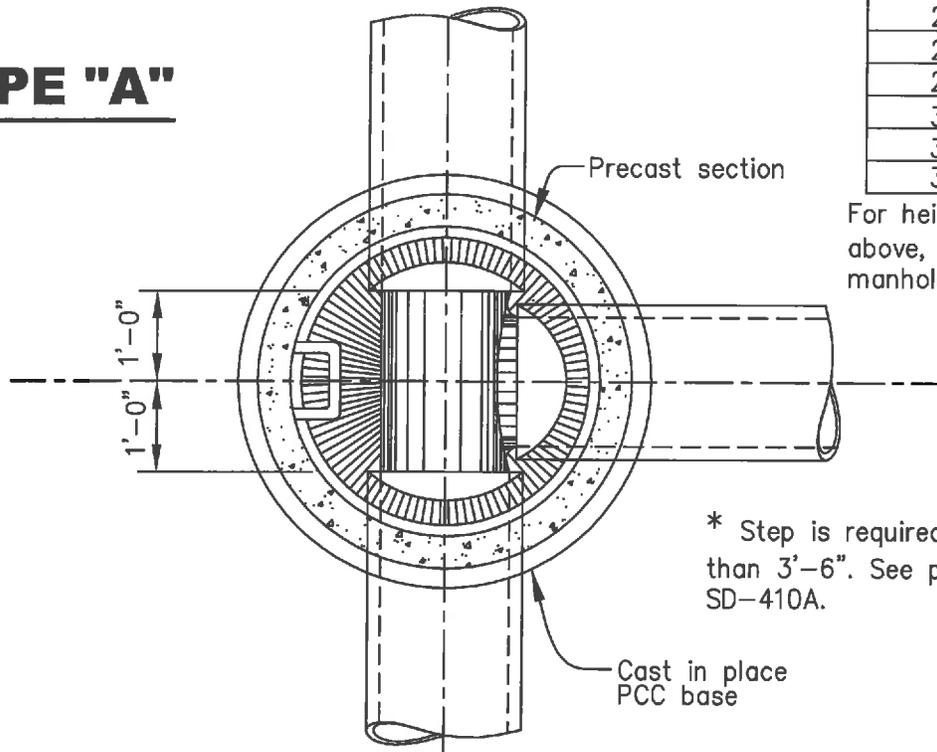
SHT. **1** OF **1**



TYPE "A" MANHOLE	
PIPE DIAMETER (inches)	MINIMUM DEPTH (D) (feet)
12	5.59
15	5.86
18	6.13
21	6.42
24	6.67
27	6.94
30	7.21
33	7.48
36	7.75

For heights less than shown above, use type "B" standard manhole or special design.

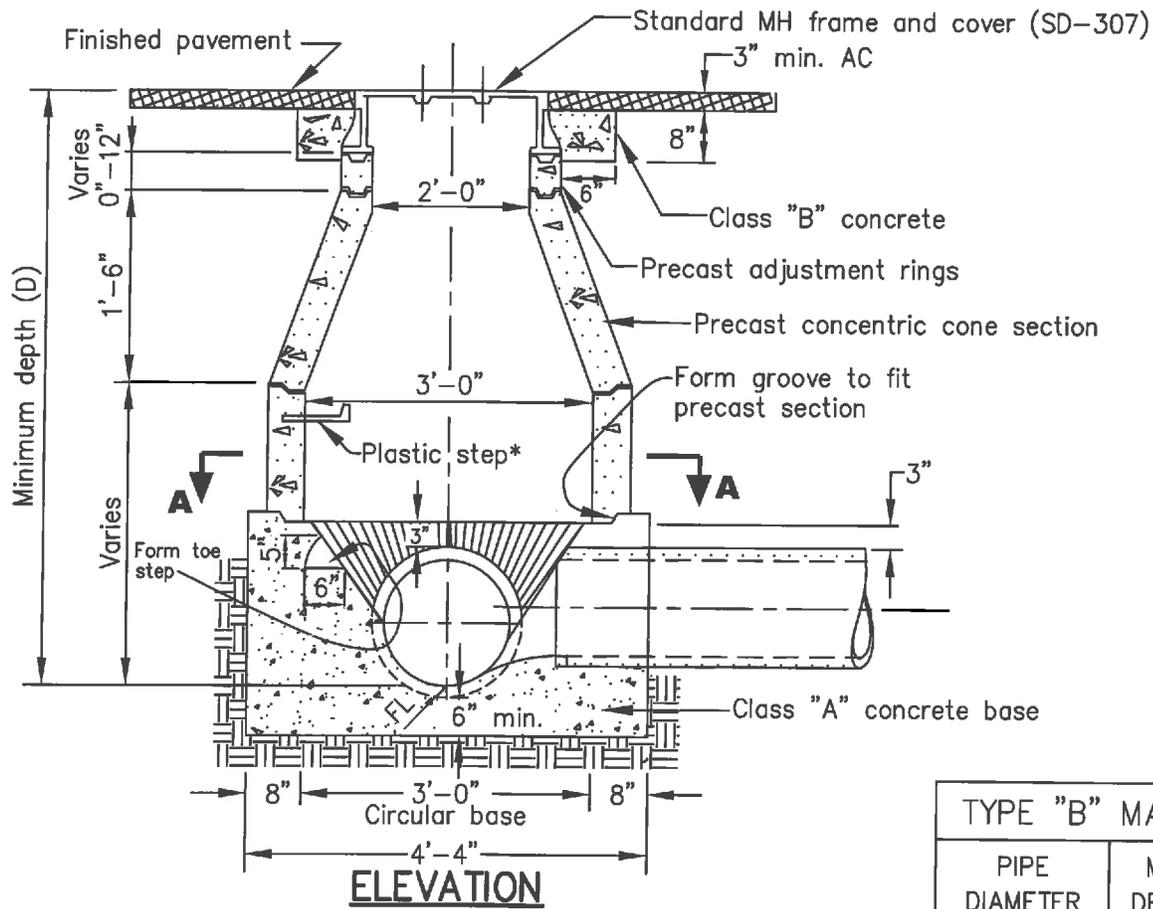
**TYPE "A"**



\* Step is required when "D" is greater than 3'-6". See plastic step detail on SD-410A.

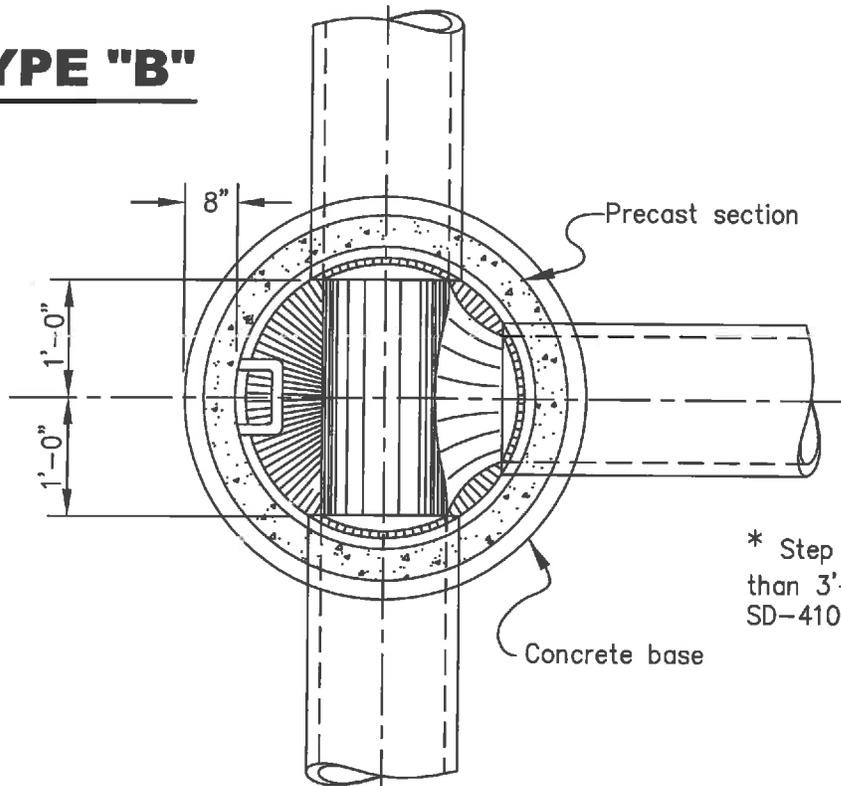
**SECTION A-A**

<p>CITY OF <b>HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD STORM DRAIN MANHOLE</b></p>		<p>DWG. NO. <b>SD-410</b></p>	
					<p>FILED</p>	
REV	DATE	BY	<p>DRAWN BY: HGM</p> <p>CHECKED BY: MHW</p> <p>APPD. BY: <i>[Signature]</i></p> <p>CITY ENGINEER</p>	<p>DATE: 09/29/10</p> <p>SCALE: NTS</p> <p>APPROVED: <i>[Signature]</i></p> <p>DIR. PUBLIC WORKS</p>	<p>SHT. <b>1</b> OF <b>2</b></p>	



**ELEVATION**

**TYPE "B"**



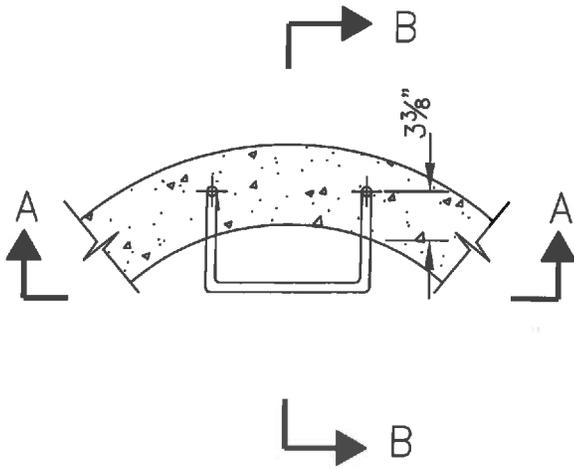
**SECTION A-A**

TYPE "B" MANHOLE	
PIPE DIAMETER (inches)	MINIMUM DEPTH (D) (feet)
12	3.34
15	3.59
18	3.86
21	4.12
24	4.38
27	4.64
30	4.90

Type "B" manhole to be used only where available height restricts the use of Type "A" manhole.

\* Step is required when "D" is greater than 3'-6". See plastic step detail on SD-410A.

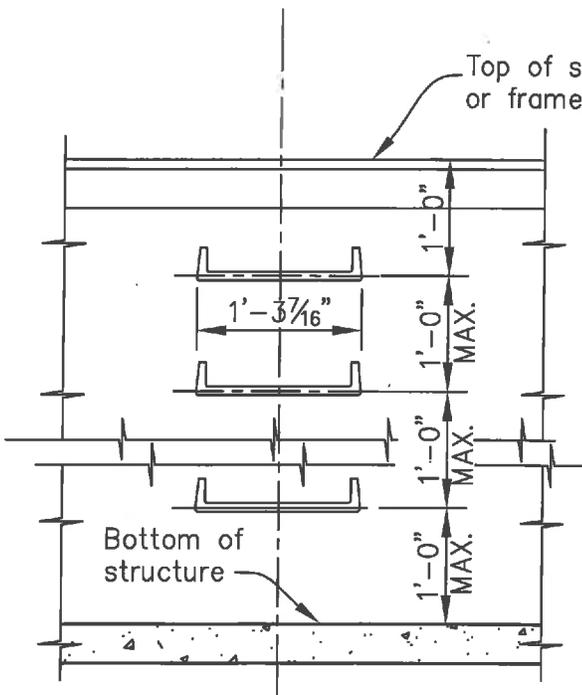
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD STORM DRAIN MANHOLE</b></p>	<p>DWG. NO. <b>SD-410</b></p>
<p>DRAWN BY: HGM</p>	<p>DATE: 10/03/10</p>	<p>FILED</p>		
<p>CHECKED BY: LAS</p>	<p>SCALE: NTS</p>	<p>APPROVED: </p>	<p>SHT. <b>2</b> OF <b>2</b></p>	
<p>REV</p>	<p>DATE</p>	<p>BY</p>	<p>CITY ENGINEER</p>	<p>DIR. PUBLIC WORKS</p>



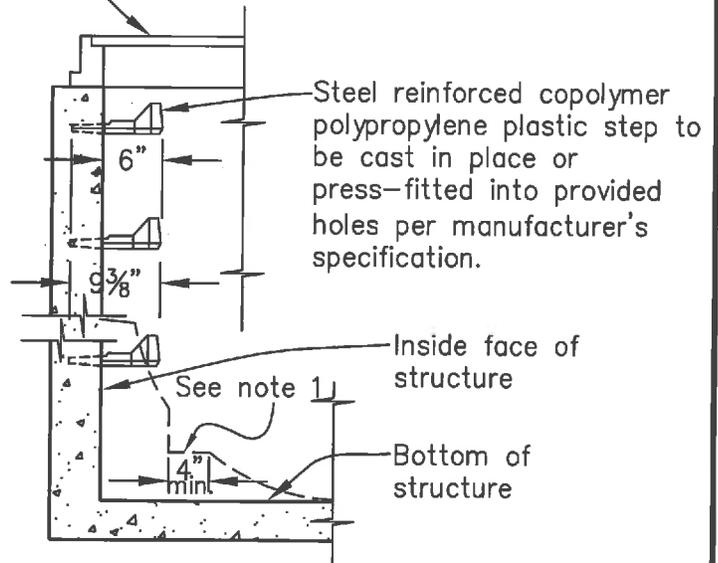
**PLAN**

General Notes:

1. Omit step in channelization of any channelized manhole and provide a notched step as directed by the City Engineer.
2. Step shall conform to ASTM C-478, paragraph # 11.
3. Polypropylene plastic molding and extrusion materials shall conform to the latest revision of ASTM D2146-78 Type II, Grade 16906.

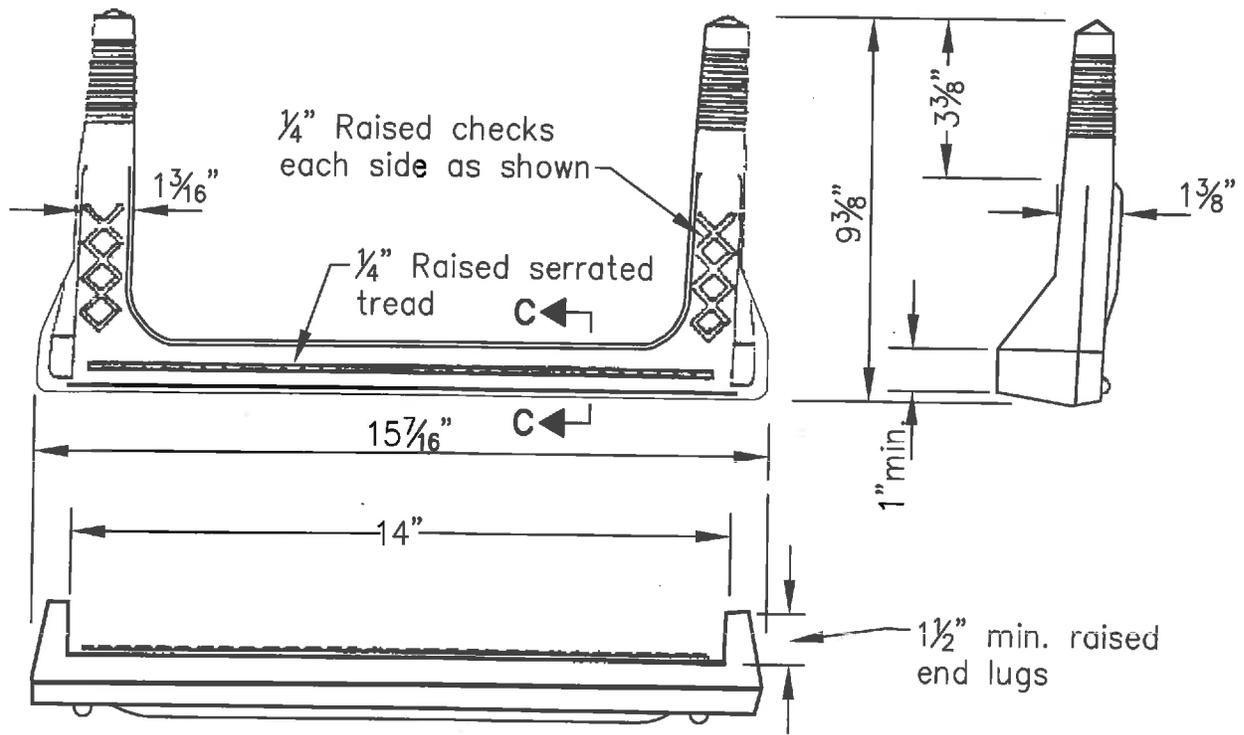


**SECTION A-A**

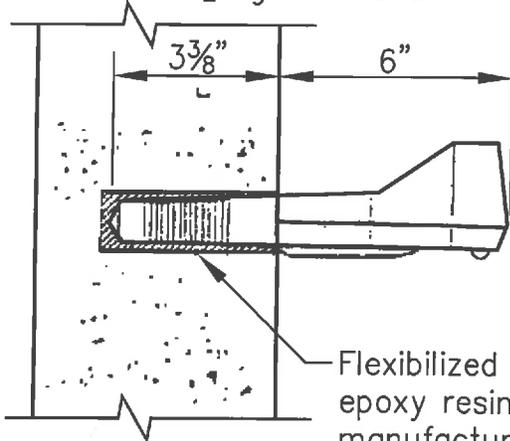


**SECTION B-B**

			<b>CITY OF HAYWARD PUBLIC WORKS DEPT.</b>		
REV DATE BY	CITY ENGINEER		DIR. PUBLIC WORKS		DWG. NO. <b>SD-410A</b>
<b>STANDARD PLASTIC STEP</b>					FILED
					SHT. <b>1</b> OF <b>2</b>



Copolymer polypropylene plastic with  $\frac{1}{2}$ " grade 60 steel reinforcement



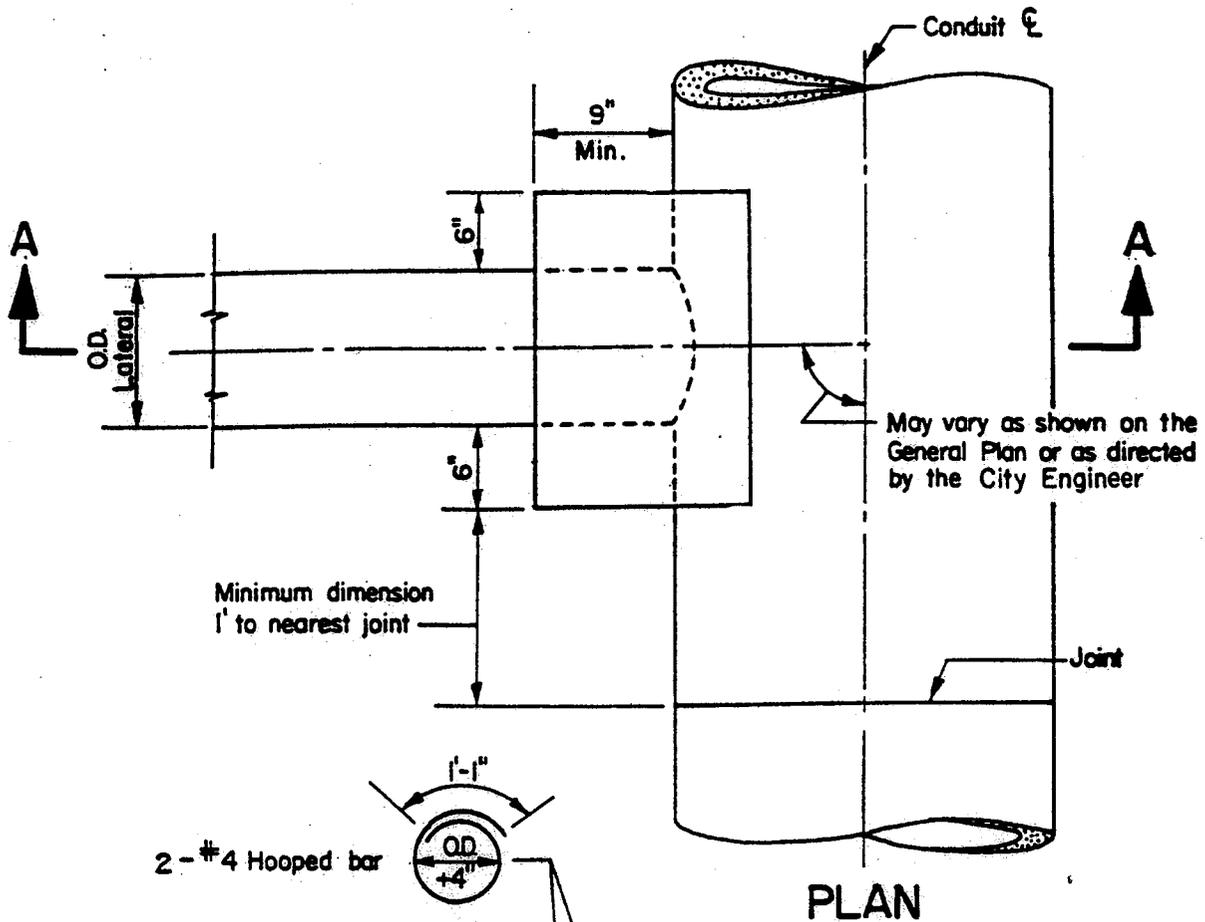
Flexibilized sewage resistant epoxy resin, concrete as manufactured by Adhesive Engineering of San Carlos CA., or approved equal

**SECTION C-C**

<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>		
DRAWN BY:	HGM	DATE: 10/10/08
CHECKED BY:	LAS	SCALE: NTS
APPD. BY:	<i>[Signature]</i>	APPROVED: <i>[Signature]</i>
REV	DATE	BY
		CITY ENGINEER
		DIR. PUBLIC WORKS

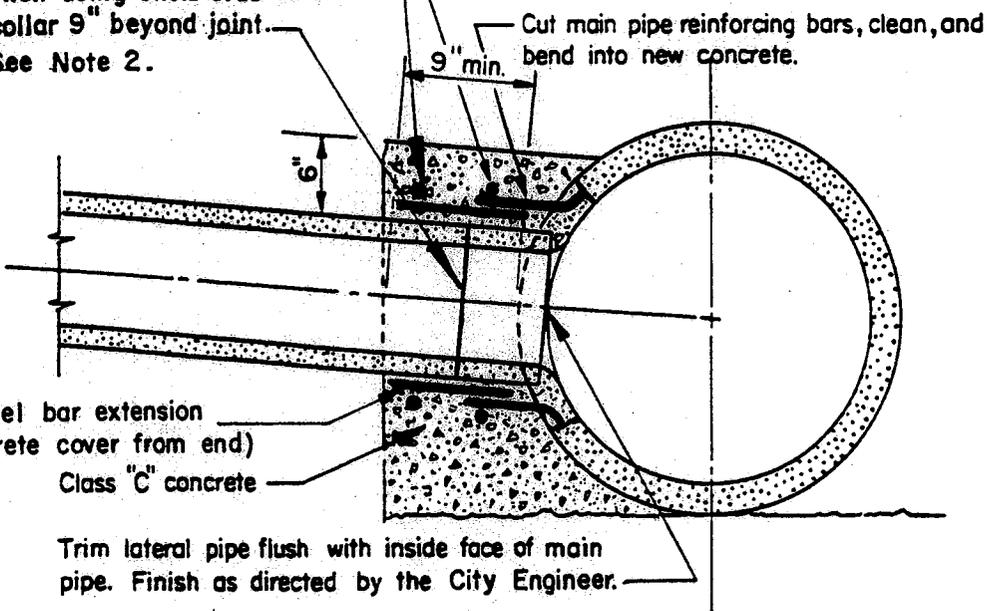
**STANDARD PLASTIC STEP**

DWG. NO.	<b>SD-410A</b>
FILED	
SHT.	<b>2 OF 2</b>



PLAN

When using short stub extend collar 9" beyond joint. See Note 2.

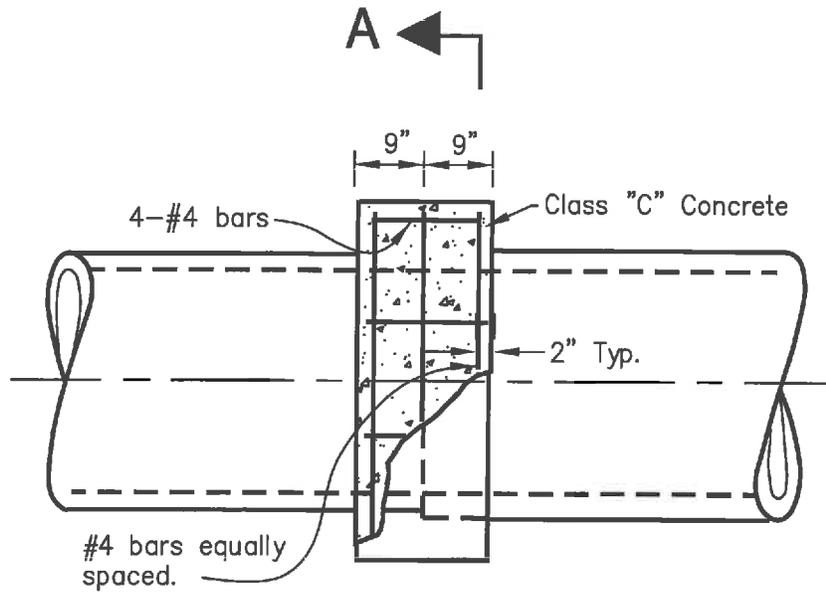


SECTION A-A

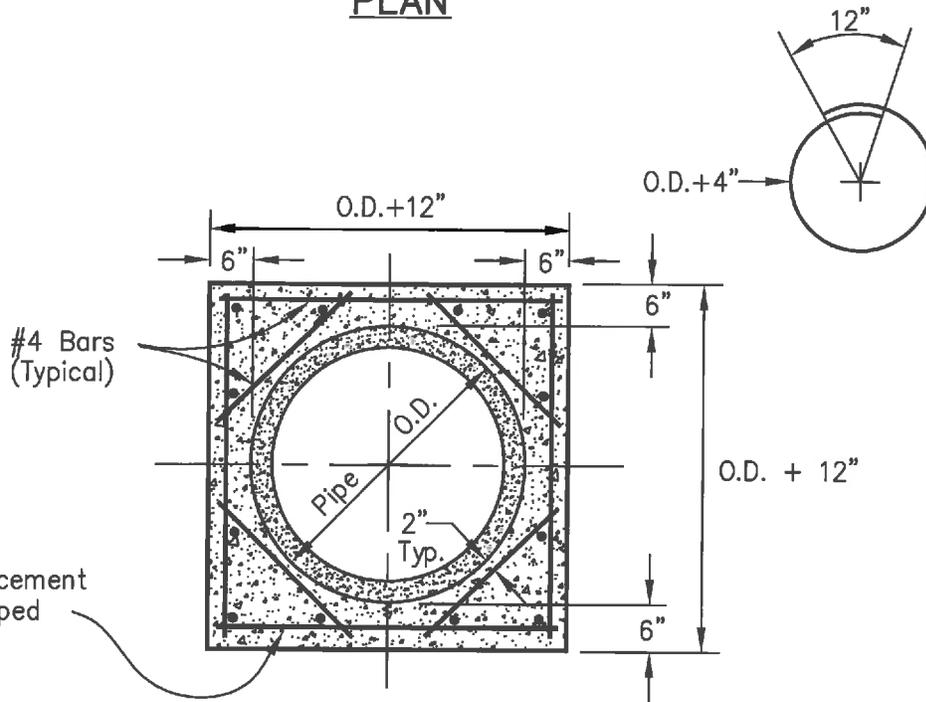
NOTES:

1. Side Connection shall only be allowed when the inside diameter of a lateral is not larger than 1/2 of inside diameter of main pipe
2. Use short stub when pipe is too small to finish from inside.

<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD</b>		DWG. NO. <b>SD-411</b>	
					FILED <b>6-15-93</b>	
DRAWN BY: F.M.			DATE: OCT. 4, 1992		SHT. <u>  </u> OF <u>  </u>	
CHECKED BY: T.M.			SCALE: NONE			
APPD. BY: <i>PHB</i>			APPROVED			
REV.	DATE	BY	CITY ENGR.		DIR. PUBLIC WORKS	



PLAN

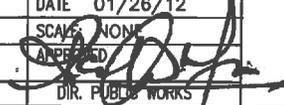


SECTION A-A

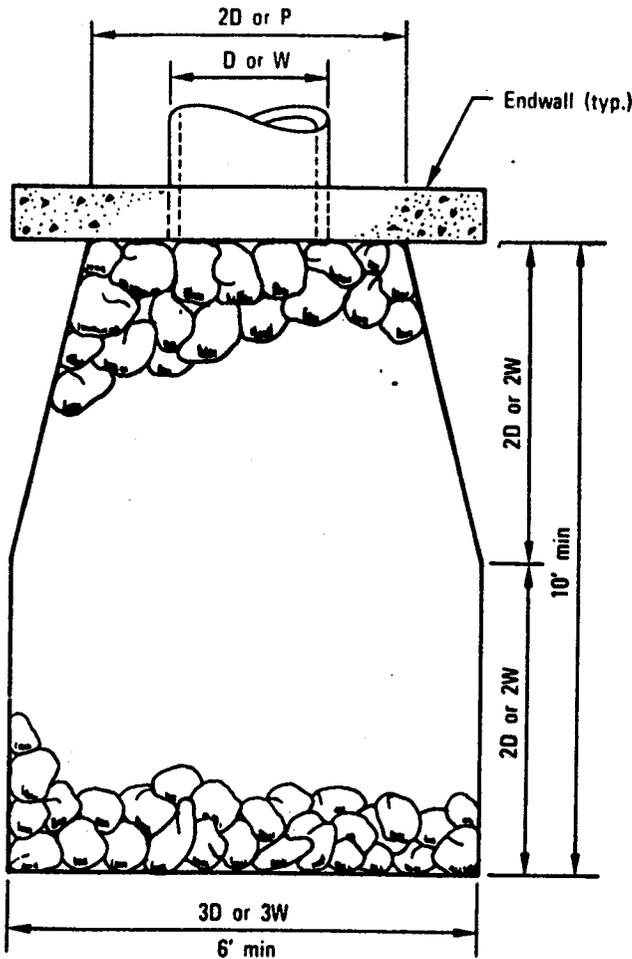
Alternative reinforcement can be 3-#4 hooped bars.

NOTE:

This joint may be used to join two pipes with the same inside diameter, but constructed of different materials.

		 <b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.		<b>STANDARD REINFORCED CONCRETE PIPE JOINT</b>	DWG. NO. <b>SD-412</b>
		DRAWN BY: HGM	DATE 01/26/12		FILED
		CHECKED BY: LAS	SCALE: NONE		SHT. <b>1</b> OF <b>1</b>
REV	DATE	BY	CITY ENGINEER		DIR. PUBLIC WORKS

Ref: San Diego Regional Standard Drawing D-40 Dec. 1975



PLAN

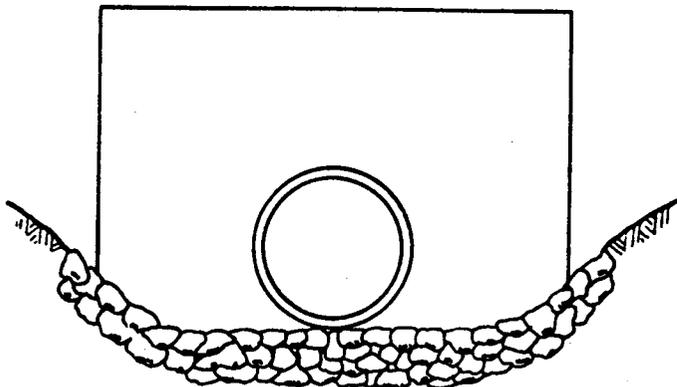
D = Pipe Diameter  
 W = Bottom Width of Channel  
 P = Wetted Perimeter of Channel

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

SELECTION OF RIP RAP

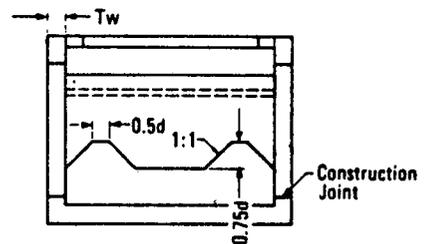
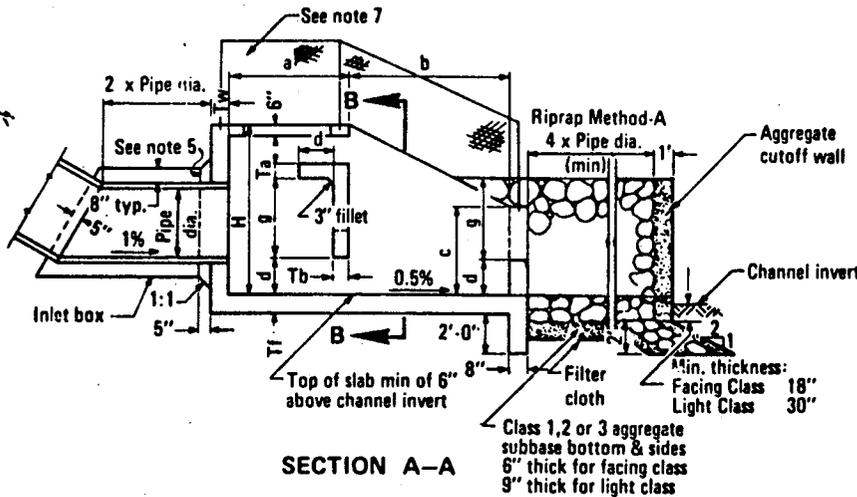
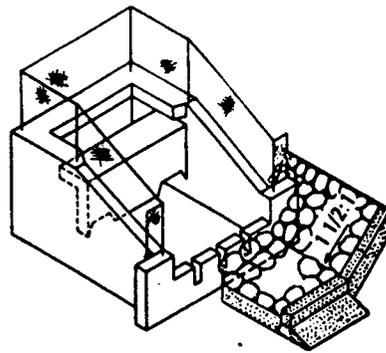
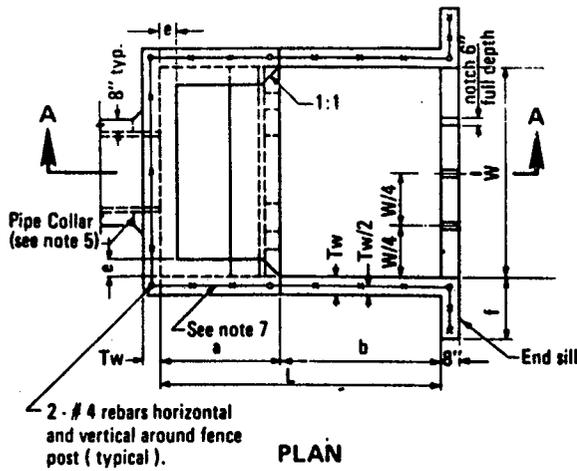
NOTES

1. Type of Rip Rap
  - a. Regular Quarry Stone
  - b. Rounded Cobblestone
  - c. Broken Concrete (only allowed upon approval of the Agency)
2. Placement
  - a. Minimum depth = 1 1/2 times average stone size.
  - b. Rocks shall be placed so as to provide a minimum of voids.
  - c. Surface rocks or concrete shall protrude to at least 1/2 their vertical dimension.
  - d. Rip Rap is to be placed over a natural bedding, or it may be grouted or placed over a gravel bedding when required by the Agency.



ELEVATION

<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD RIP RAP ENERGY DISSIPATOR</b>	DWG. NO. <b>SD-413</b>
DRAWN BY: RPE	DATE: DEC. 1976	FILED <b>6-15-93</b>		
CHECKED BY: JRL	SCALE: NONE			
APPROVED BY: <i>[Signature]</i>	APPROVED BY: <i>[Signature]</i>	SHT. <u>  </u> OF <u>  </u>		
REV. DATE BY	CITY ENGR.	DIV. PUBLIC WORKS		



NOTES:

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

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"
T <sub>l</sub>	8"		10"			12"			
T <sub>b</sub>	7"		9 1/2"			10 1/2"			
T <sub>w</sub>	7"		9 1/2"			10 1/2"			
T <sub>a</sub>	7"		8"						

**CITY OF HAYWARD**  
ENGINEERING DIVISION

DRAWN BY: RPE      DATE: DEC. 1976  
CHECKED BY: JRL      SCALE: NONE

6-28-02 FM  
REV. DATE BY

APPROVED  
CITY ENGR.

APPROVED  
DIR. PUBLIC WORKS

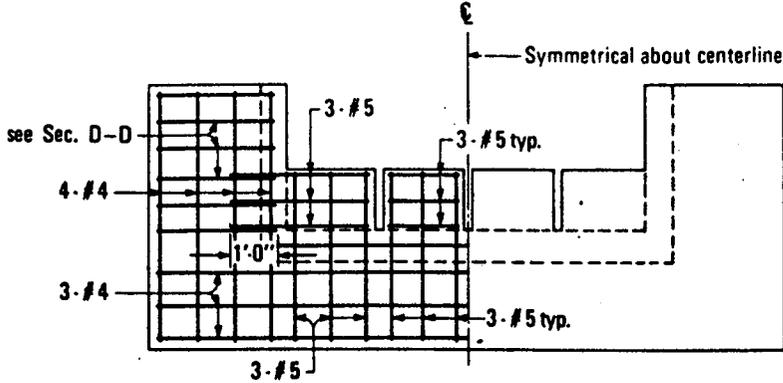
**STANDARD**  
**CONCRETE ENERGY**  
**DISSIPATOR**

DWG. NO. **SD-414**

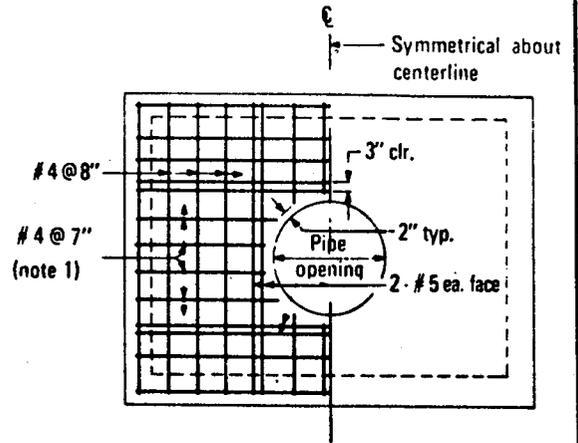
FILED

SHT. **1** OF **3**

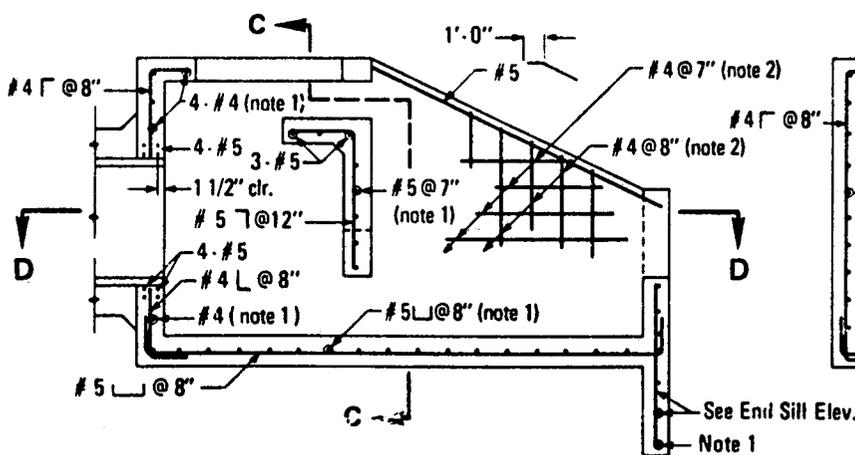
Ref: San Diego Regional Standard  
Drawing D-42 Dec. 1975



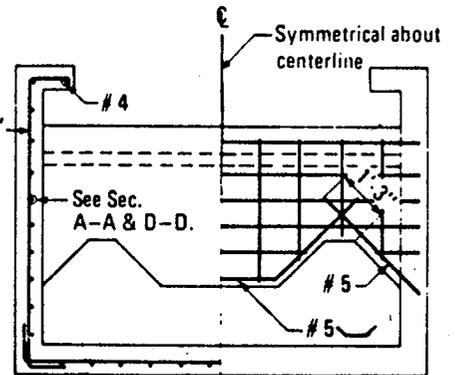
END SILL ELEVATION



HEADWALL ELEVATION



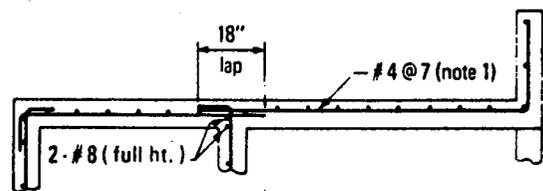
SECTION A-A



SECTION C-C

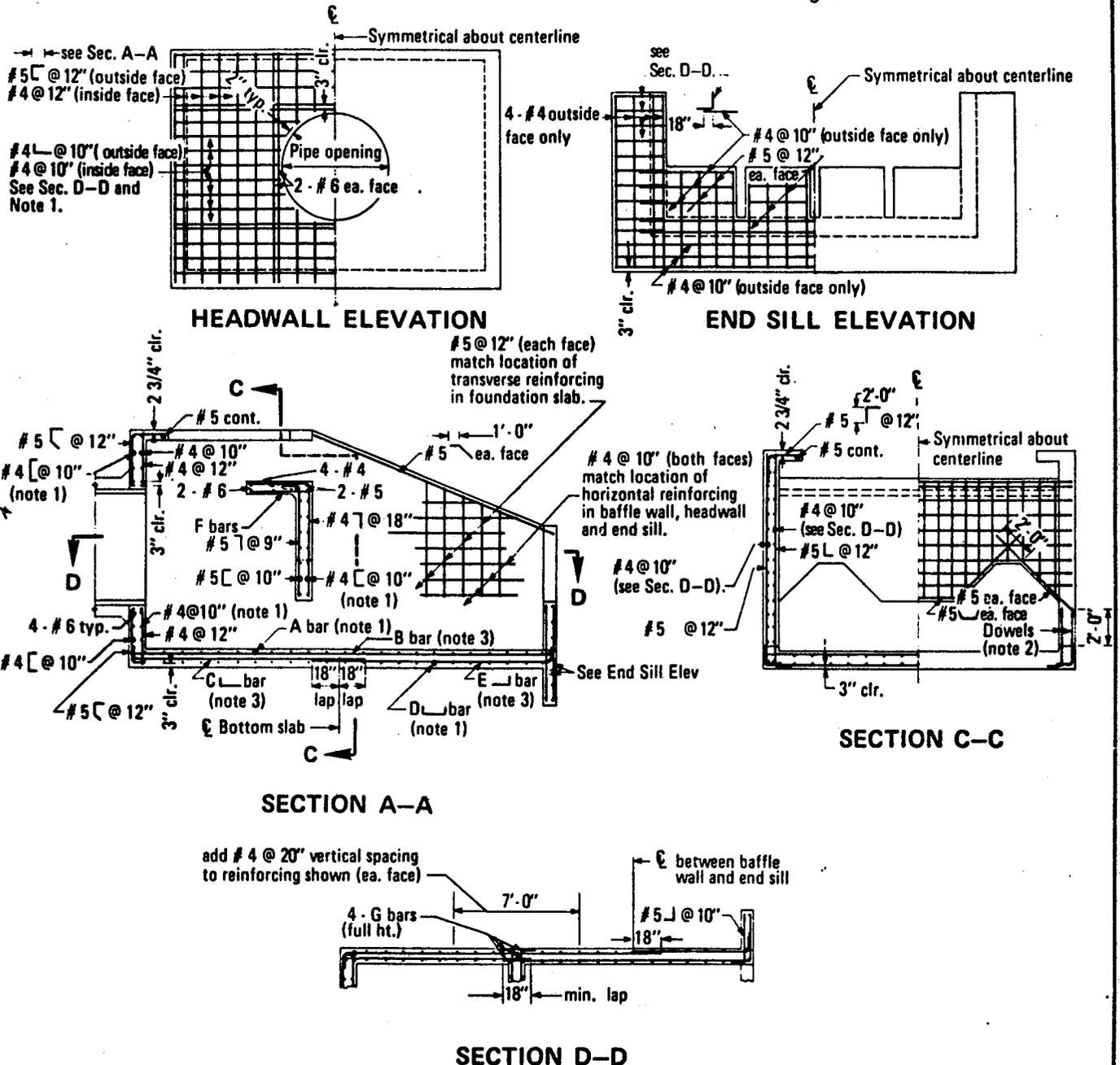
**NOTES**

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



SECTION D-D

<p><b>CITY OF HAYWARD ENGINEERING DIVISION</b></p>			<p><b>STANDARD CONCRETE ENERGY DISSIPATOR (REINFORCEMENT) 18" - 30" DIA. PIPE</b></p>			<p>DWG. NO. <b>SD-414</b></p>	
						<p>FILED <b>6-15-93</b></p>	
REV.	DATE	BY	<p>DRAWN BY: RPE CHECKED BY: JRL APPD BY: <i>[Signature]</i> CITY ENGR.</p>	<p>DATE: DEC. 1976 SCALE: NONE APPROVED DIR. PUBLIC WORKS</p>	<p>SHT. <u>2</u> OF <u>3</u></p>		

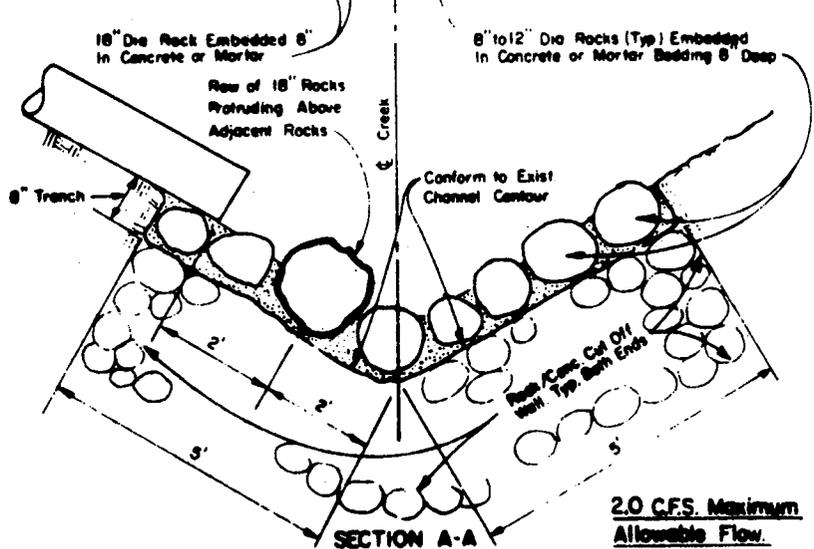
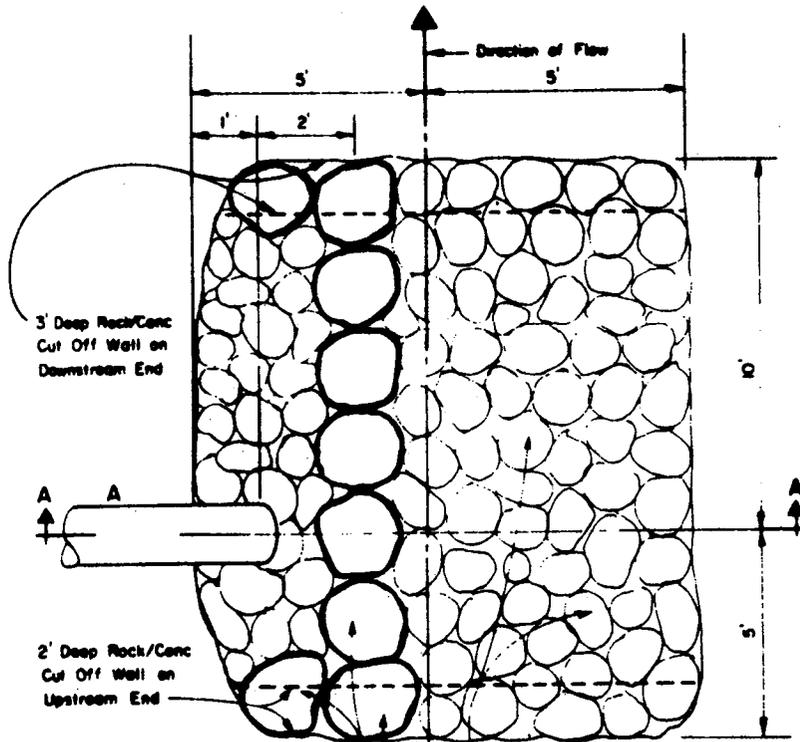
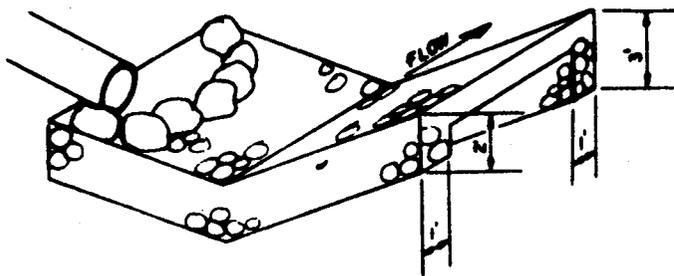


**NOTES**

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

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

<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>STANDARD CONCRETE ENERGY DISSIPATOR (REINFORCEMENT) 36"-72" DIA. PIPE</b>			DWG. NO <b>SD-414</b>	
DRAWN BY: RPE		DATE: DEC. 1976		FILED <b>6-15-93</b>			
CHECKED BY: JRL		SCALE: NONE		SHT. <b>3</b> OF <b>3</b>			
REV.	DATE	BY	APPROVED				
			CITY ENGR.	DIR. PUBLIC WORKS			

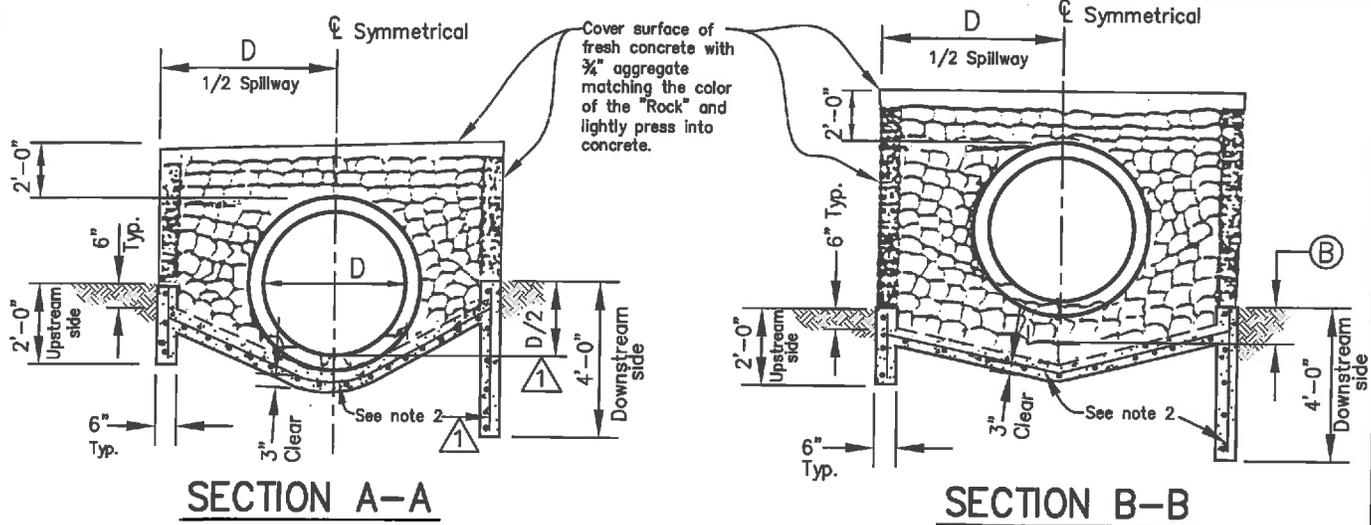


REV.	DATE	BY

<b>CITY OF HAYWARD ENGINEERING DIVISION</b>	
DESIGNED BY: <i>L. S. D.</i>	CHECKED BY: <i>R. A. G.</i>
DRAWN BY: <i>F. M.</i>	DATE: <i>11-2-00</i>
SCALE: <i>AS SHOWN</i>	APPROVED BY: <i>R. A. G.</i>
CITY ENGINEER	

**ENERGY DISSIPATOR  
For  
SMALL FLOWS**

**SD-415**  
**6-15-98**  
SHT. 1 OF 1



**DIMENSION SCHEDULE**

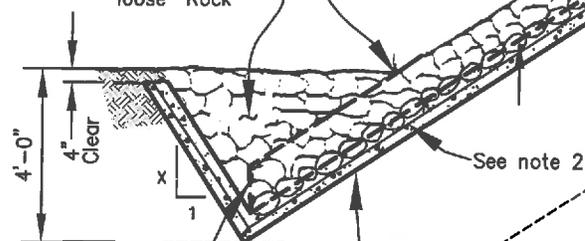
SIDE SLOPE	(A)	(B)
1½:1	¼ d	⅓ D
2:1	¼ d	⅜ D
2½:1	¼ d	⅔ D
3:1	½ d	⅓ D

Install two metal marker posts, 6 feet long, to a depth of 3 feet, straddling pipe, and spaced 2 feet apart at top of side slope, see notes 7 and 8.

Embed approximately ⅓ to ½ of each wetted "Rock" in fresh concrete as shown. Cover remaining exposed surfaces of fresh concrete in spillway with ¾" aggregate of matching color and lightly press in.

Conform to toe and flowline of channel

Fill trough with loose "Rock"



Cut-off walls to end at low point of trough as shown

Place concrete against neatly trimmed undisturbed earth or on compacted backfill material approved by the City Engineer.

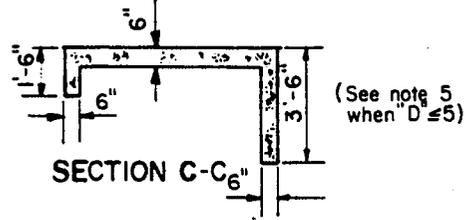
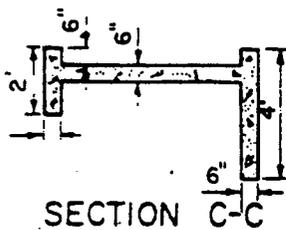
**NOTES:**

- All concrete shall be Class "A".
- Provide #4 reinforcing bar at 12" O.C. each way.
- Spillway slope shall conform to the existing earth channel side slope.
- "Rock" shall be hard, durable, resistant to water action and free from cracks, seams, and other defects that would tend to accelerate its deterioration.
- "Rock" shall measure 6" to 16" nominal size and have a minimum specific gravity of 2.5.
- Exposed surface of "Rock" shall be clean of any evidence of cement or concrete.
- Metal markers shall conform to Section 82 of the Standard Specification of the Department of Transportation, State of California.
- Metal markers may be substituted with 6" x 6" redwood marker posts, 6 feet long, and painted white.
- Design engineer shall confirm that this detail will work for the actual channel maximum velocity and discharge, and determine the size of the rock slope protection for existing conditions in accordance with Section 72-1 of the Caltrans Standard Specifications.

**SECTION THROUGH SPILLWAY & PIPE**

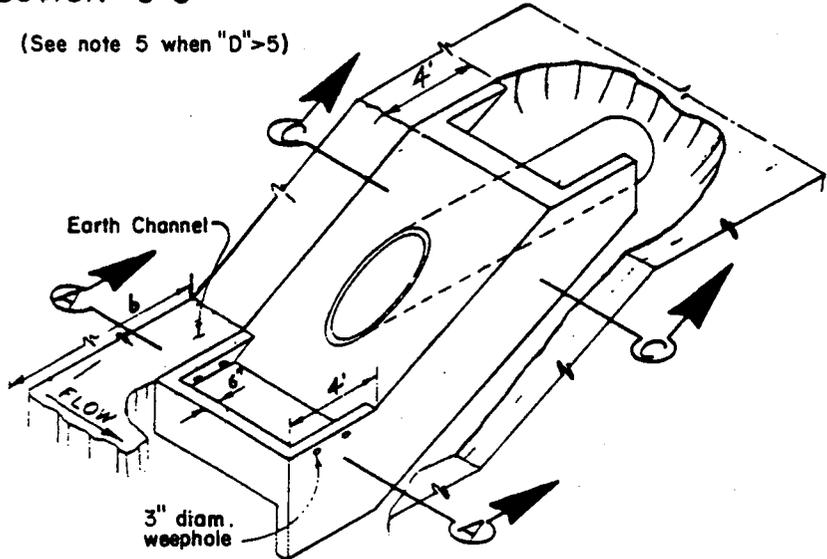
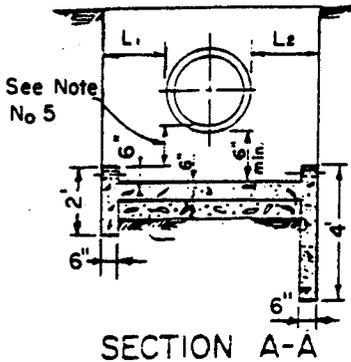
<p><b>CITY OF HAYWARD</b> PUBLIC WORKS DEPT.</p>			<p><b>STANDARD LATERAL PIPE ENTRY TO EARTH CHANNEL TYPE II</b></p>	DWG. NO.	<b>SD-416</b>
				FILED	
REV	DATE	BY	<p>DRAWN BY: HGM      DATE: 01/26/12</p> <p>CHECKED BY: AL      SCALE: NTS</p> <p>APPD. BY: <i>[Signature]</i>      APPROV: <i>[Signature]</i></p> <p>CITY ENGINEER      DIR. PUBLIC WORKS</p>	SHT.	<b>1 OF 1</b>

PIPE SIZE	L <sub>1</sub>	L <sub>2</sub>
12" to 24"	2'	2'
27" to 48"	2'	3'



(See note 5 when "D" ≤ 5)

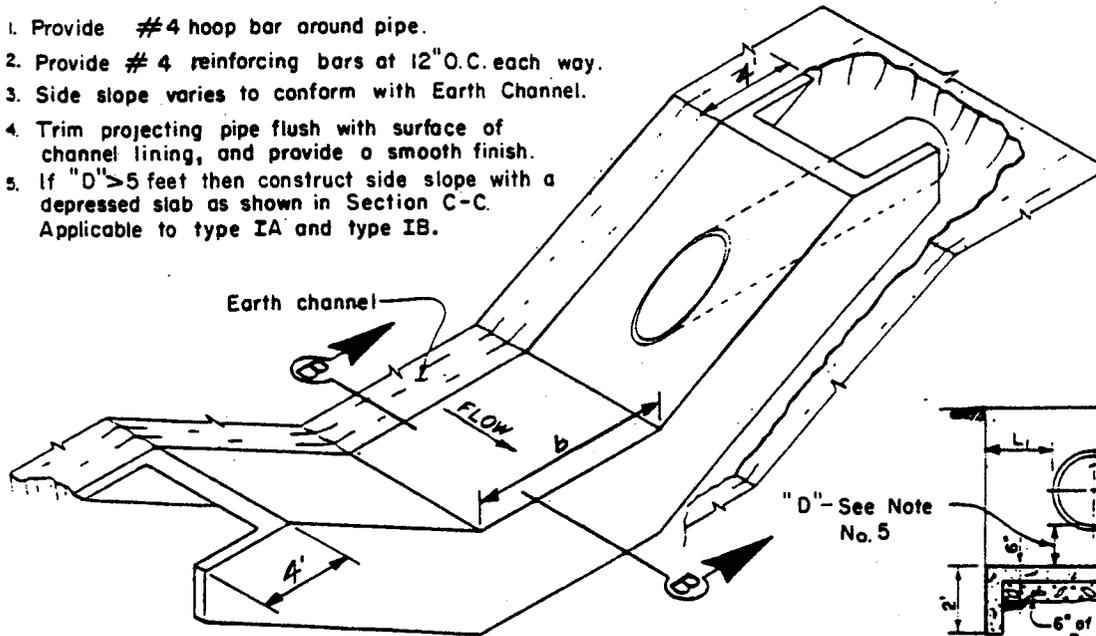
(See note 5 when "D" > 5)



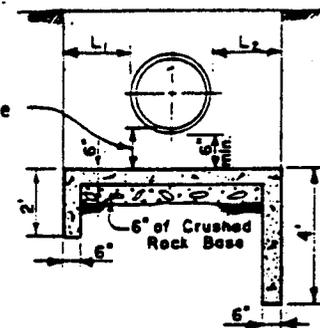
TYPE IA  
(CHANNEL BOTTOM WIDTH  $b > 8$  FEET)

GENERAL NOTES.

1. Provide #4 hoop bar around pipe.
2. Provide #4 reinforcing bars at 12" O.C. each way.
3. Side slope varies to conform with Earth Channel.
4. Trim projecting pipe flush with surface of channel lining, and provide a smooth finish.
5. If "D" > 5 feet then construct side slope with a depressed slab as shown in Section C-C. Applicable to type IA and type IB.

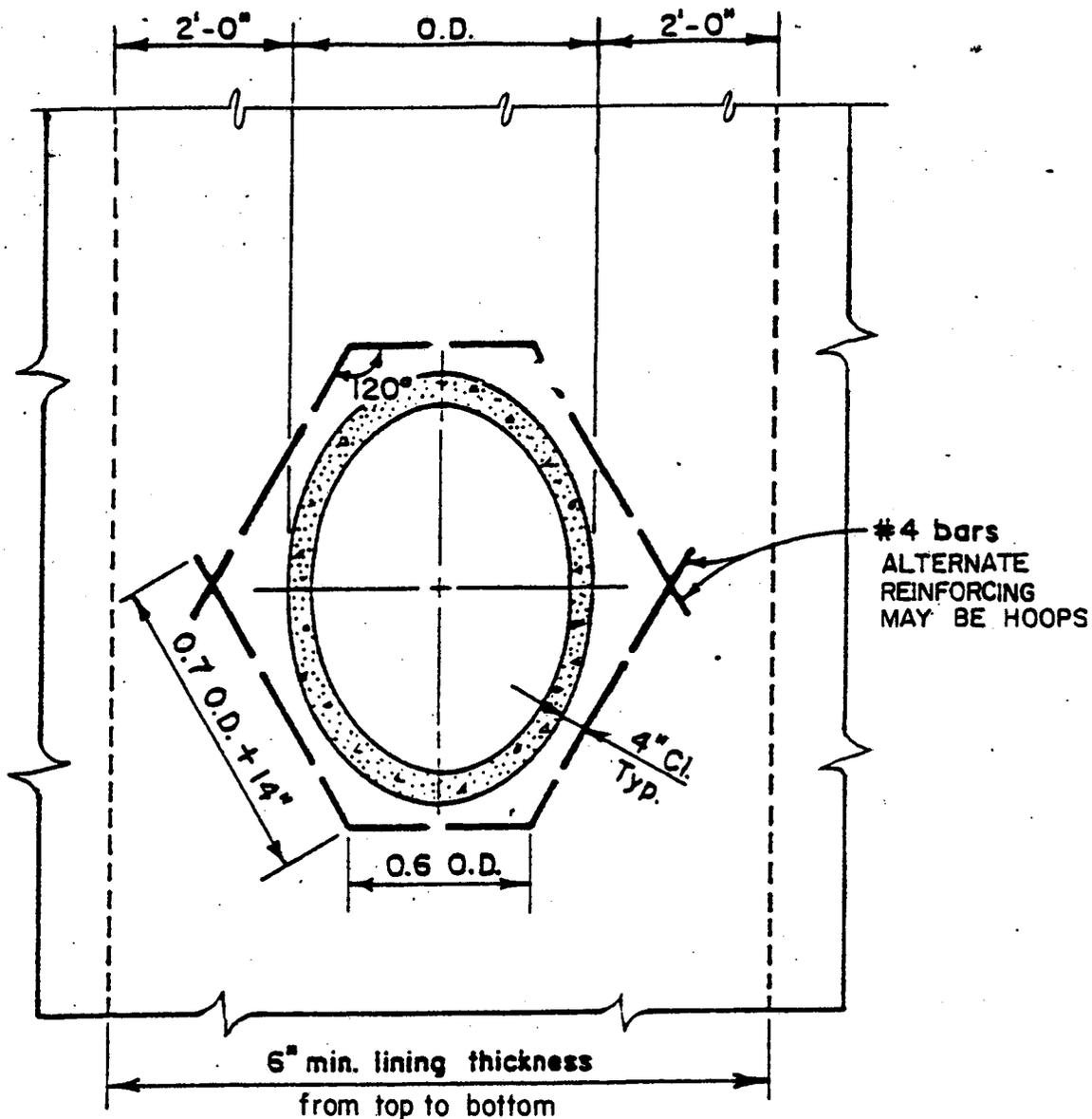


TYPE IB  
(CHANNEL BOTTOM WIDTH  $b \leq 8$  FEET)



SECTION B-B

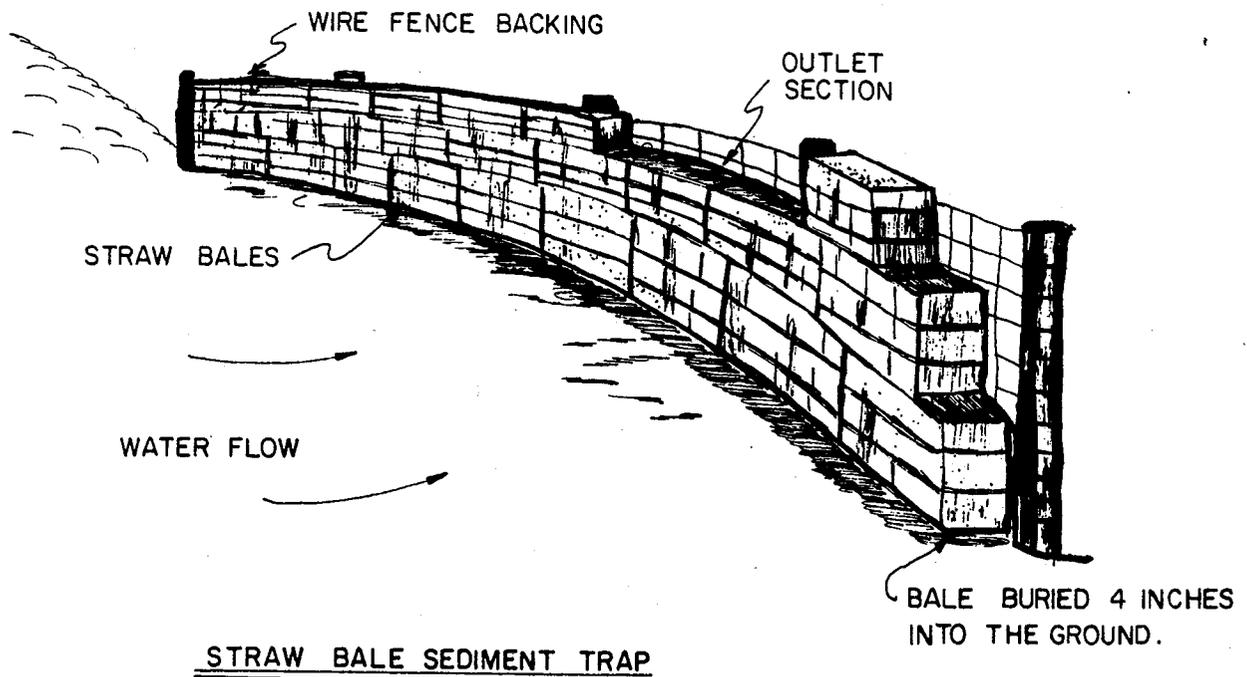
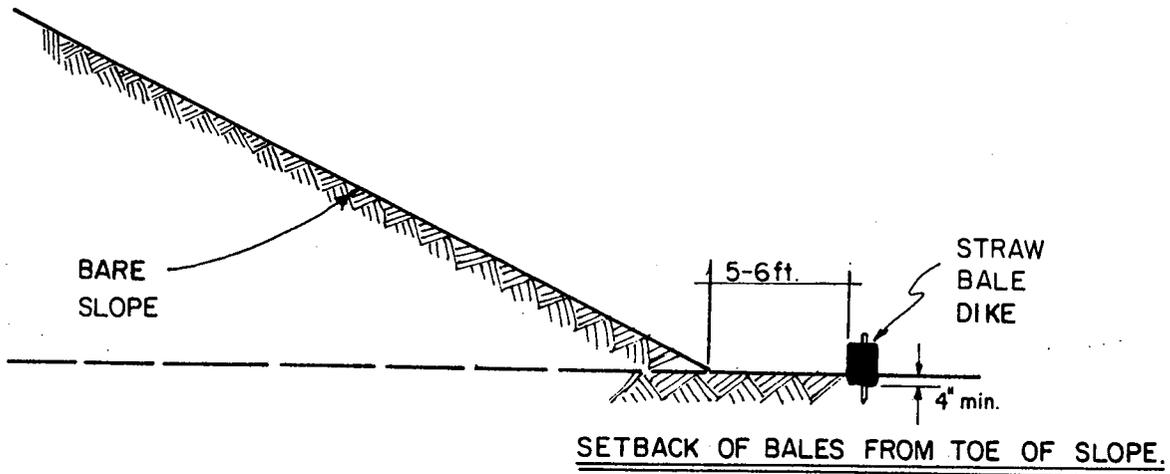
CITY OF HAYWARD ENGINEERING DIVISION			LATERAL PIPE ENTRY TO EARTH CHANNEL TYPE 1			DWG. SD-417 NO.	
						FILED 6-15-93	
REV.	DATE	BY	APPD. BY: <i>RAB</i>	DATE: <i>RAB</i>	SCALE:	SHT. 1 of 1	
			CITY ENGR.	DIA. PUBLIC WORKS			



**GENERAL NOTES:**

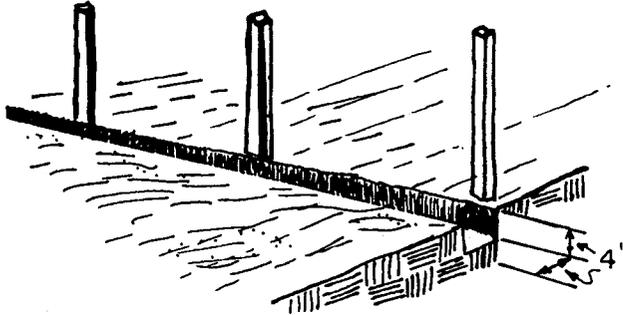
1. For use on concrete lined channel sections of 1:1 side slope only. View shown is perpendicular to side slope.
2. Construct thickened pipe entry section as shown at all side-drain connections for pipes of 12" I.D. and larger.
3. Trim projecting pipe flush with surface of channel lining, and provide a smooth finish.

CITY OF HAYWARD ENGINEERING DIVISION			<b>PIPE ENTRY</b>	DWG. NO. <b>SD-418</b>
				FILED <b>6-15-93</b>
REV.	DATE	BY	APPROVED	SHT. <u>1</u> OF <u>1</u>
			CITY ENGR.	
			DIR. PUBLIC WORKS	

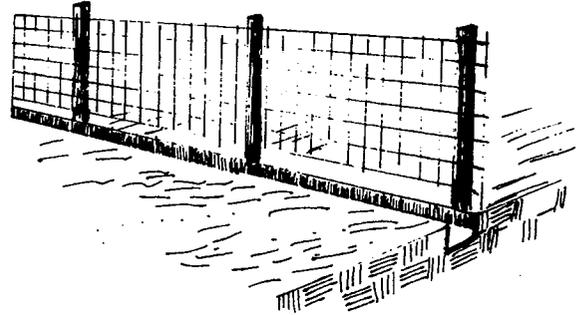


CITY OF HAYWARD ENGINEERING DIVISION			EROSION & SEDIMENTATION CONTROL MEASURES	DWG. NO. SD-419
REV.	DATE	BY		FILED 6-15-93
			APPROVED	SHT. 1 OF 4
			CITY ENGR.	
			DIR. PUBLIC WORKS	

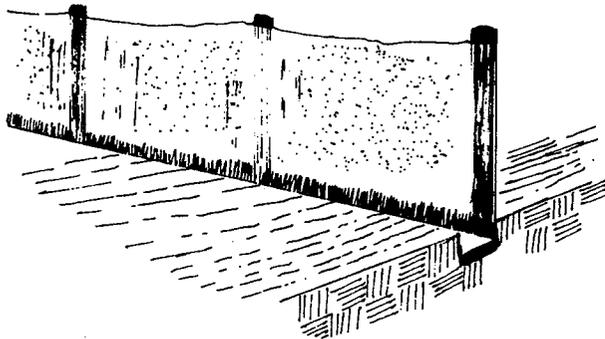
1. SET POSTS AND EXCAVATE A 4"x4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.



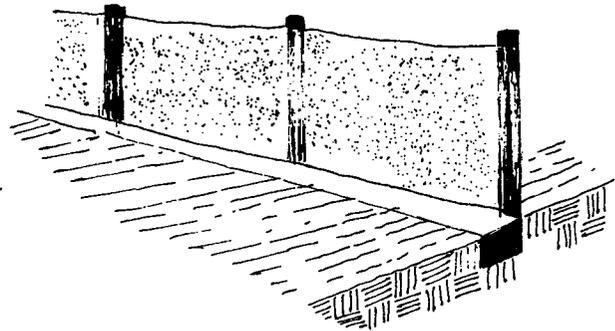
2. STAPLE WIRE FENCING TO THE POSTS.



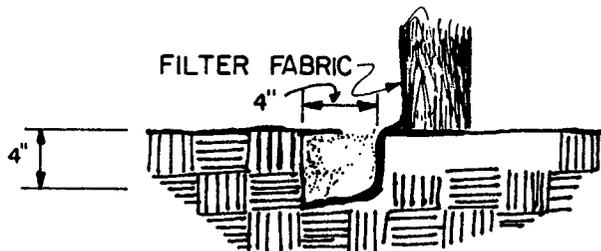
3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



EXTENSION OF FABRIC AND WIRE INTO THE TRENCH.



CONSTRUCTION OF A SILT FENCE

			<b>CITY OF HAYWARD ENGINEERING DIVISION</b>		<b>EROSION &amp; SEDIMENTATION CONTROL MEASURES</b>		DWG. NO. <b>SD-419</b>	
			DRAWN BY: F.M.	DATE: 9-14-92			FILED <b>6-15-93</b>	
			CHECKED BY: T.M.	SCALE:			SHT. <u>2</u> OF <u>4</u>	
REV.	DATE	BY	APPD. BY: <i>[Signature]</i>	APPROVED <i>[Signature]</i>				
			CITY ENGR.	DIR. PUBLIC WORKS				

# SPECIFICATIONS FOR SILT FENCE

## Materials

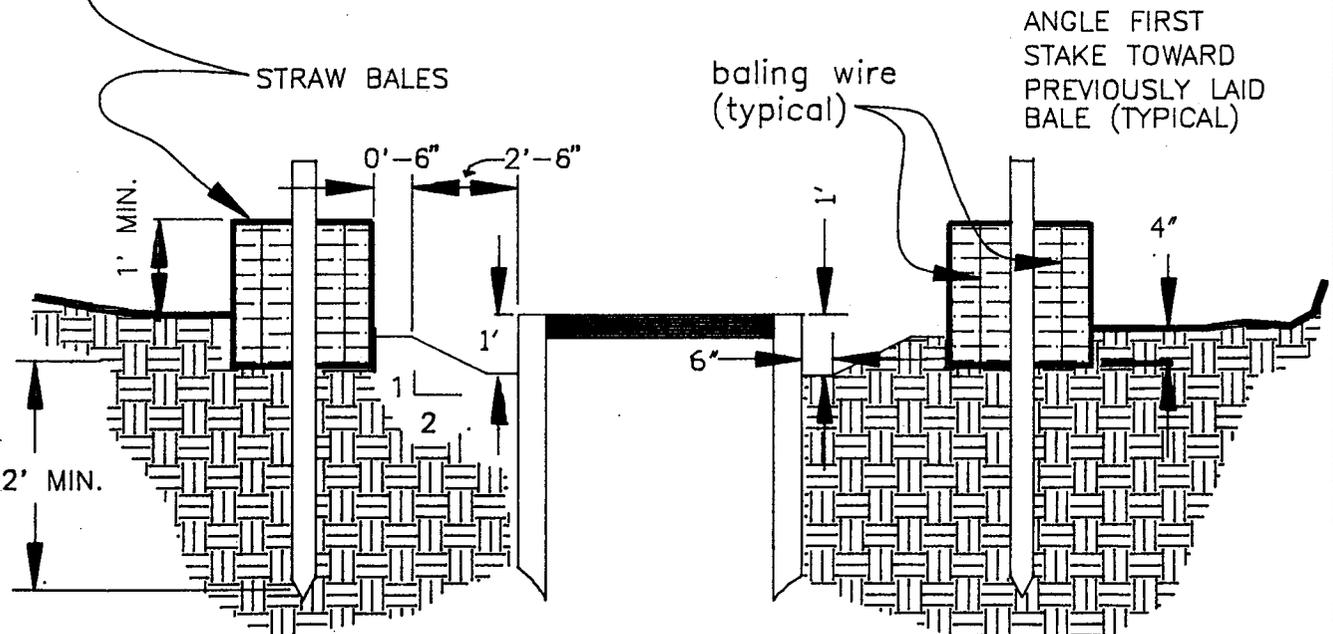
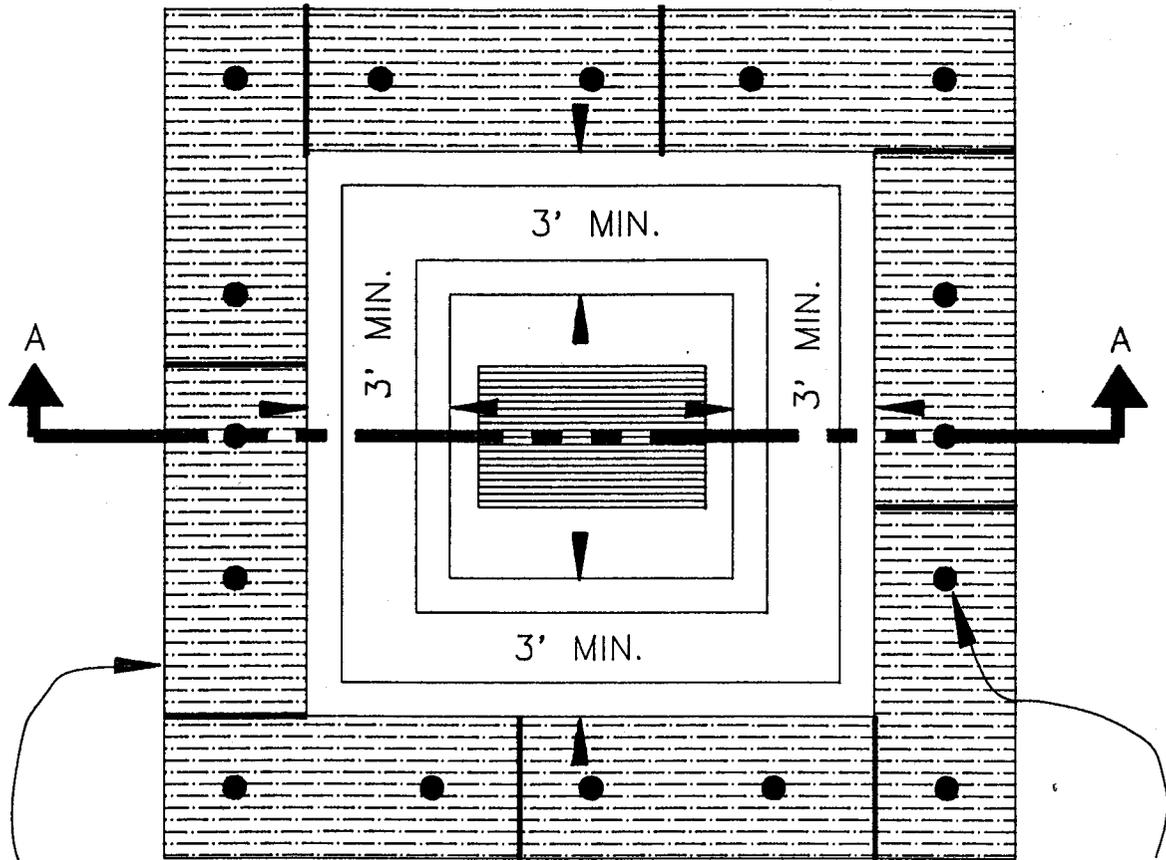
1. Filter fabric shall be a pervious sheet of synthetic polymer composed of at least 85% by weight ethylene, propylene, amide, ester or vinylidene yarn, woven or non-woven, and shall contain stabilizers and/or inhibitors to resist deterioration by heat, water, and ultra-violet light. The fabric shall conform to the following criteria:
  - a) The Equivalent Opening Size (U.S. Standard Sieve) shall be within the range 70-100.
  - b) The tensile strength (ASTM D1682G) shall be at least 120 pounds. The strength of fabric required depends on the wire support fence. The strength given is the minimum for a 6-inch square mesh wire support fence. If extra-strength fabric is used without a support fence, the strength required shall be 200 pounds minimum with posts spaced on 6-foot centers.
2. Posts for silt fences shall be either 4-inch-diameter wood, or 1.33-pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.
3. Wire fence reinforcement for silt fences shall be 42 inches in width, shall be a minimum of 14-gauge, and shall have a maximum mesh spacing of 6 inches.

## Construction Specifications

1. The height of a silt fence shall not exceed 36 inches. On slopes, the fence line shall follow the contour as closely as possible. In small swales, the fence line shall be curved upstream at the sides to direct the flow toward the middle of the fence.
2. If possible, the filter fabric shall be cut from a continuous roll to avoid the use of joints. When joints are necessary, filter cloth shall be spliced only at a support post, with a minimum 6-inch overlap and both ends securely fastened to the post.
3. Posts shall be spaced a maximum of 10 feet apart and driven securely into the ground (minimum of 12 inches). When extra-strength fabric is used without the wire support fence, post spacing shall not exceed 6 feet.
4. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upslope from the barrier.
5. When standard-strength filter fabric is used, a wire-mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires, or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.
6. The standard-strength filter fabric shall be stapled or wired to the fence, and 8 inches of the fabric shall extend into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
7. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of N<sup>o</sup> 6 above applying.
8. The trench shall be backfilled and the soil compacted over the toe of the filter fabric.
9. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

<b>CITY OF HAYWARD ENGINEERING DIVISION</b>			<b>EROSION &amp; SEDIMENTATION</b>		DWG. NO. <b>SD-419</b>
			<b>CONTROL MEASURES</b>		FILED <b>6-15-93</b>
DRAWN BY: F.M.		DATE: NOV 12, 1992			
CHECKED BY: T.M.		SCALE:			
APPD. BY: <i>LAB</i>		APPROVED			
REV.	DATE	BY	CITY ENGR.	DIR. PUBLIC WORKS	SHT. <b>3</b> OF <b>4</b>

BALES SHALL BE PLACED CLOSELY TOGETHER SO THAT NO SILT WILL ENTER THE STORM DRAINAGE SYSTEM



2" X 4" WOOD  
STAKE OR  
1" DIAM.  
STEEL PIN,  
4' LONG (MIN.)  
2 PER BALE.

SECTION A-A

STRAW BALE PROTECTION

			CITY OF HAYWARD ENGINEERING DIVISION		<b>EROSION &amp; SEDIMENTATION CONTROL MEASURES</b>		DWC. NO. <b>SD-419</b>	
			DRAWN BY: F. MORALES	DATE MARCH, 1993			FILED <b>6-15-93</b>	
			CHECKED BY: T.M.	SCALE:	<b>CONTROL MEASURES</b>		SHT. <b>4</b> OF <b>4</b>	
REV	DATE	BY	APPRO. BY: <i>KAB</i>	APPROVED: <i>McBarr</i>				
			CITY ENGINEER	DIR. PUBLIC WORKS				