



# STANDARD DETAILS

Published May 4, 2016

# CITY OF LIVERMORE

## STANDARD DETAILS

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NO.            TITLE

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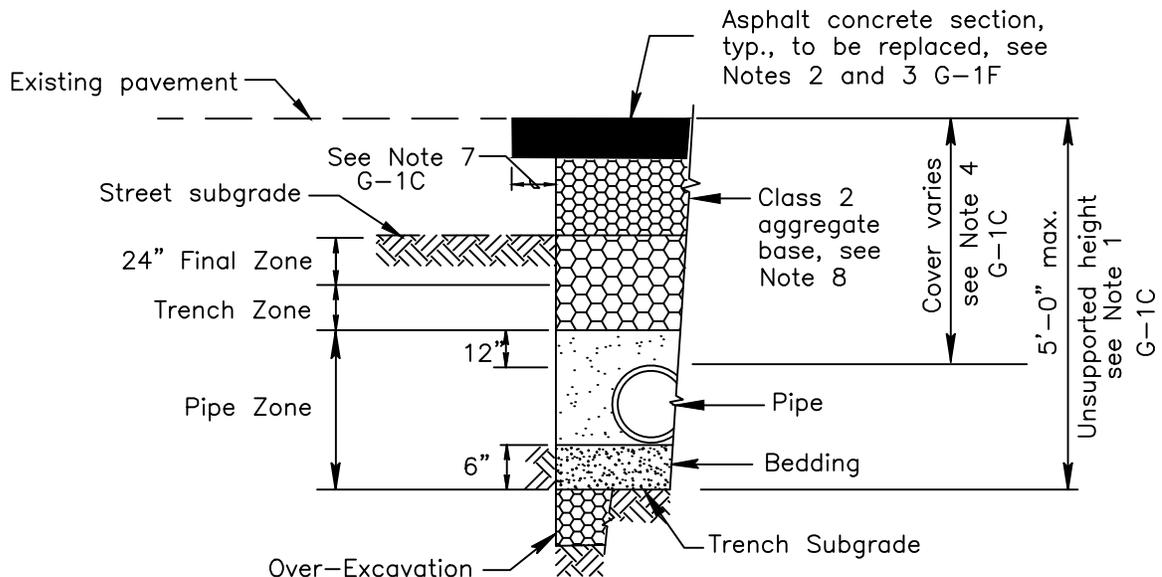
**CITY  
OF  
LIVERMORE**

**STANDARD DETAILS**

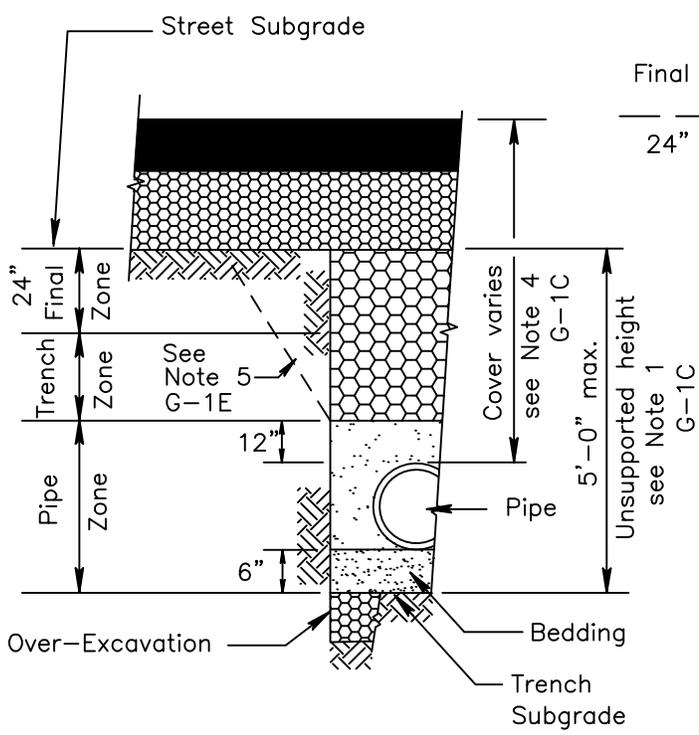
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**GENERAL - G**

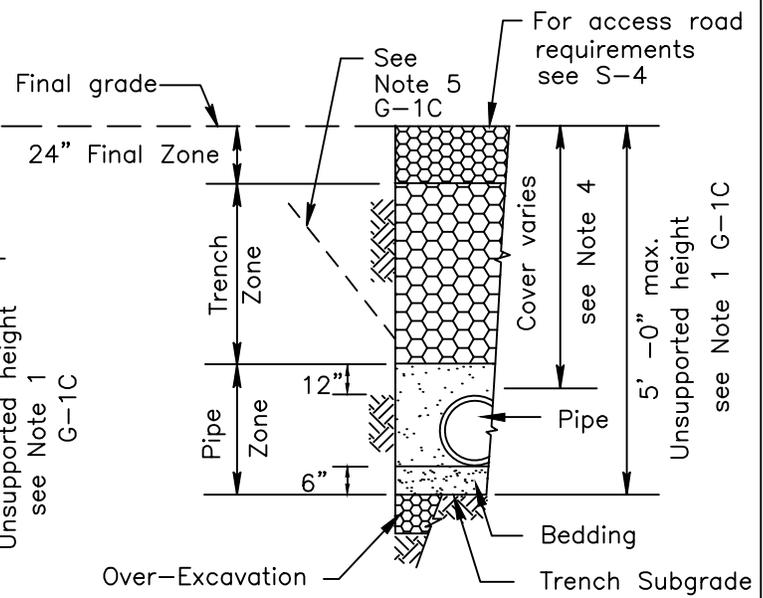
<b>DETAIL NO.</b>	<b>TITLE</b>
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G-6	ABBREVIATIONS



EXISTING STREET



NEW STREET



UNIMPROVED AREAS

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

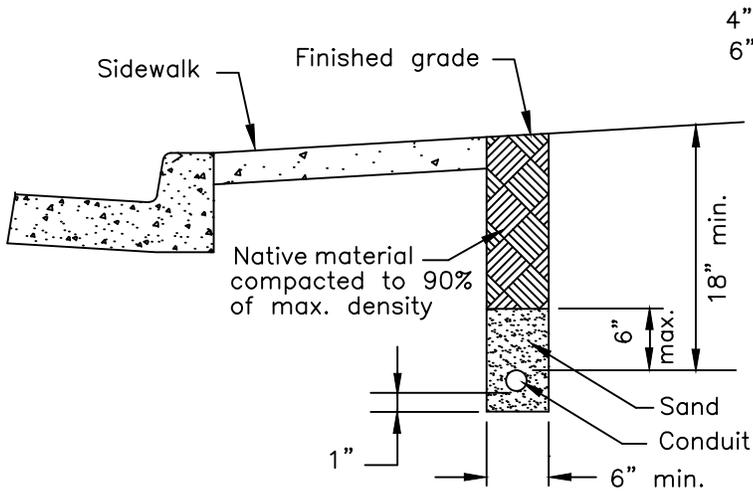
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TRENCH SECTION

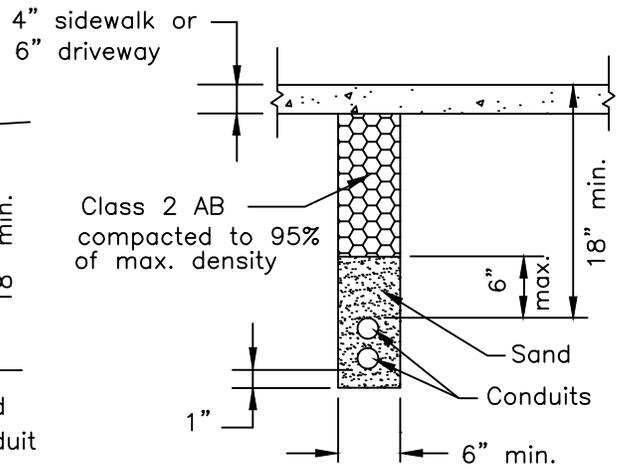
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: M-W/KY	Date: May-13	No. G-1A
Kcd: Spec. Committee	Scale: None	
 City Engineer		

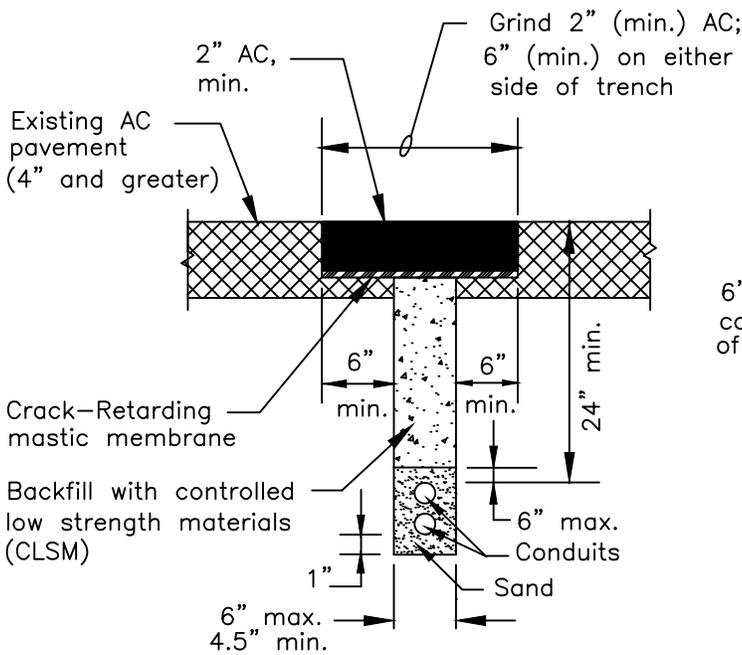
SUTADWG



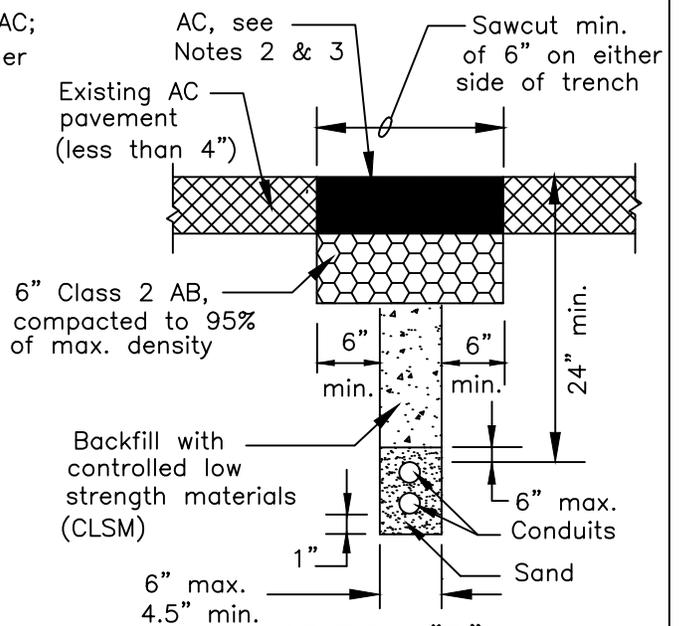
STREET LIGHT CONDUIT TRENCH SECTION  
(WHEN NOT IN JOINT TRENCH)



TRAFFIC SIGNAL CONDUIT TRENCH SECTION UNDER SIDEWALKS/DRIVEWAYS



SECTION "A"  
FOR EXISTING ASPHALT CONCRETE SECTIONS 4" AND GREATER



SECTION "B"  
FOR EXISTING ASPHALT CONCRETE SECTIONS LESS THAN 4"

User note:  
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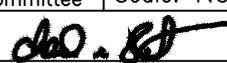
TELECOMMUNICATIONS CONDUIT TRENCH SECTIONS  
(ELECTRICAL, TRAFFIC SIGNAL CONDUITS, STREET LIGHT CONDUIT CROSSINGS, TELEPHONE, CABLE TV / COMMUNICATION CONDUITS)

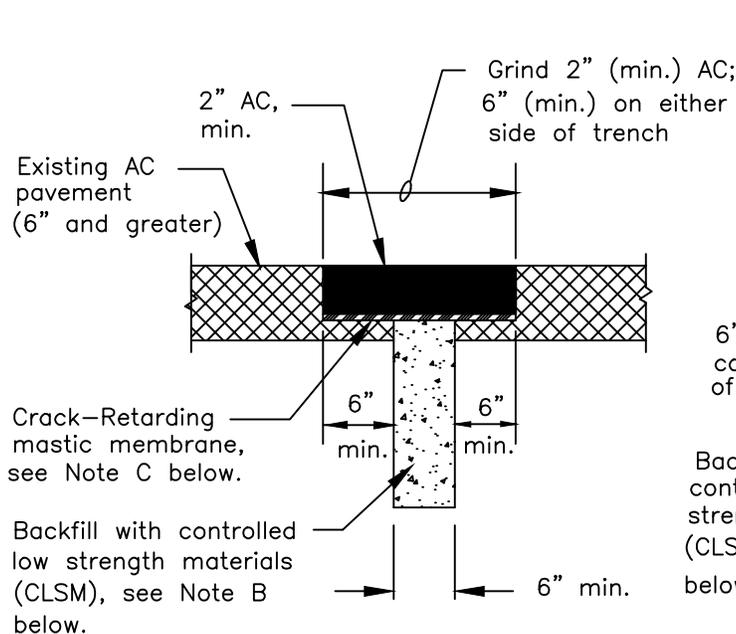
G01B.DWG

Date	By	Rev.

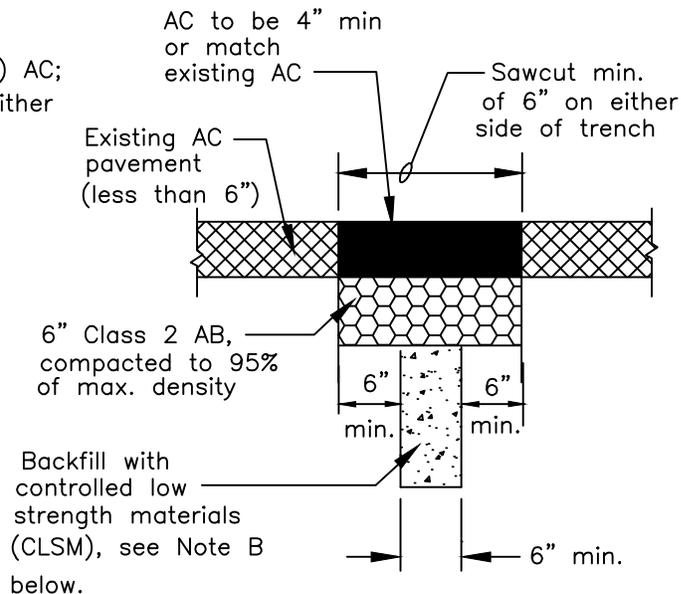
TRENCH SECTION

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	No.
Spec. Committee	Scale: None	G-1B
 City Engineer		



SECTION "A"  
FOR EXISTING ASPHALT CONCRETE  
SECTIONS 6" AND GREATER



SECTION "B"  
FOR EXISTING ASPHALT CONCRETE  
SECTIONS LESS THAN 6"

NOTES

- A. PRIOR TO TRENCHING, CONTACT USA 1-800-227-2600
- B. CONTROLLED LOW STRENGTH MATERIALS (CLSM) SHALL BE A FLOWABLE, HAND-EXCAVATABLE MIXTURE OF CEMENT, POZZOLAN, COARSE AND FINE AGGREGATE, ADMIXTURES AND WATER WHICH HAS BEEN MIXED IN ACCORDANCE WITH ASTM C 94. ALL PROPERTIES, COMPOSITIONS AND INSTALLATION REQUIREMENTS SHALL BE PER SPECIFICATION SECTION 312323. (CLSM) SHALL NOT COME IN CONTACT WITH UTILITIES. MAINTAIN A CLEARANCE OF 6" MINIMUM BETWEEN CLSM AND UTILITIES FOR BACKFILL.
- C. CRACKED-RETARDING MASTIC MEMBRANE SHALL BE AS MANUFACTURED BY CONTECH CONSTRUCTION PRODUCTS INC. - PAVEPREP, AMOCO FABRICS FIBERS COMPANY - PETROTAC OR EQUAL.
- D. ANY EXCAVATIONS LARGER THAN 3'x3' SHALL COMPLY WITH CITY STD DETAIL G-1B.

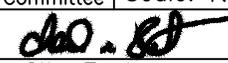
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

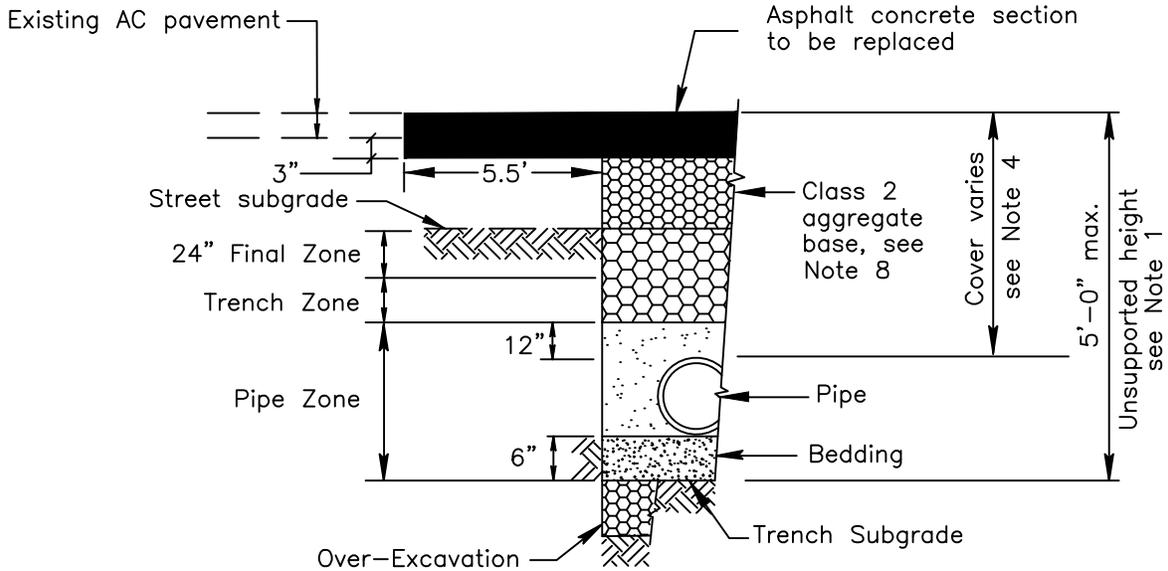
W01D.DWG

SOIL BORING AND  
 SMALL EXCAVATION IN STREET  
 SECTION

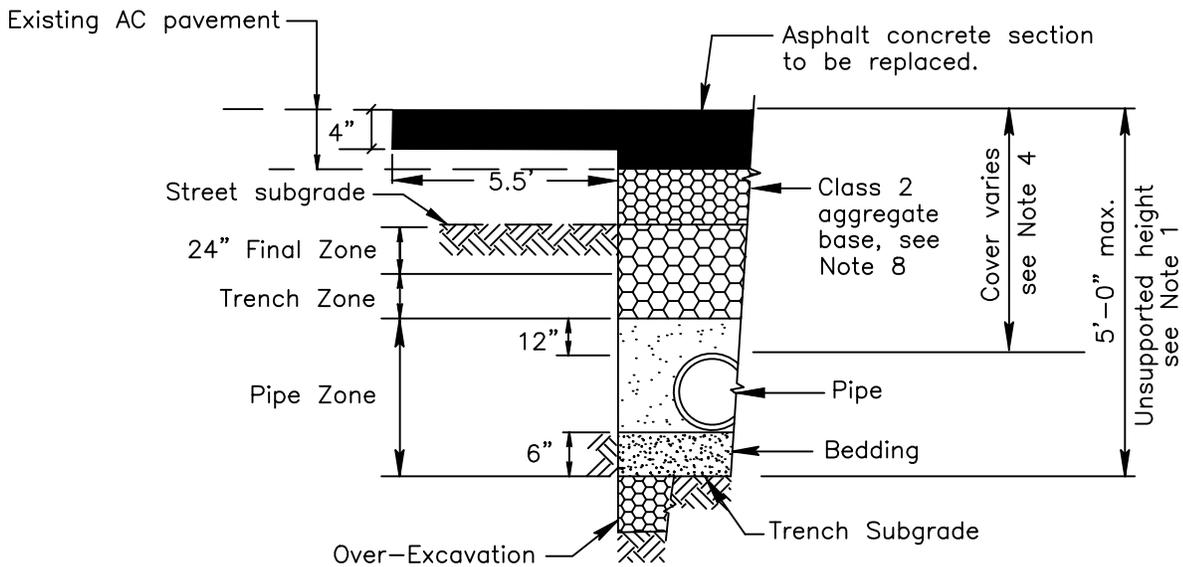
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: MAP	Date: May-13	No. G-1C
Ckd: Spec. Committee	Scale: None	
 City Engineer		

Date: By: Rev:



PAVEMENT LESS THAN 6"



PAVEMENT GREATER THAN 6"

User note:  
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Note: Refer to City Standard Detail No. G-1F for applicable street locations.

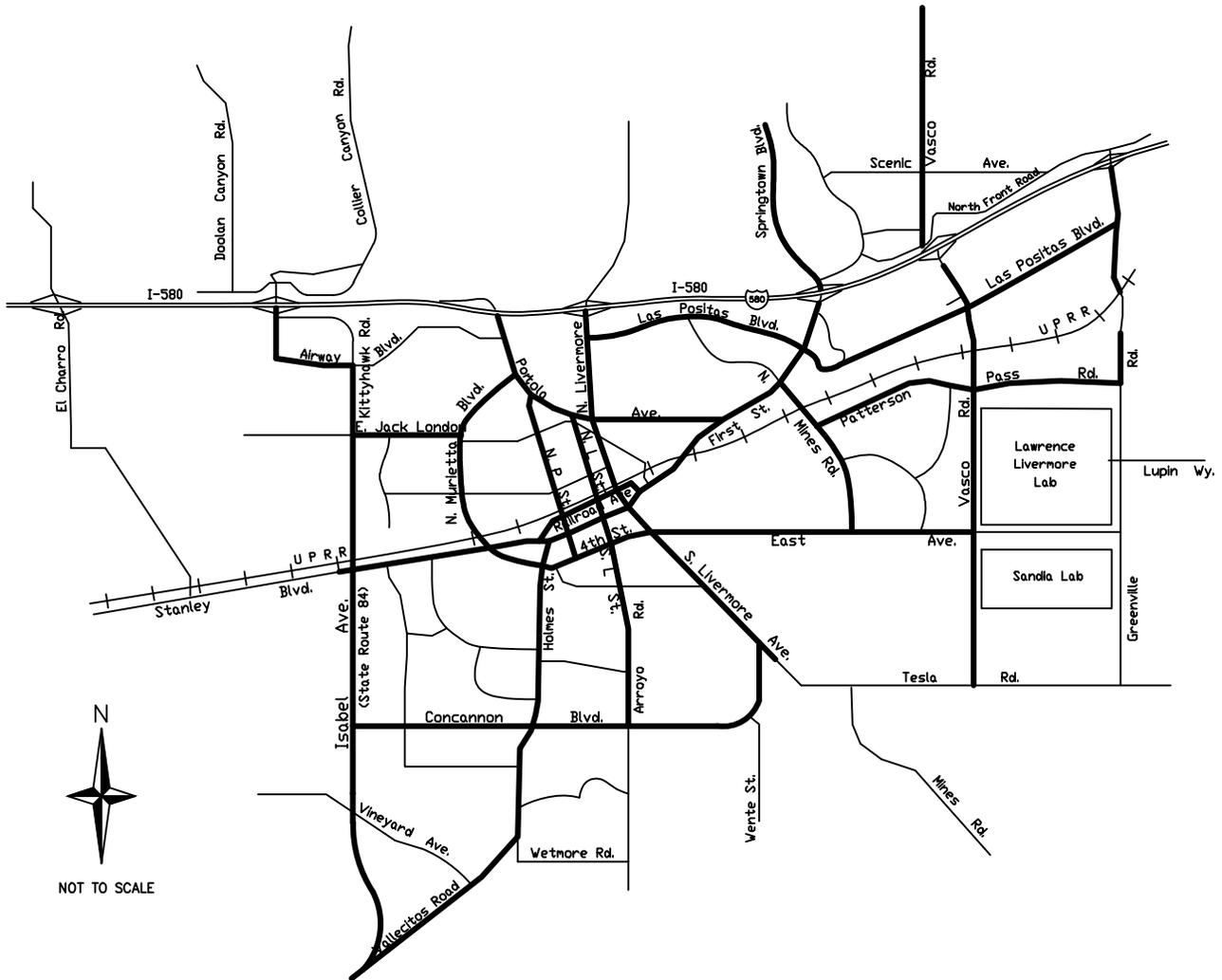
CITY OF LIVERMORE  
 STANDARD DETAIL

TRENCH PAVEMENT REPAIR  
 ARTERIALS AND COLLECTORS

Dwn: M. IRBY	Date: May-13	No. G-1D
Ckd: M. CAVALIERI	Scale: None	
<i>do. 8/8</i>		
City Engineer		

G01E.DWG

Date:	By:	Rev:
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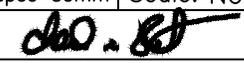


User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

TRENCH PAVEMENT REPAIR  
 ARTERIALS AND COLLECTORS  
 LOCATION MAP

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: MM	Date: May-13	No.
Ckd: Spec Comm	Scale: None	G-1E
 Acting City Engineer		

G01F.DWG

NOTES:

1. Trenching shall conform to the "Construction Safety Orders of the State of California" and Section 6705 of the California Labor Code.
2. In existing streets, the total asphalt concrete thickness replaced shall not be less than 6" (4" in residential streets), or match the existing asphalt concrete section, whichever is greater.
3. In existing streets the asphalt concrete bottom lift(s) shall not be less than 4" (2" in residential streets), and the asphalt concrete top lift shall not be less than 2".
4. Where adequate compaction cannot be achieved due to obstruction or other conditions, replace pipe zone and/or trench zone fill with Controlled Low Strength Material (CLSM) as directed by the ENGINEER.
5. Sloping trench sections, above pipe zone, can only be used where stable compact soil conditions exist, where approved by the ENGINEER, or where shown on the drawing or specifications. Sloping trench sections will not be allowed in existing streets.
6. Prior to trenching, contact USA 1-800-227-2600
7. Before pavement section is replaced, the existing pavement shall be sawcut at least 12 inches back from trench excavation along neat, straight, parallel lines. [Where the existing asphalt concrete is 6" or more in thickness or where the repaving is less than 15 square feet in area, sawcut may be the edge of the trench excavation.] Expect for Arterial and Collector Street (See G-1D). Where wall of trench excavation is within 18" of the lip of gutter replace AC from trench wall to lip of gutter.
8. In existing streets the total aggregate base shall be the greater of the existing street aggregate base section or the following minimum aggregate base:
  - a) Local, loops, cul-de-sac, and private residential streets: 12" AB (min.)
  - b) Collector, frontage, major, and industrial/commercial streets: 18" AB (min.)
9. See the "Utility Earthwork" section of the City standard specifications 31.2300 for compaction requirements, metric specifications and additional information.

User note:

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TRENCH SECTION			CITY OF LIVERMORE				
			STANDARD DETAIL				
			Dwn: M-W/KY	Date: May-13	No.  G-1F		
			Ckd: <sup>Spec.</sup> Committee	Scale: None			
			 City Engineer				
			Date	By	Rev.		

G01C.DWG

BASIC SEPARATION STANDARDS:

1. Parallel construction: The horizontal clear distance between pressure domestic water and reclaimed water mains and sewer lines shall be at least 10 feet clear.
2. Perpendicular construction (Crossing): Pressure water mains shall be at least one (1) foot clear above sanitary sewer and reclaimed water lines where these lines must cross.
3. The basic separation standard are applicable under normal conditions for sewer lines and water distribution lines. More stringent requirements as determined by the State Health Department may be necessary if conditions, such as, high ground water exist.
4. Special Provisions: Alternative construction criteria where the basic separation standards cannot be attained are shown below and on G-2B:

SPECIAL PROVISIONS GENERAL NOTES (SEE G-2B):

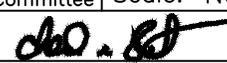
1. No pipe joints shall be permitted within Zones C and D.
2. All DIP must have hot DIP bituminous coating and all Class 200 PVC must meet DR-14 per AWWA C900 or equivalent.
3. Sewer force mains shall not be permitted in Zones A through D.
4. This criteria does not apply for a reclaimed water line crossing another reclaimed water line.
5. The construction criteria should apply to the house laterals that cross above a pressure water main but not to those house laterals that cross below a pressure water main.
6. Construction for sewer and domestic water or reclaimed water lines 24" diameter or larger will not be allowed without the approval of the Engineer and the State Health Department.
7. See G-2B for applicable situations.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

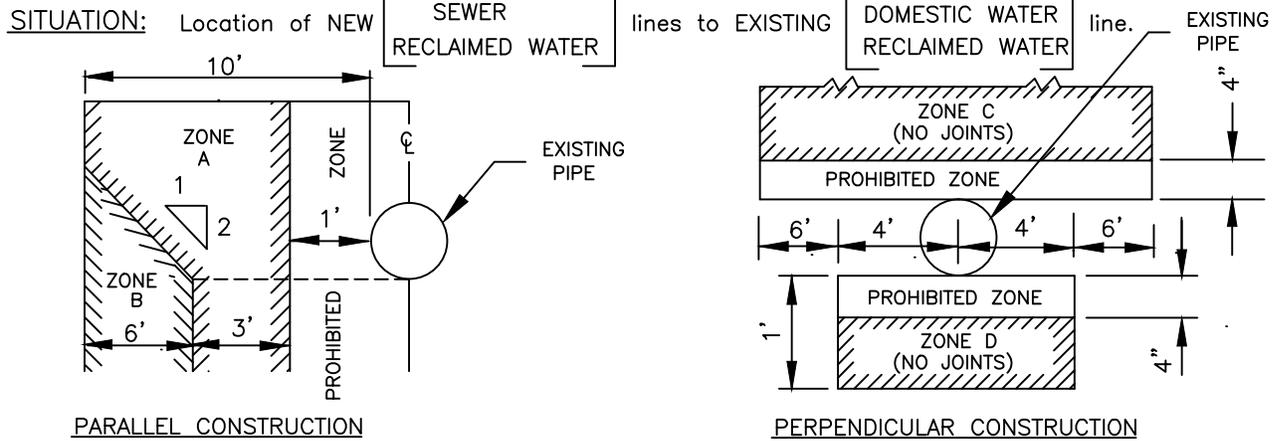
G2A.DWG

REQUIRED SEPARATION  
 BETWEEN WATER, SEWER  
 AND RECLAIMED WATER  
 PIPELINES

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: KY	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	G-2A
 City Engineer		

Date:	By:	Rev:



If any sewer or reclaimed water pipelines are to be constructed within any of the above indicated Zones, special construction shall be required as described below.

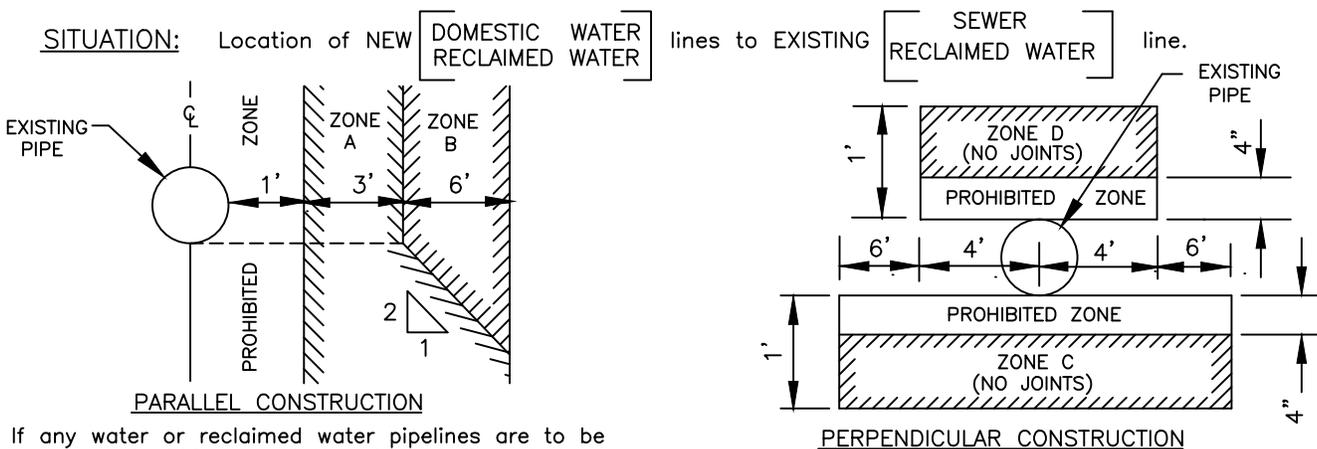
**Construction Requirements**

**ZONE NEW SEWER:**

- A Do not locate any parallel sewer lines in this area without State and Local Health Department Approval.
- B Use VCP, PVC sewer pipe with rubber ring joints, or DIP with compression joints.
- C Use DIP with mechanical joints or PVC Class 200 – AWWA C900
- D Use DIP or PVC Class 200 – AWWA C900

**ZONE NEW RECLAIMED WATER:**

- A Do not locate any parallel reclaimed water line in this area without State and Local Health Department Approval.
- B Use DIP or PVC Class 200 – AWWA C900
- C Use DIP or PVC Class 200 – AWWA C900
- D Use DIP or PVC Class 200 – AWWA C900



If any water or reclaimed water pipelines are to be constructed within any of the above indicated Zones, special construction shall be required as described below.

**Construction Requirements**

**ZONE NEW DOMESTIC OR RECLAIMED WATER:**

- A Do not locate any parallel domestic water or reclaimed water main in this area without State and Local Health Department Approval.
- B Use DIP or PVC Class 200 – AWWA C900
- C Use DIP or PVC Class 200 – AWWA C900
- D Use DIP or PVC Class 200 – AWWA C900

**User note:**

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REQUIRED SEPARATION  
BETWEEN WATER, SEWER  
AND RECLAIMED WATER  
PIPELINES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	No.
Kcd: Spec. Committee	Scale: None	G-2B
 City Engineer		

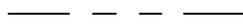
Date:	By:	Rev:

04/20/13

EXISTING

PROPOSED

DESCRIPTION



PROPERTY LINE



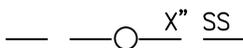
SIDEWALK, CURB @ GUTTER



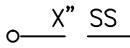
CENTERLINE



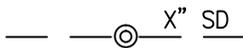
EDGE OF PAVEMENT



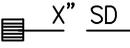
SANITARY SEWER & MAINTENANCE HOLE



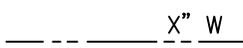
SANITARY SEWER & RISER



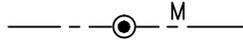
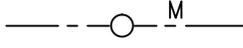
STORM SEWER & MAINTENANCE HOLE



STORM SEWER & INLET



WATER MAIN



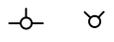
MONUMENT LINE & MONUMENT



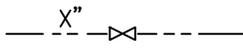
UTILITY POLE



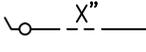
TRAFFIC SIGN



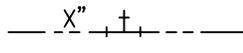
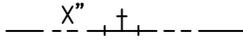
FIRE HYDRANT - commercial  
 - residential



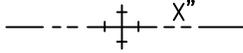
WATER MAIN & VALVE



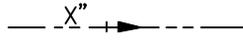
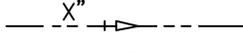
WATER MAIN & BLOW-OFF



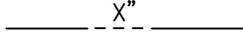
WATER MAIN & TEE



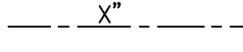
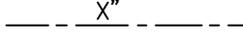
WATER MAIN & CROSS



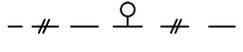
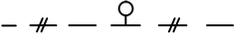
WATER MAIN & REDUCER



GAS MAIN



TELEPHONE CONDUIT



ELECTROLIER & CONDUIT

X" = indicate size in inches

G03.DWG

Date	By	Rev.

STANDARD SYMBOLS

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: KY	Date: May-13	NO.  G-3
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

PIPE TYPE IDENTIFICATION	PIPE TYPE USAGE	APPROVED PIPE MATERIALS (1)	REFERENCE TO NOTES	SPEC. SECTION
STORM DRAIN (SD)	Mains and Laterals	ABS/PVCsdnpp	4, 7	333104
		HDPE	7	334100
		RCP	7	334102
		CIPCP	2	033050
		DIP		055900
	Force Main	PVCpp		331102
		DIP		055900
SANITARY SEWER (SS)	Trunk Main (Major) 30" and larger	RCP(PVCL)	7	333100
	Trunk Main (Minor) Larger than 15" and less than 30"	VCP/PVCsdnpp	4, 7	333106/ 333104
	Force Main	PVCpp		331102
		DIP		055900
	Street Main, Up to 15"	ABS/PVC Composite	7	333102
		ABS/PVCsdnpp	7	333104
		VCP	7	333106
		DIP	7	055900
	Service Lateral	ABS/PVC Composite		333102
		ABS/PVCsdnpp		333104
		VCP		333106
DIP			055900	
WATER (W)	Distribution Main, Up to 12"	PVCpp		331102
		DIP		055900
	Transmission Main, Larger than 12"	PVCpp		331102
		MLCSP	2	331104
		DIP	2	055900
	1" Residential Domestic/ Fire Service Lateral	PE		331200
	1", 1-1/2", & 2" Service Lateral	PE		331200
	4" and larger Industrial/Commercial Fire Service Lateral	PVCpp		331102
		DIP	2	055900
	Fire Hydrant Lateral	PVCpp	3	331102
MLCSP		2	331104	
	DIP		055900	

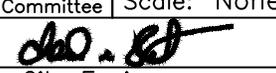
SEE G-4B

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

SCHEDULE OF ACCEPTABLE PIPE MATERIALS

CITY OF LIVERMORE STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: <small>Spec. Committee</small>	Scale: None	G-4A
 City Engineer		

G04A.DWG

<u>PIPE TYPE IDENTIFICATION</u>	<u>PIPE TYPE USAGE</u>	<u>APPROVED PIPE MATERIALS</u> (1 & 6)	<u>REFERENCE TO NOTES</u>	<u>SPEC. SECTION</u>
---------------------------------	------------------------	---	---------------------------	----------------------

RECLAIMED WATER	Distribution Main, Up to 12"	PVCpp DIP		331102 055900
	Transmission Main, Larger than 12"	PVCpp DIP	2	331102 055900
	Fire Hydrant Lateral	PVCpp DIP		331102 055900
	Irrigation	PVCpp PVCpp		331102 328000

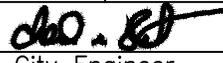
Notes:

1. Pipe material types shall be selected according to the service and function listed. Services or functions not identified or pipe types not listed require specific written approval of the ENGINEER. Pipe materials shall be in strict accordance with the City Standard Specifications.
2. Use of pipe material type requires written approval of the ENGINEER.
3. In City of Livermore water service area, where water main is MLCSP and when required by the ENGINEER, Fire Hydrant Laterals shall be MLCSP.
4. All PVCsdnpp for Storm Drain mains and Sanitary Sewer Trunk Mains (Minor) greater than 15" shall have a maximum SDR of 26 and a minimum pipe stiffness of 115 psi.
5. In areas of corrosive soils, high ground water tables and other adverse conditions, the pipe material shall be as specified by the ENGINEER.
6. See the City's latest "Guidelines for the use of Reclaimed Water" for information and requirements for connection to the City's reclaimed water system.
7. See City's latest Development Plan Check and Procedures Manual for City Pipe Design Criteria. A registered Civil Engineer shall provide deflection/load calculations for all Storm Drain and Sewer Main pipes in accordance with the City's Pipe Design Criteria.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

SCHEDULE OF ACCEPTABLE  
PIPE MATERIALS  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Spec. Ckd: Committee	Scale: None	G-4B
 City Engineer		

Date:	By:	Rev:

G04B.DWG

CONCRETE CLASS USE TABLE		
TYPE OF CONSTRUCTION	CONCRETE CLASS	Maximum Slump ± 1 Inch
<b>Street Surface Improvements (See Note 1)</b>		
Curb, Gutter, Sidewalk, Driveways	3	4
Commercial/Industrial Driveways, Bus Turnouts, Valley Gutter	Minor Concrete	4
Extruded Curb	1	2
<b>Sewer &amp; Storm Drain Facilities</b>		
Pipe Collars, Beam Support of Pipe, Pre-Cast Maintenance Hole Base, Storm Water Inlets	2	4
V-Ditches	3	4
Cast-In-Place Pipe	1	2
<b>Reinforced Structures</b>		
Retaining Walls Channels and Boxes	2	4
<b>Water System Facilities</b>		
Thrust Blocks, Valve Supports	2	4
<b>Miscellaneous</b>		
Street Light and Traffic Signal Foundations	2	4
Survey Monuments, Fence and Guardrail Post Foundations	4	4

Class 1 concrete shall contain not less than 675 pounds of Portland Cement per cubic yard  
 Class 2 concrete shall contain not less than 590 pounds of Portland Cement per cubic yard  
 Class 3 concrete shall contain not less than 505 pounds of Portland Cement per cubic yard  
 Class 4 concrete shall contain not less than 420 pounds of Portland Cement per cubic yard  
 Minor concrete shall contain not less than 550 pounds of Portland Cement per cubic yard  
 unless otherwise specified in the specifications or the special provisions.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

**NOTE:**

1. For surface improvements, use 3/4" lamp black per cubic yard

			CITY OF LIVERMORE STANDARD DETAIL		
			CONCRETE CLASS USE TABLE		NO.
			Dwn: MM	Date: May-13	G-5
			Ckd: Spec. Committee	Scale: NONE	
			 City Engineer		
Date	By	Rev.			

ABBREVIATIONS

AB = aggregate base  
 ABS = Acrylonitrile-Butadiene-Styrene pipe  
 AC = asphalt concrete  
 AWWA = American Water Works Association  
 Caltrans = State of California, Department of Transportation  
 CF = cubic foot (feet)  
 cl. = clear  
 CLSM = Controlled low strength materials  
 conc. = concrete  
 const. = construction  
 CIP = cast-in-place  
 CIPCP = cast-in-place concrete pipe  
 CVC = California Vehicle Code  
 C&G = curb & gutter  
 $\text{CL}$  = centerline  
 Detail x = Caltrans striping designation  
 DF = douglas fir  
 dia. = diameter  
 DIP = ductile iron pipe  
 dist. = distance  
 DWY = driveway  
 elev. = elevation  
 E.P. = edge of pavement  
 exist. = existing  
 FC = face of curb  
 $\text{FL}$  = flow line  
 galv. = galvanized  
 HDPE = corrugated high density polyethylene nonpressure pipe  
 HPS = high pressure sodium  
 I.D. = inside diameter  
 I.p. = iron pipe  
 LCC = Livermore City Code  
 LPD = Livermore Police Department  
 LS = registered land surveyor  
 LSE = landscape easement  
 max. = maximum  
 mech = mechanical  
 MH = maintenance hole  
 min. = minimum  
 MLCSP = mortar-lined and mortar-coated steel pipe  
 mph = miles per hour  
 O.C. = on center

O.D. = outside diameter  
 PCC = portland cement concrete  
 PE = polyethylene plastic pipe  
 $\text{PL}$  = property line  
 pt. = point  
 PUE = public utilities easement  
 PVC = polyvinyl chloride pipe  
 PVCpp = PVC pressure pipe  
 PVCsdnpp = PVC storm drain nonpressure pipe  
 R = radius  
 RCE = registered civil engineer  
 RCP = reinforced concrete pipe  
 RCPP = reinforce concrete pressure pipe  
 RCP(PVCL) = reinforced concrete pipe (PVC lined)  
 req'd = required  
 (rt) = right  
 R/W = right of way  
 "s" = slope  
 SD = storm drain  
 Sch. = schedule  
 sq. = square  
 SS = sanitary sewer  
 std. = standard  
 SW = sidewalk  
 SWE = sidewalk easement  
 T = telephone  
 TC = top of curb  
 T.V. = television  
 typ. = typical  
 T&B = top & bottom  
 VCP = vitrified clay pipe  
 W = water  
 WRD = Water Resources Division  
 w/ = with  
 $\text{Ø}$  = diameter  
 (lt) = left

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ABBREVIATIONS

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: KY	Date: May-13	NO.  G-6
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

G07.DWG

Date	By	Rev.

# CITY OF LIVERMORE

## STANDARD DETAILS

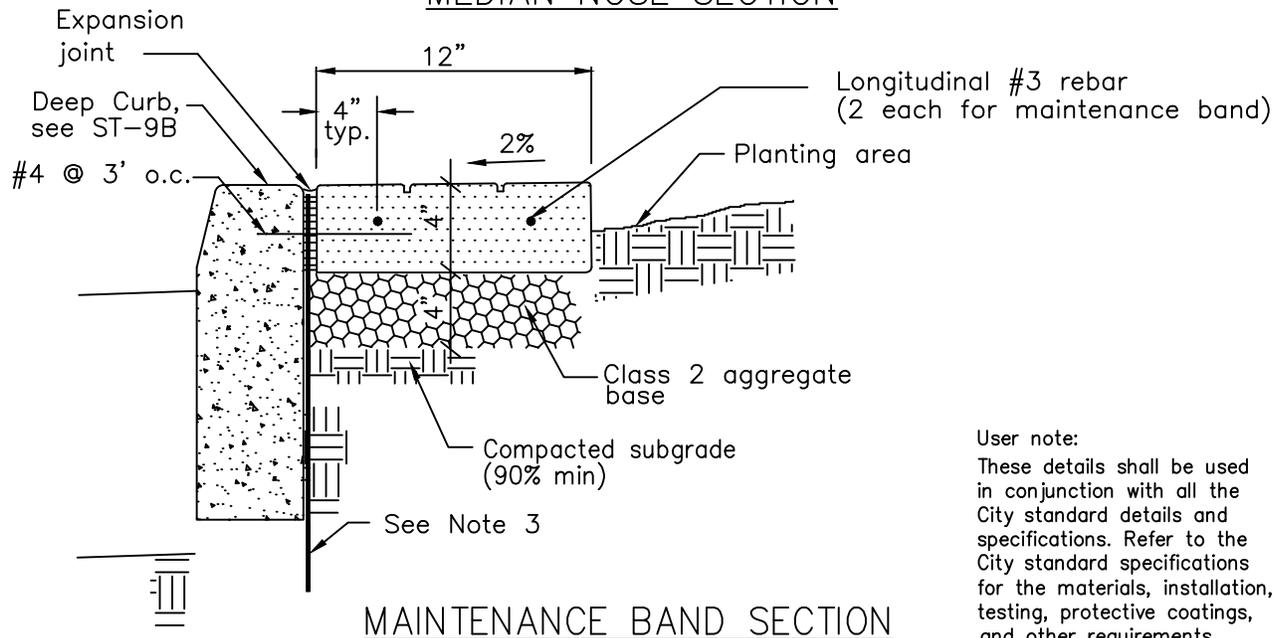
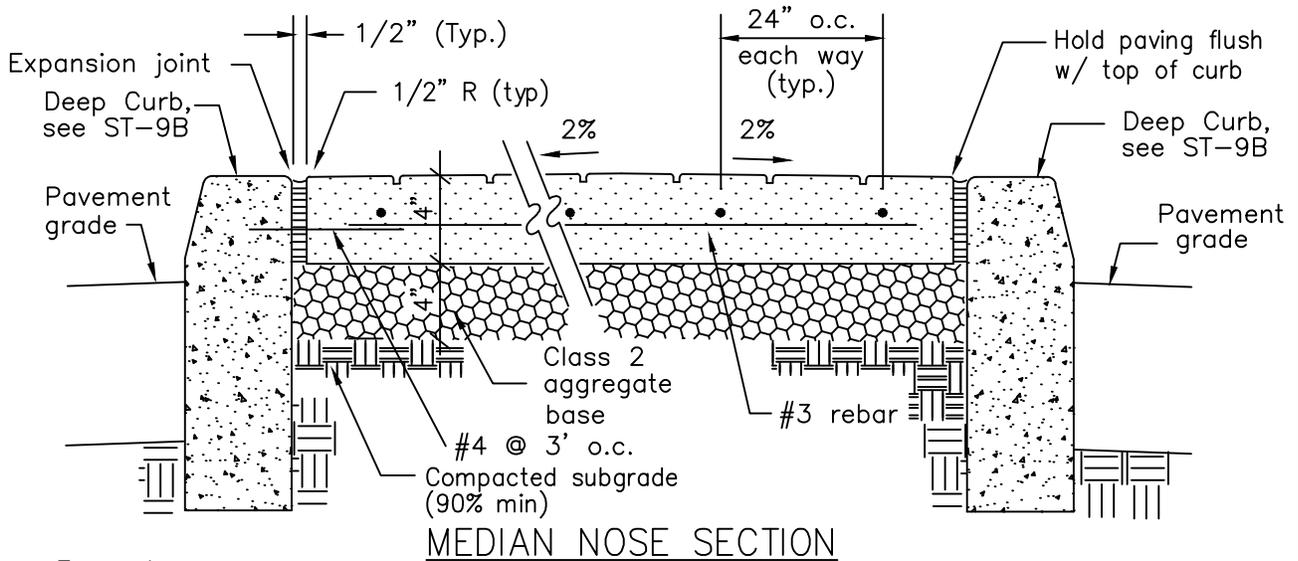
### TABLE OF CONTENTS

#### LANDSCAPE AND IRRIGATION - L

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L-1	MEDIAN PAVING
L-2	MEDIAN PLANTING
L-3	STREET TREE PLANTING
L-4	SHRUB PLANTING
L-5	GROUNDCOVER SPACING
L-6	ROTOR OR SPRAY HEAD
L-7	TREE BUBBLER
L-8	DRIP EMITTER
L-9	REMOTE CONTROL VALVE; MASTER CONTROL VALVE
L-10	BALL VALVE
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L-12	CONTROLLER; FLOW SENSOR; HIGH-GAIN ANTENNA
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L-17	ILLUSTRATIVE BACKING LOT TREATMENT, TREE & SHRUB PRUNING GUIDELINES
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NOTES:

1. Install 1"-deep transverse joints at a spacing equal to 1.5 times the width of each median section, unless otherwise approved.
2. Textured concrete paving color & pattern are subject to City approval.
3. If roadway structural section is greater than 14", install water barrier extending from top of pavers to 6" below street subgrade. See L-2C.
4. Irrigation main line to be placed outside of face of water barrier.



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L01A.DWG

Date	By	Rev.

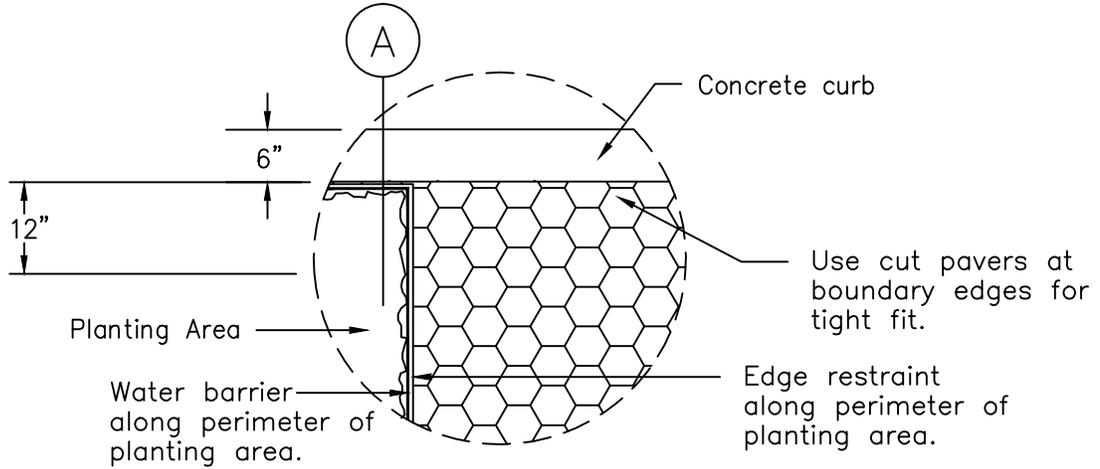
MEDIAN PAVING  
 TEXTURED CONCRETE

CITY OF LIVERMORE  
 STANDARD DETAIL

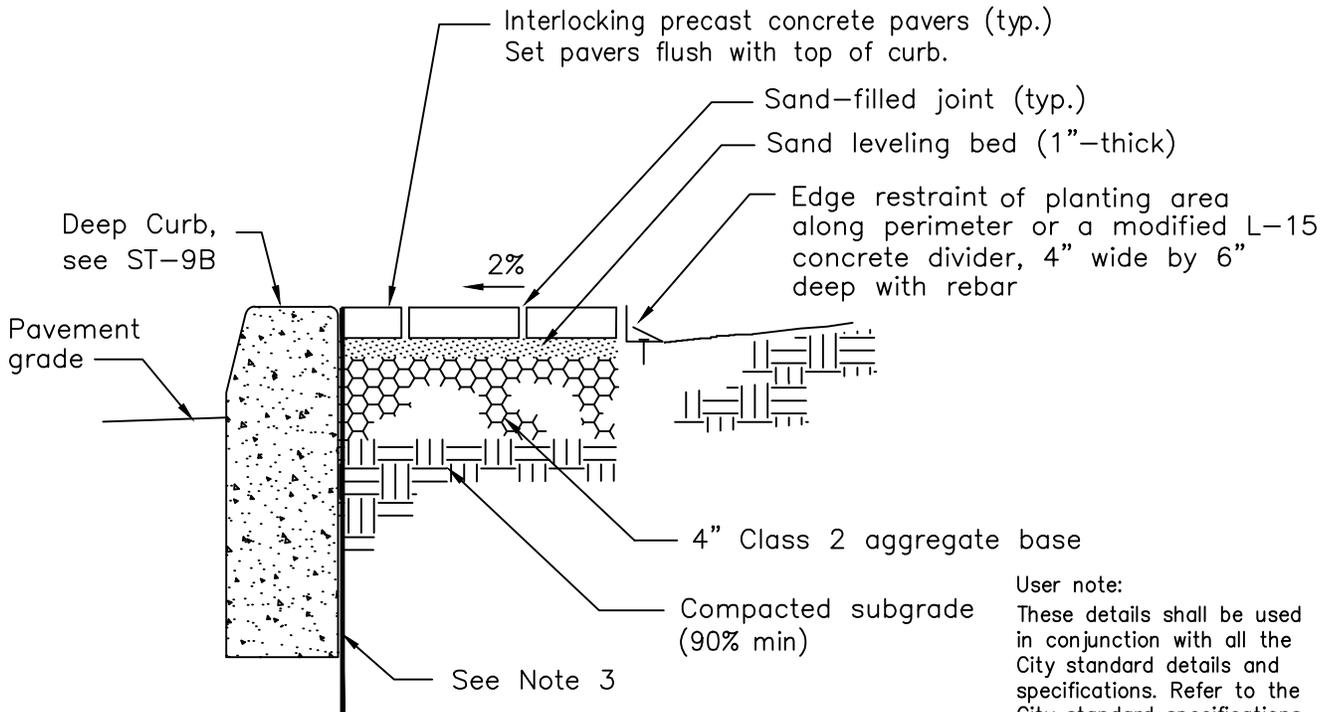
Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>deD. SJ</i> City Engineer		L-1A

NOTES:

1. Interlocking precast concrete paver color and pattern subject to City approval.
2. Aggregate base to be treated with a pre-emergent herbicide.
3. If roadway structural section is greater than 14", install water barrier extending from top of pavers to 6" below street subgrade. See L-2C.
4. Irrigation main line to be placed outside of face of water barrier.



PLAN



A MAINTENANCE BAND SECTION

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

MEDIAN PAVING  
 INTERLOCKING PRECAST  
 CONCRETE PAVERS

CITY OF LIVERMORE  
 STANDARD DETAIL

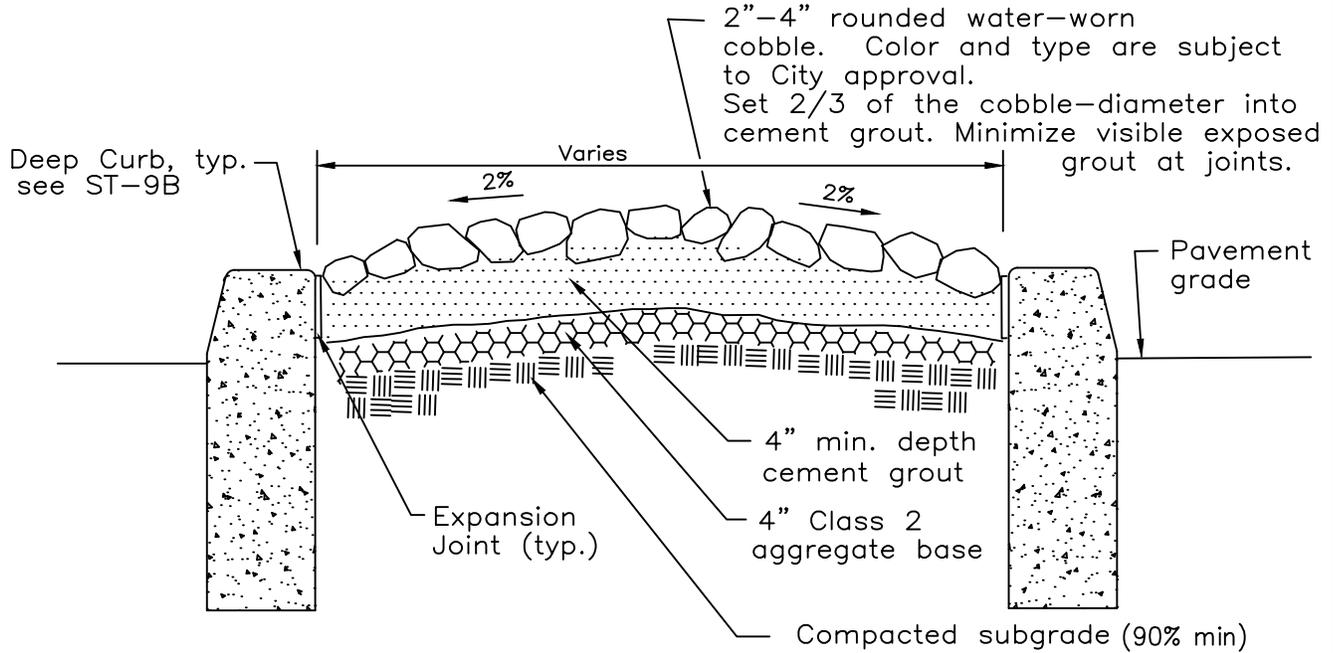
Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-1B

L01B.DWG

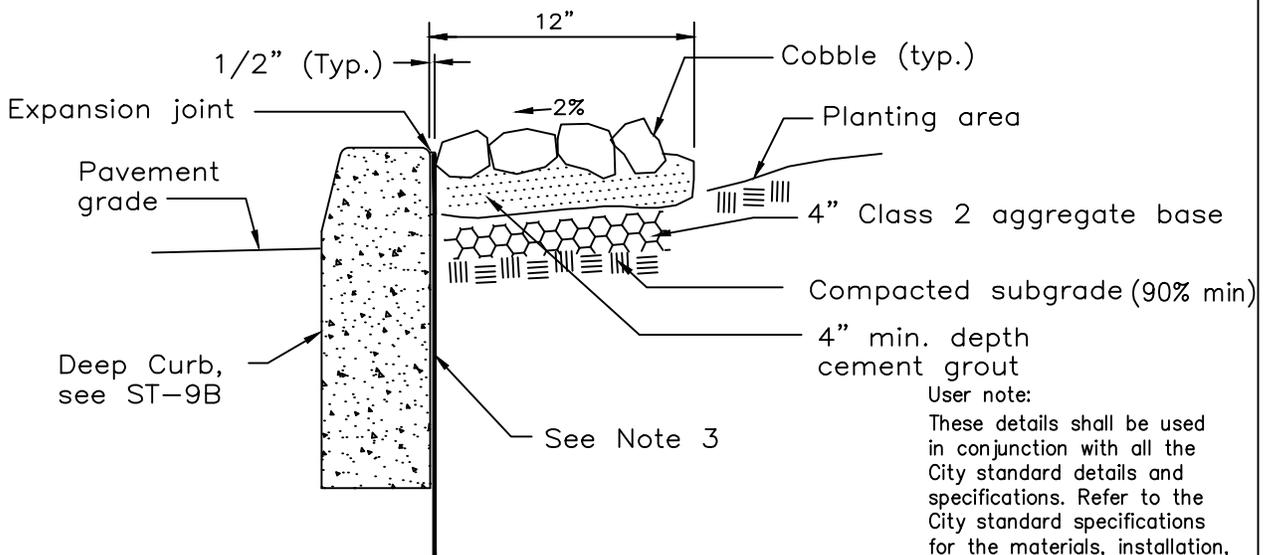
Date	By	Rev.

NOTES:

1. Cobblestone subject to City approval.
2. Aggregate base to be treated with a pre-emergent herbicide as approved by the City.
3. If roadway structural section is greater than 14", install water barrier extending from top of pavers to 6" below street subgrade, See L-2C.
4. Irrigation main line to be placed outside of face of water barrier.



MEDIAN NOSE SECTION



MAINTENANCE BAND SECTION

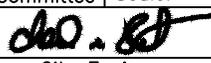
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

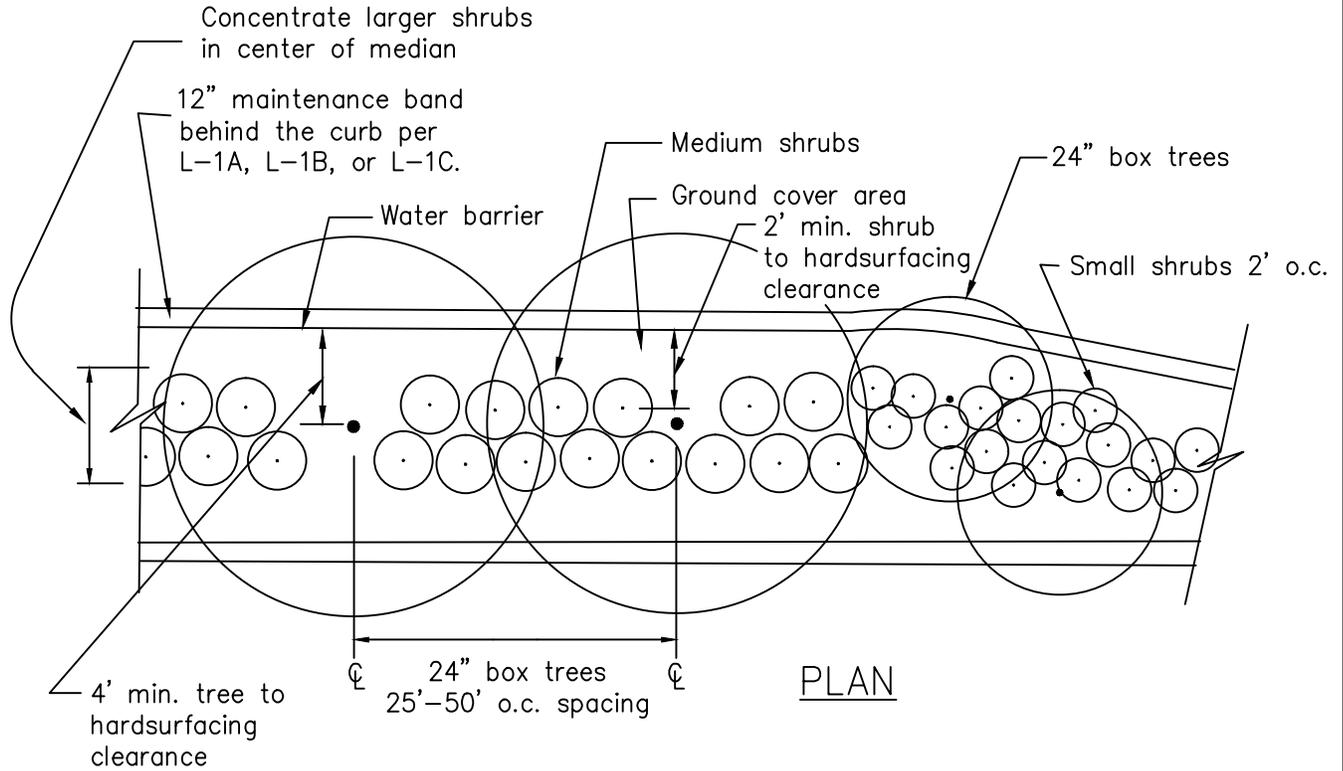
MEDIAN PAVING  
COBBLESTONE

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-10

L01C.DWG

NOTE: This detail is only a guideline. Plant variety/size and hardsurfacing materials are subject to City approval. Minimum quantities of plant materials are shown.



Minimum quantity of plant material per 100' long section of standard 16'-wide median. Quantities will vary proportionally for other median widths.

**TREES:**

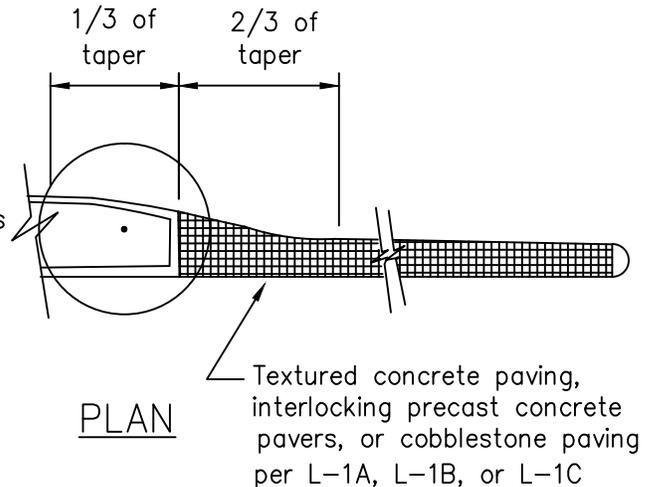
- 24"-box: 2-4 trees per 100' large canopy trees
- 24"-box: 3-7 trees per 100' accent trees

**SHRUBS (Mature Height)**

- Large: 5'-10' high, 30 shrubs per 100'
- Medium: 3'-5' high, 40 shrubs per 100'
- Small: 1'-3' high, 50 shrubs per 100'

**GROUND COVER**

- Fast growing: 12" o.c.
- Moderate growing: 9" o.c.
- Slow growing: 6" o.c.



Textured concrete paving, interlocking precast concrete pavers, or cobblestone paving per L-1A, L-1B, or L-1C

**NOTES:**

- Areas between plants shall receive a 3" layer of mulch.
- Trees within 300' of intersections, as measured from centerline of the cross-street, shall have canopies trimmed to provide 8' clear from top of curb to lowest scaffold branch. Groundcover within 300' of intersections and driveways shall be specified as a low-growing variety, with native growth height of no more than 30" above top of curb including mounding.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L02A.DWG

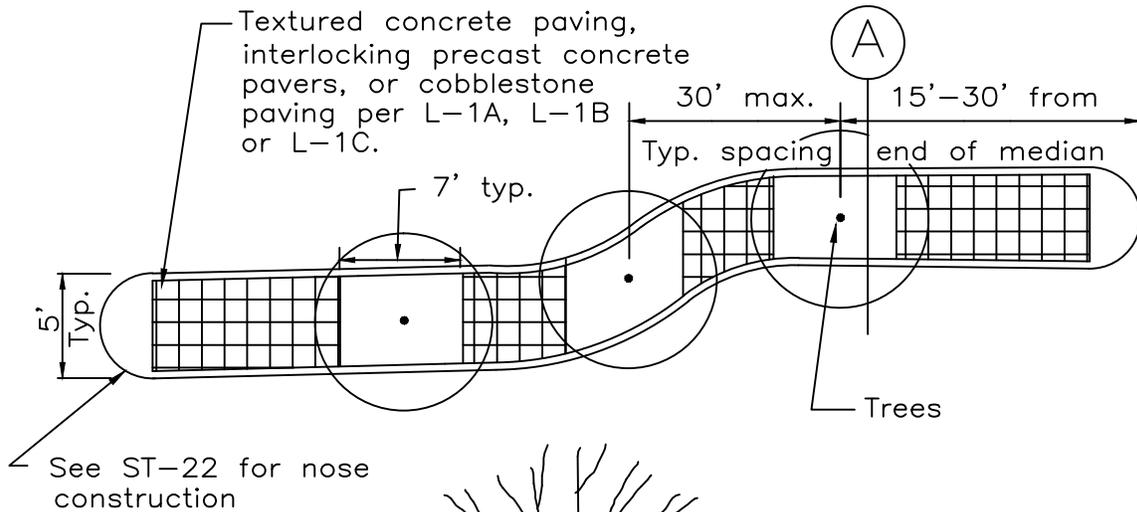
Date	By	Rev.

# MEDIAN PLANTING

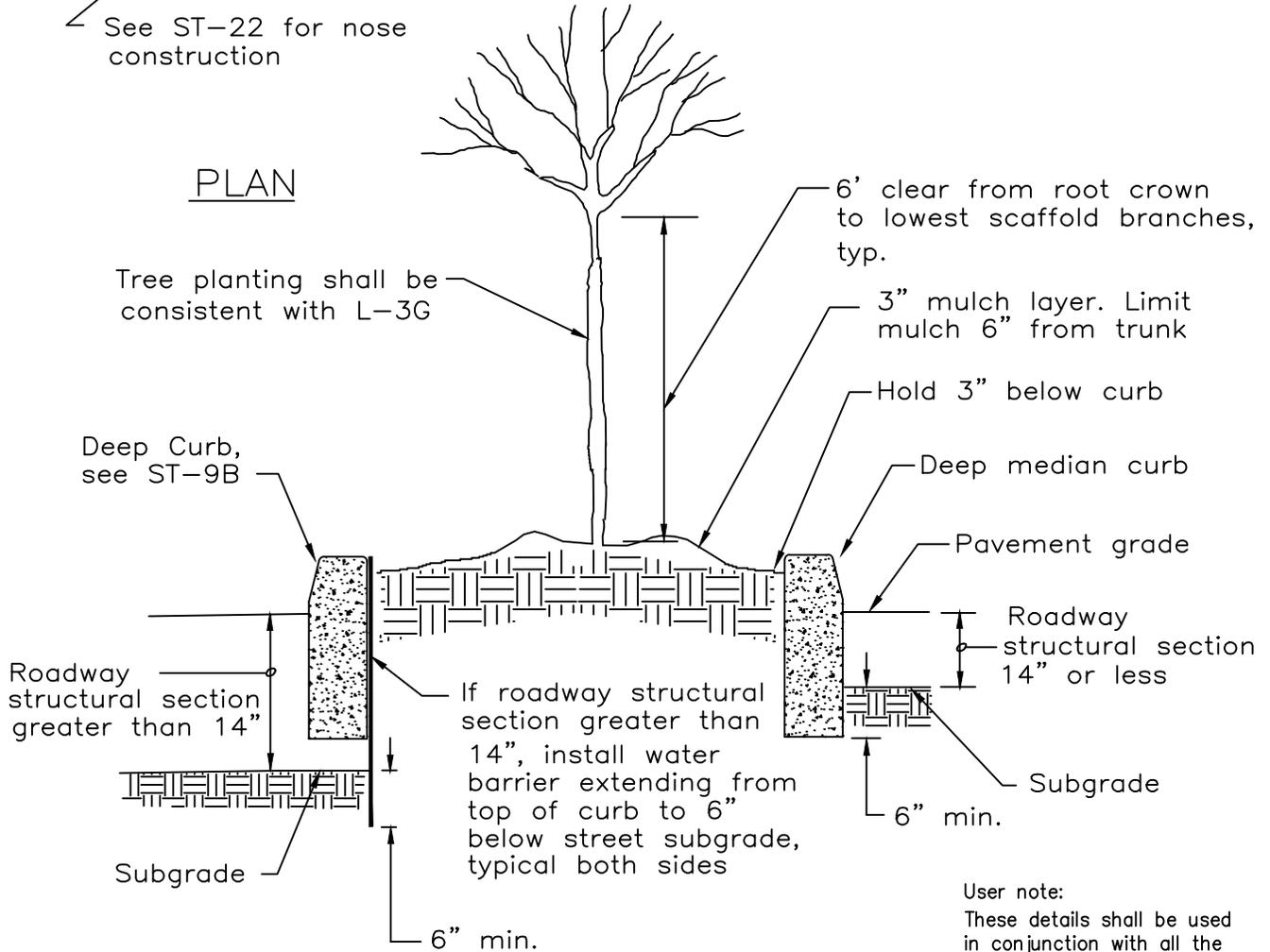
GENERAL

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>dbd</i> City Engineer		L-2A



PLAN



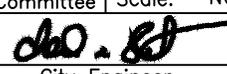
(A) SECTION

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

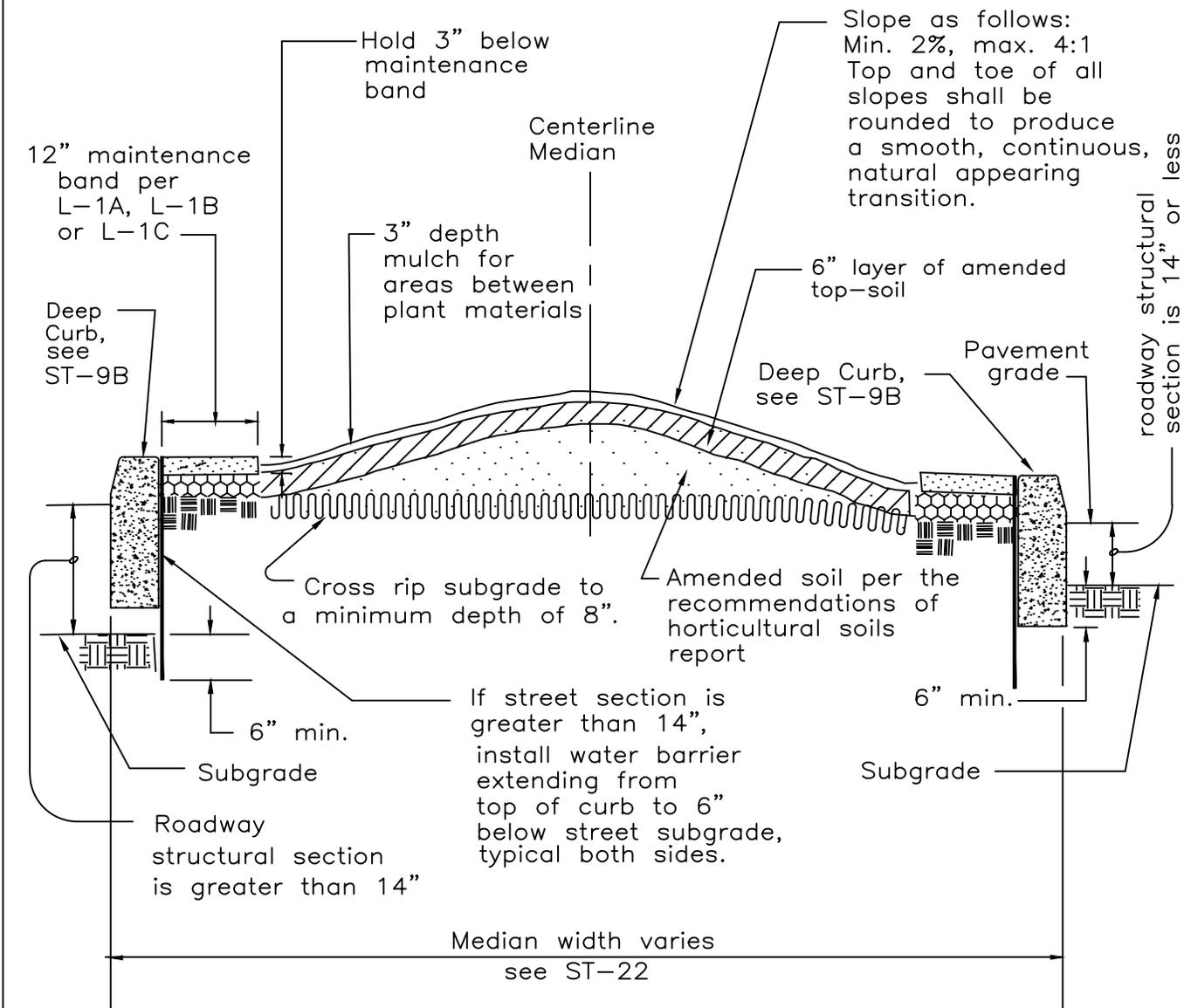
L02B.DWG

MEDIAN PLANTING  
 NARROW MEDIANS

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-2B

Date	By	Rev.



SECTION

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

LO2C.DWG

Date	By	Rev.

MEDIAN PLANTING  
WIDE MEDIANS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>do</i>		L-2C
City Engineer		

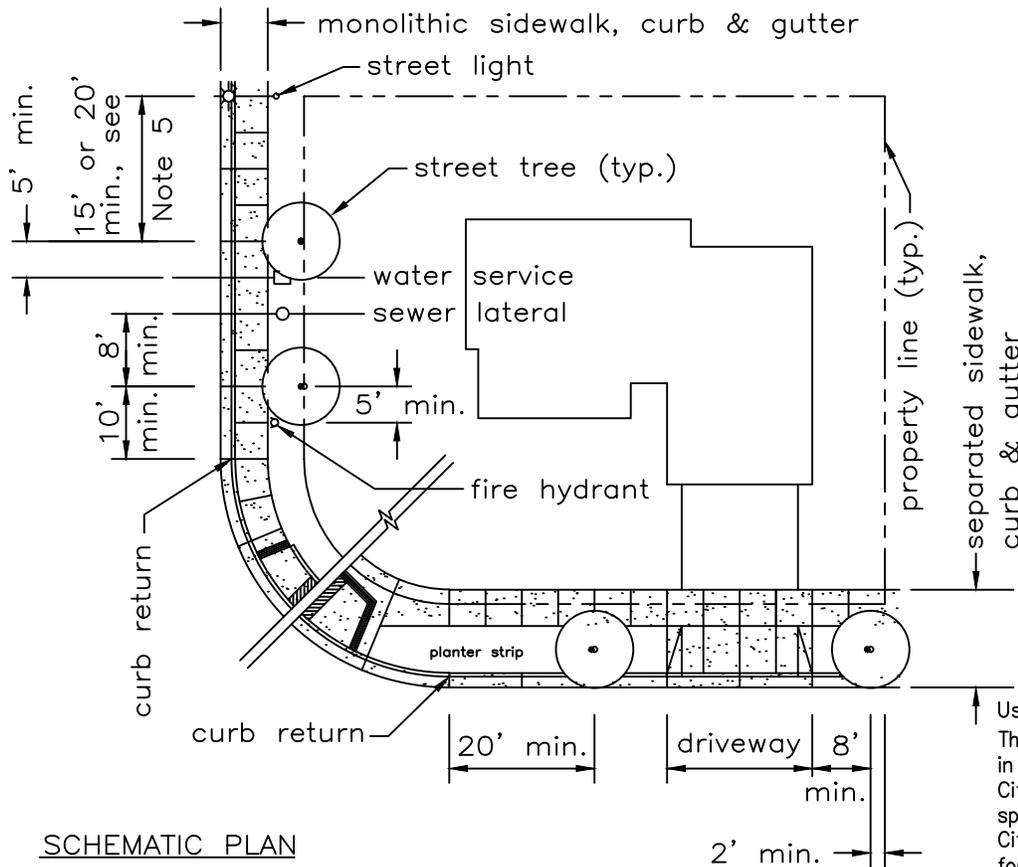
Minimum street tree quantities for new development:

1. Single frontage residential lot – 1 tree.
2. Dual frontage (corner) lot – 2 trees.
3. Industrial/commercial frontage – 1 tree per 50' of frontage.
4. Backing Lot – Per L-18A or L-18B.

All tree varieties and quantities are subject to City approval.

Minimum street tree clearances (see schematic plan below for illustration):

1. Street trees shall be located 8' (min.) from sanitary sewer mains and laterals.
2. Street trees shall be located 5' (min.) from water mains and services.
3. Street trees shall be located 5' (min.) from fire hydrants.
4. Street trees shall be located 8' from driveways.
5. Street trees shall be located 20' (min.) from standard street lights.  
Street trees shall be located 15' (min.) from decorative street lights.
6. Street trees shall be located 20' (min.) from curb returns with separated sidewalk, or 10' from curb returns with monolithic sidewalk.
7. Street trees shall be located 2' (min.) from the common property line separating lots.



**SCHEMATIC PLAN**  
(for illustration only)

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

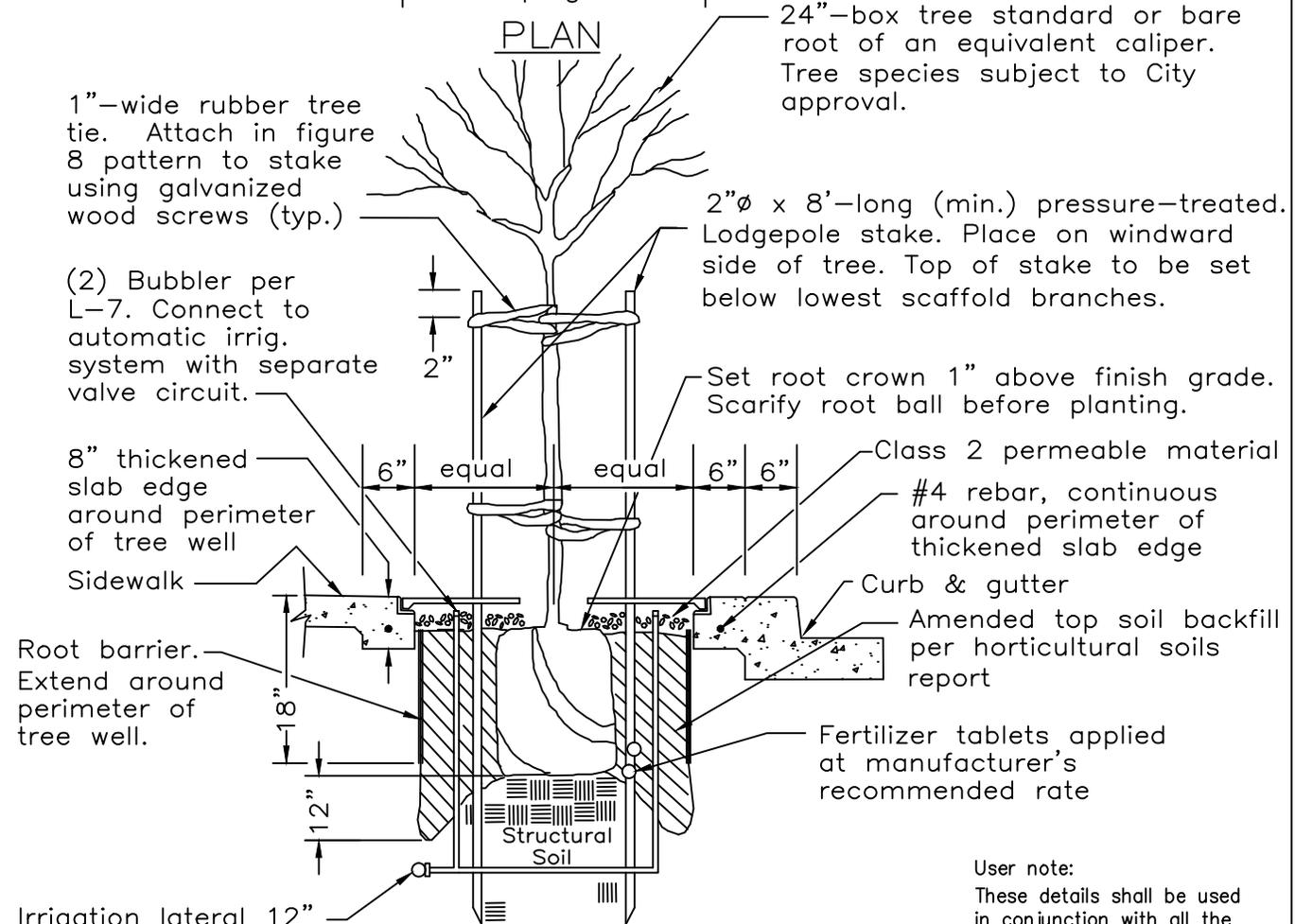
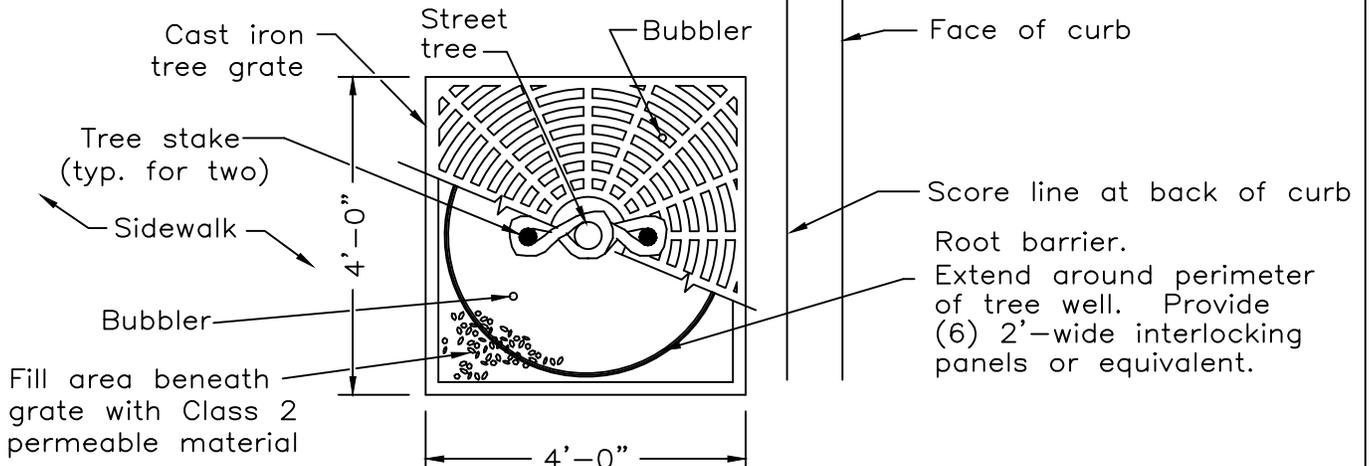
L03A.DWG

Date	By	Rev.

STREET  
TREE PLANTING  
QUANTITIES & CLEARANCES

CITY OF LIVERMORE  
STANDARD DETAIL

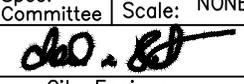
Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>do. &amp; S.</i> City Engineer		L-3A



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

STREET  
 TREE PLANTING  
 FOR TREE WELLS WITH GRATES

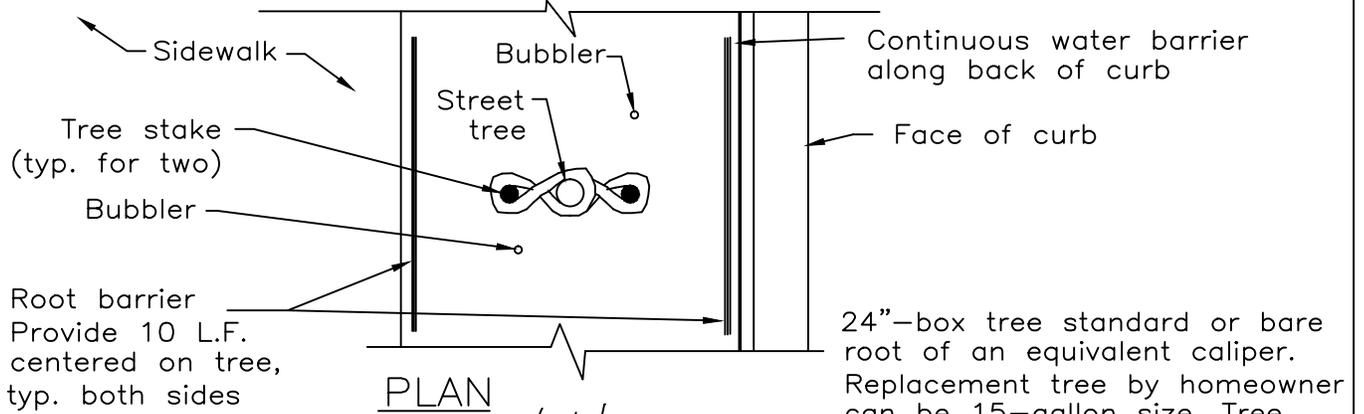
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	NO.  L-3B
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

LO3A.DWG

Date	By	Rev.

NOTE: The mulch, if required, shall not be within 6" of the trunk of the tree.



PLAN

24"-box tree standard or bare root of an equivalent caliper. Replacement tree by homeowner can be 15-gallon size. Tree species to be approved by the Design Review Committee for new development. Tree replacement to be approved by the Community Development Department.

1"-wide rubber tree tie. Attach in figure 8 pattern to stake using galvanized wood screws (typ.)

(2) Bubbler per L-7. Connect to automatic irrig. system with separate valve circuit.

2"Ø x 8' long (min.) pressure-treated lodgepole stake. Place on windward side of tree. Top of stake to be set below lowest scaffold branches.

Set root crown 1" above finish grade. Scarify root ball before planting.

Organic mulch (3"-layer) or groundcover, where required.

Sidewalk

equal equal

Curb & gutter

Continuous water barrier extending from top of curb to 6" below subgrade

Root barrier Provide 10 L.F. typ. both sides

18"  
12"

Amended top soil backfill per horticultural soils report

Fertilizer tablets applied at manufacturer's recommended rate

Irrigation lateral 12" deep inside tree root barrier. Irrigation line or component shall not be routed under tree root ball

SECTION

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

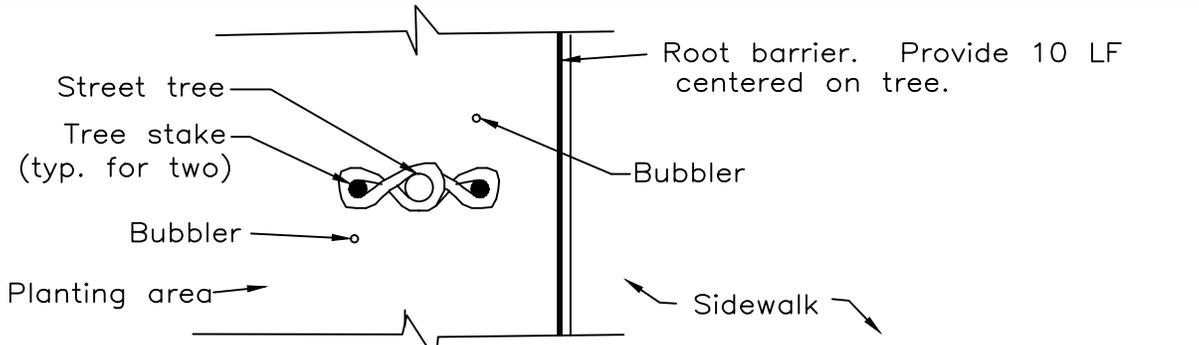
STREET  
TREE PLANTING  
FOR SEPARATED OR  
MEANDERING SIDEWALK

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	L-3C
 City Engineer		

LO3B.DWG

Date	By	Rev.



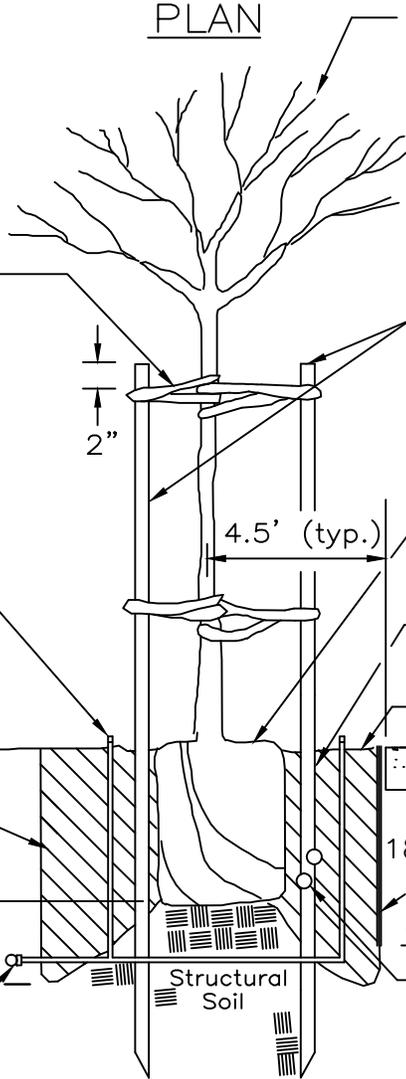
**PLAN**

1"-wide rubber tree tie. Attach in figure 8 pattern to stake using galvanized wood screws (typ.)

(2) Bubbler per L-7 Connect to automatic irrigation system with separate valve circuit.

Planting area  
Scarify walls of plant hole (typ.)

Irrigation lateral Installed away from root ball.



**SECTION**

24"-box tree standard or bare root of an equivalent caliper. Replacement tree by homeowner can be 15-gallon size. Tree species to be approved by the Design Review Committee for new development. Tree replacement to be approved by the Community Development Department.

2"Ø x 8' long (min.) pressure-treated lodgepole stake. Place on windward side of tree. Top of stake to be set below lowest scaffold branches.

Set crown 1" above finish grade. Scarify root ball immediately prior to planting.

Amended top soil backfill per horticultural soils report

Finish grade  
Monolithic sidewalk, curb & gutter

18" Root barrier Provide 10 LF per tree.

Fertilizer tablets applied at manufacturer's recommended rate

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

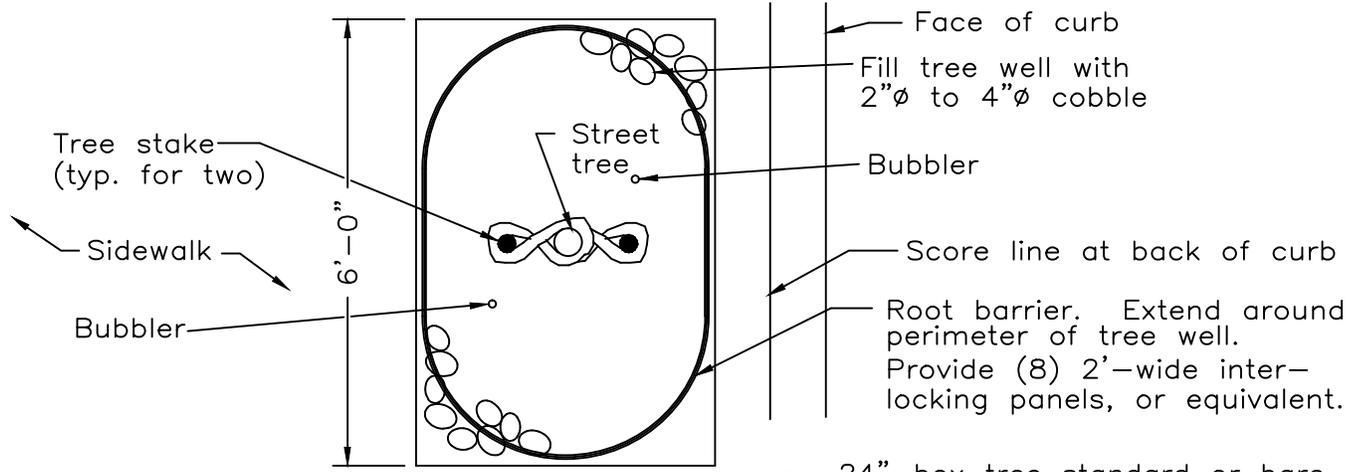
LO3C.DWG

Date	By	Rev.

**STREET TREE PLANTING FOR MONOLITHIC SIDEWALK**

**CITY OF LIVERMORE STANDARD DETAIL**

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-3D



PLAN

1"-wide rubber tree tie. Attach in figure 8 pattern to stake using galvanized wood screws (typ.)

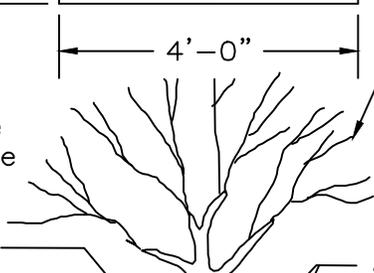
(2) Bubbler per L-7. Connect to automatic irrig. system with separate valve circuit.

8" thickened slab edge around perimeter of tree well

Sidewalk

Root barrier. Extend around perimeter of tree well.

Irrigation lateral 12" deep inside tree well  
Irrigation line or component shall not be routed under tree root ball



24"-box tree standard or bare root of an equivalent caliper. Tree species to be approved by the Design Review Committee for new development. Tree replacement to be approved by the Community Development Department.

2"Ø x 8' long (min.) pressure-treated lodgepole stake. Place on windward side of tree. Top of stake to be set below lowest scaffold branches.

Set root crown 1" above finish grade. Scarify root ball before planting.

2"Ø to 4"Ø cobbles

#4 rebar, continuous around perimeter of thickened slab edge

Curb & gutter

Amended top soil backfill per horticultural soils report

Fertilizer tablets, applied at manufacturer's recommended rate

SECTION

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

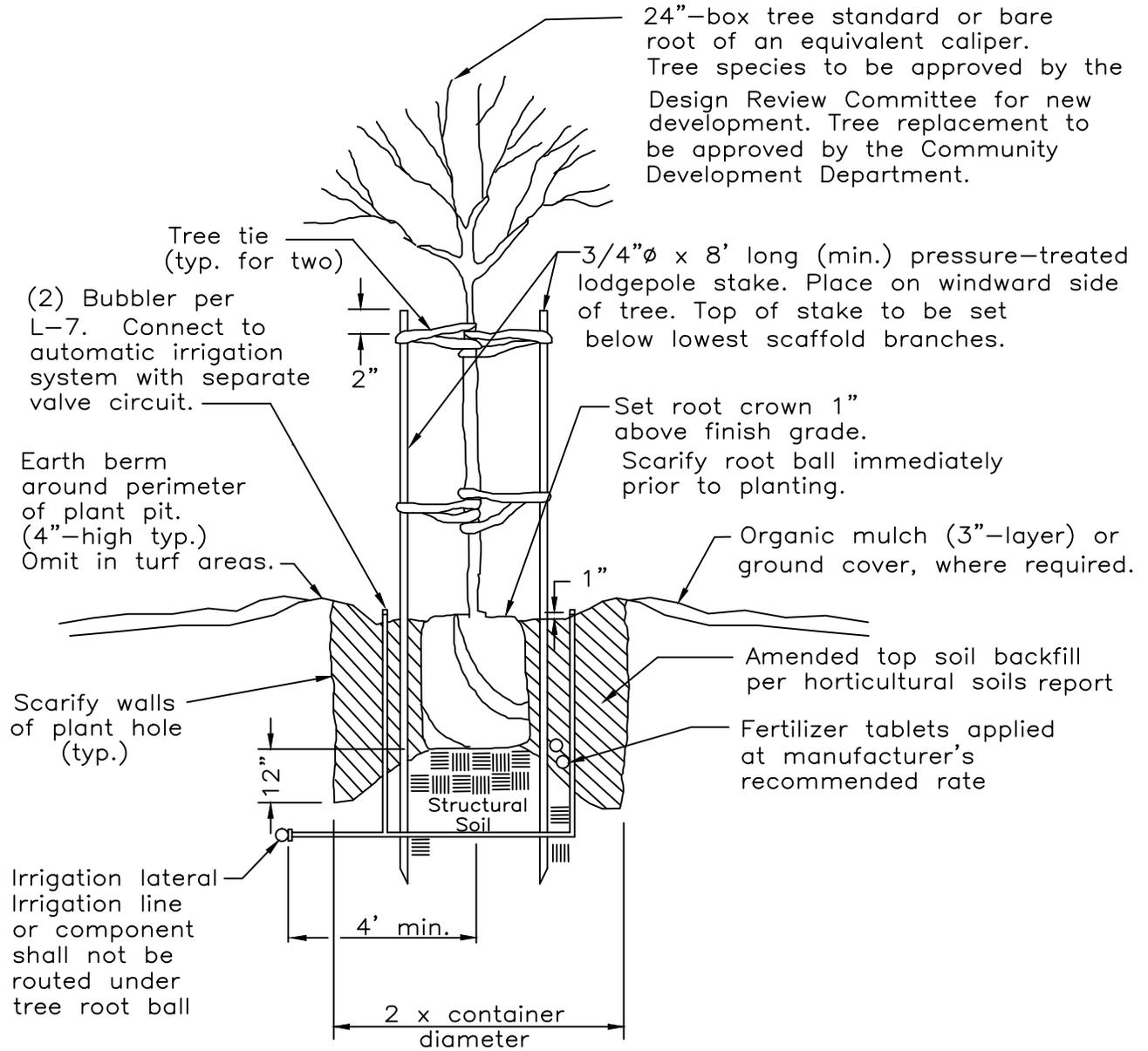
STREET  
TREE PLANTING  
FOR TREE WELLS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>do. st</i>		L-3E
City Engineer		

L03E.DWG

Date	By	Rev.



24"–box tree standard or bare root of an equivalent caliper. Tree species to be approved by the Design Review Committee for new development. Tree replacement to be approved by the Community Development Department.

Tree tie (typ. for two)

(2) Bubbler per L-7. Connect to automatic irrigation system with separate valve circuit.

Earth berm around perimeter of plant pit. (4"–high typ.) Omit in turf areas.

Scarify walls of plant hole (typ.)

Irrigation lateral  
Irrigation line  
or component  
shall not be  
routed under  
tree root ball

3/4"Ø x 8' long (min.) pressure–treated lodgepole stake. Place on windward side of tree. Top of stake to be set below lowest scaffold branches.

Set root crown 1" above finish grade. Scarify root ball immediately prior to planting.

Organic mulch (3"–layer) or ground cover, where required.

Amended top soil backfill per horticultural soils report

Fertilizer tablets applied at manufacturer's recommended rate

SECTION

NOTES:

1. When tree is located within 6' of sidewalk, curb, or other hard surfacing, plant tree per L-3C.
2. The mulch, if required, shall not be placed in contact with the parent trunk of the tree.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

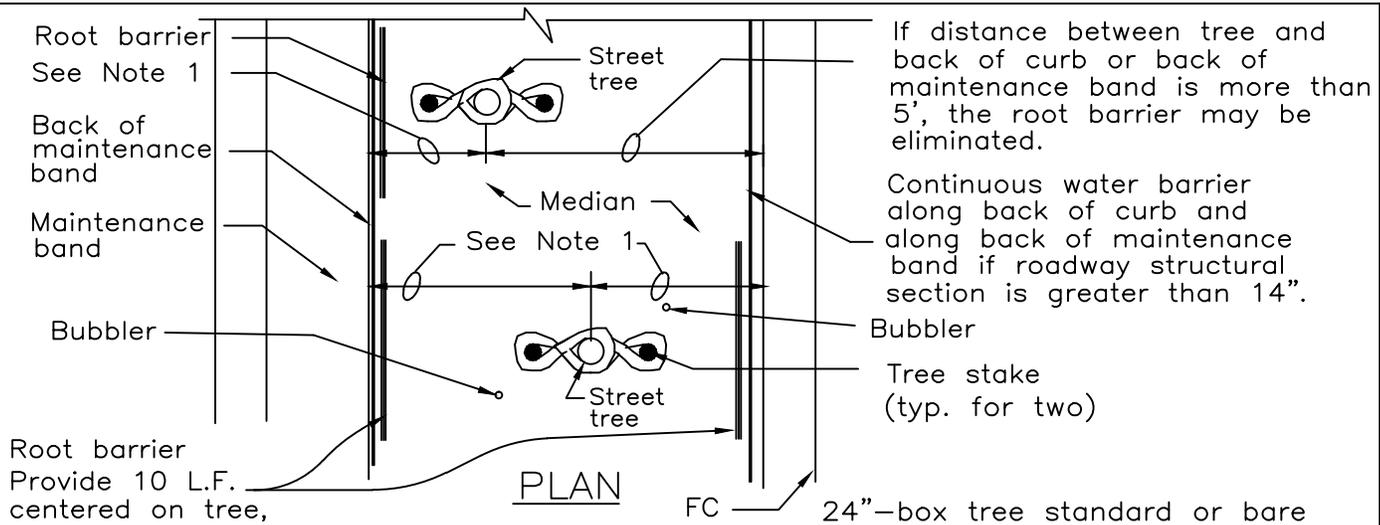
Date	By	Rev.

TREE PLANTING  
FOR OPEN AREAS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>doe. [Signature]</i> City Engineer		L-3F

L03E.DWG

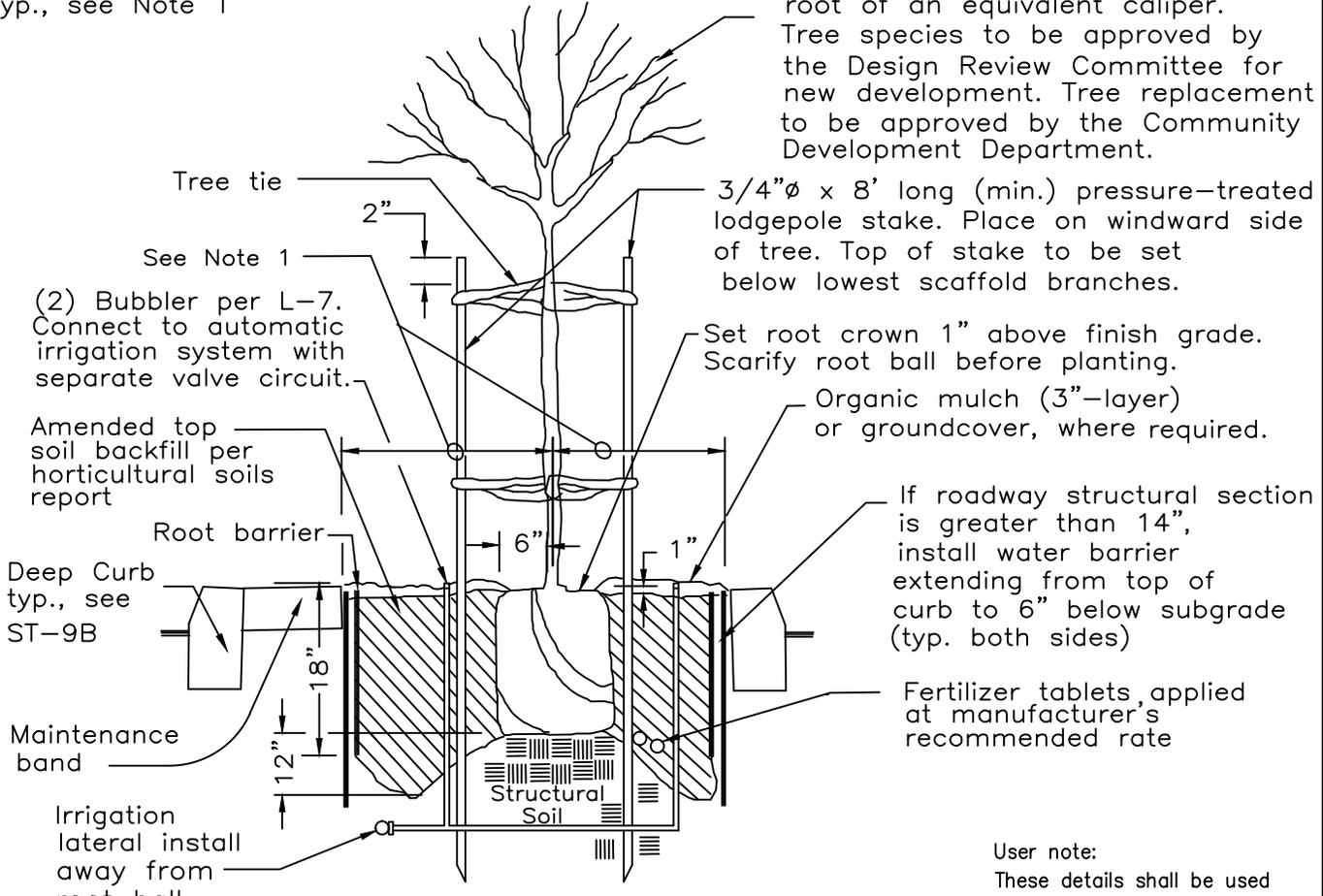


If distance between tree and back of curb or back of maintenance band is more than 5', the root barrier may be eliminated.

Continuous water barrier along back of curb and along back of maintenance band if roadway structural section is greater than 14".

Root barrier  
Provide 10 L.F. centered on tree, typ., see Note 1

24"-box tree standard or bare root of an equivalent caliper. Tree species to be approved by the Design Review Committee for new development. Tree replacement to be approved by the Community Development Department.



NOTES:

- 1) Provide 10 L.F. root barrier if distance is 5' or less.
- 2) The mulch, if required, shall not be placed within 6" of the trunk of the tree.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

STREET  
TREE PLANTING  
FOR MEDIANS

CITY OF LIVERMORE  
STANDARD DETAIL

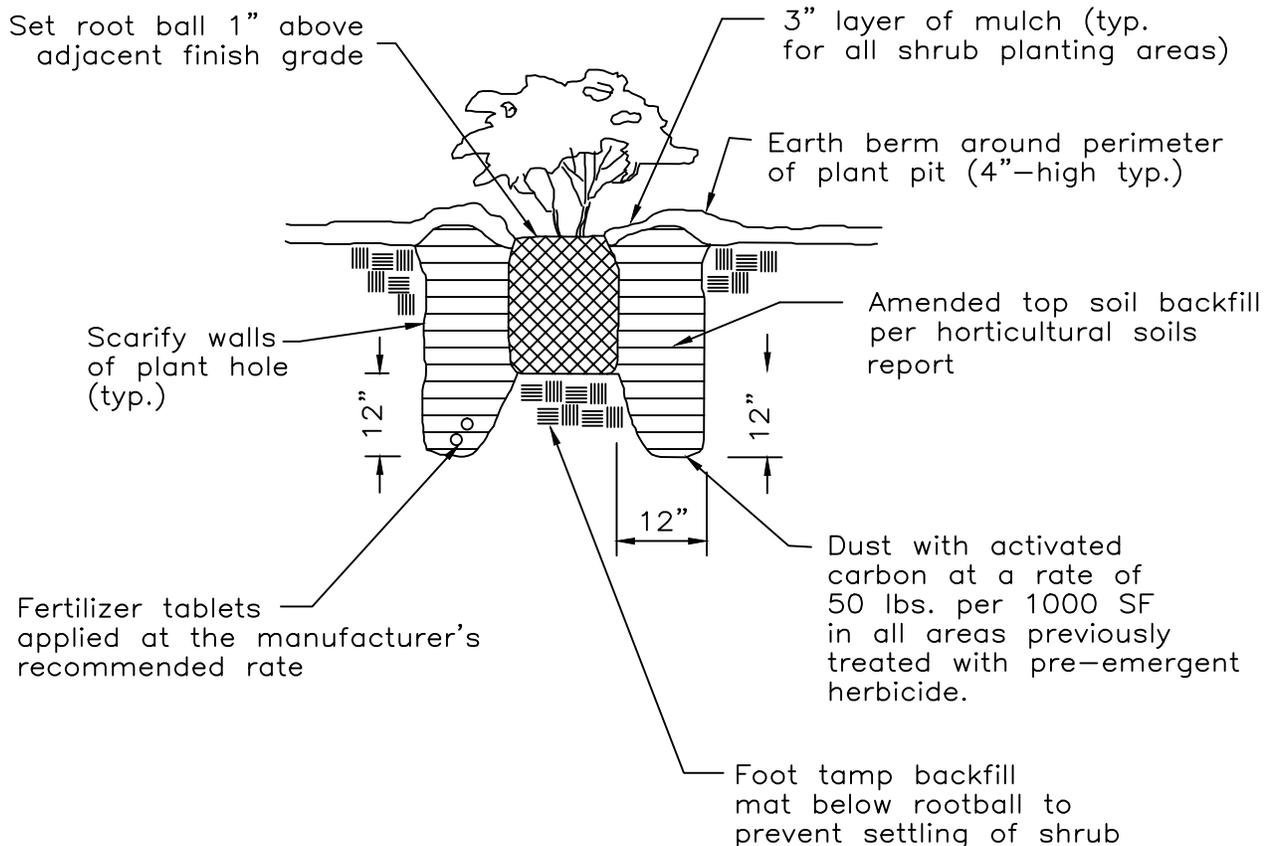
Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-3G

L03F.DWG

Date	By	Rev.

NOTES:

1. Shrub varieties, quantities, sizes, and spacing are subject to Design Review Committee approval.
2. The mulch, if required, shall not be placed within 6" of parent trunk of the shrub.
3. The shrub hole shall be 12" (min.) deeper and 12" (min.) larger on all sides of the root ball.



SECTION

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

SHRUB PLANTING

CITY OF LIVERMORE  
STANDARD DETAIL

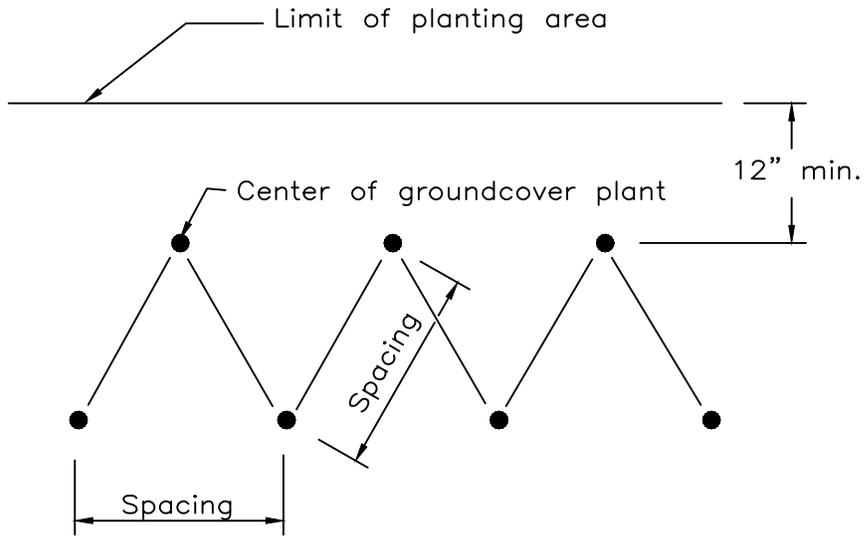
Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>db0. [Signature]</i>		L-4
City Engineer		

L04.DWG

Date	By	Rev.

NOTES:

1. Groundcover varieties, quantities, sizes, and spacing are subject to Design Review Committee approval.
2. Dust the plant pits with activated carbon at a rate of 50 lbs. per 1000 SF in all areas previously treated with pre-emergent herbicide.



PLAN

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L05.DWG

Date	By	Rev.

GROUNDCOVER  
SPACING

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>das</i>		L-5
City Engineer		

Adjacent sidewalk, curb, or wall (as occurs)

3" typ.

Set head flush with finish grade

Install concrete "sprinkler block" when adjacent to flush curb

Rotor or Spray Head

**NOTE:**

Provide in-line check valves at base of head as required to prevent unwanted discharge from low elevation heads. Omit if spray head equipped with integral check valve.

Sch. 80 PVC threaded riser (length as required)

90° marlex street elbow

90° Sch. 80 PVC elbow

6"-long Sch. 80 PVC threaded riser

30° min. to 45° max.

**SECTION**

Sch. 40 PVC tee, elbow, or adapter with FIPT outlet

Irrigation lateral

90° marlex street elbow

90° Sch. 80 PVC elbow

90° marlex street elbow

**PLAN**

6"-long Sch. 80 PVC threaded riser

Pop-up head

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

**LEGEND:**

MIPT = Male Iron Pipe Thread  
FIPT = Female Iron Pipe Thread

ROTOR OR SPRAY HEAD

CITY OF LIVERMORE STANDARD DETAIL

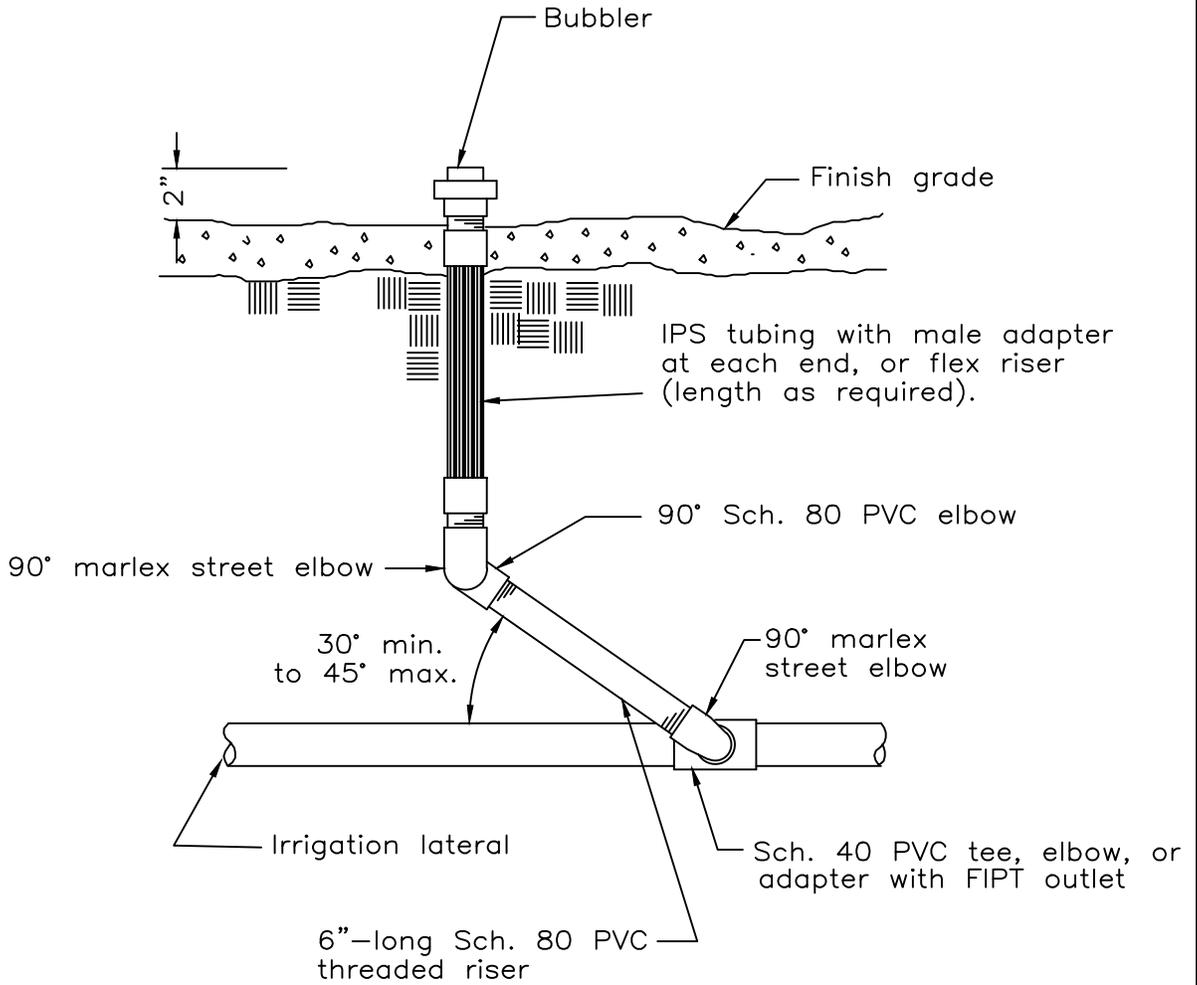
Dwn: MM	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>do. 8/1</i>		L-6
City Engineer		

L06.DWG

Date	By	Rev.

NOTE:

1. All laterals, mains, and swing joints shall be located 24" min. away from trees or plants.



SECTION

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

LEGEND:

MIPT = Male Iron Pipe Thread  
 FIPT = Female Iron Pipe Thread

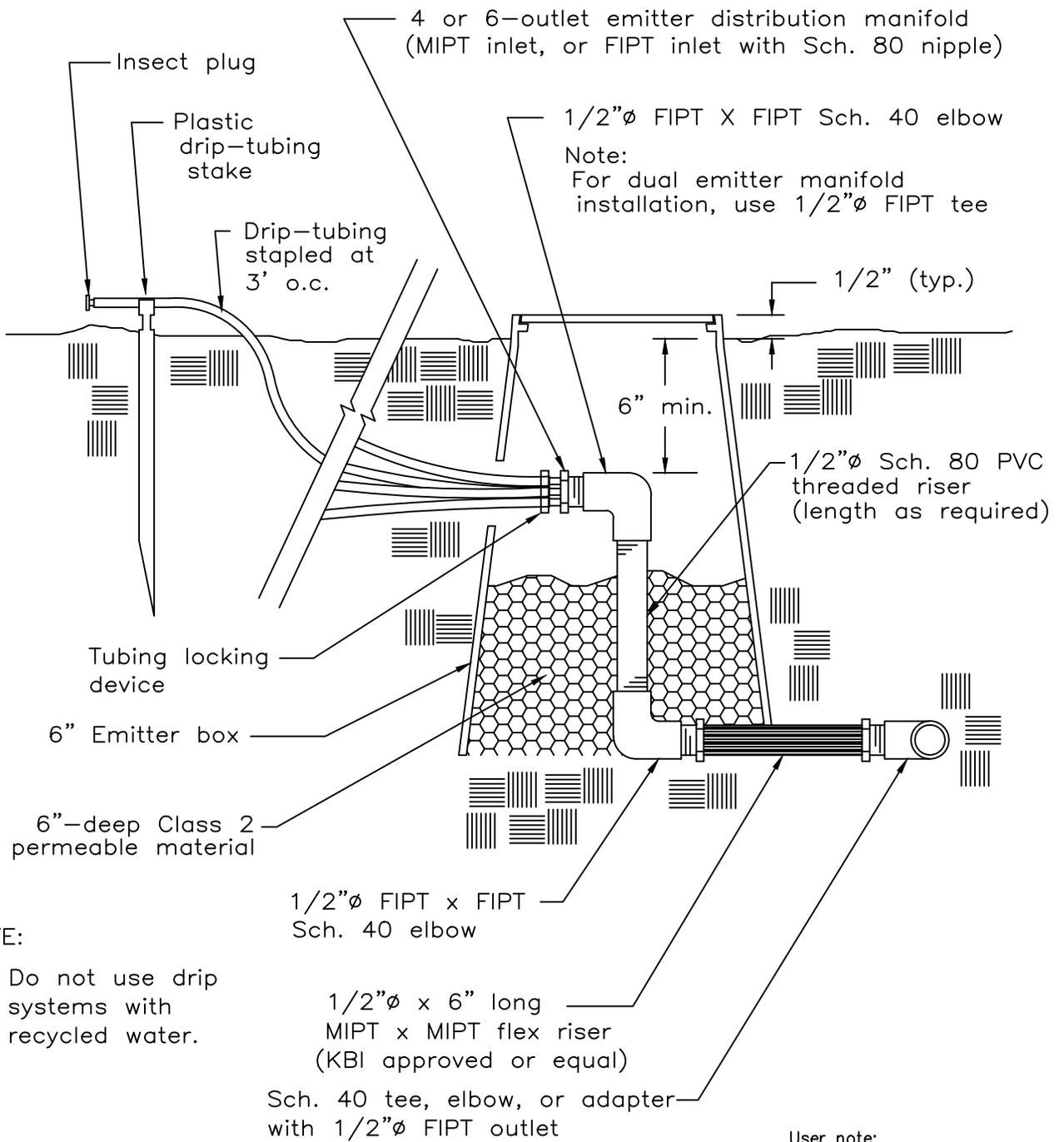
CITY OF LIVERMORE  
 STANDARD DETAIL

TREE BUBBLER

Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>do. &amp; S.</i>		L-7
City Engineer		

L07.DWG

Date	By	Rev.



NOTE:

- Do not use drip systems with recycled water.

SECTION

LEGEND:

MIPT = Male Iron Pipe Thread  
 FIPT = Female Iron Pipe Thread

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

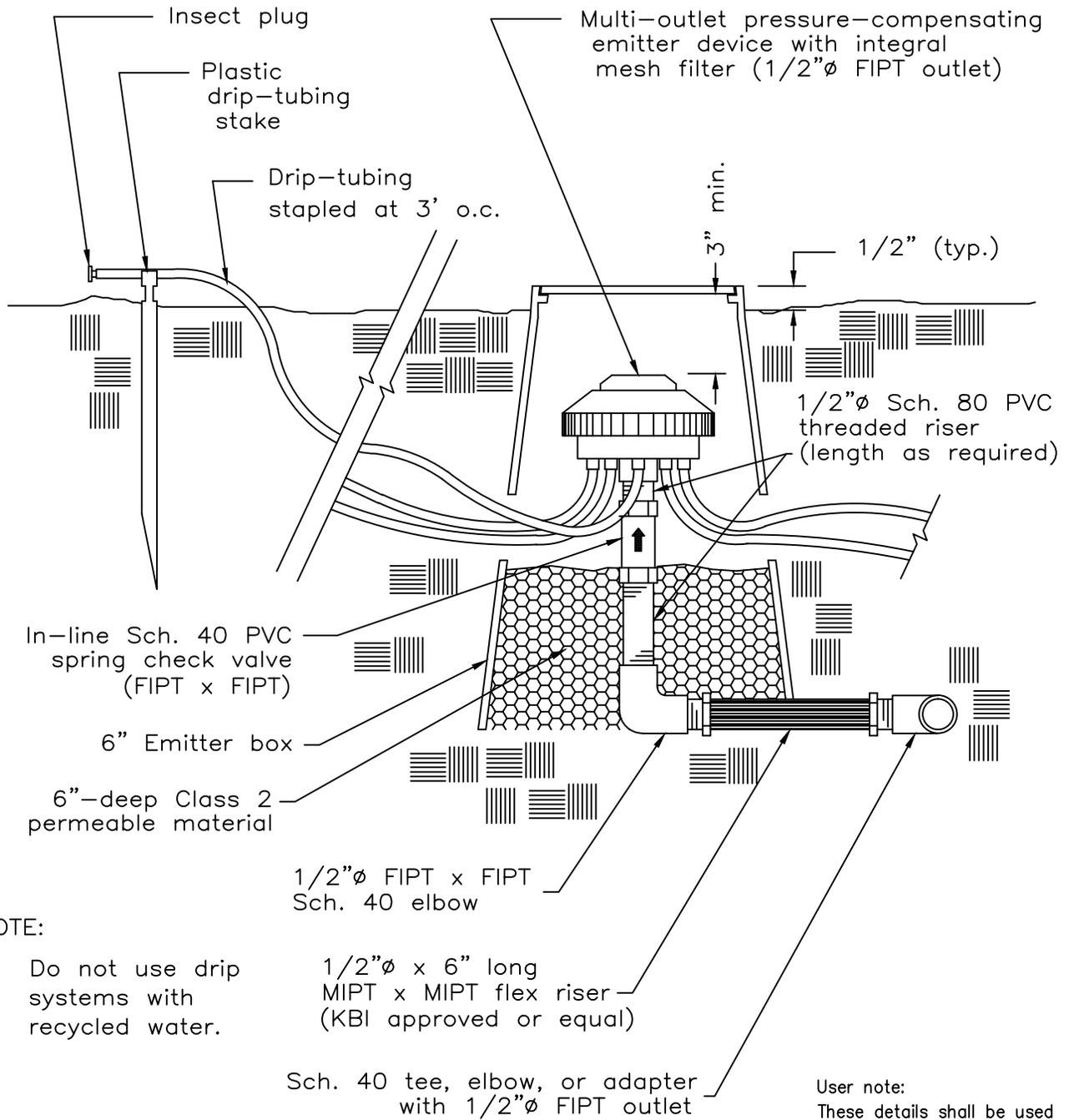
LOGA.DWG

Date	By	Rev.

DRIP EMITTER  
 FOUR OR SIX OUTLET

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: MM	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-8A



**NOTE:**

- 1. Do not use drip systems with recycled water.

1/2"Ø x 6" long  
MIPT x MIPT flex riser  
(KBI approved or equal)

Sch. 40 tee, elbow, or adapter  
with 1/2"Ø FIPT outlet

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

SECTION

LEGEND

MIPT = Male Iron Pipe Thread  
FIPT = Female Iron Pipe Thread

DRIP EMITTER  
MULTI-OUTLET

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*do. 88*  
City Engineer

L-8B

LOBB.DWG

Date	By	Rev.

NOTES:

1. Center valve box over remote control valve.
2. Set boxes 1" above finish grade or mulch cover in planting areas and flush with finish grade in turf.
3. Set boxes in ground cover/shrub areas whenever possible. Use concrete boxes in hardsurfaced areas.
4. Set boxes parallel to each other and perpendicular to edge of sidewalk, curb, wall, or hardsurfacing.
5. Avoid heavy compacting of soil around boxes to prevent collapse of box sides.
6. All fittings shown shall be the same size as the valve size specified.

Plastic valve box w/ bolt down lid. Permanently inscribe "RCV" and the station number onto the box lid.

Water-proof wire connection (typ.)

Plastic tag with valve number

12" Min.

Irrigation lateral

Female adapter

Union

Remote control valve

Irrigation main line

Spare wire

Low voltage control wires (Provide one spare of different color per valve)

SECTION

Line size plastic ball valve (low torque)

2" min.

3" min., 6" max.

Finish grade

2" min.

Coil wire (24" min. length) at each wire connection in remote control valve box (typ.)

Common brick (one each corner)

6"-deep Class 2 permeable material

Sch. 80 PVC riser & threaded fittings

45° elbow (typical)

Edge of lawn, walk fence, curb, etc.

Rectangular valve box

12"

12"

12" typ.

PLAN

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

REMOTE CONTROL VALVE STANDARD

CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.  L-9A
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

Date	By	Rev.

L09A.DWG

NOTES:

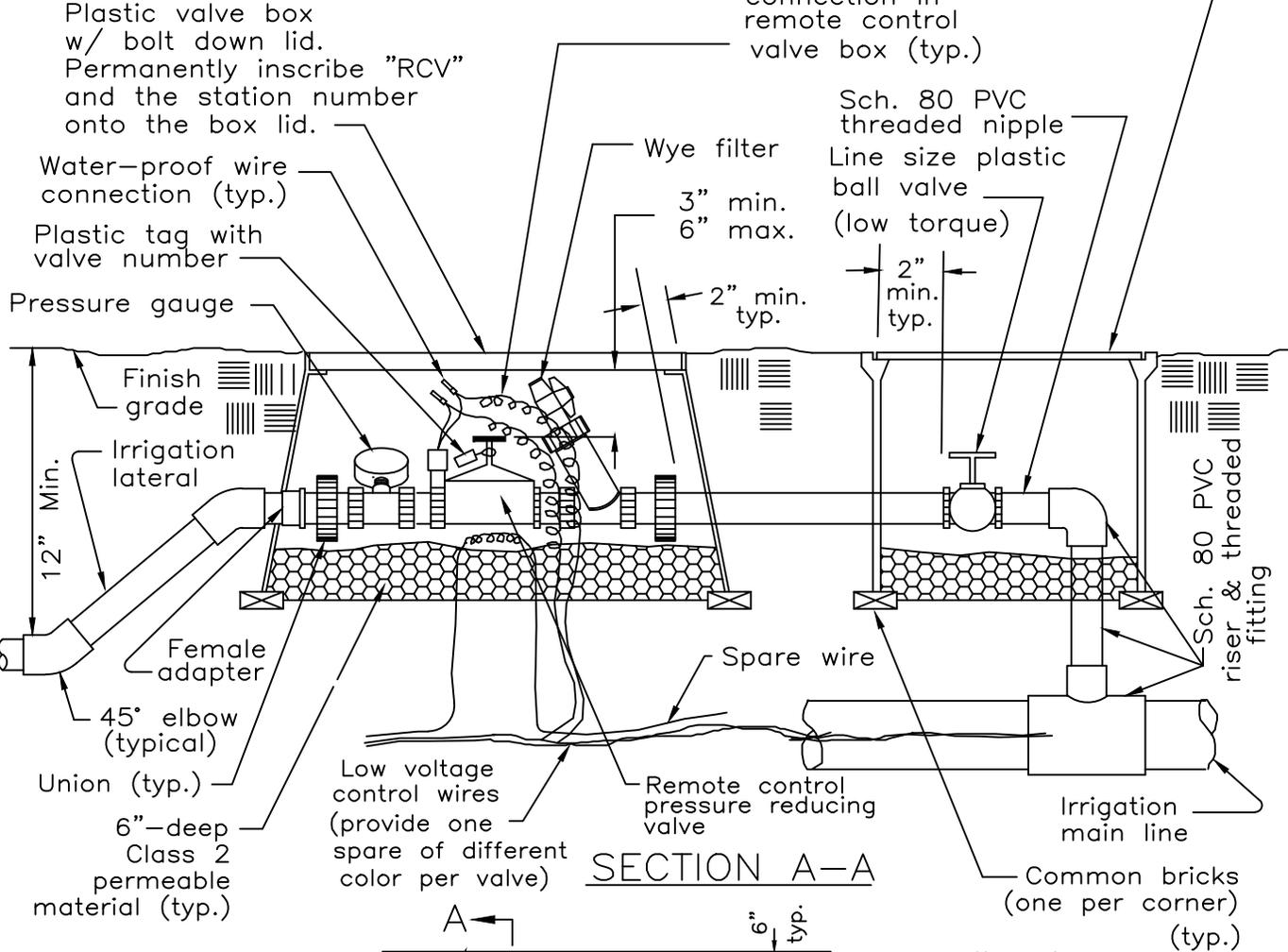
1. Center valve box over remote control valve.
2. Set boxes 1" above finish grade or mulch cover in planting areas, and flush with finish grade in turf.
3. Set boxes in ground cover/shrub areas whenever possible. Use concrete boxes in hardsurfaced areas.
4. Set boxes parallel to each other and perpendicular to edge of sidewalk, curb, wall, or hardsurfacing.
5. Avoid heavy compacting of soil around boxes to prevent collapse of box sides.
6. All fittings shown shall be the same size as the valve size specified.

Plastic valve box with bolt-down lid. Permanently inscribe "BV" onto lid

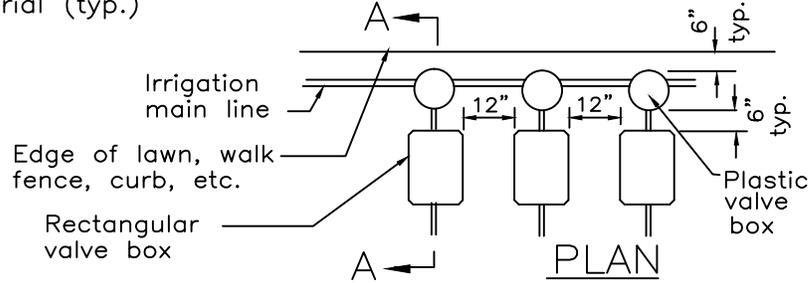
Coil wire (24" min. length) at each wire connection in remote control valve box (typ.)

Plastic valve box w/ bolt down lid. Permanently inscribe "RCV" and the station number onto the box lid.

Sch. 80 PVC threaded nipple  
Line size plastic ball valve (low torque)



SECTION A-A



PLAN

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

REMOTE CONTROL VALVE  
DRIP IRRIGATION SYSTEMS

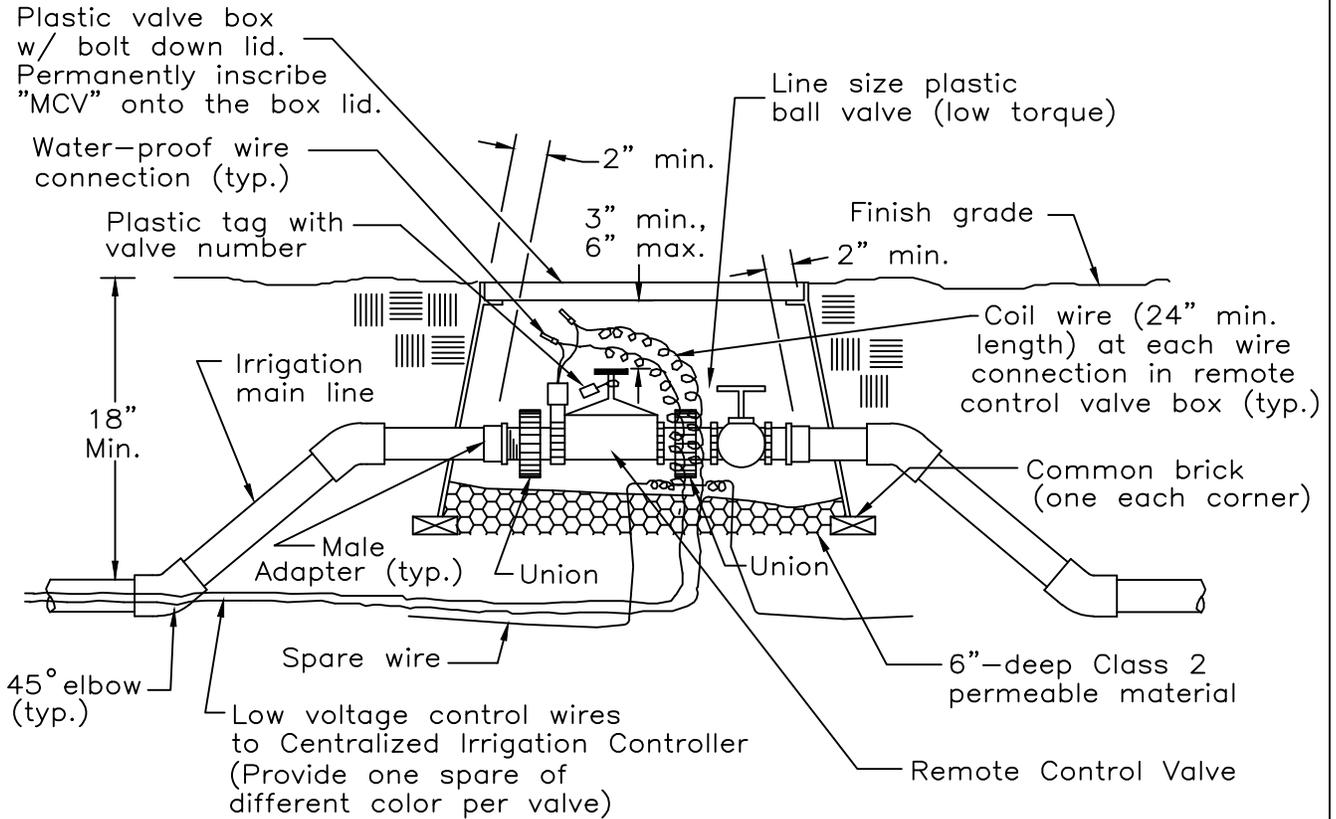
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>[Signature]</i> City Engineer		L-9B

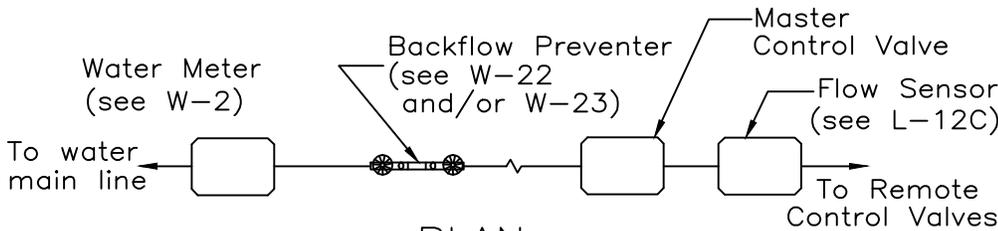
L09B.DWG

NOTES:

1. Center valve box over remote control valve.
2. Set boxes 1" above finish grade or mulch cover in planting areas and flush with finish grade in turf.
3. Set boxes in ground cover/shrub areas whenever possible. Use concrete boxes in hardsurfaced areas.
4. Set box perpendicular to edge of sidewalk, curb, wall, or hardsurfacing.
5. Avoid heavy compacting of soil around box to prevent collapse of box sides.
6. All fittings shown shall be the same size as the valve size specified.



SECTION



PLAN

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

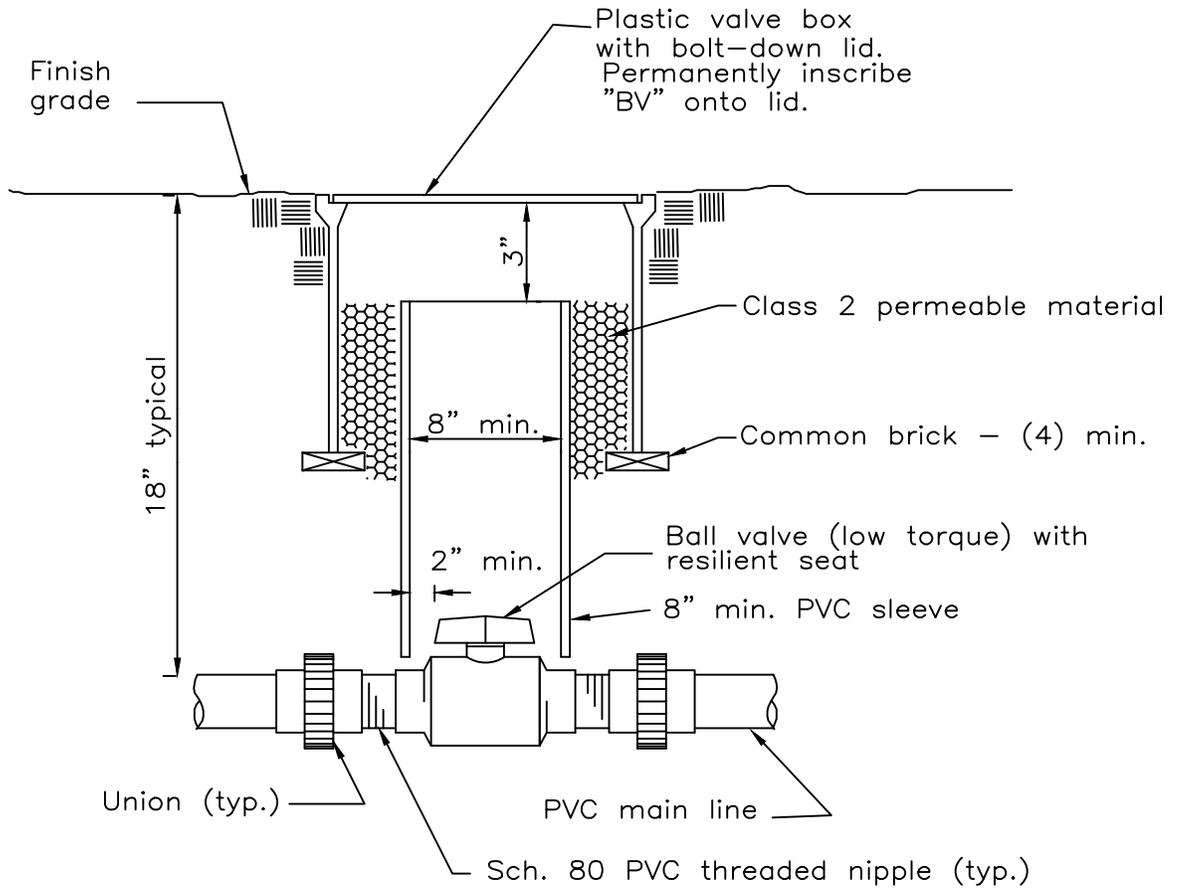
LOGC.DWG

Date	By	Rev.

MASTER CONTROL VALVE  
 FOR CENTRALIZED IRRIGATION SYSTEMS

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	L-9C
City Engineer		



SECTION

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

CITY OF LIVERMORE  
 STANDARD DETAIL

BALL VALVE

Dwn: MM Date: May-13 NO.

Ckd: Spec. Committee Scale: NONE

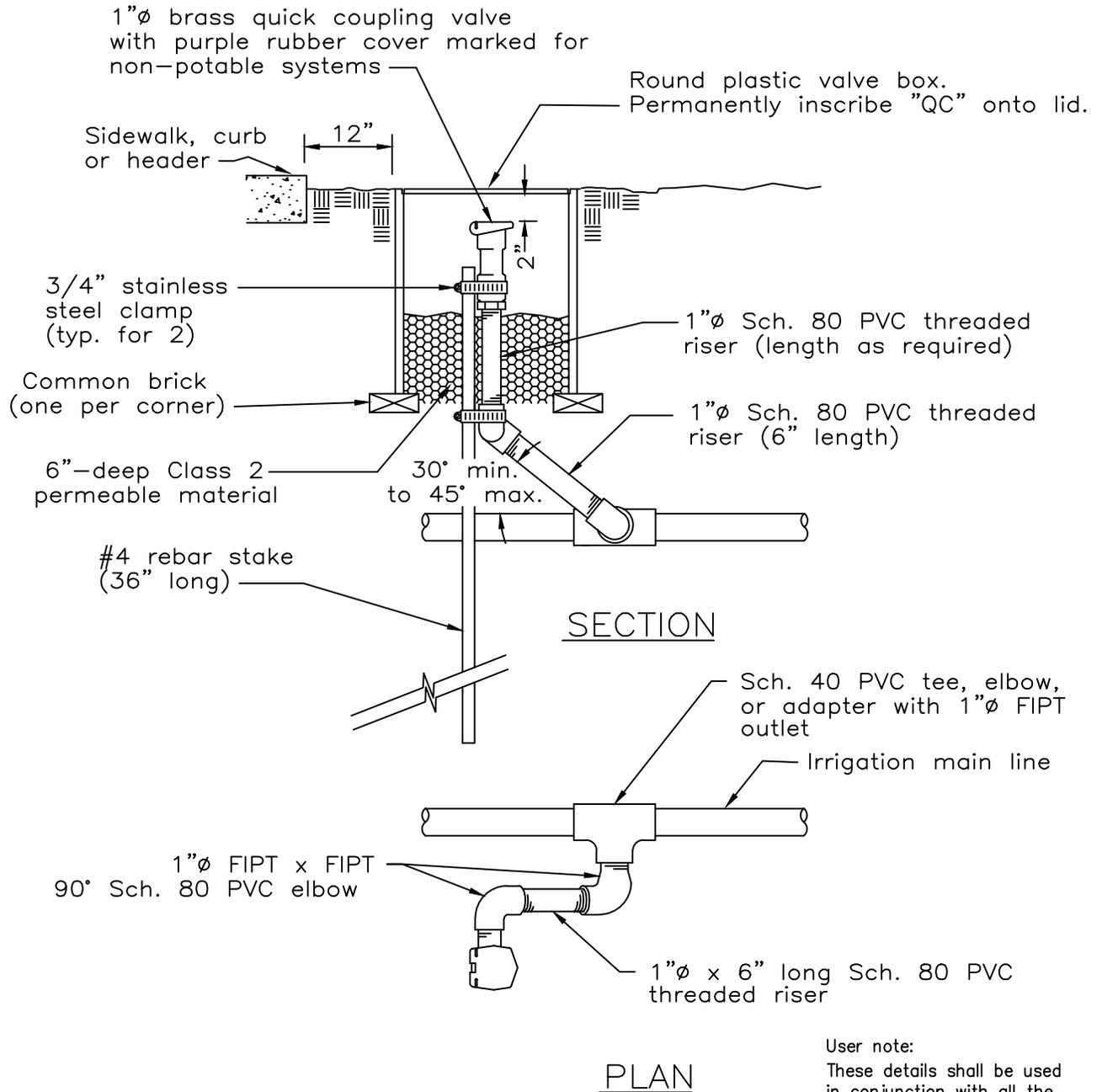
*do. & J.*  
 City Engineer

L-10

L10.DWG

Date	By	Rev.

NOTE: Set boxes 1" above finish grade or mulch cover in planting areas, and flush with finish grade in turf areas.



User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

**LEGEND:**

MIPT = Male Iron Pipe Thread  
FIPT = Female Iron Pipe Thread

CITY OF LIVERMORE  
STANDARD DETAIL

QUICK COUPLING  
VALVE

Dwn: DMc	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*[Signature]*  
City Engineer

L-11

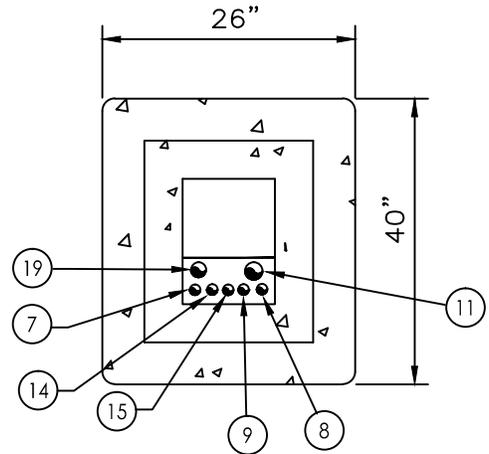
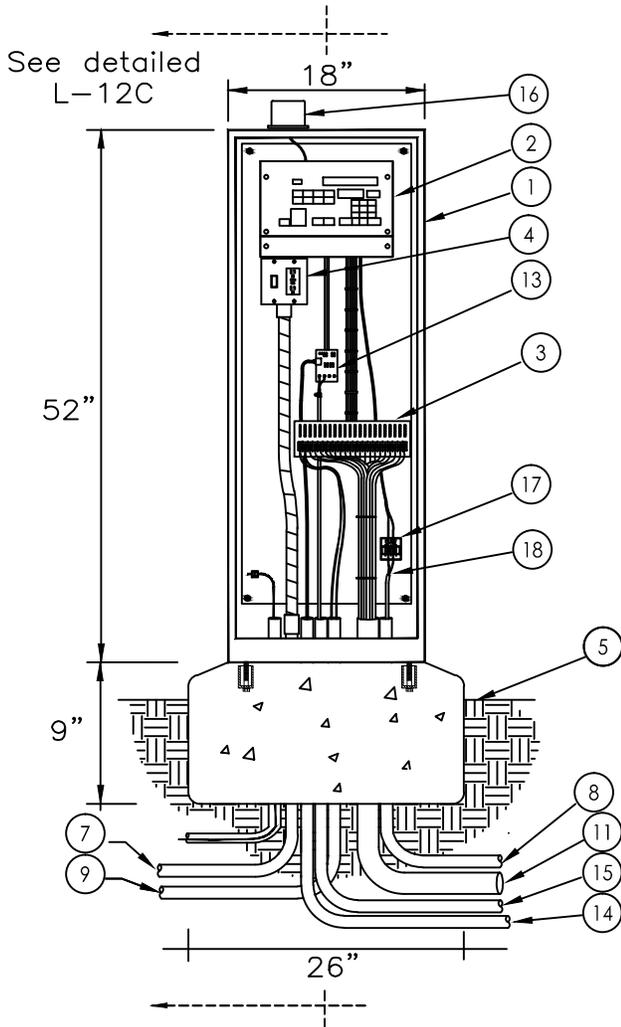
L11.DWG

Date	By	Rev.



Notes:

1. All electrical service components shall be U.L. listed and installed per National Electric Code requirements.
2. Provide dome antenna only if clear reception can be established between the controller and the City Maintenance Service Center, 3500 Robertson Park Road. Otherwise, provide a high-gain antenna per L-12E.
3. Address numbers as shown on the drawings. ID numerals dimensions per ST-14A



- ① Strongbox stainless steel NEMA 3R rainproof enclosure (UL listed).
- ② Satellite assembly. Rainmaster DX2 controller.
- ③ Terminal strip for valve wires.
- ④ Power switch/GFCI receptacle.
- ⑤ Finished grade.
- ⑥ 12" diam plastic box with lid permanently inscribed "ground rod" filled with 6" deep class 2 permeable material.

- ⑦ 120VAC electrical power run in 1" PVC conduit to controller side from electrical meter.
- ⑧ 1" conduit and sweep ell for flow sensor cables.
- ⑨ 1" conduit and sweep ell for master valve cables.
- ⑩ 5/8" x 8' ground rod with #6 ground wire and clamp.
- ⑪ PVC conduit and sweep ell for lead wire. (Size as required)
- ⑫ Utility underground service conduit. Size per code.
- ⑬ PHB-Phone hardwire board.
- ⑭ 1" conduit and sweep ell for phone cable.
- ⑮ 1" conduit and sweep ell for EV-CAB-COM (out).
- ⑯ PMR-CAC-Permanent mount receiver, antenna.
- ⑰ Flow sensor board.
- ⑱ EV-CAB-SEN-Flow sensor cable.
- ⑲ 1 1/2" conduit sweep for ground rod

FRONT VIEW  
CONTROLLER  
FOR CENTRALIZED  
IRRIGATION SYSTEMS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*[Signature]*  
City Engineer

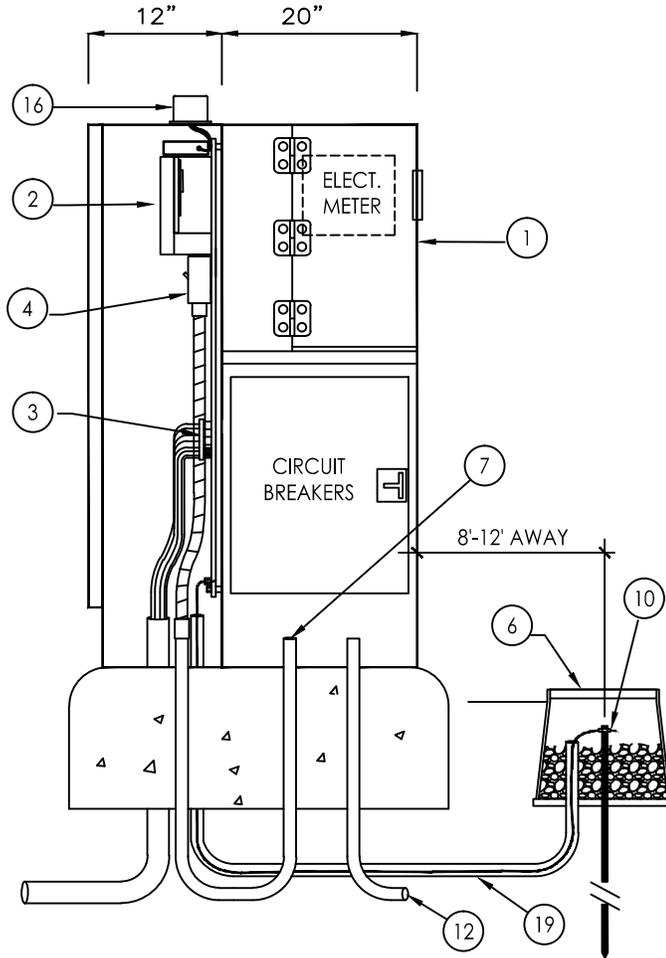
L-12B

L12C.DWG

Date	By	Rev.

Notes:

1. All electrical service components shall be U.L. listed and installed per National Electric Code requirements.
2. Provide dome antenna only if clear reception can be established between the controller and the City Maintenance Service Center, 3500 Robertson Park Road. Otherwise, provide a high-gain antenna per L-12E.
3. Address numbers as shown on the drawings. ID numerals dimensions per ST-14A



- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>① Strongbox stainless steel NEMA 3R rainproof enclosure (UL listed).</li> <li>② Satellite assembly. Rainmaster DX2 controller.</li> <li>③ Terminal strip for valve wires.</li> <li>④ Power switch/GFCI receptacle.</li> <li>⑥ 12" diam plastic box with lid permanently inscribed "ground rod" filled with 6" deep class 2 permeable material.</li> </ul> | <ul style="list-style-type: none"> <li>⑦ 120VAC electrical power run in 1" PVC conduit to controller side from electrical meter.</li> <li>⑩ 5/8" x 8' ground rod with #6 ground wire and clamp.</li> <li>⑫ Utility underground service conduit. Size per code.</li> <li>⑬ PMR-CAC-Permanent mount receiver, antenna.</li> <li>⑭ 1 1/2" conduit sweep for ground rod</li> </ul> |
|--|--|

SIDE VIEW  
CONTROLLER  
FOR CENTRALIZED  
IRRIGATION SYSTEMS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*[Signature]*  
City Engineer

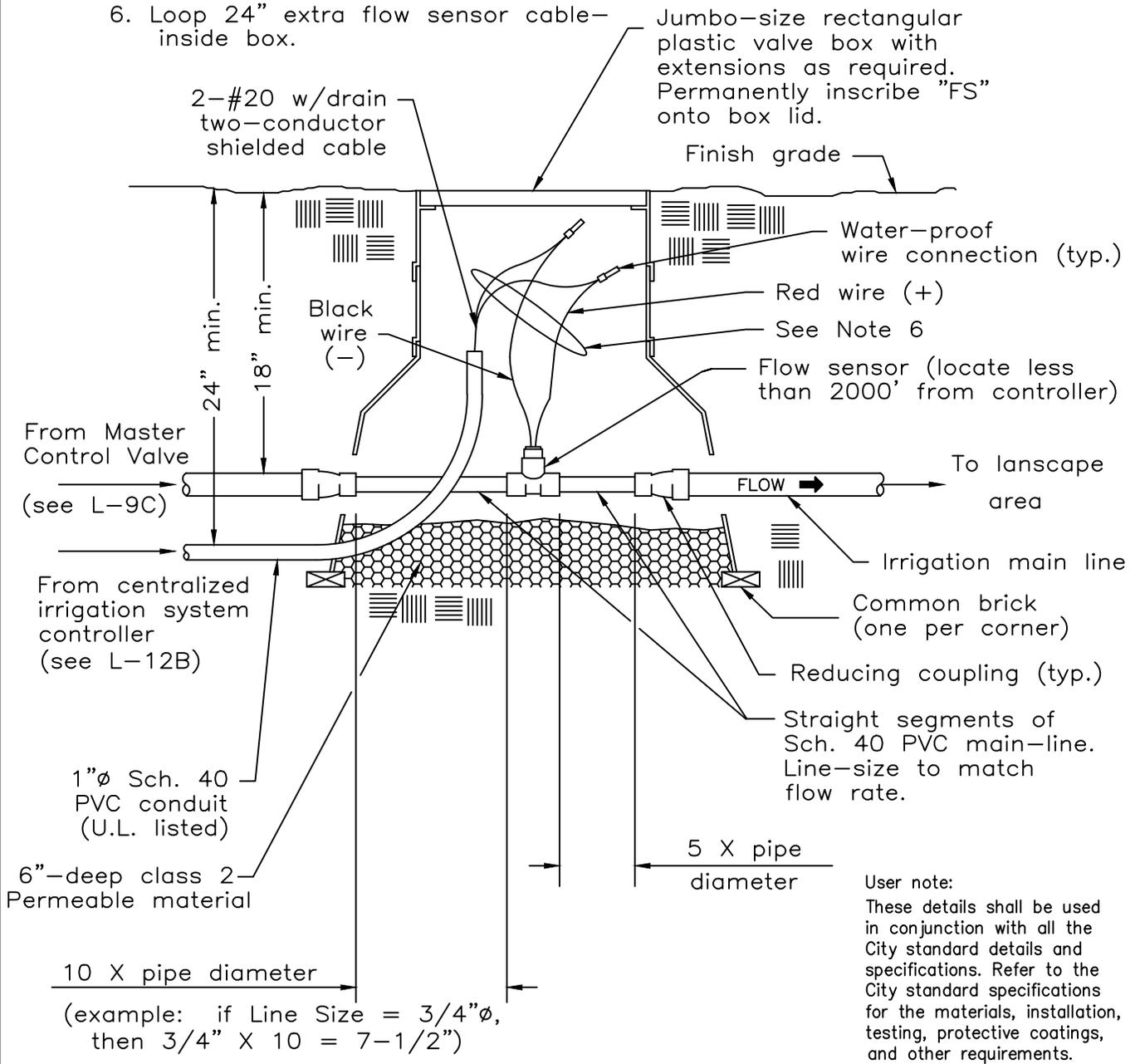
L-12C

L12C.DWG

Date	By	Rev.	

NOTES:

1. The flow sensor cable shall be continuous between the controller and the flow sensor box (no intermediate splices).
2. Set box 1" above finish grade or mulch cover in planting areas, or flush with finish grade in turf areas.
3. Set box in ground cover or shrub areas whenever possible. Use equivalent-sized concrete box in sidewalk area.
4. Avoid heavy compacting of soil around box to prevent collapse of box sides.
5. Flow sensor fuse to be installed in the controller cabinet.
6. Loop 24" extra flow sensor cable—inside box.



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

# FLOW SENSOR

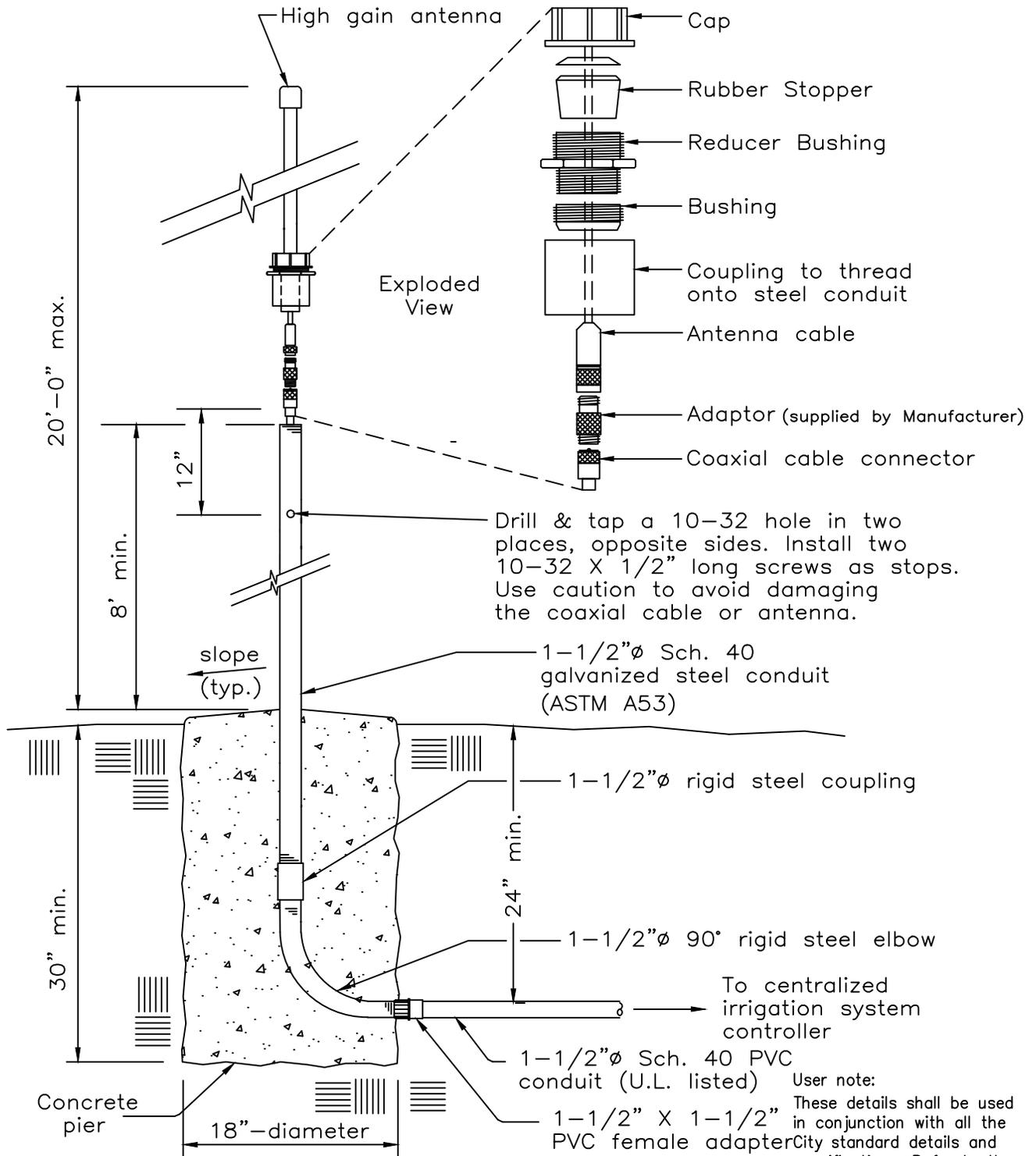
## FOR CENTRALIZED IRRIGATION SYSTEMS

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
City Engineer		L-12D

Date	By	Rev.	

L12D.DWG



NOTE: Coordinate final location and height with the Engineering Division prior to installation.

SECTION

Date	By	Rev.

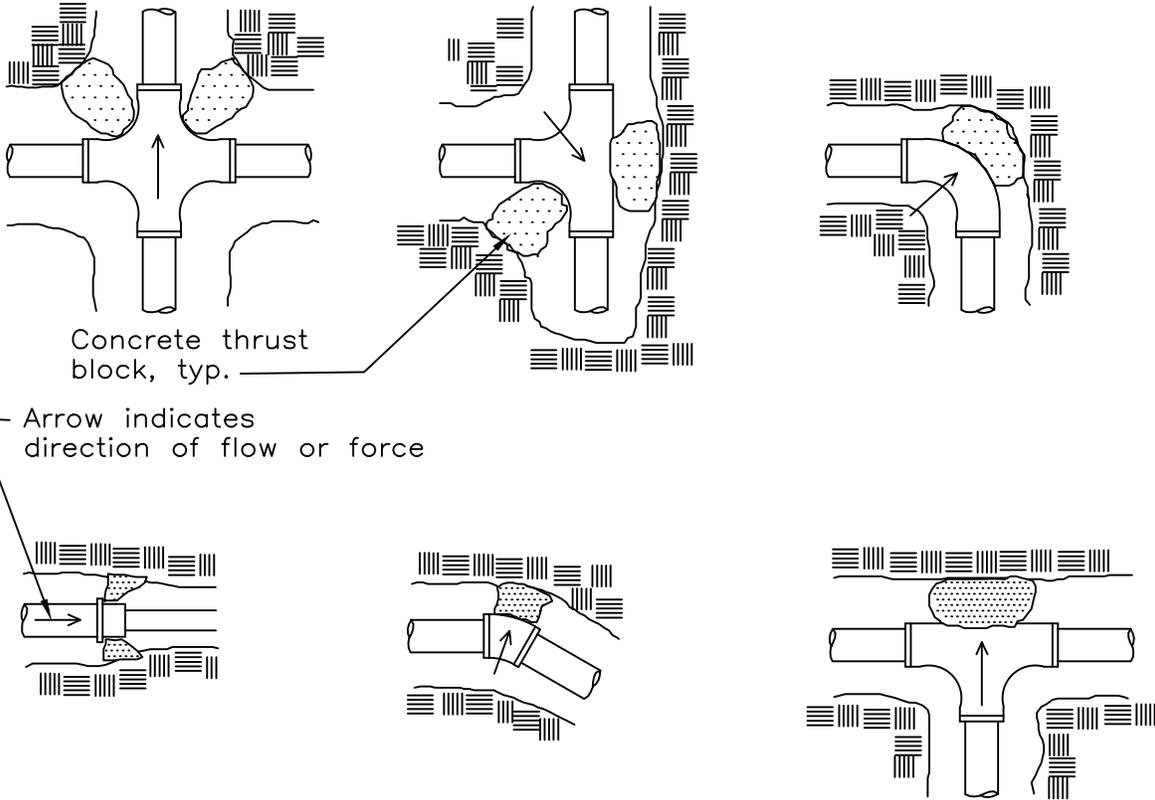
HIGH-GAIN ANTENNA FOR CENTRALIZED IRRIGATION SYSTEMS

CITY OF LIVERMORE STANDARD DETAIL

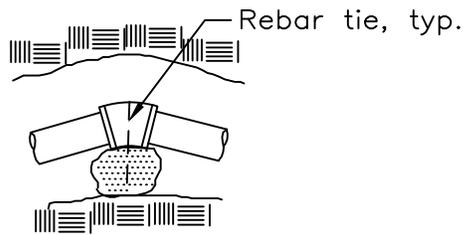
Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-12E

L12E.DWG

NOTE:  
Install main line per manufacturer's installation guide. Size of concrete thrust blocks shall be per pipe manufacturer's installation guide.



PLAN



SECTION

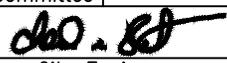
User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L13.DWG

Date	By	Rev.

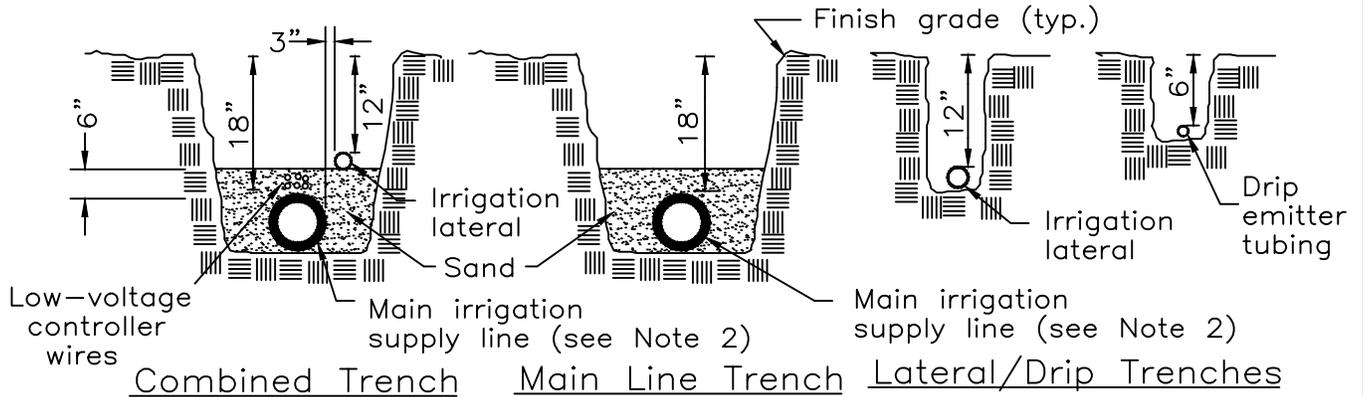
IRRIGATION MAIN  
THRUST BLOCK

CITY OF LIVERMORE  
STANDARD DETAIL

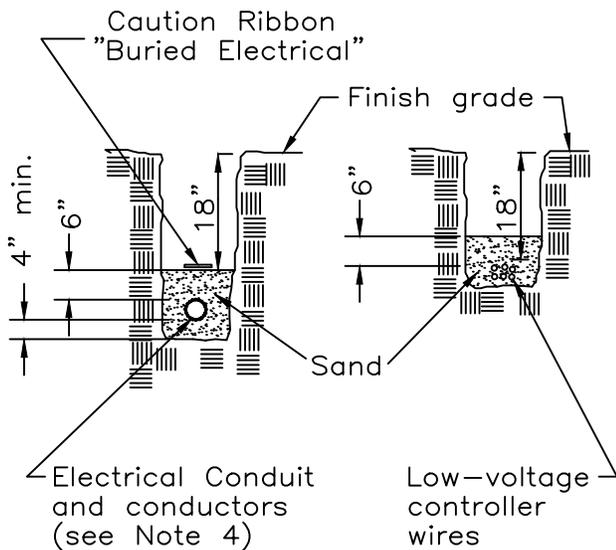
Dwn: FY	Date: May-13	NO.  L-13
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

NOTES:

1. All irrigation piping shall be installed in the trench in a serpentine manner per the manufacturer's recommendations.
2. All main supply lines to be installed per the manufacturer's recommendations.
3. Trench backfill shall be native material compacted to 90% R.C. minimum.
4. All electrical service components shall be U.L. listed and installed per National Electric Code requirements.
5. All main & lateral lines and control wiring shall be placed in sleeves under paved or hardsurfaced areas (see detail below).

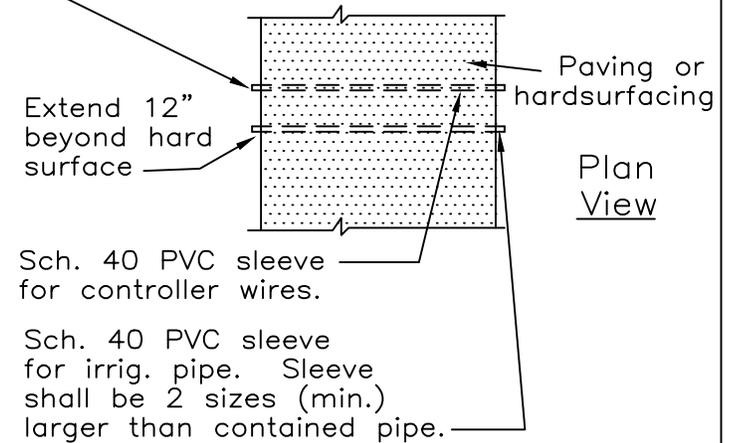


Stamp "I" on concrete curb or sidewalk above sleeve location.



120-Volt or Flow Sensor Conduit Trench

Controller Wire Trench



Note: Sleeves to be installed at depths indicated on plan, but no less than 6" below street or sidewalk subgrade.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Typical Irrigation Crossing at Paving or Hardsurfacing

L14.DWG

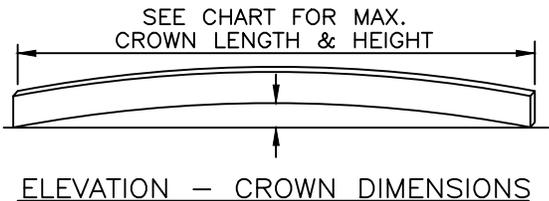
Date	By	Rev.

IRRIGATION TRENCHING

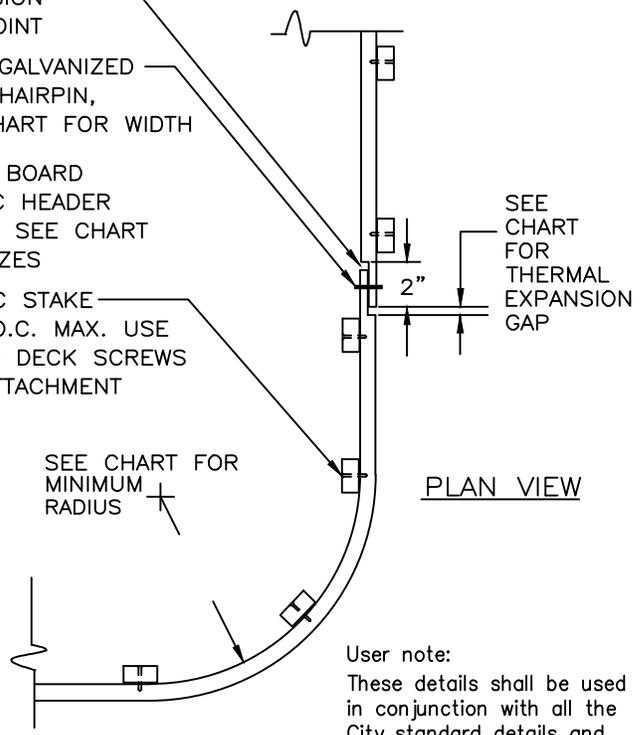
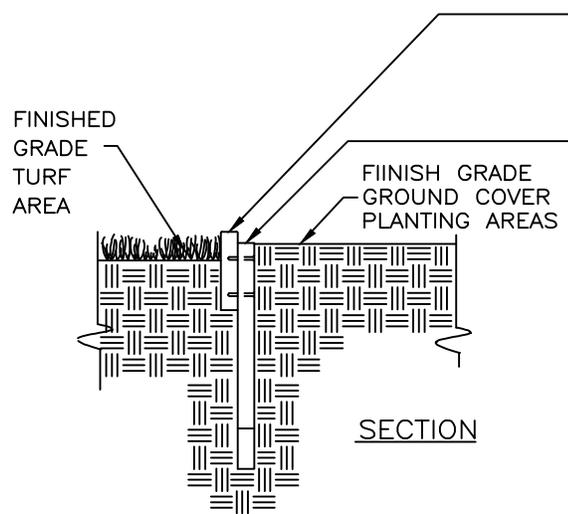
CITY OF LIVERMORE STANDARD DETAIL

Dwn: MAS	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
		L-14
City Engineer		

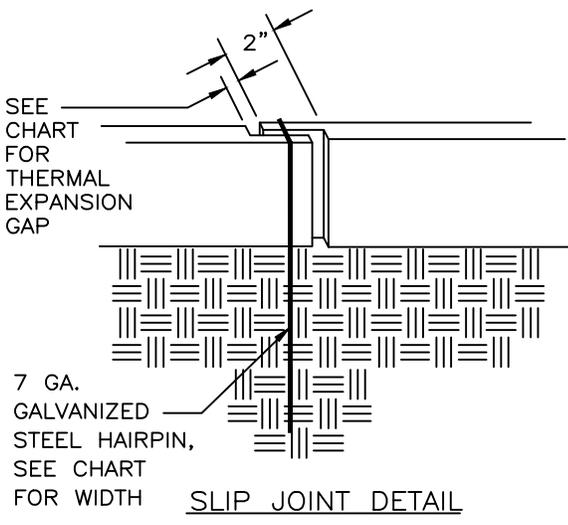




FACTORY CUT THERMAL EXPANSION SLIP JOINT  
 7 GA. GALVANIZED STEEL HAIRPIN, SEE CHART FOR WIDTH



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.



Notes:

1. DO NOT SCREW THROUGH SLIP JOINT
2. USE COARSE WOOD WORKING TOOLS FOR CUTTING & DRILLING
3. USE PLATED SCREWS OR RING SHANK NAILS TO JOIN BOARD TO STAKE
4. ALLOW FOR THERMAL EXPANSION & CONTRACTION BY LEAVING GAPS IN THE SLIP JOINTS OR AT THE END OF THE RUN (SEE CHART)
5. STAKE APPROX 3' 0" OC (MORE FOR STRAIGHT RUNS LESS FOR CURVES)

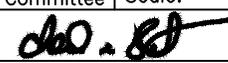
HDR. SIZE	ACTUAL DIMENSIONS	MINIMUM RADIUS POSSIBLE	MAXIMUM CROWN POSSIBLE	THERMAL EXPANSION GAP AT SLIP JOINT	SLIP JOINT HAIRPIN DIMENSIONS
1/2 x 4	3-3/8" x 5/16" x 20'	6"	22" / 20'	N/A	N/A
1 x 4	3-3/8" x 11/16" x 20'	24"	19" / 20'	1/4" - 1/2"	3/4" ID x 13"
2 x 4	3-3/8" x 1-3/8" x 20'	36"	16" / 20'	1/2" - 3/4"	1-1/2" ID x 13"
1 x 6	5-3/8" x 11/16" x 20'	24"	9" / 20'	1/2" - 3/4"	3/4" ID x 13"

L16.DWG

Date	By	Rev.

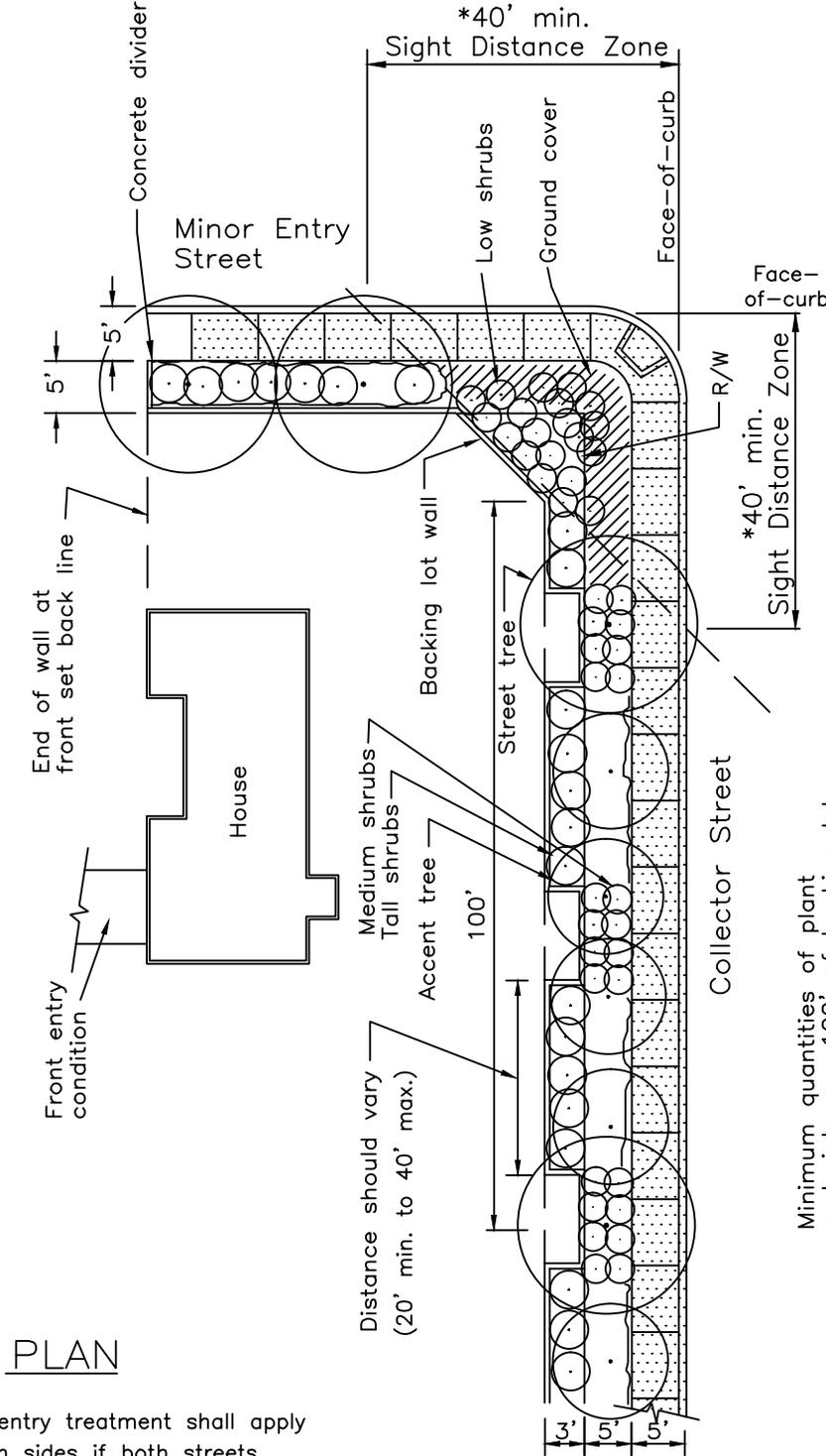
# LANDSCAPE EDGING

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-16

NOTE: Backing lot landscape treatments, which include wall materials, design, and alignment, as well as landscaping layout and design, are subject to Design Review approval.

\* SIGHT DISTANCE REQUIREMENT APPLIES TO ALL INTERSECTIONS



PLAN

Minor entry treatment shall apply to both sides if both streets are minor

SIGHT DISTANCE ZONE

No trees or accent trees allowed unless trimmed to provide 6'-minimum clearance from root crown to lowest scaffold branch. Low shrubs and accent ground cover shall be trimmed to a maximum height of 30" above the curb.

NOTE: This is a general guideline only. Wall pattern materials, alignment & planting design to be approved by Design Review Committee (DRC). These are minimums. The DRC can approve more than these minimums but not less.

Minimum quantities of plant materials per 100' of backing lot:

TREES (7 trees min. per 100'):  
 24"-box: 2-3 trees  
 15"-gallon: 4-5 trees

SHRUBS: (Mature Height)  
 Large 5'-10' high: 23 shrubs  
 Medium 3'-5' high: 24 shrubs  
 Small 1'-3' high: 30 shrubs

GROUND COVER:  
 Fast Growing: 12" o.c.  
 Moderate Growing: 9" o.c.  
 Slow Growing: 6" o.c.

User note:

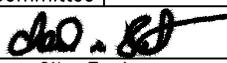
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L17A.DWG

Date	By	Rev.

ILLUSTRATIVE BACKING LOT TREATMENT COLLECTOR/MINOR STREETS

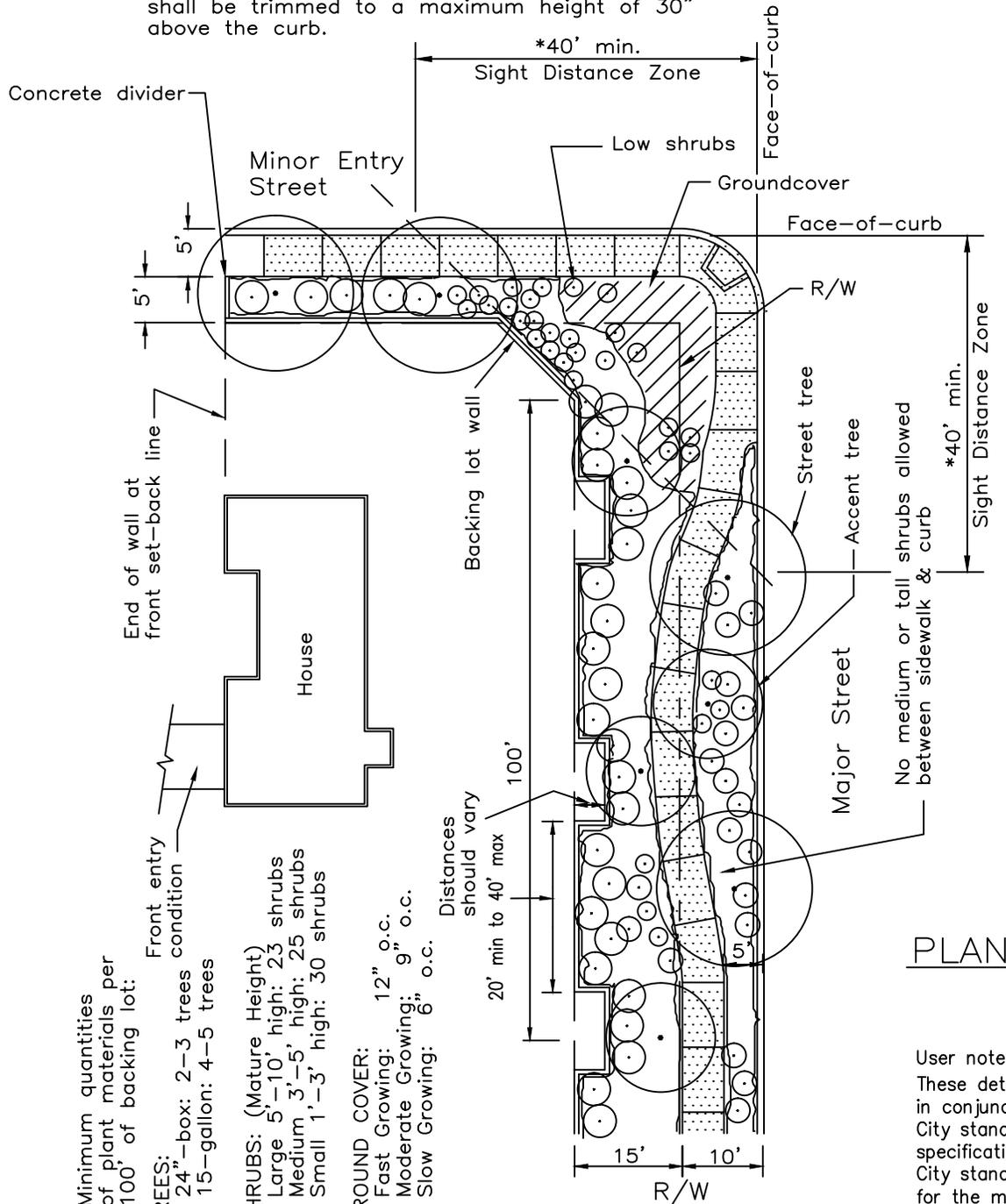
CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Spec. Committee	Scale: NONE	L-17A
 City Engineer		

NOTE: Backing lot landscape treatments, which includes wall materials, design, and alignment, as well as landscaping layout and design, are subject to Design Review approval.

**SIGHT DISTANCE ZONE**

- No trees or accent trees allowed unless trimmed to provide 6'-minimum clearance from root crown to lowest scaffold branch.
- Low shrubs and accent ground cover shall be trimmed to a maximum height of 30" above the curb.



PLAN

Minimum quantities of plant materials per 100' of backing lot:

- TREES:  
 24"-box: 2-3 trees condition  
 15-gallon: 4-5 trees
- SHRUBS: (Mature Height)  
 Large 5'-10' high: 23 shrubs  
 Medium 3'-5' high: 25 shrubs  
 Small 1'-3' high: 30 shrubs

GROUND COVER:  
 Fast Growing: 12" o.c.  
 Moderate Growing: 9" o.c.  
 Slow Growing: 6" o.c.

Distances should vary  
 20' min to 40' max

NOTE: This is a general guideline only. Wall pattern/materials, alignment & planting design to be approved by Design Review Committee (DRC). These are minimums. The DRC can approve more than these minimums but not less than.

\* SIGHT DISTANCE REQUIREMENT APPLIES TO ALL INTERSECTIONS

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

\*Sight distance requirement applies to all intersections.

L17B.DWG

Date	By	Rev.

ILLUSTRATIVE BACKING LOT TREATMENT  
 MAJOR/MINOR STREETS

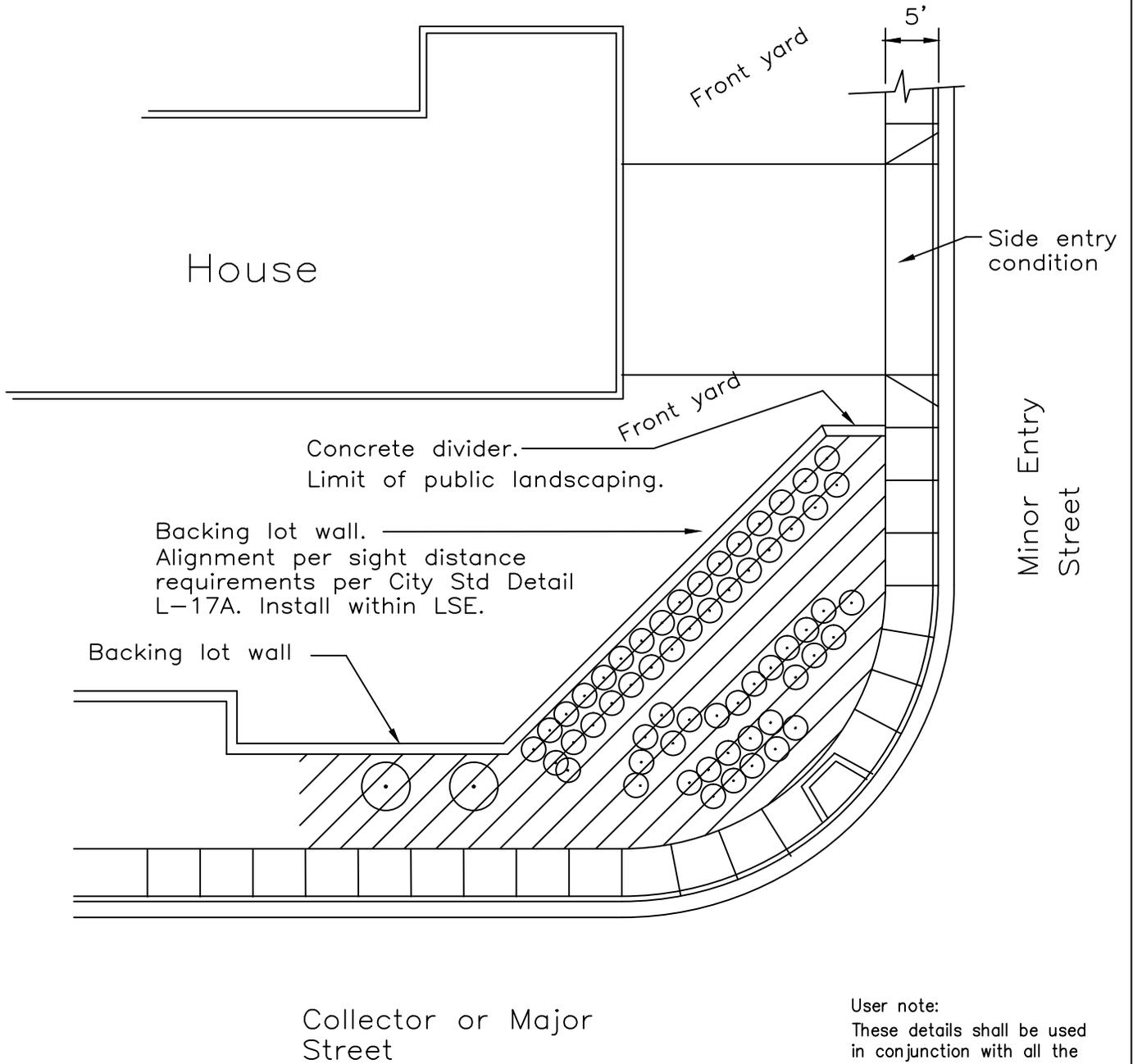
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*[Signature]*  
 City Engineer

L-17B

NOTE: Backing lot landscape treatments, which include wall materials, design, and alignment, as well as landscaping layout and design, are subject to Design Review approval.



PLAN

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

ILLUSTRATIVE BACKING LOT TREATMENT  
 (CORNER TREATMENT)

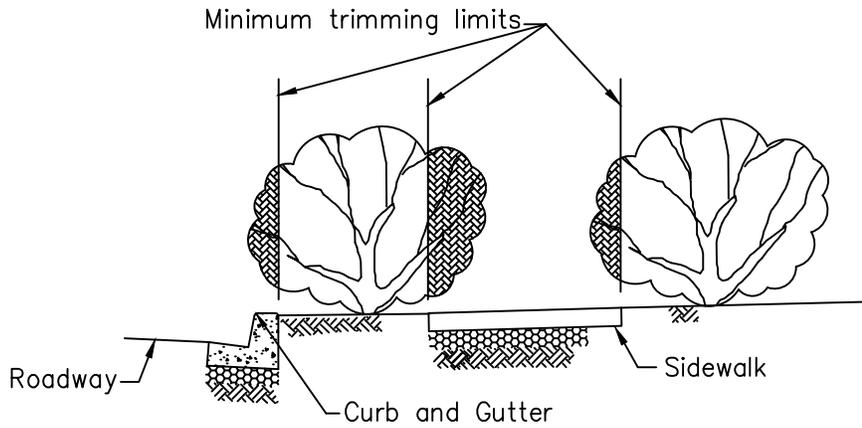
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: MAS/KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

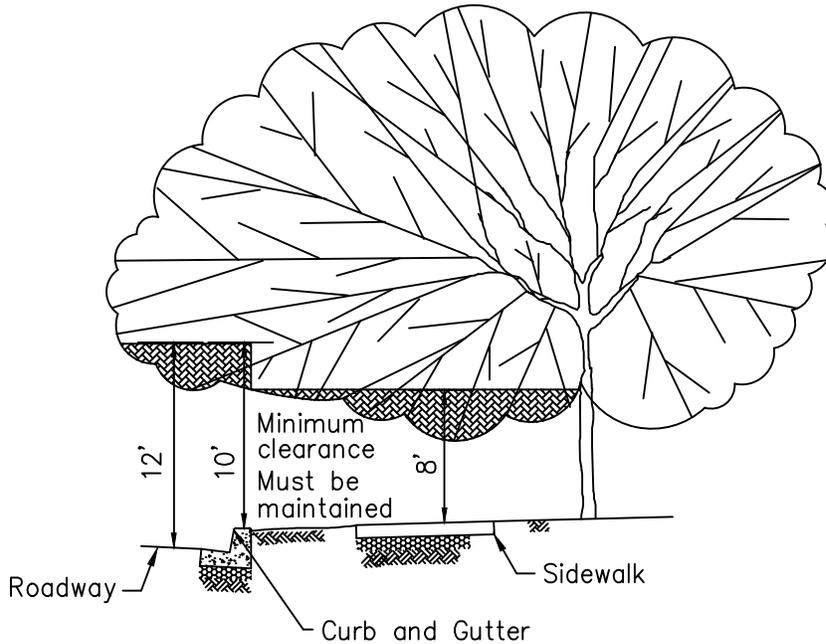
*dbw*  
 City Engineer

L-17C

L17C.DWG



Trim plants so as not to encroach into the curb and sidewalk. It is recommended that you trim branches away from the edge of the curb or sidewalk to minimize the frequency of trimming.



Note:

Trees planted adjacent to the roadway and sidewalk must be trimmed to allow safe passage of vehicles and pedestrians. Trees should be pruned whenever a street sign or traffic signal is not visible from a minimum distance of 150 feet.

User note:

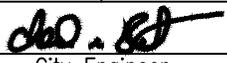
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L-17D.DWG

Date	By	Rev.

## TREE AND SHRUB PRUNING GUIDELINES

### CITY OF LIVERMORE STANDARD DETAIL

Dwn: JV	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		L-17D



Plant Name and Description	Important Character					Cultural Preference					Tolerances										Growth Info			Planting Info			Comments	
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate	Height in 10 Yrs/ Maturity	Spread in 10 Yrs/Maturity		Minimum Planter Size

Alnus Rubra Red Alder	X		Y	SP			BR	X	X				X	X					X	X				M	80	30		H		
Arbutus "marina" Strawberry Tree		X	W	FA	X	W		X	X	X		X	X	X	X	X			X	X				S	20 30	20 30	3 30	L L	2 5	AC
Arbutus Menziesii Madrone		X	PI W	SP	X	FA WI S		X	X		X								X	X				M	50 65	30 50	7	M		
Brachychiton populneus Bottle Tree		X	W	SP				X	X	X		X							X	X				M	30 50	20 30	7 30	H L	5 10	
Callistemon viminalis Weeping Bottle Brush		X	R	SP				X	X	X		X							X	X				F	20 30	10 15	3	L	3 5	FR
Carpinus betulus European Hornbeam	X							X	X	X		X							X	X				M	25 35	6 8	3	L	5 10	
Casuarina cunninghamiana Horsetail Tree		X						X	X		X		X						X	X				M	30 70	20 40	10	H	10	
Ceanothus thyrsiflorus Blue Blossom		X	B L	SP				X	X	X		X							X	X				F	10 20	10 20	3	L	3 5	AC SH
Cedrus deodara Deodar Cedar		X						X	X		X		X						X	X				F	30 70	20 40	7	H	10	
Celtis australis European Hackberry	X							X	X	X	X	X	X	X	X	X	X	X	X	X				F	15 40	10 35	7	VH	6	

**LEGEND**

AC = Avoid Clay Soils	F = Fast	H = High	MT= Multi Trunk	R = Red	SP = Spring	W = White
BL = Blue	FA = Fall	L = Low	O = Orange	S = Summer	U = Unknown	WI= Winter
BR = Brown	FB = Fireblight	M = Moderate	P = Purple	SH= Short Lived	V = Various	Y = Yellow
E = Experimental	FR = Frost Sensitive	MR=Mildew Resistant	Pi = Pink	SL=Slow	VH= Very High	

**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer

No.  
L-18B

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

<i>Celtis sinensis</i>	X						Y	X	X	X	X	X		X	X	X	X		X	X				F	15 40	10 35	7	VH	6	AC	
Chinese Hackberry	X							X	X	X	X				X	X	X		X	X				F	15 30	10 30	5	M	5		
<i>Cercidium floridum</i>	X		Y	SP				X	X	X	X																				
Blue Palo Verde	X		R		X		R	X	X	X	X													F	25 35	15 25	3	L	2		
<i>Cercis canadensis</i>	X							X	X	X	X													M	20 25	20 25	3	L	2	E	
Canadian Redbud	X		V	SP			R	X	X	X	X	X												F	25 30	10 25	5	M	2	FR	
<i>Oklahoma Redbud</i>	X		W	SP			Y	X	X	X	X													SL	12 30	10 25	5	M	2	FR	
<i>Chionanthus retusus</i>	X		Pi	S			X	X	X	X	X													F	15 25	15 25	4	L	1		
Chinese Fringe Tree	X							X	X	X	X													SL	25 40	20 30	5	M	5	E	
<i>Chitalpa tashkentensis</i>	X		P	F			X	X	X	X	X													SL	25 40	20 30	5	M	5	FR	
Pink Dawn Chitalpa	X		Y	SP	X			X	X	X	X	X												SL	25 50	25 50	10	VH	5	AC	
<i>Chorisia speciosa</i>	X		W	S				X	X	X	X												M	10 12	12		L				
Floss silk tree	X		W	F				X	X	X	X													M	30 50	15 30	4	L	10		
<i>Cinnamomum camphora</i>	X		Y	SP	X			X	X	X	X													M	12			L			
Camphor Tree	X		W	S				X	X	X	X													M	30 50	15 30	4	L	10		
<i>Cornus Sericea/ Stolonifera</i>	X		W	S				X	X	X	X													M	12			L			
Western Dogwood	X		W	F				X	X	X	X													M	30 50	15 30	4	L	10		
<i>Corylus colurna</i>	X						Y	X	X	X	X													M	12			L			
Turkish Hazelnut	X							X	X	X	X													M	30 50	15 30	4	L	10		

**LEGEND**

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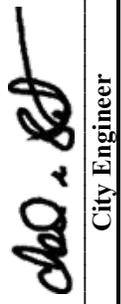
**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

No.  
L-18C

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info		Comments				
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water		Growth Rate	Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

Cotinus obovatus Smoke Tree	X		P	SP			Y R	X		X					X	X	X			X				SL	15 25	10 20	3	L L	3+ 5	E	
Crataegus phaenopyrum Washington Hawthorn	X		W	SP			R	X		X	X				X	X	X							M	15 20	10 20	3	L H	2 5		
Cupressus sempervirens Italian Cypress		X						X		X	X		X		X	X	X									30 60	15 20	7	H	5 10	AC
Eriobotrya deflexa Loquat		X	W	SP				X		X			X		X	X	X			X				F	15 30	10 20	3	L H	3 5		
Eucalyptus gunnii Cider Gum		X						X					X		X	X	X			X				F	20 40	10 20	7	H			
Eucalyptus leucosylon White Iron Bark		X	W	S				X		X	X		X		X	X	X			X				F	20 60	10 30	5	M	5	FR	
Eucalyptus microtheca Flooded Box		X						X					X		X	X	X			X				F	20 35	15 25	7	M	5	MT	
Eucalyptus nicholii Peppermint Eucalyptus		X						X		X			X		X	X	X			X				F	20 35	15 25	5	M	5		
Eucalyptus polyanthemus Silver Dollar Gum		X	W	S				X		X			X		X	X	X			X				F	20 40	15 30	7	M	5		

**LEGEND**

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E = Experimental	FR = Frost Sensitive	MR=Mildew Resistant	Pi = Pink	SL =Slow	VH= Very High	

<h1 style="margin: 0;">TREE PLANTING GUIDE</h1>	<p><b>CITY OF LIVERMORE</b> STANDARD DETAIL</p>
<p>No. <b>L-18D</b></p>	<p>Dwn: : KY Ckd: Spec Committee</p>
	<p>Date: May-2013 Scale: None</p>
	 City Engineer

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/ Maturity	Spread in 10 Yrs/ Maturity	Minimum Planter Size

<i>Fagus sylvatica</i> European Beech Tree	X						R	X	X	X	X			X	X	X	X		X	X	X			M	20	10	7	M	5	
<i>Fraxinus americana</i> Autumn Purple	X						P	X	X	X	X		X	X		X	X		X	X	X			F	30	20	7	M	5	
<i>Garrya elliptica</i> Coast Silk Tassel		X	Y	W	X	FA WS		X	X										X	X				M	10	20	5	L		
<i>Geijera parviflora</i> Australian Willow		X						X	X	X	X								X	X				SL	20	15	4	L	5	
<i>Ginkgo biloba</i> Maidenhair Tree 'Fairmount'	X						Y	X	X	X	X				X	X	X							F	20	10	3	L	5	
<i>Ginkgo biloba</i> Maidenhair Tree 'Sentinal'	X						Y	X	X	X	X				X	X	X							F	20	10	3	L	5	
<i>Gleditsia triacanthos</i> Honey Locust	X						Y	X				X			X	X	X				X			F	25	25	5	M	3	
<i>Heteromeles Arbutifolia</i> Toyon		X	W	S	X	FA W		X	X		X								X	X				SL	10	20	5	L	5	MT
<i>Hymenosporum flavum</i> Sweetshade		X	Y	S				X	X	X	X								X	X				SL	20	10	3	L	3	AC

**LEGEND**

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**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

Koelreuteria paniculata Goldenrain Tree	X		Y	S	X	WI	Y	X	X	X	X	X	X	X	X	X	X	X					X	M	15 30	15 30	3	L	3	5	
Lagerstroemia indica Crape Myrtle Hybrids	X		V			V	X	X	X	X	X	X	X	X	X	X	X	X	X	X				SL	15 30	10 20	3	L	3	5	MR
Laurus "X" Saratoga Laurel		X					X	X	X	X	X	X	X	X	X	X	X	X	X					F	15 25	10 20	3	L	5	5	AC
Liquidambar cultivars Sweet Gum	X					V	X	X	X	X	X	X	X	X	X	X	X	X	X					M	20 50	10 25	10	VH	5	10	
Liriodendron tulipifera Tulip Tree	X					Y	X	X	X	X	X	X	X	X	X	X	X	X	X					F	20 50	10 30	7	VH	8		
Magnolia "Galaxy" Galaxy Magnolia	X		Pi	SP		Y	X	X	X	X	X	X	X	X	X	X	X	X	X					M	12 30	6 15	4	M	8		
Malus cultivars Crabapples	X		V		X	FA	X	X	X	X	X	X	X	X	X	X	X	X	X					M	10 20	10 20	2	VL	2	6	AC
Maytenus boaria Mayten Tree		X					X	X	X	X	X	X	X	X	X	X	X	X	X					M	15 25	10 15	5	M	6	6	
Melaleuca linariifolia Flaxleaf Paperback		X	W	S			X	X	X	X	X	X	X	X	X	X	X	X	X					S	10 20	10 20	3	L	2	5	E FR
Melaleuca quinquenervia Cajuput Tree		X	W	SP			X	X	X	X	X	X	X	X	X	X	X	X	X					M	20 40	12 20	5	M	3	3	FR

**LEGEND**

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**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/ Maturity	Spread in 10 Yrs/ Maturity	Minimum Planter Size

Melaleuca styphelioides Prickly Melaleuca		X	W	SP			X	X	X	X		X	X		X	X			X					F	20	15	4	L	4	FR
Michelia doltsopa (No common name)		X	W	S			X	X	X	X		X			X		X			X				M	40	20	4	L	10	
Morus alba Fruitless Mulberry	X					Y	X			X		X	X	X	X	X							X	F	25	25	10	VH	2	
Nyssa sylvatica Tupelo	X					R	X	X		X		X			X									M	20	10	4	L	8	
Olea europea Majestic Beauty		X			X		X			X	X	X	X	X	X	X							X	M	20	20	3	L	2	
Olea europea "Swan Hill"	X						X	X		X		X	X	X	X	X							X	M	20	20	4	L	2	
Parkinsonia aculeata Palo Verde	X		Y	SP			X	X	X		X	X	X	X	X	X				X				F	15	15	3	L	1	E
Pinus brutia Brutia Pine		X					X			X	X	X	X	X	X	X				X				F	30	25	10	H	10	FR
Pinus canariensis Canary Island Pine		X					X	X	X		X	X	X	X	X	X				X				F	30	20	5	M	10	

**LEGEND**

AC = Avoid Clay Soils	F = Fast	H = High	MT= Multi Trunk	R = Red	SP = Spring	W = White
BL = Blue	FA = Fall	L = Low	O = Orange	S = Summer	U = Unknown	WI= Winter
BR = Brown	FB = Fireblight	M = Moderate	P = Purple	SH= Short Lived	V = Various	Y = Yellow
E = Experimental	FR = Frost Sensitive	MR=Mildew Resistant	Pi = Pink	SL=Slow	VH= Very High	

**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

Date: May-2013  
Scale: None

Dwn: : KY  
Ckd: Spec Committee

  
City Engineer

No.  
L-18G

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

Pinus eldarica		X					X				X	X	X		X	X	X		X	X			X	F	30	20	7	H	10	AC
Mondale Pine		X					X				X	X	X		X	X	X		X	X			X	M	80	50	10	H	10	AC
Pinus pinea		X					X		X		X	X	X		X	X	X		X	X			X	M	30	25	10	H	10	AC
Italian Stone Pine		X					X				X	X	X		X	X	X		X	X			X	F	40	30	7	M		
Pinus Sabiniana		X	PI	X	SP	FA					X	X	X		X	X	X		X	X			X	M	80	50	10	H	10	AC
Grey Pine		X	Y				X				X	X	X		X	X	X		X	X			X	M	30	20	10	H	10	AC
Pinus sylvestris		X					X				X	X	X		X	X	X		X	X			X	M	80	50	10	H	10	AC
Scots Pine		X					X				X	X	X		X	X	X		X	X			X	M	30	20	7	H	10	AC
Pinus thunbergiana		X					X				X	X	X		X	X	X		X	X			X	M	60	40	4	L	4	
Japanese Black Pine	X					R	X		X	X	X	X	X		X	X	X		X	X			X	M	15	10	4	L	4	
Pistacia chinensis		X	Y				X		X	X	X	X	X		X	X	X		X	X			X	S	10	6	2	L	1	E
Chinese Pistacio		X					X		X	X	X	X	X		X	X	X		X	X			M	20	15	5	M	4		
Pittosporum brevicalyx		X					X		X	X	X	X	X		X	X	X		X	X			X	F	35	30	5	M	4	AC
Saratoga		X					X		X	X	X	X	X		X	X	X		X	X			X	F	60	50	7	M		
Pinus cultivars		X					X		X	X	X	X	X		X	X	X		X	X			X	F	30	20	7	M		
Sycamores		X					X		X	X	X	X	X		X	X	X		X	X			X	F	80	50	4	L	3	
Pinus Racemosa		X					X		X	X	X	X	X		X	X	X		X	X			X	M	20	20	4	L	3	
California Sycamore		X	W				X		X	X	X	X	X		X	X	X		X	X			X	M	20	20	30	L	5	
Prunus cerasifera		X					X		X	X	X	X	X		X	X	X		X	X			X	M	20	20	4	L	3	
Krauter Vesuvius		X					X		X	X	X	X	X		X	X	X		X	X			X	M	30	30	30	L	5	

**LEGEND**

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## TREE PLANTING GUIDE

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None



City Engineer

No. L-18H

Plant Name and Description	Important Character					Cultural Preference					Tolerances										Growth Info			Planting Info					
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate	Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size	Sidewalk Damage Potential	Pruning Frequency

Prunus caroliniana							X								X	X	X		X	X		X		M	15	10	4	L	2	E		
Carolina Laurel Cherry							X								X	X	X		X	X		X		S	25	15	3	L	2	AC		
Prunus sargentii	X		V				X		X						X	X	X		X	X		X		M	15	20	5	M	3	FB		
Flowering Cherry																																
Pyrus calleryana	X		W	SP			X			X					X	X	X		X	X				M	25	20	5	M	3	FB		
"Aristocrat" Pear																																
Pyrus calleryana	X		W	SP			X			X					X	X	X		X	X				M	25	15	5	M	3			
Chanticleer Pear																																
Pyrus calleryana	X		W	SP			X			X					X	X	X		X	X				M	25	20	5	M	3	FB		
"Red Spire" Pear																																
Pyrus kawakamii	X		W	SP			X			X					X	X	X		X	X				M	25	25	5	M	3	FB		
Evergreen Pear																																
Pyrus ussuriensis	X		W	S	X		X			X					X	X	X					X		F	15	15	3	L	3	E		
Evergreen Pear																																
Prairie Gem Pear																																
Quercus agrifolia							X								X	X	X							M	15	10	5	M	5			
Coast Live Oak	X																															
Quercus bicolor																																
Swamp White Oak	X														X	X	X							M	20	10	4	L	10	AC		
Quercus berberidifolia																																
Scrub Oak																																

**LEGEND**

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**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

Quercus chrysolepis																								S	20	8	4	M	2	E					
Gold Cup Oak												X												M	60	30	4	M	10	AC					
Quercus coccinea	X																							M	20	15	4	L	8	AC					
Scarlet Oak																																			
Quercus Douglasii	X																							SL	30	40	5	M							
Blue Oak																																			
Quercus ilex																																			
Holly Oak																																			
Quercus Kelloggii	X																																		
California Black Oak																																			
Quercus lobata	X																																		
Valley Oak																																			
Quercus rubra	X																																		
Red Oak																																			
Quercus robur	X																																		
English Oak																																			
Shumard Oak	X																																		

**LEGEND**

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<h1>TREE PLANTING GUIDE</h1>	<p><b>CITY OF LIVERMORE</b> STANDARD DETAIL</p>
<p>No. L-18J</p>	<p>Dwn: : KY Ckd: Spec Committee</p> <p>Date: May-2013 Scale: None</p>

  
 City Engineer

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/ Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

Quercus suber Cork Oak		X						X	X	X	X	X	X	X	X	X	X		X	X			X	M	20	10	6	M	5		AC
Quercus Wislizenii Interior Live Oak	X	X			X	FA		X	X	X									X	X				SL	30	30	7	M			
Rhus lancea African Sumac	X				X			X	X	X	X	X	X	X	X	X	X	X						M	15	15	5	M	3		
Robinia pseudoacacia Purple Robe Locust	X		P	SP			X				X	X	X	X	X	X	X	X						F	25	20	5	M	1		
Salix Laevigata Red Willow	X										Y								X	X				M	20	30	7	H			
Sambucus Mexicana Blue Elderberry	X		Y	SP	X	S	X	X	X	X									X	X				M	10	15	5	L			SH
Schinus molle California Pepper Tree	X			S	R	FA	X	X	X	X									X					F	15	15	7	H	6		FR
Sequoia sempervirens "Coast Redwood"	X						X	X	X	X										X				F	30	20	7	H	10		
Sophora japonica Japanese Pagoda	X		Y	S	X	F	X	X	X	X									X	X				M	20	20	5	M	3		FR

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**TREE PLANTING GUIDE**

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Ckd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer

No. L-18K

Plant Name and Description	Important Character					Cultural Preference					Tolerances								Growth Info			Planting Info			Comments			
	Deciduous	Evergreen	Flowers, Color	Flowering Period	Fruit	Fruiting Period	Fall Color	Sun	Part Shade	Good Drainage	Irrigation	No water after 2 <sup>nd</sup> year	Alkaline Soils	Boron Tolerant	Sprinklers	Wind	Heat	Poorly Drained Soils	Well Drained/Clay-Loam	Well Drained/Sandy	Turf Areas	Small Planters	Re-claimed Water	Growth Rate		Height in 10 Yrs/Maturity	Spread in 10 Yrs/Maturity	Minimum Planter Size

Taxodium mucronatum Mexican Cypress	X	X						X		X		X		X	X	X	X				X			F	15	5	5			
Tilia americana Redmond Linden	X		W	SP			X	X	X	X	X			X	X	X	X					X		M	20	10	5			
Tipuana tipu Tipu Tree	X	X	Y				X		X	X	X				X	X	X					X		F	15	12	3	L	1	E
Tristania lauring Swamp Myrtle		X	Y	S			X	X	X	X	X				X	X	X					X		M	12	10	3	L	6	
Ulmus parvifolia "drake" Evergreen Elm		X					X			X	X				X	X	X					X		F	30	35	6	H	3	
Ulmus "pioneer" Pioneer Elm	X						X	X	X	X	X		X		X	X	X					X		VF	30	25	7	H	5	
Ulmus "heritage" Frontier Elm	X						X	X	X	X	X		X		X	X	X					X		VF	20	15	7	H	5	
Umbellularia Californica California Bay		X	Y	SP	X	S	X	X	X	X	X				X	X	X							SL	15	15	5	M		
Vitex angus-castus Chaste Tree	X		BL	FA			X			X	X				X	X	X					X		S	12	8	3	L	5	
Zelkova serrata Sawleaf Zelkova	X						X			X	X				X	X	X					X		M	25	25	7	H	3	
							X			X	X				X	X	X					X		F	50	50	50			

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## TREE PLANTING GUIDE

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: : KY  
Kcd: Spec Committee

Date: May-2013  
Scale: None

  
City Engineer







Botanical Name: Common Name	GROUND COVER CHARACTERISTICS						ENVIRONMENTAL TOLERANCE						COMMENTS												
	HEIGHT		VIGOR		ROOTING		LEAF SIZE		FLOWER		EXPOSURE			SOIL		FROST		DRO-UGHT							
	Low	Tall	Slow	Moderate	Fast	Shallow, Surface	Deep	Fine	Medium	Coarse	Showy	Not Showy		Sun	Partial Shade	Deep Shade	Good Drainage	Poor Drainage	Boron Contaminated	Sodium Contaminated	Yes	No	Yes	No	
Achillea Clavennae : Silver Yarrow	●			●	●	●				●			●							●				●	Can Mow Periodically
Achillea Millefolium : Yarrow		●		●	●	●				●			●							●				●	Can Mow Periodically
Achillea Millefolium 'Rosea' : Rose Yarrow		●		●	●	●				●			●							●				●	Can Mow Periodically
Asctostaphylos Uva-Ursi : 'Bearberry', 'Kinnikinnik'	●		●				●			●			●							●				●	Good for Slopes
Armeria Maritima : Sea Pink, Thrift	●			●			●						●							●				●	
Campanula Poscharskyana : Serbian Bellflower	●				●								●							●				●	
Carex Pansa : Meadow Sedge	●			●			●						●							●				●	Can Mow 2-3 Times/Year
Carex Praegracilis : Dune Sedge, Field Sedge		●		●	●	●				●			●							●				●	Can Mow 2-3 Times/Year
Carex Texensis : Texas Sedge, Catlin Sedge	●			●			●						●							●				●	Can Mow Periodically
Carex Divulsa (Tumulicola) : Berkeley Sedge		●		●			●						●							●				●	
Ceanothus Griseus Horizontalis : Carmel Creeper		●		●			●						●							●				●	
Ceanothus Hearstiroum : Hearst Ceanothus	●		●				●						●							●				●	
Chamaemelum Hobile : Chamomile	●			●			●						●							●				●	Can Mow Periodically
Coprosma X Kirkii : Creeping Coprosma		●		●			●						●							●				●	Good for Slopes
Coprosma 'Verde Vista'	●			●			●						●							●				●	Needs Tip Pruning
Correa 'Carmine Bells' : Australian Fuchsia		●		●			●						●							●				●	Good Drainage
Correa Pulchella : Australian Fuchsia		●		●			●						●							●				●	Good Drainage

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY Date: May-13  
Ckd: Spec. Committee Scale: NONE

GROUND COVER PLANTING GUIDE

No.  
L-20A

  
City Engineer

Botanical Name: Common Name	GROUND COVER CHARACTERISTICS						ENVIRONMENTAL TOLERANCE						COMMENTS													
	HEIGHT		VIGOR		ROOTING		LEAF SIZE			FLOWER		EXPOSURE			SOIL			FROST		DRO-UGHT						
	Low	Tall	Slow	Moderate	Fast	Shallow, Surface	Deep	Fine	Medium	Coarse	Showy	Not Showy		Sun	Partial Shade	Deep Shade	Good Drainage	Poor Drainage	Boron Contaminated	Sodium Contaminated	Yes	No	Yes	No		
Cotoneaster dammeri 'Carol Beauty': Bearberry Cotoneaster	●		●			●		●		●		●		●		●		●		●		●		●		Needs Tip Pruning
Drosantherum Hispidum : Red Apple Iceplant	●																									
Dymondia Margaretae : Silver Carpet	●																									
Festuca Glauca : Blue Fescue	●																									
Festuca Idahoensis : Idaho Fescue	●																									
Festuca Rubra : Red Fescue	●																									
Fuchsia Procumbens : Prostate Fuschia	●																									
Fragaria Chiloensis : Beach Strawberry	●																									
Genista Lydia : Broom	●																									Accent Only
Hypericum calycinum : Aaron's Beard	●																									Cut Back Regularly
Koeleria Macrantha : Junegrass	●																									Good for Erosion Control
Lotus Scoparius : Deerweed	●																									
Malvastrum Lateritium : Trailing Mallow	●																									Good for Slopes
Myoporum Parvifolium 'Prostrata' : Myoporum	●																									Good for Slopes
Nandina domestica 'Harbour Dwarf' : Heavenly Bamboo	●																									Best with N.E. Exposure
Nepetaracemosa : Cat Mint	●																									
Phylla Nodiflora : Lippia	●																									Can Take Foot Traffic

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY Date: May-13  
Ckd: Spec. Committee Scale: NONE

GROUND COVER PLANTING GUIDE

NO.  
L-20B

  
City Engineer



# BIORETENTION SWALE AND PLANTER DESIGN GUIDANCE

1. Longitudinal slope of swales shall be between 0.5% and 5%. Swales of greater than 3% may be required to install check dams to reduce velocity through the swale.
2. All swales shall and planters be required to provide an adequate underdrain system to prevent ponding with a minimum of 0.5% slope.
- 3 Swales and planters shall be designed to eliminate any ponding of water for more than 48 hours.
4. Side slopes shall not exceed 2:1, horizontal: vertical.
5. Erosion control practices must be implemented and maintained until such a time that the vegetation in the swale has established allowing the proper function of the drainage area as a "bioswale".
6. Swale bottom must be graded flat to improve pollutant removal. Swale bottom should ideally be at least 4–6 feet wide, with a minimum of 2 feet wide. Properly designed swales should resemble more of a flat–soft "U" shape rather than a sharp "V" ditch shape.
7. Swales shall be designed and sized to meet the latest requirements indicated in section C.3 of the City's NPDES permit with the Regional Water Quality Control Board (see Alameda County clean Water Program Technical Manual for: guidance at [www.cleanwaterprogram.org](http://www.cleanwaterprogram.org)):  
Generally, swales provided should collect runoff from the contributing drainage area using the general guideline of 0.04 sq.ft. of swale for each 1 sq.ft. of contributing drainage area.
8. For swales proposed in residential street parkway strips, the minimum width allowed should be 12 feet, with 15 feet or more recommended.
9. Maintenance of swales will be the responsibility of the property owner for residential and commercial/industrial applications, or a homeowner's association for residential common areas.
10. Swales will require sufficient irrigation to establish and maintain complete vegetation coverage. vegetation damaged due to ponding, erosion, insufficient irrigation, or other problems, it must be replaced. Turf shall be mowed as needed to maintain a 4–6 inch grass height.
11. Soil specifications for storm water measures shall be used for bio–retention soils. This specification is available at "[www.cleanwaterprogram.org](http://www.cleanwaterprogram.org)".

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L-21B.DWG

			CITY OF LIVERMORE STANDARD DETAIL BIORETENTION SWALE & PLANTER DESIGN GUIDANCE	Dwn: MM      Date: May-13 Ckd: <sup>Spec.</sup> Committee      Scale: None  City Engineer	No.  L-21A
Date:	By:	Rev:			

# BIO-RETENTION SWALE DESIGN GUIDANCE-(Continued)%%

12. Swales must be densely vegetated with conventional turf, approved alternatives to conventional turf, or other approved vegetation as referenced in the Bioswale Plant List shown below.
13. Areas of a site used for grass swales or other stormwater treatment are required to meet the City's Water Efficient Landscaping requirements.

### Highest Zone

<i>Acer negundo</i>	Box Elder
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharinum</i>	Silver Maple
<i>Alnus spp.</i>	Alder
<i>Betula spp.</i>	Birch
<i>Carya illinoensis</i>	Pecan
<i>Carya ovata</i>	Buttonbush
<i>Casuarina spp.</i>	She-Oak
<i>Clethra arborea</i>	Lily-of-the-Valley
<i>Cornus stolonifera</i>	Redtwig Dogwood
<i>Diospyros virginiana</i>	Persimmon
<i>Eucalyptus camaldulensis</i>	Red Gum
<i>E. citriodora</i>	Lemon Gum
<i>E. erythrocorys</i>	Red-Cap Gum
<i>Fraxinus latifolia</i>	Oregon Ash
<i>Gleditsia triacanthos</i>	Honey Locust
<i>Liquidambar styraciflua</i>	Liquidambar
<i>Liriodendron tulipifera</i>	Tulip Tree
<i>Magnolia grandiflora</i>	Southern Magnolia
<i>M. virginiana</i>	Sweet Bay
<i>Melaleuca quinquenervia</i>	Cajeput Tree
<i>Nyssa sylvatica</i>	Tupelo
<i>Picea sitchensis</i>	Sitka Spruce
<i>Platanus x acerifolia</i>	London plane
<i>Platanus occidentalis</i>	Sycamore
<i>P. racemosa</i>	California Sycamore
<i>Populus deltoides</i>	Cottonwood
<i>Pterocarya stenocarpus</i>	Wingnut
<i>Quercus macrocarpa</i>	Bur Oak
<i>Q. palustris</i>	Pin Oak

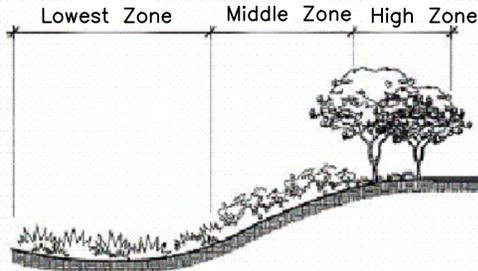
<i>Salix spp.</i>	Willow
<i>Sequoia sempervirens</i>	Coast Redwood
<i>Taxodium distichum</i>	Bald Cypress
<i>Thuja occidentalis</i>	Arborvitae

### Middle Zone

<i>Cornus stolonifera</i>	Redtwig Dogwood
<i>Gaultheria shallon</i>	Salal
<i>Equisetum hyemale</i>	Horsetail
<i>Ferns (many spp.)</i>	Fern
<i>Iris (many spp.)</i>	Iris
<i>Mimulus</i>	Monkeyflower
<i>Miscanthus sinensis</i>	Japanese Silver Grass
<i>Myoporum parvifolium</i>	Myoporum
'Putah Creek'	
<i>Myrica</i>	Pacific Wax Flower
<i>Salix spp.</i>	Willow
<i>Vaccinium</i>	Huckleberry

### Lowest Zone

<i>Acorus gramineus</i>	Acorus
<i>Carex spp.</i>	Sedge
<i>Deschampsia caespitosa</i>	Tufted Hairgrass
<i>Iris (many spp.)</i>	Iris
<i>Leucothoe davisiae</i>	Sierra Laurel
<i>Scirpus cernuus</i>	Bulrush
<i>Juncus spp.</i>	Rush
<i>Tradescantia virginiana</i>	Spiderwort
<i>Typha latifolia</i>	Common Cattail

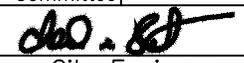


User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L-21C.DWG

## BIO-RETENTION SWALE DESIGN GUIDANCE AND PREFERRED PLANT LIST

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: MM	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	L-21B
 City Engineer		

Date:	By:	Rev:

# LANDSCAPE GENERAL DESIGN GUIDELINE REQUIREMENTS

The following is a list of ordinances, policies, and regulations with landscape related requirements applicable in the City which may apply including but not limited to:

1. Tree preservation ordinance (see Chapter 12.20 Livermore Municipal Code, Article II);
2. The current Alameda Countywide Clean Water program requirements and published associated technical guidance;
3. The current California Building Standards applicable to the City of Livermore;
4. The landscape sections of any checklists or scorecards which may be required by City Ordinance including but not limited to the Civic Bay–Friendly Landscaping Ordinance for public facilities (see Chapter 15.80 Livermore Municipal Code);
5. The Livermore Development Code (see Chapter 4.05 General Landscape Standards), the landscape standards applicable to the property zoning district, and any standards in Chapter 10 (Subdivisions) which may apply;
6. The landscape section in the City of Livermore Design Standards and Guidelines Chapter which may be applicable;
7. The landscape standards in any applicable City Specific Plan that the property may be within.
8. For any additional plants not currently listed in City Stand Details L-18 through L-21 go to [www.trivalleywaterwise.com](http://www.trivalleywaterwise.com).

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

L-21B.DWG

Date:	By:	Rev:

## GENERAL LANDSCAPE DESIGN GUIDELINES

### CITY OF LIVERMORE STANDARD DETAIL

Dwn: MM	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	L-22
 City Engineer		

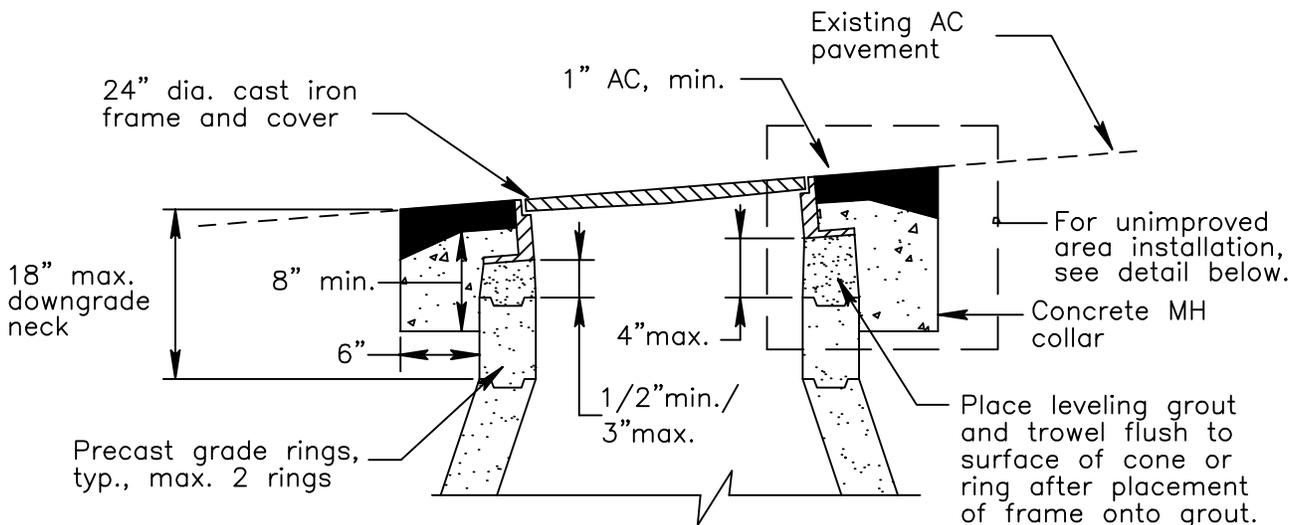
# CITY OF LIVERMORE

## STANDARD DETAILS

### TABLE OF CONTENTS

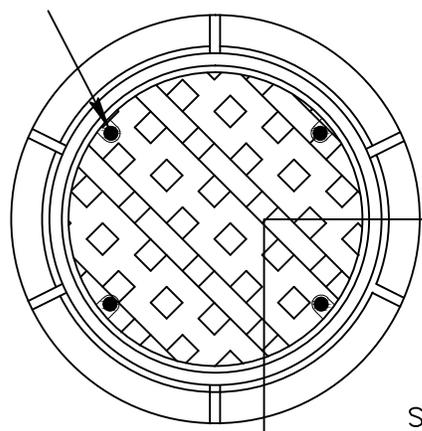
#### SANITARY SEWER AND STORM DRAIN - S

DETAIL NO.	TITLE
S-1	MAINTENANCE HOLE FRAME AND COVER
S-2	TYPE I MAINTENANCE HOLE, 8" TO 33" DIAMETER PIPES
S-3	TYPE II MAINTENANCE HOLE, 36" TO 60" DIAMETER PIPES
S-4	UNIMPROVED AREA UTILITY CONSTRUCTION
S-5	SANITARY SEWER LATERAL
S-6	SANITARY SEWER CROSSING REPLACEMENT
S-7	STORM WATER CURB INLET, TYPE I, 12" TO 30" DIAMETER PIPES
S-8	STORM WATER CURB INLET, TYPE II, 33" TO 60" DIAMETER PIPES
S-9	STORM WATER FIELD DROP INLET, UNIMPROVED/LANDSCAPED AREAS; AND FUTURE STREET AREA
S-10	STORM DRAIN LATERAL CONNECTION TO EXISTING REINFORCED CONCRETE PIPE STORM DRAIN MAIN
S-11	SEWAGE SAMPLING STATION

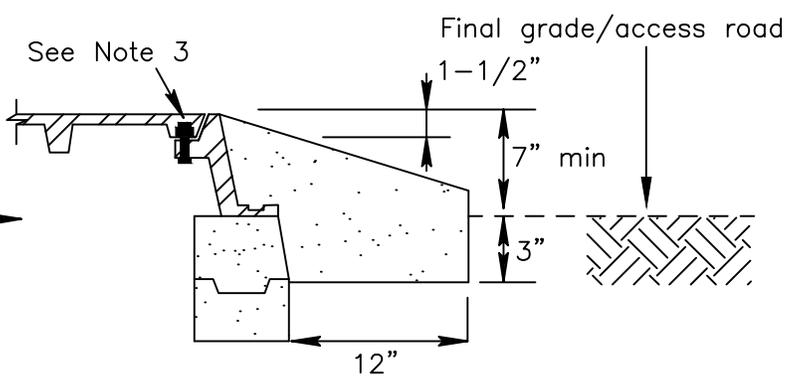


STREET PROFILE SECTION

Bolt-down Cover  
See Note 3



SANITARY SEWER MANHOLE



DETAIL FOR UNIMPROVED AREAS

Notes:

1. For Type I and Type II maintenance hole structures see S-2 or S-3.
2. Maintenance hole frame and cover to match road grade and cross slope within 0" TO + 1/8".
3. Bolt down frame and cover with four 1/2" x 2-1/2" stainless steel, hex head, recessed cap screws. Secure cover with screws, washers, and rubber gasket seals. Remove bolts upon completion of paving.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

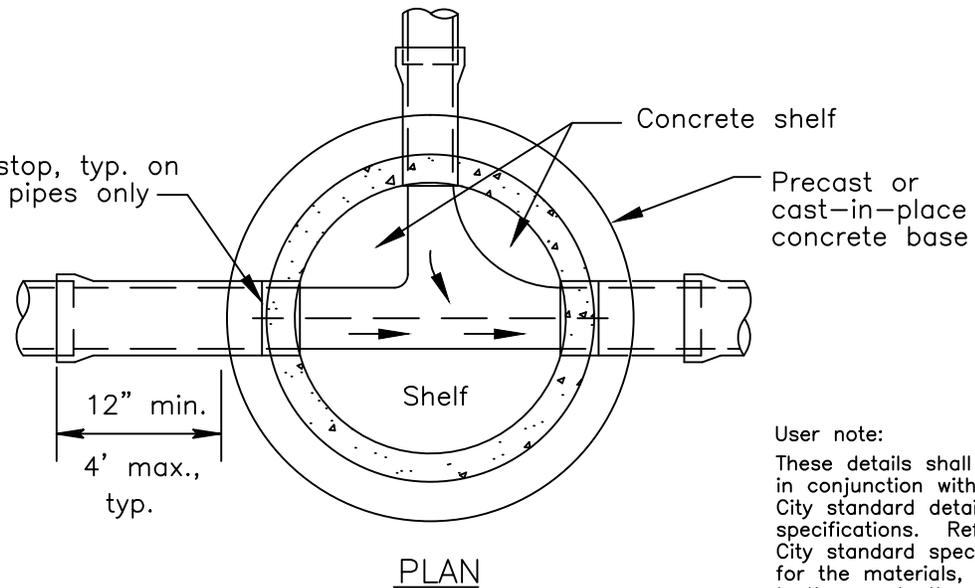
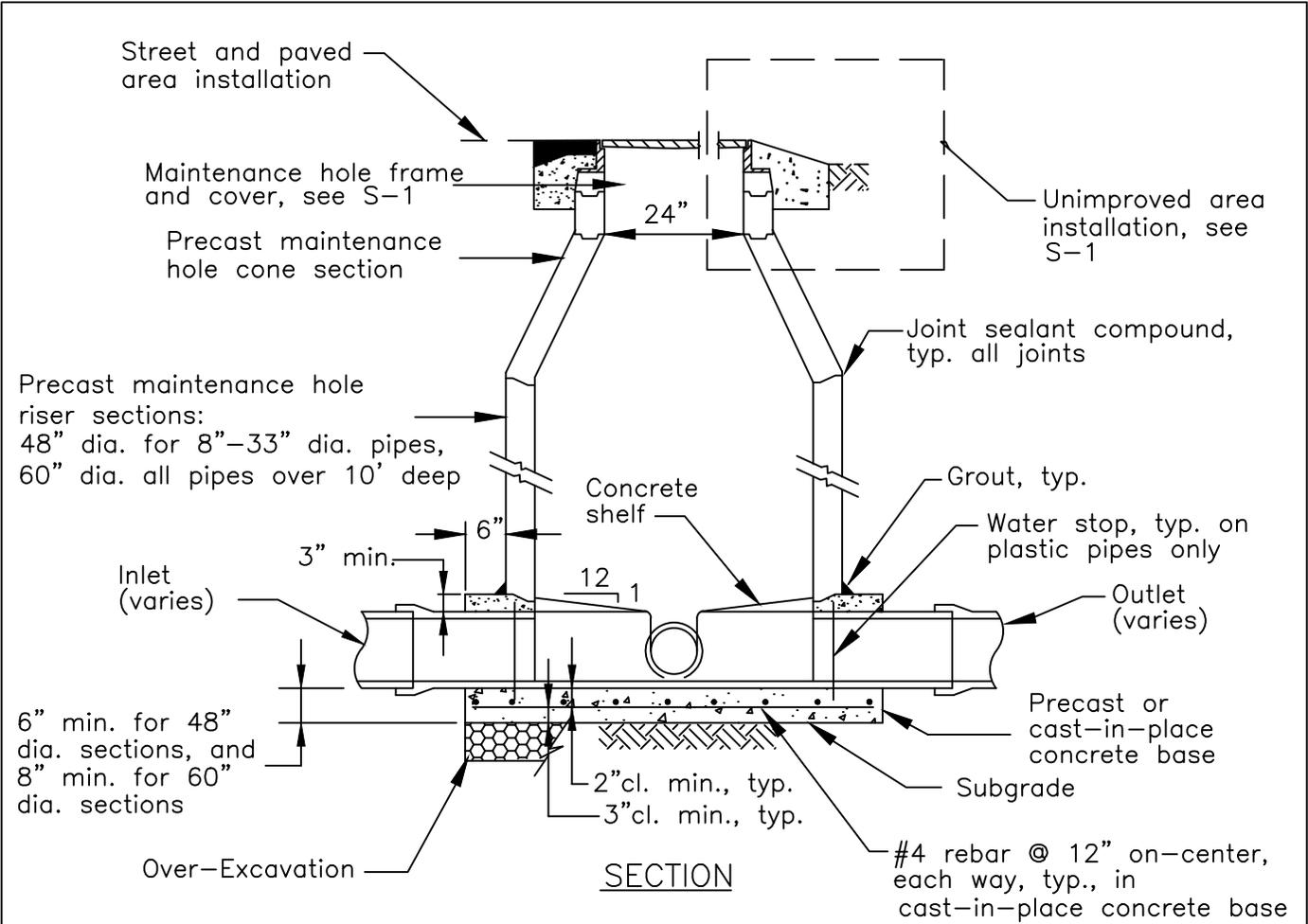
S01.DWG

Date:	By:	Rev:

MAINTENANCE HOLE  
FRAME AND COVER

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: <i>Spec. Committee</i>	Scale: None	S-1
<i>dao</i> City Engineer		



User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

See S-2B for allowable drop in maintenance hole.

TYPE I MAINTENANCE HOLE  
8" TO 33" DIA. PIPES

CITY OF LIVERMORE  
STANDARD DETAIL

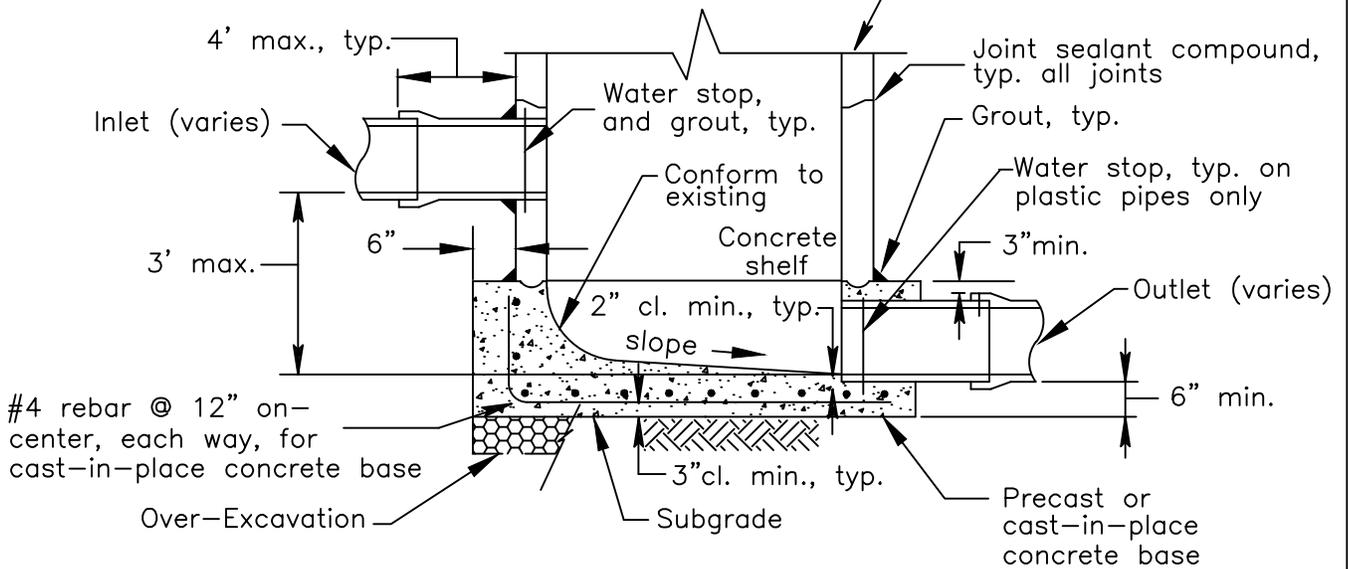
Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-2A
<i>[Signature]</i> City Engineer		

SO2A.DWG

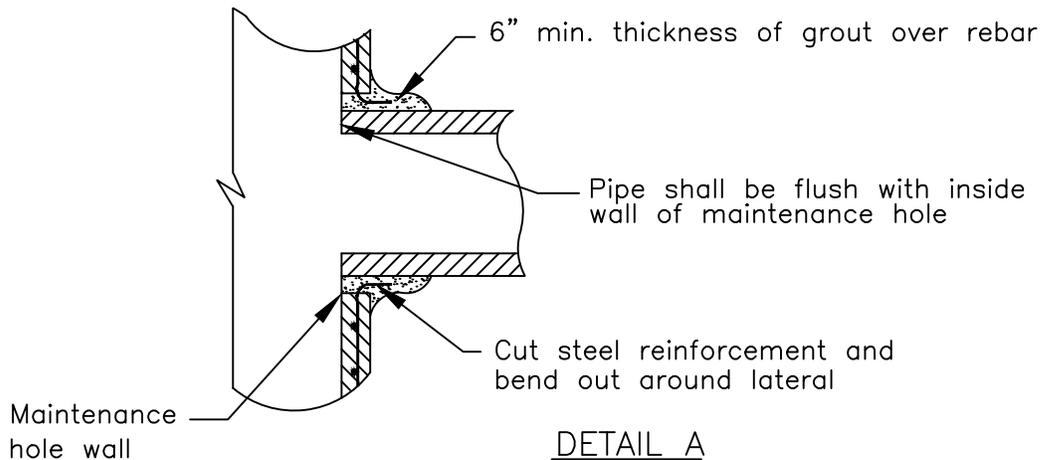
Date:	By:	Rev:

See Detail A for reinforced concrete pipe lateral to maintenance hole connection

See S-2A for maintenance hole requirements



SECTION  
ALLOWABLE DROP IN MAINTENANCE HOLE



DETAIL A  
RCP LATERAL TO MAINTENANCE HOLE WALL

Notes:

- Drop in main line outside of maintenance hole is not allowed.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

S02B.DWG

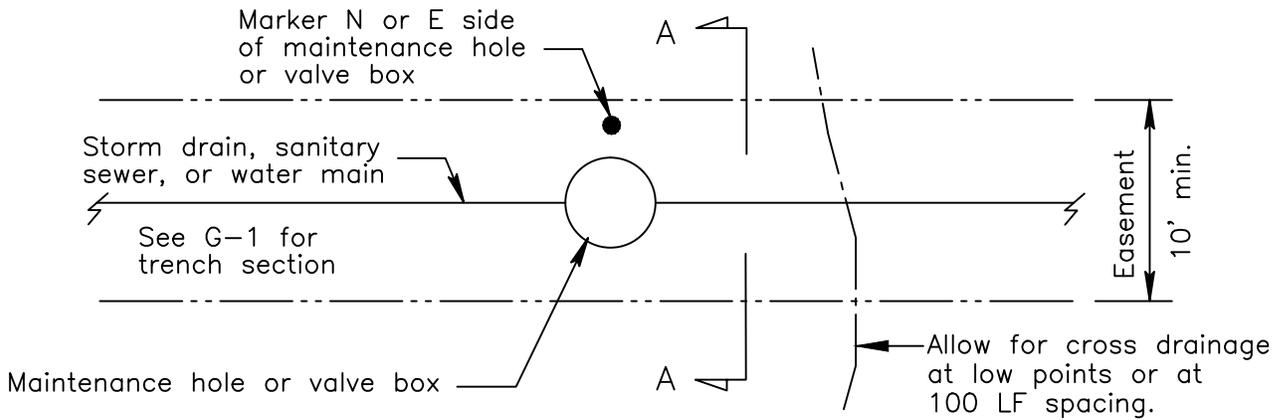
Date:	By:	Rev:

TYPE I MAINTENANCE HOLE  
8" TO 33" DIA. PIPES

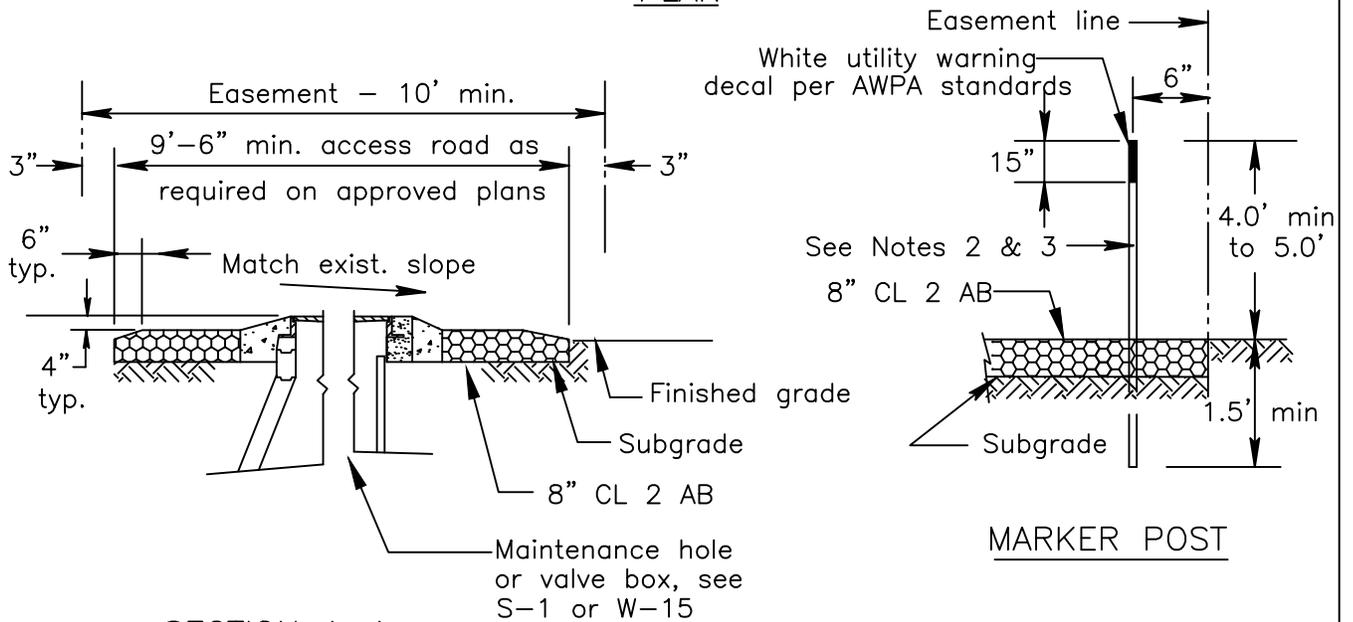
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-2B
 City Engineer		





PLAN



SECTION A-A

MARKER POST

Notes:

1. Provide locking MH frame and cover with curved, blind pick hole in all unimproved areas.
2. 4" wide 3 rail fiberglass marker post with UV protection coating. marker post to bend over when hit and snap back to normal upright position. Post shall be installed directly into soil and shall be colored per AWPA utility marking colors.
3. Provide Potable and Reclaim Water valve decals on marker post as follows to identify the type of valve: BV (butterfly valve), GV (gate valve), etc., approximately 12" down from the utility warning decal. Letters shall be 3" tall. and match color of the post. The decal background shall be white matching the utility warning label above.
4. Compaction of AB and subgrade shall be to 90% compaction in accordance with ASTM D1557.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

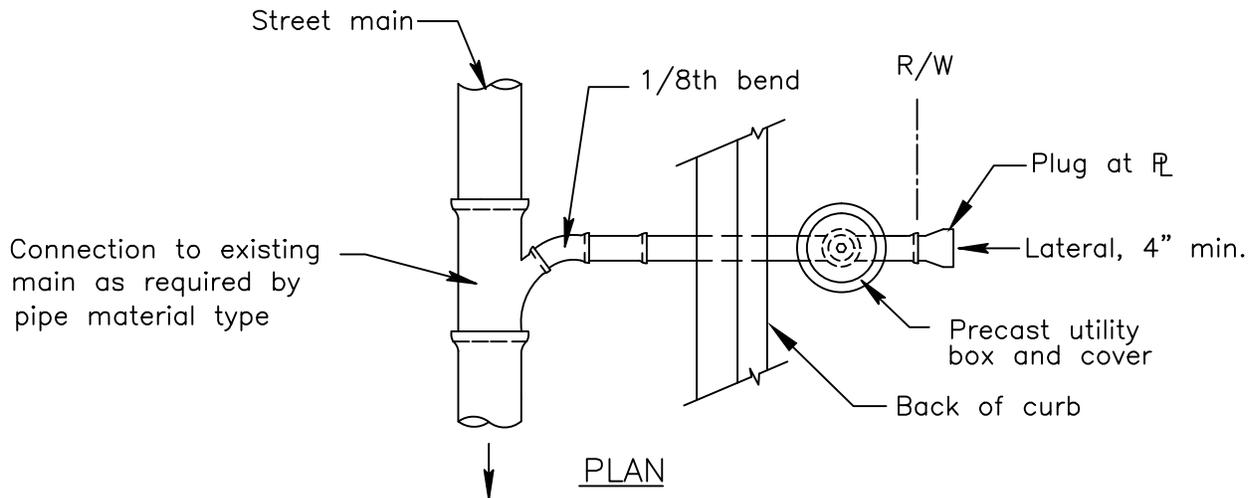
S04.DWG

Date:	By:	Rev:

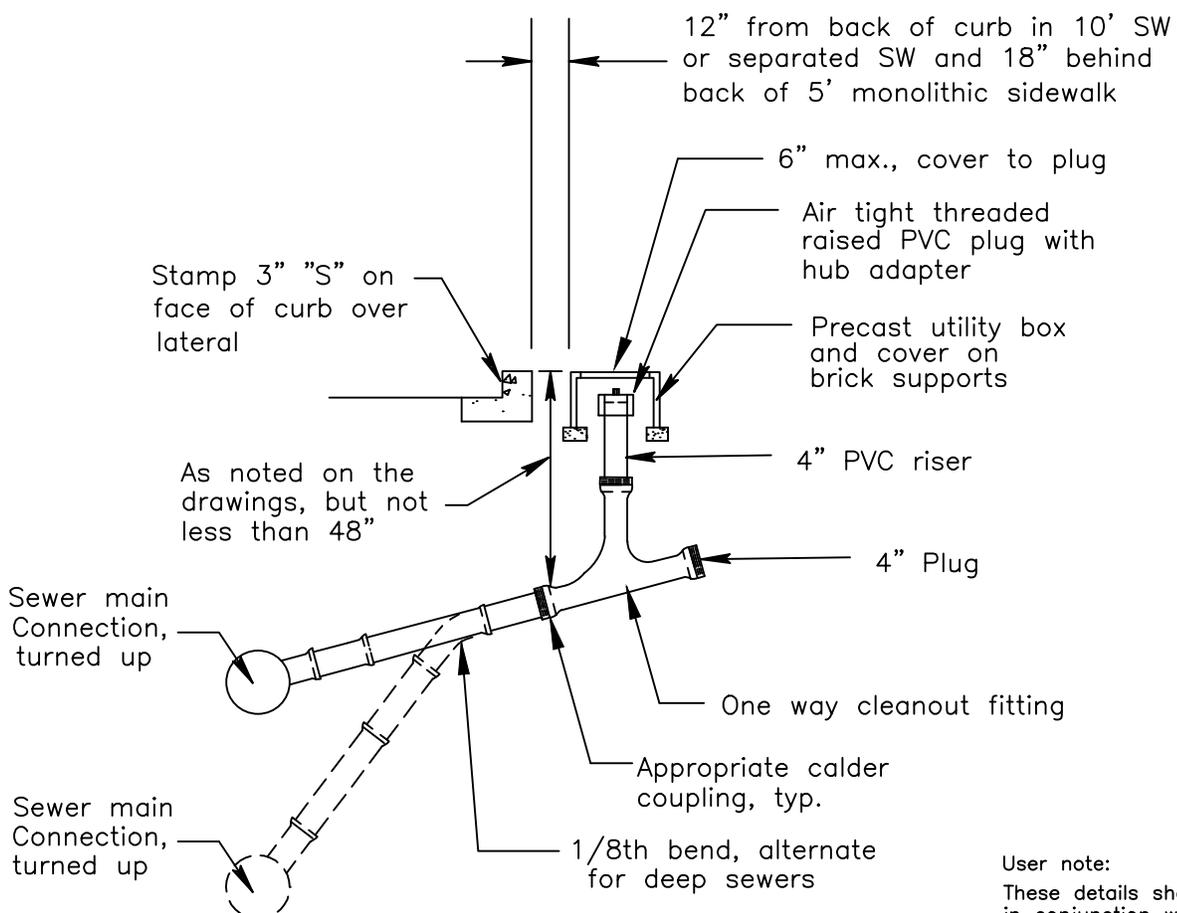
UNIMPROVED AREA  
 UTILITY CONSTRUCTION

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-4
 City Engineer		



PLAN



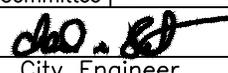
PROFILE

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

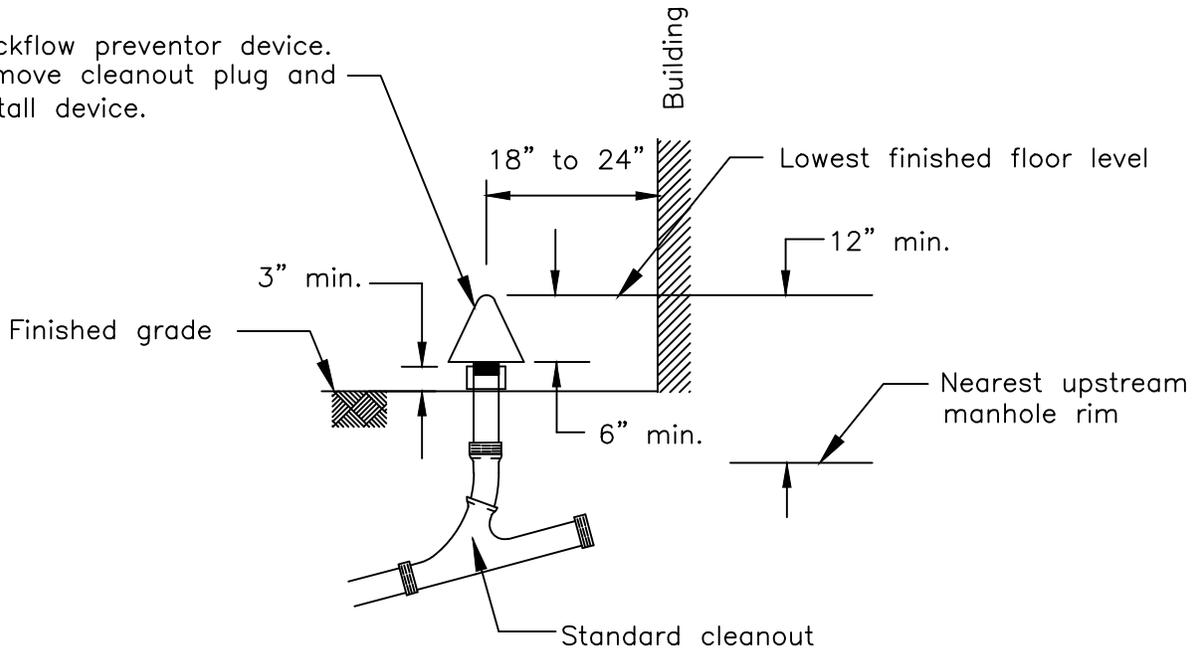
S05A.DWG			
	Date:	By:	Rev:

SANITARY SEWER LATERAL

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No. S-5A
Ckd: Spec. Committee	Scale: None	
 City Engineer		

Backflow preventor device.  
Remove cleanout plug and  
install device.



SANITARY SEWER BACKFLOW PREVENTOR

(See Note 5 for when installation is required)

Notes:

1. On laterals 6" and larger use 45° combination wye and 1/8th bend.
2. Riser material and size to be the same as lateral.
3. The minimum lateral slope shall be 1/4" per foot for 4" dia. pipe and 1/8" per foot for 6" dia. pipe.
4. All lateral piping and fittings shall be the same diameter.
5. Install sanitary sewer backflow preventor when the pad elevation is less than 12" above the nearest upstream sewer manhole rim or the finished floor (if known) is less than 12" above the nearest upstream sewer manhole rim.

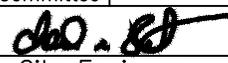
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

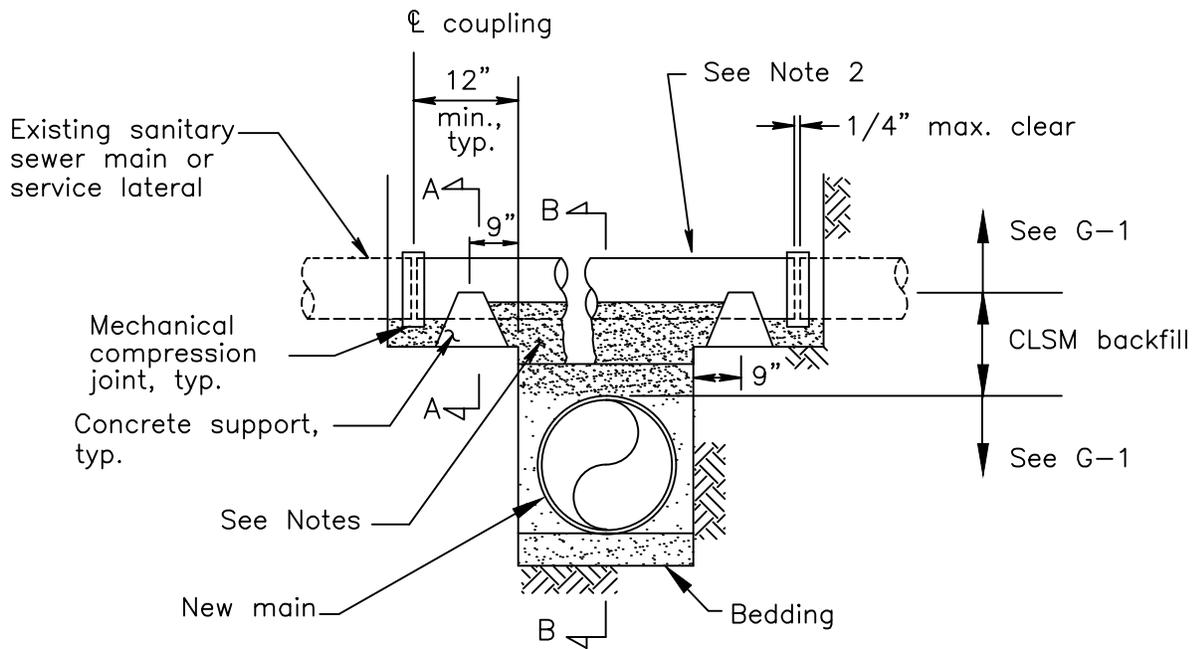
S05B.DWG

SANITARY SEWER LATERAL  
(NOTES AND BACKFLOW PREVENTOR)

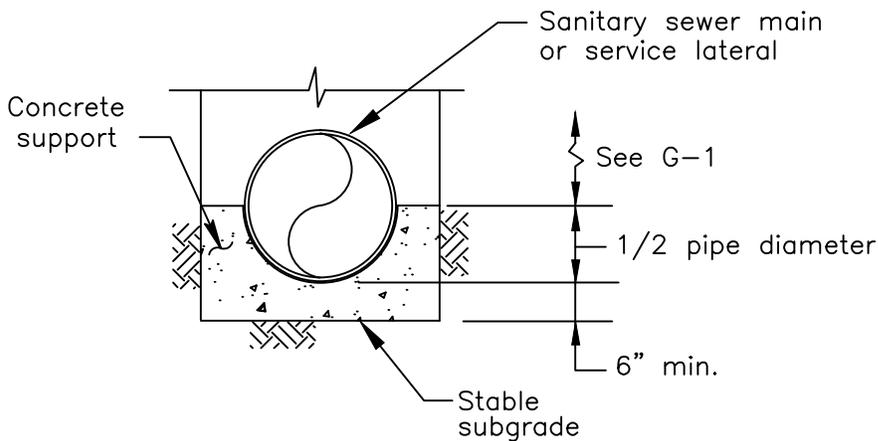
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-5B
 City Engineer		

Date: By: Rev:



MAIN LINE SECTION



SECTION A-A  
CONCRETE SUPPORT

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

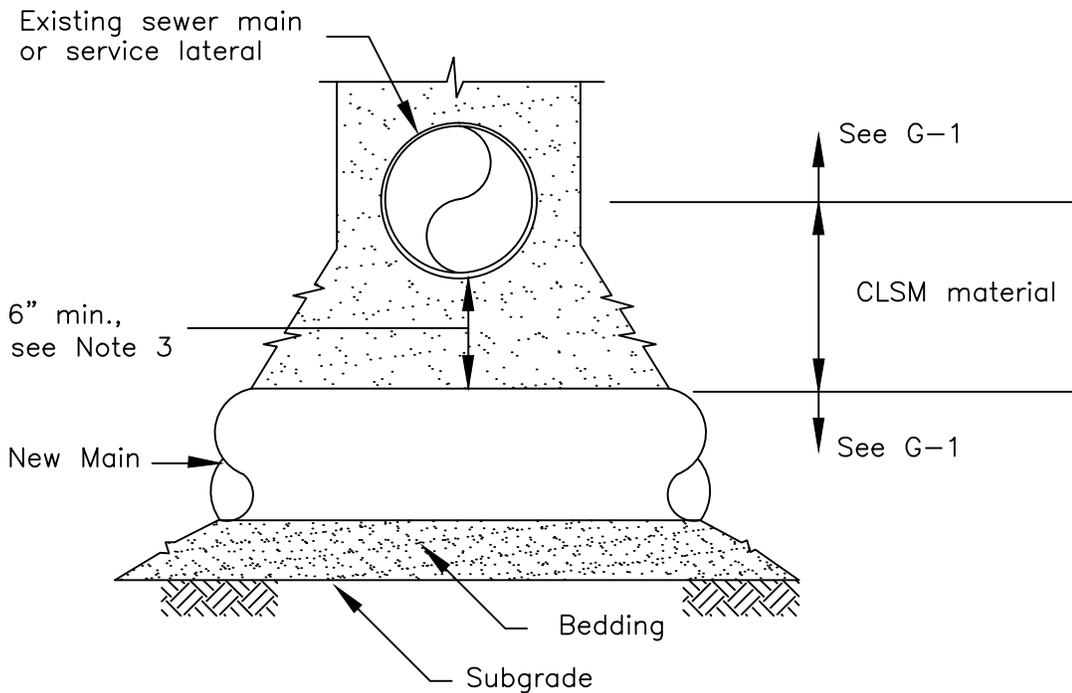
S06A.DWG

Date:	By:	Rev:

SANITARY SEWER CROSSING REPLACEMENT

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-6A
 City Engineer		



SECTION B - B

Notes:

1. If New Main is vitrified clay pipe, install banded rubber couplings on New Main at the limits of the Controlled Low Strength Material (CLSM) backfill.
2. Sanitary sewer crossing replacement to be used when: 1) New Water Main is being installed under existing sanitary sewer main or lateral; or 2) Existing sanitary sewer main or lateral is damaged; or 3) When directed by the ENGINEER.
3. Less than 6" clearance must be approved by the ENGINEER.
4. For New Mains (EXCEPT water) crossing under an existing sanitary sewer pipe and the existing sanitary sewer pipe is damaged, use pipe of the same material to replaced the damaged existing sanitary sewer pipe.
5. For New Water Main crossing under an existing sanitary sewer pipe, the sanitary sewer main or lateral and/or the New Water Main must comply with this detail and G-2.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

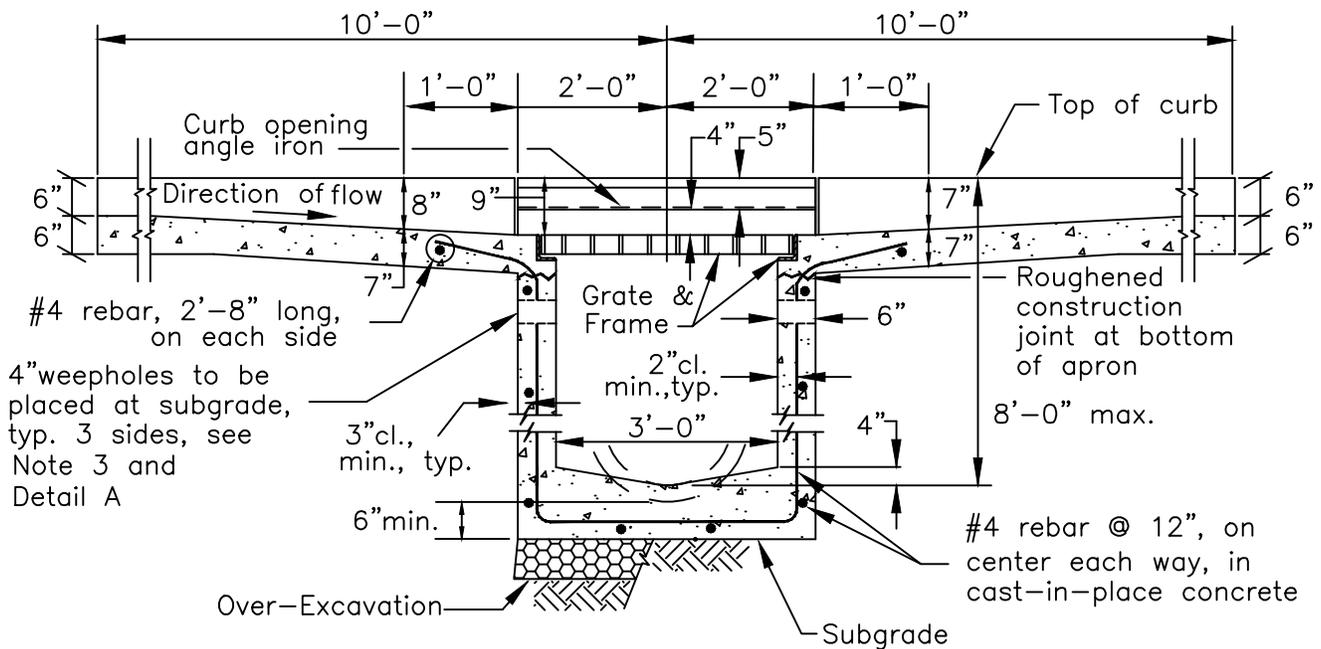
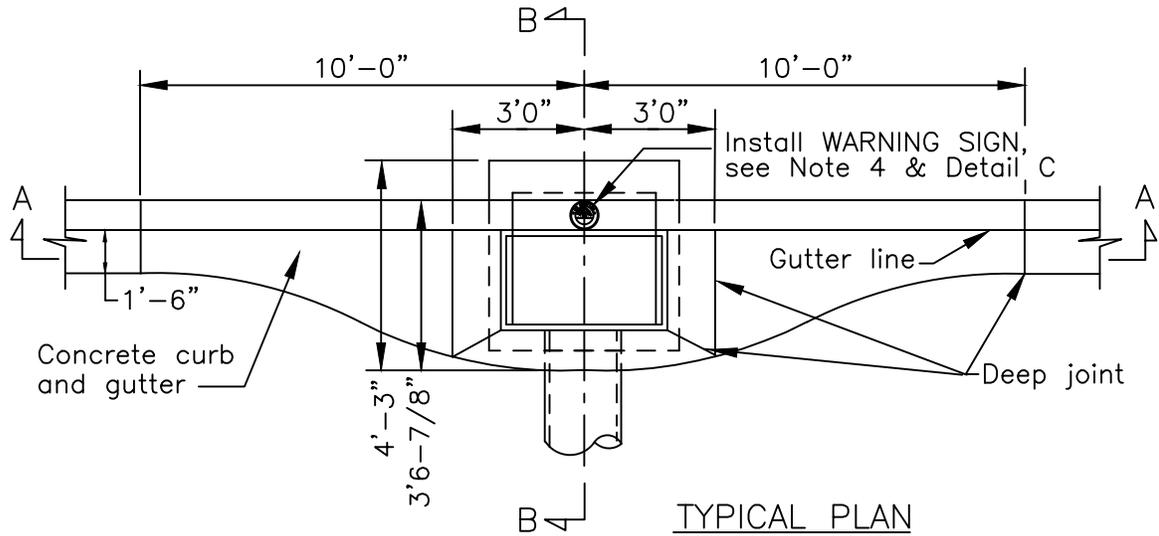
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Date:	By:	Rev:

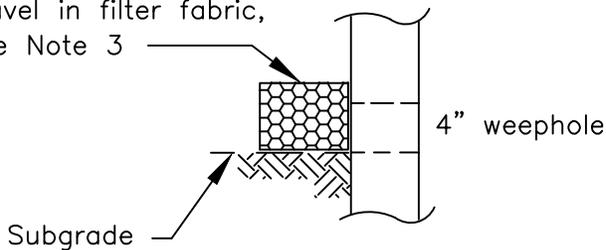
SANITARY SEWER CROSSING REPLACEMENT

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	S-6B
 City Engineer		



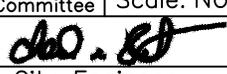
1 CF drain rock or gravel in filter fabric, see Note 3



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

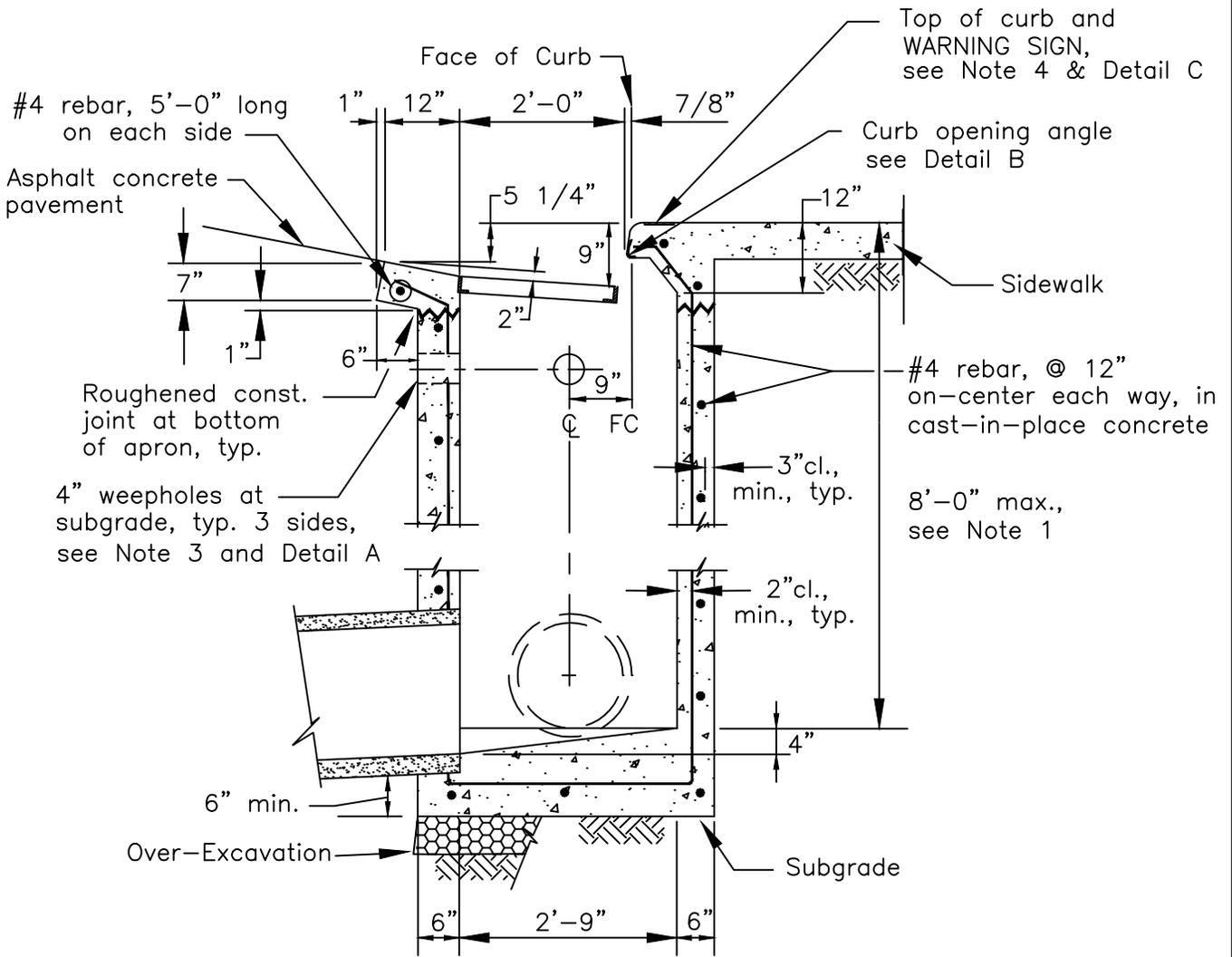
STORM WATER CURB INLET  
 TYPE I  
 12" TO 30" DIA. PIPES

CITY OF LIVERMORE  
 STANDARD DETAIL

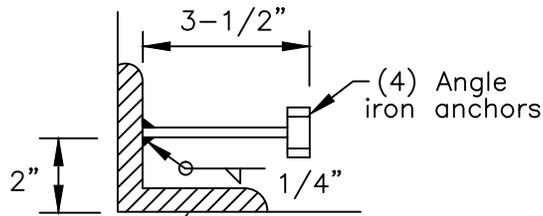
Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-7A
 City Engineer		

S07A.DWG

Date:	By:	Rev:
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SECTION B-B



3-1/2" x 3-1/2" x 1/2" x 4"  
Curb opening angle iron

DETAIL B

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

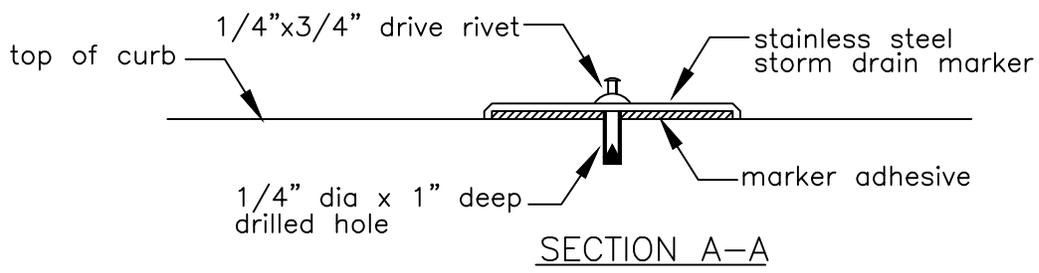
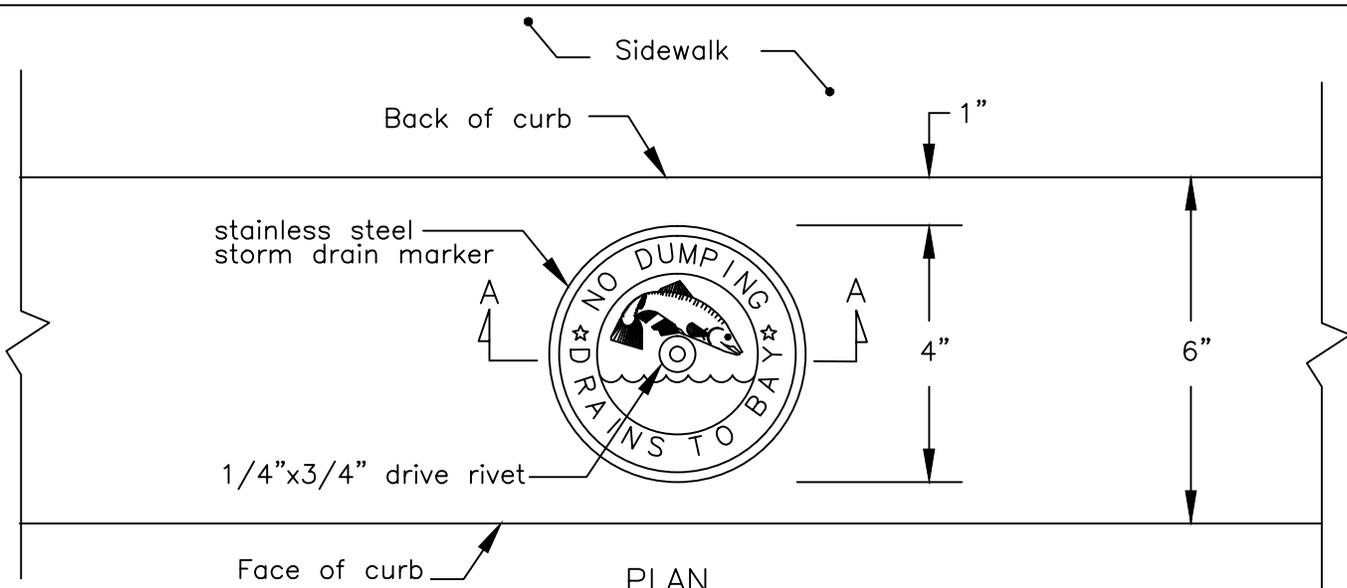
S07B.DWG

Date:	By:	Rev:

STORM WATER CURB INLET  
TYPE I  
12" TO 30" DIA. PIPES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-7B
 City Engineer		



DETAIL "C" - STORM DRAIN MARKER

Notes:

1. For storm water inlets from 8'-0" to 10'-0" deep use Type II maintenance hole base, see S-3.
2. For field drop inlet installation, see S-9.
3. Weepholes on three sides. Place one cubic foot of drain rock in filter fabric behind each weephole.
4. Install 4" Dia Storm Drain Marker at each inlet. The stainless steel marker may be purchased from the City's Water Resources Division:

101 West Jack London Blvd  
 Livermore, CA 94550  
 Phone: 925-960-8100

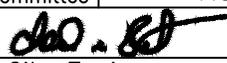
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These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

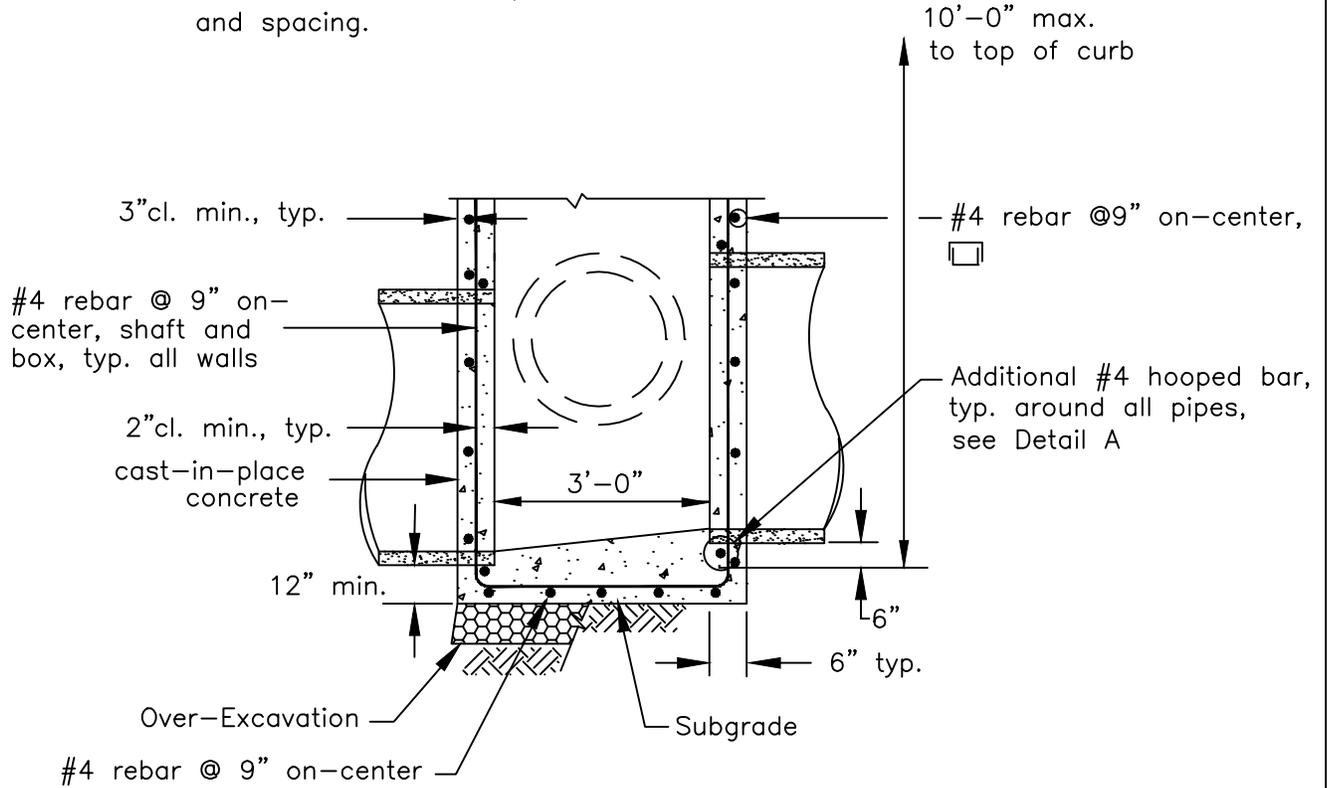
S07C.DWG

Date:	By:	Rev:

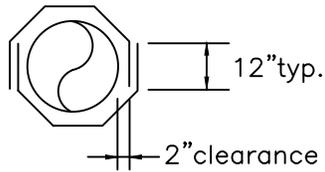
STORM WATER CURB INLET  
 TYPE I  
 NOTES

CITY OF LIVERMORE STANDARD DETAIL		
Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-7C
 City Engineer		

Construction of top of Curb Inlet per S-7A and S-7B, except for bar size and spacing.



SECTION A-A  
see S-7A



HOOPED BAR  
DETAIL A

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

SOBA.DWG			
	Date:	By:	Rev:

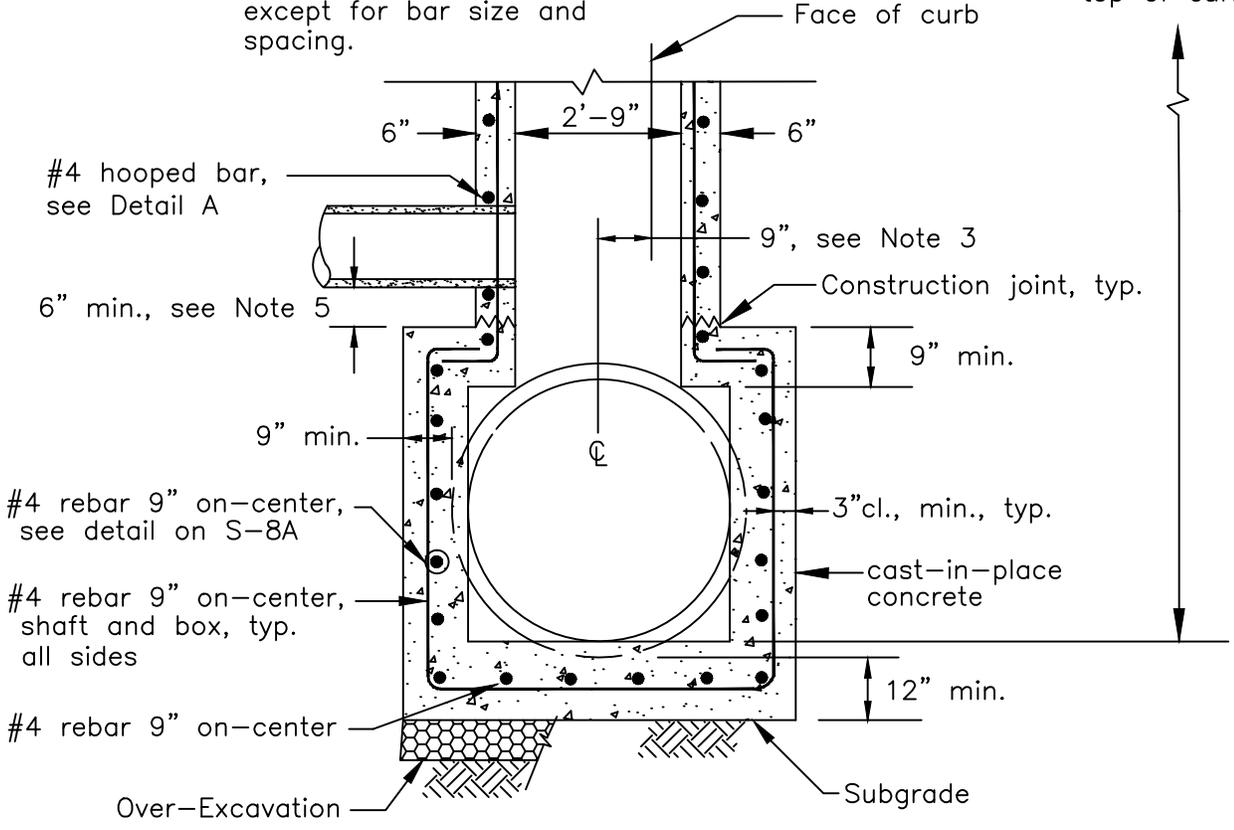
STORM WATER CURB INLET  
TYPE II  
33" TO 60" DIA. PIPES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-8A
 City Engineer		

Construction of top of Curb  
Inlet per S-7A and S-7B,  
except for bar size and  
spacing.

10'-0" max. to  
top of curb



SECTION B-B  
see S-7A

Notes:

1. For storm water curb inlets deeper than 10'-0" or for pipes larger than 60", provide special engineered design prepared by licensed Civil Engineer.
2. For field drop inlet installation, see S-9.
3. The 9" dimension from face of curb to storm drain main centerline is the standard offset for construction.
4. For top of Curb Inlet construction, see S-7A and S-7B.
5. For main/lateral connections other than as shown, provide special engineered design prepared by licensed Civil Engineer.

User note:

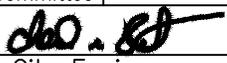
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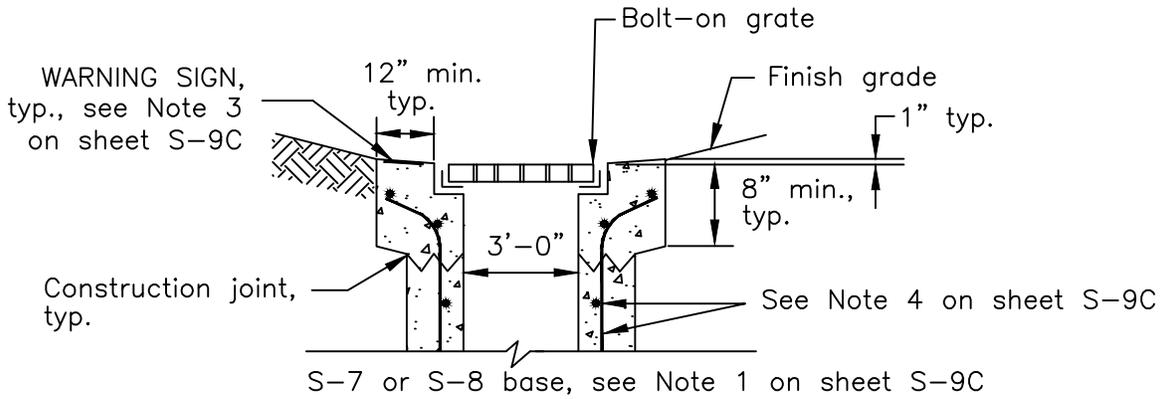
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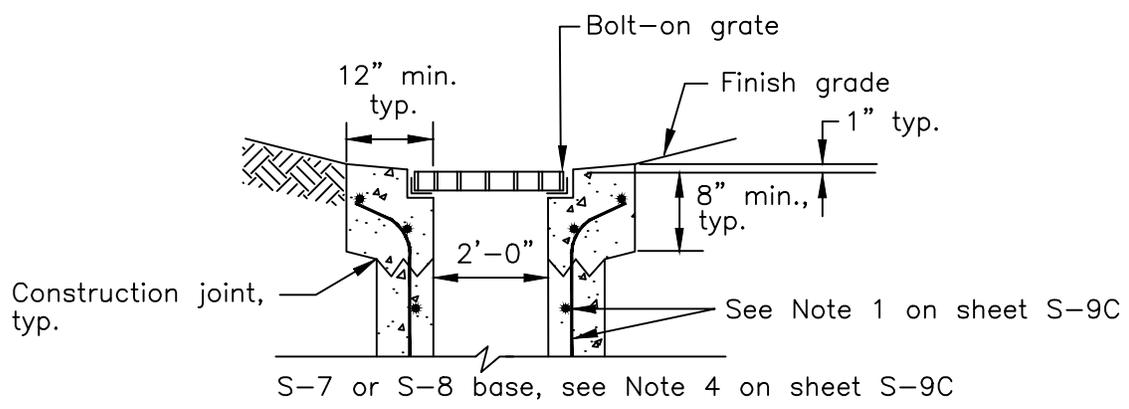
STORM WATER CURB INLET  
TYPE II  
33" TO 60" DIA. PIPES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-8B
 City Engineer		



SECTION A-A



SECTION B-B

CAST-IN-PLACE CONCRETE

See S-9B for Plan View

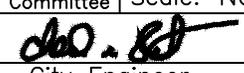
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 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

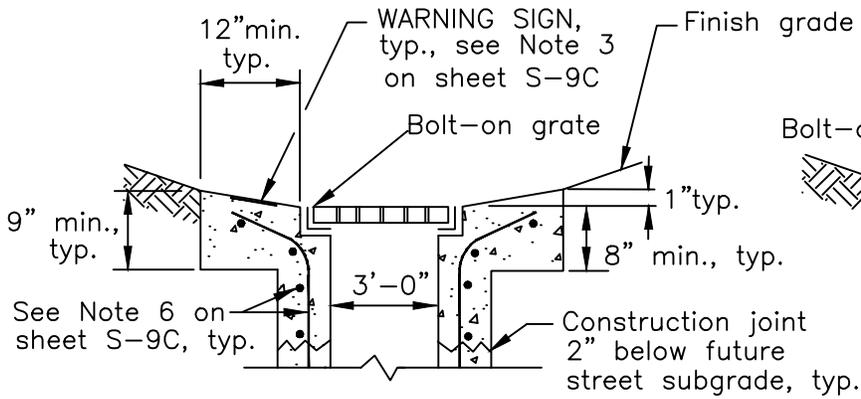
S09A.DWG

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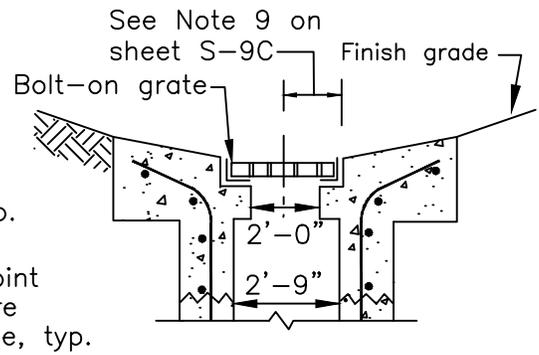
STORM WATER  
 FIELD DROP INLET  
 UNIMPROVED/LANDSCAPED  
 AREAS

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	S-9A
 City Engineer		



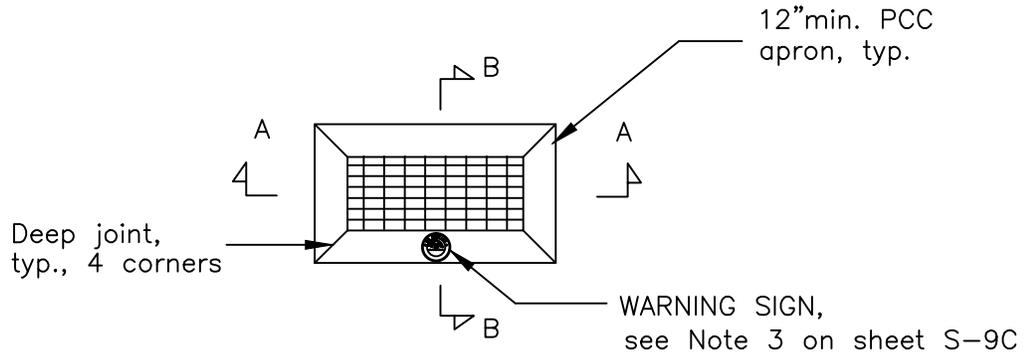
SECTION A-A



SECTION B-B

S-7 or S-8 base, see Note 6

CAST-IN-PLACE CONCRETE  
(pre-cast not allowed)



PLAN VIEW

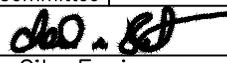
CAST-IN-PLACE CONCRETE

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

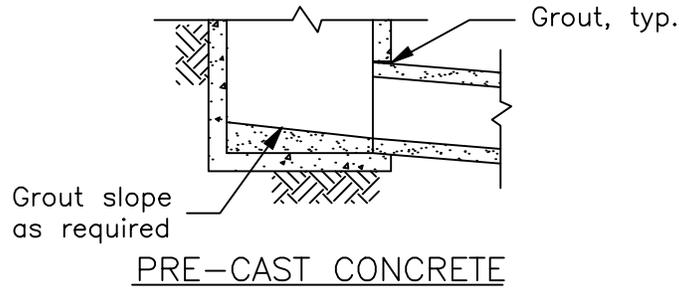
S09B.DWG

STORM WATER  
FIELD DROP INLET  
FUTURE STREET AREAS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-9B
 City Engineer		

Date: By: Rev:



Notes:

1. Reinforcing bar per S-7 of S-8.
2. Frames and grates to be standard duty, except frame and grate in vehicle access areas to be heavy duty, HS-20 traffic loading. All frames and grates shall be boltable.
3. For WARNING SIGN installation see S-7C.

For construction in Unimproved or Landscaped Areas:

4. For C-I-P inlet base construction see:  
S-7 for Type I MH, 12" to 30" dia. pipes, or  
S-8 for Type II MH, 33" to 60" dia. pipes,  
with the following exceptions:  
1: ID = 2'-0" x 3'-0", and  
2: construction joints and weepholes are not required.
5. Pre-cast catch basin with bottom is allowed for 12" to 30" dia. pipes, less than 8'-0" deep in Unimproved or Landscape Areas.

For construction in Future Street Areas:

6. For C-I-P inlet base construction see:  
S-7 for Type I MH, 12" to 30" dia. pipes, or  
S-8 for Type II MH, 33" to 60" dia. pipes.
7. For modification of Field Drop Inlet to Curb Inlet remove concrete above weakened plane joint, tie-in rebar, construct new curb inlet per S-7.
8. Do not install weepholes in Field Drop Inlet in Future Street Area.
9. 9" from centerline of pipe to future face of curb.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

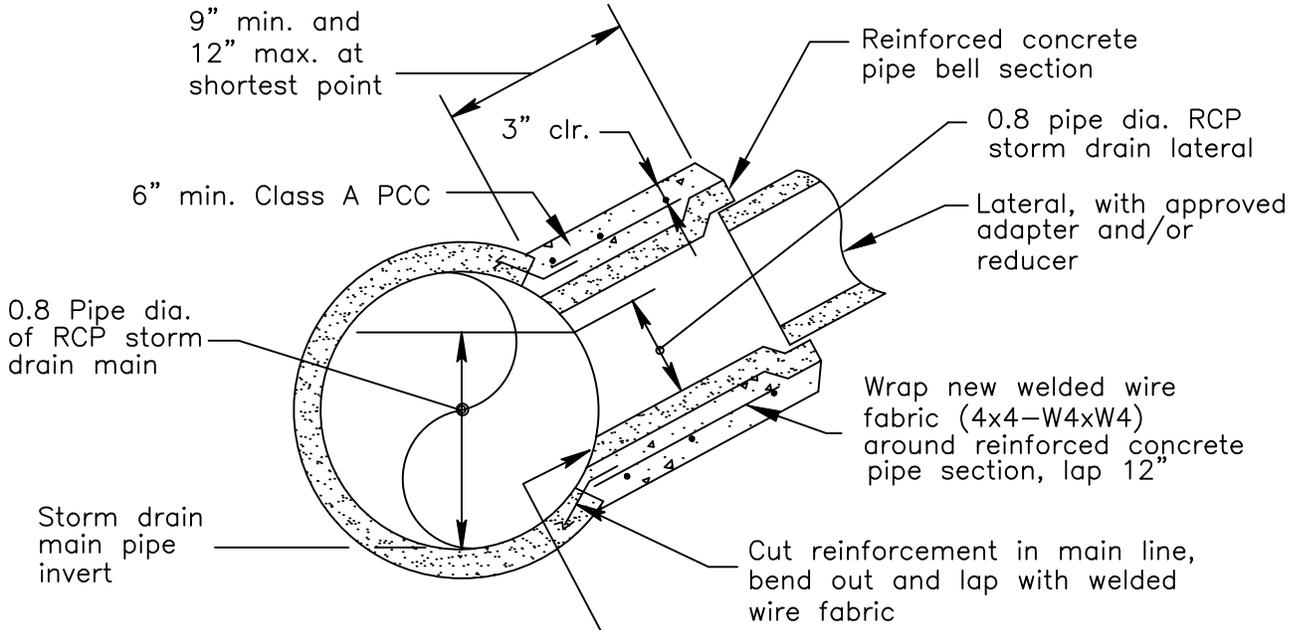
S09C.DWG

STORM WATER  
FIELD DROP INLET  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No. S-9C
Ckd: Spec. Committee	Scale: None	
 City Engineer		

Date: By: Rev:



Lateral shall be saw cut . End of lateral shall not protrude into storm drain main. Trim lateral pipe flush with inside of storm drain main.

SECTION

Notes:

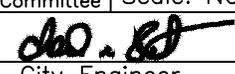
1. Maximum lateral size shall be 12".
2. Minimum existing reinforced concrete pipe storm drain main shall be 24".
3. Storm drain lateral connection to existing reinforced concrete pipe storm drain main subject to T.V. inspection by the City.
4. For storm lateral to maintenance hole, see S-2B.
5. Permitted for "on-site" lateral connections only.
6. Connection not allowed within 20' of maintenance hole or storm water inlet.
7. Minimum 12" clearance to adjacent storm drain joints.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

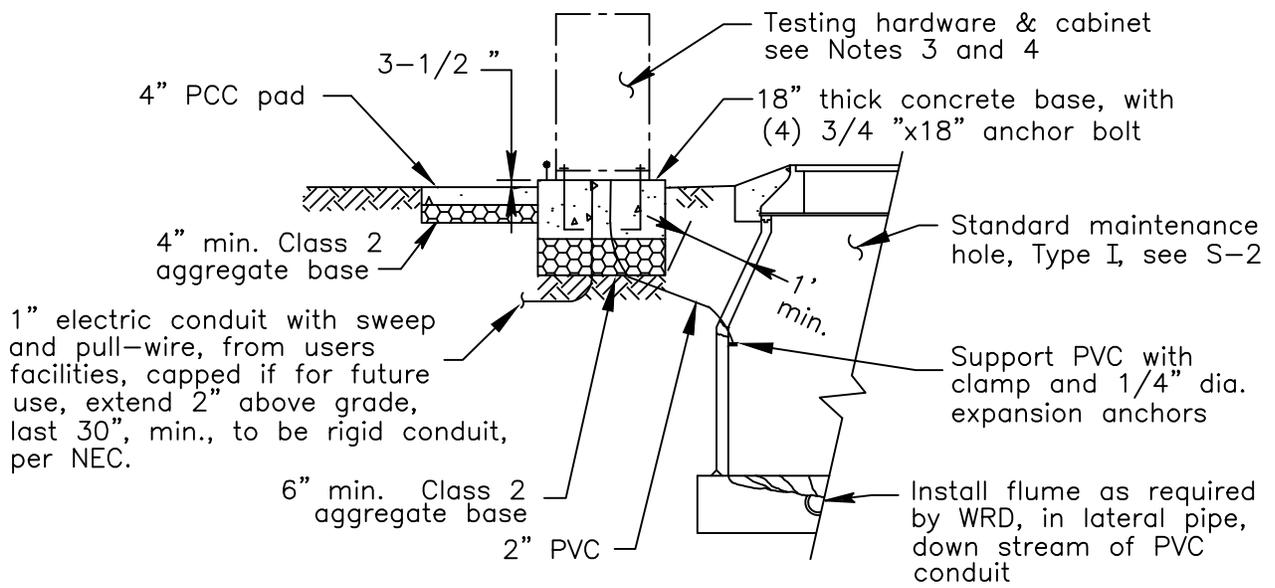
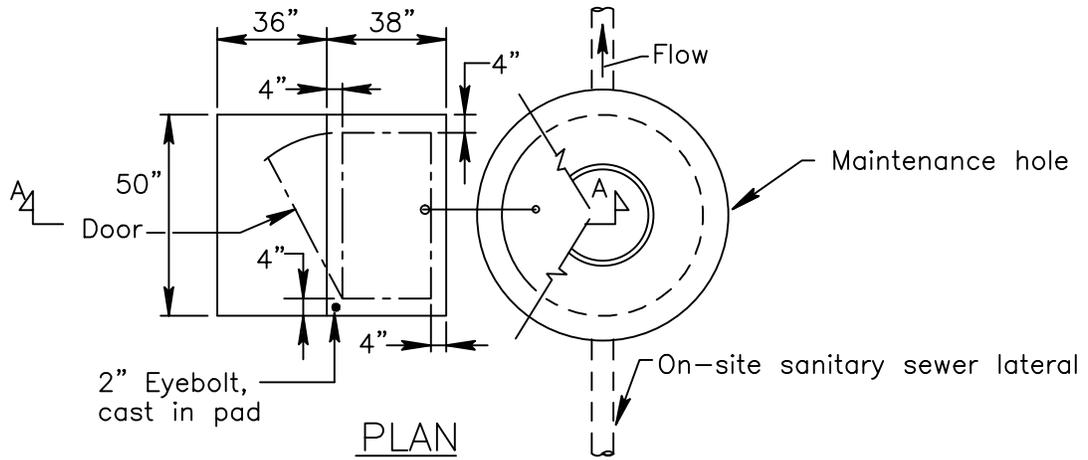
Date:	By:	Rev:

STORM DRAIN LATERAL CONNECTION TO EXISTING REINFORCED CONCRETE PIPE STORM DRAIN MAIN

CITY OF LIVERMORE STANDARD DETAIL

Dwn: M-W	Date: May-13	No. S-10
Ckd: <small>Spec. Committee</small>	Scale: None	
 City Engineer		

S10.DWG



SECTION A-A

Notes:

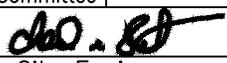
1. Detail applies to all industrial users and large commercial users, as determined by the Water Resources Division.
2. Install sampling station at location approved by Water Resources Division.
3. Testing hardware and cabinet (CAL-TRANS Type P) to be installed only when required by Water Resources Division Discharge Permit.
4. Testing hardware to be approved by the Water Resources Division.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

S11.DWG

Date:	By:	Rev:

SEWAGE SAMPLING STATION

CITY OF LIVERMORE STANDARD DETAIL		
Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-11
 City Engineer		

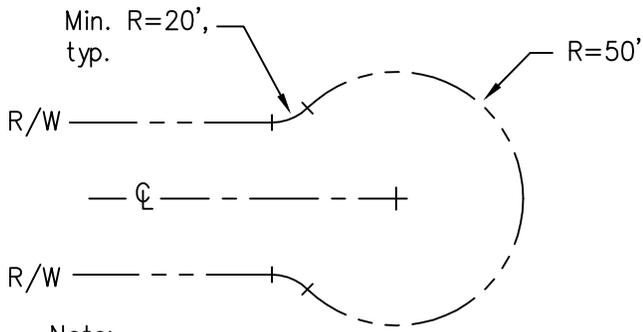
# CITY OF LIVERMORE

## STANDARD DETAILS

### TABLE OF CONTENTS

#### STREETS - ST

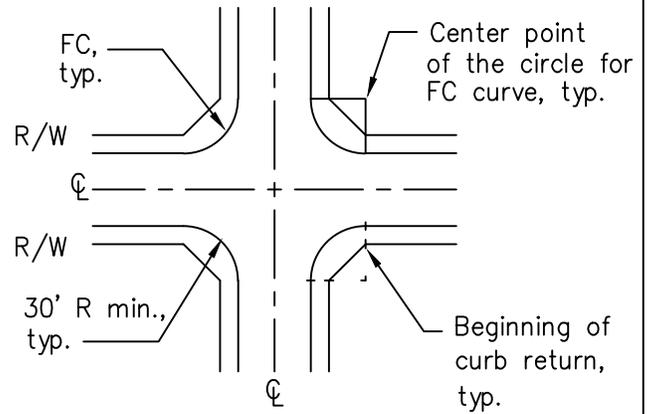
DETAIL NO.	TITLE
ST-1	CUL-DE-SAC, CURB RETURNS, AND ELBOWS; HAMMERHEADS AND TEMPORARY TURNAROUND
ST-2	STREET WIDTHS; PARTIAL STREET SECTION
ST-3	MONOLITHIC SIDEWALK (RESIDENTIAL/INDUSTRIAL)
ST-4	SEPARATED SIDEWALK AND DRIVEWAY (RESIDENTIAL)
ST-5	SIDEWALK (COMMERCIAL/INDUSTRIAL)
ST-6	DRIVEWAY (STREET-LEVEL)
ST-7	DRIVEWAY (RESIDENTIAL)
ST-8	DRIVEWAY (COMMERCIAL/INDUSTRIAL)
ST-9	CURB & GUTTER, MEDIAN CURB
ST-10	TEXTURED CONCRETE PAVING
ST-11	STREET SECTION
ST-12	UTILITY LOCATIONS
ST-13	MONUMENT
ST-14	STANDARD STREET LIGHT; DECORATIVE STREET LIGHT
ST-15	BUS TURNOUT
ST-16	VALLEY GUTTER
ST-17	ROADSIDE SIGN/POST INSTALLATION
ST-18	STREET NAME SIGN AND W53 SPECIAL SIGN
ST-19	NUMBER NOT USED
ST-20	PRIVATE PROPERTY/CITY OFF-STREET SIGNS
ST-21	BARRICADES
ST-22	MEDIAN CONSTRUCTION
ST-23	REMOVABLE BOLLARD
ST-24	MAIL BOX INSTALLATION
ST-25	PAVEMENT WIDENING, CONNECTIONS; OVERLAY
ST-26	CROSSWALK/STOP BAR INSTALLATION
ST-27	BIKE LANES, SIGNS
ST-28	SIDEWALK DRAIN
ST-29	CHAIN LINK FENCE
ST-30	PEDESTRIAN WALKWAY
ST-31	SIDEWALK REPAIR
ST-32	SIDEWALK GRINDING REPAIR



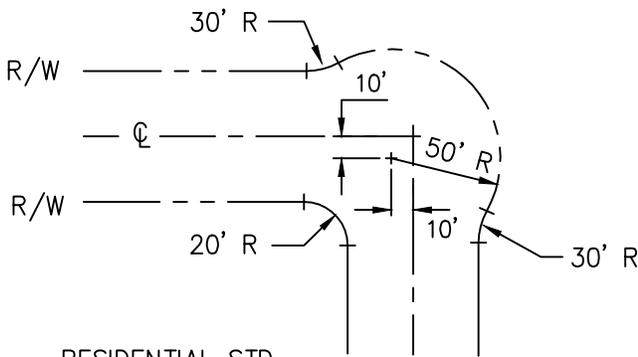
Note:

Cul-de-sac radius point may be offset from centerline.

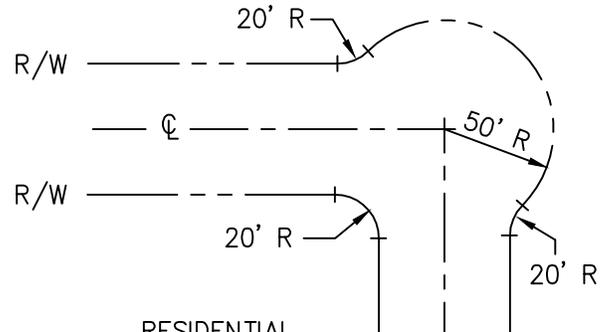
CUL-DE-SAC



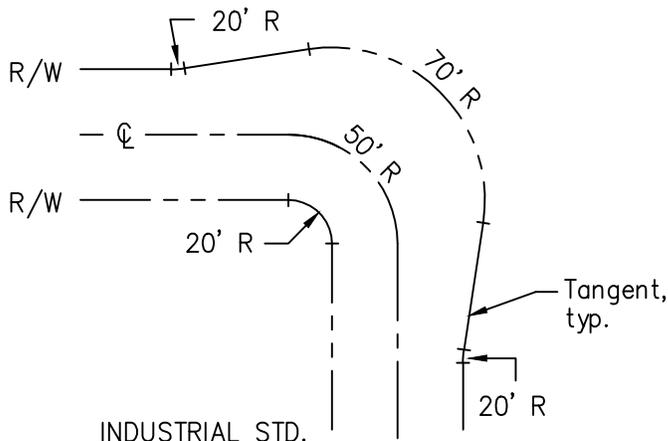
CURB RETURN



RESIDENTIAL STD.



RESIDENTIAL Alternate



INDUSTRIAL STD.

ELBOWS

Notes:

1. Radii shown are minimums.
2. See ST-2A thru ST-2D for standard street widths.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

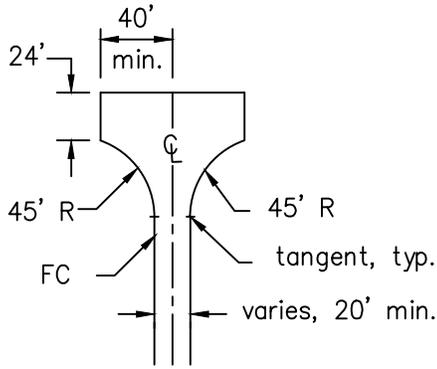
ST01A.DWG

Date	By	Rev.

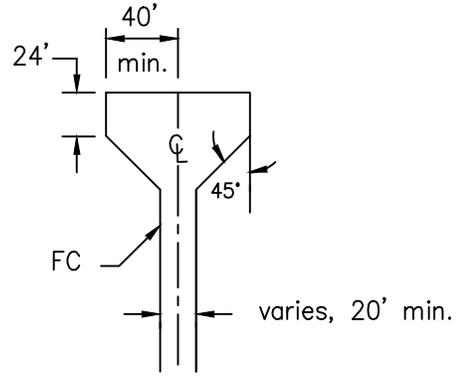
CUL-DE-SAC,  
CURB RETURN,  
AND ELBOWS

CITY OF LIVERMORE  
STANDARD DETAIL

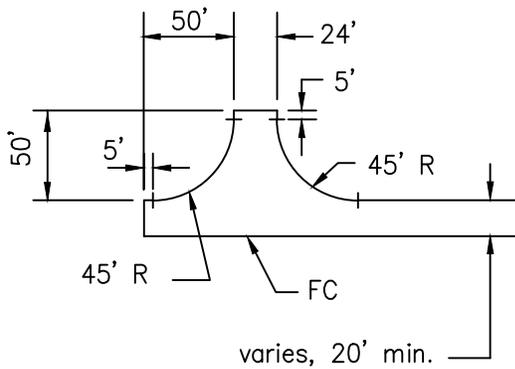
Dwn: KY/KR	Date: May-13	NO.  ST-1A
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		



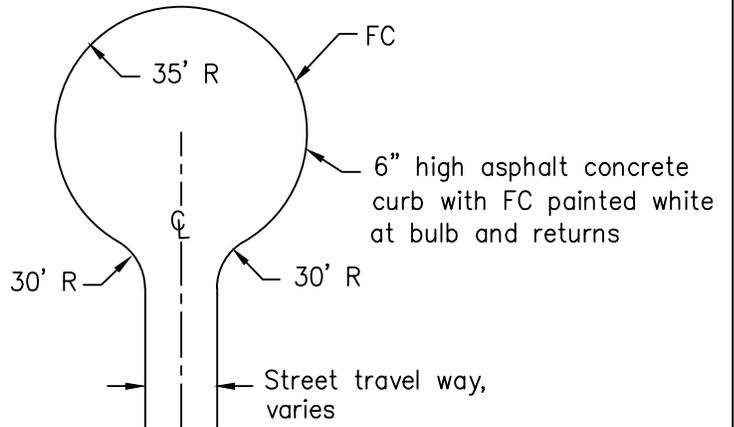
"T" HAMMERHEAD



"T" HAMMERHEAD  
(CHAMFER ALTERNATIVE)



DOG LEG HAMMERHEAD



Cul-de-sac radius point may be offset from center

TEMPORARY TURNAROUND

Notes:

1. Radii shown are minimums.
2. See ST-2A thru ST-2D for standard street widths.
3. These hammerheads are not standard design practice to be used in lieu of cul-de-sac. Hammerheads are only used on case by case basis as approved by the City.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

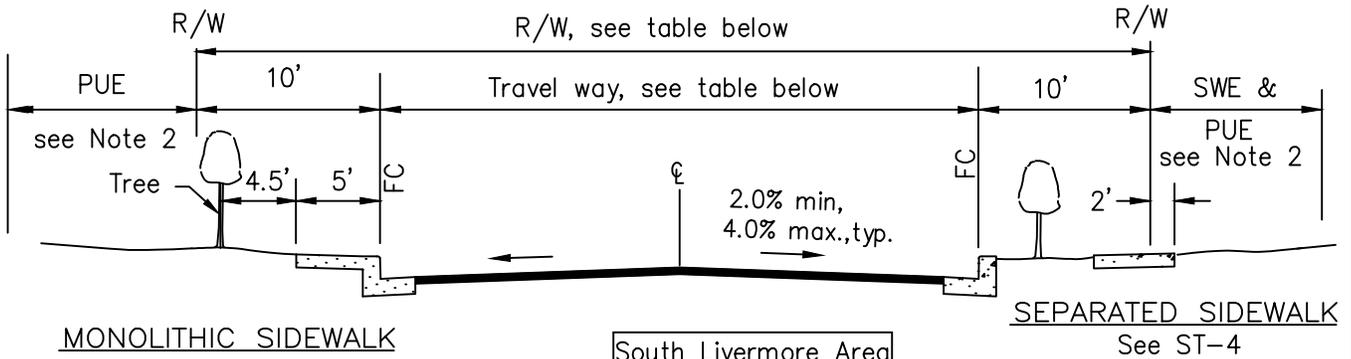
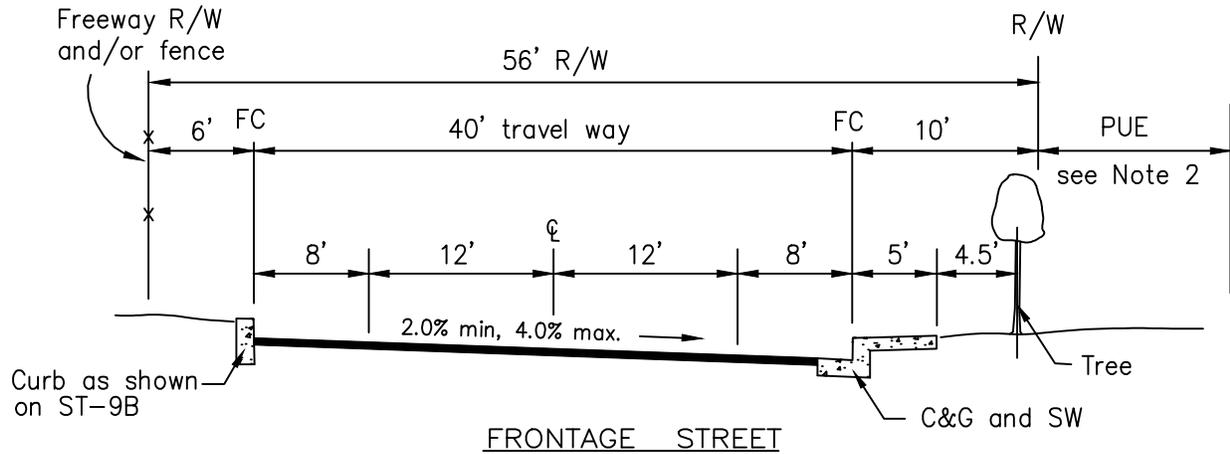
ST01B.DWG

Date	By	Rev.

HAMMERHEADS  
AND  
TEMPORARY TURNAROUND

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-1B



South Livermore Area  
Transition Area Only

Street type	*Travel way	* R/W	**Travel way	** R/W	Guideline Criteria
Local street	40'	60'	32'	52'	Planned to serve more than 50 units, each direction
Local street, with parking on one side	32'	52'	25'	45'	No homes fronting on one side of the street
Local street, with no parking	26'	27'	-	-	Planned to serve less than 20 units ***
Minor Local street, Cul-De-Sac, and Loops	36'	56'	32'	52'	Planned to serve 20 to 50 units, each direction
Short Cul-De-Sac	32'	52'	32'	52'	Planned to serve less than 20 units

\* The approved tentative map will determine actual street widths.  
This table is intended to be a guideline only.

\*\* R/W and Travel way dimensions is reduced for developments in the specific plan area.

\*\*\* Street to have monolithic sidewalk on both sides of street within 6' wide sidewalk/public utility easements adjacent to right-of-way

LOCAL STREET AND CUL-DE-SAC

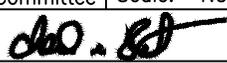
See ST-2E for notes

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

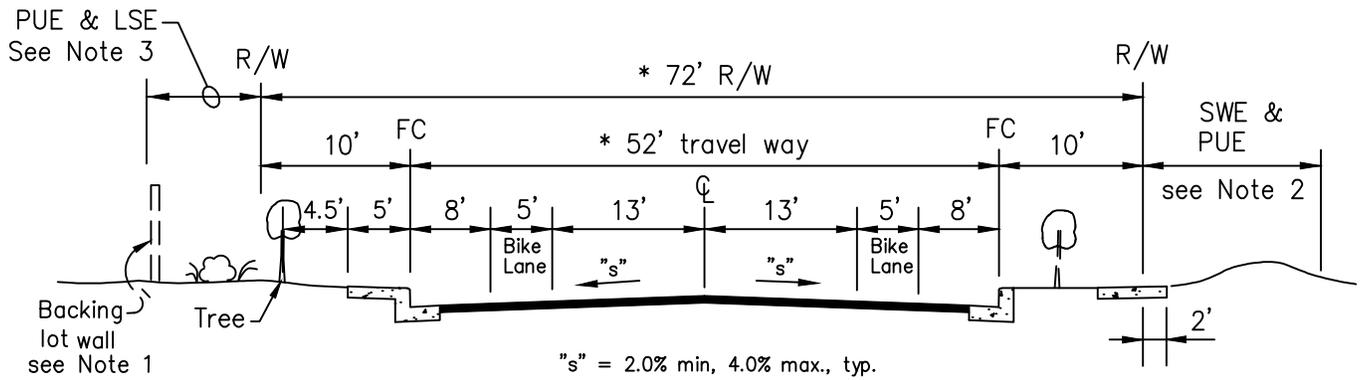
STREET WIDTHS  
(FRONTAGE, LOCAL & CUL-DE-SAC)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-2A

ST02A.DWG

Date	By	Rev.



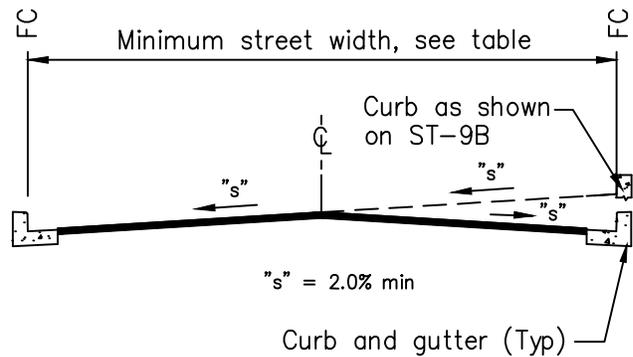
MONOLITHIC SIDEWALK  
See ST-3

COLLECTOR STREET  
(RESIDENTIAL)

SEPARATED SIDEWALK  
See ST-4

\* For collector streets with parking on one side of the street, street width may be reduce to 66' R/W and 46' travel way.

Minimum street width	
Private street with parallel parking on both sides	36'
Private street with parallel parking on one side	33'
Private street (No parking on either side)	24'
Private alley (No parking on either side)	20'



PRIVATE RESIDENTIAL STREET AND  
PRIVATE RESIDENTIAL TOWNHOUSE/CONDOMINIUM STREET

See ST-2E for notes

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST02B.DWG

STREET WIDTHS  
(COLLECTOR AND PRIVATE STREETS)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-2B

Date	By	Rev.
------	----	------

ST02C-R1.DWG

Date	By	Rev.

# STREET WIDTHS (MAJOR STREETS)

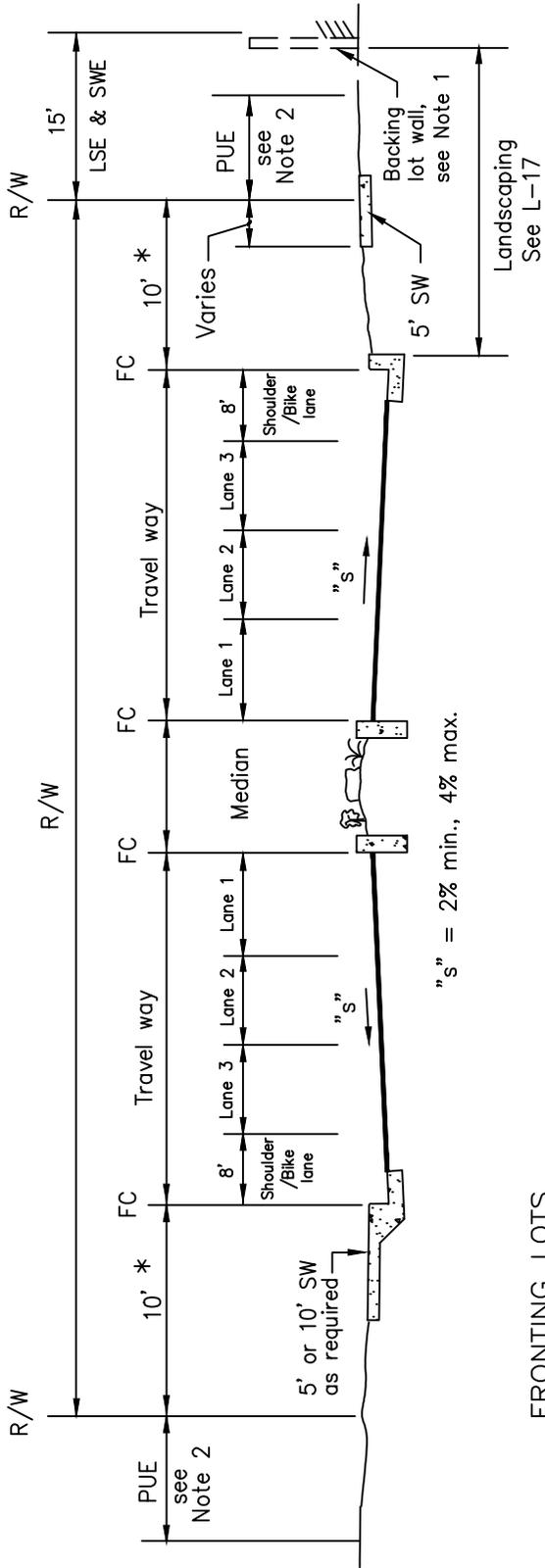
## CITY OF LIVERMORE STANDARD DETAIL

Dwn: KY      Date: May-13  
 Ckd: Spec. Committee      Scale: NONE

*[Signature]*  
 City Engineer

NO.

ST-2C



FRONTING LOTS  
MONOLITHIC SIDEWALK  
 (INDUSTRIAL OR COMMERCIAL ONLY)

BACKING LOTS  
SEPARATED, MONOLITHIC OR  
MEANDERING SIDEWALK AS REQUIRED

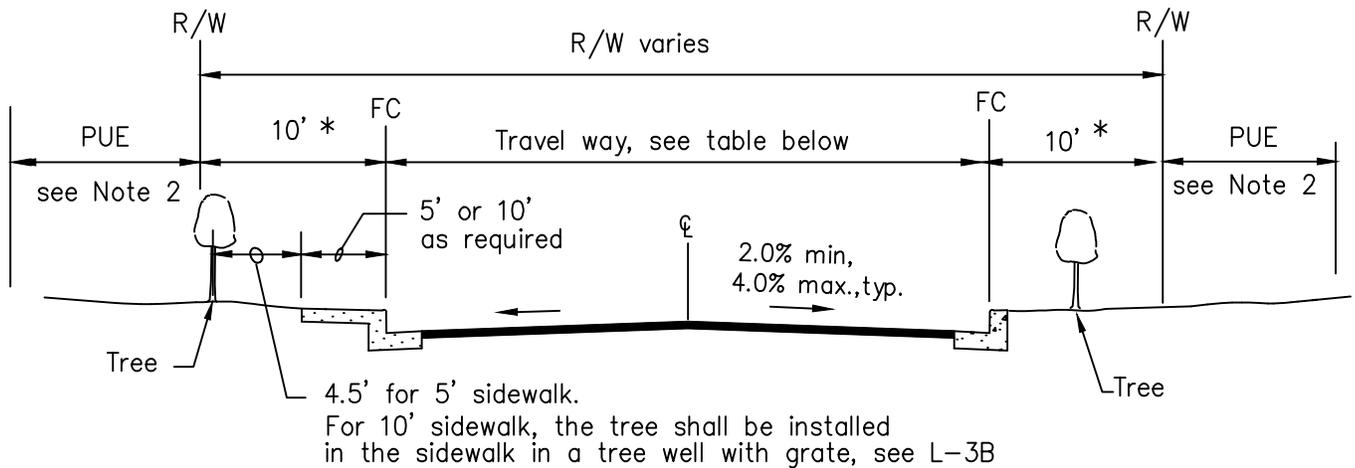
MAJOR STREET

Total Travel Lanes	* * R/W	Travel way					Median	
		Shoulder/Bike Lane width	Lane 1 width	Lane 2 width	Lane 3 width	Total	Single Left Turn	Dual Left Turn
4	104'	8'	14'	12'	-	34'	16'	-
4	116'	8'	14'	12'	-	34'	-	28'
6	128'	8'	14'	12'	12'	46'	16'	-
6	140'	8'	14'	12'	12'	46'	-	28'

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

\* Dimension is one (1) foot on Business and Commercial Park (BCP) frontages  
 \*\* Right of way (R/W) dimensions reduced in Business and Commercial Park (BCP) per Policy Proposal No. 160-98.

See ST-2E for notes.



MONOLITHIC SIDEWALK  
(ONE SIDE ONLY)  
See ST-3

Street type	Travel way	R/W	Remarks
Industrial/ Commercial	40' min.	60' min.	1. Two lane street, with no left turn lane.
	52' min.	72' min.	1. Two lane street. with left turn lane.

INDUSTRIAL/COMMERCIAL STREET

\* Dimension is one (1) foot in Business and Commercial Park (BCP) per Policy Proposal No. 160-98.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

See ST-2E for notes

STREET WIDTHS  
(INDUSTRIAL/COMMERCIAL)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-2D

ST02D-R1.DWG

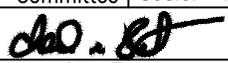
Date	By	Rev.

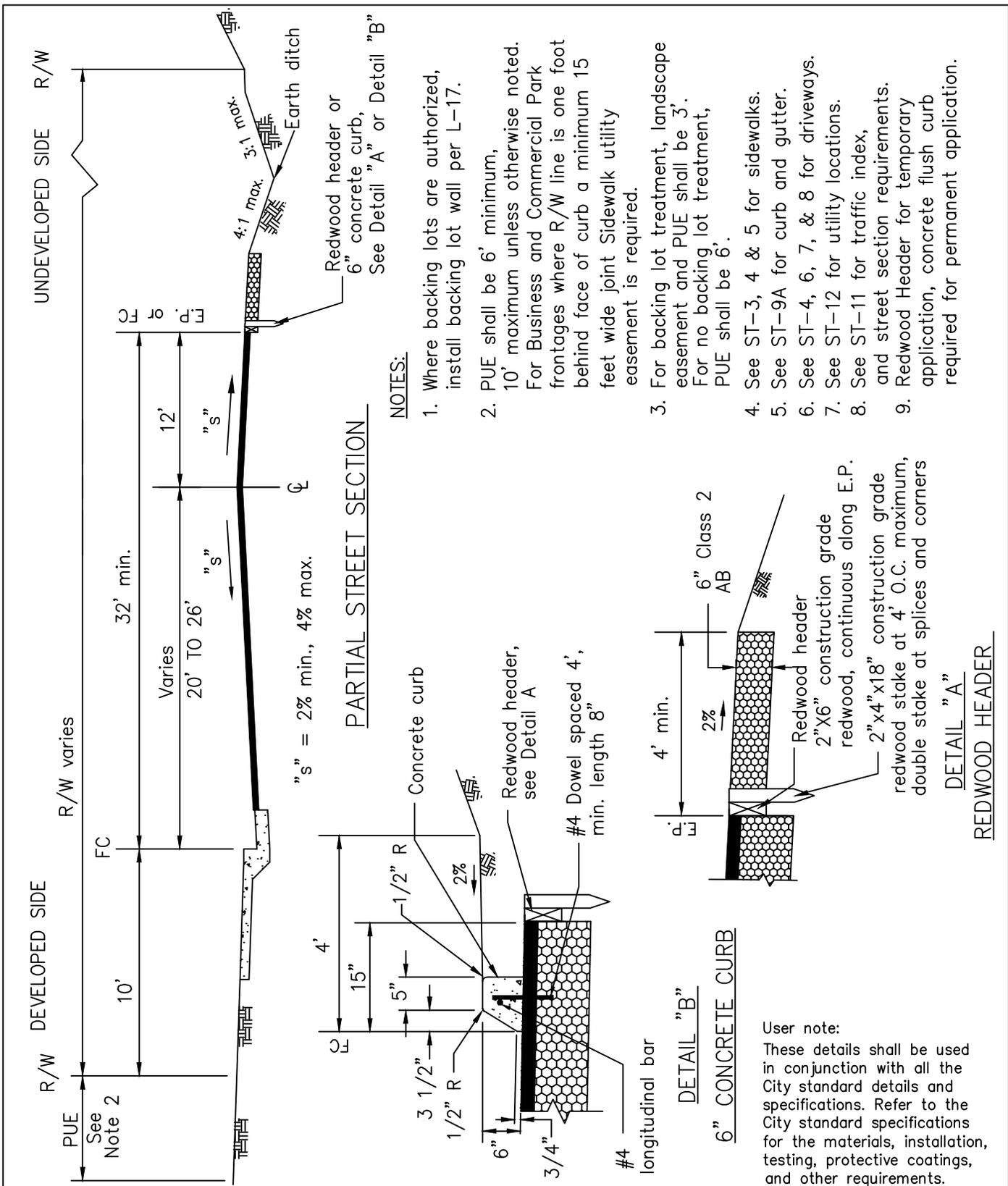
ST02E.DWG

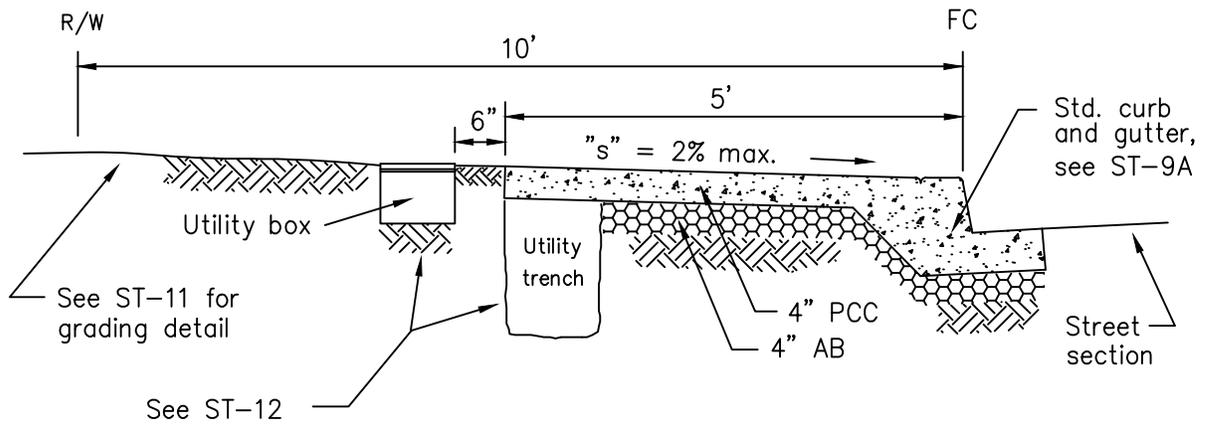
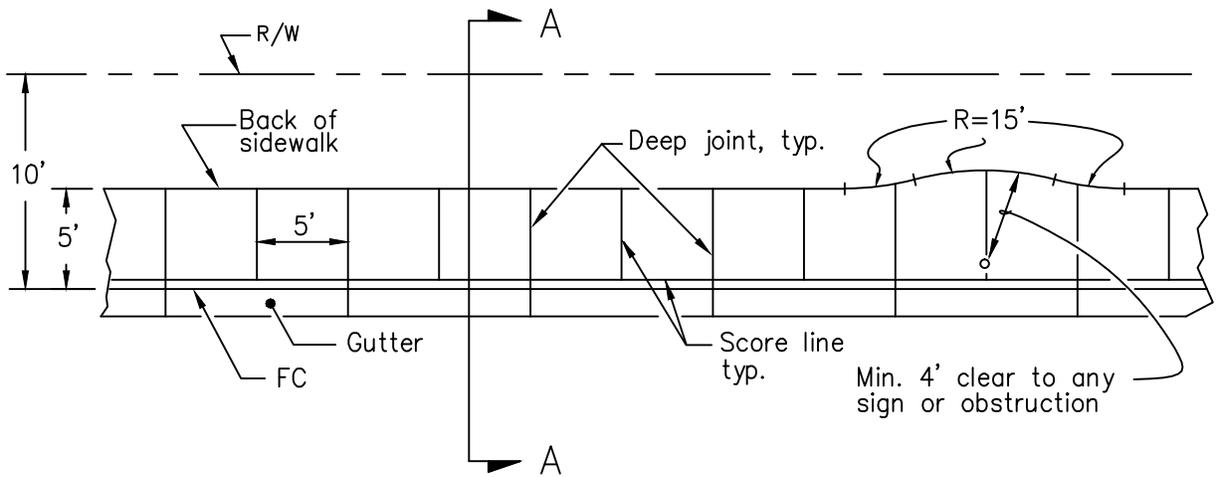
Date	By	Rev.

STREET WIDTH  
(PARTIAL STREET SECTION FOR TEMP  
40' TO 52' TRAVEL WAY STREETS)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-2E





SECTION A-A

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

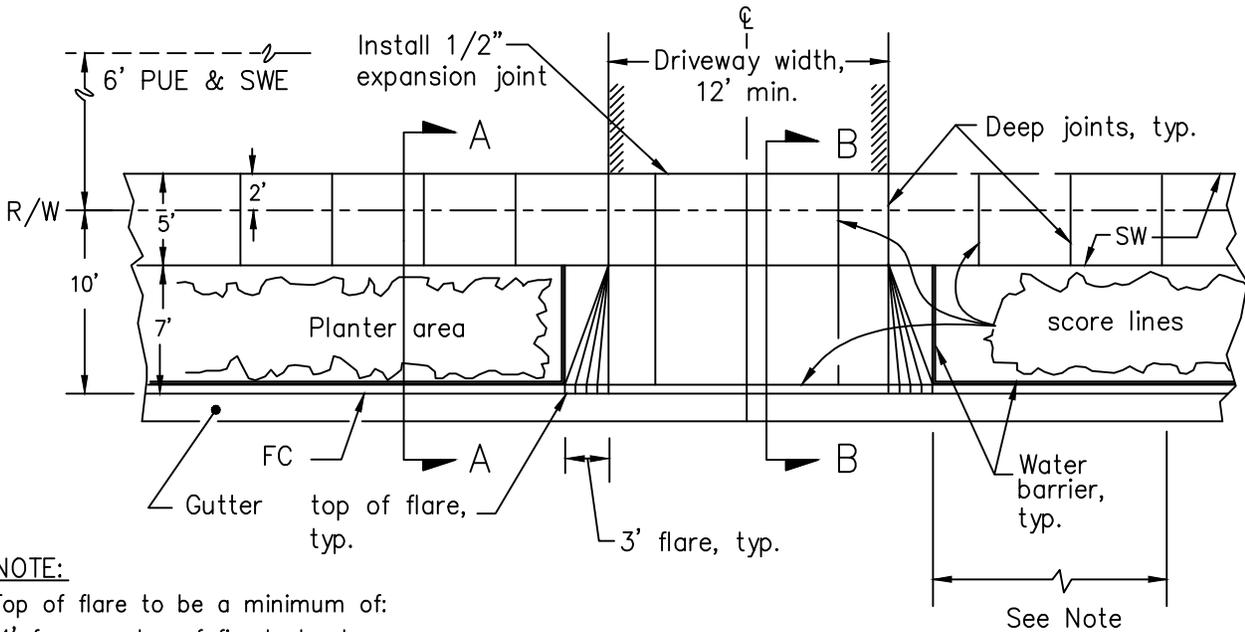
ST03.DWG

Date	By	Rev.

MONOLITHIC SIDEWALK  
 (RESIDENTIAL/INDUSTRIAL)

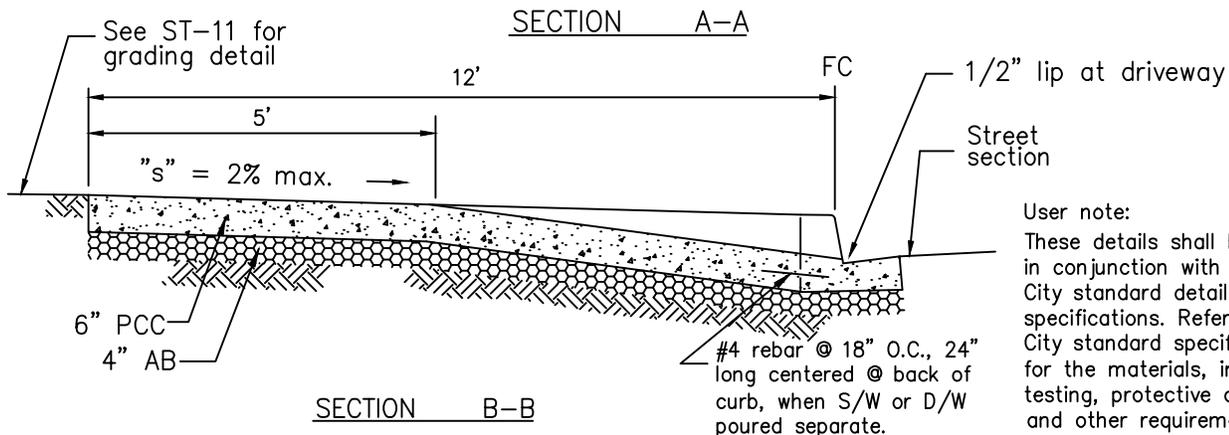
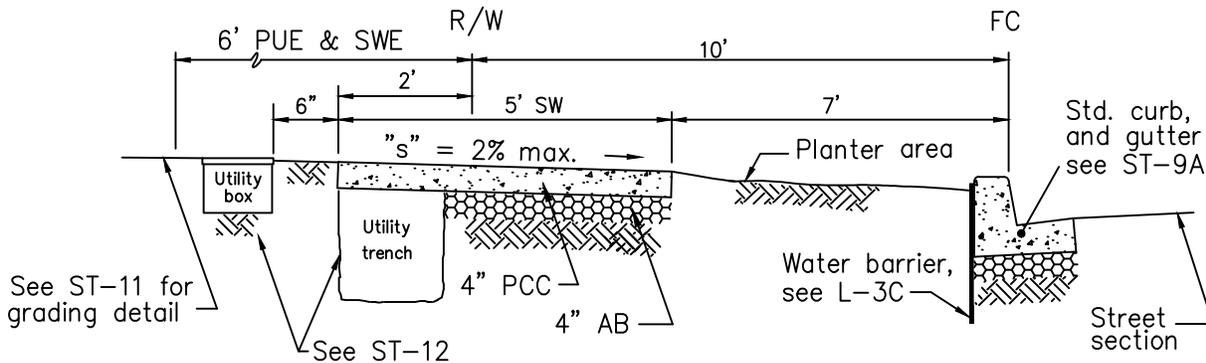
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.  ST-3
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		



**NOTE:**

- Top of flare to be a minimum of:
- 4' from center of fire hydrant
- 4' from center of street light
- 4' from property line
- 10' from beginning of curb return
- 8' from center of street tree
- 4' from top of flare of other driveway



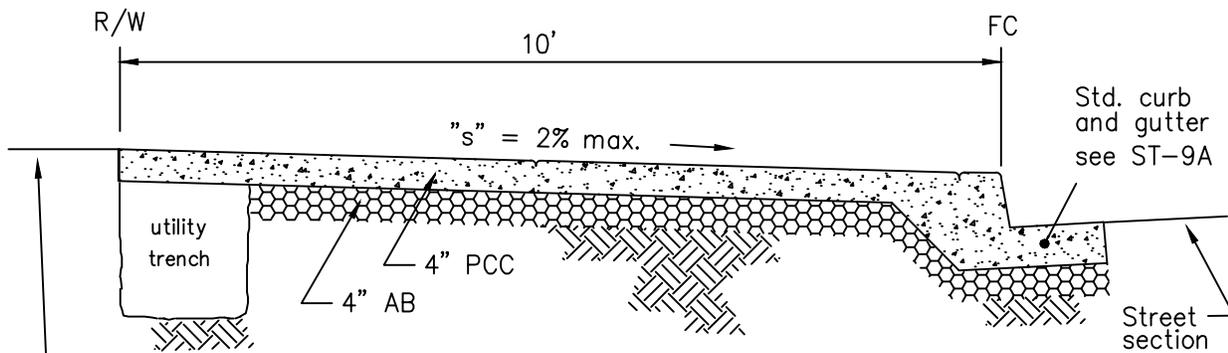
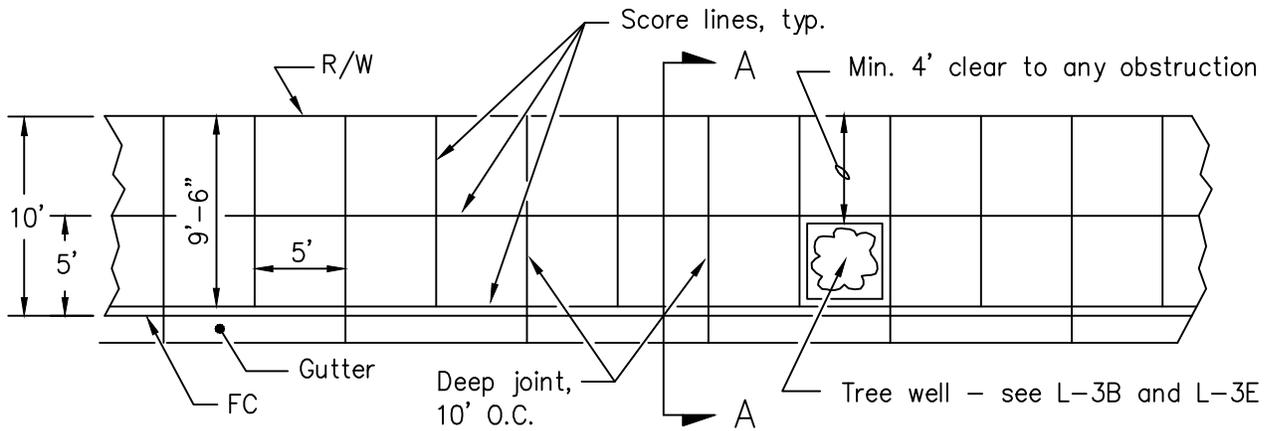
**User note:**  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST04.DWG			
Date	By	Rev.	

# SEPARATED SIDEWALK AND DRIVEWAY (RESIDENTIAL)

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
City Engineer		ST-4



Utility boxes to be placed in PUE behind sidewalk where applicable, see ST-12 for placement of utility trench and boxes.

SECTION A-A

User note:

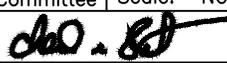
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST05.DWG

Date	By	Rev.

SIDEWALK  
(COMMERCIAL/INDUSTRIAL)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KR/KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-5

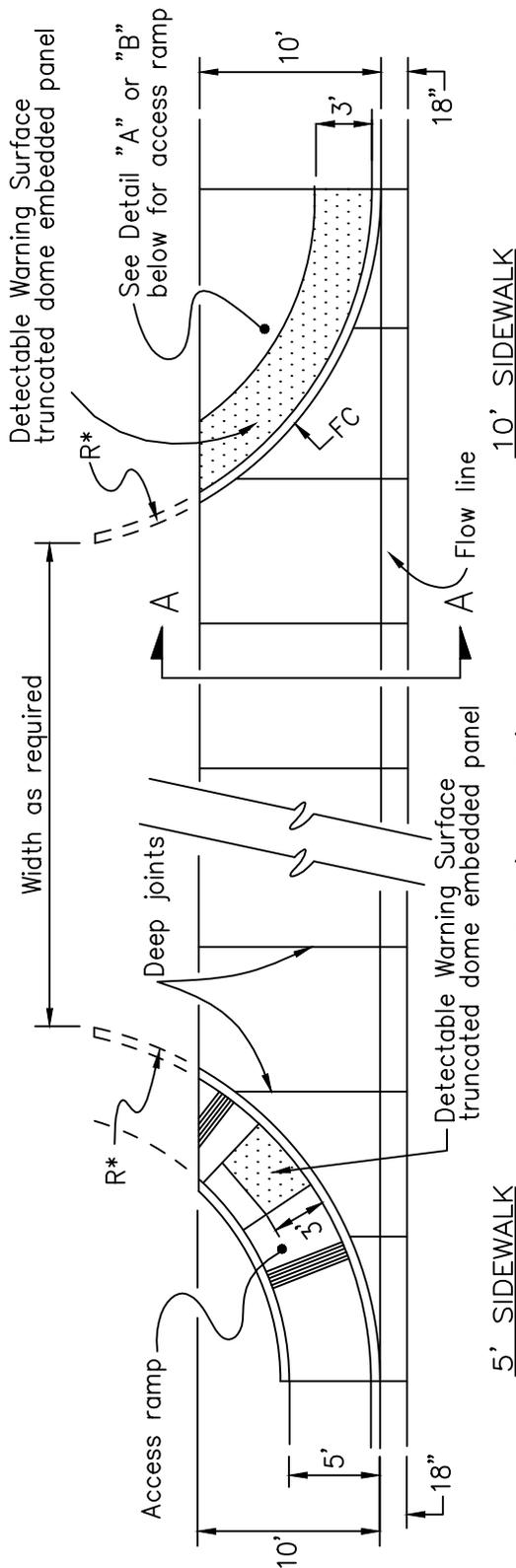
ST06.DWG

Date	By	Rev.

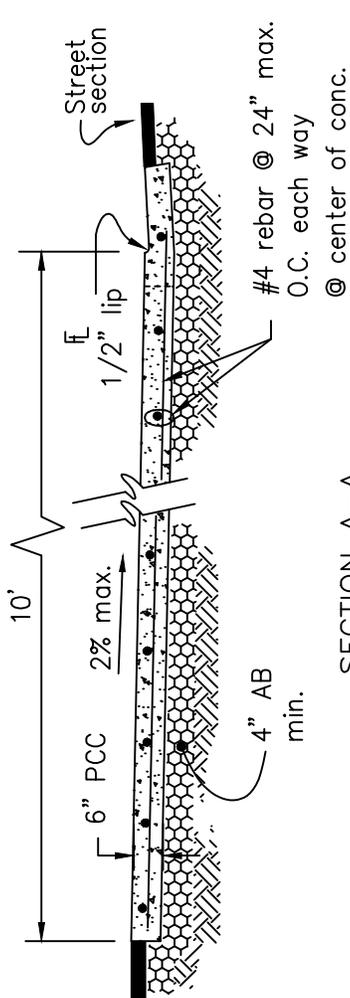
DRIVEWAY  
(STREET-LEVEL)  
(INDUSTRIAL/COMMERCIAL)

CITY OF LIVERMORE  
STANDARD DETAIL

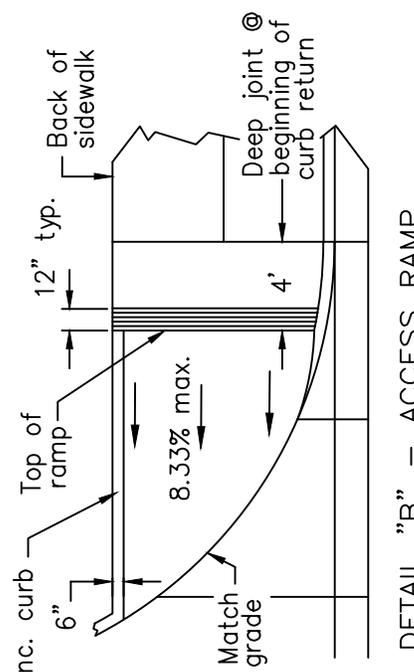
Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-6



\* R=20' min., 30' max.



SECTION A-A



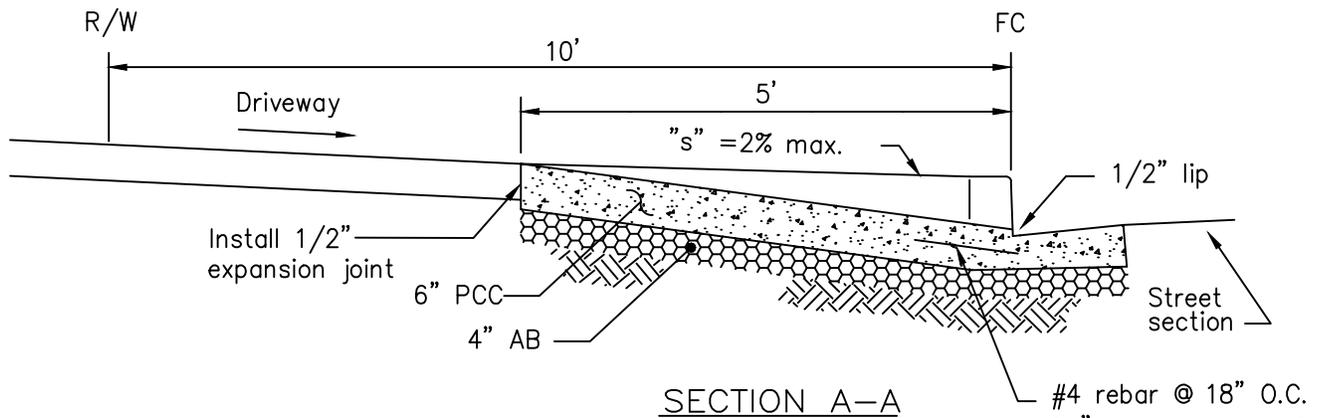
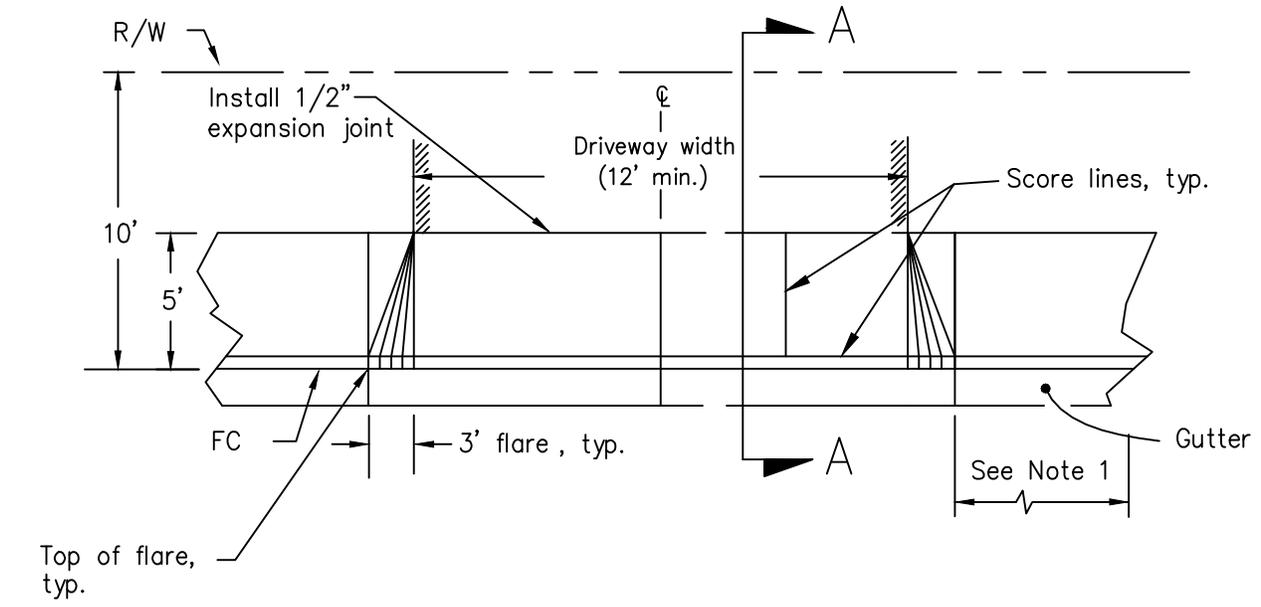
Notes:

1. See ST-3, ST-5 for sidewalk details
2. See Caltrans Curb Ramp Detail A88A for additional details and requirements.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

DETAIL "A" - ACCESS RAMP

DETAIL "B" - ACCESS RAMP



**NOTES:**

1. Top of flare to be a minimum of:
  - 4' from center of fire hydrant
  - 4' from center of street light
  - 4' from property line
  - 10' from beginning of curb return
  - 8' from center of street tree
  - 4' from top of flare of other driveway
2. See ST-3 for sidewalk.
3. The driveway shall be symmetric about the centerline.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

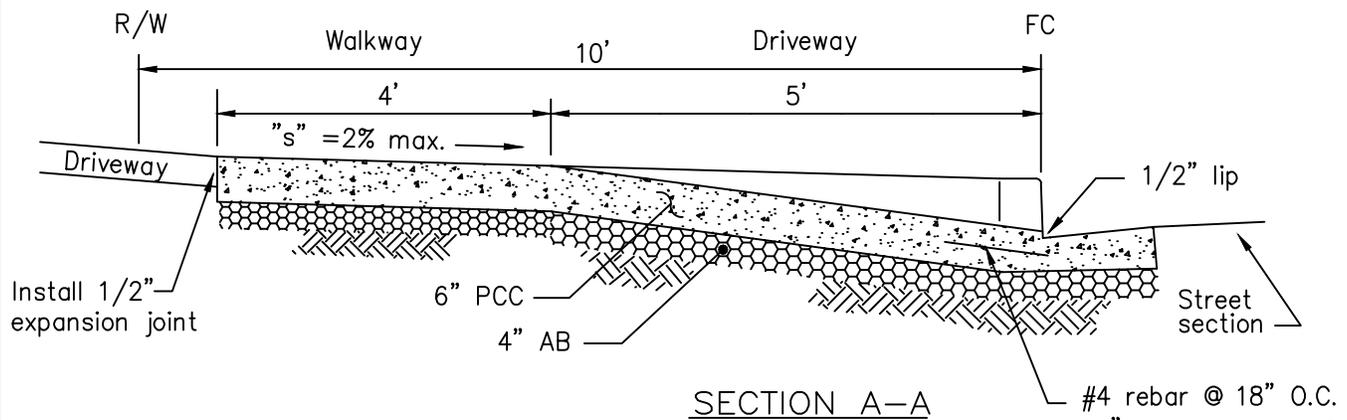
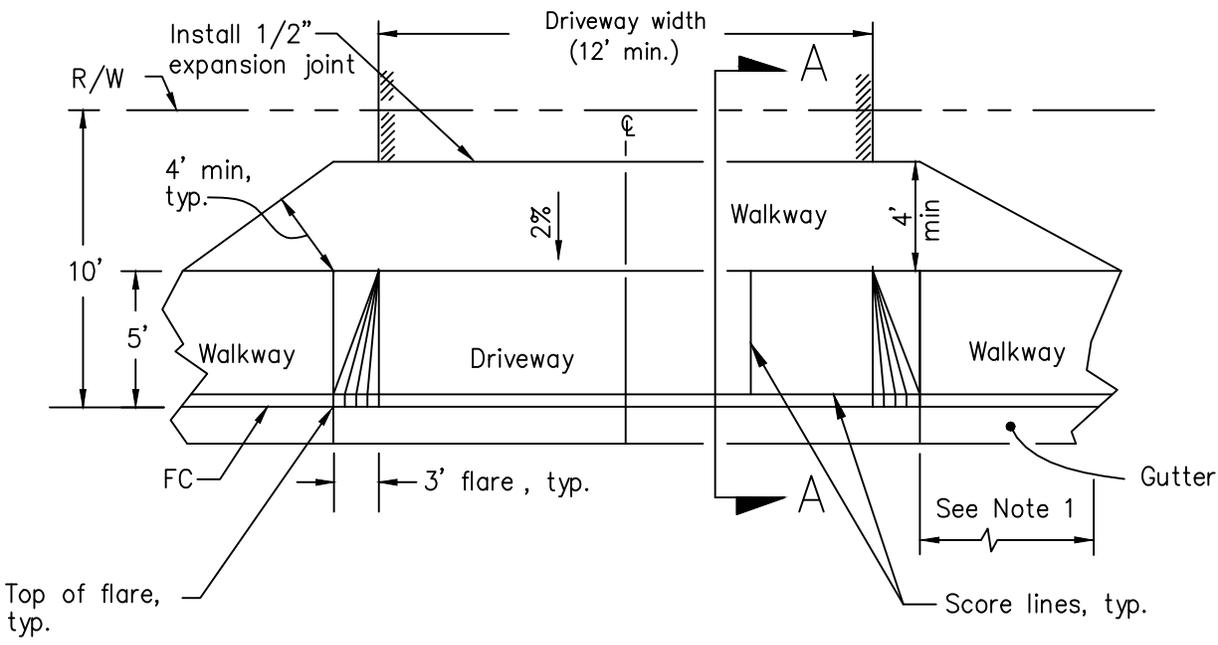
ST07A.DWG

Date	By	Rev.

DRIVEWAY  
EXISTING DEVELOPMENT  
(RESIDENTIAL)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-7A



**NOTES:**

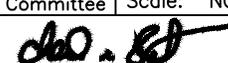
1. Top of flare to be a minimum of:
  - 4' from center of fire hydrant
  - 4' from center of street light
  - 4' from property line
  - 10' from beginning of curb return
  - 8' from center of street tree
  - 4' from top of flare of other driveway
2. See ST-3 for sidewalk.
3. The driveway shall be symmetric about the centerline.

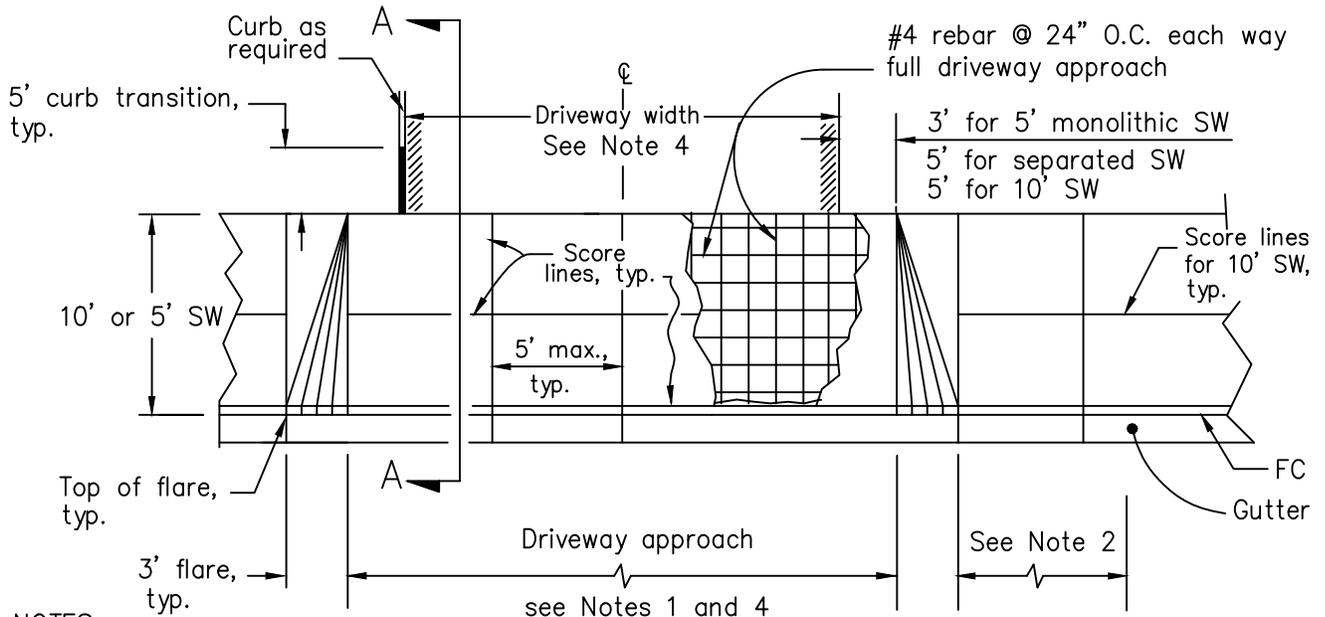
**User note:**  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST07B.DWG

Date	By	Rev.

DRIVEWAY - NEW DEVELOPMENT  
 (RESIDENTIAL)

CITY OF LIVERMORE STANDARD DETAIL		
Dwn: FY	Date: May-13	NO.
Kcd: Spec. Committee	Scale: NONE	ST-7B
 City Engineer		

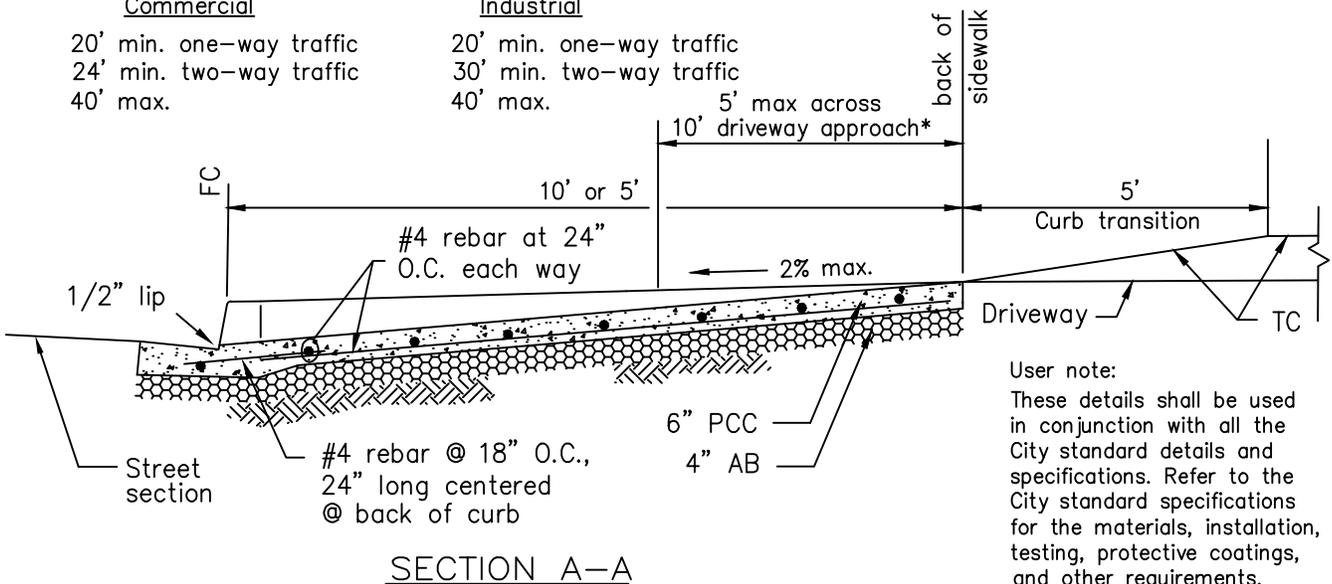


**NOTES:**

1. Driveway approach to be 10' min. wider than the driveway width for 10' monolithic SW or 5' separated SW and 6' min. wider than the driveway width for 5' SW.
2. Top of flare to be a minimum of:
  - 10' from center of fire hydrant
  - 4' from center of street light
  - 4' from property line
  - 10' from beginning of curb return
  - 8' from center of street tree
  - 4' from top of flare of other driveway
3. See ST-3 & ST-5 for sidewalk.
4. Driveway width:

Commercial	Industrial
20' min. one-way traffic	20' min. one-way traffic
24' min. two-way traffic	30' min. two-way traffic
40' max.	40' max.

\*For 10' driveways provide a 5' max walkway at 2% slope across back of driveway approach. For 5' driveways, see detail ST-7B for walkway behind driveway approach.



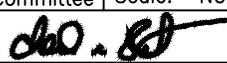
User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

SECTION A-A

DRIVEWAY

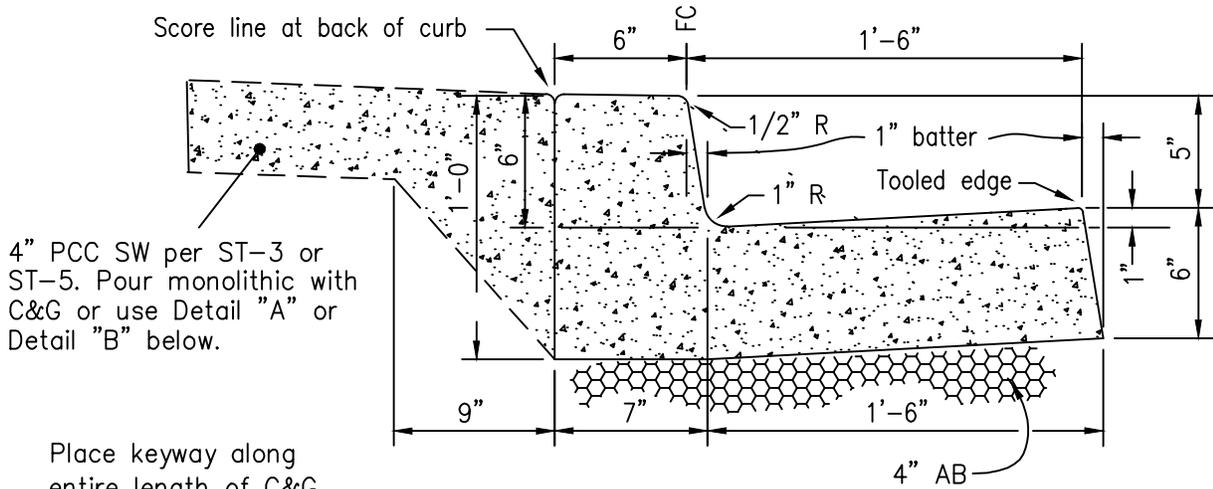
(COMMERCIAL/INDUSTRIAL)

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Kcd: Spec. Committee	Scale: NONE	
 City Engineer		ST-8

ST08.DWG

Date	By	Rev.

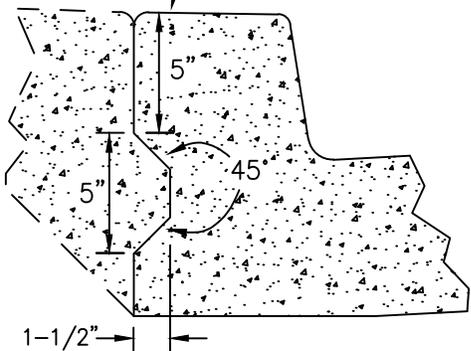


4" PCC SW per ST-3 or ST-5. Pour monolithic with C&G or use Detail "A" or Detail "B" below.

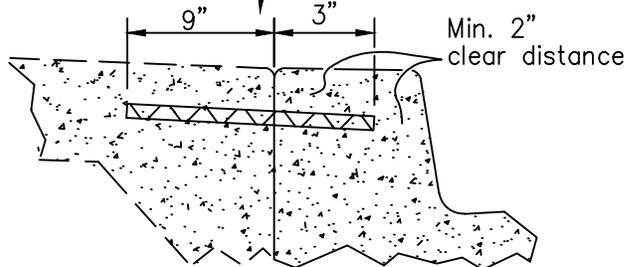
Place keyway along entire length of C&G as shown.

CURB & GUTTER

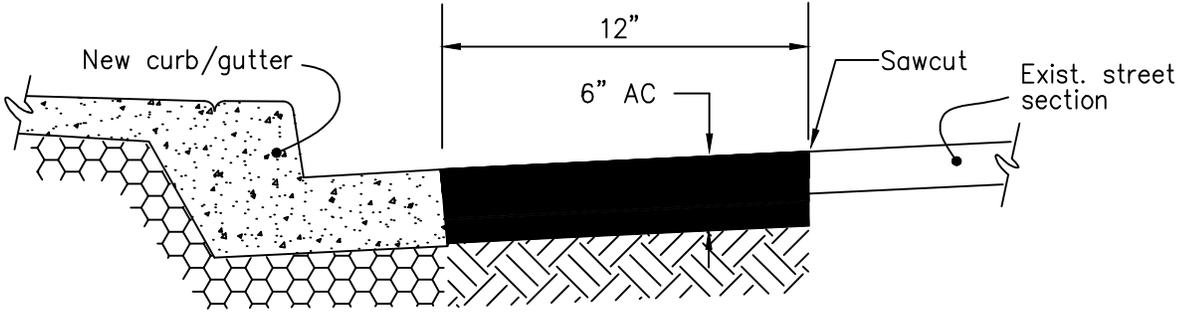
#4 rebar, 12" long. Install rebar into 3" deep hole drilled into existing curb at 3' O.C. for entire length as shown.



DETAIL "A"  
KEYWAY



DETAIL "B"  
DOWELS



NEW OR REPLACEMENT CURB & GUTTER  
AT EXISTING STREET

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

NOTE:

Curb, gutter, and sidewalk to be placed monolithically where possible. Where non-monolithic, place dowels and/or keyway as shown above.

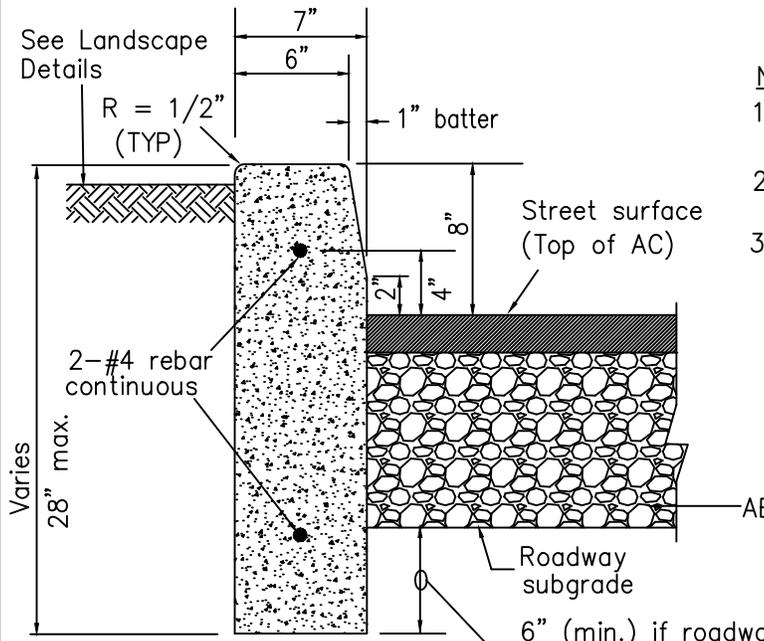
ST09A.DWG

Date	By	Rev.

CURB & GUTTER

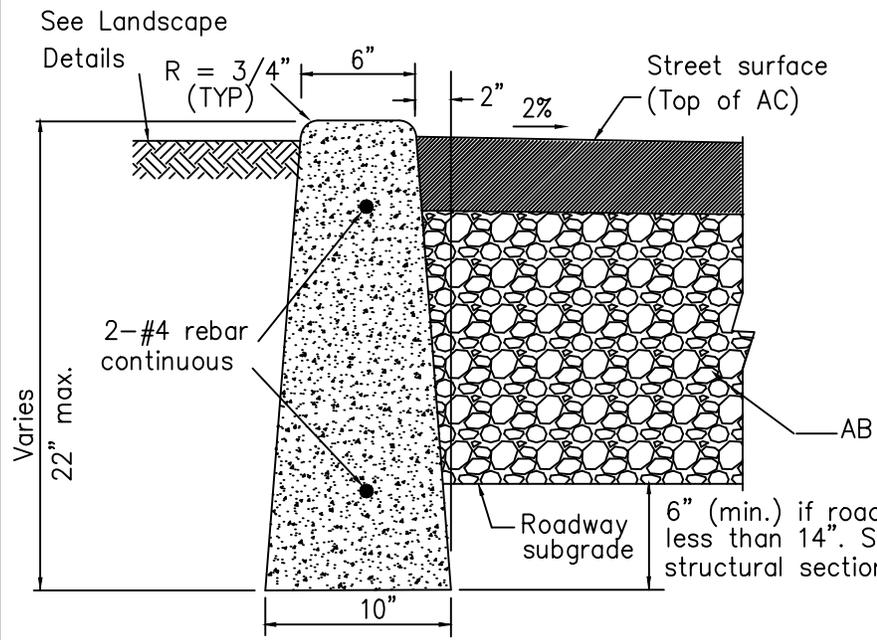
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-9A



MEDIAN CURB

- NOTES:**
1. Place deep joints at 10' spacing along median curb.
  2. See L-2B and L-2C for water barrier installation.
  3. If roadway structural section is greater than 14", install water barrier extending from top of curb to 6" below roadway subgrade. See L-2B and L-2C.



FLUSH CURB

6" (min.) if roadway structural section is less than 14". See Note 3 for roadway structural sections greater than 14".

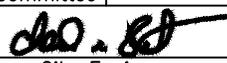
User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

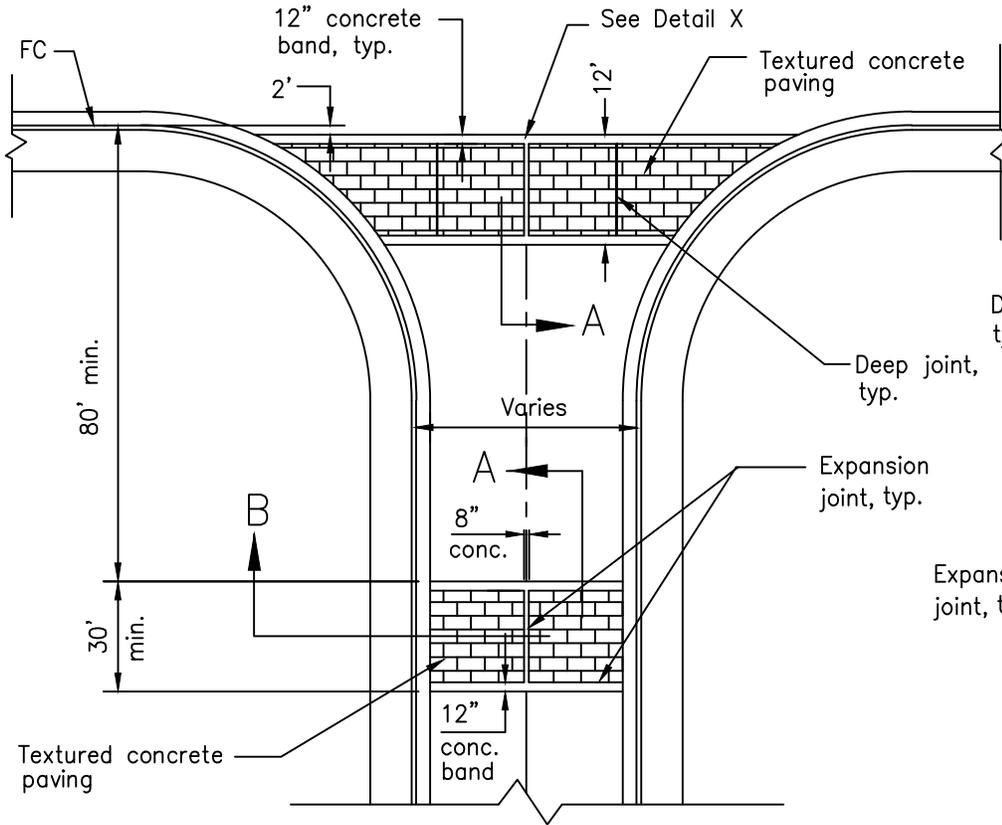
ST09B.DWG

Date	By	Rev.

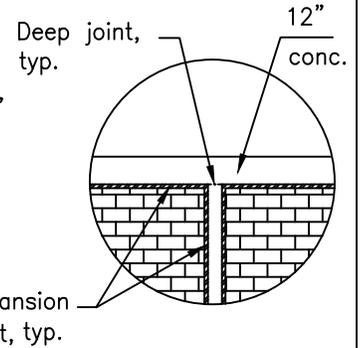
MEDIAN CURB/FLUSH CURB  
 (DEEP CURB)

CITY OF LIVERMORE  
 STANDARD DETAIL

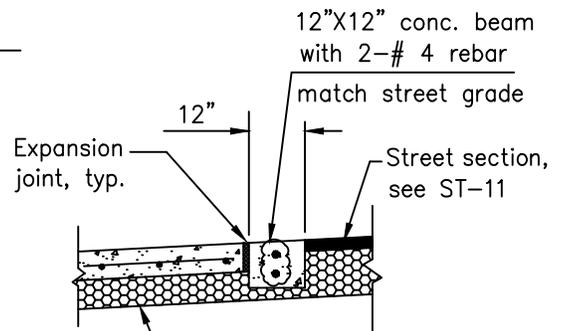
Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-9B



PLAN



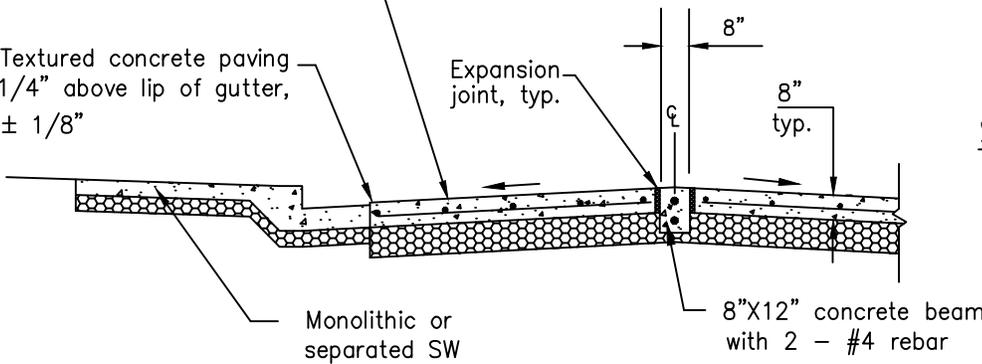
DETAIL X



SECTION "A"

Textured concrete paving  
W/ #3 rebar @ 18" O.C.  
each way, 3" clearance  
from top of concrete,  
see drawing for texture  
and color

Textured concrete paving  
1/4" above lip of gutter,  
± 1/8"



SECTION "B"

User note:  
These details shall be used  
in conjunction with all the  
City standard details and  
specifications. Refer to the  
City standard specifications  
for the materials, installation,  
testing, protective coatings,  
and other requirements.

# TEXTURED CONCRETE PAVING

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.  ST-10
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

ST10.DWG

Date	By	Rev.

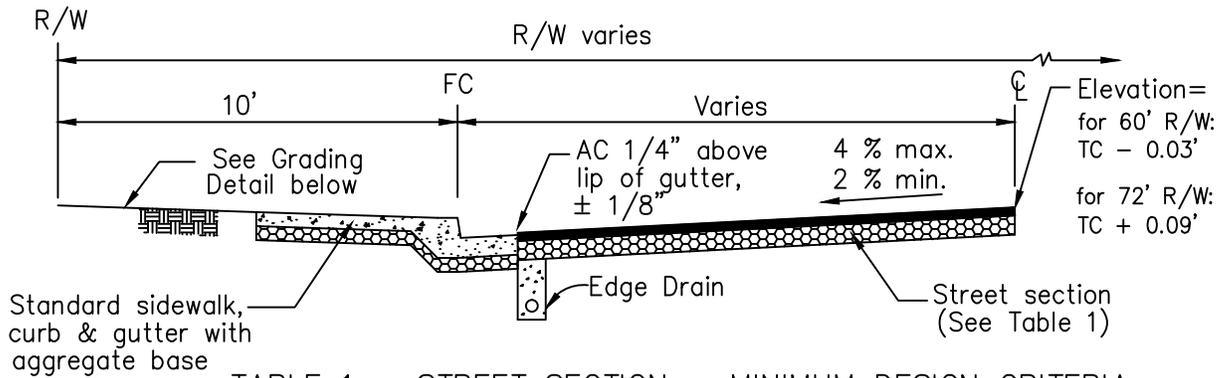


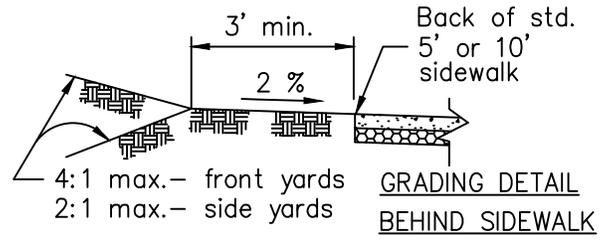
TABLE 1 - STREET SECTION - MINIMUM DESIGN CRITERIA

STREET TYPE	MIN. TRAFFIC INDEX	AC & BASE	
		MIN. AC	MIN. BASE
Private/townhouse/condo	NA	4.0"	6.0"-8.0" *
Cul-de-sac	NA	4.0"	6.0"-8.0" *
Local	NA	4.0"	6.0"-8.0" *
Collector (Residential) **	7.0	4.0"	8.0"
Major (Residential) **	9.0	5.5"	7.0"
Major (Industrial/Commercial)**	10.0	6.5"	7.0"
Frontage**	9.0	5.5"	7.0"
Industrial/Commercial**	9.0	5.5"	7.0"
Bus stops	in street area in turnout area	12" full depth AC 12" concrete. See ST-15	

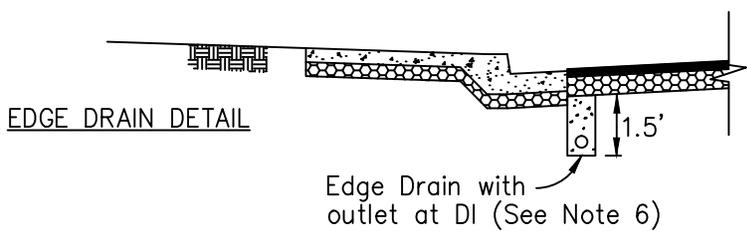
\* See Table 2 - Base Thickness Requirement  
 \*\* Street section design to be based on Caltrans flexible pavement design method  
 Submit supporting data for traffic index calculation for City Engineer's approval

NOTES:

1. See ST-3, 4 & 5 for sidewalks.
2. See ST-9A for curb and gutter.
3. See ST-4, 6, 7, & 8 for driveways.
4. See ST-12 for utility locations.
5. See ST-2 for travel way and R/W widths.
6. Edge drain required at all park frontage, and at toe of slope or as required by the City Engineer.  
 (Construct per Caltrans Standard Plan D102, Perforated Pipe Dia.=4")



Note: No retaining walls allowed within 3' of back of sidewalk.



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

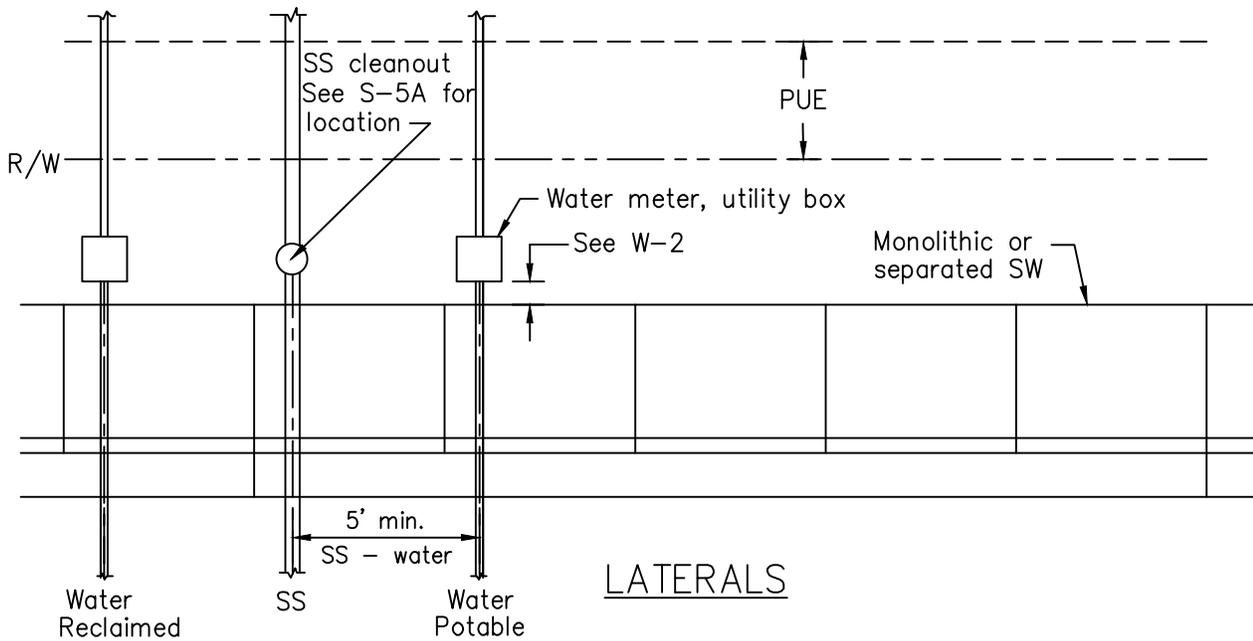
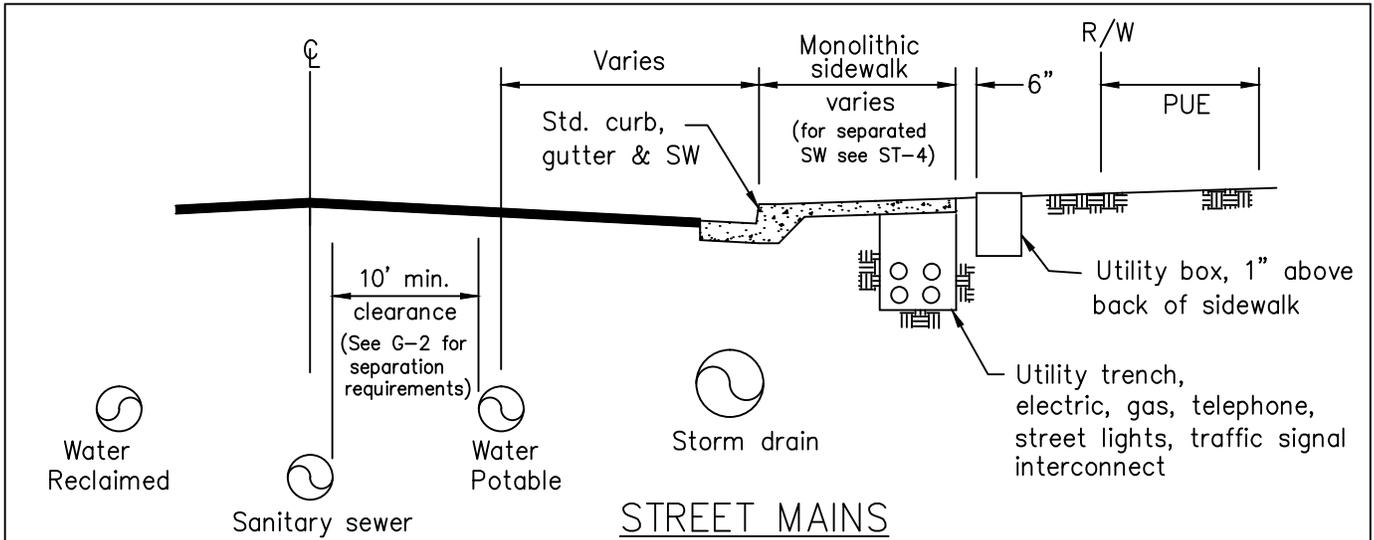
ST011.DWG

Date	By	Rev.

STREET SECTION

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	NO.  ST-11
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		



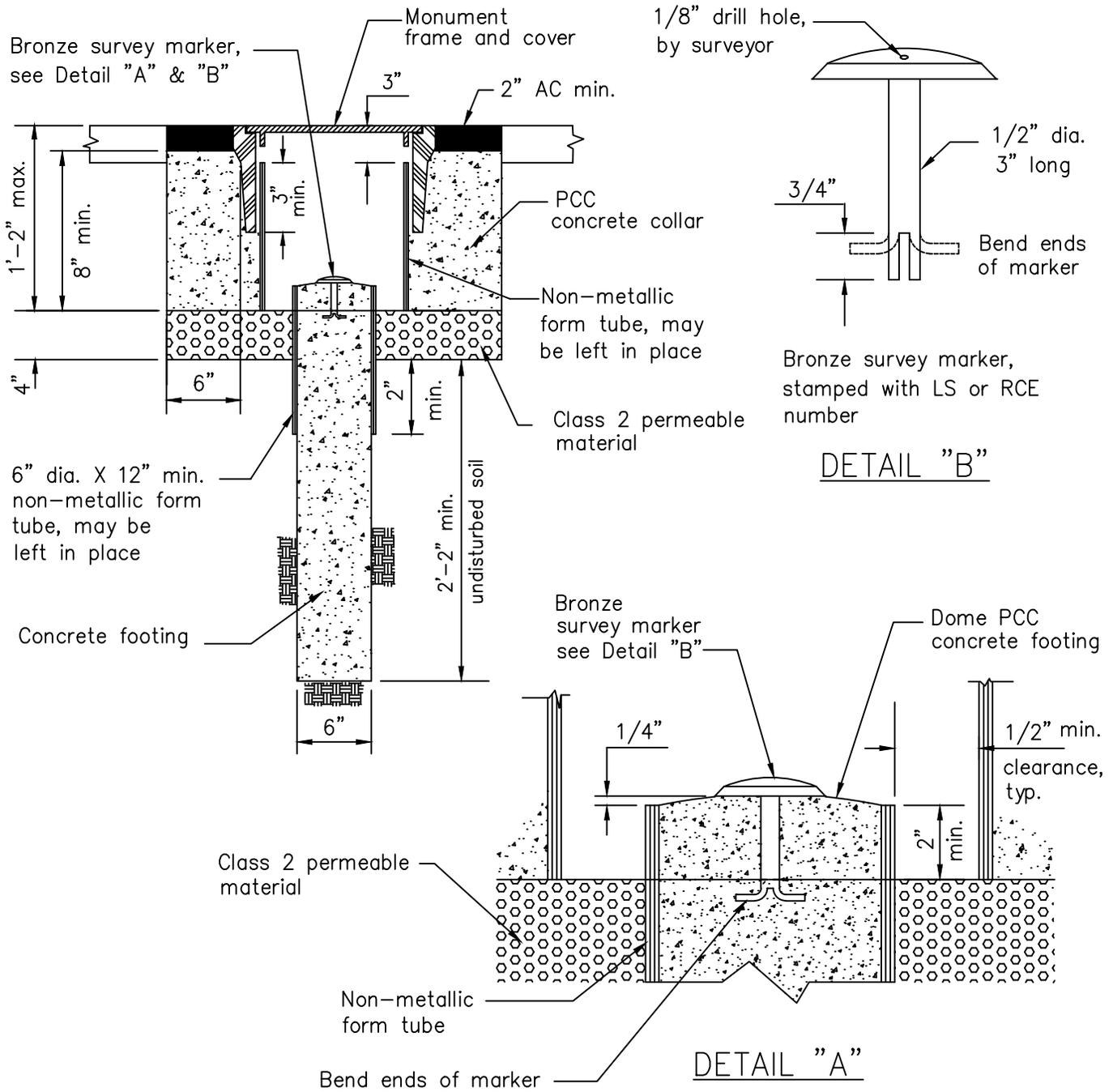
NOTES:

1. Water lines to be placed on the north or west side of the centerline.
2. See ST-3, 4, & 5 for sidewalks.
3. See ST-4, 6, 7, & 8 for driveways.
4. See ST-9A for curb and gutter.
5. Utility services shall be located a minimum of 2' away from any driveway. No utility services shall be placed beneath a driveway unless otherwise approved by the Engineer.
6. Utility boxes in driveway areas to have traffic lids.
7. A 10' distance must be maintained between reclaimed and portable water

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST12.DWG

UTILITY LOCATIONS			CITY OF LIVERMORE STANDARD DETAIL		
			Dwn: FY	Date: May-13	NO.
			Kcd: Spec. Committee	Scale: NONE	ST-12
			City Engineer		
Date	By	Rev.			



User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

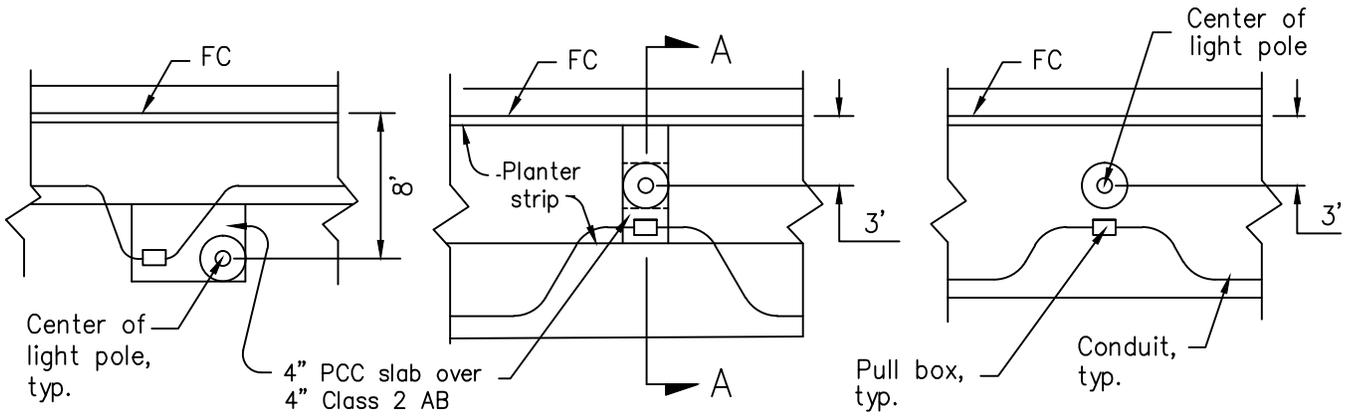
ST13.DWG

Date	By	Rev.

MONUMENT

CITY OF LIVERMORE  
 STANDARD DETAIL

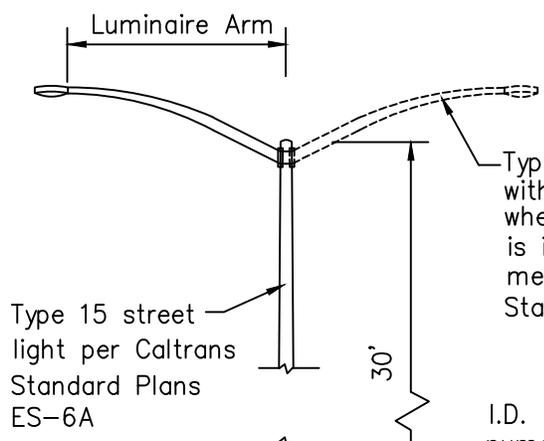
Dwn: KY	Date: May-13	NO.
Spec. Committee	Scale: NONE	
 City Engineer		ST-13



5' SIDEWALK  
Luminaire Arm = 12'

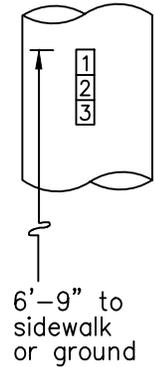
SEPARATED SIDEWALK  
Luminaire Arm = 6'

10' SIDEWALK  
Luminaire Arm = 6'

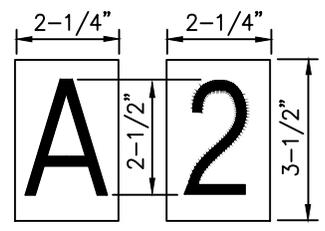


Type 15 street light per Caltrans Standard Plans ES-6A

Type 15D Pole with double arm when street light is installed in median per Caltrans Standard Plan ES-6D



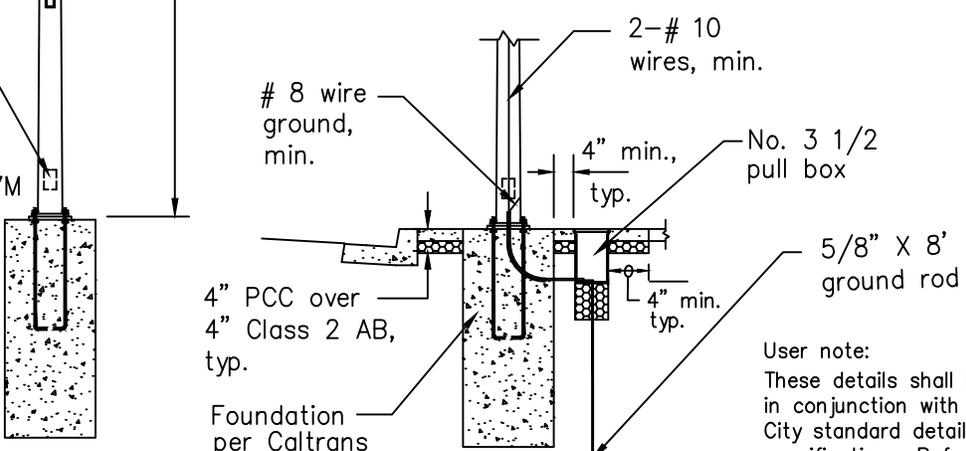
6'-9" to sidewalk or ground



I.D. NUMERALS  
TYPICAL DIMENSIONS

Fuse holder with 5' conductor coiled inside handhole on opposite side of approaching traffic per Caltrans Standard Plan ES-7M See ST-14D

I.D. numerals place facing approaching traffic



4" PCC over 4" Class 2 AB, typ.

Foundation per Caltrans Standard Plans ES-7N

SECTION A-A

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST14A.DWG

Date	By	Rev.

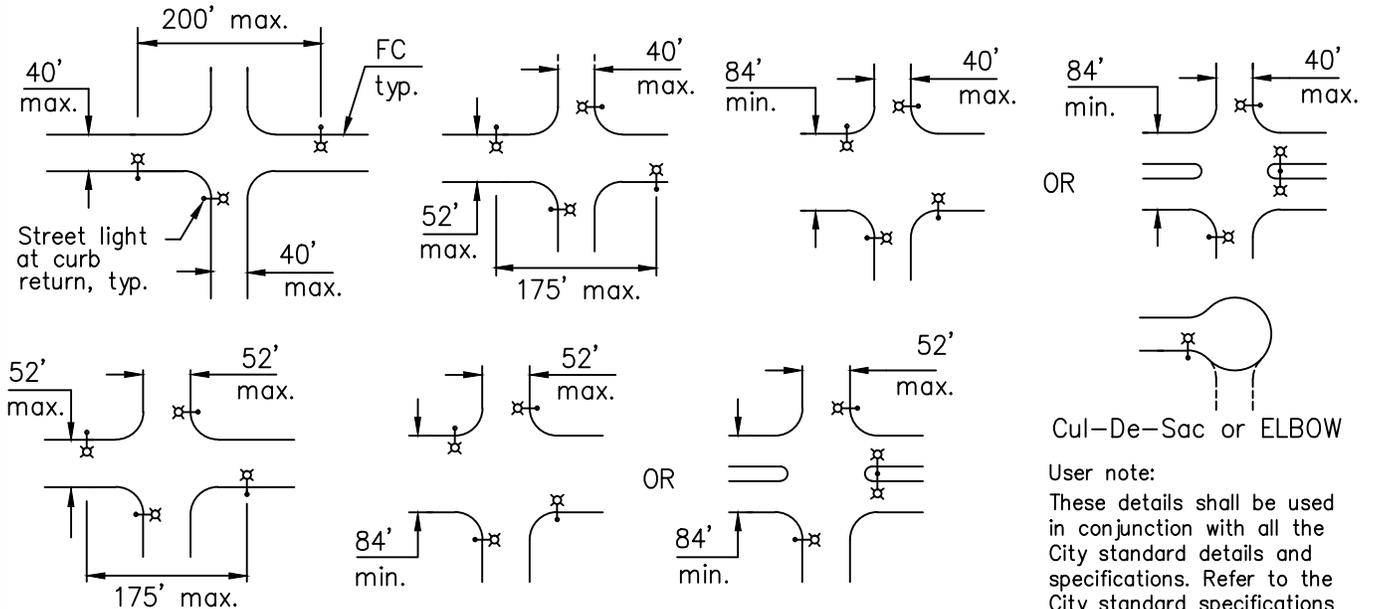
STANDARD STREET LIGHT

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-14A

MAXIMUM STREET WIDTH (FC TO FC)	MEDIAN WIDTH	STREET LIGHT			
		LOCATION	PATTERN	MAXIMUM SPACING	LED LUMINAIRE
40'	0	roadside	staggered	* 200'	LEOTEK Green Cobra GCI-20E-MV-NW-2-350 With house side shield or approved equal
52'	0	roadside	staggered	* 175'	
84'	16'	roadside	staggered	160' each side	LEOTEK Green Cobra GC1-30E-MV-NW-2-530 approved equal
		median	dual arm centered	200'	
96'	28'	roadside	staggered	160' each side	
		median	dual arm centered	180'	
108'	16'	roadside	staggered	200' each side	LEOTEK Green Cobra GC1-40E-MV-NW-2-700 approved equal
		median	dual arm centered	200'	
120'	28'	roadside	staggered	200' each side	
		median	dual arm centered	200'	

\* NOTE: The maximum street light spacing may be increased by 40% on industrial streets up to 52' wide.



MINIMUM INTERSECTION AND CUL-DE-SAC LIGHTING REQUIREMENTS

User note:  
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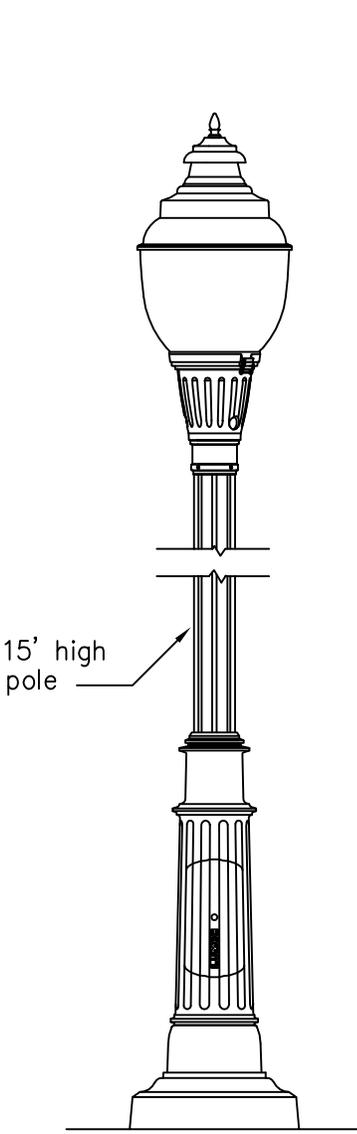
ST14B.DWG

Date	By	Rev.

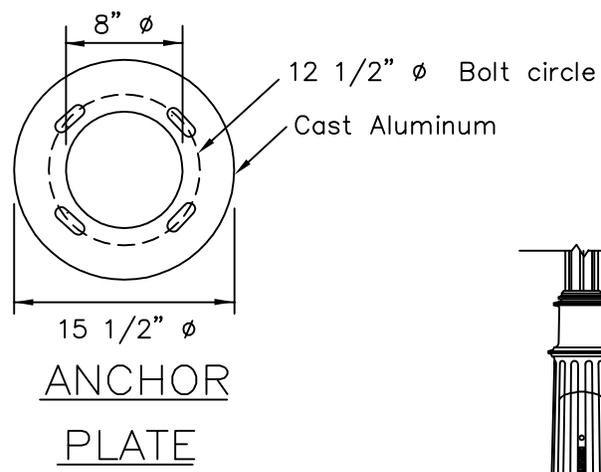
STANDARD STREET LIGHT LAYOUT

CITY OF LIVERMORE  
STANDARD DETAIL

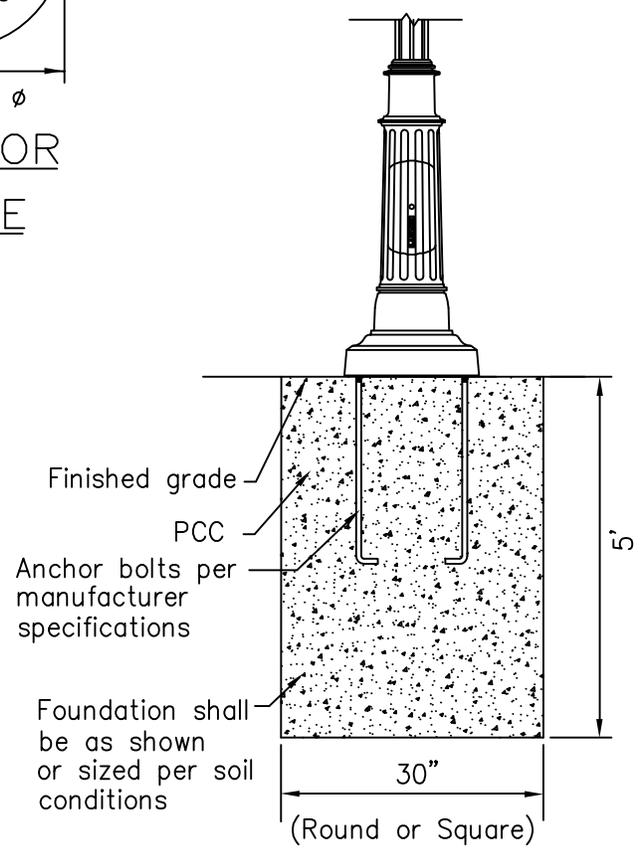
Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-14B



LUMEC LUMINAIRE  
AND POLE



ANCHOR  
PLATE



TYPICAL FOUNDATION

NOTE:

1. PULL BOX LOCATION PER ST-14A
2. THIS STREET LIGHT TO BE INSTALLED IN ALL AREAS OF THE CITY EXCEPT WHERE THE DOWNTOWN AND FIRST STREET LIGHT LOCATIONS ARE SPECIFIED ON DETAIL ST-14E

DECORATIVE STREET LIGHT LAYOUT

MAXIMUM STREET WIDTH FC TO FC	STREET LIGHT		LED LUMINAIRE	
	LOCATION	PATTERN	SIZE WATT	MAXIMUM SPACING
40'	roadside	staggered	65	160'

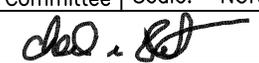
User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

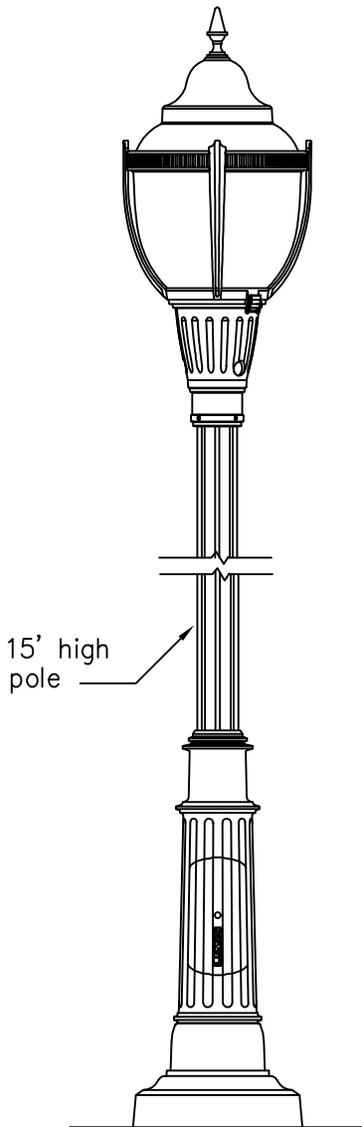
ST14C.DWG

Date	By	Rev.

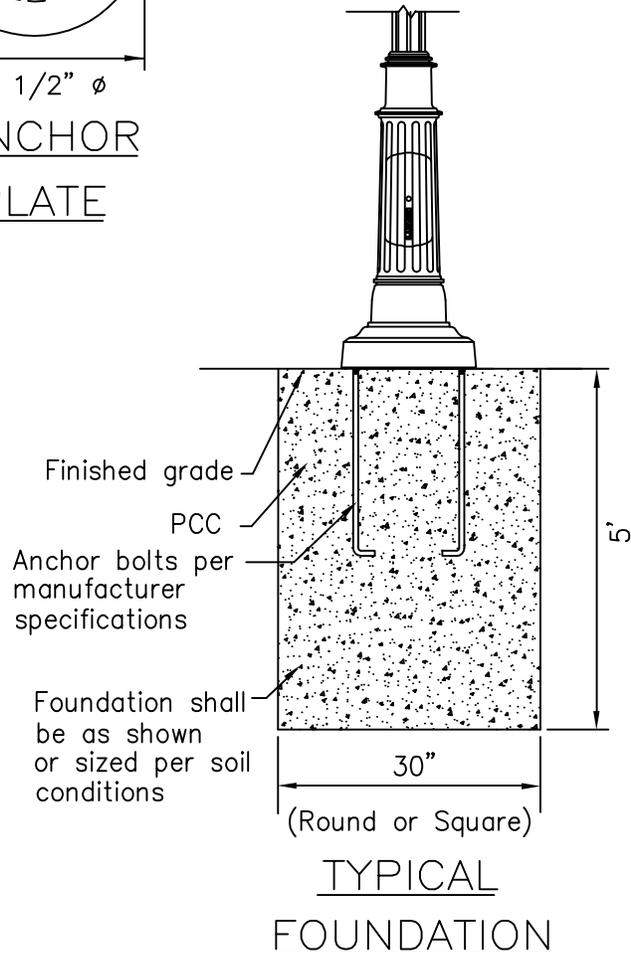
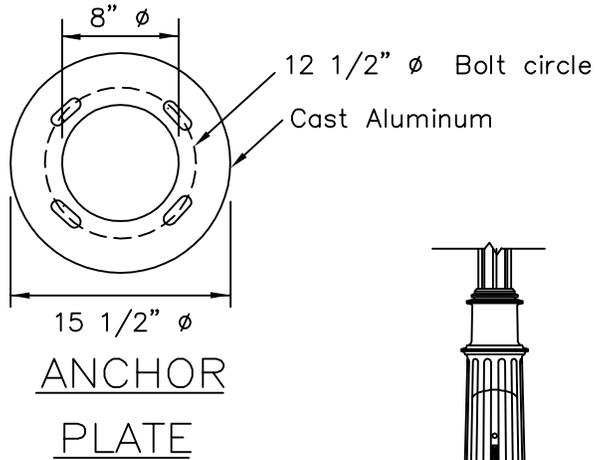
DECORATIVE  
STREET LIGHT

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.  ST-14C
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		



LUMEC LUMINAIRE  
AND POLE



NOTE:

1. PULL BOX LOCATION PER ST-14A

DECORATIVE STREET LIGHT LAYOUT

STREET LIGHT		LED LUMINAIRE	
LOCATION	PATTERN	SIZE WATT	MAXIMUM SPACING
roadside	staggered	90	100'

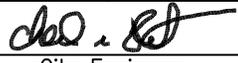
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

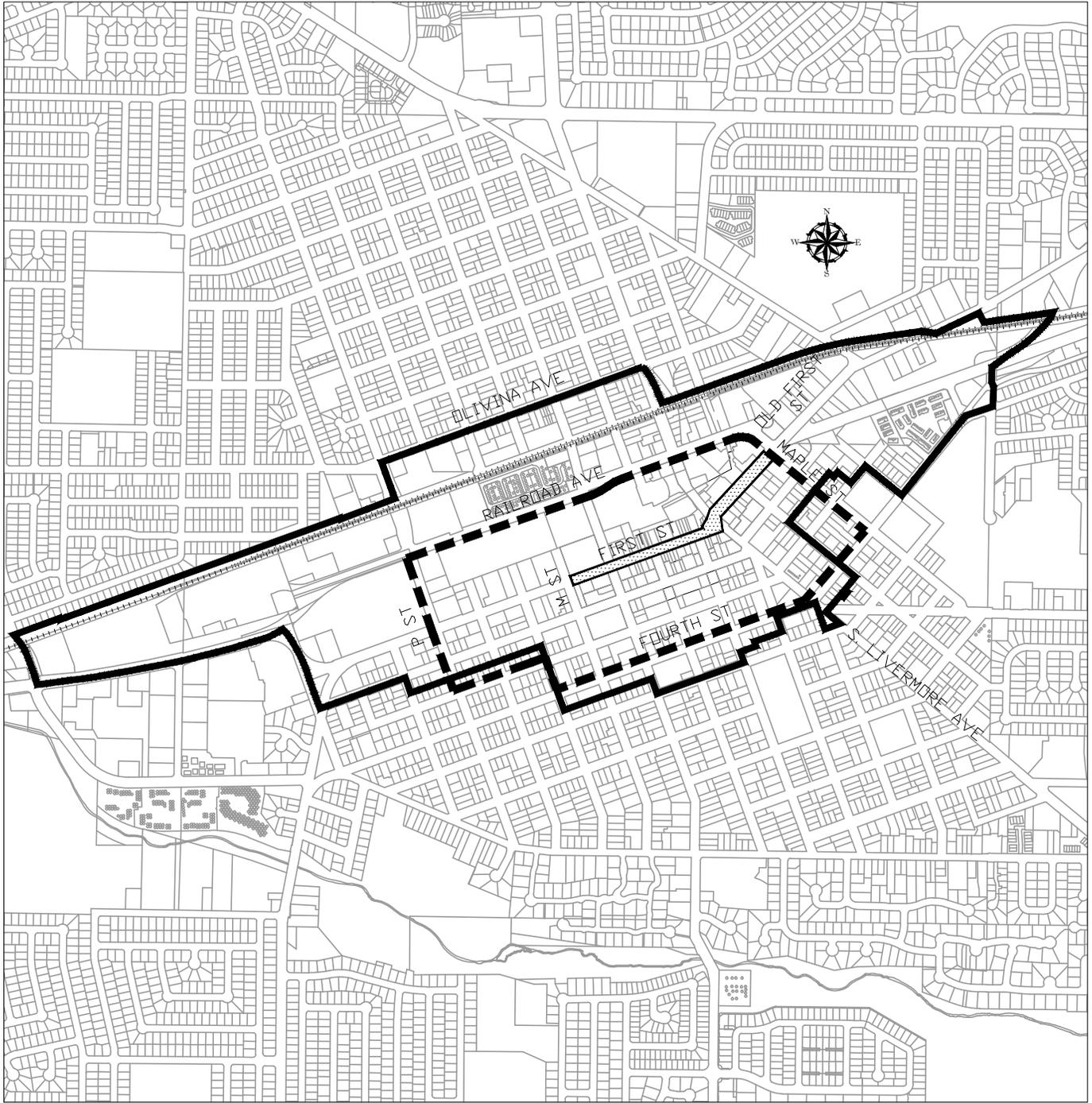
ST14C.DWG

DOWNTOWN DECORATIVE  
STREET LIGHT

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.  ST-14D
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

Date	By	Rev.



STREET LIGHT BOUNDARY

- First Street Decorative Street Light to be installed on First Street in the Downtown Core Area between Old First Street and M Street only. (See detail ST-14F)
- Downtown Decorative Street Light to be installed within this boundary except for the Downtown Core Area of First Street as indicated above. (See detail ST-14D)
- Downtown Specific Plan Area Boundary.

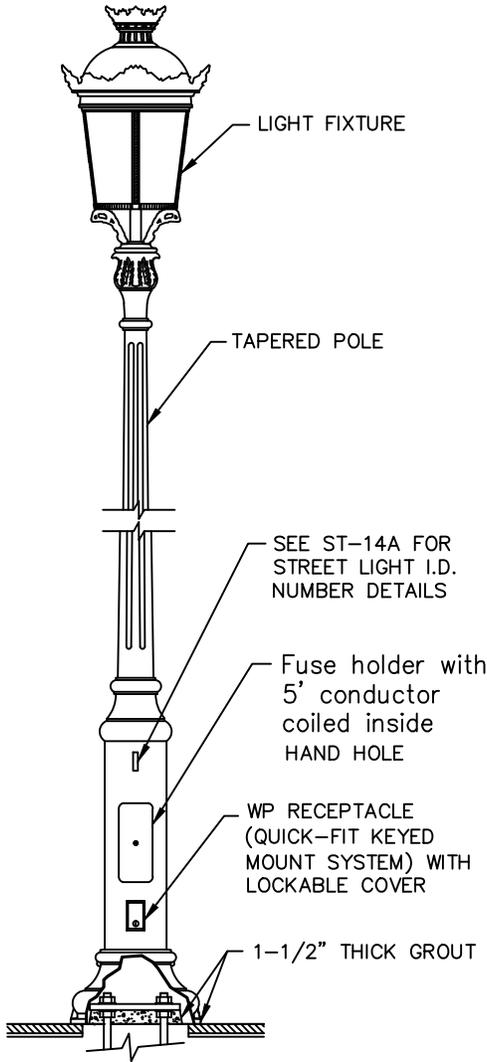
User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

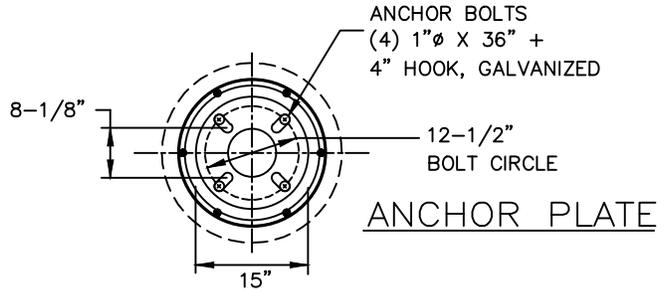
DOWNTOWN DECORATIVE  
 STREET LIGHT

CITY OF LIVERMORE  
 STANDARD DETAIL

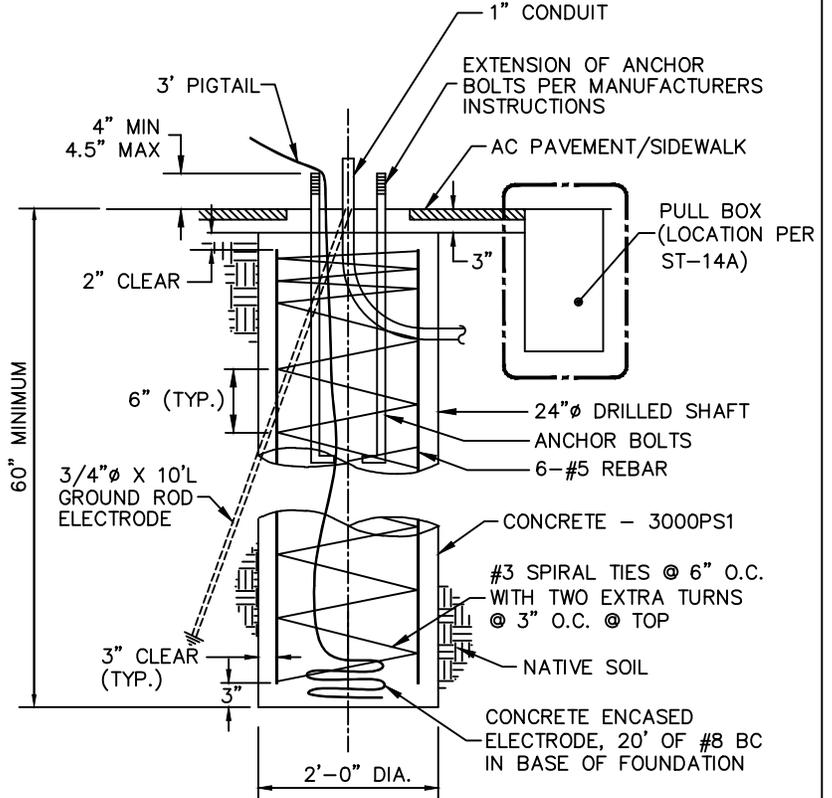
Dwn: FY	Date: May-13	NO.
Kcd: Spec. Committee	Scale: NONE	ST-14E
 City Engineer		



LUMEC LUMINAIRE  
AND POLE



ANCHOR PLATE



TYPICAL  
FOUNDATION

DECORATIVE STREET LIGHT LAYOUT

	LUMINAIRE TYPE	POLE HEIGHT	POLE SPACING
MAIN CORE	100w METAL HALIDE	9'	50'
THIS LIGHT TO BE USED ON FIRST STREET BETWEEN OLD FIRST ST. AND M STREET ONLY			
SEE ST-14E FOR STREET LIGHT USE BOUNDARIES			

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST14D.DWG

Date	By	Rev.

FIRST STREET  
DECORATIVE  
STREET LIGHT

CITY OF LIVERMORE  
STANDARD DETAIL

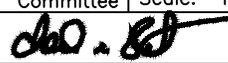
Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>[Signature]</i> City Engineer		ST-14F

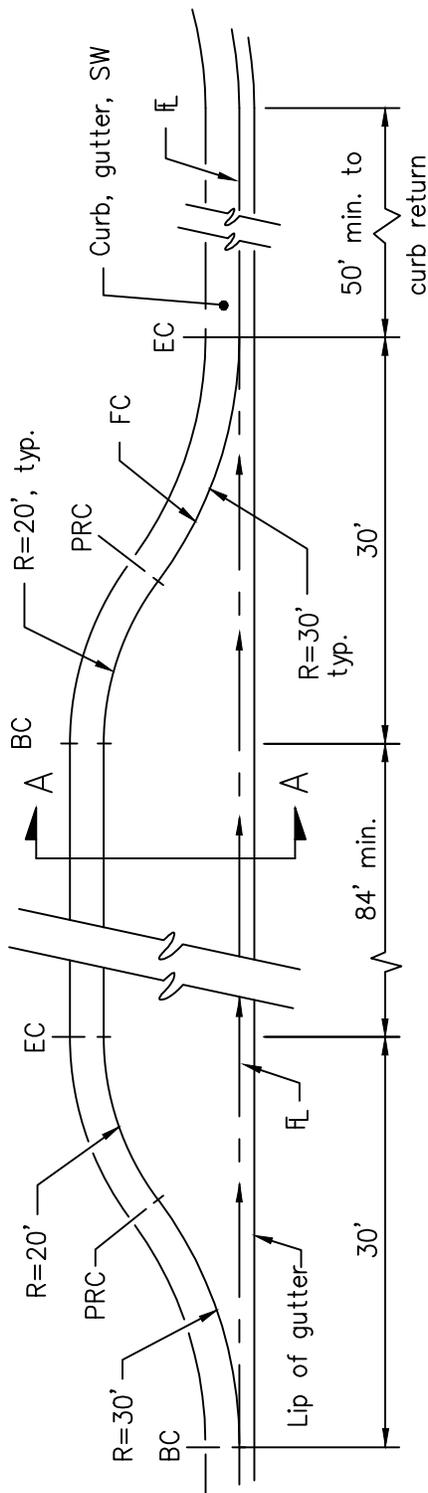
ST15.DWG

Date	By	Rev.

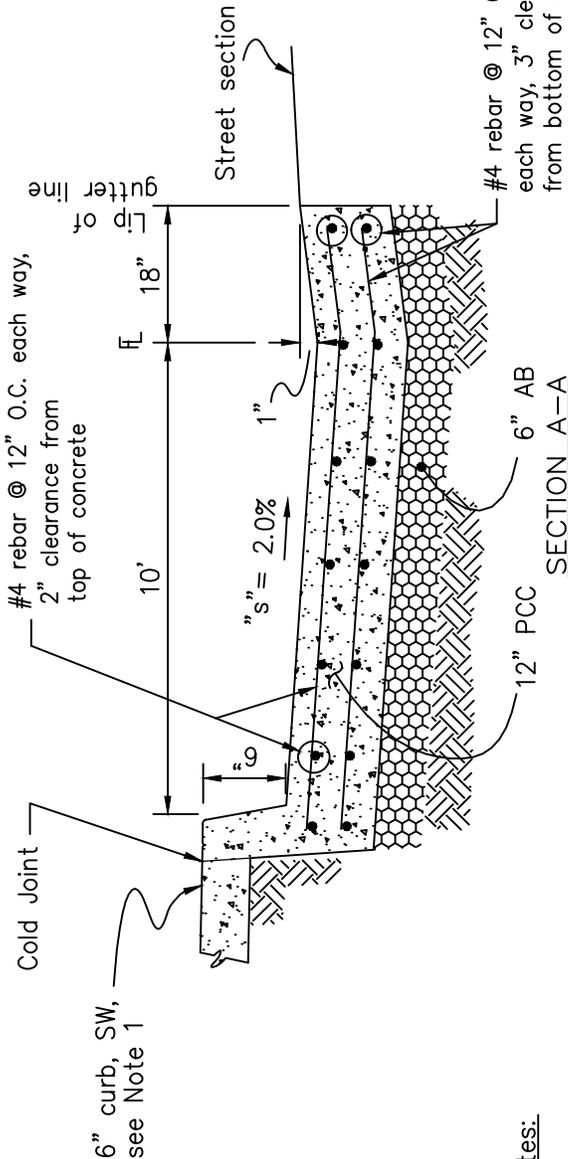
# BUS TURNOUT

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-15



BC = begin curve  
 PRC = point of reverse curve  
 EC = end curve

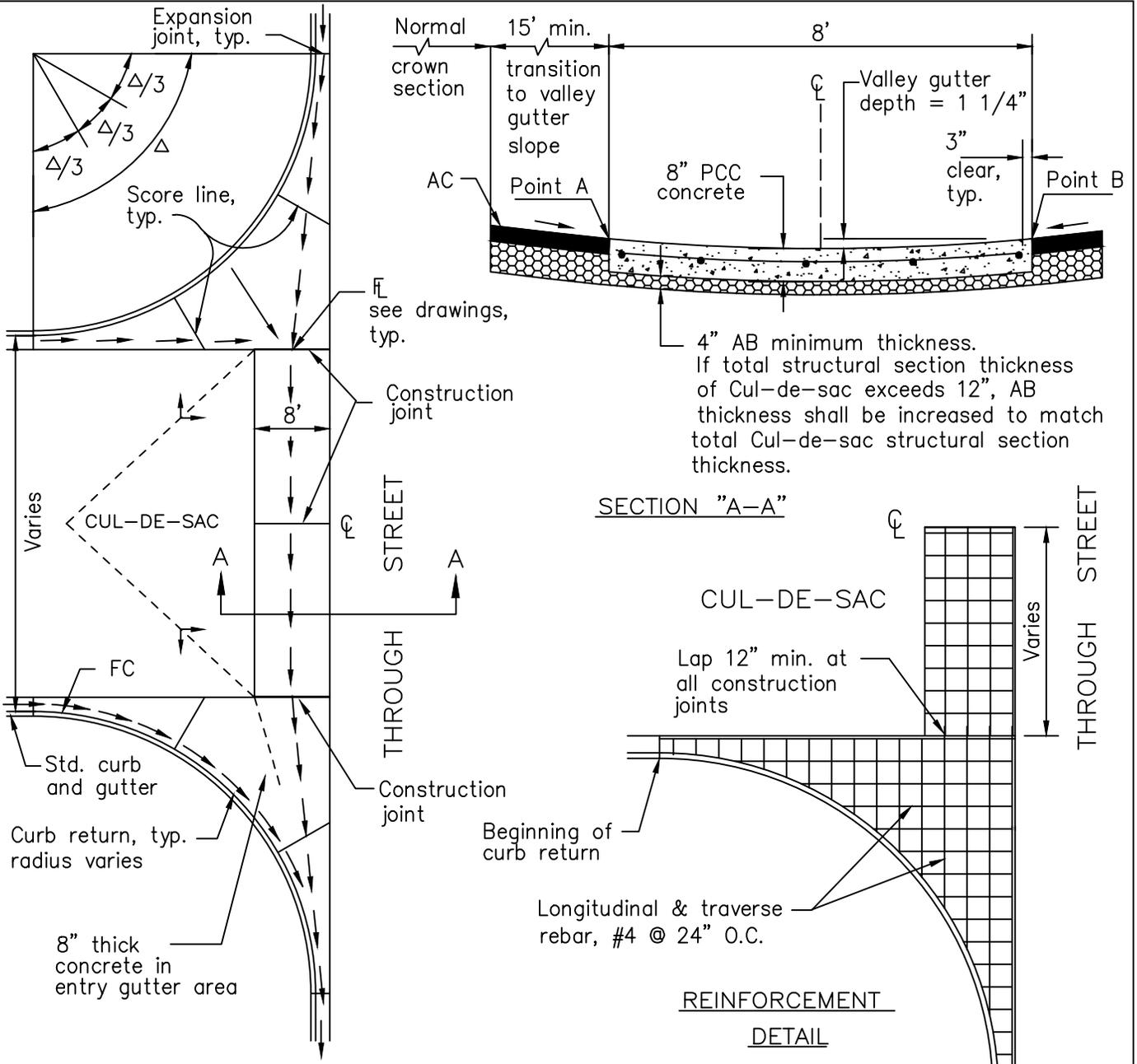


Notes:

1. See ST-9A or 9B for curb detail.
2. E elevation to control TC elevation.
3. Bus turnout to be installed beyond intersection, not immediately before intersection.
4. See ST-11 for bus stop structural section in paved areas.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.



**NOTES:**

1. See ST-9A for curb and gutter.
2. Points A & B shall be at the same elevation.
3. Pavement replacement for existing street shall be approved on a case by case basis by the Engineer.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

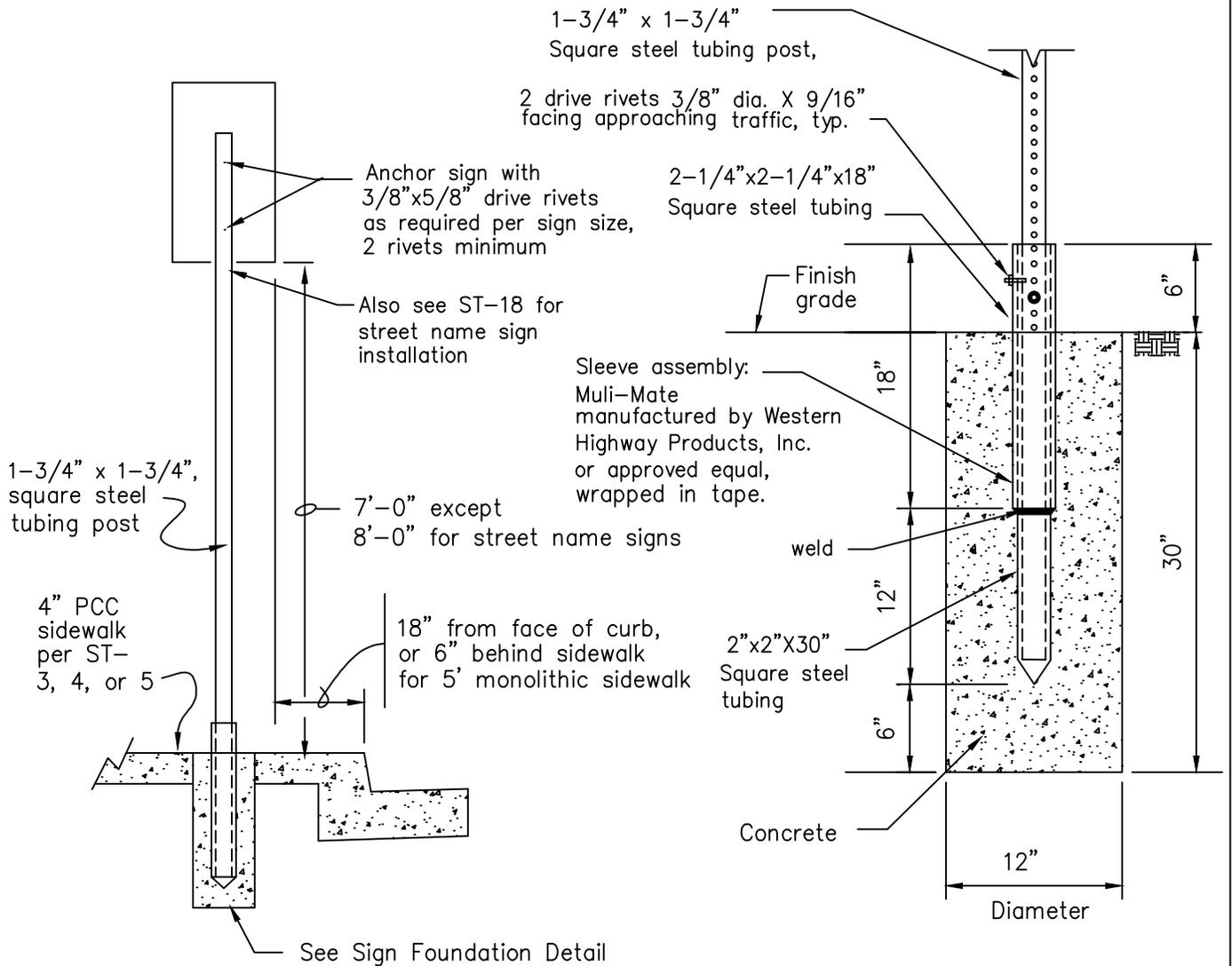
ST16.DWG

Date	By	Rev.

VALLEY GUTTER

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-16



STEEL POST

SIGN FOUNDATION DETAIL

NOTES:

1. See ST-18 for street name sign requirements.
2. See ST-22 for median island sign requirements.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST17.DWG

Date	By	Rev.

ROADSIDE SIGN/POST  
INSTALLATION

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*dbw. [Signature]*  
City Engineer

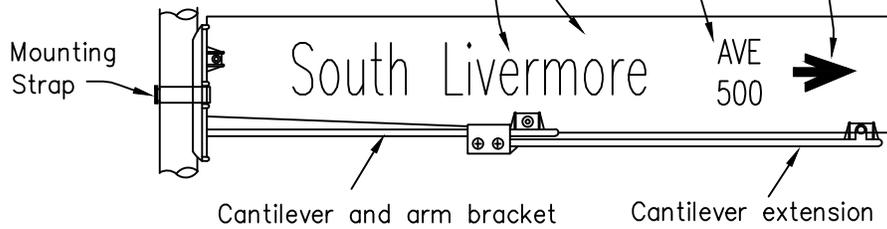
ST-17

.080 aluminum blank no holes  
with 1/2" corner radius, see Note 7

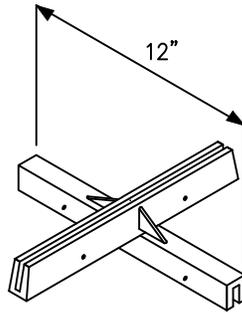
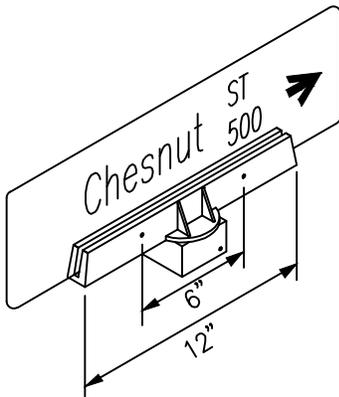
6" upper case (Legacy Sans Bold)  
6" lower case (Highway Gothic Series C)

Block number  
1-3/4" prefix and address number  
(Highway gothic series C), see Note 5

2-1/4" high x 3" long, see Note 6



STREET NAME SIGN INSTALLATION ON A STREET LIGHT



90 DEGREE CROSSPIECE 12"

1-3/4" x 1-3/4" post  
perforated tubing powder  
green, see ST-17



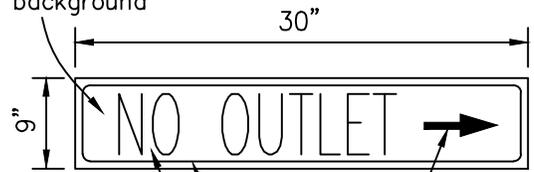
POST

NOTES:

1. Reflective sheeting material 3M DG3 4090 white.  
Electro cut film 3M 1177c green reserve weed.
2. See ST-17 for pole installation.
3. Bottom of lowest sign on post to be 8'-0" min. above finish grade, and bottom of lowest sign on street light to be 10'-0" above finished grade.
4. Signs shall be installed 18" behind face of curb or 6" behind 5' monolithic sidewalk.
5. Block number to denote highest address number adjacent to intersection by hundreds (or by tens if applicable).
6. Arrow to point in direction of increase in address. Omit arrow if the street does not continue in the direction of increase.
7. The size of the street name sign blank depends on how many letters are in the name:

24" x 9"	1-5 letters
30" x 9"	6-8 letters
36" x 9"	9-12 letters
42" x 9"	13+ letters

Yellow reflective background



5" arrow, see Note 6  
1/4" border, 1/4" inset  
black 4" (series "c") letters

W53 SPECIAL

W53 (Rt) SPECIAL SHOWN

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

STREET NAME SIGN  
AND  
W53 SPECIAL SIGN

CITY OF LIVERMORE  
STANDARD DETAIL

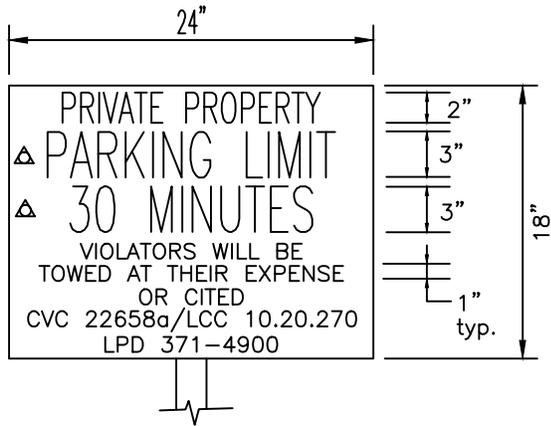
Dwn: KY/KR Date: May-13 NO.  
Ckd: Spec. Committee Scale: NONE

*[Signature]*  
City Engineer

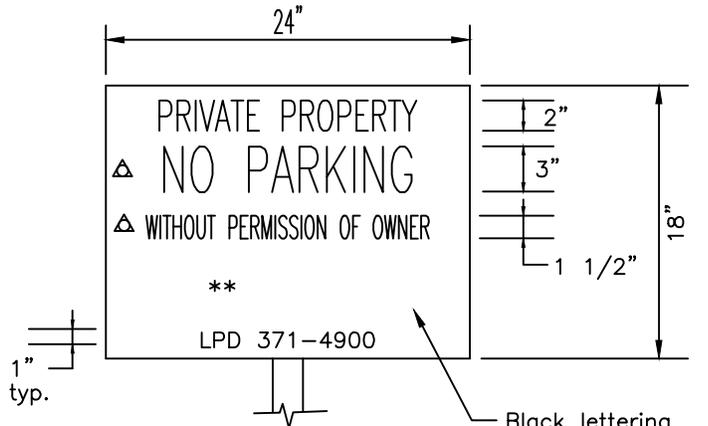
ST-18

ST18.DWG

Date	By	Rev.



SIGN A



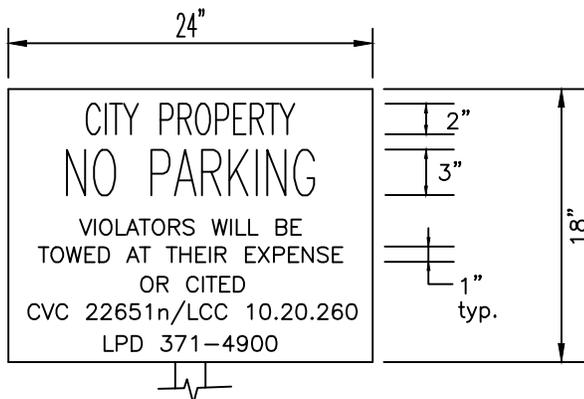
SIGN B

Black lettering on white background, typ.

- \*\* Both codes may be used together (see above example) or individually:  
 " VIOLATORS WILL BE TOWED AT THEIR EXPENSE CVC 22658a "  
 " VIOLATORS WILL BE CITED LCC 10.20.270 ".

Additional signs may be installed within the parking area with approval of the Planning Department.

△ Message may vary (TIME LIMIT, CUSTOMERS ONLY, etc.) with approval of the Police Department.



SIGN C

NOTES:

1. For enforcement of public traffic regulations and control see ST-20B.
2. Private Property signs to be purchased, installed and maintained at no cost to the City.
3. Private Property signs to be installed at each entrance to the subject private property outside of the public right-of-way.
4. City off-street signs on City property shall use square steel tubing poles per ST-17.
5. Optional wording : " VIOLATORS WILL BE CITED/TOWED AT THEIR EXPENSE "

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

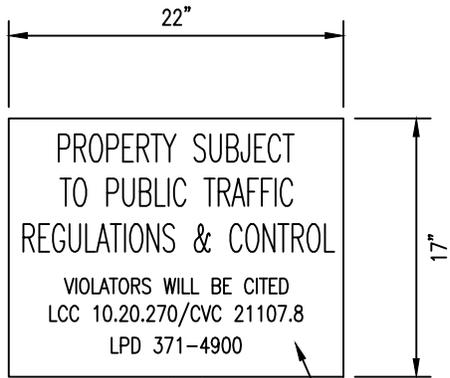
PRIVATE PROPERTY/  
CITY OFF-STREET  
SIGNS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	NO.
Kkd: Spec. Committee	Scale: NONE	

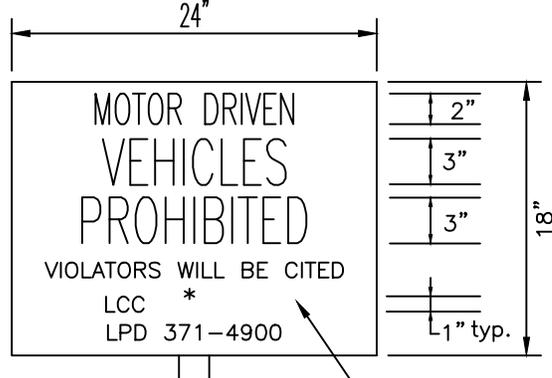
*do. ST*  
City Engineer

ST-20A



SIGN D

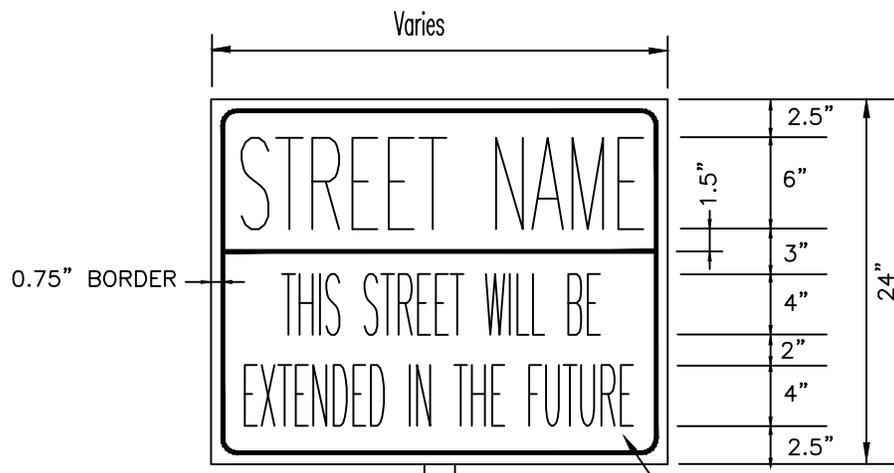
Black lettering on white background, also see Note 1



SIGN E

\* 10.20.270 for private property  
10.28.070 for public property

Black lettering on white background



SIGN F

\* See Note 4

Black lettering on white background

NOTES:

1. The following apply to Sign D :
  - a. These signs must be posted for enforcement of public traffic regulations and control.
  - b. Signs may be posted alone or with Parking Limit signs, see ST-20A
2. Minimum letter size 1" .
3. See ST-20A for additional notes.
4. Sign F to be installed at end of stubbed streets which are to be extended in the future.

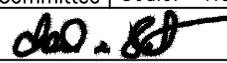
User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

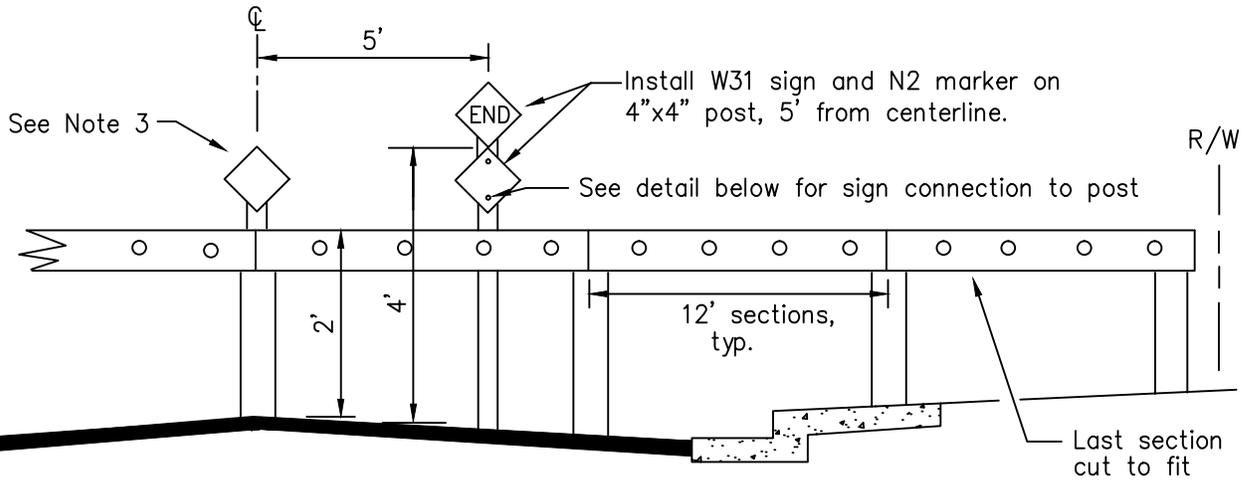
ST20B.DWG

Date	By	Rev.

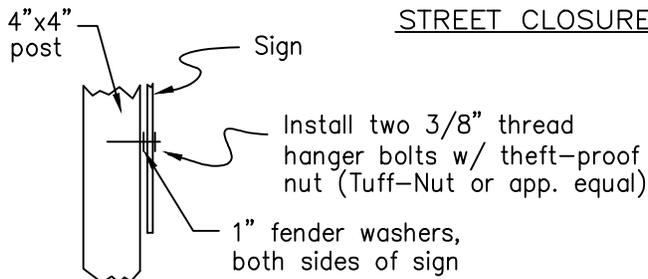
PRIVATE PROPERTY/  
CITY OFF-STREET  
SIGNS

CITY OF LIVERMORE  
STANDARD DETAIL

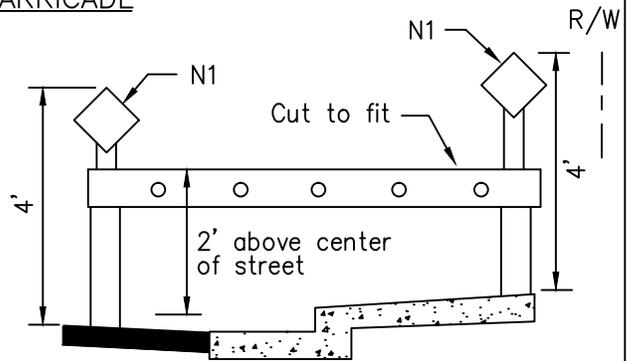
Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-20B



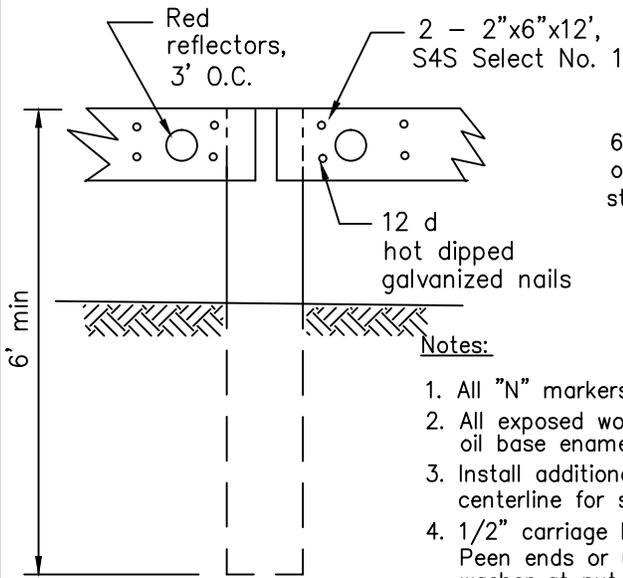
**STREET CLOSURE BARRICADE**



**SIGN CONNECTION TO POST**



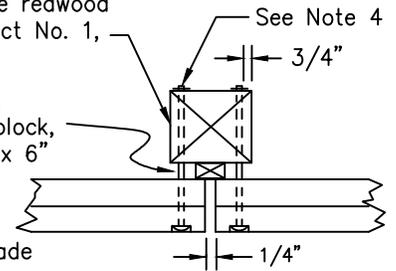
**STREET SHOULDER BARRICADE**



**ELEVATION**

6"x6" S4S construction grade redwood or pressure-treated DF, Select No. 1, stamped "ground contact"

Separate post from boards w/ spacer block, 1-5/8" x 2'-1/8" x 6"



**PLAN**

**Notes:**

1. All "N" markers shall be high-intensity grade
2. All exposed wood to have 2 coats of gloss oil base enamel exterior white paint.
3. Install additional N2 markers in line with centerline for streets more than 40' wide.
4. 1/2" carriage bolts, countersunk full depth; Peen ends or use theft-proof nuts; 1/4" washer at nut end.
5. Use Sign F per ST-20B for end of stubbed streets to be extended in the future.

**User note:**

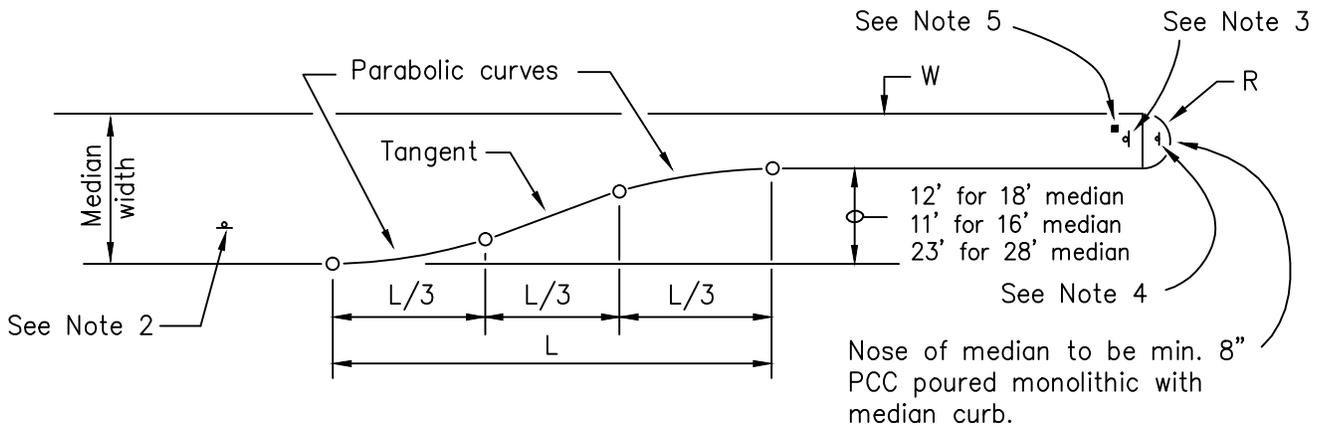
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST21.DWG			
Date	By	Rev.	

**BARRICADES**

**CITY OF LIVERMORE  
STANDARD DETAIL**

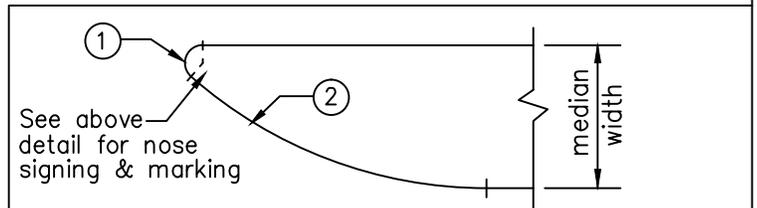
Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>[Signature]</i>		ST-21
City Engineer		



Nose of median to be min. 8"  
PCC poured monolithic with median curb.

L=length of taper			Offset distance for lane width of...		
60'	90'	120'			
dist. from beg. 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
16'	5'	2.5'
18'	6'	3'
28'	5'	2.5'



MEDIAN WIDTH	CURVE # ① DATA			CURVE # ② DATA		
	R	DELTA	L	R	DELTA	L
16'	2'	138° 35' 25"	4.84'	50'	41° 24' 35"	36.14'
18'	2'	139° 43' 28"	4.87'	60'	40° 34' 02"	42.48'
28'	4'	134° 11' 04"	9.38'	70'	45° 48' 56"	55.79'

Notes

1. See Notes 3, 4, and 5
2. R= Radius; Delta= internal angle; L= Length of curve
3. In the presence of roadway features, such as curves, which would affect the layout of the median, see the drawing for layout data.

MEDIAN NOSE OPPOSITE A LEFT TURN LANE

NOTES:

1. See ST-2A thru ST-2C for street widths, ST-9B for median curb, and ST-19 for roadside sign/pole installation.
2. Install R10 (rt) opposite driveways as directed by the Engineer.
3. Install R7 ; bottom of sign 5' above median surface, 4' from nose of median, as directed by the Engineer.
4. Install Type K reflector, with 8" anchor, 18" from nose of median. Paint nose w/ reflective yellow paint, as directed by the Engineer.
5. All boxes installed in nose of median to be 5' from end of PCC concrete nose.

User note:

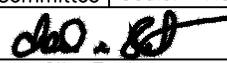
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

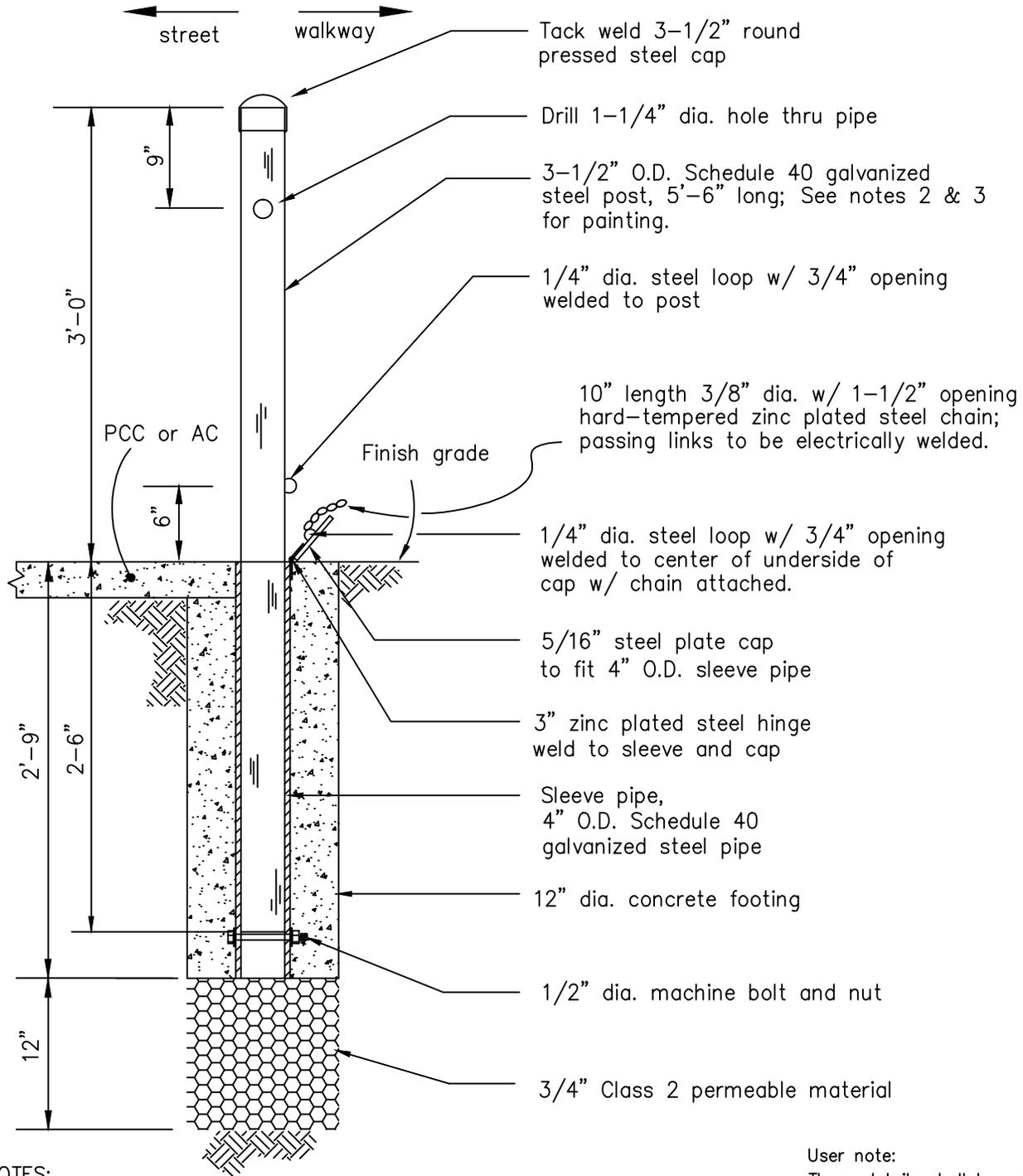
ST22.DWG

Date	By	Rev.

# MEDIAN CONSTRUCTION

## CITY OF LIVERMORE STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-22



- Tack weld 3-1/2" round pressed steel cap
- Drill 1-1/4" dia. hole thru pipe
- 3-1/2" O.D. Schedule 40 galvanized steel post, 5'-6" long; See notes 2 & 3 for painting.
- 1/4" dia. steel loop w/ 3/4" opening welded to post
- 10" length 3/8" dia. w/ 1-1/2" opening hard-tempered zinc plated steel chain; passing links to be electrically welded.
- 1/4" dia. steel loop w/ 3/4" opening welded to center of underside of cap w/ chain attached.
- 5/16" steel plate cap to fit 4" O.D. sleeve pipe
- 3" zinc plated steel hinge weld to sleeve and cap
- Sleeve pipe, 4" O.D. Schedule 40 galvanized steel pipe
- 12" dia. concrete footing
- 1/2" dia. machine bolt and nut
- 3/4" Class 2 permeable material

**NOTES:**

1. Locate all underground utilities prior to excavating post footing.
2. Prime all metal with one coat of galvanize-compatible primer and two coats of white industrial enamel.
3. Apply two 3" wide strips of reflectorized yellow tape. Provide a 3" gap between each strip.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

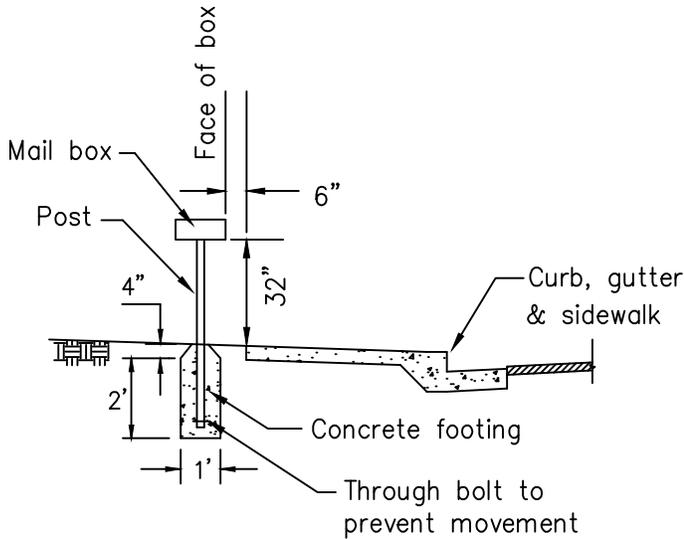
ST23.DWG

Date	By	Rev.

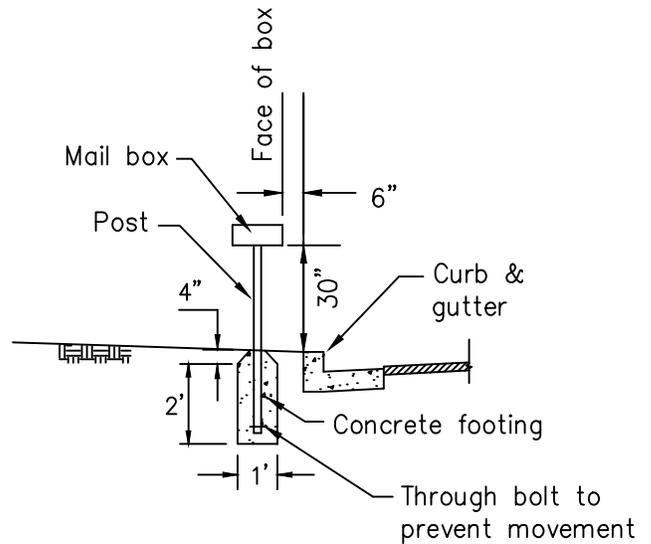
## REMOVABLE BOLLARD

### CITY OF LIVERMORE STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Ckd: <small>Spec. Committee</small>	Scale: NONE	ST-23
City Engineer		



WITH MONOLITHIC SIDEWALK



ALL OTHER CASES

NOTES:

1. Residential boxes may be installed on 4"x4" construction Heart S4S Grade wood post set in concrete footing.
2. Residential installation shall be dual or cluster installation. Single box installation allowed only upon approval of Postmaster.
3. Install industrial boxes on 2" diameter steel pipe.
4. Industrial boxes to be installed on side of street without sidewalk, and may be single box installation.
5. Edge of box to be a minimum of :
  - 5' from poles
  - 3' from driveways
  - 10' from curb returns
  - 5' from fire hydrants in 5' SW
  - 10' from fire hydrants in 10' SW
6. Location of all boxes subject to approval of Postmaster.

User note:

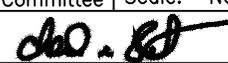
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

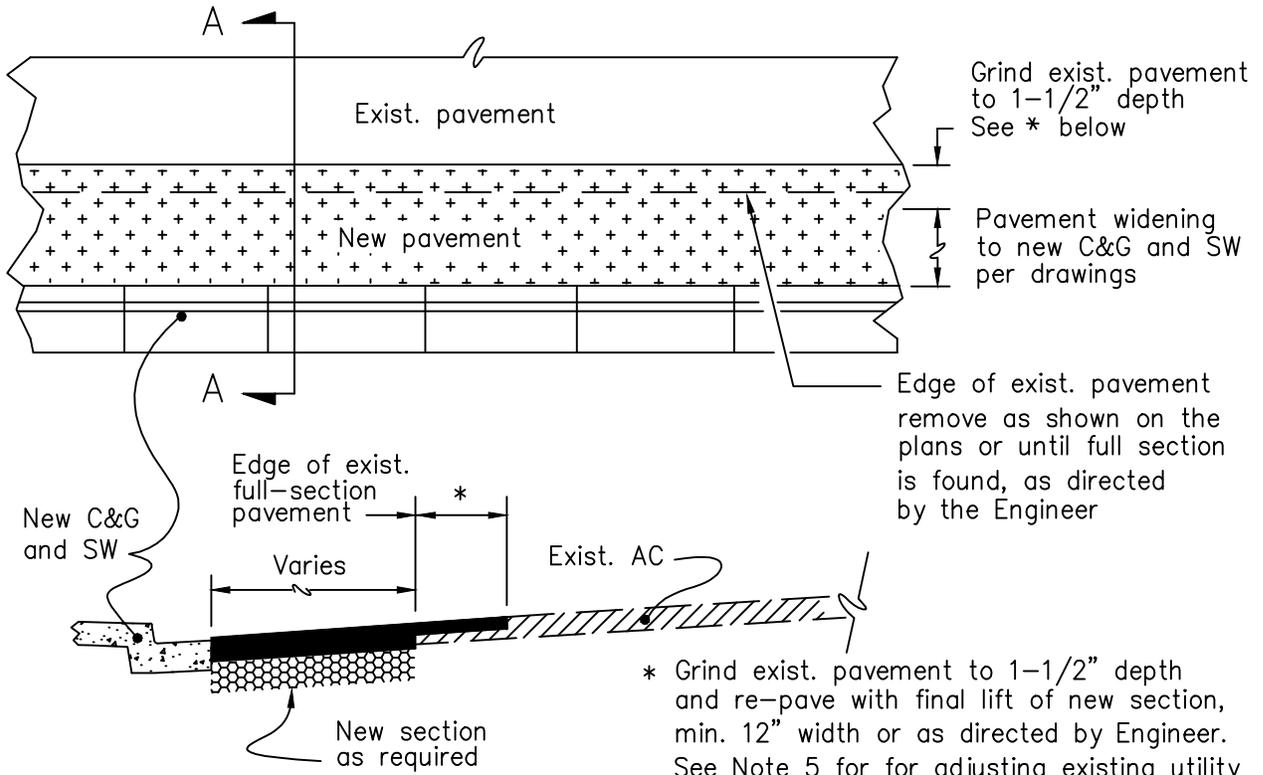
ST24.DWG

Date	By	Rev.

MAIL BOX INSTALLATION

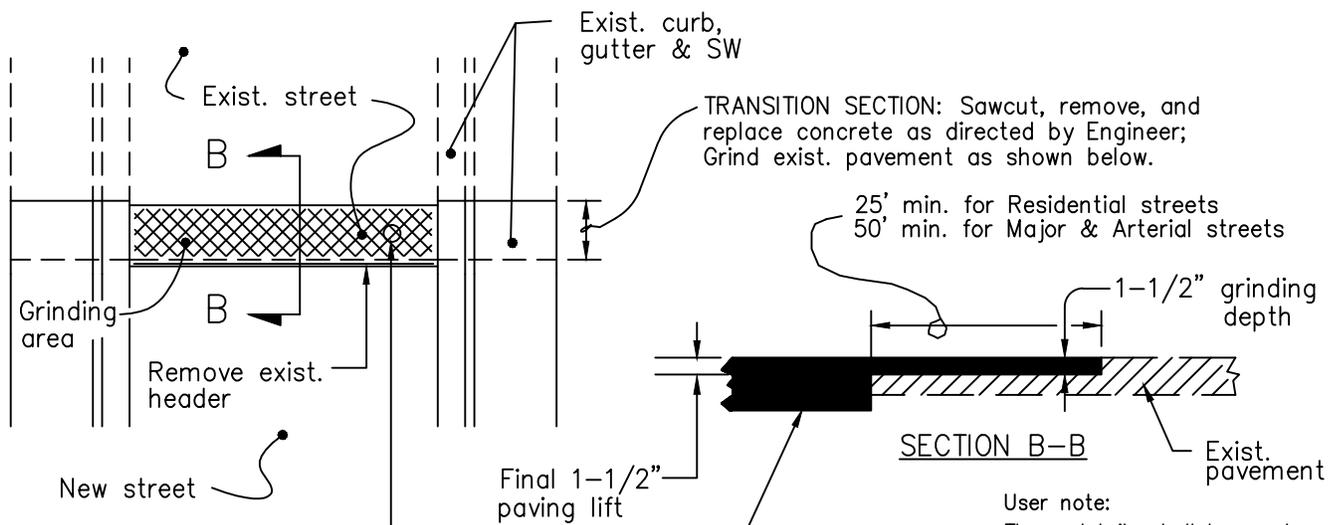
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-24



SECTION A-A

PAVEMENT WIDENING



SECTION B-B

STREET EXTENSION

See Note 5 for for adjusting existing utility frames & covers in this area.

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

PAVEMENT WIDENING,  
CONNECTIONS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*[Signature]*  
City Engineer

ST-25A

ST25A.DWG

Date	By	Rev.

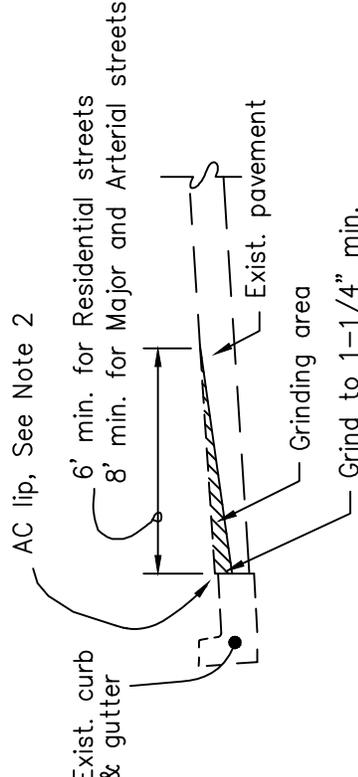
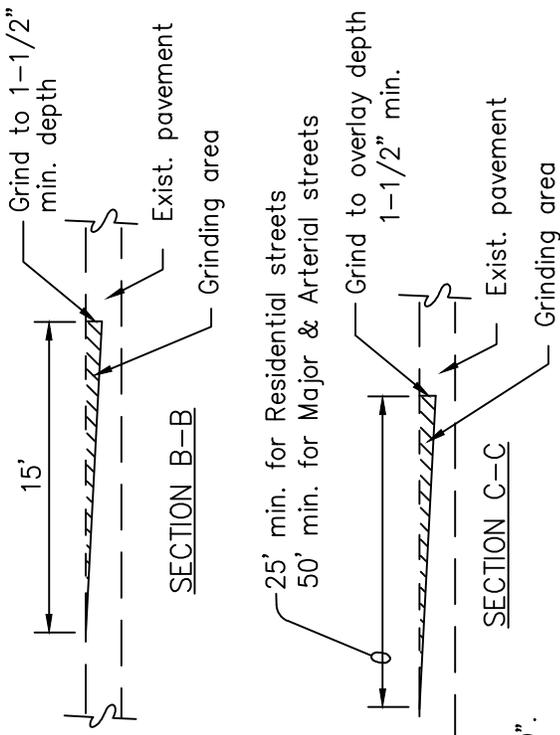
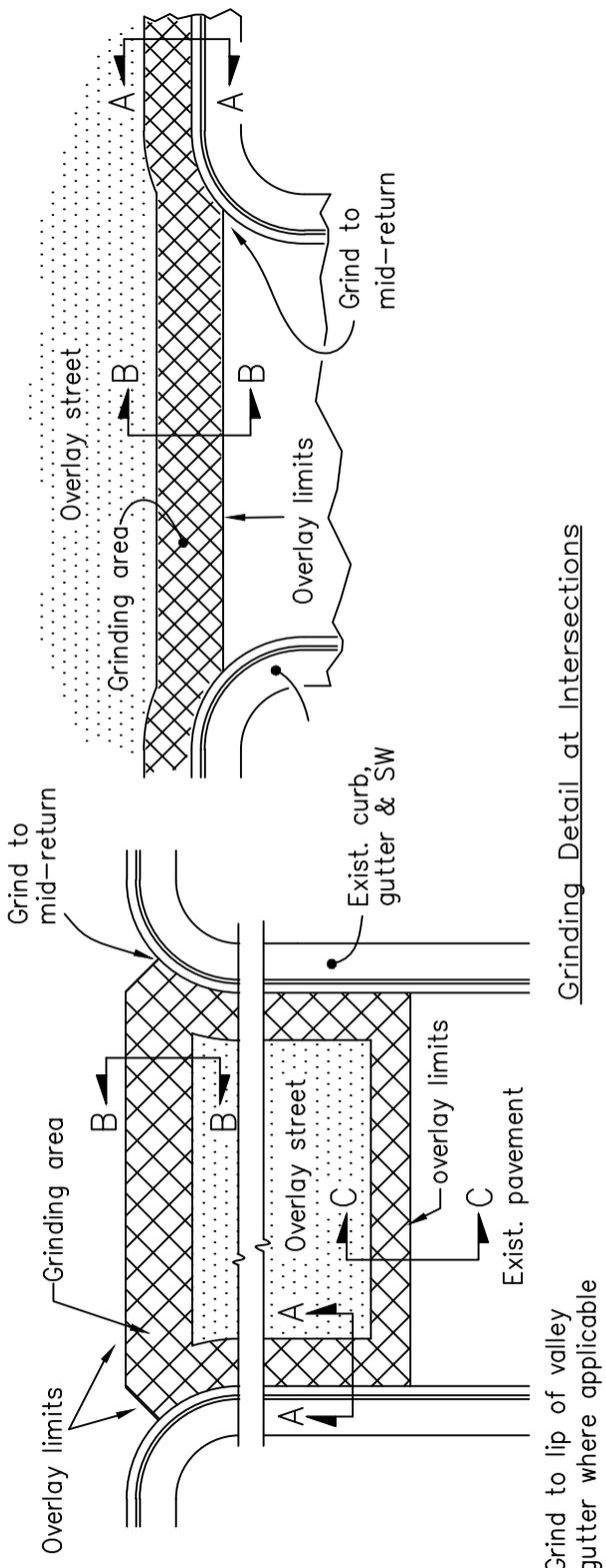
ST25B.DWG

Date	By	Rev.

# PAVEMENT OVERLAY

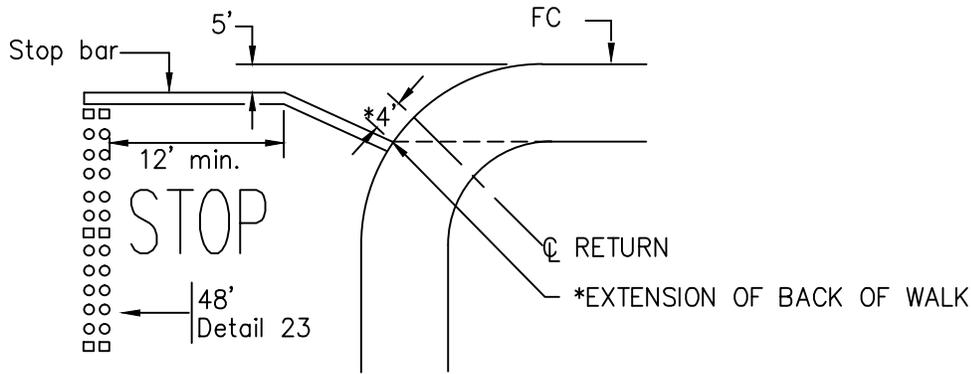
## CITY OF LIVERMORE STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Spec. Committee	Scale: NONE	ST-25B
 City Engineer		



User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

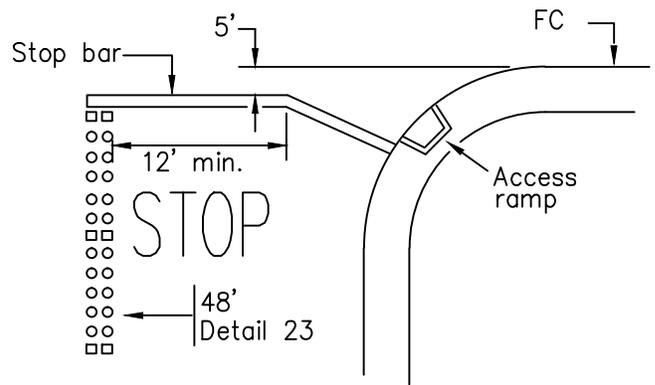
- Notes:
- Grinding shall taper from depth specified to 0".
  - Place AC at gutter to 1/4" above lip.
  - At curb with no gutter, grind to 2" depth at face of curb and pave to grades specified by Engineer in field.
  - Break overlay at grinding so that min. 1-1/4" thickness is achieved.
  - In conform and grinding areas, existing utility frames and covers shall be lowered and then raised to finished grade after paving.



STOP BAR AT INTERSECTION

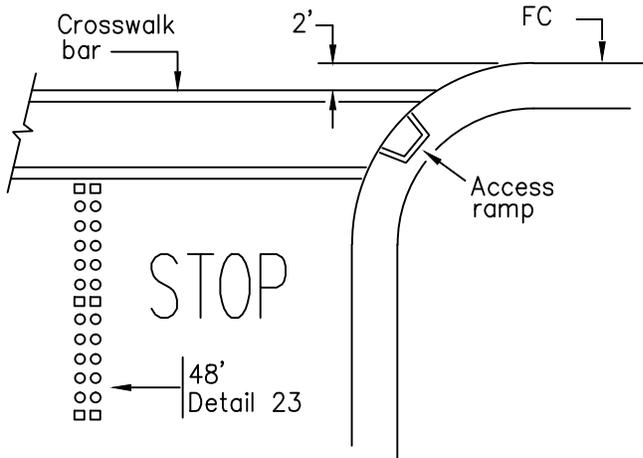
NO ACCESS RAMP

\* STOP BAR SHALL ANGLE TO GUTTER EITHER AT 4' FROM C OF RETURN OR AT EXTENSION OF BACK OF WALK, WHICHEVER IS GREATER.



STOP BAR AT INTERSECTION

W/ ACCESS RAMP



CROSSWALK

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

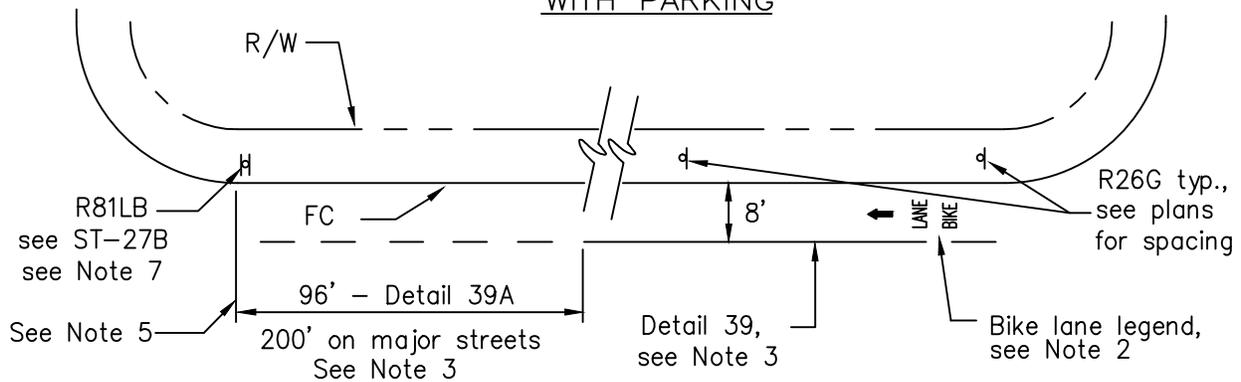
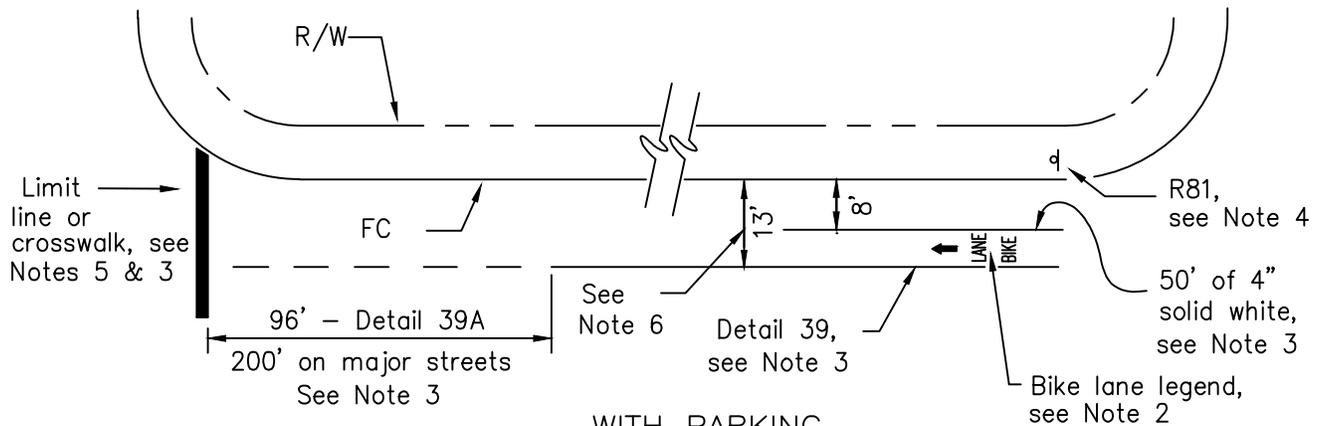
ST26.DWG

Date	By	Rev.

CROSSWALK/STOP BAR  
INSTALLATION

CITY OF LIVERMORE  
STANDARD DETAIL

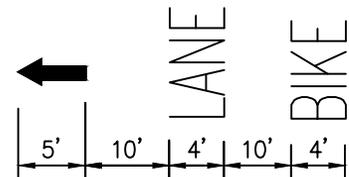
Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
<i>do. 8/8</i>		ST-26
City Engineer		



WITHOUT PARKING

NOTES:

1. See Detail ST-17 for sign pole installation.
2. Bike Lane legend shall be per Caltrans Standard Plans A24A "Pavement Marking Arrows", and A24D "Pavement Marking Words". Bike lane legends shall be installed using a specialized crushed glass thermoplastic composition per the specifications.
3. All striping to be white thermoplastic.
4. Install 12"x8" R81 signs at the beginning of bike lane at all major street intersections and at 1/2 mile maximum spacing. Install legends at the beginning of the bike lane at all intersections and 1/2 mile maximum spacing.
5. At crosswalk or limit line, extend Detail 39A to line; otherwise terminate at curb return.
6. Parking plus Bike Lane width may be reduced to 12' in special cases, if approved by the Engineer.
7. On major streets, install R81LB back to back with the last R26G on each block.



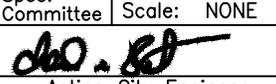
BIKE LEGEND DETAIL

Legend type	Legend area
←	7 SF
LANE	6 SF
BIKE	5 SF
total:	18 SF

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

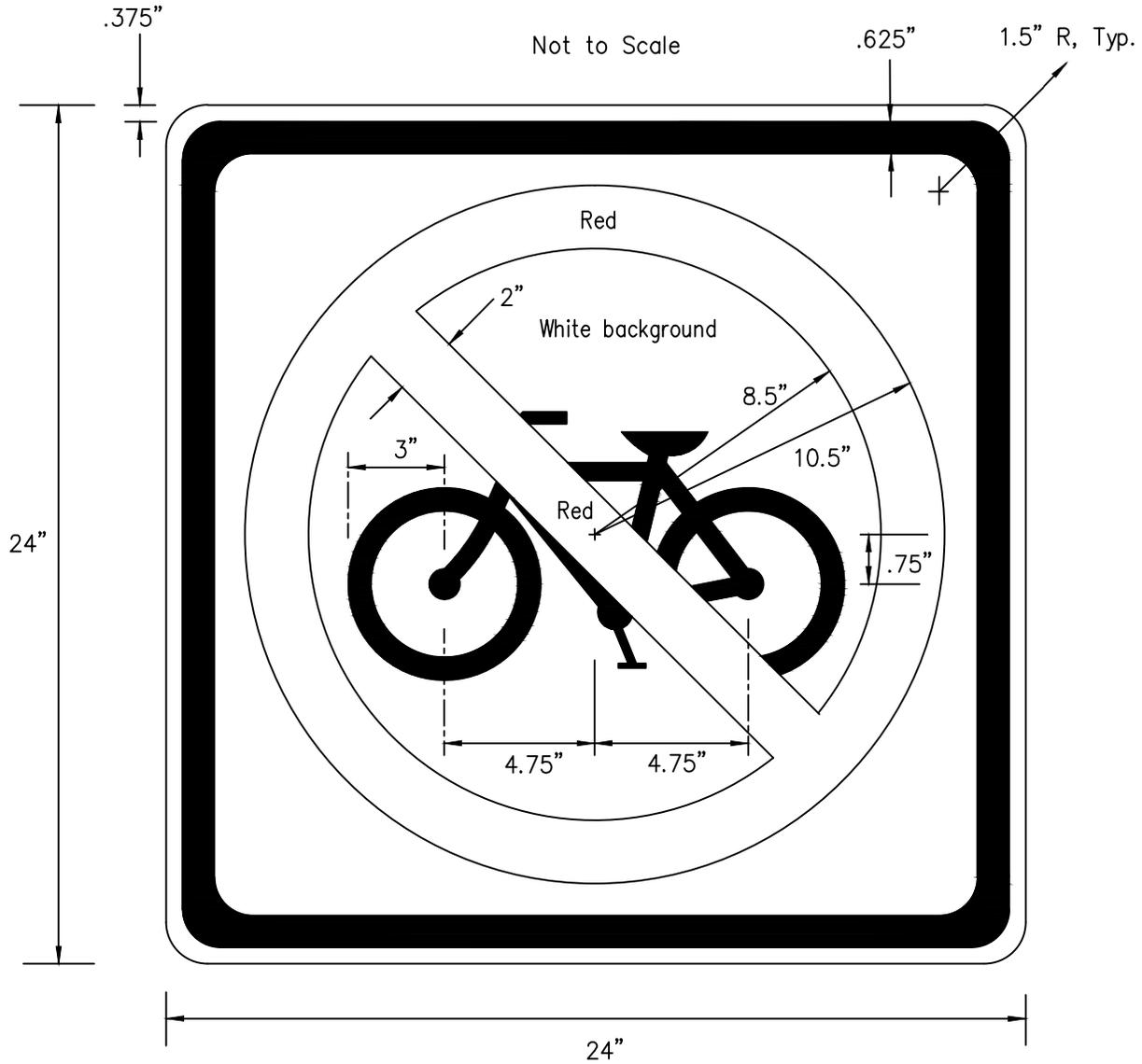
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY/KR/JV	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	ST-27A
 Acting City Engineer		

BIKE LANES

ST27A.DWG

Date	By	Rev.



R81LB

NOTE:

See ST-27A for notes.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

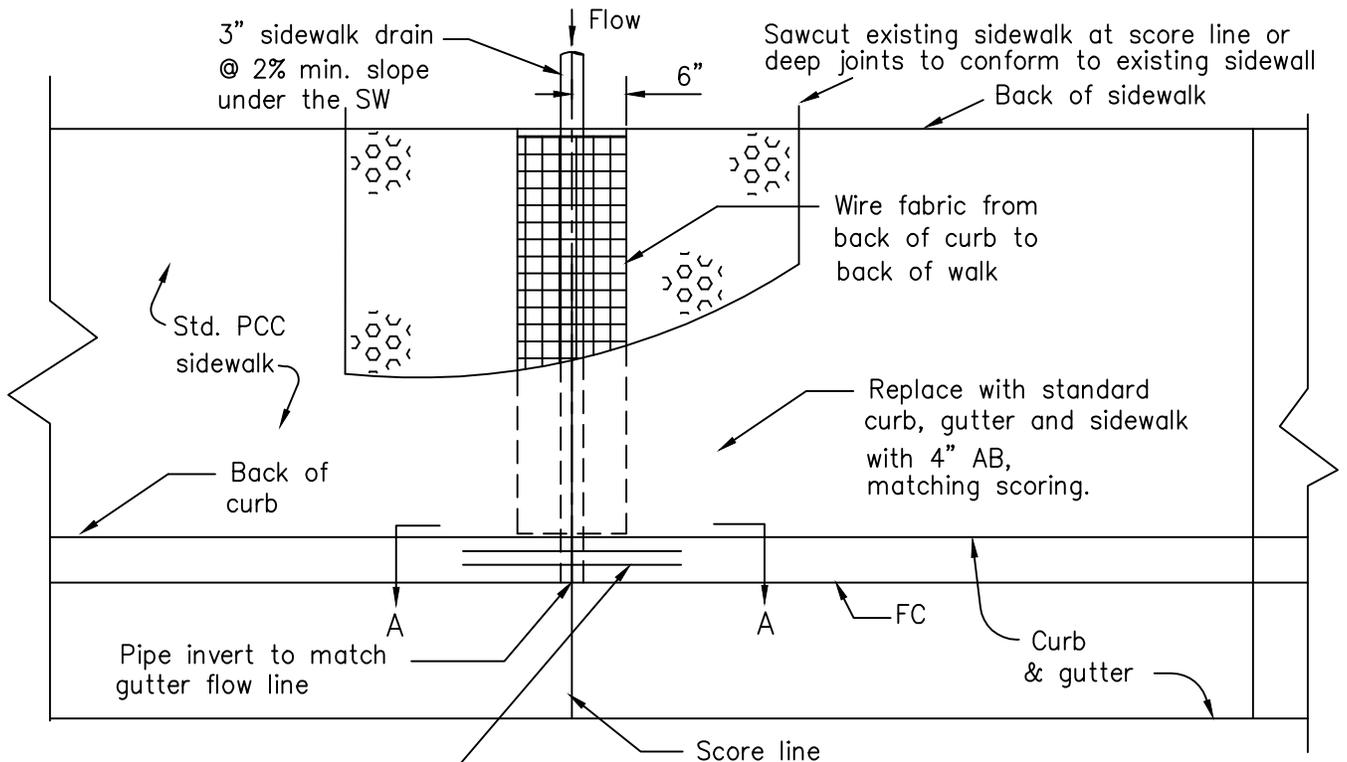
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY/JV	Date: May-13	NO.
Ckd: <i>do. &amp; J</i> Spec. Committee	Scale: NONE	
Acting City Engineer		ST-27B

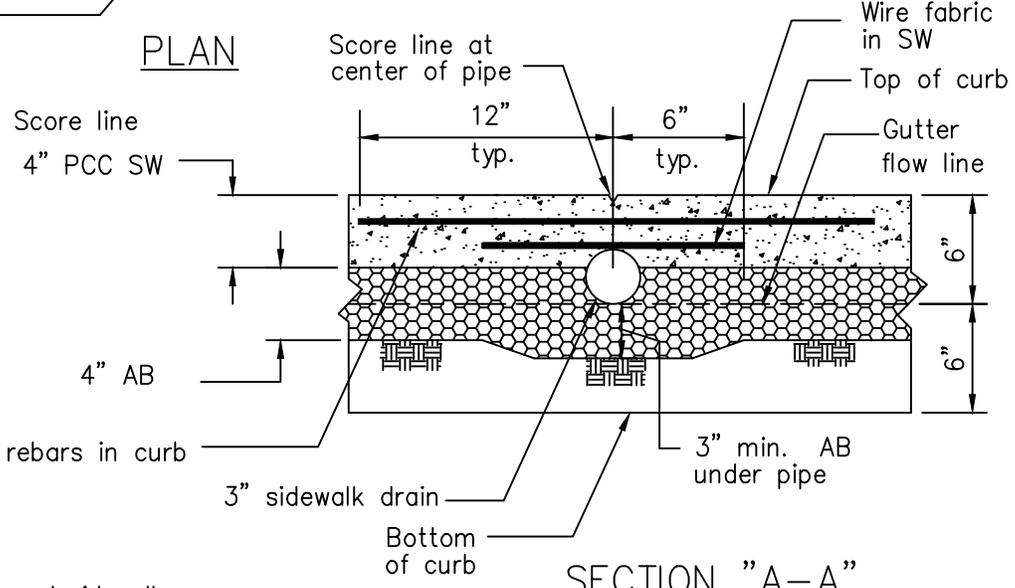
NO BIKE LANE SIGN

ST27B.DWG

Date	By	Rev.



PLAN



SECTION "A-A"

NOTES:

1. Standard curb, gutter and sidewalk:
  - a. See ST-3, 4, & 5 for sidewalks.
  - b. See ST-9A for curb and gutter.
2. Minimum 4" between pipes in multiple installations.
3. Sidewalk drain may not be installed within driveway approach (top of flare) .
4. Sidewalk drain to be perpendicular to face of curb.

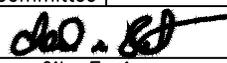
User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

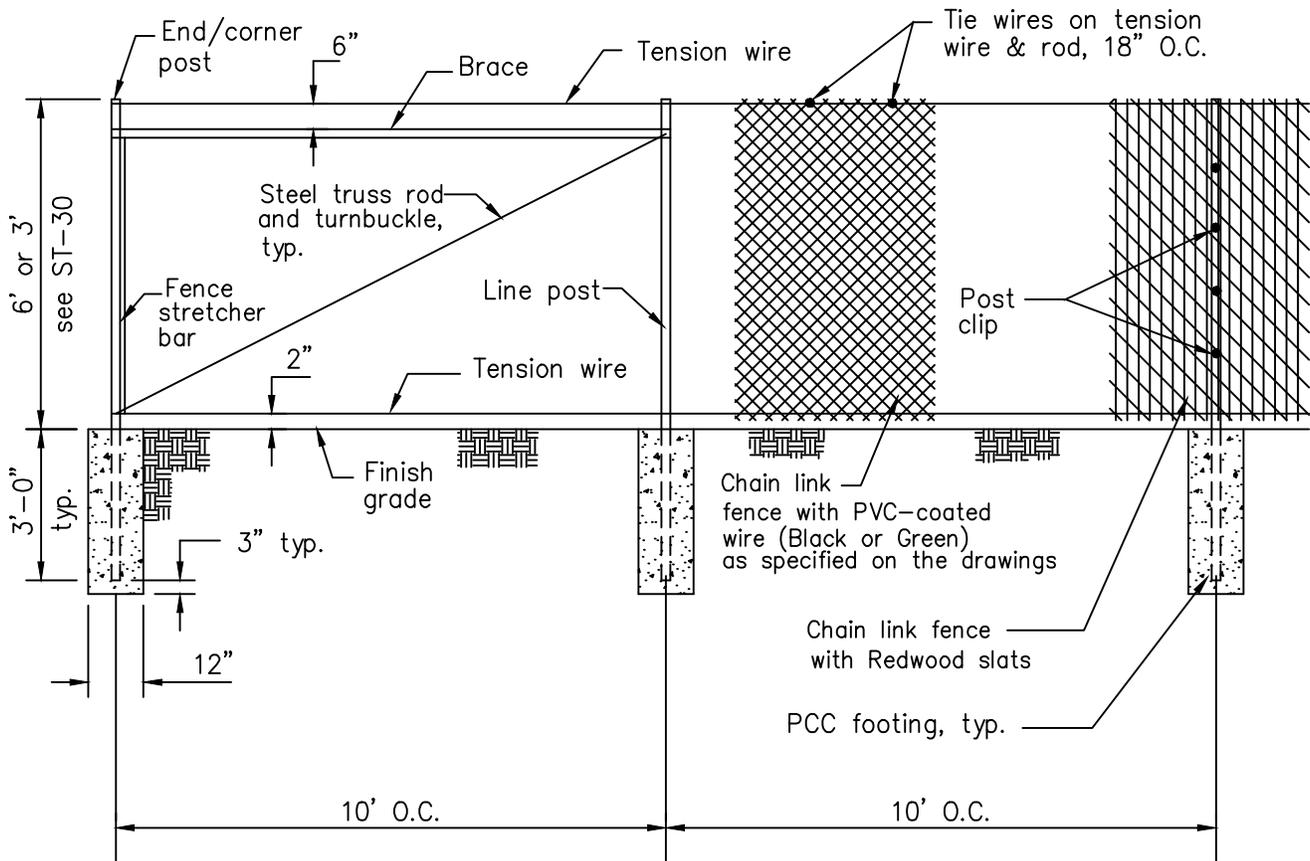
ST28.DWG

Date	By	Rev.

SIDEWALK DRAIN

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	ST-28
 City Engineer		



**NOTE:**

See ST-30 for Pedestrian Walkway fence height and setback requirements.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

CHAIN LINK FENCE

CITY OF LIVERMORE  
STANDARD DETAIL

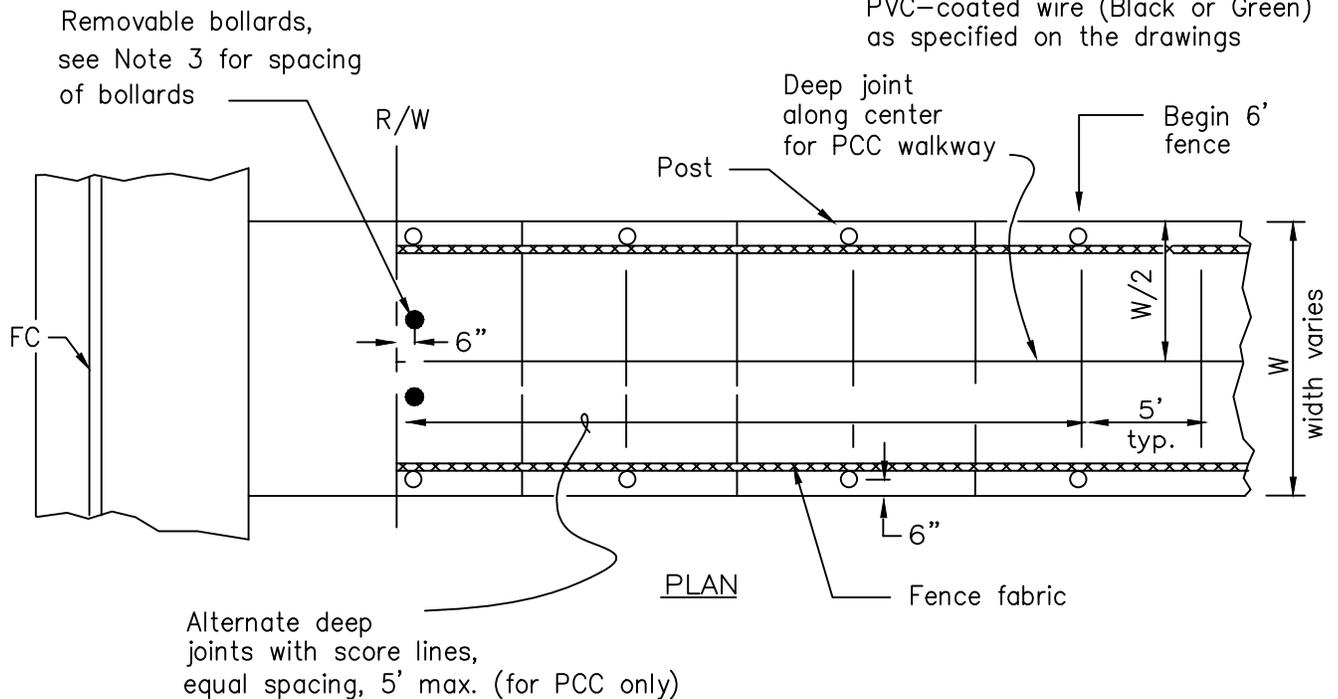
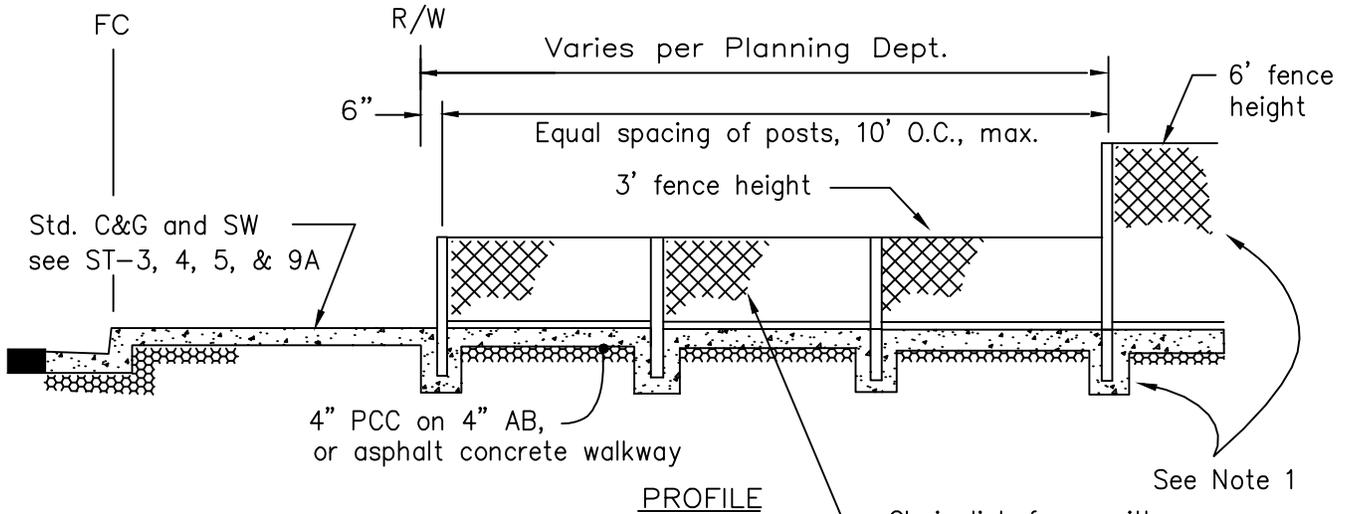
Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*dbw - [Signature]*  
City Engineer

ST-29

ST29.DWG

Date	By	Rev.



**NOTES:**

1. See ST-29 for chain link fence and concrete footing details.
2. See ST-23 for removable bollard details.
3. For walkways 10 feet or narrower, install one bollard at 5 feet from one edge of travel path. For walkways wider than 10 feet, install bollards (2 min.) with a 5 feet wide gap at the center of walkway.

**User note:**

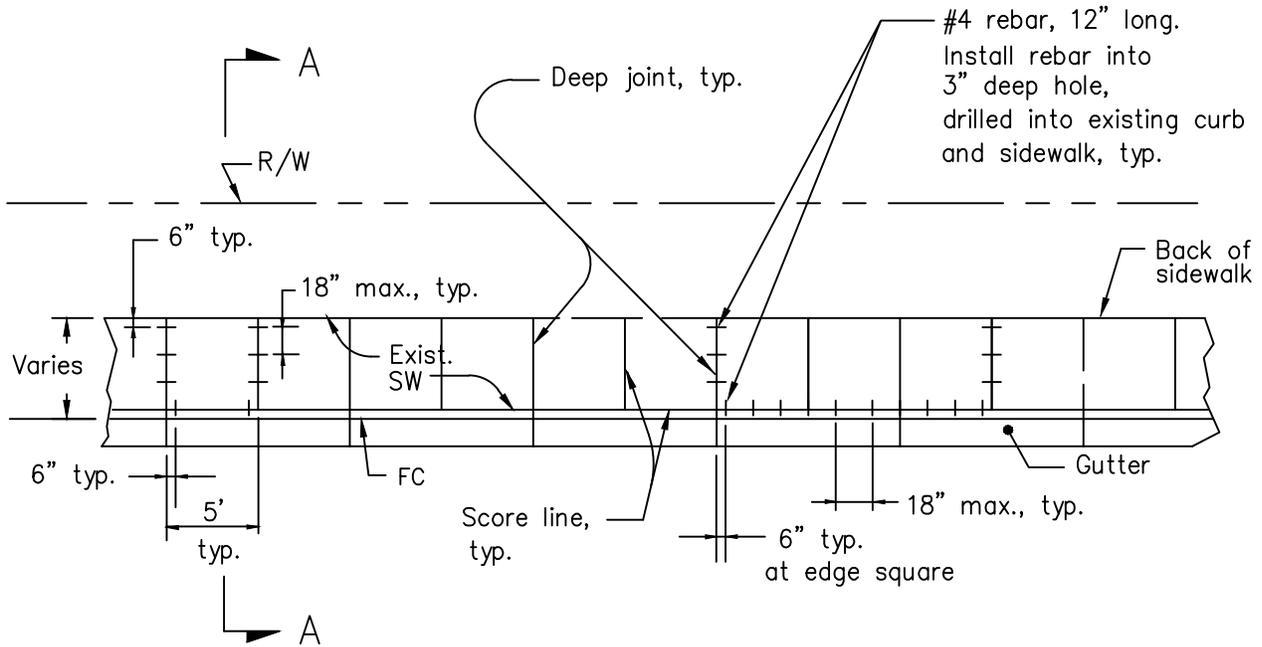
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST30.DWG			
	Date	By	Rev.

PEDESTRIAN  
WALKWAY

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: KY/KR	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		ST-30

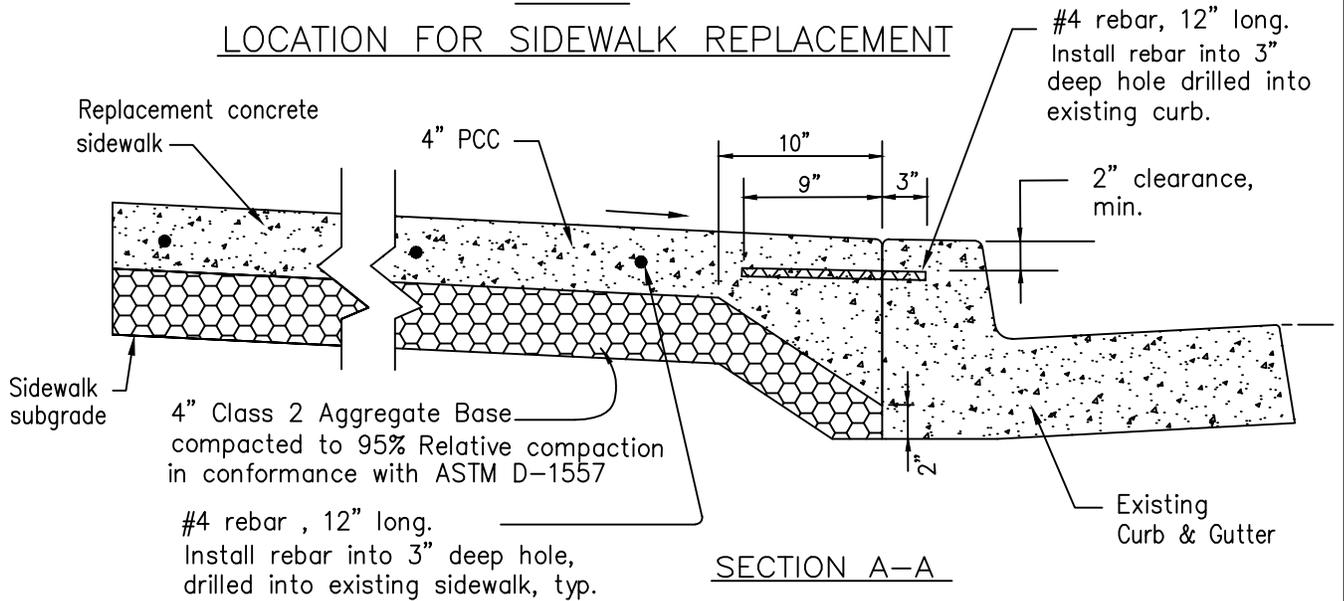


REPLACEMENT OF ONE SQUARE

REPLACEMENT OF TWO OR MORE SQUARES

PLAN

LOCATION FOR SIDEWALK REPLACEMENT



SECTION A-A

NOTES:

1. Match width and scoring pattern with adjacent existing sidewalk.
2. Moist undisturbed native subgrade may not need to be compacted as approved by the City.
3. All exposed corners shall have 1/2" radius.
4. Sawcut existing sidewalk at score line or deep joints to conform to existing sidewalk.
5. The concrete shall have a minimum 28 day compressive strength of 3000 psi. Lampblack shall be added at a rate of 3/4 pound/pint per cubic yard of concrete.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST31.DWG

Date	By	Rev.

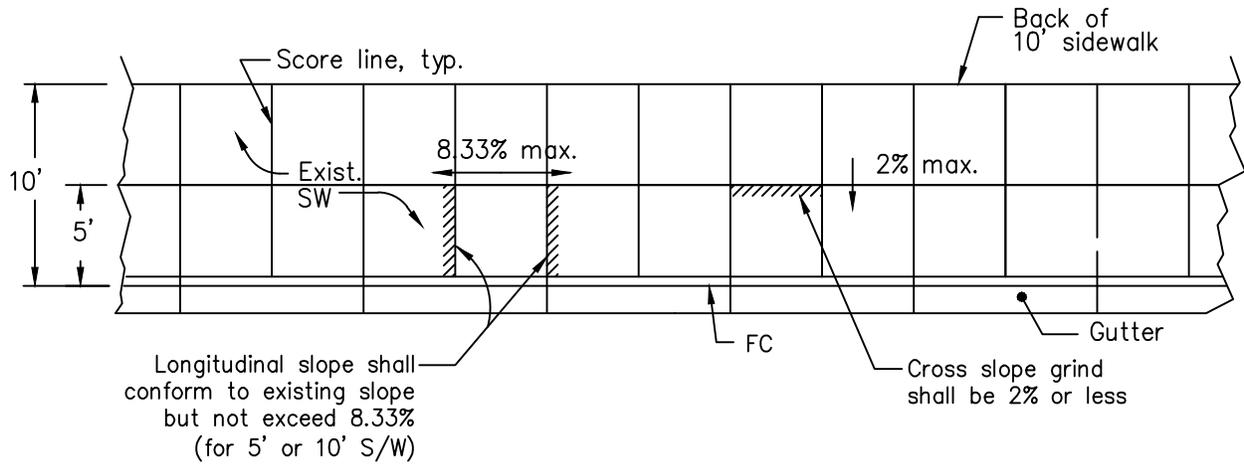
SIDEWALK REPAIR

CITY OF LIVERMORE  
STANDARD DETAIL

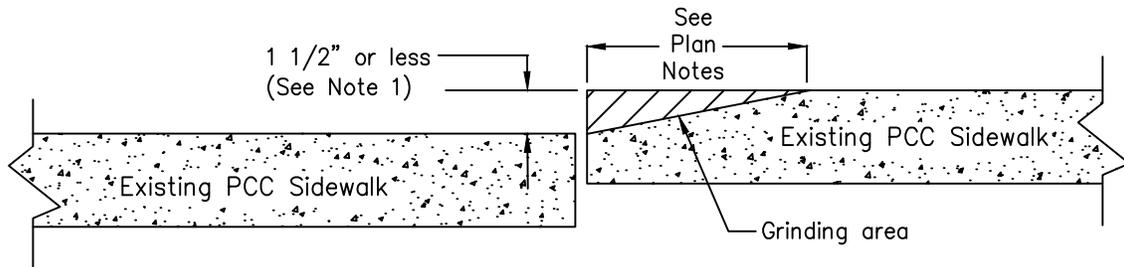
Dwn: KY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	

*[Signature]*  
City Engineer

ST-31



PLAN



TYPICAL SECTION

NOTE:

1. If separation is greater than 1 1/2" then sidewalk is to be removed and replaced per City Standard Detail ST-31.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

ST31.DWG

Date	By	Rev.

SIDEWALK  
GRINDING  
REPAIR

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: MJT	Date: May-13	NO.  ST-32
Ckd: Spec. Committee	Scale: NONE	
 City Engineer		

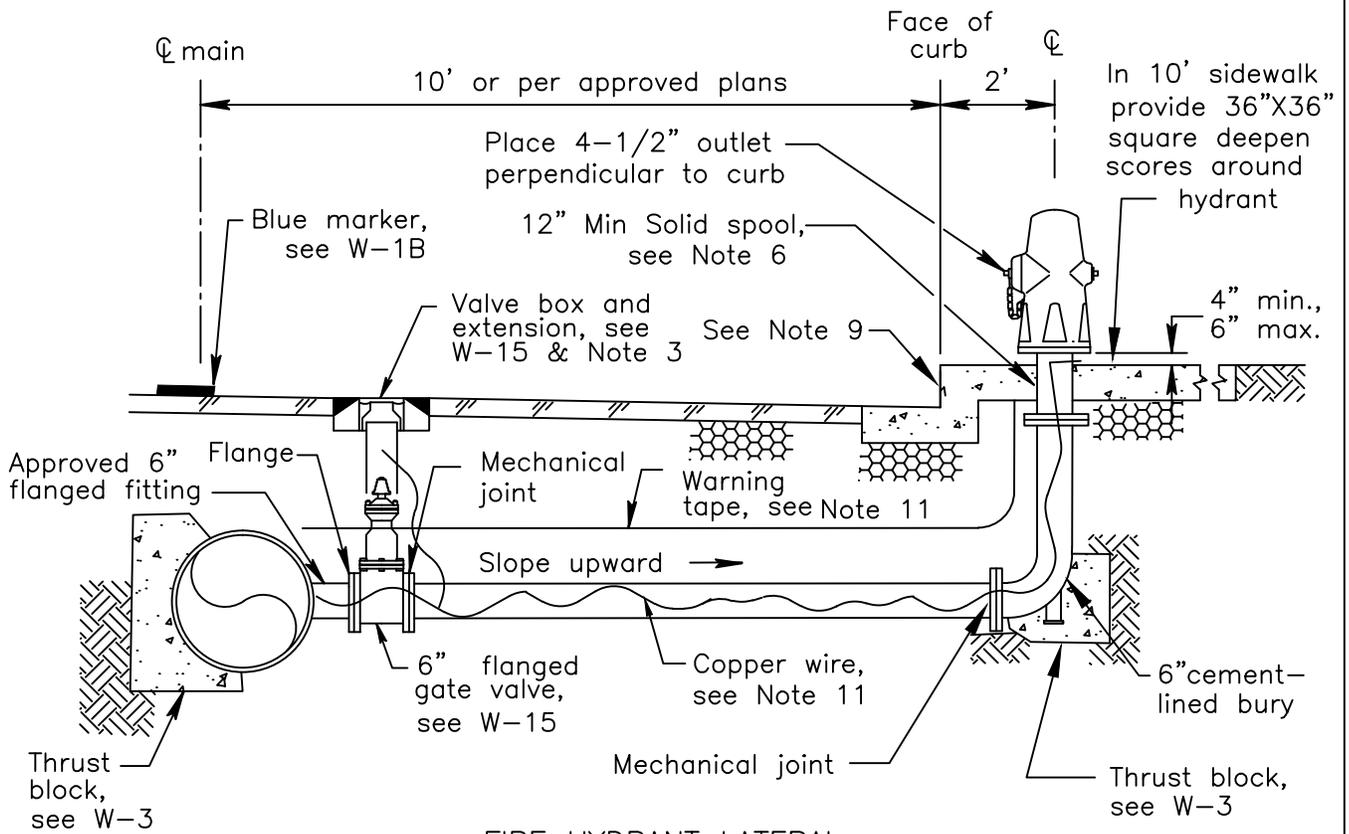
# CITY OF LIVERMORE

## STANDARD DETAILS

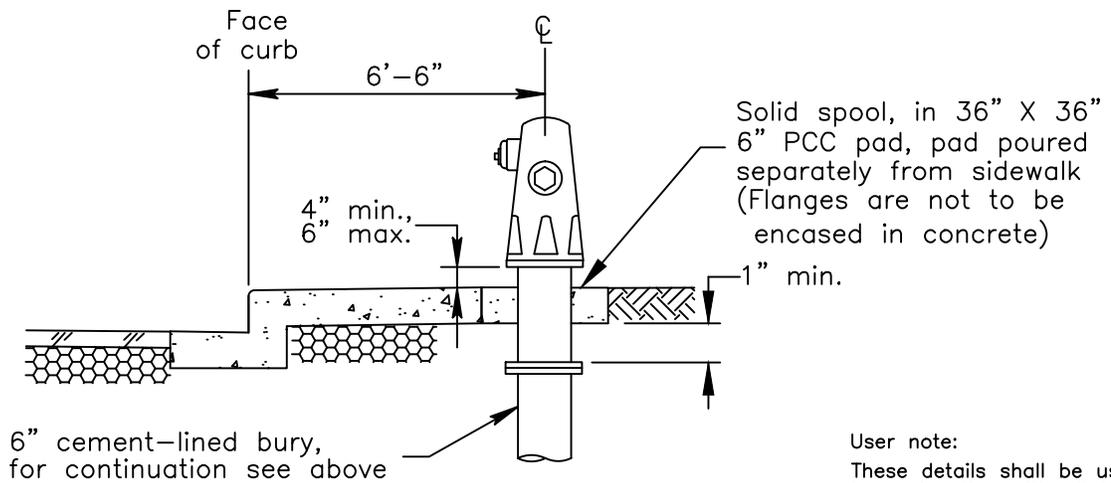
### TABLE OF CONTENTS

#### WATER - W

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W-2	WATER SERVICE CONNECTION, 1", 1-1/2", AND 2"
W-3	THRUST/ANCHOR BLOCK
W-4	AIR RELEASE/BLOW-OFF
W-5	DEAD END BLOW-OFF; IN-LINE BLOW-OFF; LOW POINT BLOW-OFF (FOR PIPES LARGER THAN 12")
W-6	AIR RELEASE VALVE
W-7	WATER MAIN TEMPORARY JUMPER CONNECTIONS
W-8	TAPPING SLEEVE AND VALVE, 4" SERVICE AND LARGER (ACP, PVC & DIP)
W-9	TAPPING OUTLET AND VALVE, 4" SERVICE AND LARGER (MLCSP)
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W-17	MANIFOLD WATER METER INSTALLATION
W-18	PRESSURE REDUCING STATION
W-19	(NUMBER NOT USED, FUTURE ANODE DETAIL)
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W-22	REDUCED PRESSURE BACKFLOW PREVENTER
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W-25	WATER QUALITY SAMPLING STATION
W-26	WATER LINE ANGLE MARKER
W-27	STEEL CASINGS FOR MAINS



FIRE HYDRANT LATERAL  
with 10' sidewalk or no sidewalk



FIRE HYDRANT LATERAL  
with 5' sidewalk

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

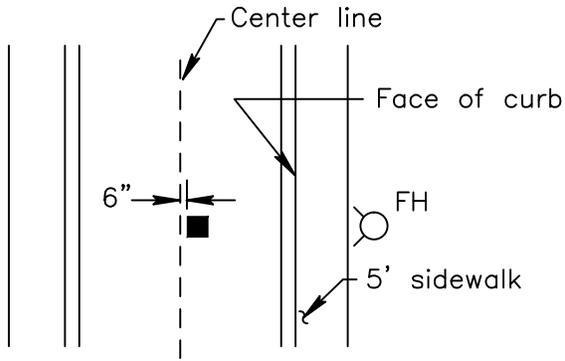
Date:	By:	Rev:

FOR CITY OF LIVERMORE  
WATER SERVICE AREA  
  
FIRE HYDRANT AND LATERAL

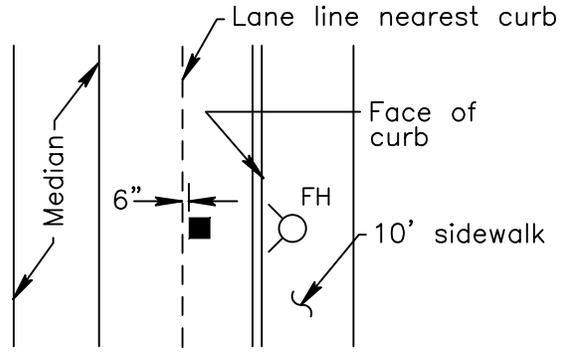
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-1A
<i>do</i>		
City Engineer		

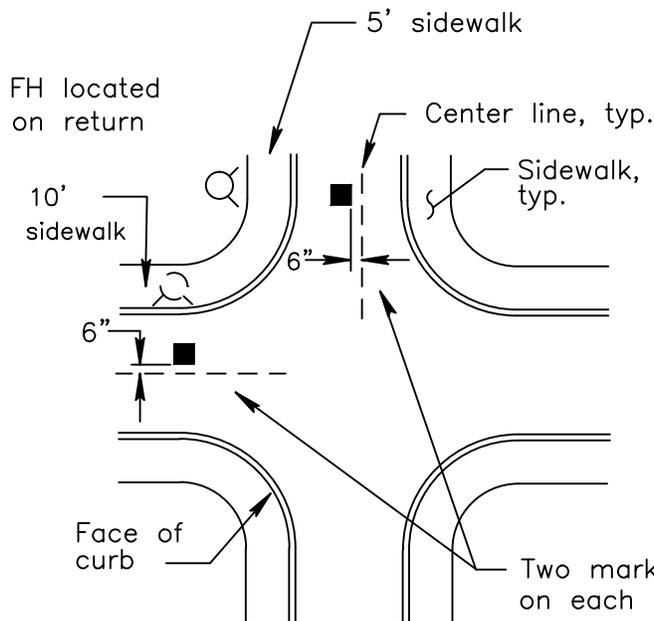
W01A.DWG



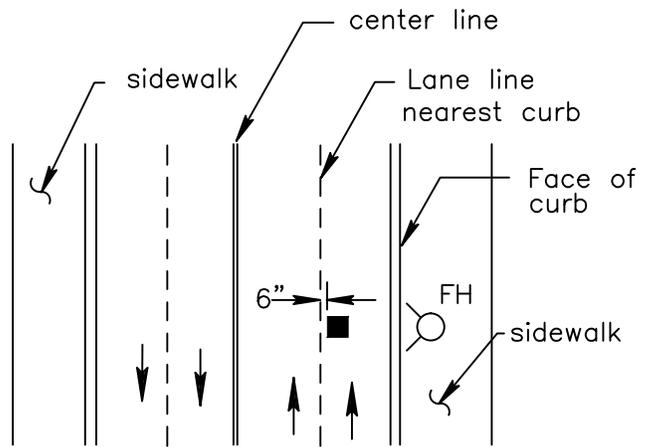
FH MARKER LOCATION



FH MARKER LOCATION  
with median



FH MARKER LOCATION  
at intersection



FH MARKER LOCATION  
without median

■ Two-way blue reflective pavement marker, typ.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

CITY OF LIVERMORE  
STANDARD DETAIL

FIRE HYDRANT MARKER

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-1B
 City Engineer		

W01B.DWG

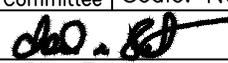
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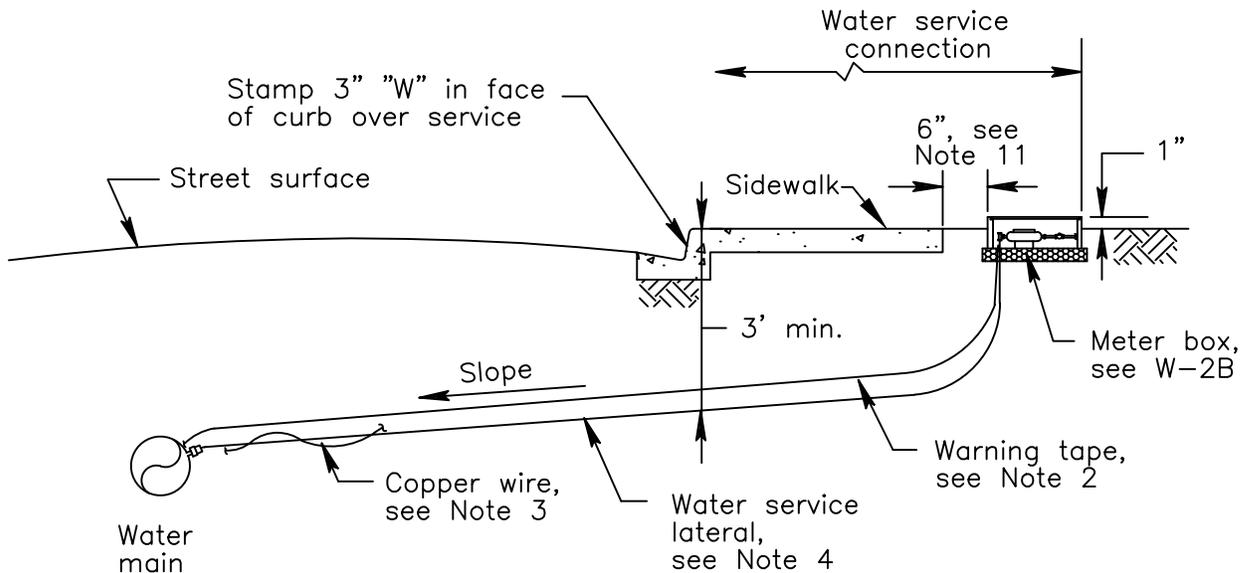
Notes:

1. Deviations to the installation and location of fire hydrants are subject to Fire Department approval.
2. Where sidewalk is not provided, cast pipe in 36" sq. x 6" concrete pad.
3. Gate valve lids to be painted per the City Standard Specifications.
4. Blue reflective pavement markers are required. Marker and installation of marker per Section 85-1.05 and 85-1.06 of Caltrans Standard Specifications. Use Rapid Set Adhesive only per Caltrans Standard Specifications Section 95-2.04.
5. See W-15 for valve installation, and W-12 for guard post installation.
6. Hydrant flange bolts above grade to be break-off type with hollow bolt end installed facing up. All other hydrant flange bolts to be 12" min solid spool.
7. Locate as follows: Min. 6" from face of curb or back of sidewalk to closest point on fire hydrant, and:
  - For 5' sidewalk = 6'-6" from face of curb.
  - For 10' sidewalk, = 1'-6" from face of curb.
  - separated sidewalk,
  - or no sidewalk
  - Residential = Minimum 5' from driveways.  
Minimum 3' from any obstruction.
  - Commercial/Industrial = Minimum 10' from driveways.  
Minimum 3' from any obstruction.
  - Intersections = At end of return.
  - For offset to street trees see L-3.
8. Offset or slotted spools will only be allowed on a case by case basis, as approved by the ENGINEER. If allowed slotted spools, ends shall be attached to bury.
9. Stamp or chip 3" high valve type "GV" and distance of valve from face of curb, in Roman numerals, in face of curb over fire hydrant lateral. Paint the Roman numerals per the City Standard Specifications.
10. Warning signs are required for all Fire Hydrant installations on Recycled Water Systems. Contact the City Water Resources Division for specific size, materials, wording, and location.
11. Fire hydrant lateral shall have warning tape and copper wire installed along it's entire length and extended up through the concrete pad, see W-1A.
12. Fire hydrant and lateral in the California Water Company service area are to be constructed per Cal Water's latest standard detail.

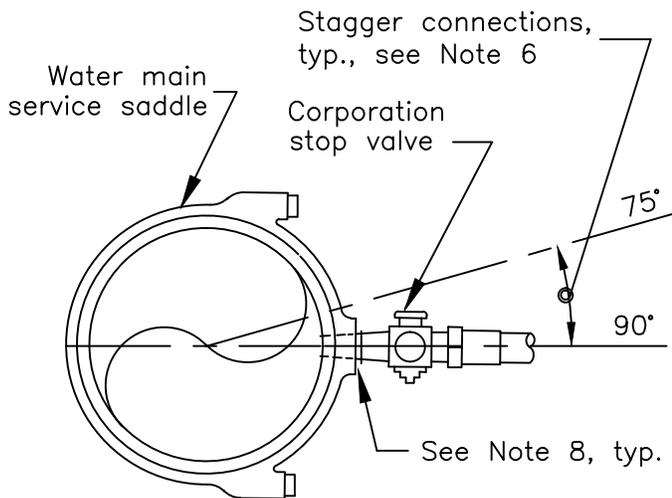
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

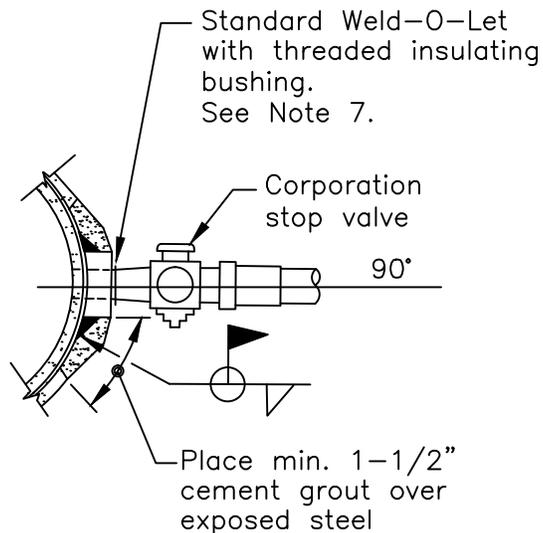
W01C.DWG				FIRE HYDRANT AND LATERAL NOTES	CITY OF LIVERMORE STANDARD DETAIL			
					Dwn: FY	Date: May-13	No.	
					Ckd: <small>Spec. Committee</small>	Scale: None	W-1C	
					 City Engineer			
	Date:	By:	Rev:					



SERVICE CONNECTION



TYPICAL WATER MAIN CONNECTION



ALTERNATE WATER MAIN CONNECTION FOR STEEL PIPE

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

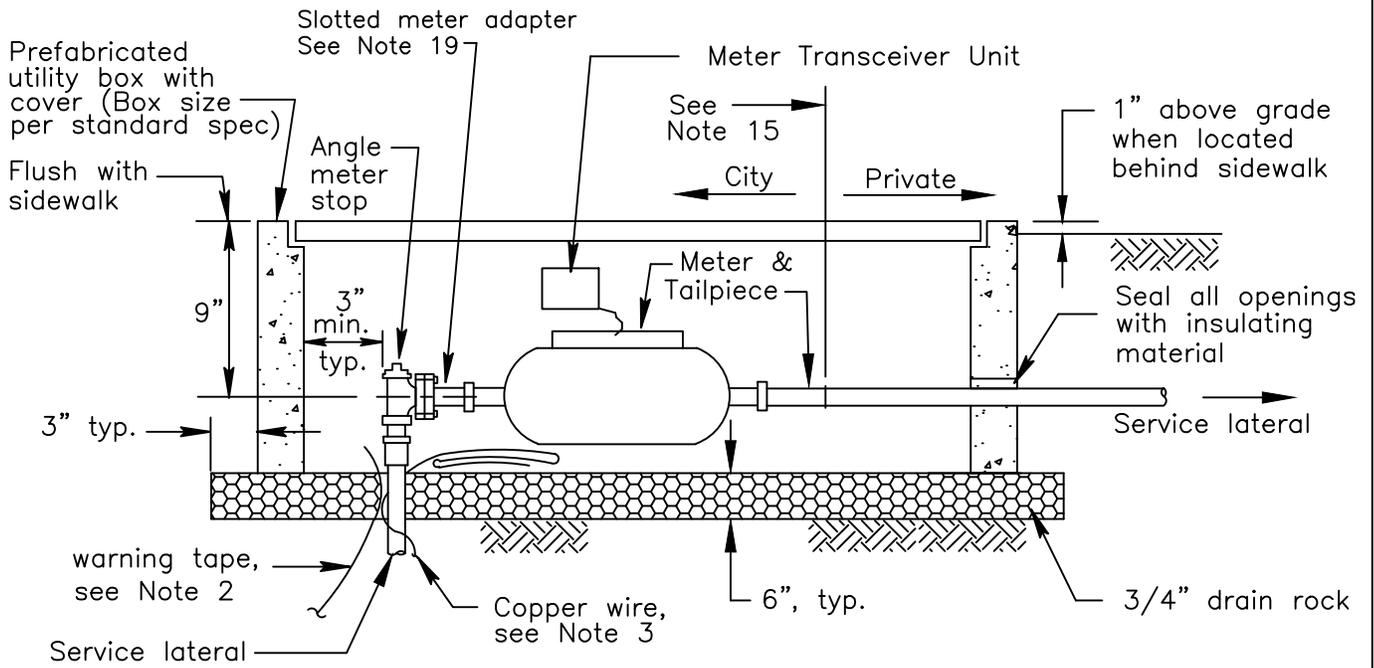
W02A.DWG

Date:	By:	Rev:

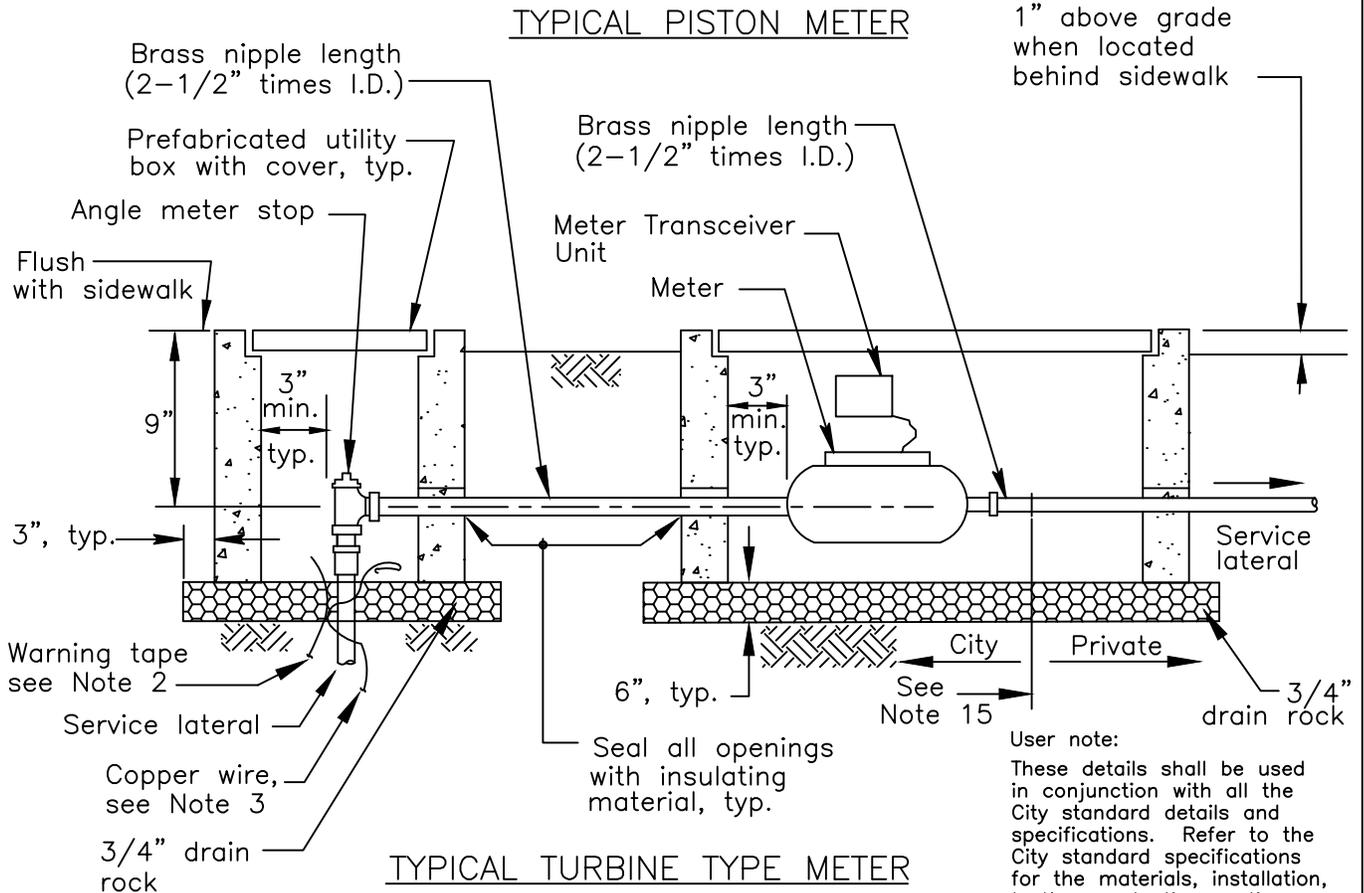
WATER SERVICE CONNECTION  
1", 1-1/2", and 2"

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-2A
 City Engineer		



TYPICAL PISTON METER



TYPICAL TURBINE TYPE METER

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

WATER SERVICE CONNECTION  
1", 1-1/2", and 2"

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-2B
 City Engineer		

Date:	By:	Rev:
-------	-----	------

W02B.DWG

Notes:

1. A check valve is required after the meter if service is a "Dedicated Fire Service". See W-10A
2. Provide warning tape. Place 1'-0" above service lateral between water main and curb. Lower to directly above service lateral from curb to meter.
3. Provide AWG Number 10 USE-2 insulated copper wire between meter and water main. Wrap insulated copper wire around service lateral and splice into main line copper wire. Provide 18" slack in utility box.
4. All service laterals to be polyethylene tubing, installed joint free.
5. Service connections shall be on service side of pipe and spaced at least 2' from fittings or end of pipe; and a minimum of 2' apart along water main.
6. Service connections shall be staggered 15 degrees from location of adjacent connection, and shall be at 75 and 90 degrees from vertical.
7. After completing water main connection, all coatings shall be repaired. All ferrous surfaces shall be coated.
8. From corporation stop valve through meter installation, all hardware to be brass or bronze (including nuts and bolts).
9. Split "T" services are not allowed.
10. All meters are to be purchased from the City, and installed by the city. All fittings or appurtenances not supplied with the meter are to be supplied by the contractor.
11. Location of meter box:
  - 6" from back of 5' monolithic sidewalks
  - 6" from back of curb without sidewalk or in 10' sidewalk
  - 6" from front of 5' separated sidewalk.
12. Service lateral shall be perpendicular to main, and run in a straight line without bends. Service laterals must not cross.
13. For turbine meter 3" and larger see W-11.
14. Meters for irrigation systems 1 1/2" and larger must be a turbine meter.
15. The City's maintenance jurisdiction is up to the tail piece.
16. Use a slotted meter adapter for meter sizes 1" and smaller when service laterals are 1-1/2" or 2".
17. For water service connections in City's Pressure Zone (east of Vasco Road and north of Highway I-580), pressure reducing valves shall be installed. For areas south of Highway I-580, west of Vasco Road, and Zone 1 area, contact the Building and Water Resources Divisions for information.
18. A reduce pressure back flow device is required on all commercial services.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

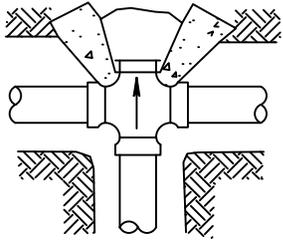
W02C.DWG

Date:	By:	Rev:

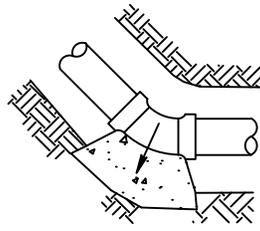
WATER SERVICE  
CONNECTION  
1", 1-1/2", and 2"  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

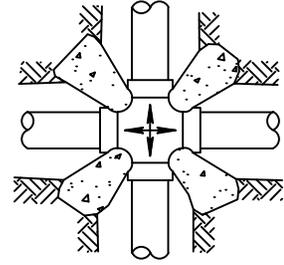
Dwn: FY	Date: May-13	No.  W-2C
Ckd: <small>Spec. Committee</small>	Scale: None	
 City Engineer		



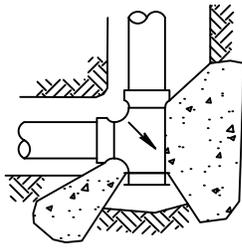
75 % of "Tee" thrust  
BLIND CROSS



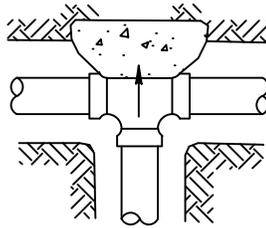
100% "Elbow" thrust  
HORIZONTAL BEND



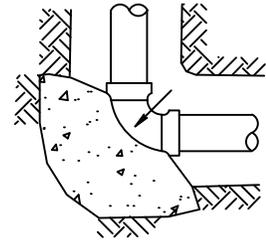
75 % of "Tee" thrust  
CROSS



100% of  
"Tee" thrust

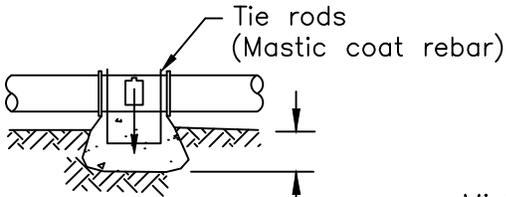


100% of "Tee" thrust  
TEE



100% of "Elbow" thrust  
90° ELL

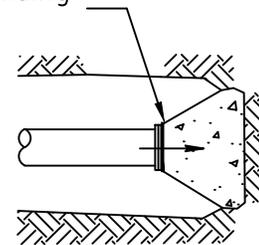
75% of "Tee" thrust  
BLIND TEE



100 % of "tee" thrust  
IN - LINE  
VERTICAL VIEW

Foam board or building  
paper separator

Minimum 6" cavity  
into undisturbed  
soil, typ., all details



100 % of "Tee" thrust  
DEAD - END  
PLAN VIEW

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W03A.DWG

Date:	By:	Rev:

## THRUST/ANCHOR BLOCK

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY  
Ckd: Spec. Committee

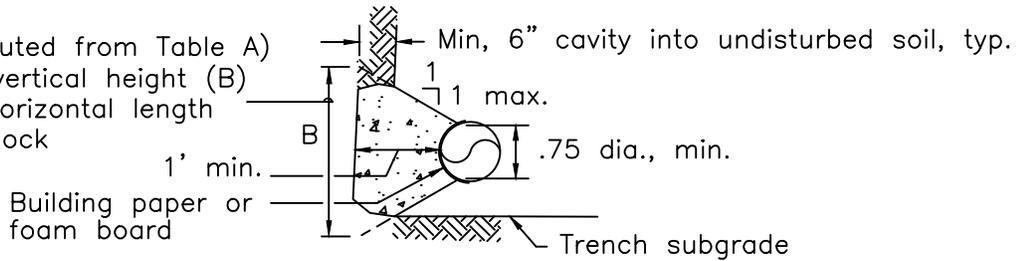
Date: May-13  
Scale: None

No.

W-3A

*dbd - BT*  
City Engineer

Area (computed from Table A) divided by vertical height (B) equals to horizontal length of thrust block



TYPICAL THRUST BLOCK SECTION-VERTICAL VIEW

TABLE A - THRUST BLOCKS FOR FITTINGS

THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS (T)					
PIPE SIZE	DEAD END, TEE, OR CROSS	90° ELBOW	45° ELBOW	22-1/2° ELBOW	11-1/4° ELBOW
4	19	27	15	7	4
6	39	55	30	15	8
8	67	94	51	26	13
10	109	154	84	43	21
12	155	218	119	61	32
14	210	296	161	82	41
16	272	383	209	106	53
18	351	494	269	137	68
20	434	611	333	169	85
24	623	878	478	244	122

The bearing area required for a thrust block shall be determined from the following formula:

$$A = \frac{P \times T}{S}$$

Where A= Area of bearing required for thrust block (sq. ft.).  
 P= Internal Pressure (PSI). 200 PSI minimum, see Note 1.  
 T= Thrust (lb. per PSI of water pressure) from Table A above.  
 S= Allowable bearing pressure of Soil (PSF). See Note 2.  
 PSF= Pound per square foot  
 PSI= Pound per square inch

Example:

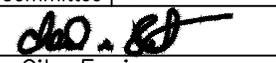
Given : An 8-inch 90° elbow with internal pressure (P)= 200 PSI,  
 Allowable bearing pressure of Soil (S)= 1500 PSF.

From Table : Thrust (T)= 94 lb. per PSI of water pressure.

Required bearing area for thrust block (A) =  $\frac{94 \times 200}{1500} = 12.5$  sq. ft.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W03B.DWG

			CITY OF LIVERMORE STANDARD DETAIL		
			Dwn: M-W/KY	Date: May-13	No.
			Ckd: Spec. Committee	Scale: None	W-3B
			 City Engineer		
Date:	By:	Rev:	THRUST/ANCHOR BLOCK		

Notes:

1. In using the tables, use the maximum internal pressure anticipated ( i.e. hydrostatic test pressure, possible surge pressure, due to pump shut-off, etc.). Minimum 200 PSI
2. See soils report for bearing strength of soil. In the absence of soils report obtain soil bearing strength from the ENGINEER.  
(Note: 1500 PSF is used only as an example in these calculations.)
3. Thrust blocks are not required on PVC pipe with solvent welded joints.
4. Thrust blocks for horizontal loads are not required if  $(0.0139 \times \text{dia. of pipe in inches})^2 \times \text{allowable soil bearing pressure (PSF)}$  is larger than the thrust calculated in the tables.
5. Install thrust blocks at all pipe size changes, and at all fittings.
6. Figure (100%) in thrust block diagrams indicates percent of total calculated thrust load to be applied for each bearing area. Thrust loads to be calculated per Table A and example on W-3B.
7. Arrows (————→) indicate thrust direction.
8. Concrete is to be placed against undisturbed soil, in minimum 6" cavity.
9. Limit thrust/anchor block contact to "fittings" only, except on Horizontal Curves. Building paper or foam board material shall be used to prevent contact between concrete and "fittings".

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W03C.DWG

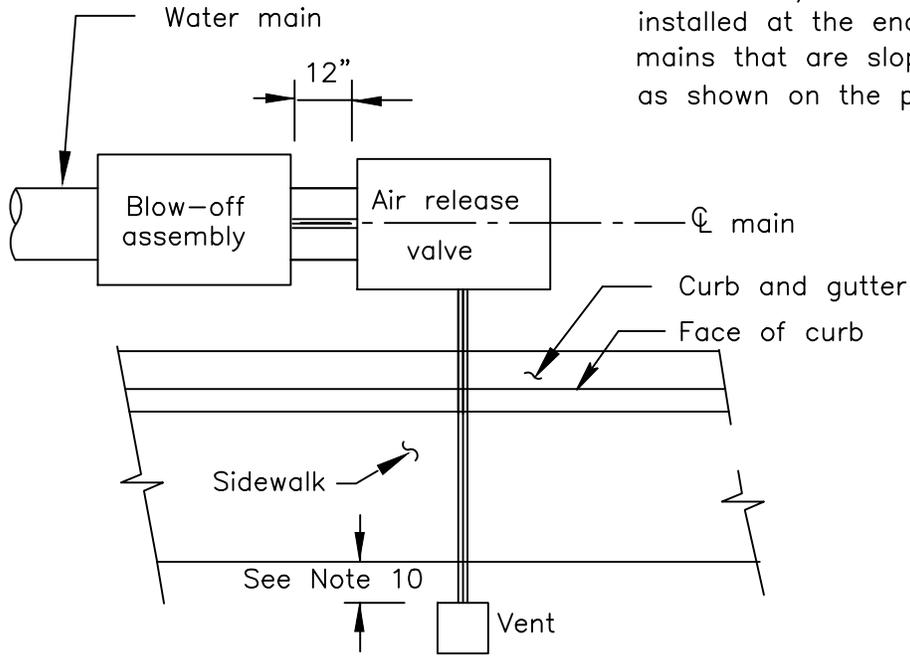
Date:	By:	Rev:

THRUST/ANCHOR BLOCK  
NOTES

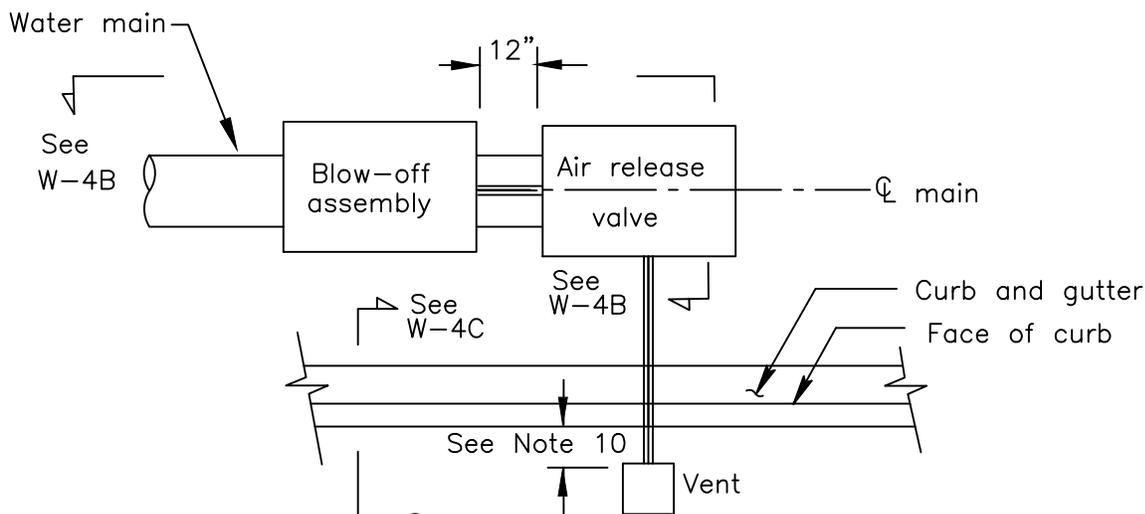
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: <small>Spec. Committee</small>	Scale: None	W-3C
 City Engineer		

Air Release/Blow-Off assembly to be installed at the end of "Dead-end" water mains that are sloped upward, and as shown on the plans.



PLAN WITH SIDEWALK



PLAN WITHOUT SIDEWALK

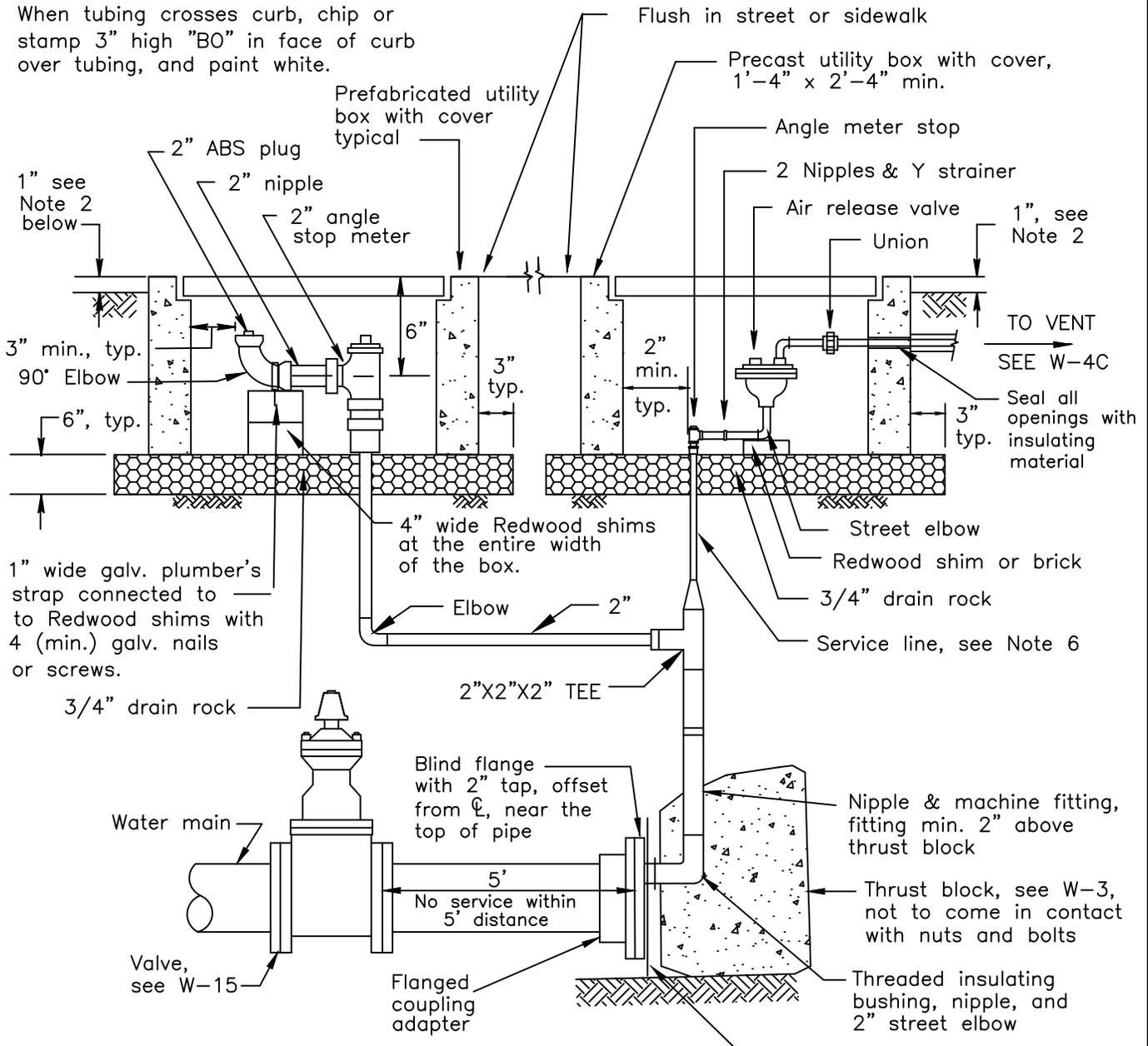
User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W04A.DWG			
	Date:	By:	Rev:

AIR RELEASE/BLOW-OFF  
 (FOR CUL-DE-SAC AND DEAD END STREET)

CITY OF LIVERMORE STANDARD DETAIL		
Dwn: KY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-4A
 City Engineer		

When tubing crosses curb, chip or stamp 3" high "B0" in face of curb over tubing, and paint white.



**NOTES:**

**DEAD-END ELEVATION**

Bow-Off Notes (Notes 1 through 5):

1. Contractor shall not operate City valves. 24 hour notice required for City to operate valves.
2. Locate utility box 1" above grade in unimproved areas.
3. All material to be brass or bronze, except 2" ABS plug.
4. See W-5B for "In-Line" Blow-off.
5. For mains larger than 12" Blow-off assembly must be designed for adequate flow rate and approved by the ENGINEER.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

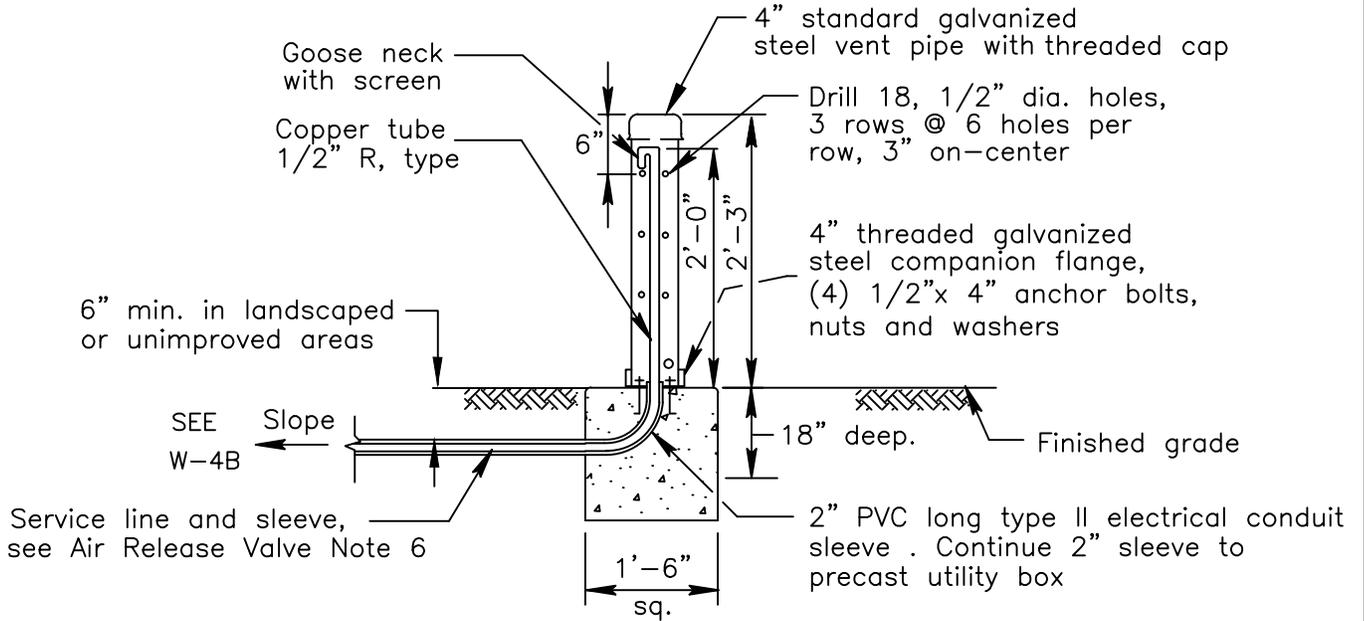
W04B.DWG

Date: By: Rev:

**AIR RELEASE/BLOW-OFF**  
(FOR CUL-DE-SAC AND DEAD END STREETS)

**CITY OF LIVERMORE**  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	<b>W-4B</b>
City Engineer		



VENT ELEVATION

NOTES CONTINUED:

Air Release Valve Notes ( Notes 6 through 15):

6. All service lines shall have warning tape and copper wire installed along its entire length. See W-2.
7. Provide bolt down cover on utility box.
8. All line and hardware sizes depend on size of air release valve.
9. All metal to be brass or bronze from the main thru the PVC street elbow above the air release valve. Line shall be copper tubing from the PVC street elbow to the top of the vent pipe.
10. 6" behind back of sidewalk or 12" behind back of curb without sidewalk.
11. Stamp "AV" with 3" letters in face of curb over tubing and paint white.
12. Paint vent pipe per the City Standard Specifications.
13. PVC street elbow above valve shall have a compression by mechanical iron pipe adapter.
14. Air release valves shall be 1" for pipelines less than or equal to 12" and 2" for pipelines greater than 12".
15. Orifice size for 1" and 2" air release valves shall be determined as follows:

<u>Valve size</u>	<u>Max. operating pressure</u>	<u>Orifice size</u>
1"	150 psi	1/4"
1"	200 psi	3/16"
2"	150 psi	5/16"
2"	200 psi	1/4"

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

CITY OF LIVERMORE  
STANDARD DETAIL

AIR RELEASE/BLOW-OFF  
(FOR CUL-DE-SAC AND DEAD END STREETS)

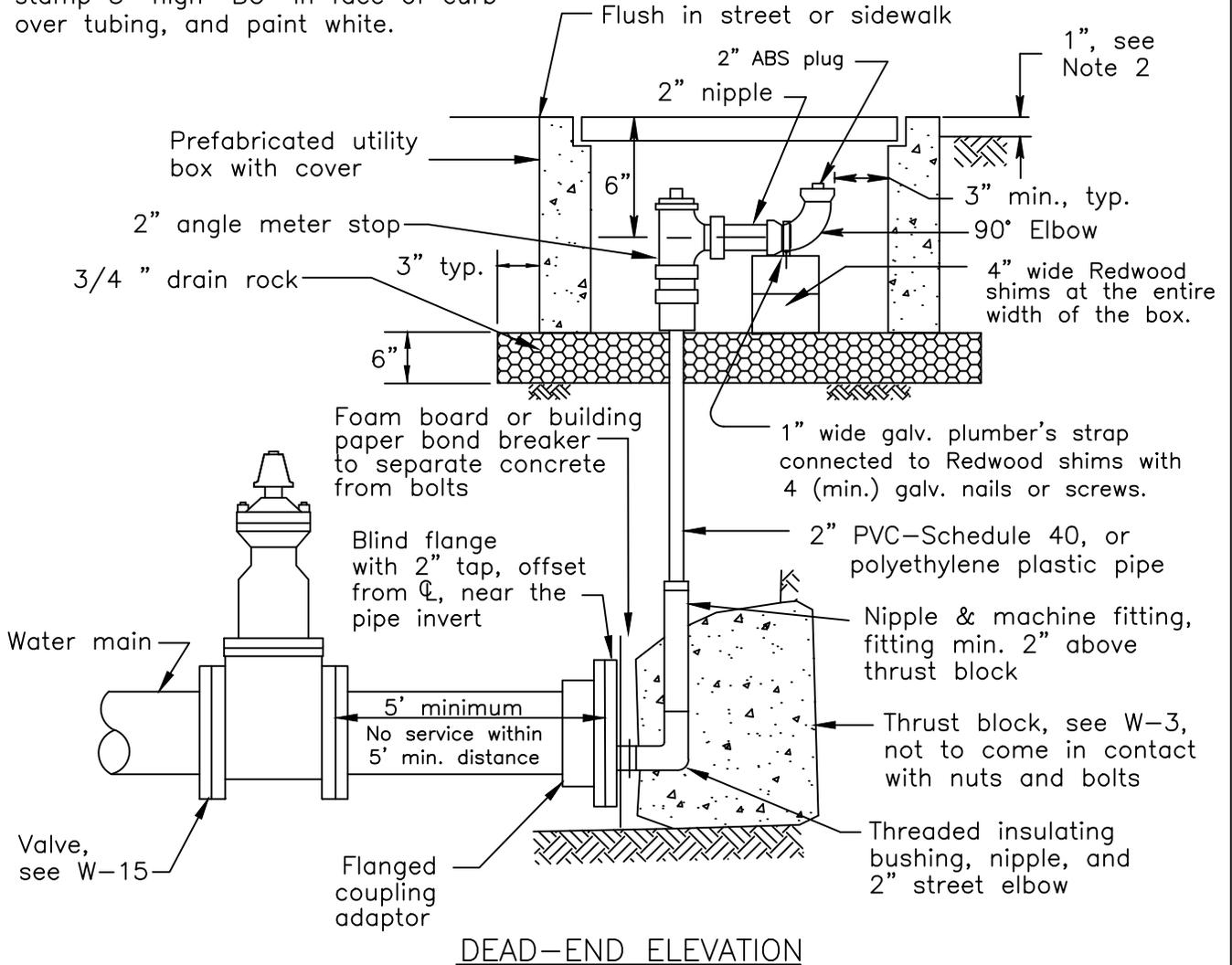
Dwn: FY	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	W-4C

*dbw. [Signature]*  
City Engineer

W04C.DWG

Date: By: Rev:

When tubing crosses curb, chip or stamp 3" high "BO" in face of curb over tubing, and paint white.



**Notes:**

1. Contractor shall not operate City valves. 48 hour notice required for City to operate valves.
2. Locate utility box 1" above grade in unimproved areas.
3. All parts to be brass or bronze, except 2" ABS plug.
4. See W-5B for "In-Line" Blow-off.
5. For mains larger than 12" see W-5C.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W05A.DWG

**DEAD END BLOW-OFF**

(FOR CUL-DE-SAC AND DEAD END STREETS)

**CITY OF LIVERMORE  
STANDARD DETAIL**

Dwn: FY      Date: May-13  
Ckd: Spec. Committee      Scale: None

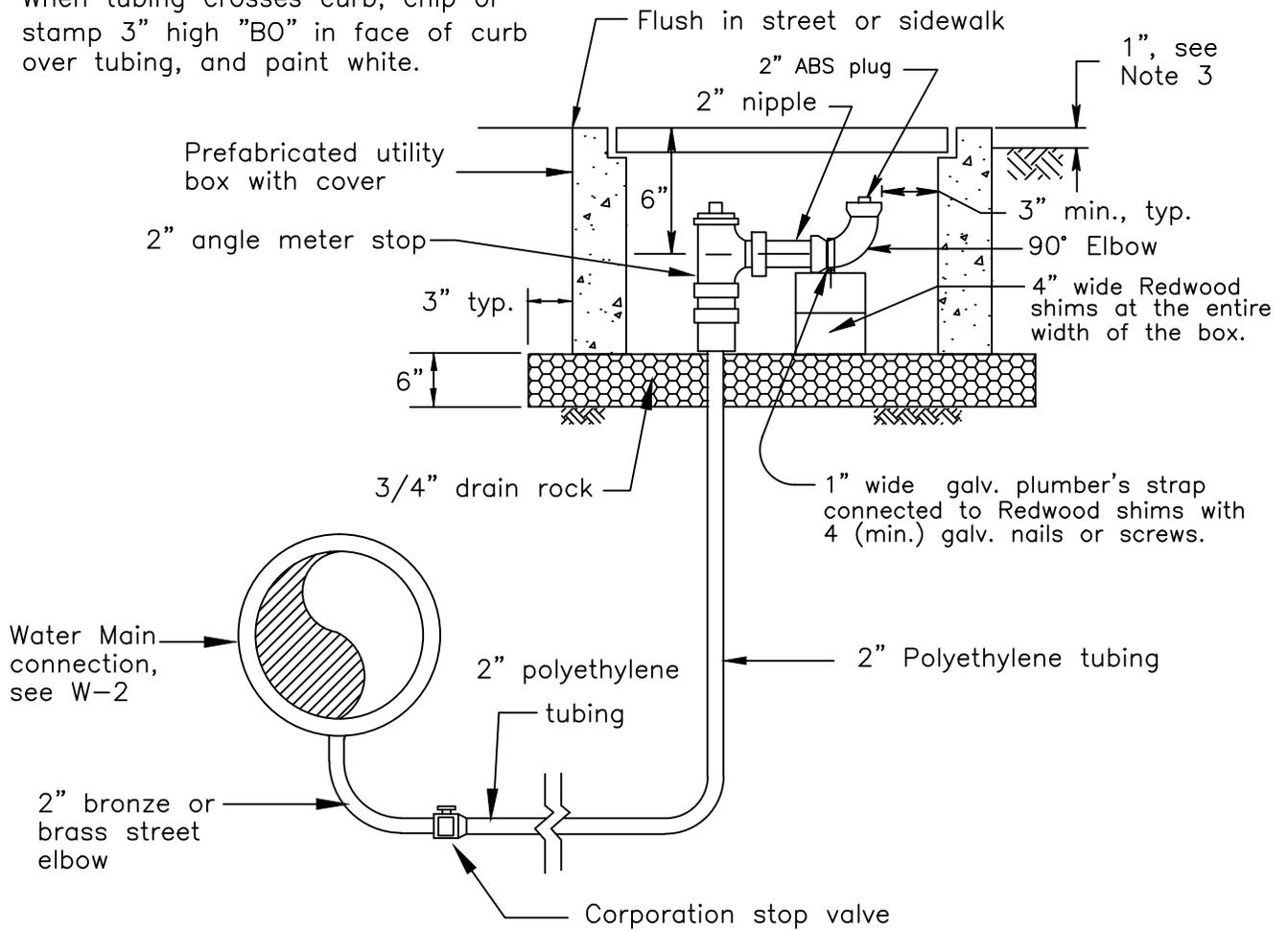
No.

*[Signature]*  
City Engineer

W-5A

Date:    By:    Rev:

When tubing crosses curb, chip or stamp 3" high "BO" in face of curb over tubing, and paint white.



IN-LINE SECTION

(For 8" to 12" dia. pipe only.  
For larger pipes see Note 1.)

Notes:

1. For pipe larger than 12" see W-5C.
2. On "In-Line" blow-off installations all polyethylene tubing shall have warning tape and copper wire installed along its entire length. See W-2.
3. Locate utility box 1" above grade in unimproved areas.
4. All metal to be brass or bronze, except 2" ABS plug.
5. See W-5A for CUL-DE-SAC and dead end streets blow-off.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

CITY OF LIVERMORE  
STANDARD DETAIL

IN-LINE BLOW-OFF

Dwn: FY Date: May-13  
Ckd: Spec. Committee Scale: None

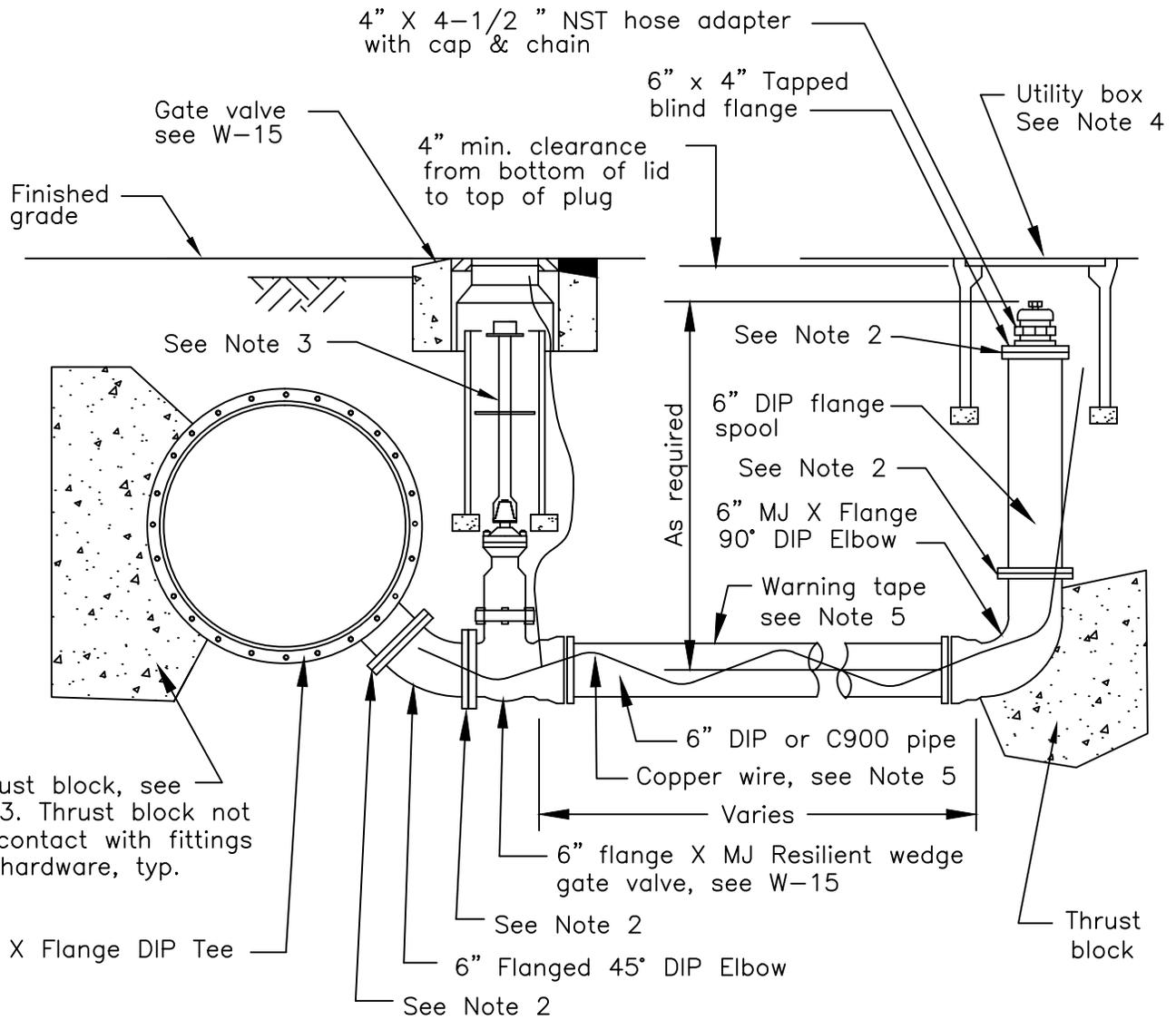
No.

*dbw. [Signature]*  
City Engineer

W-5B

W05B.DWG

Date:	By:	Rev:
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MJ = MECHANICAL JOINT

VERTICAL ELEVATION

Notes:

1. Use building paper or foam board to prevent direct contact of concrete with pipe fittings, flanges, or nuts and bolts. See W-3.
2. 6" 316 stainless steel bolt & gasket set.
3. Provide valve stem extension where depth to operator exceeds 8 feet.
4. Locate utility box for hose adapter 6" behind back of sidewalk or 12" behind back of curb without sidewalk. 1" above grade in landscaped or unimproved areas.
5. Low Point Blow-off line shall have warning tape and copper wire installed along its entire length as shown, see W-2.

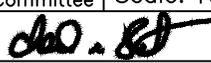
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

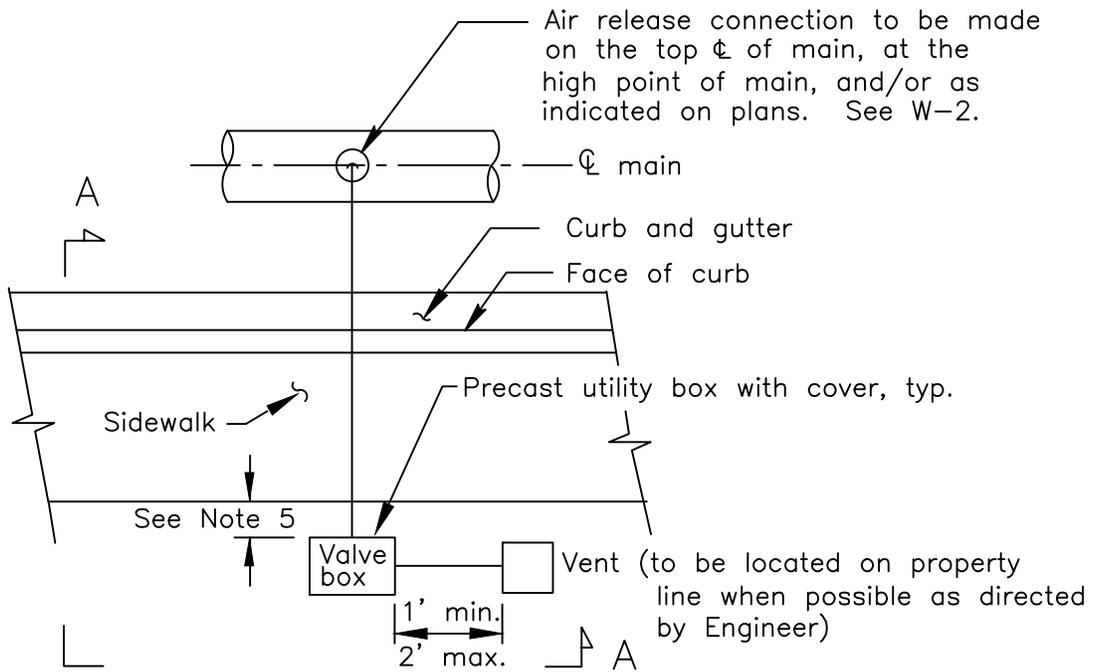
Date:	By:	Rev:

LOW POINT BLOW-OFF  
(FOR PIPES LARGER THAN 12")

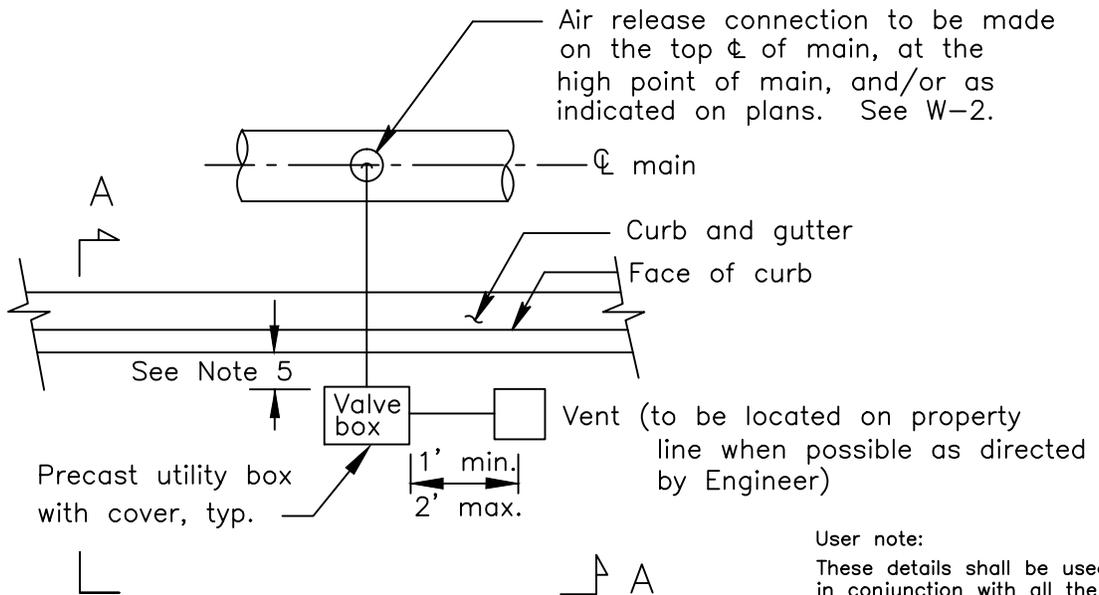
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-5C
 City Engineer		

W5c.DWG



PLAN WITH SIDEWALK



PLAN WITHOUT SIDEWALK

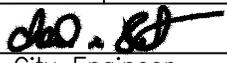
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

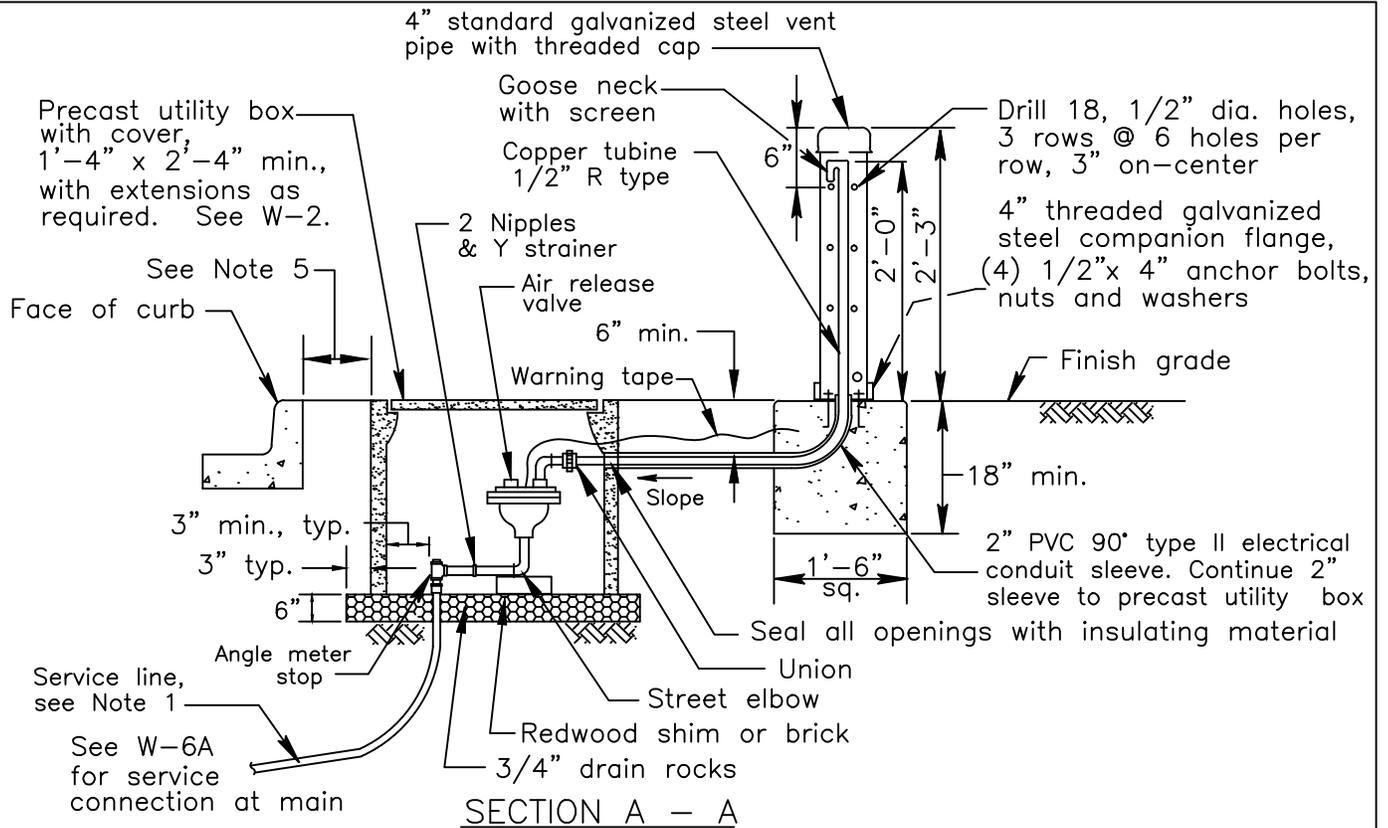
Date:	By:	Rev:

AIR RELEASE VALVE

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-6A
 City Engineer		

W06A.DWG



**Notes:**

1. All service lines shall have warning tape and copper wire installed along its entire length. See W-2.
2. Provide bolt down cover on utility box.
3. All line and hardware sizes depend on size of air release valve.
4. All metal to be brass or bronze from the main thru the PVC street elbow above the air release valve. Line shall be copper tubing from the PVC street elbow to the top of the vent pipe.
5. 6" behind back of sidewalk or 12" behind back of curb without sidewalk. (See W-6A for vent location.)
6. Stamp "AV" with 3" letters in face of curb over tubing and paint white.
7. Paint vent pipe per the City Standard Specifications.
8. PVC street elbow above valve shall have a compression by mechanical iron pipe adapter.
9. Air release valves shall be 1" for pipelines less than or equal to 12" and 2" for pipelines greater than 12".
10. Orifice size for 1" and 2" air release valves shall be determined as follows:

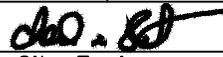
Valve size	Max. operating pressure	Orifice size
1"	150 psi	1/4"
1"	200 psi	3/16"
2"	150 psi	5/16"
2"	200 psi	1/4"

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

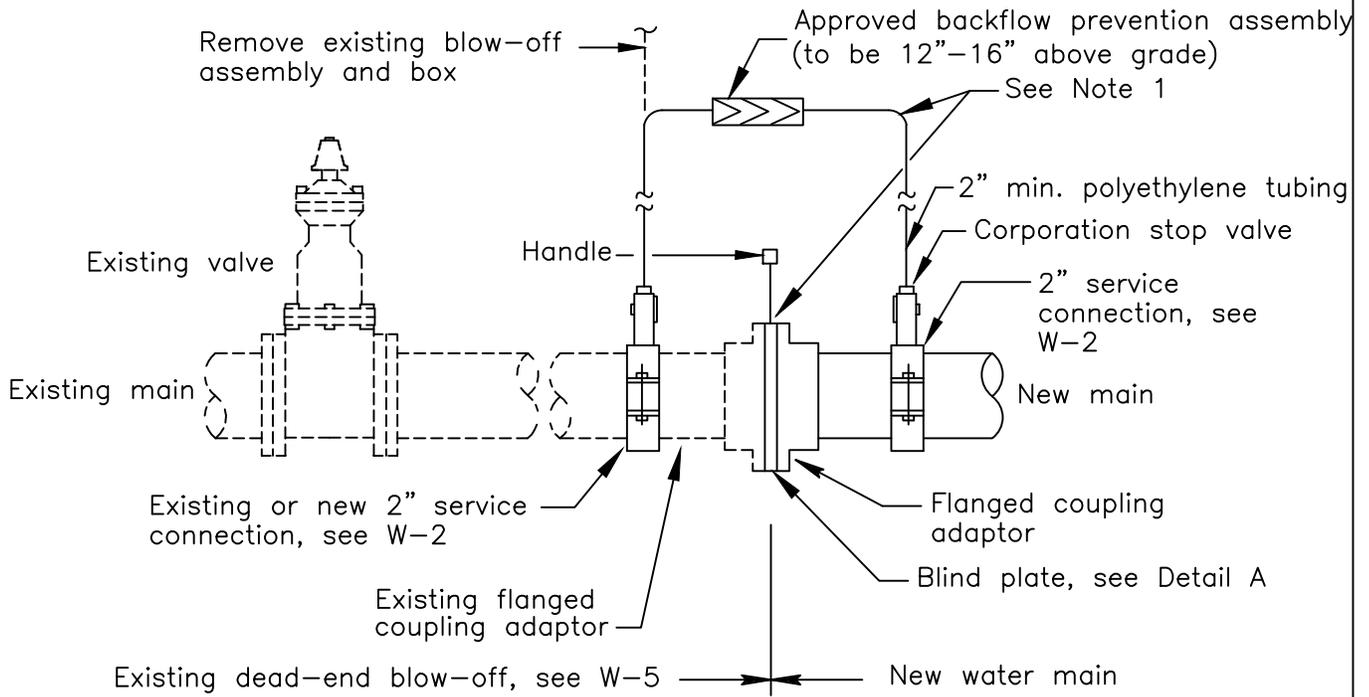
CITY OF LIVERMORE  
STANDARD DETAIL

AIR RELEASE VALVE

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-6B
 City Engineer		

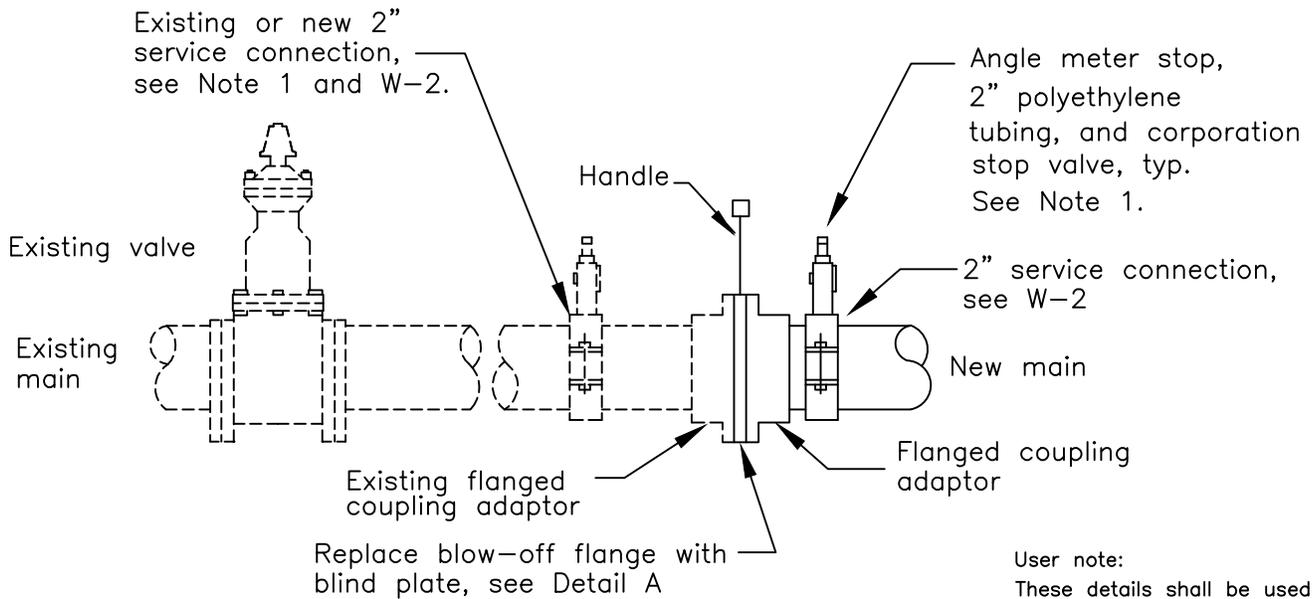
W06B.DWG

Date:	By:	Rev:
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ELEVATION

Temporary Jumper Connection with Bypass –  
Primary Location



ELEVATION

Temporary Connection with-out Bypass –  
Secondary Location

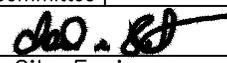
User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

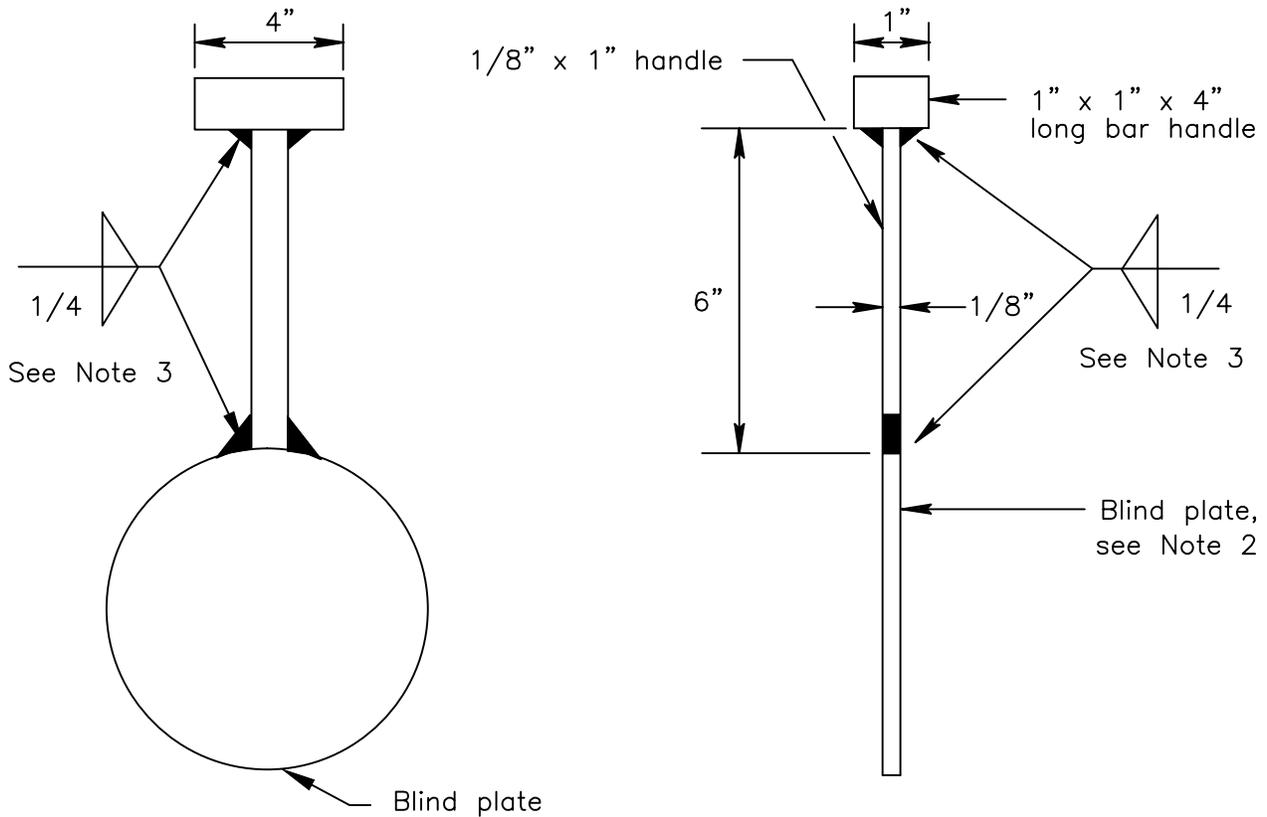
W07A.DWG

Date:	By:	Rev:

WATER MAIN  
TEMPORARY JUMPER  
CONNECTIONS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-7A
 City Engineer		



DETAIL A  
TEMPORARY BLIND PLATE AND HANDLE

Notes:

1. After acceptance of the new water system: 1) Remove temporary connection assemblies up through corporation stop valves, and replace with plugs of similar material as service connection: 2) Remove blind plate.
2. Blind plate with gaskets (2). Temporary blind plate blank shall be minimum 1/8" thick and shall be 1/4" smaller in diameter than the inside edge of the bolt holes.
3. Blind plate and handle can be one piece or welded.
4. Prior to connection, backflow assembly shall be certified by a City approved tester.

User note:

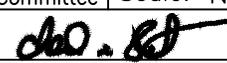
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

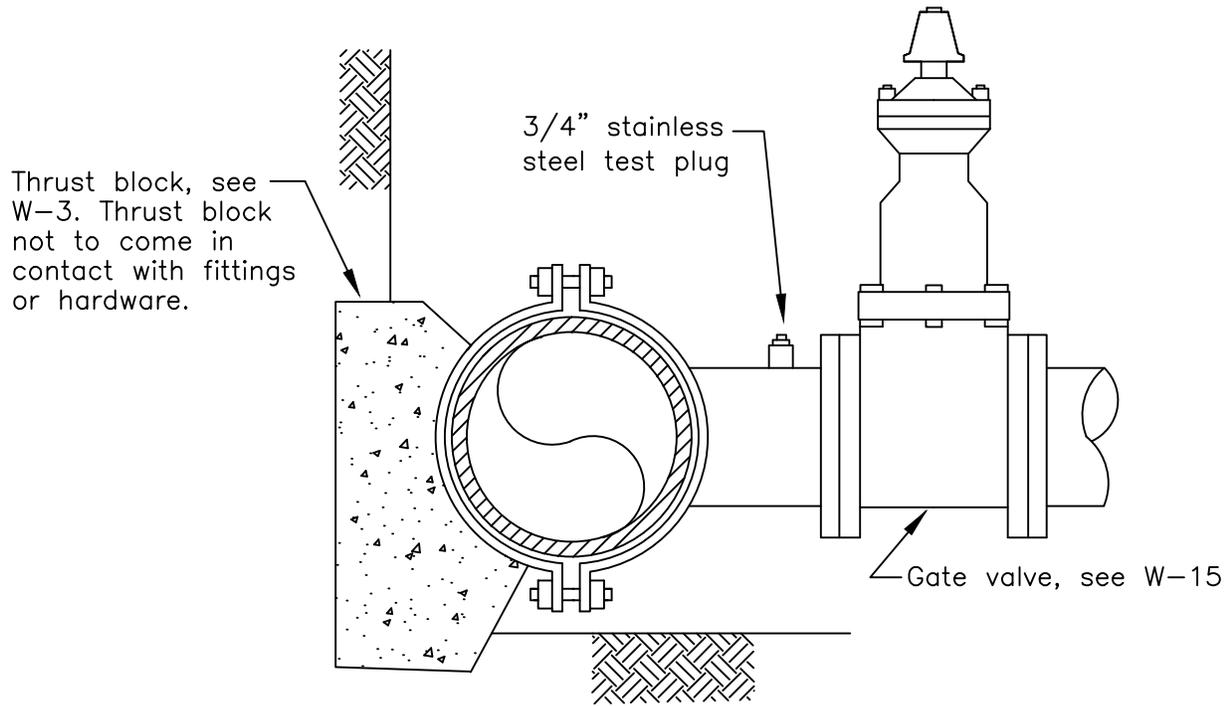
W07B.DWG

Date:	By:	Rev:

WATER MAIN  
TEMPORARY JUMPER  
CONNECTIONS

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-7B
 City Engineer		



ELEVATION

Notes:

1. For mains larger than 12", field verify existing o.d. pipe dimension for the ENGINEER'S approval before ordering tapping sleeve.
2. Tapping sleeve shall be minimum 3' from joints, connections or fittings.
3. Maximum size tap allowed, without approval of the ENGINEER, shall be main line pipe inside diameter minus 2". Tee fittings are required for 'size' to 'size' connections.
4. All tapping valves to be resilient seat type gate valves with EPDM rubber.
5. Grind 3" valve type "GV", and distance of valve from face of curb (in Roman numerals) in face of curb. Paint white, except for 1) potable fire hydrant or dedicated fire service which shall be painted red, or 2) reclaimed system valves which shall be painted purple.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

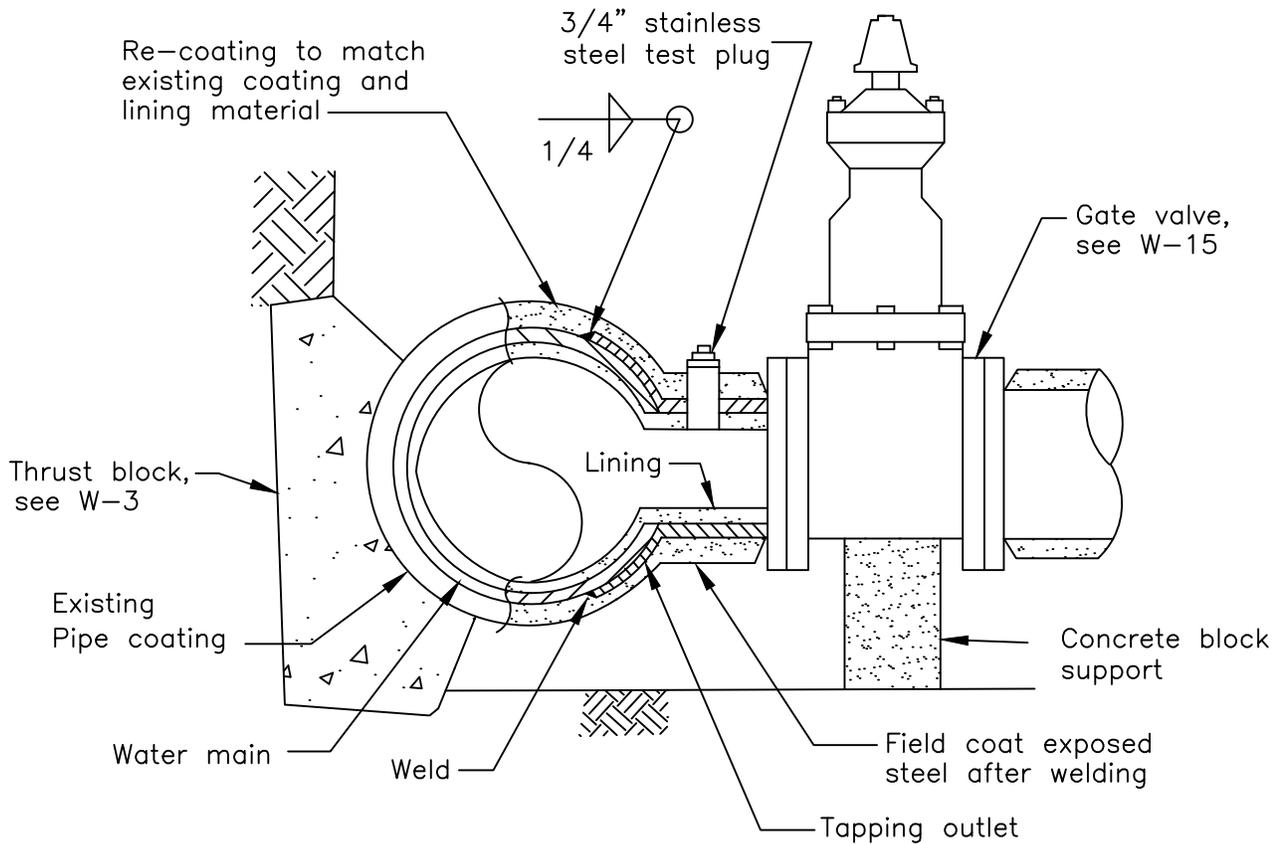
TAPPING SLEEVE AND  
 VALVE, 4" SERVICE AND  
 LARGER (ACP, PVC & DIP)

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-8
 City Engineer		

W08.DWG

Date:	By:	Rev:
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ELEVATION

Notes:

1. For mains larger than 12", verify existing pipe outside dimension with City's Water Resources Division before ordering tapping sleeve.
2. Tapping outlet shall be minimum 3' from joints, connections or fittings.
3. Maximum size tap allowed, without approval of the ENGINEER, shall be main line pipe inside diameter minus 2". Tee fittings are required for 'size' to 'size' connections.
4. All tapping valves to be resilient seat type gate valves.
5. Grind 3" valve type "GV", and distance of valve from face of curb (in Roman numerals) in face of curb. Paint white, except for 1) potable fire hydrant or dedicated fire service which shall be painted red, or 2) reclaimed system valves which shall be painted purple.
6. All welding per the American Welding Society (AWS) DI.1.
7. For spiral wrapped pipe, tack weld spirals before cutting pipe.
8. On "non-cathodically" protected systems, install anode before re-coating. Submit anode installation design to the ENGINEER for approval.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

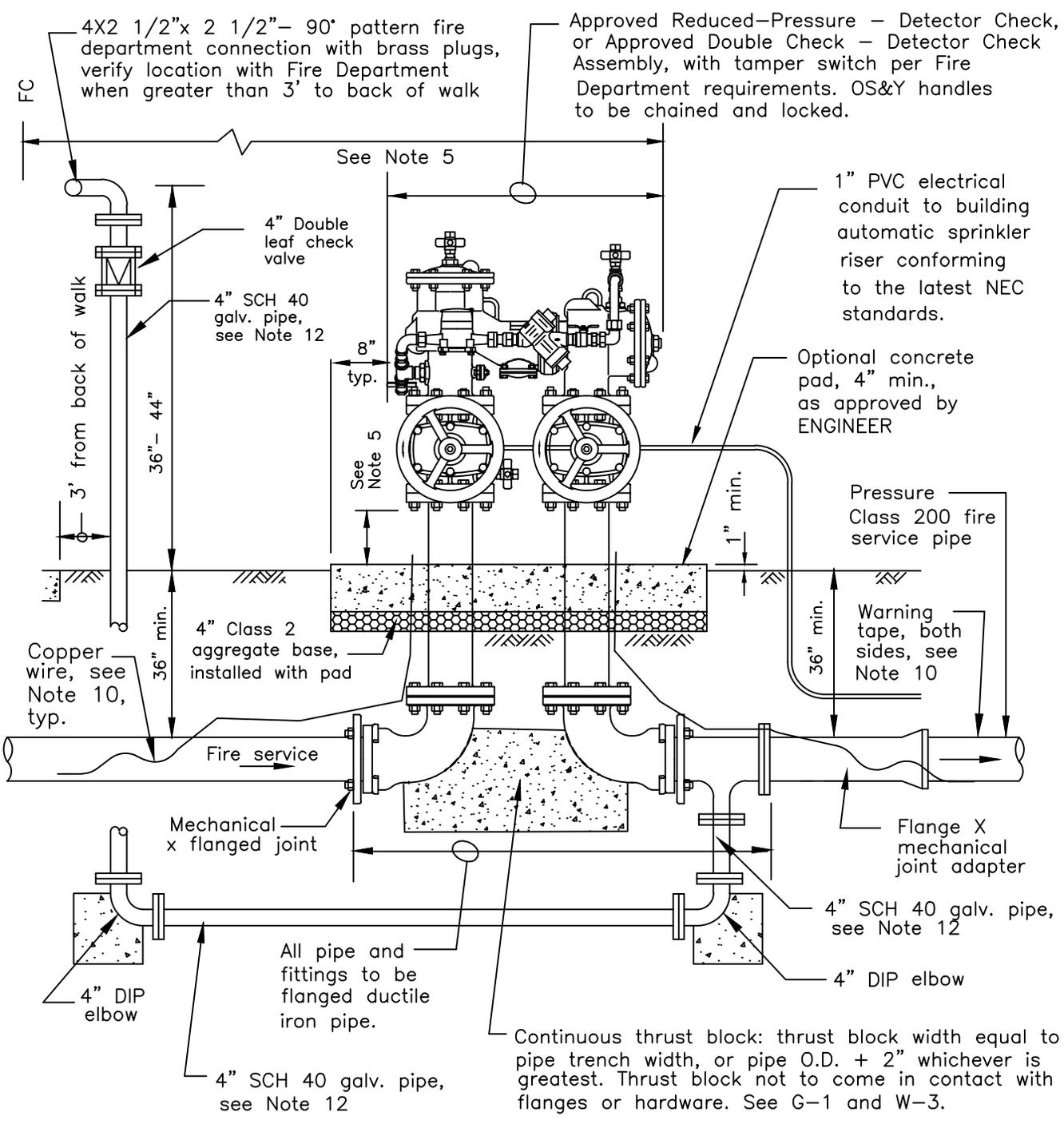
Date:	By:	Rev:

TAPPING OUTLET &  
VALVE, 4" SERVICE AND  
LARGER (MLCSP)

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-9
 City Engineer		

W09.DWG



- \* SEE NOTES ON SHEETS W-10B & W-10C
- \* For screening requirements see Note 5.
- \* For on-site installation see Note 7.
- \* Size & location of fire department connection to be approved by the Fire Department.
- \* See Note 13 for connection to the City's reclaimed water system.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W10A.DWG

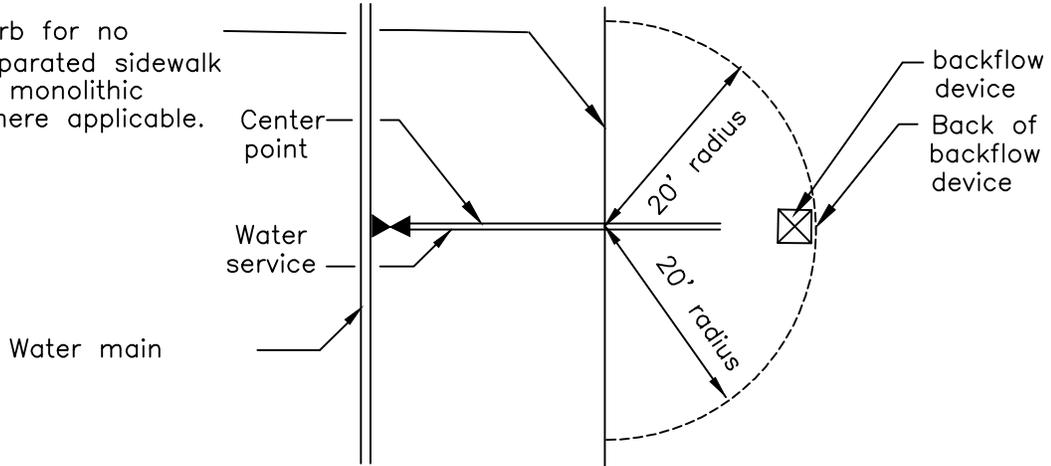
INDUSTRIAL/COMMERCIAL  
 FIRE SERVICE  
 (CLASS 1 THROUGH 6)

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: KY	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	W-10A
 City Engineer		

Date:	By:	Rev:

Back of curb for no sidewalk/separated sidewalk or back of monolithic sidewalk, where applicable.



PLAN VIEW

LOCATION OF BACKFLOW PREVENTER

Notes:

1. Pipe size shall be determined by fire flow requirements.
2. Double Check-Detector Check assemblies shall be fully factory assembled.
3. Size and location of fire service, Double Check-Detector Check and Detector Check assemblies shall be approved by the ENGINEER AND FIRE MARSHALL.
4. By-pass trim shall be wrapped with insulation.
5. All aboveground industrial and commercial fire service devices shall be installed in accordance with City of Livermore City Council Resolution No. 93-116, Standard Conditions of Approval for Industrial and Commercial Development, Ordinance No. 1486 and the following:

Location and placement:

- locate backflow device as shown in the detail above.
- install as near the minimum of 12" but not to exceed a maximum of 24" above 1) the street curb elevation, and 2) the grade elevation measured directly below the device;
- place "DO NOT CONNECT" warning tape over the lateral from the main to the device;
- devices shall be accessible for servicing.

Screening requirements:

- screen from view, except for the fire department connection which is to remain visible, by installing a combination of landscaped berms and/or masonry walls blending with the overall landscaping theme which forms a 100% opaque screen to the normal field of public street traffic; maintain 36" minimum clearance from plants and shrubs.
- installation subject to design review approval.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W10B.DWG

INDUSTRIAL/COMMERCIAL  
FIRE SERVICE  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	W-10B
 City Engineer		

Date:	By:	Rev:
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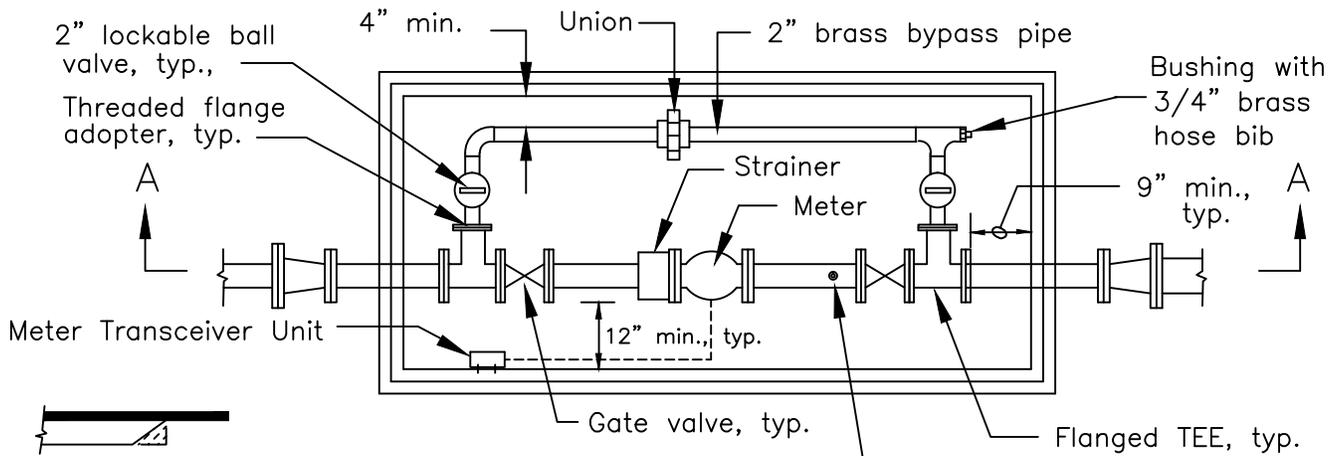
Notes continued :

6. For Class 1 through 6, meter to be purchased from City and installed by Contractor unless the device approval does not include the use of "SENSUS" meters. Meters to be installed by the Contractor. Meter and by-pass line shall be insulated.
7. For all classes, on the "on-site" service side, the location and requirements for the Fire Department Connection are subject to Fire Department requirements and approval. All on site piping shall be installed in accordance with the City standard specifications.
8. For assemblies installed with concrete pad, additional protective wrap or coating shall be placed around pipe passing through the concrete.
9. For sites with high degrees of hazard, as determined by the Water Resources Division, the Double Check-Detector Check assembly shall be replaced with an approved Reduced Pressure assembly as directed by the Water Resources Division.
10. Service lateral shall have warning tape and copper wire installed along it's entire length up to the backflow prevention device.
11. Access to fire department connections to remain accessible and fire lane to be posted per City and Fire Department standards.
12. All underground SCH 40 galv. pipe shall be wrapped with 10 mil. protective tape or polyethylene encasement. Above ground pipe shall be wrapped with 10 mil. protective tape.
13. Recycled water:
  - See the latest City of Livermore "Guidelines for the use of Recycled Water" for installation and additional information.
  - Pressure Class 200 pipe shall be used when connecting to the City's recycled water system.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W10C.DWG

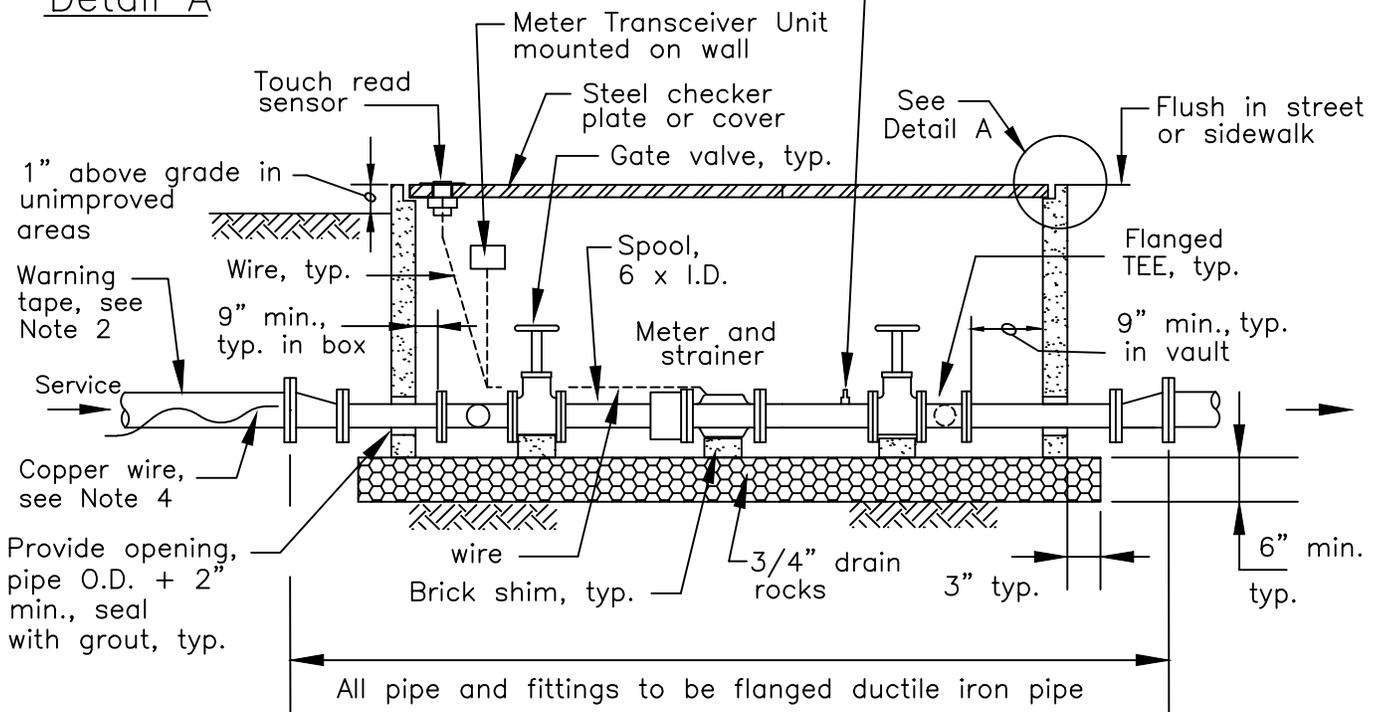
			INDUSTRIAL/COMMERCIAL FIRE SERVICE NOTES	CITY OF LIVERMORE STANDARD DETAIL			
				Dwn: M-W/KY	Date: May-13	No.	
				Ckd: <small>Spec.</small> Committee	Scale: None	W-10C	
				 City Engineer			
Date:	By:	Rev:					



PLAN

For steel checker plate cover  
Cover and structural reinforcing  
Miter and remove 4", typ.

Detail A



SECTION A-A

Notes:

1. Meters larger than 3" to be installed in vault with cover and a permanent bypass line.
2. Service lateral shall have warning tape and copper wire installed along its entire length, see W-2.

User note:

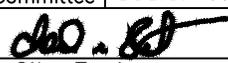
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W11.DWG

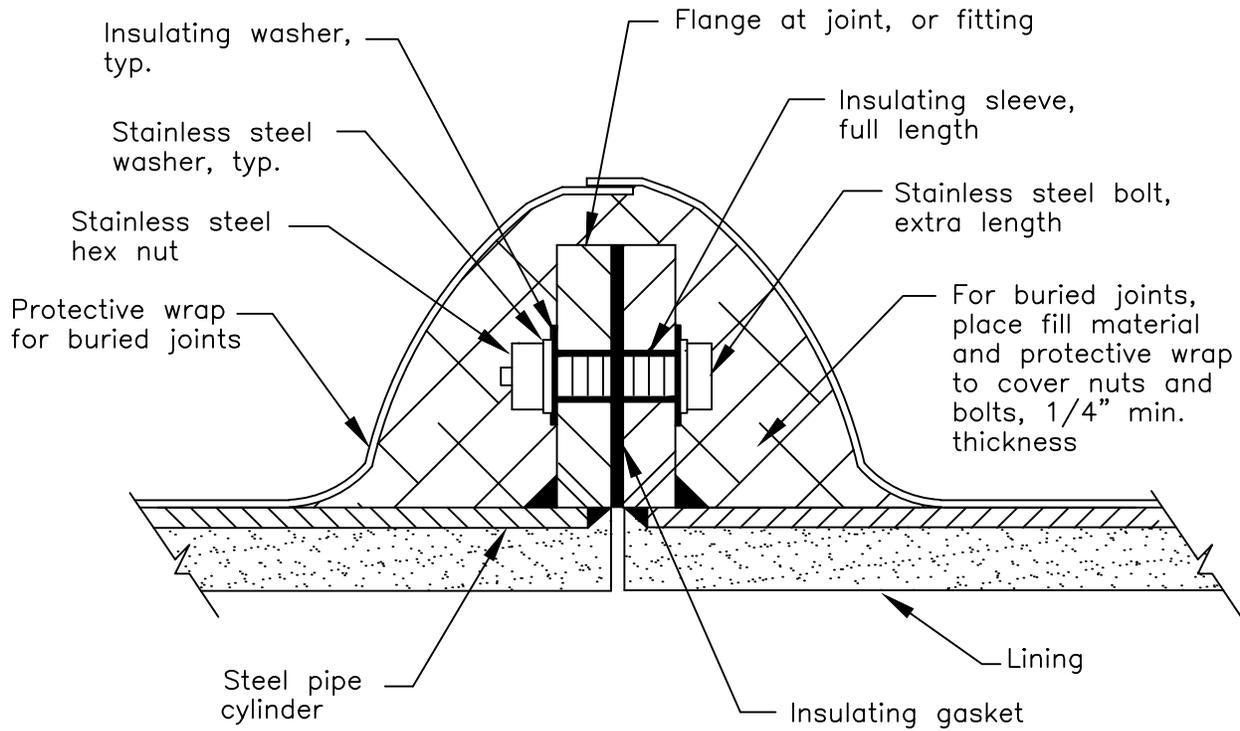
Date:	By:	Rev:

TURBINE TYPE METER  
3" AND LARGER

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W/KY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-11
 City Engineer		





INSULATING FLANGE

Notes:

1. Filler and wrappings may be deleted for above-grade insulating joints.
2. Insulating gasket shall be appropriate for "water" service and shall be the same pressure rating as the flange.
3. For exposed joints, coat flanges (except machined flange face) same as pipe. Do not coat bolts or washers.
4. "Fill" material shall be as recommended by the manufacturer.

User note:

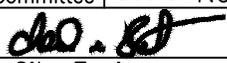
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

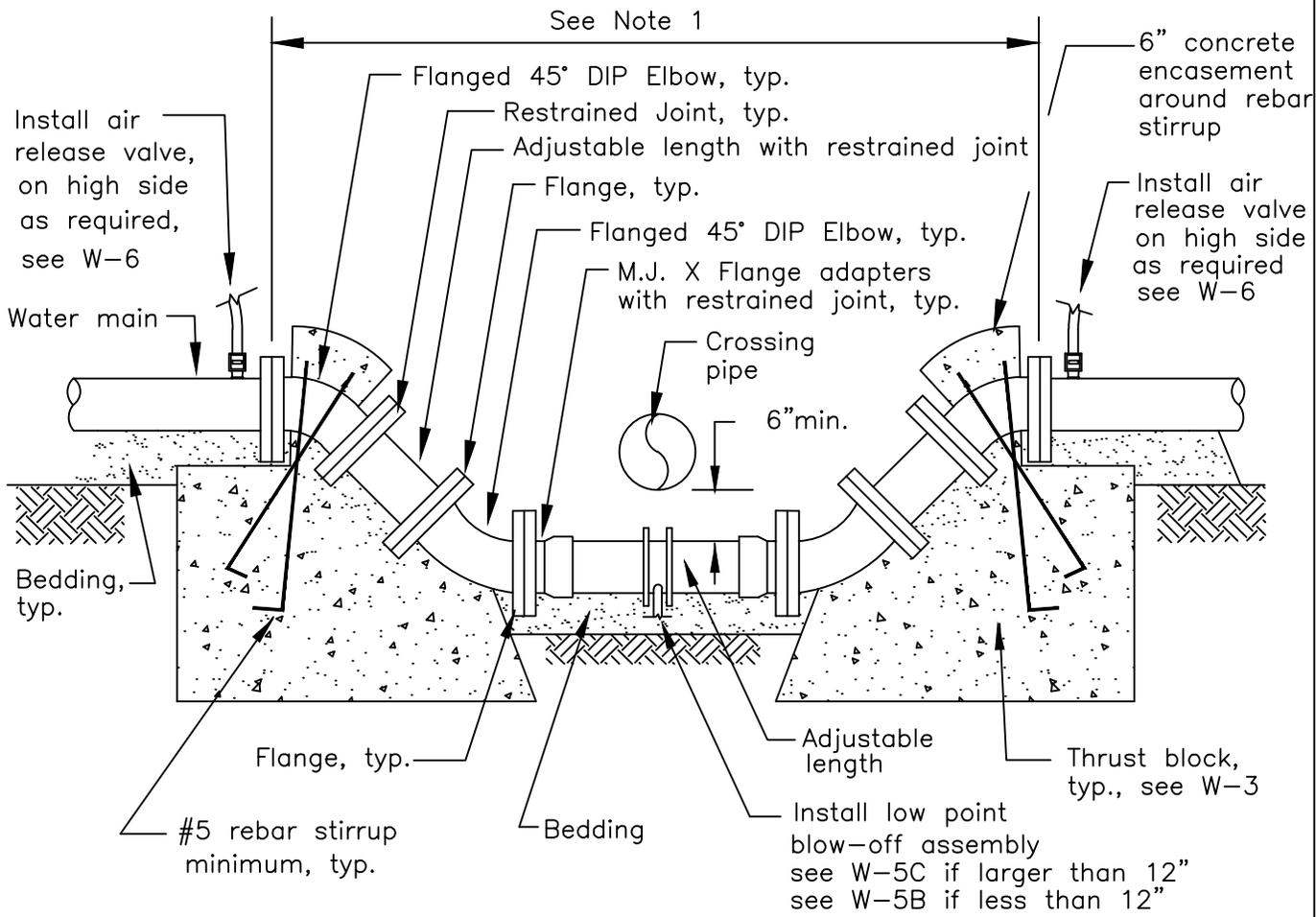
W13.DWG

Date:	By:	Rev:

INSULATING FLANGE

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-13
 City Engineer		



M.J. = MECHANICAL JOINT      VERTICAL ELEVATION

Notes:

1. On ACP, PVC, and DIP pipe all material shall be flanged ductile iron pipe. On steel pipe all material shall be flanged steel.
2. Use building paper or foam board to prevent direct contact of concrete with pipe fittings, flanges, or nuts and bolts. See W-3.
3. Water line "off-set" is allowed only when all three of the following conditions are met:
  - a. Crossing pipe is a gravity line,
  - b. "off-set" line invert is more than 6' below finish grade, and
  - c. only when approved by ENGINEER.
4. Install "Low Point Blow-off" at low point of offset. See W-5C.
5. For New Water line offset under an existing sanitary sewer pipe, the New Water line must comply with this detail and G-2.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

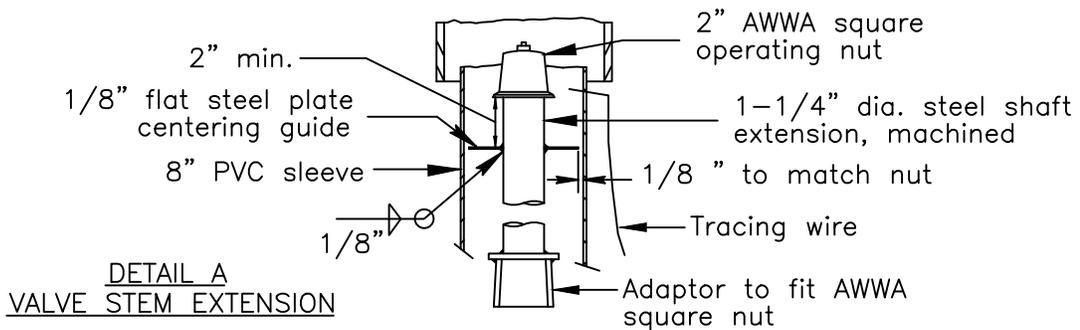
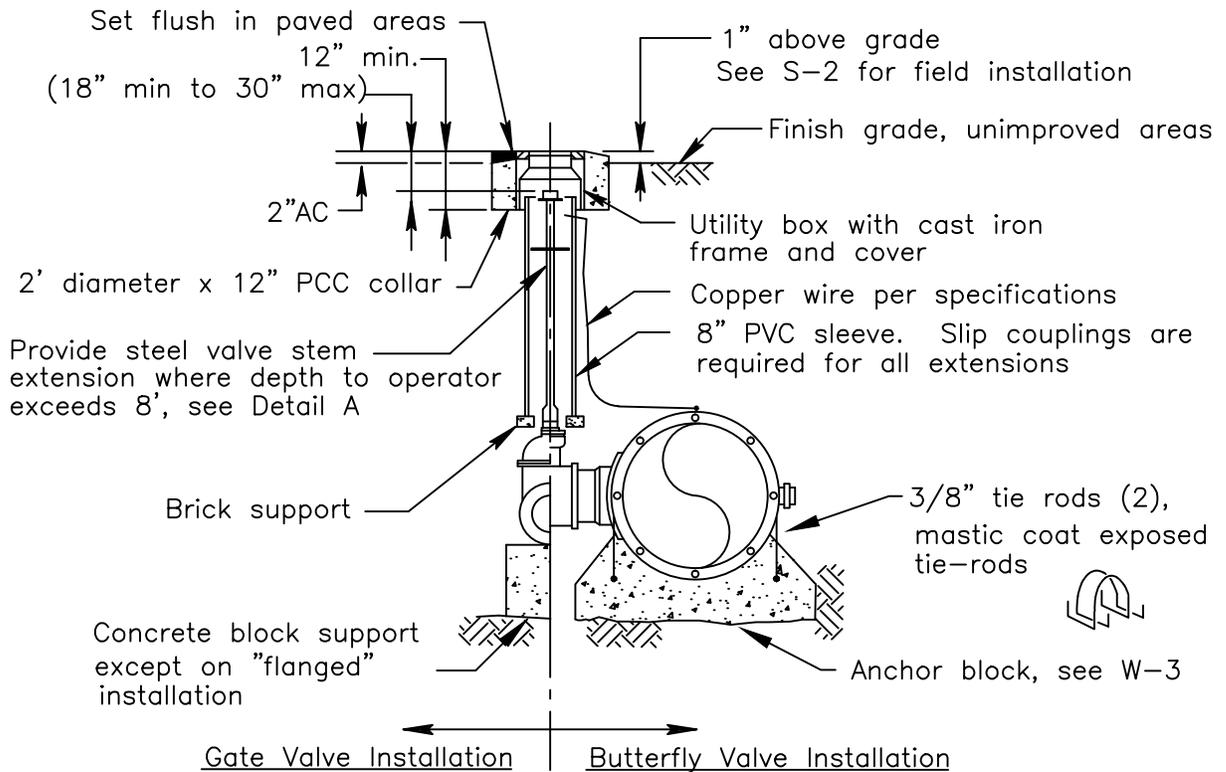
Date:	By:	Rev:

WATER LINE OFFSET

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-14
 City Engineer		

W14.DWG



Notes:

1. Anchor block is not required with flanged butterfly valve.
2. Install butterfly valve with operating nut on curb side of main.
3. Grind 3" valve type "BV", "GV", and distance of valve from face of curb (in Roman numerals) in face of curb. Paint red for fire hydrant and dedicated fire service, paint purple for reclaimed water, paint white for all others. If valve is on a dedicated fire service grind 3" "W" on top of curb over lateral, paint white for potable systems and purple for reclaimed systems.
4. Main line valve cover to be painted Handicap blue. On recycled water system, paint valve cover purple per the City Standard Specifications.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

BURIED VALVE

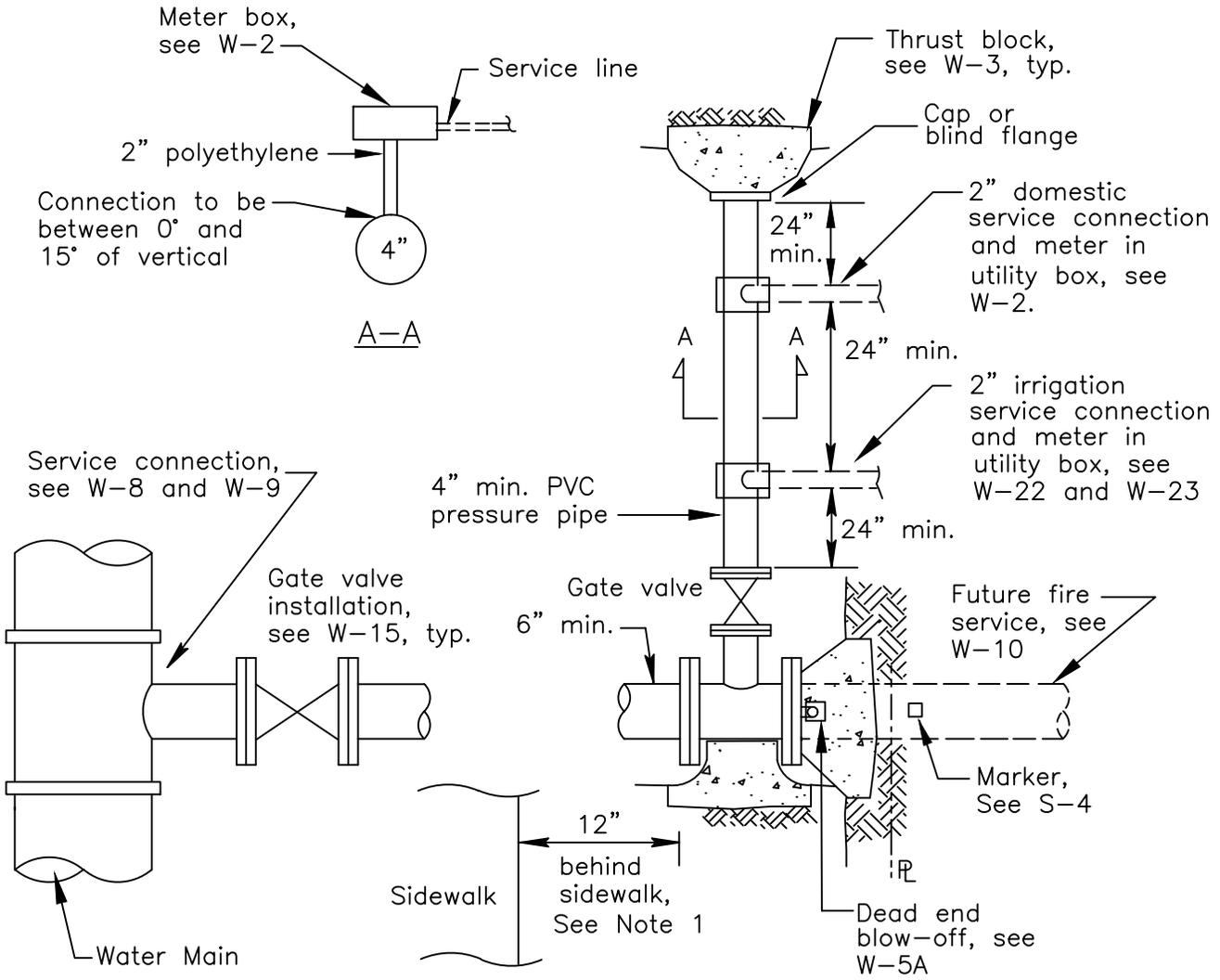
14" AND LARGER BUTTERFLY VALVE  
 12" AND SMALLER GATE VALVE

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-15
<i>do. 8/1</i> City Engineer		

W15.DWG

Date:	By:	Rev:



PLAN

Notes:

1. Grind 3" high "W" on top of curb over service and paint white. Grind 3" high valve type (i.e. "BV", "GV", etc. ) and distance of valve to face of curb (in Roman numerals) in face of curb and paint white.
2. All pipes shall have blue warning tape and copper wire, see W-2.
3. For Commercial/Industrial Joint Domestic/Fire Service installation with MULTIPLE on-site domestic or irrigation service lines, install as shown above, for installation with only ONE on-site domestic or irrigation service line, connect to Fire service line in accordance with W-2.

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

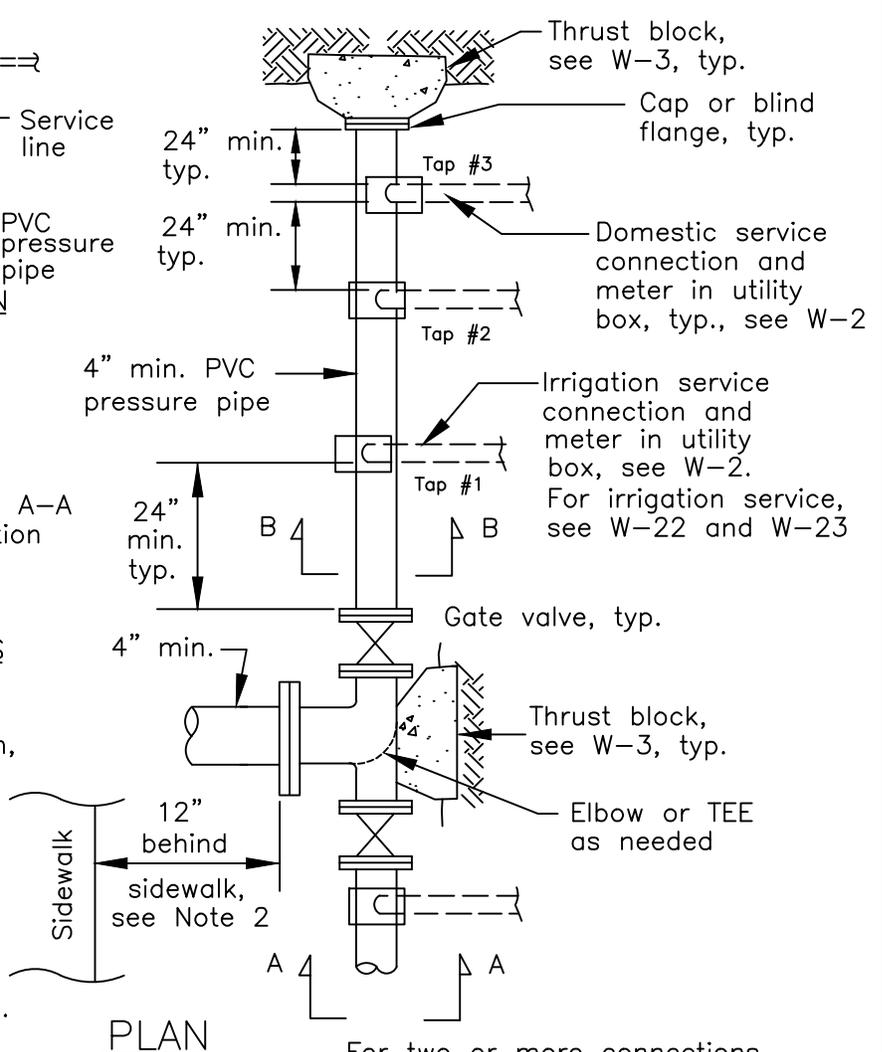
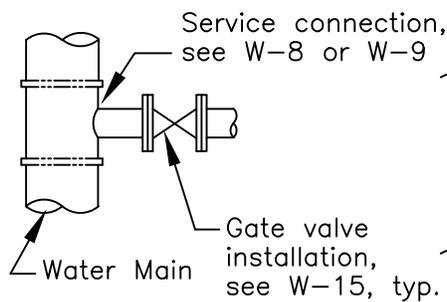
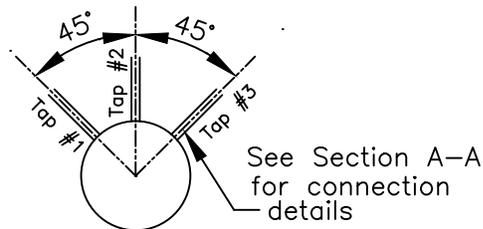
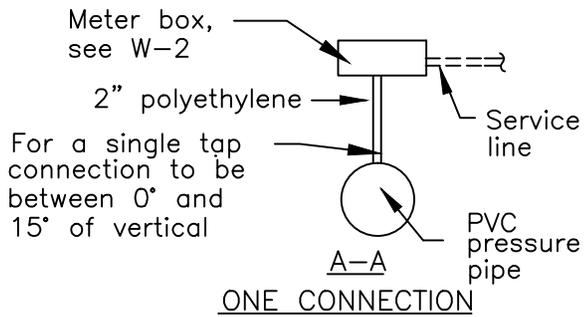
W16.DWG

Date:	By:	Rev:

COMMERCIAL/INDUSTRIAL  
 JOINT DOMESTIC/  
 FIRE SERVICE

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-16
 City Engineer		



**Notes:**

1. Manifold water meter installation is for domestic service only.
2. Grind 3" high "W" on top of curb over service and paint white. Grind 3" high valve type (i.e. "BV" "GV", etc.) and distance of valve to face of curb (in Roman numerals) in face of curb and paint white.
3. All pipes shall have blue warning tape and copper wire, see W-2.
4. For two or more taps on one length of PVC pipe, the taps should be staggered and no closer than 24" apart, measured longitudinally.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

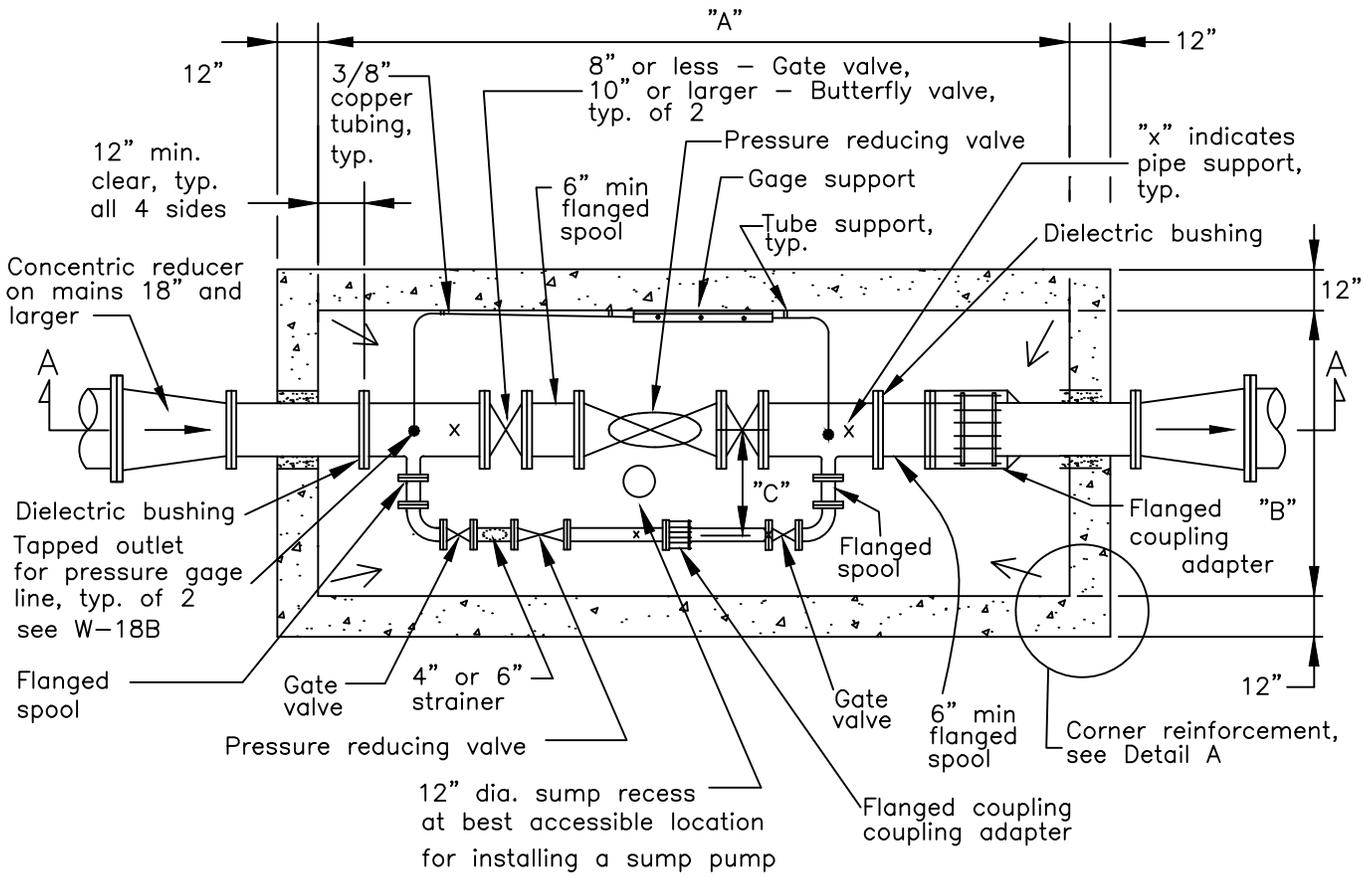
**CITY OF LIVERMORE  
STANDARD DETAIL**

**MANIFOLD WATER METER  
INSTALLATION**

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-17
 City Engineer		

W17.DWG

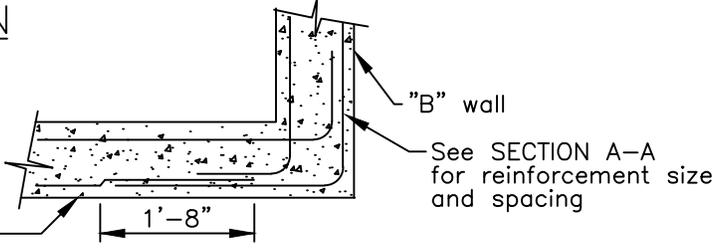
Date: By: Rev:



PLAN

DETAIL A

Corner Reinforcement Overlap



Vault Size					
Main Size	Vault Piping	"A" min.	"B" min.	"C" min.	Bypass Piping and valve size
18"	16"	16'-0"	7'-0"	2'-1"	6"
16"	16"	16'-0"	7'-0"	2'-1"	6"
14"	14"	14'-0"	7'-0"	2'-1"	6"
12"	12"	12'-0"	6'-0"	2'-1"	see Note 5
10"	10"	12'-0"	4'-6"	1'-6"	4"
8"	8"	10'-6"	4'-6"	1'-6"	4"
6"	6"	10'-6"	4'-6"	1'-6"	4"

User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

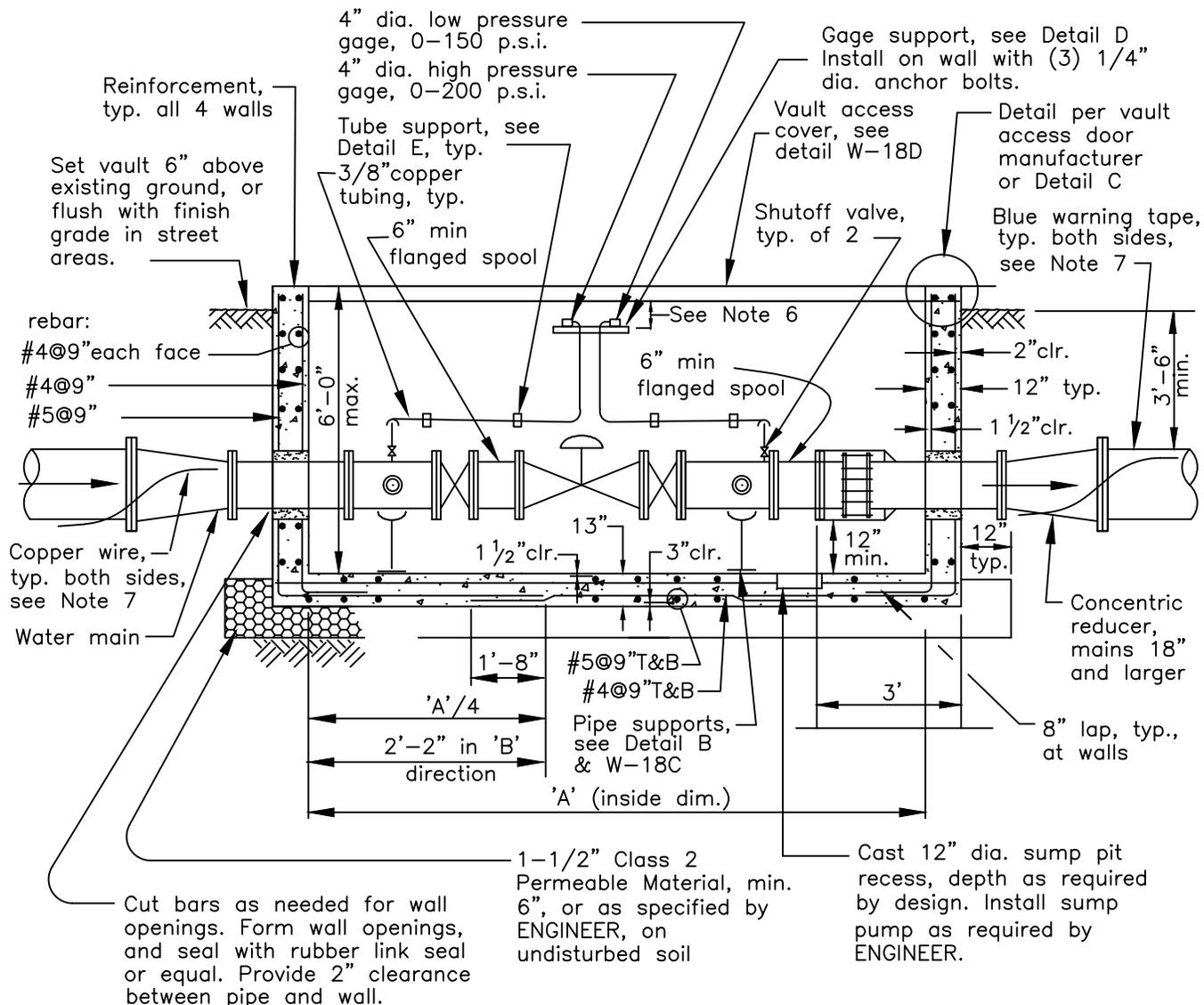
W18A.DWG

Date:	By:	Rev:

PRESSURE REDUCING STATION

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-18A
 City Engineer		



SECTION A-A

ASSUMED DESIGN CRITERIA, SEE NOTE 3:

- Lateral soil pressure: 75 pcf (equivalent fluid)
- Traffic surcharge: 150 psf (uniform)
- No ground water
- H-20 traffic loading on top of vault
- allowable soil bearing: 1000 psf
- f'c=3000 psi min.
- Grade 40 or 60 Reinforcement
- Seismic: zone 4,  
 increase in soil pressure: 24H (plf)  
 applied at 0.6H

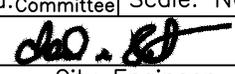
User note:  
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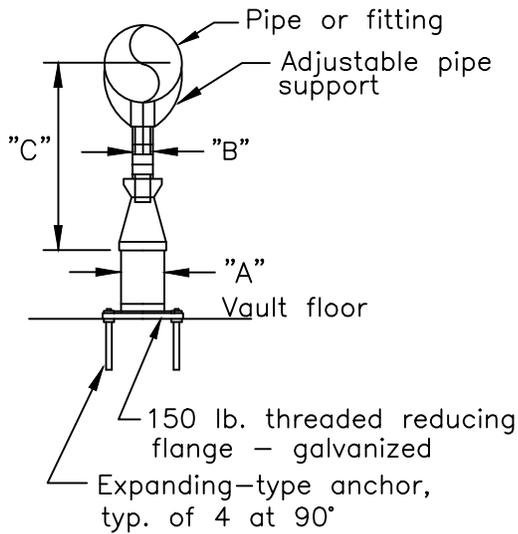
W18B.DWG

Date:	By:	Rev:

PRESSURE REDUCING STATION

CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Spec. Ckd: Committee	Scale: None	W-18B
 City Engineer		



ADJUSTABLE PIPE SUPPORT APPROXIMATE DIMENSIONS IN INCHES				
PIPE SIZE	"A"	"B"	"C" MIN.	"C" MAX.
4	3	2-1/2	10-1/4	14
6	3	2-1/2	11-5/8	15-1/4
8	3	2-1/2	13-5/8	16-1/2
10	3	2-1/2	14-5/8	18-1/4
12	3	2-1/2	15-5/8	19-3/4
14	4	3	18-7/8	20-3/4
16	4	3	19-7/8	22-1/4
18	6	3-1/2	21-1/4	24

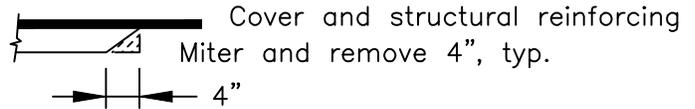
ADJUSTABLE PIPE SUPPORT  
DETAIL B

Notes:

1. Pipe fittings, valves, tees and cocks for pressure gauges to be brass, bronze, or copper.
2. Slope floor of vault to drain to sump pit, min, 1% and max. 2%.
3. Mains larger than 18" and specific site conditions that do not meet "ASSUMED DESIGN CRITERIA" per W-18A require custom designed box and assembly as approved by ENGINEER
4. For Pressure Reducing Stations installed in non-street areas, install 4 guard posts, one at each corner, 12" clear from outside edge of vault wall, and as directed by ENGINEER. Installation of guard posts per W-12.
5. Min. 4", or 6" as determined by ENGINEER and Water Resources Division.
6. Mounting height of gauges shall be as specified by the Water Resources Division.
7. Water main shall have warning tape and copper wire installed along it's entire length up to the vault, see W-2
8. For pressure reducing stations, installed in steel main areas, a bonding jumper will be installed around the station for cathodic protection.

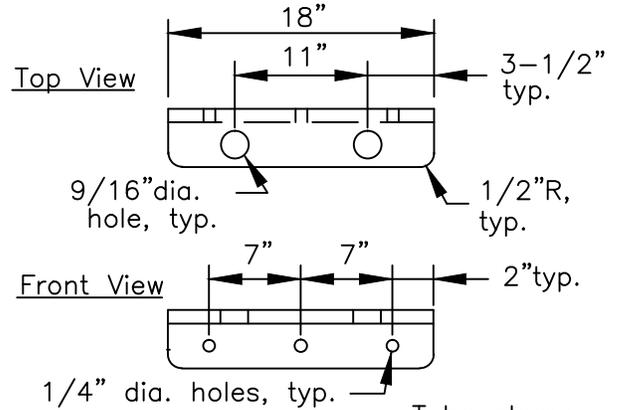
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.



For steel checker plate cover

DETAIL C



Top View

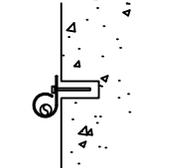
Front View

Side View

1/8" aluminum plate  
Gage support

DETAIL D

Tube clamp,  
screw, fill  
with grout



Section

Tube support

DETAIL E

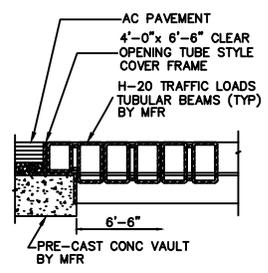
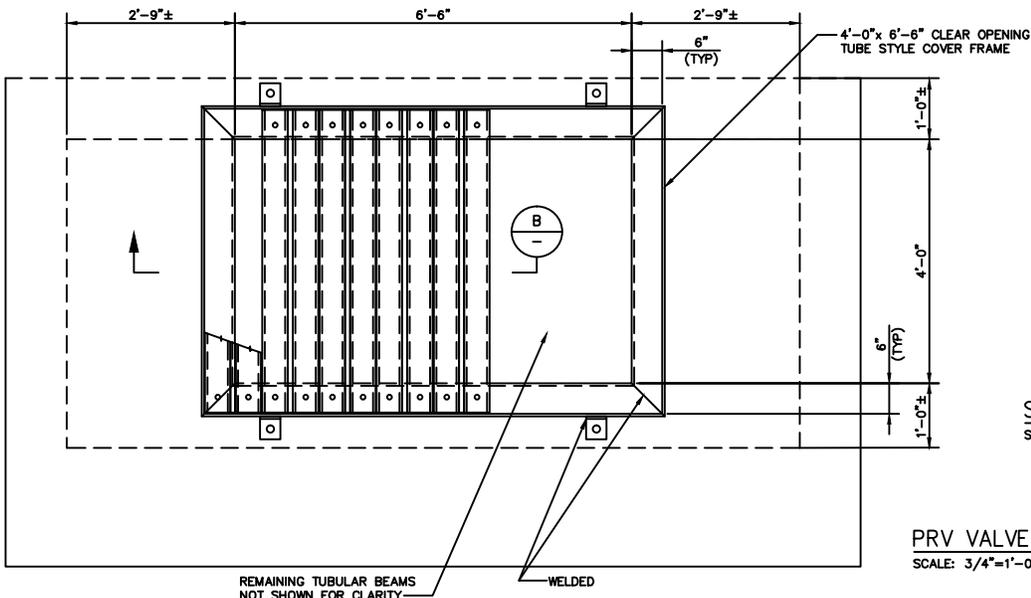
W18C.DWG

PRESSURE REDUCING  
STATION

CITY OF LIVERMORE  
STANDARD DETAIL

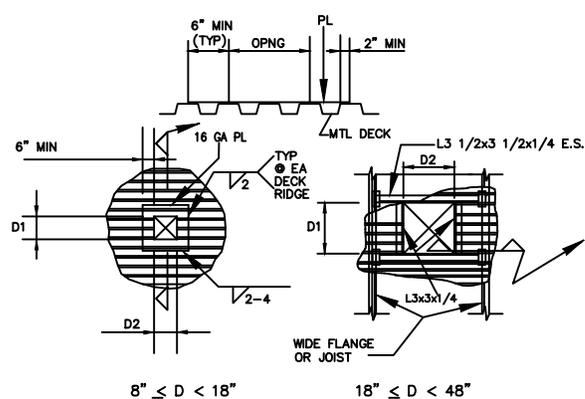
Dwn: M-W	Date: May-13	No.
Spec. Ckd: Committee	Scale: None	W-18C
 City Engineer		

Date: By: Rev:

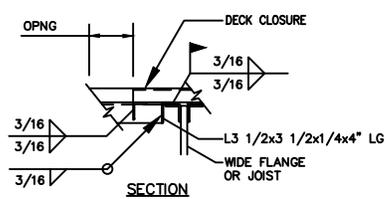


SECTION B-B  
SCALE: 1 1/2" = 1' - 0"

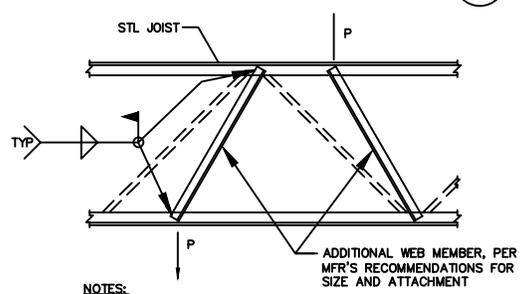
PRV VALVE VAULT HATCH PLAN  
SCALE: 3/4" = 1' - 0"



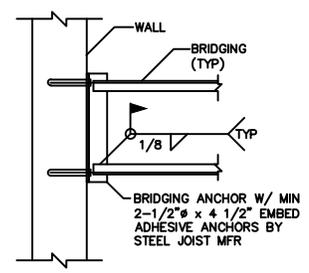
METAL DECK OPENING FRAMING 5208 VAR  
NO SCALE



- NOTES:
1. D = LARGER OF D1 AND D2.
  2. FOR D < 8", NO SPECIAL FRAMING IS REQUIRED.
  3. SEE STRUCTURAL FRAMING PLAN FOR D > 48".
  4. SEE PLAN FOR OPENING DIMENSIONS. WHERE DIMENSION IS NOT PROVIDED, COORDINATE SIZE OF OPENING WITH MECHANICAL DRAWINGS.
  5. PROVIDE TYP DECK WELDS AT ALL 4 SIDES OF OPENING.



- NOTES:
1. LOCATE ADDITIONAL WEB MEMBER AT EACH CONCENTRATED LOAD POINT.
  2. MAXIMUM CONCENTRATED LOAD IS 200#.
- STEEL JOIST  
ADDITIONAL WEB MEMBER 5206 VAR  
NO SCALE



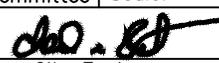
STEEL JOIST BRIDGING TO WALL CONNECTION 5207 VAR  
NO SCALE

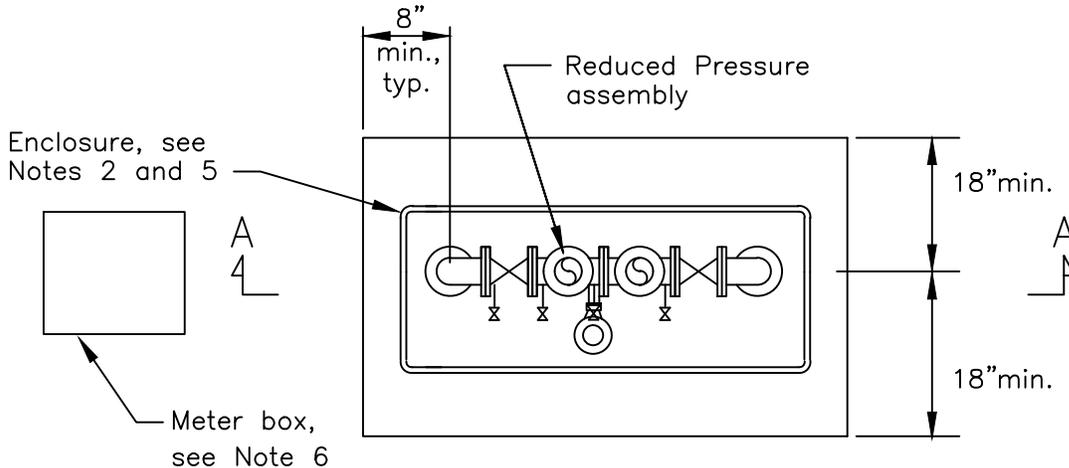
L16.DWG

Date	By	Rev.

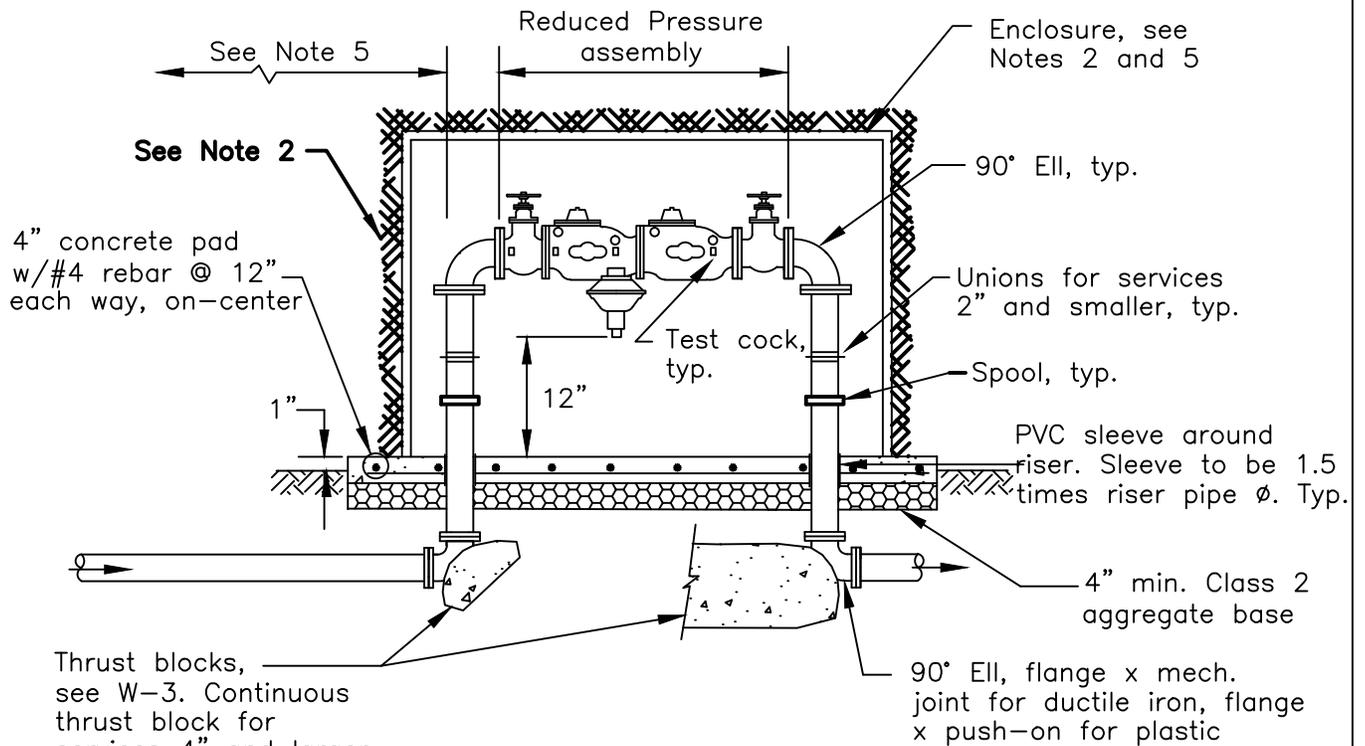
# PRV VALVE VAULT HATCH

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Kcd: Spec. Committee	Scale: NONE	W-18D
 City Engineer		



PLAN



SECTION A-A

Thrust blocks, see W-3. Continuous thrust block for services 4" and larger. Continuous thrust block width equal to pipe trench width or pipe O.D. + 2", whichever is greater. See G-1 and W-3.

For screening requirements see Note 5.

User note:

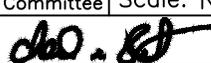
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W22A.DWG

Date:	By:	Rev:

REDUCED PRESSURE  
BACKFLOW PREVENTER

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Spec. Ckd: Committee	Scale: None	W-22A
 City Engineer		

Notes:

1. Reduced Pressure Backflow assemblies shall be fully factory assembled.
2. City owned Insulated enclosure (or an enclosure with an insulating blanket) is required for backflow preventers of 2" size and smaller.  
(Refer to Spec section 331213)
3. Concrete pad shall be sized to accommodate the insulated enclosure. Where an enclosure is not required, provide the minimum dimensions and clearances shown. Concrete pad may be deleted on private service installations.
4. Piping materials:
  - 2" and smaller: Brass, bronze or copper  
Threaded insulating bushing is required on installations with dissimilar materials.
  - Larger than 2": Flanged Ductile iron

All pipe materials shall have protective wrap or coating around pipe passing through 4" concrete pad.

5. All aboveground irrigation service devices shall be installed as follows:  
Location and placement:
  - locate within 5' of water meter;
  - install at 12" above grade measured directly below the device;
  - place "DO NOT CONNECT" warning tape over the lateral from the meter to the device;
  - devices shall be accessible for servicing.

In accordance with City of Livermore City Council Resolution No. 93-116, Standard Conditions of Approval for Industrial and Commercial Development, screening requirements shall be as follows:

- screen from public street by installing a combination of landscaping, berms, and/or masonry walls;
  - installation subject to design review approval.
6. See W-2 for meter and service connection. Location subject to the approval of CITY ENGINEER.
  7. Service lateral for Reduced Pressure Backflow Preventer assembly on a fire service line shall have blue warning tape and copper wire installed along it's entire length up to meter, see W-2.

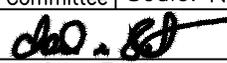
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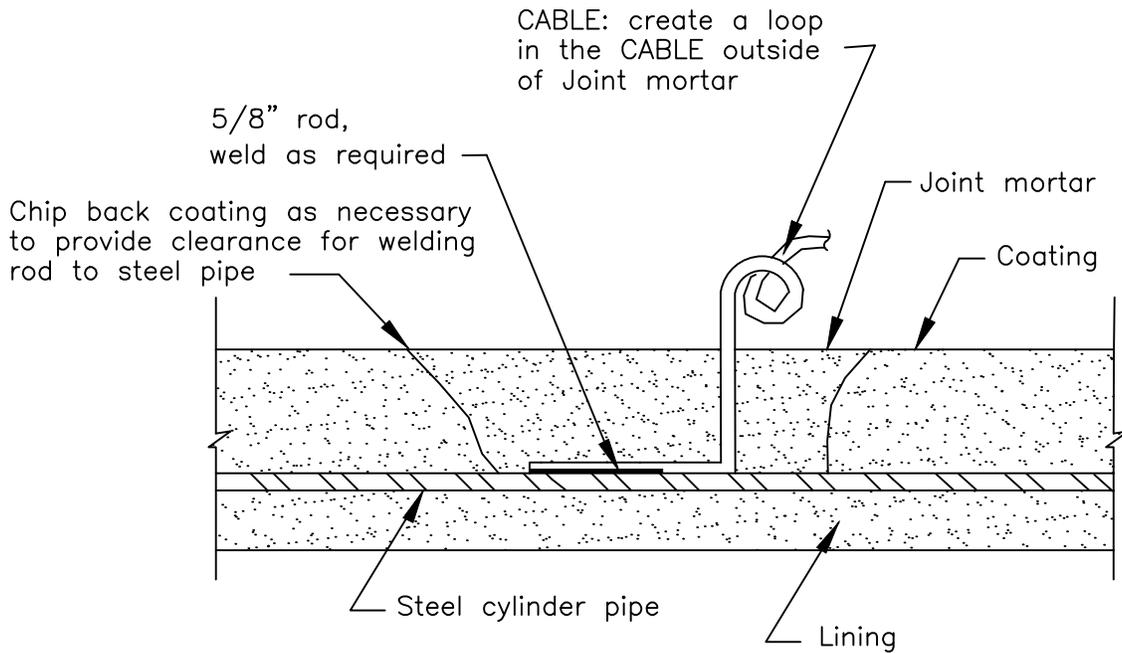
W22B.DWG

Date:	By:	Rev:

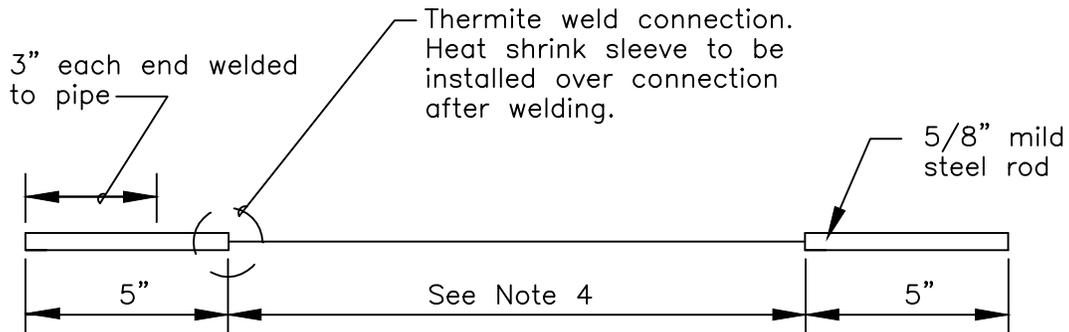
REDUCED PRESSURE  
BACKFLOW PREVENTER  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.  W-22B
Ckd: <sup>Spec.</sup> Committee	Scale: None	
 City Engineer		



BONDING JUMPER CONNECTION DETAIL



CABLE DETAIL

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W23A.DWG

Date:	By:	Rev:

BONDING JUMPER

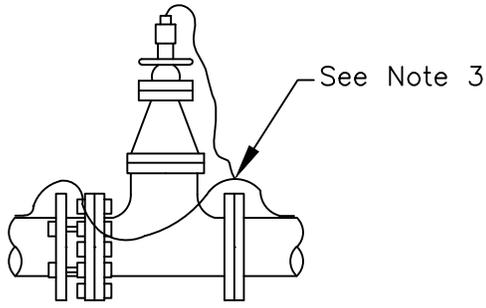
CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13
Ckd: <sup>Spec.</sup> Committee	Scale: None

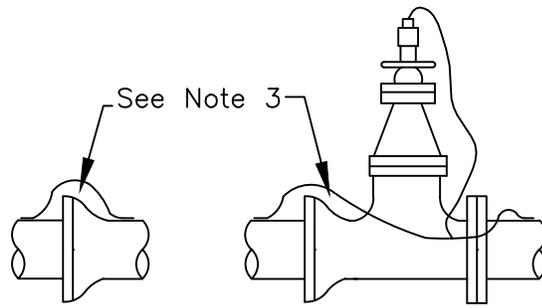
No.

W-23A

*[Signature]*  
City Engineer



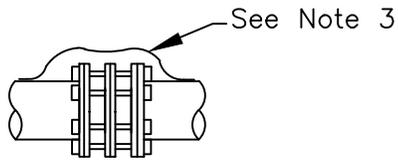
FLANGED ADAPTER



JOINT

JOINT/FITTING

BELL AND SPIGOT



FLEXIBLE COUPLING

INSTALLATION DETAILS

Notes:

1. Bonding jumpers shall be installed, as shown, across all flexible couplings, flanged adapters and hub-end valves and fittings installed in electrically continuous pipelines.
2. Bonding jumper is NOT to be installed across insulating joints or insulating couplings.
3. Bonding jumpers to be installed with a cable length of 10" at joints. On all other connections length of cable shall be "body length" of fitting(s) plus 8" additional cable for slack.
4. LOOP CABLE sizes shall be:  
 #0000 on 30" and larger pipes,  
 #0 on 14" thru 27" pipes, and  
 #1 on 12" and smaller pipes.

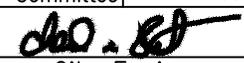
User note:

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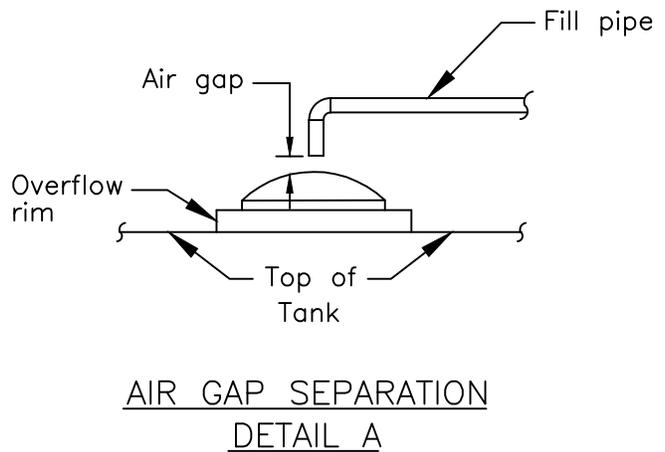
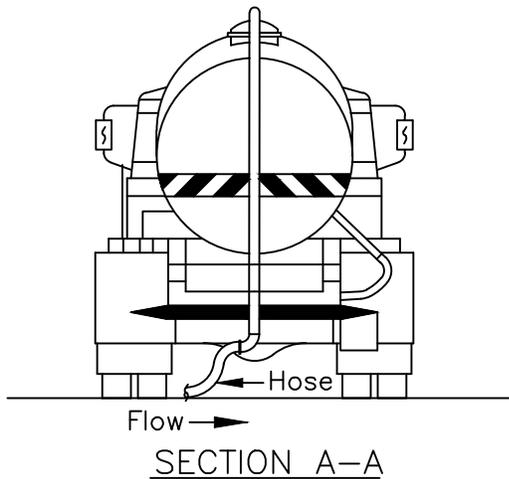
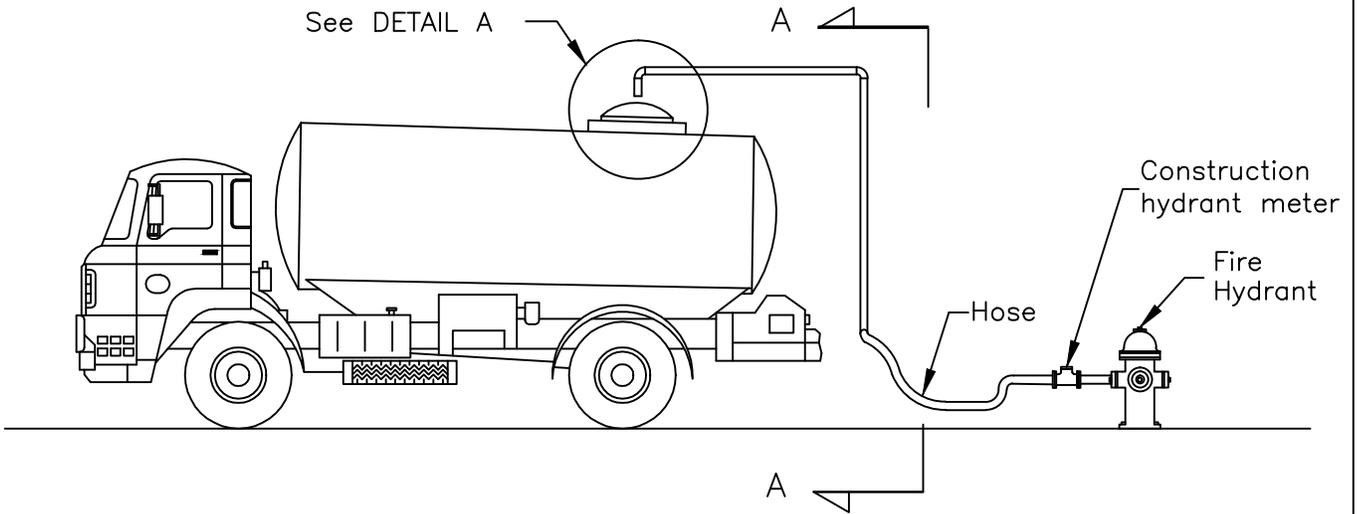
Date:	By:	Rev:

BONDING JUMPER

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	W-23B
 City Engineer		

W23B.DWG



Notes:

1. All piping up to air gap must be mounted permanently to the exterior of the tank, and clearly visible.
2. Air gap must be at least 2 times the fill pipe diameter from the overflow rim but in no case less than a 1 inch minimum gap, see Detail A.
3. No internally mounted air gap piping is permitted.
4. Elevated storage tank must have backflow preventer and air gap per Detail A and certified backflow preventer.

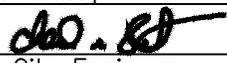
User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

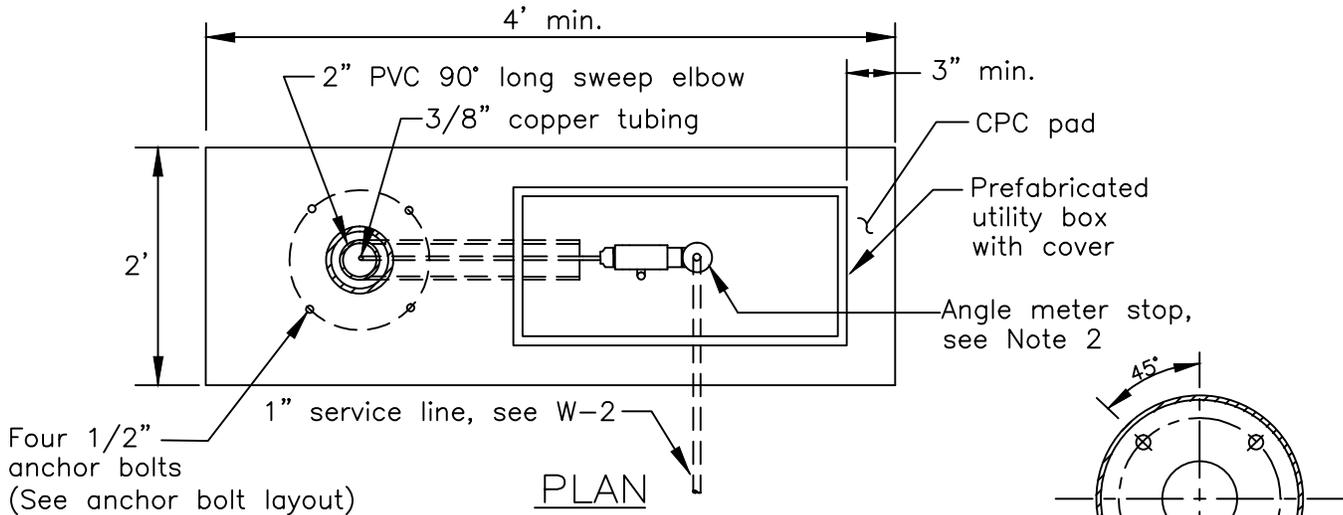
Date:	By:	Rev:

WATER TANK  
TRUCK HOOK-UP

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: <sup>Spec.</sup> Committee	Scale: None	W-24
 City Engineer		

W24.DWG



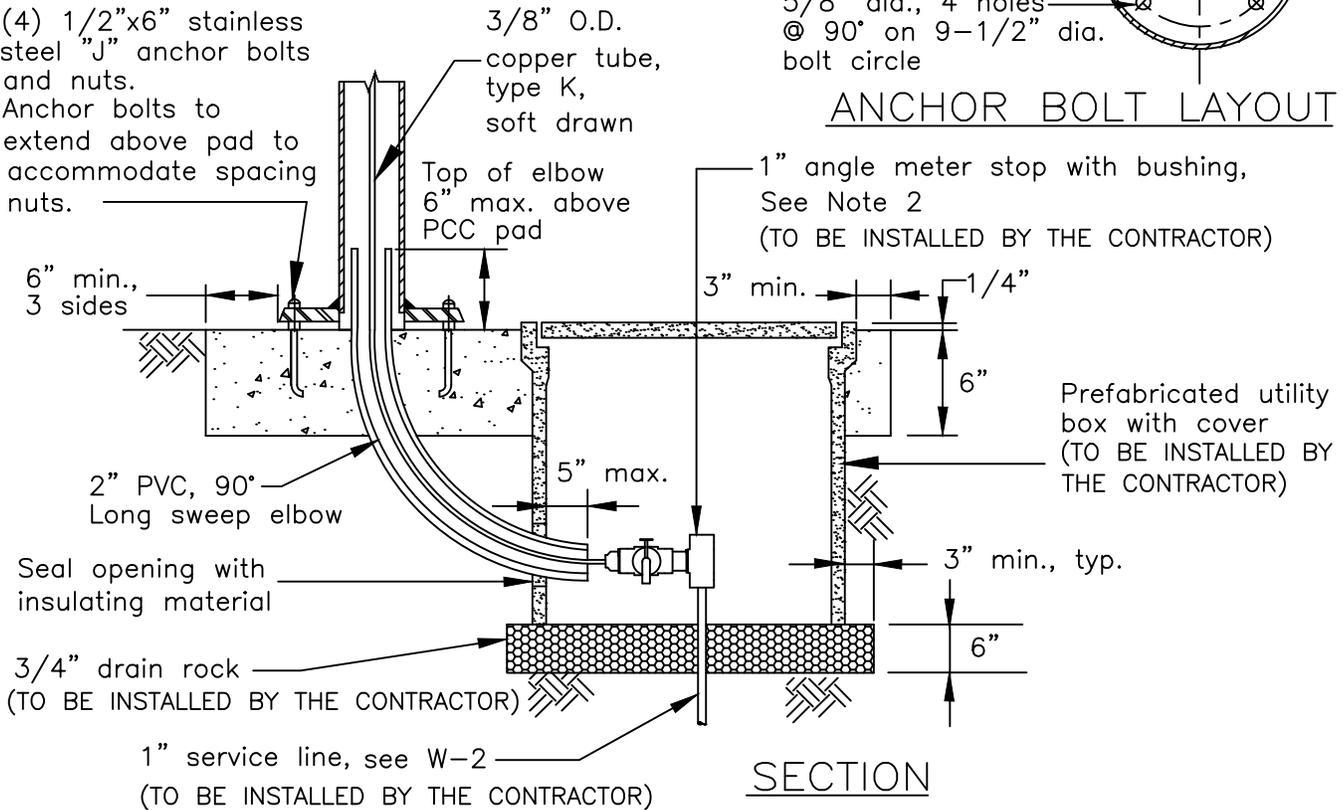
Four 1/2" anchor bolts  
(See anchor bolt layout)

PLAN

5/8" dia., 4 holes  
@ 90° on 9-1/2" dia.  
bolt circle

ANCHOR BOLT LAYOUT

(4) 1/2"x6" stainless steel "J" anchor bolts and nuts. Anchor bolts to extend above pad to accommodate spacing nuts.



SECTION

**Notes:**

1. Locate Sampling Stations within City Right-of-Way or Public Utility Easement, behind sidewalk or behind curb with no sidewalk. All locations to be approved by the ENGINEER.
2. Point the angle meter stop toward the Water Sampling Station as directed by the ENGINEER.

**User note:**

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

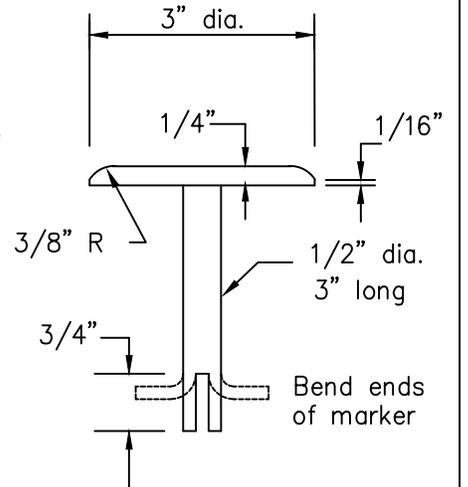
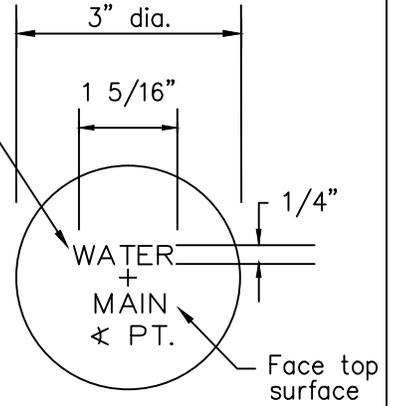
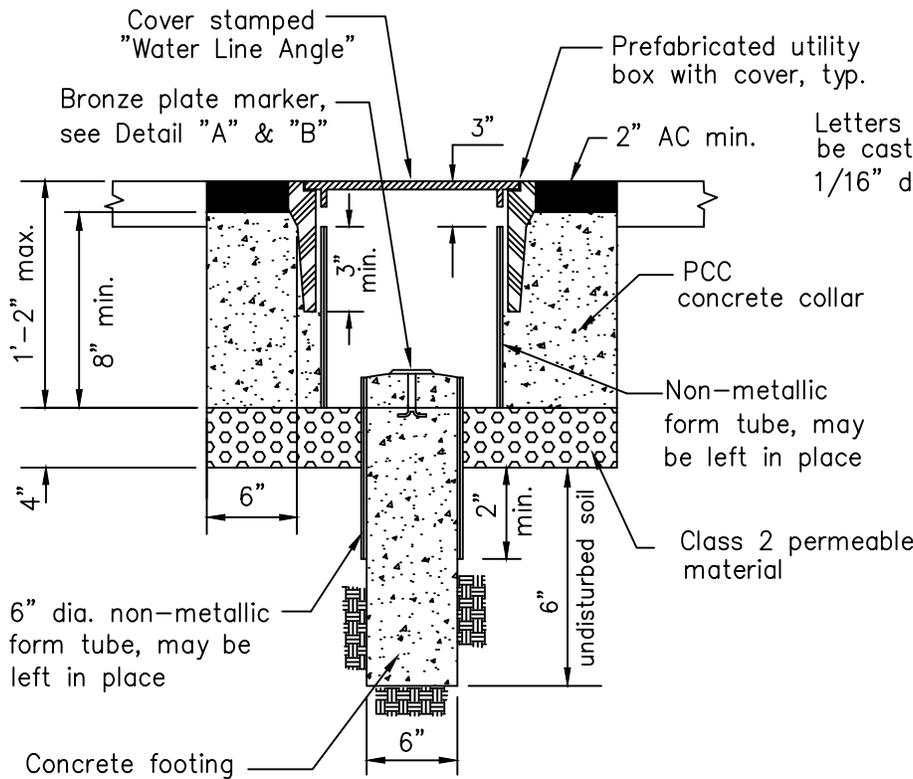
CITY OF LIVERMORE  
STANDARD DETAIL

WATER QUALITY SAMPLING  
STATION

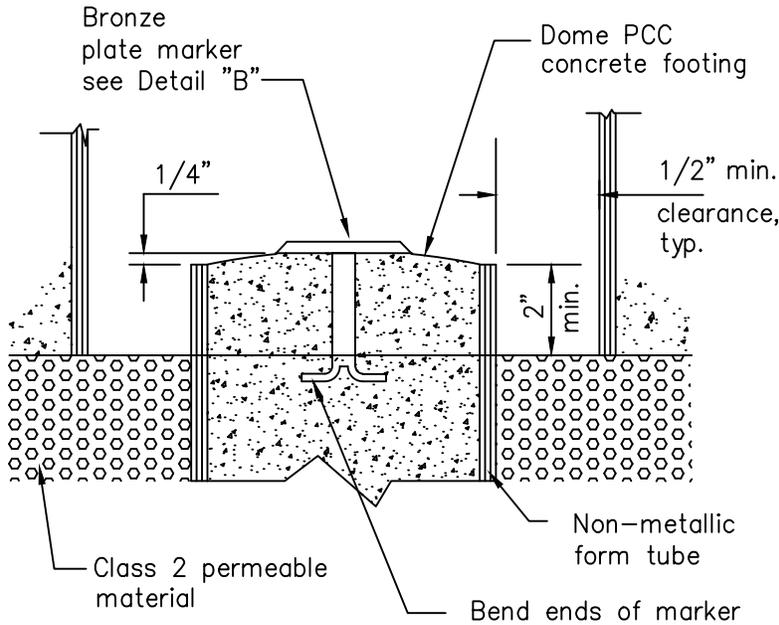
Dwn: FY	Date: May-13	No.
Spec. Ckd: Committee	Scale: None	W-25
 City Engineer		

W25.DWG

Date: By: Rev:



BRONZE PLATE MARKER  
DETAIL "B"



DETAIL "A"

User note:  
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

W26.DWG

Date	By	Rev.

## WATER LINE ANGLE MARKER

### CITY OF LIVERMORE STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	W-26
 City Engineer		



Plate thickness of casing pipe				
Diameter	To 12"	15" to 27"	30" to 54"	60" to 72"
Minimum thickness	1/4"	3/8"	1/2"	5/8"

Casing shall be smooth steel pipe

Notes:

1. Carrier pipe must have restrained joints, and carrier pipe shall be tested before ends are sealed.
2. A minimum of 2 casing insulators shall be securely attached to carrier pipe. Install according to manufacturers recommendations.
3. Provide couplings in carrier pipe within 1' of each end of casing.
4. Vent pipe shall be 2" steel pipe with long radius bend, coated, and a 2" x 2" uncoated nipple with screen. Weld vent pipe to casing pipe.
5. On non-cathodically protected systems install anode(s) on casing pipe. Submit anode design for approval by the ENGINEER.
6. On cathodically protected systems insure electrical continuity on the casing pipe and the carrier pipe. Install electrolysis test station on casing pipe. Submit test station design for approval by the ENGINEER.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

G05B.DWG

Date:	By:	Rev:

STEEL CASING  
FOR MAINS  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: <small>Spec. Committee</small>	Scale: None	W-27B
 City Engineer		