

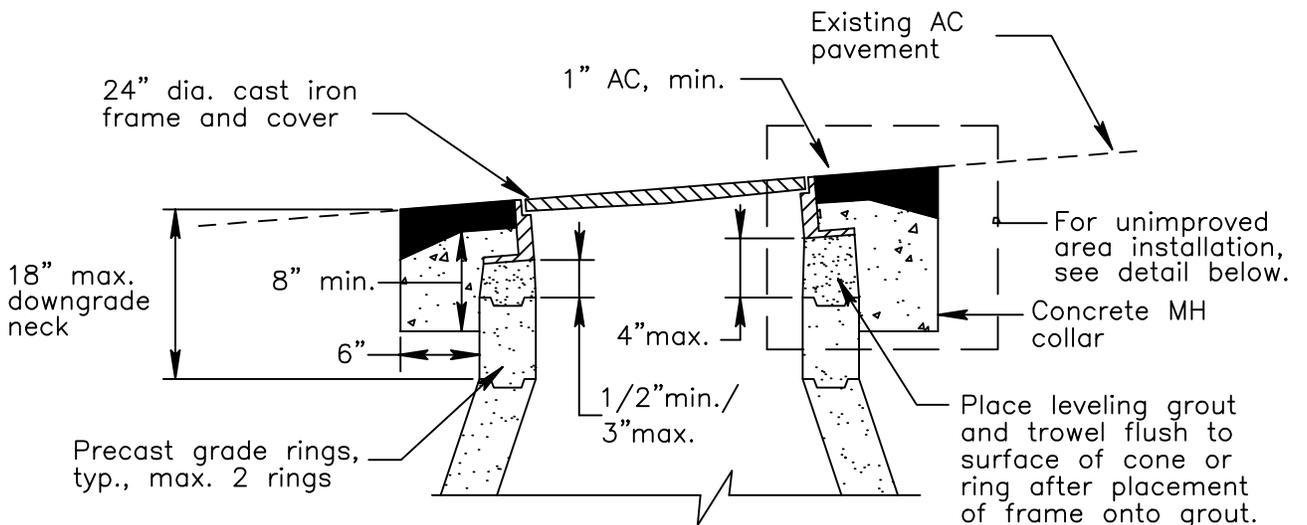
**CITY  
OF  
LIVERMORE**

**STANDARD DETAILS**

**TABLE OF CONTENTS**

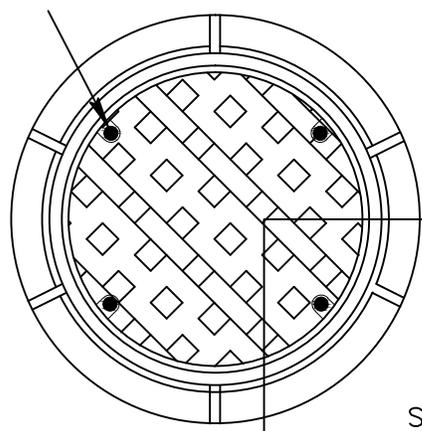
**SANITARY SEWER AND STORM DRAIN - S**

<b>DETAIL NO.</b>	<b>TITLE</b>
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

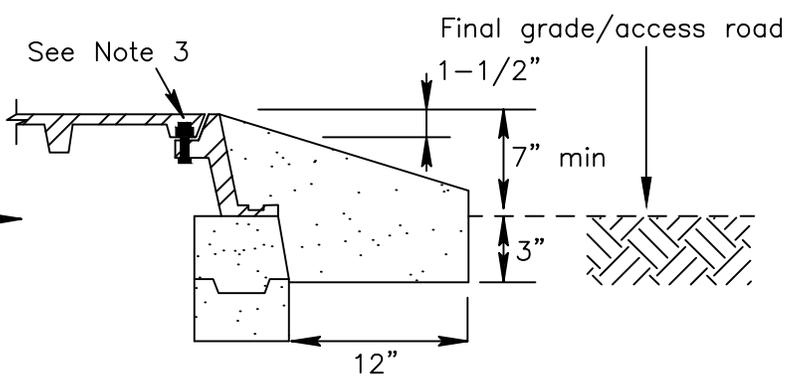


STREET PROFILE SECTION

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.

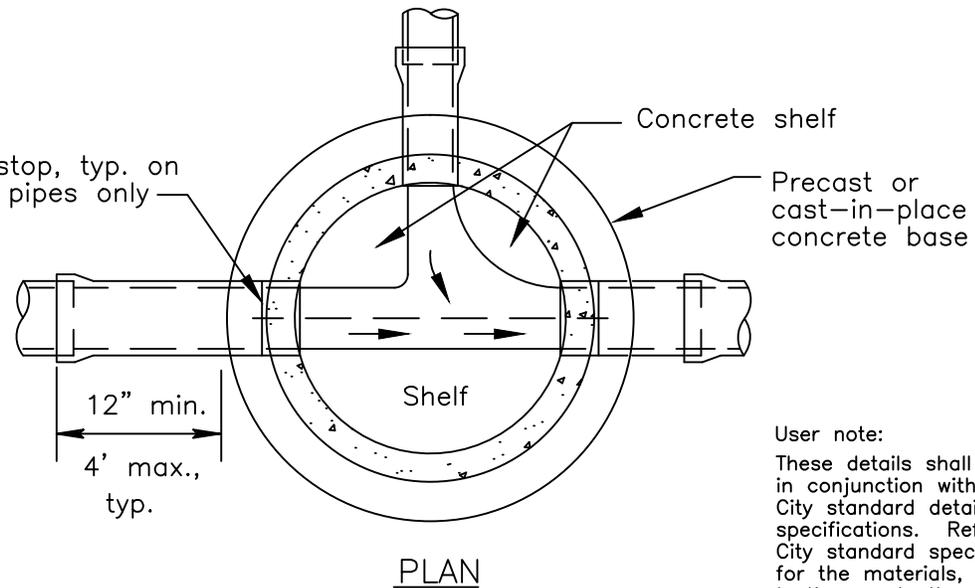
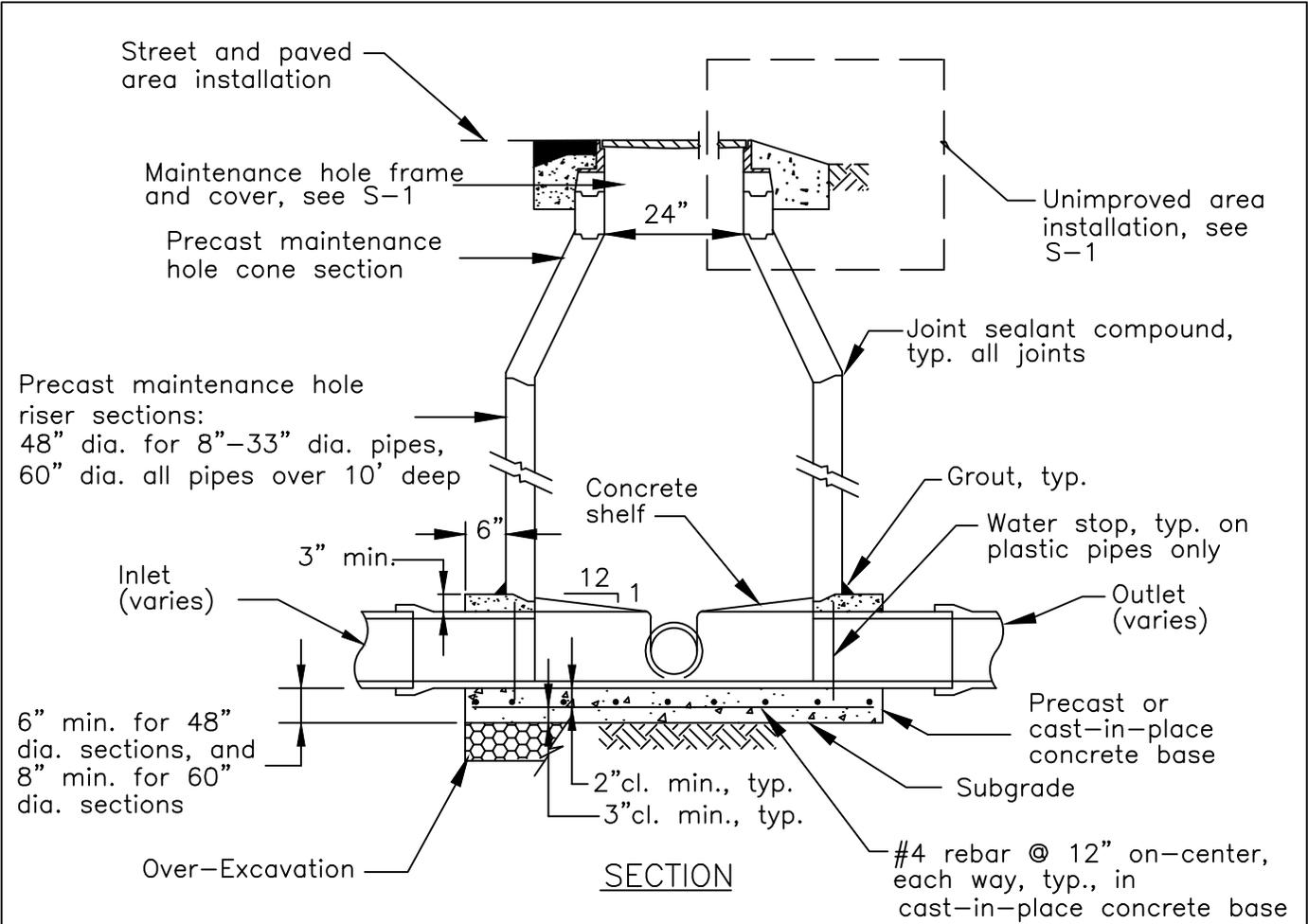
S01.DWG

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

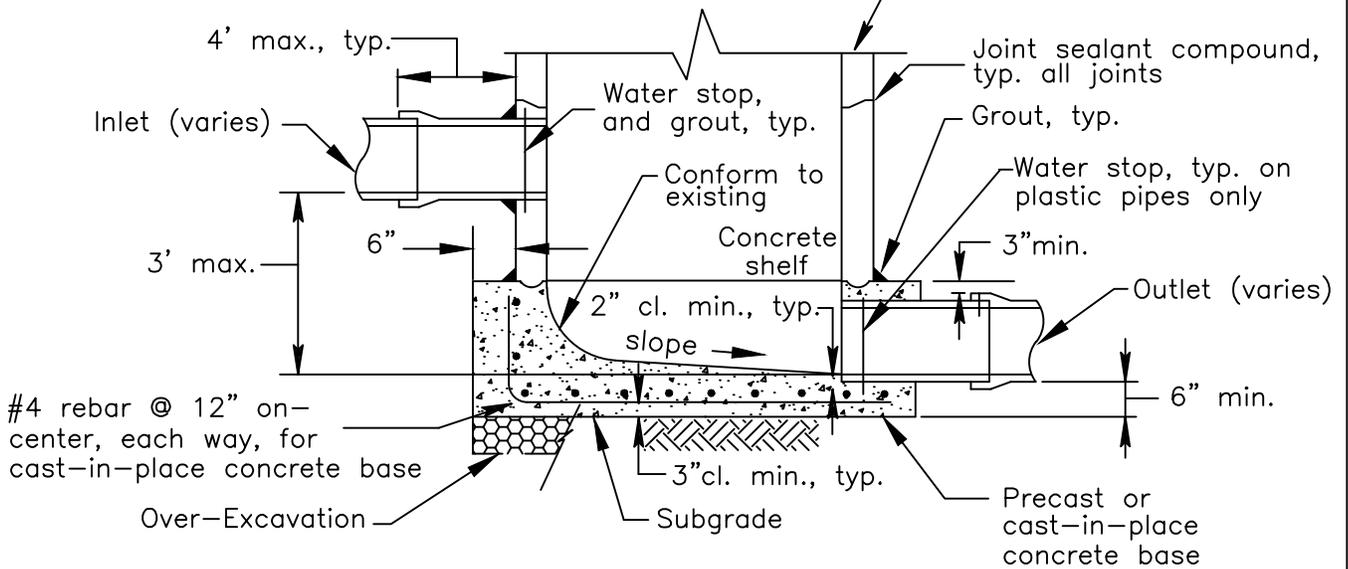
Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-2A
<i>do. &amp; do.</i> City Engineer		

SO2A.DWG

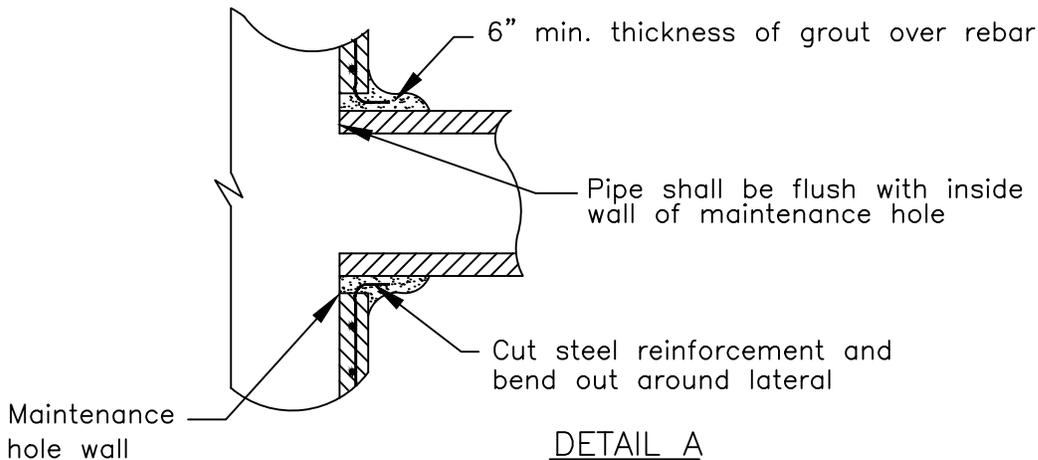
Date:	By:	Rev:

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.

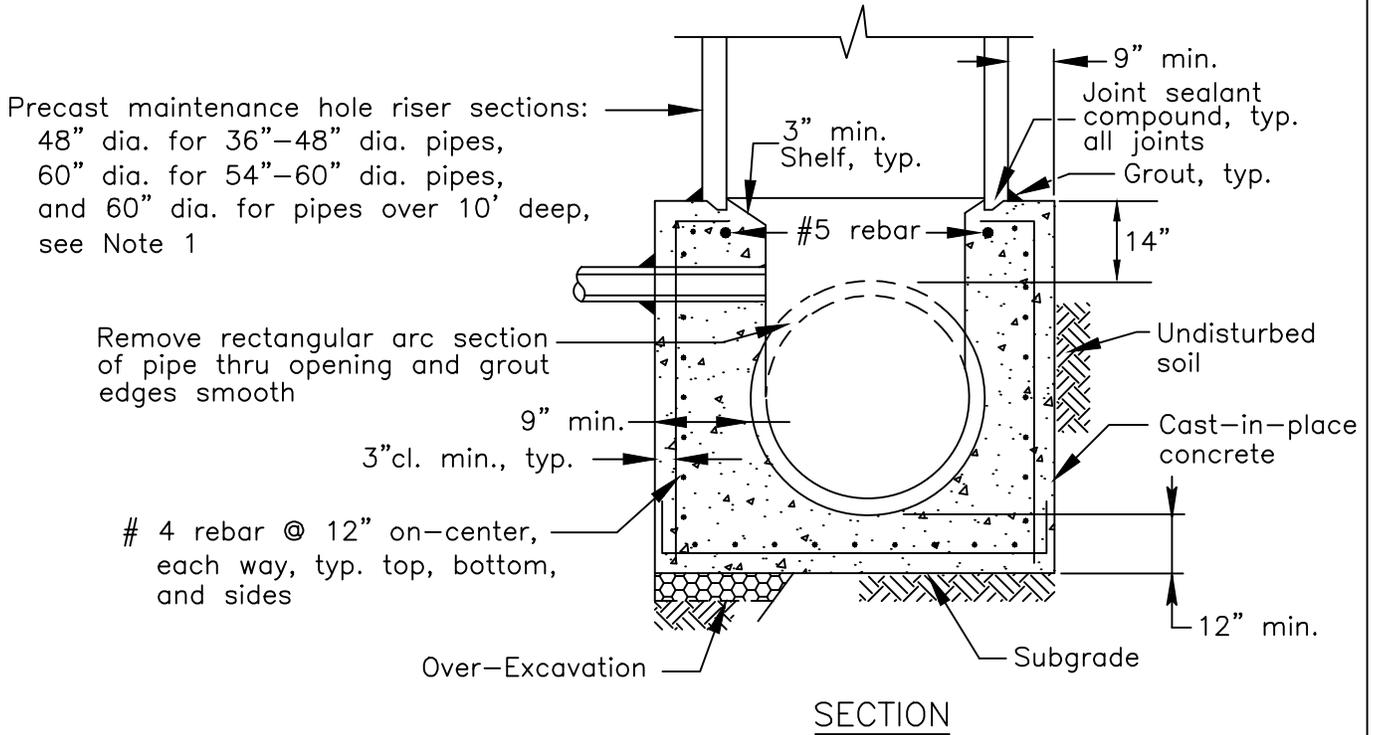
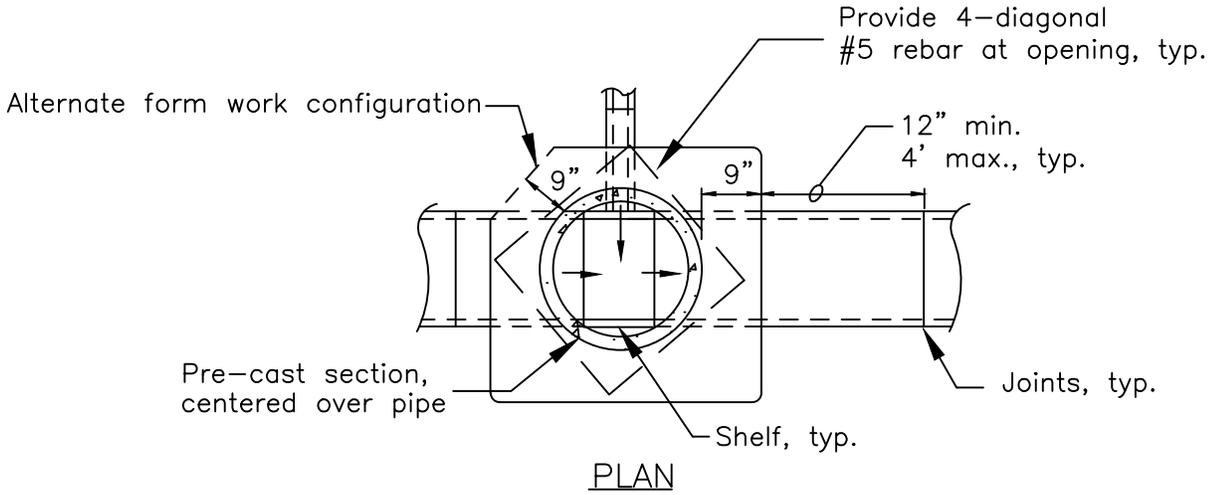
S02B.DWG

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		



Notes:

1. See S-2 for Type I maintenance hole requirements and notes.
2. For depths of cover greater than 20 feet or pipes larger than 60" diameter provide special engineered design prepared by licensed Civil 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.

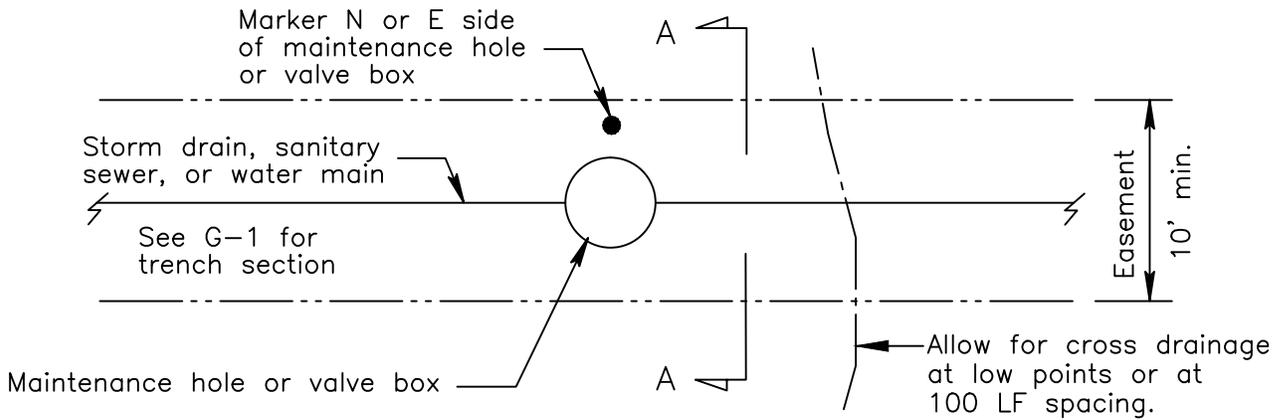
S03.DWG

Date:	By:	Rev:

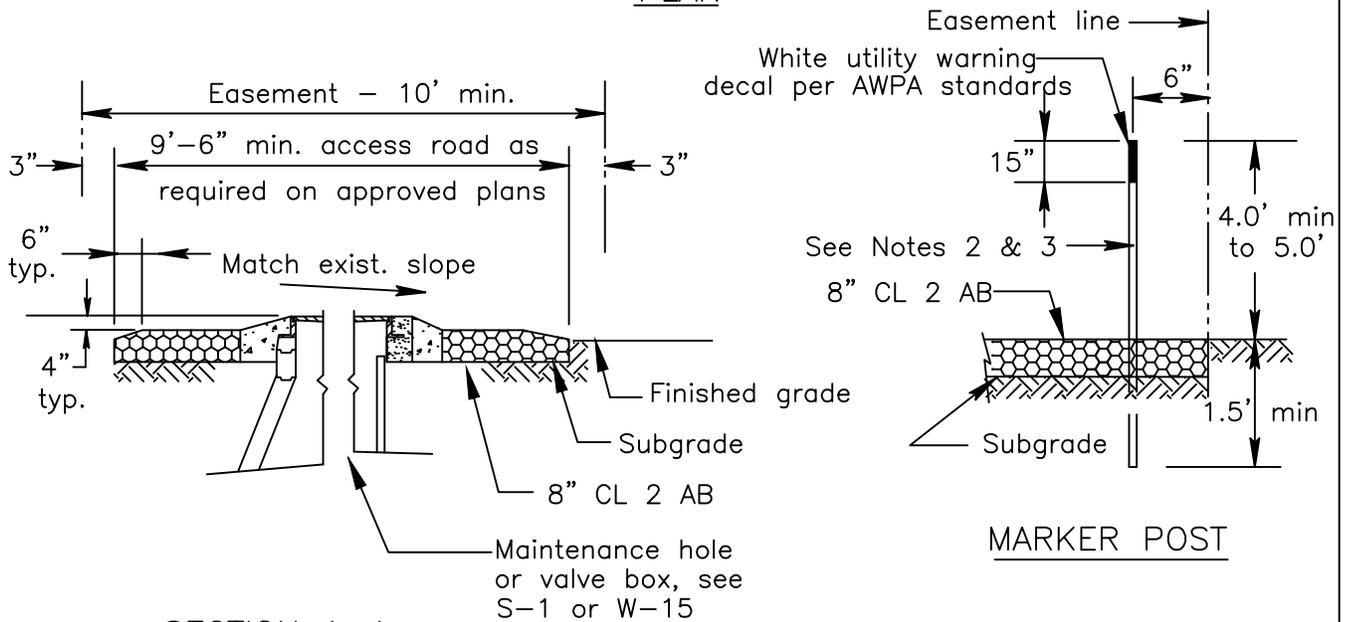
TYPE II MAINTENANCE HOLE  
36" TO 60" DIA. PIPES

CITY OF LIVERMORE  
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-3
 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.

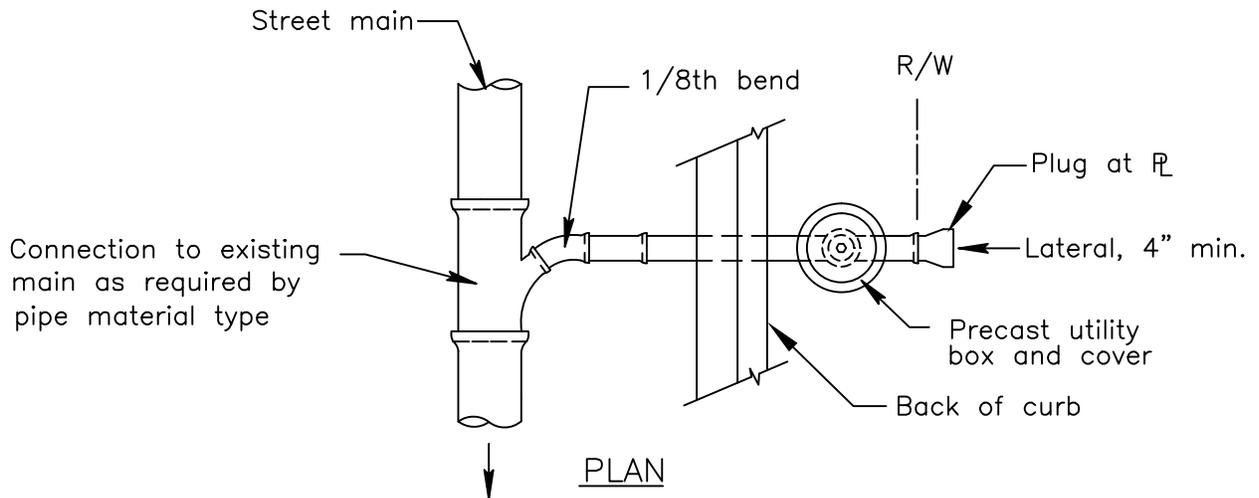
S04.DWG

Date:	By:	Rev:

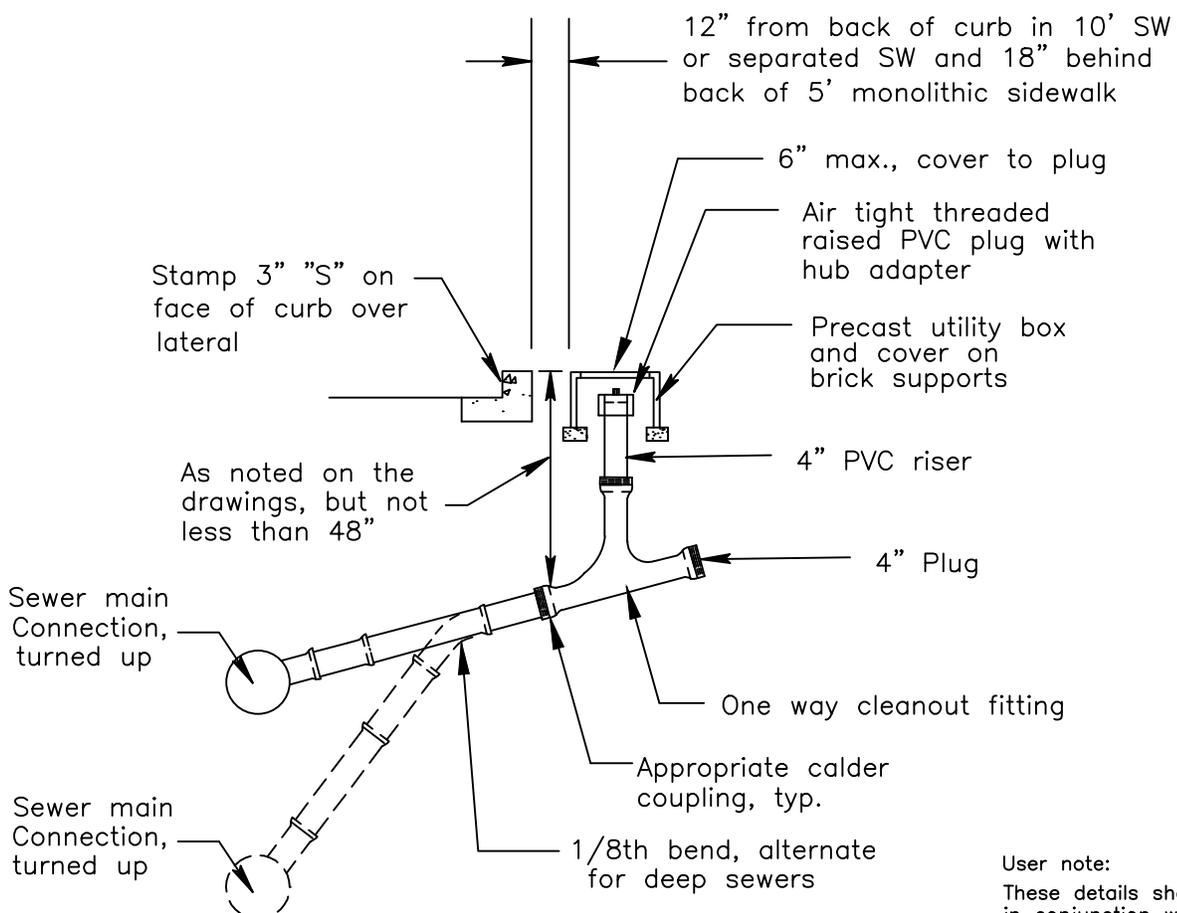
UNIMPROVED AREA  
 UTILITY CONSTRUCTION

CITY OF LIVERMORE  
 STANDARD DETAIL

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



PLAN



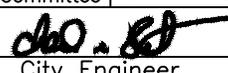
PROFILE

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.

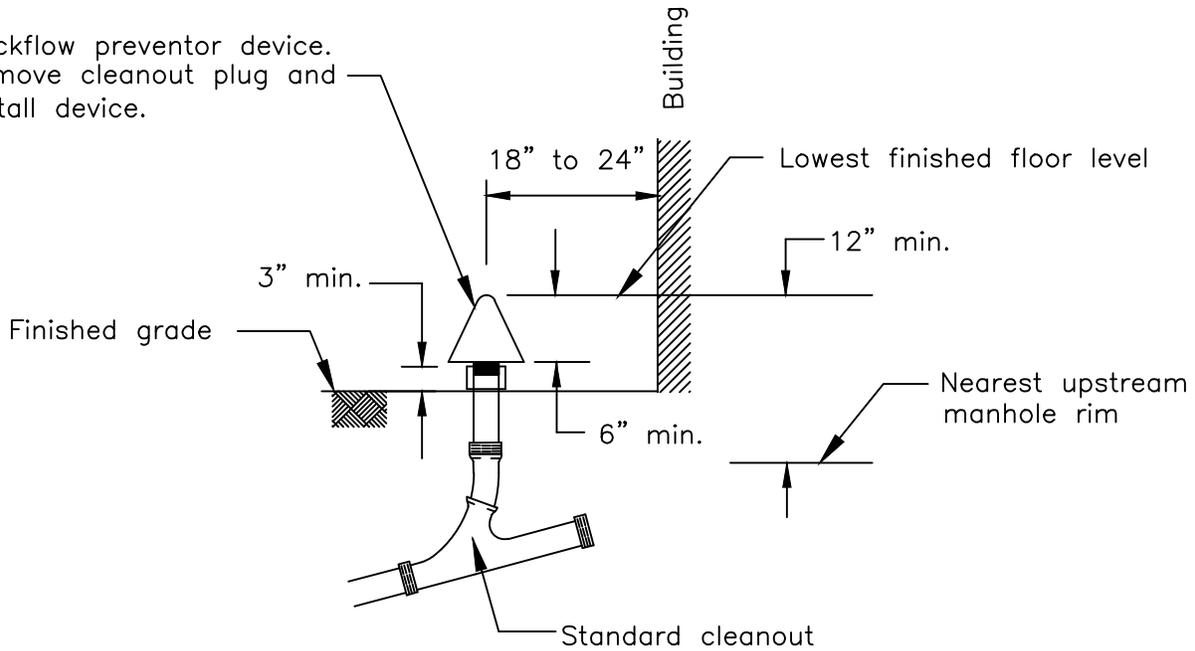
S05A.DWG			
	Date:	By:	Rev:

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.

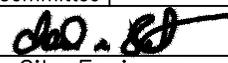
User note:

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.

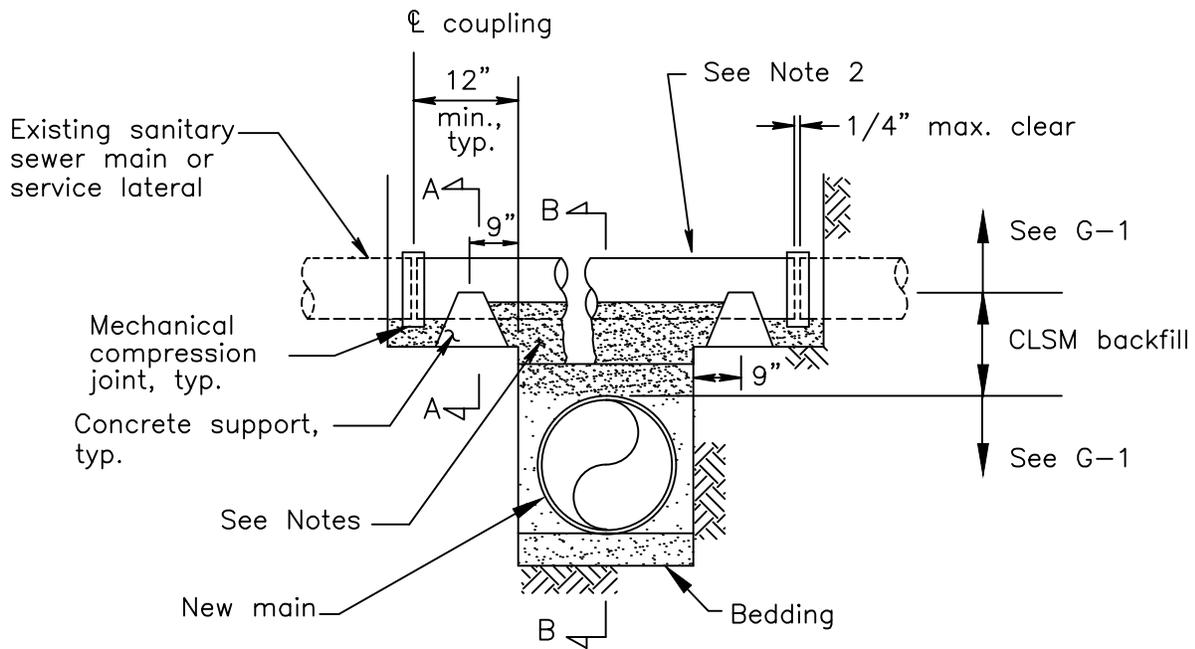
S05B.DWG

SANITARY SEWER LATERAL  
(NOTES AND BACKFLOW PREVENTOR)

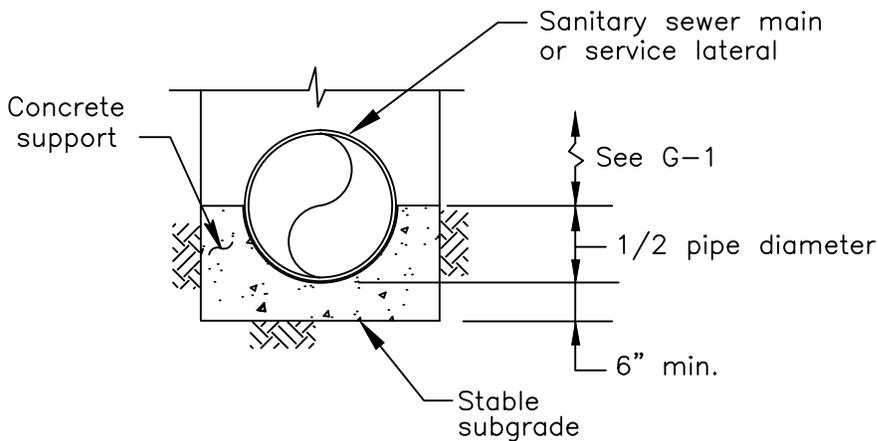
CITY OF LIVERMORE  
STANDARD DETAIL

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:

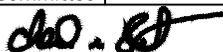
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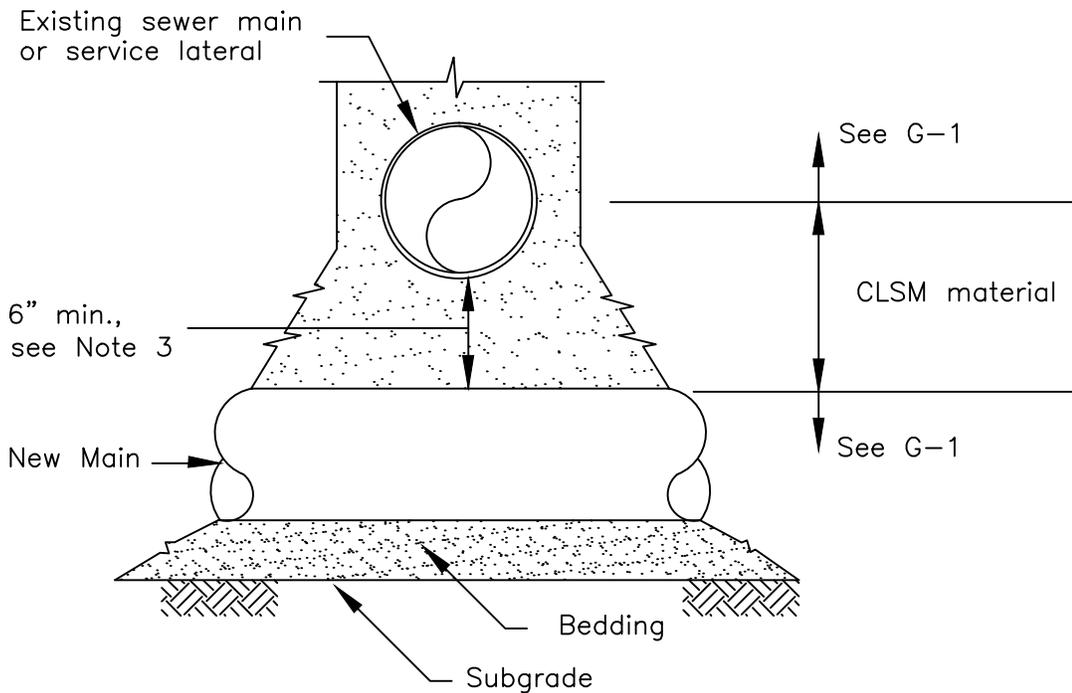
S06A.DWG

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.

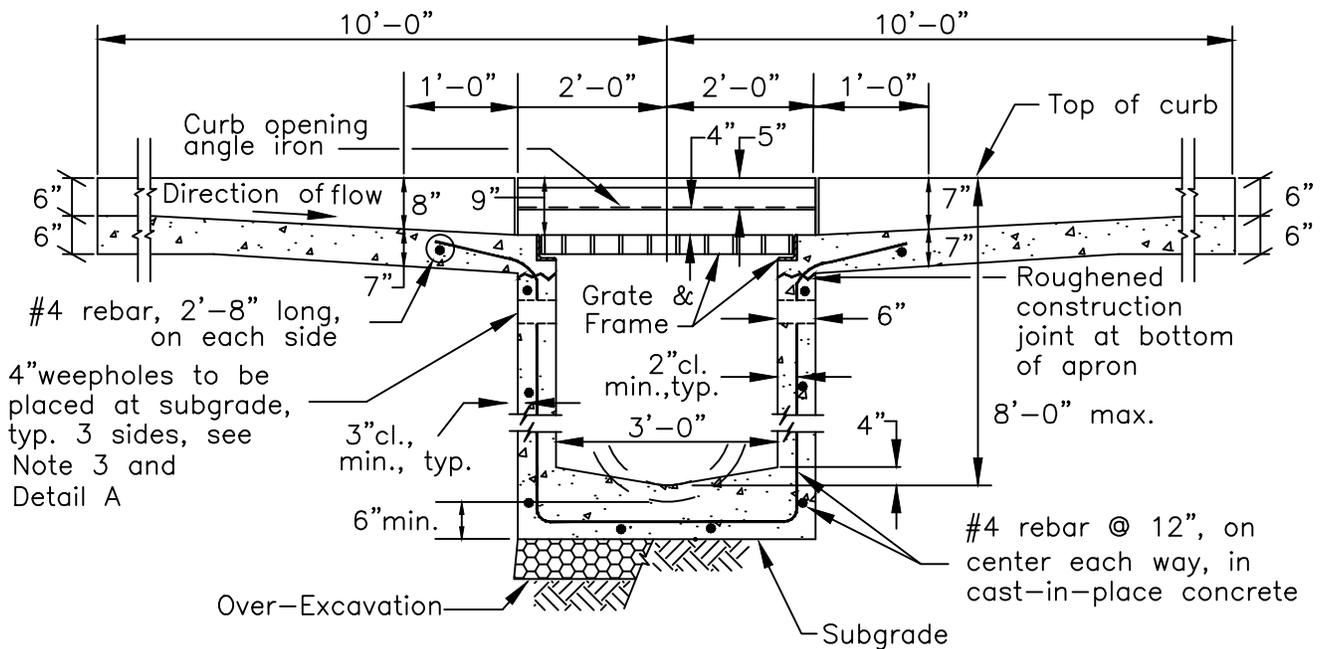
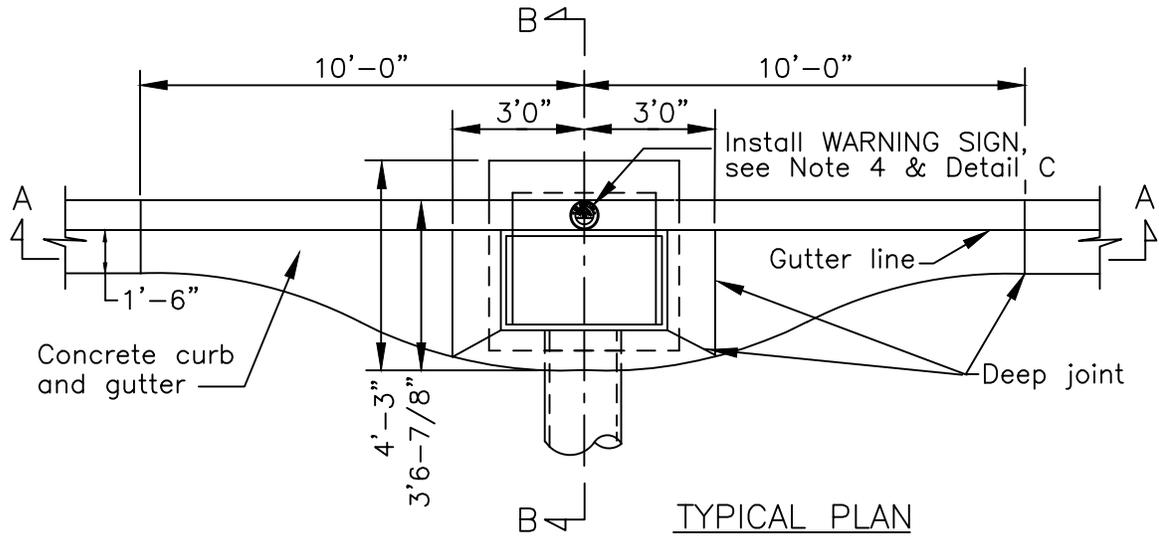
S06B.DWG

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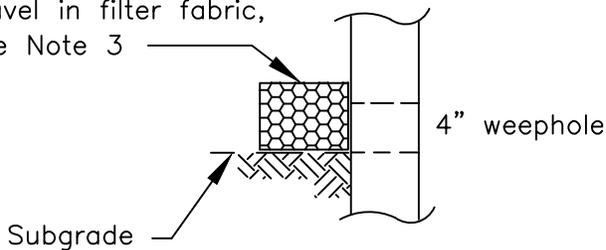
SANITARY SEWER CROSSING REPLACEMENT

CITY OF LIVERMORE  
 STANDARD DETAIL

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



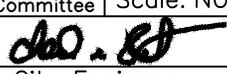
1 CF drain rock or gravel in filter fabric, see Note 3



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.

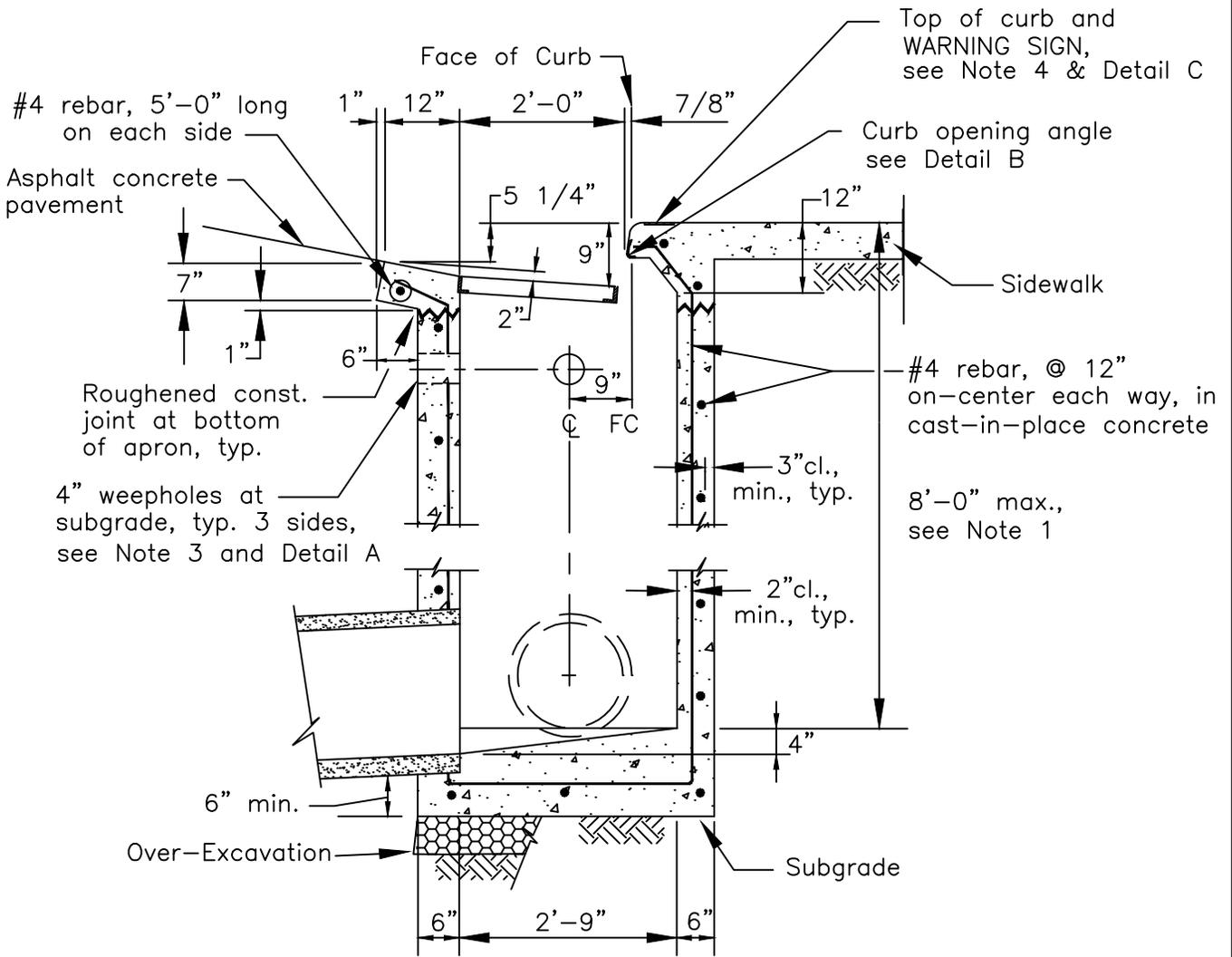
STORM WATER CURB INLET  
 TYPE I  
 12" TO 30" DIA. PIPES

CITY OF LIVERMORE  
 STANDARD DETAIL

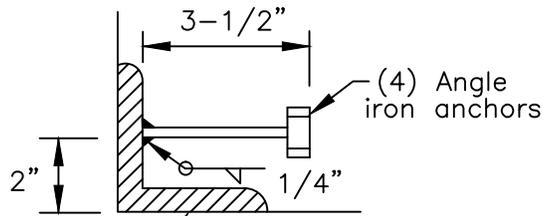
Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	S-7A
 City Engineer		

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.

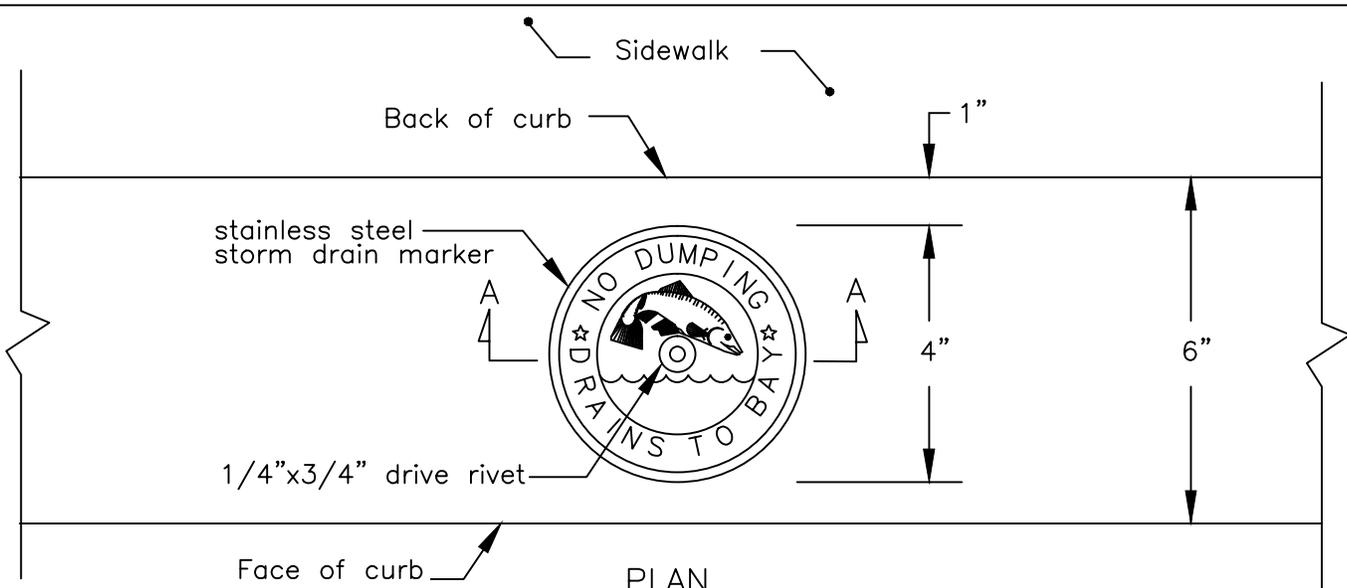
S07B.DWG

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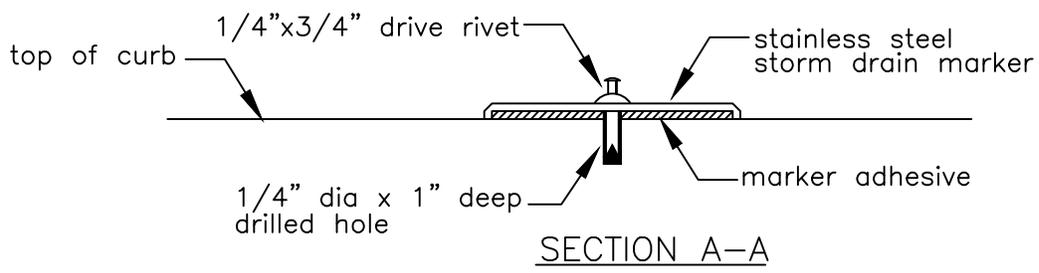
STORM WATER CURB INLET  
TYPE I  
12" TO 30" DIA. PIPES

CITY OF LIVERMORE  
STANDARD DETAIL

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



PLAN



SECTION A-A

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

User note:

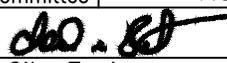
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

S07C.DWG

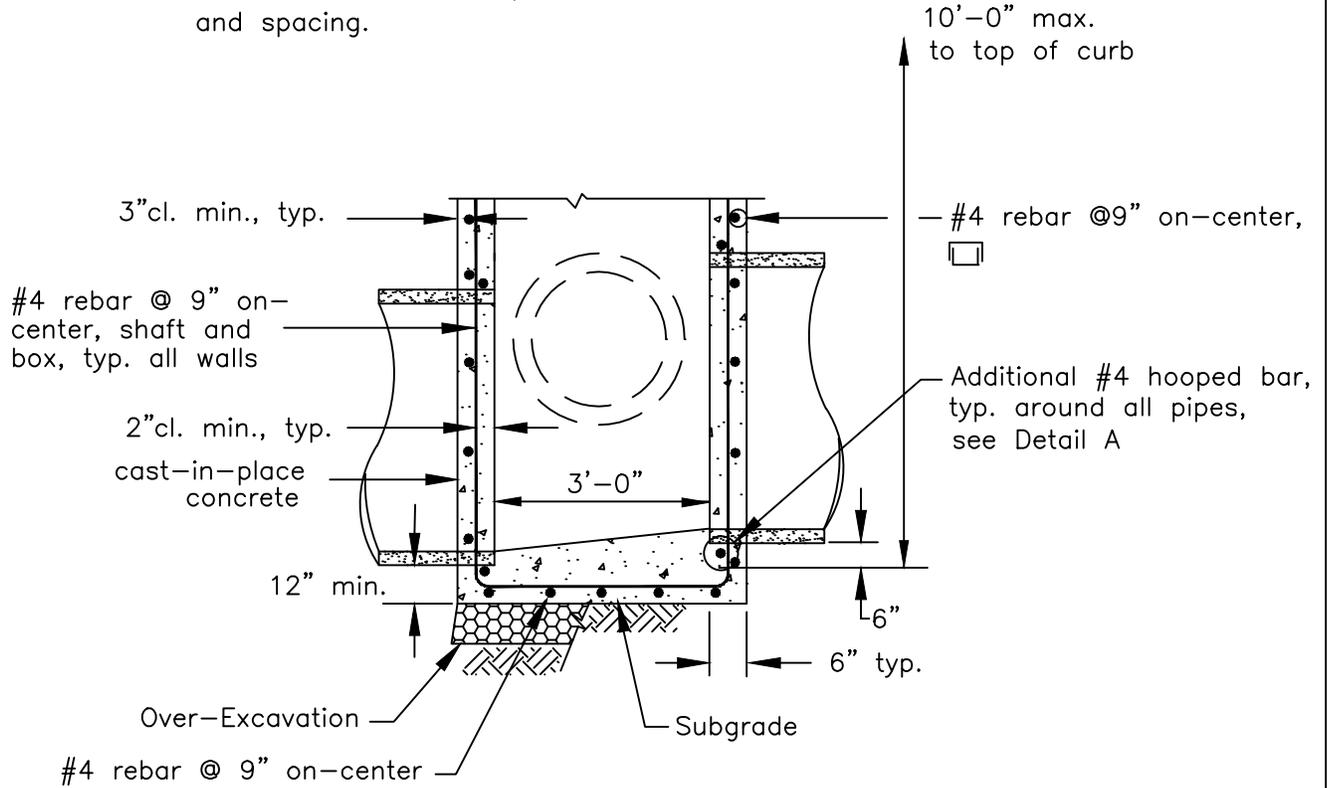
Date:	By:	Rev:

STORM WATER CURB INLET  
 TYPE I  
 NOTES

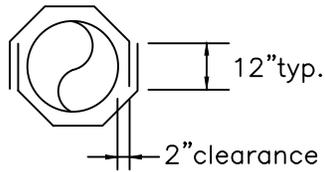
CITY OF LIVERMORE  
 STANDARD DETAIL

Dwn: FY	Date: May-13	No.  S-7C
Ckd: Spec. Committee	Scale: None	
 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



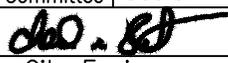
HOOPED BAR  
DETAIL A

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:

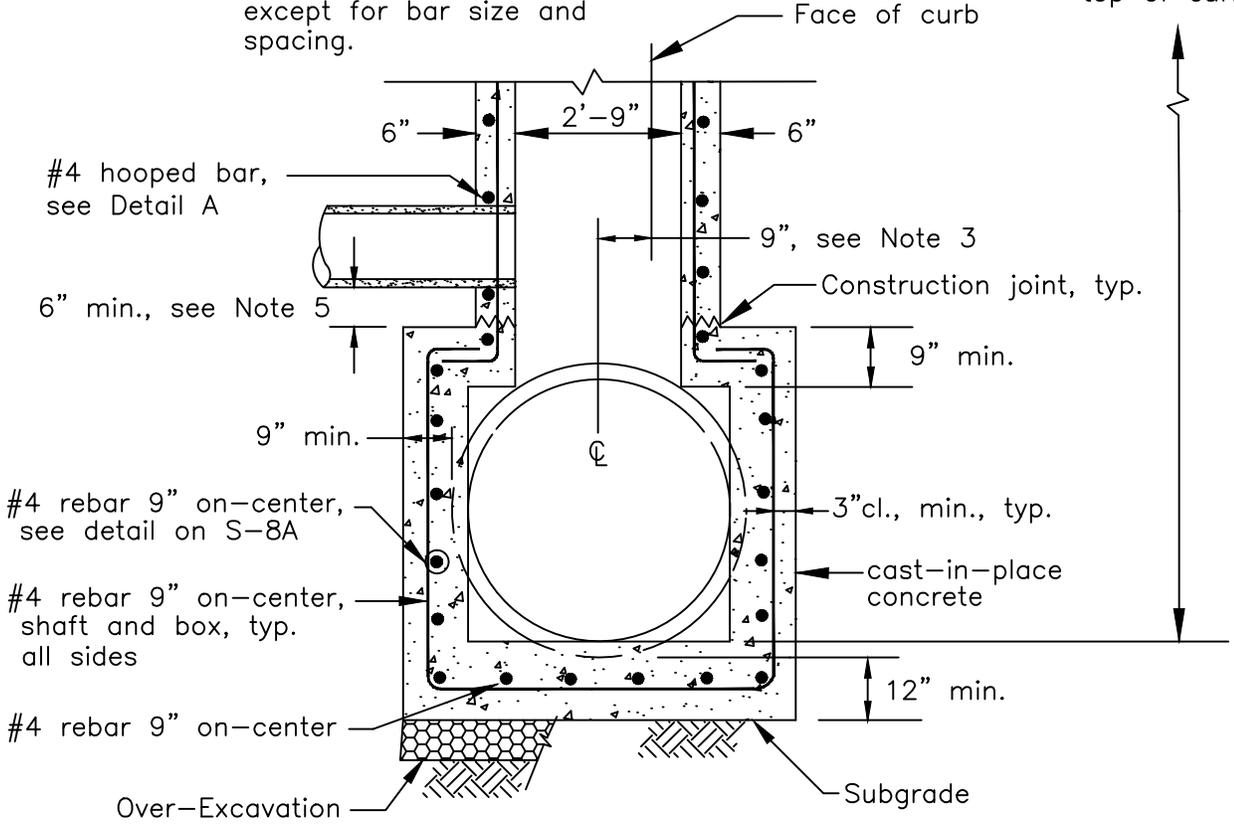
STORM WATER CURB INLET  
TYPE II  
33" TO 60" DIA. PIPES

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:

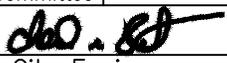
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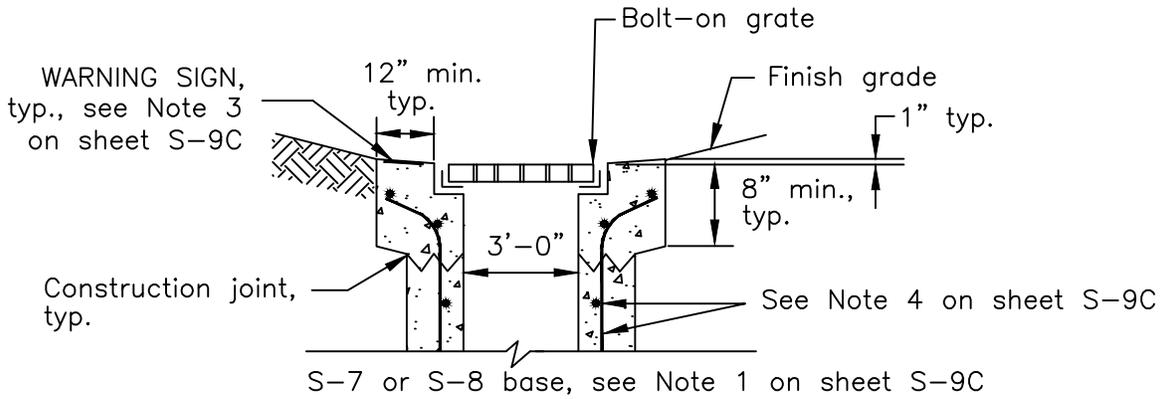
S08B.DWG

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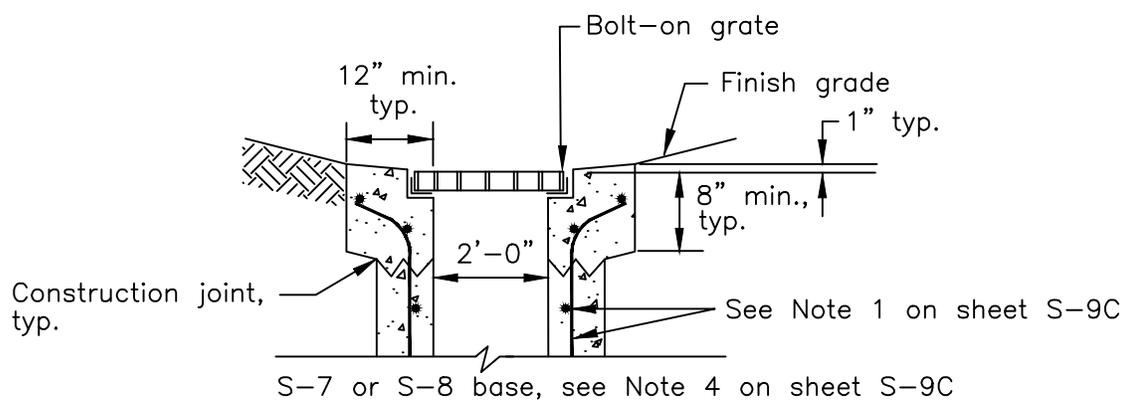
STORM WATER CURB INLET  
TYPE II  
33" TO 60" DIA. PIPES

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

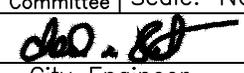
See S-9B for Plan View

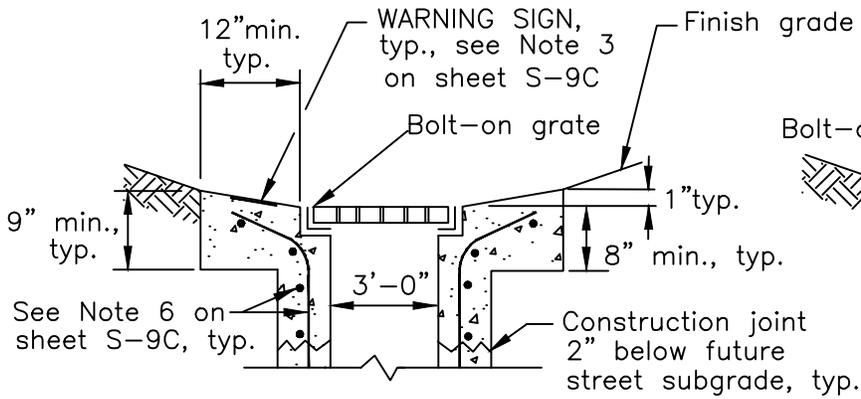
User note:  
 These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

S09A.DWG

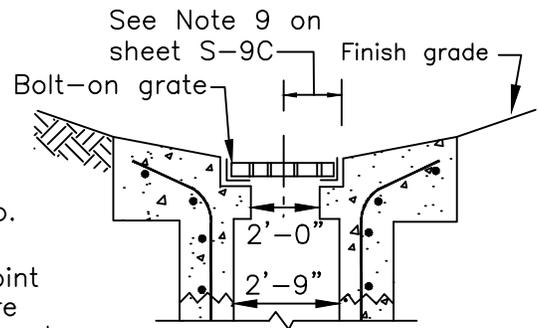
Date:	By:	Rev:

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		



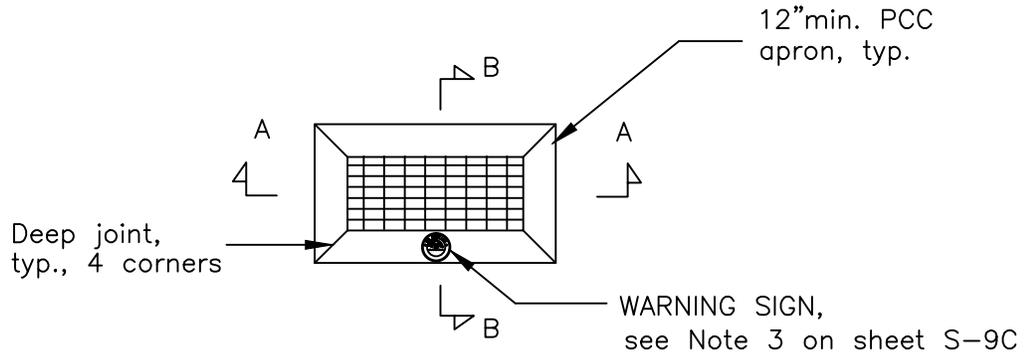
SECTION A-A



SECTION B-B

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

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



PLAN VIEW

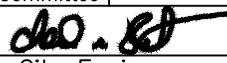
CAST-IN-PLACE CONCRETE

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.

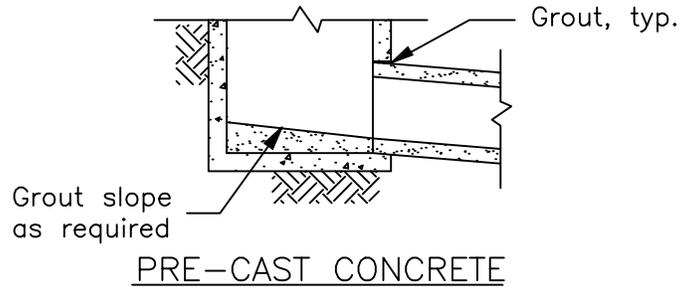
S09B.DWG

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:

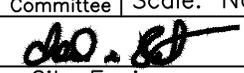
6. For C-I-P inlet base construction see:  
S-7 for Type I MH, 12" to 30" dia. pipes, or  
S-8 for Type II MH, 33" to 60" dia. pipes.
7. For modification of Field Drop Inlet to Curb Inlet remove concrete above weakened plane joint, tie-in rebar, construct new curb inlet per S-7.
8. Do not install weepholes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

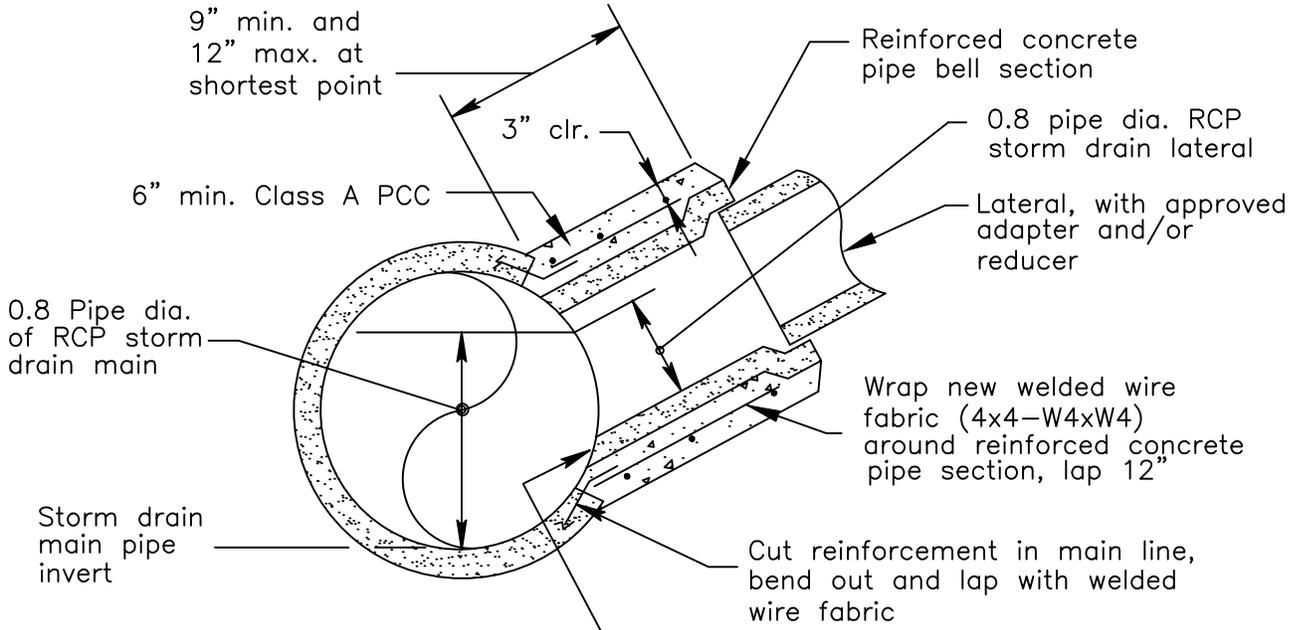
S09C.DWG

STORM WATER  
FIELD DROP INLET  
NOTES

CITY OF LIVERMORE  
STANDARD DETAIL

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

Date:	By:	Rev:	
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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:

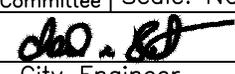
1. Maximum lateral size shall be 12".
2. Minimum existing reinforced concrete pipe storm drain main shall be 24".
3. Storm drain lateral connection to existing reinforced concrete pipe storm drain main subject to T.V. inspection by the City.
4. For storm lateral to maintenance hole, see S-2B.
5. Permitted 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.

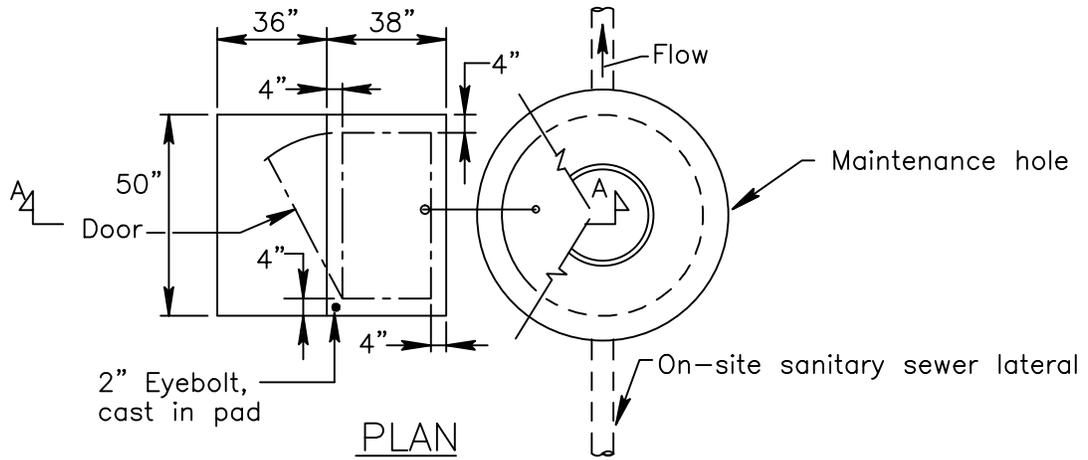
Date:	By:	Rev:

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

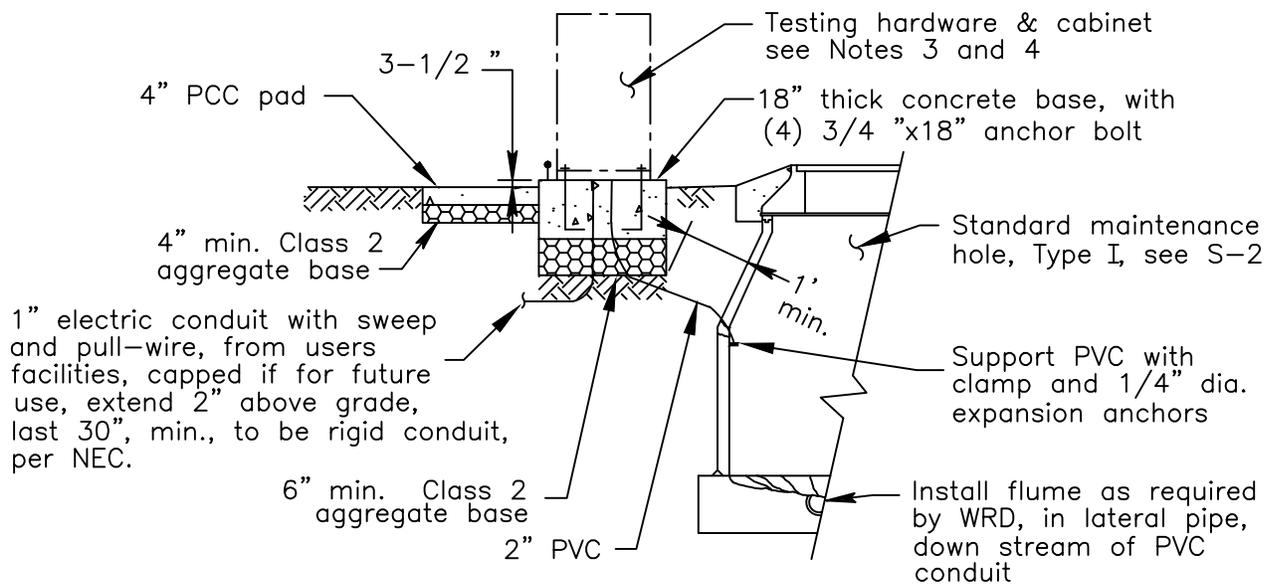
CITY OF LIVERMORE STANDARD DETAIL

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

S10.DWG



PLAN



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:

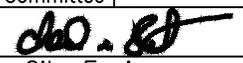
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

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		