STANDARD DETAILS
AND
SPECIFICATIONS

ISSUED BY
CITY OF SEBASTOPOL
DEPARTMENT OF PUBLIC WORKS/ENGINEERING
Joseph G. Gaffney, City Engineer
Susan Kelly, Engineering Director
Richard Emig, Superintendent of Public Works

Approved by the Sebastopol City Council
July 1998

Street Standards Approved by Sebastopol
City Council September 2021

RESOLUTION NO. 4978

A RESOLUTION OF THE SEBASTOPOL CITY COUNCIL
ADOPTING THE CITY STANDARD CONSTRUCTION DRAWINGS
AND STANDARD SPECIFICATIONS

WHEREAS, Standard Construction Drawings and Specifications are necessary to achieve quality and consistent construction of street, drainage, water and wastewater facilities within the City; and

WHEREAS, the City Engineer has submitted said Standards and recommends adoption; and

WHEREAS, minor discrepancies in the Standards may be found from time to time.

NOW, THEREFORE BE IT RESOLVED that the City Council adopts the Standard Construction Drawings and Specifications dated July, 1998 attached hereto as Exhibit "A"; and

BE IT FURTHER RESOLVED, that the City Engineer is authorized to make minor changes to the Standards to correct errors, conflicts, and discrepancies; and

BE IT FURTHER RESOLVED, that said "Standard Construction Drawings & Specifications" shall be effective for any project for which improvement plans are submitted to the City for review and approval which standards shall be available in book form at the City Corporation Yard for a $25.00 fee, said fee to include copies of future updates; and

IN COUNCIL DULY PASSED this 1st day of September, 1998.

APPROVED: _____
Mayor

VOTING AYE: 5 Councilmembers Crump, Foley, Magnie, Roventini and Mayor Austin
VOTING NO: 0
ABSENT: 0
ABSTAIN: 0

ATTEST: _____
City Clerk

CITY OF SEBASTOPOL
STANDARD DETAILS
AND
SPECIFICATIONS
JULY 1998

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CITY OF SEBASTOPOL
PUBLIC WORKS DEPARTMENT
714 JOHNSON STREET
SEBASTOPOL, CA 95472

Paul H. Klassen City Engineer
Dave Baranzini, Superintendent

PHONE (707) 823-5331
FAX (707) 823-4721
email davebar@sonic.net

SECTION 1

WATER STANDARDS

1. ALL MATERIAL, WORKMANSHIP, AND CONSTRUCTION DETAILS SHALL CONFORM TO THE CITY OF SEBASTOPOL, "STANDARD SPECIFICATIONS," INCLUDING ALL ADDENDA, STANDARD PLAN REVISIONS AND SPECIAL PROVISIONS.

2. START EXCAVATION BY EXPOSING END OF EXISTING MAIN TO DETERMINE ITS LINE AND GRADE. START NEW MAIN 8 – 10 FEET FROM, AND ON SAME LINE AND GRADE AS EXISTING MAIN. PIPE LAYING SHALL THEN BE ADJUSTED SO THE DEPTH OF NEW MAIN CONFORMS TO NOTE #3.

3. STANDARD DEPTH OF COVER FROM FINISHED GRADE SHALL BE: 48" FOR ALL SIZE MAINS.
   4" AND 10" MAINS MUST BE SPECIFICALLY APPROVED BY THE CITY ENGINEER.
   4" THROUGH 16" MAIN LINE VALVES SHALL BE RESILIENT SEAT GATE.
   18" AND LARGER MAINLINE VALVES SHALL BE BUTTERFLY VALVES.
   BLOW OFF VALVES SHALL BE 2" OR 3" BALL VALVES WITH ROTATION STOPS. THE MINIMUM DEPTH OF COVER FOR ALL WATER MAIN CONSTRUCTION IS 32".

4. NO. 12 INSULATED COPPER WIRE SHALL BE LAID ON TOP OF AND ALONG ENTIRE LENGTH OF ALL MAINS AND SHALL BE EXTENDED TO THE SURFACE AT ALL VALVE LOCATIONS, BLOWOFFS AND METER BOXES SUFFICIENT FOR LOCATOR EQUIPMENT TO BE ATTACHED. FASTEN THE WIRE TO THE TOP OF THE PIPE SO AS NOT TO BE DISPLACED BY BACKFILLING PROCEDURE (ONE METHOD OF ACCOMPLISHING THIS IS TO AFFIX THE WIRE TO THE TOP OF THE PIPE WITH DUCT TAPE AT APPROXIMATELY 10 FEET INTERVALS).

5. MAINS TO BE CONSTRUCTED WITHIN 10' OF SEWER PIPE REQUIRE SPECIAL INSTALLATION AND DESIGN MUST BE SPECIFICALLY APPROVED BY THE CITY ENGINEER.

6. ALL TRENCHING, BACKFILL AND RESURFACING REQUIRED FOR INSTALLATION OF WATER SYSTEM FACILITIES SHALL BE PER CITY STANDARD S–1.1 AND S–1.2.

7. ONLY CITY PERSONNEL SHALL OPERATE VALVES ON EXISTING WATER MAINS OR WATER SERVICES.

8. SERVICE LATERALS OTHER THAN THOSE SHOWN OR NOTED ON THE PLANS SHALL NOT BE INSTALLED PRIOR TO OBTAINING CITY APPROVAL.

9. UNLESS OTHERWISE SHOWN ON THE PLANS, 3/4" WATER SERVICE LATERALS FOR SINGLE METER INSTALLATIONS AND 1" WATER SERVICE LATERALS FOR DOUBLE METER INSTALLATIONS SHALL BE INSTALLED IN RESIDENTIAL DEVELOPMENTS.

10. WATER AND SEWER SERVICE LATERALS SHALL BE SEPARATED HORIZONTALLY BY A MINIMUM OF 5 FEET.

11. AT THE LOCATION OF EACH WATER SERVICE LATERAL, THE LETTER "W" SHALL BE INSCRIBED INTO THE FACE OF THE CURB. THE LETTER "W" SHALL BE 4" HIGH AND COMPLETELY LEGIBLE.

12. ALL COPPER WATER SERVICE TUBING SHALL BE IN CONFORMANCE WITH THE LATEST AWWA STANDARDS AS DESCRIBED IN ANSI/AWWA C800 OR THE LATEST REVISION, AND WITH ASTM B88, AND SHALL BE TYPE "K" SOFT TEMPER TUBING FOR 3/4" AND 1" TUBING AND TYPE "K" HARD TEMPER FOR 1–1/2" AND 2" TUBING.

NOTES CONTINUE ON STD. W–1.2

SEBASTOPOL CALIFORNIA PUBLIC WORKS	**WATER MAIN CONSTRUCTION NOTES**	STD. NO. **W-1.1**
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK		DATE: JULY 1998

13. ALL METER BOXES, VAULTS AND PITS SHALL BE BEDDED ON 3" MINIMUM THICK, 3/4" DRAIN ROCK, AB-2, OR OTHER CLEAN MATERIAL WITH TYPICAL SAND EQUIVALENT OF 20 MINIMUM, UNCONTAMINATED BY NATIVE SOIL, AGAINST COMPACTED OR UNDISTURBED BASE. THE GRAVEL BED SHALL EXTEND TO A 4" MINIMUM BEYOND ALL SIDES OF THE METER BOX. BOX SHALL BE SET FLUSH WITH TOP OF CURB, SIDEWALK OR GROUND, WHICHEVER IS APPLICABLE. LOT NUMBERS MUST BE NOTED ON TOP SIDE OF METER BOX WITH A PERMANENT MARKING PEN.

14. METER BOXES SHALL BE LOCATED OUT OF TRAFFIC LOADING AREAS WHENEVER POSSIBLE. METER BOXES LOCATED IN TRAFFIC LOADING AREAS SHALL BE FITTED WITH TRAFFIC LIDS.

15. METER BOXES AND VAULTS SHALL BE SET SO THAT THE READING LIDS ARE ALIGNED OVER THE METER REGISTERS AS CLOSELY AS POSSIBLE.

16. UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER, THE ON-SITE WATER LINE SHALL BE THE SAME SIZE AS THE WATER METER.

17. FOR SERVICES LARGER THAN 1", IF EITHER THE WATER SERVICE LATERAL OR THE ON-SITE BUILDING LINE IS ALREADY EXISTING WITHIN THE TOLERANCES SPECIFIED ON THE STANDARD PLAN, THE LAST ONE INSTALLED SHALL BE ON THE SAME LINE AND GRADE AS THE EXISTING ONE.

18. ITEMS SPECIFIED ON THE STANDARD PLANS, OR THE ENGINEER'S APPROVED LIST, ARE APPROVED FOR USE BY THE CITY ENGINEER. ALL OTHERS SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

19. METER MANIFOLDS MUST BE DETAILED AND APPROVED BY THE CITY ENGINEER. IN GENERAL, MANIFOLDS WHERE ALL FITTINGS ARE 2" OR LESS, SHALL BE CONSTRUCTED FROM THREADED BRASS PIPES AND FITTINGS FROM THE END OF THE SERVICE LATERAL TO THE METER CONNECTION. NO PLASTIC PIPE SHALL BE USED IN CONSTRUCTING MANIFOLDS OF ANY SIZE. NO MORE THAN SIX METERS MAY BE MANIFOLDED OFF A SINGLE WATER SERVICE LATERAL, WITH NO MORE THAN 3 ON EITHER SIDE OF THE SERVICE.

20. GASKETS FOR FLANGE FITTINGS SHALL CONFORM TO AWWA STD. C115.

21. TO ABANDON A WATER SERVICE, EXPOSE AND TURN OFF CORPORATION STOP, THEN SEVER THE LATERAL CONNECTION.

22. THERE SHALL BE NO UNMETERED CONNECTIONS TO THE CITY OF SEBASTOPOL WATER SYSTEM, INCLUDING CONNECTIONS BYPASSING METER FOR TESTING ON-SITE PLUMBING OR FOR OBTAINING CONSTRUCTION WATER. PRESSURE TESTING AGAINST VALVES WILL NOT BE ALLOWED. WHEN A SUBDIVISION WATER MAIN HAS BEEN ACCEPTED AND TIED IN, THE INDIVIDUAL CURB STOPS WILL BE LOCKED OFF WITH CABLE TIES. CUTTING OFF OR TAMPERING WITH THE CABLE TIES WILL CONSTITUTE A STRAIGHT TIE-IN CONNECTION. SUCH CONNECTIONS WILL BE SEVERED BY THE CITY AND WILL RESULT IN PENALTIES INCLUDING PAYMENT OF FINES AND ESTIMATED WATER USAGE FEES.

23. UPON APPLICATION, THE CONTRACTOR SHALL INSTALL A 2" TEMPORARY CHECK VALVE ON THE END OF THE EXISTING MAIN FOR CONSTRUCTION WATER (SEE STANDARD), OR AT THE OPTION OF THE CITY ENGINEER, THE CONTRACTOR MAY INSTALL A FIRE HYDRANT METER.

NOTES CONTINUE ON STD. W-1.3

SEBASTOPOL CALIFORNIA PUBLIC WORKS

WATER MAIN CONSTRUCTION NOTES (CONTINUED)

STD. NO. W-1.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

24. BEFORE COMBUSTIBLE MATERIALS MAY BE STORED OR CONSTRUCTED ON SITE, THE FIRE DEPARTMENT MUST APPROVE FIRE FLOW AND ACCESS. BEFORE A FIRE HYDRANT MAY BE PLACED IN SERVICE, A HIGH VELOCITY FLUSHING OF THE HYDRANT LATERAL SHALL BE WITNESSED AND APPROVED BY CITY PERSONNEL. HIGH VELOCITY FLUSHING SHALL CONSIST OF REMOVING THE HYDRANT AND REPLACING IT WITH A SUITABLE ELBOW AND DIFFUSER. UNDER CITY SUPERVISION, THE HYDRANT LATERAL IS FLUSHED UNTIL CITY PERSONNEL ARE SATISFIED THAT THE LINES ARE CLEAR OF DEBRIS.

25. UPON COMPLETION OF CONSTRUCTION, FINAL CONNECTION WILL BE MADE BY THE CONTRACTOR AT THE DEVELOPER'S EXPENSE UNDER INSPECTION BY A CITY REPRESENTATIVE, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

26. WHEN A CONNECTION IS REQUIRED TO AN EXISTING WATER MAIN, THE CONTRACTOR SHALL PROVIDE ALL EXCAVATION, SHORING, BACKFILL AND TRENCH RESURFACING PER CITY STANDARD S-1.1. WHERE THE CONNECTION IS TO BE A "HOT TAP," THE CONTRACTOR SHALL PROVIDE AND INSTALL THE TAPPING VALVE AND SLEEVE, AND ANY OTHER HARDWARE REQUIRED AND WILL MAKE THE TAP. NO HOT TAP SHALL BE MADE WITHIN 4 FEET OF A JOINT (MEASURED FROM JOINT TO CENTERLINE OF INTERSECTING PIPE). THE JOINT SHALL BE REMOVED, AND THE PROPOSED HOT TAP SHALL BE REPLACED WITH A "CUT-IN" TEE. WHEN A "CUT-IN" TEE AND VALVE(S) ASSEMBLY IS REQUIRED ON THE PLANS, THE CONTRACTOR SHALL PROVIDE AND INSTALL THE ENTIRE ASSEMBLY (INCLUDING VALVES), AND ANY OTHER HARDWARE NECESSARY UNDER CITY INSPECTION, AND SHALL PROVIDE ALL OTHER WORK AND MATERIALS NECESSARY TO COMPLETE THE INSTALLATION TO CITY STANDARDS.

27. THE CONTRACTOR SHALL COORDINATE ALL WATER MAIN CONNECTION WORK WITH THE CITY OF SEBASTOPOL PUBLIC WORKS DEPT. AT (707) 823-5331 A MINIMUM OF 72 HOURS PRIOR TO COMMENCING WORK IN ACCORDANCE WITH THE CITY POLICY.

28. AFTER A STREET HAS BEEN OVERLAID, ALL WATER VALVE BOXES WILL BE MARKED IN WHITE PAINT BEFORE THE CLOSE OF THAT WORK DAY.

29. WITHIN 48 HOURS OF PAVING, ALL WATER VALVE BOXES WILL BE BROUGHT TO GRADE AND INSPECTED.

SEBASTOPOL CALIFORNIA PUBLIC WORKS	**WATER MAIN CONSTRUCTION NOTES (CONTINUED)**	**STD. NO. W-1.3**
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK		DATE: JULY 1998

STEM EXTENSION FABRICATION NOTES:

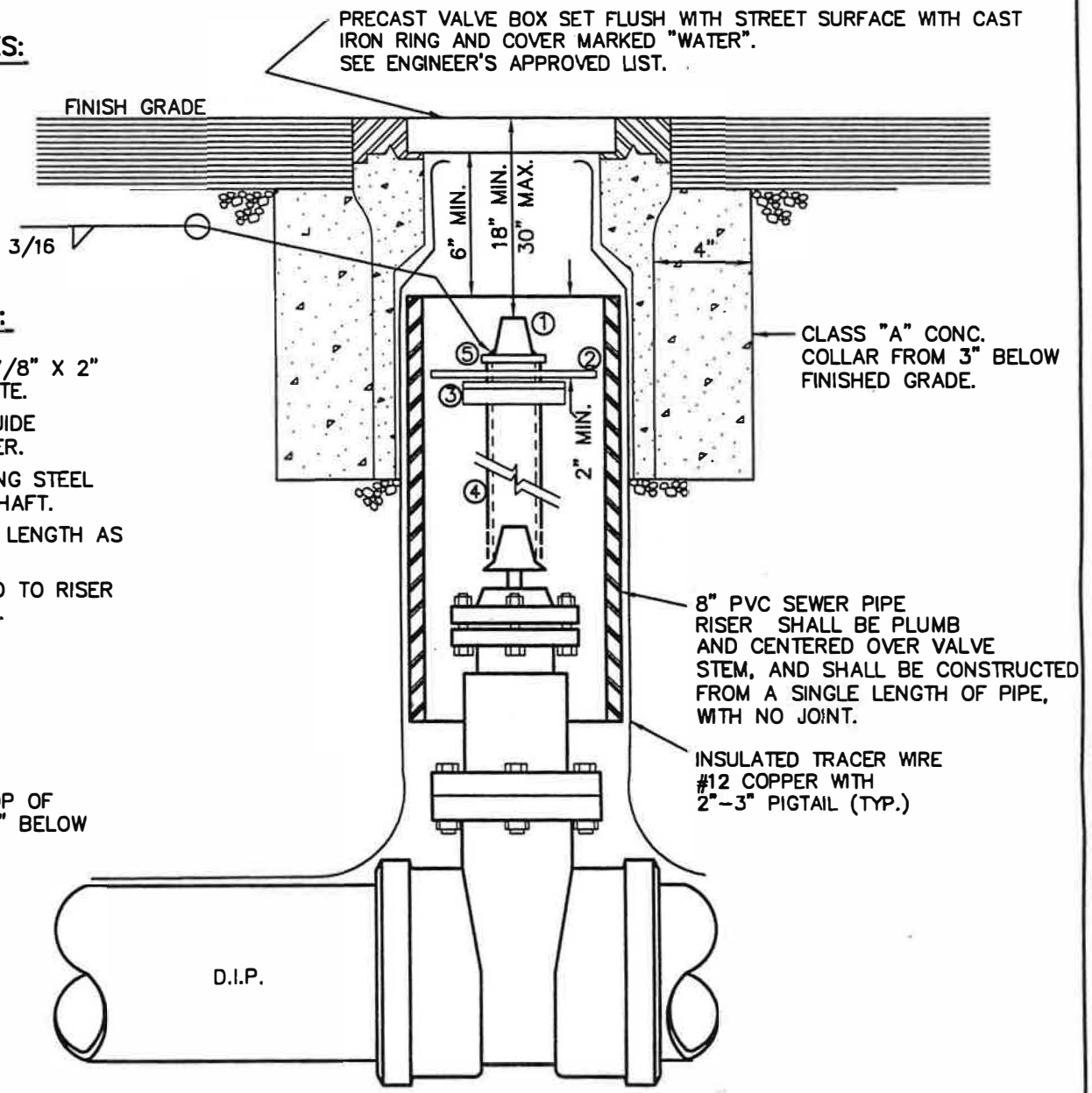
1. ALL WELDS TO RISER SHAFT SHALL BE FILLET WELD ALL AROUND. AS SPECIFIED BELOW.
2. ALL STEEL REQUIRED FOR RISER FABRICATION SHALL BE STRUCTURAL STEEL PER ASTM A36.

VALVE STEM EXTENSION PARTS LIST:

1. VALVE OPERATING NUT OR 1 7/8" X 1 7/8" X 2" HIGH, SOLID STEEL WELDED TO TOP PLATE.
2. 3/16" THK. X 7" DIA. FREE SPINNING GUIDE PLATE WITH 3 5/8" DIA. HOLE IN CENTER.
3. TWO 3/16" X 1 1/2" X 1 1/2" X 5" LONG STEEL ANGLE WELD TO TWO SIDES OF RISER SHAFT.
4. 2 1/2" X 3/16" SQUARE STEEL TUBING, LENGTH AS REQUIRED. EDGE WELD TO TOP PLATE.
5. 3" X 3" X 1/4" STEEL TOP PLATE. WELD TO RISER SHAFT AFTER GUIDE PLATE IS IN PLACE.

NOTES:

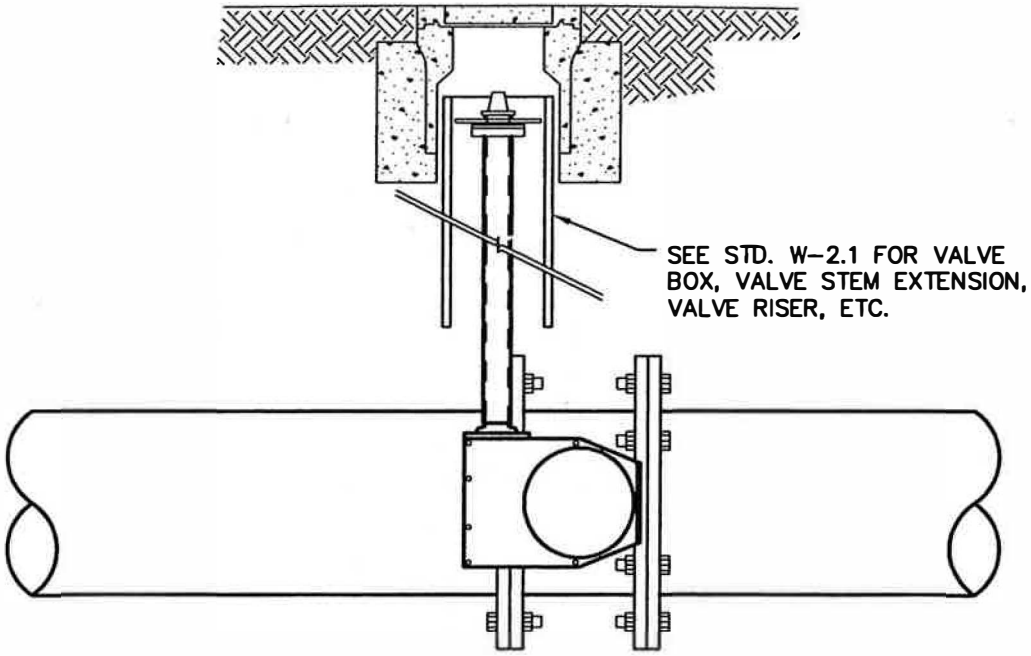
1. IF VALVE IS INSTALLED SO THAT THE TOP OF THE OPERATING NUT IS LESS THAN 30" BELOW FINISHED GRADE, THE VALVE STEM RISER IS NOT REQUIRED.
2. VALVES 2" THROUGH 16" SHALL BE RESILIENT WEDGE GATE VALVES AND VALVES 18" AND LARGER SHALL BE BUTTERFLY VALVES (SEE STD W-2.2) UNLESS OTHERWISE APPROVED BY THE CITY.
3. GATE VALVES SHALL CONFORM TO CITY STANDARD SPECIFICATIONS.
4. SEE STD. W-1.1, W-1.2, AND W-1.3 FOR GENERAL CONSTRUCTION NOTES.



TYPICAL INSTALLATION OF GATE VALVE, VALVE STEM EXTENTION, AND VALVE BOX WITH RISER

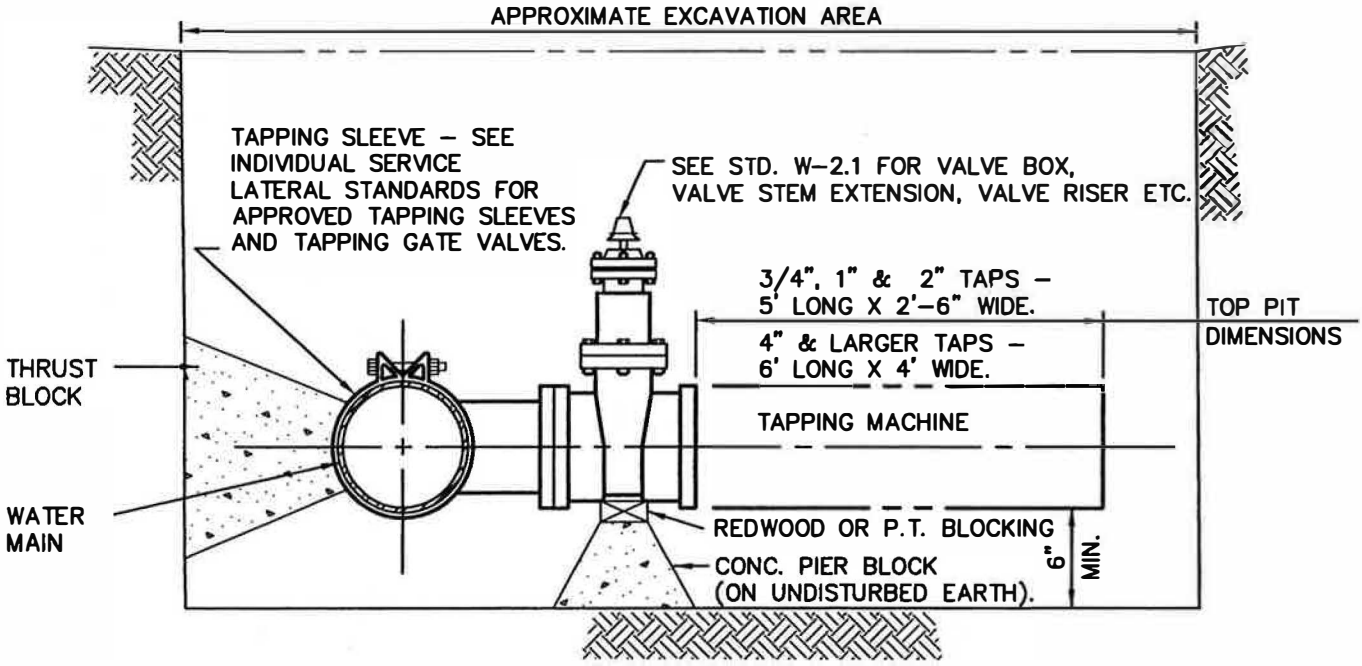
STD. NO. W-2.1

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998



BUTTERFLY VALVE INSTALLATION

TO BE USED ON PIPE 18" AND LARGER



TAPPING SLEEVE & VALVE INSTALLATION

NOTES:

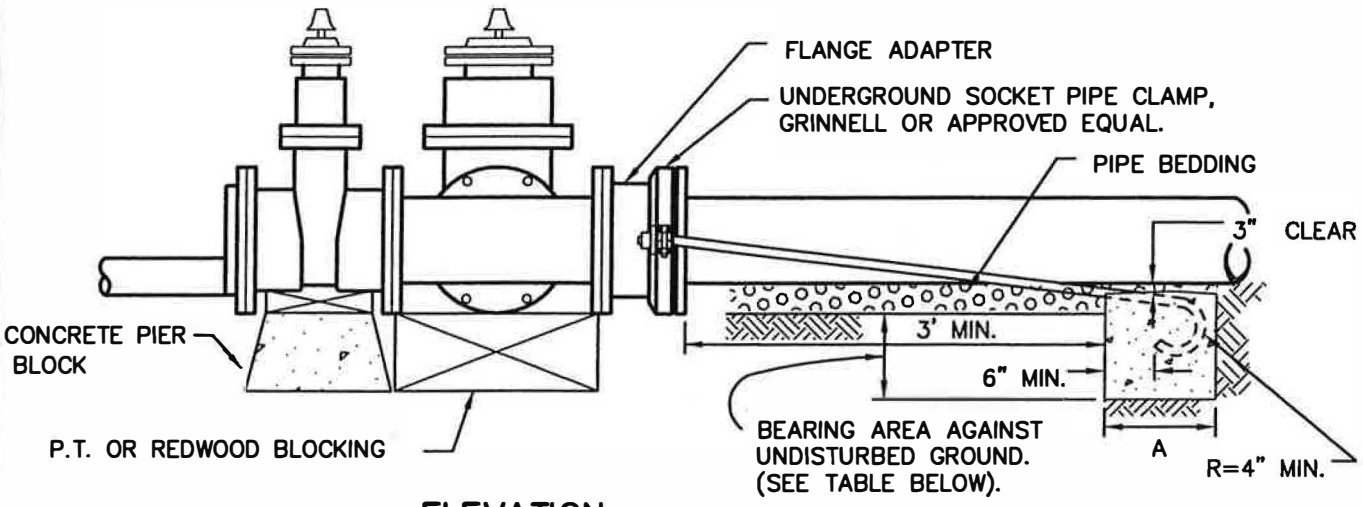
1. ALL EXTERNAL BOLTS AND NUTS ON VALVES SHALL BE 304 STAINLESS STEEL OR VALVE ASSEMBLY SHALL BE POLY-WRAPPED.
2. TAPS SHALL BE MADE BY CONTRACTOR UNDER CITY INSPECTION.
3. ALL BUTTERFLY VALVES SHALL CONFORM TO CITY STANDARD SPECIFICATIONS.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

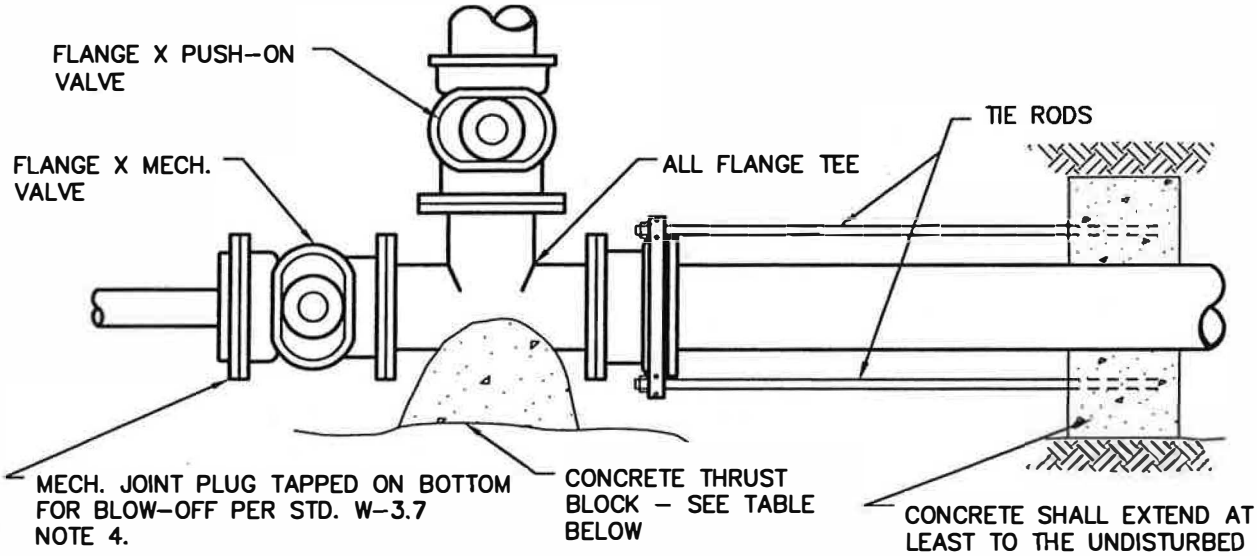
INSTALLATION OF BUTTERFLY VALVE AND TAPPING VALVE

STD. NO. **W-2.2**

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



ELEVATION



PLAN

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	HARNESS BLOCK *	A	THRUST BLOCK **
6"	5/8"	4 SQ. FT.	2'	4 SQ. FT.
8"	3/4"	7 " "	3'	7 " "
12"	1 1/8"	15 " "	3'	15 " "
OVER 12" BY THE DESIGN ENGINEER				

NOTES

1. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.
2. SEE NOTE STD. W-1 FOR CONSTRUCTION NOTES.

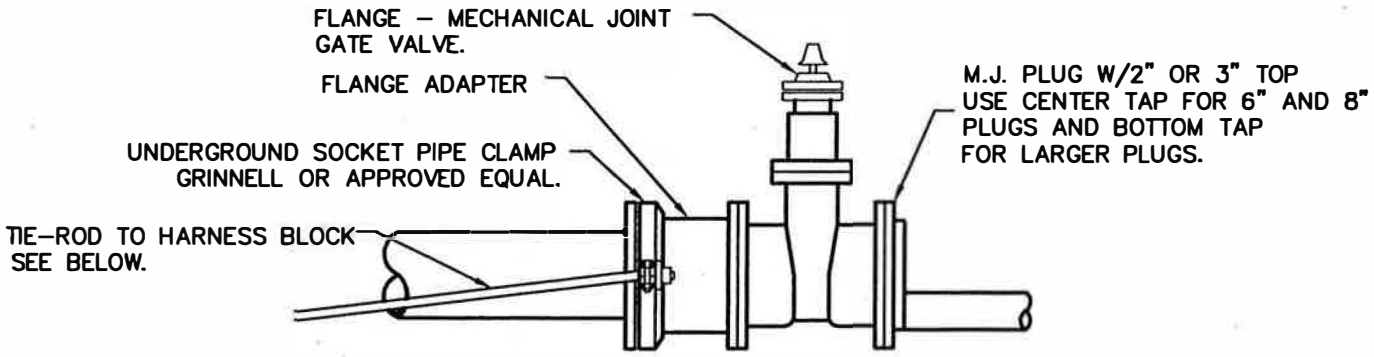
* BEARING AREA BELOW GRADE OF PIPE AGAINST UNDISTURBED GROUND.
** BEARING AREA AGAINST UNDISTURBED GROUND.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

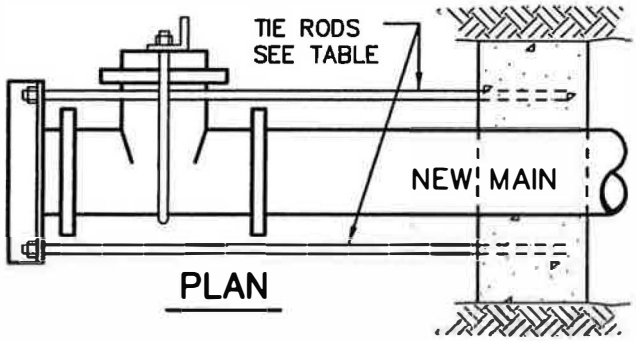
TYPICAL HARNESS INSTALLATION FOR FLANGE FITTINGS

STD. NO. W-3.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

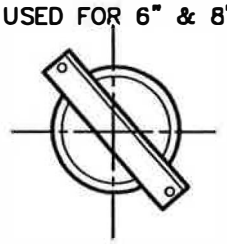


HARNESS FOR VALVE WITH PLUG

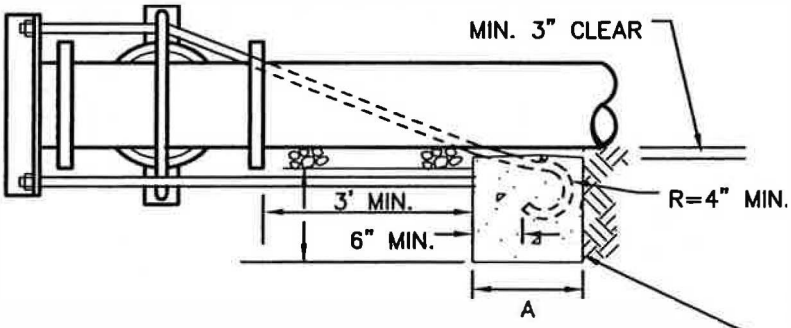


PLAN

PLUGS FOR MAINS 12" AND LARGER SHALL BE TAPPED OFF CENTER AND HELD WITH ANGLE IRON, AS SHOWN. PLUGS WITH EARS AND CENTER TAP MAY BE USED FOR 6" & 8" MAINS.



CONCRETE SHALL EXTEND AT LEAST TO THE UNDISTURBED EARTH AT BOTH SIDES OF THE TRENCH.



CONCRETE HARNESS BLOCK SEE TABLE BELOW.

ELEVATION

NOTES

1. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.
2. SEE STD. W–1 FOR CONSTRUCTION NOTES.

TYPICAL FITTING HARNESS

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	ANGLE IRON	* HARNESS BLOCK	A
6"	5/8"	3"X3"X1/4"	4 SQ. FT.	2'
8"	3/4"	3–1/2"X3"X1/4"	7 " "	3'
12"	1–1/8"	4"X3"X1/2"	15 " "	3'
OVER 12"	BY THE DESIGN ENGINEER			

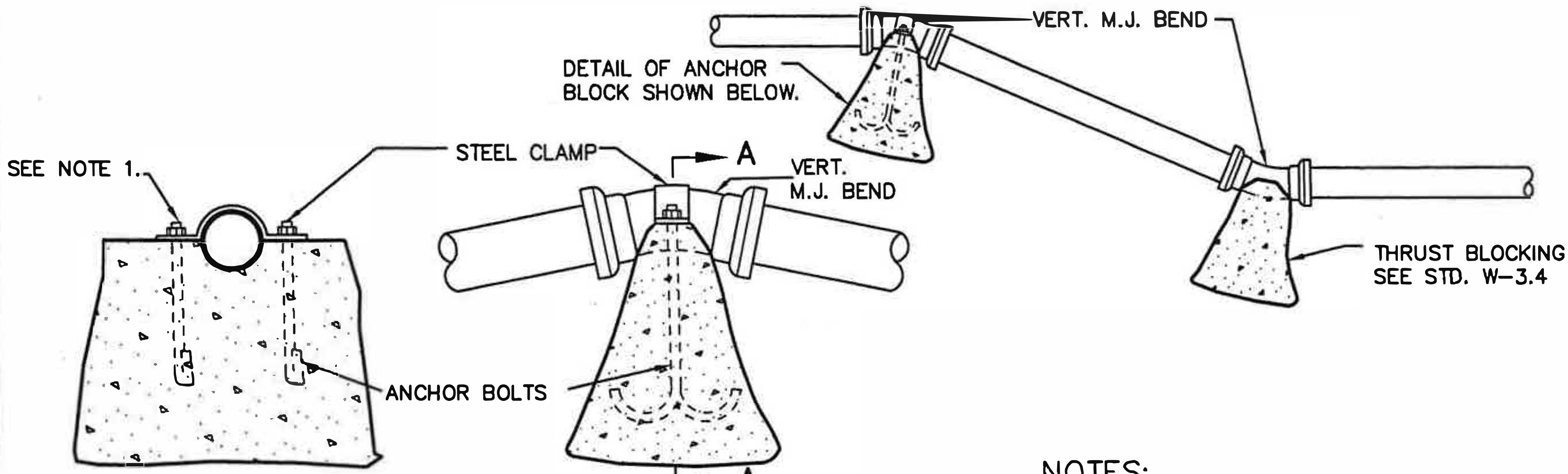
* BEARING AREA BELOW GRADE OF PIPE AGAINST UNDISTURBED GROUND.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

TYPICAL HARNESS INSTALLATION

STD. NO. W-3.2

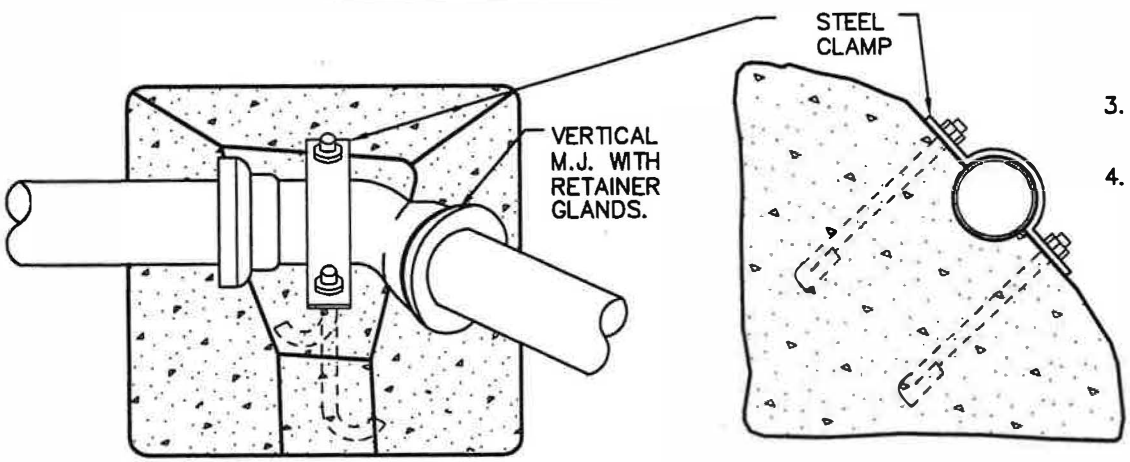
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



SECTION "A-A"

ELEVATION

TYPICAL CONCRETE ANCHOR BLOCK FOR VERTICAL BEND



TYPICAL CONCRETE ANCHOR BLOCK FOR COMBINATION HORIZONTAL–VERTICAL BEND

NOTES:

1. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC OR APPROVED EQUAL, AFTER NUTS ARE TIGHTENED.
2. CONCRETE ANCHOR BLOCKS SHALL BE INSTALLED BY THE CONTRACTOR TO WITHSTAND A THRUST PRODUCED BY THE TEST PRESSURE PLUS 50 P.S.I. MINIMUM DIMENSIONS FOR TIE RODS AND CLAMPS ARE LISTED IN THE TABLE BELOW.
3. ALL FITTINGS ARE MECHANICAL JOINT WITH RETAINER GLANDS
4. SEE STD. W–1 FOR CONSTRUCTION NOTES.

PIPE SIZE	TIE RODS	STEEL CLAMPS
6"	5/8"	3" X 1/4"
8"	3/4"	3-1/4" X 1/4"
12"	1-1/4"	4" X 1/2"

CONCRETE ANCHOR BLOCKS FOR VERTICAL BENDS

STD. NO. W-3.3

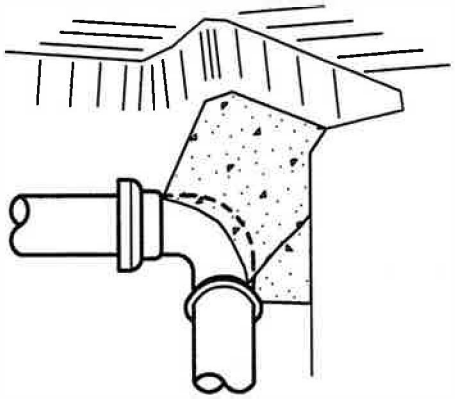
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

BEBASTOP CALIFORNIA PUBLIC WORKS

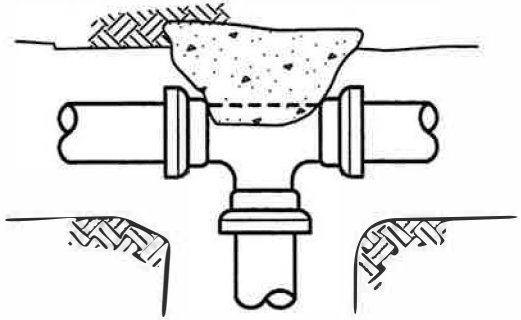
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

CONCRETE THRUST BLOCKING

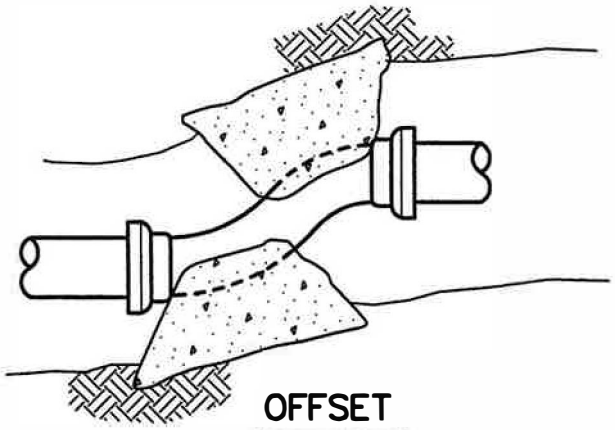
STD. NO. **W-3.4**



BEND

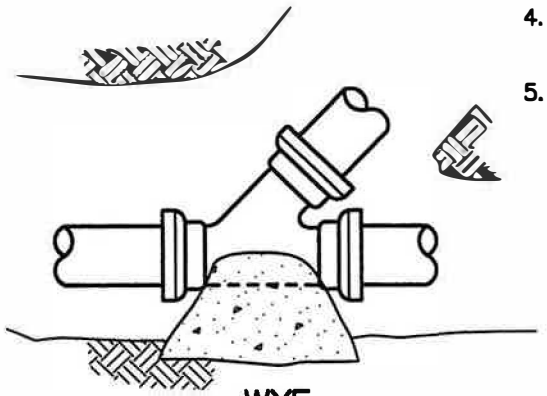


TEE



OFFSET

TYPICAL CONC. BLOCKING SHOWN IN PERSPECTIVE



WYE

NOTES:

1. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
2. CONCRETE BLOCKING, CAST-IN-PLACE, TO EXTEND FROM BELLS OF FITTINGS TO UNDISTURBED SOIL AND ENTIRE BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
3. IN USING THE THRUST BLOCKING TABLE BELOW, ASSUME 2000 P.S.F. BEARING CAPACITY UNLESS OTHERWISE SHOWN ON THE PLANS. THE DESIGN ENGINEER SHALL SPECIFY THRUST BLOCKING REQUIREMENTS FOR ALL OTHER SOIL BEARING CONDITIONS.
4. FOR PLUGGED LEG(S) OF TEE OR CROSS, USE HARNESS TYPE BLOCKING AS SHOWN ON STD. W-3.2 AND CONCRETE BLOCKING INDICATED IN TABLE BELOW.
5. SEE STD. W-1 FOR CONSTRUCTION NOTES.

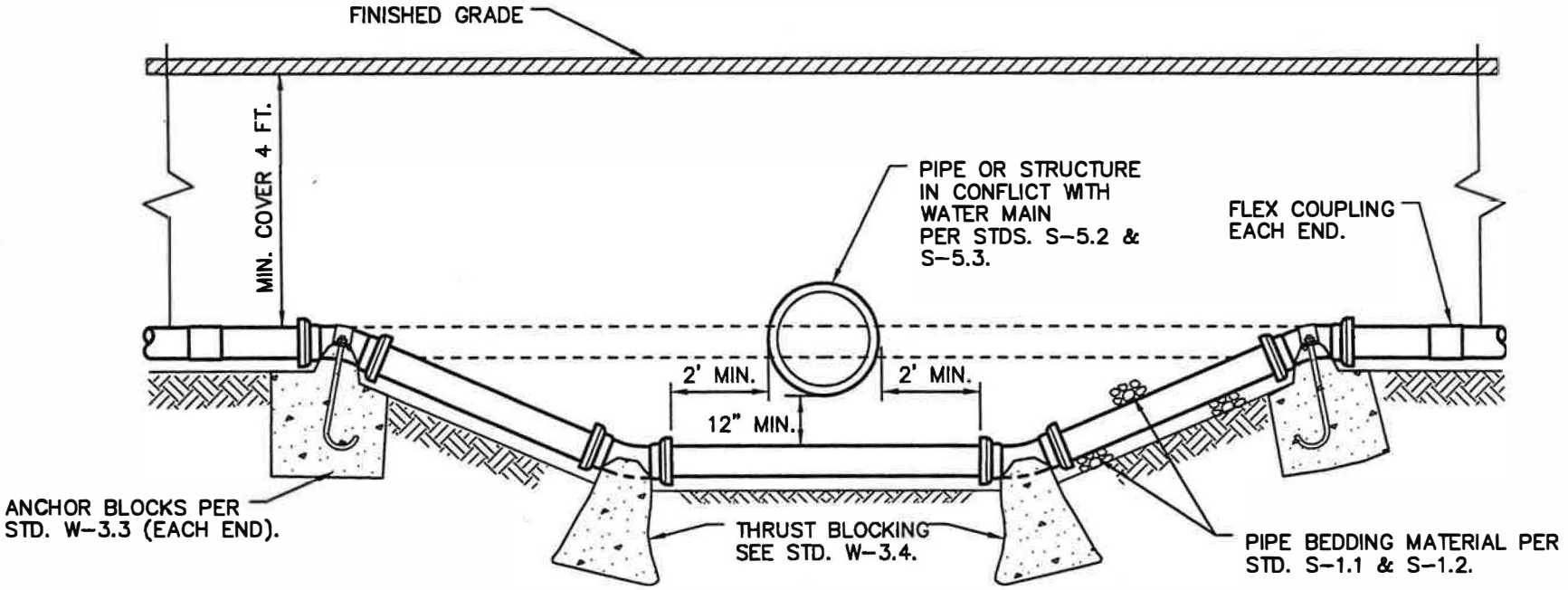
MIN. REQ'D BEARING AREA IN SQ. FT. PER 100 P.S.I. TEST PRESSURE *						
PIPE SIZE	SOIL BEARING CAPACITY	HARNESS BLOCKS	TEES & DEAD ENDS	90° BENDS	45° BENDS	22-1/2° BENDS
6"	1000 2000	4 2	4 2	6 3	3 2	2 1
8"	1000 2000	7 4	7 4	10 5	5 3	3 2
12"	1000 2000	16 8	16 8	22 11	12 6	6 3

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVIDE BY 100.

TYPICAL WATER MAIN LOWERING DETAIL

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-3.5



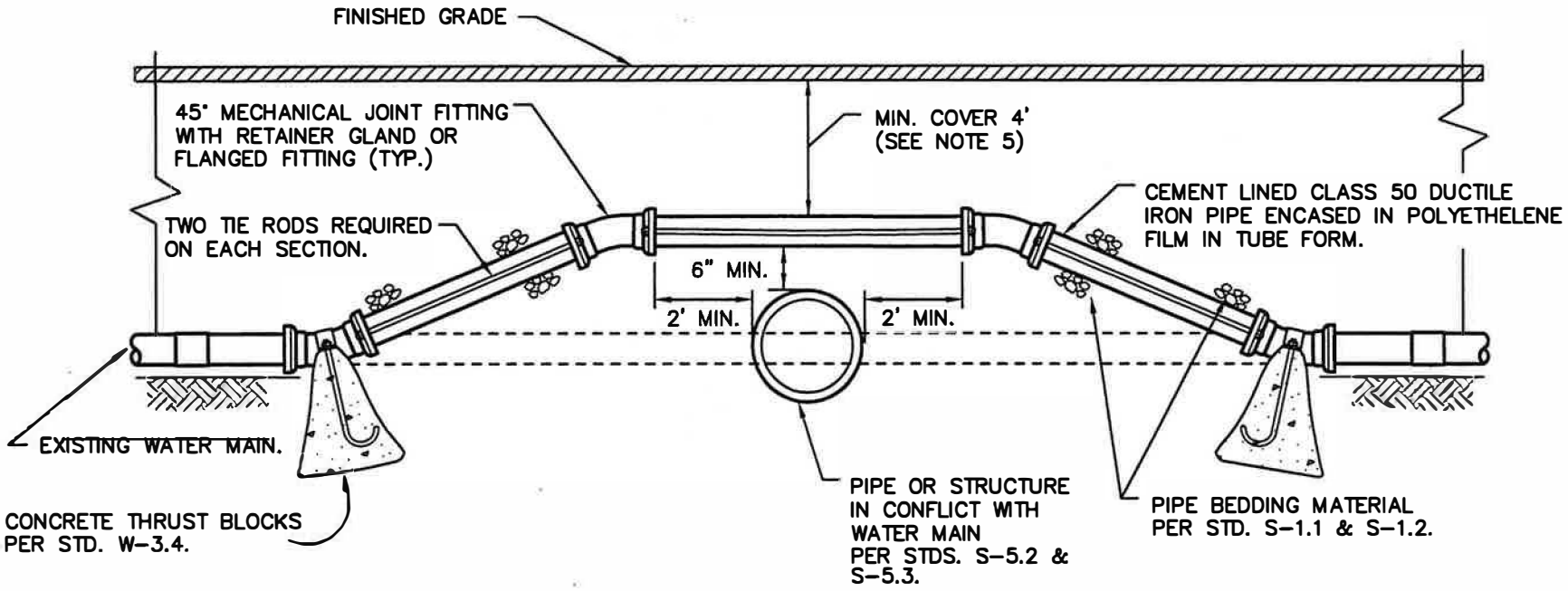
NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHELENE PER CITY STD. CONSTRUCTION SPECIFICATIONS.
2. ONLY MECHANICAL JOINT FITTINGS WITH RETAINER GLANDS MAY BE USED.
3. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS.

TYPICAL WATER MAIN INSTALLATION OVER STRUCTURE

STD. NO. W-3.6

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998



NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHELENE PER THE CITY STD. CONSTRUCTION SPECIFICATIONS.
2. ONLY MECHANICAL JOINT FITTINGS WITH RETAINER GLANDS MAY BE USED.
3. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS – NO 90° BENDS ALLOWED.
4. TO BE USED ONLY AT THE DIRECT APPROVAL OF THE CITY ENGINEEER.
5. CL. 52 D.I.P. REQUIRED WHERE COVER IS LESS THAN STANDARD.

PIPE SIZE	TIE RODS
6"	5/8"
8"	3/4"
12"	1-1/8"

BLOWOFF WITH HARNESS

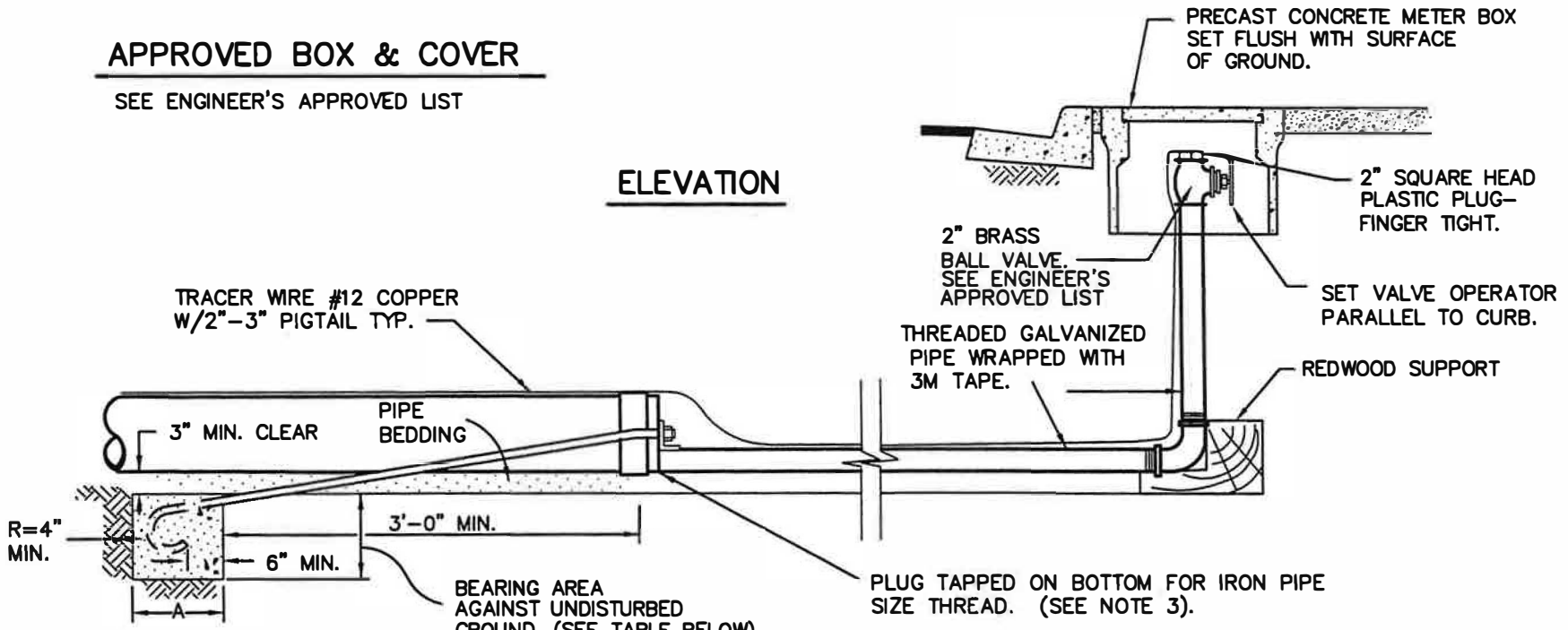
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-3.7

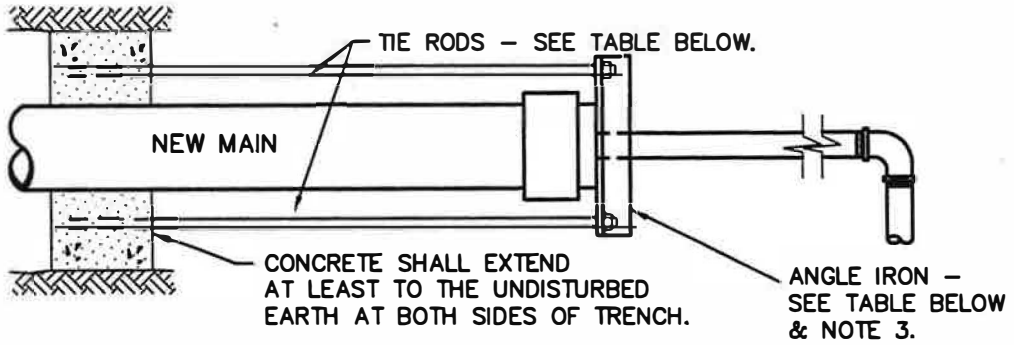
APPROVED BOX & COVER

SEE ENGINEER'S APPROVED LIST

ELEVATION



PLAN



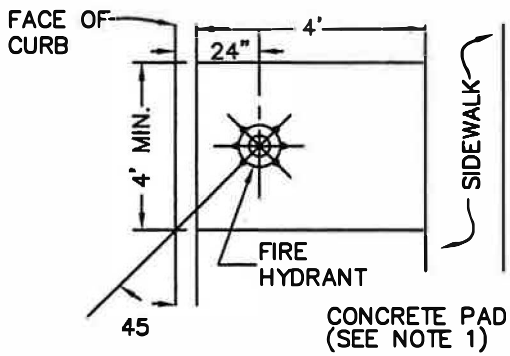
MINIMUM DIMENSIONS					
PIPE SIZE	TIE RODS	ANGLE IRON	BEARING AREA	A	SIZE B.O.
6"	5/8"	3"x3"x1/4" *	4 SQ. FT.	2'	2"
8"	3/4"	3–1/2"x3"x1/4" *	7 " "	3'	2"
12"	1 1/8"	4"x3"x1/2"	15 " "	3'	3"
OVER 12"	BY THE DESIGN ENGINEER				

* SEE NOTE 3.

NOTES:

1. SEE STD. W–1.1 FOR CONSTRUCTION NOTES.
2. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE AFTER NUTS ARE TIGHTENED.
3. FOR 6" & 8" MAINS, M.J. PLUGS WITH DILLY LUGS AND 2" CENTER TAP MAY BE USED IN LIEU OF ANGLE IRON.
4. BLOW–OFF SHALL NOT BE INSTALLED WITHIN THE TRAVELED WAY. IF MAIN ENDS WITHIN STREET AREA, BLOW–OFF TO BE EXTENDED TO AREA OUTSIDE OF TRAVELED WAY AND INSTALLED AS SHOWN ABOVE.

TYPICAL FIRE HYDRANT INSTALLATION WITH HYDRANT BREAK-OFF



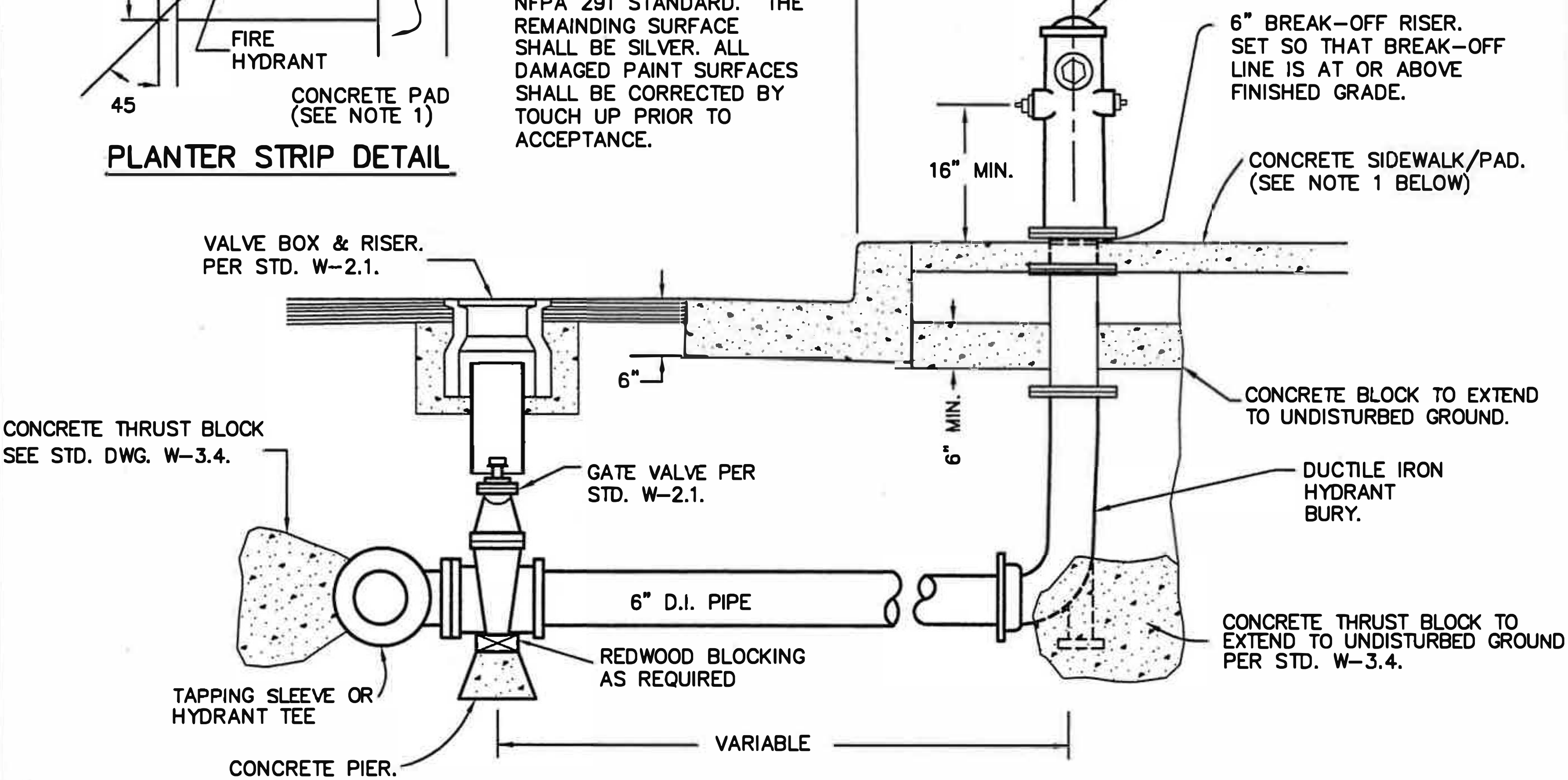
PLANTER STRIP DETAIL

FIRE HYDRANT PAINTING

FIRE HYDRANT PAINTING SHALL CONFORM TO AWWA STANDARD SPECIFICATION C 503. THE HYDRANT TOP & CAP SHALL BE COLOR CODED TO MEET NFPA 291 STANDARD. THE REMAINDING SURFACE SHALL BE SILVER. ALL DAMAGED PAINT SURFACES SHALL BE CORRECTED BY TOUCH UP PRIOR TO ACCEPTANCE.

APPROVED HYDRANTS

SEE ENGINEER'S APPROVED LIST



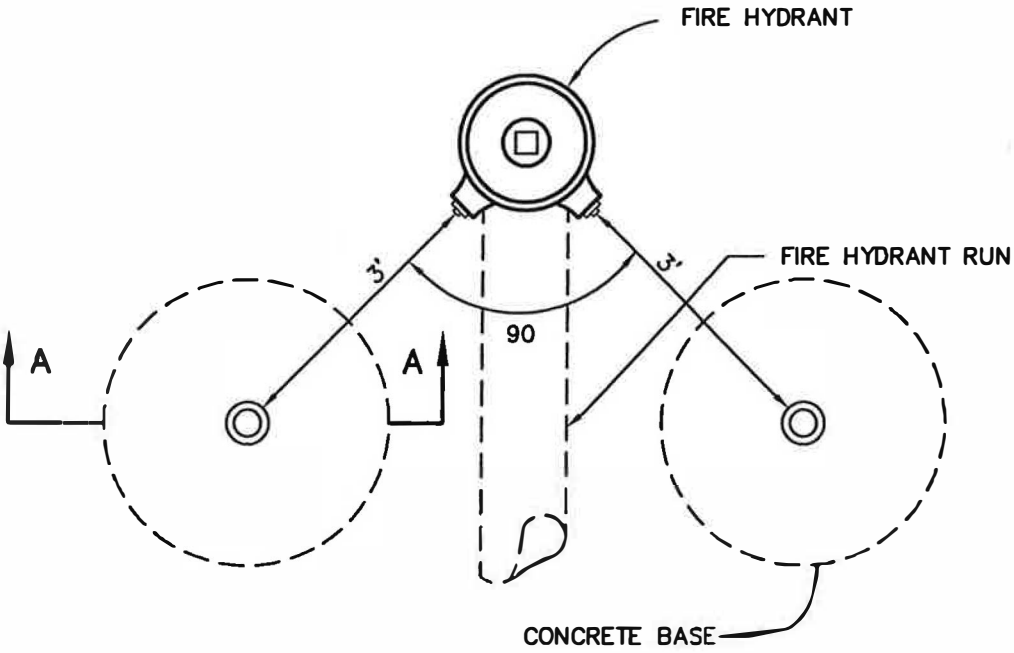
ELEVATION

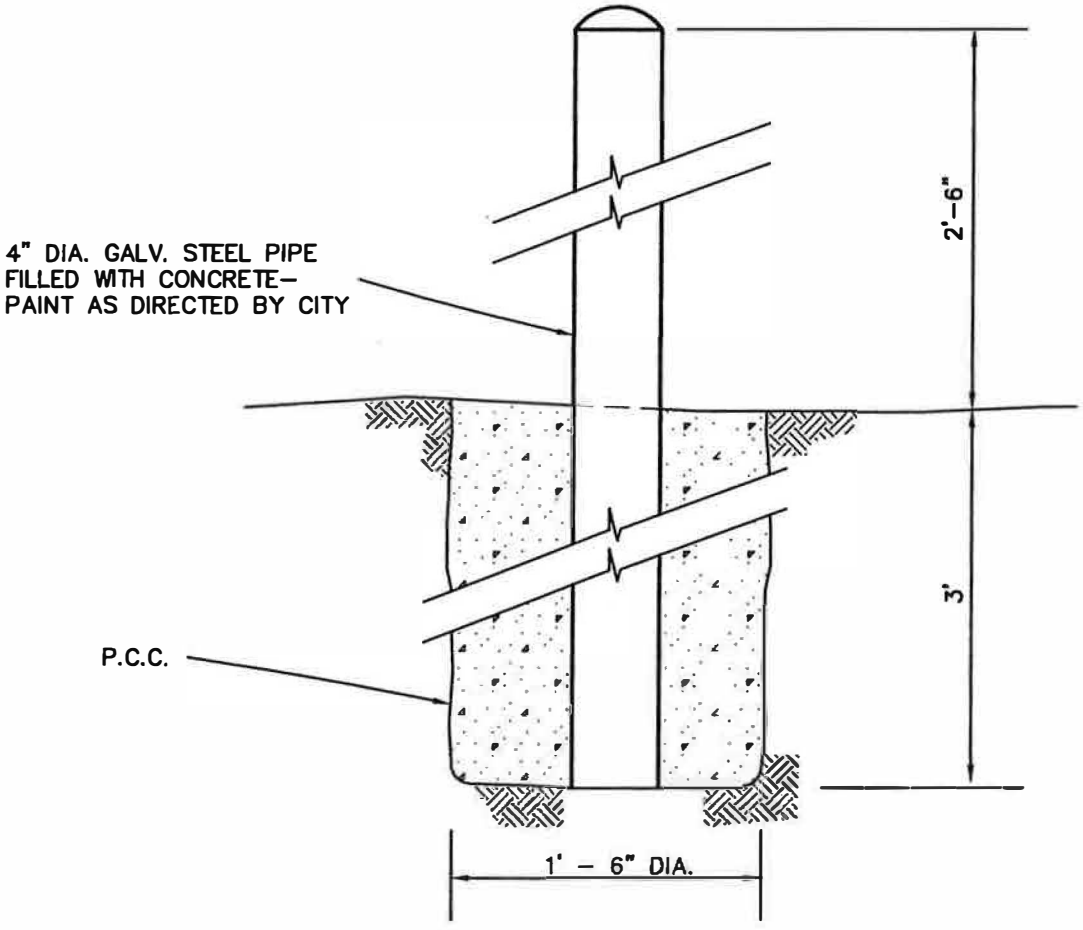
NOTES

1. WHERE NO SIDEWALK EXISTS, OR WHERE HYDRANT IS INSTALLED IN PLANTER STRIP, A 4" THICK CONCRETE PAD SHALL BE INSTALLED AS SHOWN IN THE TYPICAL PLAN VIEW ABOVE.
2. RESIDENTIAL FIRE HYDRANTS WILL HAVE ONE 2-1/2" & 4-1/2" OUTLET. COMMERCIAL FIRE HYDRANTS WILL HAVE ONE 2-1/2" & TWO 4-1/2" OUTLETS.
3. VERIFY FIRE PROTECTION REQUIREMENTS WITH THE CITY FIRE DEPARTMENT.
4. SEE STD. W-1 FOR CONSTRUCTION NOTES.
5. INSTALL MIN. OF 10' FROM DRIVEWAY.

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-4.1





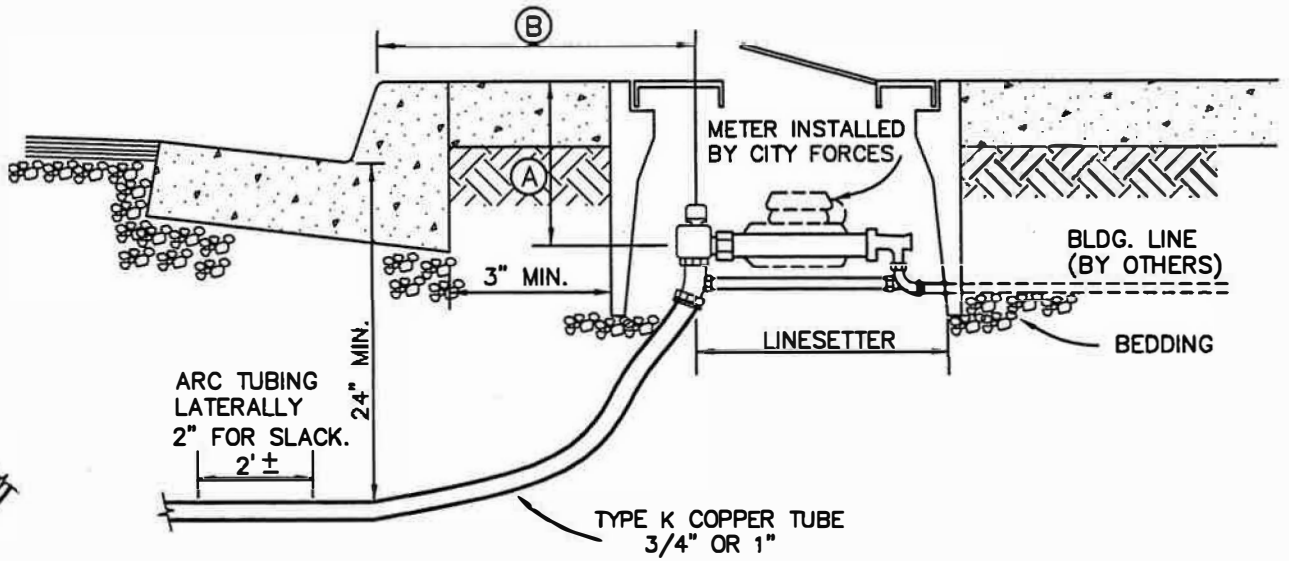
SECTION A – A

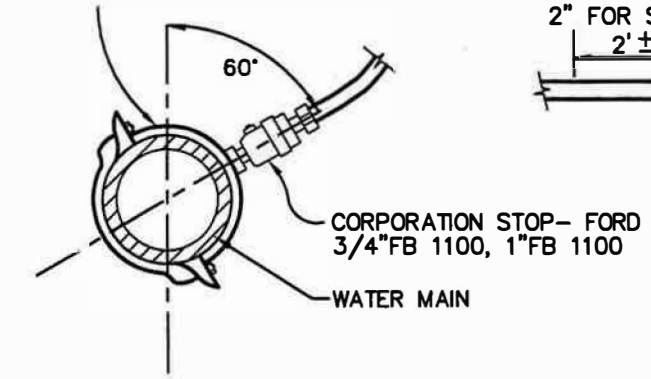
SEBASTOPOL CALIFORNIA PUBLIC WORKS

FIRE HYDRANT GUARD POST

STD. NO. W-4.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998





SIZE OF METER	DIMENSION (INCHES)	
	(A)	(B)
3/4" x 5/8"	8	10–12
1"	10	10–12

NOTES:

1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, PROVIDE FOR 3/4" x 5/8" METER INSTALLATION.

2. 1" LINESETTER IS PROVIDED WITH TWO BRACING EYES. INSTALL APPROXIMATELY 1 FOOT OF 3/4" P.V.C. IN EACH EYE TO STABILIZE METER ASSEMBLY IN UPRIGHT POSITION.

APPROVED LINESETTER ASSEMBLIES

3/4" X 5/8" METER:

FORD LSAVH 41–233W WITH SCHEDULE 80 PVC BRACE BAR, OR EQUAL.

1" METER:

FORD LSVH 41–444W WITH SCHEDULE 80 PVC BRACE BAR & NO. BA13–444W ANGLE BALL METER VALVE, OR EQUAL.

APPROVED METER BOXES & COVERS:

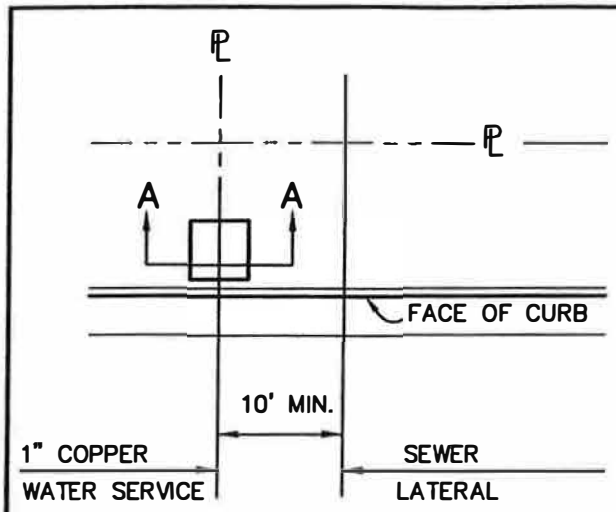
SEE ENGINEER'S APPROVED LIST OF PARTS.

CITY OF SEBASTOPOL · PUBLIC WORKS · CALIFORNIA

WATER SERVICE LATERAL 3/4" & 1"

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

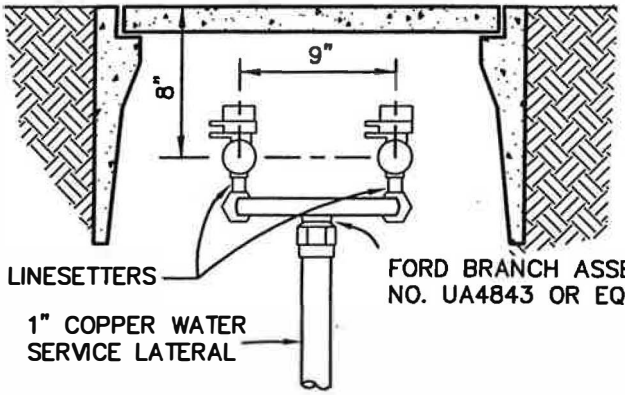
STD. NO. W-5.1



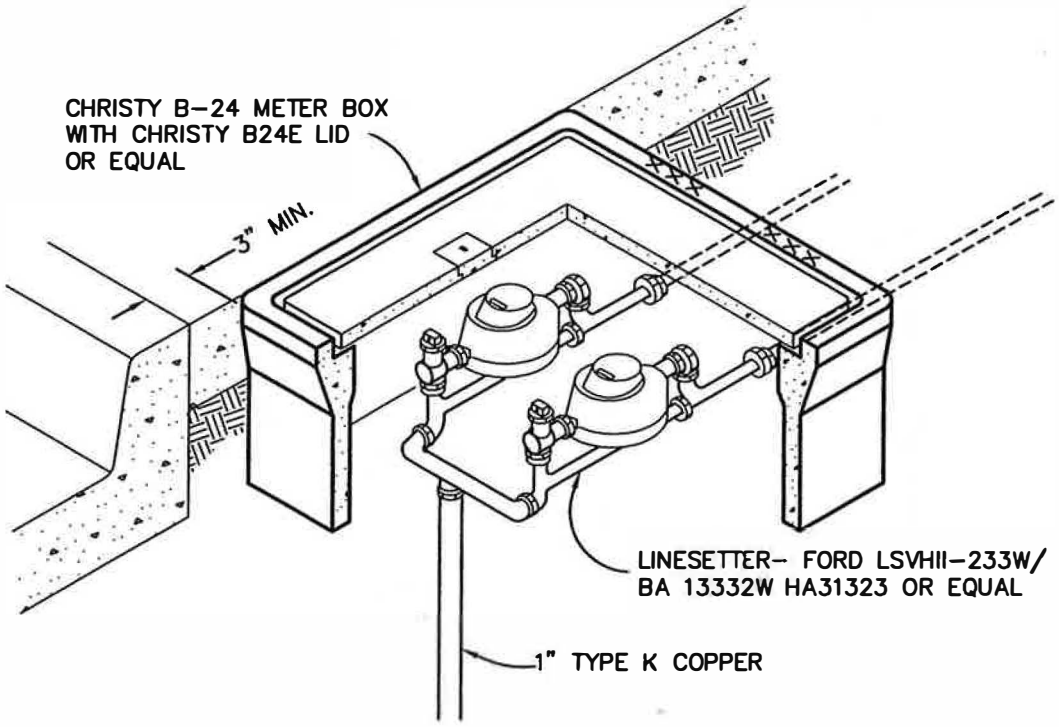
PLAN VIEW

APPROVED CONCRETE METER BOX & LID.

CHRISTY NO. B24 METER BOX WITH CHRISTY NO. B24E CONC. READING LID (NON TRAFFIC) OR B24-61G COVER (TRAFFIC LOADING)



SECTION A-A



NOTES

1. METER BOX TO BE INSTALLED SO THAT READING LID IS CENTERED OVER THE METER REGISTERS.
2. IN TRAFFIC LOADING AREAS, BOX TO BE INSTALLED SO THAT THE STEEL COVER IS SET FLUSH WITH SURFACE.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

1" DUAL WATER SERVICE FOR TWO - 3/4" METERS

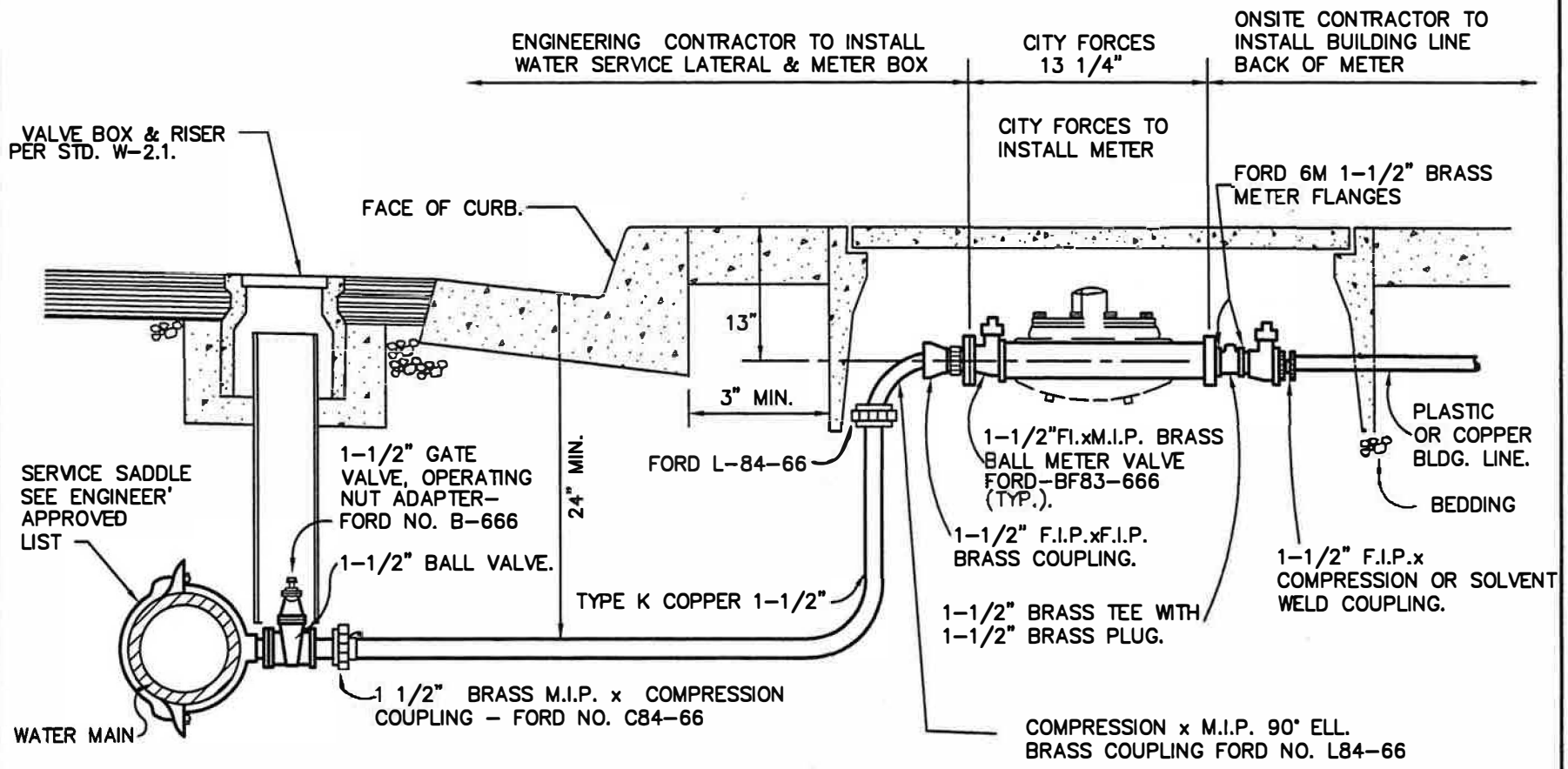
STD. NO. W-5.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

1-1/2" WATER SERVICE LATERAL

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-5.3



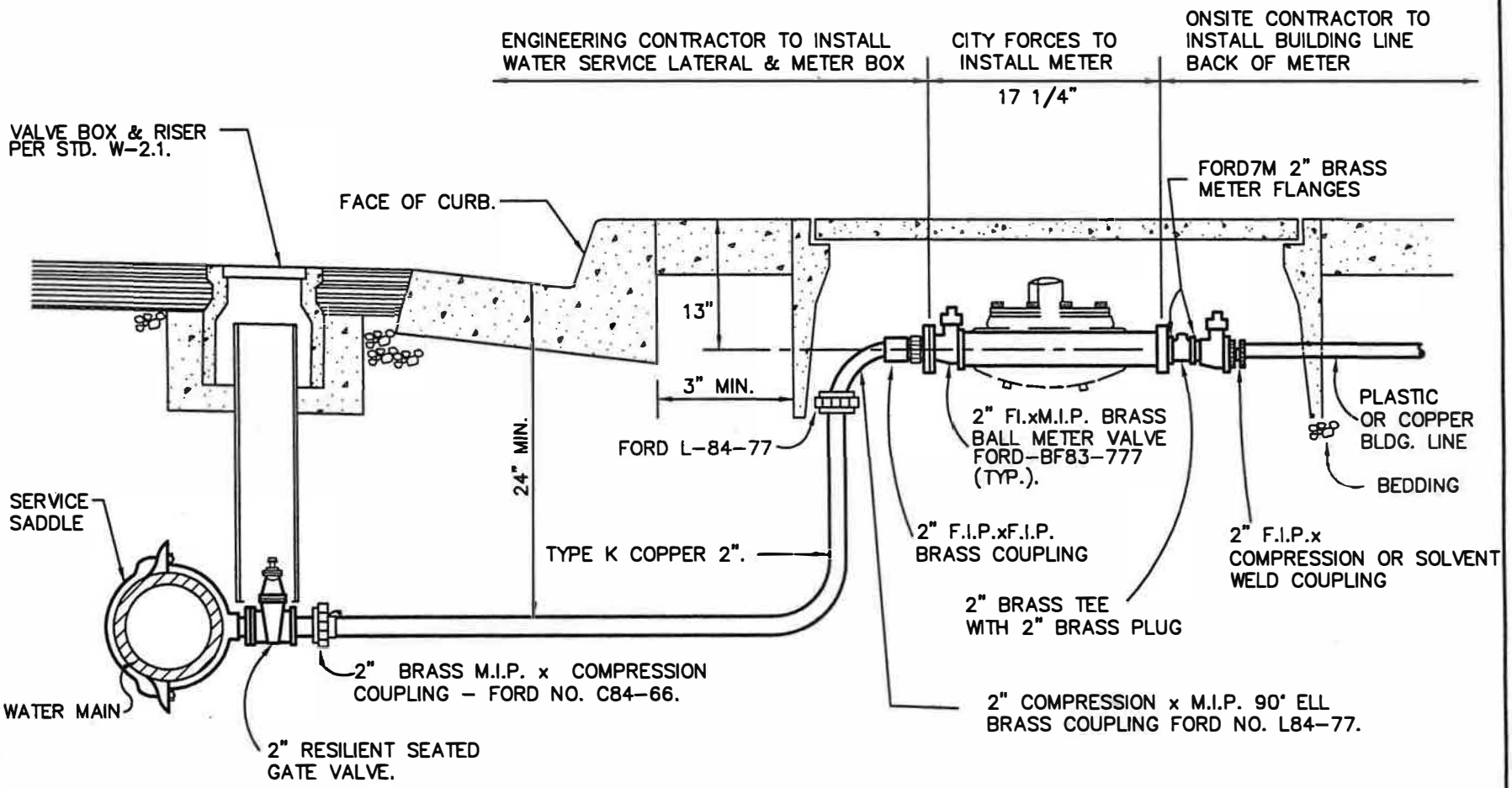
NOTES:

1. USE FORD OR EQUAL FOR FITTINGS.
2. POSITION METER REGISTER DIRECTLY UNDER READING LID.

APPROVED METER BOXES & COVERS:

NON-TRAFFIC AREAS: CHRISTY B-40 BOX WITH B40D LID.
TRAFFIC BEARING: CHRISTY B-40 BOX WITH B40-61D LID.

2" WATER SERVICE LATERAL FOR 2" METER



NOTES:

1. POSITION METER REGISTER DIRECTLY UNDER READING LID.
2. SPACER SHALL BE SCHL. 80 PVC PIPE WITH 1/2" ø HOLES @ 2" O.C. (VERTICALLY DRILLED THROUGH PIPES, THREAD BOTH ENDS). CITY FORCES TO REMOVE SPACER BAR & INSTALL INSTALL WATER METER.
3. IF MORE THAN ONE LENGTH OF TUBING IS REQUIRED, COMPRESSION COUPLINGS SHALL BE USED. JONES J-2609 OR McDONALD 4758-22.
4. BOX PIPE KNOCKOUTS TO BE GROUTED SUFFICIENTLY TO PREVENT INTRUSION OF DIRT.
5. METERS PROVIDED AND SET BY CITY AT DEVELOPERS EXPENSE.
6. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.

APPROVED METER BOXES & COVERS:

NON- TRAFFIC AREAS:
CHRISTY B-48 BOX WITH B48M LID

TRAFFIC BEARING:
CHRISTY B-48 BOX WITH B48-62G LID

APPROVED DOUBLE-STRAP SERVICE SADDLES

MUELLER BRONZE OR EQUAL

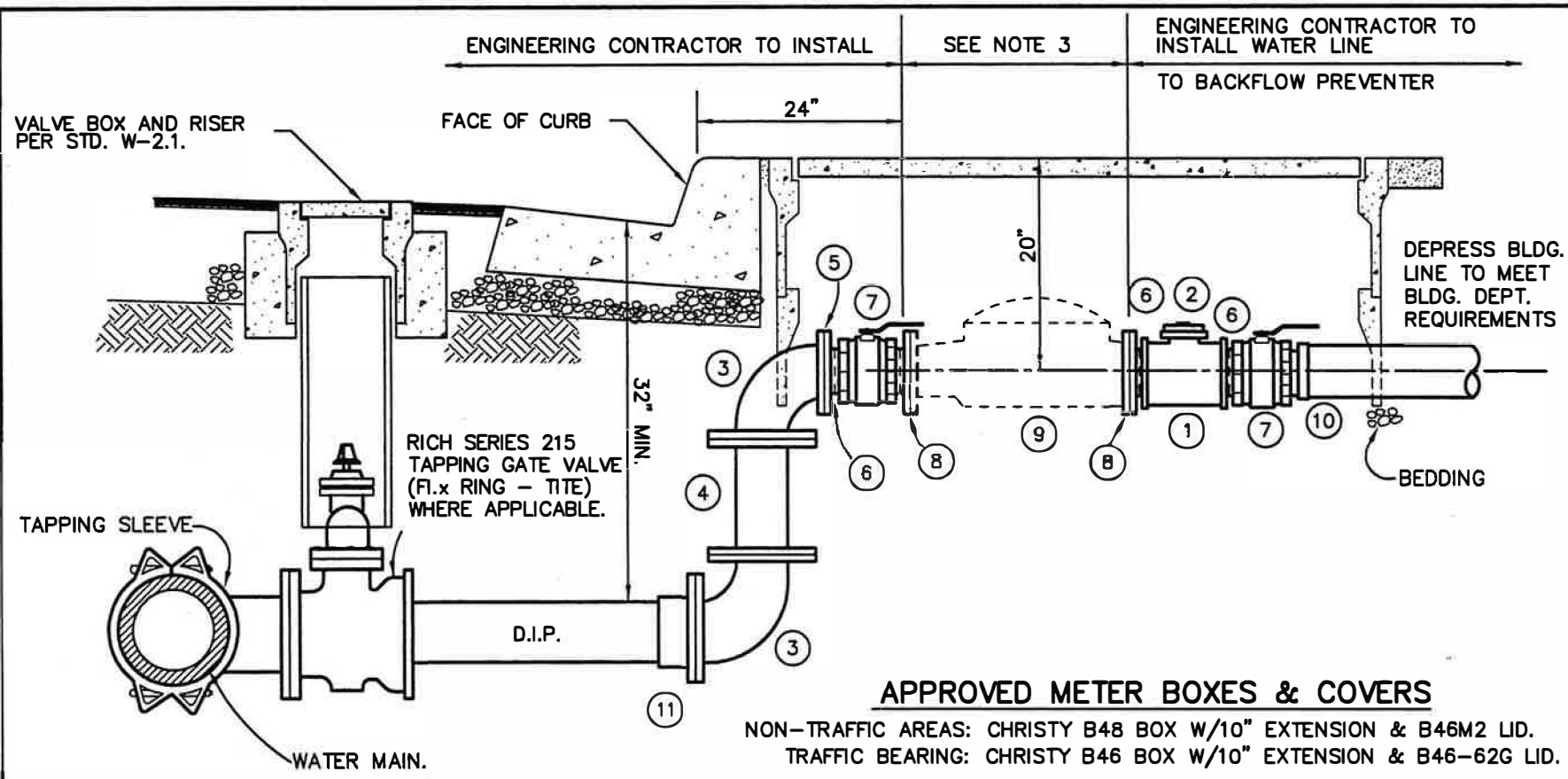
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-5.4

4" WATER SERVICE LATERAL INSTALLATION FOR 3" METER

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. **W-5.5**



APPROVED METER BOXES & COVERS

NON-TRAFFIC AREAS: CHRISTY B48 BOX W/10" EXTENSION & B46M2 LID.
TRAFFIC BEARING: CHRISTY B46 BOX W/10" EXTENSION & B46-62G LID.

APPROVED TAPPING SLEEVES

SEE ENGINEER'S APPROVED LIST OF PARTS

NOTES:

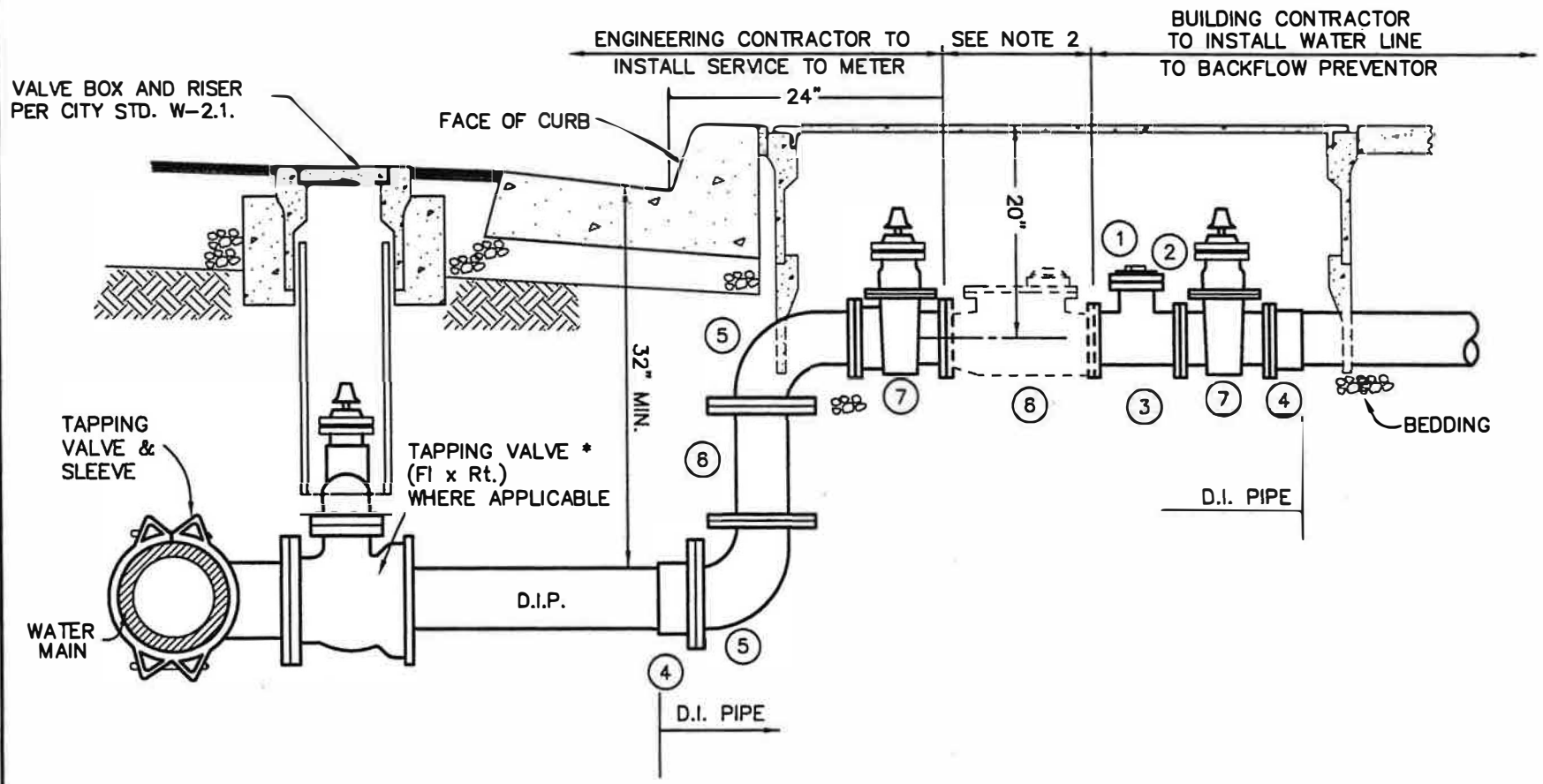
1. CONTRACTOR TO INSTALL PERFORATED P.V.C. SPACER WITH 1/4" Ø HOLES DRILLED VERTICALLY THROUGH PIPE AT 2" O.C. CITY FORCES TO INSTALL METER UPON INSPECTORS APPROVAL.
2. FOR IRRIGATION SERVICES ONLY.
3. FOR DIMENSION CONTACT DEPT. OF P.W.

NO.	ITEM
1	3" THREADED BRASS TEE
2	3" SQUARE HEAD BRASS PLUG
3	4" x 90° FLANGED EII
4	4" FLANGED SPOOL - LENGTH AS REQUIRED
5	4" x 3" COMPANION FLANGE
6	3" x CLOSE NIPPLE
7	3" BALL VALVE - WATTS NO.6000
8	3" x 3" BRASS COMPANION FLANGE
9	WATER METER BY CITY FORCES
10	M.I.P. x SOLVENT WELD SCH. 80 P.V.C. ADAPTER
11	4" FLANGE ADAPTER

4" WATER SERVICE LATERAL INSTALLATION FOR 4" METER

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. **W-5.6**



APPROVED TAPPING SLEEVES

SEE ENGINEER'S APPROVED LIST OF PARTS

APPROVED METER BOXES & COVERS

NON-TRAFFIC AREAS: CHRISTY B52 BOX W/10" EXTENSION & B52M3 LID

TRAFFIC BEARING: CHRISTY B52 BOX W/10" EXTENSION & B52-62G LID

NOTES:

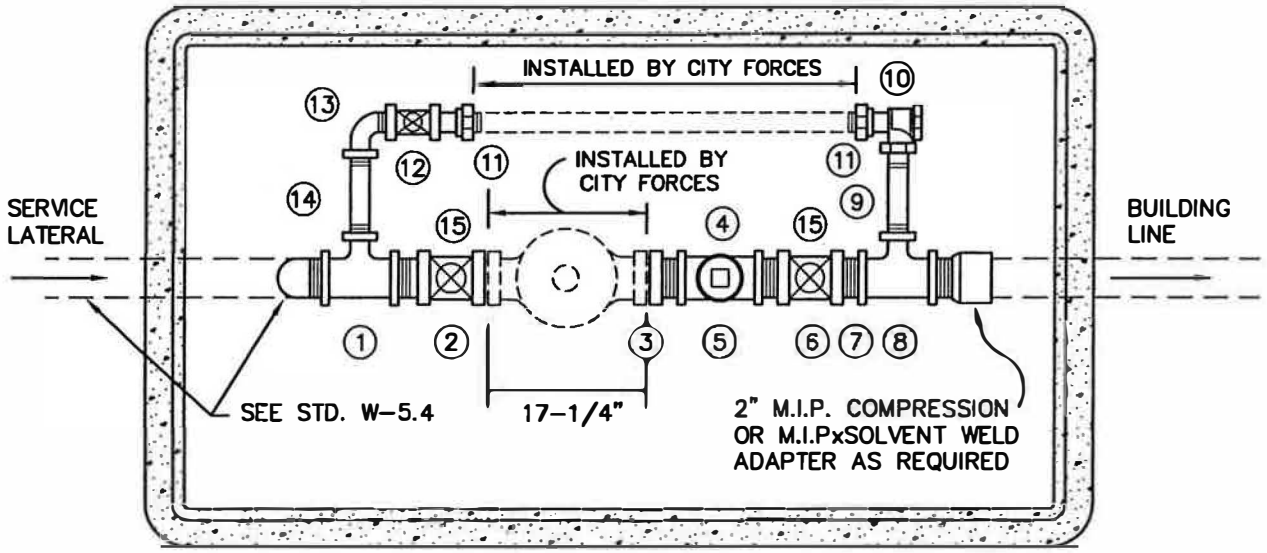
1. CONTRACTOR TO INSTALL SPACER, CITY FORCES TO INSTALL METER UPON INSPECTORS APPROVAL.
2. FOR DIMENSION CONTACT DEPT. OF P.W.

* GATE VALVE TO BE RESILIENT SEAT TYPE PER AWWA SPEC. C509

NO.	ITEM
1	4" SQUARE HEAD PLUG
2	4" COMPANION FLANGE
3	4" FLANGED TEE
4	4" Fl. ADAPTER AS REQUIRED
5	4" x 90° FLANGED Ell
6	4" FLANGED SPOOL - LENGTH AS REQUIRED
7	* 4" AWWA GATE VALVE
8	METER BY CITY FORCES

APPROVED METER BOXES & COVERS

NON-TRAFFIC AREAS: CHRISTY B-48 BOX WITH B-48 LID
TRAFFIC BEARING: CHRISTY B-48 BOX WITH B48-62G LID



No.	Item
①	2"x1" BRASS TEE
②	BALL VALVE (FORD BF-83-777)
③	BRONZE METER FLANGE (FORD 7M)
④	2" BRASS PLUG
⑤	2" BRASS TEST TEE
⑥	BALL VALVE (FORD B81-777)
⑦	2"x CLOSE BRASS NIPPLE
⑧	2"x1" BRASS TEE
⑨	1"x4-1/2" BRASS NIPPLE
⑩	ANGLE CHECK VALVE (FORD HA31-444)
⑪	1-1/4" BRASS PLUG
⑫	1" BALL VALVE (FORD BB-444W)
⑬	1" BRASS 90° STREET ELL
⑭	1"x5" BRASS NIPPLE
⑮	2 LOCK CAP (FORD BVLC)

NOTE: USE FORD OR EQUAL FOR FITTINGS

SEBASTOPOL CALIFORNIA PUBLIC WORKS

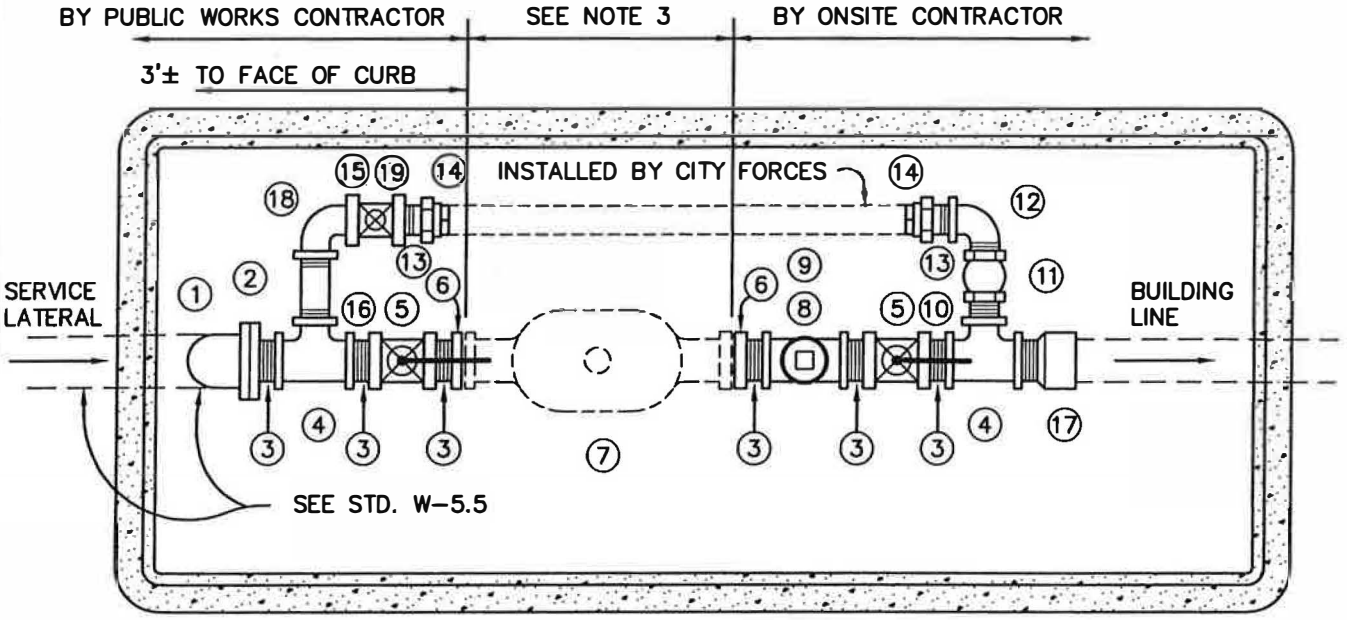
BY-PASS INSTALLATION FOR 2" METER

STD. NO. W-5.7

SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998

APPROVED METER BOX & COVER

CHRISTY PIT NO. R10P24 (2' DEEP) WITH No. R10-52H 2-PIECE CHECKER PLATE, PARKWAY, HINGED, SPRING LOADED, SCREW DOWN, GALVANIZED LID WITH 8" ROUND RADING LID.



No.	Item
①	4" x 90° FLANGED ELL
②	4" x 3" COMPANION FLANGE
③	3" x CLOSE BRASS NIPPLE
④	3" x 2" BRASS TEE
⑤	3" BELL VALVE (WATTS No. 6000)
⑥	3" BRASS COMPANION FLANGE
⑦	WATER METER BY CITY FORCES
⑧	3" BRASS TEST TEE
⑨	3" BRASS PLUG
⑩	2" x CLOSE BRASS NIPPLE

No.	Item
⑪	2" NIBCO CHECK VALVE
⑫	2" x 90° BRASS STREET ELL
⑬	2" BRASS METER COUPLING
⑭	2" BRASS PLUG
⑤	2" BALL VALVE (FORD B81-666W)
⑯	2" x 6" BRASS NIPPLE
⑰	3" SCH. 80 PVC M.I.P. x SOLVENT WELD ADAPTOR
⑱	2" x 90° BRASS ELL
⑲	2 LOCK CAP (FORD BVLC)

NOTES:

1. REFER TO DETAIL W-5.5 FOR DIMENSIONS & PROFILE FIEW OF SERVICE LATERAL INSTALLATION.
2. THE CITY WATER UTILITY SHALL PROVIDE & INSTALL THE MASTER PADLOCK ON THE BY-PASS BALL VALVE.
3. FOR DIMENSION CONTACT DEPT. OF PUBLIC WORKS.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

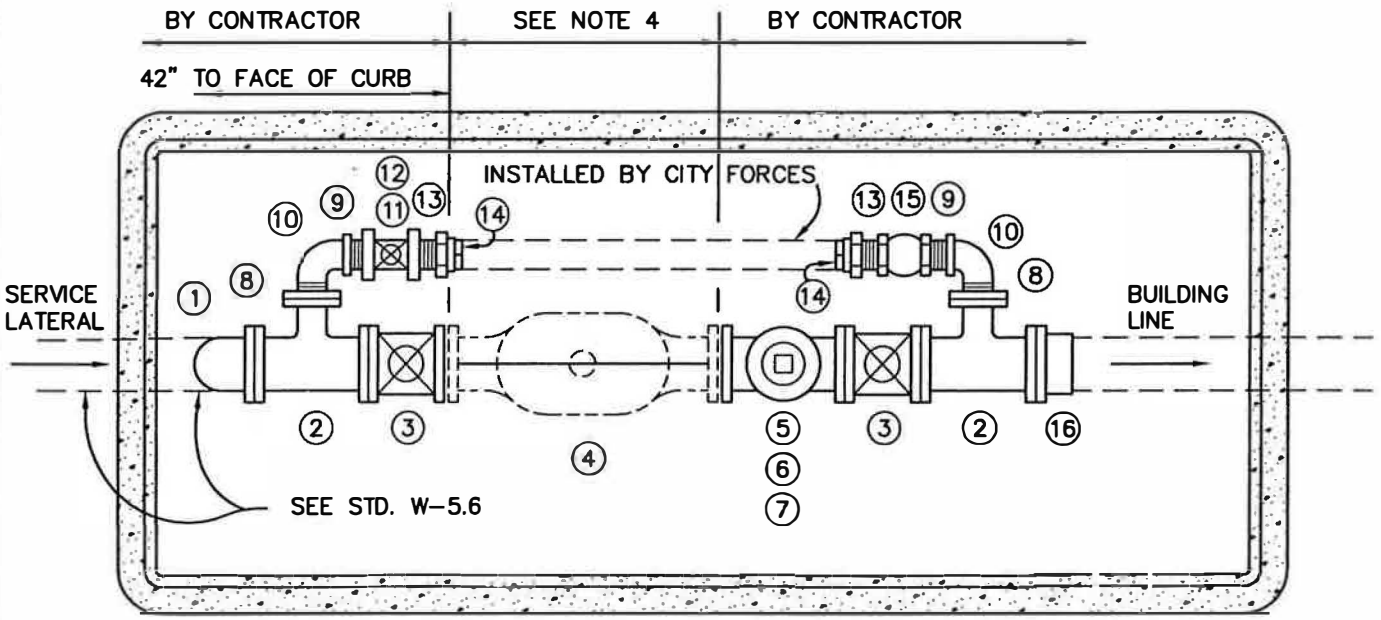
BY-PASS INSTALLATION FOR 3" METER

STD. NO. W-5.8

SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998

APPROVED METER BOX & COVER

CHRISTY PIT NO. R10P24 (2' DEEP) WITH No. R10–52H 2–PIECE CHECKER PLATE, PARKWAY, HINGED, SPRING LOADED, SCREW DOWN, GALVANIZED LID WITH 8" ROUND RADING LID.



No.	Item
①	4" x 90° FLANGED ELL
②	4" x 2" FLANGED TEE
③	4" FLANGED GATE VALVE *
④	METER BY CITY FORCES
⑤	4" FLANGED TEST TEE
⑥	4" COMPANION FLANGE
⑦	4" PLUG – SQUARE HEAD
⑧	2" COMPANION FLANGE

No.	Item
⑨	2" x CLOSE BRASS NIPPLE
⑩	2" x 90° BRASS STREET ELL
⑪	2" BALL VALVE (FORD B81–777)
⑫	2 LOCK CAP (FORD No. BVLC)
⑬	2" BRASS METER COUPLING
⑭	BRASS PLUG
⑮	2" NIBCO CHECK VALVE
⑯	4" FLANGE ADAPTER AS REQUIRED

* GATE VALVE TO BE RESILIENT SEATED TYPE PER AWWA SPEC. C509–80

NOTES:

1. CONTRACTOR TO INSTALL SPACER, CITY FORCES TO INSTALL METER UPON INSPECTOR'S APPROVAL.
2. REFER TO CITY STANDARD W–5.6 FOR DIMENSIONS & PROFILE VIEW OF SERVICE LATERAL INSTALLATION.
3. THE CITY SHALL PROVIDE AND INSTALL THE MASTER PADLOCK ON THE BY–PASS VALVE.
4. FOR DIMENSION CONTACT DEPARTMENT OF PUBLIC WORKS.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

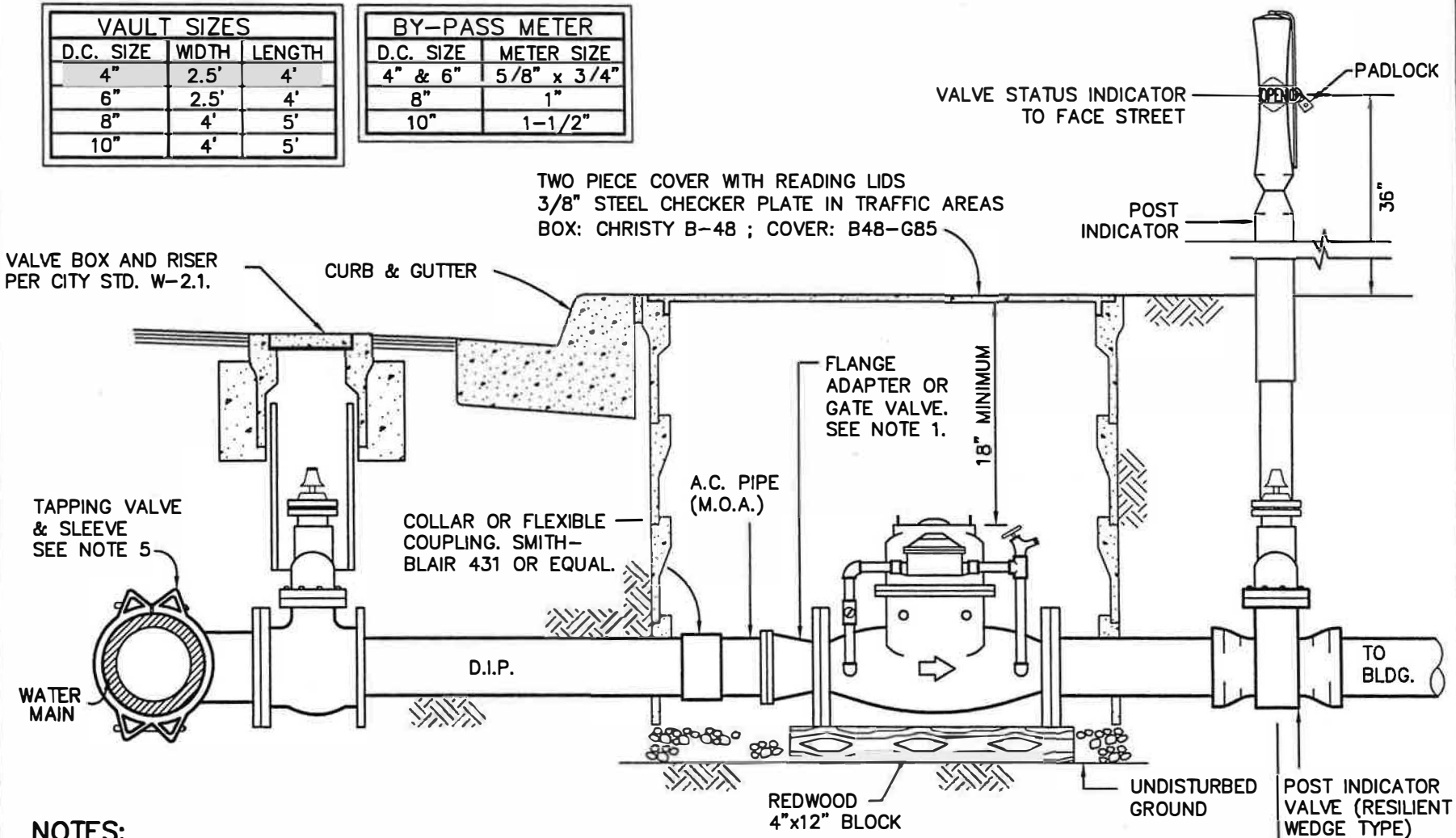
BY–PASS INSTALLATION FOR 4" METER

STD. NO. **W-5.9**

SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998

VAULT SIZES		
D.C. SIZE	WIDTH	LENGTH
4"	2.5'	4'
6"	2.5'	4'
8"	4'	5'
10"	4'	5'

BY-PASS METER	
D.C. SIZE	METER SIZE
4" & 6"	5/8" x 3/4"
8"	1"
10"	1-1/2"



NOTES:

1. IN CASES WHERE A DOMESTIC WATER SERVICE IS TAPPED OFF OF FIRE SERVICE LATERAL, AN ADDITIONAL GATE VALVE SHALL BE INSTALLED ON THE FIRE SERVICE LATERAL ON THE STREET SIDE OF THE DETECTOR CHECK VALVE. GATE VALVE SHALL BE FLANGE CONNECTED TO THE DETECTOR CHECK VALVE.
2. GATE VALVES SHALL BE OPERATED BY THE CITY WATER DEPARTMENT PERSONNEL ONLY.
3. DETECTOR CHECK VALVE SHALL NOT BE LOCATED IN TRAFFIC AREAS UNLESS APPROVED BY THE CITY.
4. EXACT LOCATION OF DETECTOR CHECK VALVE TO BE AS SPECIFIED BY THE CITY.
5. WHEN INSTALLATION IS MADE SIMULTANEOUS WITH NEW MAIN, USE TEE WITH FLANGED BRANCH AND FLANGED BY RING TITE GATE VALVE. TAPPING VALVE AND SLEEVE TO BE INSTALLED BY CONTRACTOR AT APPLICANT'S EXPENSE.

TYPICAL FIRE SPRINKLER SERVICE INSTALLATION - 4" THRU 10"

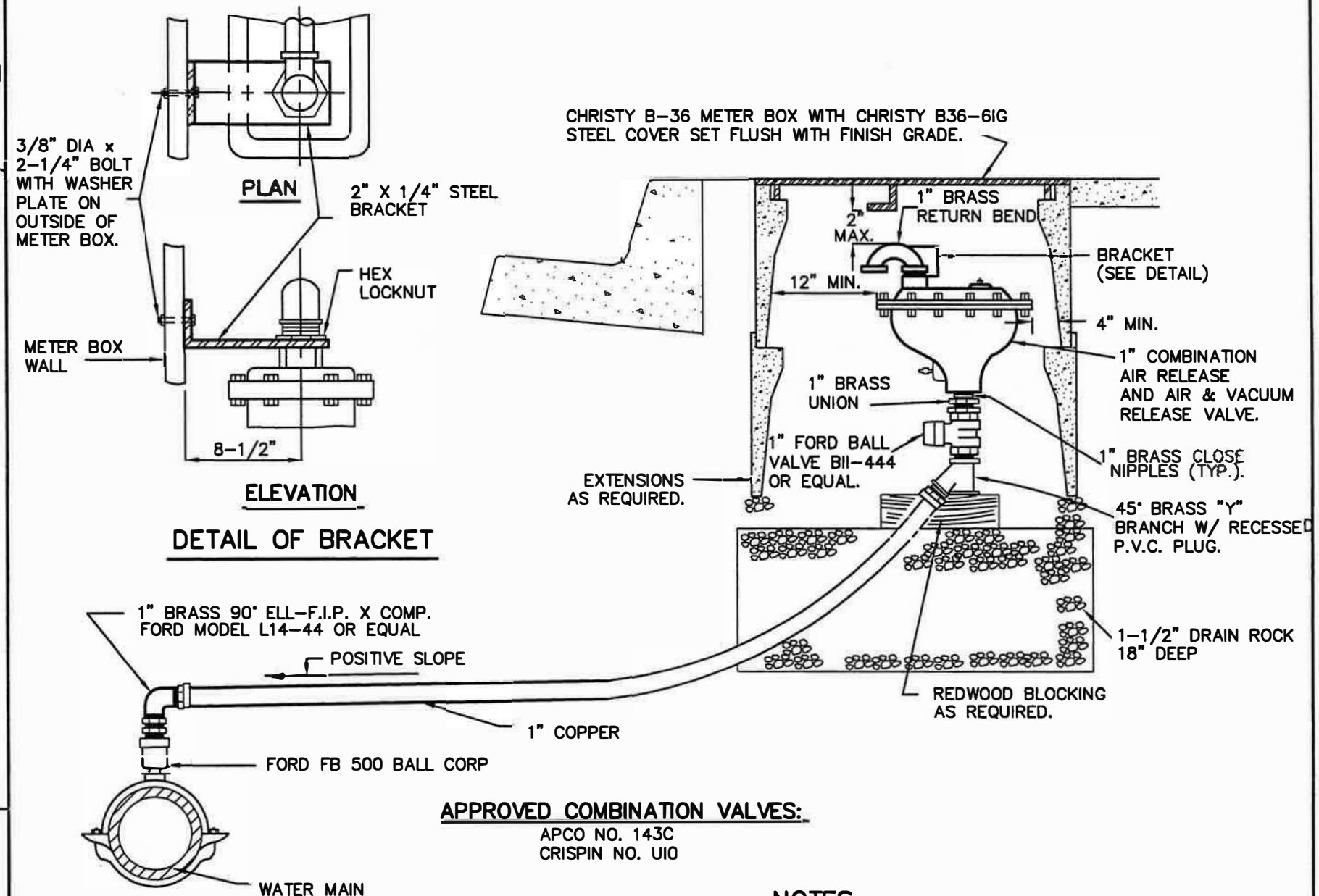
SCALE: NONE | DRAWN: LMM | CHK: PHK | APPVD: PHK | DATE: JULY 1998

STD. NO. **W-5.10**

TYPICAL INSTALLATION OF AIR AND VACUUM & AIR RELEASE VALVE

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-6.1

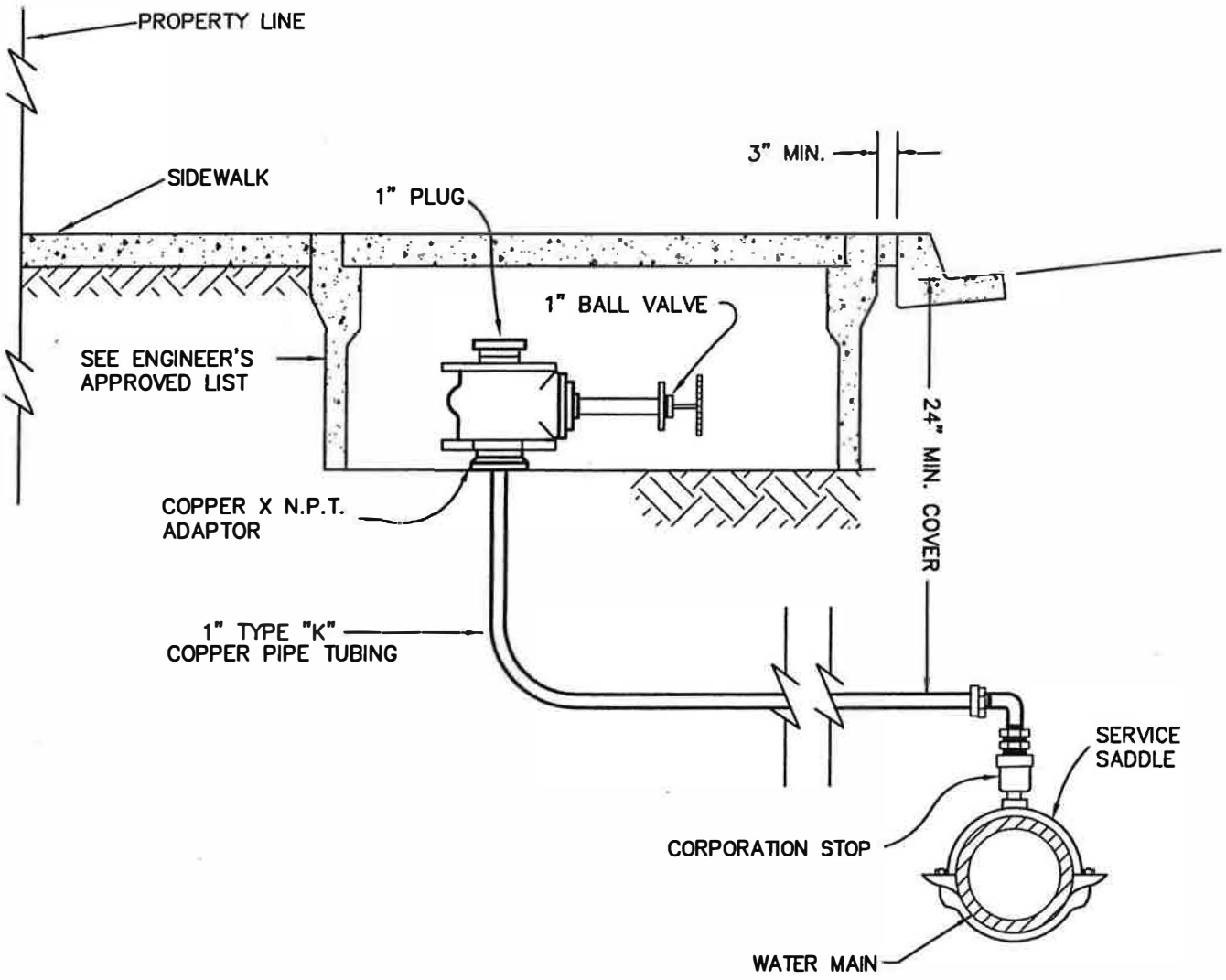


APPROVED COMBINATION VALVES:

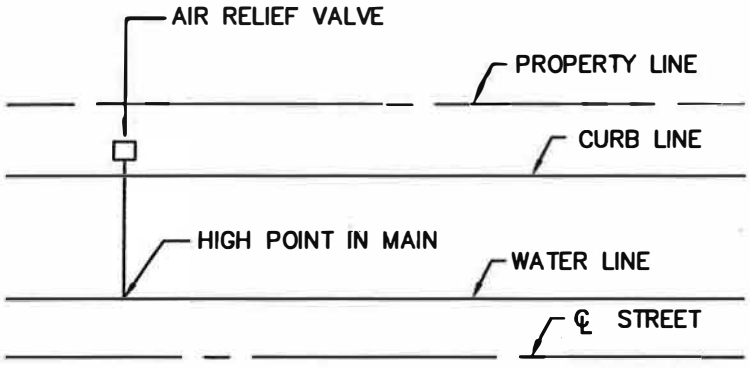
APCO NO. 143C
CRISPIN NO. UI0

NOTES:

1. AIR RELEASE VALVES SHALL HAVE 1" THREADED INLETS UNLESS OTHERWISE SHOWN ON PLANS.



SEE STD. W-5.1 FOR MAIN SERVICE CONECTION.



PLAN

NO SCALE

NOTE:

SEE ENGINEER'S APPROVED LIST OF PARTS FOR SADDLE, CORP STOP, ADAPTER, BALL VALVE AND BOX.

1" MANUAL AIR RELIEF VALVE ASSEMBLY

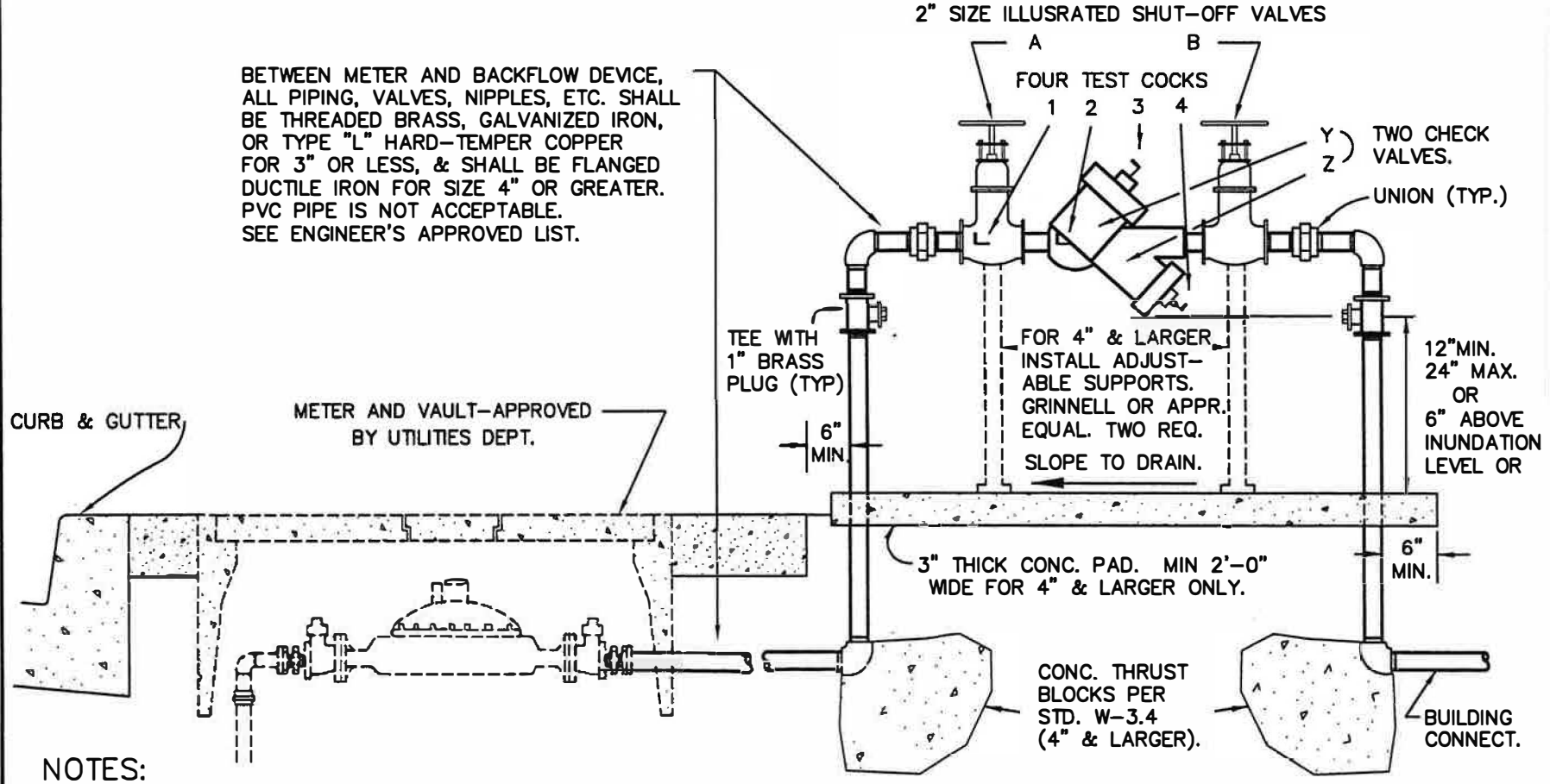
STD. NO. W-6.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

TYPICAL INSTALLATION OF REDUCED-PRESSURE TYPE BACKFLOW PREVENTER

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. W-7.1



NOTES:

1. REDUCED PRESSURE TYPE BACKFLOW DEVICES SHALL BE REQUIRED FOR ANY USE WHERE TOXIC MATERIALS ARE USED OR STORED ON SITE OR WHERE POSITIVE PROTECTION FOR THE PUBLIC WATER SUPPLY IS REQUIRED. TYPICAL APPLICATIONS INCLUDE: ALL IRRIGATION SERVICES & PARKS, HOSPITALS, INDUSTRIAL SERVICES, OR AS DETERMINED BY CITY PUBLIC WORKS DEPT.
2. APPROVED REDUCED PRESSURE BACKFLOW DEVICE SHALL BE AS SHOWN ON "LIST OF APPROVED BACKFLOW PROTECTION DEVICES" (LATEST REVISION) BY THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS-CONNECTION CONTROL & HYDRAULIC RESEARCH.
3. BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED ADJACENT TO AND ON PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. WHERE NO SIDEWALK EXISTS THE ASSEMBLY SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE WATER METER LOCATION..
4. A VALVE OF THE SAME SIZE AS THE BACKFLOW PREVENTER SHALL BE INSTALLED ON EACH SIDE OF THE BACKFLOW PREVENTION ASSEMBLY. VALVES 2" & LESS SHALL BE THREADED FORD BALL VALVES. VALVES 3" SHALL BE WATTS BALL VALVES, AND 4" & LARGER SHALL BE RESILIENT SEATED GATE VALVES.
5. ANY COVER OR SCREENING FOR THE BACKFLOW PREVENTION ASSEMBLY MUST BE APPROVED BY THE CITY PUBLIC WORKS DEPT. PRIOR TO INSTALLATION.
6. ALL COMMERCIAL BLDGS. SHALL HAVE R.P. DEVICE.
7. IN LIMITED SPACE APPLICATIONS VALVES MAY BE INSTALLED ON RISERS, MIN. 4" ABOVE GRADE.
8. THE ADDITION OF SPOOLS MUST BE APPROVED BY THE CITY INSPECTOR PRIOR TO INSTALLATION.
9. THE PIPING FROM THE REDUCED PRESSURE BACKFLOW PREVENTER & THE REDUCED PRESSURE BACKFLOW PREVENTER VALVE ASSEMBLY ITSELF MUST BE THE SAME SIZE AS THE SERVICE LINE UNLESS OTHERWISE APPROVED BY CITY ENGINEER.

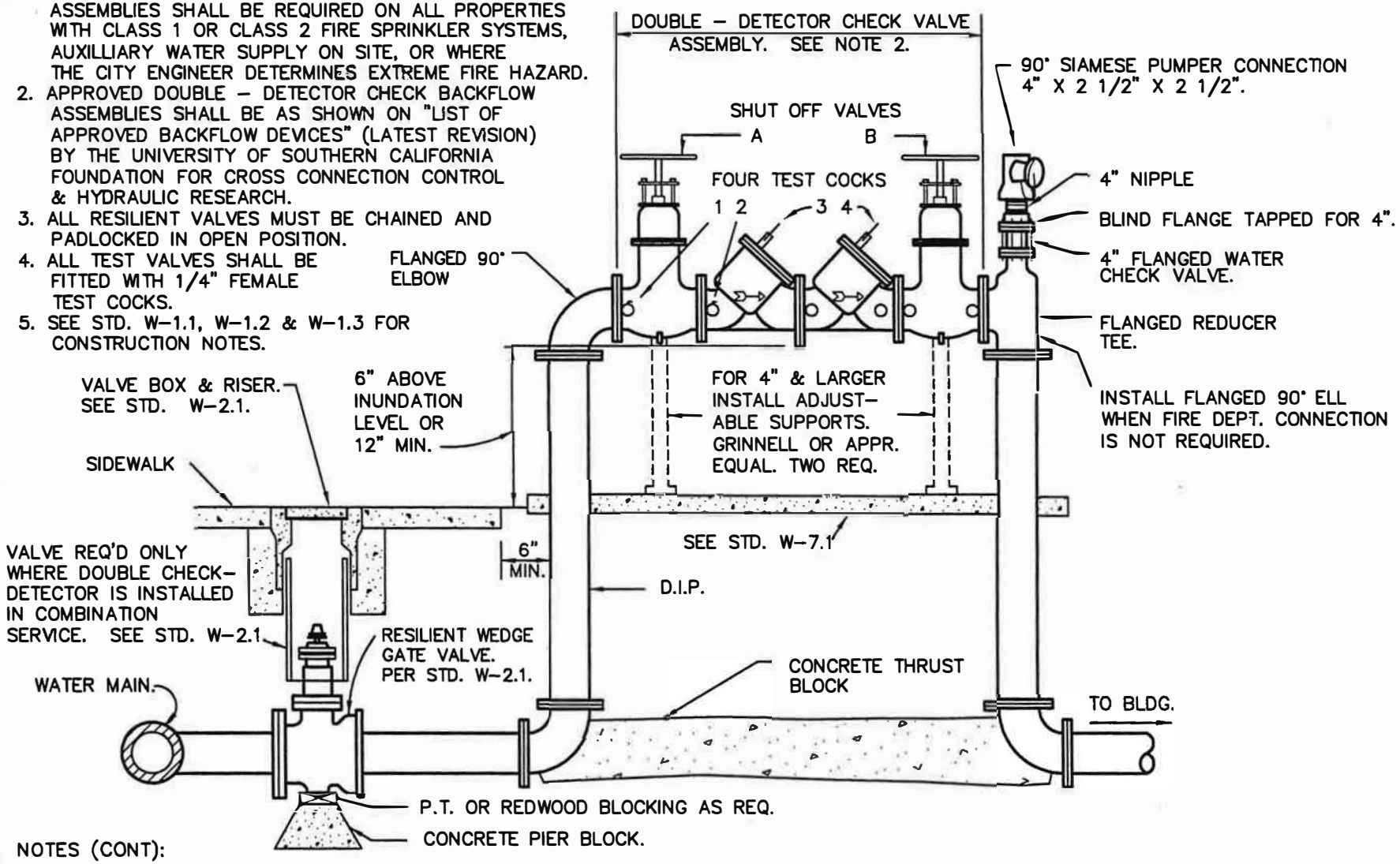
DOUBLE DETECTOR CHECK VALVE SINGLE SERVICE

SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. **W-7.2**

NOTES:

1. DOUBLE – DETECTOR CHECK VALVE BACKFLOW ASSEMBLIES SHALL BE REQUIRED ON ALL PROPERTIES WITH CLASS 1 OR CLASS 2 FIRE SPRINKLER SYSTEMS, AUXILLIARY WATER SUPPLY ON SITE, OR WHERE THE CITY ENGINEER DETERMINES EXTREME FIRE HAZARD.
2. APPROVED DOUBLE – DETECTOR CHECK BACKFLOW ASSEMBLIES SHALL BE AS SHOWN ON "LIST OF APPROVED BACKFLOW DEVICES" (LATEST REVISION) BY THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS CONNECTION CONTROL & HYDRAULIC RESEARCH.
3. ALL RESILIENT VALVES MUST BE CHAINED AND PADLOCKED IN OPEN POSITION.
4. ALL TEST VALVES SHALL BE FITTED WITH 1/4" FEMALE TEST COCKS.
5. SEE STD. W-1.1, W-1.2 & W-1.3 FOR CONSTRUCTION NOTES.



NOTES (CONT):

6. DOUBLE DETECTOR CHECK ASSEMBLY SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE SIDEWALK OR PUBLIC RIGHT-OF-WAY.
7. ANY COVER OR SCREENING FOR THIS ASSEMBLY MUST HAVE BOTH FIRE DEPARTMENT & ENGINEER'S APPROVAL PRIOR TO INSTALLATION.
8. SHUT-OFF VALVES TO BE RESILIENT WEDGE TYPE O.S. & Y.
9. MUST ALSO MEET THE REQUIREMENTS OF THE FIRE DEPARTMENT.
10. TO BE USED ONLY ON SPECIFIC APPROVAL OF THE FIRE DEPARTMENT.
11. SHOULD NOT BE USED WHERE THERE ARE YARD HYDRANTS AND WHERE ADEQUATE FIRE FLOWS CANNOT BE OBTAINED.
12. DOUBLE DETECTOR CHECK SHALL BE THE SAME SIZE AS THE FIRE LINE. (EXCEPT WHEN A 12" FIRE LINE IS REQUIRED, THEN A 10" DOUBLE DETECTOR CHECK BACKFLOW ASSEMBLY IS REQUIRED.

SECTION 2

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF

WATER MAINS

CITY OF SEBASTOPOL
SONOMA COUNTY, CALIFORNIA
JULY 1998

To be used with City of Sebastopol Water Standards dated July, 1998 and State of California Department of Transportation Standard Specifications, latest edition.

TABLE OF CONTENTS

SECTION 2 - CONCRETE

2.01. SCOPE OF WORK:

1. Anchors, supports, and bases for pipe lines and hydrants.

2. Replacement of damaged or removed concrete curbs, gutters, sidewalks, and pavements.

2.02. GENERAL:

Portland cement concrete shall conform to the requirements of Section 90 of the Standard Specifications and as herein specified.

2.03. MATERIALS:

The concrete shall be Class "B" containing five (5) sacks of Portland cement per cubic yard of concrete. The grading of the combined aggregate shall conform to the requirements for the 1 1/2 inch maximum size. The consistency of the fresh concrete shall be such that the slump does not exceed four (4) inches as determined by Test Method No. Calif. 520.

Reinforcement shall be deformed, intermediate grade steel conforming to the specifications of ASTM Designation A15.

2.04. CONSTRUCTION:

Ground against which concrete is to be placed shall be moistened prior to placing so that it will not absorb excessive moisture from the fresh concrete. Forms, if required, shall be smooth, mortar tight and of sufficient strength to maintain shape during the placing of the concrete. Placing methods shall be such that the concrete shall be rodded and spaded to insure smooth surfaces along form lines and to eliminate rock pockets.

Reinforcing bars, if required, shall be cleaned of all loose mill and rust scale, mortar, oil, dirt, or other foreign substances; shall be accurately bent to prescribed dimensions; and shall be placed accurately to the dimensions shown on the drawings. Where bars are spliced they shall be lapped at least 25 diameters.

Anchors shall be constructed to obtain full bearing, opposed to axial and lateral thrusts, against solid undisturbed material.

Concrete shall not be placed in free water on foundations or elsewhere. Pumping from the interior of any foundation enclosures shall be done in such a manner as to preclude the possibility of any portion of the concrete materials being carried away. No pumping will be permitted during the placing of concrete or for a period of 24 hours thereafter, unless it is done from a suitable

sump separated from the concrete. Water shall not be allowed to rise on any concrete until the concrete has attained its initial set.

SECTION 3 - PIPING AND PIPELINES

3.01. SCOPE OF WORK:

The work shall include all labor and materials to complete all work as shown on the Plans and herein specified, including the following:

1. Water Mains.

2. All necessary supports, anchors, fittings and special appurtenances to make the work complete and operable.

3.02. MATERIALS:

1. GENERAL: Water Mains shall be Ductile Iron (D.I.) pipe, unless otherwise designated on the drawings and approved by the City Engineer.

2. DUCTILE IRON PIPE: Shall be rated at 150 psi working pressure. Pipe shall be furnished with a nominal laying length of 18 feet. Ductile Iron Pipe shall meet requirements of AWWA C151-65. The pipe shall be cement mortar lined in accordance with AWWA C104-64, with standard bituminous inside seal coat and outside coating. Minimum thickness of cement mortar linings shall be in accordance with Section 4-10.1 of AWWA C104-64.

Cast iron fittings shall be rated at 150 psi or greater and conform to the requirements of AWWA C-110-64. Fittings shall have a cement mortar lining and bituminous lining and outside coating equal to the cast iron pipe.

All D.I. pipe and fittings shall be furnished with rubber ring push on type joints except as shown on the drawings. Rubber rings shall be in accordance with AWWA C111-64.

The pressure rating, metal thickness, class, net weight of pipe without lining, length of pipe and name of manufacturer shall be clearly marked on each length of pipe.

3. FLEXIBLE COUPLINGS: Shall be cast sleeve type, with the stop removed in the middle ring, equal to Smith-Blair type 431 for cast iron or asbestos-cement mains of Type 433 for transition from cast iron to asbestos-cement. When connecting to existing steel mains, couplings shall be galvanized, fabricated steel, Type 411.

Flanged coupling adaptors shall be Smith-Blair Type 916 or cast adaptors, Type 913 for fabricated steel or an approved equal. Fabricated stel adaptors shall be galvanized.

Couplings and adaptors located underground shall be furnished with high tensile strength ductile iron bolts.

3.03. INSTALLATION OF PIPELINES:

1. GENERAL: All pipe shall be laid true to line and grade as shwon on the Plans or as directed by the Engineer to pass existing obstructions. Before any pipe is laid, it shall be carefully inspected for defects. No pipe or other material whichis cracked or shows other defects shall be placed.

Each section of pipe and each fitting shall be thoroughly cleaned out before it is installed. All pipe, fittings, valves, etc., shall be carefully lowered into the trench by suitable tools or equipment in such a manner as to prevent damage to the pipe, lining, coating, fitting, or other appurtenances.

Pipe must be given a solid uniform bearing in the bottom of the trench. Blocking or supporting pipe on earth mounds will not be permitted.

Whenever pipe laying is discontinued for short periods, the maximum deflection at any joint shall not exceed 1/2 the manufacturer's recommendation for the type of pipe and joint being used.

Whenever it is necessary to use a short length of pipe at a fitting or valve, the minimum length shall be thirty-two (32) inches. If it is necessary to cut pipe, said cut shall be made with an approved pipe cuter. The use of hammer and chisel for pipe cutting will not be permitted.

2. INSTALLATION OF DUCTILE IRON PIPE:

a. Joints for D.I. Pipe. Joints shall be an approved single rubber gasket type, except where flanged joints are shown on the drawings. The assembly of the joint shall be made as recommended by the manufacturer. The joint shall be thoroughly cleaned before assembly and shall provide a secure, water tight joint.

Before installing gaskets in flanged joints, the faces of the flanges shall be perfectly clean. Bolts for flanged joints shall be of sufficient length to give a full nut when the joint is made. In bolting flanges together, the bolt shall be tightened in such a way that the flanges in the completed joint will be parallel and free from unequal stresses. Care shall be taken to prevent damage to the bolt heads, nuts or thread, and if any such damage is done, the damaged material shall be replaced.

If leakage occurs at a flanged joint, such leakage shall be stopped by cleaning flanges, replacement of gaskets or adjustment of tension on the bolts. No other method will be permitted. After the flanged connection has been tested and inspected by the Engineer, the Contractor shall apply a coating of an asphalt of bitumastic paint (approved by the Engineer) on all exposed metal surfaces of the flange connection and bolts.

b. Protective Coatings. When shown on the drawings, underground ductile iron surfaces shall be enclosed in a minimum of one sheet of 8-mil thick polyethylene to form a continuous and all-encompassing layer or polyethylene between all ductile iron surfaces and the surrounding earth or backfill material. All polyethylene shall be carefully secured with Scotch-wrap 10-mil thick tape, or an approved equal.

Polyethylene tubes shall be installed over pipes in the following manner: (1) Enclosed pipe in tube, (2) pull tube upward so that the polyethylene is snug against the bottom one-half of the pipe, (3) fold remaining polyethylene so that folded area extends equally over the pipe, and (4) tape completely and securely around pipe and polyethylene at 4 foot intervals.

Polyethylene sheets shall be installed around pipe fittings in a manner similar to that stated above. There shall be a minimum of one foot overlap between adjacent polyethylene sheets or tubes.

Care shall be exercised by the Contractor to prevent damage to polyethylene during installation, after installation prior to backfill, and during backfill operations. Broken areas shall be covered with another layer of polyethylene and securely taped.

3.04. THRUST BLOCKS AND ANCHORS:

Concrete thrust blocks and anchors shall be constructed at all fittings, and dead-ends as shown on the drawings and at all other locations as directed by the Engineer. Thrust blocks will be required at all changes in horizontal and vertical alignment greater than 10 degrees.

Trenches at thrust block and anchor locations shall be carefully handshaped from the standard trench so that thrust blocks and anchors can be poured against undisturbed earth. Concrete for thrust blocks and anchors shall be Class B.

3.05. CONNECTION TO EXISTING MAINS:

Connections to existing mains shall be made as shown on the Plans and as specified. However, the Contractor may submit details of alternate methods for approval.

The Contractor shall notify the Engineer at least 48 hours before any connection shall be made to an existing main. The Contractor shall indicate the expected period required for the shutdown and the time of which he desires the shutdown.

In general, shutdowns shall be made at times when there will be at least interference with normal water service. The Contractor shall notify all users who will be temporarily out of service indicating date and times. Connections shall be made only after complete and satisfactory preparation for the work has been made, including testing of the new main, in order that the shutdown may be as short as possible. The Engineer shall be the sole judge of the adequacy of the preparation.

Under no circumstances shall anyone other than an authorized representative of the City open or close any valve in the city-operated water system.

In certain circumstances as determined by the Engineer, it may be necessary to make a connection to an existing main at other than normal working hours. For this purpose, normal working hours are defined as 7:30 a.m. through 4:30 p.m., Monday through Thursday, and 7:30 a.m. to 4:30 p.m. alternate Fridays.

Connections to existing mains outside normal working hours shown or specified in the contract documents shall be made at no additional compensation over the bid price. Should such a connection be required by the Engineer that was not shown as specified in the contract documents, the premium labor costs shall be paid by the City. Premium labor costs shall be computed on the basis of the difference between the applicable straight time and premium time rates. No additional compensation for connections outside normal working hours will be allowed.

3.06. PROTECTIVE COATINGS:

1. GENERAL: All buried surfaces shall be given protective coatings for protection from corrosion as provided in the various sections of these Specifications or as shown on the drawings. Where protective coatings for particular elements have not been specified in detail, the provisions of this section shall be followed.

2. PROTECTION OF PIPE:

a. D.I. pipe. When shown on the plans ductile iron mains shall be protected with a polyethylene wrap as herein specified.

b. Tie rods. All buried parts of relatively thin cross section (for example: tie rods, leak clamps, bolts, etc.) shall be coated with a mastic coating or as otherwise specified.

3. APPLICATION OF PROTECTIVE COATINGS:

Coatings shall be continuous and unbroken. Insulating coatings shall be free of pinholes and holidays. Protective coatings shall be applied over a properly prepared surface in the specified number of coats and in the required thickness. All protective coatings shall be applied according to these specifications. If there are no application provision for the coating specified, the applicable AWWA Specification or the manufacturer's instructions shall be followed.

a. Mastic Coating: Apply one coat, 1/8 inch thick. Mastic shall be Bitumastic 505 by the Koppers Co., or an approved equal.

b. Polyethylene Wrapping. Shall be applied in accordance wit the requirements in section entitled, "Installation of Ductile Iron Pipe."

3.07. CLEANING, TESTING AND DISINFECTION OF WATER LINES:

When the pipe line has been installed, it shall be cleaned of all dirt and construction debris before backfilling.

After the trench has been completely backfilled, the newly laid pipe or any valve section thereof, shall be subjected to a hydrostatic pressure as specified herein.

The Contractor shall furnish all equipment for making tests including a suitable gauge for measuring the applied line pressure. The tank containing the water to maintain line pressure shall be of such a design that the volume of water used may be accurately measured.

Each section of the pipe to be tested shall be slowly filled with water, and all air shall be expelled from the pipe. The release of the air can be accomplished by opening hydrants and service line cocks at the high points of the system and the blowoffs at all dead ends. The valve controlling the admission of water into the section of pipe to be tested should be opened wide before shutting the hydrants or blowoffs. After the system has been filled with water and air expelled, all the valves controlling the section to be tested shall be closed, and the line be allowed to set for a period of not less than 24 hours.

The pipe shall then be refilled, if necessary, and subjected to a pressure of not less than 150 pounds per square inch or the service pressure plus 50 pounds, whichever is greater, for a period of four hours.

The allowable leakage in the test section shall not exceed 15 gallons per mile, per day, per inch diameter of pipe tested.

If defects are found or the line does not meet the allowable leakage rate, the Contractor shall locate the leaks, make the necessary repairs at his own expense, backfill and repeat the pressure and leakage tests in the presence of the Engineer as specified above. No pipeline section shall be accepted until the leakage is within the specified allowance.

At the proper time, the system should be thoroughly flushed out and disinfected in accordance with the "procedure for Disinfecting Water Mains", AWWA Specifications C 601-54.

3.08. ABANDONING WATER MAINS:

At each location where an existing water line is cut it shall be sealed with a cap or plug suitable for the type of pipe in question, in accordance with Standard Drawing. Romac EC501 or Rockwell 482 Cast End Cap Coupling or approved equal shall be used.

Where shown on the drawings valves shall be removed from the existing lines and the line capped at each side.

All other valves in lines to be abandoned, including hydrant valves, shall be closed, the valve box removed, backfilled with Class II A.B. and the area repaved with appropriate thickness of surfacing.

All valves, pipes, fittings, and other appurtenances removed during the course of the work, unless otherwise specified or indicated on the drawings, shall remain the property of the City, and shall be delivered to the Corporation Yard.

Section 4 - VALVES, HYDRANTS, AND APPURTENANCES

4.01. SCOPE OF WORK:

The work shall include all labor and materials for furnishing, installing and testing all valves, hydrants and appurtenances as shown on the Plans and herein specified.

4.02. VALVES:

1. GENERAL: Shutoff valves installed in the main run of pipelines and hydrant runs shall be either gate valves or rubber-seated butterfly valves as shown on the plans.

2. GATE VALVES: Shall be modified wedge disc with back side flat which travels along a machined surface in the valve body. Solid guide lugs shall travel within channels cast in the side of the valve. Front sides shall have an angular mounted resilient rubber seat ring. Valves shall have non-rising stems, or rubber gasket type ends, as required, cast iron body and stems of bronze. When valves are open, the area of the opening shall be at least equal to the adjacent pipe. Valves shape open counterclockwise and have standard AWWA type opening nuts. Stuffing boxes shall be bolted and constructed so as to permit removal of parts for repair. "O" ring type seals are required on all gate valves. Valves shall conform in material of construction, quality and performance to AWWA C500-61 and shall be tested at not less than 300 psi hydrostatic pressure.

Gate Valves shall be Mueller, Resilient Seat, or equal.

3. BUTTERFLY VALVES: Shall be rubber seated, flanged, Class 150 conforming to AWWA Standard C504-66. Valves shall have a stainless steel body seat ring that "floats" in the body over a resilient "O" ring seal, a rubber disc seat ring molded to stainless retaining ring, secured by self-locking stainless steel hex head screws.

Valve operators shall be worm gear type mounted on the valve and equipped with a standard AWWA operating nut. Valve and operator shall be suitable for buried service. Valve operators shall turn counter-clockwise to open, shall be suitable to operate the valve at a line pressure of 150 psi and shall be capable of holding the valve in any position between open and closed without creeping and flutter.

Valves shall be Mueller "Lineseal" III or equal.

4. CHECK VALVES: Shall be flanged, iron body, bronze mounted, swing check with outside level end weight. Flanges shall be faced and drilled in accordance with the 125 lb. ASA American Standard.

Check valves shall be Walworth No. LS 928 and LWM 928 (for vertical mounting), Mueller Co., A-2600, or an approved equal.

4.03. HYDRANTS:

Hydrants shall be wet barrel, California Type, conforming to the requirements of AWWA C503-59. Hydrants shall be rated at 150 psi working pressure. As shown on the Plans, hydrants shall be either Type I or Type II as follows:

Type I - One 2 1/2" outlet and one 4 1/2" outlet.
Type II - Two 2 1/2" outlets and one 4 1/2" outlet.

Hydrants shall be Rich, Model 950 or 960 equal.

All outlets shall have National Standard Threads. Nozzle caps shall be equipment with a chain. Hydrant valves shall open counter-clockwise.

All hydrants shall be equipped with break-off risers. Where shown on the Plans, hydrants shall also be equipped with break-off check valve assemblies.

Burys shall be a minimum of 6 inches in diameter and be equipped with rubber gasket joints for connection to ductile iron hydrant runs.

The above ground portions of hydrants shall be painted in accordance with AWWA 503-59 with a color determined by the Engineer.

4.04. INSTALLATION OF VALVES AND HYDRANTS:

Immediately before installation, each valve and hydrant shall be operated through one complete open-close cycle and visually checked for proper operation.

Valves shall be set plumb, supported on a wood block and properly fitted to the adjacent sections of the main. Typical valve installations are shown in the City Standard Drawings.

Fire hydrants and fire hydrant connections shall be installed where indicated on the plans except where the Engineer directs that they be relocated to avoid an obstruction. The Contractor shall make such relocations at the time of construction and without additional compensation. Hydrants

shall be installed in accordance with City Standard Drawings. Break-off check valves shall be installed at all locations shown on the plans.

4.05. HYDRANT REMOVAL:

At each location where an existing hydrant is removed, the riser and bury shall be removed to a distance of not less than 12 inches from the surface and the line capped. The excavation shall then be backfilled with sand the proper paving, concrete, or planting shall be replaced.

4.06. VALVE BOXES:

Valve Boxes: Valve Boxes shall be furnished and installed on all underground valves. They shall be of concrete or enamelled cast iron adjustable to grade, and shall be installed vertically, centered on and covering the upper portions of the valves. The top of each valve box shall be placed flushed with finished grade unless otherwise directed. Valves boxes shall be Christy G5 with traffic lid or approval equal. A Concrete collar shall be placed around each valve box.

4.07. AIR RELEASE AND BLOW-OFF ASSEMBLIES:

Air release or blow=off assemblies shall be installed at high, low or terminal point of the main as shown on the plans. They shall be manual type conforming to City Standard Drawing.

4.08. VALVE BOX EXTENSION:

Shall fit tight inside the valve box, shall be in one piece from top of valve to valve box. If space occurs between riser and box, the Contractor shall caulk the annular space with mastic.

SECTION 5 - SERVICES

5.01. SCOPE OF WORK:

The work shall include all labor and materials for furnishing, installing and testing all house laterals and service lines as shown on the Plans and herein specified.

5.02. GENERAL:

House laterals and services shall consist of components between the water main through and including the water meter. Component parts include service clamp, corporation stops, service piping and fittings, service shut-off valve, meters and meter boxes.

5.03. CORPORATION STOPS:

Corporation stops shall be bronze for use with copper service pipe and shall have standard

corporation stop threads as specified in AWA C800-66.

Corporation stops shall be equal to Mueller NO. H-15000.

5.04. SERVICE CLAMPS:

Service clamps shall be two strap as shown in the Standard Drawings. Clamps shall be bronze with "O" ring seal cemented in place and shall have I.P. thread. Service clamps shall be Mueller or equal.

5.05. SERVICE PIPING:

Service piping shall be Type K soft copper tubing conforming to the requirements of AWWA C800-66. Compression type fittings may be used for service lines.

5.06. SERVICE SHUT-OFF VALVE:

Service shut-off valves shall be Ford Product in accord with Standard Detail or equal.

5.07. METERS:

Meters will be furnished by the City.

5.08. METER BOXES:

Meter boxes shall be equal to Christy.

1. 2" Service - Box B-48 with M-85 cover, or when installed in driveways, a 62G85 cover.

2. 1 1/2" Service - Box B-40 with M-75 cover or, when installed in driveways, a GA675.

3. 1" Service - Box B-16 with B16G cover, or when installed in driveways, a B16C cover.

4. 3/4" Service 0 Box B-9 wit B90 cover, or in driveways a BPc cover.

5.09. INSTALLATION OF SERVICES:

1. GENERAL: Service lines shall be installed in accordance with these specifications and the City Standard Drawings.

2. CORPORATION STOP INSTALLATION: The water main shall be topped at a position perpendicular to the axis of the main and 30 degrees to the horizontal at a location as nearly opposite of the curb stop as possible.

The main shall be tapped with an approved type combination drilling and tapping machine equipped with an I.P. thread. The drill and tap shall be properly lubricated during the drilling and tapping process to insure true, clean-cut threads.

The corporation stop shall be turned to a final position which will prevent any leakage or weeping and which will locate the operating key above the horizontal.

3. INSTALLATION OF COPPER TUBING: Copper tubing shall be installed beneath all sidewalk, curb, gutter and roadway areas by means of boring. In the event that excavation of any sidewalk, curb, gutter or roadway area becomes necessary, all such excavation shall be backfilled with sand, or other approved granular material, and thoroughly water tamped. The use of excavated material for backfill will not be permitted.

The copper tubing shall be a minimum of 36" below the pavement surface at the water main and a a minimum of 24" below the flow line at the curb face. Where there is no existing curb, the service line shall be a minimum of 24" below the surface of the ground at the edge of the right-of-way.

Between the side of the water main trench and the corporation stop at an "S" type curve shall be introduced into the tubing in order to provide flexibility between the service and the water main. Extreme care shall be exercise in the bending operation to prevent kinking or flattening the tubing.

The copper tubing shall be cut to such a length as will locate the curb stop back of the sidewalk, or back of the curb if sidewalks are not adjacent to the curb. When the curb stop has been connected, the operating key shall be upright and the axis through the stop perpendicular to the edge of the sidewalk.

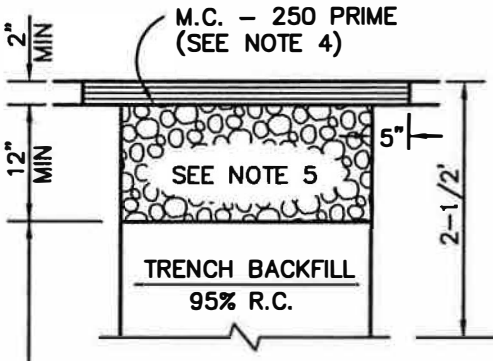
4. FLUSHING AND ADJUSTING: When the service has been completely connected, water from the main shall be flushed through the service with the operating key on the corporation and curb stops in a maximum open position.

All connections shall be thoroughly inspected and wiped clean of any dirt or mud in order that any "weeping" may be detected. Any and all leaks must be completely stopped and the Inspector notified before backfilling either end of the service.

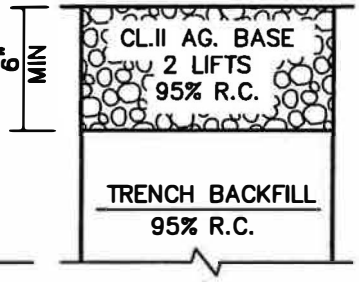
SECTION 3

SEWER STANDARDS

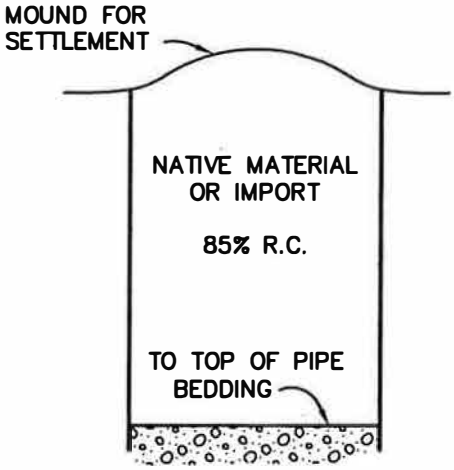
PAVED AREAS

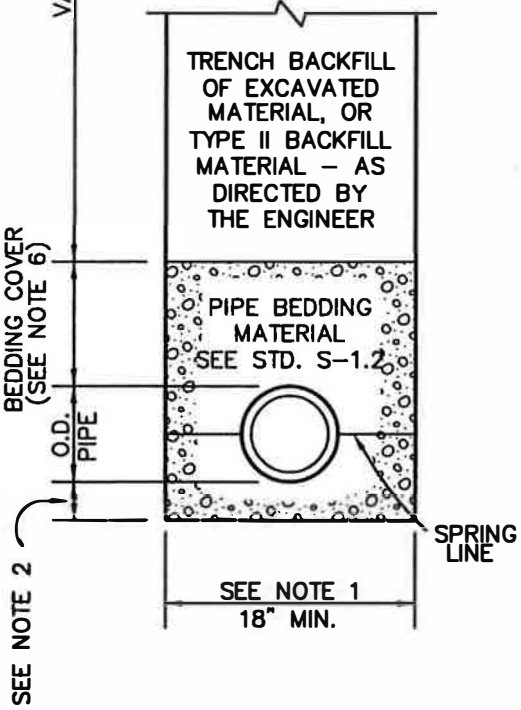


SHOULDER AREAS



UNIMPROVED AREAS





NOTES:

1. MAXIMUM TRENCH WIDTH SHALL BE 16" PLUS O.D OF PIPE. MINIMUM WIDTH SHALL BE 18".
2. IN UNSTABLE MATERIAL– 12", OR TO STABLE MATERIAL, WHICHEVER IS LESS, OR AS DIRECTED BT THE ENGINEER.
   IN ROCK– 1/3 O.D. OF PIPE, OR 4" MIN.
   IN STABLE MATERIAL– 3" MIN.
3. R.C. SHALL MEAN RELATIVE COMPACTION.
4. A.C. PAVING SHALL BE EQUAL IN THICKNESS TO EXIST. PAVING, OR 2" MIN., WHICHEVER IS GREATER. SEE PLANS.
5. CLASS II AGG. BASE, WHICHEVER IS GREATER. SEE PLANS.
6. 6" MINIMUM PIPE BEDDING COVER FOR D.I.P. AND 12" MINIMUM FOR ALL OTHER PIPE.
7. PIPE BEDDING MATERIAL SHALL BE PLACED IN 3 OPERATIONS.
   a. BEDDING TO BOTTOM OF PIPE AND COMPACTED.
   b. BACKFILL TO SPRING LINE AND COMPACTED.
   c. BACKFILL TO 12" ABOVE PIPE AND COMPACTED.
8. ALL TRENCH EXCAVATION AND SHORING SHALL CONFORM TO CAL–OSHA REGULATIONS.
9. THE ENGINEER MAY DIRECT THE CONTRACTOR TO EXCAVATE THE TRENCH TO A DEPTH GREATER THAN SHOWN ON THIS DRAWING WHEN, IN THE ENGINEER'S OPINION, THE NATIVE MATERIAL AT THE TRENCH BOTTOM WILL NOT PROVIDEPROPER SUPPORT FOR THE PIPE. THE RESULTING ADDITIONAL EXCAVATED VOLUME SHALL BE BACKFILLED WITH TYPE 1 MATERIAL TO THE GRADE LINE. PAYMENT FOR THE ADDITIONAL EXCAVATION AND BACKFILL MATERIAL WILL BE BASED ON THE ADDITIONAL DEPTH ORDERED BY THE ENGINEER, THE STANDARD WIDTH OF THE TRENCH (PIPE O.D. + 16") AND THE UNIT PRICE BID.

SEE STD. S–1.2 FOR ADDITIONAL NOTES

SEBASTOPOL CALIFORNIA PUBLIC WORKS

STANDARD SANITARY SEWER TRENCH DETAIL

STD. NO. S-1.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

MATERIAL SPECIFICATIONS:

DRAIN ROCK SHALL BE EITHER OF THE NOMINAL SIZES DESIGNATED AS 1–1/2" BY 3/4" OR 2–1/2" BY 1–1/2".

PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE A WELL GRADED AGGREGATE MATERIAL AND SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADINGS:

	PERCENT PASSING			
	3"	1"	3/4"	NO. 4
PIPE BEDDING		100	95–100	55–100
TRENCH BACKFILL	100			40–100

AGGREGATE BASE SHALL BE CLASS 2, 1–1/2" MAX. OR 3/4" MAX CONFORMING TO THE PROVISIONS OF SECTION 26 OF THE STATE STANDARD SPECIFICATIONS.

NATIVE MATERIAL SHALL NOT CONTAIN ROCKS LARGER THAN 3".

COMPACTION REQUIREMENTS: (AS SHOWN ON STD. S–1.1 AND BY THE FOLLOWING MODIFICATIONS).

DRAIN ROCK SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR.

PIPE BEDDING MATERIAL USED TO GRADE THE TRENCH SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR WHEN IT IS PLACED OVER DRAIN ROCK OR WHEN DEPTH IS GREATER THAN 12".

PIPE BEDDING MATERIAL SHALL EITHER BE HAND TAMPED UNDER AND AT THE SIDES OF THE PIPE IN LIFTS NOT GREATER THAN 6" OR SHAPED AND COMPACTED PRIOR TO PIPE INSTALLATION.

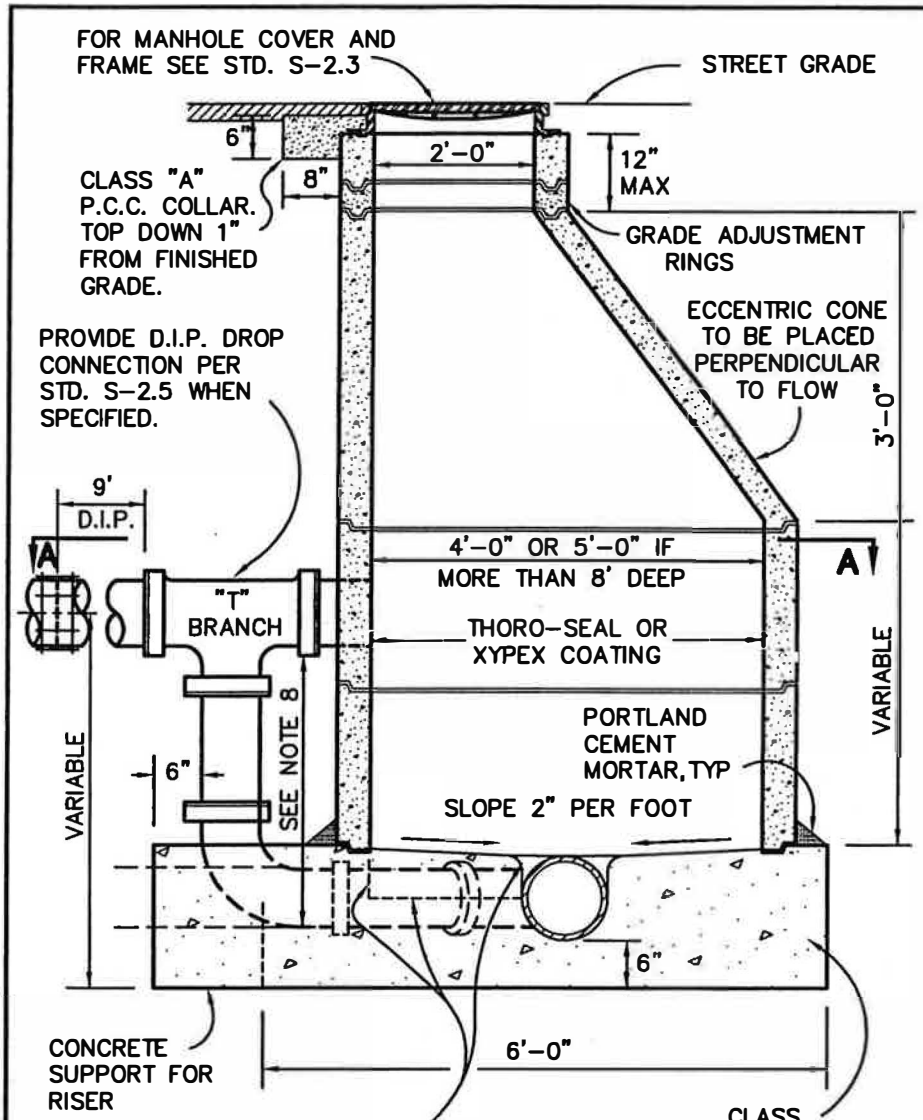
GENERAL: THE COMPACTION REQUIREMENTS SHALL BE ACHIEVED UTILIZING METHODS AND EQUIPMENT APPROVED BY THE CITY. ANY METHOD OF COMPACTION WHICH FAILS TO UNIFORMLY ACHIEVE THE REQUIRED LEVELS OF COMPACTION THROUGHOUT THE LENGTH AND DEPTH OF TRENCHES SHALL BE DISCONTINUED. COMPACTION METHODS AND EQUIPMENT SHALL BE SUCH AS NOT TO DAMAGE THE INSTALLED PIPE, EXCEED ITS LOADING CAPACITY, OR DISTURB ITS ALIGNMENT. FLOODING, PONDING, OR THE USE OF DROP HAMMER TYPE COMPACTION EQUIPMENT WILL NOT BE ALLOWED.

MECHANICAL COMPACTION: TRENCH BACKFILL SHALL BE PLACED IN UNIFORM, HORIZONTAL LAYERS NOT EXCEEDING EIGHT (8) INCHES IN THICKNESS BEFORE COMPACTION. EACH LAYER SHALL BE COMPACTED, USING MECHANICAL MEANS, TO THE SPECIFIED DENSITY SHOWN ON THE PLANS.

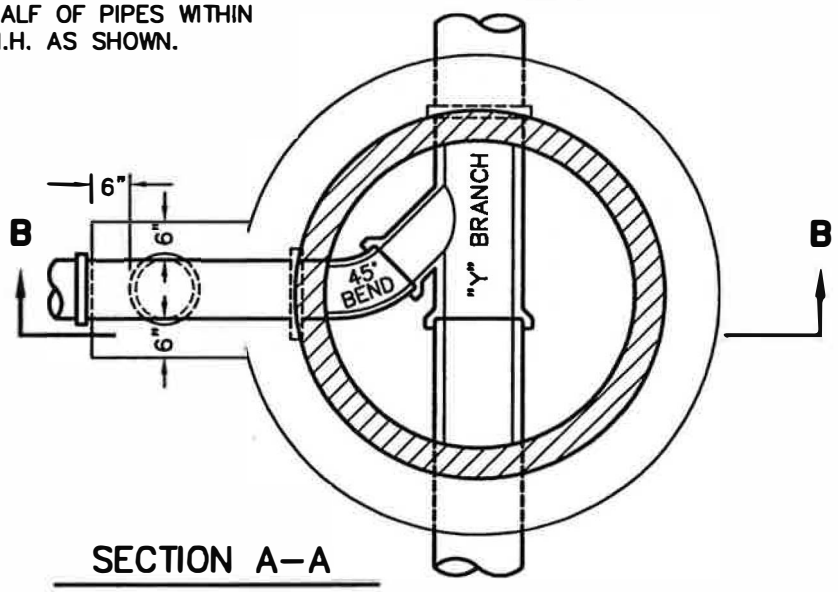
THE CONTRACTOR MAY, AT HIS SOLE OPTION AND AT HIS SOLE EXPENSE, CONSTRUCT A TEST TRENCH SECTION WHICH DEMONSTRATES METHODS, EQUIPMENT, OR MATERIALS WHICH WILL RELIABLY ACHIEVE THE REQUIRED COMPACTION IN LIFTS GREATER THAN 8 INCHES. AT ITS SOLE DISCRETION, THE CITY MAY INCREASE THE MAXIMUM ALLOWABLE LIFT THICKNESS PERMITTED BASED UPON THE RESULTS DEMONSTRATED BY THE TEST TRENCH SECTION. SHOULD SUBSEQUENT TESTING DEMONSTRATE THAT THE REQUIRED COMPACTION IS NOT BEING RELIABLY ACHIEVED, THE CITY MAY, AT ITS SOLE DISCRETION, REDUCE THE MAXIMUM LIFT THICKNESS TO ITS ORIGINAL VALUE OF 8 INCHES.

JETTING: JETTING IS NOT ALLOWED.

SEBASTOPOL CALIFORNIA PUBLIC WORKS	STANDARD SANITARY SEWER TRENCH DETAIL (CONTINUED)	STD. NO. S-1.2
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK		DATE: JULY 1998



SECTION B-B



SECTION A-A

NOTES:

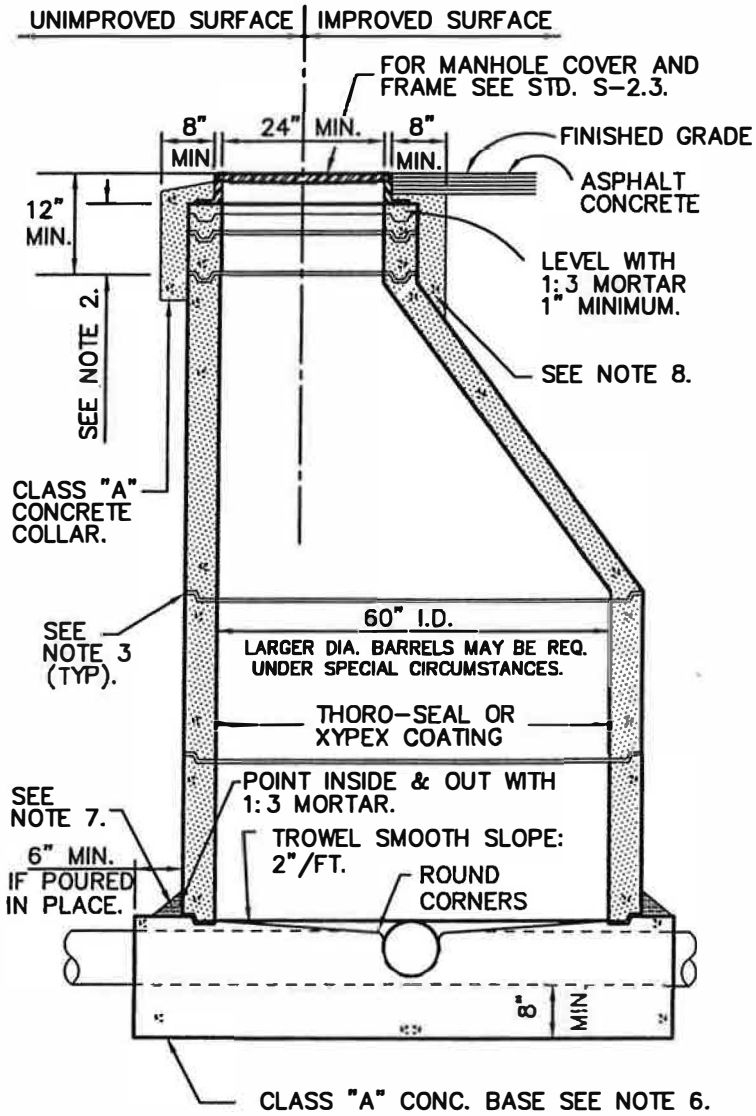
1. PRE-CAST MANHOLES TO BE MANUFACTURED TO A.S.T.M. SPECIFICATION C-478.
2. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP JOINT 1-1/2" (3/4"x 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
3. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
4. OUTSIDE DROP FITTINGS SHALL BE DUCTILE IRON CLASS 50 WITH MECHANICAL JOINTS.
5. FLEXIBLE COUPLING SHALL BE PLACED OUTSIDE M.H. EXCAVATION AND SHALL BE SMITH BLAIR OR EQUAL.
6. WHEN D.I.P. OR PVC PIPE IS USED, A SEWER COUPLING ADAPTER SHALL BE USED WITH RUBBER GASKET.
7. MINIMUM DIFFERENCE BETWEEN INVERTS IS AS FOLLOWS:
   - 6" DIA. - 30"
   - 8" DIA. - 32"
   - 10" DIA. - 36"
   - 12" DIA. - 38"
8. FOR LESS THAN MIN. DIFFERENCE, SHAPE BOTTOM OF MANHOLE TO ACHIEVE DROP IN ELEVATION.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

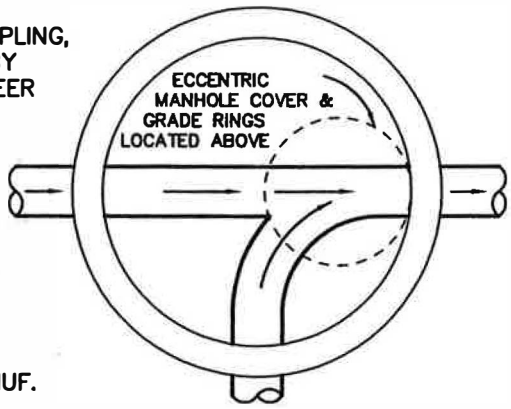
STANDARD 48" DIAMETER CONCRETE SANITARY SEWER MANHOLE

STD. NO. S-2.1

SCALE: NONE	DRAWN: LMM	CHK: SAL	APPVD: PHK	DATE: JULY 1998



A FLEXIBLE COUPLING, AS APPROVED BY THE CITY ENGINEER SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE (TYP). NOT REQUIRED WHEN PRECAST BASES ARE MANUF. W/FLEX. CPLGS. ALREADY INSTALLED.



MANHOLE BASE

CHANNELIZATION PLAN AND LOCATION OF ECCENTRIC MANHOLE COVER

NOTES:

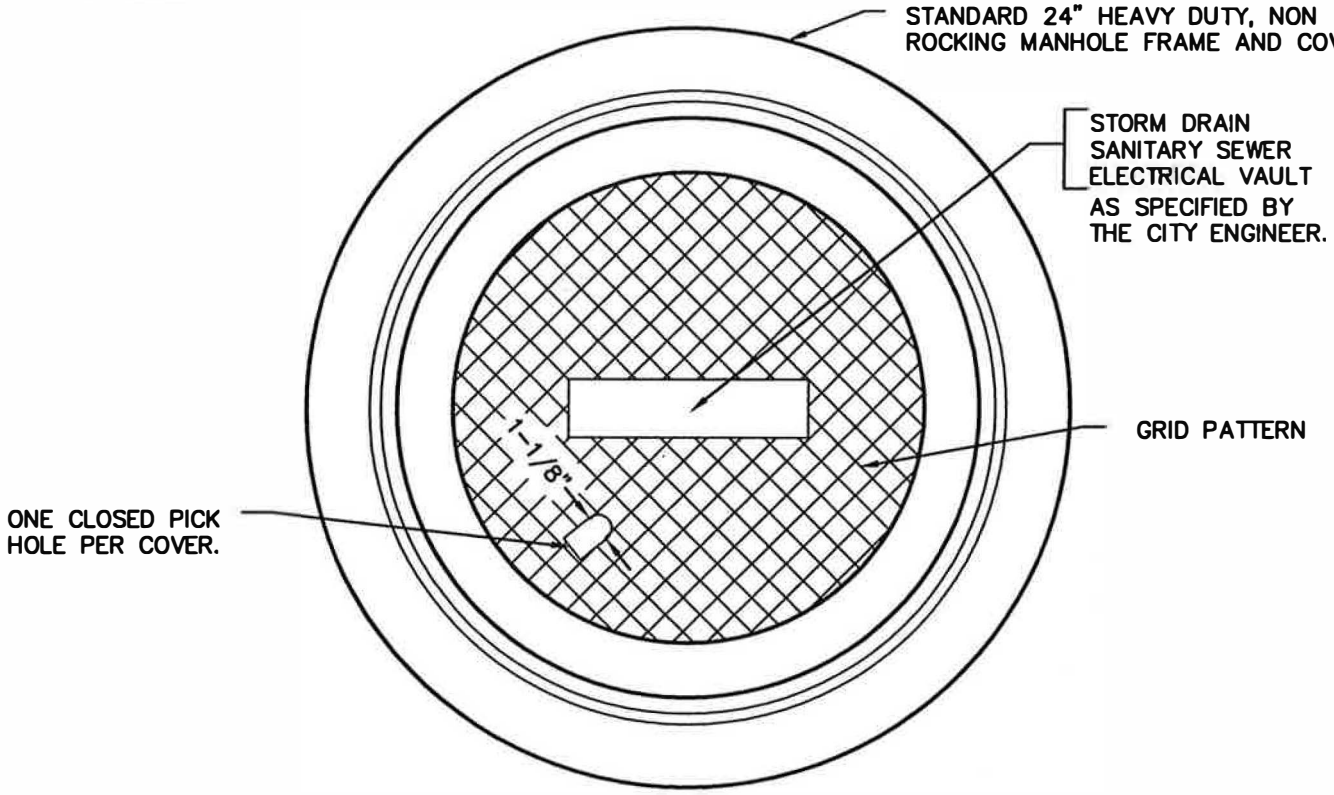
1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP JOINT 1-1/2" (3/4" X 2-1/2")RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
4. CONE SECTION (TAPER) MUST BE ECCENTRIC FOR 60" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE CITY ENGINEER.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN SUB-BASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL SHALL BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS), AND PLASTER 6" FILLET, 1:3 MORTAR.
8. CLASS "A" CONC. COLLAR SHALL BE 2" BELOW FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE CITY ENGINEER.
11. 60" I.D. MANHOLE TO BE USED FOR ALL TRUNK AND COLLECTOR SEWERS 18" OR LARGER, OR WHERE DIMENSION FROM FINISHED GRADE TO THE SEWER FLOW LINE IS GREATER THAN 8'-0", AS INDICATED ON THE DESIGN PLANS.
12. MANHOLES ON TRUNK SEWERS LARGER THAN 30"SHALL BE SIZED BY THE CITY ENGINEER.
13. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
14. MANHOLE SHALL BE DEWATERED AND DRY PRIOR TO INSPECTION.

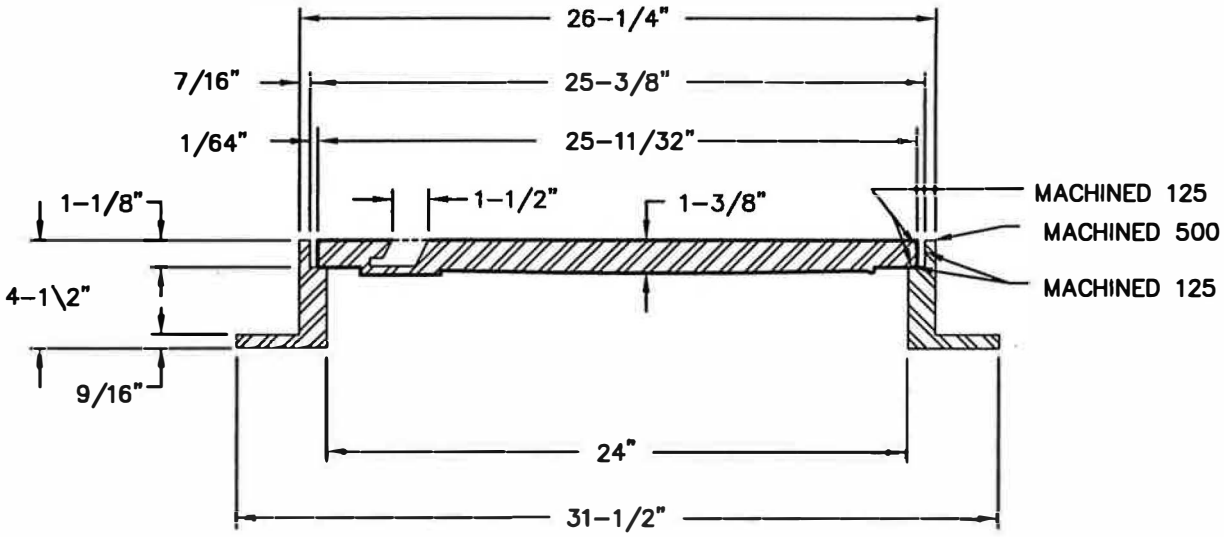
SEBASTOPOL CALIFORNIA PUBLIC WORKS

STANDARD 60" DIAMETER PRECAST CONCRETE SANITARY SEWER MANHOLE

STD. NO. S-2.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998





NOTES:

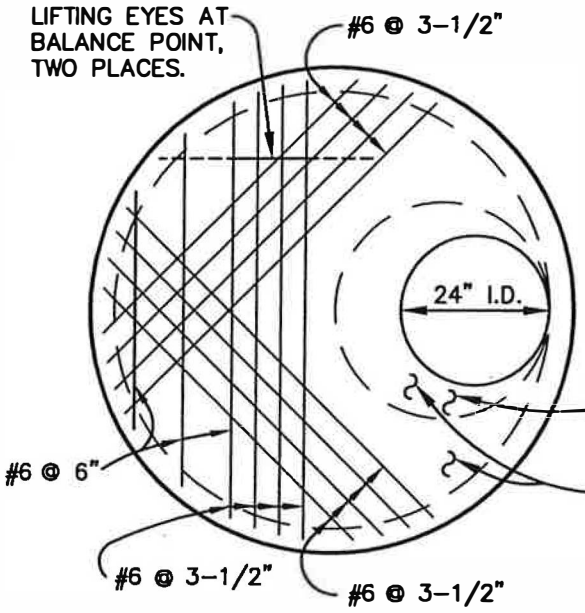
1. SPECIFY SANITARY SEWER, STORM DRAIN OR ELECTRICAL VAULT WHEN ORDERING. ALL CASTINGS SHALL BE DIPPED IN APPROVED ASPHALT PAINT.
2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION A-159-G3000, OR TO UNITED STATES GOVERNMENT SPECIFICATIONS QQI-652b.
3. MINIMUM WEIGHT COMPONENTS: COVER – 130 POUNDS
   FRAME – 135 POUNDS
4. SEE CITY'S APPROVED LIST FOR MANHOLE FRAME AND COVER.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

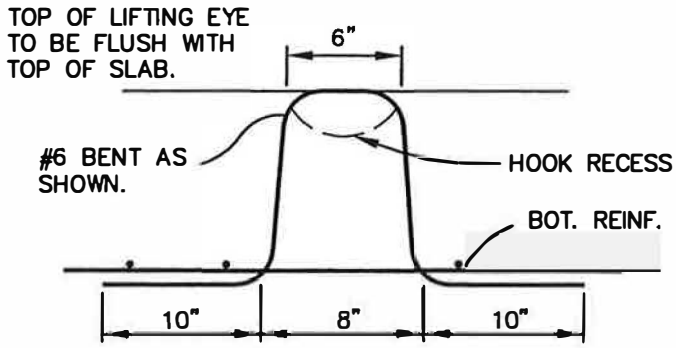
STANDARD MANHOLE FRAME AND COVER

STD. NO. S-2.3

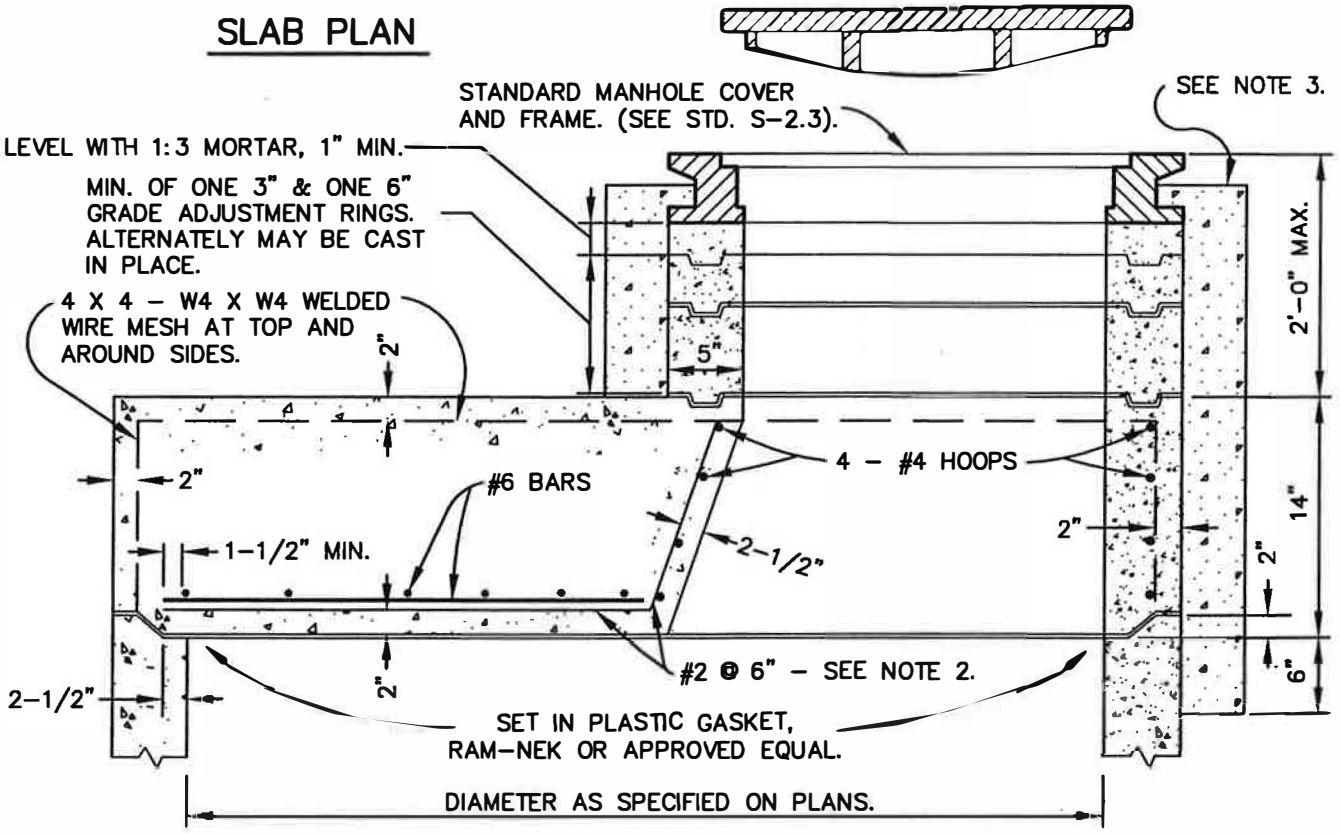
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



SLAB PLAN



LIFTING EYE DETAIL



NOTES:

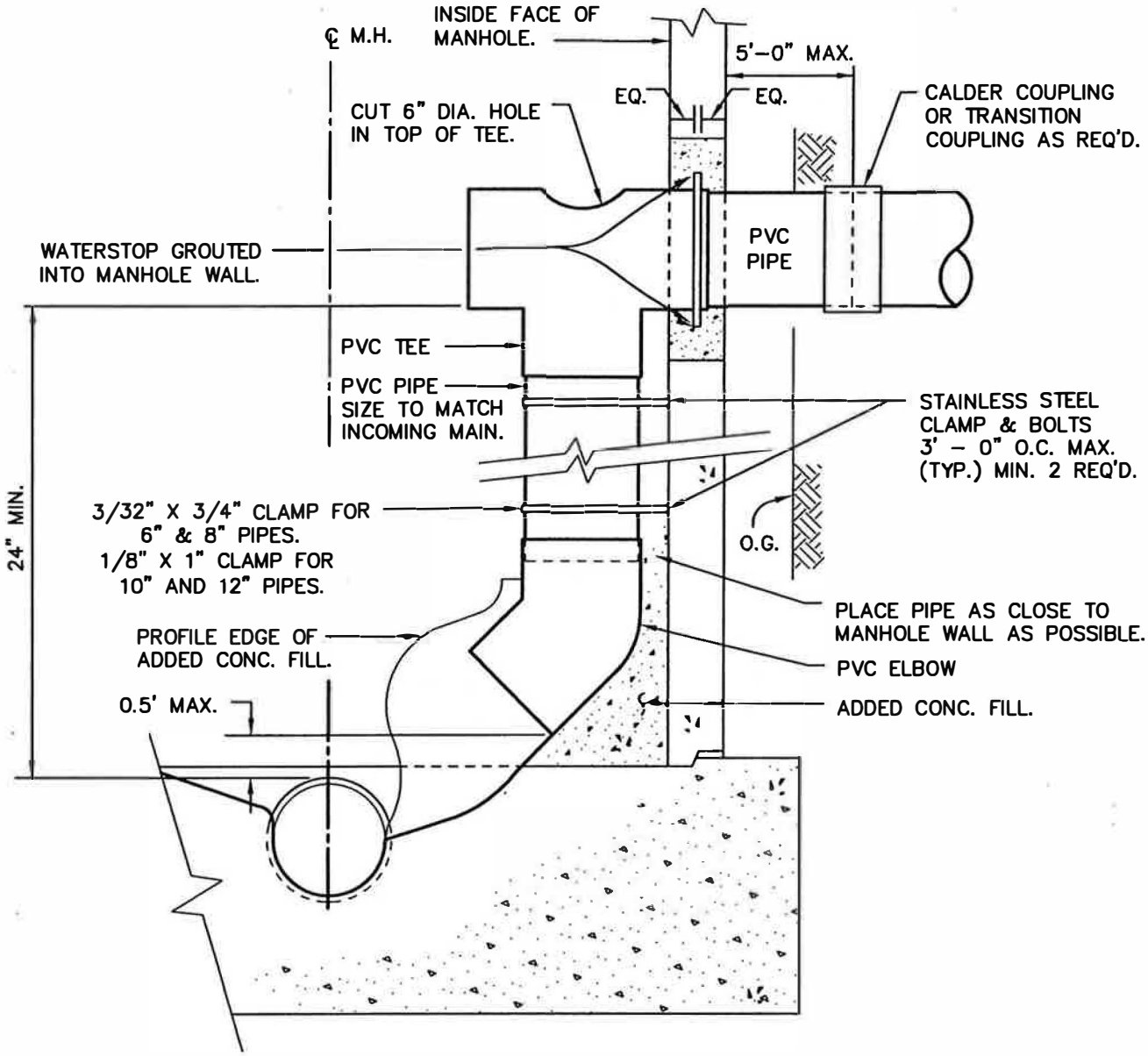
1. FOR DETAILS AND SPECIFICATIONS OF BASE AND BARREL SECTIONS, SEE STDS. S-2.1 AND S-2.2.
2. #2 BARS BENT UP AND SPACED 6" O.C. AROUND 24" OPENING. HORIZONTAL LEGS TO FAN OUT EQUALLY SPACED, TO 2-1/2" CLEAR AT EDGE OF SLAB.
3. CLASS "A" CONCRETE COLLAR.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

STANDARD PRECAST CONCRETE SANITARY SEWER MANHOLE REDUCER SLAB

STD. NO. **S-2.4**

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



NOTES:

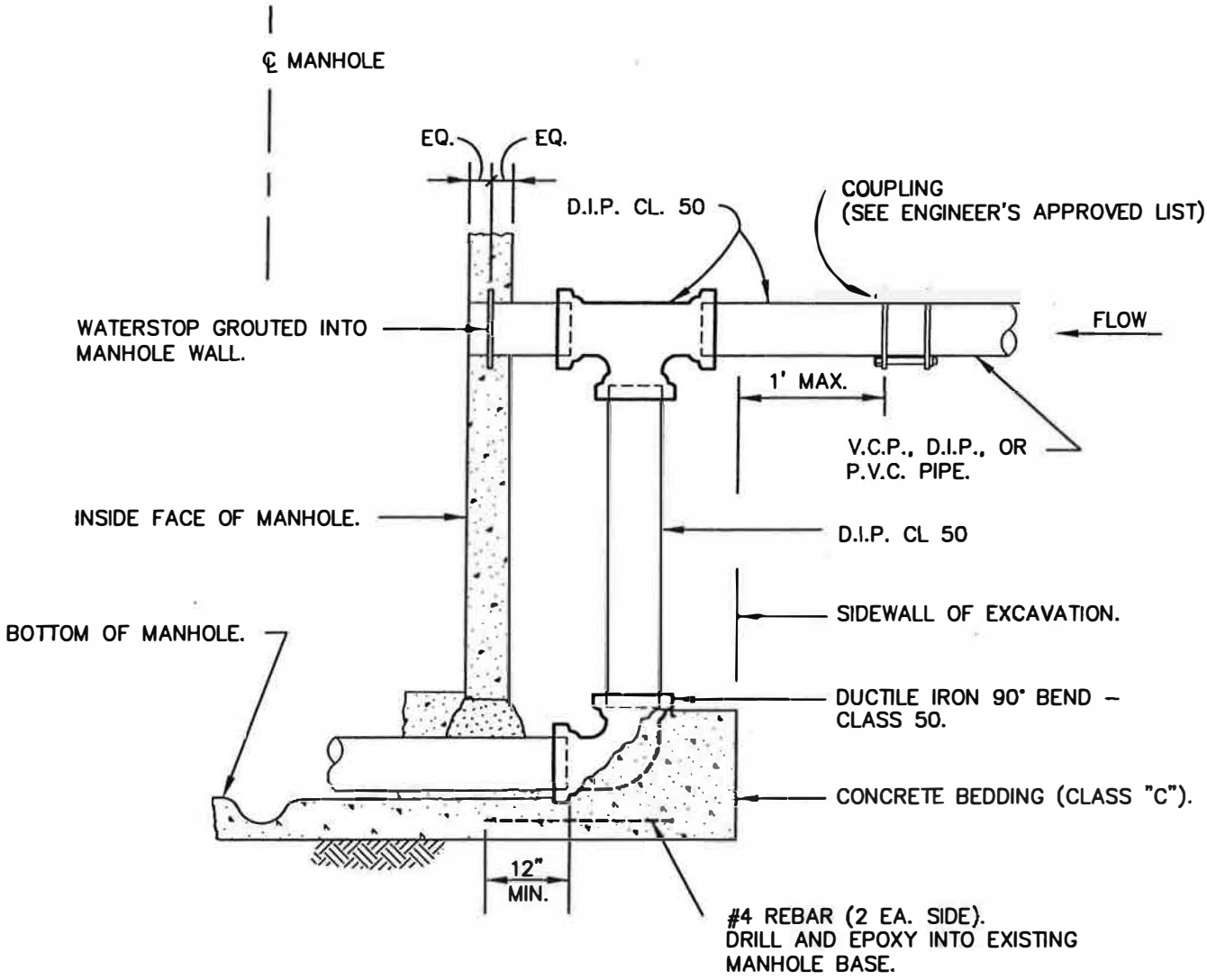
1. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.
2. NEW MANHOLES CONSTRUCTED USING THIS STANDARD SHALL BE 60 INCHES IN DIAMETER, & INSTALLED IN CONFORMANCE WITH STD. S-2.2.
3. ENCLOSE ELBOW IN CONCRETE. FORM SMOOTH CHANNEL TO MANHOLE FLOWLINE.
4. PVC PIPE AND FITTINGS TO BE SDR 35 OR SCH 40.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

INSIDE DROP INLET FOR SANITARY SEWER MANHOLE

STD. NO. S-2.5

SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998



NOTES:

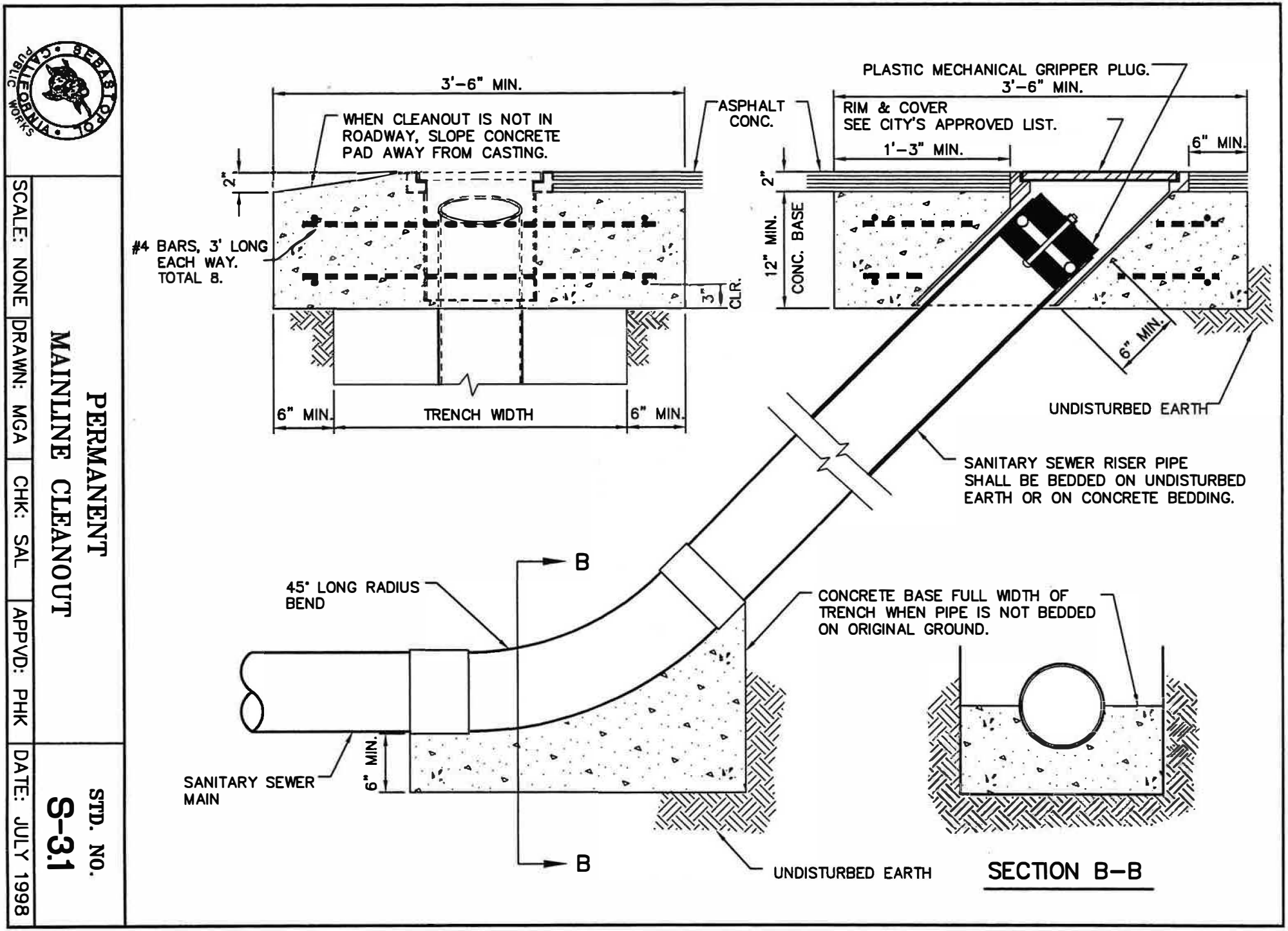
1. DUCTILE IRON PIPE AND FITTINGS SHALL BE CLASS 50 CONFORMING TO THE REQUIREMENTS OF ANSI A21.51.
2. PIPE AND FITTINGS SHALL BE FURNISHED WITH BELL AND SPIGOT ENDS, "TYTON JOINT" OR MECHANICAL JOINTS.
3. TO BE INSTALLED AT EXISTING 48" MANHOLES OR WHERE SPECIFICALLY APPROVED BY THE CITY ENGINEER.
4. DROP INLET PIPE AND FITTINGS SHALL BE THE SAME SIZE AS THE INCOMING SEWER MAIN.
5. SEE STD. S–2.5 FOR STANDARD INSIDE DROP INSTALLATION.
6. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

OUTSIDE DROP INLET FOR SANITATRY SEWER MANHOLE

STD. NO. S-2.6

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



CITY OF SEBASTOPOL · CALIFORNIA · PUBLIC WORKS

PERMANENT
MAINLINE CLEANOUT

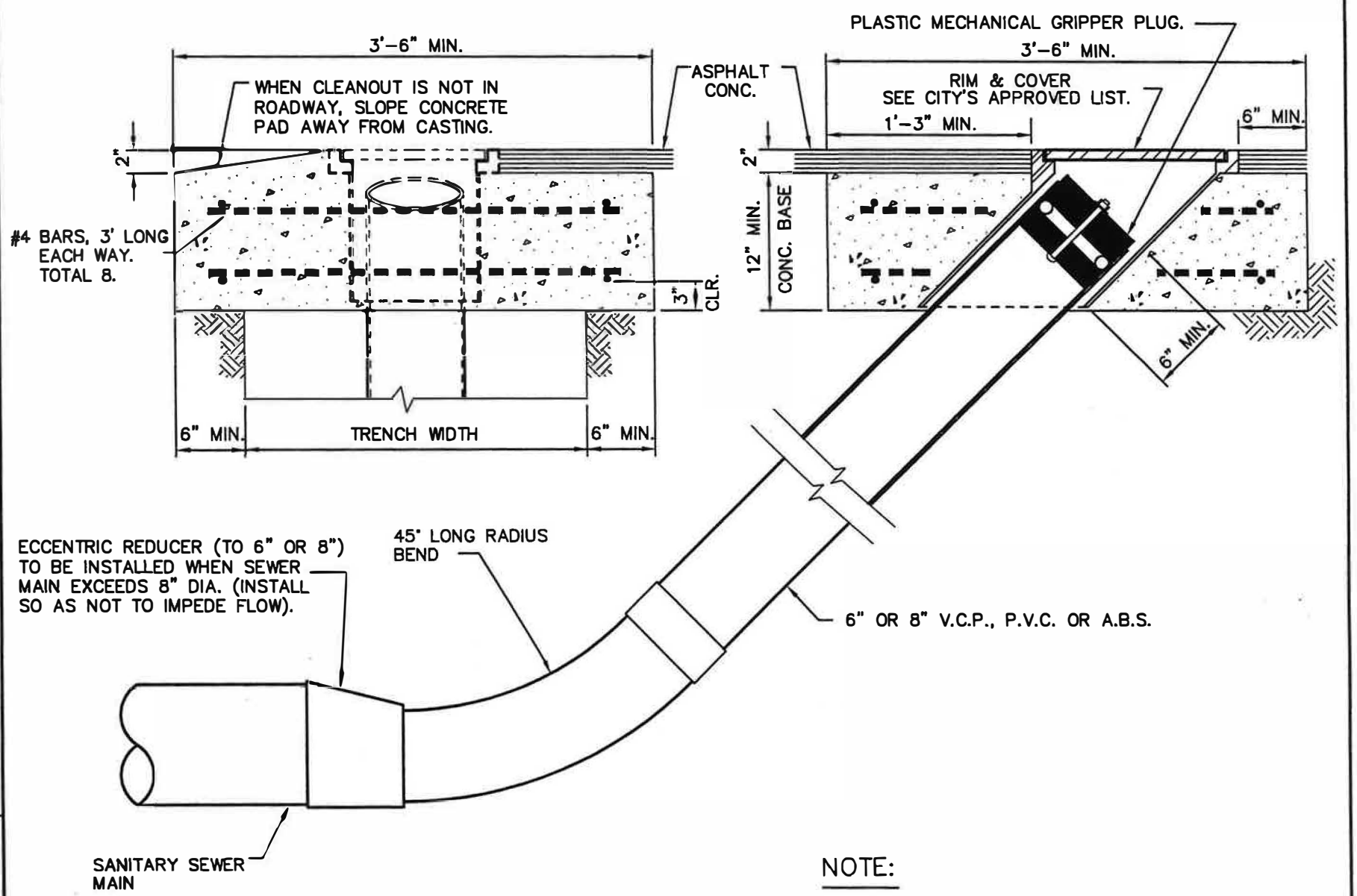
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. S-3.1

TYPE I TEMPORARY MAINLINE CLEANOUT

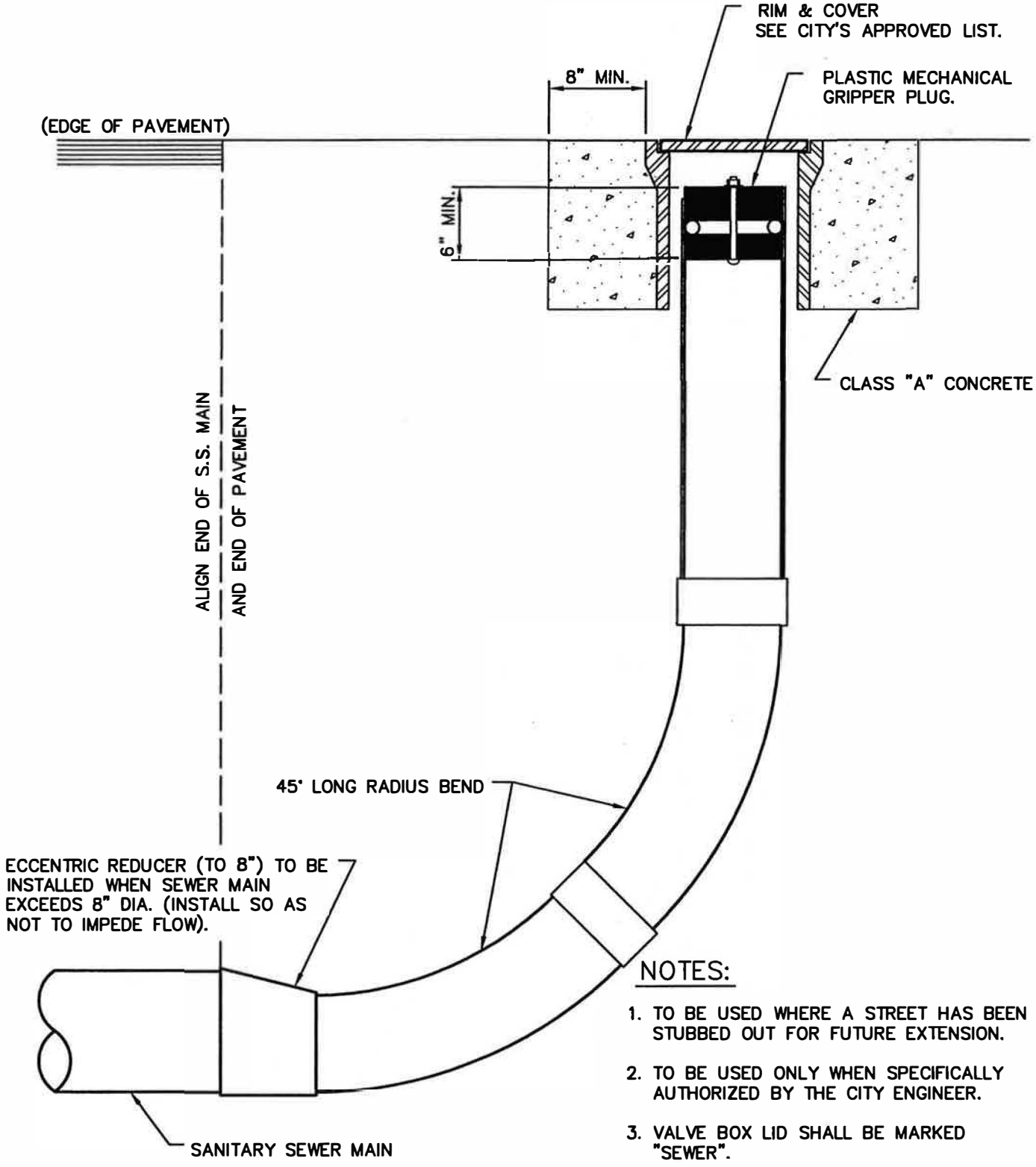
SCALE: NONE | DRAWN: MGA | CHK: SAL | APPVD: PHK | DATE: JULY 1998

STD. NO. S-3.2



NOTE:

TO BE USED ONLY WHEN SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER.



NOTES:

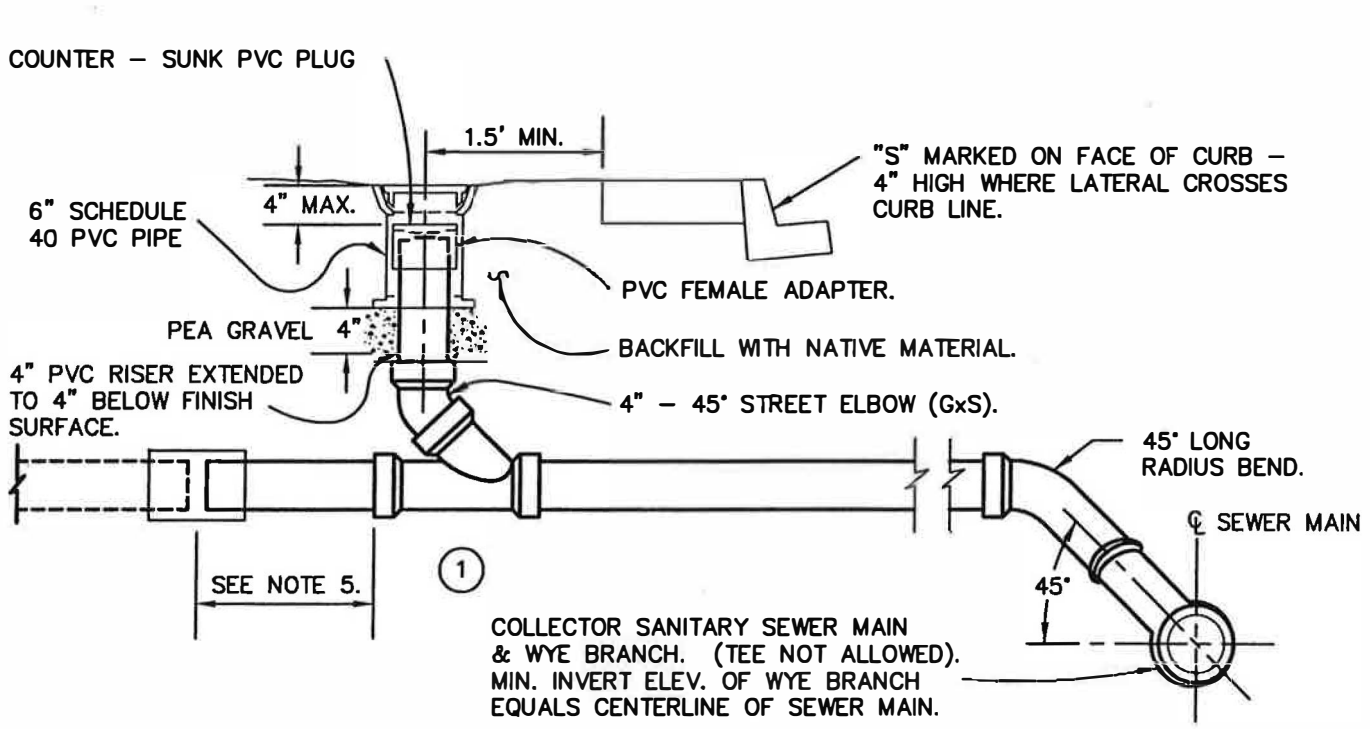
1. TO BE USED WHERE A STREET HAS BEEN STUBBED OUT FOR FUTURE EXTENSION.
2. TO BE USED ONLY WHEN SPECIFICALLY AUTHORIZED BY THE CITY ENGINEER.
3. VALVE BOX LID SHALL BE MARKED "SEWER".
4. EASEMENT ACQUISITION MAY BE REQ'D.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

TYPE II TEMPORARY MAINLINE CLEANOUT

STD. NO. S-3.3

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



CLEANOUT COMPONENTS:

(1) FOR 4" SVC. LATERAL USE 4" PVC 45° (GxGxG). FOR 6" SVC. LATERAL USE 6" X 6" X 4" WYE. WHEN LATERAL IS NOT PVC USE COUPLINGS AS NECESSARY TO INSTALL WYE.

(2) 4" PVC RISER LENGTH AS NECESSARY TO EXTEND TO WITHIN 4" OF FINISHED GRADE.

LATERAL CONNECTIONS TO EXISTING MAINS:

PVC, (SDR 35):
4" – 8" : CUT IN WYE
10" & LARGER: GLUE ON SADDLE WITH STRAP TIES.

LATERAL PIPE TO BE 4" MINIMUM DIAMETER AND ONE OF THE FOLLOWING MATERIALS:

1) DUCTILE IRON PIPE
2) POLYVINYL CHLORIDE (PVC) PIPE, SDR 35 WHEN USED WITH A MANUFACTURED "Y" SPECIFICALLY DESIGNED FOR PVC LATERALS. THE "Y" SHALL BE POLYVINYL CHLORIDE (PVC), SDR 35.

NOTES:

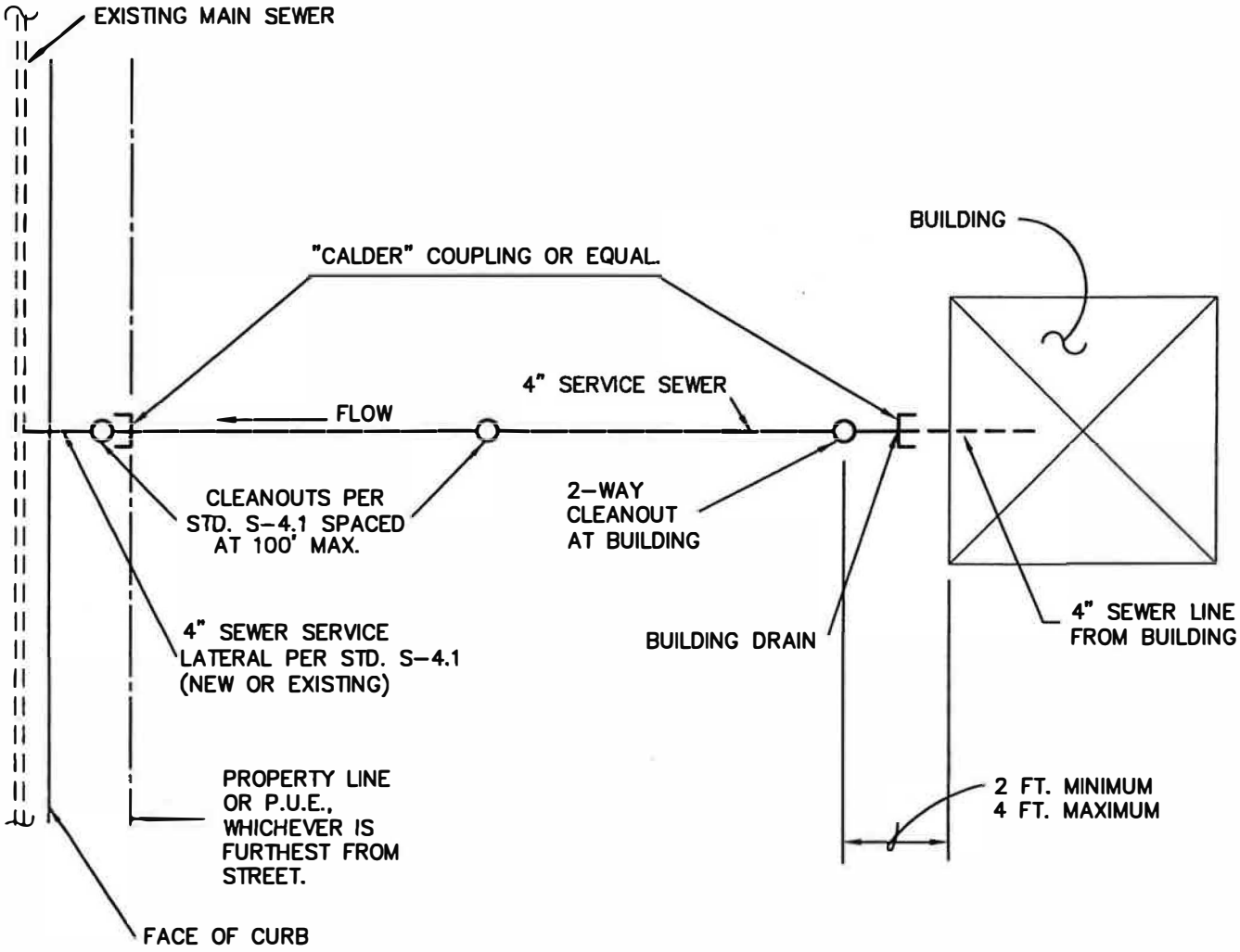
1. THE SEWER SERVICE LATERAL SHALL BE OF SUFFICIENT DEPTH TO ADEQUATELY SERVE THE BUILDING SITE, AND IN NO CASE SHALL HAVE LESS THAN 3 FT OF COVER AT THE CLEANOUT UNLESS OTHERWISE AUTHORIZED BY THE CITY ENGINEER.
2. WHERE PROBLEMS ARE ANTICIPATED IN PROVIDING SEWER SERVICE TO A GIVEN BUILDING SITE, THE LATERAL INVERT AT THE BACK OF THE P.U.E. SHALL BE STAKED BY THE OWNER'S ENGINEER.
3. WHERE SERVICE LATERAL IS LOCATED IN DRIVEWAY APPROACH, THE CLEANOUT IS TO BE LOCATED 18" BEHIND APRON.
4. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
5. A MINIMUM OF 12" WHEN CONNECTING TO EXISTING SEWER LATERAL AND EXTEND TO 1' BEHIND P.U.E.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

SEWER SERVICE LATERAL

STD. NO. S-4.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



PLAN

NOTES:

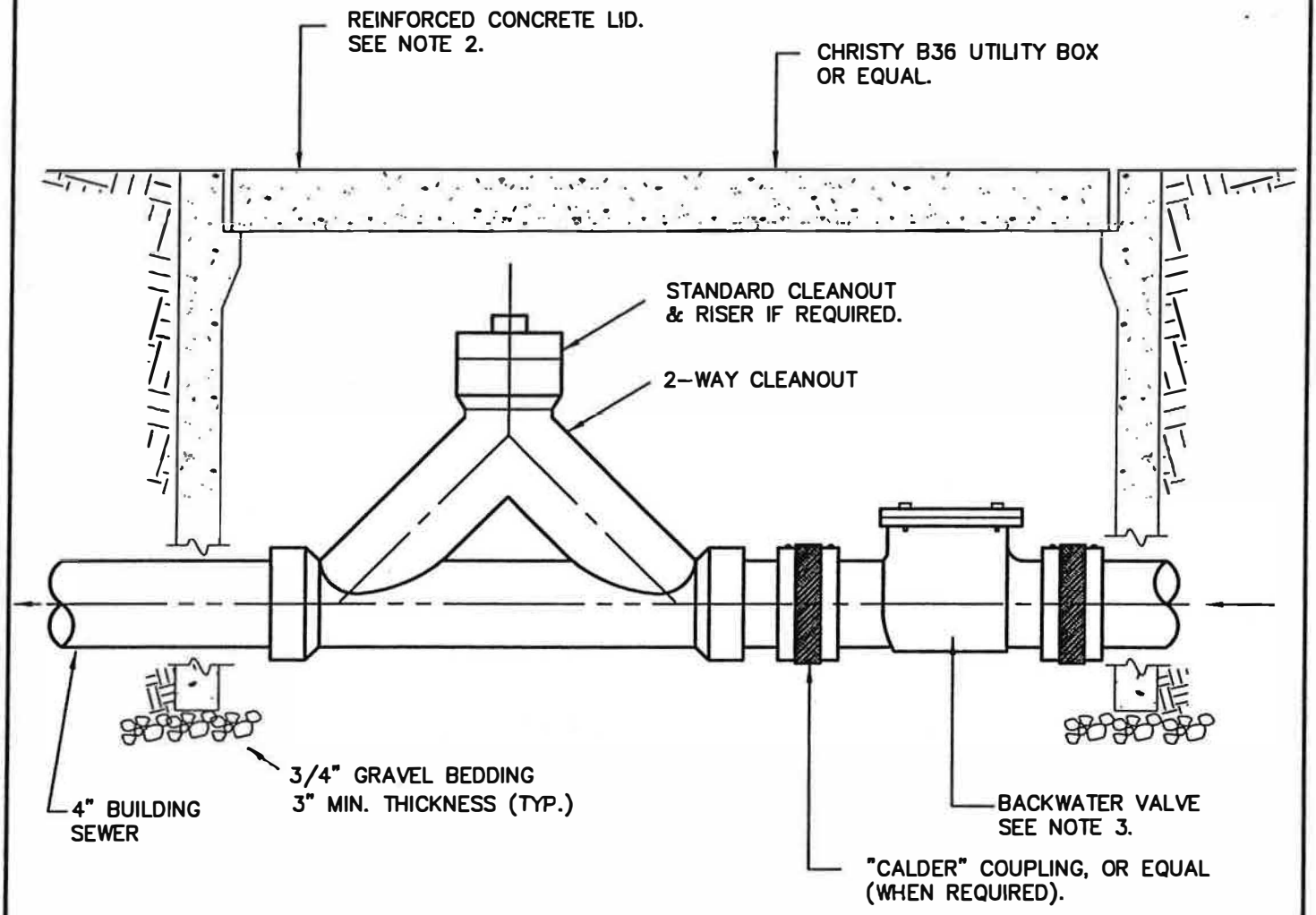
1. WHERE BUILDING SEWERS ARE LOCATED UNDER DRIVEWAYS, CAST IRON OR DUCTILE IRON SEWER PIPE SHALL BE USED.
2. SEE STD. S-4.4 FOR TRENCH DETAIL.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

TYPICAL SEWER SERVICE CONNECTION DETAILS

STD. NO. S-4.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



NOTES:

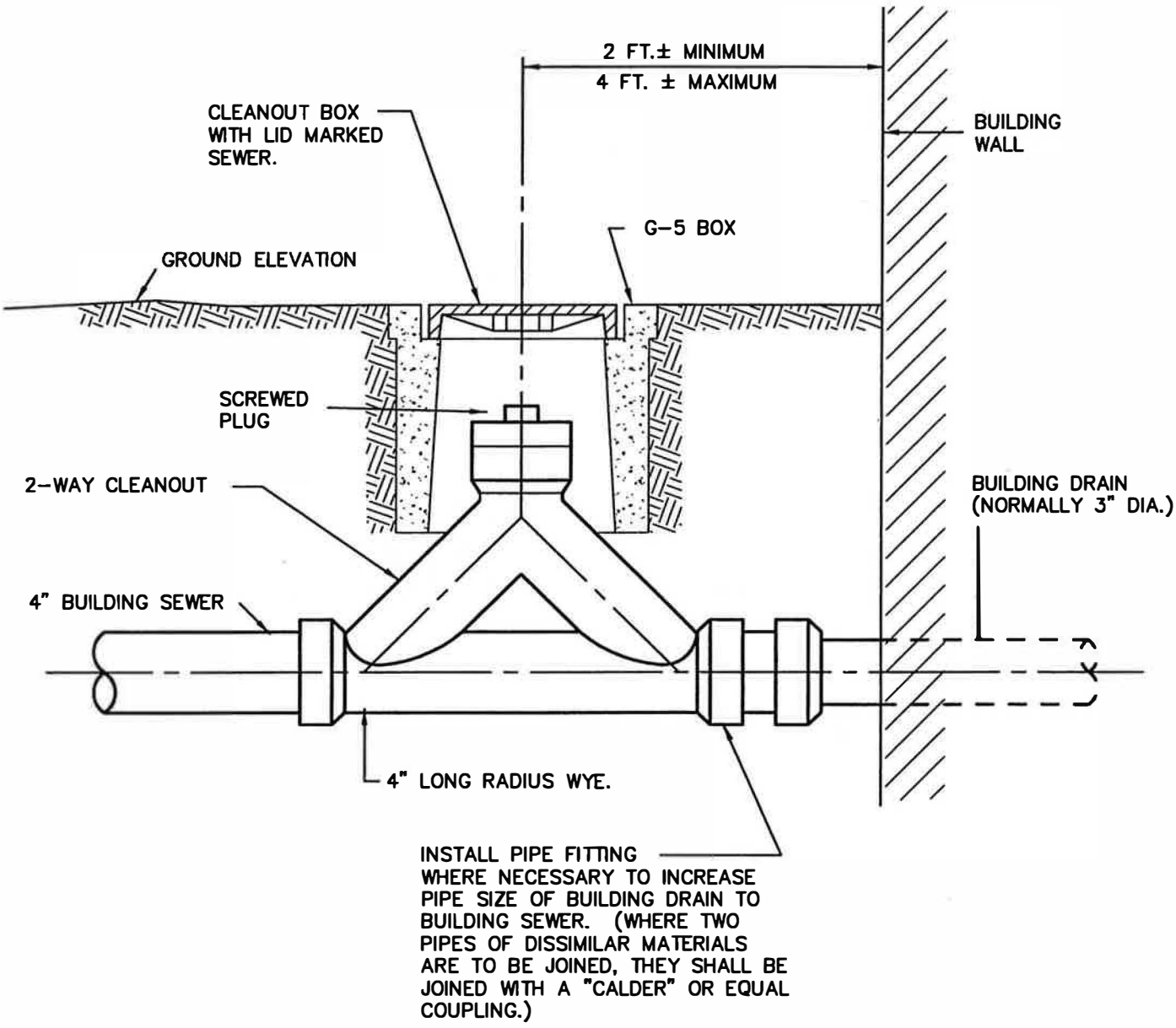
1. THIS INSTALLATION IS REQUIRED WHEREVER THE LOWEST FINISHED FLOOR ELEVATION IS TWELVE (12") INCHES, OR LESS ABOVE THE TOP ELEVATION OF THE NEAREST UPSTREAM MANHOLE OR CLEANOUT.
2. IF THE LID IS SUBJECT TO VEHICULAR TRAFFIC, USE LID DESIGNED FOR H-20 TRAFFIC LOADINGS.
3. BACKWATER VALVE SHALL BE CAST IRON OR CAST BRONZE. VALVE SHALL BE APPROVED BY THE CITY ENGINEER.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

BACKWATER CHECK VALVE INSTALLATION

STD. NO. S-4.3

SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998



SEBASTOPOL CALIFORNIA PUBLIC WORKS

CLEANOUT DETAIL AT BUILDING

STD. NO. S-4.4

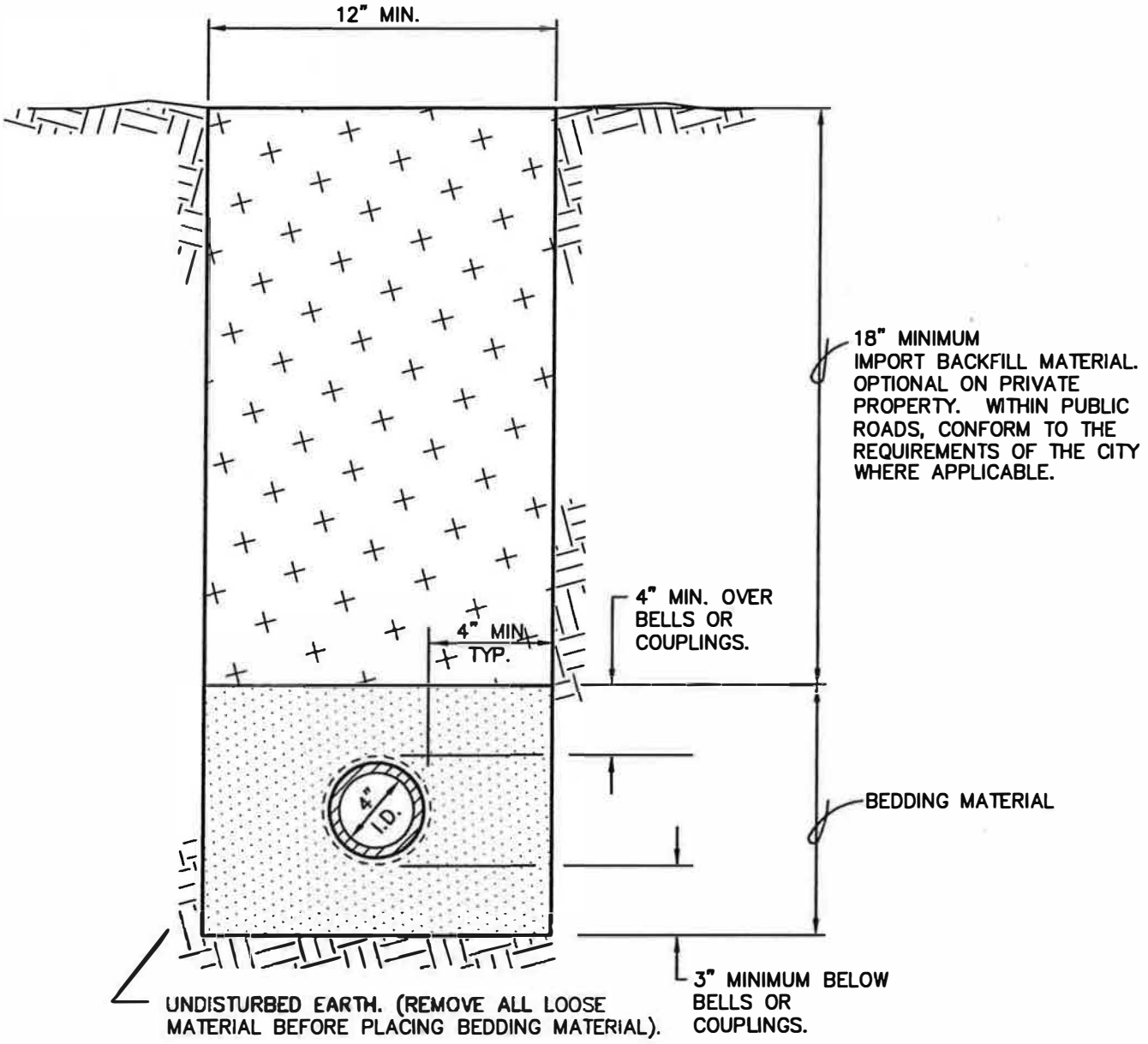
SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998

NOTES:

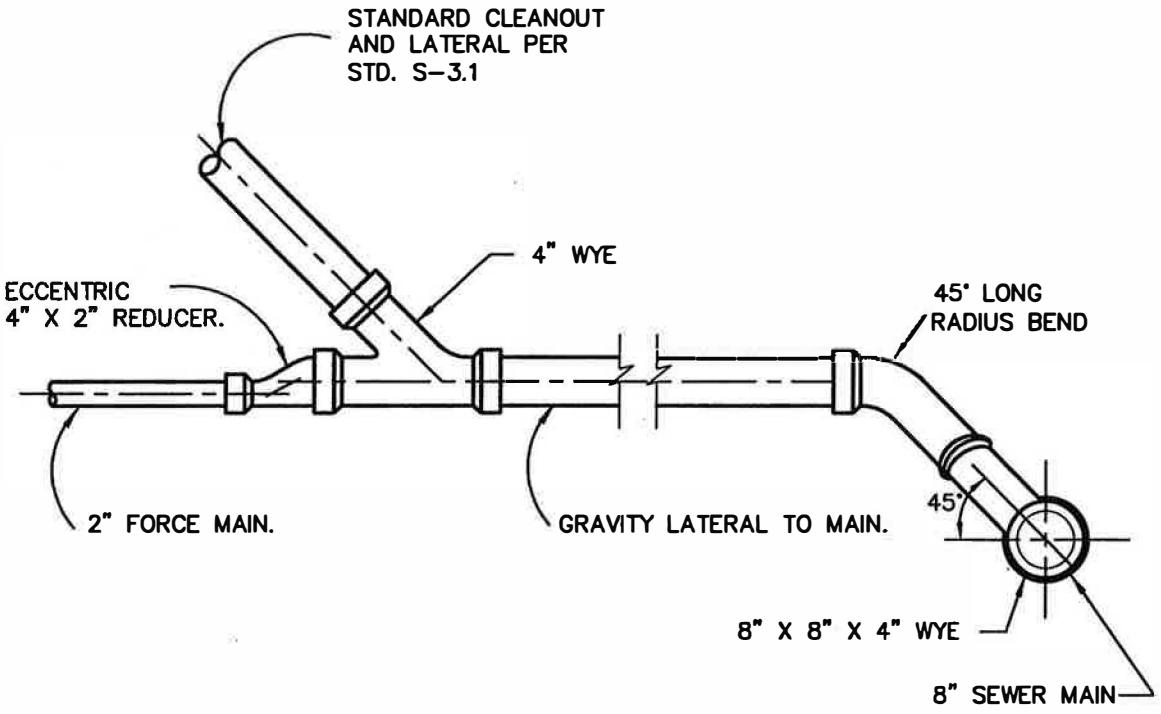
PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE A WELL GRADED MATERIAL AND SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADINGS:

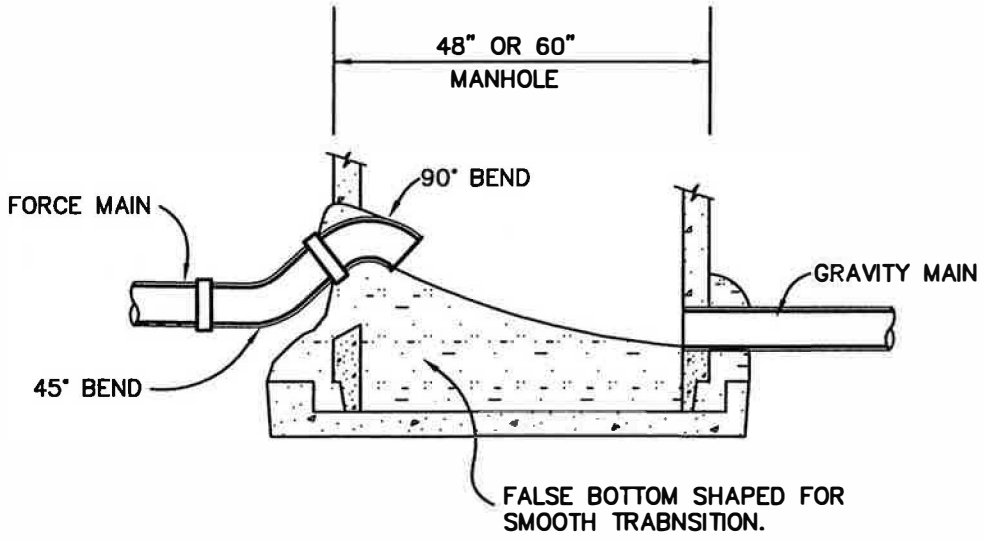
	PERCENT PASSING					
	3"	3/4"	3/8"	NO.4	NO.16	NO.200
PIPE BEDDING	100	80–100	10–50	5–30		0–4
TRENCH BACKFILL	NATIVE MATERIAL MAY BE USED					

IN ADDITION, WHEN TESTED WITH THE FOLLOWING SERIES OF SIEVES, NO MORE THAN 25% OF THE MATERIAL WILL BE RETAINED BETWEEN ANY ADJACENT SIEVES: 3", 2–1/2", 2", 1–1/2", 1", 3/4", 1/2", 3/8", NO. 4, NO. 8, NO. 16, NO. 30, NO. 50, NO. 100, AND NO. 200.



SEBASTOPOL CALIFORNIA PUBLIC WORKS	SEWER SERVICE TRENCH DETAIL				STD. NO. S-4.5
	SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998





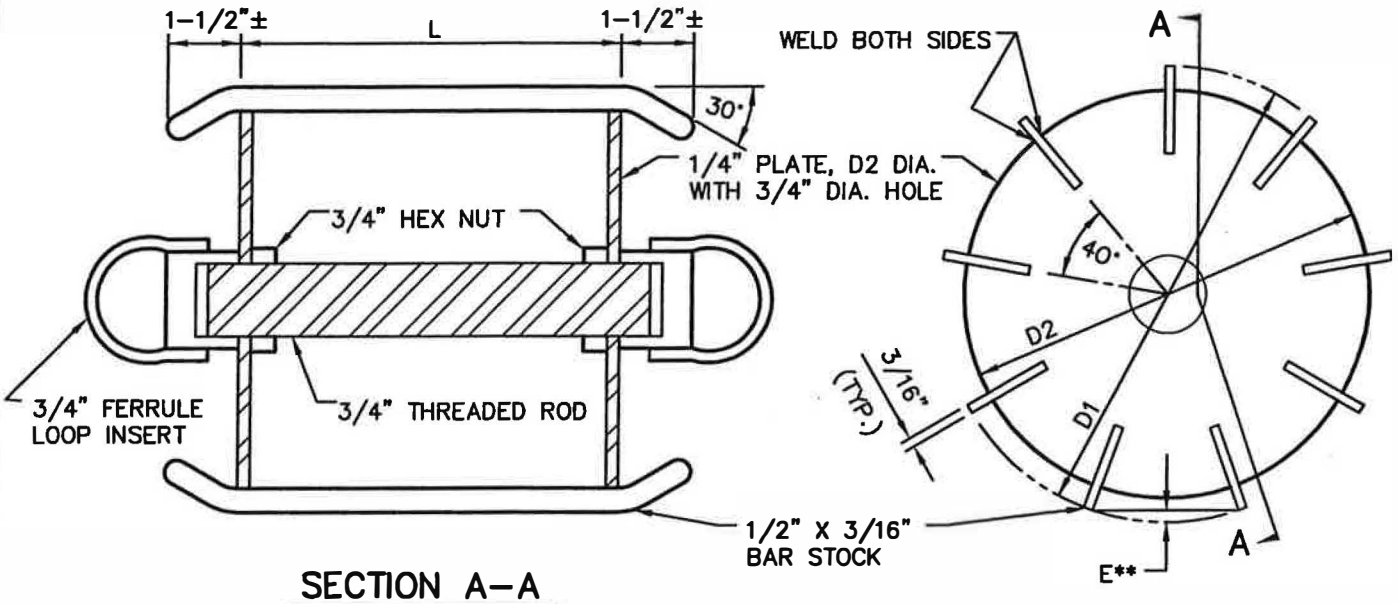
TERMINAL MANHOLE OF FORCE MAIN

NOTES:

1. MUST BE USED FOR ALL PRIVATE SEWAGE LIFT STATION DISCHARGES. NO DISCHARGES MAY BE MADE DIRECTLY TO THE COLLECTOR SEWER, TRUNK SEWER, OR MANHOLE.
2. ANY ALTERNATE DESIGN MUST BE APPROVED BY THE CITY ENGINEER.
3. CONSTRUCTION DETAILS, SLOPE, AND MATERIALS CONFORM TO STD. S-4.1.

SEBASTOPOL CALIFORNIA PUBLIC WORKS	PRESSURE SEWER SERVICE LATERAL AND PRESSURE MAIN CONNECTIONS	STD. NO. S-4.6

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



SECTION A-A

		4% DEFLECTION		5% DEFLECTION			
		PVC ASTM D 2680		ABS ASTM D 2751 PVC ASTM D 3034		ASTM D 2680	
		COMPOSITE (1)		SDR35		COMPOSITE (1)	
NOM. DIA.	L	D(2)	R(3)	D(2)	D(3)	D(2)	R(3)
6"	6"	5.544	4.544	5.629	4.629	5.492	4.492
8"	8"	7.473	6.473	7.537	6.537	7.402	6.402
10"	10"	9.401	8.401	9.421	8.421	9.312	8.312
12"	12"	11.330	10.330	11.210	10.210	11.223	10.223
15"	15"	14.222	13.222	13.729	12.729	14.088	13.088

1. TRUSS PIPE – ABS OR PVC.
2. GAGE DIAMETER HAS BEEN CALCULATED TO CORRECT CHORD LENGTH ERROR "E".
3. MINIMUN PLATE DIAMETER.
4. A PROVING RING OF THE SPECIFIED DIAMETER (D) SHALL BE SUPPLIED WITH EACH DEFLECTION GAGE.

NOTES:

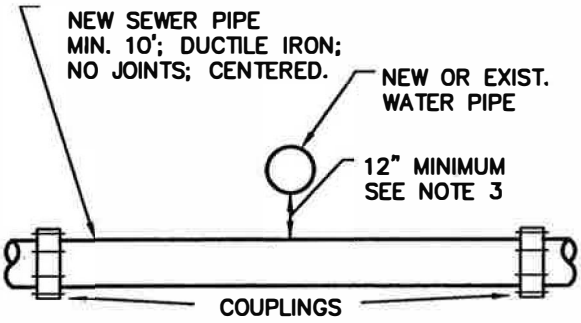
1. MARK ALL GAGES WITH ASTM SPECIFICATION NUMBER, SDR NUMBER AND DEFLECTION.
2. THE 1/2" BAR STOCK ON EDGE PROVIDES CLEARANCE TO PASS SMALL AMOUNTS OF SOIL WHICH MAY BE IN PIPE.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

PLASTIC SEWER PIPE DEFLECTION GAGE

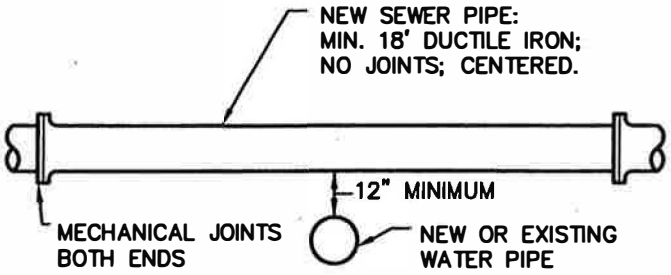
STD. NO. S-5.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



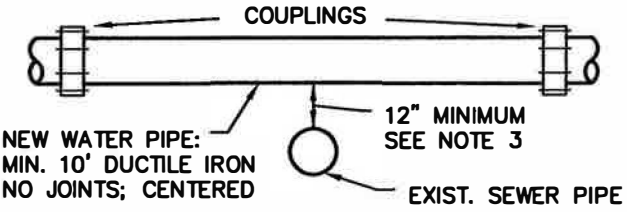
NEW SEWER UNDER NEW OR EXISTING WATER

CASE 1



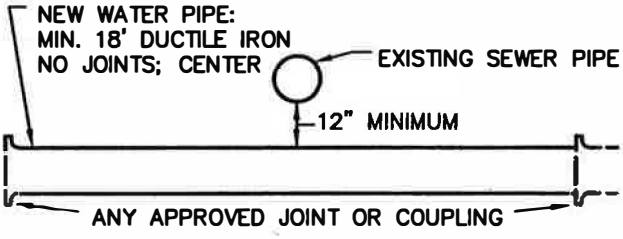
NEW SEWER OVER NEW OR EXISTING WATER

CASE 2



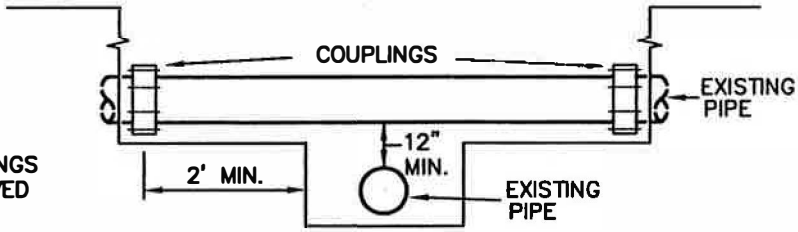
NEW WATER OVER EXISTING SEWER

CASE 3



NEW WATER UNDER EXISTING SEWER

CASE 4



NEW PIPE UNDER EXISTING

CASE 5 – SEE NOTE 4

NOTES:

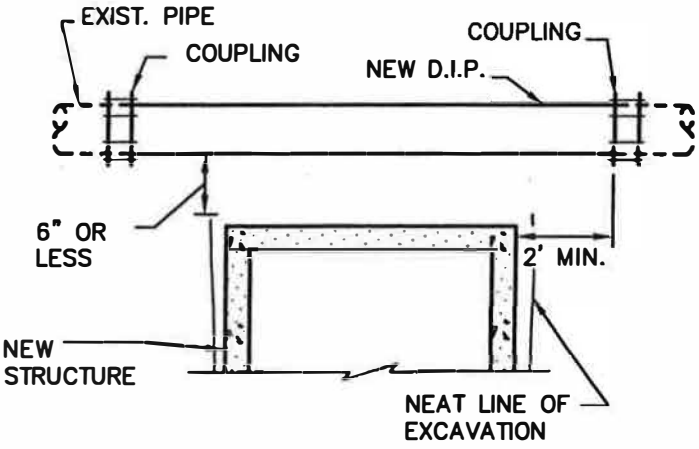
1. THIS STANDARD APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS OF LARGER DIAMETER SHALL BE AS APPROVED BY THE CITY ENGINEER.
2. ALL NEW DUCTILE IRON SHALL BE WRAPPED IN POLYETHYLENE PER CITY CONSTRUCTION SPECIFICATIONS.
3. WHERE SEWER CROSSES BELOW A WATER MAIN, WITH 1' OR MORE VERTICAL CLEARANCE, NO SPECIAL INSTALLATION IS REQUIRED.
4. "NEW PIPE UNDER EXISTING–CASE 5" SHALL BE USED WHEN THE EXISTING PIPE HAS A JOINT OVER OR WITHIN 2' OF THE NEW TRENCH.
5. ANY PIPE–PIPE CROSSING WITH LESS THAN 6" VERTICAL CLEARANCE SHALL NOT BE INSTALLED WITHOUT APPROVAL OF THE CITY ENGINEER.
6. FOR WATER MAIN LOWERING DETAIL, SEE CITY STD. W–3.5.
7. SEE CITY'S APPROVED LIST FOR APPROVED COUPLINGS.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

PIPE – PIPE CROSSING DETAILS

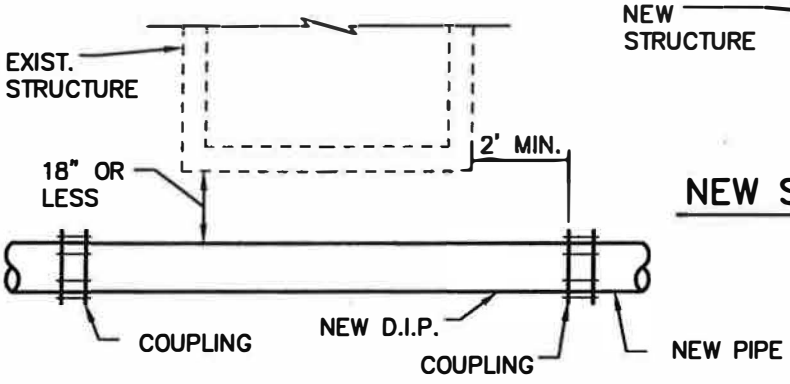
STD. NO. S-5.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



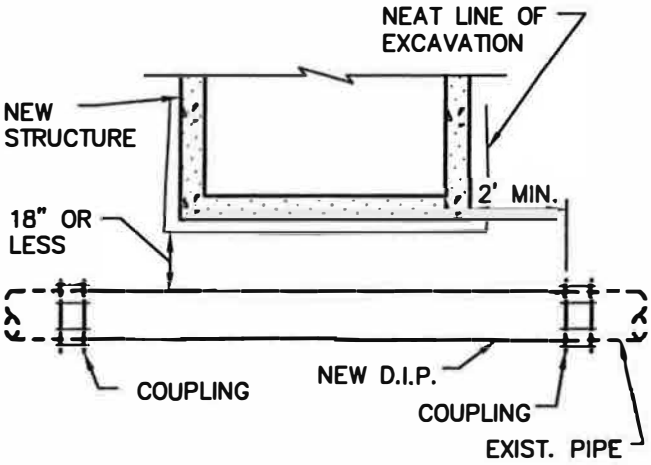
NEW STRUCTURE UNDER EXIST.

TYPE C



NEW PIPE UNDER EXISTING

TYPE A



NEW STRUCTURES OVER EXISTING PIPES

TYPE B

NOTES:

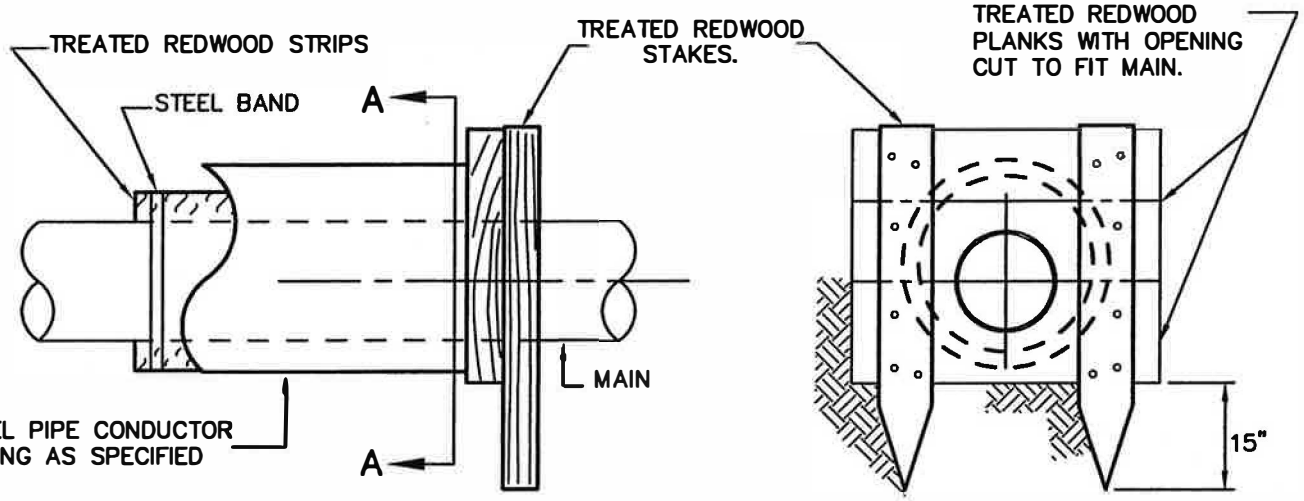
1. THIS STD. APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS INVOLVING PIPES OF LARGER DIAMETER SHALL BE AS APPROVED BY THE CITY ENGINEER.
2. WHEN PIPES CROSS WITHIN THE DIMENSIONS SHOWN, A NEW DUCTILE IRON PIPE SECTION SHALL BE INSTALLED AS DETAILED.
3. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE FILM IN TUBE FORM.
4. ANY TYPE "A" INSTALLATION REQUIRING MORE THAN ONE LENGTH OF PIPE SHALL BE ENCASED PER STD. S-5.4.
5. SEE CITY APPROVED LIST FOR APPROVED COUPLINGS.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

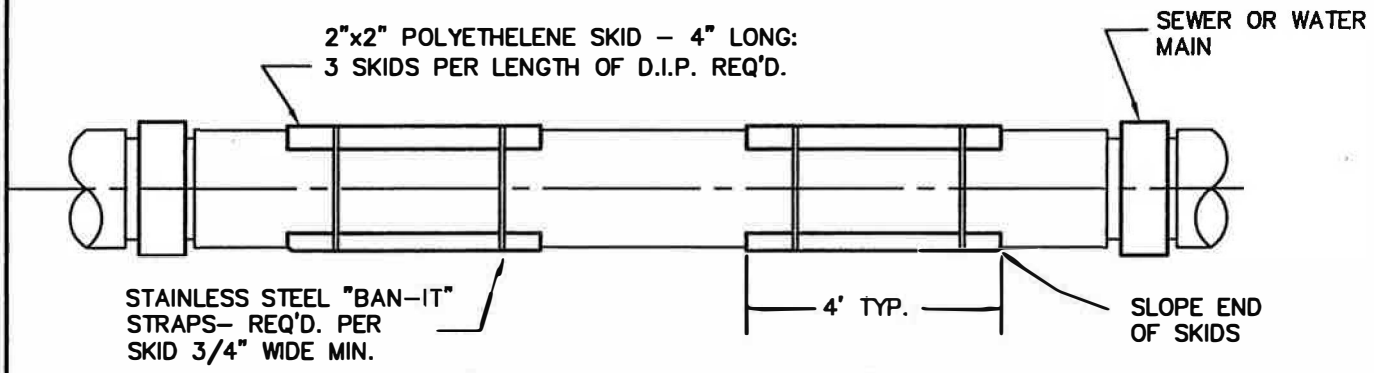
PIPE – STRUCTURE CROSSING DETAIL

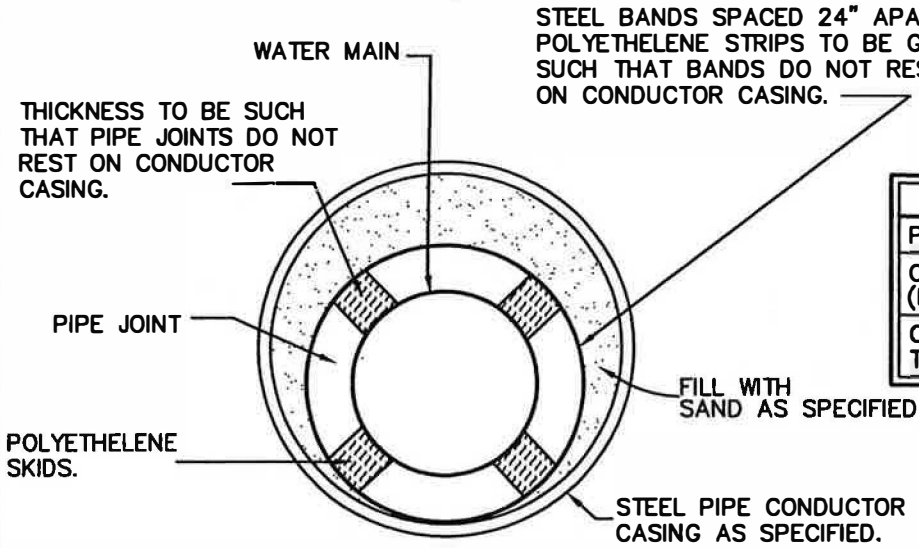
STD. NO. S-5.3

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



TYPICAL DIRT STOP AT ENDS OF CONDUCTOR CASING





MINIMUM SIZE CASING REQUIRED					
PIPE SIZE	6"	8"	12"	14"	16"
CASING SIZE (INSIDE DIA.)	16"	16"	20"	24"	30"
CASING WALL THICKNESS	.375"	.375"	.375"	.375"	.500"

SECTION "A–A"

TYPICAL MAIN ENCASEMENT

NOTES

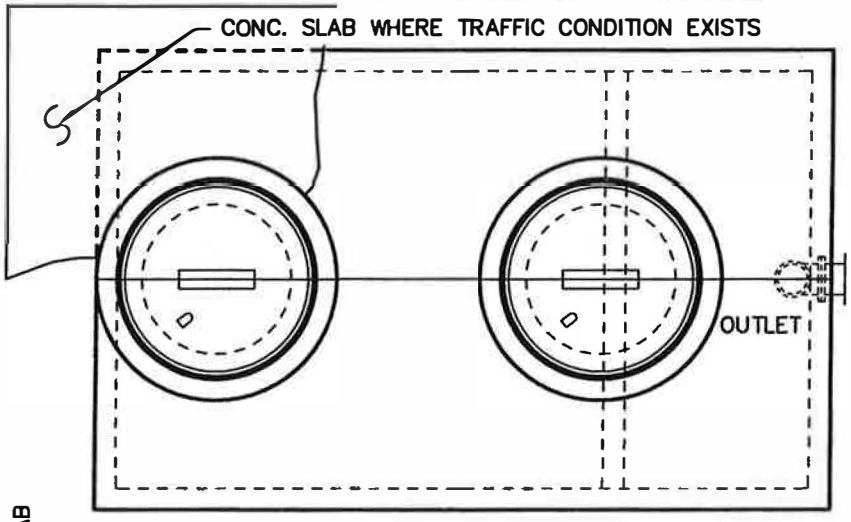
1. STAKES SHALL BE 2"x6"
2. PLANKS SHALL BE MIN. 2" "T"

SEBASTOPOL CALIFORNIA PUBLIC WORKS

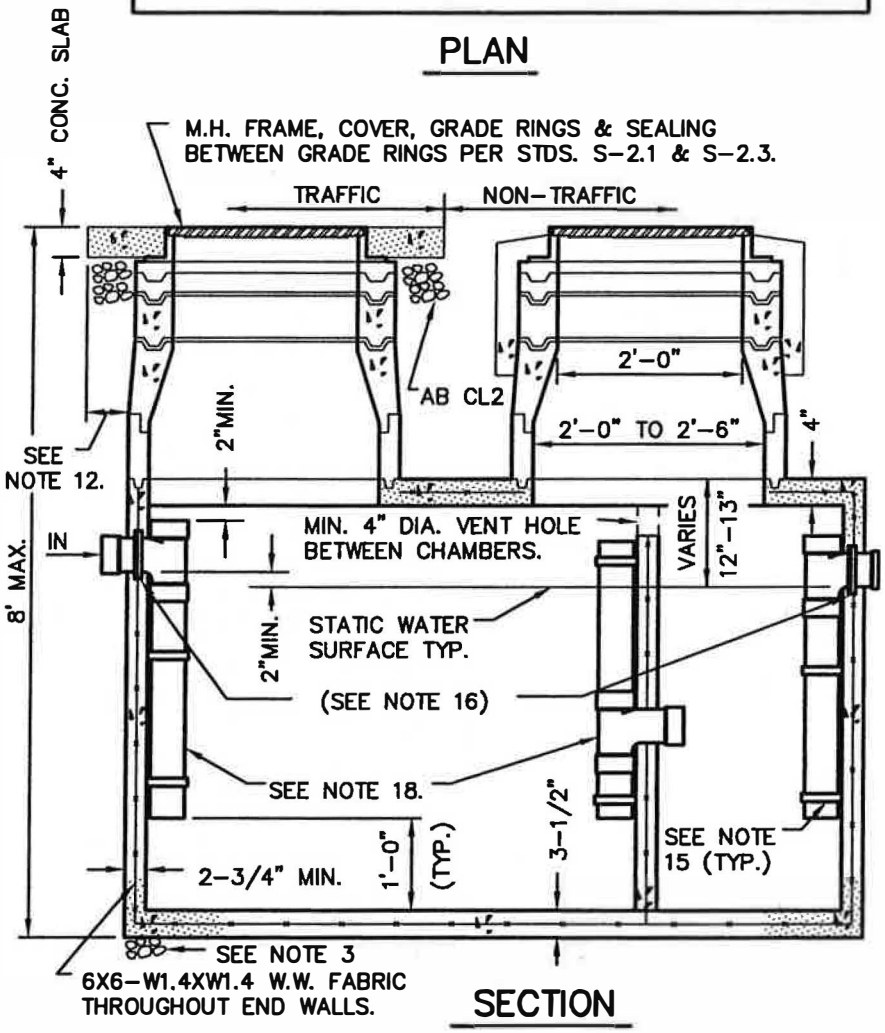
TYPICAL DETAILS FOR SEWER & WATER MAIN ENCASEMENTS

STD. NO. S-5.4

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



PLAN



SECTION

NOTES:

1. TANK TO BE PRECAST. SEE CITY'S APPROVED LIST.
2. POLYETHYLENE TANKS ACCEPTABLE IN NON-TRAFFIC AREAS UPON SPECIFIC APPROVAL OF THE CITY ENGINEER.
3. 3" MIN. BEDDING MAT'L PER CITY STD. S-1.1.
4. ALL SURFACE WATER MUST DRAIN AWAY FROM MANHOLES.
5. PIPE SHALL BE 6" MAX. DIAMETER PER U.P.C.
6. CONCRETE MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
7. ALL WYES SHALL BE ONE-WAY CLEANOUT WYES EXCEPT AS NOTED. TYPE PER U.P.C.
8. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSIBLE TO WASTE HAULER PUMPER.
9. ALL GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE PUBLIC RIGHT-OF-WAY.
10. EXCAVATIONS SHALL BE NEAT LINE TYPICALLY ALL SIDES.
11. INTERCEPTOR TO BE USED IN CONJUNCTION WITH "SAMPLING MANHOLE" PER STD. S-6.3.
12. SLAB TO EXTEND MIN. 24" BEYOND ALL SIDES OF TANK. (TRAFFIC AREA)
13. ALL WASTE MUST ENTER THROUGH INLET FITTING ONLY.
14. TANK TO BE STENCILED ON UPPER LEFT HAND CORNER OF INLET END IN WHITE.
15. STAINLESS STEEL CLAMP & BOLTS 3'-0" O.C. MAX. (TYP.) MIN. 2 REQ'D.
16. A WATERSTOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUTED INTO THE INTERCEPTOR WALL NEAR THE CENTER OF THE WALL.
17. TANK CAPACITY TO BE DETERMINED AT THE TIME OF INDUSTRIAL WASTE PERMIT APPLICATION.

NOTES: (CONT.)

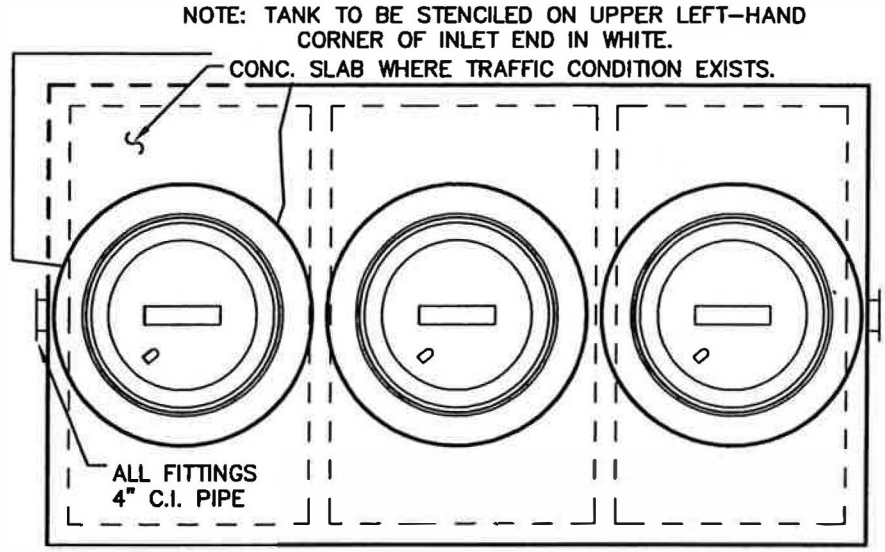
18. PIPE & FITTINGS TO BE 4" SCH. 40 PVC.
19. REINFORCING BARS INTERMEDIATE GRADE ASTM A615-62T & A305-56T. REINFORCING WIRE FABRIC - ASTM A185-61T.
20. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBSTITUTED FOR REVIEW BY THE CITY.
20. TOILETS, URINALS AND SIMILAR FIXTURES SHALL NOT BE CONNECTED TO INTERCEPTOR.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

PRECAST CONCRETE GREASE INTERCEPTOR

STD. NO. S-6.1

SCALE: NONE	MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



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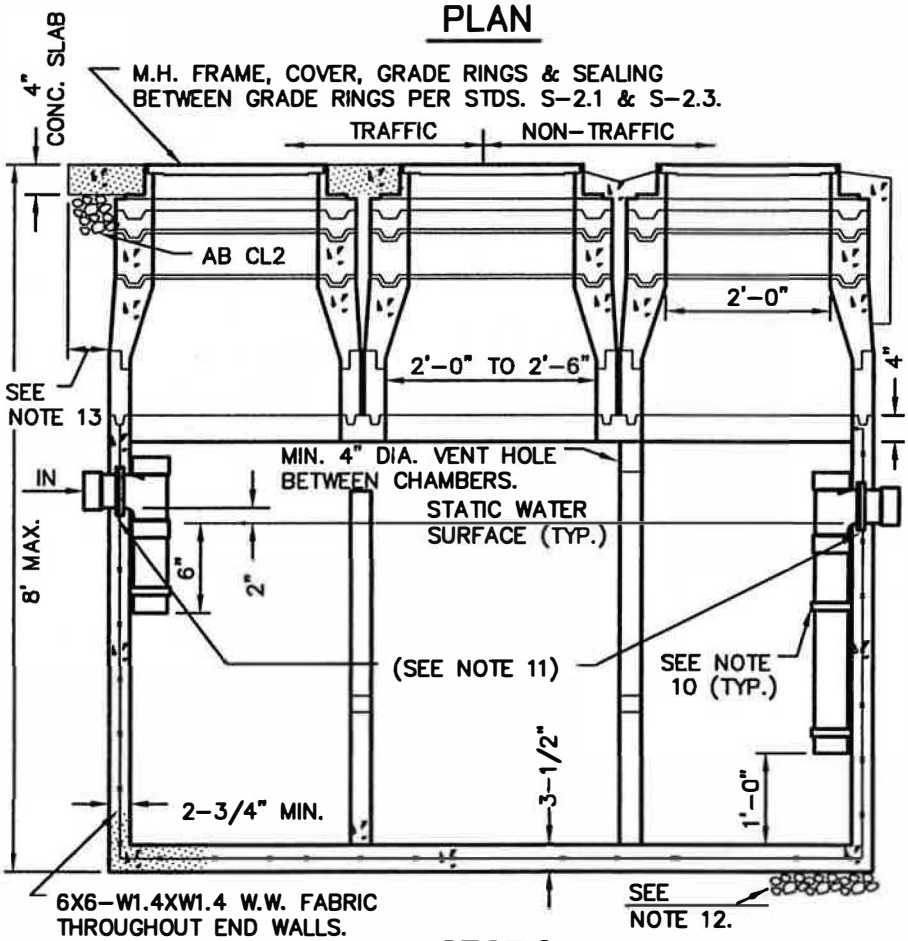


SECTION

NOTES:

1. TANK TO BE PRECAST. SEE CITY'S APPROVED LIST.
2. ALL GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE PUBLIC R/W
3. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSIBLE TO WASTE HAULER PUMPER.
4. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBSTITUTED FOR REVIEW BY THE CITY.
5. PIPE SHALL BE 6" MAX. DIAMETER PER U.P.C.
6. EXCAVATIONS SHALL BE NEAT LINE TYPICALLY ALL SIDES.
7. HEIGHT OF TANK ABOVE FITTINGS VARIABLE. ONE FT. SECTIONS MAY BE ADDED TO REQUIRED F.G.
8. ALL WYES SHALL BE ONE-WAY CLEANOUT WYES EXCEPT AS NOTED. TYPE PER U.P.C.
9. INTERCEPTOR TO BE USED IN CONJUNCTION WITH "SAMPLING MANHOLE" PER STD. S-6.3.
10. STAINLESS STEEL CLAMP & BOLTS 3'-0" O.C. MAX. (TYP.) MIN. 2 REQ'D.
11. A WATERSTOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUTED INTO THE INTERCEPTOR WALL NEAR THE CENTER OF THE WALL.
12. 3" MIN. BEDDING MAT'L PER CITY STD. S-1.1.
13. SLAB TO EXTEND MIN. 24" BEYOND ALL SIDES OF TANK. (TRAFFIC AREA)
14. TANK CAPACITY TO BE DETERMINED AT THE TIME OF INDUSTRIAL WASTE PERMIT APPLICATION.
15. PIPE & FITTINGS TO BE 4" SCH. 40 PVC.
16. CONCRETE MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
17. ALL WASTE MUST ENTER THROUGH INLET FITTING.

NOTES: (CONT.)

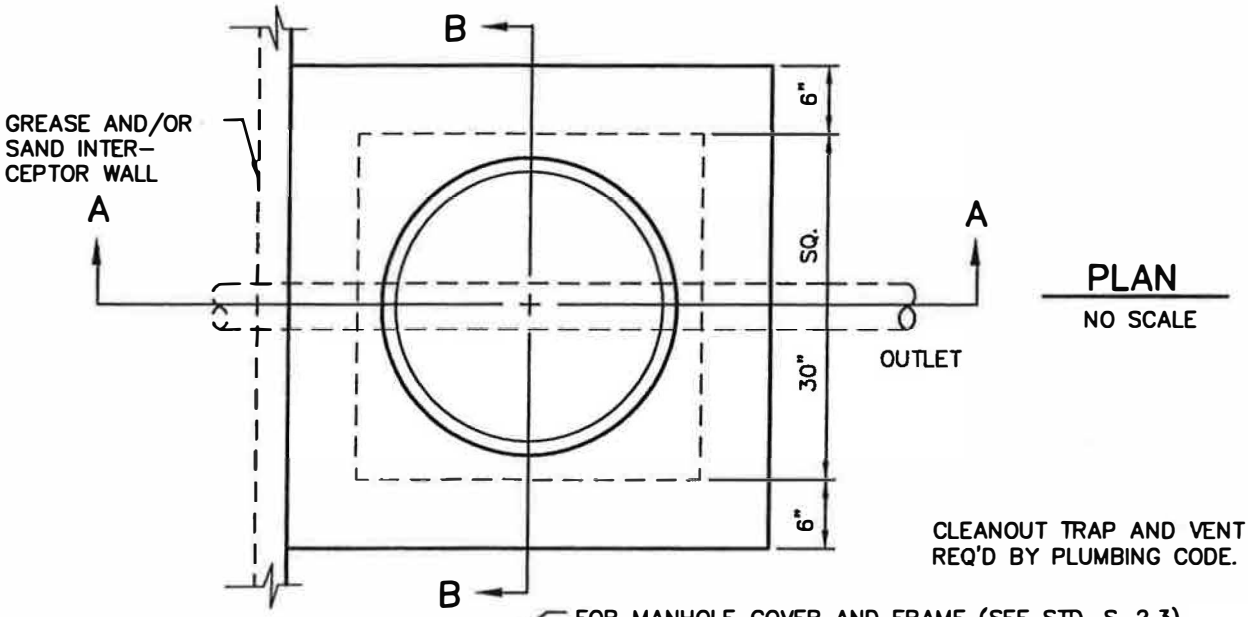
18. REINFORCING BAR INTERMEDIATE GRADE ASTM A615-62T & A305-56T.
19. REINFORCING WIRE FABRIC- ASTM A185-61T.
20. TOILETS, URINALS AND SIMILAR FIXTURES SHALL NOT BE CONNECTED TO INTERCEPTOR.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

PRECAST CONCRETE SAND AND GREASE INTERCEPTOR

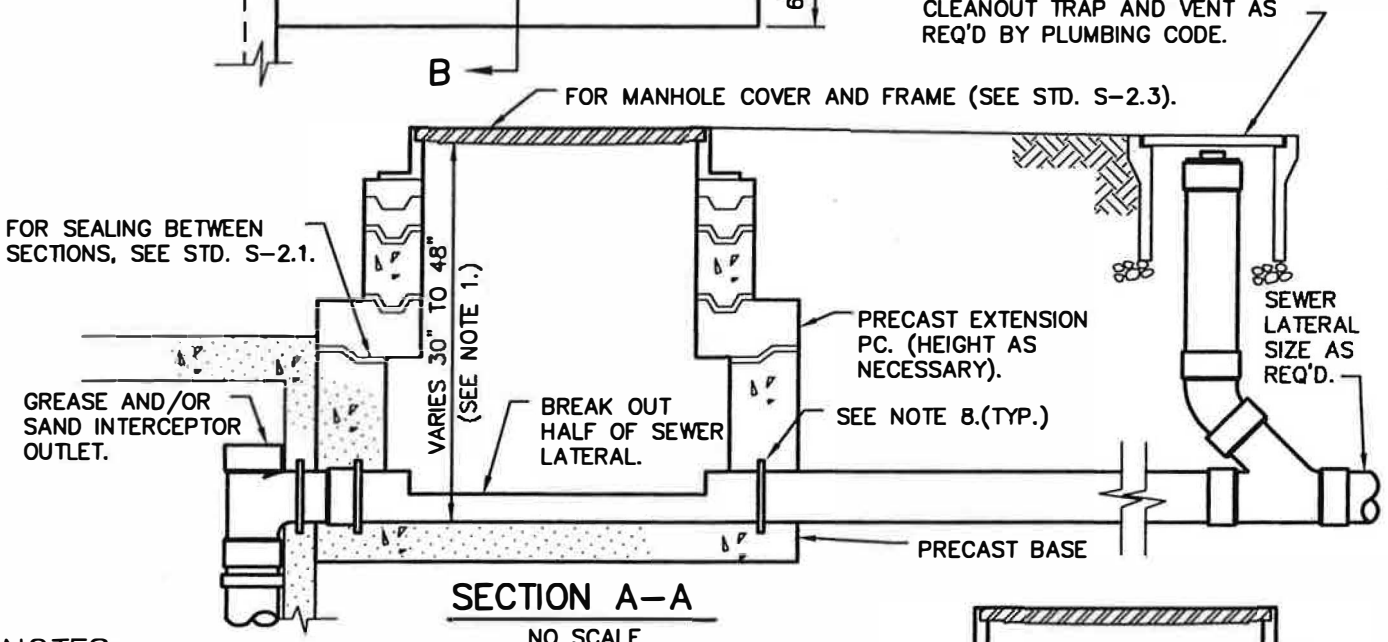
STD. NO. S-6.2

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



PLAN

NO SCALE

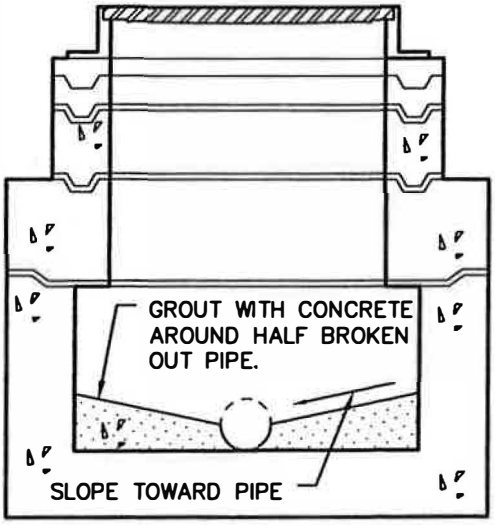


SECTION A-A

NO SCALE

NOTES:

1. IF LESS THAN 30" REVIEW WITH CITY FOR ADD'L VAULT REQ'MTS. IF GREATER THAN 48" INSTALL SAMPLING M.H. SIM. TO STD. S-2.1 WITH FLOW-THROUGH CUT-AWAY PIPE AS PER THIS STD.
2. SAMPLING M.H. TO BE LOCATED OUTSIDE OF PUBLIC RIGHT-OF-WAY EXCEPT WITH WRITTEN APPROVAL OF THE PUBLIC WORKS ENCROACHMENT OFFICER.
3. AN ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY THE CITY.
4. LOCATION SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
5. MANHOLE SHALL BE SANTA ROSA CAST PRODUCTS PRECAST CONC. DROP INLET BOX #5K WITH #5K X 24" DIAMETER TRANSITION SLAB.
6. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING M.H.
7. SAMPLING M.H. TO BE USED IN CONJUNCTION WITH EITHER STDS. S-6.1 OR S-6.2.
8. A WATERSTOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MFR. TO BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.



SECTION B-B

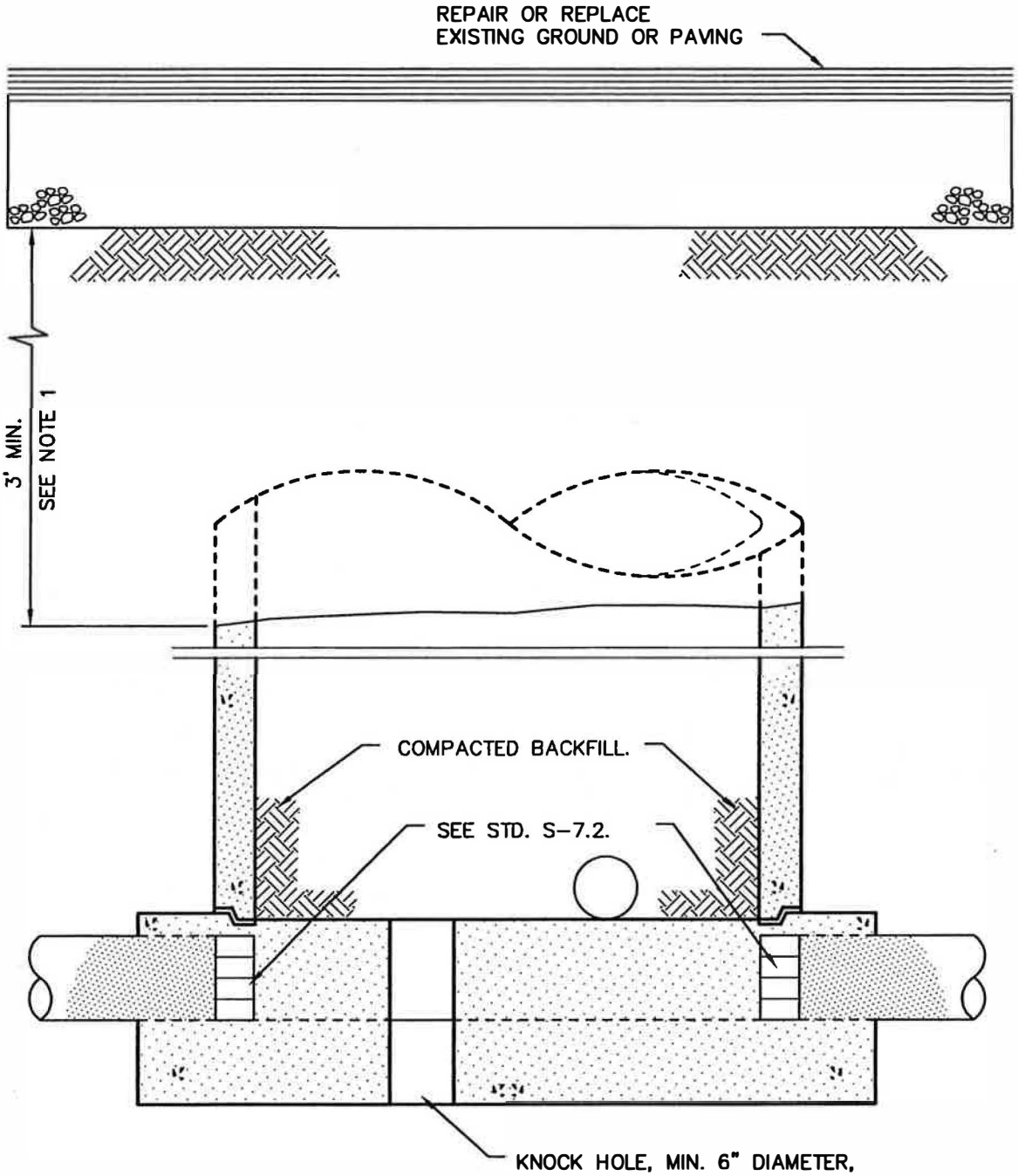
NO SCALE

SEBASTOPOL CALIFORNIA PUBLIC WORKS

SAMPLING MANHOLE EXTERIOR USE

STD. NO. S-6.3

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



NOTES:

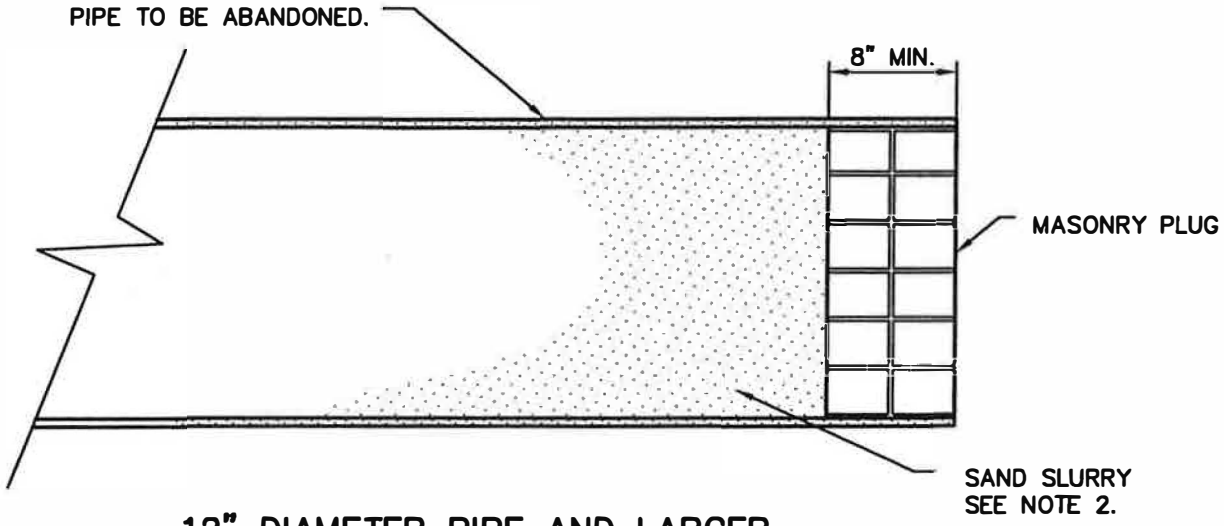
1. REMOVE FRAME, COVER, TAPER AND BARREL SECTIONS.
2. AFTER PLUGGING ALL PIPES IN MANHOLE, THE REMAINING PORTION OF THE BARREL SECTION AND ALL VOIDS CREATED BY THE REMOVAL OF THE UPPER PORTIONS OF THE MANHOLE, SHALL BE BACKFILLED AND COMPACTED TO 90% RELATIVE DENSITY. USE TRENCH BACKFILL OR PIPE BEDDING MATERIAL.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

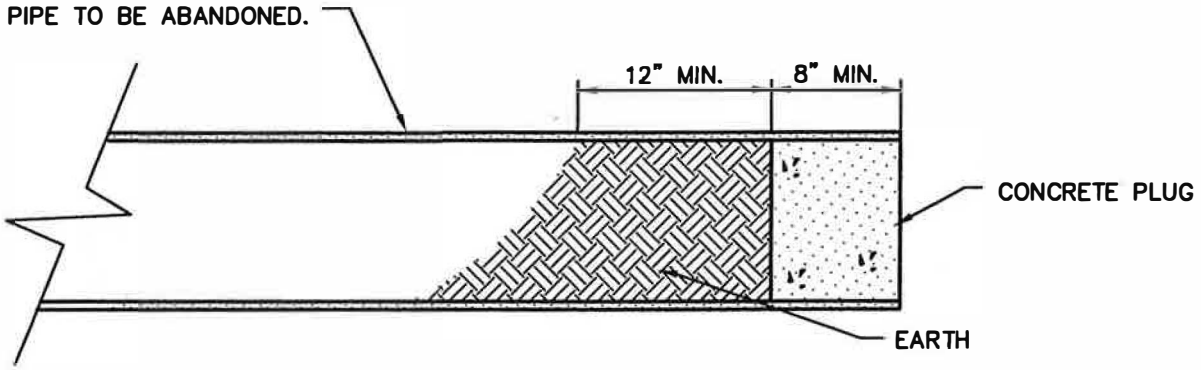
ABANDONED SANITARY SEWER MANHOLE DETAIL

STD. NO. S-7.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



12" DIAMETER PIPE AND LARGER

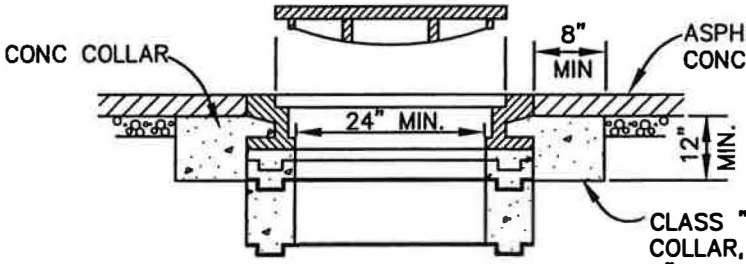


10" DIAMETER PIPE AND SMALLER

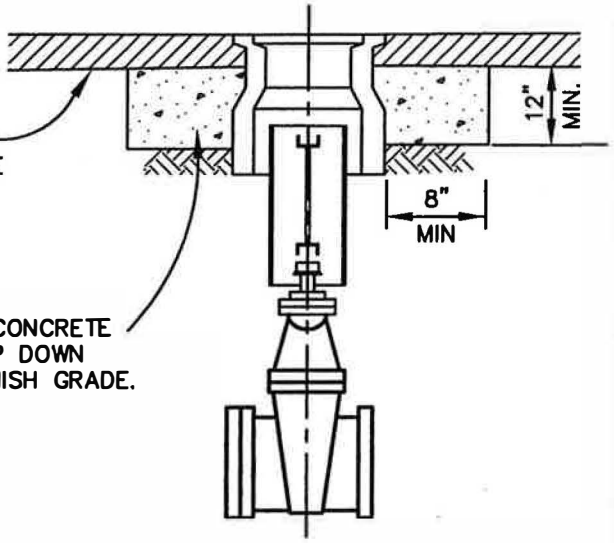
NOTES:

1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE CITY ENGINEER.
2. ABANDONED PIPES, 12" AND LARGER, SHALL BE BROKEN INTO EVERY 50' AND SHALL BE FILLED COMPLETELY WITH SAND SLURRY.

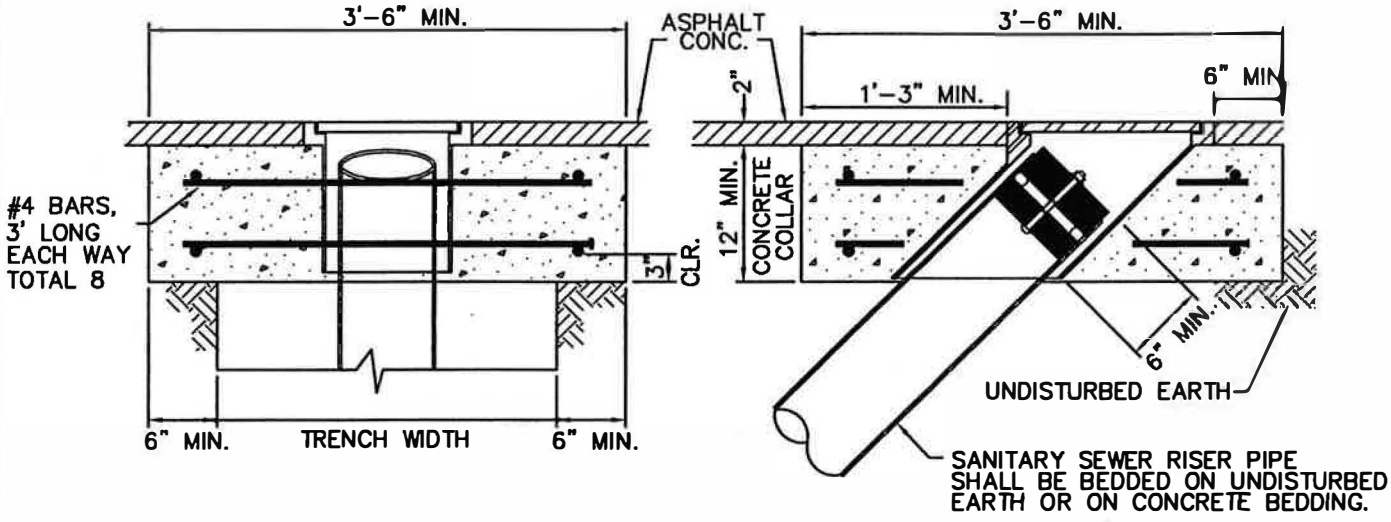
SEBASTOPOL CALIFORNIA PUBLIC WORKS	ABANDONED SANITARY SEWER PIPE PLUG DETAIL				STD. NO. S-7.2
	SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



SEWER MANHOLE

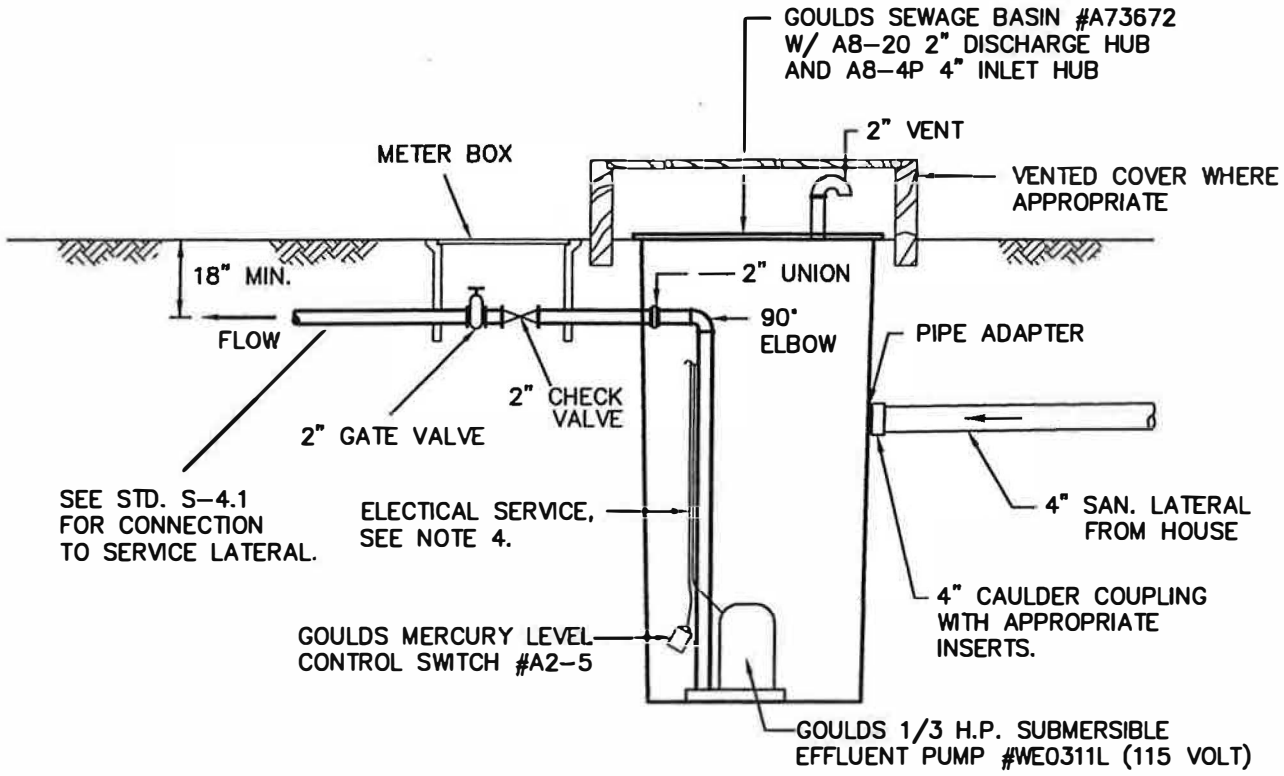


WATER VALVE



SEWER CLEANOUT

SEBASTOPOL CALIFORNIA PUBLIC WORKS	**STANDARD MANHOLE, CLEANOUT & VALVE BOX ADJUSTMENT**				**STD. NO. S-7.3**
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998	



NOTES:

1. PUMPING SYSTEM TO BE MAINTAINED BY PROPERTY OWNER.
2. THE FACILITIES SHOWN ARE MINIMUM AND CALCULATIONS AND SHOP DRAWINGS BY THE MANUFACTURER OR ENGINEER MUST BE SUBMITTED TO THE CITY FOR APPROVAL FOR EACH INSTALLATION.
3. AN AUDIBLE HIGH-WATER ALARM SHALL BE PROVIDED.
4. ROUTE ELECTICAL SERVICE UNDERGROUND TO HOUSE MAIN PANEL (110 VOLT MIN.).

SEBASTOPOL CALIFORNIA PUBLIC WORKS

INDIVIDUAL PUMPING SYSTEM

STD. NO. S-7.4

SCALE: NONE	DRAWN: LMM	CHK: PHK	APPVD: PHK	DATE: JULY 1998

SECTION 4

STANDARD SPECIFICATIONS FOR CONSTRUCTION OF

SANITARY SEWER LINES

CITY OF SEBASTOPOL
SONOMA COUNTY, CALIFORNIA
JULY 1998

To be used with City of Sebastopol Sewer Standards dated July, 1998 and State of California Department of Transportation Standard Specifications, latest edition.

TABLE OF CONTENTS

SECTION 1 - EARTHWORK

1.01. SCOPE OF WORK:

1. Pipe line excavation and backfill.

2. Structural excavation and backfill.

1.02. GENERAL:

Earthwork shall include the loosening, removing, loading, transporting, depositing and compacting in final location all materials, wet and dry, necessary to be removed for the purposes of construction, or as required for pipelines, and other purposes as indicated on the drawings; the furnishings, placing, and removing of all sheeting and bracing; all pumping and draining of excavation; the supporting of structures above and below ground; the handling of all water encountered in the excavations; all backfilling around structures and backfilling of all trenches and pits and all other incidental excavation as shown on the drawings and as specified.

1.02. PIPELINE EXCAVATION:

1. TRENCHING: Where trenching occurs in paved areas, the pavement shall be cut on neat lines prior to ditching, parallel to the trench at the width required for the trench. Concrete pavement shall only be cut by sawing. Any pavement damaged outside these lines shall be restored by the Contractor at his own expense.

The width of unsheathed trenches shall not be greater than 16 inches plus the outside diameter of the pipe barrel. Where sheathing is required, the width of trench shall be increased only sufficiently to accommodate the sheathing and timbers. The bottom of the trench shall be finished off with a firm bed free of gravel or rocky projections as approved by the Engineer. Bottom of trench must be free from loose material before placing backfill material. No steel wheeled or crawler type construction machinery, exclusive of trenching machines, shall be operated on the pavement without the approval of the Engineer.

2. BLASTING: No blasting will be permitted without the approval of the City. When blasting is permitted, it shall be done only by skilled operators and under the direction of a competent foreman.

Permits for blasting shall be obtained and paid for by the Contractor.

3. EXCAVATED MATERIAL: Material excavated shall be laid alongside the trench, and kept trimmed up so as to cause as little inconvenience as possible to public travel and the normal use of adjacent properties.

4. BEDDING: In such cases where the ground is too soft to furnish a firm support for the pipe at the grade of the line, excavation shall be carried, when directed by the Engineer, to firm ground or a minimum depth of 12 inches below the grade. The trench shall then be backfilled with Type I material to the grade line and compacted. The Engineer shall be the sole judge of the suitability of the trench bottom and as to the amount of imported backfill required to stabilize a soft foundation.

The Contractor shall remove any soft material when ordered to do so by the Engineer. If any trench, through neglect of the Contractor, be excavated below the bottom grade as required by the drawings, it shall be refilled to grade with Type I backfill at the Contractor's expense.

As pipe laying proceeds, bell holes shall be excavated at each joint to facilitate the jointing operation, and shall be only of sufficient size for that purpose. In order that bell holes may be properly located, not more than six (6) bell shall be excavated ahead of the actual pipe laying.

5. LENGTH OF TRENCH OPEN: Unless otherwise approved by the Engineer, the length of trench at any location remaining open at the end of each day's work shall not exceed 50 feet as measured from the point where excavation is in progress to the point where backfill has been completed to a degree that the trench is passable to traffic.

When construction is within State highways or County roads, the length of open trench at the end of each day's work, if permitted, shall conform to the requirements of the appropriate encroachment permit. It will be the responsibility of the contractor to secure such permit(s) and be familiar with the requirements therein.

1.04. PIPELINE BACKFILL:

1. SCOPE: Pipeline trenches shall be backfilled with appropriate material to the level of the original ground surface, to the underside of the pavement base course, or as shown on the drawings, unless otherwise ordered by the Engineer. Typical trench sections for the various pipeline materials are shown on the drawings.

2. GENERAL: Before backfilling, the trench shall be cleared of all timber and debris such as wood blocks, grade stakes, paper, rope, rags, and broken pavement. Care shall be taken to insure that backfill material is free from debris.

All backfill material shall be placed in the trench to the full width as excavated. Backfill material shall not be dropped directly upon the pipe. All selected excavated material placed within six inches of the pipe shall be free from rocks and boulders larger than four inches in maximum dimension and from unbroken masses of earthy materials which might lodge and thereby cause unfilled pockets.

It is highly important that a dense, well compacted backfill be placed around the pipeline. The

Contractor will be required to produce such a backfill under all circumstances. The materials used for the backfill, the amount thereof, and the manner of deposition shall be subject to the approval of the Engineer, but the Contractor will be held responsible for any displacement of instability of the pipeline or any damage to the coating caused by improper installation of backfill materials.

No material shall be used for trench backfill, which, because of excessive moisture or any other reason, cannot be compacted to the degree specified.

Any such material shall be considered unsuitable, and if it is deposited in the trench, it shall be removed and replaced with suitable material.

During the process of backfilling, any timbering, sheeting, shoring and sheet piling used to shore the excavation shall be carefully removed by the Contractor in such a manner as will result in a minimum of cabling, lateral movement or flowing of the soil. On approval of the Engineer, the Contractor may leave in place sheet piling, sheeting, and bracing, but in such event, no payment shall be made by the Owner for such materials left in place.

Low points along the pipe trench shall not be backfilled until all backfill at adjacent higher elevations has been completed. Water collecting at the low points along the trench from jetting operation or other causes shall be removed by pumping or other approved means in order to avoid softening of adjacent natural ground. An adequate number of sump pumps at proper spacing shall be supplied to prevent the accumulation of excess water in the trench.

3. BEDDING: Where shown in the typical trench sections on the drawings, a pipe bedding of compacted Type I backfill material shall be provided. The bedding shall be brought to a uniform grade in three (3)-inch compacted layers and bell holes formed to provide continuous support along the pipe barrel.

4. BACKFILL (PVC & D.I.P.): Initial backfill material for that portion of the trench from the grade of the pipe to a compacted depth of six (6) inches for PVC and three (3) inches for D.I.P. over the top of the pile shall be Type I backfill material unless otherwise directed by the Engineer. After the pipe has been properly laid and inspected, initial backfill material shall be placed simultaneously on both sides and over the pipe.

Compaction shall be by saturation by water and vibrating or by hand tamping. Saturation shall be by the use of water jets or any other desensification by vibration is in progress. Consolidation shall be performed alternately on both sides of the pipe. Excessive or improper jetting or flooding of the backfill will not be allowed. All compaction methods and equipment shall be subject to the approval of the Engineer.

Backfill material for the remainder of the pipe trench shall be selected from the excavated material, if suitable in the opinion of the Engineer, or otherwise shall be imported material that will meet the compaction requirements.

5. BACKFILL (PVC): Haunching backfill material for that portion of the trench from the grade of the pipe to spring line (1/2 pipe diameter) shall be Type I and placed simultaneously on both sides of the pipe. Compaction shall be by hand tamping to 95% relative density. Care shall be taken to insure that all voids under the pipe are filled and compacted to provide full pipe support at haunches. After haunching backfill has been placed, compacted and inspected, the initial backfill of Type I material shall be placed from springline to 6" over the top of pipe. Compaction of this initial backfill shall be by hand tamping to 95% relative density.

Backfill material for the remainder of the pipe shall be selected from the excavated material, if suitable in the opinion of the Engineer, or otherwise shall be imported material, that will meet the compaction requirements.

6. COMPACTION REQUIREMENTS: Relative compaction shall be determined using ASTM D-1557-78 test.

Compaction requirements are shown on the typical sections on the Plans.

7. JETTING: Jetting (water consolidation of backfill) shall be accomplished by introducing water into the backfill by means of a jet pipe. The jet pipe shall not be less than one and one-half (1 1/2) inches in diameter and shall extend wo within fifteen (15) inches of the top of the pipe during jetting of backfill over pipe. The source of water for jetting shall be a water tank with a pressure of sixty (60) pounds per square inch. All bridges shall be completely broken down during the jetting process. Jet points along the line of the ditch shall be staggered from side to side at intervals not to exceed six (6) feet center to center or as necessary so that the backfill takes full possible subsidence while water is being introduced into it through the jet pipe. The maximum lift for jetting shall be six (6) feet.

8. RE-EXCAVATING: If the compaction requirements as specified above are not met within 60 calendar days after jetting the backfill, the trench shall be re-excavated. Backfill material shall then be compacted by tamping and/or rolling as specified above until the compaction requirements are satisfied. The cost of testing recompacted areas shall be paid by the Contractor.

9. SUBGRADE PREPARATION: Subgrade meeting the requirements of Section 19 of the July, 1995, Standard Specifications is required. The finished subgrade immediately prior to placing base material thereof shall have a relative compaction of not less than 95% for a depth of 2 1/2 feet below finished permanent surfacing grade. Mud or other soft or spongy material shall be removed and the space filled with import backfill material and rolled or tamped in layers not exceeding 8 inches in thickness until the above relative compaction requirement is satisfied.

Subgrade preparation is not required in unimproved area where trench surfacing is not required.

10. EXCESS MATERIAL: Excess trench material shall be promptly removed and disposed

of elsewhere by the Contractor at his own expense and profit. The Contractor shall not dump material on any private property without first obtaining a permit to do so from the regulating authority.

1.05. BACKFILL MATERIAL:

a. Type I backfill - materials furnished for Type I backfill shall consist of any one or a mixture of broken stone or crushed gravel, natural material having essentially the same qualities of angularity or surface irregularities and roughness as broken stone or natural rough surface gravel. The material shall be of such a nature that it will bind and compact readily to form a firm, stable base.

The percentage composition by weight of Type I backfill shall conform to the following gradings:

Sieve Size	Percent Passing Sieve	
	MIN.	MAX.
1/2"	100	
3/8"	30	100
No. 4	5	35
No. 8	0	5

b. Type 2 backfill - with the approval of the Engineer, material for Type 2 backfill may be obtained from the excavation. Type 2 backfill shall be free from stones, lumps, broken concrete or bituminous surfacing exceeding four (4) inches in greatest dimension, vegetable matter or other unsatisfactory material.

The material shall have a plasticity index not exceeding 10 and an R value of not less than 25. The material shall compact into a stable mass which will not flow nor run whenever lateral support (such as the side of a trench) is removed.

The material shall contain sufficient fines to ensure that voids will be filled and that specified compaction requirements will be met. When material from the excavation is not suitable for use as backfill, it shall be disposed of and suitable material shall be furnished.

Representative samples of all materials to be imported shall be submitted sufficiently in advance of installation operations for testing and approval of the Engineer. Imported material shall not be installed until it has been so approved.

Tests will be made in accordance with the following standards: grading, ASTM C117 and C136; plasticity index, ASTM< D424; and sand equivalent value, Test Method No. California 217 (Department of Transportation).

1.06. JACKED CROSSINGS:

The pipe shall be enclosed in a smooth steel casing (as indicated on the drawings) at the locations shown on the drawings and the pipe casing shall be installed in a hole bored by use of a "hydrauger" or equal earth boring machines, which will cut a true circular tunnel to the required line and grade. Bored tunnels shall be not greater in diameter than four (4) inches larger than the outside diameter of the conductor pipe to be placed herein. Conductor pipes shall be of the type and size delineated on the drawings.

The Contractor may, at his option, jack the conductor pipe into position in lieu of boring. The method and materials must meet the Engineer's approval.

The metal casing shall be filled with sand before completion of the work and redwood bulkhead constructed at each end of the conductor casing.

1.07. TRENCH SURFACING:

1. GENERAL: Where an unimproved surface is encountered, the trench shall be restored to its original surface.

Where gravel surface is encountered, it shall be replaced over the width of the trench with Class II Aggregate Base six (6) inches in depth.

Where the existing surface is of asphalt concrete, it shall be restored with a temporary surface followed by a permanent surface as specified herein.

2. TEMPORARY SURFACING: The temporary surfacing shall be Class II Aggregate Base as specified in Section 26 of the Standard Specifications and plant-mixed Cold Laid Asphalt Concrete. The aggregate base shall be equal in depth to the existing pavement structural sections but in any case, not less than fourteen (14) inches in depth on the State Highway, 9 inches in depth on other paved streets, and 6" in depth on parking areas. Plant-mixed cold laid asphalt concrete shall be a minimum of 1" thick and consist of well-graded aggregate having 4% to 10% passing the No. 200 sieve and Mc-900 asphalt.

All temporary surfacing shall be laid within two (2) days after backfilling. Before the street is opened for traffic, all excess dirt, rock, and debris shall be removed and the street surface shall be swept clean. Temporary surfacing shall be maintained constantly so that at no time will there by any mudholes nor shall the surface settle below one (1) inch not be raised more than one (1) inch from the existing pavement.

3. PERMANENT SURFACING: Shall not be constructed until the compaction requirements of the specifications are satisfied.

The existing pavement shall be neatly cut to a depth of two (2) inches and removed to at least five (5) inches outside each side line of the pipe trench to permit proper keying in the restored pavement. The existing pavement cut shall be straight, vertical, and with no ragged edges.

The base course for permanent surfacing shall be Class II Aggregate Base as specified in Section 26 of the Standard Specifications. The aggregate base shall be placed to a depth as shown on the Typical Sections.

The wearing surface for permanent surfacing shall be asphalt concrete "Type A" conforming to the requirements of Section 39 of the Standard Specifications and placed to a depth as shown on the Typical Sections.

1.08. SHORING, SHEETING, AND BRACING:

Where necessary, trenches or other excavations shall be properly sheeted and braced, to finish acceptable working conditions. The bracing shall comply in all respects to the rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California. The bracing shall be so arranged as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provided ample strength. Any damage to structures occurring through settlements, water or earth pressures, slides, caves or other causes, due to failure of lack of sheeting or bracing or improper bracing, or through negligence or fault of the Contractor in any other manner, shall be repaired by the Contractor at his own expense. Sheet piling and other timbering shall be withdrawn in such a manner as to prevent caving of the walls or excavations or damage to piping or other structures.

1.09. CONTROL OF DUST:

The Contractor shall at all times keep the streets sufficiently watered and swept of all loose material produced by his operations in order that traffic and construction does not raise an objectionable amount of dust. When directed by the Engineer, the Contractor shall apply a suitable dust palliative to control dust.

1.10. STATE HIGHWAY OR COUNTY ROAD:

Whenever the work to be done under these Specifications includes encroachment upon State or County rights-of-way, easement or other property owned by the State or County, an Encroachment Permit shall first be obtained from the applicable jurisdiction. The Contractor shall comply with all requirements imposed in the Encroachment Permit in addition to those set forth in these Specifications, in connection with performance of the work and shall give such notice as is required before beginning work. Contractor shall post any bond required in order to obtain permit.

1.11. CARE OF EXISTING STRUCTURES AND UTILITIES.

(a) Contractor shall call Underground Service Alert (USA) Toll Free (800) 642-2444 at least 48 hours prior to any excavation.

(b) Existing power, telephone and cable television lines, trees, fences, water pipes, gas lines, sewers or other conduits, embankments, and sundry structures, in the vicinity of the work shall be supported and protected from injury by the Contractor during the construction and until the completion of the work. The Contractor shall be liable for all damages done to such structures, as herein provided, and shall save and keep the Owner harmless from any liability or expense for injuries, damages or repairs to same.

A thorough attempt shall been made to show the type, size, location, and number of all utility mains and services on the plans; however, no guarantee is made as to the true type, size, location and number of such mains and services. The information was taken from various maps and transferred to the drawings as accurately as possible. Neither the Owner nor the Engineer shall in any way be responsible for the omission on the drawings of any mains or services of whatever nature nor shall they be responsible for any misrepresentation of size, type, numbers, location or depth. The Contractor shall repair, in a manner satisfactory to the Engineer, all mains or services damaged in the progress of his work. The Contractor shall notify all owners of utilities when his work is in progress and shall make such arrangements as are necessary to make any emergency repair. The Contractor shall be prepared at all times with labor, equipment and materials to make repairs on damaged mains or utilities.

No extra compensation will be made for the repair of any services or mains damaged by the Contractor's labor forces or equipment, nor for any damage incurred through the neglect or failure of providing protective barriers, lights or other devices or means required to protect such existing utilities.

The Contractor shall restore and/or replace curbing, sidewalks, gutters, shrubbery, fences, sod or other disturbed structures or surfaces to a condition equal to that before the work began and to the satisfaction of the Engineer and shall furnish all labor and material incidental thereof.

1.12. MAINTAINING DRAINAGE:

The Contractor shall provide and maintain temporary drainage for all excavations, drains, sewers, ditches, trenches, and structures. The Contractor shall keep the excavations dry throughout the construction operations. Whenever necessary, in order to provide proper drainage, the Contractor shall, at his own expense, install underdrains, furnish and operate all necessary pumping equipment, drainage sumps, well point systems and other drainage facilities. The laying of pipe or the placing of concrete in water will not be allowed under any circumstances.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property and in such a manner as not to be a menace to the public health. No water shall be drained into work built or under construction without prior consent of the Engineer.

1.13. MAINTENANCE OF TRAFFIC:

A schedule of operations affecting traffic on existing street shall be approved by the Engineer prior to initiation of construction. Notice shall be given to the Engineer at least 24 hours in advance of the closing of a traffic lane and the Contractor shall post suitable signs, where directed by the Engineer, indicating that the street is closed and the location of necessary detour routes.

Two-way traffic must be maintained at all times on the State Highway. Flagmen must be available at any time one-way traffic is in force. Parking may be restricted as desired to facilitate construction, subject to the requirements of the Encroachment Permit.

1.14. CONSTRUCTION STAGING:

Staging area for storage of construction materials and equipment shall be established to the satisfaction of the Public Works Superintendent. No storage of materials or equipment is permitted on City streets.

1.15. MAINTENANCE:

Following the certification of completion by the Engineer and final acceptance by the Owner, the Contractor shall, unless otherwise stipulated by the Owner, maintain the surface of trenches for a period of one year after said final acceptance. All material and labor required for the maintenance of the trench surfaces and structures shall be supplied by the Contractor, and the work shall be done in a manner satisfactory to the Engineer.

SECTION 2 - PIPING AND PIPELINES

2.01. SCOPE OF WORK:

1. WORK INCLUDED: All labor and materials to complete all work as shown on the drawings, or herein specified, or both, including the following:

a. Gravity Sewer.
b. Manholes.
c. Pressure line.

2.02. MATERIALS - GRAVITY SEWER:

1. GENERAL: Gravity sewers, unless otherwise designated on the drawings, shall be VCP, P.V.C., SDR 35 or Ductile Iron. Note joint deflection specification, Section 2.03.

2. VITRIFIED CLAY PIPE (VCP): Shall be new, first quality bell and spigot, extra strength conforming to ASTM Designation C700-71T. Joints shall conform to ASTM Designation C425-71. Where new work is joined to existing pipe that joint shall conform to ASTM C-594 Compression Couplings for plain end pipe.

3. POLYVINYL CHLORIDE (PVC) PIPE: Shall conform to ASTM D3034-SDR35 specifications. Joints shall conform to ASTM D3212 specifications.

4. DUCTILE IRON (DI) PIPE: Shall conform to latest revision ANSI A21.51 (AWWA C151) and Federal Specification WW P-421C. Joints shall be Tyton, Mechanical Joint or Flange as indicated on plan. Pipe shall be cement mortar lined in accord with AWWA specifications.

2.03. INSTALLATION OF GRAVITY LINES:

Pipe laying shall proceed upgrade without break from structure to structure with the socket or bell end forward. All pipe shall be laid to conform to the prescribed line and grade, as shown on the drawings, and each pipe length shall be checked to grade line by establishing from the survey stakes a grade line above the trench. This grad line will not be over 50 feet in length and shall be established before any pipe is laid in the trench.

The deflection in the joint between any two successive pipe sections shall not exceed 80 percent (80%) of the maximum deflection as recommended in writing by the pipe manufacturer. Short lengths of pipe if needed to meet this requirement shall be fabricated by the manufacturer.

Each length of pipe shall be laid on a firm bed and shall have a true bearing for its entire length between bell holes. An adequate bell hole shall be dug at the end of each pipe. Adjustment of

pipe to line and grade shall be made by scraping away or filling in and tamping, under the body of the pipe. No wedging or blocking to support the pipe will be permitted.

Both bell and spigot shall be clean before the joint is made, and care shall be taken that nothing but the joint making materials enters the joint.

Place Class I material to the spring line of the pipe and compact by hand or mechanical tamping. However, in the initial stage of placing this material, take care to ensure that sufficient Class I material has been worked under the haunch of the pipe to provide adequate side support. Take precautions to prevent movement of the pipe during placing of the material under the pipe haunch. Place initial backfill material in two stages: one to the center of the pipe and the other to a point at least 6 inches over the top of the pipe. Compact each stage of haunching and initial backfill by hand or mechanical tamping to a minimum of 95 percent density. If the remaining backfill material contains large particles which could damage the pipe from impact during placement, increase the second stage of initial backfill to a point of at least 12 inches over the top of the pipe.

When the pipe being installed is provided with elastomeyric seal joints, bell holes shall be excavated in the bedding material to allow for unobstructed assembly of the joint. Care should be taken that the bell hole is no larger than necessary to accomplish proper joint assembly. When the joint has been made, the bell hole should be carefully filled with bedding haunching material to provide for adequate support of the pipe throughout its entire length.

Provide at least 30 inches of cover over the top of the pipe before the trench is wheel-loaded, and 48 inches of cover before utilization of a hydrohammer during compaction.

Take care to avoid contact between the pipe and compaction equipment. Compaction of haunching, initial backfill, and backfill material should generally be done in such a way so that compaction equipment is not used directly above the pipe until sufficient backfill has been placed to ensure that such compaction equipment will not have a damaging effect on the pipe.

If sheeting or other trench protection is removed, take care so as not to disturb previously constructed foundation bedding, haunching, and initial backfill. If it has been necessary to place or drive sheeting or other trench protection below the top of the pipe., consideration should be given to leaving in place this portion of the sheeting or trench protection, since its removal could jeopardize the side support necessary for "flexible conduits".

When pipe laying is not in progress, the forward end of the pipe shall be kept effectively closed with an approved temporary barricade.

2.04. MANHOLES:

1. GENERAL: Manhole construction and location shall be shown on the Drawings and as herein specified.

2. MANHOLE BASE: Shall be Class "B" Portland Cement concrete poured in place conforming to Section 90 of the July, 1995 Standard Specifications. The invert shall be shaped to provide an adequate channel between the inlet and outlet pipes. The channel and shelf shall be steel troweled to a smooth dense surface. Adequate care must be taken to prevent displacement of the sewer pipe from line or grade during construction of the base.

The Contractor shall have the option of laying pipe through the manhole, shaping the upper half of the channel and the shelf, and later breaking out the pipe above the spring line, in which case he will be require to patch and smooth up with mortar the broken edges of pipe, or he may stop the pipe at the inside face of the manhole and construct the channel to the shape and size of the pipe. The invert shall follow a straight line between the inlet and outlet pipe, or a smooth curve on an even grade, if changing direction.

3. MANHOLE SHAFT: Precast concrete pipe sections, adjustment rings, steps and eccentric tapered section shall conform to the requirements of ASTM Designation C478.

4. MANHOLE STEPS: Three quarter inch iron bars, galvanized after bending, as shown on the Drawings, shall be firmly embedded in the wall of the manhole.

5. JOINTS: Shall be filled with mortar consisting of one (1) part cement to three (3) parts sand by volume before placing each section, and after the shaft is in place the joints inside and outside shall be neatly stuck and outside joints shall be banded to insure waterproofing the completed structure. RAM-NEK or approved equal will be allowed for jointing.

6. RING AND COVER: Casting shall be first-class grey iron, tough, and of even grain, and shall be dipped after they have been thoroughly cleaned in asphalt that has been heated to not less than 200 degrees F.

After castings have seasoned sufficiently so that there will be no further distortion due to temperature changes, the cover and ring seat shall be machined so that the tops are flush and the entire area of the seat is in contact with the cover in any position of the cover on the seat. Ring and cover shall be Phoenix Iron Works P-1090 or approved equal with closed pick hole.

7. P.V.C. OR D.I. SEWER ADAPTER GASKET: When P.V.C. or D.I. pipe is used, sewer coupling shall be used with gasket. The coupling shall be grouted into the wall of manhole or poured in the manhole base.

8. V.C.P: When V.C.P. is specified, a PVC C-900 bell with gasket shall be cast into the Manhole at both inlet and outlet. A 2' maximum length of D.I. pipe shall then be installed at inlet and outlet. The D.I. plain end pipe shall then be connected to V.C.P. plain end pipe with a flexible coupling.

9. FLEXIBLE COUPLINGS: Flexible couplings shall be as manufactured by Mission

Rubber Company or equal.

2.05. CLEANING AND TESTING GRAVITY SEWERS:

1. GENERAL: Sewer lines shall be cleaned of all foreign matter and tested, unless otherwise specified, in the presence and to the satisfaction of the Engineer. Leakage shall be brought within the allowable limit.

The contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the contractor to know and control its position at all times. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water shall be introduced behind it. The ball shall pass through the pipe with only the force of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris, or a damaged pipe shall stop the ball, the contractor shall remove the obstruction.

All sewers shall be tested for air leakage and each section between manholes shall be required to meet the minimum standards.

2. AIR TEST: The Contractor shall furnish test plugs, air compressor, test gauge, stopwatch, and personnel for conducting the acceptance test under the direction of the Owner. The Owner shall furnish the supervision of the test.

Immediately following the pipe cleaning described, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The rate of air loss shall then be determined by measuring the time interval required for internal pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe.

The pipeline shall be considered acceptable, when tested at an average pressure of 3.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe, if: (1) the total rate of air loss from any section tested in its entirety between manhole and cleanout structures does not exceed 1.0 cubic feet per minute, or (2) the section under test does not lose air at a rate greater than 0.015 cubic feet per square foot of internal pipe surface.

The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 pounds per square inch grater than the average back pressure of any ground water that may submerge the pipe is not less than that listed under Testing

Procedures.

If the pipe installation fails to meet these requirements, the Contractor shall determine at his own expense, the source or sources of the leakage, and he shall repair or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this test.

Special care shall be exercised during testing to adequately secure test plugs. Also, equipment shall be so arranged that personnel checking plugs are not required to enter the danger zone behind the plug while the pipe is under pressure. Plugs shall not be removed until the pressure in the pipe has returned to zero.

3. TESTING PROCEDURE:

(1) Clean pipe to be tested by propelling snug fitting inflated rubber ball through the pipe with water.

(2) Plug all pipe outlets with suitable test plugs. Brace each plug securely.

(3) If the pipe to be tested is submerged in ground water, insert a pipe probe, by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.

(4) Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psi, greater than the average back pressure of any ground water.

(5) Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any failures are observed, bleed off air and make necessary repairs.

(6) After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.

(7) After the two minute period, disconnect air supply.

(8) When pressure decreases to 3.5 psig, start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. This time interval should not be less than the following listed time for the size of pipe tested.

(9) Minimum time for pressure drop in tested section of pipe. T = time, L = length.

Pipe Diameter (inches)	Length for Min. T (ft)	Min. T. (Min & Sec)	T for Longer L. (Sec)

24"	99	22:40	13.674 L
21"	114	19:50	10.470 L
18"	133	17:00	7.692 L
15"	159	14:10	5.342 L
12"	199	11:20	3.474 L
10"	239	9:26	2.374 L
8"	298	7:34	1.520 L
6"	398	5:40	.854 L
4"	597	3:46	.380 L

4. MANHOLES: Each manhole shall be tested for leakage by plugging the sewer line between the manhole and the first joint. The manhole shall be filled with water and any drop in water level over a four hour period shall be carefully measured. A leakage rate in excess of 10 gallons per day shall be cause for rejection and the contractor shall repair the manhole until the leakage is within the limits specified.

5. DEFLECTION TEST FOR PVC. Thirty (30) days after completion of the backfill and compaction each pipe shall be checked for ring deflection by pulling a template or pig through the pipe. This template shall be cylindrical in shape. The diameter of which will be 5% less than the inside diameter of the pipe being placed. The length of the pig shall be a minimum of 2.5 times nominal pipe diameter. The pig shall be constructed so as not to hang up at the joints. If the template or big does not pass through the pipe it is assumed that the pipe deflection exceeds 5% of the inside diameter of the pipe and such pipe section or sections shall be removed and replaced to the satisfaction of the Engineer.

Pipe diameter for deflection testing is defined as average 0.0 minus twice the minimum wall thickness.

Mandrel size shall be as follows:

Note: All measurements are in inches.

Nominal Pipe Size	Average O.D.	2t	Pipe Diameter	5% Deflection Mandrel
6	6.275	.360	5.915	5.619
8	8.400	.480	7.920	7.524
10	10.500	.600	9.900	9.405
12	12.500	.720	11.780	11.191
15	15.300	.874	14.426	13.705

2.06. MATERIALS - PRESSURE LINE:

POLYVINYL CHLORIDE (PVC) PIPE: Shall conform to AWWA C900-81 specifications (latest revision). It shall be rates for a pressure class of 150 psi and have a Dimension Ratio (DR) of 18. Pipe shall have elastometric gaskets compatible with pipe materials.

Fittings shall be cement mortar lined cast iron, 250 psi, with rubber ring joints compatible with PVC pipe being used. Fittings shall conform to AWWA C-110-64 for cast iron fittings and AWWA C-104-74 for cement mortar linings. Cement shall be Type V (sulfate resistant) manufactured in accord with ASTM Spec. C-150.

2.07. INSTALLATION OF PRESSURE LINES:

1. GENERAL: All pipe shall be laid true to line and grade as shown on the Plans or as directed by the Engineer to pass existing obstructions. Before any pipe is laid, it shall be carefully inspected for defects. No pipe or other material which is cracked or shows other defects shall be placed.

Each section of pipe and each fitting shall be thoroughly cleaned out before it is installed. All pipe, fittings, valves, etc, shall be carefully lowered into the trench by suitable tools or equipment in such a manner as to prevent damage to the pipe, lining, coating, fitting or other appurtenances.

Pipe must be given a solid uniform bearing in the bottom of the trench. Blocking or supporting pipe on earth mounds will not be permitted.

Wherever pipe laying is discontinued for short periods, or when work is stopped at the end of the day, the open ends of all mains shall be closed with water tight plugs or bulkheads. The plug or bulkhead shall not be removed unless or until the trench is dry.

When curved alignment is shown on the plans, the maximum deflection at any joint shall not exceed 80% of the manufacturer's recommendation for the type of pipe and joint being used.

Whenever it is necessary to use a short length of pipe at a fitting or valve, the minimum length shall be thirty two (32) inches. If it is necessary to cut pipe, said cut shall be made with an approved pipe cutter. The use of hammer and chisel for pipe cutting will not be permitted.

2. INSTALLATION OF P.V.C. PIPE.

a. Clean ring groove. Inspect the bell to be sure that no dirt or foreign material is in the groove. Dirt of foreign material could interfere with proper seating of the rubber ring and cause leakage. If necessary, wipe groove with a clean, dry cloth. DO NOT LUBRICATE RUBBER RINGS OR THE RING GROOVE.

b. Clean and insert ring. Inert a clean ring in the groove with color marking facing toward the outside of the bell. Be sure the ring is seated evenly all around and is free from twists. DO NOT LUBRICATE RUBBER RINGS.

c. Clean pipe end. Make sure the pipe end is clean. Wipe with a clean dry cloth around the entire circumference from the end of the spigot to 1 inch beyond the reference mark.

d. Lubricate the spigot end of he pipe using manufacturer's recommended lubricant. Be sure to cover the entire circumference with particular attention paid to the beveled end of the spigot. The coating should be the equivalent of a brush coast of enamel paint. It can be applied by brush, cloth, sponge, or glove. Do not lubricate the rubber ring or the ring groove in the bell because lubrication could cause ring displacement. After the spigot end has been lubricated, it must be kept clean and free of dirt or sand. If dirt and sand adhere to the lubricated end, the spigot must be wiped clean and re-lubricated.

e. Insert the spigot end into the bell so that it is in contact with the ring. Align the pipe sections and push the spigot end in until the reference mark on the spigot end is flush with the end of the bell. The recommended method for assembly is using a bar and a block; however, pullers such as the lever or come-along may also be used.

If undue resistance to insertion of the spigot end is encountered or the reference mark does not reach the flush position, disassemble the joint and check the position of the rubber ring. IF it is twisted or pushed out of its seat, clean the ring, bell, and spigot end and repeat the assembly steps. Be sure both lengths are in proper alignment during assembly.

3. TRACER WIRES: Tracer wire shall be installed and shall be No. 12 solid copper or aluminum National Electrical Code Type TW insulation, and shall form a mechanically and electrically continuous line throughout the length of the pipe. Conductors shall be spliced and insulated in accordance with the code. The wires shall be carefully placed so as not to be broken or stressed by the backfilling operations.

At gate valves and other pipeline appurtenances designated by the Engineer, the tracer wire shall be looped to the ground terminating at the underside of the valve box covers or manhole.

4. THRUST BLOCK AND ANCHORS: Concrete thrust blocks and anchors, for pressure line shall be constructed at all fittings, and dead-ends as shown on the drawings and at all other locations as directed by the Engineer. Thrust blocks will be required at all changes in horizontal and vertical alignment greater than 10 degrees.

Trenches at thrust block and anchor locations shall be carefully hand shaped from the standard trench so that thrust blocks and anchors can be poured against undisturbed earth. Concrete for thrust blocks and anchors shall be Class B as specified in Section 90 of the July, 1995, California Standard Specifications.

2.08. CLEANING AND TESTING OF PRESSURE LINES:

When the pipe line has been installed, it shall be cleaned of all dirt and construction debris before backfilling.

After the trench has been completely backfilled, the newly laid pipe or any valved section thereof, shall be subject to a hydrostatic pressure as specified herein.

The Contractor shall furnish all equipment for making tests including a suitable gauge for measuring the applied line pressure. The tank containing the water to maintain line pressure shall be of such a design that the volume of water used may be accurately measured.

Each section of the pipe to be tested shall be slowly filled with water, and all air shall be expelled from the pipe. After the system has been filled with water and air expelled, all the valves controlling the section to be tested shall be closed or the line plugged.

The pipe shall then be refilled, if necessary, and subjected to a pressure of not less than 150 pounds per square inch or the service pressure plus 50 pounds if pipe other than 150 psi class is specified, for a period of four hours.

The allowable leakage in the test section shall not exceed 15 gallons per mile, per day, per inch diameter of pipe tested.

If defects are found or the line does not meet the allowable leakage rate, the Contractor shall locate the leaks, make the necessary repairs at his own expense, backfill and repeat the pressure and leakage tests in the presence of the Engineer as specified above. No pipeline section shall be accepted until the leakage is within the specified allowance.

2.09. SEWER LATERALS:

1. SCOPE OF WORK: All labor and materials to complete all work as shown on the drawings, or herein specified, or both, for connection of existing sewer laterals to new main lines or for construction of new sewer laterals.

2. MATERIALS (V.C.P. OR D.I. MAIN): Sewer laterals shall be of the same material as mainline construction within the street right-of-way. Outside of right of way laterals may be V.C.P., D.I., or P.V.C. as specified in Section 2.02.

3. MATERIALS (P.V.C. MAIN): Sewer laterals shall be of the same material as main line construction as specified in Section 2.02.

4. INSTALLATION OF SEWER LATERALS: Sewer laterals shall be connected to the main sewer line by means of a wye or tee integrally cast into the main line sewer pipe. Installation

shall be in accord with the Standard Details. If lateral is to connect to an existing main, then connection shall be "Tap-Tite" or equal.

RESOLUTION NO. 6371-2021

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SEBASTOPOL
ADOPTING THE STREET STANDARD DETAILS AND SPECIFICATIONS ("STREET STANDARDS")

WHEREAS, the City of Sebastopol has previously adopted the City of Sebastopol Standard Details and Specifications, more commonly referred to as "Standards," including the Street Standards, by Resolution No. 4978 on September 1, 1998; and

WHEREAS, said Street Standards should periodically be updated to comply with current engineering best practices, and state and federal regulations; and

WHEREAS, the City Engineer has reviewed the updated Street Standards and recommends adoption; and

WHEREAS, minor discrepancies may be found from to time.

NOW, THEREFORE, BE IT RESOLVED that the City Council adopts the Street Standard Details and Specifications ("Street Standards") dated June 2021 attached hereto as Exhibit "A," and

BE IT FURTHER RESOLVED, that the City Engineer is authorized to make minor changes to the Street Standards to correct errors, conflicts, and discrepancies.

The above and foregoing Resolution was duly passed, approved, and adopted at a meeting by the City Council on the 7th day of September 2021, by the following vote.

VOTE:
Ayes: Councilmembers Hinton, Rich, Slayter, Vice Mayor Gurney and Mayor Glass
Noes: None
Absent: None
Abstain: None

APPROVED: _____
Mayor Una Glass

ATTEST: _____
Mary Gourley, Assistant City Manager/City Clerk, MMC

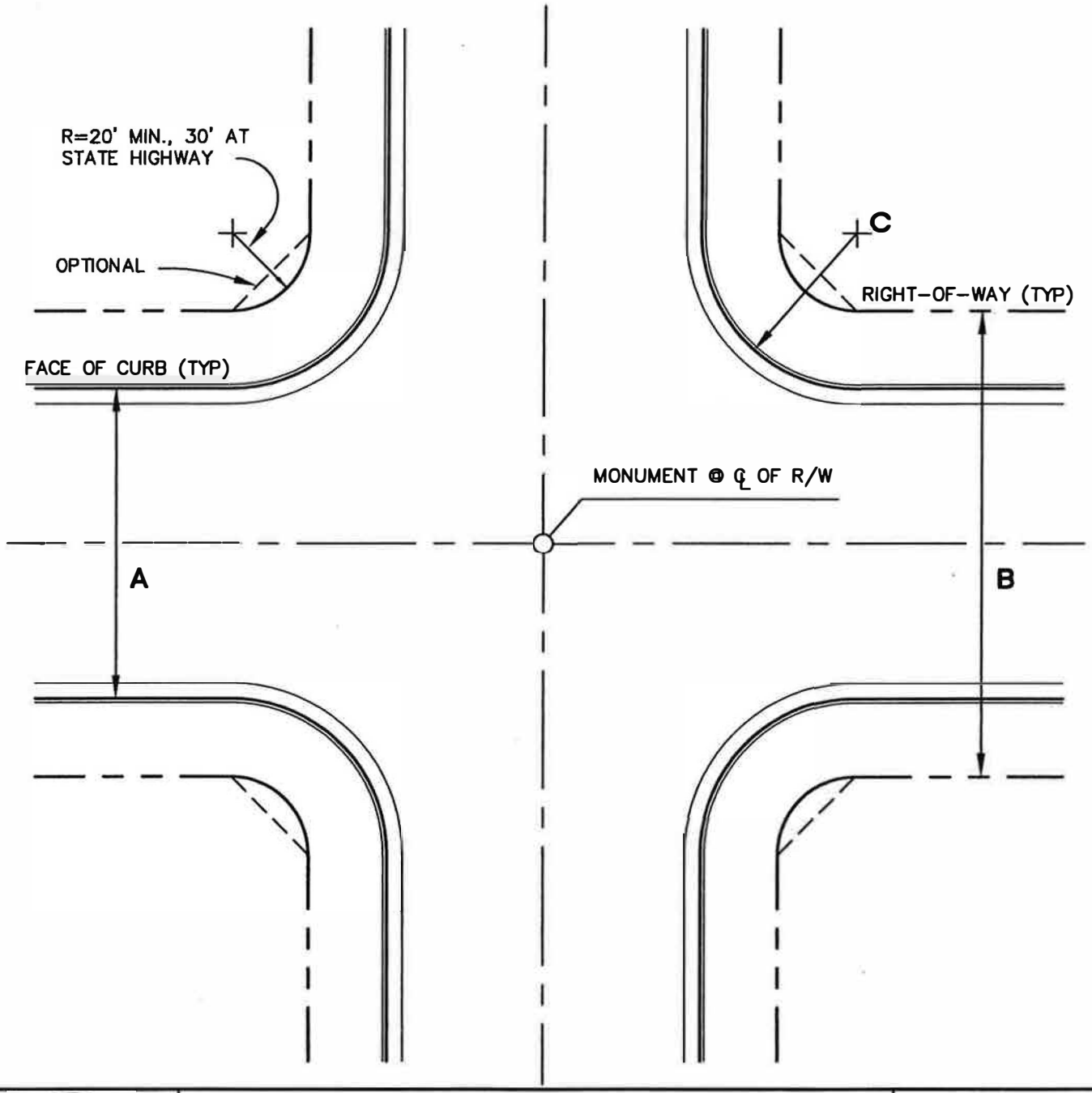
APPROVED AS TO FORM: _____
Larry McLaughlin, City Attorney

SECTION 5

STREET STANDARDS

STREET TYPE	A CURB TO CURB WIDTH	B RIGHT-OF-WAY WIDTH	C CURB RETURN RADIUS
ARTERIAL	40'	64'	30', 35' AT STATE HWY
COLLECTOR	36'	60'	25'
LOCAL	32'	44'	20'
CUL DE SAC	36'	60'	25'

NOTES:
1. ADDITIONAL SIDEWALK EASEMENTS REQUIRED.
2. ADDITIONAL PUBLIC UTILITY EASEMENTS MAY BE REQUIRED ON BOTH SIDES OF RIGHT-OF-WAY.

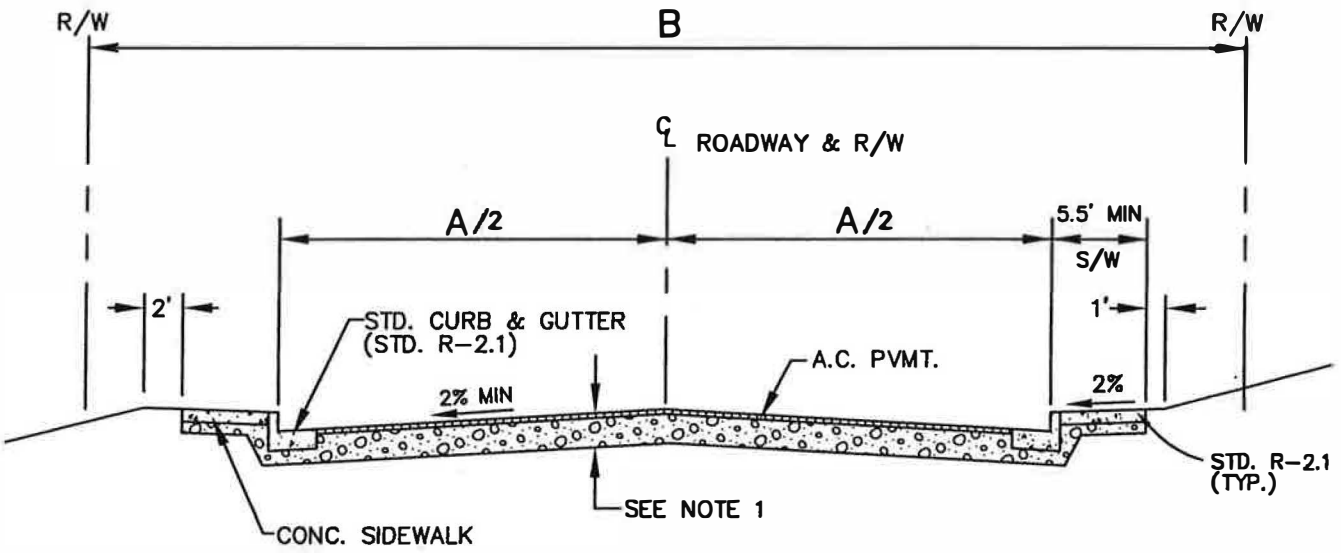


SEBASTOPOL CALIFORNIA PUBLIC WORKS

STREET LAYOUT

STD. NO. R-1.1

SCALE: NONE	DRAWN: LMM	APPROVED	JG, CITY ENG.	DATE: JUNE 2021

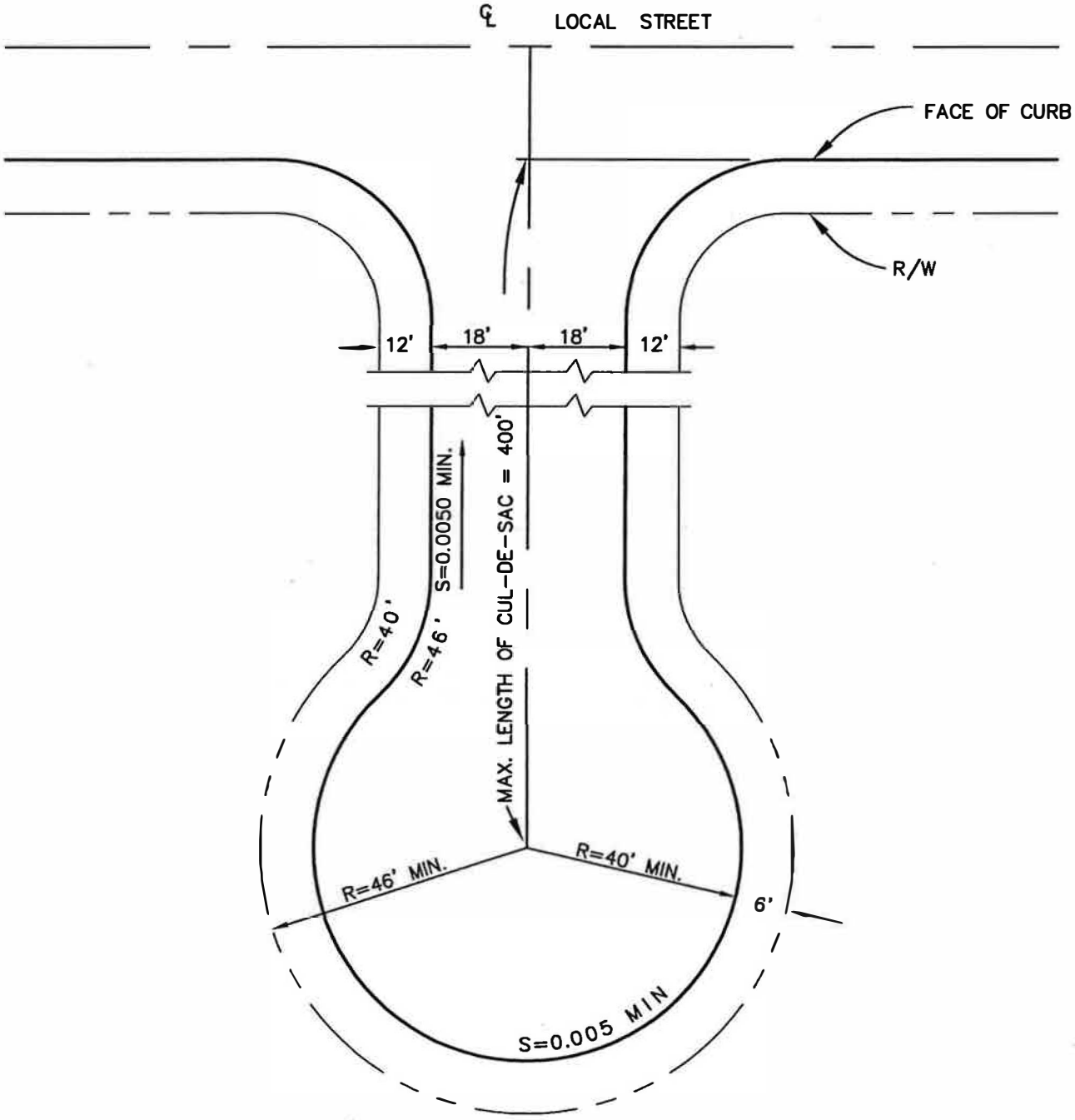


NOTES:

1. STRUCTURAL SECTION OF ROADWAY SHALL BE DETERMINED BY SOILS REPORT AND SHOWN ON PLANS, SHOW "R" VALUE & T.I.
2. CUT SLOPES SHALL BE A MAXIMUM OF 2:1, UNLESS SOILS REPORT DETERMINES OTHERWISE.
3. FILL SLOPES SHALL BE A MAXIMUM OF 2:1
4. CONSTRUCTION OUTSIDE R/W LINE SHALL REQUIRE SLOPE EASEMENTS.
5. A 5'-10' P.U.E. AND SIDEWALK EASEMENTS REQUIRED ADJACENT TO THE RIGHTS-OF-WAY.

SEBASTOPOL CALIFORNIA PUBLIC WORKS	**STREET SECTION**	**STD. NO. R-1.2**

SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021



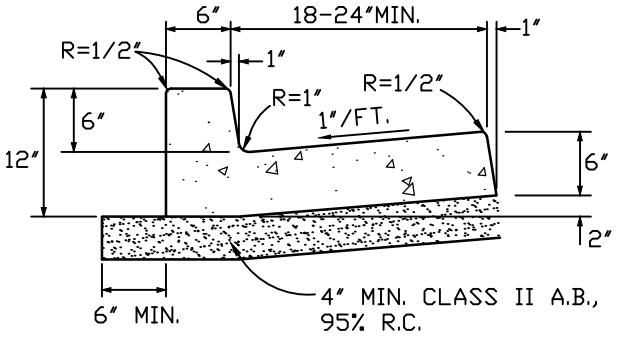
CROSS SLOPE IN BULB AREA
SHALL BE MIN 2%.

NOTES:

1. ADDITIONAL SIDEWALK EASEMENT REQUIRED IN BULB.
2. ADDITIONAL PUBLIC UTILITY EASEMENTS MAY BE REQUIRED ON BOTH SIDES OF RIGHT-OF-WAY.

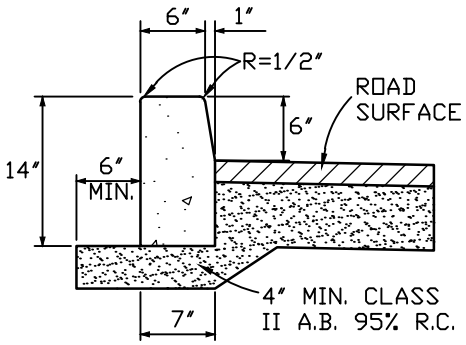
SEBASTOPOL CALIFORNIA PUBLIC WORKS	CUL-DE-SAC	STD. NO. R-1.3

SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021



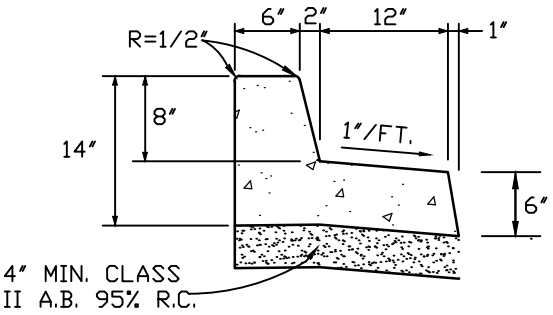
STANDARD CURB AND GUTTER

NOT TO SCALE



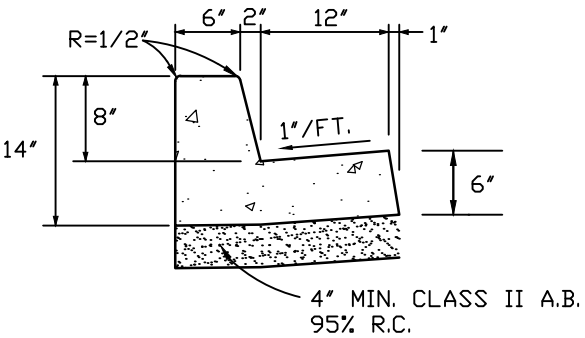
STANDARD VERTICAL CURB

NOT TO SCALE



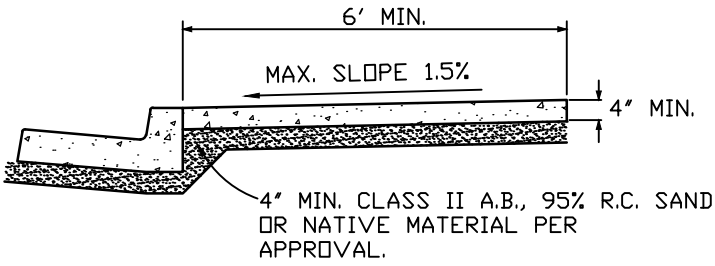
TYPE A MEDIAN CURB

NOT TO SCALE



TYPE B MEDIAN CURB

NOT TO SCALE



STANDARD SIDEWALK

NOT TO SCALE

NOTES:

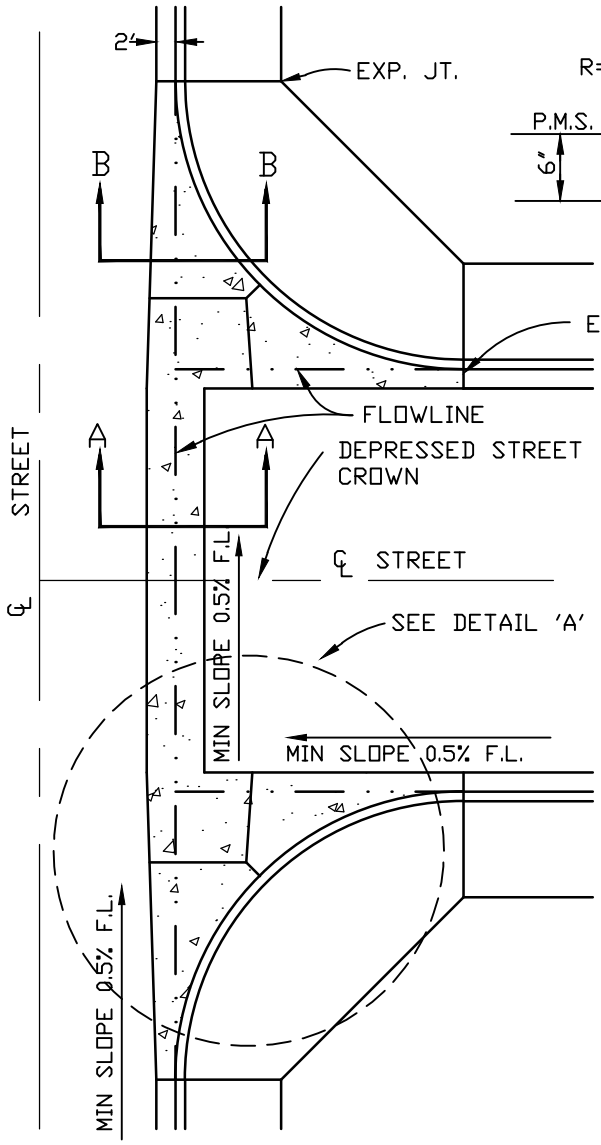
1. CONCRETE SHALL BE CLASS A AND SHALL CONTAIN NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD.
2. EXPANSION JOINTS, 1/4 INCH WIDE, SHALL BE INSTALLED AT EACH SIDE OF STRUCTURES, AT ENDS OF CURB RETURNS AND AT THE TOP OF DRIVEWAY TAPERS.
3. EXPANSION JOINTS SHALL BE INSTALLED AT 60FT INTERVALS, WITH WEAKENED PLANE JOINTS EVERY 15 FEET.
4. EXPANSION JOINTS SHALL BE PLACED IN CURB, GUTTER AND SIDEWALK AT ALL CURB RETURNS.
5. SIDEWALKS SHALL BE SCORED INTO 5 FOOT SQUARES UNLESS OTHERWISE SPECIFIED BY ENGINEER.
6. IF EXTRUSION MACHINE IS USED, EXPANSION JOINTS SHALL BE DEEP SCORED 1/3 THE THICKNESS.
7. WEIGHT OF CURB AND/OR SIDEWALK AND CLASS 2 AGGREGATE BASE SHALL EXCEED THE EXPANSION PRESSURE OF THE BASEMENT SOIL 'R' VALUE
8. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
9. WHERE APPLICABLE, NEATLY CUT AND REMOVE PAVEMENT. REPLACE WITH NEW A.C. AFTER CURB AND GUTTER IMPROVEMENTS ARE COMPLETE.
10. NEW CONCRETE POURED ADJACENT TO EXISTING CONCRETE SHALL CONTAIN AT LEAST ONE POUND OF LAMPBLACK PER CUBIC YARD.

CURB, GUTTER AND SIDEWALK

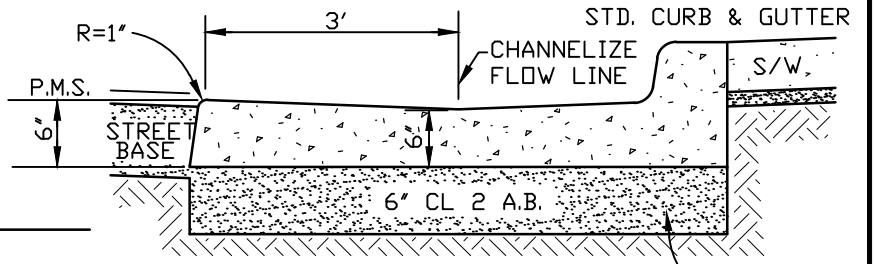
STD. NO.

R-2.1

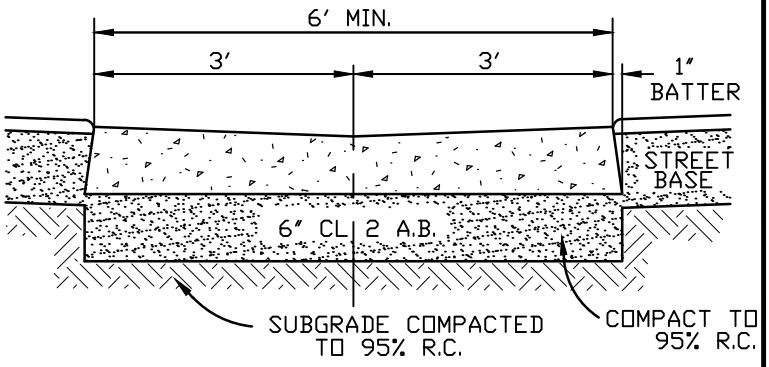
SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENGINEER	DATE: JUNE 2021



TYP. CROSS-GUTTER PLAN

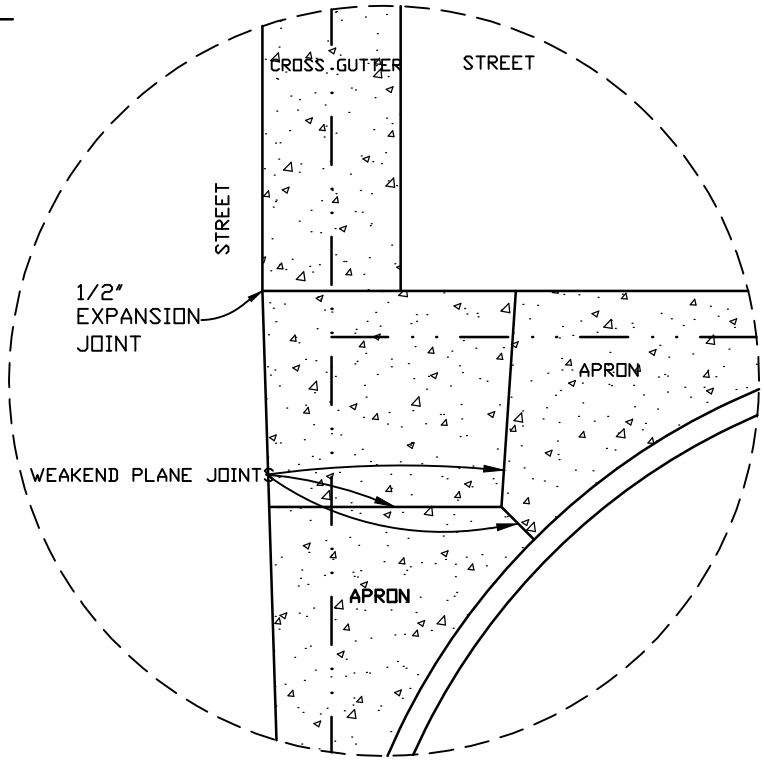


SECTION B-B



SECTION A-A

SEE DETAIL 'A'



DETAIL "A"

TYPICAL BOTH SIDES

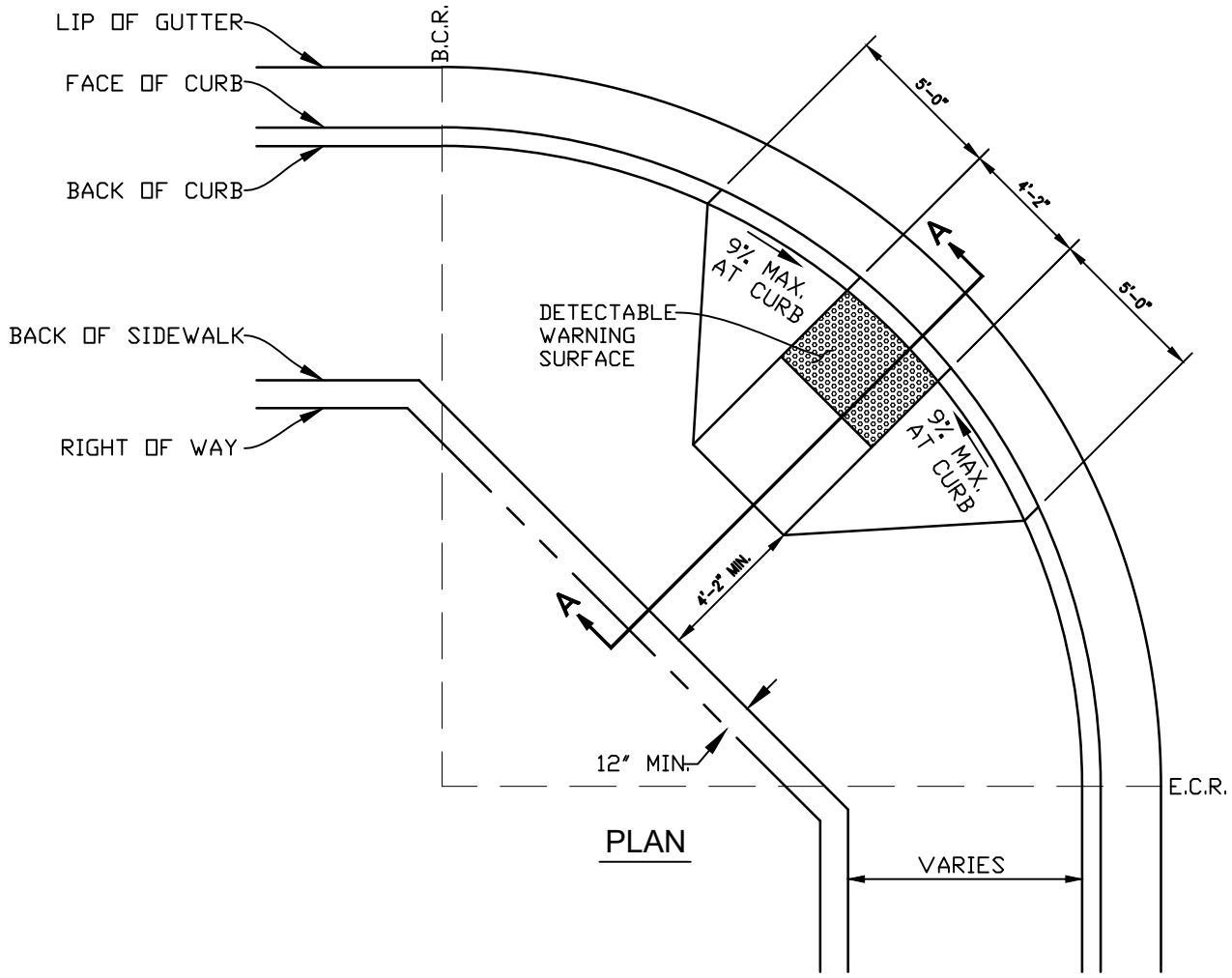
NOTES:

1. ALL CONCRETE SHALL BE CLASS "A" (6 SACK/ CU. YARD)
2. NEW CONCRETE POURED ADJACENT TO EXISTING CONCRETE SHALL CONTAIN AT LEAST ONE POUND OF LAMPBLACK PER CUBIC YARD.

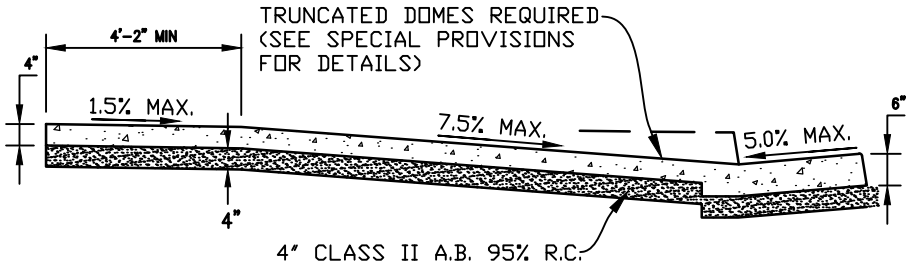
CROSS GUTTER

STD. NO. R-2.2

SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENGINEER	DATE: JUNE 2021



PLAN

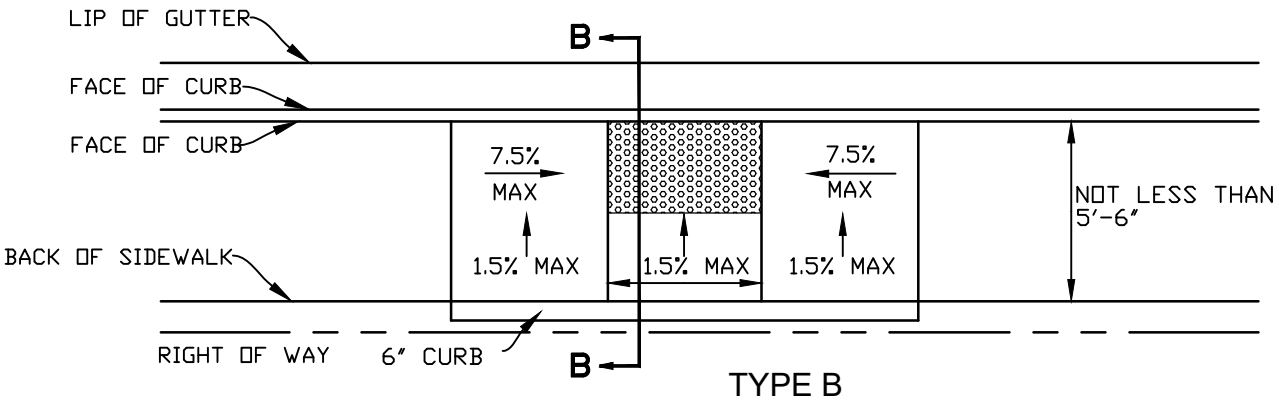


SECTION A-A

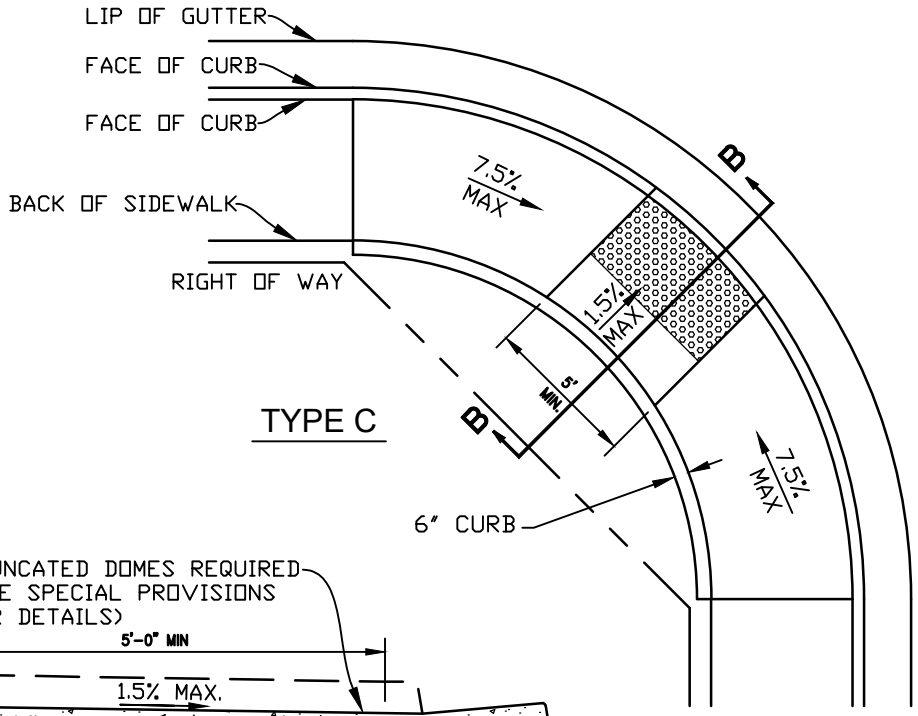
PEDESTRIAN RAMP TYPE A

STD. NO. R-3.1

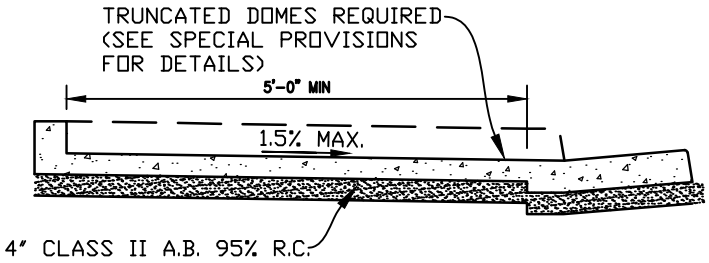
SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENGINEER	DATE: JUNE 2021



TYPE B



TYPE C



SECTION B-B

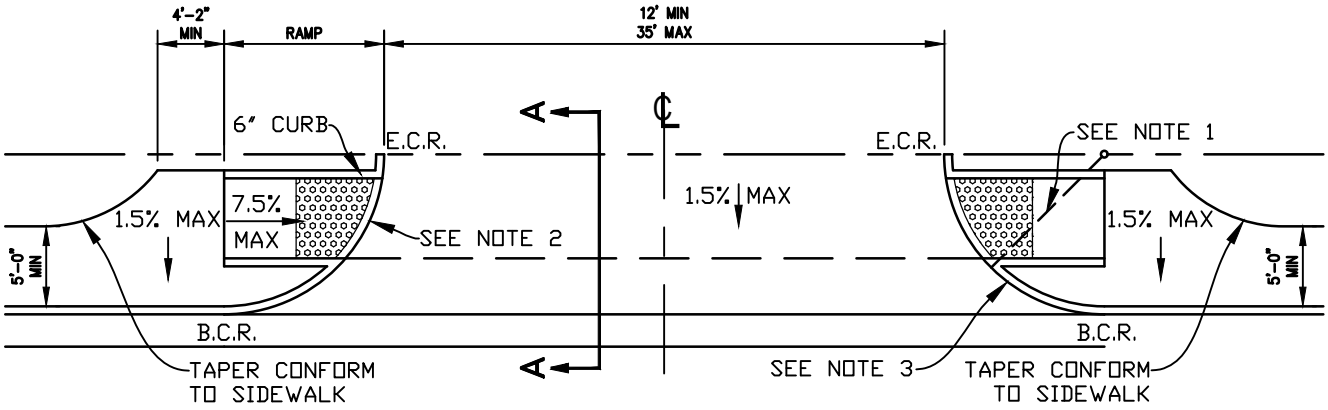
NOTES:

1. RAMP SHALL BE CONSTRUCTED WITH ½" LIP AND 45° BEVEL.
2. TYPE A AND C RAMPS SHALL BE LOCATED AT THE CENTER OF THE CURB RETURN.
3. CONCRETE SHALL BE CLASS "A" WITH NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD.
4. DESIGN SHALL CONFORM TO THESE REQUIREMENTS, EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER.
5. NEW CONCRETE POURED ADJACENT TO EXISTING CONCRETE SHALL CONTAIN AT LEAST ONE POUND OF LAMPBLACK PER CUBIC YARD.

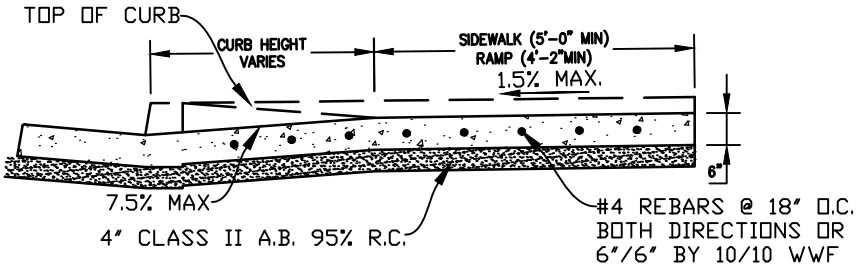
PEDESTRIAN RAMP TYPE B AND C

STD. NO.
R-3.2

SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENGINEER	DATE: JUNE 2021



COMMERCIAL DRIVEWAY

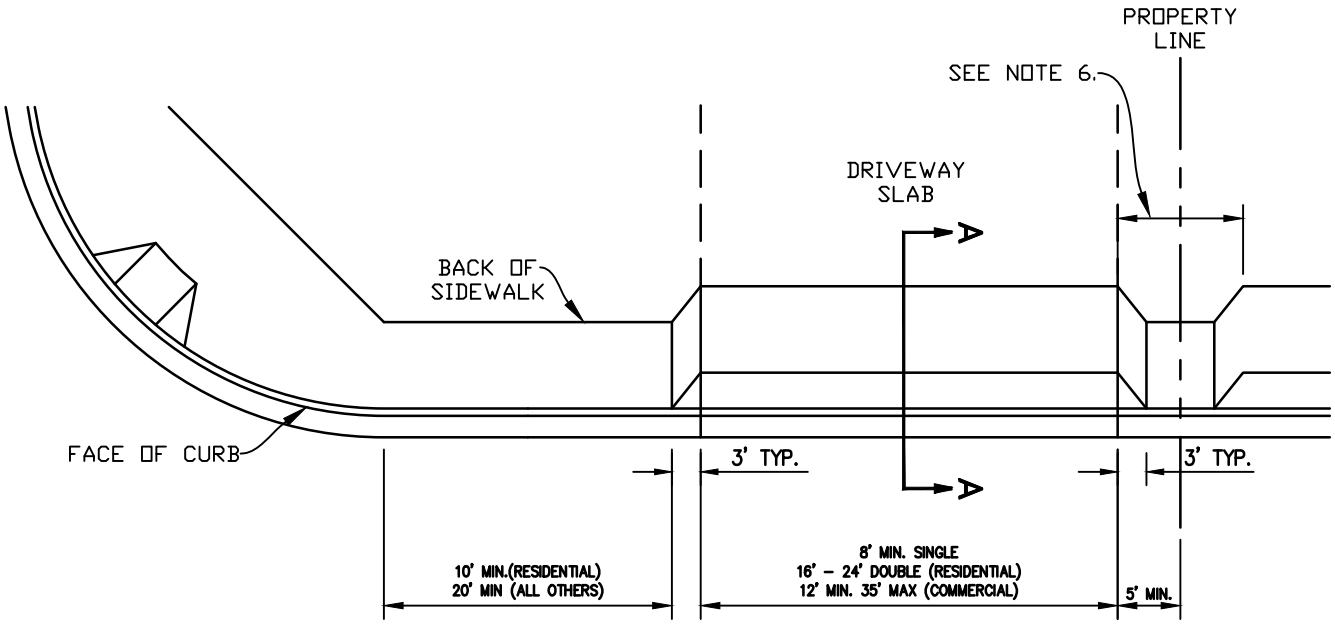


SECTION A-A

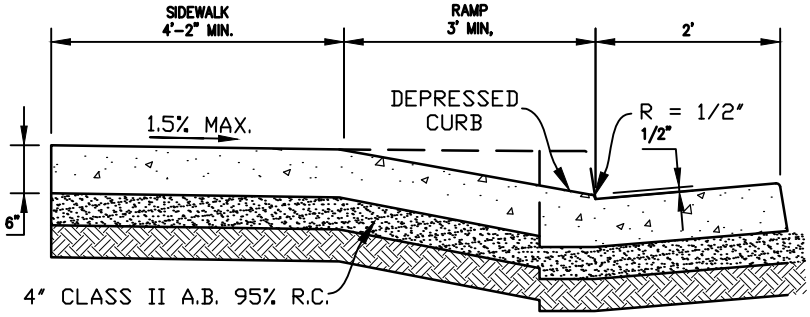
NOTES:

1. RADIUS TO BE A MINIMUM OF 10 FEET.
2. RAMP SHALL BE FLUSH ACROSS DRIVEWAY.
3. CURB HEIGHT VARIES FROM FULL HEIGHT AT B.C. TO FLUSH AT RAMP.
4. NEW CONCRETE POURED ADJACENT TO EXISTING CONCRETE SHALL CONTAIN AT LEAST ONE POUND OF LUMPBLACK PER CUBIC YARD.

SEBASTOPOL 1902 CALIFORNIA	**COMMERCIAL DRIVEWAY AND ALLEY APPROACH**				STD. NO. **R-4.1**
	SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENGINEER	DATE: JUNE 2021



PLAN

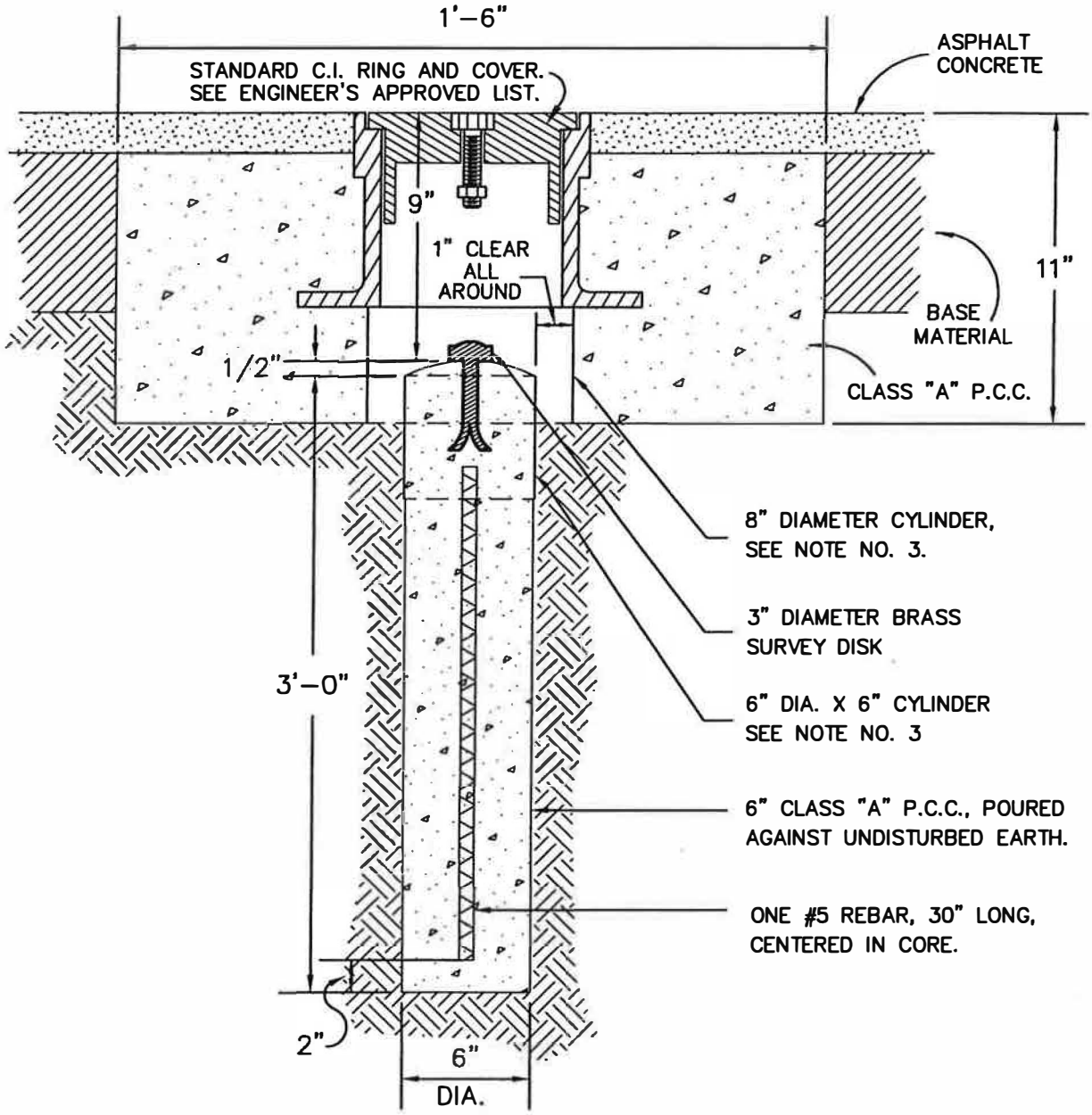


SECTION A-A

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE INSTALLED AT THE CENTER OF ALL DRIVEWAYS OVER 20' WIDE.
2. MAXIMUM SIDEWALK CROSS SLOPE 1.5%
3. WIDEN OR MEANDER SIDEWALK AT OBSTRUCTIONS (INCLUDING DRIVEWAYS) TO MAINTAIN A 4'-2" MINIMUM CLEARANCE.
4. ALL CONCRETE SHALL BE CLASS "A" CONTAINING NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD.
5. WELDED WIRE FABRIC (4"X4",10/10) SHALL BE PLACED THROUGHOUT COMMERCIAL AND INDUSTRIAL DRIVEWAYS WITHIN THE STREET RIGHT OF WAY.
6. IF DISTANCE BETWEEN DRIVEWAYS IS LESS THAN 10', OMIT CURB ISLAND.
7. NEW CONCRETE POURED ADJACENT TO EXISTING CONCRETE SHALL CONTAIN AT LEAST ONE POUND OF LAMPBLACK PER CUBIC YARD.

SEBASTOPOL 19 02 CALIFORNIA	**DRIVEWAY**				STD. NO. **R-4.2**
SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENGINEER		DATE: JUNE 2021



NOTES:

1. SURVEYOR OR ENGINEER SETTING THE MONUMENT SHALL INDICATE EXACT POINT BY MAKING A CROSS ON THE CAP AND SHALL STAMP YEAR SET AND HIS/HER LICENSE TYPE AND NUMBER.
2. THE DEPTH OF THE MONUMENT POST SHALL BE LENGTHENED OR SHORTENED AS DICTATED BY THE GROUND CONDITIONS OR AS APPROVED BY THE CITY ENGINEER. IN SOFT GROUND OR FILL AREAS THE MONUMENT POST SHALL BE LENGTHENED TO BED IT ON A STABLE BASE.
3. CYLINDER MATERIAL SHALL BE THINWALL A.B.S. OR P.V.C. PLASTIC PIPE.
4. TOP OF MONUMENT CORE SHALL BE FINISHED SMOOTH AND ROUNDED WITH NO CONCRETE ABOVE EDGE OF BRASS SURVEY MARKER.
5. ASTM CLASS 30 IRON CASTINGS DIPPED IN ASPHALT PAINT

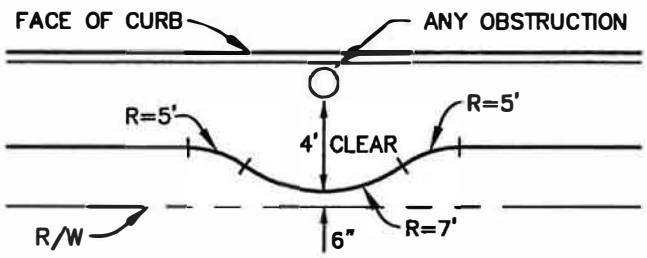
SEBASTOPOL CALIFORNIA PUBLIC WORKS

CITY MONUMENT

STD. NO. R-5.1

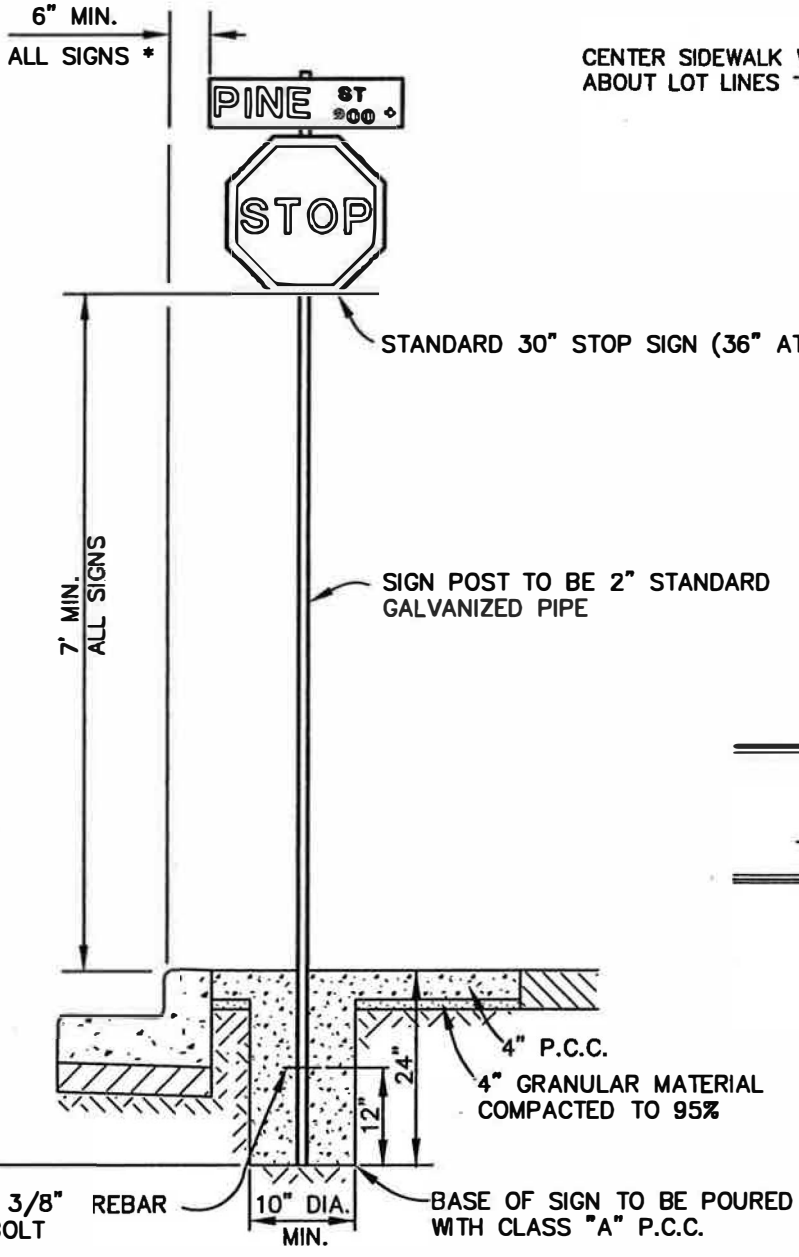
SCALE: NONE	DRAWN: MGA	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021

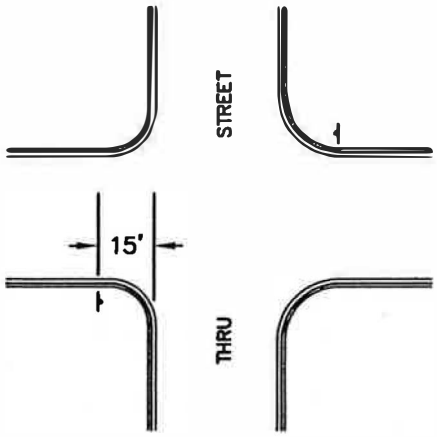
SIDEWALK WARP



CENTER SIDEWALK WARPS ABOUT LOT LINES

* MAY BE REDUCED TO 3" ON EXISTING STREETS TO PROVIDE A MINIMUM SIDEWALK CLEARANCE OF 3 FEET.



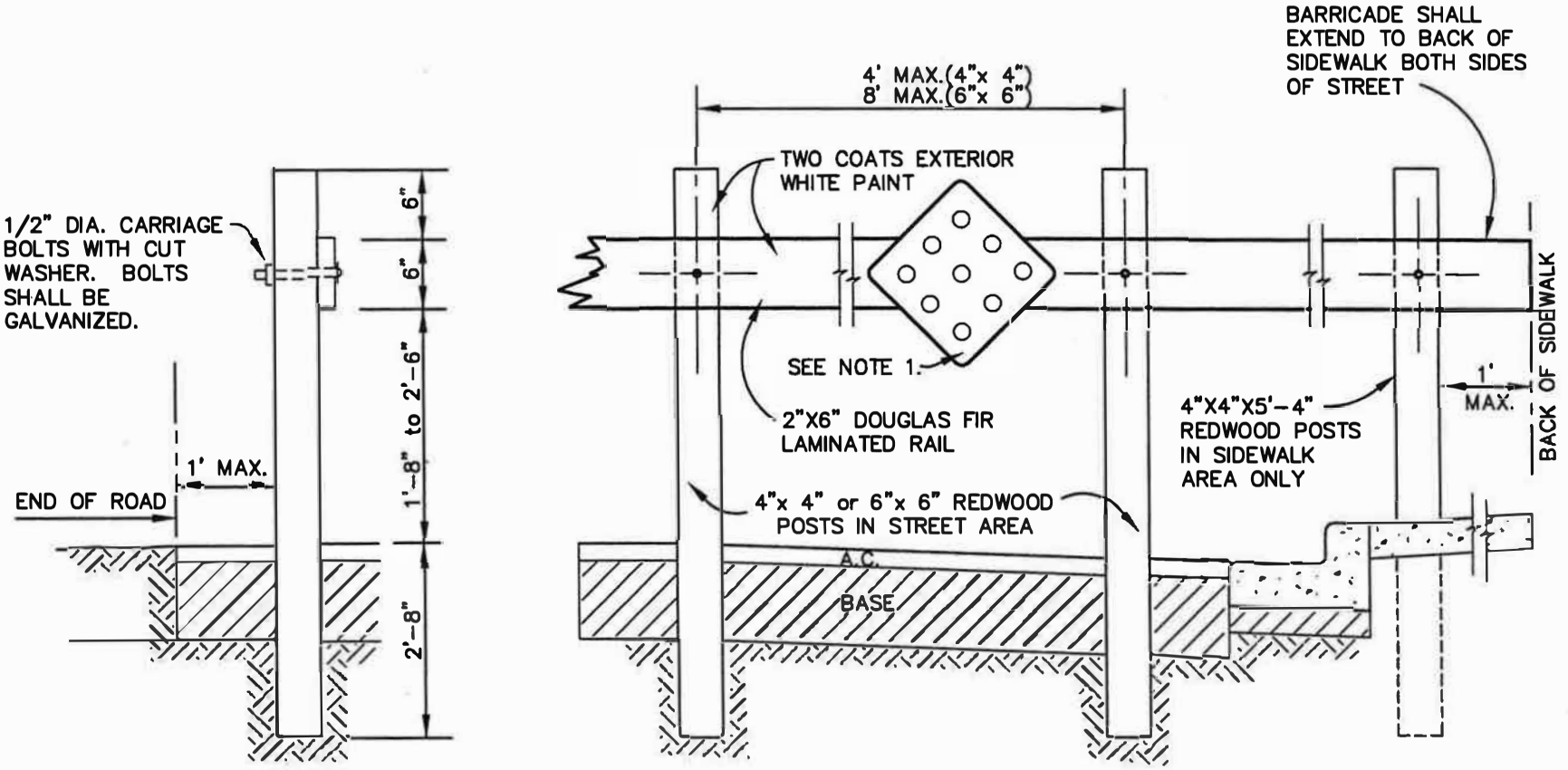


SEBASTOPOL CALIFORNIA PUBLIC WORKS	**STREET NAME SIGN AND SIDEWALK WARP**				**STD. NO. R-5.2**
	SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021

STANDARD BARRICADE

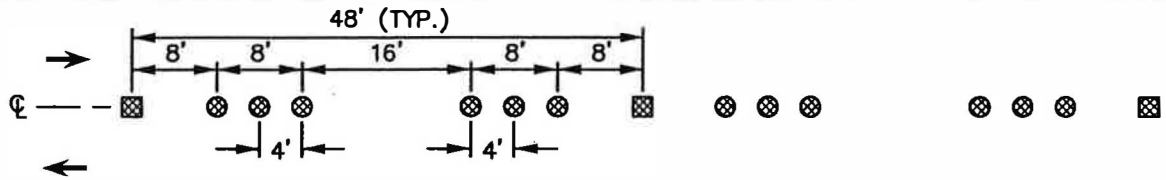
SCALE: NONE | DRAWN: MGA | APPROVED: JG, CITY ENG. | DATE: JUNE 2021

STD. NO. R-5.3

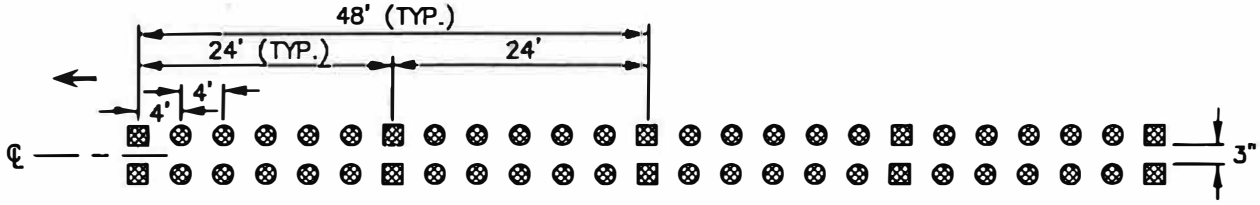


NOTES:

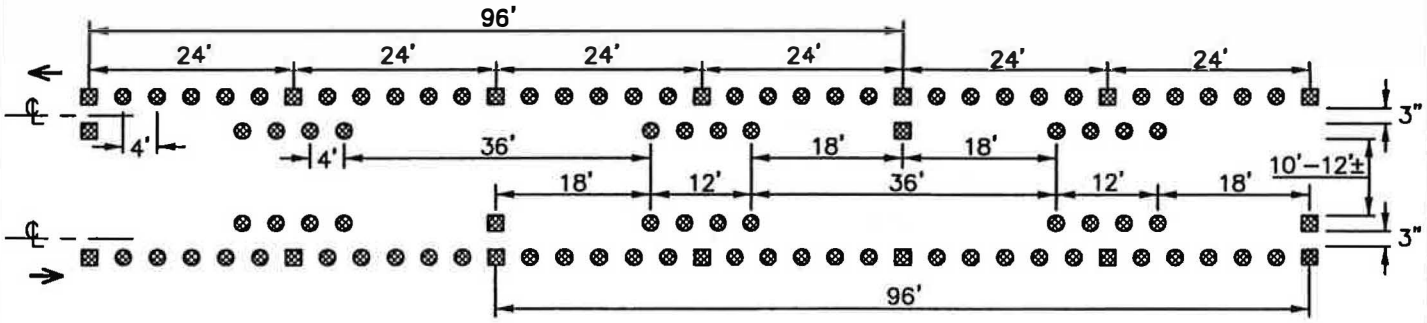
1. INSTALL 18" X 18" ALUMINUM TYPE N-5 REFLECTOR, NO MORE THAN 8' o.c., MINIMUM 3
2. SIDEWALKS ONLY – INSTALL 4" YELLOW REFLECTORS.



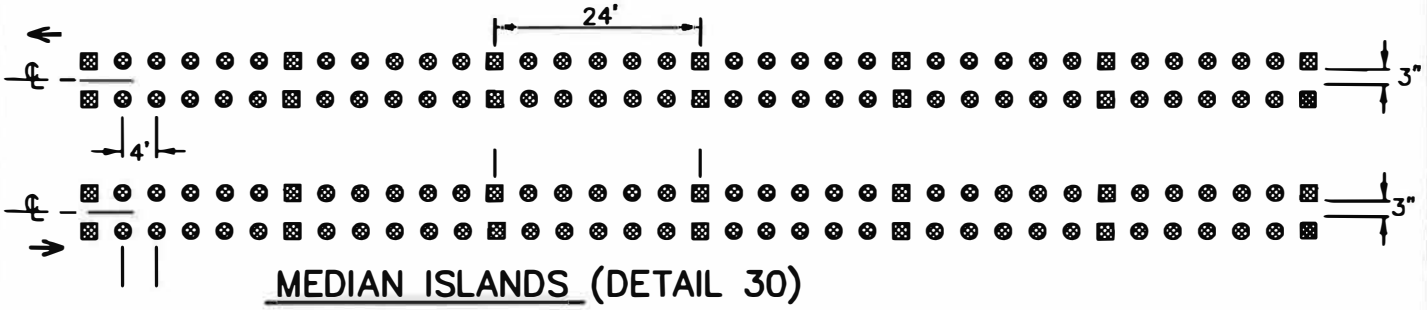
2–LANE ROADWAYS (DETAIL 4)



MULTI–LANE ROADWAYS (DETAIL 23 NO PASSING ZONE)



TWO–WAY LEFT TURN LANE (DETAIL 33)



MEDIAN ISLANDS (DETAIL 30)

LEGEND

- ▣ TWO–WAY YELLOW REFLECTIVE MARKER
- ⊗ NON–REFLECTIVE YELLOW MARKER
- → DIRECTION OF TRAVEL

NOTES:

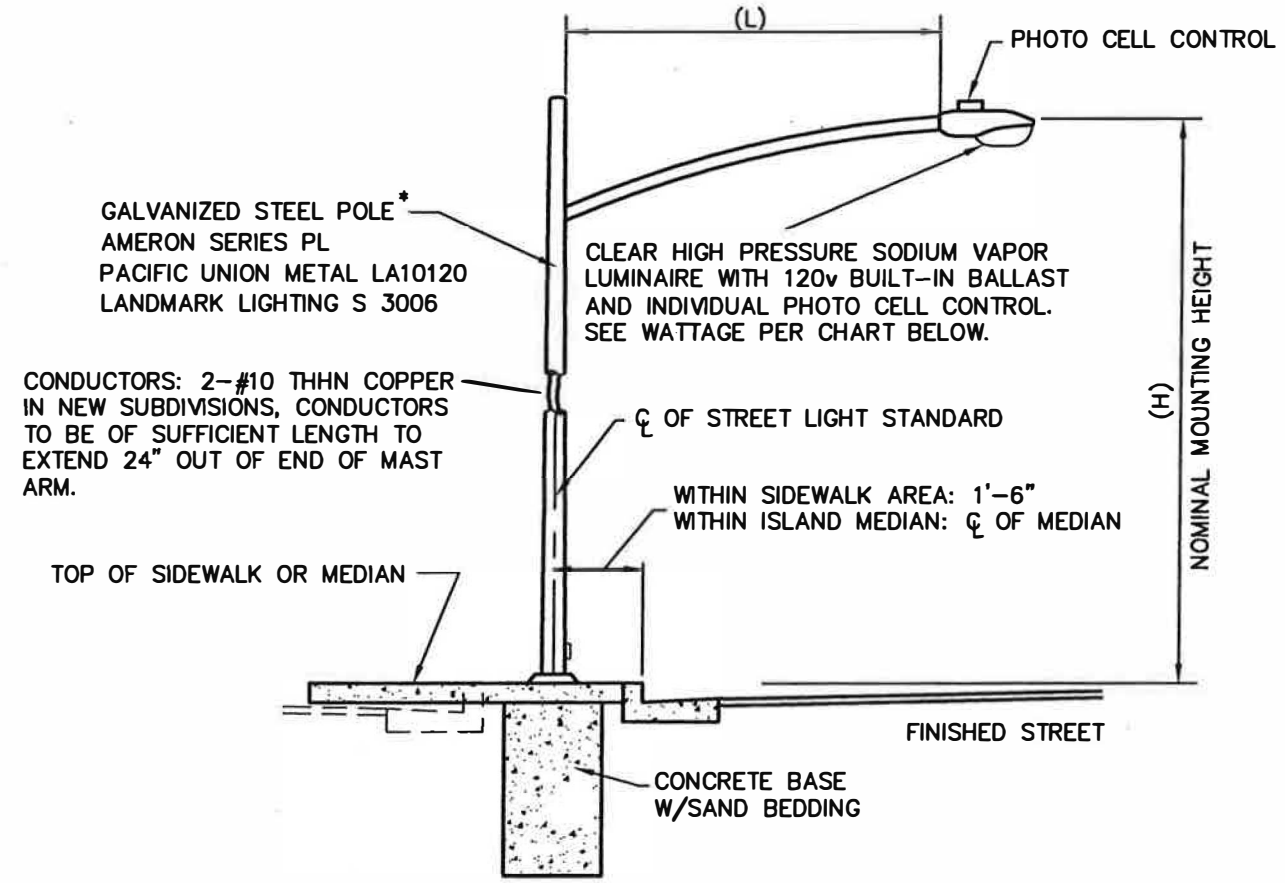
1. FOR TWO LANE ROADWAYS, PLACE ADDITIONAL REFLECTORS AT 24 FT. O.C. ON CURVES WITH A RADIUS OF 750 FT. OR LESS.
2. THE FIRST AND LAST MARKER AT EACH INTERSECTION SHALL BE A REFLECTOR.
3. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER
4. ALL PARKERS AND MARKER INSTALLATION SHALL MEET STATE STANDARDS EXCEPT AS NOTED.

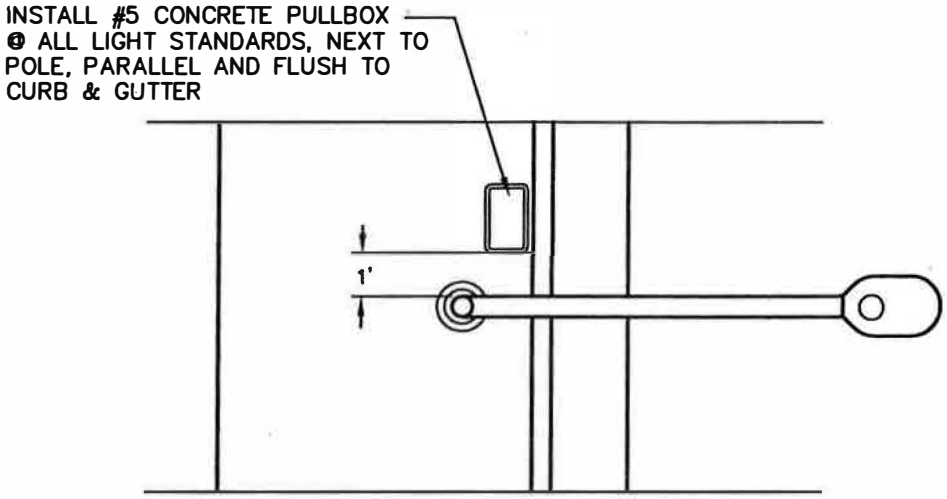
SEBASTOPOL CALIFORNIA PUBLIC WORKS

PAVEMENT MARKINGS: CENTER LINES, TWO–WAY LEFT TURN LANES, AND MEDIAN ISLANDS

STD. NO. R-5.4

SCALE: NONE	MGA	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021





*ALTERNATES TO BE SPECIFICALLY APPROVED BY THE CITY ENGINEER.

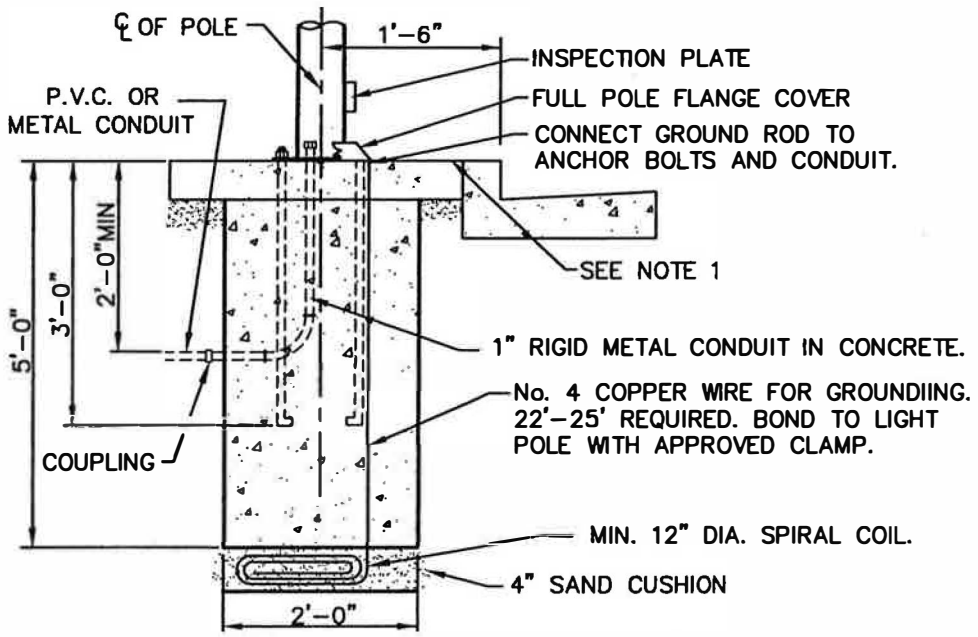
STREET CLASSIFICATION	POLE HEIGHT(H)	ARM LENGTH(L)	MAXIMUM SPACING	WATTAGE
ARTERIAL	32'-6"	8'-0"	100'	150
COLLECTOR, CUL-DE-SAC	28'-0"	6'-0"	200'	100
LOCAL	27'-6"	4'-0"	200'	70

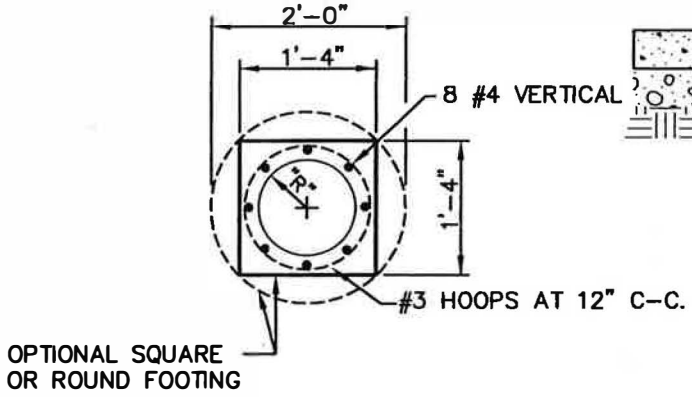
SEBASTOPOL CALIFORNIA PUBLIC WORKS

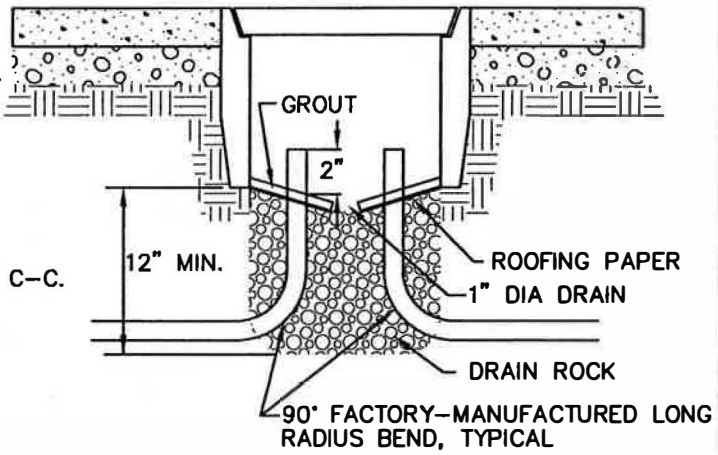
STREET LIGHT

STD. NO. R-6.1

SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021







PULLBOX

NOTES:

1 IN UNDEVELOPED AREAS, CONSTRUCT A 2'x2' CONC. PAD (4" THICK). IF ROUND FOTTING IS POURED, STOP AT THE ELEVATION OF BOTTOM OF THE SIDEWALK.

2 ANCHOR BOLT DIMENSION "R" AND BOLT PATTERN TO SUIT POLE BASE FURNISHED.

3 CONCRETE SHALL BE CLASS "A" P.C.C. AGAINST UNDISTURBED SOIL.

4 SEE ENGINEER'S APPROVED LIST FOR ALTERNATE FOUNDATIONS.

5 A MINIMUM OF TWO FULL THREADS TO BE EXPOSED ABOVE ANCHOR BOLT NUTS.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

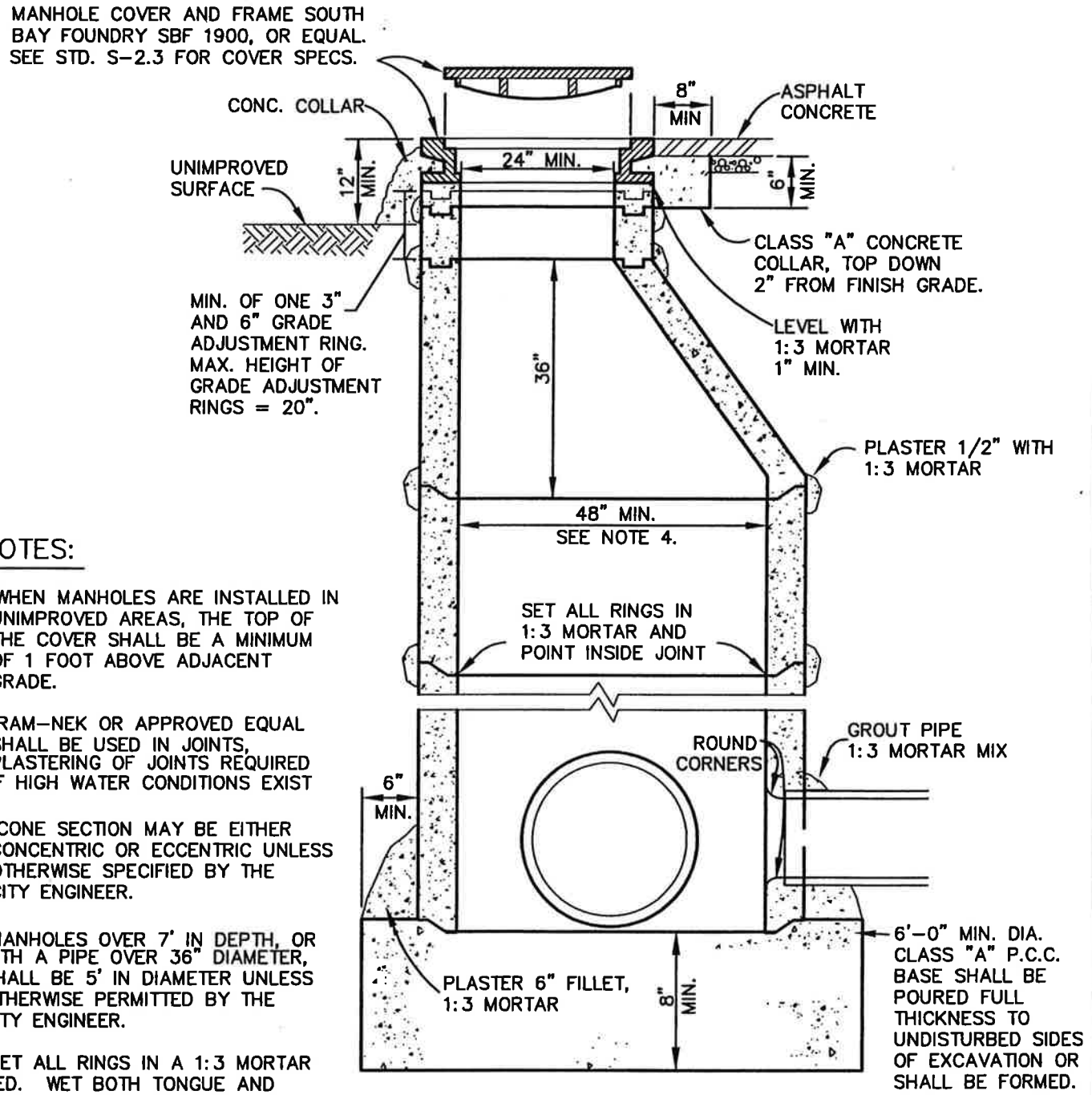
STREET LIGHT POLE FOUNDATION

STD. NO. R-6.2

SCALE: NONE	DRAWN: LMM	APPROVED:	JG, CITY ENG.	DATE: JUNE 2021

SECTION 6

STORM DRAIN STANDARDS



NOTES:

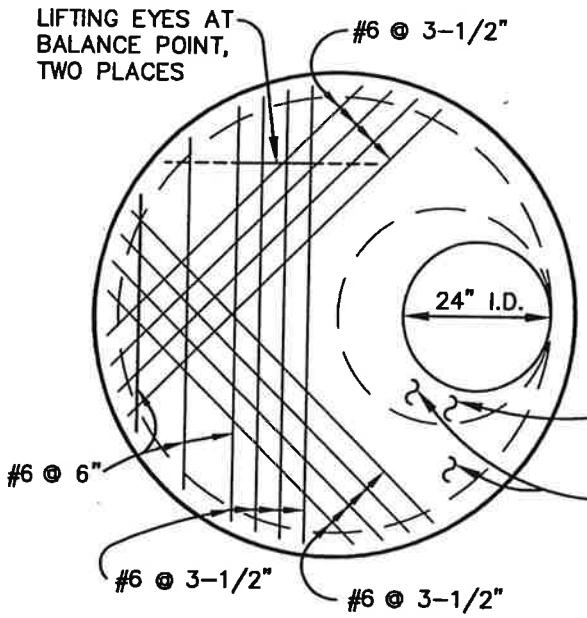
1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF 1 FOOT ABOVE ADJACENT GRADE.
2. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS, PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST
3. CONE SECTION MAY BE EITHER CONCENTRIC OR ECCENTRIC UNLESS OTHERWISE SPECIFIED BY THE CITY ENGINEER.
4. MANHOLES OVER 7' IN DEPTH, OR WITH A PIPE OVER 36" DIAMETER, SHALL BE 5' IN DIAMETER UNLESS OTHERWISE PERMITTED BY THE CITY ENGINEER.
5. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.
6. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.
7. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

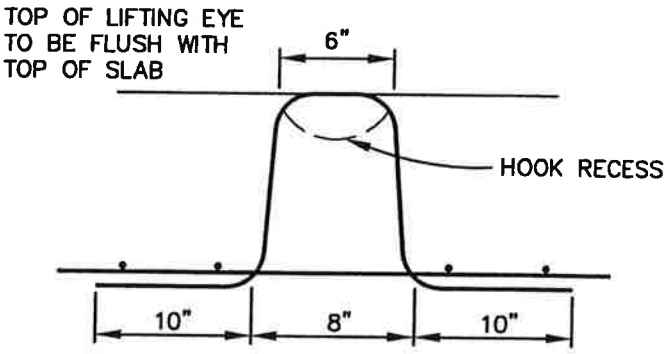
STORM DRAIN MANHOLE

STD. NO. SD-1.1

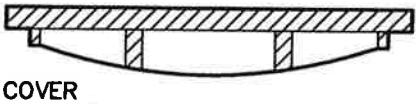
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

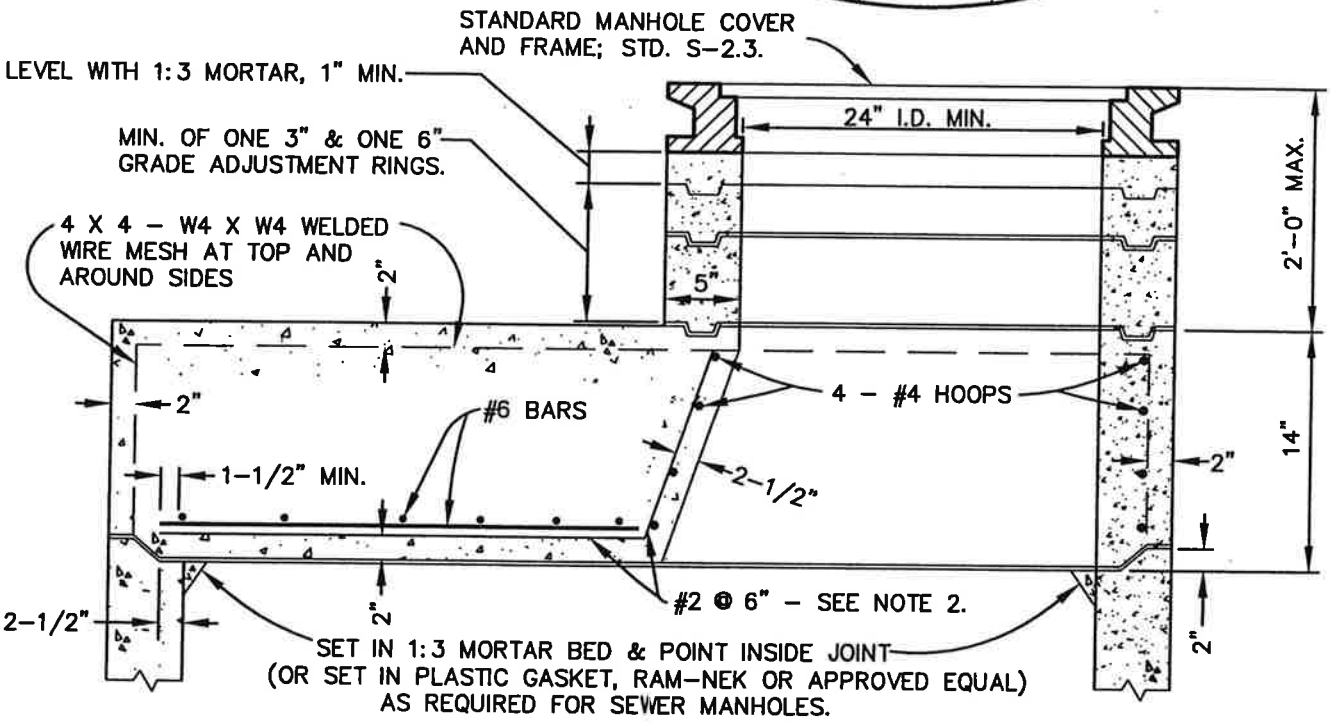


SLAB PLAN



LIFTING EYE DETAIL





NOTES:

1. FOR DETAILS OF BASE AND BARREL SECTIONS, SEE CITY STD. SD-1.1.

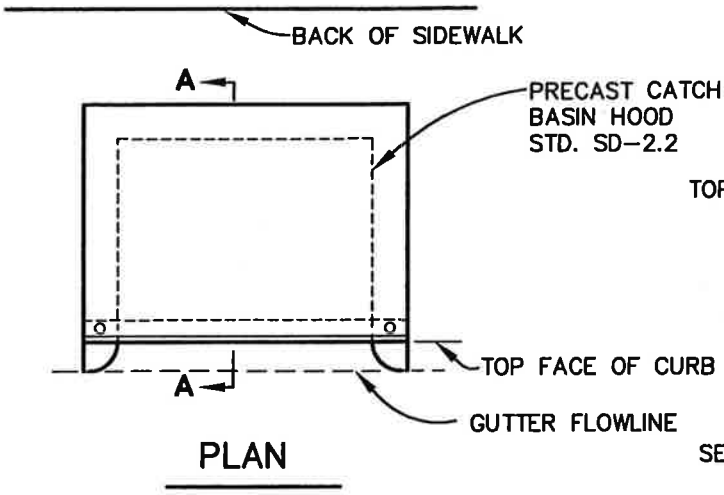
2. #2 BARS BENT UP AND SPACED 6" O.C. AROUND 24" OPENING. HORIZONTAL LEGS TO FAN OUT EQUALLY SPACED, TO 2-1/2" CLEAR AT EDGE OF SLAB.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

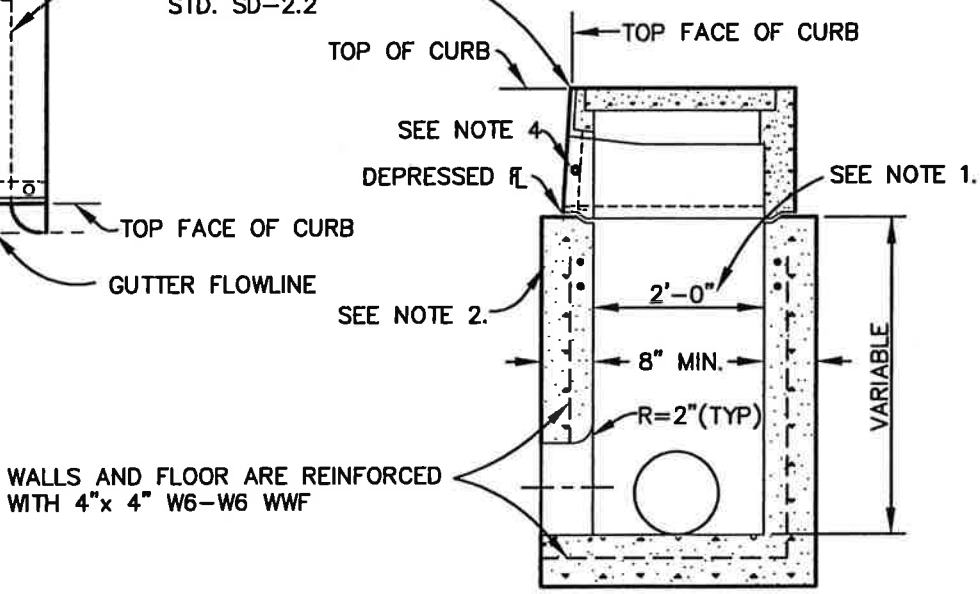
STANDARD PRECAST CONCRETE STORM DRAIN MANHOLE REDUCER SLAB

STD. NO. SD-1.2

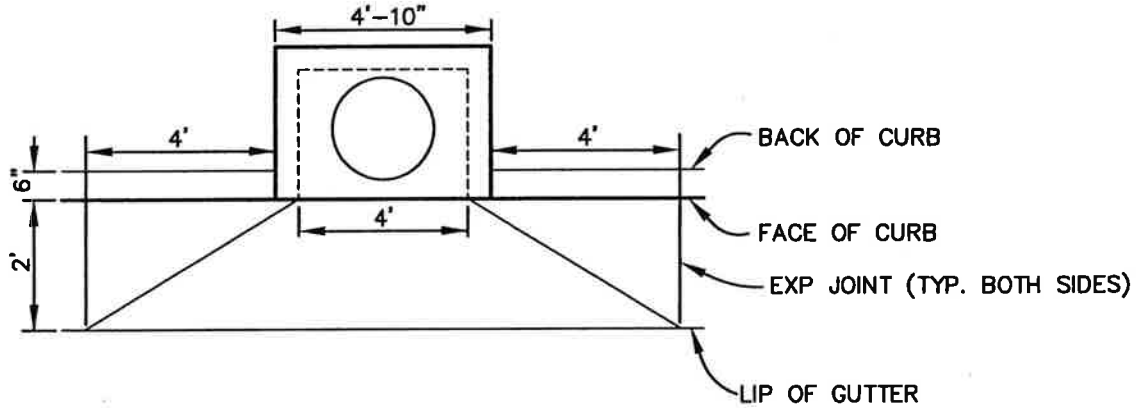
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

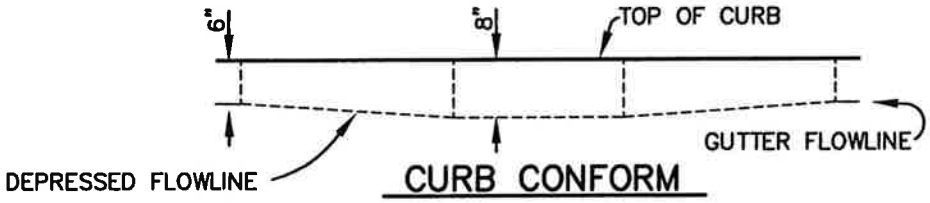


PLAN



SECTION A-A





CURB CONFORM

NOTES:

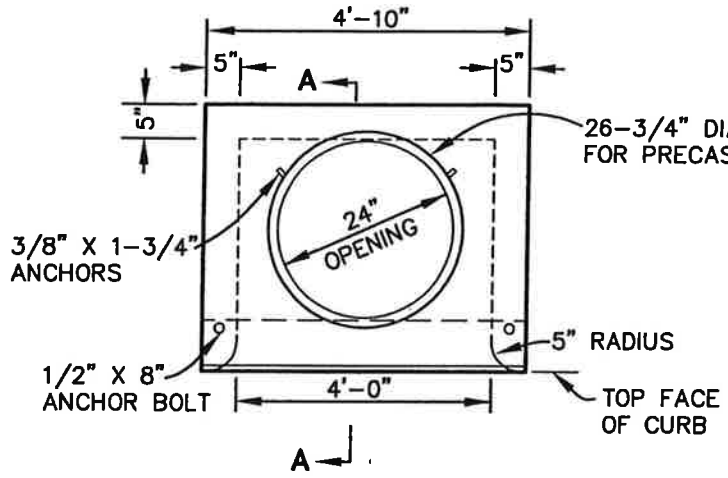
1. IF PIPE INTO OR OUT OF THE CATCH BASIN IS LARGER THAN 24", UNIT SHALL BE TAILOR MADE BY SUPPLIER.
2. APPROVED ALTERNATES FOR CURB INLET BASE SECTIONS: SANTA ROSA CAST PRODUCTS BASE SECTION MODEL 4A.
3. ALL HOOD, BASE, AND PIPE CONNECTIONS SHALL BE GROUTED.
4. 3/4" GALVANIZED STEEL GUARD ROD MUST BE INSTALLED AT CENTER OF OPENINGS IN EXCESS OF 9" INCHES IN LENGTH.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

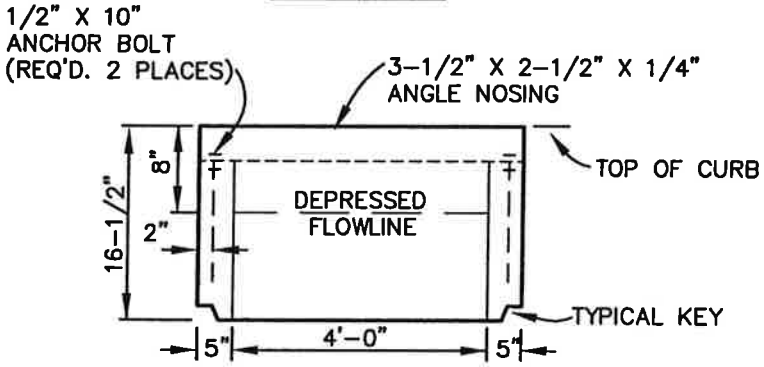
CURB OPENING CATCH BASINS

STD. NO. SD-2.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



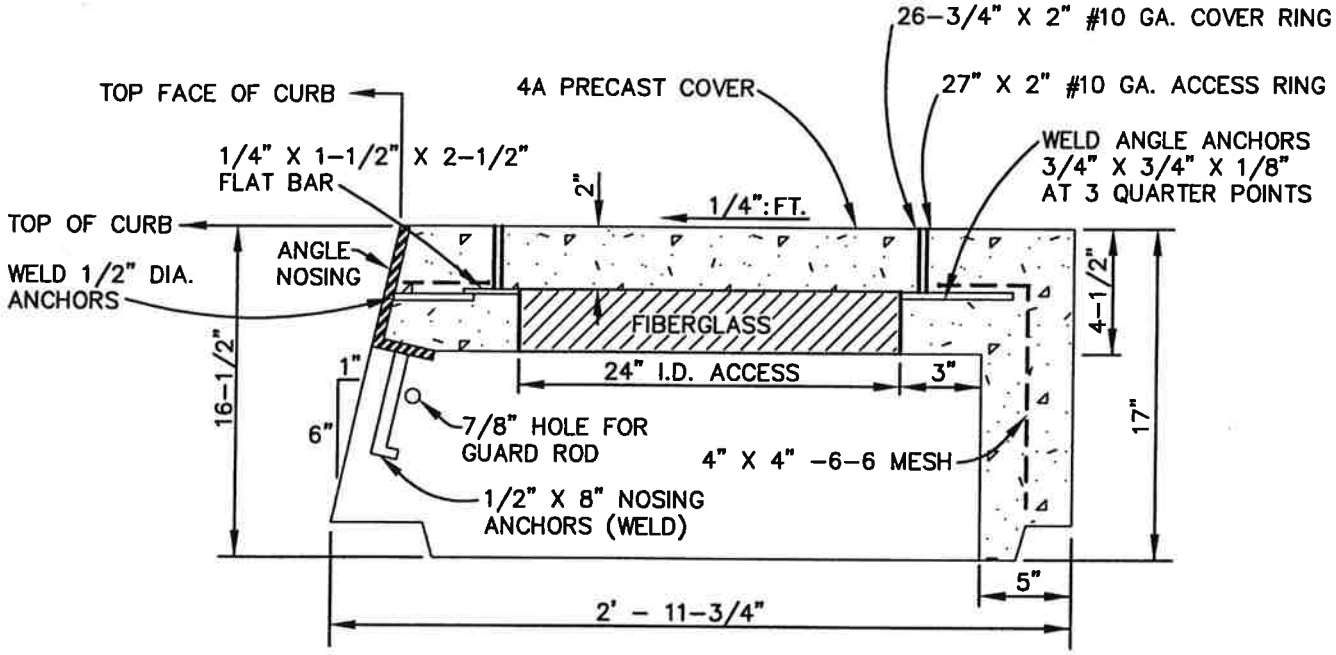
PLAN



ELEVATION

NOTES:

1. ALL METAL PARTS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123.
2. CONCRETE SHALL TEST 3000 PSI AT 28 DAYS.
3. ALL REINFORCING SHALL BE 2" X 6" – 6-10 MESH.
4. WEIGHT OF UNIT COMPLETE = 1000± LBS. COVER ONLY = 60± LBS.
5. 3/4" GALVANIZED STEEL GUARD ROD FOR OPENINGS IN EXCESS OF 9".
6. BASE MAY BE PRECAST OR CAST IN PLACE TO SUIT.
7. MAXIMUM UPSTREAM GUTTER SLOPE WITHOUT GALLERY IS 6%.



SECTION A-A

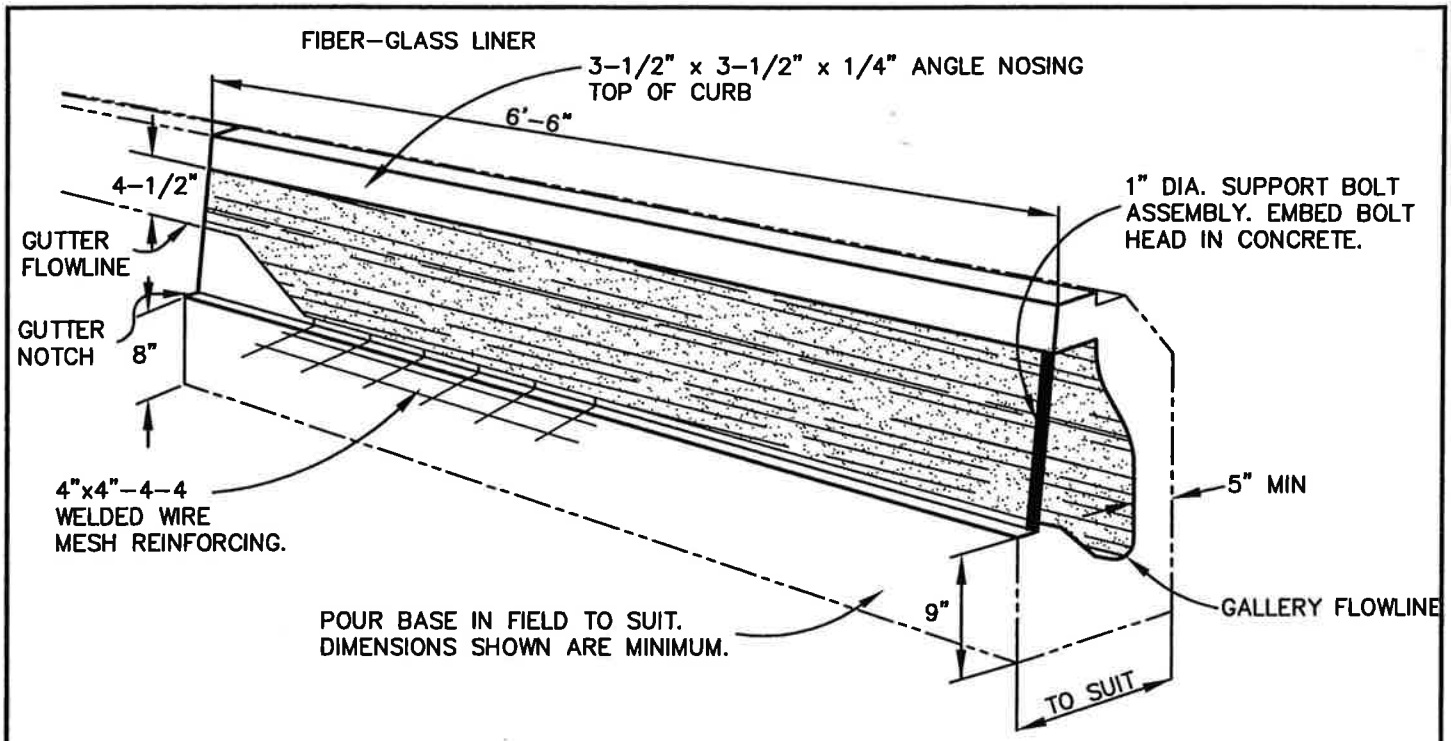
APPROVED ALTERNATES:
SANTA ROSA CAST PRODUCTS MODEL 4A
W SRJC CICO COVER.

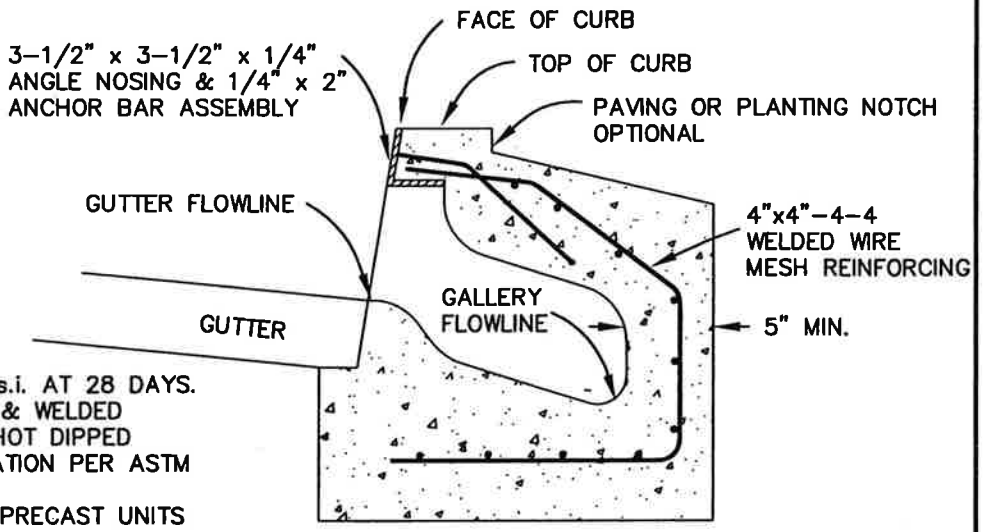
SEBASTOPOL CALIFORNIA PUBLIC WORKS

PRECAST CATCH BASIN HOOD

STD. NO. SD-2.2

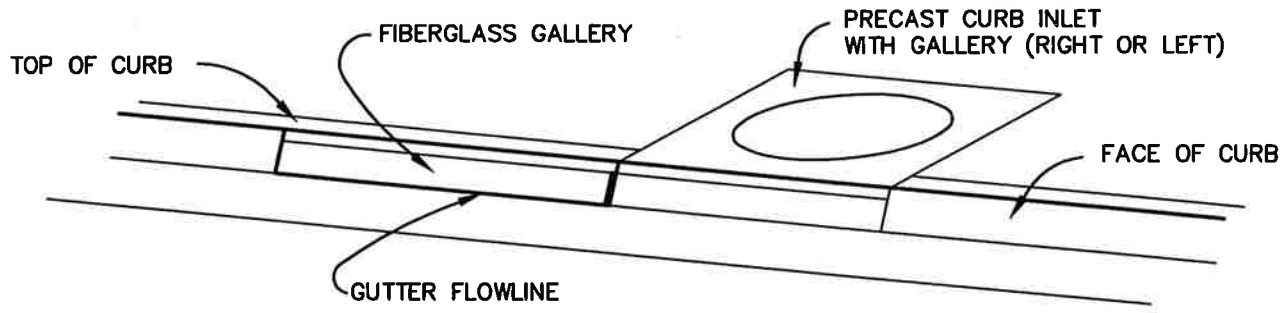
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998





NOTES:

1. CONCRETE SHALL BE 3000p.s.i. AT 28 DAYS.
2. NOSING ASSEMBLY (ANGLED & WELDED ANCHOR BARS) SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM SPEC. A123-59.
3. EITHER CAST-IN-PLACE OR PRECAST UNITS ARE ACCEPTABLE.

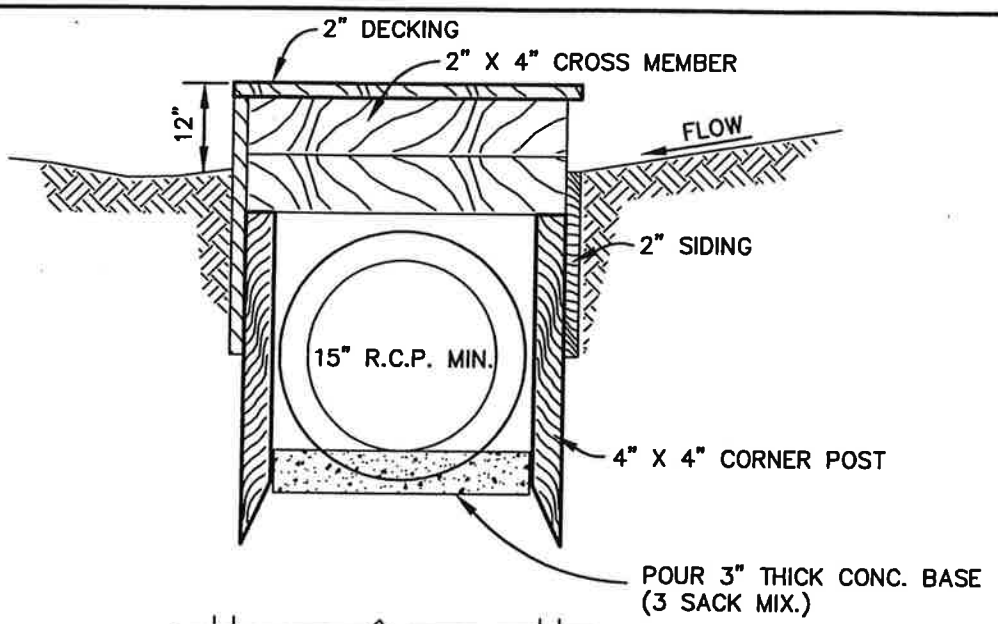


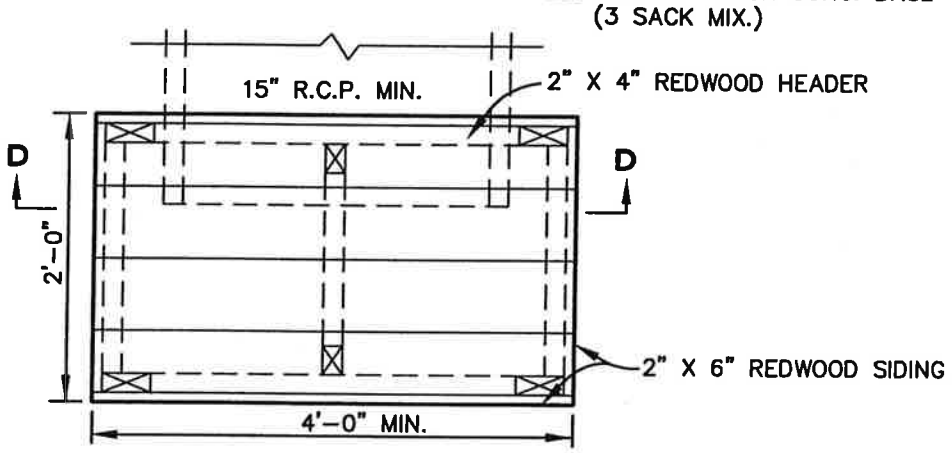
SEBASTOPOL CALIFORNIA PUBLIC WORKS

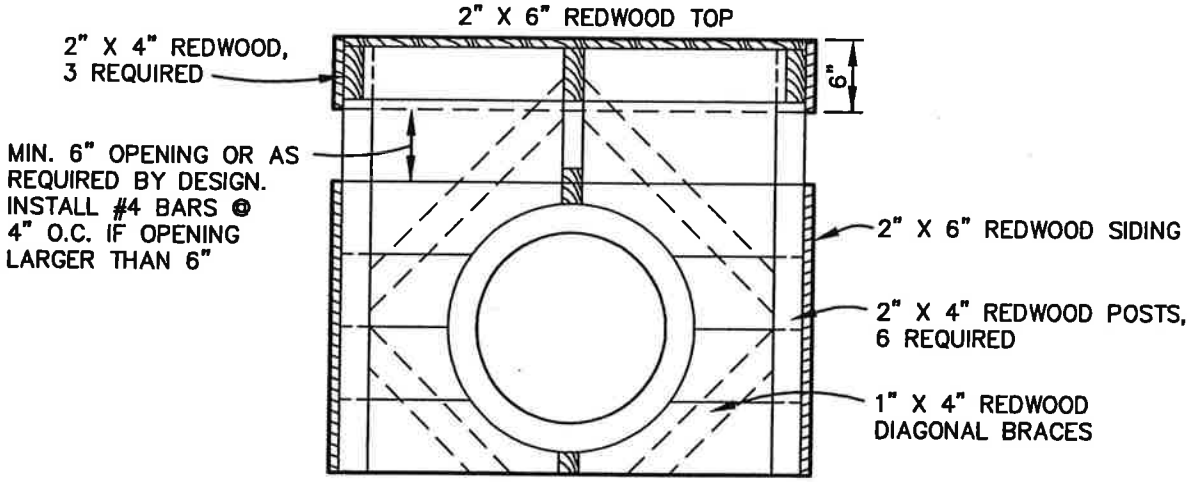
STORM DRAIN GALLERY

STD. NO.
SD-2.3

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998







SECTION D–D

NOTES:

1 ALL WOOD SHALL BE CONSTRUCTION HEART REDWOOD OR BETTER.

2 HOT DIPPED GALVANIZED NAILS SHALL BE USED THROUGHOUT.

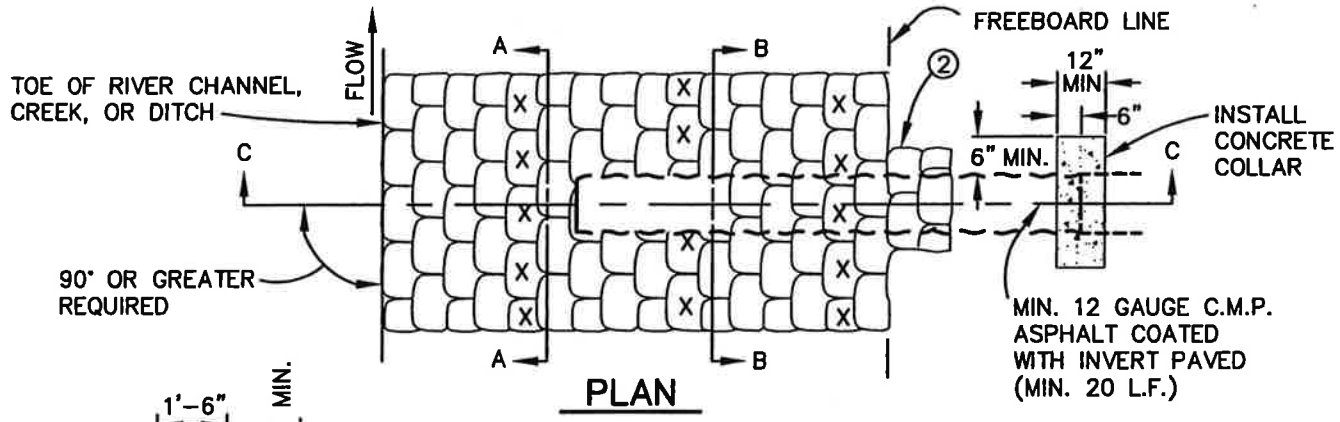
2 THIS DETAIL IS TO BE USED IF THE DURATION OF USE IS LESS THAN 2 YEARS. USE A CONCRETE STRUCTURE IF LONGER DURATION.

SEBASTOPOL • CALIFORNIA • PUBLIC WORKS

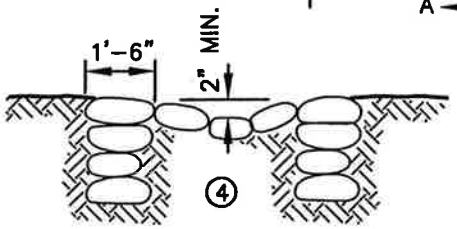
TEMPORARY REDWOOD BOX FIELD DRAIN

STD. NO. SD-2.4

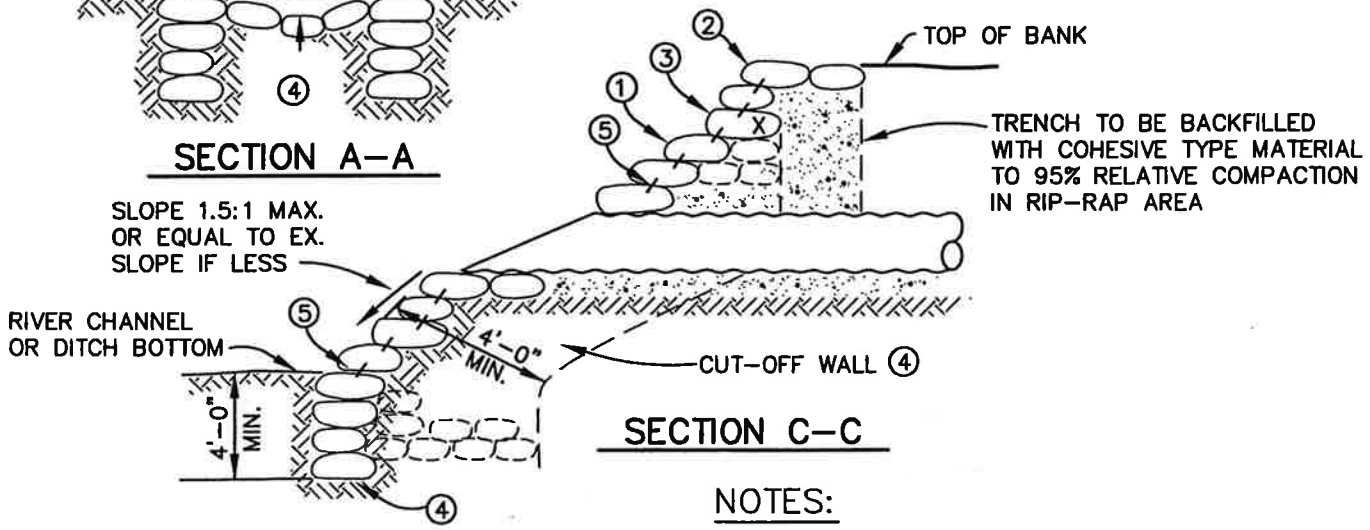
SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998



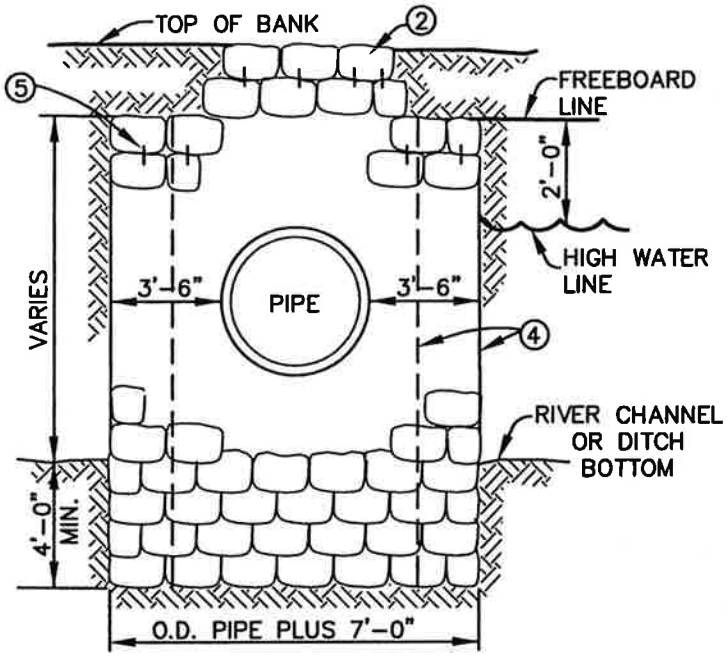
PLAN



SECTION A–A



SECTION C–C



SECTION B–B

NOTES:

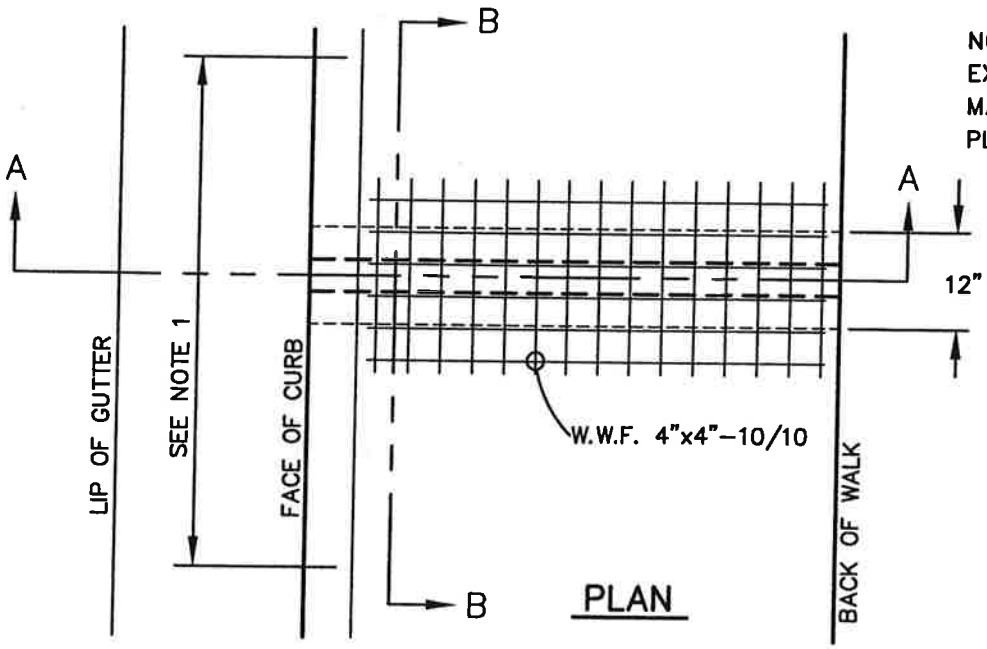
1. FACE OF RIP–RAP TO BE COINCIDENT WITH EXISTING (OR FUTURE DESIGN) SIDE SLOPE OF CHANNEL.
2. CARRY RIP–RAP TO TOP OF BANK IN TRENCH EXCAVATION ABOVE FREEBOARD.
3. SACK CONCRETE RIP–RAP PLACED ON UNDISTURBED SOIL. ANY OVER EXCAVATION MUST BE FILLED WITH SACKS, NO EARTH BACKFILL WILL BE PERMITTED. (EVERY FIFTH COURSE TO BE A HEADER COURSE. ⊗)
4. INSTALL CUT–OFF WALL UPSTREAM & DOWNSTREAM TO AN ELEVATION WHICH IS EQUAL TO THE FREEBOARD ELEVATION OR TOP OF PIPE, WHICH EVER IS HIGHER, & ACROSS THE BOTTOM WITH 4.0 MINIMUM DEPTH.
5. IN ALL TOP COURSES AND THROUGHOUT, IF SIDE SLOPE IS STEEPER THAN 1:1 AND/OR HIGHER THAN 10 FEET, DRIVE ONE #4 REINFORCING BAR 18" LONG THROUGH EACH SACK. DO NOT LEAVE ENDS OF BARS EXPOSED, NOR DRIVE INTO DIRT.
6. OUTFALLS TO BE APPROVED BY FISH AND GAME AND FLOOD CONTROL AS APPROPRIATE.
7. SCWA STANDARD DETAIL MAY BE USED AS AN ALTERNATIVE WITH APPROVAL FROM THE CITY ENGINEER.

SEBASTOPOL CALIFORNIA PUBLIC WORKS

TYPICAL STORM DRAIN OUTFALL DETAIL

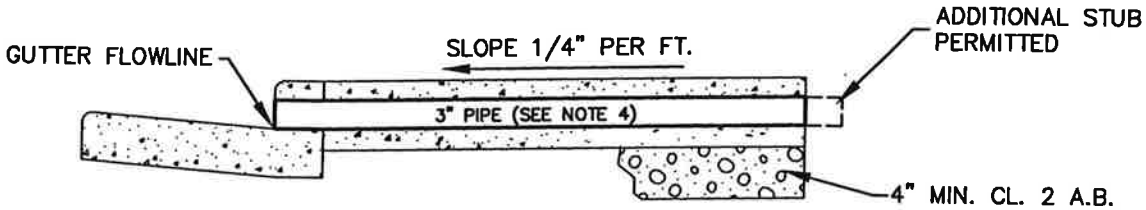
STD. NO. **SD-3.1**

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998

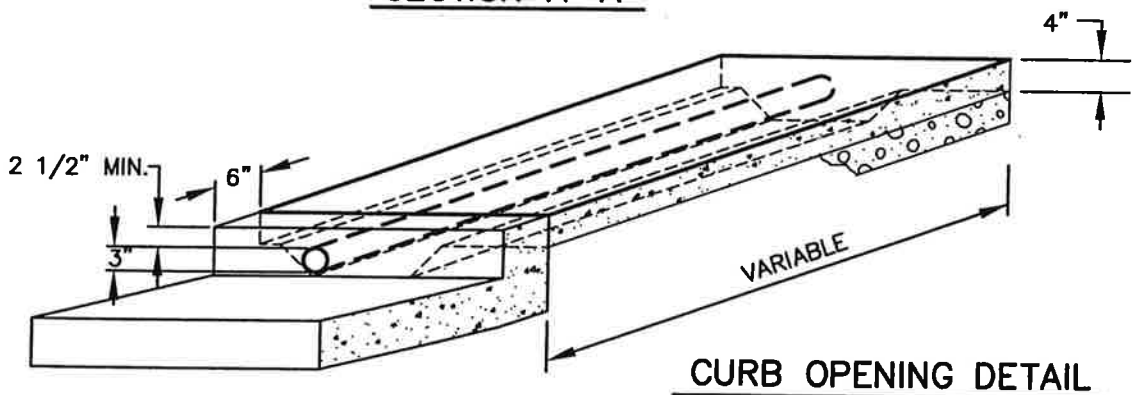


PLAN

NOTE: IF SIDEWALK IS EXISTING, A 12" SECTION MAY BE SAW CUT TO PLACE 3" P.V.C. & W.W.F.



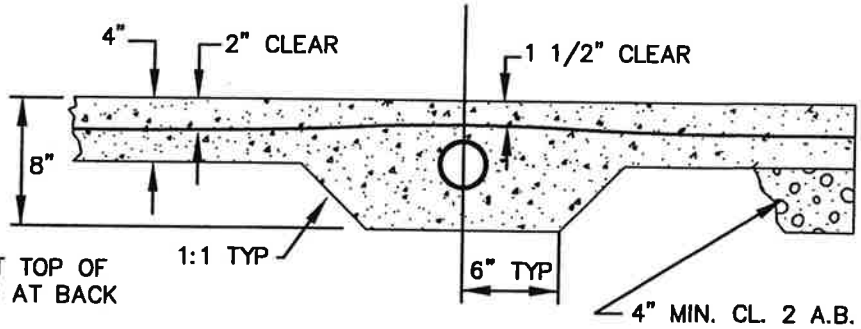
SECTION A–A



CURB OPENING DETAIL

NOTES:

1. WIRE MESH SHALL BE 2' WIDE. LENGTH SHALL EQUAL SIDEWALK WIDTH MINUS 4". IF SIDEWALK EXISTING, SEE NOTE ABOVE.
2. ON SITE DRAINAGE AND LOCATION OF CURB OUTLETS SHALL BE BY THE OWNER TO THE SATISFACTION OF THE CITY ENGINEER.
3. DRAIN PIPE SHALL BE INSTALLED SO THAT TOP OF PIPE IS 2 1/2" MIN. BELOW FINISH GRADE AT BACK OF SIDEWALK
4. SIDEWALK DRAIN TO BE 3" SCH 40 HEAVY WALL RIGID POLYVINYL CHLORIDE PIPE OR APPROVED SUBSTITUTE.



SECTION B–B

SEBASTOPOL CALIFORNIA PUBLIC WORKS

SIDEWALK DRAIN

STD. NO. SD-4.1

SCALE: NONE	DRAWN: MGA	CHK: SAL	APPVD: PHK	DATE: JULY 1998