SEWER SYSTEM

TABLE OF CONTENTS

SEWER SYSTEM

I. Connection to an Existing Public Sewer

A. A proposed sewer design must show a point of connection to an existing public sewer main. It is common for a project on one property to require the construction of sewer on an adjacent property before it can connect to the public sewer. Sewer system designs shall incorporate the design of any off-site sewer that is required for the connection to the public main. Appropriate portions of the City approved designs shall be included in the plans unless the mains have been accepted for maintenance by the City.

II. Materials

A. Gravity sewer mains shall be Polyvinyl Chloride (PVC) SDR 35 or Ductile Iron Pipe.

B. Large diameter gravity mains may be concrete cylinder pipe or reinforced concrete pipe with City Engineer approval.

C. If a gravity sewer main is installed outside of a paved roadway, Ductile Iron Pipe is required.

D. All Ductile Iron Pipe shall be polyethylene encased.

E. Use of Asbestos Cement Pipe is not allowed under <u>any</u> circumstances.

F. Sewer force mains shall conform with the materials requirements for water mains. Non-metallic pipes require tracer wire in accordance with Std. Dwg. 500.

III. Alignment

A. Follow the State of California, Department of Health Services, "Criteria for the Separation of Water and Sanitary Sewer Main."

B. Public sewer mains outside the public street shall be kept to a minimum.

C. Horizontal separation from storm drains shall be a minimum five feet clear.

D. Horizontal separation from other utilities, such as gas, underground electric, underground television cable, etc., shall be a minimum of four feet clear between the pipes.

E. Horizontal and vertical curves in gravity sewer mains will not be allowed unless specifically authorized by the City Engineer.

F. In general, public sewer mains run parallel to street centerline.

IV. Manholes and Cleanouts

A. A manhole is required at every horizontal or vertical change in alignment.

B. Maximum distance between manholes is 300 feet.

C. A manhole is required at the end of every main.

D. Cleanouts may be installed in lieu of manholes at the end of a sewer main where the distance is less than 200 feet to the nearest manhole and the main size is 8" or less.

E. Minimize the number of manholes.

F. 60" diameter manholes are required for mains larger than 18" in diameter, or deeper than 8'(indicate manhole diameter on plans).

G. Private sewer mains must connect to the public main at a manhole.

H. Provide sufficient drop through the manhole to compensation for energy loss caused by change of alignment. A minimum drop of 0.10 foot is required for deflection angles greater than 30□.

I. When pipe size increases, set inlet crown at least as high as the outlet crown.

V. Drop Manholes

A. Minimize the number of manholes.

B. Standard drop manhole installations are required when the drop in the manhole is greater than 2 feet.

VI. Accessibility

A. All-weather vehicle access is required to every manhole.

B. Sewer easements are to be a minimum of 15' in width.

C. All access roads must be a minimum 12' in width.

D. Acceptable types of access road are:

1. 6" of blue shale for slopes up to 10%.

2. 2" of AC on 6" of aggregate base for slopes in excess of 10%.

E. All access roads longer than 100' must have an approved turn-around.

VII. Size

A. Mains shall be sized to provide adequate capacity and a minimum 2 feet per second velocity.

B. The minimum public main is 8" in diameter.

C. The minimum private main is 6" in diameter.

VIII. Cover

A. Minimum cover for all gravity sewers is 24".

B. Where cover is less than 36", Ductile Iron Pipe must be used.

C. Definition of cover: distance from the top of the pipe to finished grade.

IX. Slope

A. Design all gravity sewers to achieve a minimum velocity of 2 feet per second. Use n = 0.013 for new pipe and n = 0.015 for the existing system.

B. The minimum slope for 8" sewers is 0.5%, or ½' per 100'.

C. Maximum slope for gravity sewers is 15%, or 15' per 100'.

X. Sewer Laterals

A. Each lot should be served by one lateral.

B. When more than one residential or commercial lot is served by a single lateral, the lateral must meet the private main standards.

C. All laterals must connect to the main with a wye connection.

D. Minimum slope of sewer laterals is 2% or ¼" per foot, unless otherwise approved by the City Engineer.

XI. Lift Stations

A. General Requirements.

5. Provide a spare rotating mechanism to replace either pump.

6. Provide one set of routine service replacement parts for the pumps.

7. Provide calculations used to determine the capacity of the wet-well and specifications for the pump.

8. Provide hour meters for each pump.

9. Provide an echo processing liquid level control system wired into the Gorman-Rupp control panel at the factory. Level control standard is Milltronics Hydro-Ranger 1.

10. Provide for automatic pump alternation.

11. Provide an automatic dialing remote monitoring system. City Standard is RACO Verbatim VSS-4C, 4-channel auto dialer wired at the factory into the control panel.

12. Provide the following:

    a. Alarm horn
    b. Alarm light
    c. Station light
    d. Pump sequence selector switch
    e. Hand-off-auto switch
    f. High pump temperature protection
    g. Pump run lights
    h. Elapsed time indicator
    i. Duplex ground fault interrupting receptacle
    j. Motor overload resetter
    k. Ventilator fan.

13. Provide a 10-year warranty for the pump enclosure.

14. Provide a 5-year warranty for all pumps, equipment, apparatus and parts.

C. Electrical Service.

1. Provide electrical service required by the pump station manufacturer.

2. All electrical circuitry shall be designed and installed in accordance with the Uniform Electrical Code and National Electric Code.

3. Provide a telephone service for the auto-dialer.

D. Details Required on Improvement Plans.

1. Site Plan: Locations of power pole, wet-well, ground slab, driveway, fencing, water service.

2. Wet-well: influent piping (standard inside drop manhole); suction piping (min. 6" off bottom of manhole; emergency suction line; water/alarm levels (pump on, pump off, low level, high level), redundant high water float switch.

3. Force Main Discharge Manhole: Inverts, channelization.

1. Lift stations will not be allowed where an alternative gravity route exists.

2. Design the lift station to serve the entire tributary at build-out densities conforming to the General Plan. (Submit flow calculations).

3. Lift stations must be of the wet-well, above ground lift station type. Submersible pump lift stations may not be used.

4. Lift stations are not allowed within the street right-of-way.

5. Provide a paved access road to allow service vehicle to be parked off the street and clear of the sidewalks. Turn-arounds may be required for stations constructed along heavily traveled streets. Provide service vehicle access to wet-well.

6. Provide a reinforced concrete base slab sized adequately to counteract buoyancy. Provide supporting design calculations.

7. Wet-well to be a minimum of 60" diameter. Provide resilient seat gate valve on-line into wet-well.

8. Provide a wet-well vent system. Venting through a grated sewer manhole cover will not be allowed.

9. Provide water service with reduced pressure backflow preventer.

10. Provide a spare air release valve prior to acceptance.

11. Provide calculations to determine the need for hydrogen sulfide suppression in force main.

B. Pumping Equipment.

1. Lift station standard is 6' x 6' diameter, above underground lift station by Gorman-Rupp.

2. All pumps, motors, internal valves and piping, level indicators, control switches, ladder, alarms, blower and dehumidifier shall be manufactured and assembled as a package. Supply and warranty shall be through one company.

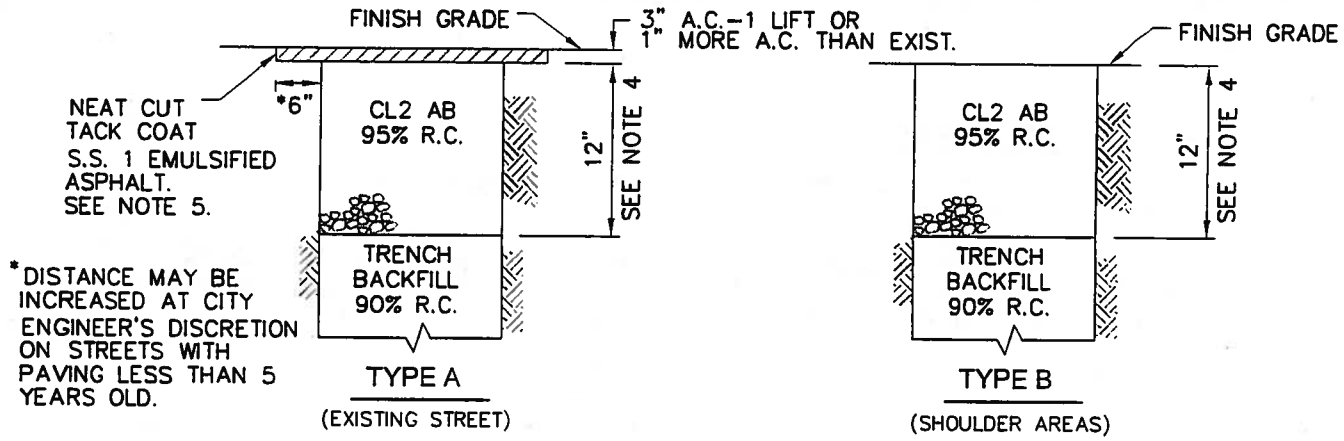
3. The pumps shall be self-priming, horizontal, centrifugal, sewage pumps. Pumps shall pass a maximum solid, 2½" diameter sphere.

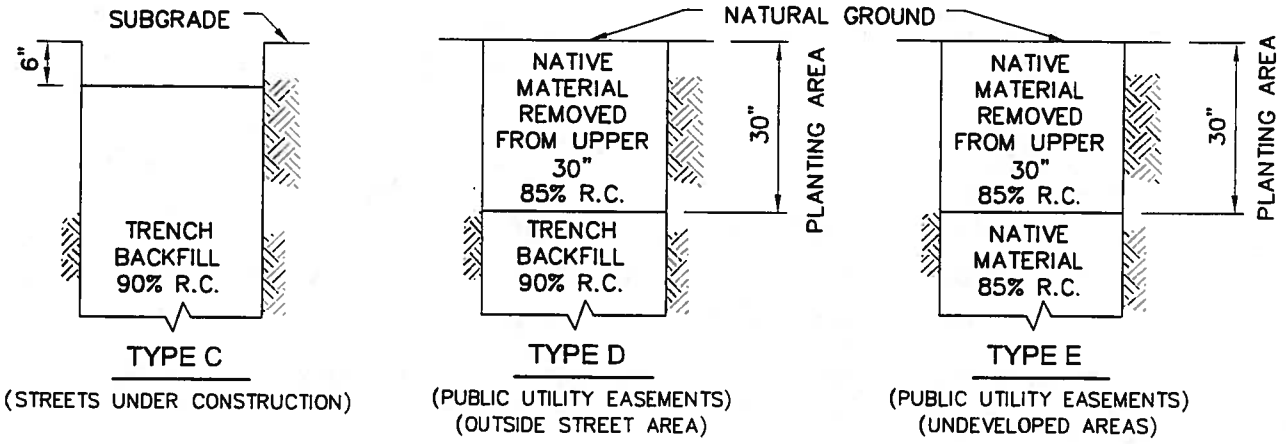
4. Provide two pumps and controls to alternate lead and lag pump.

SEWER STANDARD PLANS

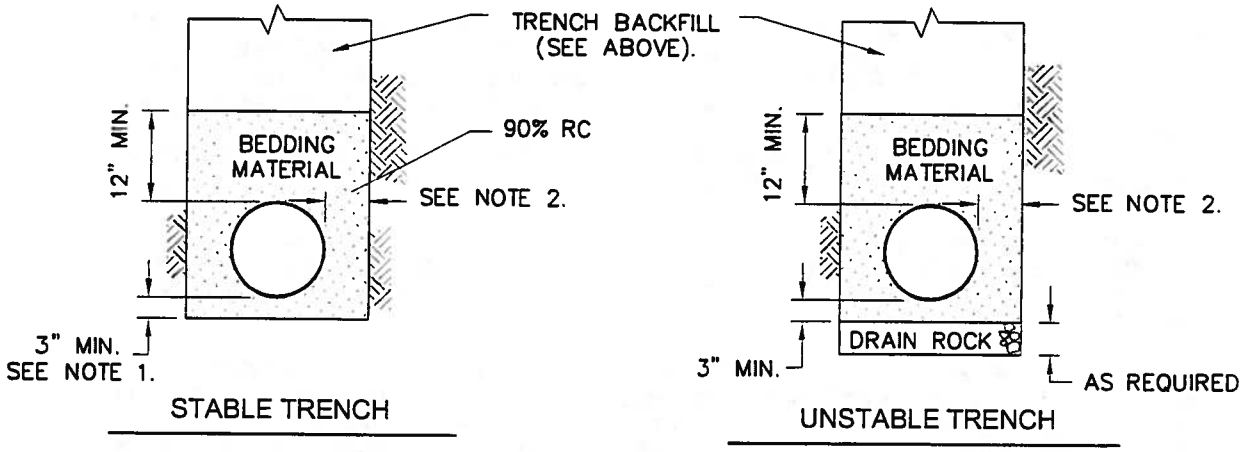
DESCRIPTION

300 SERIES - SEWERS





TRENCH BACKFILL AND SURFACING



PIPE BEDDING

NOTES:

1. 1/4 PIPE O.D. OR 4" MIN. WHEN EXCAVATION IS IN ROCKY GROUND.
2. PIPE DIAMETER 18" OR LESS: 6" MIN., 9" MAX. PIPE DIAMETER GREATER THAN 18": 9" MIN., 12" MAX.
3. RELATIVE COMPACTION DESIGNATED R.C.
4. THE STREET STRUCTURAL SECTION SHALL BE A MIN. OF 3" A.C. ON 12" A.B. OR MATCH EXISTING PAVEMENT THICKNESS PLUS 1" A.C., WHICHEVER IS THICKER OR AS SPECIFIED ON PLANS.
5. NEATLY CUT PAVEMENT SIX INCHES FROM EDGE OF TRENCH AFTER TRENCH IS BACKFILLED.

STANDARD TRENCH DETAIL

STD. NO. 300

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

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 (PEA GRAVEL WILL NOT BE ACCEPTED) 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 SHEET 1 AND IN 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.

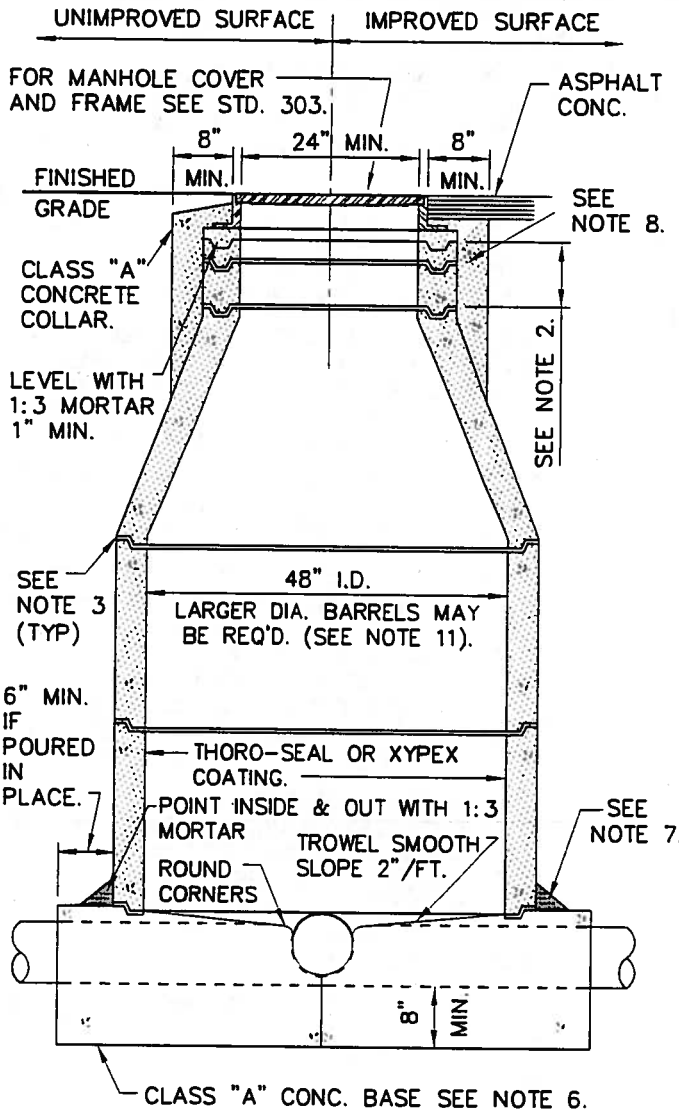
MECHANICAL COMPACTION: TRENCH BACKFILL SHALL BE PLACED IN UNIFORM, HORIZONTAL LAYERS NOT EXCEEDING EIGHT (8) INCHES IN THICKNESS BEFORE COMPACTION. EACH LAYER SHALL BE COMPACTED, USING MECHANICAL MEANS, TO THE SPECIFIED DENSITY SHOWN ON THE PLANS.

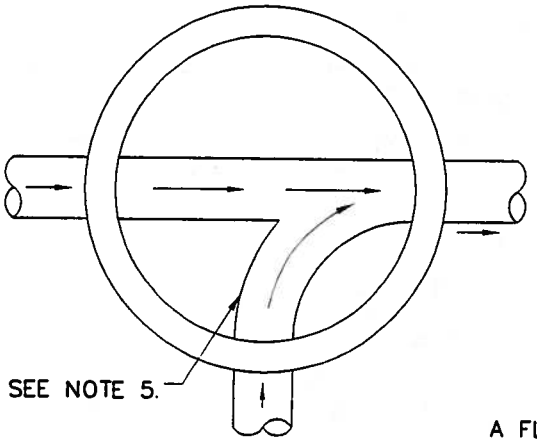
THE CONTRACTOR MAY, AT HIS SOLE OPTION AND AT HIS SOLE EXPENSE, CONSTRUCT A TEST TRENCH SECTION WHICH DEMONSTRATES METHODS, EQUIPMENT, OR MATERIALS WHICH WILL RELIABLY ACHIEVE THE REQUIRED COMPACTION IN LIFTS GREATER THAN 8 INCHES. AT ITS SOLE DISCRETION, THE CITY MAY INCREASE THE MAXIMUM ALLOWABLE LIFT 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.

CITY OF CLOVERDALE CALIFORNIA	STANDARD TRENCH DETAIL	STD. NO. 300
SCALE: NONE | DRAWN: CLG | CHK: JHG | APPVD:		DATE: APR. 2004

FILE: BMAP-S1D\CLOVER\S1D\CLOV300-310.DWG





MANHOLE BASE

CHANNELIZATION PLAN

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 CONCENTRIC FOR 48" 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 A DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL TO 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. 48" I.D. M.H. TO BE USED ONLY FOR SEWER MAINS LESS THAN 18" DIAMETER AND LESS THAN 8 FT. DEEP FROM FINISHED GRADE. 60" I.D. MANHOLES PER STD. 302 FOR ALL OTHER APPLICATIONS.
12. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
13. MANHOLE SHALL BE DEWATERED AND DRY PRIOR TO INSPECTION.

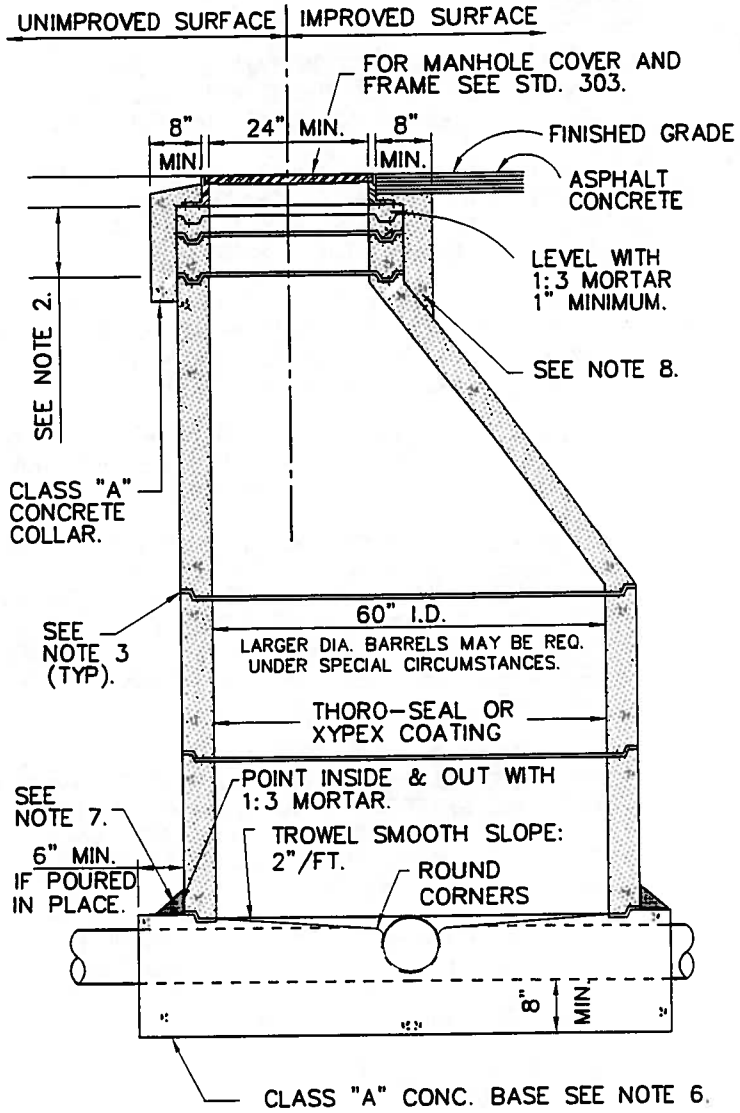
A FLEXIBLE COUPLING, AS APPROVED BY THE CITY ENGINEER, SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE (TYP). NOT REQUIRED WHEN PRECAST BASES ARE MANUF. W/FLEX. CPLGS. ALREADY INSTALLED.

STANDARD 48" DIA. PRECAST CONCRETE MANHOLE SANITARY SEWER

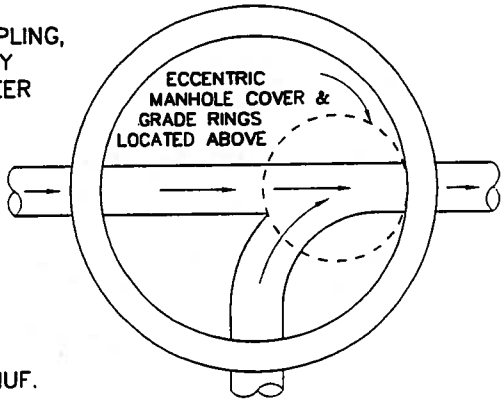
STD. NO. 301

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG



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:

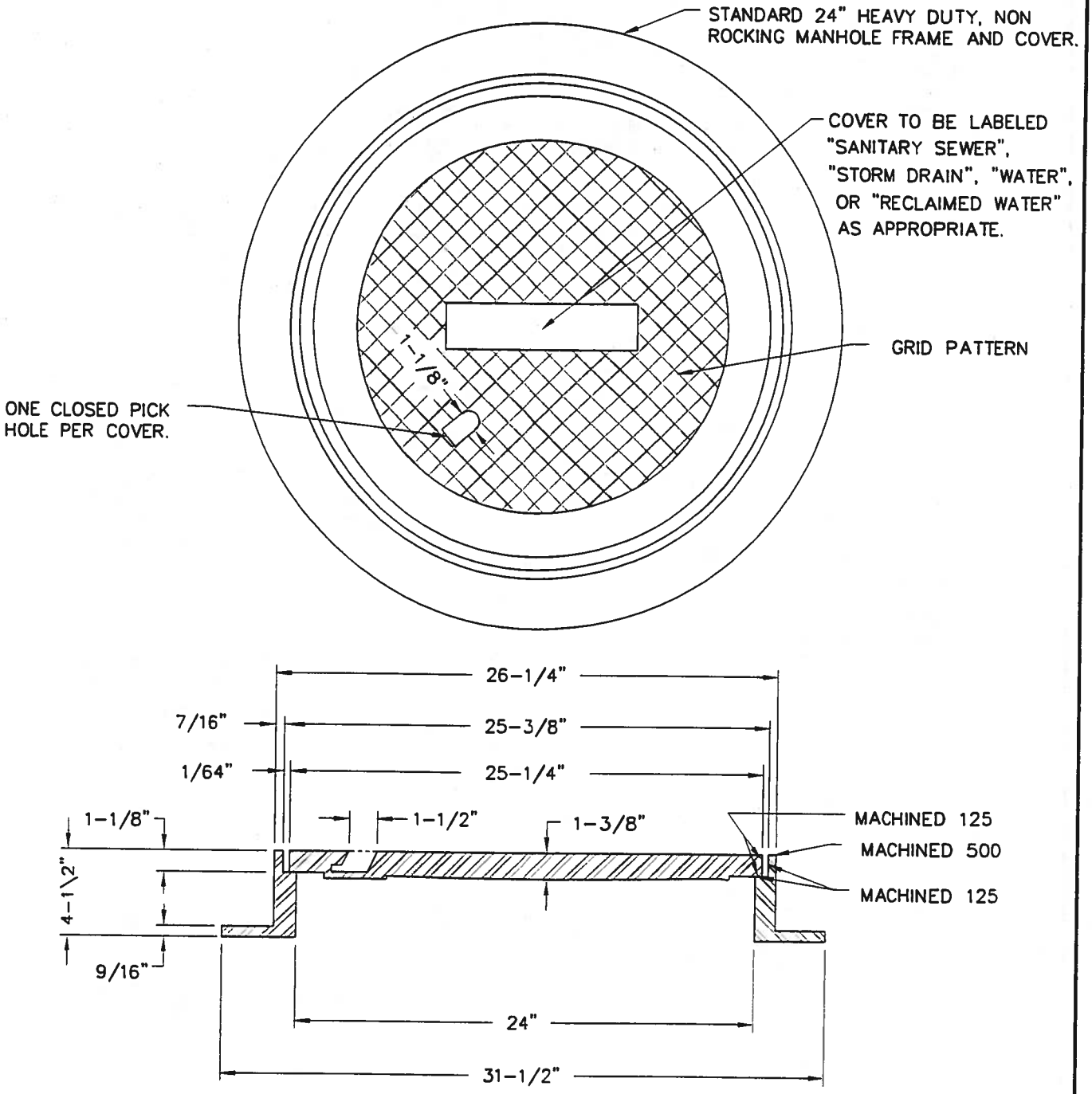
1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET 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 ENGR.
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" TO 30" 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.

STANDARD 60" DIA. PRECAST CONCRETE MANHOLE SANITARY SEWER

STD. NO. 302

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG



NOTES:

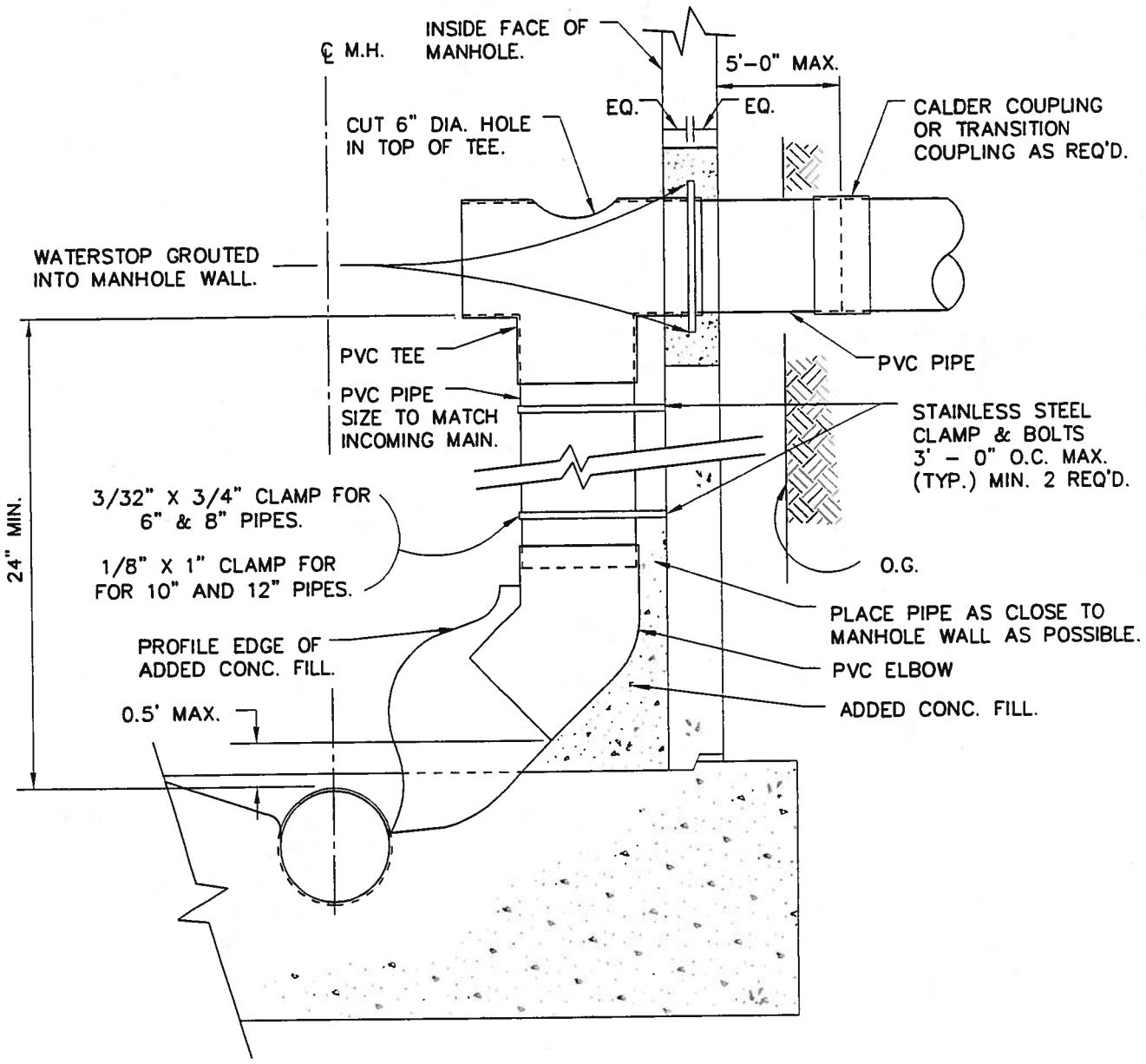
1. SPECIFY SANITARY SEWER WHEN ORDERING.
   ALL CASTINGS SHALL BE DIPPED IN APPROVED ASPHALT PAINT.
2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION 48-30, OR TO UNITED STATES GOVERNMENT SPECIFICATIONS QQI-652B.
3. MINIMUM WEIGHT COMPONENTS: COVER - 130 POUNDS
   FRAME - 135 POUNDS
4. SEE CITY'S APPROVED LIST FOR MANHOLE FRAME AND COVER.

STANDARD MANHOLE FRAME AND COVER

STD. NO. 303

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG



NOTES:

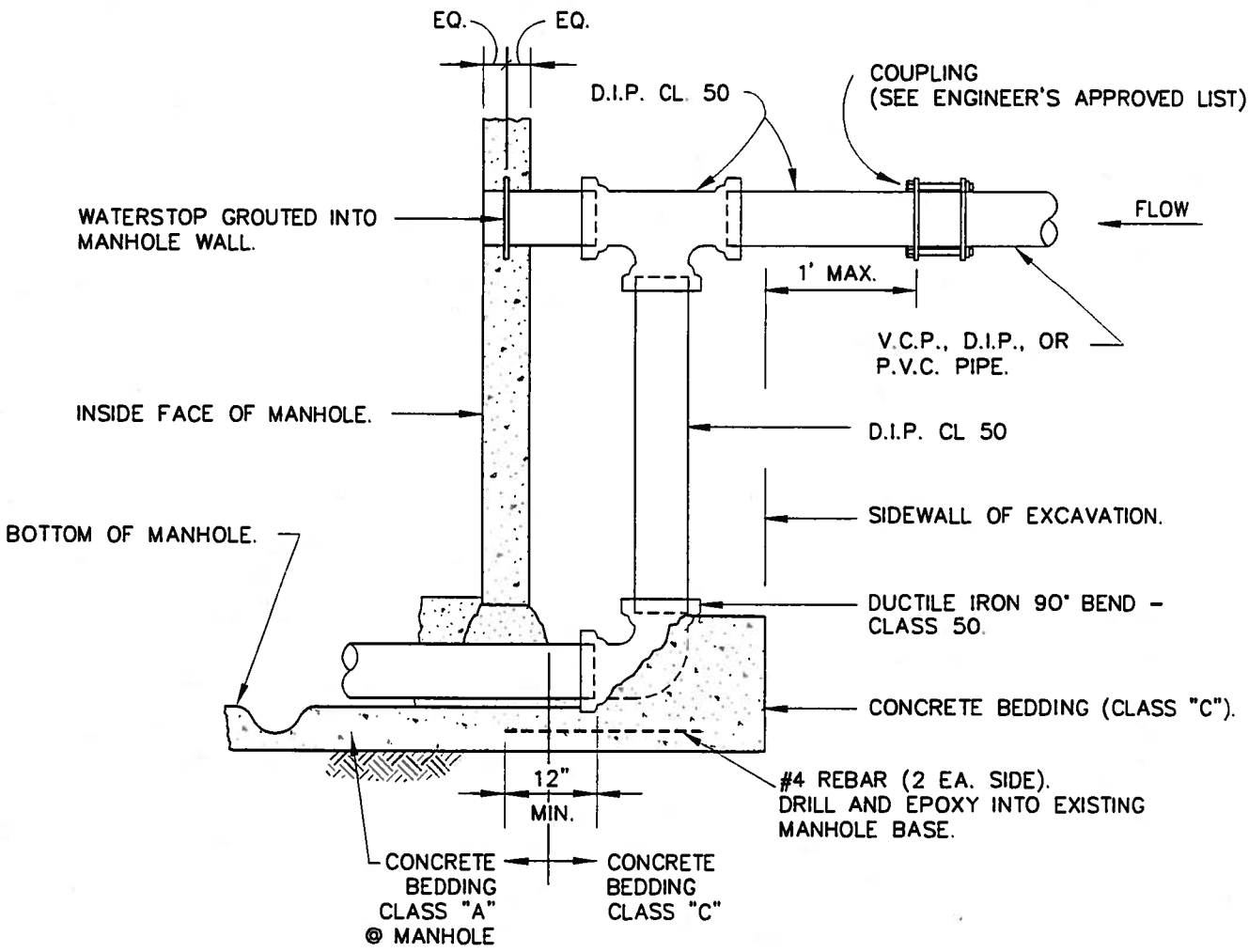
1. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.
2. NEW MANHOLES CONSTRUCTED USING THIS STANDARD SHALL BE 60 INCHES IN DIAMETER, & INSTALLED IN CONFORMANCE WITH STD. 302.
3. ENCLOSE ELBOW IN CONCRETE. FORM SMOOTH CHANNEL TO MANHOLE FLOWLINE.
4. PVC PIPE AND FITTINGS TO BE SDR 35 OR SCH 40.

INSIDE DROP INLET SANITARY SEWER MANHOLE

STD. NO. 304

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG



NOTES:

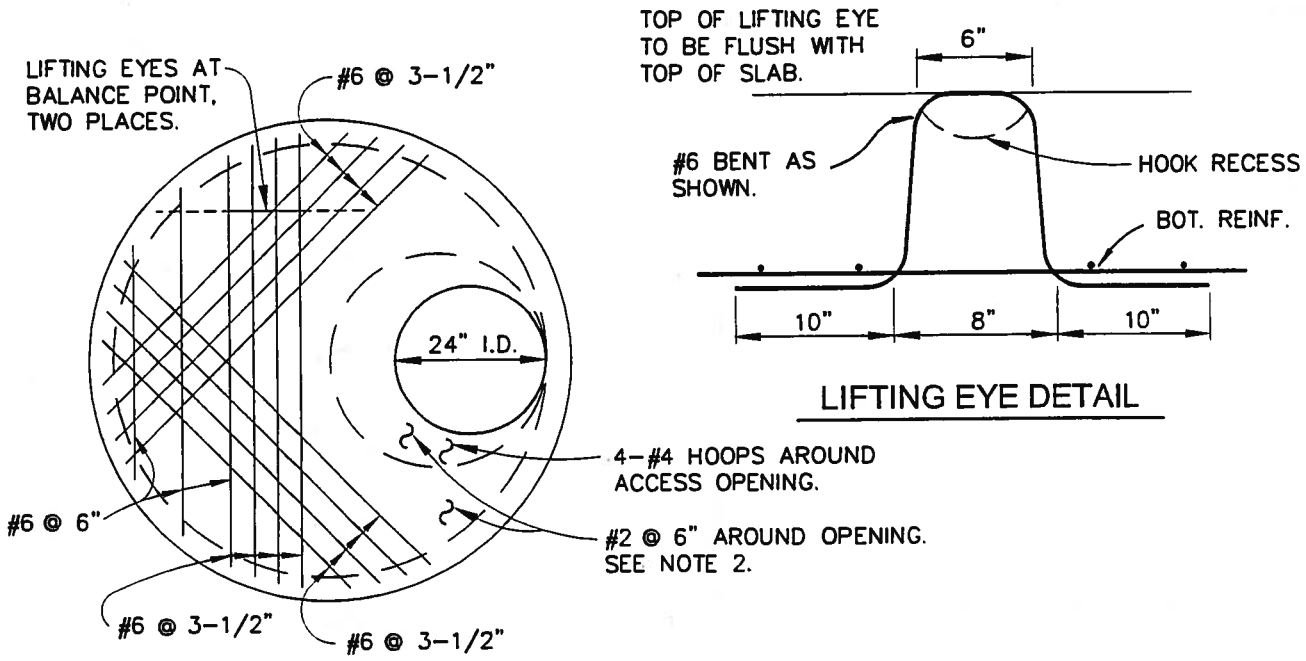
1. DUCTILE IRON PIPE AND FITTINGS SHALL BE CLASS 50 CONFORMING TO THE REQUIREMENTS OF ANSI A21.51.
2. PIPE AND FITTINGS SHALL BE FURNISHED WITH BELL AND SPIGOT ENDS, "TYTON JOINT" OR MECHANICAL JOINTS.
3. TO BE INSTALLED AT EXISTING 48" MANHOLES OR WHERE SPECIFICALLY APPROVED BY THE CITY ENGINEER.
4. DROP INLET PIPE AND FITTINGS SHALL BE THE SAME SIZE AS THE INCOMING SEWER MAIN.
5. SEE STANDARD 304 FOR STANDARD INSIDE DROP INSTALLATION.
6. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.

DUCTILE IRON FITTINGS FOR OUTSIDE DROP INLET MANHOLE

STD. NO. 305

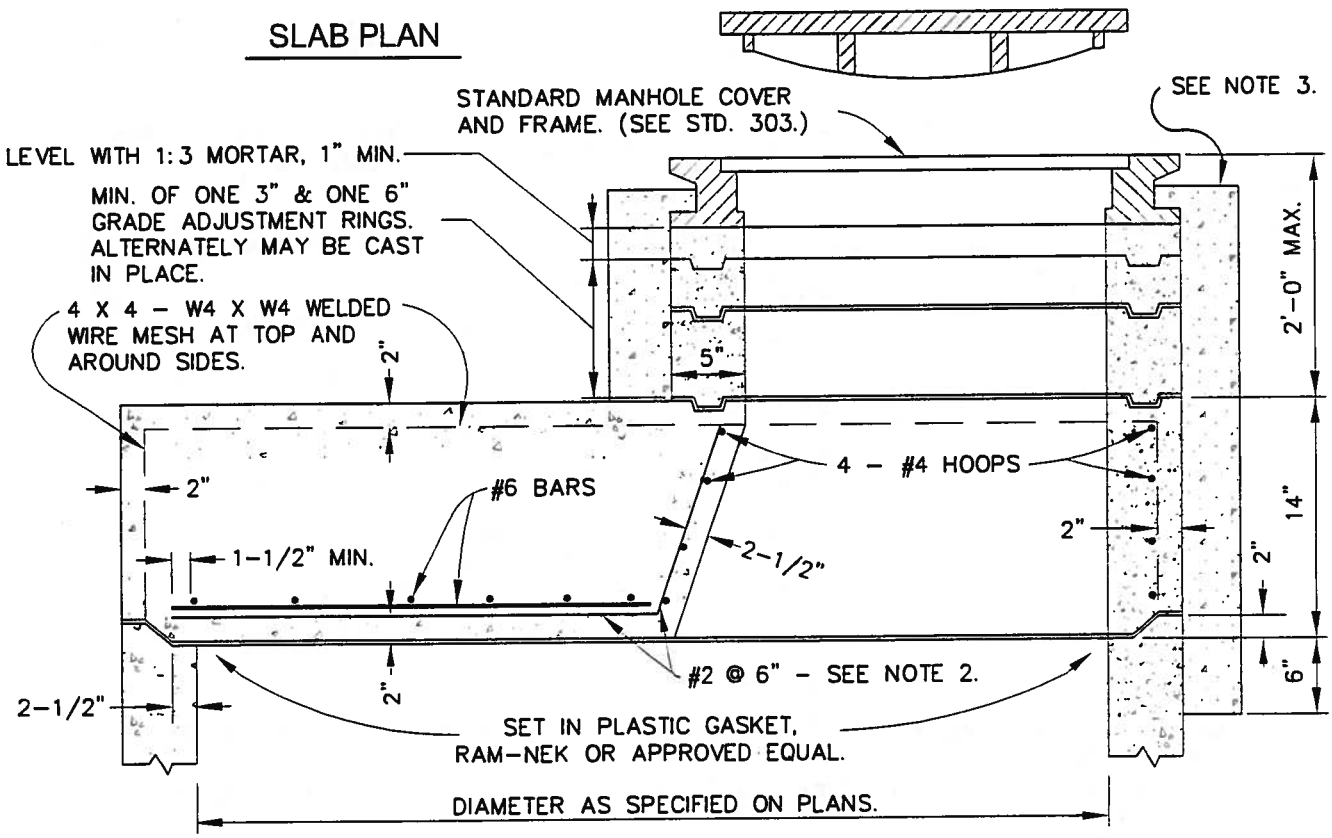
SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG



SLAB PLAN

LIFTING EYE DETAIL



NOTES:

1. FOR DETAILS AND SPECIFICATIONS OF BASE AND BARREL SECTIONS, SEE STDS. 301 & 302.
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.

CITY OF CLOVERDALE CALIFORNIA

STANDARD PRECAST CONCRETE MANHOLE REDUCER SLAB SANITARY SEWER

STD. NO. 306

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

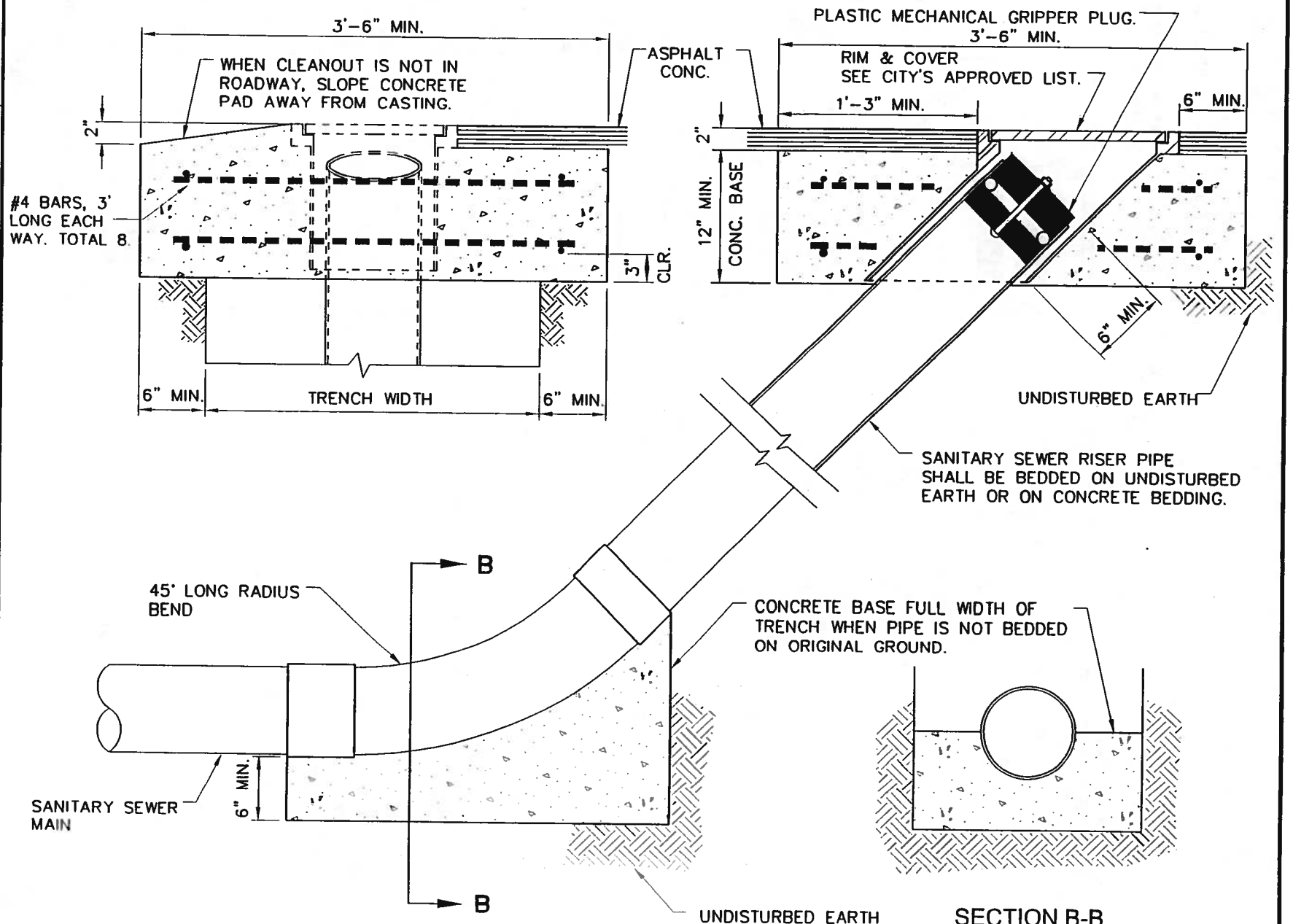
FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

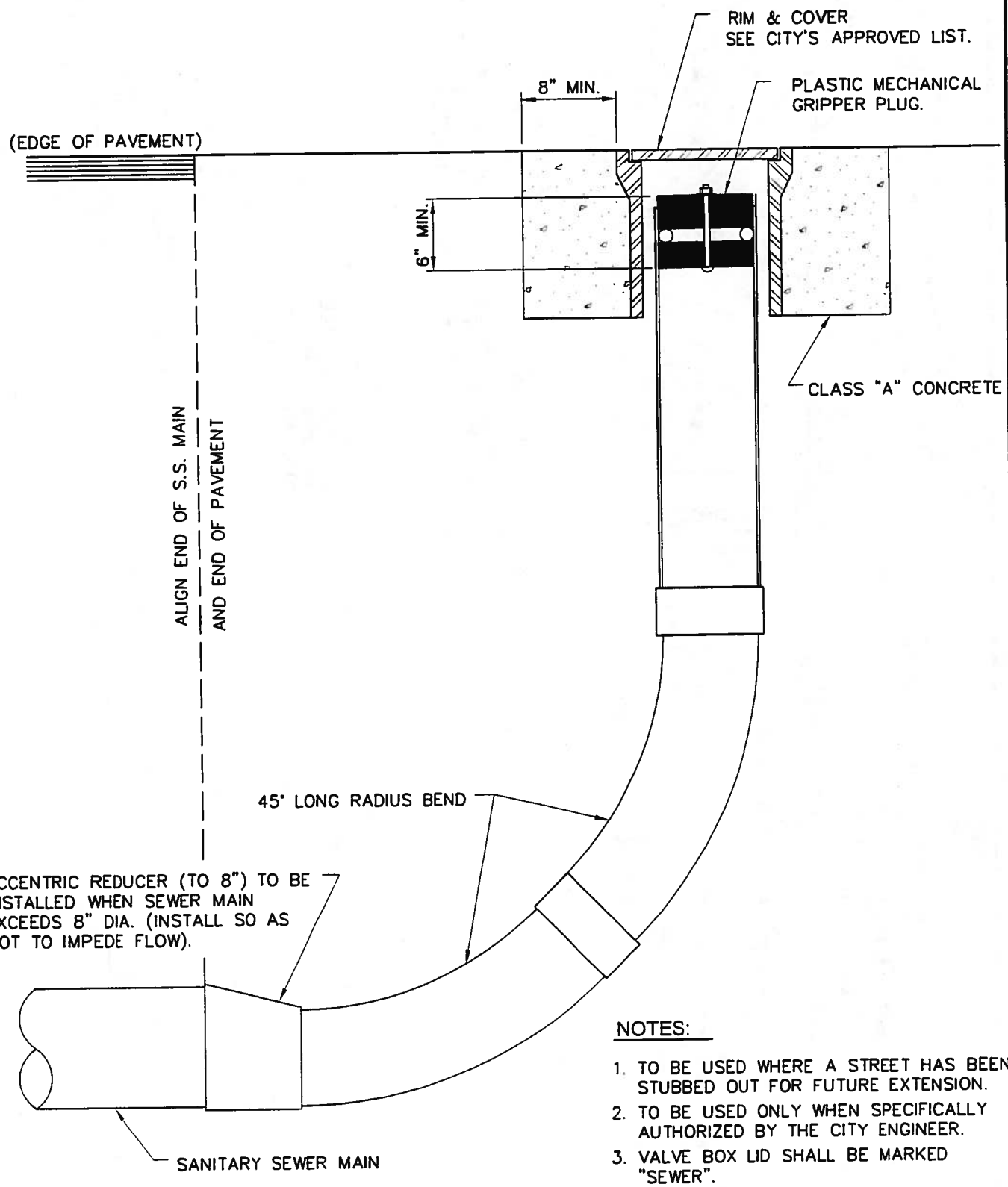
FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

PERMANENT
MAINLINE CLEANOUT

SCALE: NONE | DRAWN: CLG | CHK: JHG | APPVD: | DATE: APR. 2004

STD. NO. 307





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.

TEMPORARY MAINLINE CLEANOUT

STD. NO. 308

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

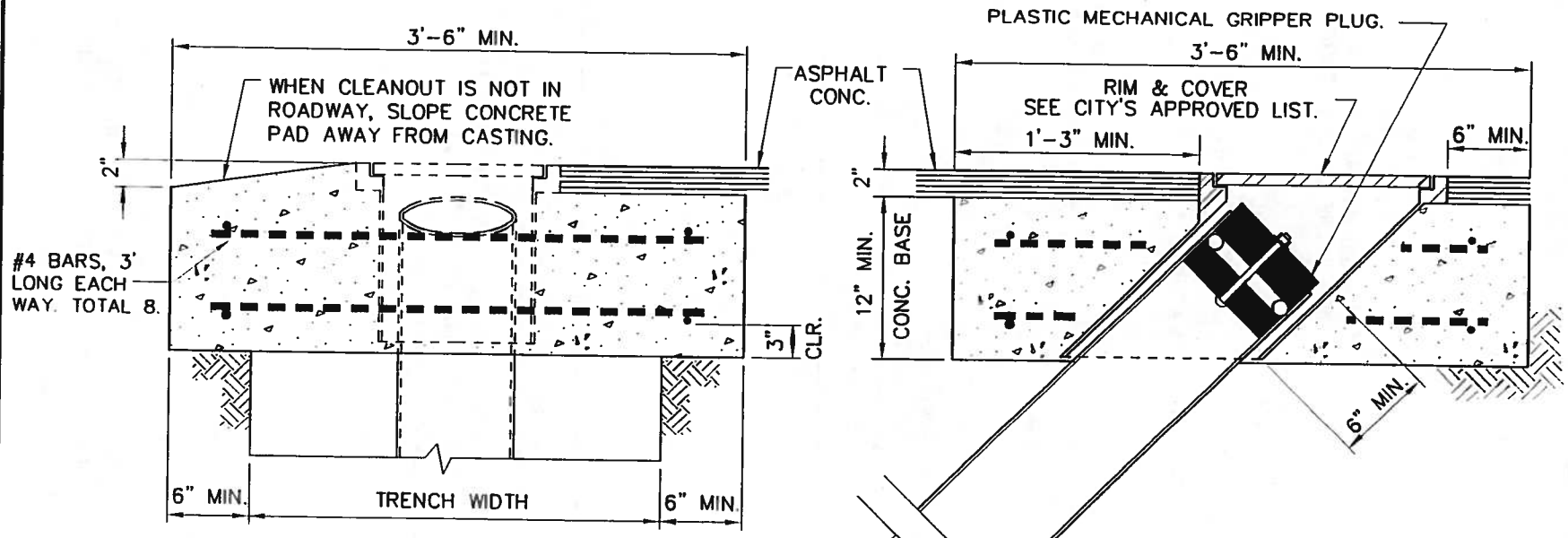
FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

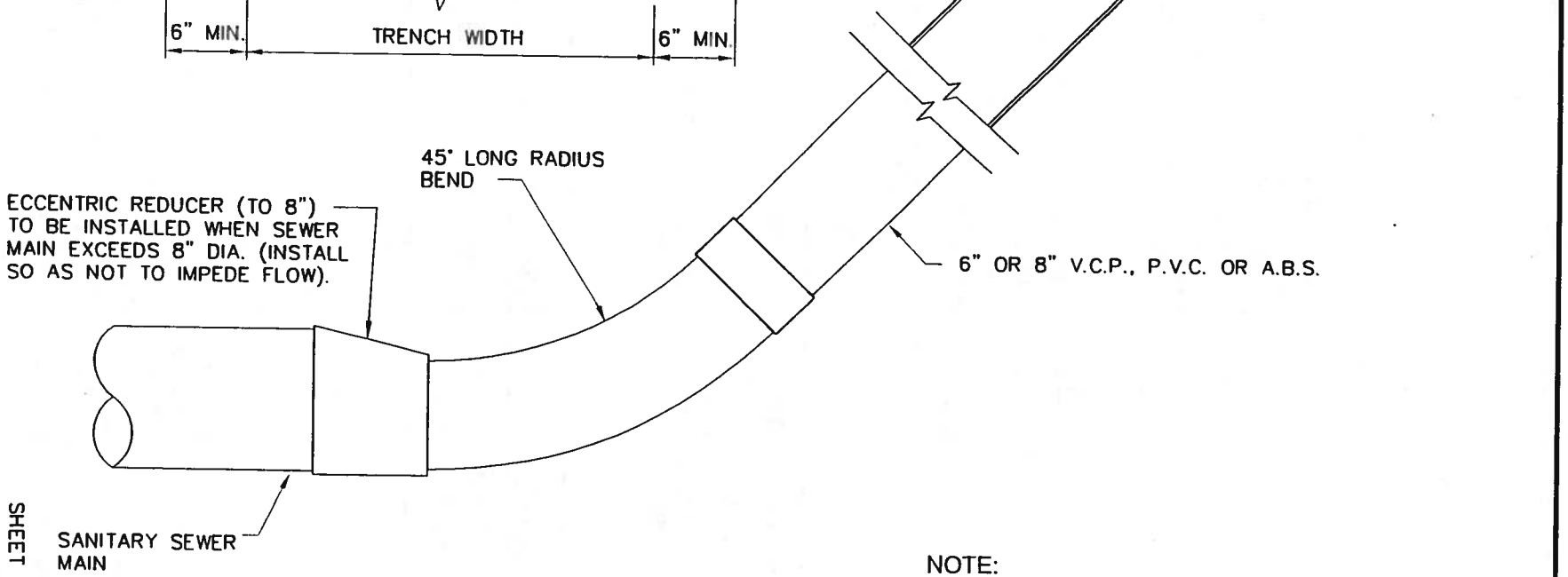
FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

TEMPORARY MAINLINE CLEANOUT

SCALE: NONE | DRAWN: CLG | CHK: JHG | APPVD: | DATE: APR. 2004

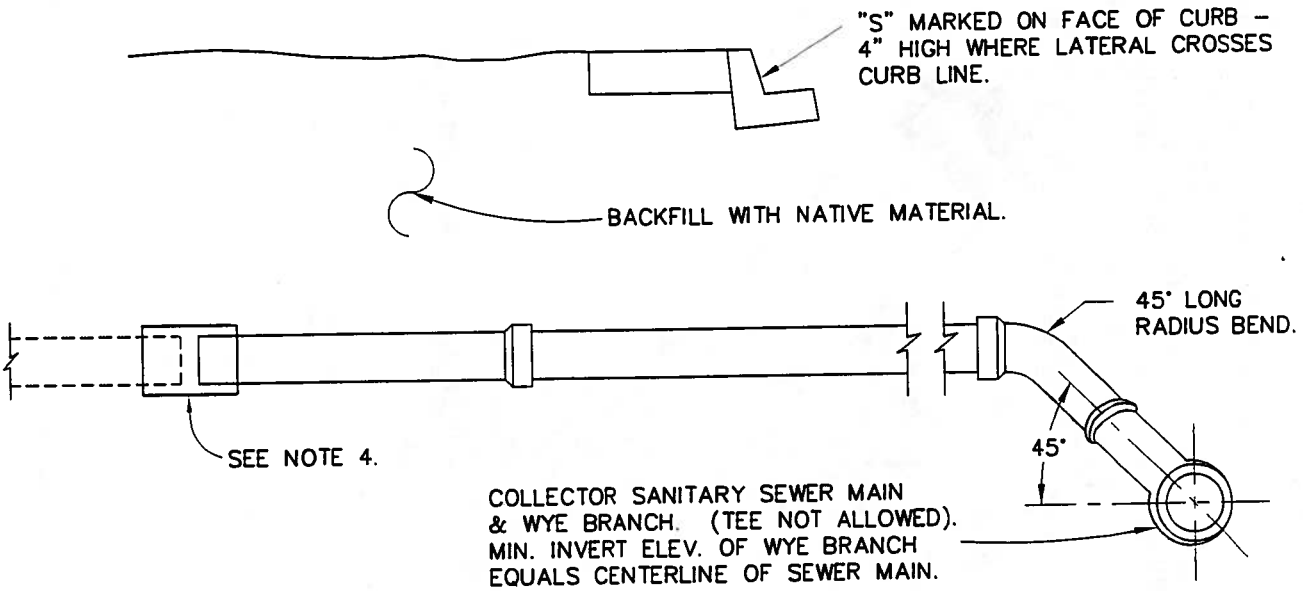
STD. NO. 308





NOTE:

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



LATERAL CONNECTIONS TO EXISTING MAINS:

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

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

DUCTILE IRON PIPE
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 BE LESS THAN 3 FT. DEEP AT THE BACK OF THE P.U.E. 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. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE CITY ENGINEER.
4. WHEN CONNECTING TO EXISTING SEWER LATERAL EXTEND TO 1' BEHIND P.U.E.

SEWER SERVICE LATERAL

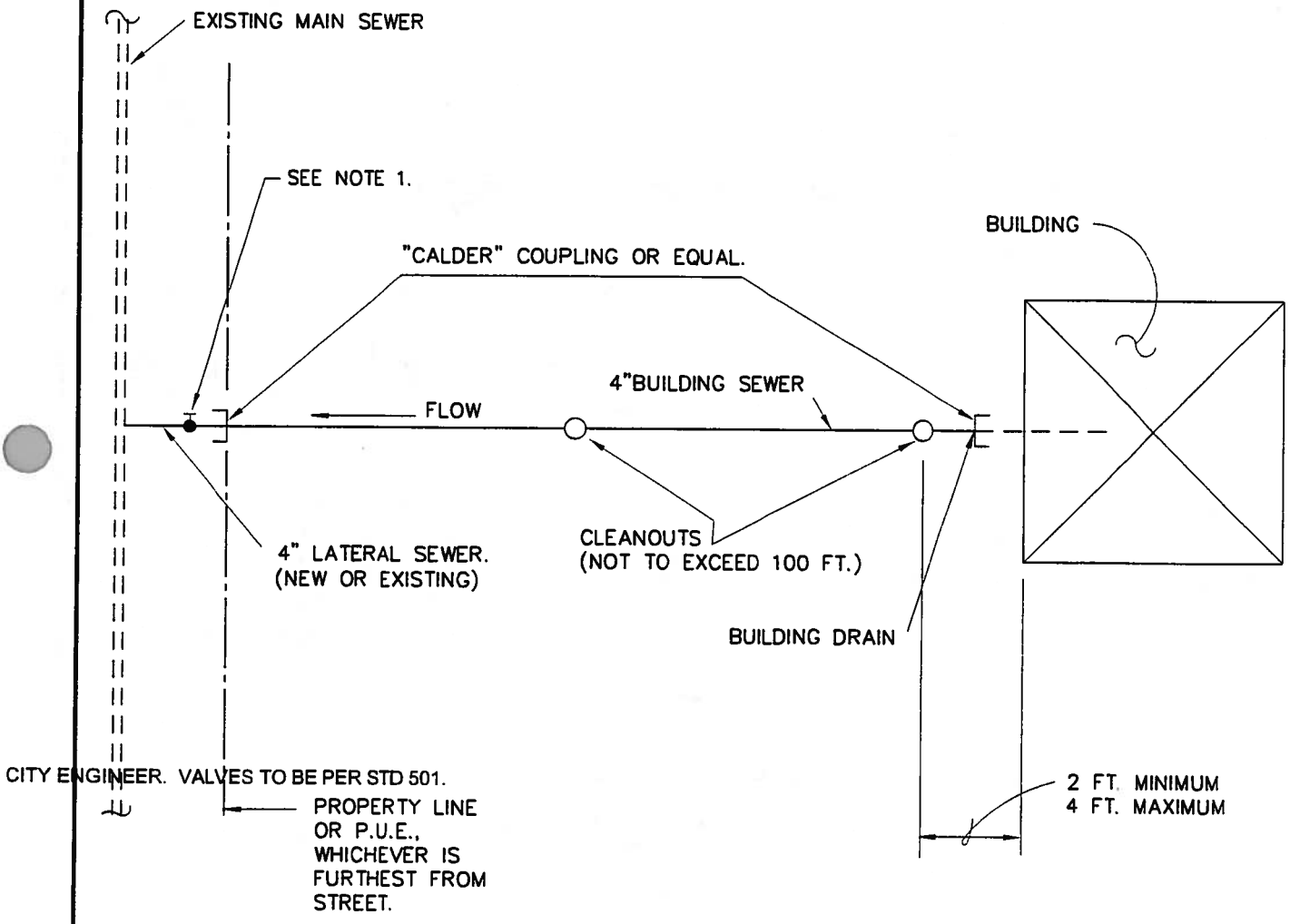
STD. NO. 309

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

NOTE:

WHERE BUILDING SEWERS ARE LOCATED UNDER DRIVEWAYS, CAST IRON OR DUCTILE IRON SEWER PIPE SHALL BE USED.



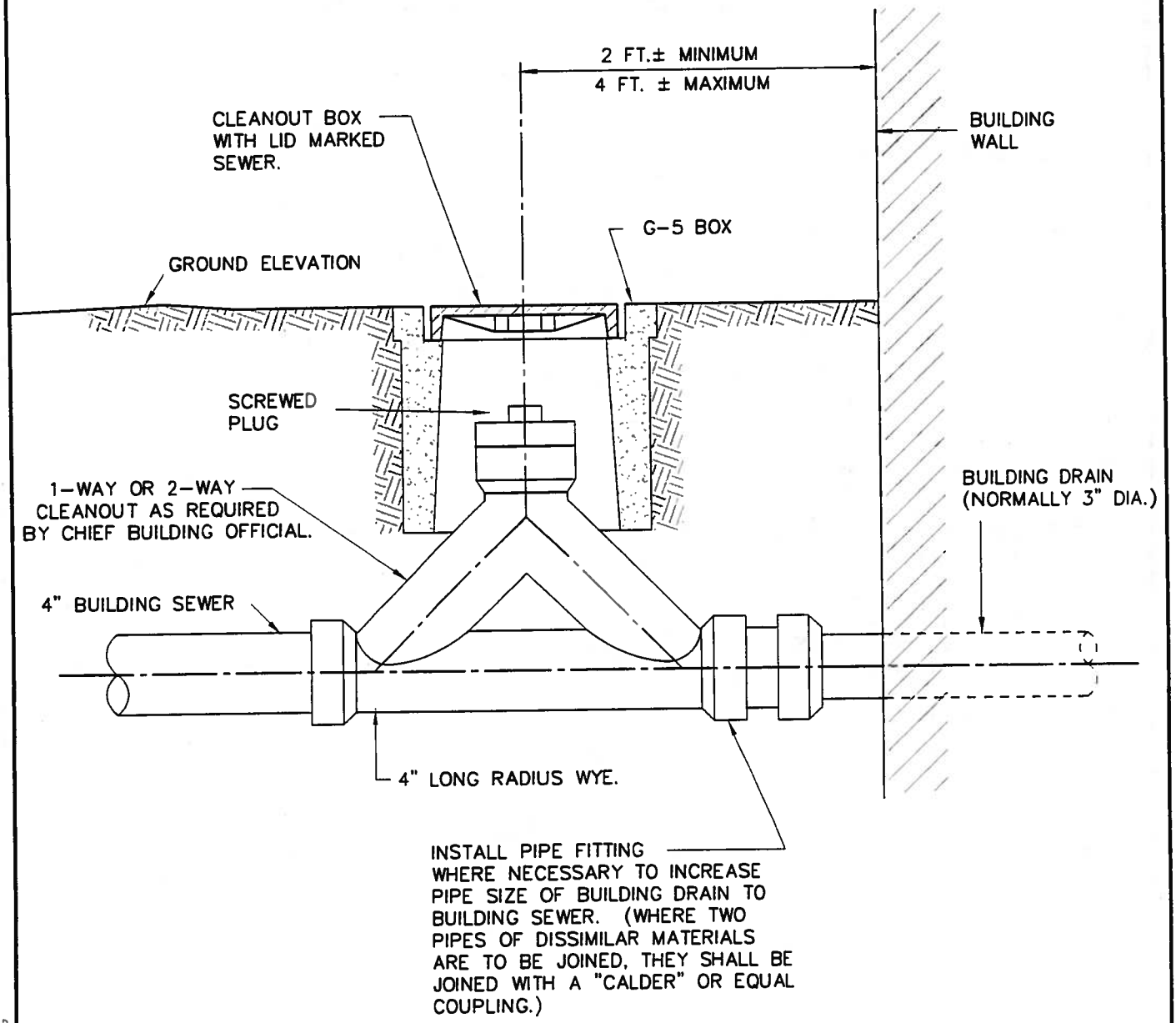
PLAN

NOTES:

1. VALVE SHALL BE INSTALLED ON NON-RESIDENTIAL DEVELOPMENTS AT THE DISCRETION OF THE CITY ENGINEER. VALVES TO BE PER STD 501.

CITY OF CLOVERDALE CALIFORNIA	TYPICAL SERVICE SEWER CONNECTION DETAILS				STD. NO. 310
	SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

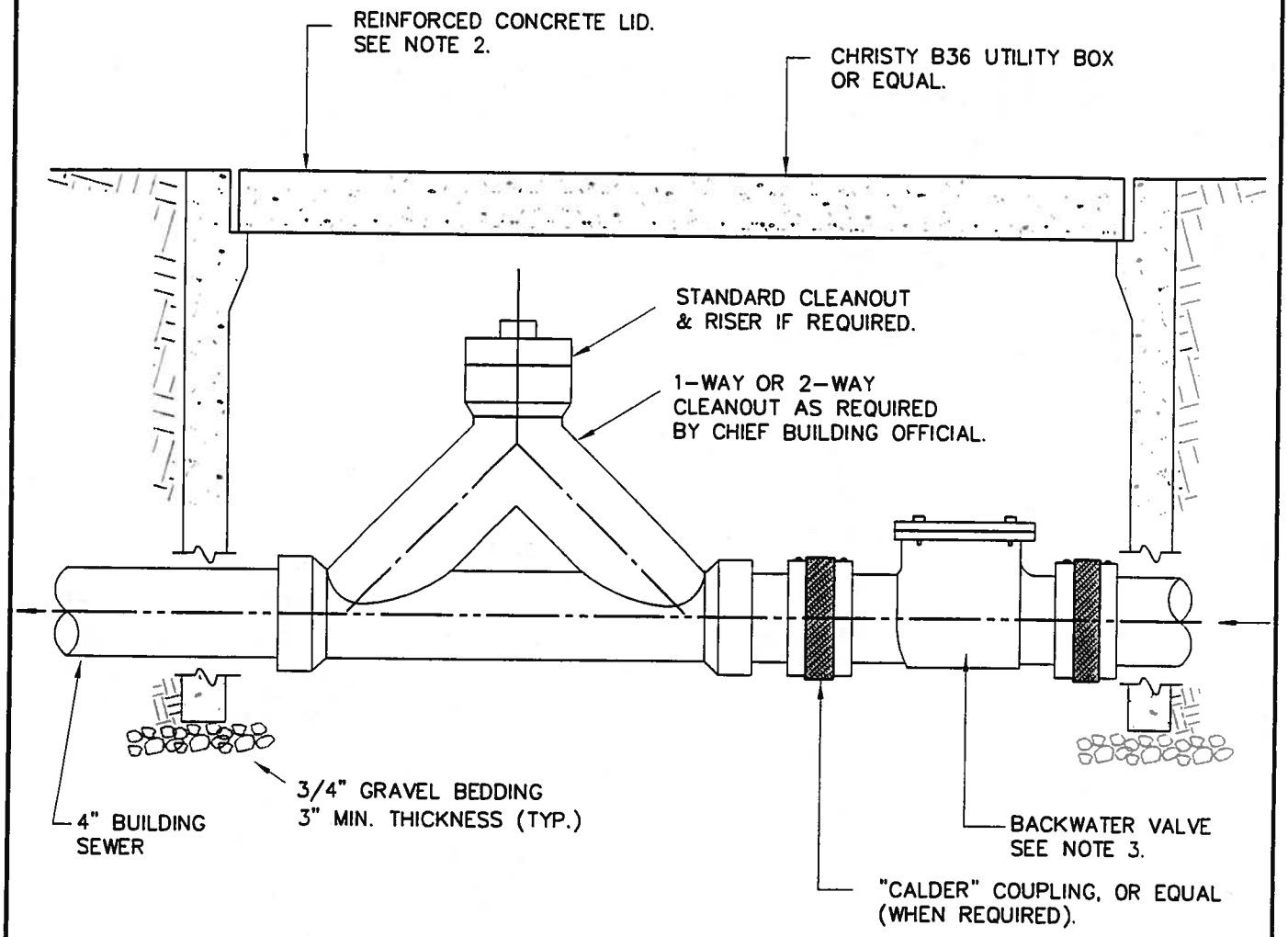


CLEANOUT DETAIL AT BUILDING

STD. NO. 310

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG



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.

BACKWATER CHECK VALVE INSTALLATION

STD. NO. 310

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

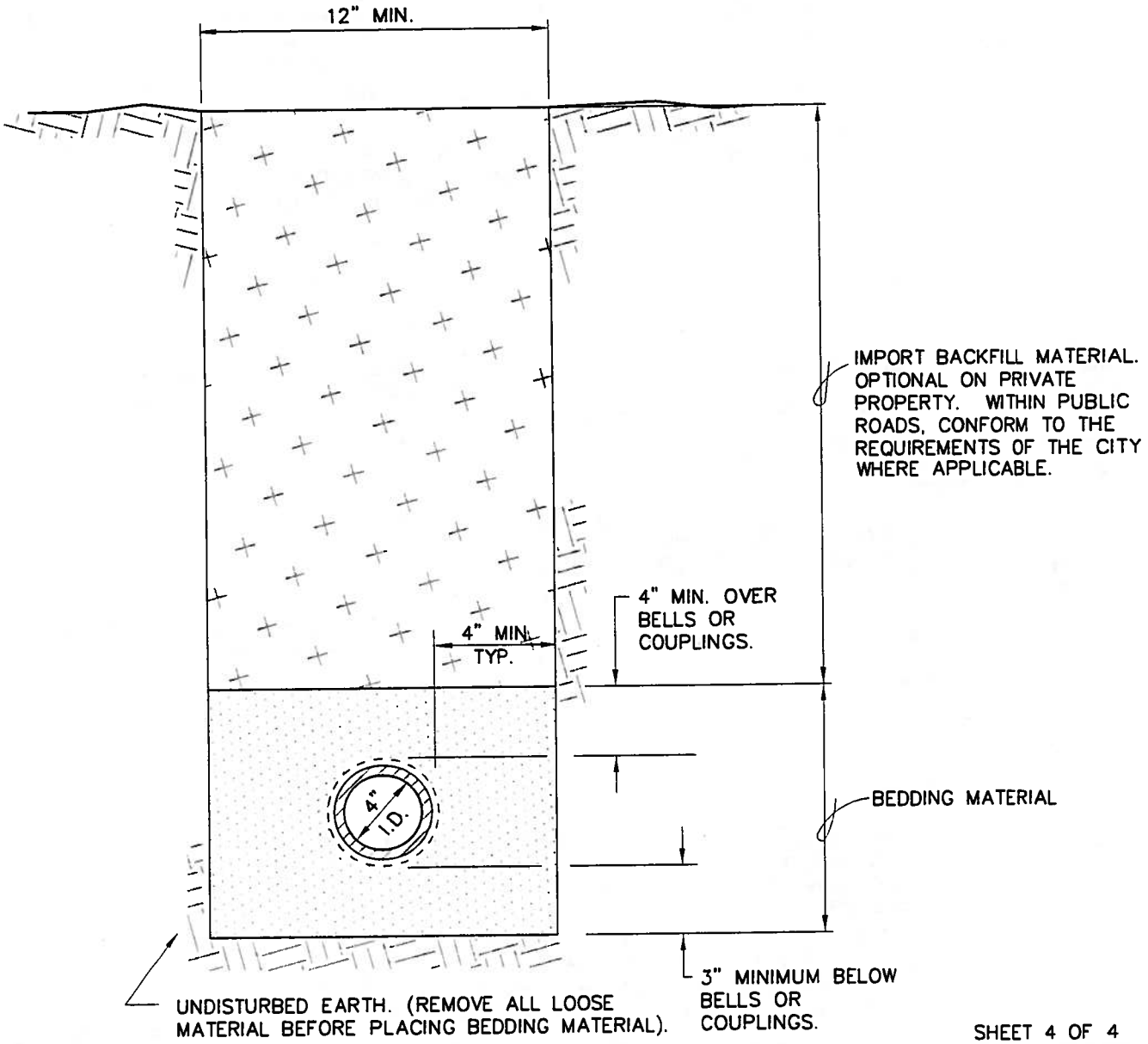
FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

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.

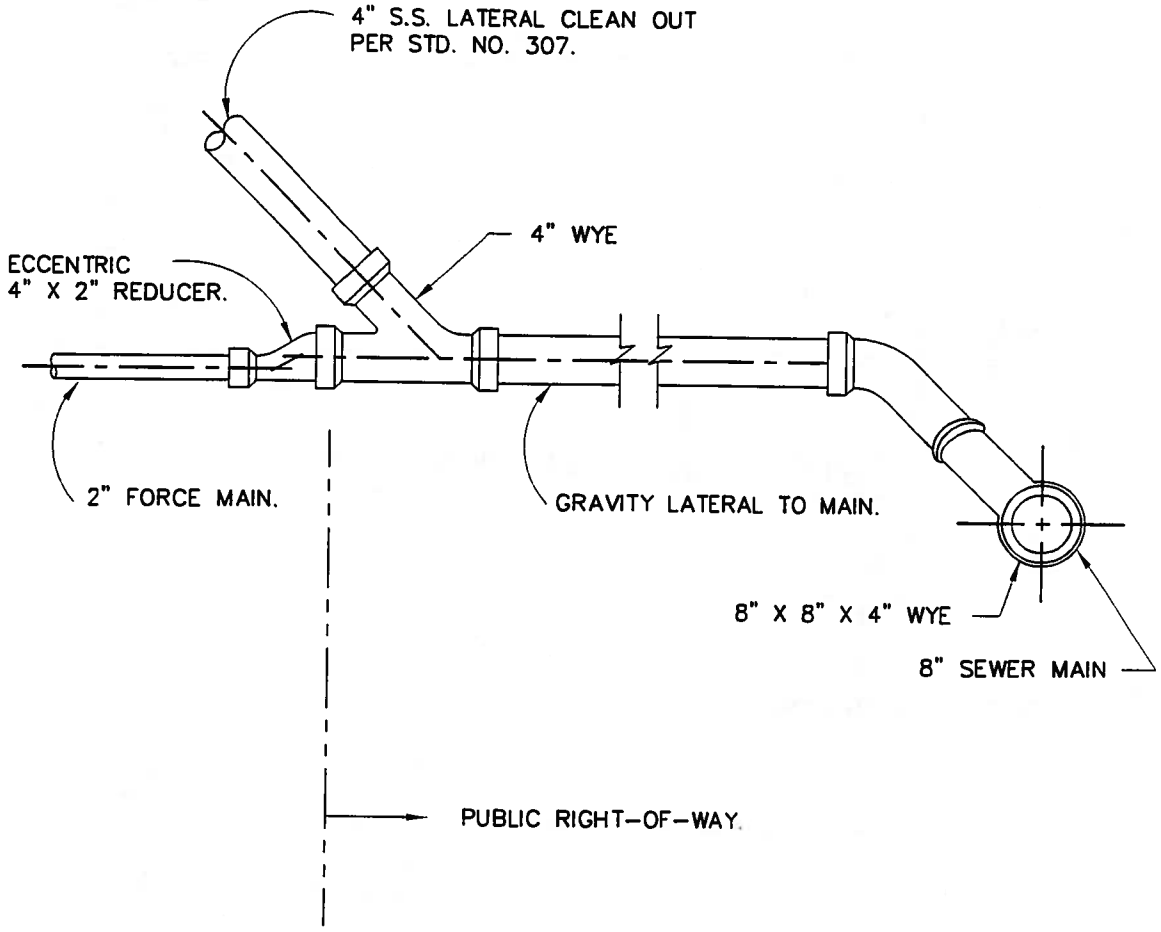


SERVICE SEWER TRENCH DETAIL

STD. NO. 310

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV300-310.DWG

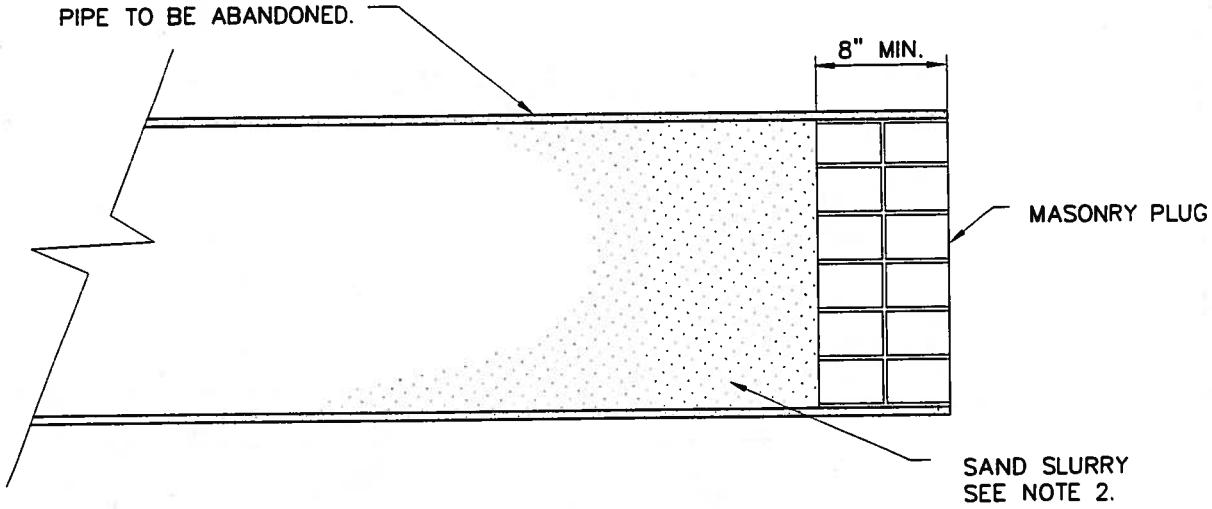


NOTES:

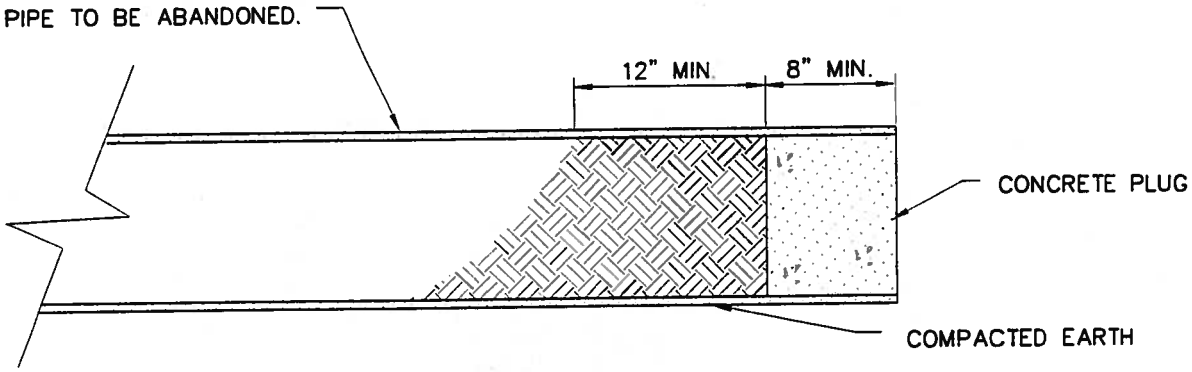
1. MUST BE USED FOR ALL PRIVATE SEWAGE LIFT STATION DISCHARGES. NO DISCHARGES MAY BE MADE DIRECTLY TO THE COLLECTOR SEWER, TRUNK SEWER, OR MANHOLE.
2. ANY ALTERNATE DESIGN MUST BE APPROVED BY THE CITY ENGINEER.
3. CONSTRUCTION DETAILS, SLOPE, AND MATERIALS CONFORM TO STD. NO. 309.

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG

CITY OF CLOVERDALE CALIFORNIA	DISCHARGE FOR PRIVATE FORCE MAIN				STD. NO. 311
	SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004



12" DIAMETER PIPE AND LARGER



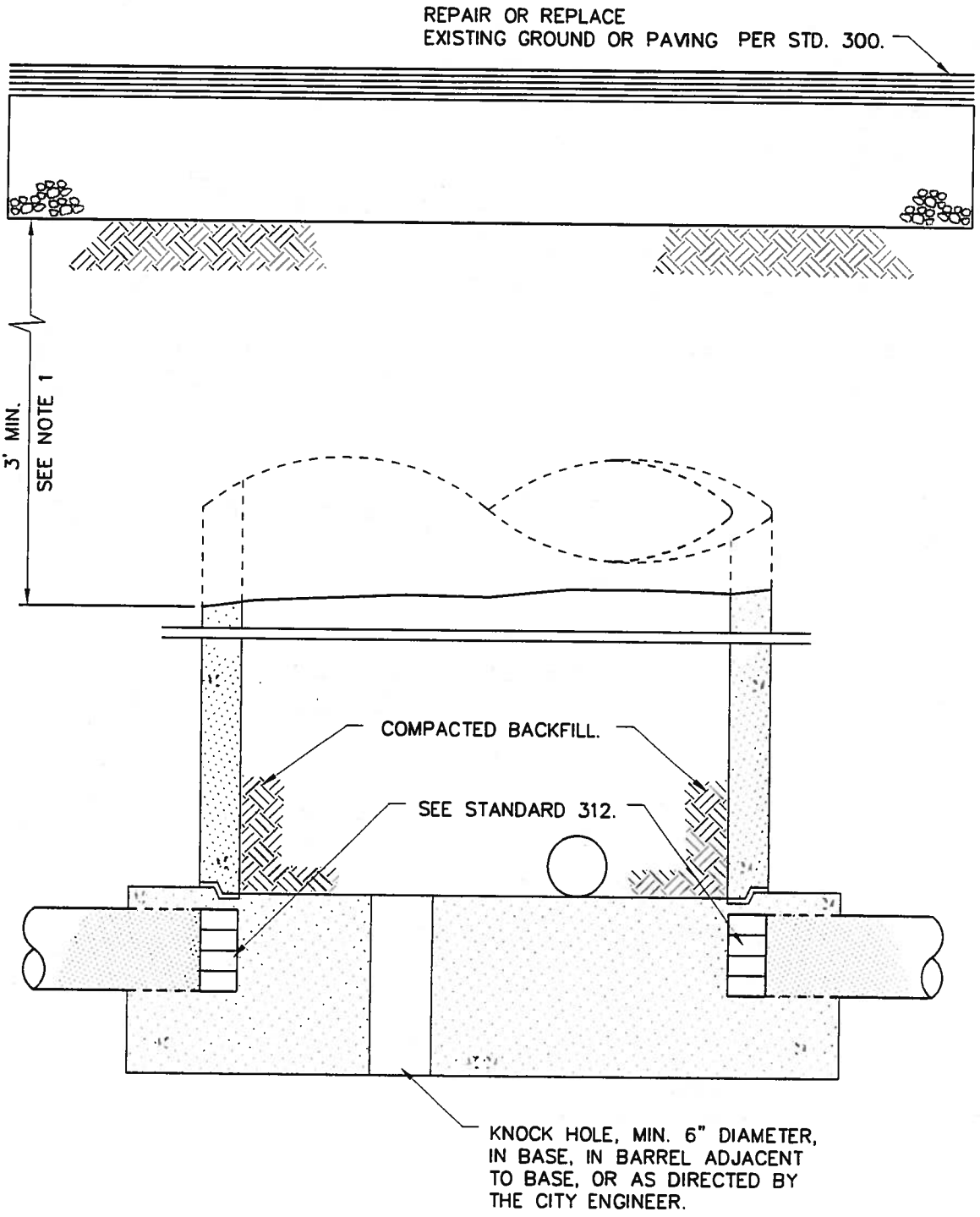
10" DIAMETER PIPE AND SMALLER

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.

CITY OF CLOVERDALE CALIFORNIA	ABANDONED PIPE PLUG DETAIL				STD. NO. 312
	SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG



NOTES:

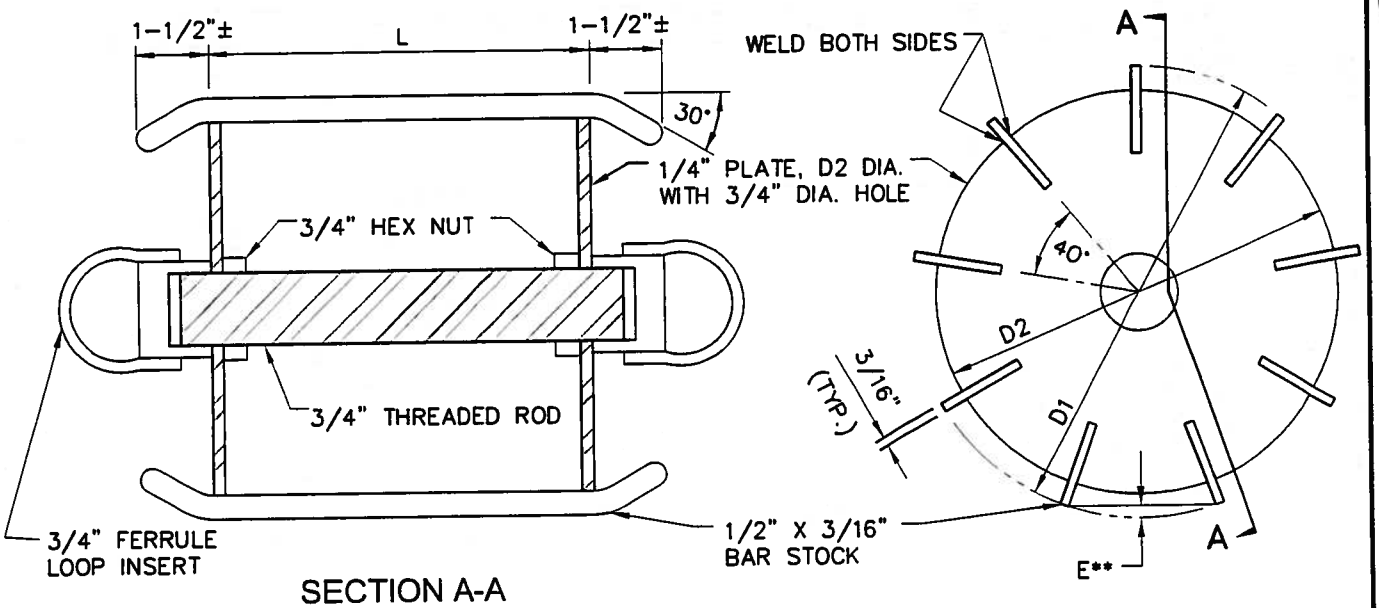
1. REMOVE FRAME, COVER, TAPER AND BARREL SECTIONS.
2. AFTER PLUGGING ALL PIPES IN MANHOLE, THE REMAINING PORTION OF THE BARREL SECTION AND ALL VOIDS CREATED BY THE REMOVAL OF THE UPPER PORTIONS OF THE MANHOLE, SHALL BE BACKFILLED AND COMPACTED TO 90% RELATIVE DENSITY. USE TRENCH BACKFILL OR PIPE BEDDING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

ABANDONED MANHOLE DETAIL

STD. NO. 313

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG



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:

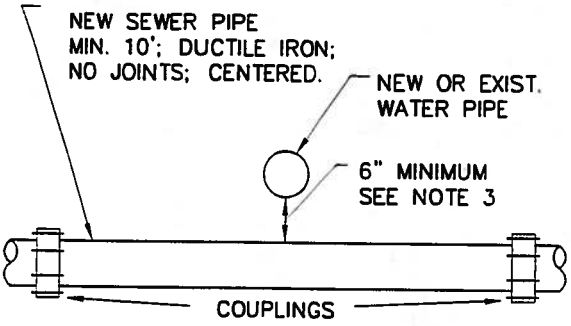
1. MARK ALL GAGES WITH ASTM SPECIFICATION NUMBER, SDR NUMBER AND DEFLECTION.
2. THE 1/2" BAR STOCK ON EDGE PROVIDES CLEARANCE TO PASS SMALL AMOUNTS OF SOIL WHICH MAY BE IN PIPE.

PLASTIC SEWER PIPE DEFLECTION GAGE

STD. NO. 314

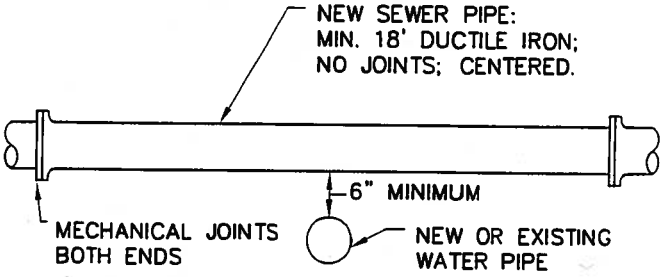
SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG



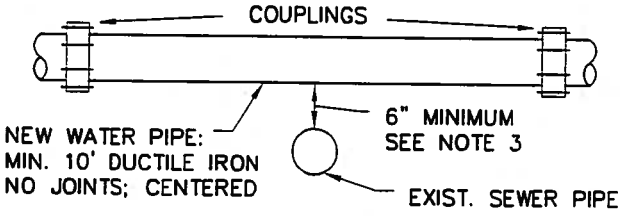
NEW SEWER UNDER NEW OR EXISTING WATER

CASE 1



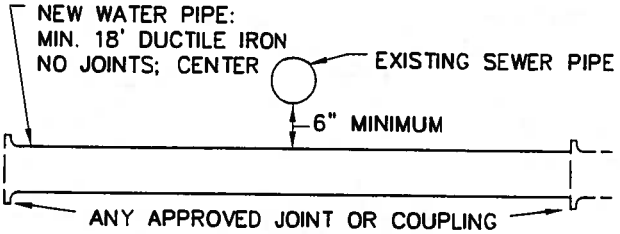
NEW SEWER OVER NEW OR EXISTING WATER

CASE 2



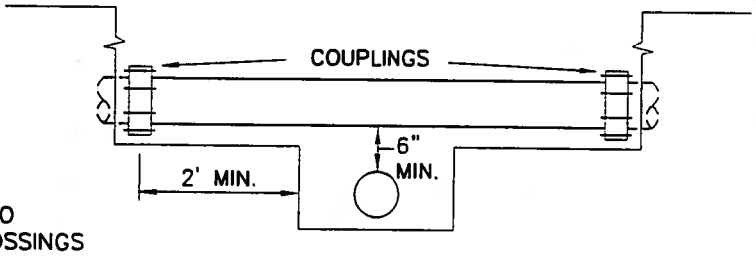
NEW WATER OVER EXISTING SEWER

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 STANDARD 528.
7. SEE CITY'S APPROVED LIST FOR APPROVED COUPLINGS.

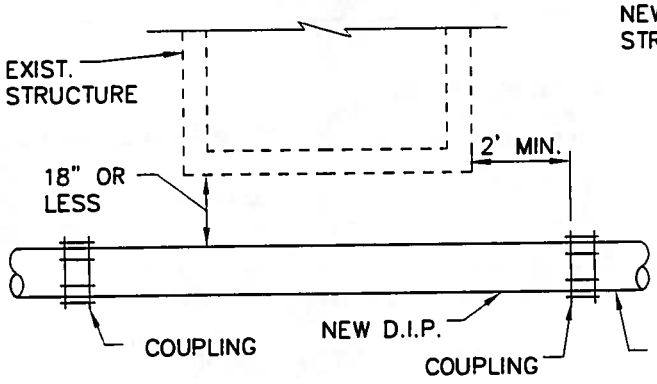
CITY OF CLOVERDALE CALIFORNIA

PIPE – PIPE CROSSING DETAILS

STD. NO. 315

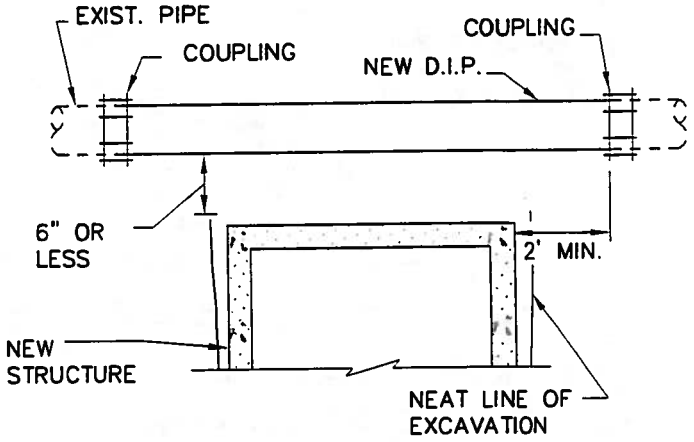
SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG



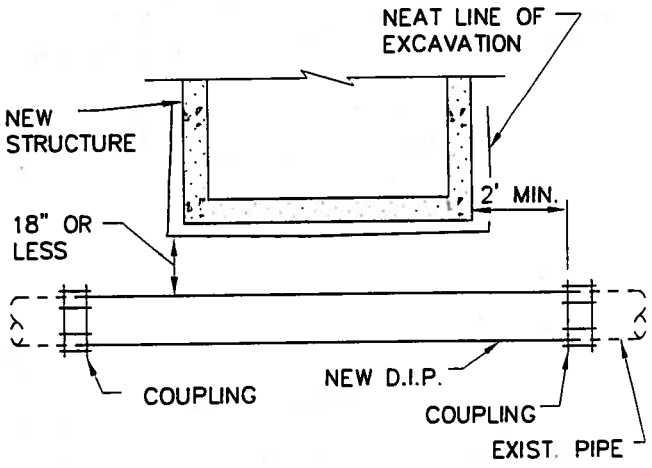
NEW PIPE UNDER EXISTING

TYPE A



NEW STRUCTURE UNDER EXISTING

TYPE C



NEW STRUCTURE OVER EXISTING

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. 527.
5. SEE CITY APPROVED LIST FOR APPROVED COUPLINGS.

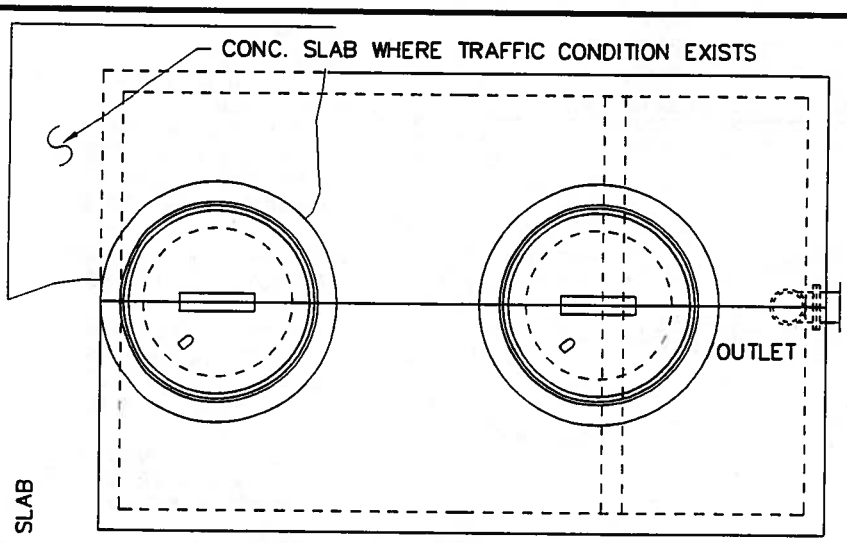
CITY OF CLOVERDALE CALIFORNIA

PIPE – STRUCTURE CROSSING DETAIL

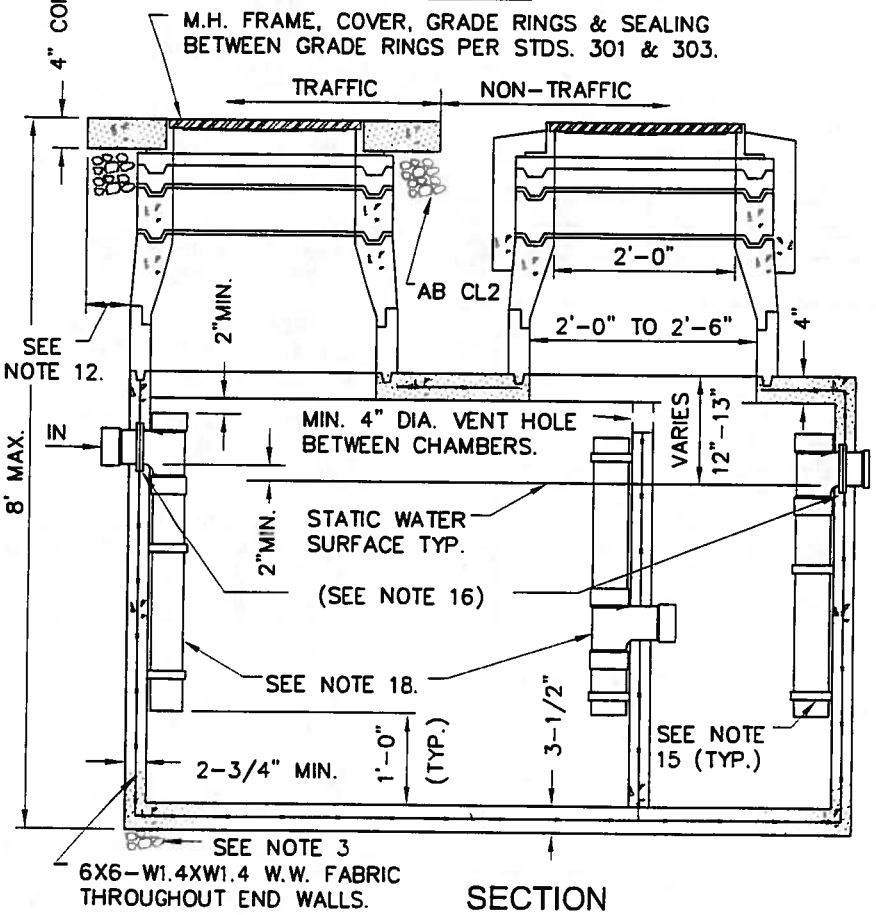
STD. NO. 316

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG



PLAN



SECTION

NOTES:

1. TANK TO BE PRECAST AS MANUFACTURED BY:
   M.C. NOTTINGHAM
   PACIFIC CONC. PRODUCTS
   SELVAGE CONC. PRODUCTS
   OR CITY APPROVED EQUAL.
2. POLYETHYLENE TANKS ACCEPTABLE IN NON-TRAFFIC AREAS UPON SPECIFIC APPROVAL OF THE CITY ENGINEER.
3. 3" MIN. BEDDING MAT'L PER CITY STD. 300.
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. 319.
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.

NOTES: (CONT.)

17. TANK CAPACITY TO BE DETERMINED AT THE TIME OF INDUSTRIAL WASTE PERMIT APPLICATION.
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.

CITY OF CLOVERDALE CALIFORNIA

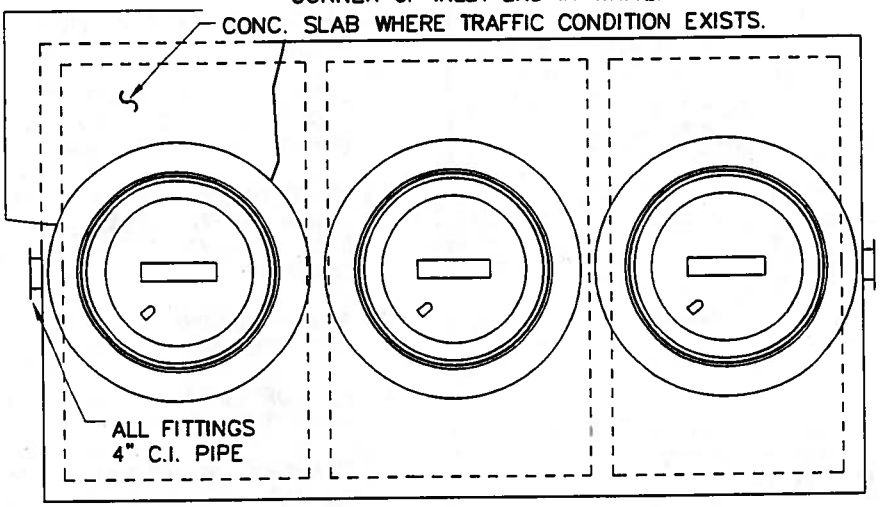
PRECAST GREASE INTERCEPTOR

STD. NO. 317

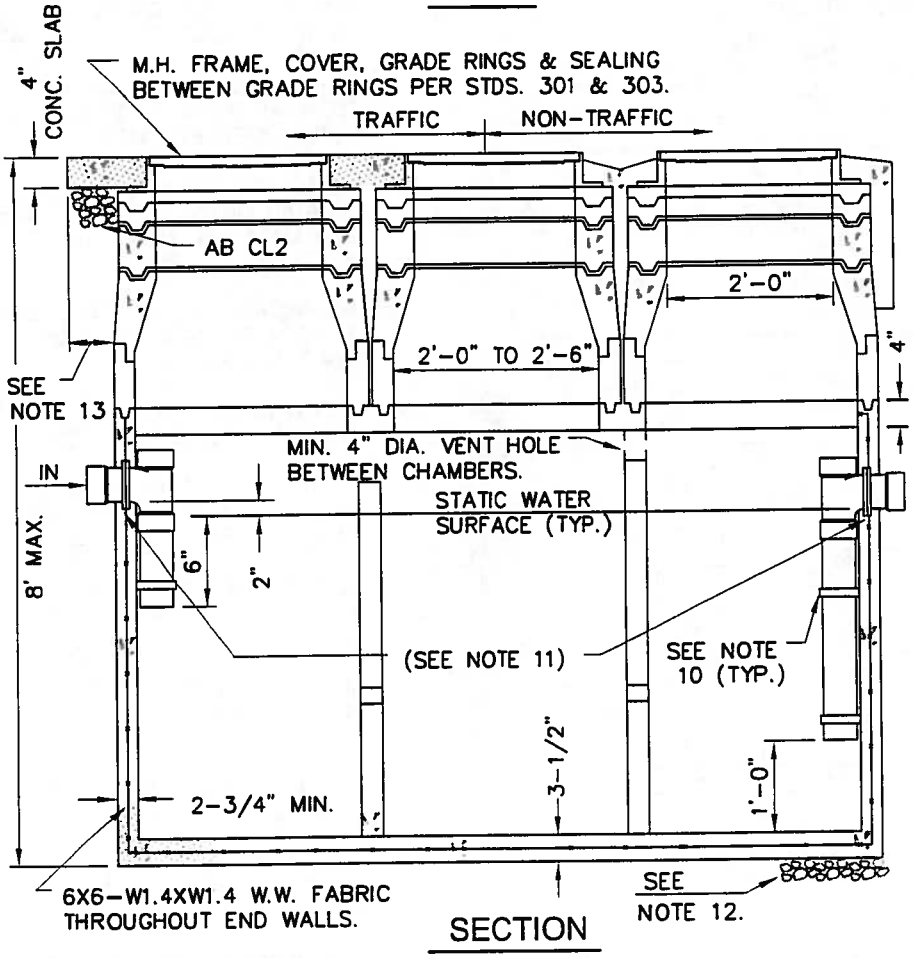
SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG

NOTE: TANK TO BE STENCILED ON UPPER LEFT-HAND CORNER OF INLET END IN WHITE.



PLAN



SECTION

NOTES:

1. TANK TO BE PRECAST AS MANUFACTURED BY:
   M.C. NOTTINGHAM
   PACIFIC CONC. PRODUCTS
   SELVAGE CONC. PRODUCTS
   OR CITY APPROVED EQUAL.
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. 319.
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. 300.
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.)

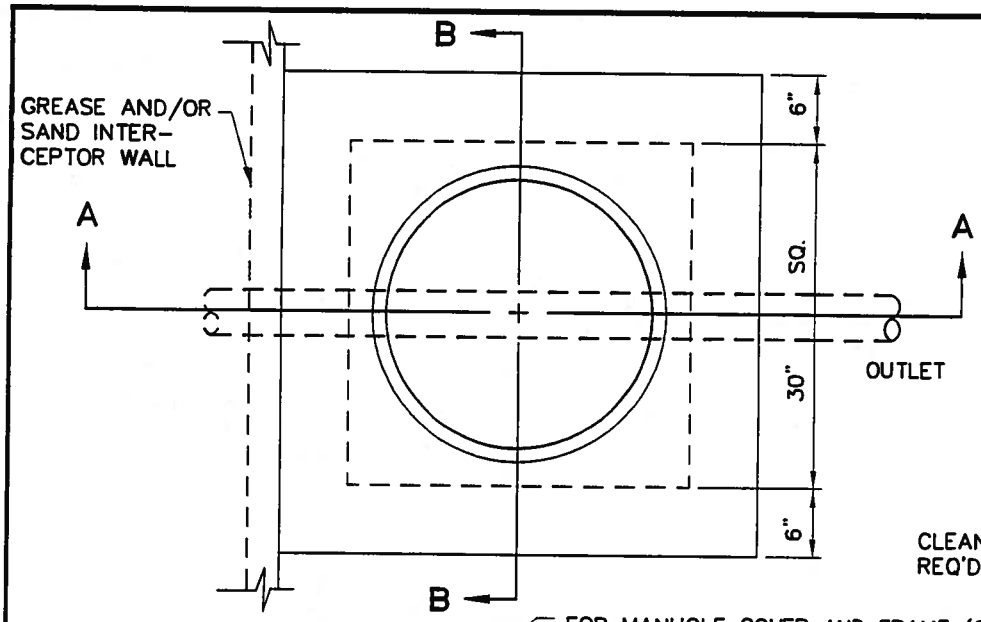
18. REINFORCING BAR INTERMEDIATE GRADE ASTM A615-62T & A305-56T.
19. REINFORCING WIRE FABRIC- ASTM A185-61T.

SAND AND GREASE INTERCEPTOR

STD. NO. 318

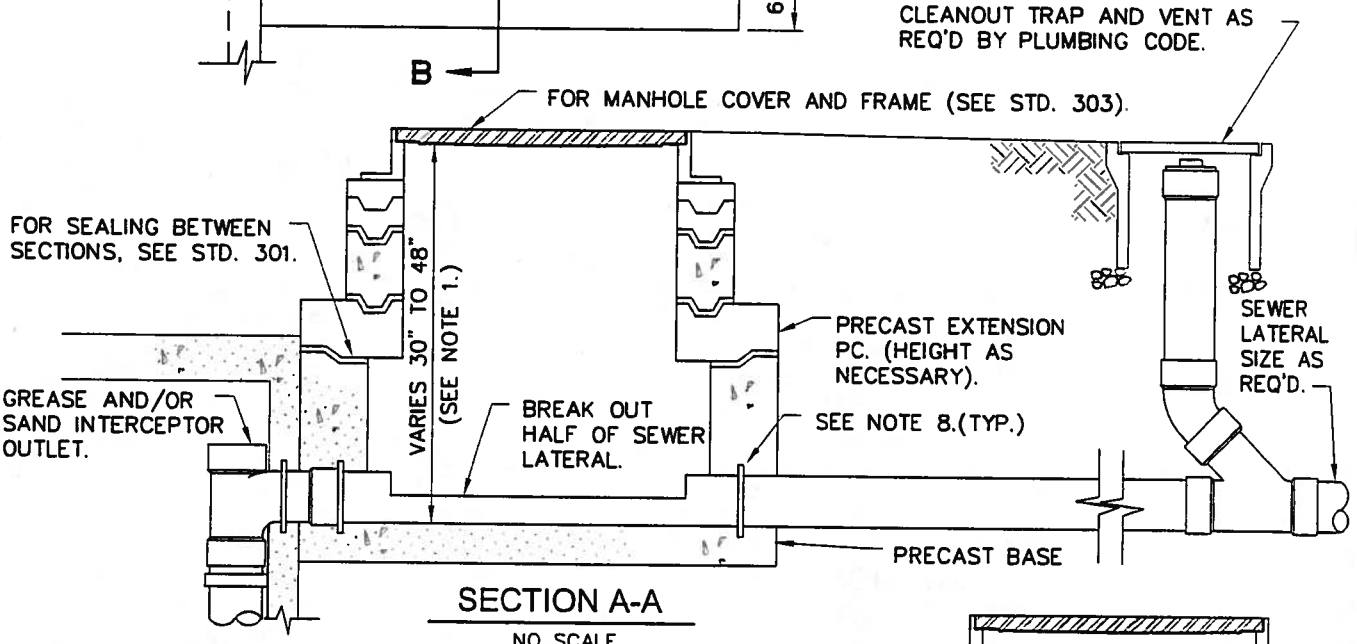
SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG



PLAN

NO SCALE

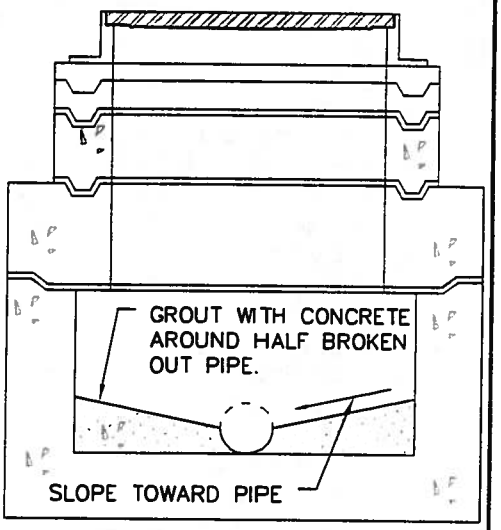


SECTION A-A

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. 301 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. 317 OR 318.
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

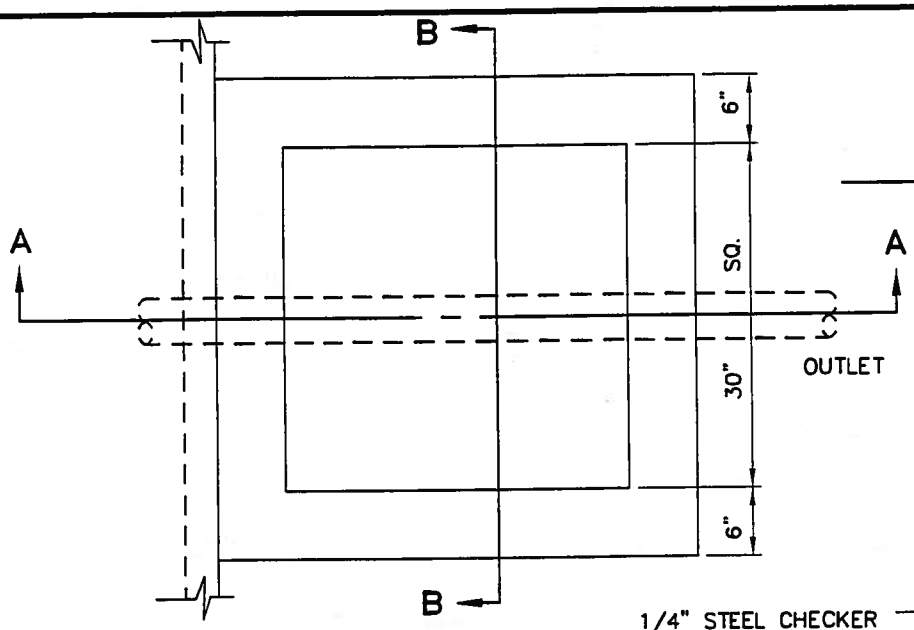
NO SCALE

SAMPLING MANHOLE EXTERIOR USE

STD. NO. 319

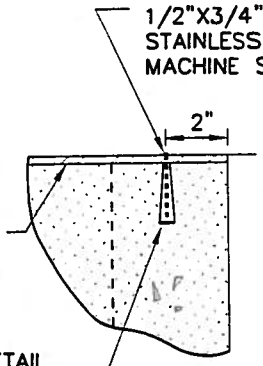
SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG

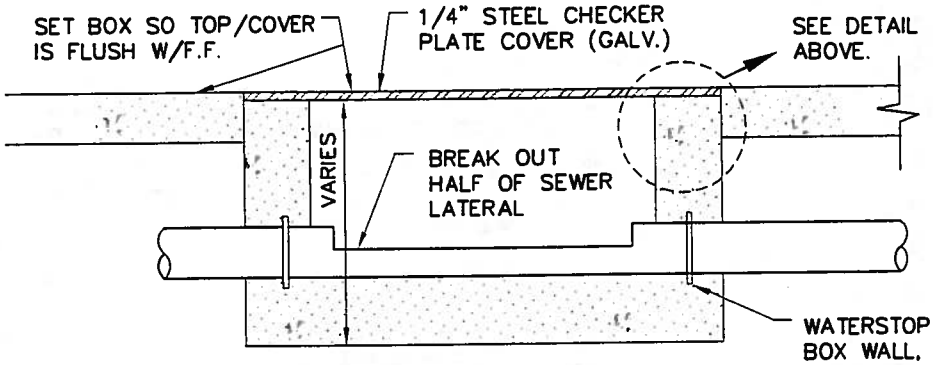


PLAN

NO SCALE

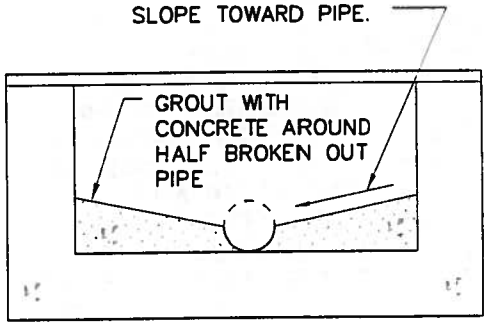


STEEL PLATE COVER FASTENER DETAIL



SECTION A - A

NO SCALE



SECTION B - B

NO SCALE

NOTES:

1. TO BE USED IN THE INTERIOR OF BUILDINGS IN CONJUNCTION W/SAMPLING MANHOLE AND TO BE UPSTREAM OF THE SAMPLING MANHOLE.
2. LOCATION SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
3. TO BE USED ONLY WITH THE APPROVAL OF THE CITY ENGINEER.
4. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY THE CITY.
5. BOX SHALL BE SANTA ROSA CAST PRODUCTS MODEL 5K OR APPROVED EQUAL.
6. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING BOX.
7. SAMPLING BOX TO BE USED IN CONJUNCTION WITH EITHER STDS. 317 OR 318.
8. A WATERSTOP CONSISTING OF A STANDARD MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.

CITY OF CLOVERDALE CALIFORNIA

SAMPLING BOX BUILDING INTERIOR

STD. NO. 320

SCALE: NONE	DRAWN: CLG	CHK: JHG	APPVD:	DATE: APR. 2004

FILE: BMAP-STD\CLOVER\STD\CLOV311-320.DWG