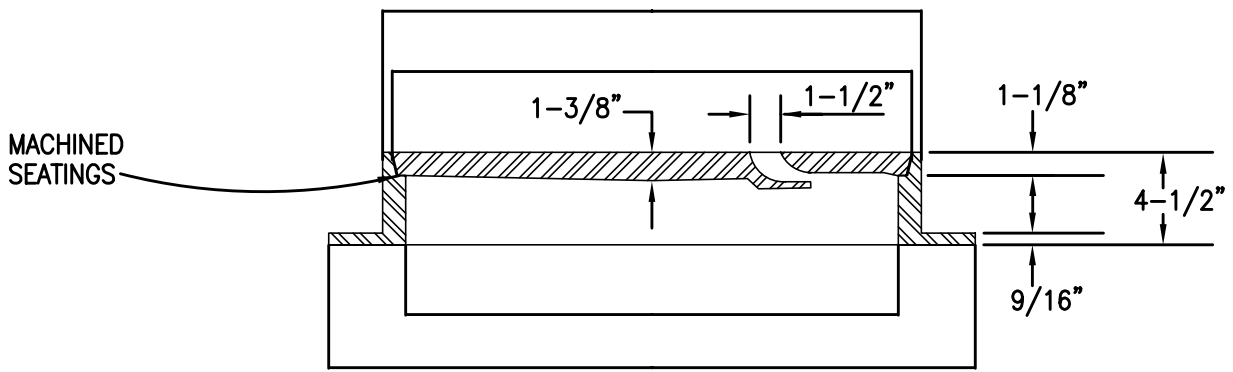


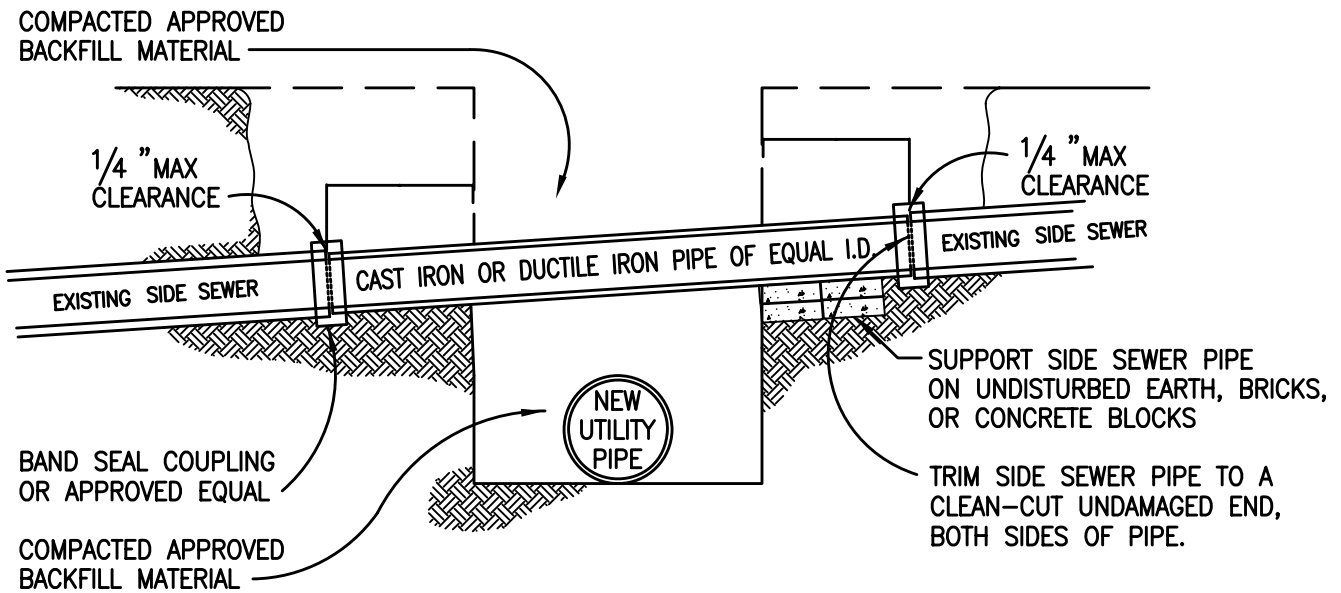
PLAN



SECTION THRU FRAME AND COVER

- NOTES:
1. MANHOLE FRAME AND COVER SHALL BE AS MANUFACTURED BY PHOENIX IRON WORKS, OAKLAND, NO. P-1090 OR APPROVED EQUIVALENT.
 2. FOR MANHOLES LOCATED IN SIDEWALK AREAS USE PHOENIX NO. P-1067 FRAME AND COVER OR APPROVED EQUIVALENT.
 3. MINIMUM WEIGHT OF FRAME IS 138 LBS.
MINIMUM WEIGHT OF COVER IS 130 LBS.

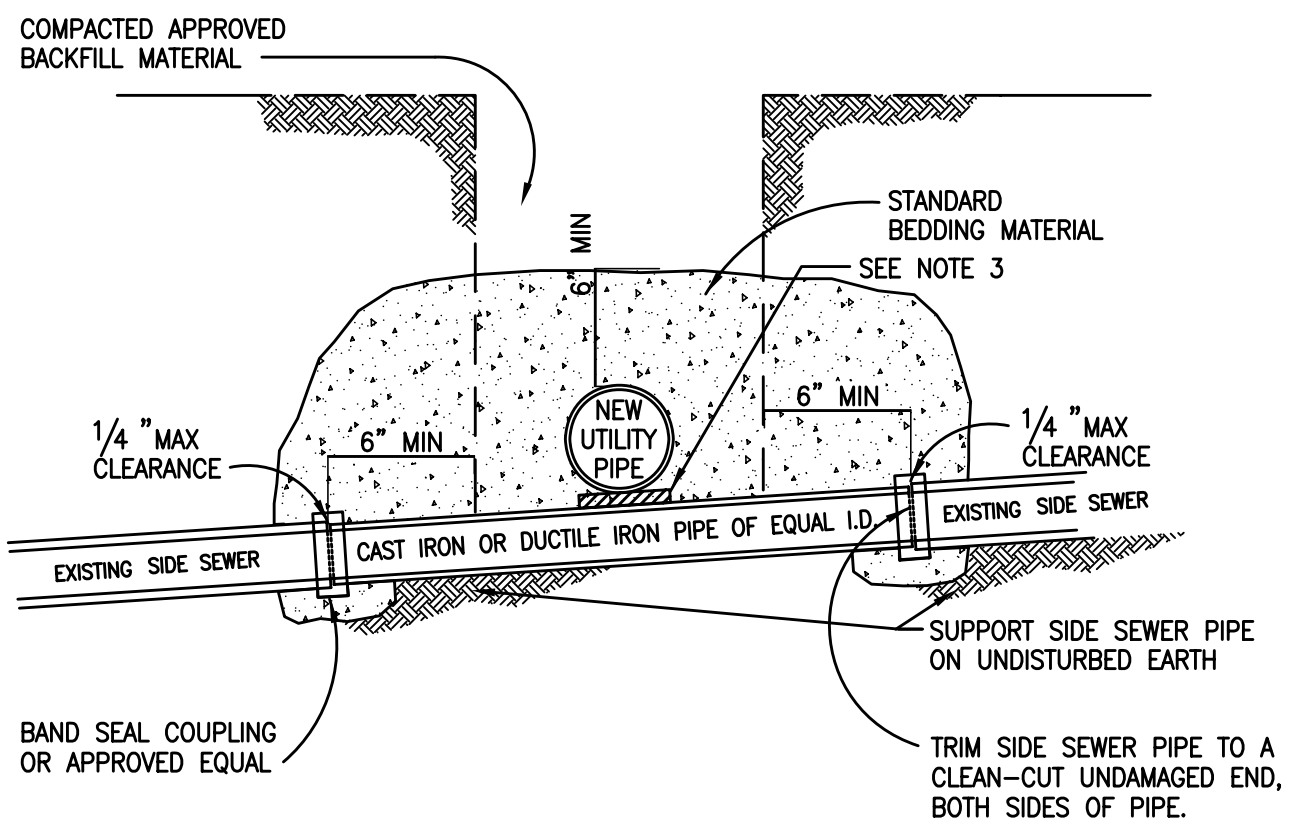
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| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| STANDARD MANHOLE FRAME AND COVER | | |
| 1995 | | SD 1 |



NOTES:

1. SEWER PROTECTION, AS DETAILED HEREON, SHALL BE PROVIDED WHEN ANY NEW UTILITY PIPE IS INSTALLED BELOW AN EXISTING SIDE SEWER.
2. BACKFILL AROUND NEW UTILITY PIPE MUST BE PLACED AND COMPACTED BEFORE SIDE SEWER PIPE INSTALLATION.
3. BACKFILL ABOVE SIDE SEWER SHALL NOT BE PLACED UNTIL PIPE INSTALLATION HAS BEEN INSPECTED AND APPROVED BY THE DISTRICT.
4. WHEN THE CLEARANCE BETWEEN THE PIPES IS 1" OR LESS, INSTALL A 4" x 4" PAD OF 35-45 DUROMETER RUBBER SNUGLY FIT BETWEEN THE PIPES.

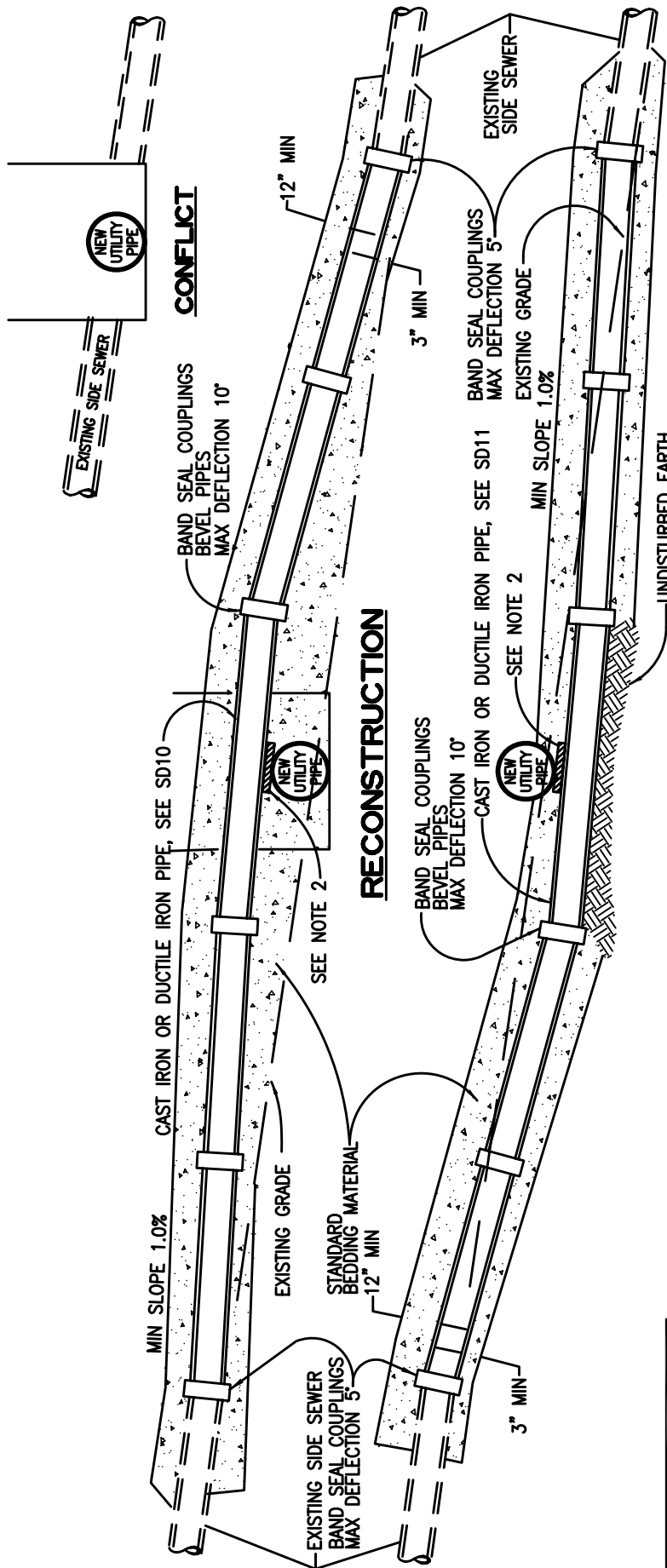
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|---|--|-------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| SIDE SEWER PROTECTION ABOVE UTILITY CROSSING | | |
| 1995 | | SD 10 |



NOTES:

1. SEWER PROTECTION, AS DETAILED HEREON, SHALL BE PROVIDED WHEN ANY NEW UTILITY PIPE IS INSTALLED ABOVE AN EXISTING SIDE SEWER AND THE CLEARANCE IS LESS THAN 12".
2. BACKFILL SHALL NOT BE PLACED UNTIL PIPE INSTALLATION HAS BEEN INSPECTED AND APPROVED BY THE DISTRICT.
3. WHEN THE CLEARANCE BETWEEN THE PIPES IS 1" OR LESS, INSTALL A 4" x 4" PAD OF 35-45 DUROMETER RUBBER SNUGLY FIT BETWEEN THE PIPES.

| | | |
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| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| SIDE SEWER PROTECTION BELOW UTILITY CROSSING | | |
| 1995 | | SD 11 |

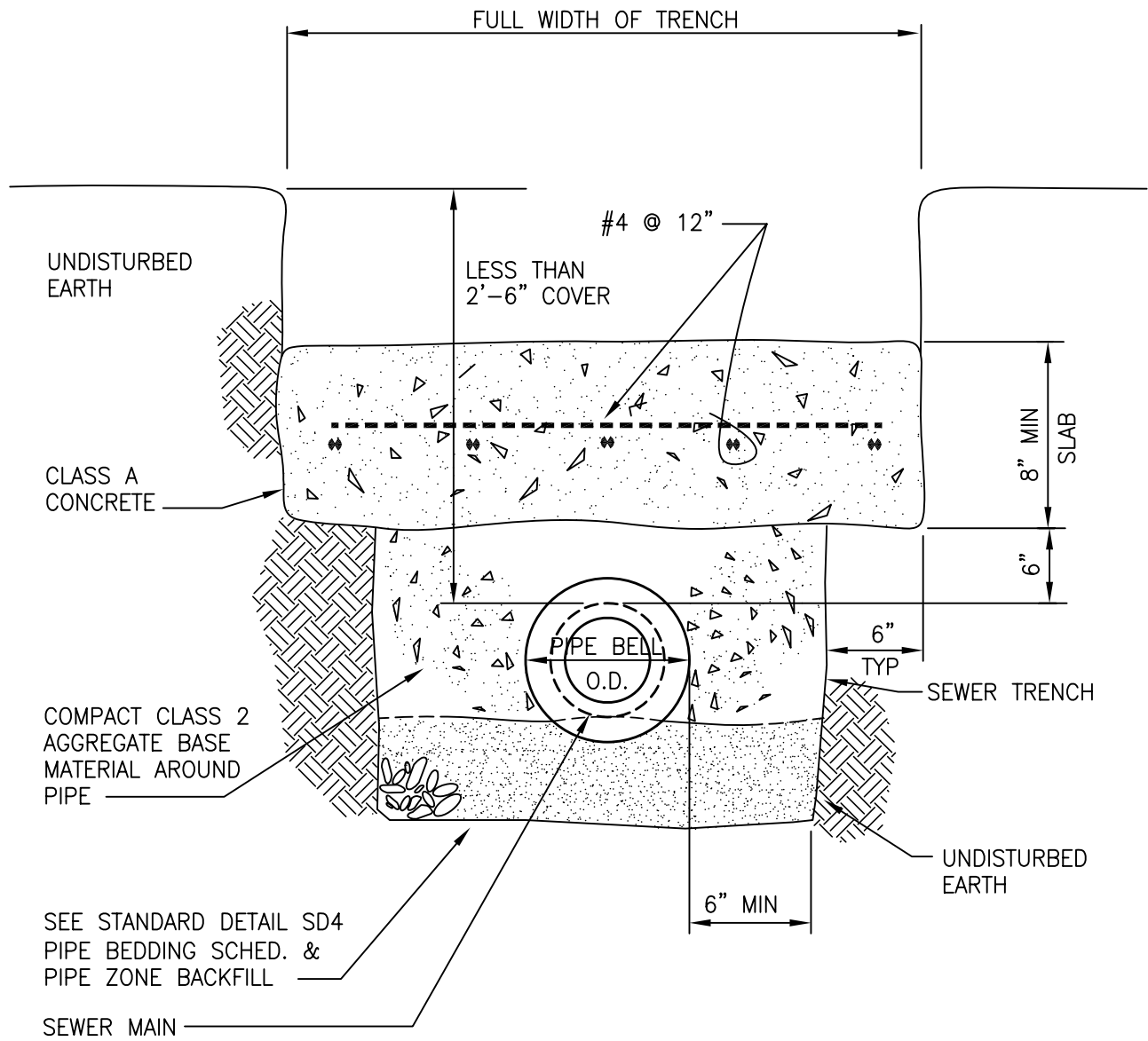


RECONSTRUCTION

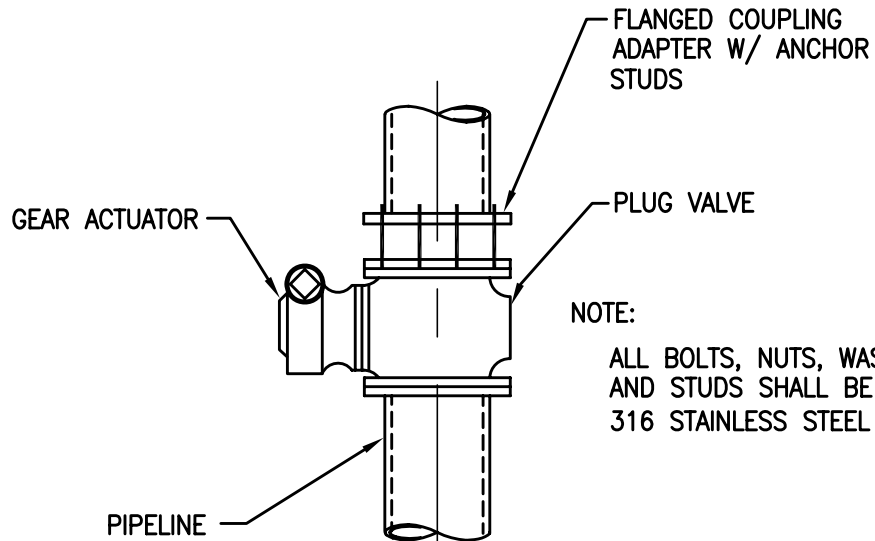
NOTES:

1. WHEN ANY NEW UTILITY PIPE OR CONDUIT CONFLICTS WITH AN EXISTING SEWER LINE GRADE, THE UTILITY PIPE OR CONDUIT SHALL BE RAISED OR LOWERED, IF POSSIBLE, TO MISS THE SEWER LINE. IF IT IS NOT POSSIBLE TO MOVE THE UTILITY LINE, WRITTEN PERMISSION SHALL BE OBTAINED FROM THE SANITARY DISTRICT, AND THE SEWER LINE SHALL BE RECONSTRUCTED IN ACCORDANCE WITH ONE OF THE DETAILS ABOVE AND THE STANDARD SPECIFICATIONS OF THE DISTRICT.
2. WHEN THE CLEARANCE BETWEEN THE PIPES IS 1" OR LESS, INSTALL A 4" x 4" PAD OF 35-45 DUROMETER RUBBER SNUGLY FIT BETWEEN THE PIPES.

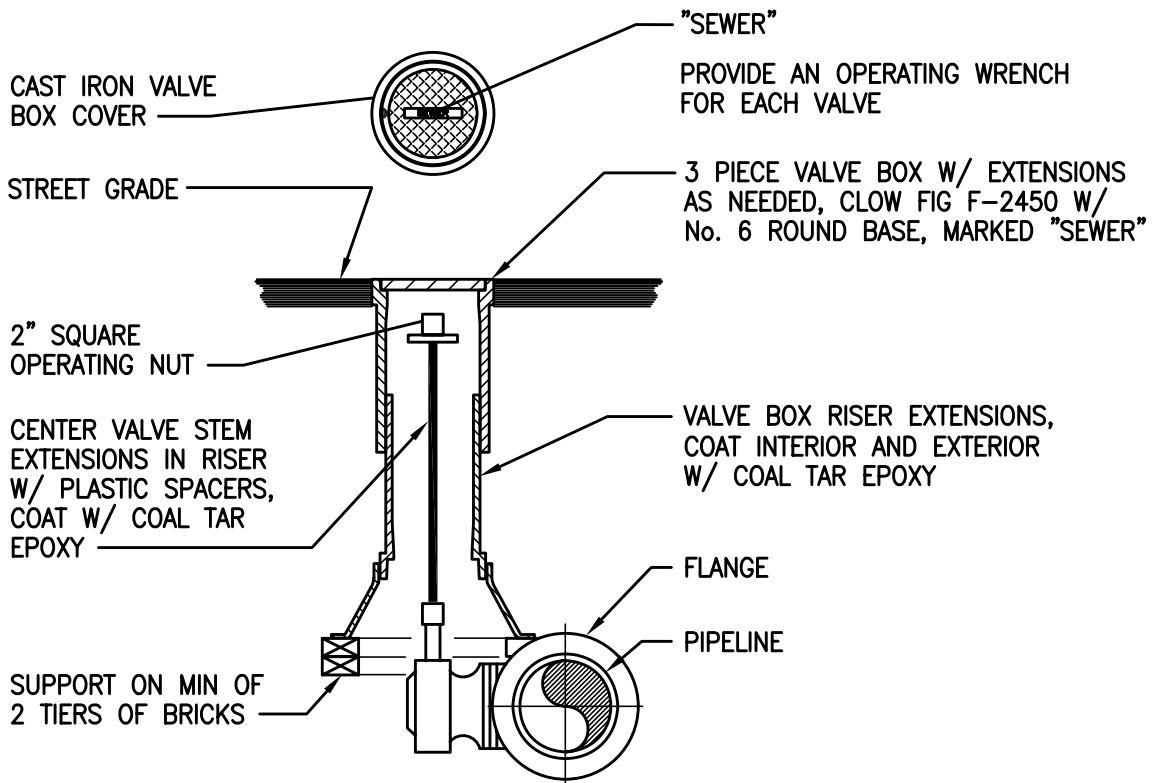
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|---|-------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | |
| SIDE SEWER RECONSTRUCTION AT UTILITY CROSSING | |
| 1995 | SD 12 |



| | | |
|---|--|--------------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| STANDARD CONCRETE PIPE PROTECTION | | |
| 1995 | | SD 13 |



PLAN VIEW



SECTION

NOTE:

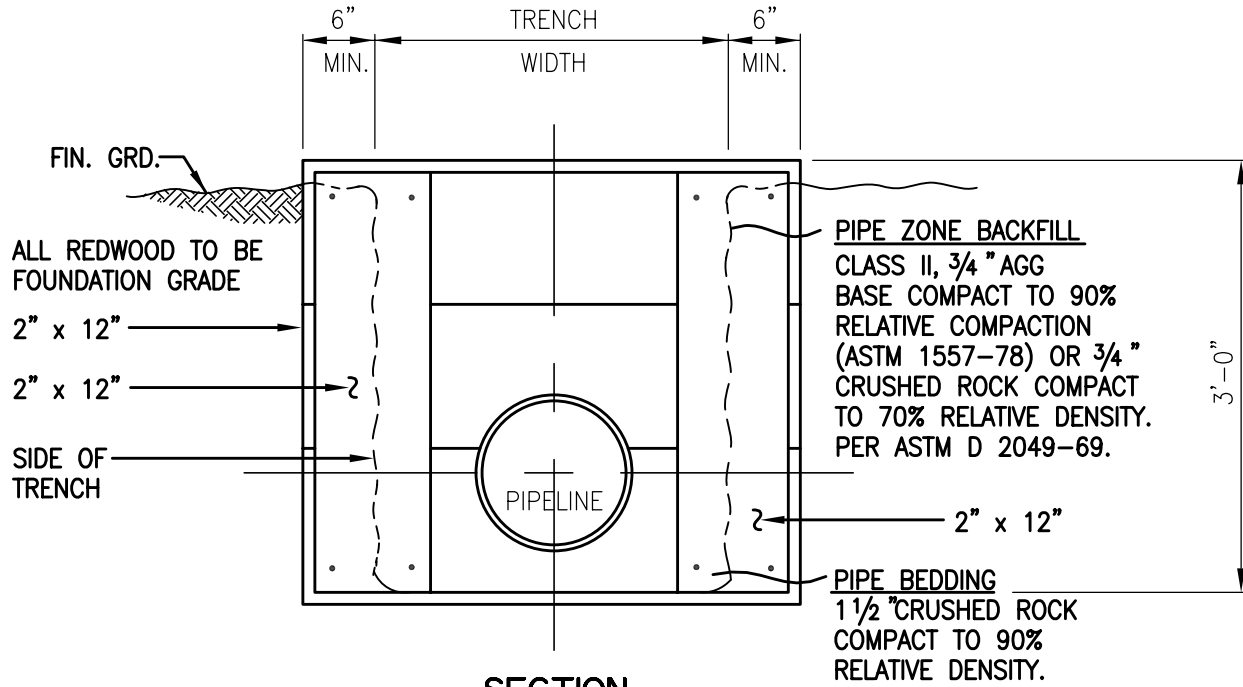
ALL BURIED VALVES, GEAR ACTUATORS, FLEX COUPLINGS AND HARNESSSES SHALL BE COATED AND WRAPPED PER SPECIFICATIONS.

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

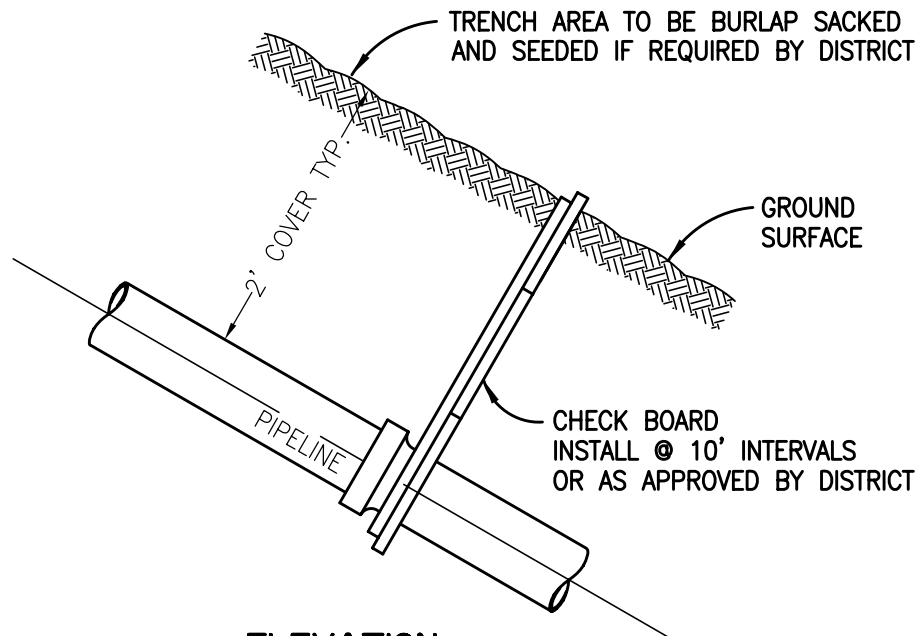
FORCE MAIN VALVE

1995

SD 14



SECTION

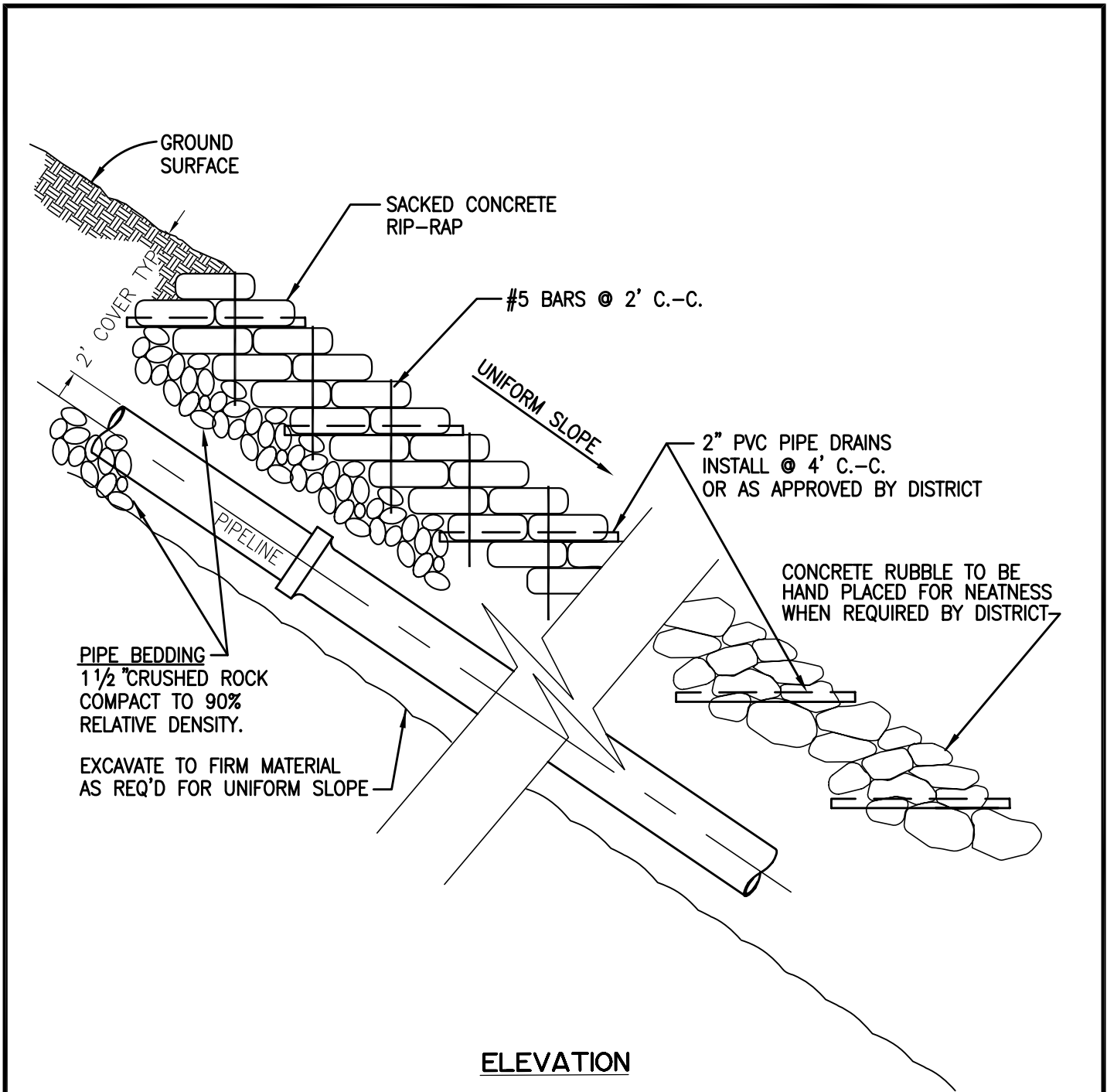


ELEVATION

NOTES:

1. CHECK BOARDS TO BE PLACED ON ALL SLOPES GREATER THAN 50% OR WHERE REQUIRED BY THE DISTRICT.
2. ALL SLOPES 50% OR GREATER SHALL HAVE CLASS 150 C.I. BELL & SPIGOT PIPE.

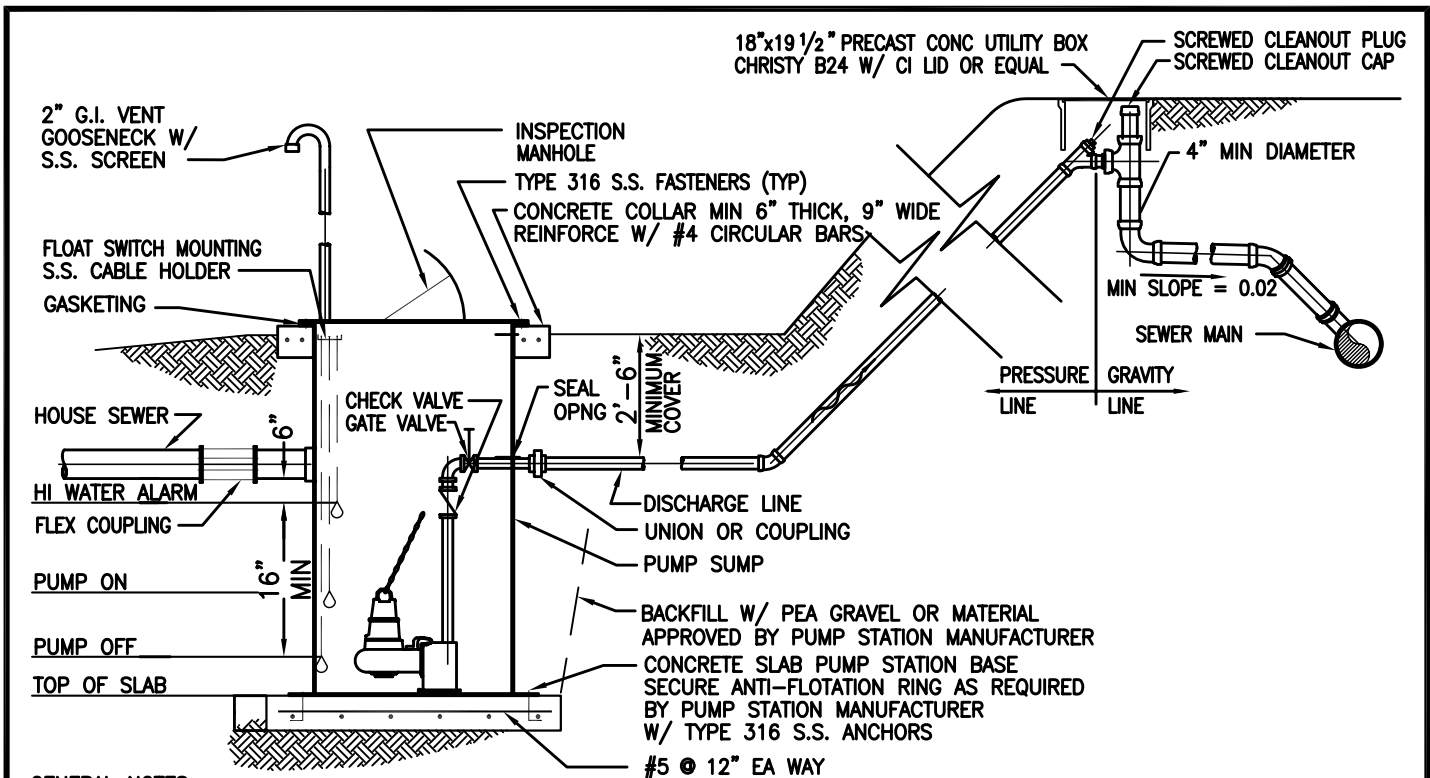
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| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| STANDARD REDWOOD CHECK BOARD | | |
| 1995 | | SD 15 |



NOTES:

1. CHECK BOARDS TO BE PLACED ON ALL SLOPES GREATER THAN 50% OR WHERE REQUIRED BY THE DISTRICT. SEE SD-15.
2. ALL SLOPES 50% OR GREATER SHALL HAVE CLASS 150 C.I. BELL & SPIGOT PIPE.

| | | |
|---|--|--------------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| STANDARD RIP-RAP INSTALLATION | | |
| 1995 | | SD 16 |



GENERAL NOTES:

THE MINIMUM REQUIREMENTS FOR A RESIDENTIAL SEWAGE PUMPING SYSTEM CONNECTING A SINGLE RESIDENCE OR EQUIVALENT TO THE DISTRICT'S SYSTEM ARE SPECIFIED BELOW. THE DISTRICT ACCEPTS NO RESPONSIBILITY FOR THE DESIGN, OPERATION OR MAINTENANCE OF SUCH PRIVATELY OWNED AND OPERATED SYSTEMS. ALL WORK SHALL COMPLY WITH THE UNIFORM PLUMBING AND BUILDING CODES. MANUFACTURERS:

ALL EQUIPMENT AND ACCESSORIES SHALL BE INDUSTRY STANDARD MANUFACTURED ITEMS AND THOSE COMING IN DIRECT CONTACT WITH SEWAGE SHALL BE SPECIFICALLY MANUFACTURED FOR SEWAGE USE.

PUMPS:

PUMPS SHALL BE SUBMERSIBLE SOLIDS HANDLING OR GRINDER TYPE SEWAGE PUMPS. PUMP MOTORS FOR RESIDENTIAL SERVICE SHALL BE EXPLOSION PROOF OR MEET CLASS 1, DIVISION 2 REQUIREMENTS PER NEC. ALL COMMERCIAL INSTALLATIONS SHALL CONSIST OF DUPLEX EXPLOSION PROOF PUMPS EACH RATED FOR TOTAL LOADING. ALL PUMP MOTORS SHALL BE UL LISTED.

PUMP SUMP:

THE PUMP SUMP SHALL BE CONSTRUCTED OUT OF NON-CORROSIVE MATERIAL OF SUITABLE STRENGTH TO WITHSTAND HYDRAULIC AND EARTH LOADS. THE PUMP SUMP SHALL BE A MINIMUM 36" DEEP WITH A MINIMUM CAPACITY OF 100 GALLONS AND SHALL BE PROVIDED WITH A FOUR (4) INCH MINIMUM INLET. IN ANY CASE THE INLET I.D. SHALL BE EQUAL TO OR GREATER THAN THE BUILDING PLUMBING STUB. THE TOP OF THE PUMP SUMP SHALL BE GASKETED AND SECURELY ANCHORED TO THE PUMP SUMP BY BOLTS. ALL JOINTS BETWEEN THE COMPONENT PARTS SHALL BE SEALED WITH A WATERPROOF MASTIC.

ELECTRIC POWER SERVICE:

THE POWER REQUIREMENTS SHALL BE AS RECOMMENDED BY PACIFIC GAS AND ELECTRIC COMPANY.

ELECTRICAL WORK AND CONTROLS:

ALL ELECTRICAL WIRING AND INSTALLED CABLING, CONDUIT AND CONTROLS SHALL MEET NEC CLASS 1, DIVISION 2 REQUIREMENTS AND CONFORM TO THE REQUIREMENTS OF THE CITY OR COUNTY. THE ELECTRICAL CONTROLS SHALL PROVIDE ADEQUATE PROTECTION FOR MOTOR AND EQUIPMENT. THE ELECTRICAL CONTROL PANEL SHALL MEET NEC AND UL STANDARDS FOR SAFETY. OUTDOOR PANELS SHALL BE WEATHER TIGHT NEMA 4X. INDOOR PANELS SHALL BE NEMA 1.

FLOAT SWITCH ASSEMBLY AND HIGH-WATER ALARM:
A VISIBLE RED LIGHT AND AUDIBLE HIGH WATER ALARM SHALL BE PROVIDED. THE HIGH WATER ALARM SHALL BE ACTIVATED BY A DEDICATED FLOAT AND SHALL HAVE BATTERY BACKUP. ALL FLOAT SWITCHES SHALL HAVE GAS-TIGHT MOUNTINGS.

VENT FOR PUMP SUMP:

WHERE SYSTEM IS LOCATED WITHIN THE DWELLING, A VENT TWO (2) INCHES OR LARGER SHALL BE PROVIDED. WHERE SYSTEM IS LOCATED OUTSIDE THE DWELLING, A TWO (2) INCH OR LARGER VENT SHALL BE EXTENDED TO A POINT TEN (10) FEET ABOVE THE PUMP SUMP COVER.

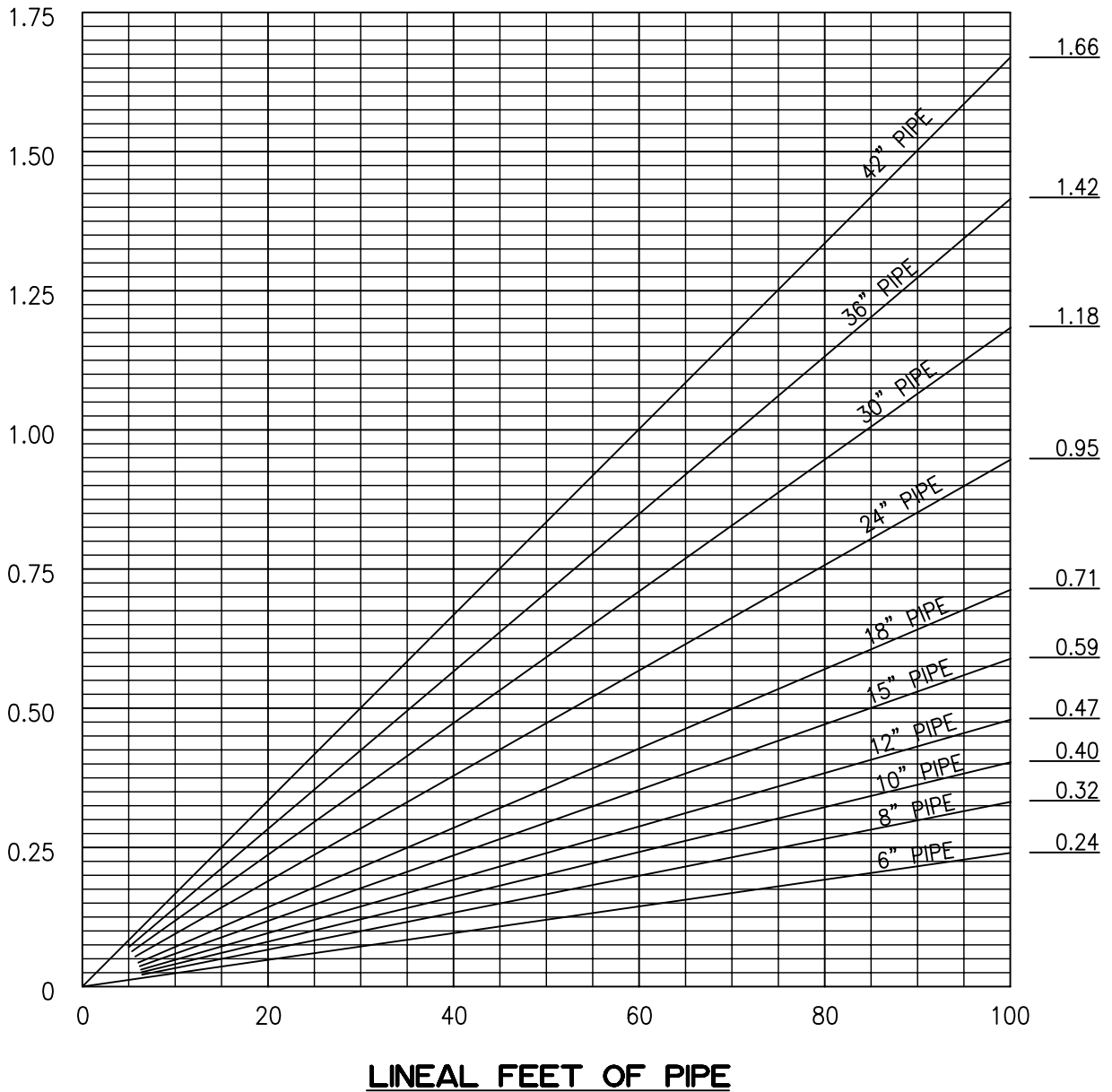
DISCHARGE LINE:

THE PRESSURE PORTION OF THE DISCHARGE LINE SHALL INCLUDE A CHECK VALVE, GATE VALVE AND FLEXIBLE COUPLINGS AND SHALL BE A MINIMUM 1/2" DIAMETER LARGER THAN THE PUMP DISCHARGE. ALL PIPE, VALVES AND COUPLINGS SHALL CONFORM TO THE STANDARD SPECIFICATIONS. THE GRAVITY PORTION OF THE DISCHARGE LINE SHALL BE FOUR (4) INCH MINIMUM DIAMETER PIPE, SHALL MEET THE DISTRICT REQUIREMENT FOR SIDE SEWERS AND SHALL PROVIDE A MINIMUM TWELVE (12) INCH VERTICAL DROP AT THE JUNCTION WITH THE PRESSURE LINE.

| | | |
|---|--|-------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| RESIDENTIAL SEWAGE PUMPING SYSTEM | | |
| 1995 | | SD 17 |

ALLOWABLE LEAKAGE (in gallons per hour)

(50 GAL. PER INCH DIA. PER MILE OF PIPE PER DAY)



CONVERSION TABLE

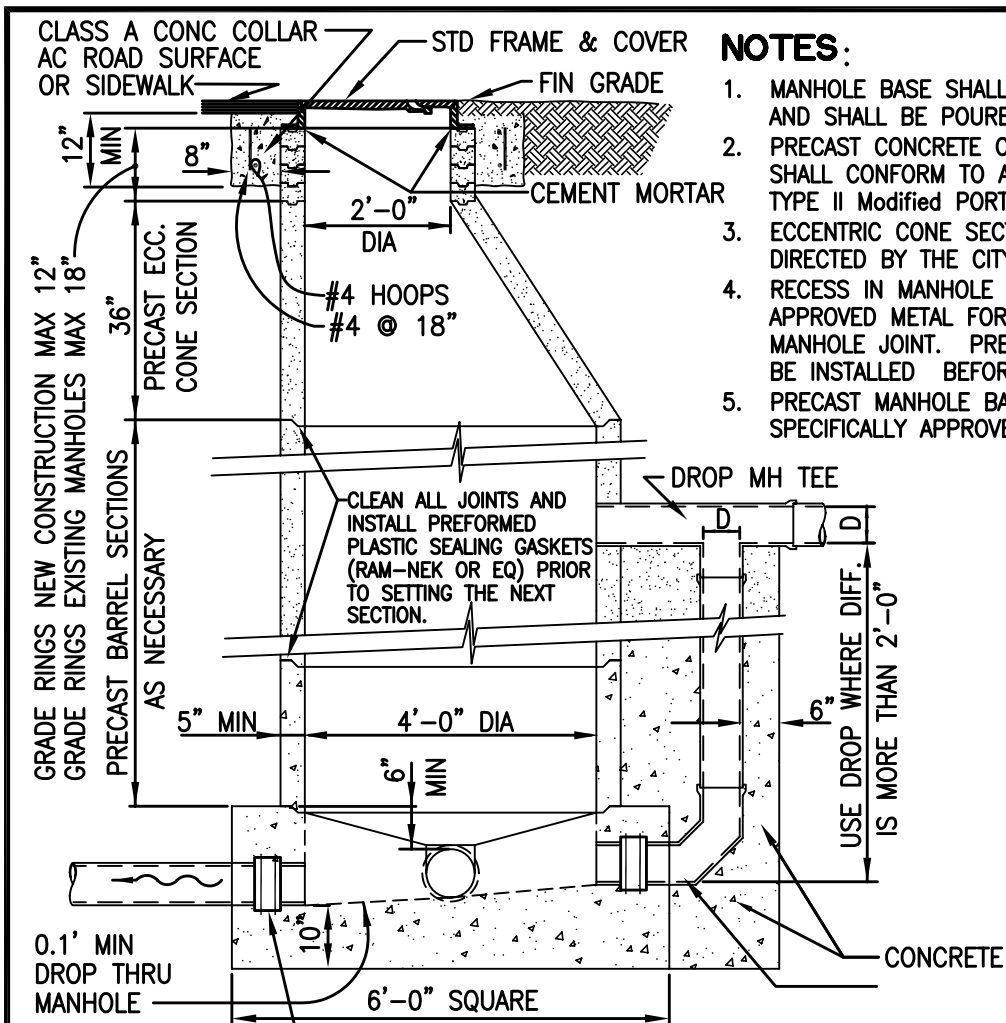
| DIA. OF PIPE OR M.H. IN INCHES | GAL PER FT. OF DEPTH IN PIPE OR M.H. | GAL PER INCH OF DEPTH IN PIPE OR M.H. |
|--------------------------------|--------------------------------------|---------------------------------------|
| 6" PIPE | 1.5 GAL./FT. | 0.125 GAL./IN. |
| 8" PIPE | 2.6 GAL./FT. | 0.217 GAL./IN. |
| 10" PIPE | 4.1 GAL./FT. | 0.342 GAL./IN. |
| 15" PIPE | 5.9 GAL./FT. | 0.492 GAL./IN. |
| 12" PIPE | 9.2 GAL./FT. | 0.766 GAL./IN. |
| 24" PIPE | 23.4 GAL./FT. | 1.950 GAL./IN. |
| 48" PIPE | 52.7 GAL./FT. | 4.390 GAL./IN. |
| 36" M.H. | 94.0 GAL./FT. | 7.830 GAL./IN. |
| 60" M.H. | 147.0 GAL./FT. | 12.250 GAL./IN. |

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

**ALLOWABLE LEAKAGE CHART
WATER TEST**

1995

SD 18

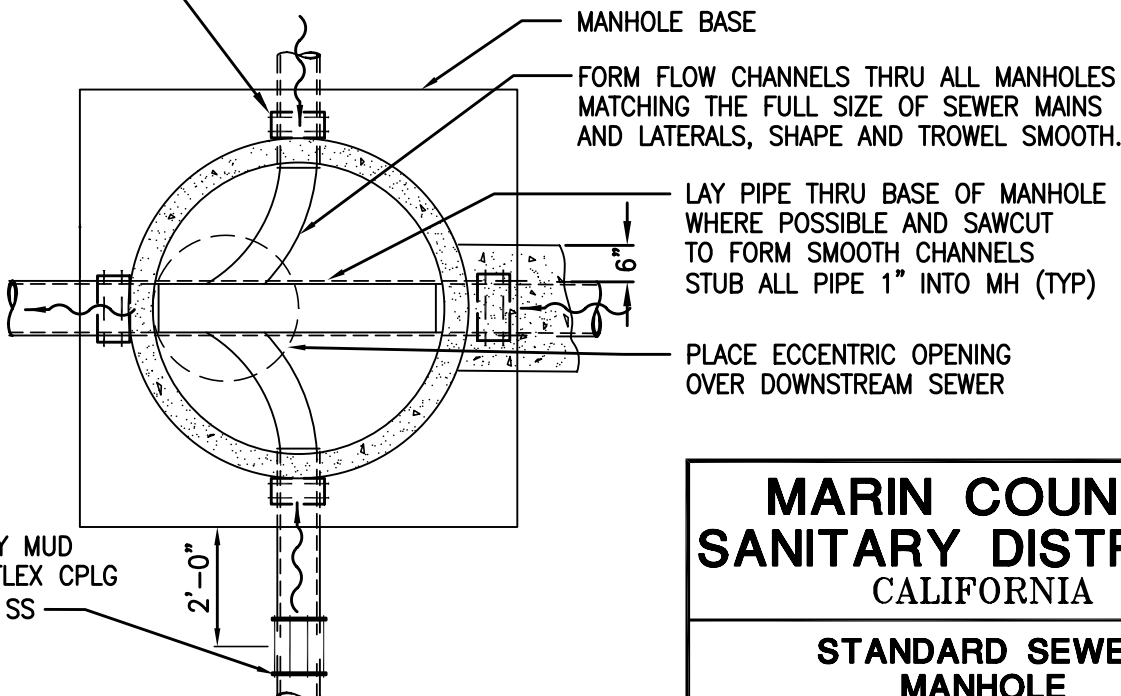


NOTES:

1. MANHOLE BASE SHALL BE CLASS A (6-sack) CONCRETE AND SHALL BE POURED AGAINST UNDISTURBED SOIL.
2. PRECAST CONCRETE CONE, BARREL AND GRADE RINGS SHALL CONFORM TO A.S.T.M. Spec C-478, EXCEPT THAT TYPE II Modified PORTLAND CEMENT SHALL BE USED.
3. ECCENTRIC CONE SECTION SHALL BE POSITIONED AS DIRECTED BY THE CITY.
4. RECESS IN MANHOLE BASE SHALL BE FORMED WITH AN APPROVED METAL FORMING RING TO RECEIVE PRECAST MANHOLE JOINT. PREFORMED PLASTIC SEAL GASKET SHALL BE INSTALLED BEFORE PLACING FIRST BARREL SECTION.
5. PRECAST MANHOLE BASES ARE NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY.

SECTION

WATERSTOP (TYP)



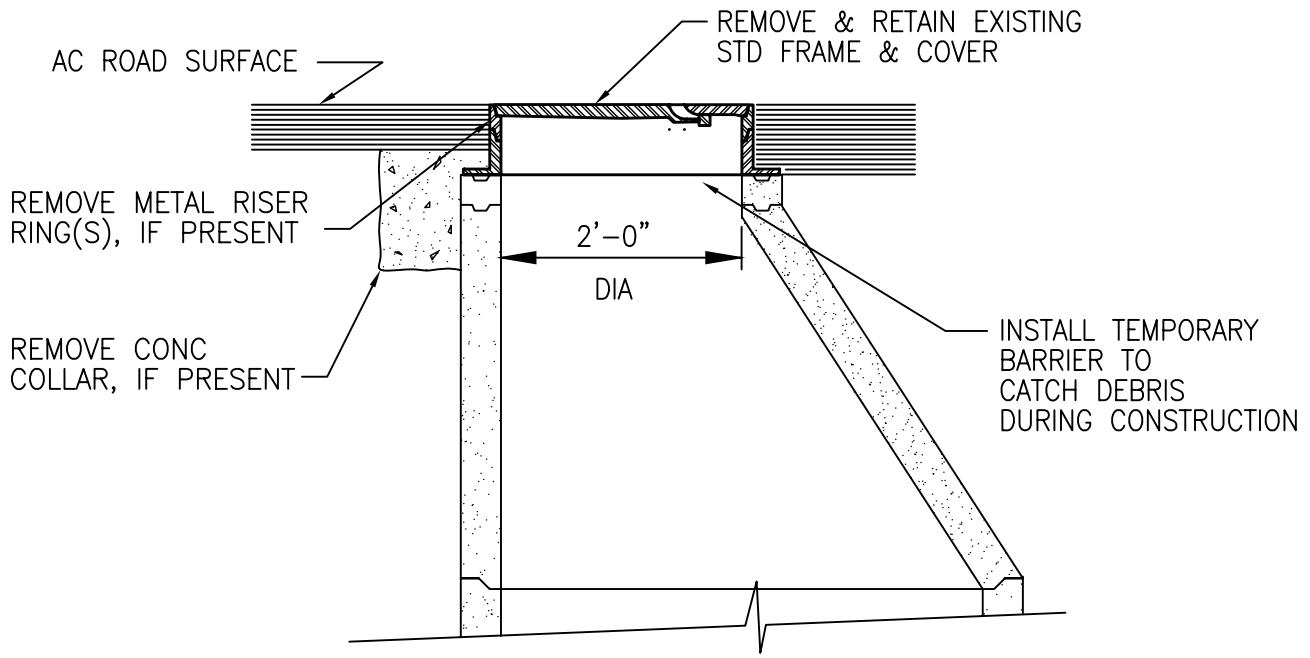
PLAN AT MH BOTTOM

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

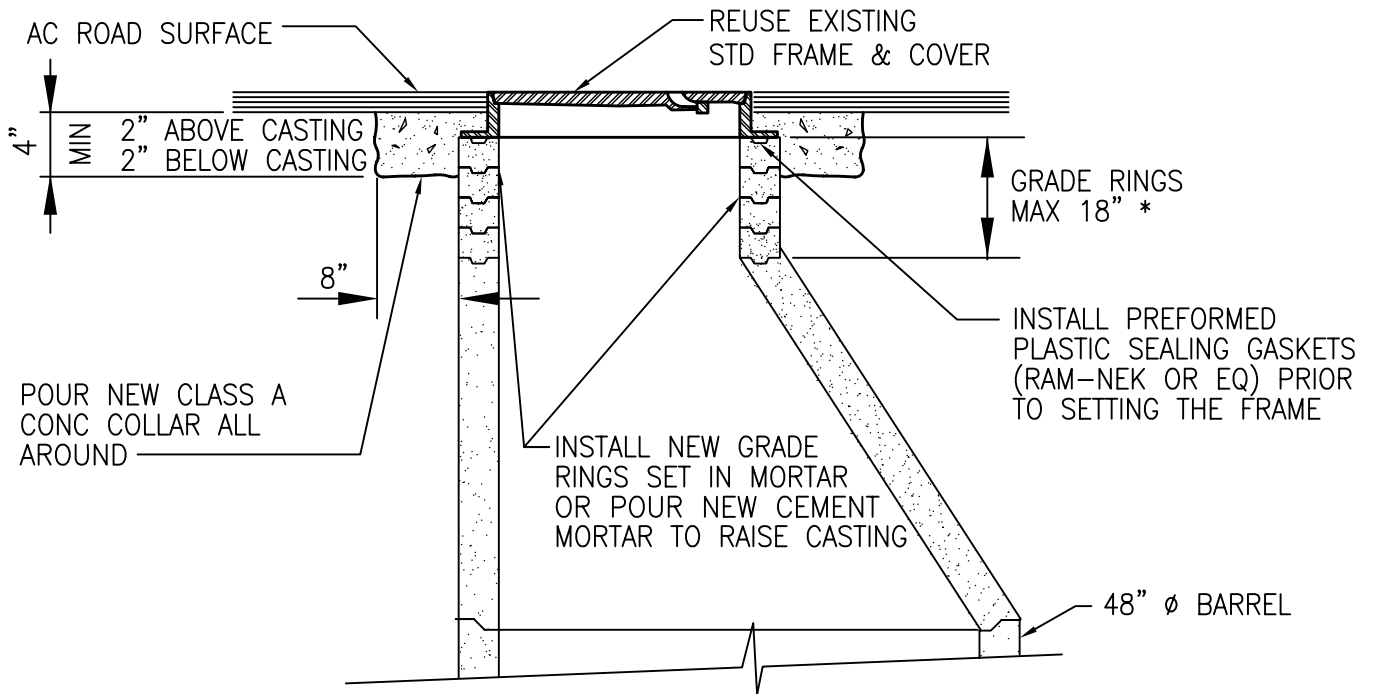
**STANDARD SEWER
MANHOLE**

1995

SD 2.0



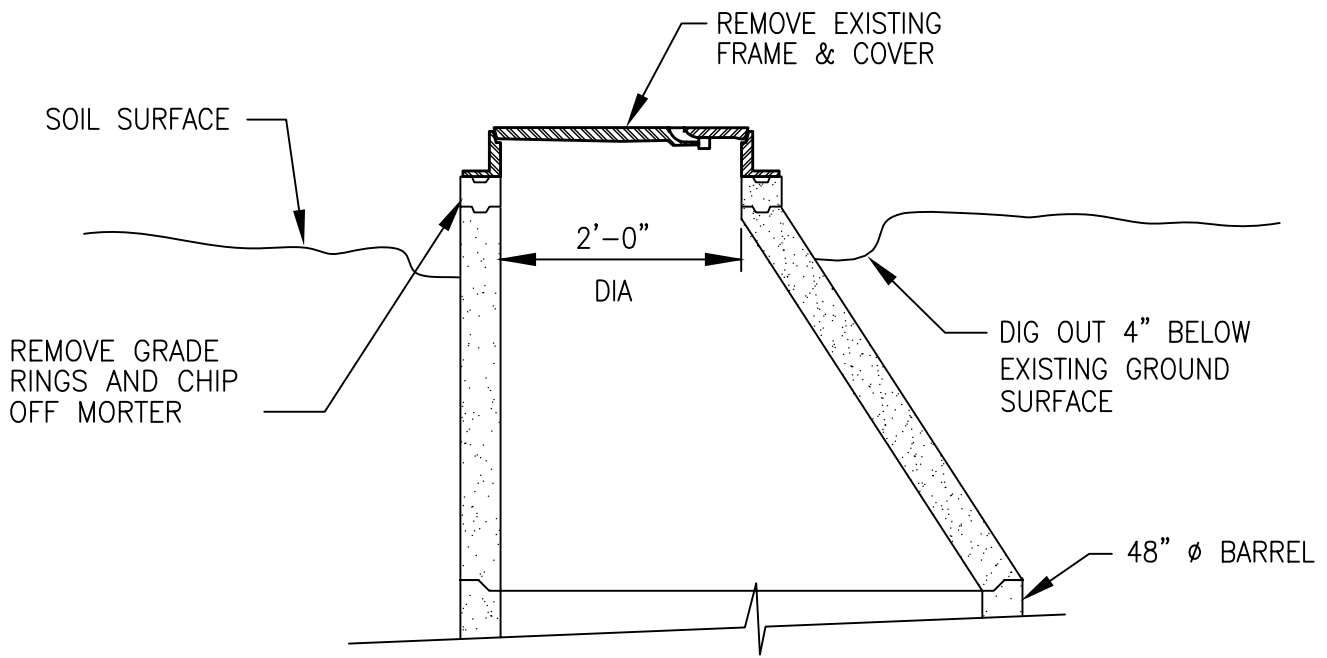
EXISTING CONDITION



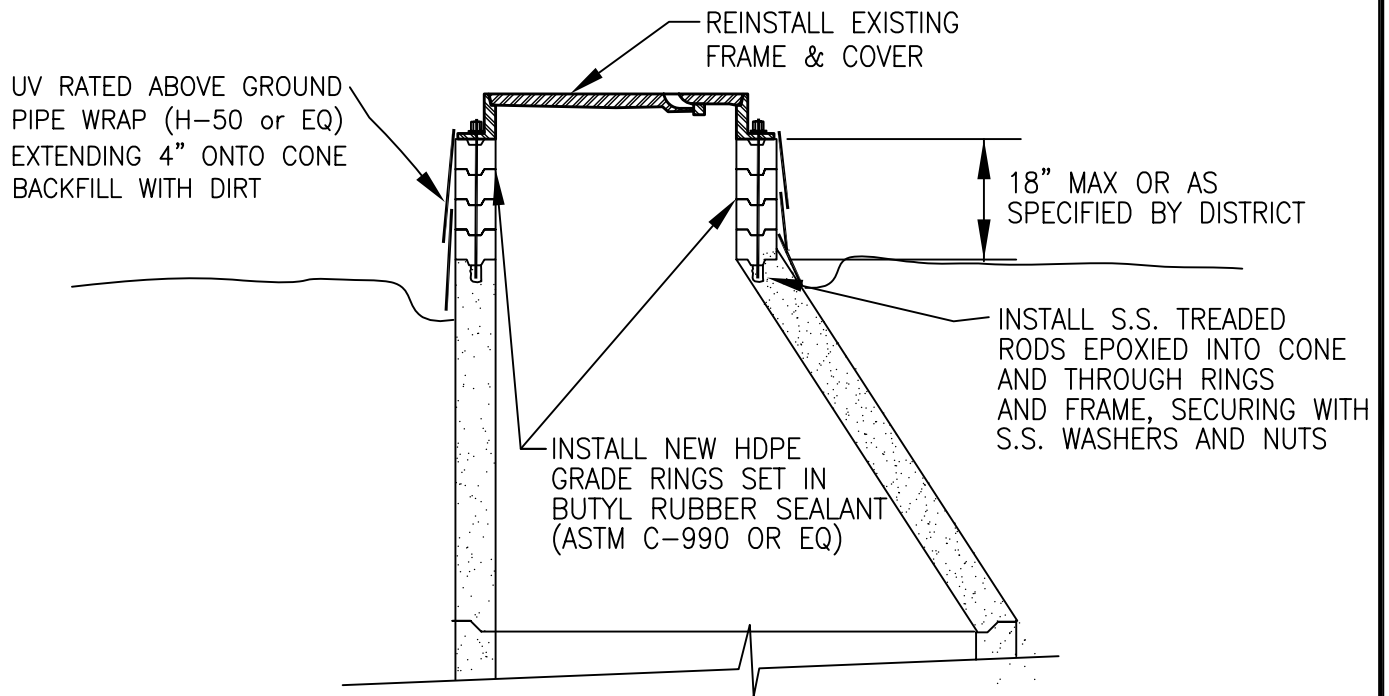
RAISED RING CONDITION

* IF GRADE RINGS EXCEED 18"
 REMOVE CONE AND INSTALL
 NEW 48" DIAMETER BARREL
 SECTION

| | | |
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| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| MANHOLE REPAIR TO RAISE FRAME & COVER | | |
| 1995 | | SD 2.1 |

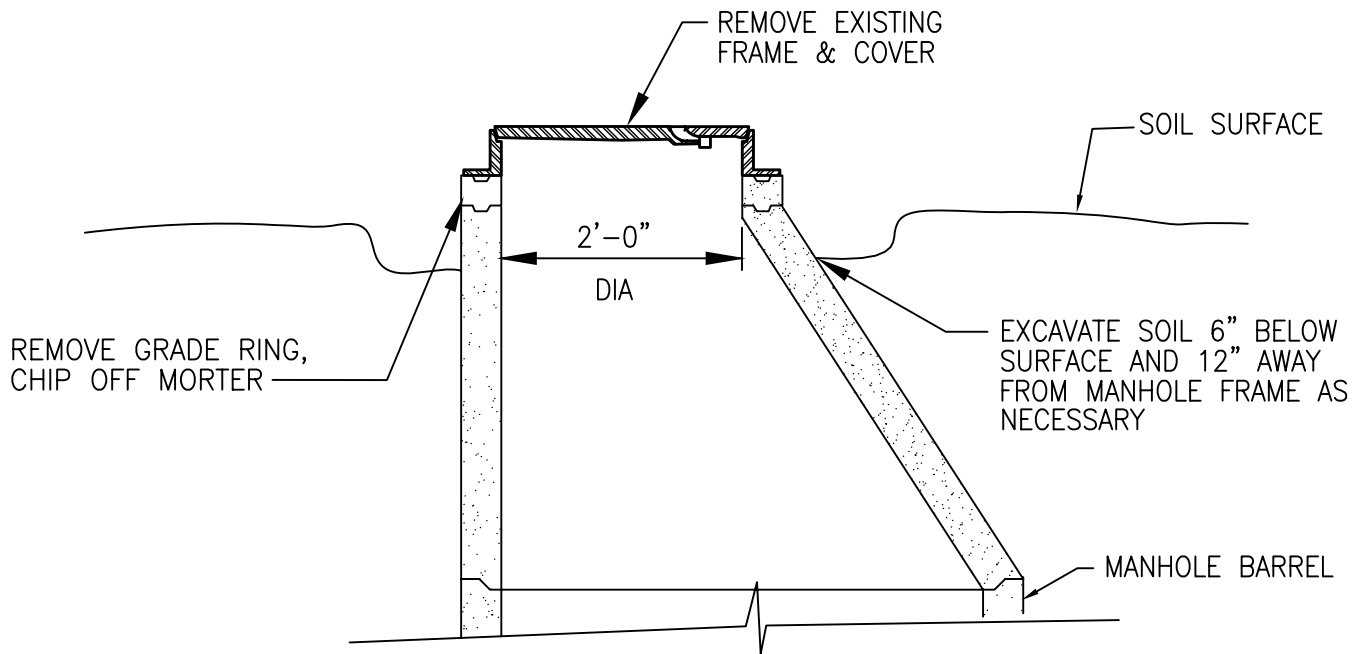


DEMOLITION

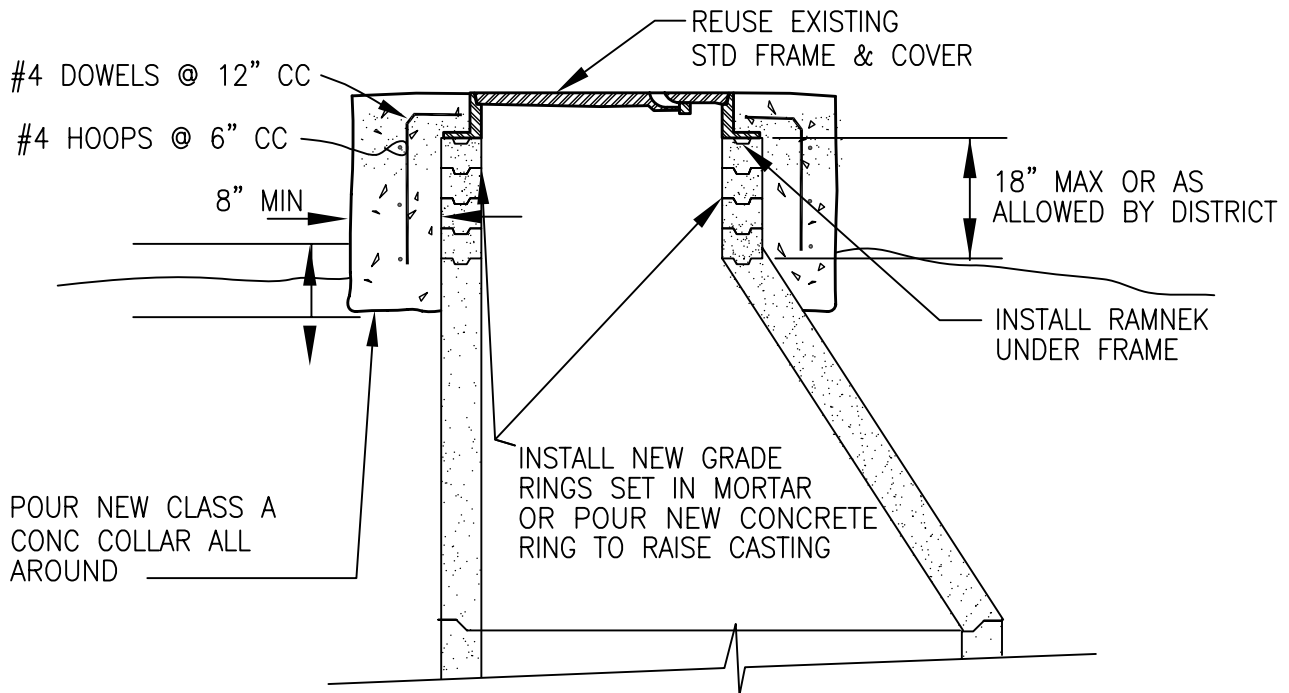


HDPE GRADE RING INSTALLATION

| | | |
|---|--|---------------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| RAISE MANHOLE COVER WITH HDPE GRADE RING | | |
| 2003 | | SD 2.2 |



DEMOLITION



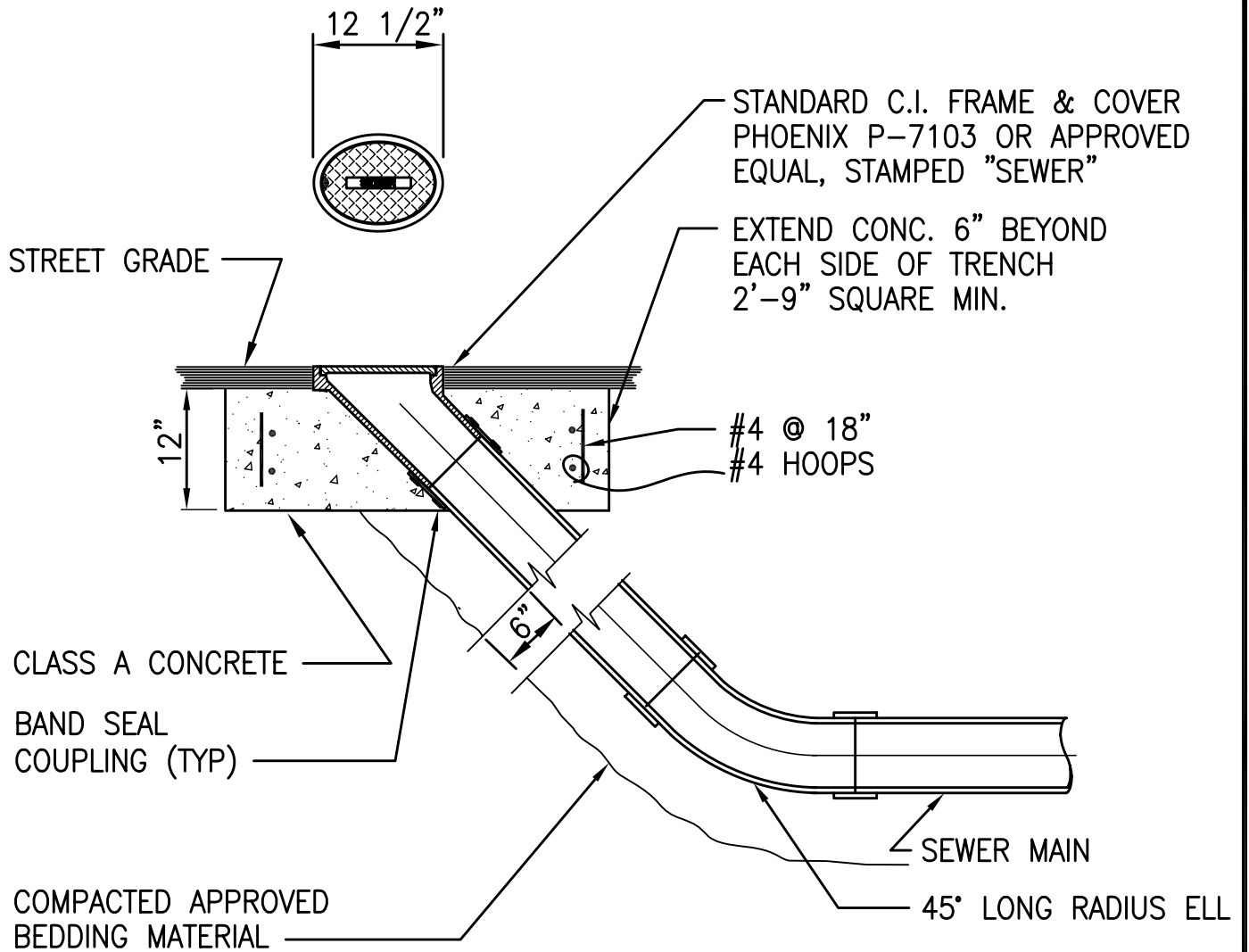
GRADE RING INSTALLATION

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

**RAISE MANHOLE COVER
WITH CONCRETE GRADE RINGS**

2003

SD 2.3



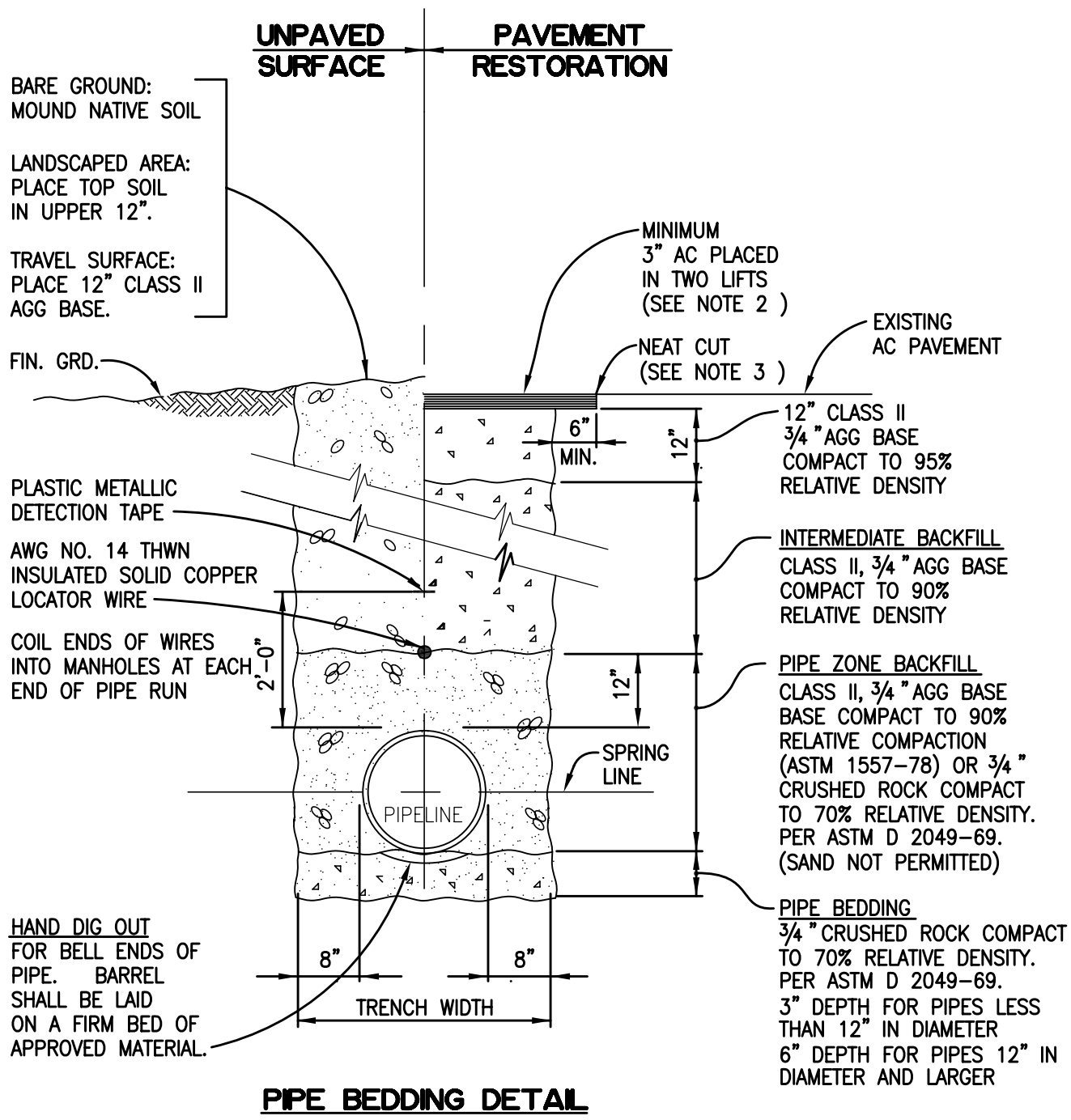
STANDARD ROD HOLE

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

**STANDARD 6 INCH
RODDING INLET**

1995

SD 3



PIPE BEDDING DETAIL

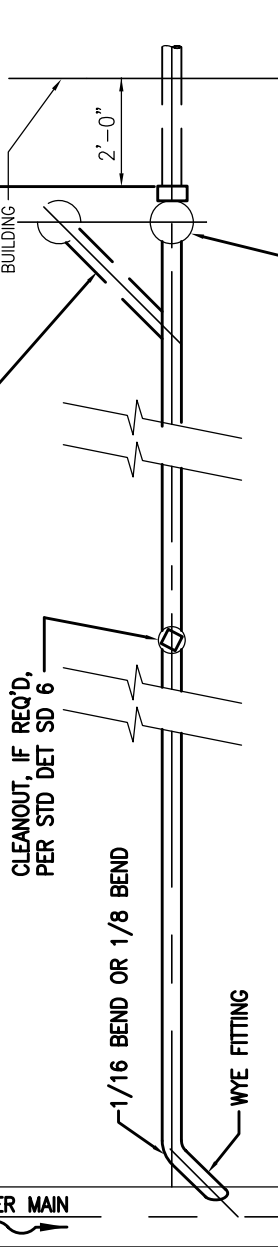
- NOTES:
1. INSTALL 4' LONG COMPACTED IMPERVIOUS CLAY OR SLURRY CEMENT PLUGS IN PIPE ZONE BACKFILL AND PIPE BEDDING AT 400' INTERVALS.
 2. ASPHALT THICKNESS SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY WITH JURISDICTION OVER STREET.
 3. CONSULT LOCAL JURISDICTION FOR ASPHALT CUTTING REQUIREMENTS.

| | |
|---|-------------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | |
| TYPICAL TRENCH SECTION | |
| 1995 | SD 4 |

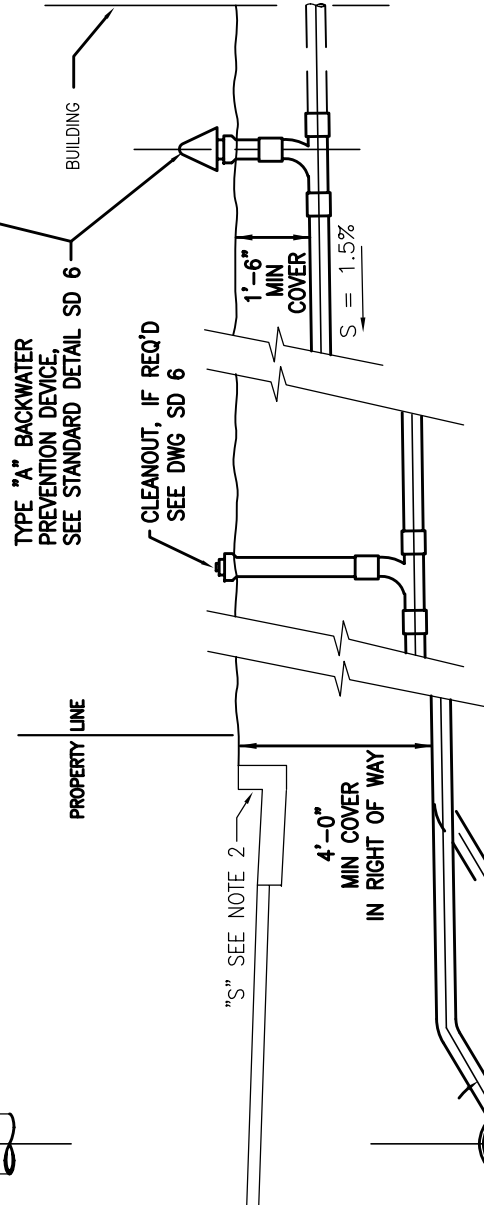
NOTE: TYPE "A" BACKWATER PREVENTION DEVICE MAY BE INSTALLED TO LEFT OR RIGHT SIDE OF LATERAL FOR CONVENIENCE

SANITARY DISTRICT REQUIREMENTS

CITY OR COUNTY REQUIREMENTS



PLAN



DRAINAGE SLOPE MAY BE 1.0% IF APPROVED IN ADVANCE BY THE SANITARY DISTRICT.

CLEANOUTS AND RISER PIPES SHALL BE 4" I.D., CI OR EQUAL, ON 4" SEWER LATERALS. 6" LATERALS SHALL HAVE 6" RISER PIPE FOR CLEANOUTS AND RISER PIPES.

ADDITIONAL CLEANOUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE UNIFORM PLUMBING CODE.

SECTION

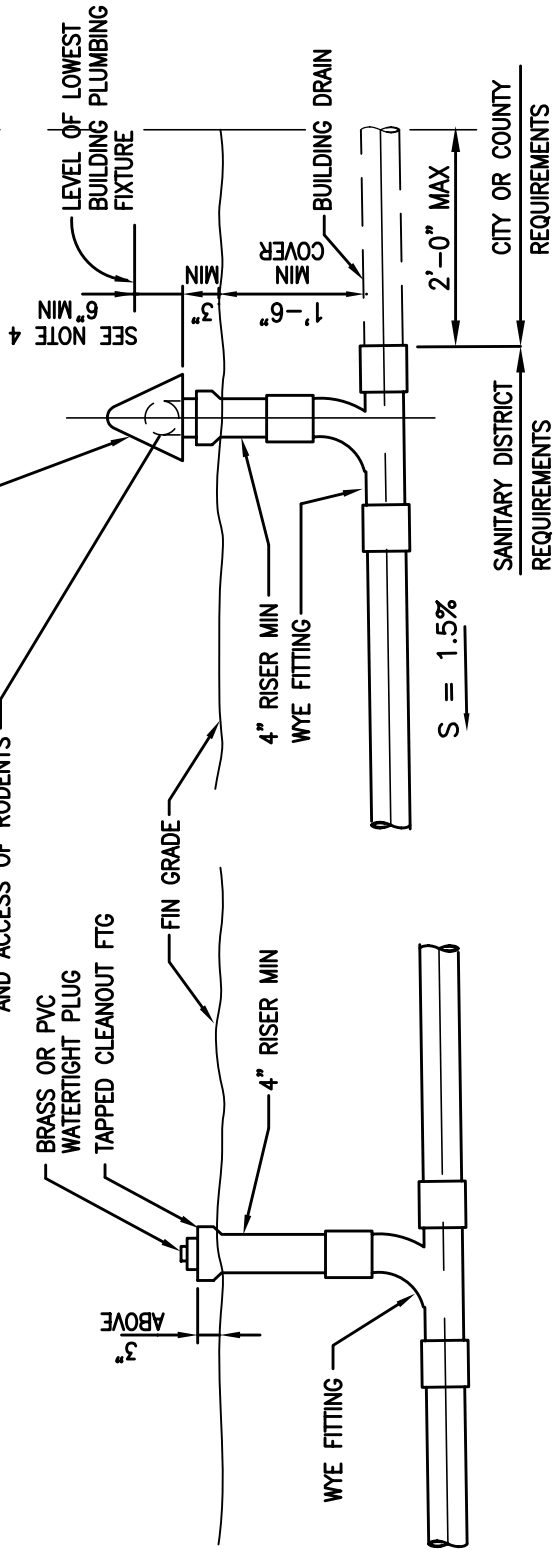
NOTES:

1. WHEN A LATERAL SEWER IS INSTALLED IN ADVANCE OF THE BUILDING SEWER, IT SHALL BE TERMINATED AT OR NEAR THE PROPERTY LINE. THE END OF THE LATERAL SHALL BE MARKED WITH A 4" x 4" REDWOOD STAKE.
2. WHERE CONCRETE CURBS AND GUTTERS EXIST OR ARE TO BE A PART OF AN IMPROVEMENT, EACH SIDE SEWER SHALL BE PERMANENTLY LOCATED BY IMPRINTING OR CHISELING AN "S" (3" size) IN THE FACE OF THE CURB VERTICALLY ABOVE THE SEWER PIPE.
3. BACKFILL SHALL NOT BE PLACED UNTIL PIPE INSTALLATION HAS BEEN INSPECTED AND APPROVED BY THE DISTRICT.
4. LATERAL TRENCHES SHALL BE THE SAME AS TYPICAL TRENCH DETAIL SD4.
5. THE SIZE OF THE SEWER LATERAL OR MAIN MUST BE EQUAL TO OR LARGER THAN THE SIZE OF THE BUILDING DRAIN.

| | | |
|---|--|-------------|
| MARIN COUNTY SANITARY DISTRICTS CALIFORNIA | | |
| TYPICAL SIDE SEWER DETAILS | | |
| 1995 | | SD 5 |

CLEANOUTS LOCATED UNDER PAVED DRIVEWAYS, WALKWAYS, ETC. SHALL BE RAISED TO GRADE AND INSTALLED IN PRECAST CONC METER BOXES AND FLUSH FITTED TO PAVING W/ GALVANIZED STEEL CHECKERED PLATE TRAFFIC LIDS MARKED "SEWER", CHRISTY B9 W/ 61D15 LID, OR EQUAL, AS DIRECTED BY THE DISTRICT.

TYPE A BACKWATER PREVENTION DEVICE SHALL BE AS MANUFACTURED BY REAM MACHINE SHOP, LAFAYETTE, CA, OR APPROVED EQUAL
BALL TO ELIMINATE EMISSION OF ODORS AND ACCESS OF RODENTS



STANDARD CLEANOUT

TYPE A BACKWATER PREVENTION DEVICE

NOTES:

1. A STANDARD 4" C.I. CLEANOUT IS THE MINIMUM DISTRICT REQUIREMENT.
2. A BACKWATER PREVENTION DEVICE IS REQUIRED AND SHALL BE INSTALLED ON ALL SIDE SEWERS.
3. A TYPE "A" BACKWATER PREVENTION DEVICE SHALL BE INSTALLED IN A LOCATION WHERE SEWAGE CAN OVERFLOW ON THE SURROUNDING AREA WITHOUT DAMAGE TO PROPERTY.
4. IF THE DIFFERENCE IN ELEVATION OF THE LOWEST FIXTURE AND THE TYPE "A" BACKWATER PREVENTION DEVICE IS LESS THAN SIX (6) INCHES, A BACKWATER CHECK VALVE SHALL BE INSTALLED AS SHOWN IN STANDARD DETAIL SD 7.

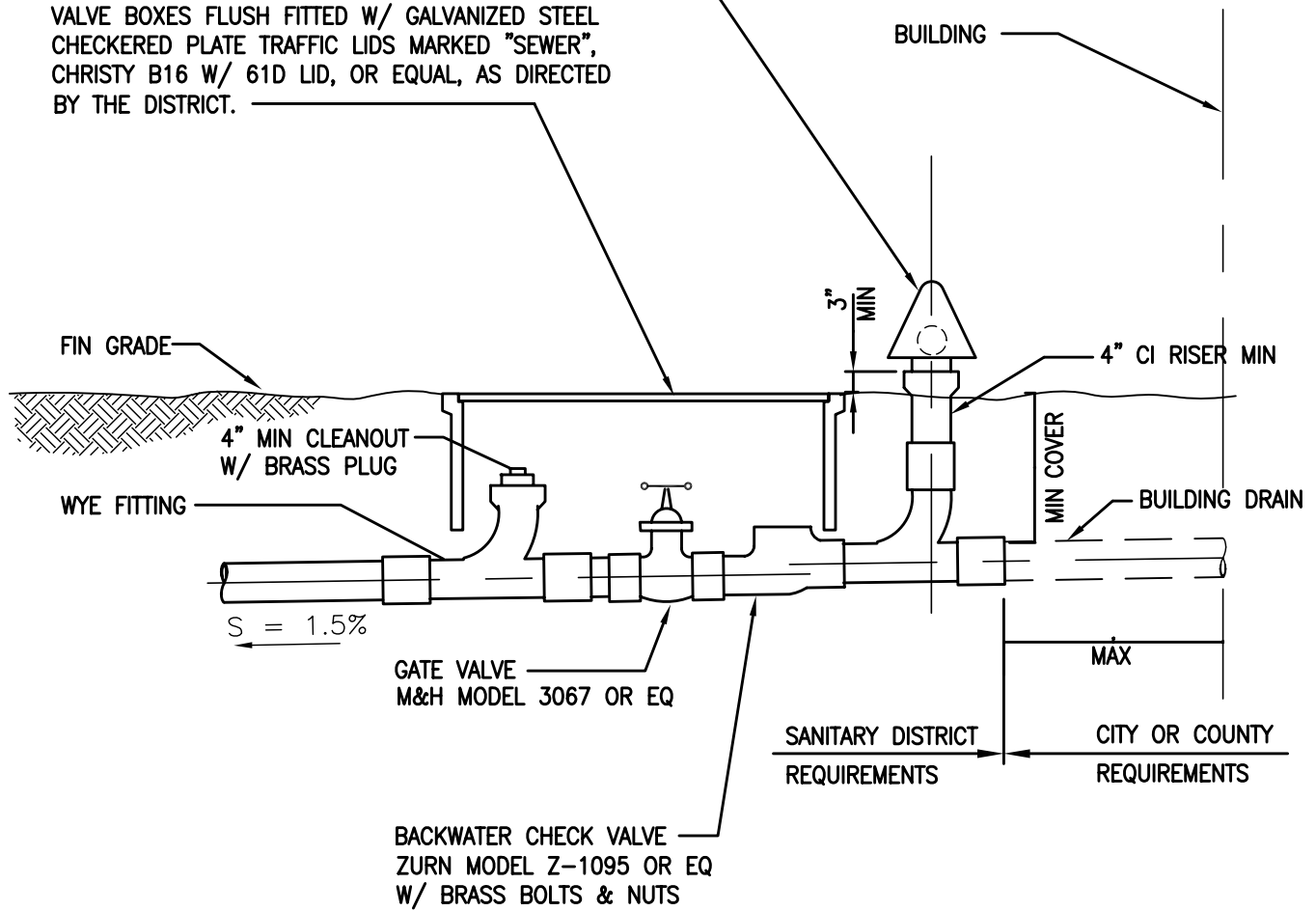
**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

**STANDARD CLEANOUT AND
BACKWATER PREVENTION DEVICE**

| | | |
|------|--|-------------|
| 1995 | | SD 6 |
|------|--|-------------|

TYPE "A" BACKWATER PREVENTION DEVICE,
SEE STANDARD DETAIL SD 6

VALVES SHALL BE INSTALLED IN PRECAST CONCRETE
VALVE BOXES FLUSH FITTED W/ GALVANIZED STEEL
CHECKERED PLATE TRAFFIC LIDS MARKED "SEWER",
CHRISTY B16 W/ 61D LID, OR EQUAL, AS DIRECTED
BY THE DISTRICT.



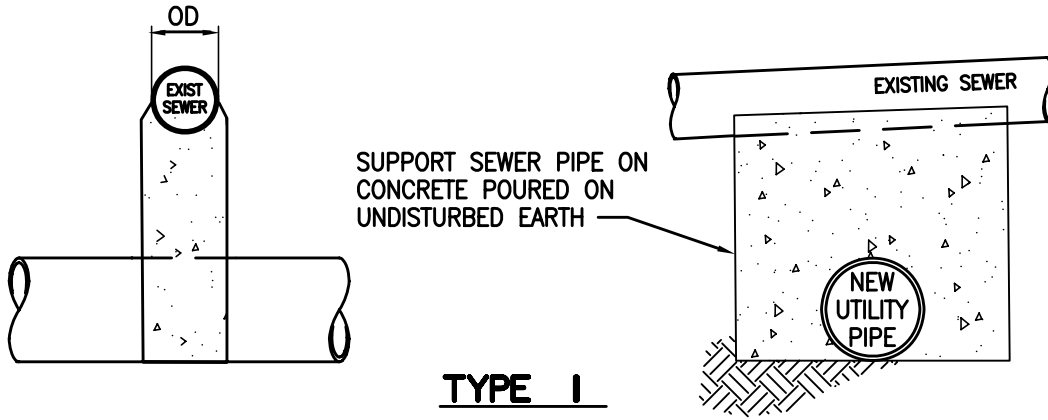
IF THE DIFFERENCE IN ELEVATION OF THE LOWEST FIXTURE AND THE TYPE "A" BACKWATER
PREVENTION DEVICE IS LESS THAN SIX (6) INCHES, A BACKWATER CHECK VALVE SHALL BE INSTALLED.

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

**BACKWATER CHECK VALVE
AND SHUTOFF SYSTEM**

1995

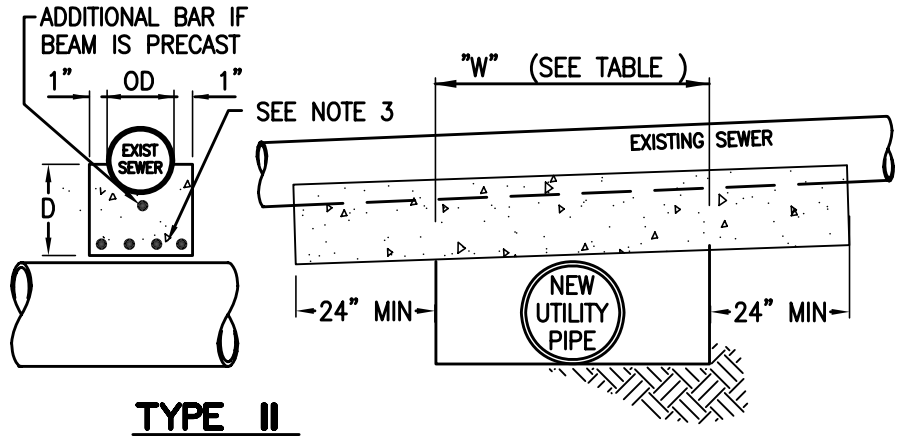
SD 7



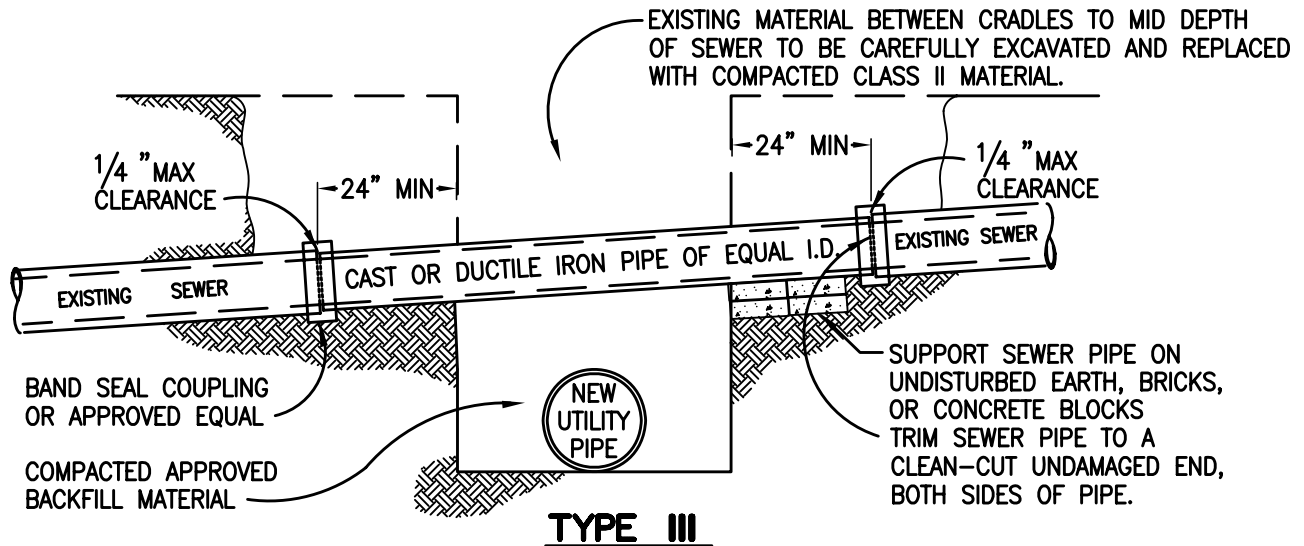
TYPE I

DIMENSIONS OF REINFORCED CONCRETE BEAM

| W | DEPTH OF COVER TO SEWER | | | |
|-----|-------------------------|---------|----------------|---------|
| | 0' - 8'-0" | | 8'-0" - 16'-0" | |
| | D | BAR No. | D | BAR No. |
| 4' | 8" | 4 | 8" | 4 |
| 5' | 8" | 4 | 9" | 5 |
| 6' | 8 1/2" | 5 | 10 1/2" | 5 |
| 7' | 9" | 5 | 11 1/2" | 6 |
| 8' | 10" | 5 | 12 1/2" | 6 |
| 9' | 11" | 6 | 13 1/2" | 6 |
| 10' | 12" | 6 | 15" | 7 |



TYPE II



TYPE III

NOTES:

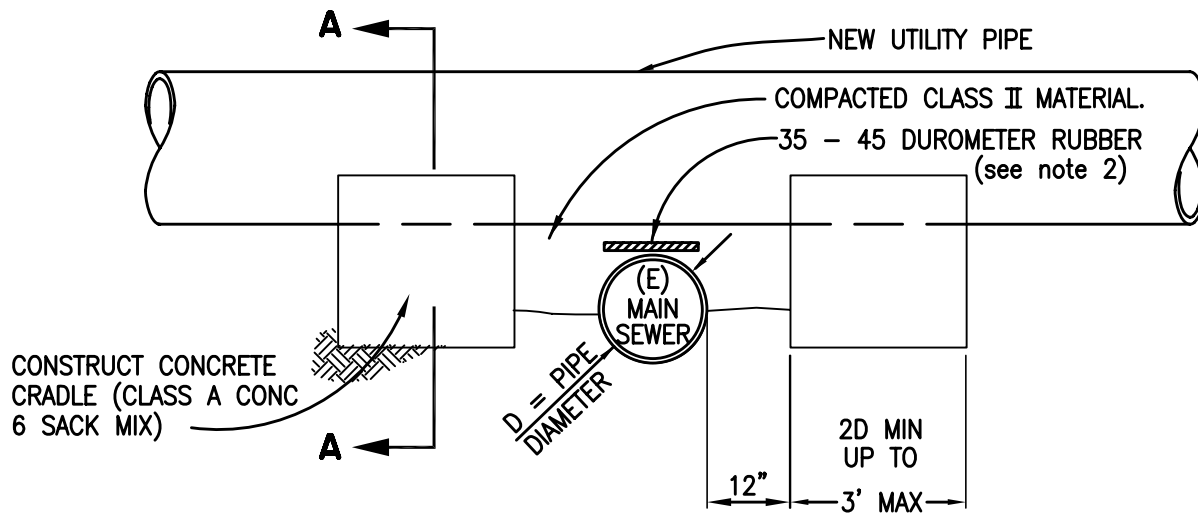
- SEWER PROTECTION, AS DETAILED HEREON, SHALL BE PROVIDED WHEN A NEW UTILITY PIPE, IS INSTALLED BELOW AN EXISTING MAIN SEWER. TYPE I, TYPE II OR TYPE III MAY BE USED AT THE CONTRACTOR'S OPTION, UNLESS OTHERWISE SHOWN ON THE PLANS OR DIRECTED BY THE DISTRICT.
- WHEN THE CLEARANCE BETWEEN THE PIPES IS 1" OR LESS INSTALL A 4" x 4" PAD OF 35-45 DUROMETER RUBBER SNUGLY FIT BETWEEN THE PIPES.
- MAXIMUM SPACING OF REINFORCING STEEL TO BE 4" CENTER TO CENTER.
- CONCRETE TO BE CLASS A (6 sack mix)
- BACKFILL SHALL NOT BE PLACED UNTIL PIPE INSTALLATION HAS BEEN INSPECTED AND APPROVED BY THE DISTRICT.

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

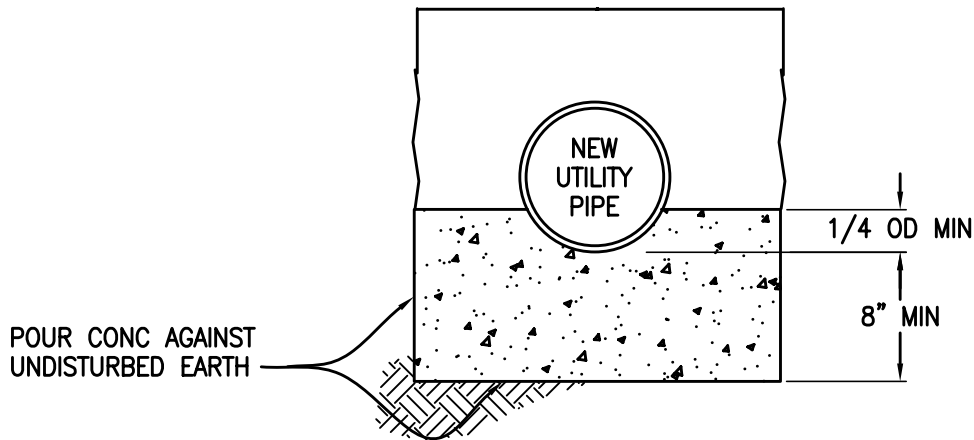
**MAIN SEWER PROTECTION
ABOVE UTILITY CROSSING**

1995

SD 8



MAIN SEWER



SECTION A-A

NOTES:

1. SEWER PROTECTION, AS DETAILED HEREON, SHALL BE PROVIDED WHEN A NEW UTILITY PIPE IS INSTALLED ABOVE AN EXISTING MAIN SEWER AND THE CLEARANCE IS LESS THAN 12".
2. WHEN THE CLEARANCE BETWEEN THE PIPES IS 1" OR LESS INSTALL A 4" x 4" PAD OF 35-45 DUROMETER RUBBER SNUGLY FIT BETWEEN THE PIPES.
3. EXISTING MATERIAL BETWEEN CRADLES TO MID DEPTH OF SEWER TO BE CAREFULLY EXCAVATED AND REPLACED WITH COMPACTED CLASS 2 AGGREGATE BASE.
4. BACKFILL SHALL NOT BE PLACED UNTIL PIPE INSTALLATION HAS BEEN INSPECTED AND APPROVED BY THE DISTRICT.

**MARIN COUNTY
SANITARY DISTRICTS
CALIFORNIA**

**MAIN SEWER PROTECTION
BELOW UTILITY CROSSING**

1995

SD 9