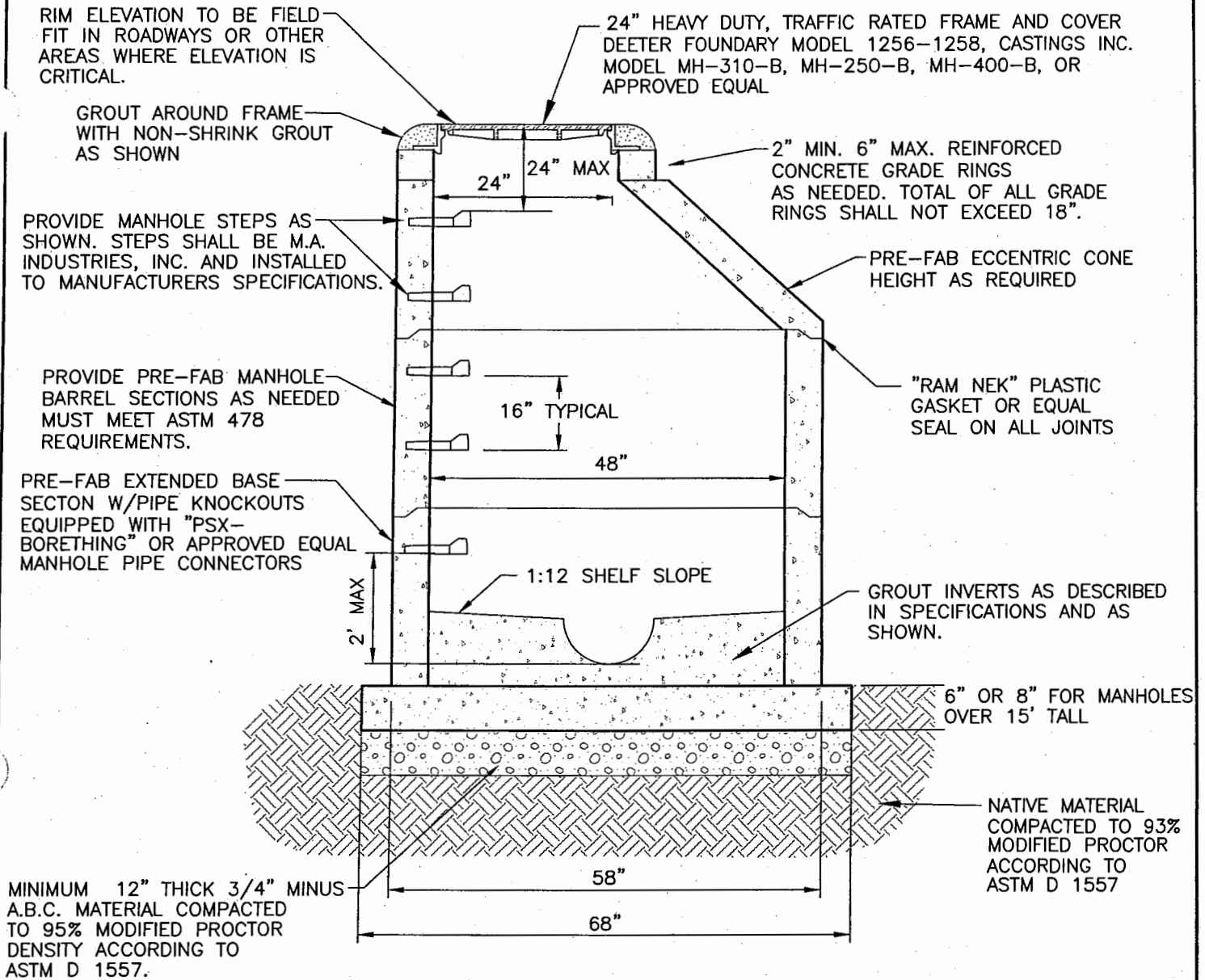


**APPENDIX C  
STANDARD DETAILS****WASTEWATER SYSTEM**

1. Standard Sewer Manhole Detail
2. Drop Sewer Manhole Detail
3. Drop Sewer Connection Detail
4. Flat Top Manhole Detail
5. Cast in Place Manhole Base Detail
6. New Pipe Penetration Detail
7. Manhole Collar Detail
8. Typical Trench and Bedding Detail
9. Sewer Crossing and Encasement Detail
10. Pipe Casing Detail
11. Sewer Service Detail
12. Gravity Clean-Out Detail
13. Pressure Clean-Out Detail
14. Valve Box Detail
15. Valve Box Collar Detail
16. Thrust Block Detail - I
17. Thrust Block Detail - II
18. Grease Interceptor Detail
19. Sand and Oil Interceptor Detail
20. Lift Station Detail
21. Typical Access & Maintenance Road Detail



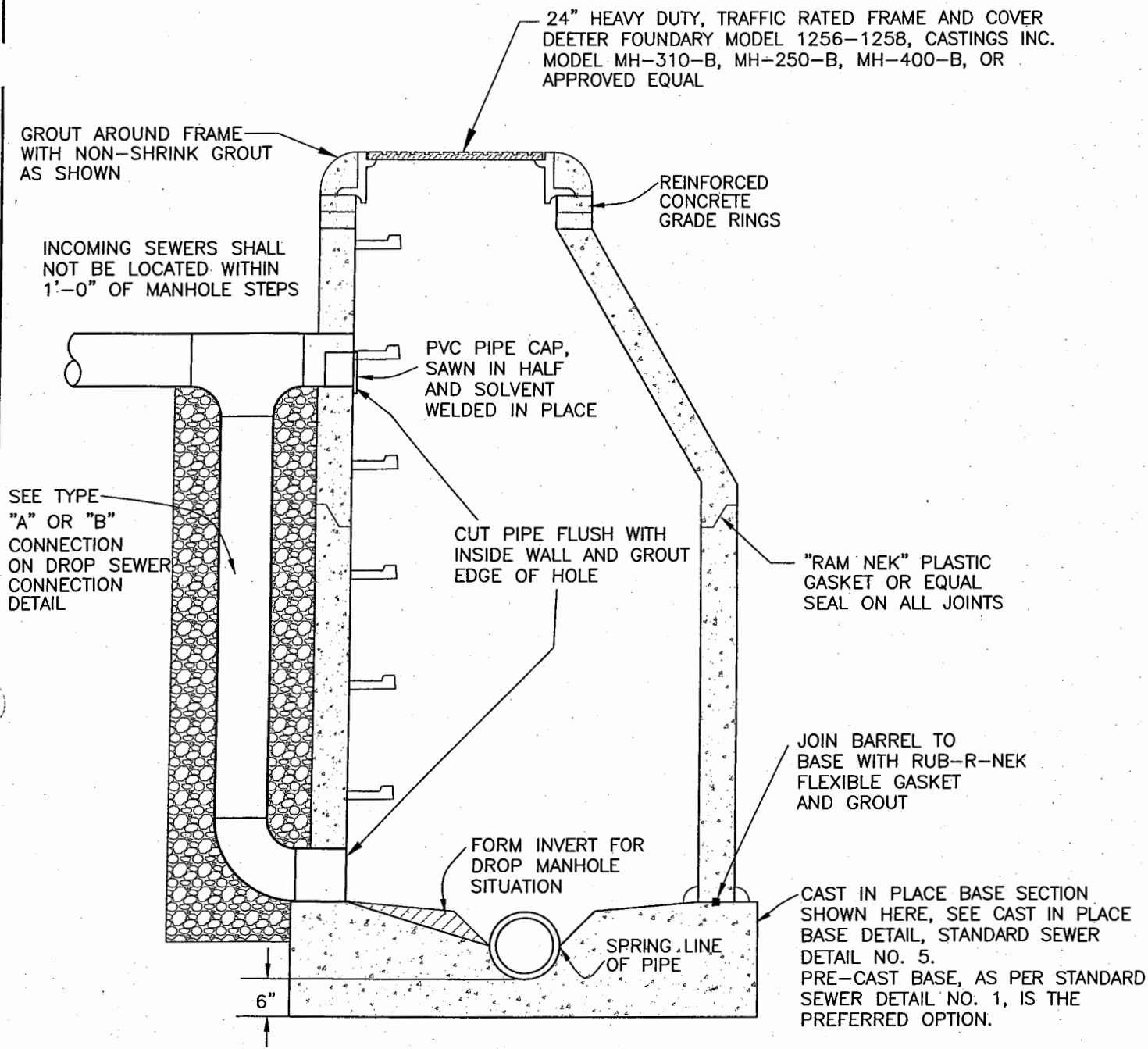
**NOTES:**

1. 4' MANHOLES SHALL BE USED FOR PIPES UP TO 21" DIAMETER.
2. 5' MANHOLES SHALL BE USED FOR PIPES FROM 24"-36" DIAMETER.
3. SPECIAL MANHOLES SHALL BE USED FOR PIPES LARGER THAN 36" DIAMETER.
4. MANHOLES LESS THAN OR EQUAL TO 5' FROM TOP OF CASTING TO INVERT SHALL HAVE FLAT TOPS WITH CONCENTRIC OPENING. ALL ADJUSTING RINGS, CASTINGS, INVERTS, BOTTOMS, ETC., SHALL BE SIMILAR TO SHOWN MANHOLE.
5. IF MANHOLE BASE SECTION IS TO BE PLACED ON NON-SUITABLE SOILS AS DESCRIBED IN THE SPECIFICATIONS, OR IN HIGH GROUNDWATER CONDITIONS, OR AT THE DISCRETION OF THE ENGINEER, OVER EXCAVATION MAY BE REQUIRED AS DESCRIBED IN THE SPECIFICATIONS

**SOUTH DURANGO  
SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 1  
SEWER MANHOLE DETAIL**

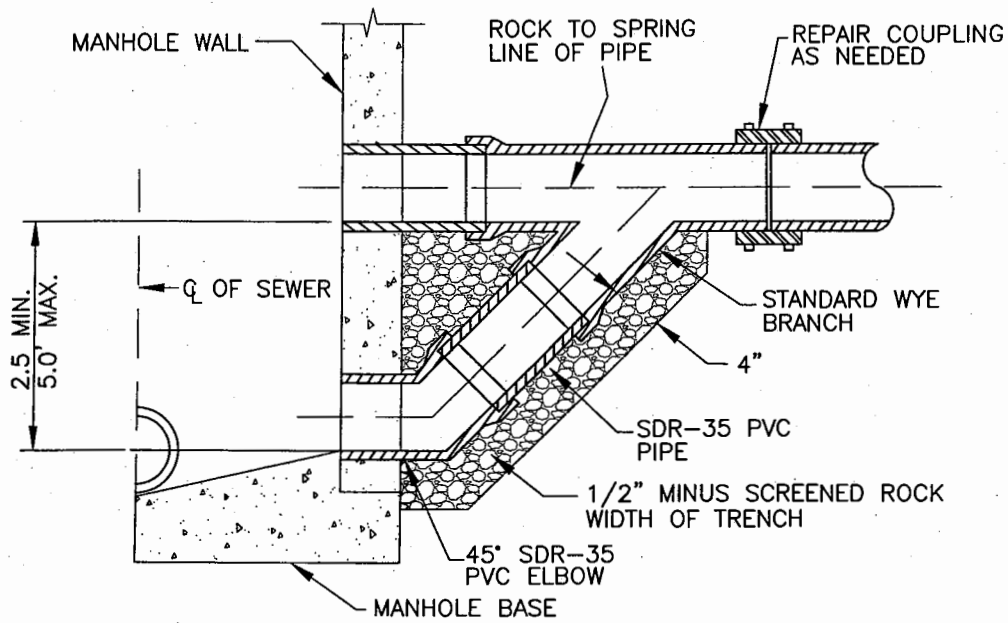
DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER01.DWG



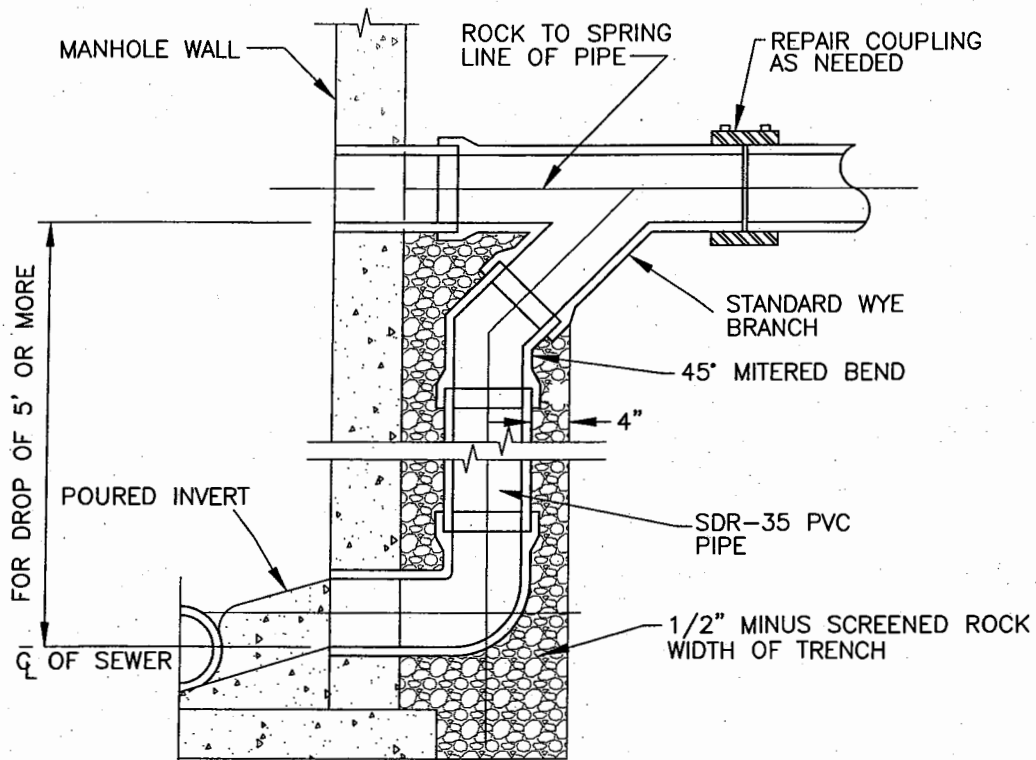
**NOTES:**

1. DROP MANHOLE SHALL BE PROVIDED WHERE SEWER ENTERS M.H. 18" OR MORE ABOVE LOWEST INVERT OF MANHOLE.
2. SEE NOTES ON STANDARD SEWER MANHOLE DETAIL.

<b><i>SOUTH DURANGO SANITATION DISTRICT</i></b>	
<b>STANDARD SEWER DETAIL NO. 2 DROP SEWER MANHOLE DETAIL</b>	
DATE: 6/17/04	SCALE: N.T.S.
CAD FILE NAME: SEWER02.DWG	



**TYPE 'A'**  
2.5' - 5' DROP

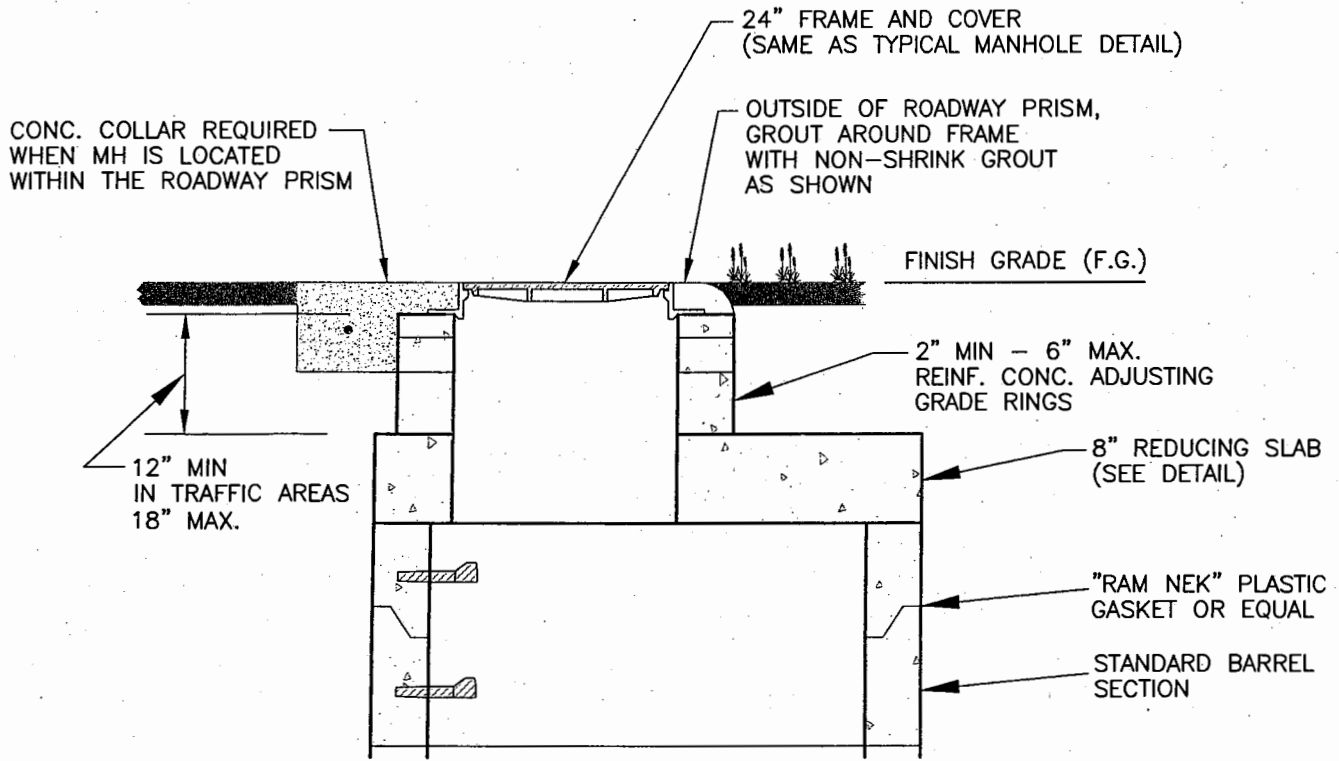


**TYPE 'B'**  
DROP 5' OR MORE

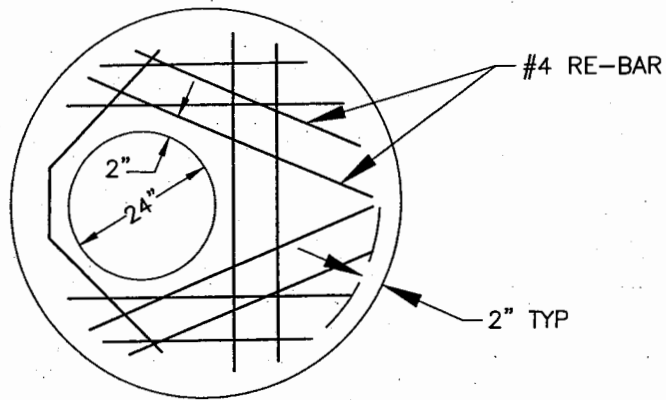
**SOUTH DURANGO  
SANITATION DISTRICT**

STANDARD SEWER DETAIL NO. 3  
DROP SEWER CONNECTION DETAIL

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER03.DWG



FLAT TOP MANHOLE DETAIL



8" THICK CONC. SLAB W/REINF.  
PLACED 2" CLEAR OF BOTTOM FACE

MANHOLE REDUCING SLAB DETAIL

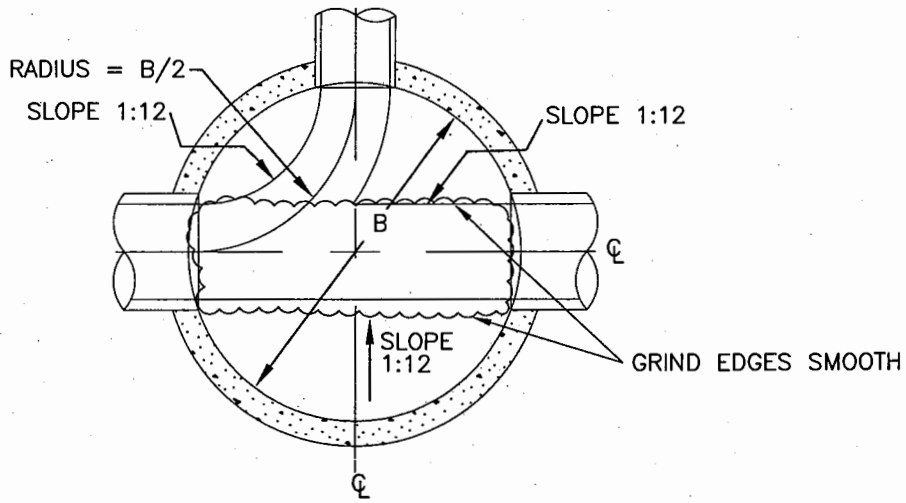
**NOTES:**

1. 4' MANHOLES SHALL BE USED FOR PIPES UP TO 21" DIAMETER.
2. 5' MANHOLES SHALL BE USED FOR PIPES FROM 24"-36" DIAMETER.
3. SPECIAL MANHOLES SHALL BE USED FOR PIPES LARGER THAN 36" DIAMETER.
4. MANHOLES LESS THAN OR EQUAL TO 5' FROM TOP OF CASTING TO INVERT SHALL HAVE FLAT TOPS WITH CONCENTRIC OPENING.

**SOUTH DURANGO  
SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 4  
FLAT TOP MANHOLE DETAIL**

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER04.DWG



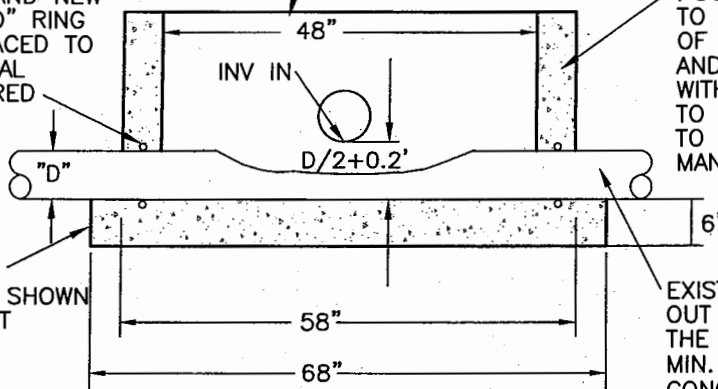
PLAN

POUR INSIDE OF BASE TO PROVIDE A SMOOTHLY CHanneled FLOW LINE TRANSITION FROM THE NEW TO THE EXISTING PIPE ALSO PROVIDE A BENCH POURED AT 2" ABOVE THE TOP OF THE EXISTING PIPE ON BOTH SIDES THAT SLOPES FROM THE WALL BACK TO THE MAIN OPENING AT APPROX. 12:1 SLOPE CONTRACTOR SHALL CONTACT ENGINEER TO EVALUATE CONDITIONS PRIOR TO PLACING CONCRETE

SEAL AROUND EXISTING AND NEW PIPES WITH STANDARD "O" RING STYLE PIPE GASKETS PLACED TO FORM A WATER TIGHT SEAL ONCE THE BASE IS POURED AS SHOWN

POUR THE BASE SECTION TO AT LEAST 6" ABOVE THE TOP OF THE NEW PIPE AS SHOWN AND FORM A FLAT ROUND SURFACE WITH A STEEL GRADE FORM TO PROVIDE A LEVEL FLAT SURFACE TO MATE TO A PRE-FABRICATED MANHOLE BARREL SECTION ABOVE

CONTRACTOR SHALL POUR ENTIRE BASE SECTION AS SHOWN THERE SHALL BE AT LEAST 6" OF CONCRETE BELOW THE EXISTING PIPE



EXISTING SEWER MAIN, CUT OUT CROWN TO AT LEAST  $1/2$  THE PIPE DIAMETER AND PROVIDE A MIN. 6" WIDE 3' LONG OPENING, THE CONCRETE SHALL BE POURED FIRST THEN CUT OUT AND GRIND THE EDGES OF THE OPENING SMOOTH

SECTION

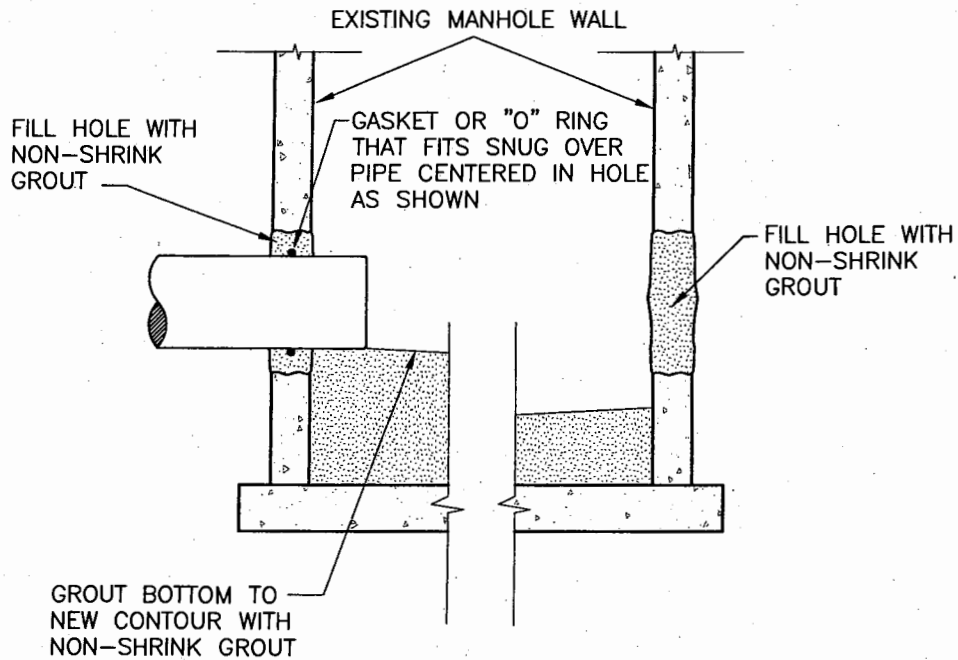
NOTE:

PRE-CAST BASE SECTIONS ARE RECOMMENDED FOR ALL NEW CONSTRUCTION. CAST IN PLACE BASE SECTIONS WILL BE ALLOWED AT CONNECTIONS WITH EXISTING MAINS AND IN SPECIAL CONDITIONS WITH THE ENGINEER'S APPROVAL.

**SOUTH DURANGO  
SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 5  
CAST IN PLACE MANHOLE BASE DETAIL**

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER05.DWG

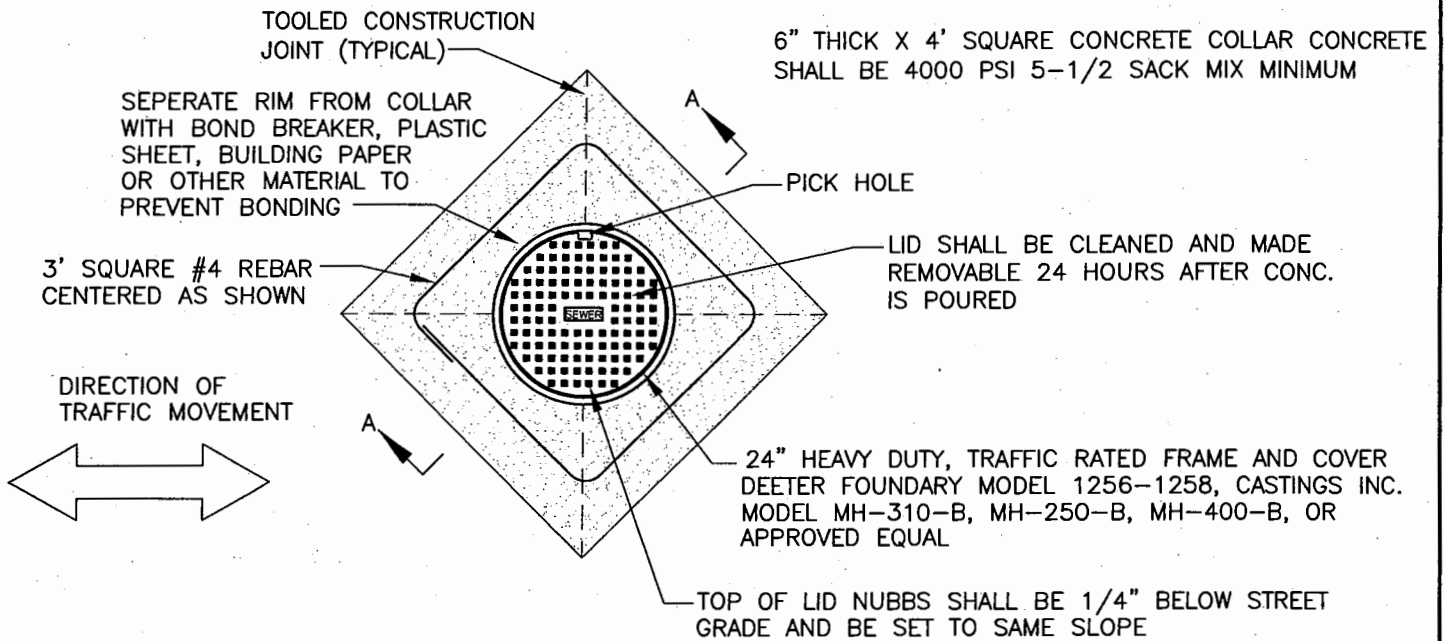


NOTE: CUT NEW HOLE IN THE EXISTING MANHOLE WALL FOR NEW PIPE PENETRATION AS NECESSARY. CLEAN ALL CONCRETE SURFACES BEFORE APPLYING GROUT

**SOUTH DURANGO  
SANITATION DISTRICT**

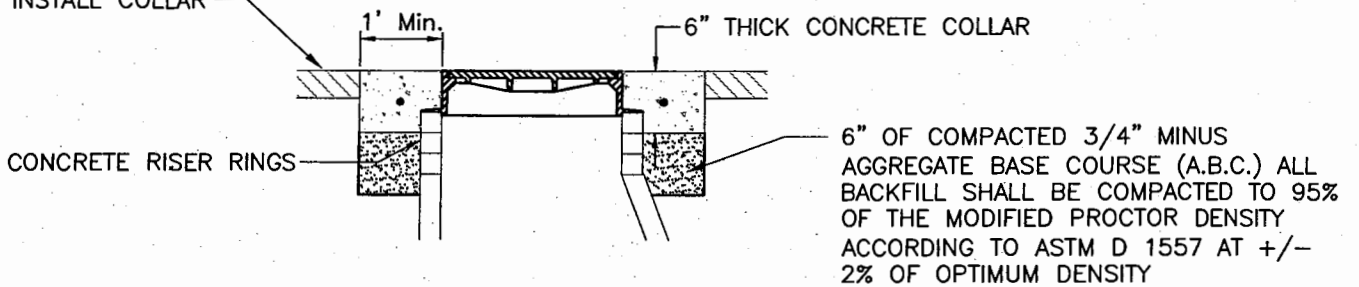
STANDARD SEWER DETAIL NO. 6  
NEW PIPE PENETRATION DETAIL

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER06.DWG



PLAN

NEW OR EXISTING PAVEMENT.  
IF EXISTING, SAW CUT PAVEMENT FOR CLEAN STRAIGHT EDGE. TO INSTALL COLLAR

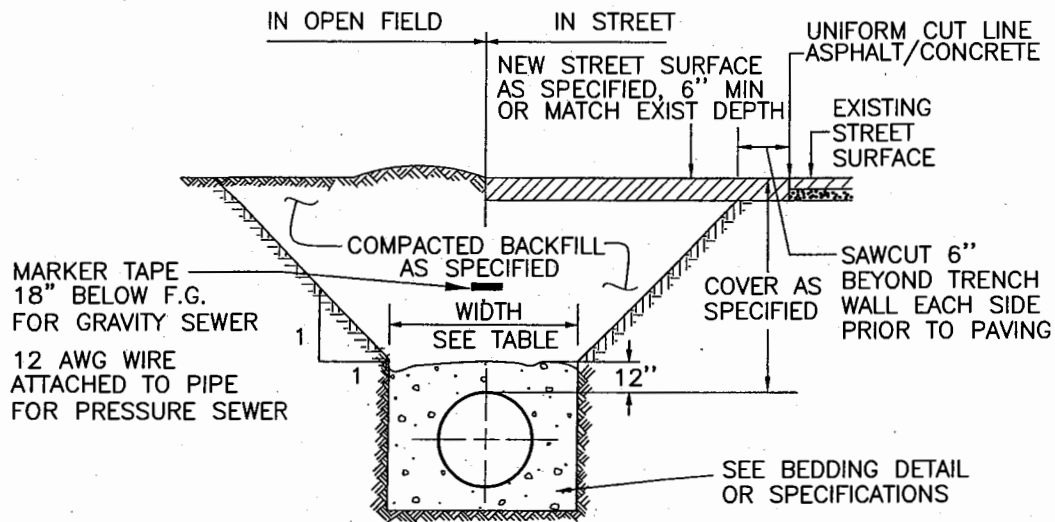


SECTION A-A

***SOUTH DURANGO  
SANITATION DISTRICT***

**STANDARD SEWER DETAIL NO. 7  
MANHOLE COLLAR DETAIL**

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER07.DWG



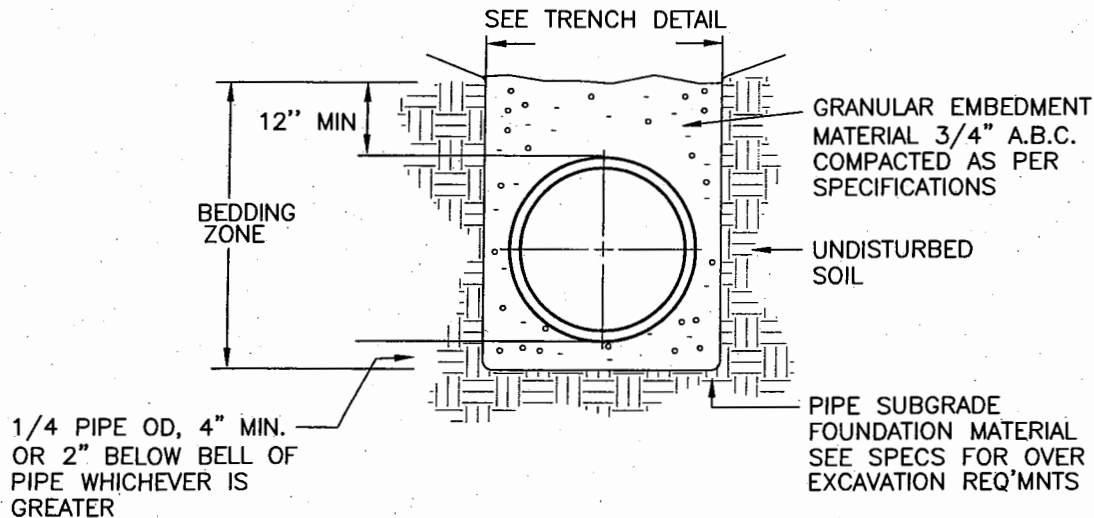
**TRENCH WIDTH**

PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
4"	1'-4"	2'-4"
6"	1'-6"	2'-6"
8"	1'-8"	2'-8"
10"	1'-10"	2'-10"
12"	2'-0"	3'-0"
18"	2'-6"	3'-6"

FOR TRENCHES GREATER THAN 5 FEET IN DEPTH, SIDEWALLS SHALL BE SLOPED AT 45° ANGLE OR SUITABLY BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKERS AND THE PROTECTION OF OTHER UTILITIES AS REQUIRED BY OSHA OR IN UNSTABLE SOIL CONDITIONS, SLOPE TRENCH WALLS ACCORDING TO GEOTECHNICAL RECOMMENDATIONS.

A HORIZONTAL CLEARANCE OF 2 FEET SHALL BE MAINTAINED BETWEEN DISTRICT PIPES AND ALL OTHER FACILITIES THAT WILL SHARE THE SAME TRENCH

**TYPICAL TRENCH DETAIL**



**PIPE BEDDING DETAIL**

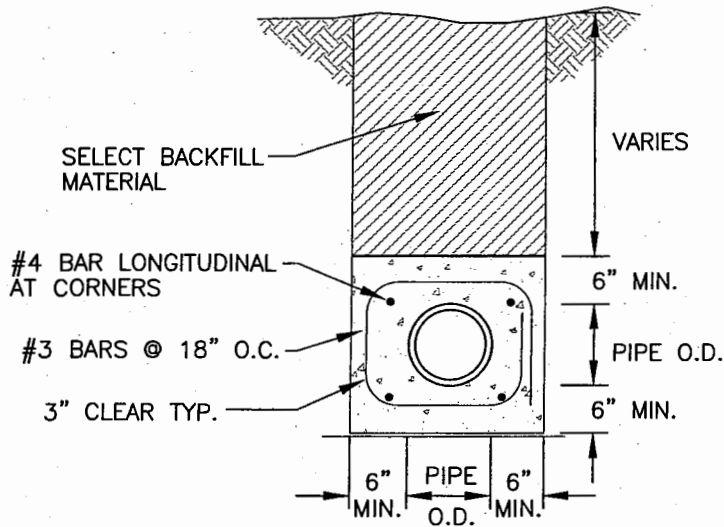
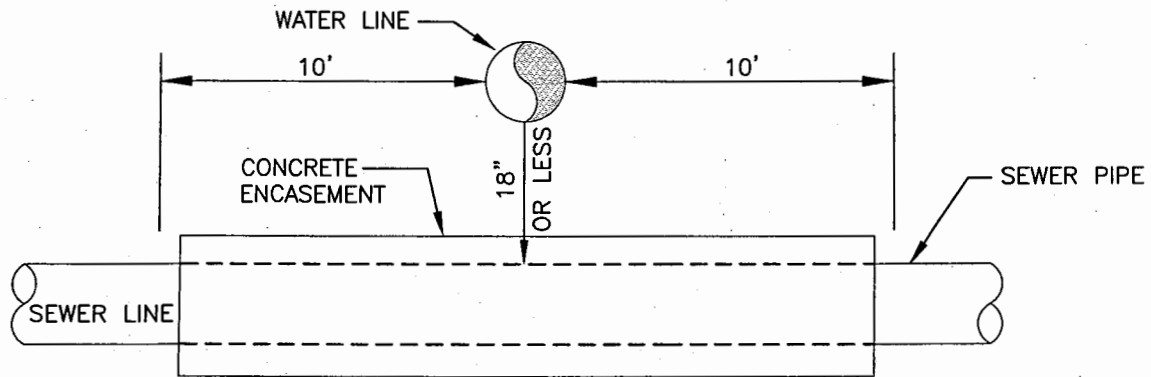
**NOTES:**

1. MARKER TAPE SHALL BE 6" WIDE, GREEN WITH BLACK LETTERING STATING THE FOLLOWING AS A MINIMUM, "CAUTION SEWER".

***SOUTH DURANGO  
SANITATION DISTRICT***

**STANDARD SEWER DETAIL NO. 8  
TYPICAL TRENCH AND BEDDING DETAIL**

DATE: 6/17/04    SCALE: N.T.S.  
CAD FILE NAME: SEWER08.DWG



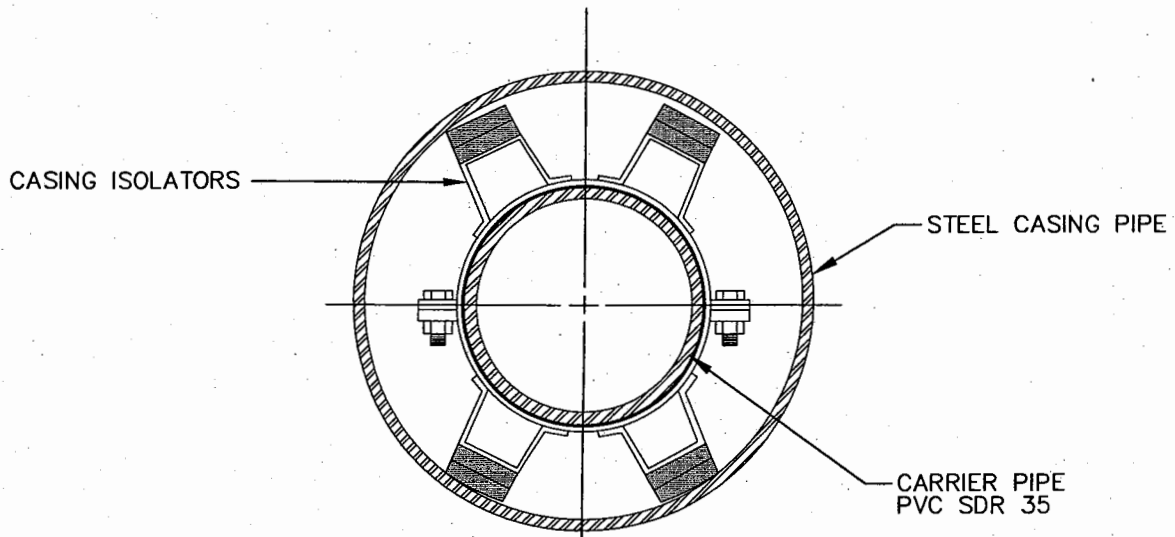
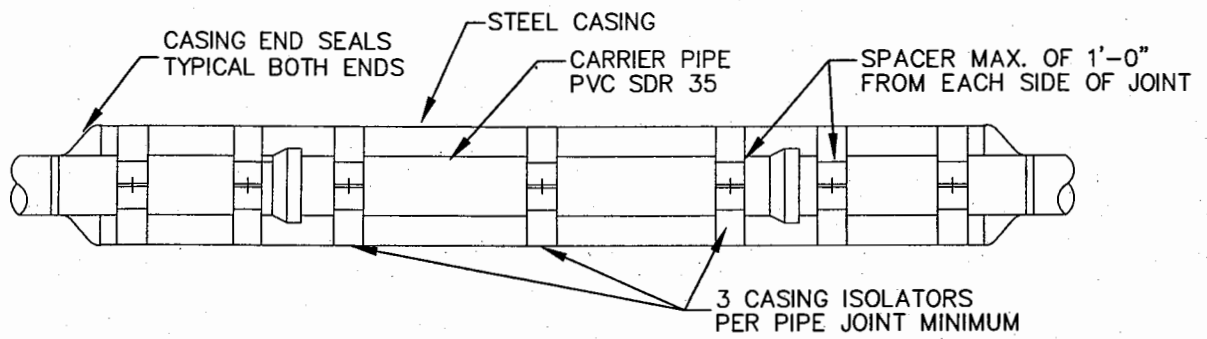
**NOTES:**

1. THE DISTRICT SHALL REVIEW THIS DETAIL FOR USE ON A CASE BY CASE BASIS. SPECIAL ENCASEMENTS MAY BE REQUIRED AT CREEK CROSSINGS AND CONDUIT CROSSINGS.
2. WHEN SEWER MAIN IS LOCATED ABOVE WATER MAIN, ALWAYS PROVIDE PROTECTION.

***SOUTH DURANGO  
SANITATION DISTRICT***

**STANDARD SEWER DETAIL NO. 9  
SEWER CROSSING AND ENCASEMENT DETAIL**

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER09.DWG



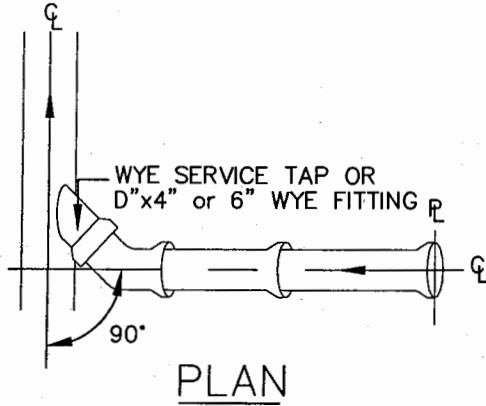
**NOTE:**

WHERE INFORMATION ON THIS DETAIL CONFLICTS WITH REQUIREMENTS  
 OF REGULATORY AGENCIES WHO ALSO HAVE JURISDICTION OVER THIS  
 WORK, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.

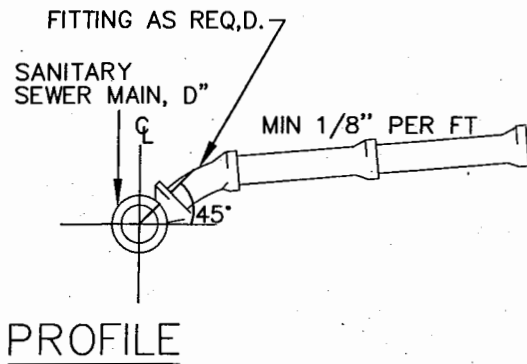
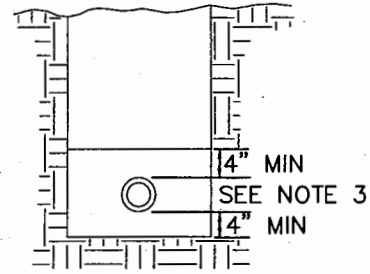
***SOUTH DURANGO  
 SANITATION DISTRICT***

STANDARD SEWER DETAIL NO. 10  
 PIPE CASING DETAIL

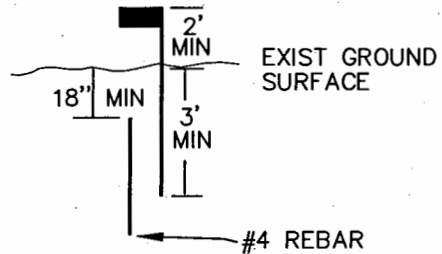
DATE: 6/17/04 | SCALE: N.T.S.  
 CAD FILE NAME: SEWER10.DWG



MINIMUM TRENCH WIDTH SHALL BE THE DIAMETER OF THE PIPE PLUS 8"



GREEN METAL TEE POST



NOTES:

1. ALL SERVICE LINES SHALL BE 4" MINIMUM IN DIAMETER.
2. THE MINIMUM SLOPE FOR 4" OR 6" SERVICE LINES SHALL BE 1/8" PER FOOT.
3. BEDDING FOR HOUSE CONNECTION WITHIN DISTRICT R.O.W. SHALL BE THE SAME AS FOR SEWER MAIN, LAID TO A MINIMUM DEPTH OF 4" BELOW THE PIPE INVERT AND 4" ABOVE THE TOP OF THE PIPE.
4. SERVICE LINE WILL BE PLUGGED AT THE PROPERTY LINE WITH APPROPRIATE PLUG FOR TYPE OF LINE INSTALLED UNTIL CONNECTED TO BUILDING. AFTER ABANDONMENT OF A SERVICE LINE IT MUST BE PLUGGED 5' INSIDE THE PROPERTY LINE.
5. CLEANOUT SHALL BE INSTALLED AT PROPERTY LINE IN ACCORDANCE WITH STANDARD SEWER DETAIL NO. 12
6. COMPACTION OF BACKFILL SHALL BE AS STATED IN THE TYPICAL TRENCH DETAIL FOR MAINS.

***SOUTH DURANGO  
SANITATION DISTRICT***

STANDARD SEWER DETAIL NO. 11  
SEWER SERVICE DETAIL

DATE: 6/17/04    SCALE: N.T.S.  
CAD FILE NAME: SEWER11.DWG

8" C.I. TRAFFIC RATED FRAME AND COVER W/ THE  
WORD "SEWER" ON COVER

SEE VALVE BOX COLLAR DETAIL

PVC CAP LEFT  
UNGLUED

4" SCH. 40 PVC  
PIPE

4" x D x D SANITARY  
TEE FITTING

PIPE

D"

GRAVITY SINGLE CLEAN-OUT DETAIL

8" C.I. TRAFFIC RATED FRAME AND COVER W/ THE  
WORD "SEWER" ON COVER

PVC CAP LEFT  
UNGLUED

SEE VALVE BOX  
COLLAR DETAIL

PVC CAP LEFT  
UNGLUED

4" SCH. 40 PVC  
PIPE

4" x D x D SANITARY  
TEE FITTING

12"

4" x D x D SANITARY  
TEE FITTING

PIPE

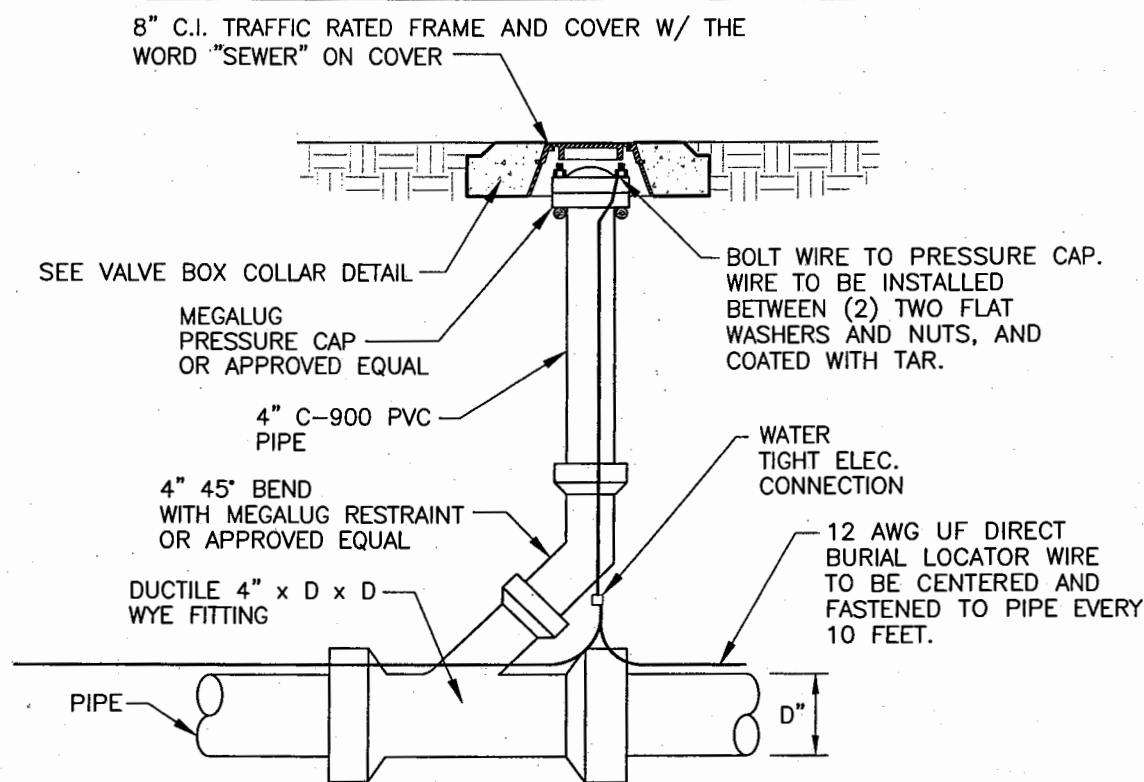
D"

GRAVITY TWO-WAY CLEAN-OUT DETAIL

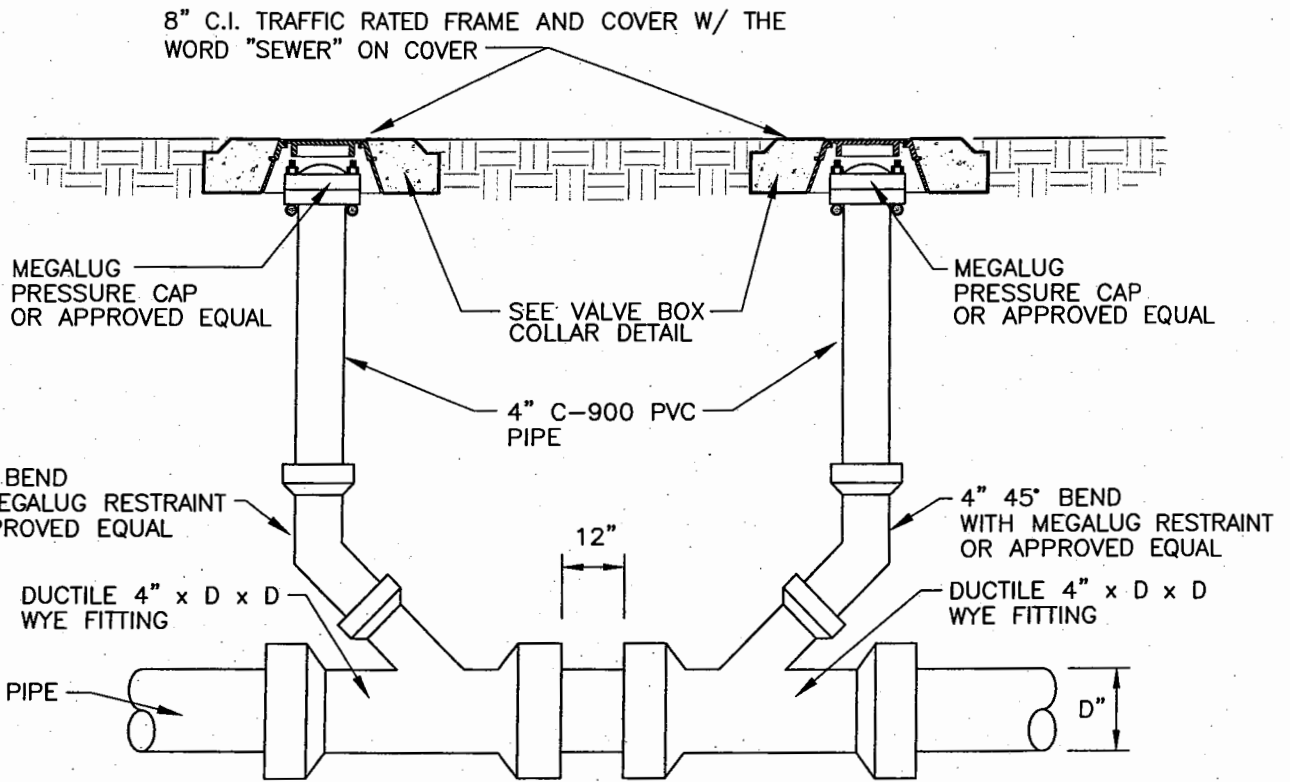
**SOUTH DURANGO  
SANITATION DISTRICT**

STANDARD SEWER DETAIL NO. 12  
GRAVITY CLEAN-OUT DETAIL

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER12.DWG



PRESSURE SINGLE CLEAN-OUT DETAIL

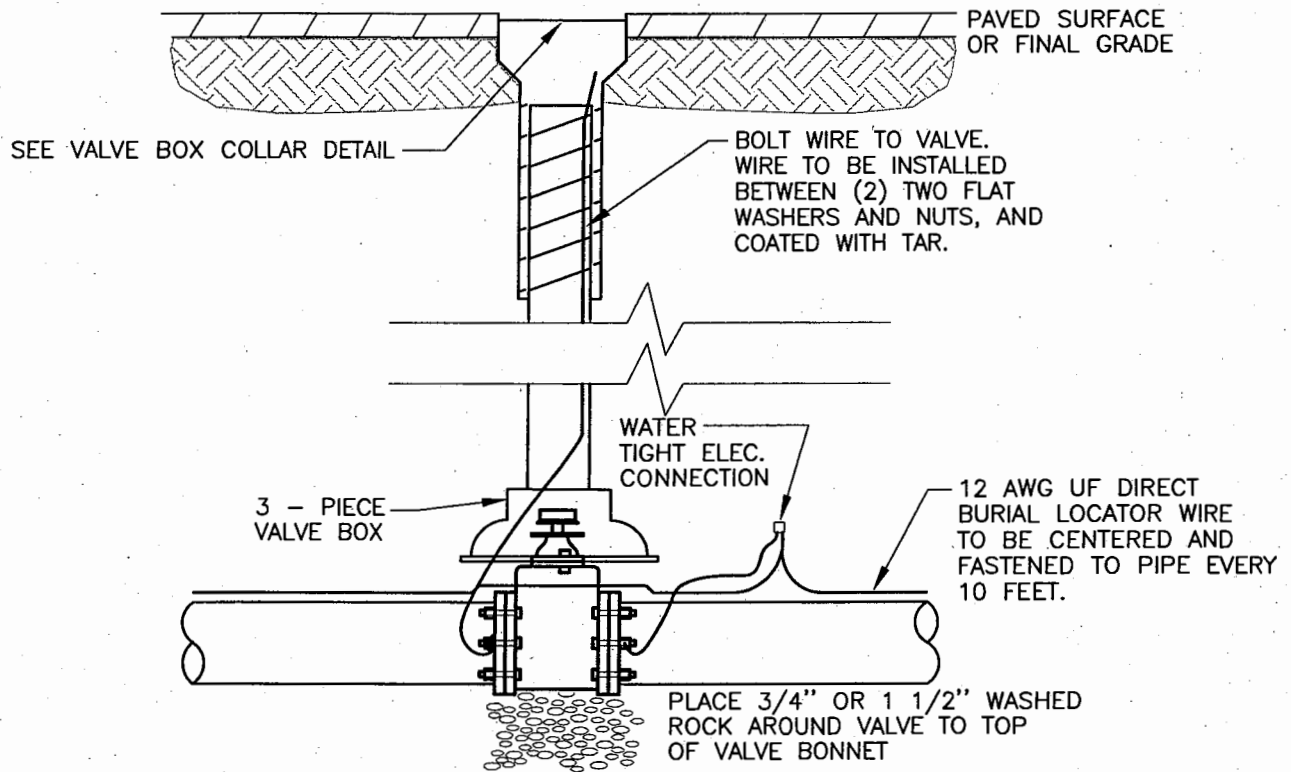


PRESSURE TWO-WAY CLEAN-OUT DETAIL

**NOTES:**

1. ALL JOINTS ARE TO BE MECHANICAL JOINTS WITH MEGALUG GLANDS.
2. CLEANOUTS ARE REQUIRED EVERY 100 FT AND AT ALL CHANGES IN DIRECTION.
3. 12 AWG UF LOCATOR WIRE SHALL BE INSTALLED ON PRESSURE TWO-WAY CLEAN-OUT AS SHOWN ON PRESSURE SINGLE CLEAN-OUT DETAIL.

<b>SOUTH DURANGO SANITATION DISTRICT</b>	
STANDARD SEWER DETAIL NO. 13 PRESSURE CLEAN-OUT DETAIL	
DATE: 6/17/04	SCALE: N.T.S.
CAD FILE NAME: SEWER13.DWG	



**NOTES:**

1. OPERATING NUT SHALL BE EXTENDED WITHIN 4 FEET OF SURFACE.
2. EXTENSION STEMS REQUIRED WHERE VALVE IS AT DEPTH GREATER THAN 5 FEET.

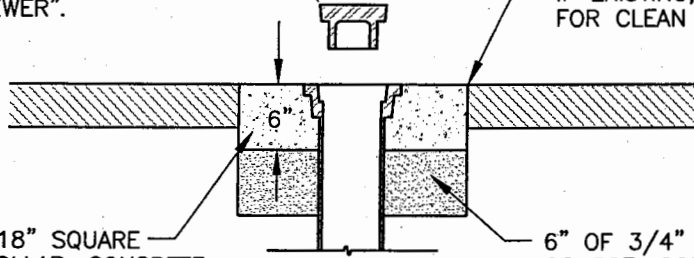
***SOUTH DURANGO  
SANITATION DISTRICT***

**STANDARD SEWER DETAIL NO. 14  
VALVE BOX DETAIL**

DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER14.DWG

TYLER 6850 SERIES ADJUSTABLE  
CAST IRON RISER AND DROP LID  
MARKED "SEWER".

NEW OR EXISTING PAVEMENT.  
IF EXISTING, SAW CUT PAVEMENT  
FOR CLEAN STRAIGHT EDGE.



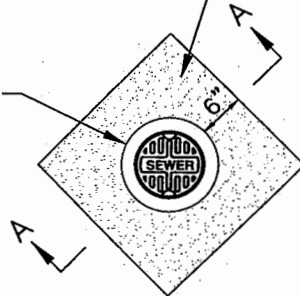
6" THICK X 18" SQUARE  
CONCRETE COLLAR, CONCRETE  
SHALL BE 4000 PSI 5-1/2  
SACK MIX MINIMUM

6" OF 3/4" AGGREGATE BASE  
COURSE, COMPACTED TO AT LEAST 95  
% OF THE MAXIMUM MODIFIED  
PROCTOR DENSITY AT A MOISTURE  
CONTENT NEAR OPTIMUM, ACCORDING  
TO ASTM D 1557

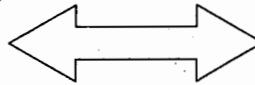
SECTION A-A

BOND BREAKER, PLASTIC  
SHEET, BUILDING PAPER  
OR OTHER MATERIAL TO  
PREVENT BONDING

6" THICK X 18" SQUARE CONCRETE COLLAR, CONCRETE  
SHALL BE 4000 PSI 5-1/2 SACK MIX MINIMUM



DIRECTION OF  
TRAFFIC MOVEMENT



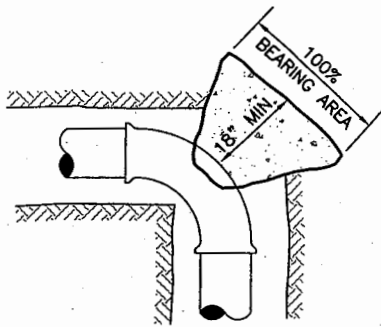
PLAN

***SOUTH DURANGO  
SANITATION DISTRICT***

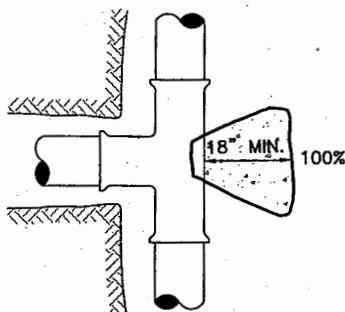
STANDARD SEWER DETAIL NO. 15  
VALVE BOX COLLAR DETAIL

DATE: 6/17/04 | SCALE: N.T.S.

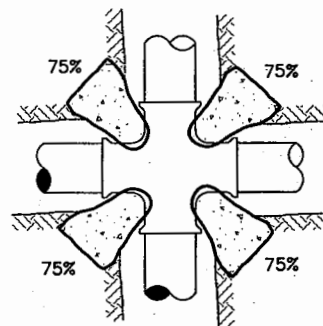
CAD FILE NAME: SEWER15.DWG



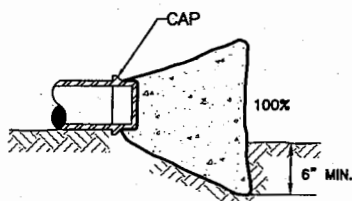
**HORIZONTAL BEND**



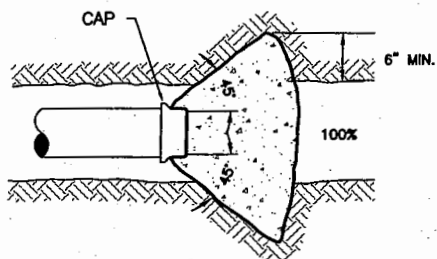
**TEE**



**CROSS**

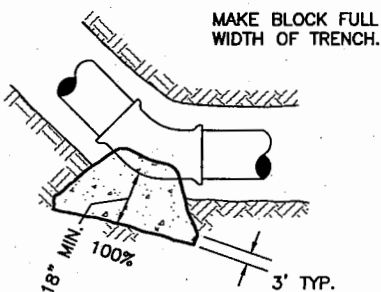


**SECTION VIEW**

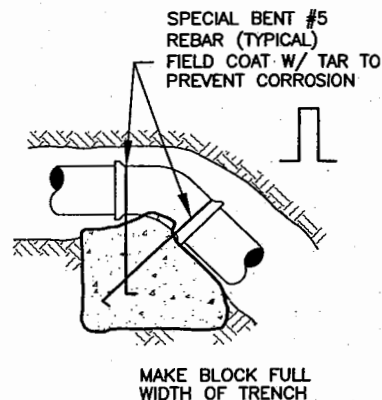


**TOP VIEW**

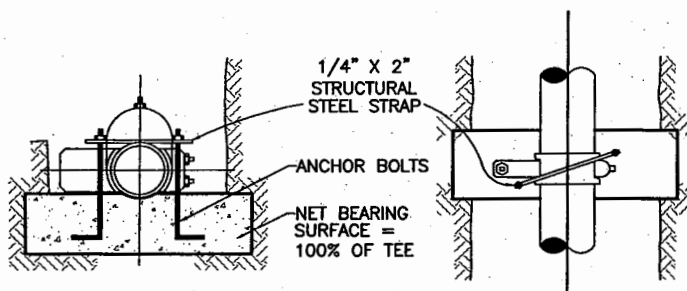
**DEAD END**



**VERTICAL BEND - UP**



**VERTICAL BEND - DOWN**



**TYPICAL VALVE**

**NOTES:**

- 1) SEE THRUST BLOCK DETAIL - II FOR NOTES AND SCHEDULES
- 2) VALUE (100%) AT THRUST BLOCK INDICATES PERCENT OF TOTAL THRUST TO BE APPLIED TO DETERMINE THE APPROPRIATE BEARING AREA

**SOUTH DURANGO  
SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 16  
THRUST BLOCK DETAIL - I**

DATE: 6/17/04 SCALE: N.T.S.  
CAD FILE NAME: SEWER16.DWG

LBS OF THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS				
NOMINAL PIPE SIZE (Inches)	DEAD ENDS WYES & TEES	90 DEGREE BENDS	45 DEGREE BENDS	22 1/2 DEGREE BENDS OR LESS
4"	19	27	15	7
6"	39	55	30	15
8"	57	94	51	26
10"	109	154	84	43

**EXAMPLES**

10-INCH HORIZONTAL 45-DEGREE BEND AT 200 PSI  
 FROM TABLE, THRUST = 84 \* 200 = 16,800 LBS  
 ASSUME SOIL BEARING STRENGTH = 2000 LBS/SQ. FT.  
 REQUIRED BEARING AREA OF THRUST BLOCK = 16,800/2,000 = 8.40 SQ. FT.

10-INCH DOWNWARD VERTICAL 22.5-DEGREE BEND AT 200 PSI  
 FROM TABLE, THRUST = 43 \* 200 = 8,600 LBS  
 WEIGHT OF CONCRETE = 150 LBS/CUBIC FOOT  
 SIZE OF CONCRETE THRUST BLOCK = 8,600/150 = 57.3 CU. FT. = 2.12 CU YDS

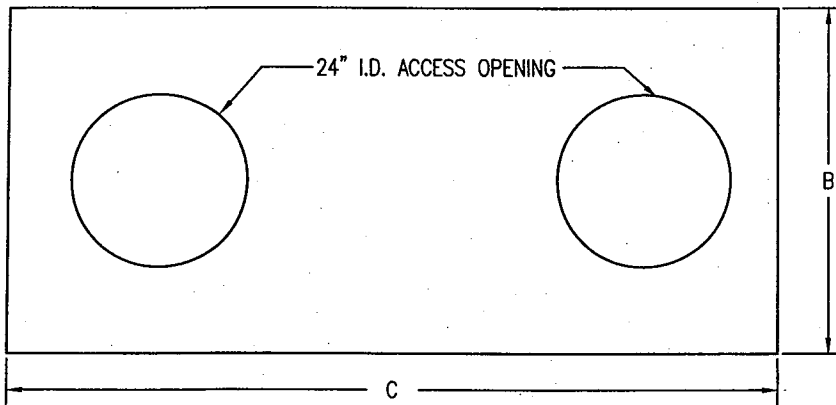
**NOTES**

1. USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (I.E. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP OR VALVE SHUT-OFF, ETC)
2. SEE SOILS REPORT FOR BEARING STRENGTH OF SOIL. IN THE ABSENCE OF A SOILS REPORT ASSUME 2,000 PSF.
3. CONCRETE THRUST BLOCKS TO BE 2,000 PSI STRENGTH AT 28-DAYS
4. THRUST BLOCKS TO BEAR ON UNDISTURBED EARTH. IF NOT POSSIBLE, MECHANICAL RESTRAINTS SHALL BE USED.
5. DO NOT EXTEND CONCRETE BEYOND THE FITTING JOINTS.
6. INSTALL POLYETHYLENE BOND BREAKER BETWEEN PIPE AND CONCRETE.
7. IN ADDITION TO THRUST BLOCKS, MECHANICAL RESTRAINTS (MEGA-LUGS, OR EQUAL) SHALL BE USED AT ALL VALVES, BENDS, FITTINGS WITH MECHANICAL OR PUSH-ON TYPE CONNECTIONS, AND DEAD ENDS.

**SOUTH DURANGO  
 SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 17  
 THRUST BLOCK DETAIL - II**

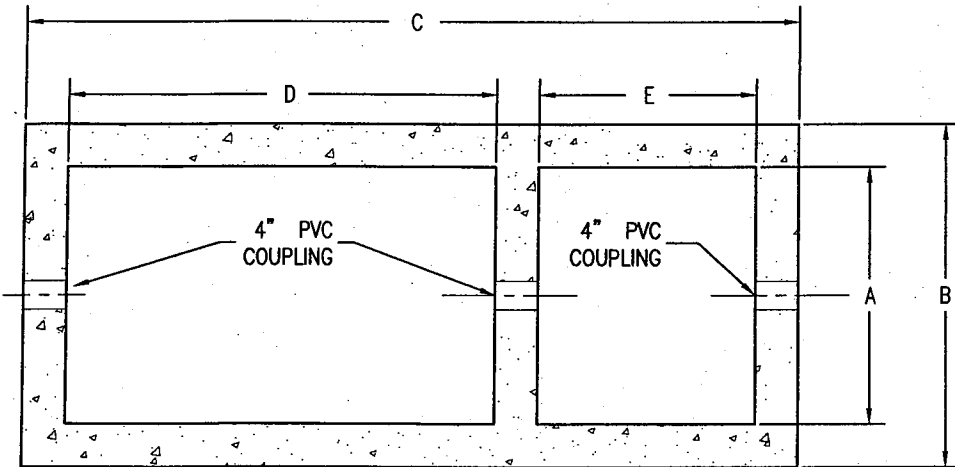
DATE: 6/17/04 | SCALE: N.T.S.  
 CAD FILE NAME: SEWER17.DWG



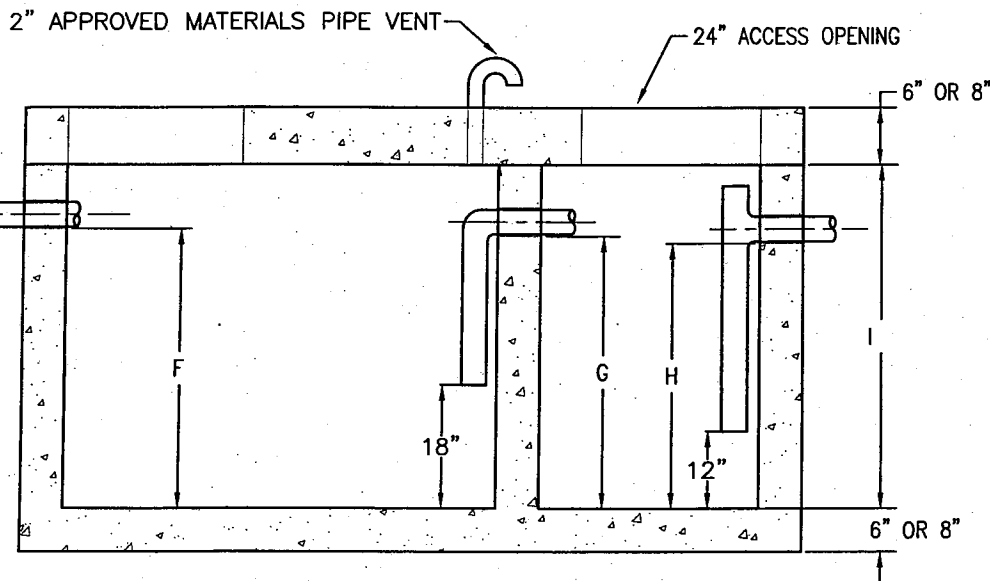
TOP VIEW OF GREASE TRAP LID

**NOTES:**

1. SECONDARY COMPARTMENT HAS VOLUME EQUAL TO 1/3 OF TOTAL CAPACITY.
2. ALL PIPE AND FITTINGS TO BE APPROVED MATERIALS



PLAN



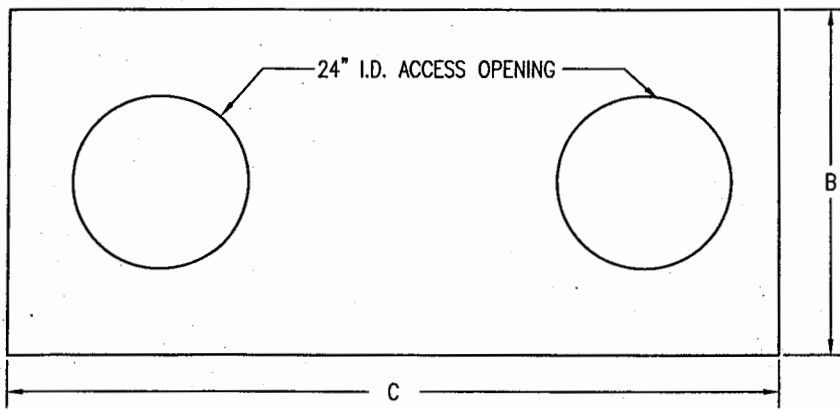
SECTION

TANK CAPACITY (GALLONS)	TANK DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	H	I
500	36	48	108	60	30	38	37	36	48
1000	49	61	115	64	33	53	52	51	63
1500	60	72	138	80	40	50	49	48	60
2000	60	72	138	80	40	66	65	64	72

**SOUTH DURANGO  
SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 18  
GREASE INTERCEPTOR DETAIL**

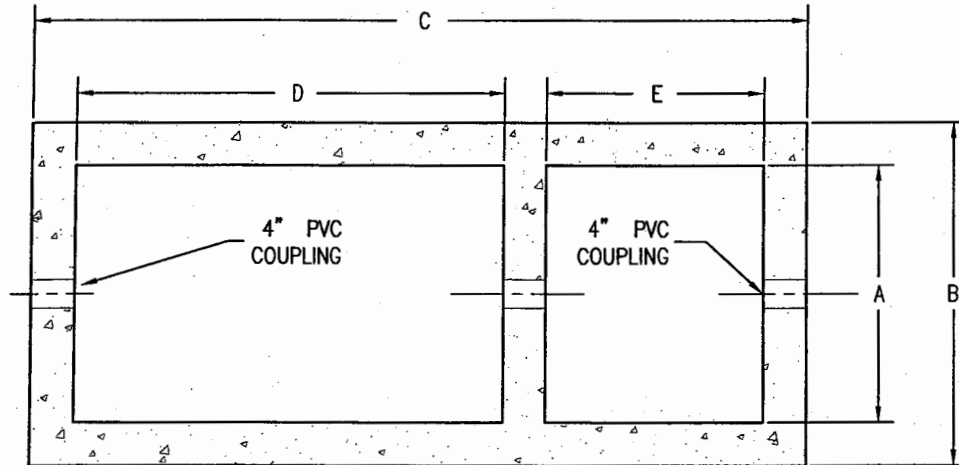
DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER18.DWG



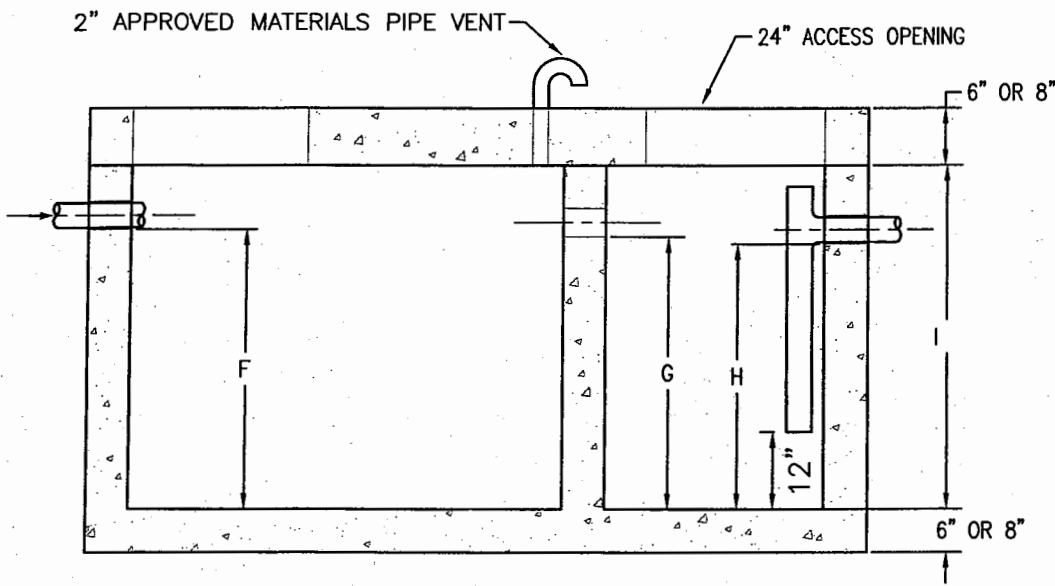
TOP VIEW OF GREASE TRAP LID

NOTES:

1. SECONDARY COMPARTMENT HAS VOLUME EQUAL TO 1/3 OF TOTAL CAPACITY.
2. ALL PIPE AND FITTINGS TO BE APPROVED MATERIALS



PLAN



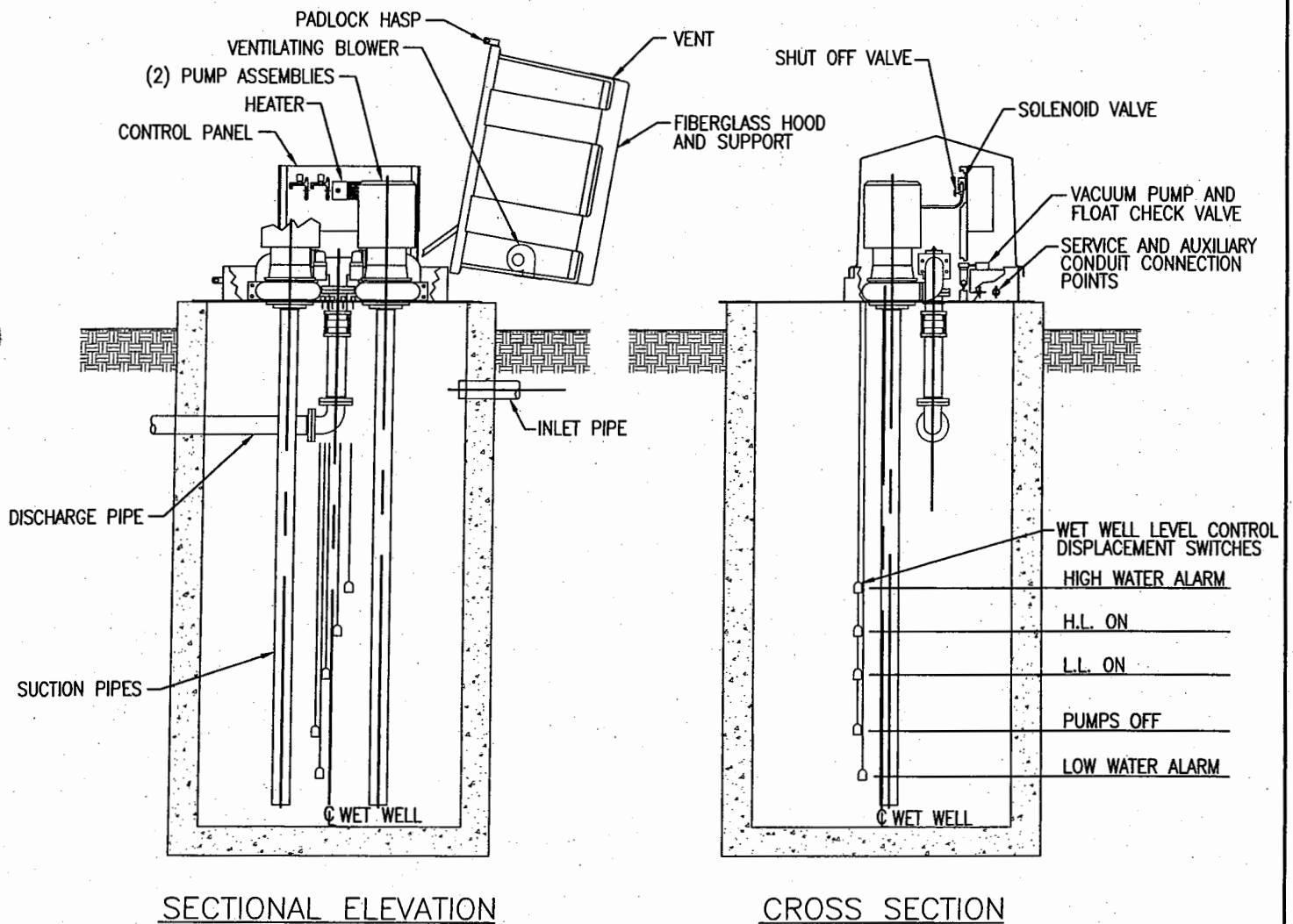
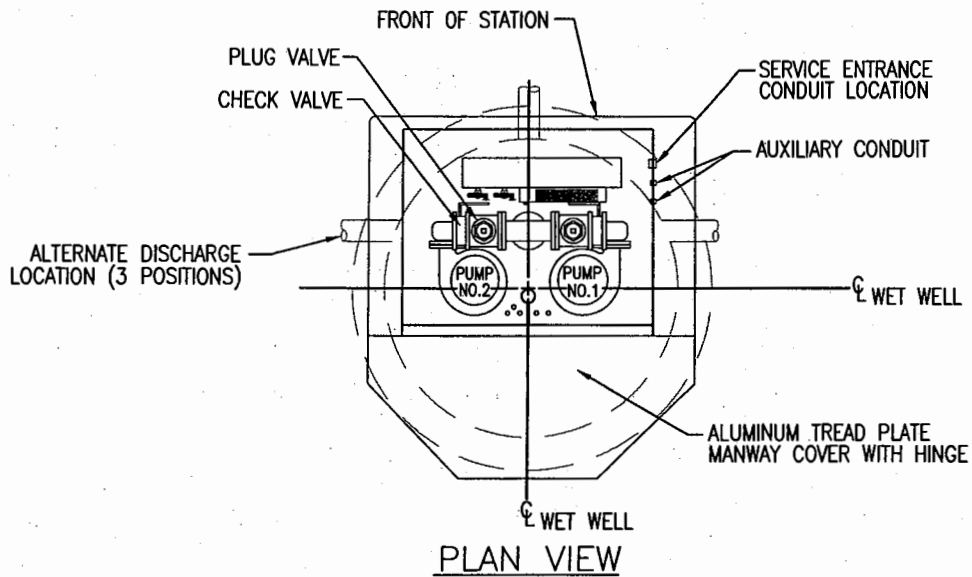
SECTION

TANK CAPACITY (GALLONS)	TANK DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	H	I
500	36	48	108	60	30	38	37	36	48
1000	49	61	115	64	33	53	52	51	63
1500	60	72	138	80	40	50	49	48	60
2000	60	72	138	80	40	66	65	64	72

**SOUTH DURANGO  
SANITATION DISTRICT**

**STANDARD SEWER DETAIL NO. 19  
SAND AND OIL INTERCEPTOR DETAIL**

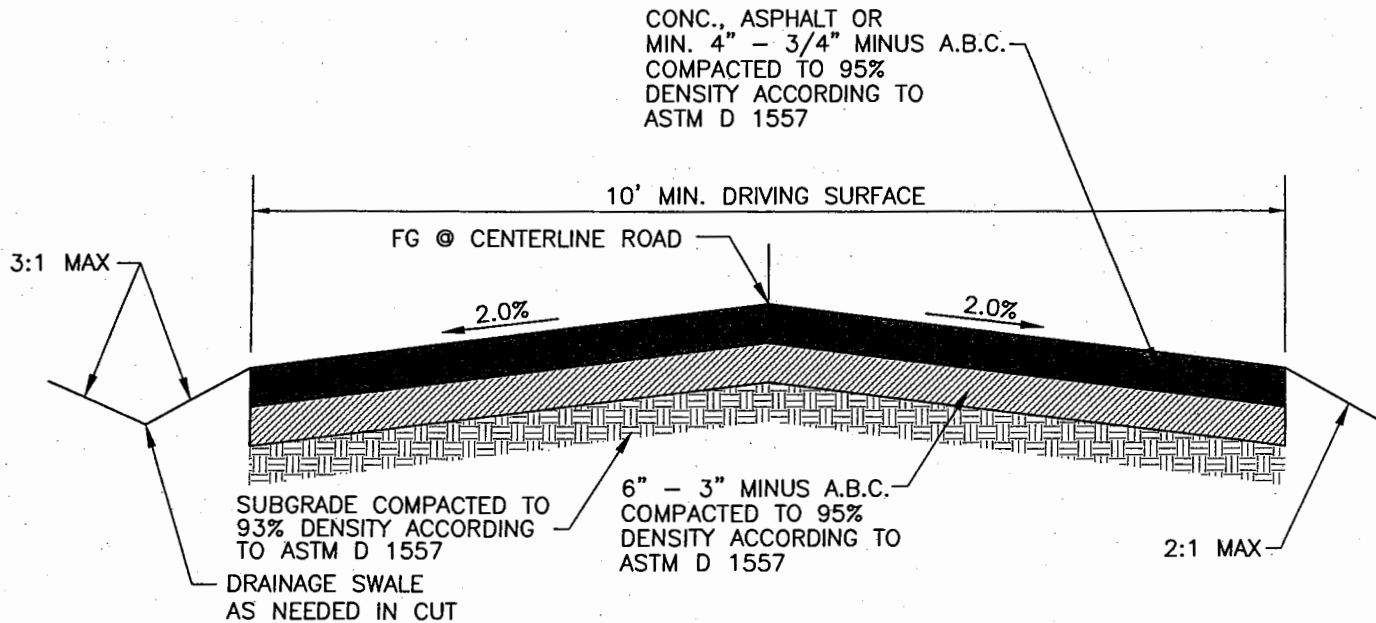
DATE: 6/17/04 | SCALE: N.T.S.  
CAD FILE NAME: SEWER19.DWG



***SOUTH DURANGO  
SANITATION DISTRICT***

**STANDARD SEWER DETAIL NO. 20  
LIFT STATION DETAIL**

DATE: 6/17/04    SCALE: N.T.S.  
CAD FILE NAME: SEWER20.DWG



**NEW ACCESS/MAINTENANCE ROAD TYPICAL SECTION**  
 NTS

<b>SOUTH DURANGO SANITATION DISTRICT</b>	
STANDARD SEWER DETAIL NO. 21 TYPICAL ACCESS & MAINTENANCE ROAD DETAIL	
DATE: 6/17/04	SCALE: N.T.S.
CAD FILE NAME: SEWER21.DWG	