

DWG NO.

GS-27	Trench Resurfacing Asphalt Concrete Pavement For Trench Widths Greater Than 48"
GS-28	Notes for Asphalt Concrete Trench Resurfacing
GS-29	Exploratory Utility Pothole Backfill & Resurfacing (Diam ≤ 8 in)
GS-32	General Notes for Pedestrian Ramps

Sewer Improvements

S-1	Standard Sewer Manhole
S-1A	PVC Lined Manhole
S-2	Drop Manhole
S-3	Shallow Manhole
S-4	Manhole Frame and Cover
S-5	Pipe Bedding and Trench Backfill for Sewers
S-6	Sewer Main Cleanout
S-7	Sewer Lateral
S-8	Sewer Lateral (Deep Cut)
S-9	Manhole Marker Post

STANDARD CAST IRON MANHOLE
 FRAME & COVER - SEE DWG. NO. S4.

PAVEMENT OR
 FINISH GRADE.

MIN. SLOPE
 1" PER FT.

WIDTH SHALL EQUAL
 INSIDE DIA. OF PIPE.

12" WIDE X 6" THICK
 CONCRETE COLLAR,
 CLASS 560-C-3250
 WITH 3" ASPHALT
 CONCRETE OVERLAY
 (TYPICAL).

ADJUST WITH
 CONCRETE RINGS
 AS REQUIRED.
 MAX.=11",
 MIN.=5",
 TOP=2-2 1/2"
 RINGS.

INVERT
 GRADE

MIN. DEPTH
 = PIPE DIA.

SECTION A-A

NOTES:

MANHOLE TO BE CONSTRUCTED IN
 ACCORDANCE WITH S-1 AND THE FOLLOWING
 NOTES.

INSTALL 1" WELD STRIPS WHERE T-LOCK IS
 WELDED; I.E., TOP OF CHANNEL, SHAFT TO
 SHELF, TURN BACK TO PIPE FACE, CORNERS,
 ETC.

PVC TURN BACK ON PVC PIPING SHALL BE A
 MINIMUM OF 6".

PVC TURN BACK SHALL BE HELD TIGHT TO
 PVC PIPING BY 1/2" STEEL BAND WITH
 CONTACT CEMENT ADHESIVE APPLIED TO
 BOTH SURFACES.

NO FLAT SHEET PVC SHALL BE USED. FORM
 IN T-LOCK OR ARROWLOCK ON SHELF AND
 CHANNEL. OVERLAP PVC ONTO MANHOLE
 SHAFT AND CHANNEL LINER; WELD TO BOTH
 AND COMPLETE WITH 1" WELD STRIPS.

INSTALL NONSKID SURFACE ON MANHOLE
 SHELF.

INSTALL PRE FORMED AMER-PLATE 95V PVC
 SLEEVE UNDER FRAME AT TOP OPENING.

WELD 4" JOINT STRIPS AND FINISH BOTH
 EDGES WITH 1" WELD STRIPS.

COMPLETE CONCRETE CHANNEL SHALL BE
 CONSTRUCTED WITH FORMS AND ALL BUT
 THE LOWER 90° SHALL BE T-LOCK LINED.
 THE "T'S" SHALL RUN VERTICAL AS IN THE
 MANHOLE SHAFT AND SHALL BE TACKED AT
 THE TERMINUS OF THE T-LOCK.

SIDES AND ENDS OF THE BASE TO BE EITHER
 FORMED, SANDBAGGED OR POURED AGAINST
 UNDISTURBED EARTH.

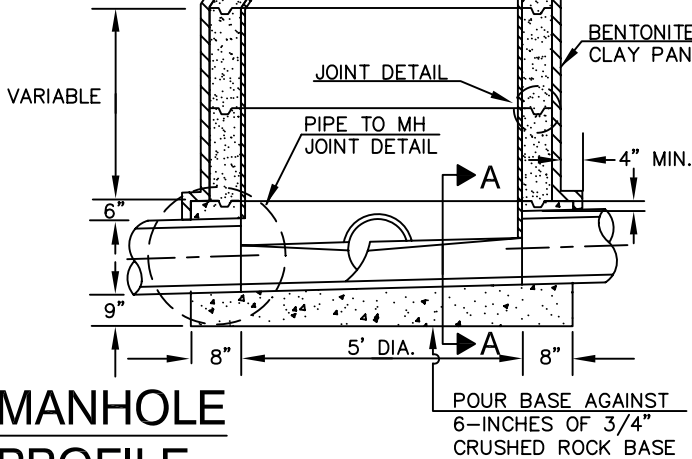
MANHOLE SHELVES TO BE SLOPED 1" PER
 FOOT TO CHANNEL.

WRAP MANHOLE JOINTS BELOW WATER TABLE
 WITH BENTONITE GEOTEXTILE WATERPROOFING
 SYSTEM, VOLCLAY VOLTEX OR APPROVED
 EQUAL.

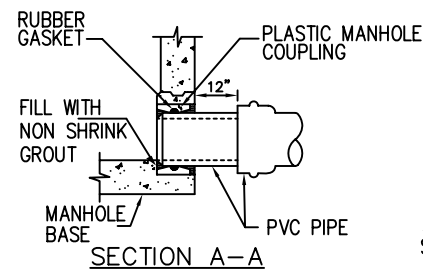
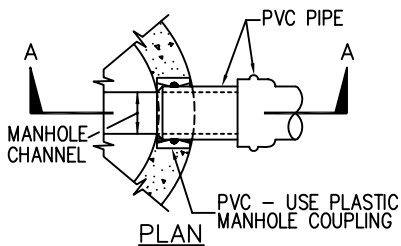
ALL LINER JOINTS SHALL BE HEAT WELDED
 BY WELDERS CERTIFIED BY THE PVC
 MANUFACTURER. LINER WILL BE SPARK
 TESTED AT 20,000 VOLTS MIN.

EPOXY COATING SYSTEM MAY BE USED IN
 LIEU OF PVC LINING FOR THE SHELF AND
 CHANNEL OF THE MANHOLE. COATING SYSTEM
 SHALL BE APPROVED BY CITY ENGINEER AND
 SUBJECT TO SPECIAL INSPECTION.

ANGLES OR JUNCTIONS SHALL HAVE 0.2' MIN.
 DROP THROUGH MANHOLE

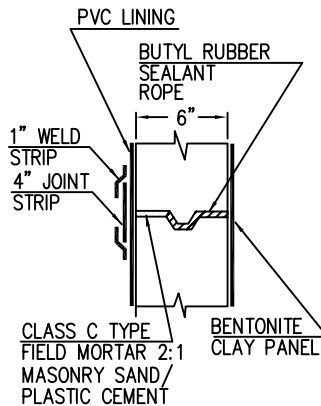


MANHOLE PROFILE



PIPE TO MANHOLE CONNECTION DETAIL

NOT TO SCALE



JOINT DETAIL

ALL CONCRETE TO CONCRETE JOINTS
 SHALL BE NOTCHED

REV.	APPROVED	DATE

CITY OF CARLSBAD	
PVC LINED MANHOLE	

<i>Allen X. Van Pelt</i>	12/11
CITY ENGINEER	DATE
SUPPLEMENTAL STANDARD NO.	S-1A

STANDARD CAST IRON MANHOLE
 FRAME & COVER —
 SEE DWG. NO. S4.

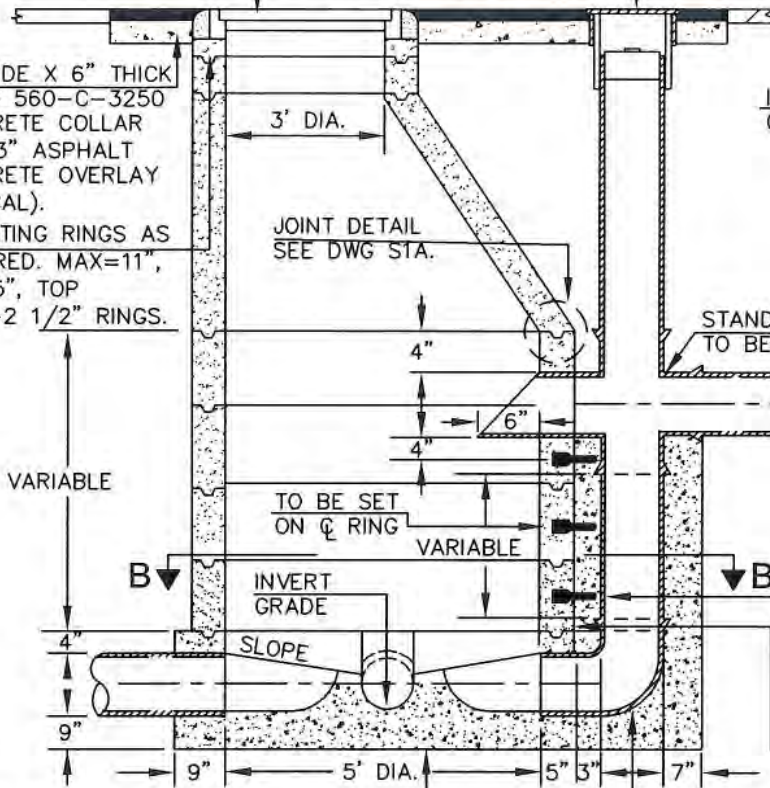
CLEANOUT COVER DETAIL
 SEE DWG S-6. MODIFIED
 WITH SBF 1243 VALVE BOX

MIN. SLOPE
 1/4" PER FT.

WIDTH SHALL EQUAL
 INSIDE DIA OF PIPE.

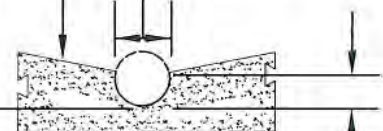
12" WIDE X 6" THICK
 CLASS 560-C-3250
 CONCRETE COLLAR
 WITH 3" ASPHALT
 CONCRETE OVERLAY
 (TYPICAL).
 ADJUSTING RINGS AS
 REQUIRED. MAX=11",
 MIN.=5", TOP
 5"=2-2 1/2" RINGS.

VARIABLE



SECTION A-A

INVERT
 GRADE



DEPTH=MIN.
 3/4" PIPE DIA.

SECTION C-C

STANDARD CROSS BRANCH SPIGOT END
 TO BE CUT OFF FLUSH WITH SURFACE.

JOINT WITH CROSS BRANCH
 AND FIRST SECTION OF
 PIPE TO BE JOINED PRIOR
 TO INSTALLATION IN MANHOLE.

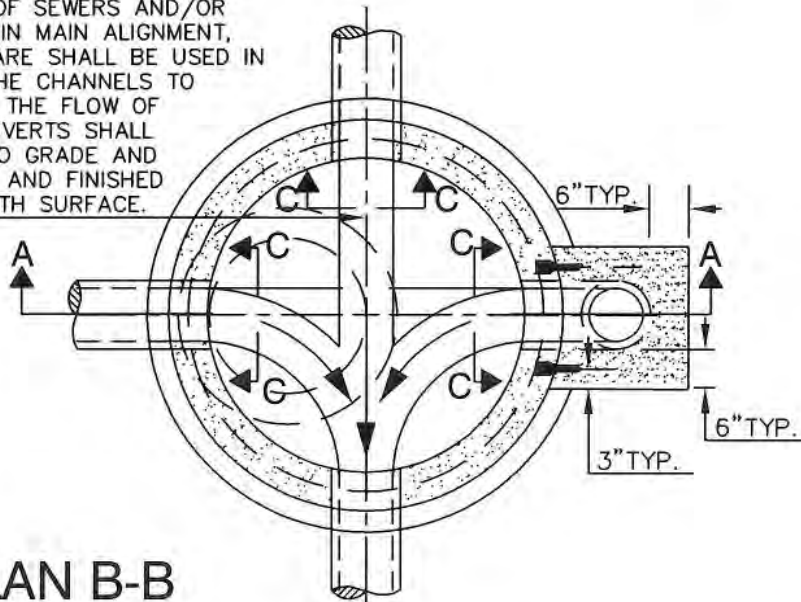
TWO 3/8"x2 3/4" LAG SCREW
 EXTENSION SHIELDS GALVANIZED
 AND 3/8"x6" LAG SCREWS
 GALVANIZED PER EACH 4 FOOT
 ACCESSHOLE RING AS SHOWN.

CLEAN AND ROUGHEN SURFACE
 RINGS AND APPLY NEAT CEMENT
 PASTE PRIOR TO POURING SUPPLY
 DROP SECTION.

90° PIPE SPIGOT END TO BE CUT
 OFF FLUSH WITH INSIDE SURFACE.

POUR BASE AGAINST
 6-INCHES OF 3/4"
 CRUSHED ROCK BASE.

WHEN MANHOLE FORMS THE
 JUNCTION OF SEWERS AND/OR
 AN ANGLE IN MAIN ALIGNMENT,
 SPECIAL CARE SHALL BE USED IN
 FORMING THE CHANNELS TO
 FACILITATE THE FLOW OF
 SEWAGE. INVERTS SHALL
 BE TRUE TO GRADE AND
 ALIGNMENT AND FINISHED
 WITH SMOOTH SURFACE.



PLAN B-B

NOTES:

ALL CAST IN PLACE CONCRETE
 SHALL BE TYPE 560-B-3250.

ALL PIPE IN MANHOLE SHALL
 BE PVC OR VITRIFIED CLAY PIPE
 AND SHALL BE INCLUDED AS
 PART OF MANHOLE.

DOUBLE DROP MANHOLE IS
 CONSTRUCTED THE SAME AS
 DROP MANHOLE EXCEPT THAT
 IT HAS TWO DROP SECTIONS.

REV.	APPROVED	DATE

CITY OF CARLSBAD

DROP MANHOLE

Robert T. Johnson Jr. 7/10/08
 CITY ENGINEER DATE
 SUPPLEMENTAL STANDARD NO. S-2

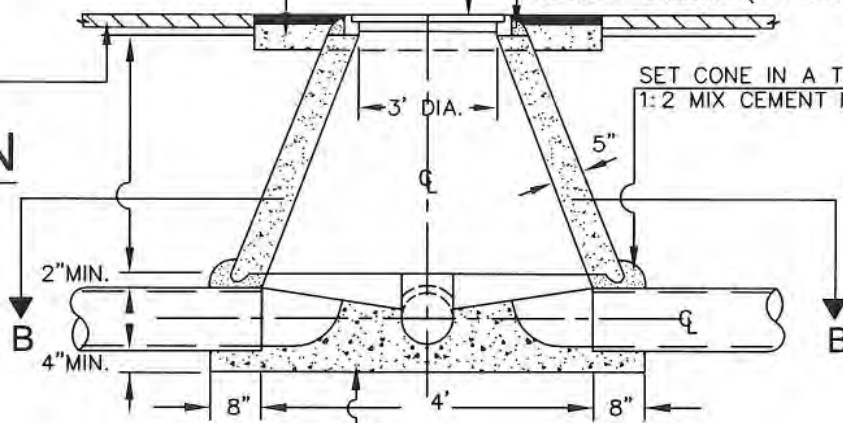
6" X 6" THICK CLASS 560-C-3250
 CONCRETE COLLAR WITH 3" ASPHALT
 CONCRETE OVERLAY (TYPICAL).

STANDARD CAST IRON MANHOLE
 FRAME & COVER - SEE DWG. NO. S4.
 CEMENT IN PLACE WITH 1:2 MIX
 CEMENT MORTAR (TYPICAL).

PAVEMENT OR
 FINISH GRADE.

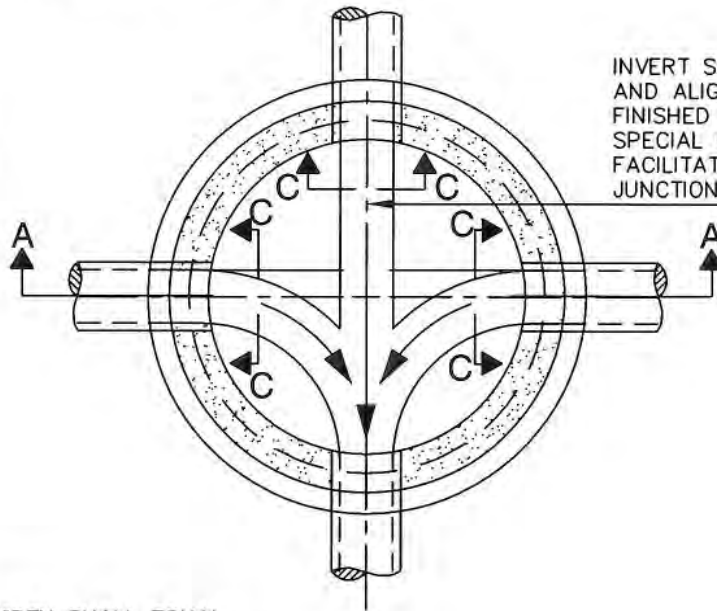
SET CONE IN A THICK BED OF
 1:2 MIX CEMENT MORTAR

**SECTION
 A-A**



POUR BASE AGAINST
 6-INCHES OF 3/4" OF CRUSHED
 ROCK BASE.

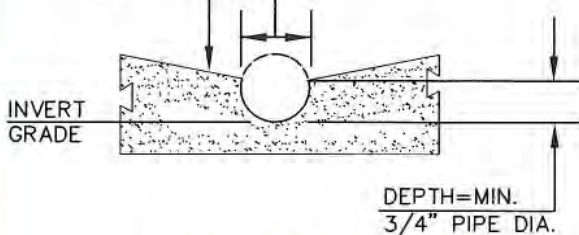
PLAN B-B



INVERT SHALL BE TRUE TO GRADE
 AND ALIGNMENT AND SHALL BE
 FINISHED WITH A SMOOTH SURFACE.
 SPECIAL CARE SHALL BE USED TO
 FACILITATE FLOW OF SEWAGE THROUGH
 JUNCTION CHANNELS.

MIN. SLOPE
 1" PER FT.

WIDTH SHALL EQUAL
 INSIDE DIA OF PIPE.



SECTION C-C

NOTES:

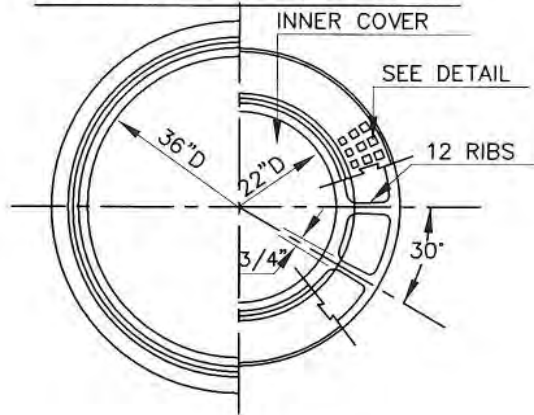
ALL CAST IN PLACE CONCRETE SHALL BE TYPE
 560-B-3250.

MANHOLE SHALL BE CONSTRUCTED IN ACCORDANCE
 WITH ASTM C-478.

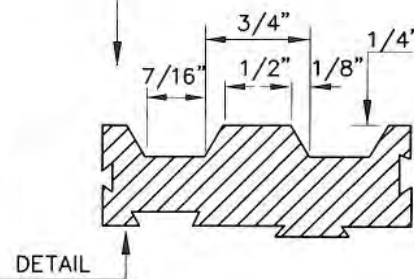
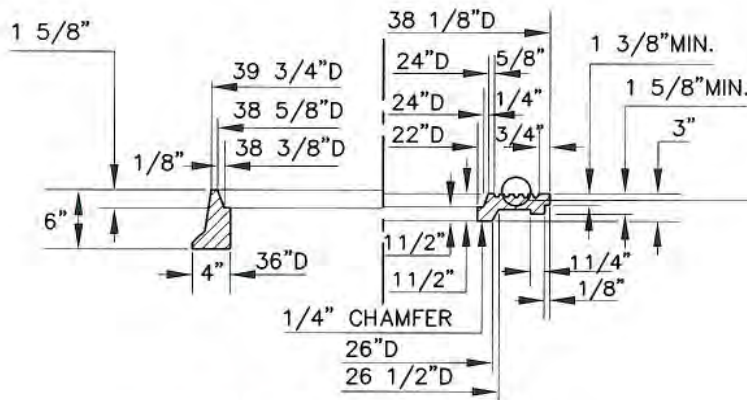
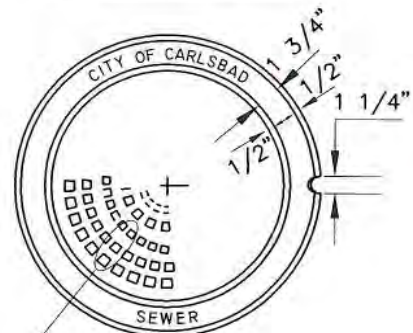
STUB OUTS SHALL HAVE A MINIMUM LENGTH OF 3
 FEET.

REV.	APPROVED	DATE	CITY OF CARLSBAD	
			SHALLOW MANHOLE	
			Robert T. Johnson, Jr. 7/10/08 CITY ENGINEER	DATE
			SUPPLEMENTAL STANDARD NO.	S-3

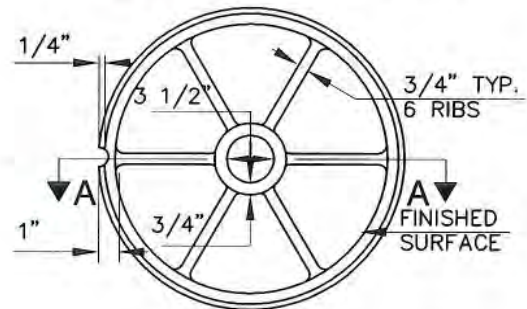
HALF PLAN FRAME & COVER



INNER COVER TOP SIDE



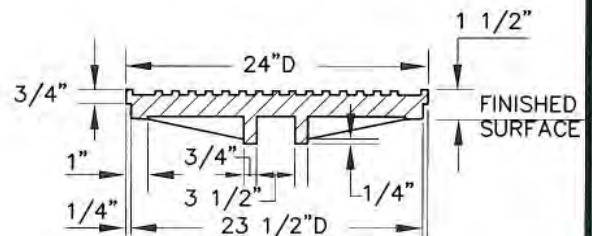
BOTTOM SIDE



HALF SECTION FRAME & COVER

NOTES:

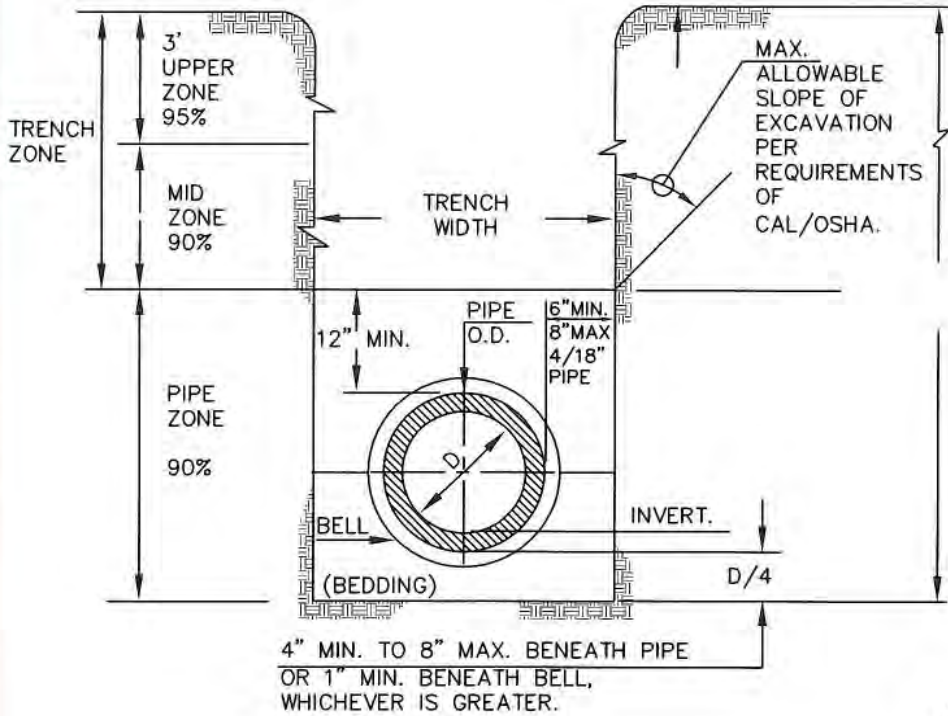
- WEIGHTS:
 INNER COVER = 155 LBS.
 OUTER COVER = 300 LBS.
 FRAME = 330 LBS.
- MATERIAL: CAST IRON.
- MACHINE SEATS TO PREVENT NOISE.
- FILLET RADII TO BE 12".
- IMPORTED COVERS AND FRAMES SHALL HAVE CONTRY OF ORIGIN MARKING IN COMPLIANCE WITH FEDERAL REGULATIONS.



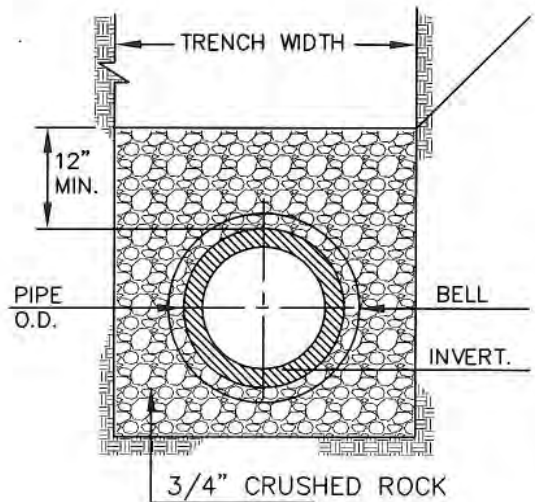
SECTION A-A

REV.	APPROVED	DATE	CITY OF CARLSBAD	Robert T. Johnson Jr. 7/10/08
			MANHOLE	CITY ENGINEER DATE
			FRAME & COVER	SUPPLEMENTAL STANDARD NO. S-4

TYPICAL TRENCH SECTION WITH DIMENSIONS AND COMPACTION ZONES



P.V.C. PIPE PIPE ZONE



NOTES:

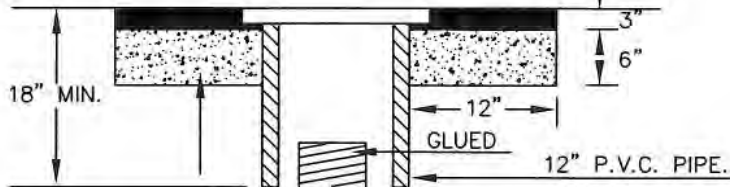
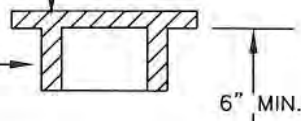
1. PERCENTAGES SHOWN EQUAL MINIMUM RELATIVE COMPACTION.
2. MINIMUM DEPTH OF COVER FROM TOP OF PIPE TO FINISH GRADE FOR ALL SANITARY SEWER INSTALLATIONS SHALL BE 3 FEET. FOR COVER LESS THAN 3', SPECIAL DESIGN AND APPROVAL REQUIRED.
3. TRENCH ZONE BACKFILL SHALL BE PER SECTION 02223. NO ROCKS LARGER THAN 4" IN ANY DIMENSION WILL BE ALLOWED IN BACKFILL. ASPHALT OR CONCRETE CHUNKS WILL NOT BE ALLOWED.

REV.	APPROVED	DATE	CITY OF CARLSBAD	
			PIPE BEDDING AND TRENCH BACKFILL FOR SEWERS	<i>Robert T. Johns, Jr.</i> 7/10/08 CITY ENGINEER DATE
				SUPPLEMENTAL STANDARD NO. S-5

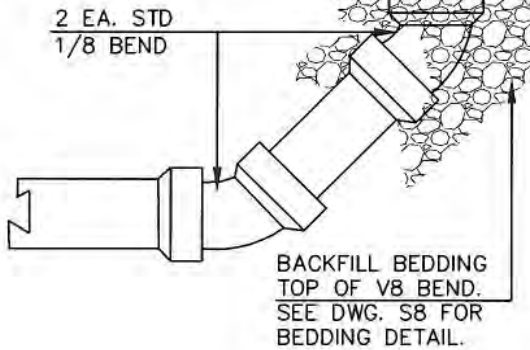
12" CAST IRON GATE CAP
 PER DETAIL HEREON.

ALHAMBRA FOUNDRY
 #29612 CAST IRON
 BOX/LID MARKED
 SEWER #

SEWER CLEAN-OUT RISERS
 TO BE FITTED WITH MALE
 SCREW IN PLUG.

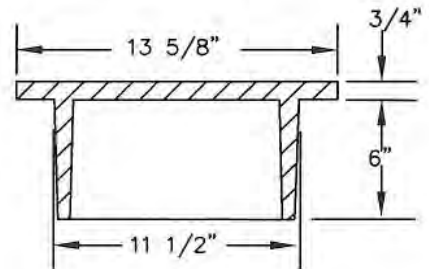
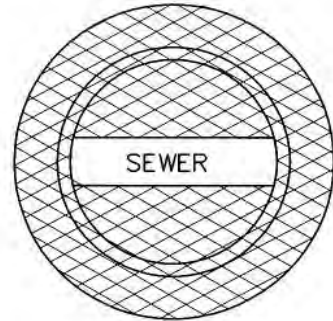


12" WIDE X 6" THICK
 CLASS 560-C-3250 CONCRETE
 COLLAR WITH 3" ASPHALT
 CONCRETE OVERLAY
 (TYPICAL).



BACKFILL BEDDING
 TOP OF V8 BEND.
 SEE DWG. S8 FOR
 BEDDING DETAIL.

GATE CAP (HEAVY DUTY)



NOTES:

1. GATE CAP SHALL BE LABELED SEWER.
2. CLEANOUTS MAY BE USED WITH P.V.C. SEWER MAIN.
3. RISER SHALL BE SAME DIAMETER AS SEWER MAIN.

REV.	APPROVED	DATE	CITY OF CARLSBAD	Robert T. Johnson Jr. 7/10/08
			SEWER MAIN CLEANOUT	CITY ENGINEER DATE
				SUPPLEMENTAL STANDARD NO. S-6

CLEAN-OUTS IN YARD TO BE COVERED WITH 10" PLASTIC COVER BY CARSON PART NO. 910 O.A.E. CLEAN-OUTS IN CONCRETE TO HAVE CONCRETE BOX WITH TRAFFIC LID BY J&R OR BROOKS PART NO. 3-R-T.

SEWER CLEAN-OUT RISERS TO BE FITTED WITH MALE SCREW IN PLUG.

OPTIONAL WYE (WHEN APPROVED).

WYE WITH 1 FOOT STUB AND PLUG.

WYE (TO BE SET AT 45 DEGREE ANGLE).

GLUED

FIN. GRADE

12"

5' MIN.

OPTIONAL 90° ELBOW WHEN APPROVED

1/4" PER FOOT MIN. SLOPE

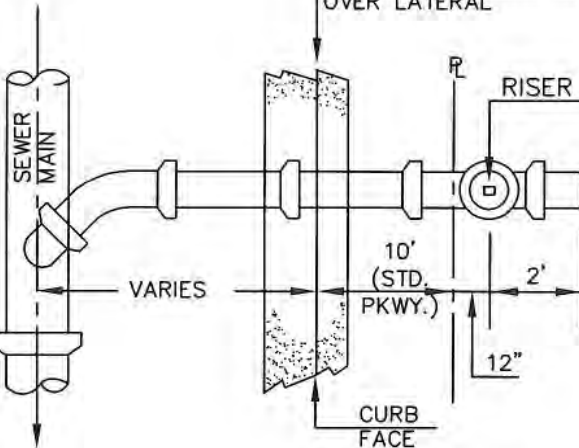
FOR BEDDING AND TRENCH COMPACTION SEE DWG. NO. S5.

SEWER MAIN

SECTION

STAMP CURB FACE "SS" OVER LATERAL

RISER PLUG



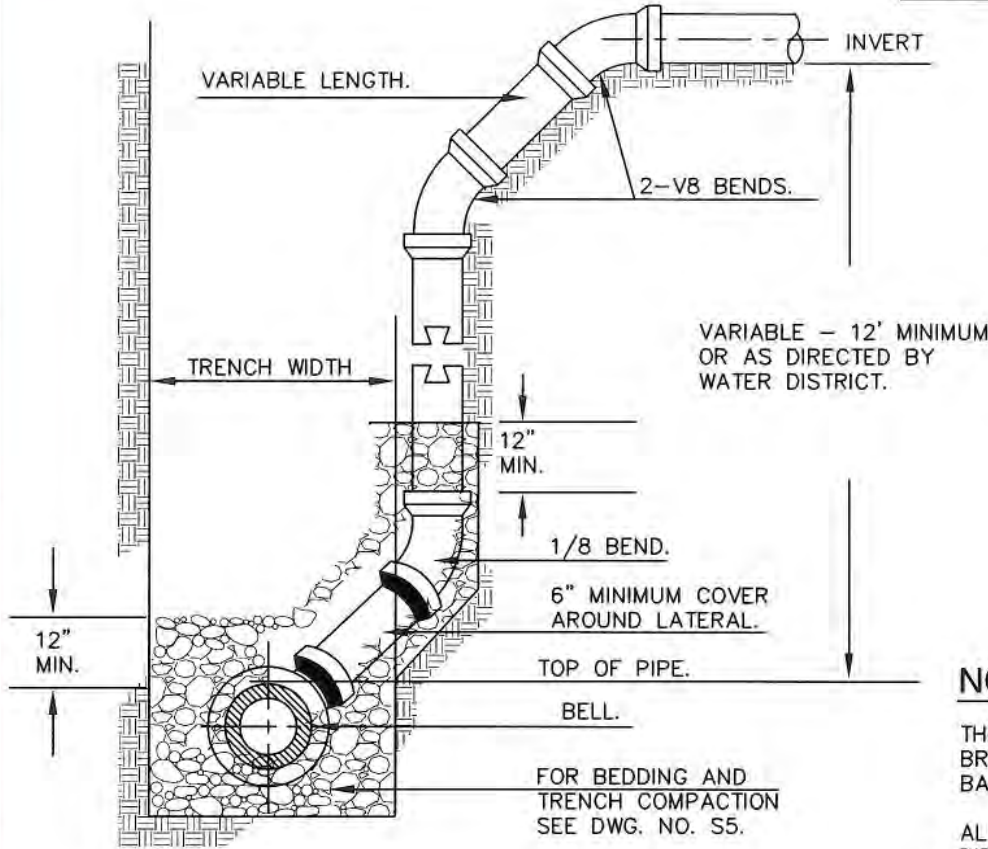
PLAN VIEW

NOTES:

1. THE LATERAL SHALL BE BEDDED THE SAME AS THE MAIN LINE SEWER.
2. IN NO CASE SHALL A LATERAL CONNECT TO THE SEWER MAIN DIRECTLY ON TOP OF THE PIPE.
3. SEWER LATERALS SHALL HAVE A 2% MINIMUM SLOPE.
4. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
5. AS-BUILT SEWER LATERAL LOCATIONS SHALL BE FURNISHED TO THE CITY INSPECTOR ON FORMS PROVIDED PRIOR TO FINAL APPROVAL OF WORK.
6. ALL LATERAL TRENCHES TO PROPERTY LINE AND SEWER MAIN TRENCHES TO BE COMPACTED PER S5.
7. CLEAN-OUT TO BE ADJUSTED TO GRADE AFTER FINAL FINISH GRADING.
8. FOR BACKFILL AROUND CLEANOUT RISER SEE DWG. S-5, NOTE 3.
9. MAINTENANCE OF THE SEWER LATERAL FROM THE SEWER MAIN TO THE BUILDING IS THE RESPONSIBILITY OF THE PROPERTY OWNER.

REV.	APPROVED	DATE	CITY OF CARLSBAD	Robert T. Johnson Jr. 7/10/08
			SEWER LATERAL	CITY ENGINEER DATE
			(WITH OPTIONAL WYE)	SUPPLEMENTAL STANDARD NO. S-7

ELEVATION

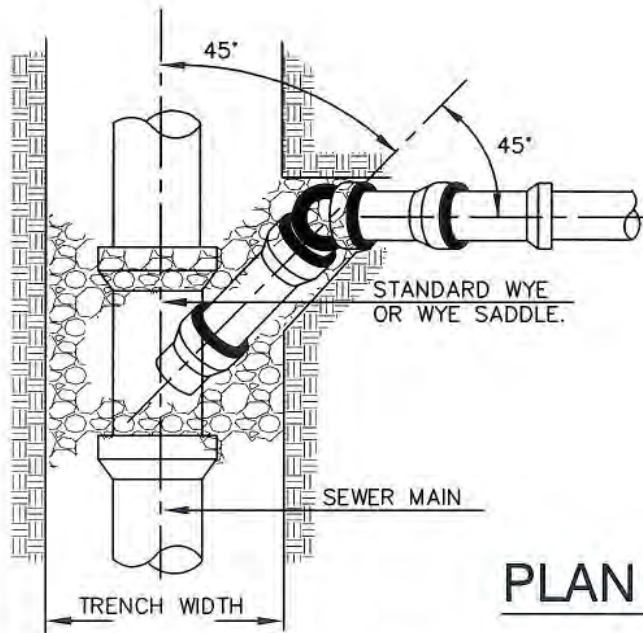


NOTES:

THE VERTICAL PIPE SHALL BE BRACED WHILE TRENCH IS BEING BACKFILLED.

ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.

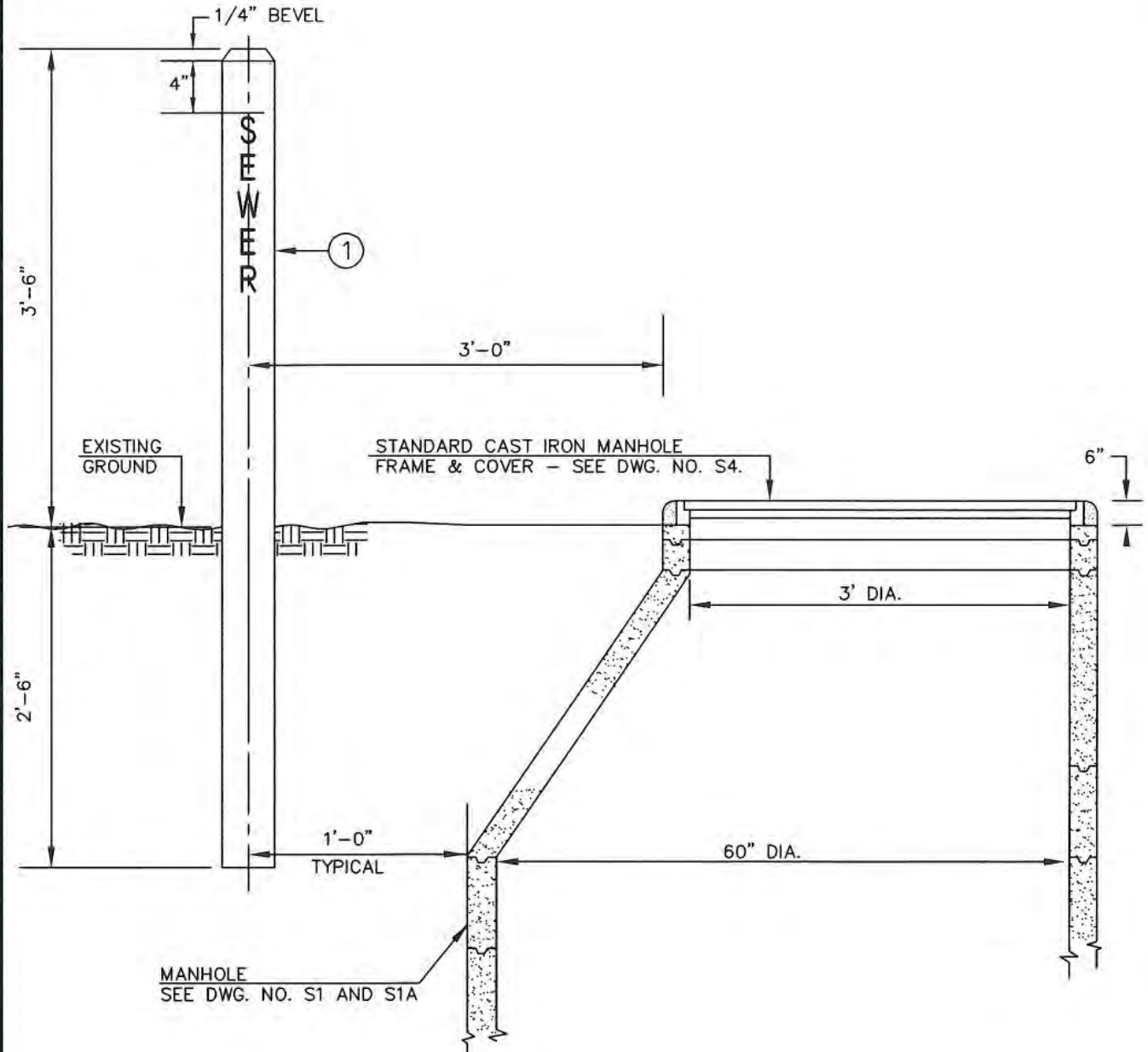
MAINTENANCE OF SEWER LATERAL FROM MAIN TO BUILDING IS THE RESPONSIBILITY OF THE OWNER.



SEE DWG. NO. S7 FOR CONTINUATION OF SEWER LATERAL TO PROPERTY LINE.

PLAN VIEW

REV.	APPROVED	DATE	CITY OF CARLSBAD	
			SEWER LATERAL (DEEP CUT HOUSE CONNECTION)	
			Robert T. Johnson Jr. 7/10/08 CITY ENGINEER	DATE
			SUPPLEMENTAL STANDARD NO.	S-8



NOT TO SCALE

ITEM	DESCRIPTION	SPEC/DWG
1	4X4" REDWOOD OR PRESSURE TREATED DOUGLAS FIR (S4S).	

REV.	APPROVED	DATE	CITY OF CARLSBAD	
			MANHOLE MARKER POST	
			Robert T. Johnson Jr. 7/10/08 CITY ENGINEER DATE	SUPPLEMENTAL STANDARD NO. S-9