



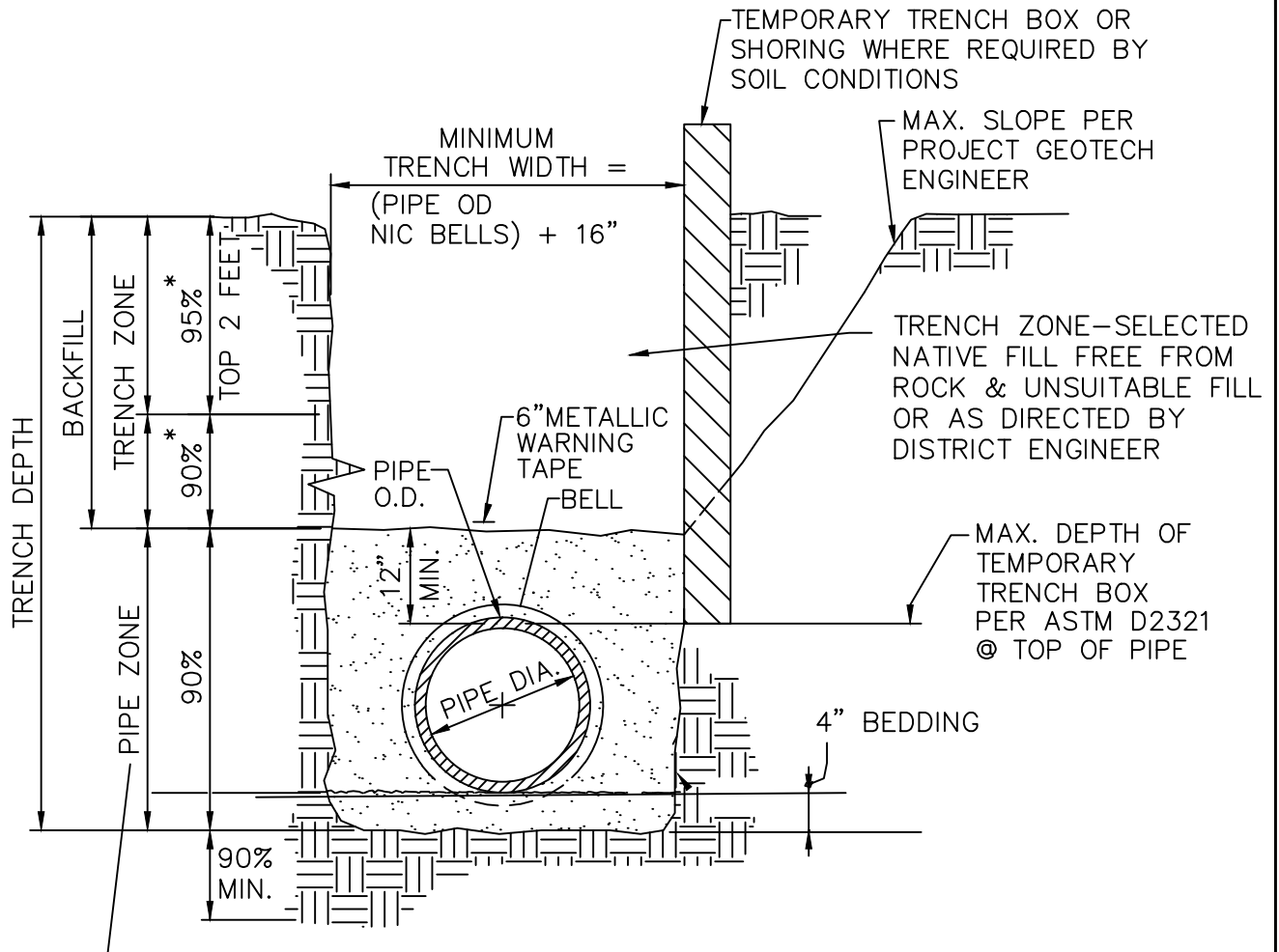
SECTION 4

STANDARD DRAWINGS SANITARY SEWER FACILITIES

SECTION 4

STANDARD DRAWINGS – SANITARY SEWER



S-1	Standard Pipe Zone and Trench Backfill
S-2	Concrete Encasement
S-3	Pipeline Separation Requirements
S-4	Drawing Deleted
S-5	Standard Precast Concrete Manhole (5' dia.)
S-6	Standard Precast Concrete Inside Drop Manhole
S-7	36" Manhole Frame and Two Concentric Covers
S-8	New Installation Sewer Lateral
S-9	Deep Cut Sewer Lateral
S-10	Standard Cutoff Wall (Anchor)
S-11	Standard Cul-de-Sac Sewer Laterals
S-12	Sewer Manhole Adjustment & Notes
S-13	DELETED = notes moved to S-12
S-14	Trench Resurfacing Type A & B

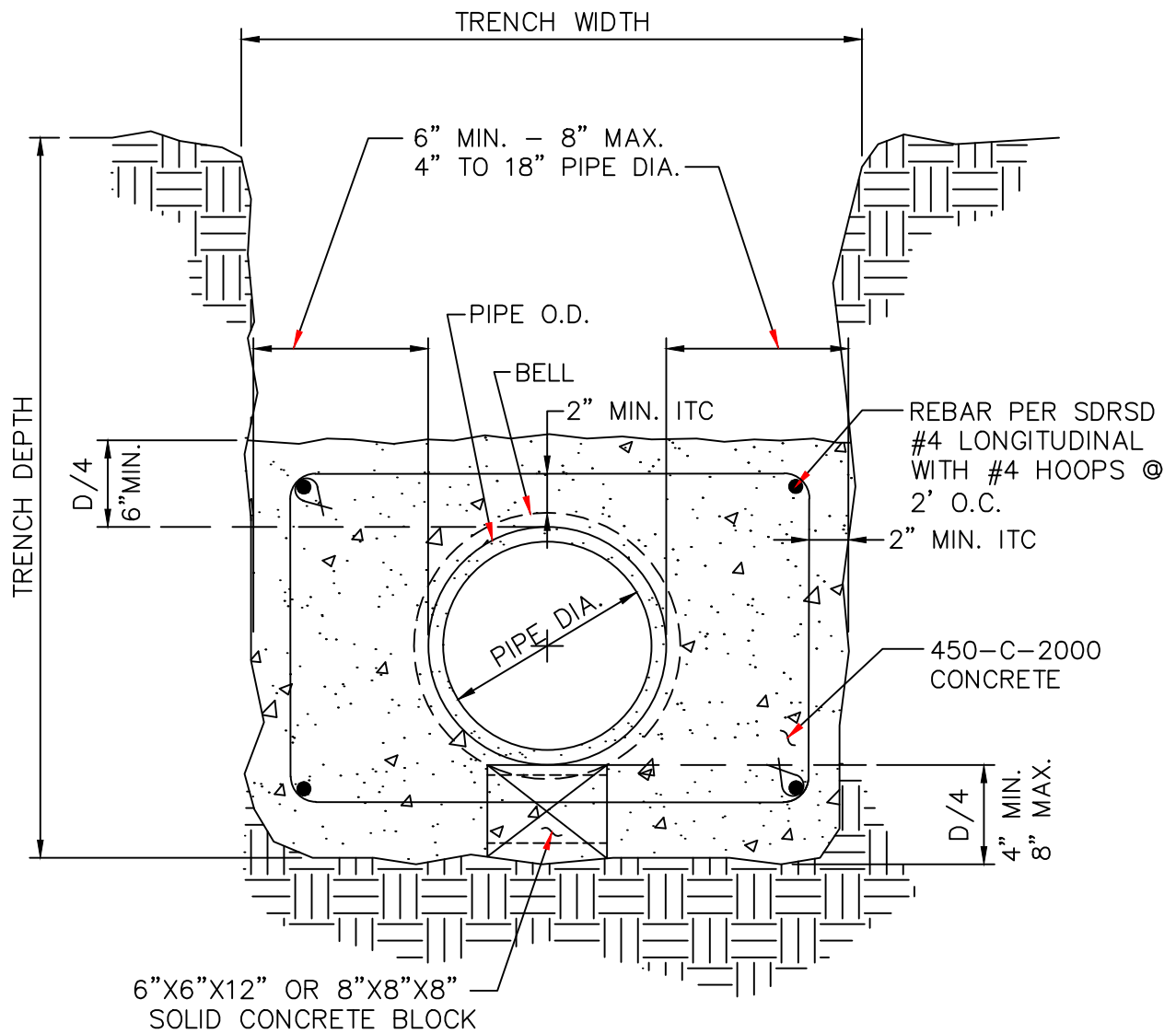


PIPE ZONE - 3/8" MAX,
CRUSHED ROCK, ENCASEMENT
(OR PEA GRAVEL)

NOTES:

1. ALL PIPING SHALL BE INSTALLED IN ACCORDANCE W/ ASTM D2321 (STD PRACTICE FOR UG INSTALLATION OF PIPE FOR SEWERS & OTHER GRAVITY-FLOW APPLICATIONS.)
2. FOR TRENCHING IN IMPROVED STREETS, RESTORE PAVEMENT TO THE JURISDICTIONAL AGENCY'S STANDARDS.
3. (*) INDICATES MINIMUM RELATIVE COMPACTION. RELATIVE COMPACTION UNDER STREETS SHALL BE IN ACCORDANCE WITH LOCAL CITY OR JURISDICTIONAL REQUIREMENTS.

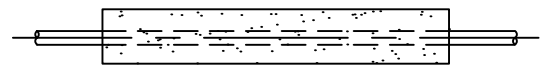
	Rev.Date	By	Apprv'd		STANDARD PIPE ZONE AND TRENCH BACKFILL	DRAWING NO.
	5/24/17	SMD	JRB			S-1
	3/13/18	SMD	JRB			



SECTION

NOTE:

1. ENCASE PIPE TO NEAREST FLEXIBLE JOINT
2. ALSO APPLIES WHERE WATER LINES MUST BE ENCASED AS DIRECTED BY DISTRICT ENGINEER



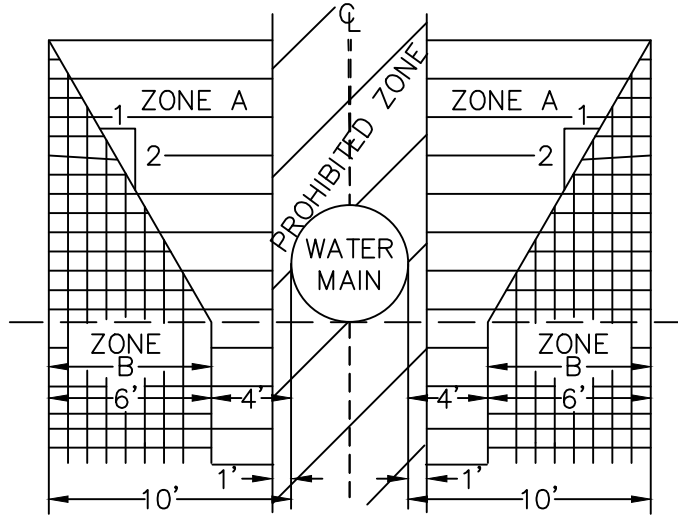
LEGEND ON PLANS

	Rev.Date	By	Apprv'd		<p style="text-align: center; font-size: 24pt; font-weight: bold;">CONCRETE ENCASEMENT</p>	DRAWING NO.
	5/24/17	SMD	JRB			S-2

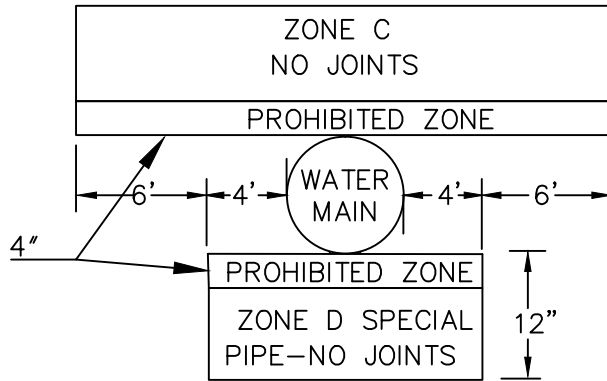
SEPARATION STANDARDS:

1. WATER & SEWER MAINS SHALL BE INSTALLED IN SEPARATE TRENCHES.
2. PARALLEL CONSTRUCTION: THE HORIZONTAL DISTANCE BETWEEN PRESSURE WATER LINE AND SEWER OR NON-POTABLE PIPE SHALL BE AT LEAST 10 FEET.
3. PERPENDICULAR CONSTRUCTION (CROSSING): PRESSURE WATERLINES SHALL BE AT LEAST 12" ABOVE SEWER LINES OR NON-POTABLE RECYCLED WATERLINES, WHERE THESE LINES MUST CROSS.
4. SPECIAL PROVISIONS: ALTERNATIVE CONSTRUCTION CRITERIA WHERE THE BASIC SEPARATION STANDARDS ABOVE CANNOT BE ATTAINED ARE SHOWN BELOW.

PARALLEL CONSTRUCTION (CASE 1)



PERPENDICULAR CONSTRUCTION (CASE 1)



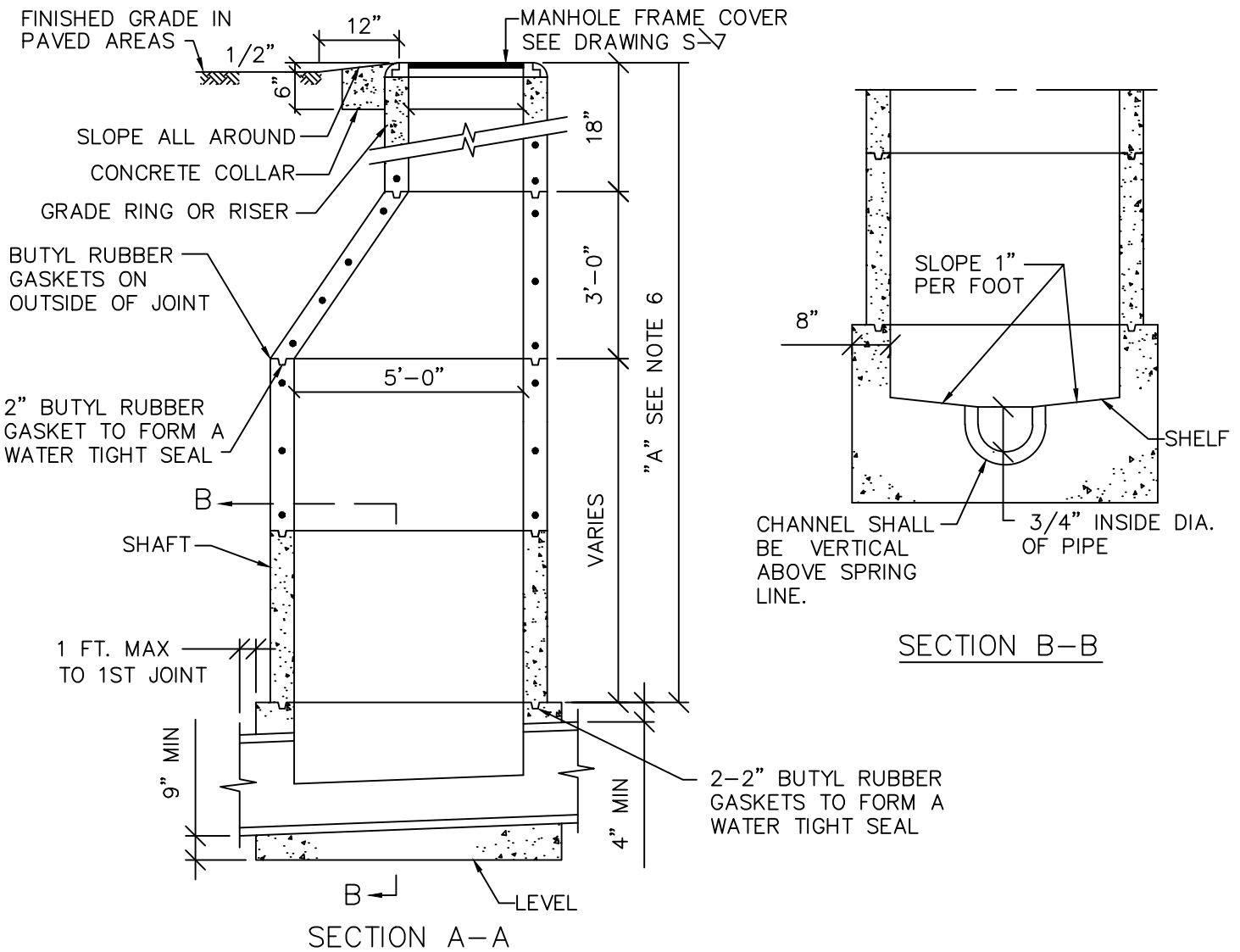
NOTES:

- A. DIMENSIONS ARE FROM OUTSIDE OF WATER MAIN TO OUTSIDE OF SEWER.
- B. SANITARY SEWERS OR WATERLINES ARE NOT PERMITTED WITHIN ANY OF THE INDICATED ZONES UNLESS CONSTRUCTED IN CONFORMANCE WITH THE SPECIAL REQUIREMENTS NOTED BELOW.

ZONE SPECIAL SEWER CONSTRUCTION REQUIREMENTS: (INSTALLING NEAR EXISTING WATERLINE = CASE 1)

- A. SANITARY SEWER MAINS RUNNING PARALLEL TO WATER MAINS SHALL NOT BE PERMITTED WITHIN THIS ZONE WITHOUT SPECIAL WRITTEN PERMISSION FROM THE SAN DIEGO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH.
- B. NEW SEWER MAINLINES INSTALLED IN THIS ZONE SHALL BE SDR-35 PVC RUBBER GASKETED PIPE.
- C. NEW SEWER MAINLINES INSTALLED IN THIS ZONE, PERPENDICULAR TO AND ABOVE WATERLINE, REQUIRES THAT THE SEWER LINE HAVE NO JOINTS TEN (10) FEET ON EITHER SIDE OF THE WATERLINE, AND CONSTRUCTED OF MATERIAL LISTED IN ZONE D.
- D. NEW SEWER LINE INSTALLED IN THIS ZONE, BELOW EXISTING WATERLINE, SHALL HAVE NO JOINTS WITHIN FOUR (4) FEET OF THE WATER LINE CROSSING AND BE CONSTRUCTED OF GASKETED CLASS 200, C900 PVC, CENTERED OVER PIPE BEING CROSSED, AND CONCRETE ENCASED OR, OPTIONALLY, WITHIN A CONTINUOUS STEEL CASING 1/4" THICK AND ALL VOIDS BETWEEN SEWER AND CASING PRESSURE GROUTED WITH SAND CEMENT GROUT.

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	5/24/17	SMD	JRB			S-3



NOTES:

1. MANHOLE FRAME SHALL BE SET IN CLASS "C" MORTAR.
2. ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. VERTICAL WALL OF CONE SHALL BE ON THE UPSTREAM SIDE OF THE MANHOLE.
4. CONCRETE BASE SHALL BE 560-C-3250.
5. "SAND COLLAR" MH ADAPTORS SHALL BE PROVIDED FOR ALL MH CONNECTIONS.
6. PRECAST SECTIONS SHALL BE USED WITHIN DIMENSION "A" AS REQUIRED, IN ORDER OF PREFERENCE LISTED:
 - A. CONE (NOTCHED FOR PIPE IF DIMENSION "A" IS LESS THEN 3').
 - B. 6" TO 18" OF 3' DIAMETER GRADE RINGS/AND/OR RISERS.
 - C. 5' DIAMETER SHAFT VARIABLE HEIGHT.
7. ALL PATCHING WITHIN MANHOLE BASE SHALL BE EPOXY MORTAR.
8. PRIOR APPROVAL OF PRECAST BASE IS REQUIRED BY THE DISTRICT ENGINEER.
9. MAXIMUM ALLOWABLE CHANGE OF DIRECTION AT MH = 45°.
10. PROVIDE SPECIFIC DETAIL FOR REVIEW AND APPROVAL BY DISTRICT ENGINEER FOR MH'S W/ MORE THAN ONE INLET OR OUTLET, 18" OR LARGER.
11. APPLY CORROSION PROTECTION PER SECTION 03461-1.06



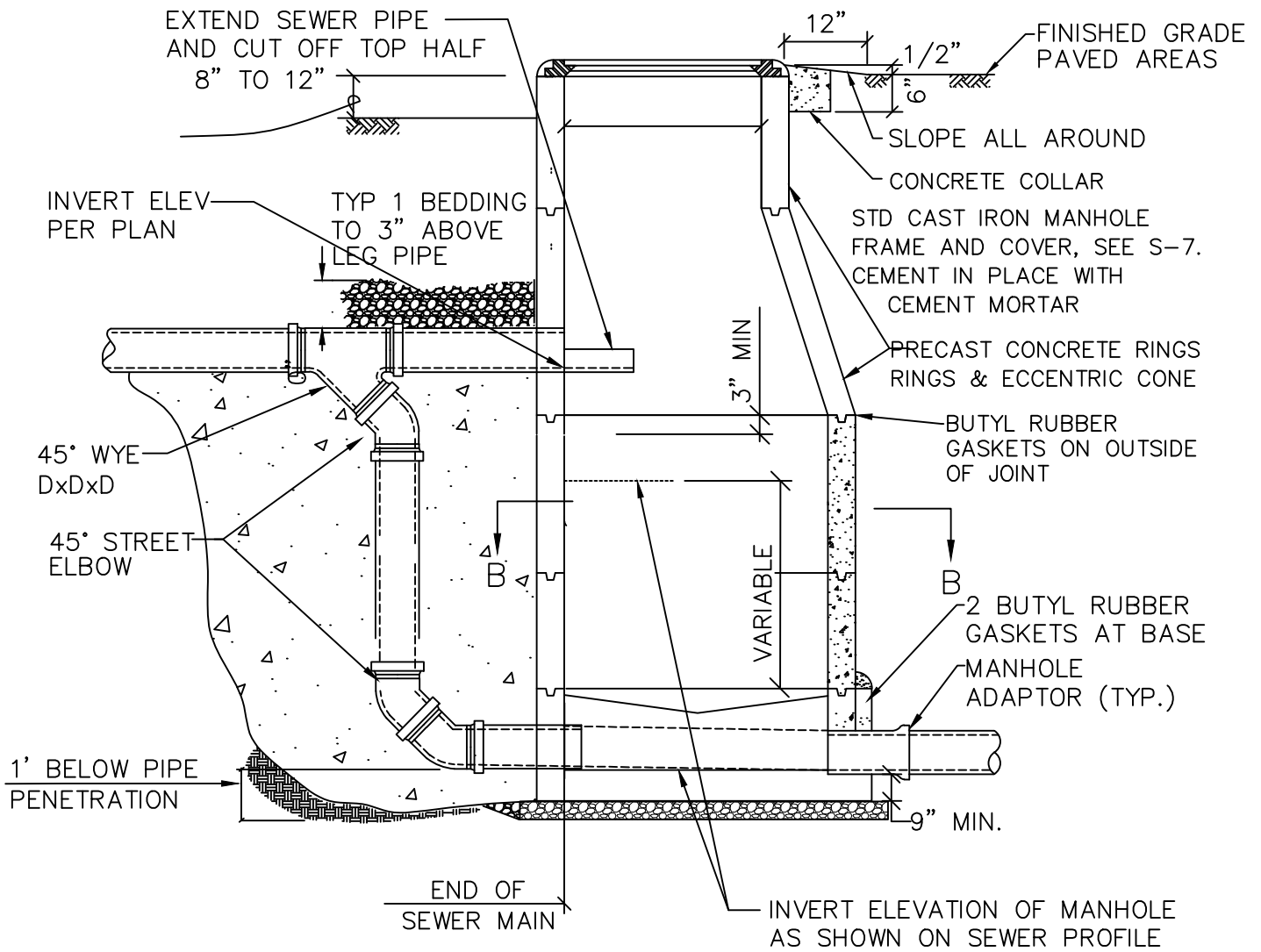
Rev. Date	By	Apprv'd
5/24/17	SMD	JRB



**STANDARD PRECAST CONCRETE
MANHOLE (5' DIA.)
5x3**

DRAWING NO.

S-5

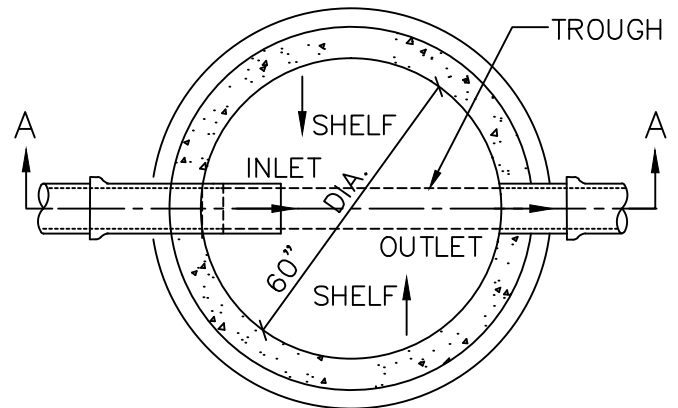


SECTION A-A

(316 SST)

NOTES:

1. DROP MANHOLE SHALL BE IDENTICAL TO STANDARD CONCRETE MANHOLE, EXCEPT FOR PIPE DETAILS AS SHOWN.
2. THE DROP MANHOLE TEE SHALL ENTER THE 5' DIA. RING
3. CLEAN AND ROUGHEN OUTSIDE SURFACE OF RINGS AND APPLY NEAT CEMENT PAST PRIOR TO POURING SUPPORT FOR DROP SECTION.
4. NO MANHOLE STEPS ALLOWED.
5. APPLY CORROSION PROTECTION PER SECTION 03461-1.06



SECTION B-B



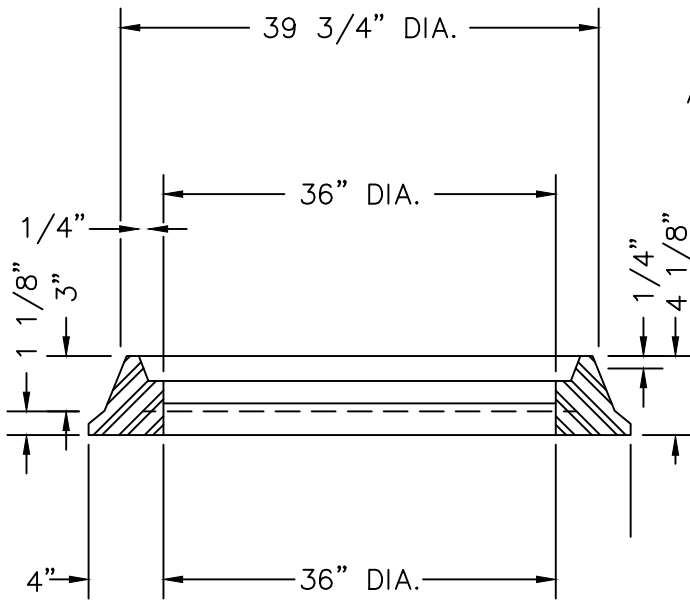
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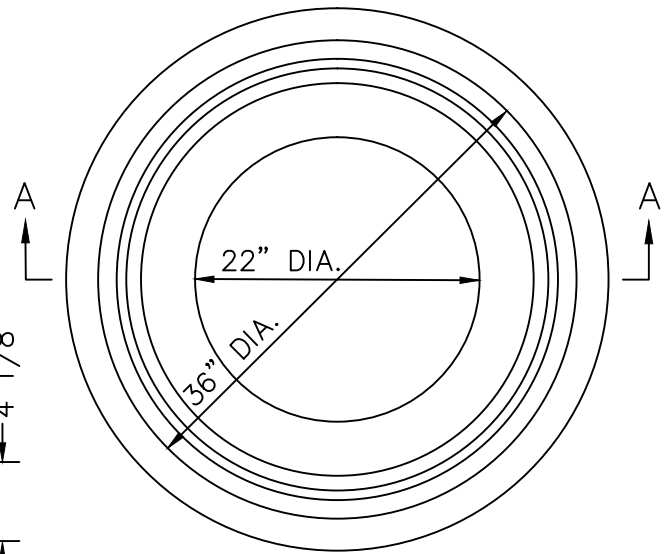
**STANDARD PRECAST
CONCRETE INSIDE
DROP MANHOLE 5x3**

DRAWING NO.

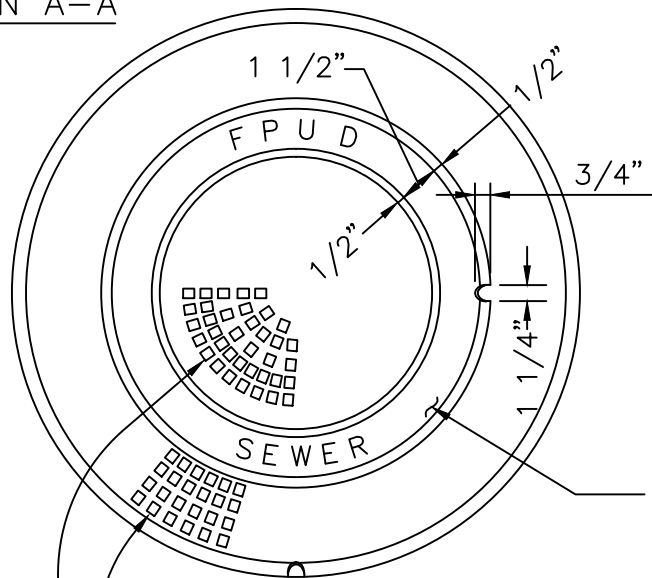
S-6



SECTION A-A



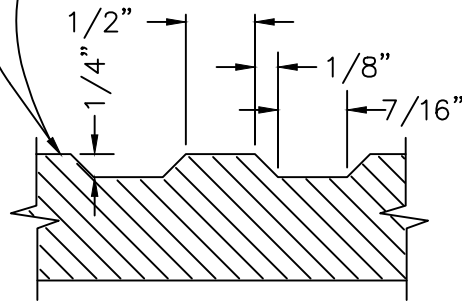
FRAME



FOR INNER COLLAR
SEE STANDARD
DRAWING S-6

NOTE:

1. LOCKING FRAMES AND COVERS ARE REQUIRED IN REMOTE AREAS OR AS DETERMINED BY THE DISTRICT ENGINEER



COVER

LETTER 'S' STAMPED OR CHISELED IN FACE OF CURB, NOT LESS THAN 2" HIGH AND 3/16" DEEP.

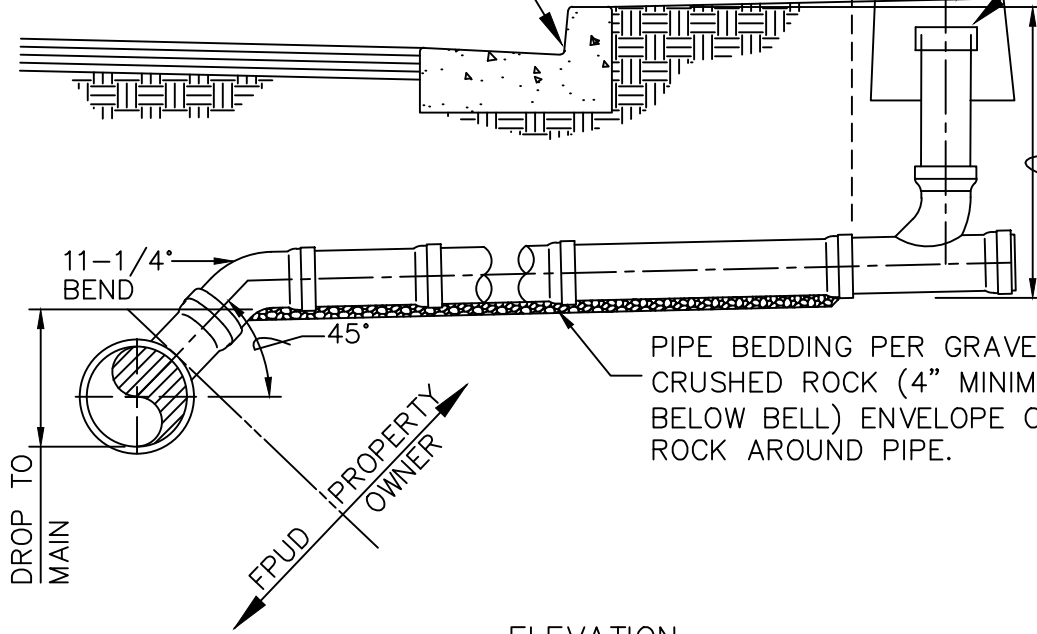
GROUND SURFACE GRADED AWAY FROM BOX.

PROPERTY LINE

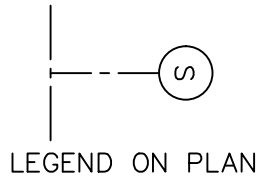
CLEAN OUT BOX (SEE NOTES).

POP-OFF LID SHALL BE LOOSE FIT RUBBER CAP WITH STEEL BANDS REMOVED, AT LEAST 1" BELOW LID.

5-1/2' MIN. FL TO TOP OF CURB MEASURED AT FL

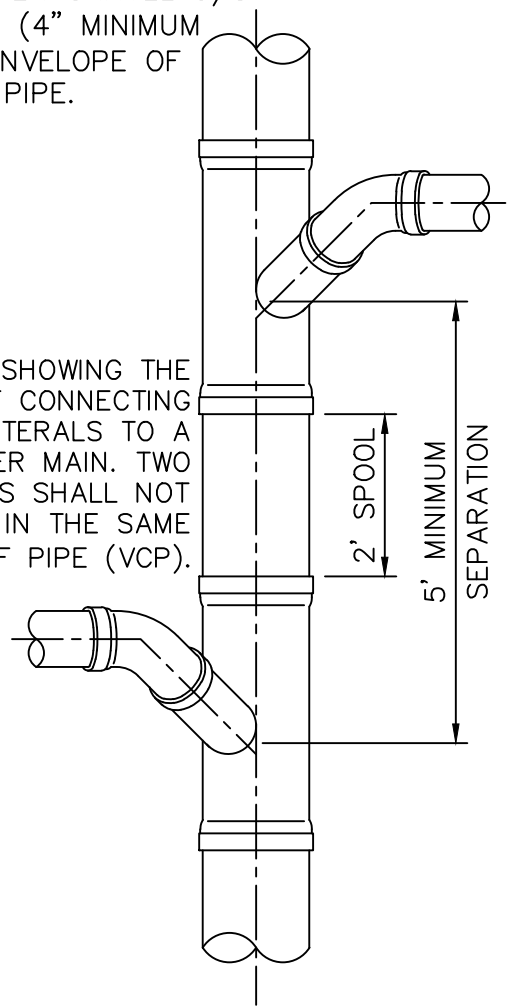


ELEVATION



LEGEND ON PLAN

DETAIL SHOWING THE MANNER OF CONNECTING OPPOSITE LATERALS TO A SEWER MAIN. TWO CONNECTIONS SHALL NOT BE MADE IN THE SAME LENGTH OF PIPE (VCP).



PLAN

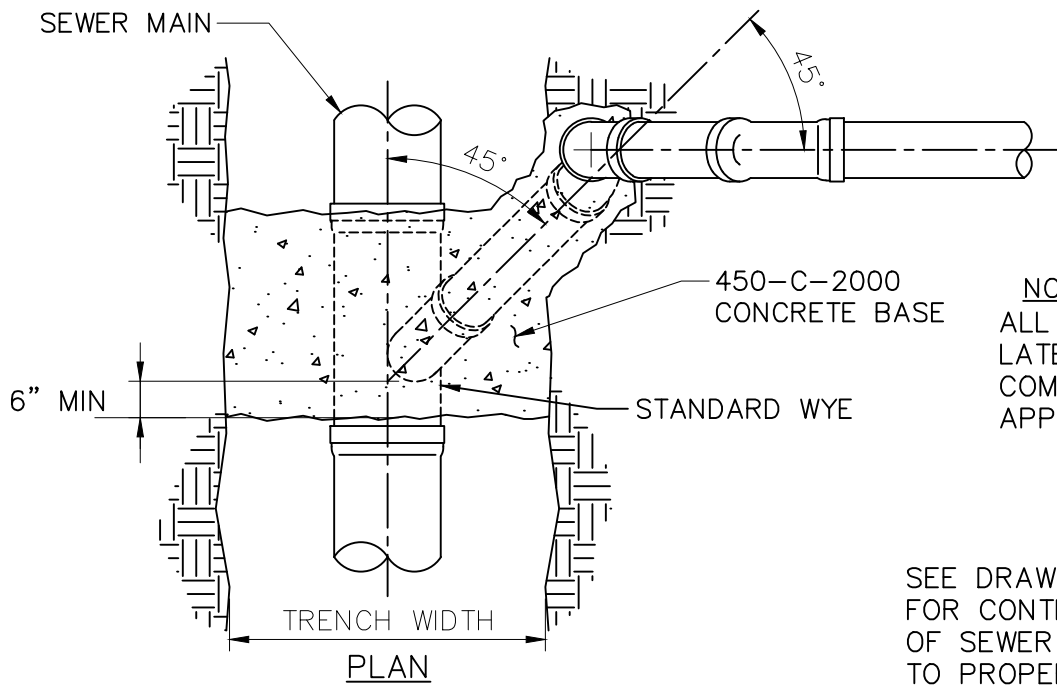
NOTES:

1. IN NO CASE SHALL A LATERAL CONNECT TO THE SEWER MAIN DIRECTLY ON TOP OF THE PIPE.
2. SEWER LATERALS SHALL HAVE A MIN. SLOPE OF 2%.
3. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE OR APPROVED SOLVENT WELD.
4. LATERAL SHALL EXTEND TO PROPERTY LINE UNLESS OTHERWISE SHOWN ON PLANS.
5. CLEAN OUT BOX: CARSON IND. SERIES 910-10 / 910-4T COVER, MARKED "SEWER" ON LID. IN PAVED OR TRAFFIC AREAS, USE CONCRETE BOX: BROOKS PROD. P3 W/ STEEL LID MARKED "SEWER".
6. TOP OF CLEAN-OUT BOX MUST BE AT LEAST 2 FT. BELOW HOUSE ELEVATION.
7. CLAY PIPE LATERALS USE BAND-SEAL STOPPER FOR POP-OFF LID (STEEL BAND REMOVED).
8. LATERALS INSTALLED ON EXISTING SEWER MAIN SHALL BE CUT-IN; WYE SHALL BE INSTALLED WITH STUBS AND MAX-ADAPTER COUPLINGS, AS INDICATED ON THE "APPROVED MATERIALS LIST."

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5/24/17	SMD	JRB
4/26/18	SMD	JRB

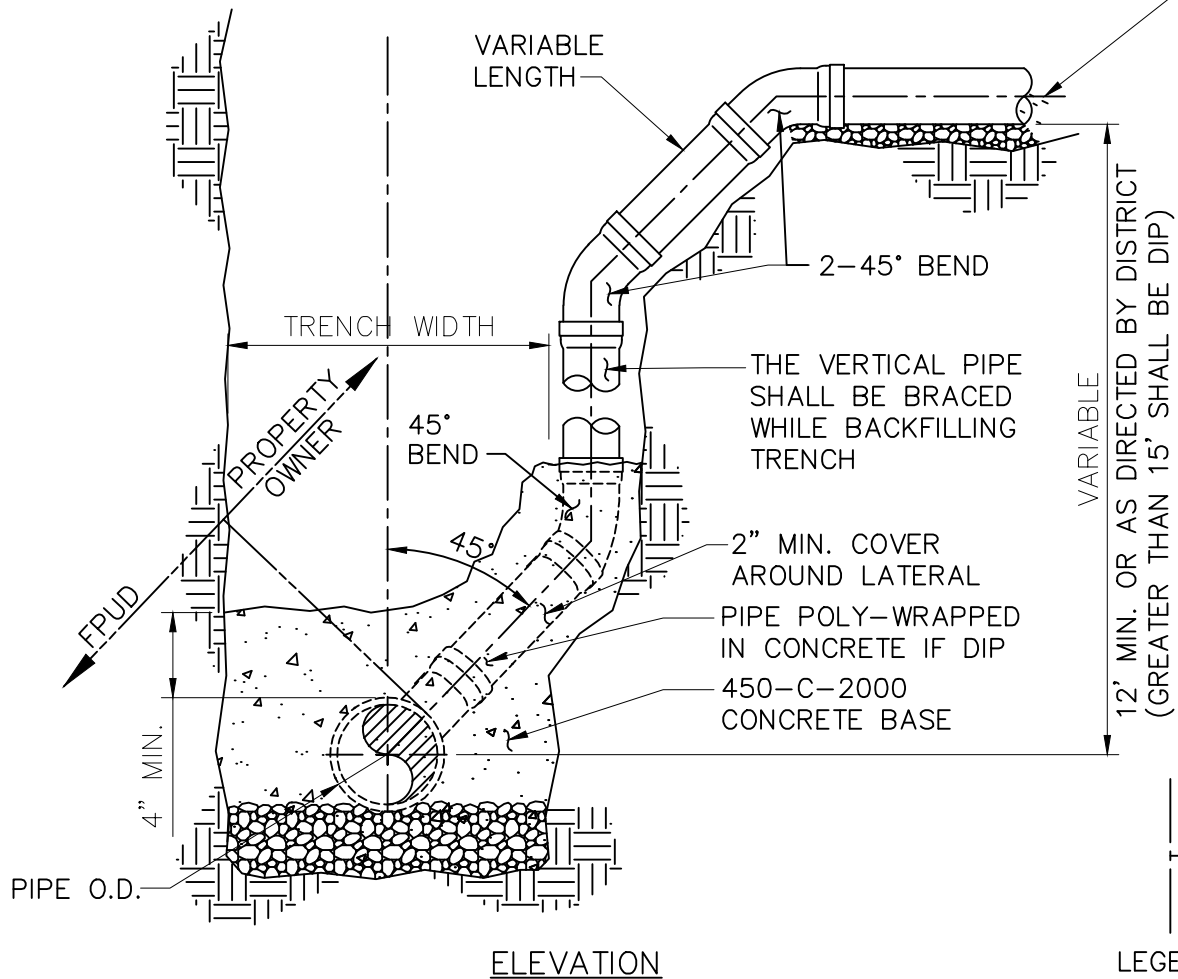
NEW INSTALLATION
PVC SEWER LATERAL

DRAWING NO.
S-8



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

SEE DRAWING S-8 FOR CONTINUATION OF SEWER LATERAL TO PROPERTY LINE



LEGEND ON PLAN

2



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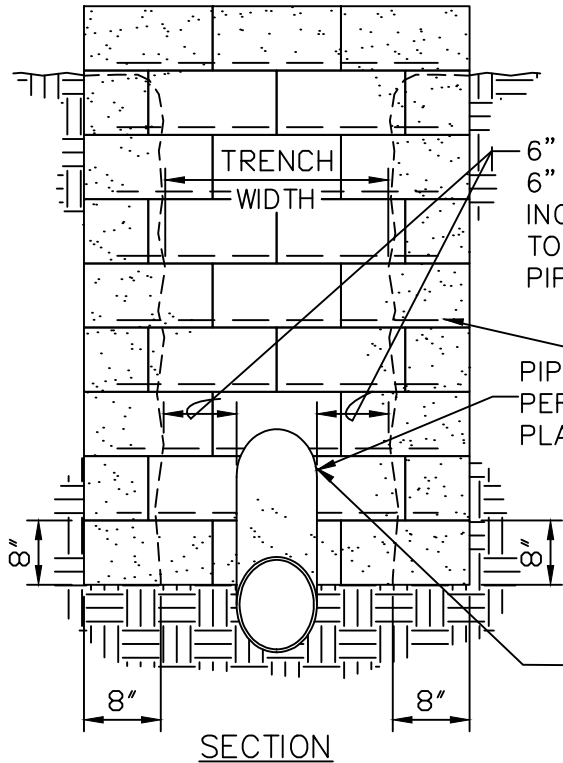
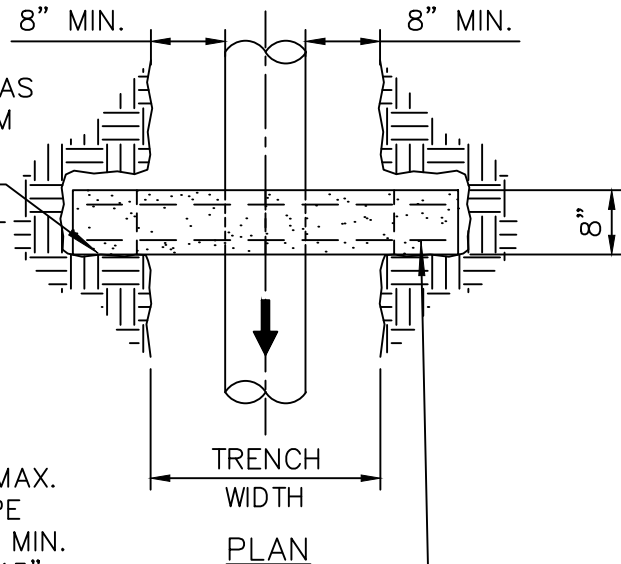
DEEP CUT SEWER LATERAL

DRAWING NO.

S-9

'X' TO NEXT STRUCTURE

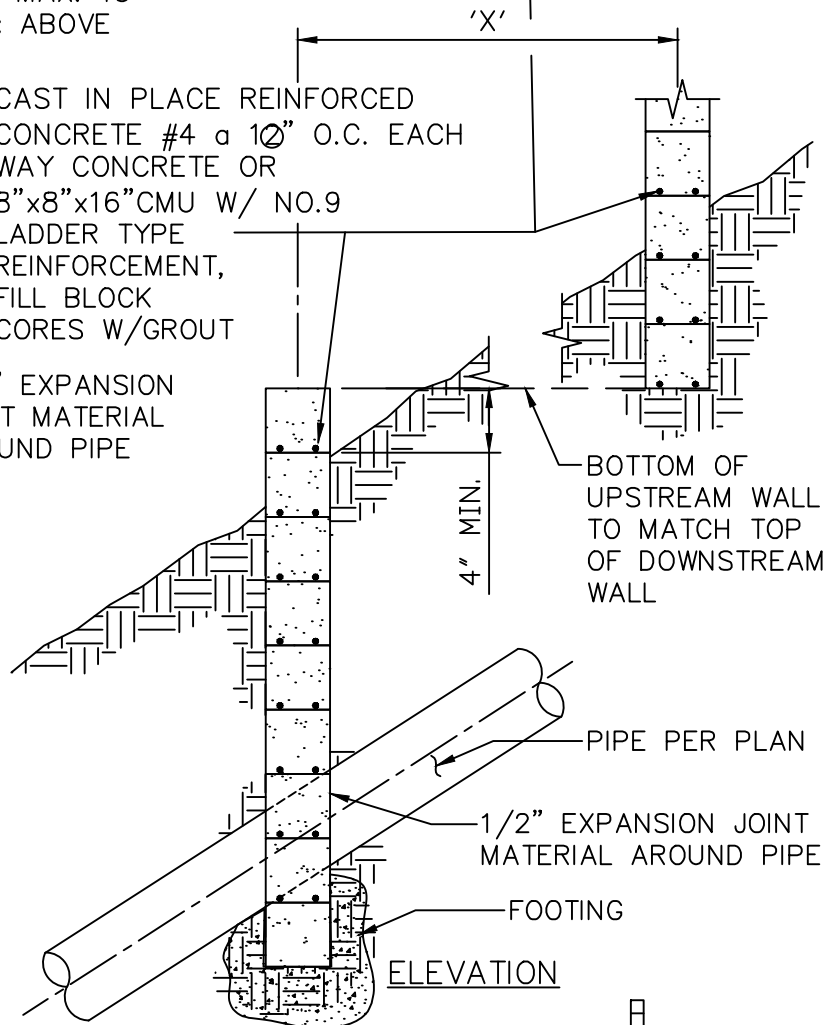
CMU BLOCKS LAID TIGHT AS POSSIBLE TO DOWNSTREAM PORTION OF NOTCH INTO ORIGINAL GROUND



6" MIN. - 8" MAX.
6" TO 12" PIPE
INCLUSIVE, 6" MIN.
TO 10" MAX. 15"
PIPE & ABOVE

CAST IN PLACE REINFORCED
CONCRETE #4 @ 10" O.C. EACH
WAY CONCRETE OR
8"x8"x16" CMU W/ NO.9
LADDER TYPE
REINFORCEMENT,
FILL BLOCK
CORES W/GROUT

1/2" EXPANSION
JOINT MATERIAL
AROUND PIPE



BOTTOM OF
UPSTREAM WALL
TO MATCH TOP
OF DOWNSTREAM
WALL

PIPE PER PLAN
1/2" EXPANSION JOINT
MATERIAL AROUND PIPE

FOOTING

ELEVATION



LEGEND ON PLAN

PIPE SLOPE	'X'-MAX. DISTANCE
15-20%	45'
20-25%	35'
25-30%	30'
30-40%	20'
>40%	CONSULT DISTRICT

NOTES

1. PIPE ANCHORS REQUIRED ON ALL SLOPES OF 15% OR GREATER.
2. ANCHOR SHALL EXTEND 8" MIN. INTO NATURAL UNDISTURBED SOIL.
3. CONCRETE SHALL BE 450-C-2000
4. ANCHORS FOR TRAPEZOIDAL TRENCH SECTIONS WILL CONFORM TO TRENCH CROSS SECTION AND EXTEND 8" MIN. IN TO UNDISTURBED SOIL.



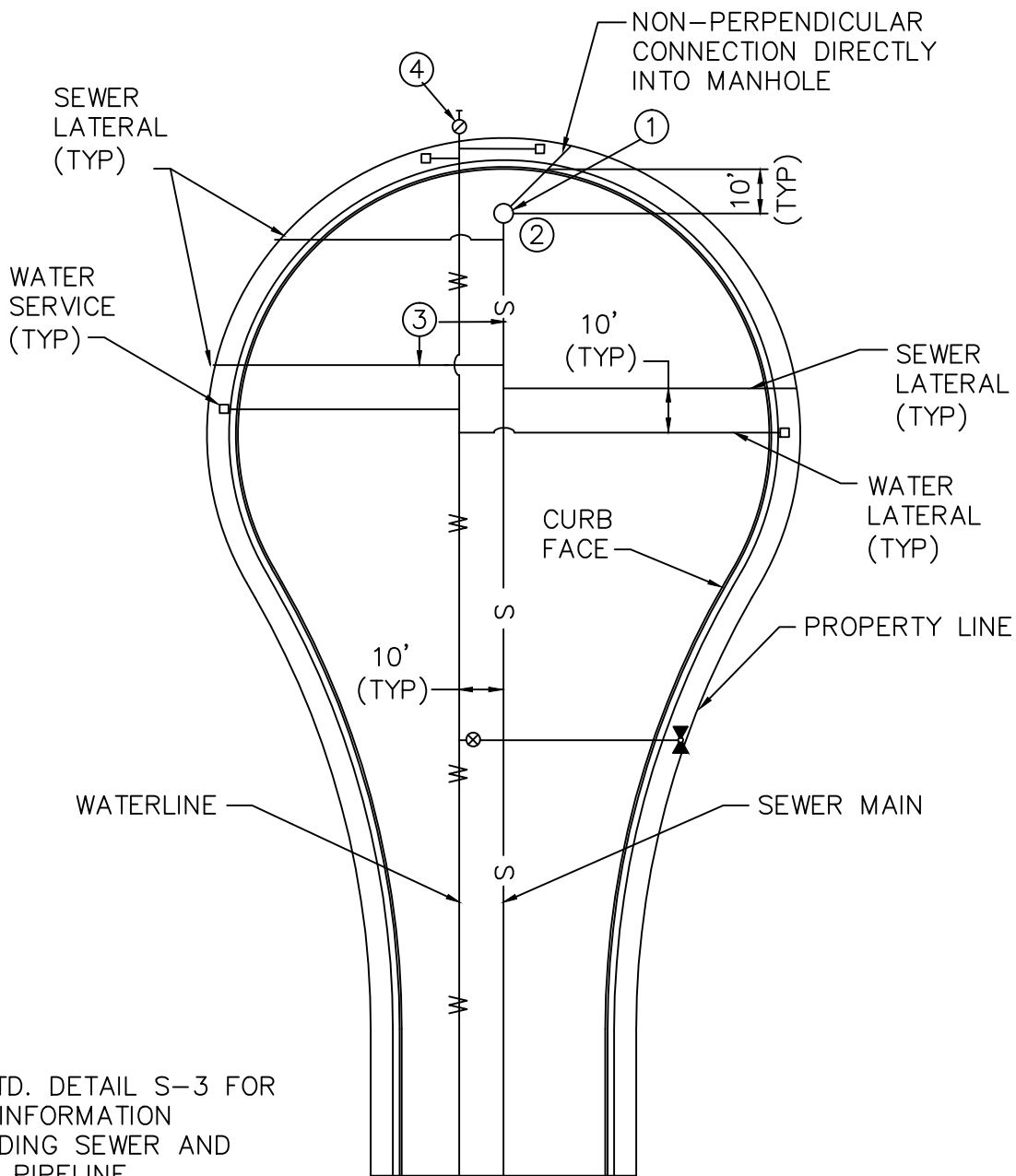
Rev. Date 5/24/17 By SMD Appr'd JRB



STANDARD CUTOFF WALL (ANCHOR)

DRAWING NO.

S-10



NOTE:
 SEE STD. DETAIL S-3 FOR
 MORE INFORMATION
 REGARDING SEWER AND
 WATER PIPELINE
 SEPARATION REQUIREMENTS.

ITEM	DESCRIPTION
1	USE WATER-TIGHT MANHOLE COVER WHERE CUL-DE-SAC CREATES LOW POINT
2	45° ANGLE ONLY IF NECESSARY TO SERVE REAR LOTS (WATER & SEWER)
3	90° ANGLE (STANDARD) (WATER & SEWER)
4	END OF MAIN (BLOWOFF OR AAV). LOCATE TO CLEAR DRIVEWAYS



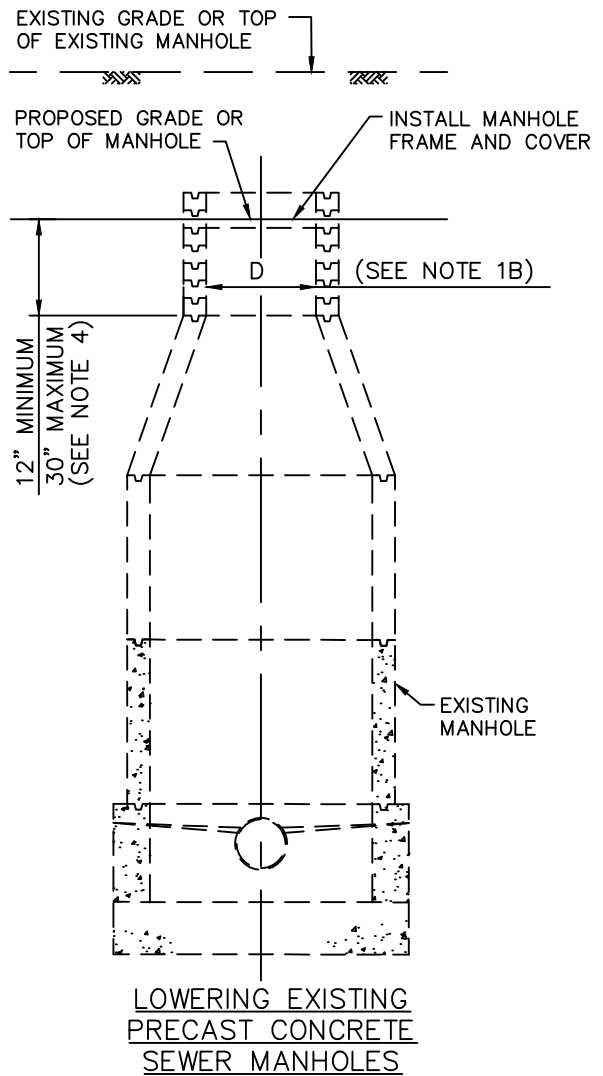
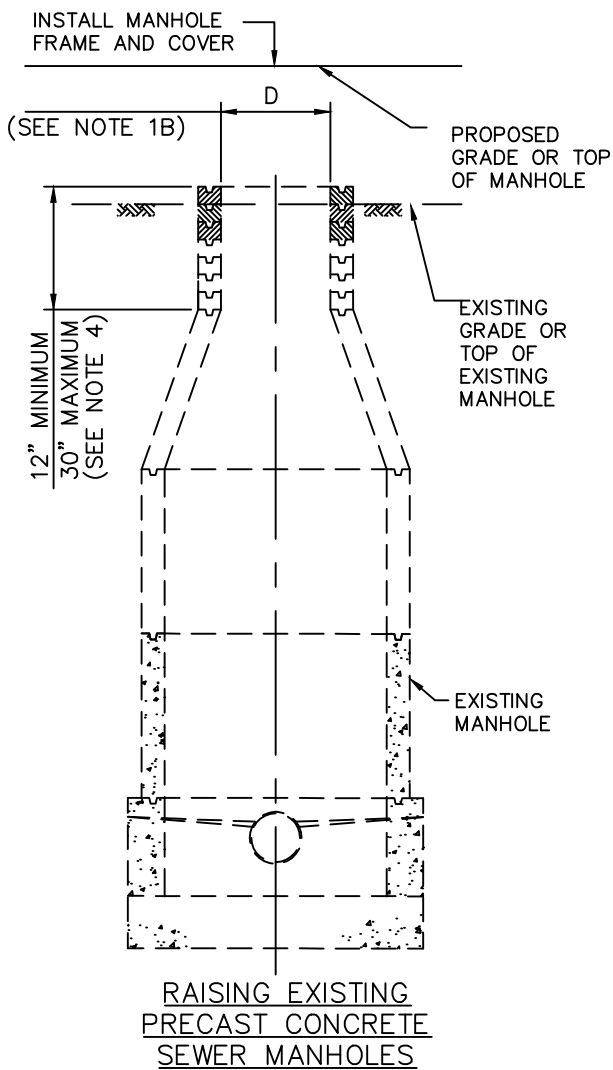
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**STANDARD CUL-DE-SAC
 SEWER LATERALS**

DRAWING NO.



S-11

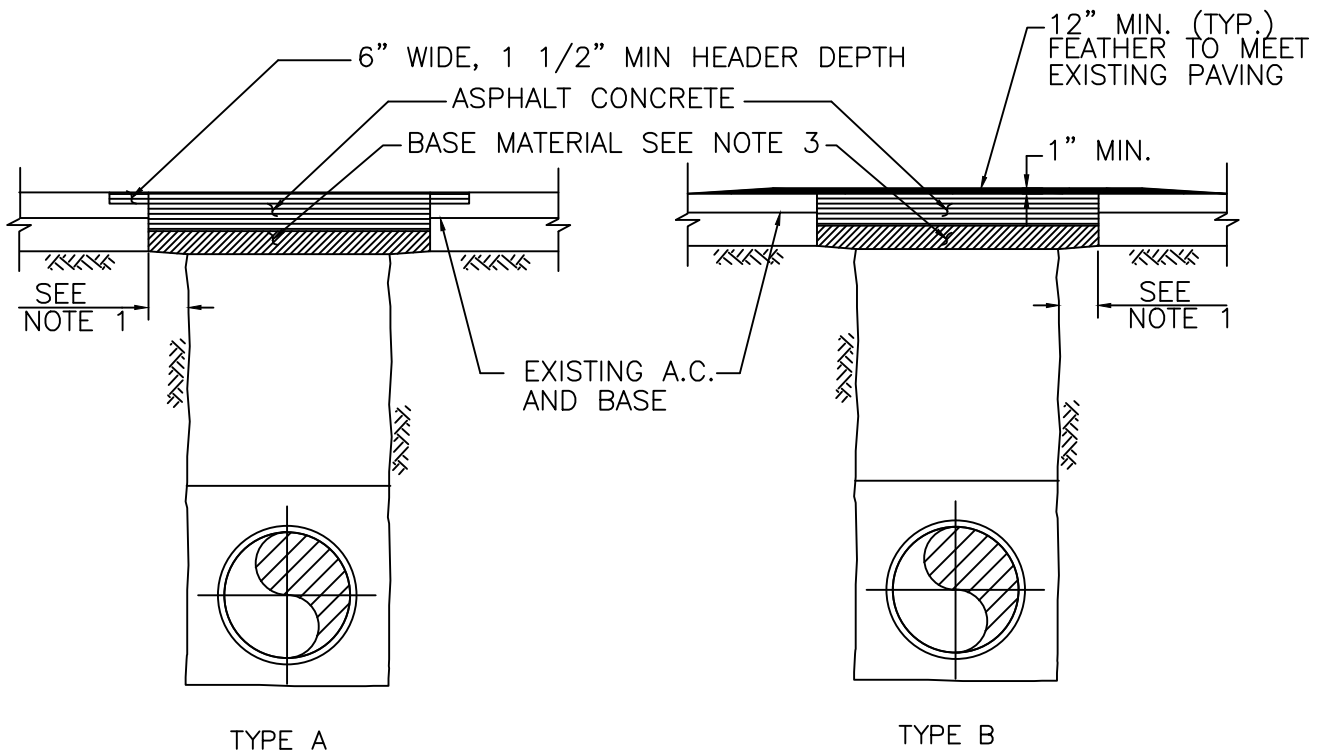


PRECAST CONCRETE SEWER MANHOLES

NOTES:

1. GENERAL
 - A. DIMENSION "D" SHALL BE THE SAME AS THE SIZE OF MANHOLE FRAME AND COVER TO BE USED.
 - B. THE CONTRACTOR MAY REUSE THE EXISTING MANHOLE FRAME AND COVER, UNLESS DAMAGED BY HIM DURING HIS CONSTRUCTION OPERATIONS OR WHEN OTHERWISE INDICATED ON THE PROJECT PLANS. ITEMS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH IDENTICAL NEW ITEMS AT NO EXPENSE TO THE AGENCY.
2. RAISING EXISTING PRECAST CONCRETE SEWER MANHOLES
 - A. PRECAST CONCRETE MANHOLES TO BE RAISED LESS THAN 3 INCHES MAY BE RAISED BY APPLYING CLASS "D" MORTAR TO THE TOP OF THE EXISTING MANHOLE, PROVIDED THE TOTAL HEIGHT OF MORTAR, EXISTING AND NEWLY APPLIED DOES NOT EXCEED 3 INCHES.
 - B. WHERE THE PRECAST CONCRETE MANHOLE IS TO BE RAISED 3 INCHES OR MORE, OR WHERE THE TOTAL HEIGHT OF MORTAR, EXISTING AND NEWLY APPLIED, WOULD EXCEED 3 INCHES, GRADE RINGS SHALL BE UTILIZED. CLASS "D" MORTAR MAY BE USED FOR FINAL ADJUSTMENT, BUT NOT MORE THAN 3 INCHES IN HEIGHT. WHERE RAISING THE MANHOLE WOULD RESULT IN THE UPPER SEGMENT OF THE SHAFT BEING MORE THAN 30 INCHES IN HEIGHT, REMOVE THE REDUCER AND THE UPPER SEGMENT OF THE SHAFT. INSTALL ADDITIONAL RINGS OR PIPE TO THE LOWER SEGMENT OF THE SHAFT AND REINSTALL THE REDUCER AND GRADE RINGS AS REQUIRED.
3. LOWERING EXISTING PRECAST CONCRETE SEWER MANHOLES
 - A. REMOVE SUFFICIENT GRADE RINGS TO LOWER THE MANHOLES AS REQUIRED. APPLY CLASS "D" MORTAR TO A HEIGHT NOT EXCEEDING 3 INCHES FOR ADJUSTMENT TO FINAL GRADE.
 - B. WHERE REMOVAL OF GRADE RINGS WOULD RESULT IN THE UPPER SEGMENT OF THE SHAFT BEING LESS THAN 12 INCHES IN HEIGHT, REMOVE THE REDUCER AND SUFFICIENT SECTIONS OF THE LOWER SEGMENT OF THE SHAFT AND REINSTALL ANY NECESSARY SEGMENT OF THE LOWER SHAFT, THE REDUCER, AND THE GRADE RINGS TO CONFORM TO THE REQUIREMENTS OF THIS PLAN.
 - C. EXISTING GRADE RINGS NEED NOT BE REMOVED IF EXISTING MORTAR IS REMOVED AND AT LEAST 1 1/2 INCHES OF MORTAR MAY BE PLACED ON TOP OF THE EXISTING GRADE RINGS TO RESEAT THE FRAME.

	Rev.Date	By	Apprv'd		<p align="center">SEWER MANHOLE HEIGHT ADJUSTMENT</p>	DRAWING NO.
	5/24/17	SMD	JRB			S-12



NOTES:

- 1) TRENCH EDGES TO BE CUT A MINIMUM OF 6" WIDER THAN TRENCH FOR TRENCHES 3' WIDE OR LESS, AND 12" WIDER FOR TRENCHES OVER 3' WIDE.
- 2) EXISTING AC SHALL BE CUT AND REMOVED IN SUCH A MANNER SO AS NOT TO TEAR, BULGE OR DISPLACE ADJACENT PAVEMENT. EDGES SHALL BE CLEAN AND VERTICAL. ALL CUTS SHALL BE PARALLEL OR PERPENDICULAR TO STREET CENTERLINE, WHEN PRACTICAL.
- 3) BASE MATERIAL TO BE REPLACED TO DEPTH OF EXISTING BASE OR 6" MINIMUM, AC MAY BE SUBSTITUTED FOR BASE MATERIAL.
- 4) A TACK COAT OF ASPHALT EMULSION OR PAVING ASPHALT SHALL BE APPLIED TO EXISTING AC OR P.C.C. CONTACT SURFACES, PRIOR TO RESURFACING.
- 5) ASPHALT CONCRETE RESURFACING:
 - A) MINIMUM TOTAL THICKNESS SHALL BE ONE INCH GREATER THAN EXISTING AC OR 3" MINIMUM,
 - B) AC SHALL BE HOT PLANT MIX CALTRANS SPEC GRADE C2-PG-64-10
 - C) FINISH COURSE FOR TYPE B RESURFACING SHALL BE LAID DOWN USING A SPREADER BOX.
- 6) ALL AC RESURFACING SHALL BE SEAL COATED WITH AN EMULSIFIED ASPHALT AND COVERED WITH SAND. CHIP SEALING TO BE APPLIED AS REQUIRED BY AGENCY.
- 7) TYPE B SHALL NOT BE USED ON LATERAL CROSSINGS.
- 8) SLOUGHING OF TRENCH UNDER PAVEMENT SHALL BE CAUSE FOR REQUIRING ADDITIONAL PAVEMENT AND BASE.

	Rev. Date	By	Apprv'd		TRENCH RESURFACING TYPES A & B	DRAWING NO.
	5/24/17	SMD	JRB			S-14