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NOTE:

* INDICATES 11X17 SHEET

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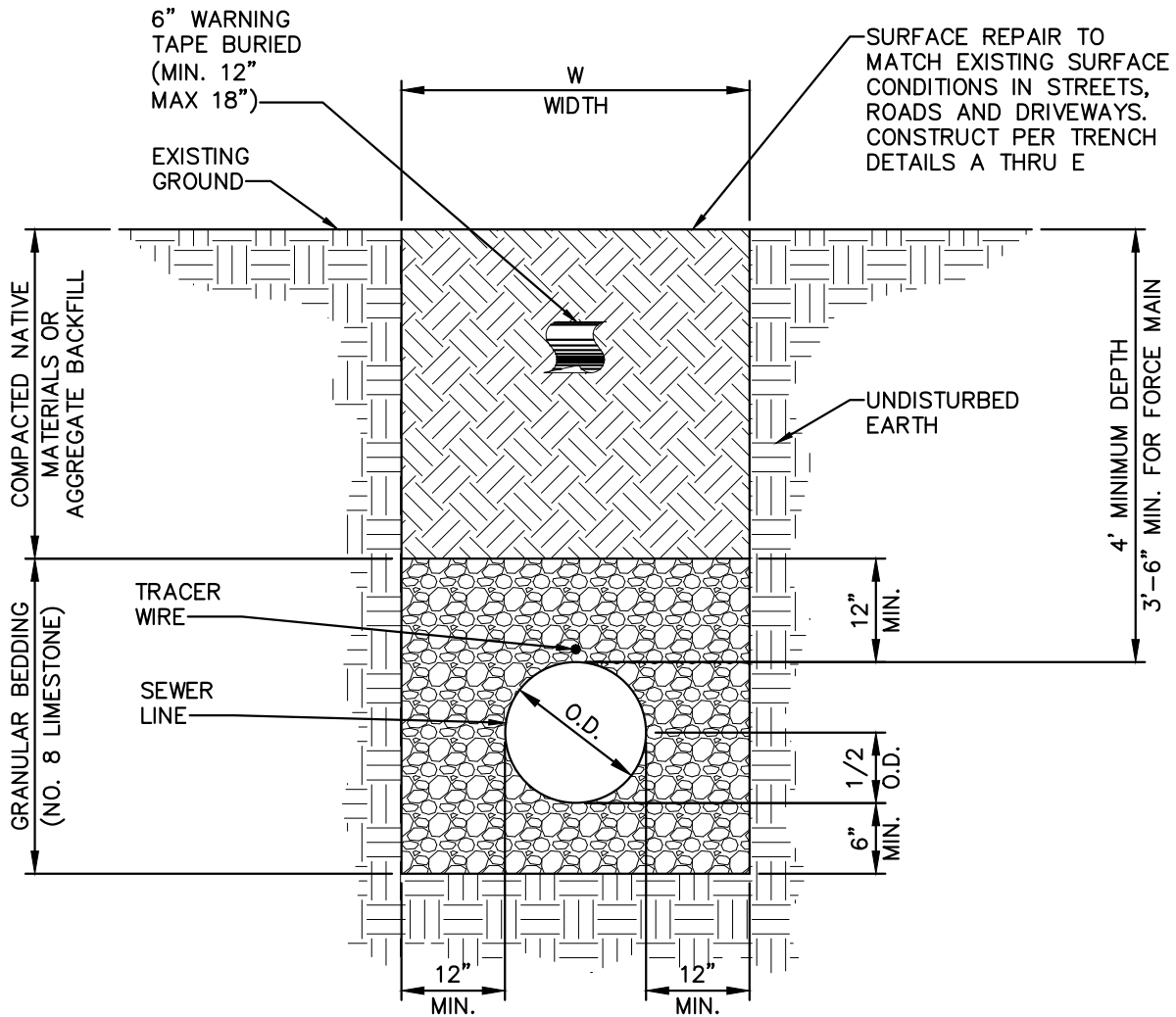
**STANDARD DETAIL
INDEX**

STANDARD DETAIL NO.

S-INDEX

NOT TO SCALE

JULY 2025



NOTES:

1. W = MAXIMUM PERMISSIBLE TRENCH WIDTH, BASED UPON, W = O.D. + 24", UNLESS APPROVED BY THE ENGINEER.
2. CONTRACTOR IS FULLY RESPONSIBLE FOR ALL MEANS, METHODS AND SAFETY FOR TRENCH EXCAVATIONS.
3. PROVIDE BEARING FOR FULL LENGTH OF BARREL, DIG HOLES FOR THE BELL.
4. BACKFILL ON SIDES TO 1/2 O.D. OF PIPE TO HOLD PIPE IN PLACE PRIOR TO PLACING ADDITIONAL BEDDING.
5. BACKFILL TO BE COMPACTED IN 6" LAYERS TO 95% OF MAXIMUM DENSITY (MODIFIED PROCTOR) AT OPTIMUM MOISTURE (+2%) IN ROADS AND STREETS. COMPACT TO MATCH EXISTING OR PROPOSED GRADE IN OTHER AREAS.
6. A CASING PIPE SHALL BE REQUIRED IN ROAD CROSSINGS WHERE SHOWN ON PLANS.

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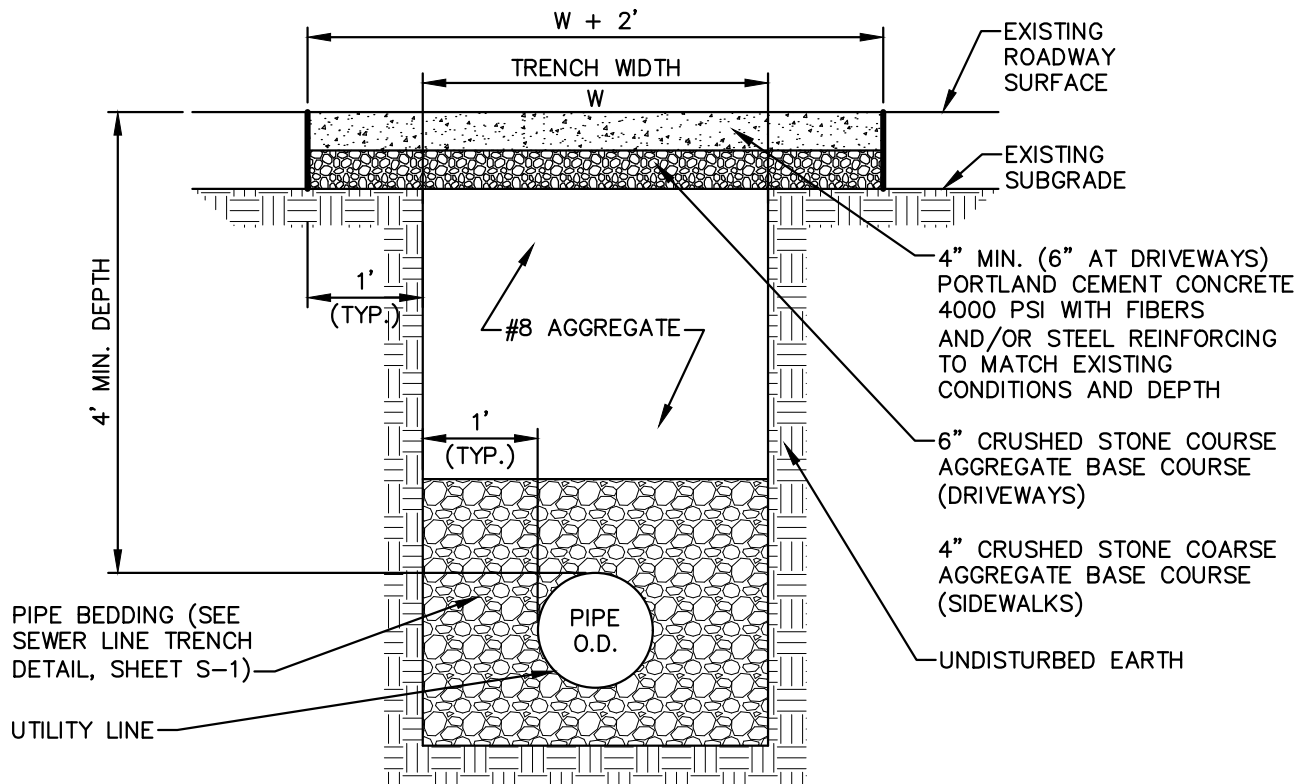
**SEWER LINE
TRENCH
DETAIL**

STANDARD DETAIL NO.

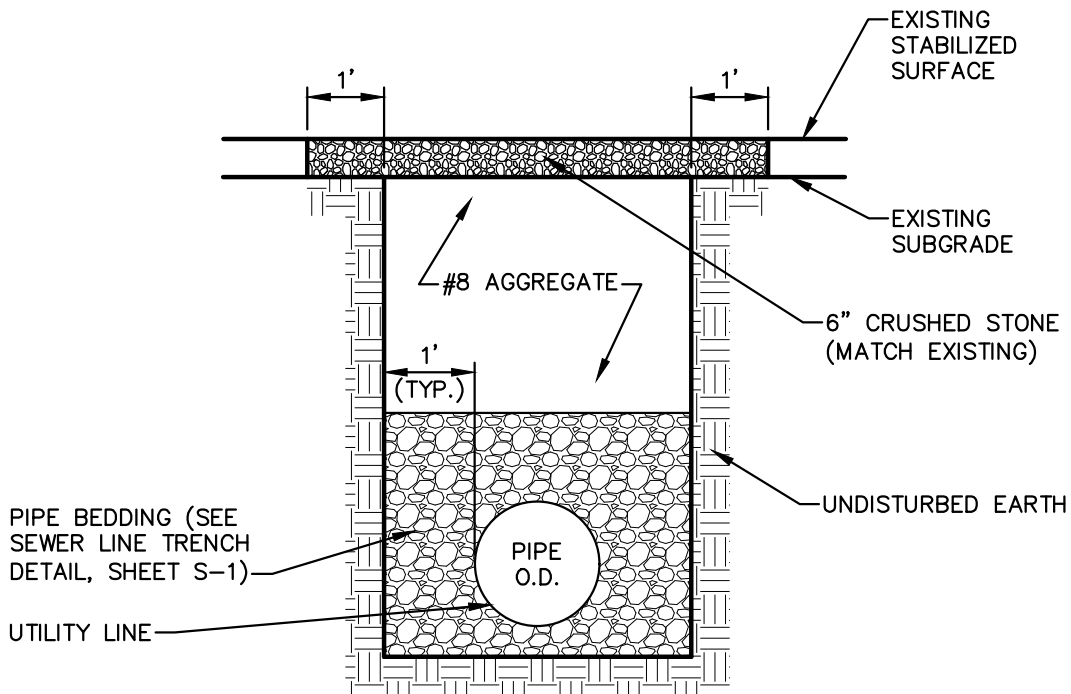
S-1

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TYPE A
TRENCH REPAIR CONCRETE DRIVEWAYS AND SIDEWALKS



TYPE B
TRENCH REPAIR STABILIZED AREAS

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TYPE A AND B
TRENCH REPAIR
DETAILS

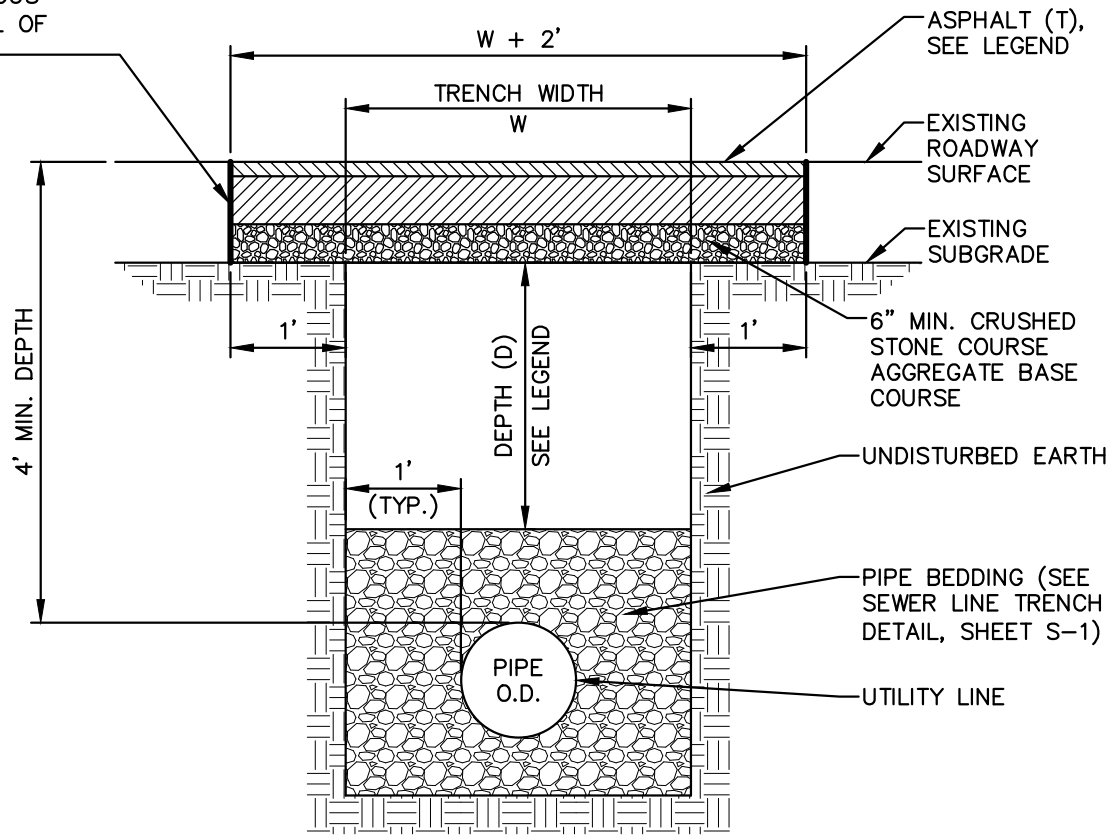
STANDARD DETAIL NO.

S-2

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EXISTING PAVEMENT SHALL BE SAW CUT IN A NEAT STRAIGHT LINE PRIOR TO TRENCH RESTORATION TO THE LIMITS SHOWN. ALL JOINTS SHALL BE SEALED WITH HOT BITUMINOUS MATERIAL (TYPICAL OF BOTH SIDES)



TYPE C
TRENCH REPAIR ASPHALT PAVEMENT

LEGEND:

(T) ASPHALT
 6" STATE HIGHWAY - 4" BASE, 2" WEARING
 4.5" CITY STREETS AND ALLEYS - 3" BASE, 1.5" WEARING
 3" DRIVEWAY - 2" BASE, 1" WEARING

(D) DEPTH
 PAVED STATE HIGHWAY - 6" LIFTS OF #8 AGGREGATE REQUIRED ABOVE BEDDING ZONE, OR FLOWABLE FILL IF REQUIRED BY WVDOH.
 PAVED CITY STREETS, ALLEYS AND DRIVEWAYS - 6" LIFTS OF #8 AGGREGATE REQUIRED ABOVE BEDDING ZONE.

NOTE: IF MORE STRINGENT, PERMIT REQUIREMENTS SUPERCEDE ABOVE DEPTHS.

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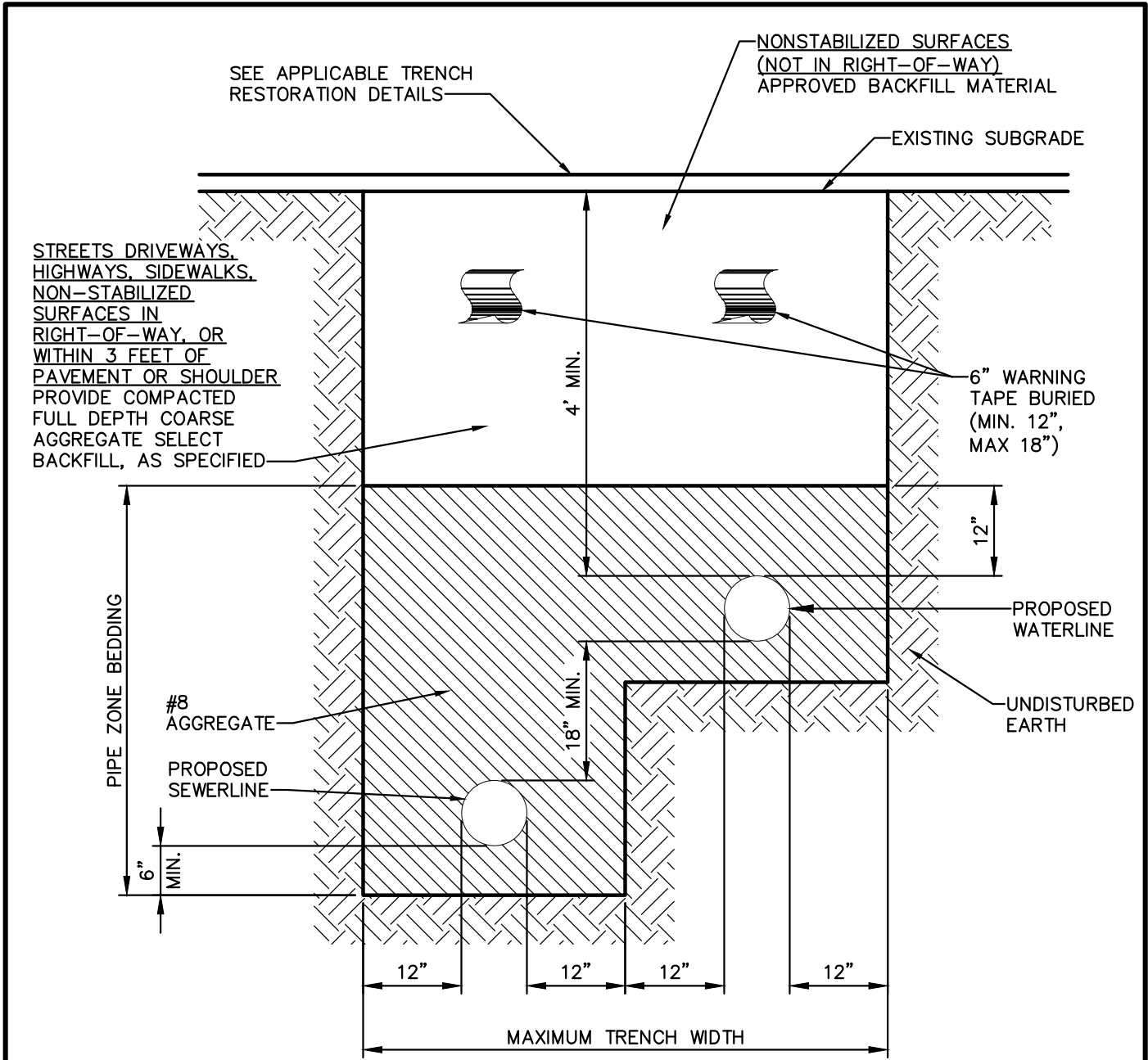
**TYPE C TRENCH
 REPAIR ASPHALT
 PAVEMENT DETAIL**

STANDARD DETAIL NO.

S-3

NOT TO SCALE

JULY 2025



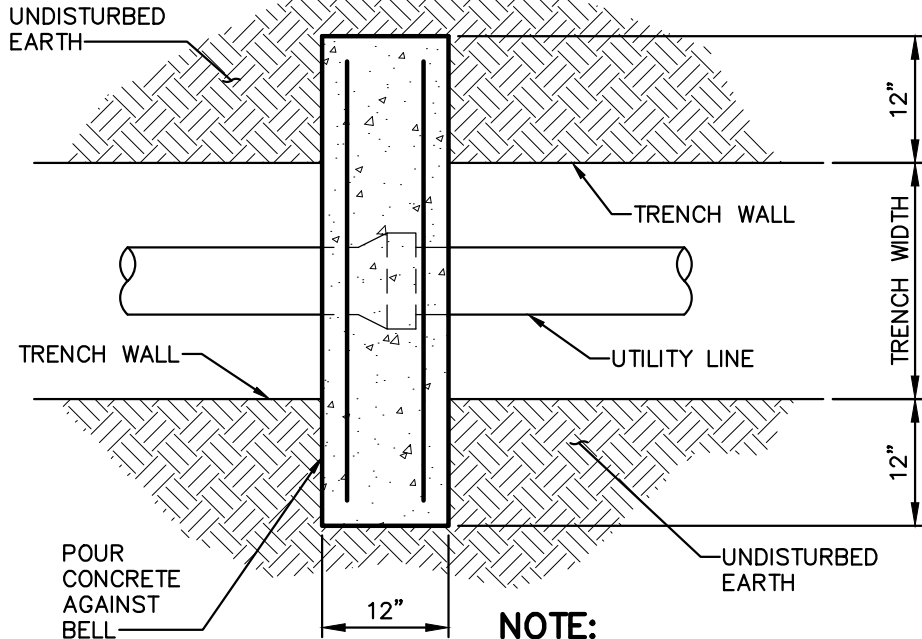
**TYPE E
TRENCH REPAIR STEPPED
BACKFILLING AND PIPE BEDDING**

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**TYPE E TRENCH
REPAIR
DETAIL**

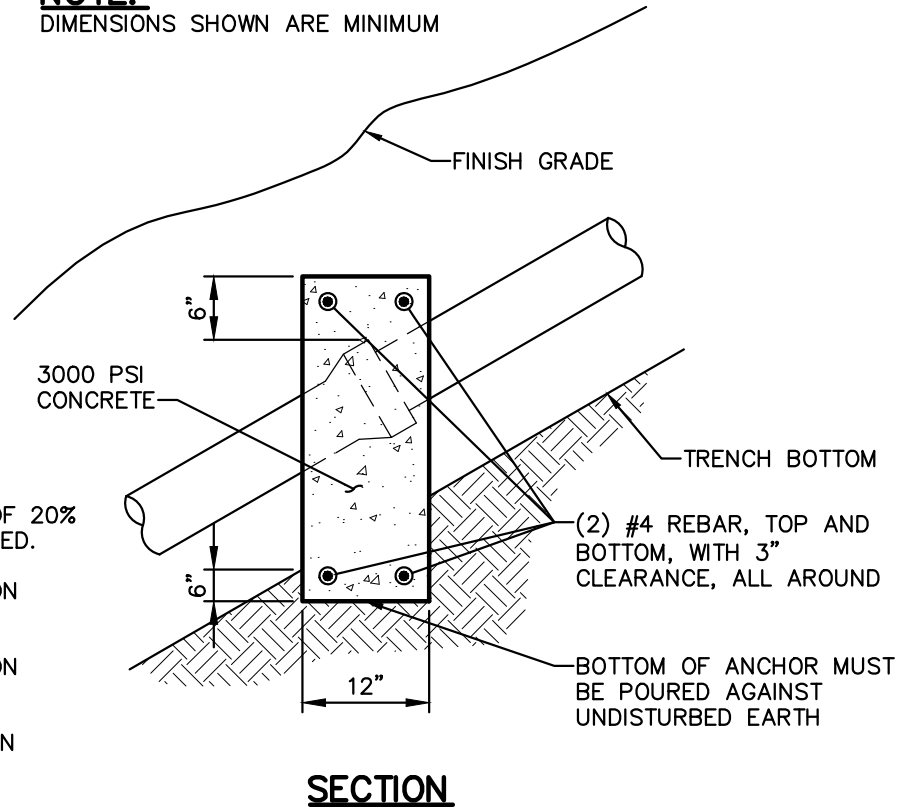
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S-5
NOT TO SCALE
JULY 2025

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NOTE:
DIMENSIONS SHOWN ARE MINIMUM

PLAN



SECTION

NOTES:

1. PROVIDE ANCHORS ON GRADES OF 20% AND GREATER OR WHERE SPECIFIED.
2. PROVIDE ANCHORS 36 FT. O.C. ON GRADES BETWEEN 20% AND 34%.
3. PROVIDE ANCHORS 24 FT. O.C. ON GRADES BETWEEN 34% AND 50%.
4. PROVIDE ANCHORS 16 FT. O.C. ON GRADES 50% OR GREATER.
5. WHEN NECESSARY, EXTEND ANCHOR TO 12" BELOW FINISH GRADE TO PREVENT WASHOUT OF BACKFILL BY SURFACE WATER.
6. ANCHORS SHALL BE PLACED AT JOINTS NOT TO EXCEED O.C. DISTANCES.
7. CONCRETE ANCHORS TO BE PLACED AGAINST DOWNGRADE SIDE OF PIPE JOINTS.

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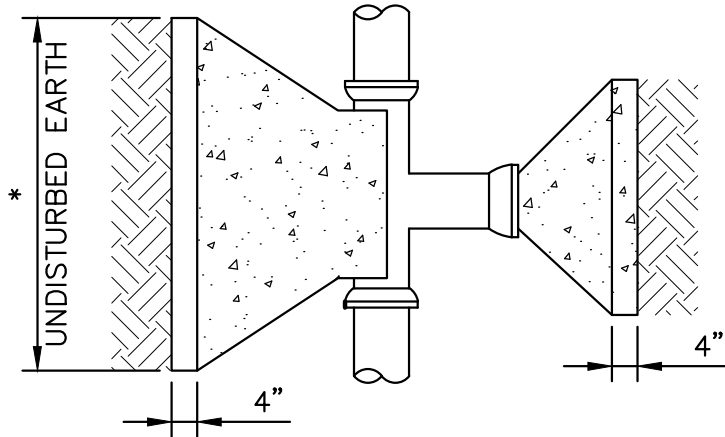
**CONCRETE SLOPE
ANCHOR DETAIL**

STANDARD DETAIL NO.

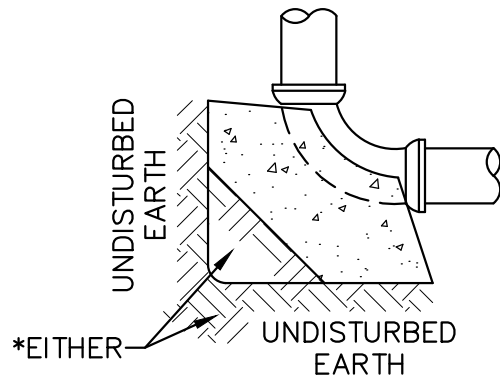
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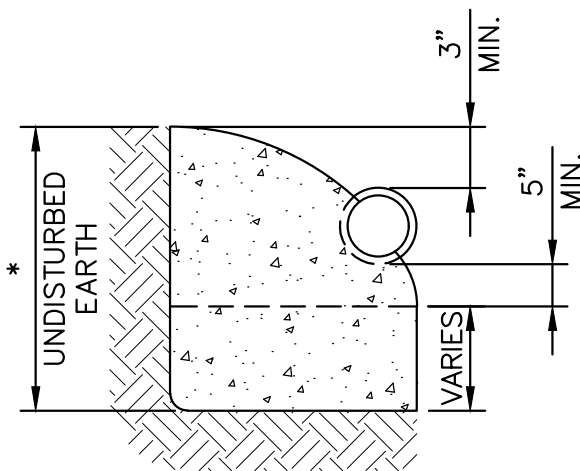
JULY 2025



PLAN-TEES, WYES AND PLUGS



PLAN-BENDS



ELEVATION-TEES, WYES AND PLUGS

NOTES:

1. ALL CONCRETE SHALL BE MINIMUM 3,000 P.S.I.
2. THRUST BLOCKS SHALL BE IMBEDDED IN UNDISTURBED SOIL.
3. SOIL BEARING CAPACITY IS ASSUMED AT 3000 LB. SQ. FT. FOR WEAKER SOILS THRUST BLOCK AREAS SHALL BE INCREASED AS REQUIRED.
4. WRAP PIPE WITH POLYETHYLENE TO PREVENT CONTACT BETWEEN PIPE AND CONCRETE.
5. WITH APPROVAL OF ENGINEER, MEGA-LUG JOINT RESTRAINTS MAY BE SUBSTITUTED FOR THRUST BLOCKS PER MANUFACTURER'S RECOMMENDATION (TO BE FURNISHED BY CONTRACTOR). FOR DUCTILE IRON, USE UNIFLANGE 1400 OR EBBA 1100 AND FOR C900 PVC, USE UNIFLANGE 1500 OR EBBA 2000PV.
6. THRUST BLOCKING GENERALLY ONLY APPLIES TO PIPE FITTINGS 4" IN DIAMETER OR LESS.

PIPE SIZE (IN.)	AREA (SQ IN.)	TOTAL FORCE (LBS.)	AREA OF BLOCK IN SQ. FT.				
			TEES & PLUGS	90° BENDS	45° BENDS	22 1/2° BENDS	11 1/4° BENDS
4	12.57	2,827	1.0	1.0	1.0	1.0	1.0
6	28.27	6,361	1.6	2.3	1.2	1.0	1.0
8	50.26	11,308	2.8	4.0	2.2	1.1	1.0
10	75.54	17,672	4.4	6.3	3.4	1.7	1.0
12	113.16	25,461	6.4	9.0	4.9	3.0	1.3
14	153.94	34,637	8.7	12.3	6.6	3.4	1.7
16	201.06	45,239	11.3	16.0	8.7	4.4	2.2
18	254.47	57,256	14.3	20.3	11.0	5.6	2.8
20	314.16	70,686	17.7	25.0	13.5	6.9	3.5
24	452.39	101,788	25.4	36.0	19.5	9.9	5.0

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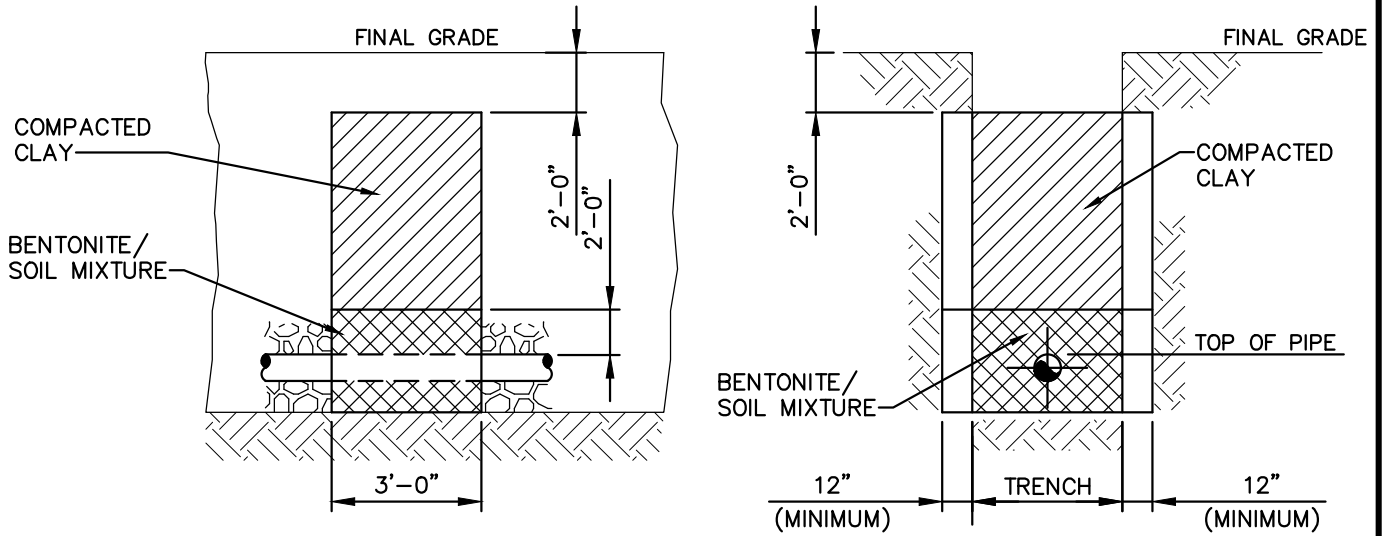
**PIPE BUTTRESS
DETAIL**

STANDARD DETAIL NO.

S-7

NOT TO SCALE

JULY 2025



NOTE:

1. COMPACTED TRENCH PLUGS SHALL EXTEND VERTICALLY FROM UNDISTURBED GROUND AT BOTTOM OF TRENCH TO WITHIN TWO (2') FEET OF FINAL GRADE, AND FROM UNDISTURBED GROUND ON TRENCH SIDES FOR WIDTH OF TRENCH AND 12" BEYOND EACH SIDE OF TRENCH.
2. CLAY BACKFILL TO A POINT TWO (2') FEET OVER THE PIPE SHALL CONSIST OF A BENTONITE/SOIL MIXTURE AT A 5:1 MIX.
3. REMAINING BACKFILL SHALL CONSIST OF CLAY CONTAINING NO MORE THAN 15% (BY VOLUME) STONE NOT LARGER THAN TWO (2") INCHES IN DIAMETER. CLAY SHALL BE PLACED IN SIX (6") INCH LIFTS AND COMPACTED BY MECHANICAL TAMPER TO NOT LESS THAN 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT.
4. TRENCH PLUGS SHALL BE USED WHEN/WHERE GROUNDWATER IS ENCOUNTERED IN TRENCH, WHICH IS AT A 5% SLOPE OR GREATER.

REQUIRED SPACING AND MATERIAL FOR TRENCH PLUGS		
TRENCH SLOPE (%)	SPACING (FEET)	PLUG MATERIAL
0-5	----	NONE
5-15	500	EARTH FILLED SACKS
15-25	300	EARTH FILLED SACKS
25-30	200	EARTH FILLED SACKS
35-100	100	EARTH FILLED SACKS
OVER 100	50	CEMENT FILLED BAGS (WETTED) OR MORTARED STONE

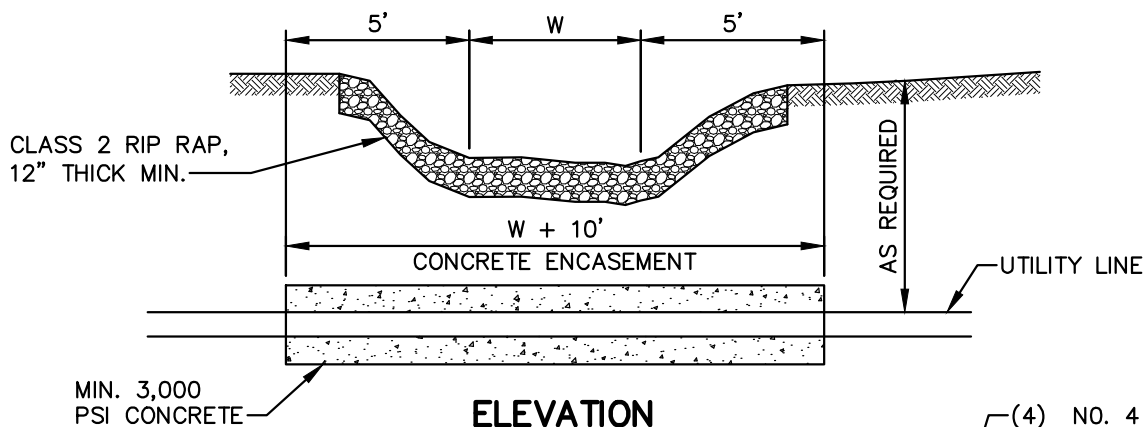
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**TRENCH PLUG
 DETAIL**

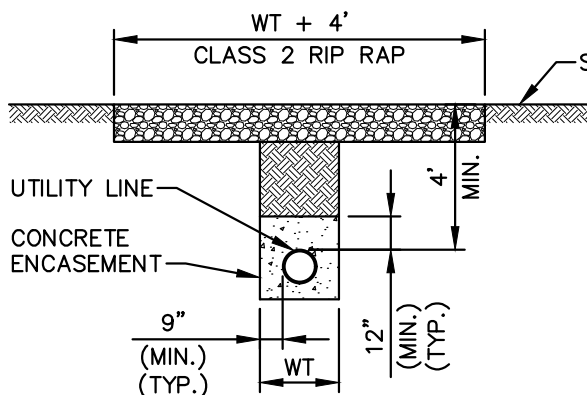
STANDARD DETAIL NO.
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 NOT TO SCALE
 JULY 2025

NOTE:

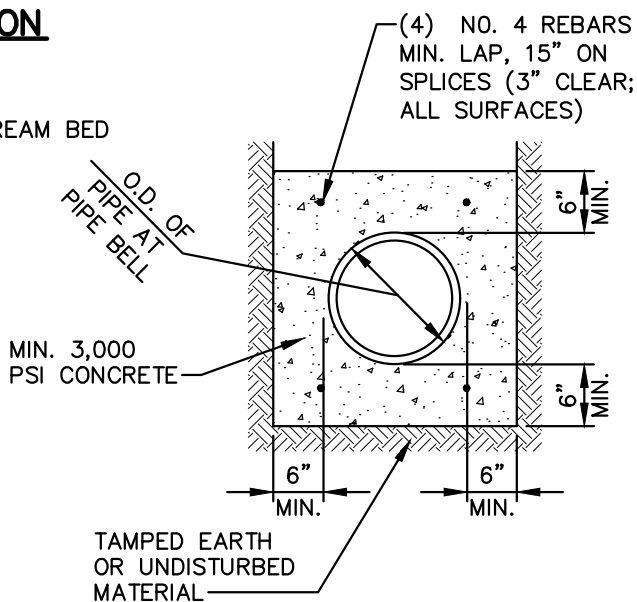
STREAMS TO BE DIVERTED DURING CONSTRUCTION TO PREVENT CONCRETE GETTING INTO WATER.



ELEVATION



TYPICAL SECTION



SECTIONAL ELEVATION

NOTES:

WT = MAXIMUM PERMISSIBLE TRENCH WIDTH BASED UPON WT = O.D.+24", UNLESS OTHERWISE APPROVED BY ENGINEER.

DO NOT BACKFILL TRENCH UNTIL CONCRETE HAS SET SUFFICIENTLY TO SUPPORT WEIGHT OF BACKFILL OR AS DIRECTED BY THE ENGINEER.

NOTE:

FOR STREAM CROSSING, PLACE 12" MINIMUM CONCRETE OVER PIPE

NOTES:

STREAMS TO BE DIVERTED DURING CONSTRUCTION TO PREVENT GREEN CONCRETE FROM GETTING INTO WATER.

ALL STREAM CROSSINGS REQUIRE PERMIT FROM THE STATE AND ARMY CORP OF ENGINEERS. PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS SHOWN ON PLANS.

NOTE:

ROCK RIP RAP AND GABION STONE SHALL BE NON-ACIDIC AND OF ADEQUATE HARDNESS WITH SIZES AS FOLLOWS:

CLASS 0 (GABION)	4" TO 7"
CLASS I	3" TO 12"
CLASS II	6" TO 24"
CLASS III	36" TO 42"

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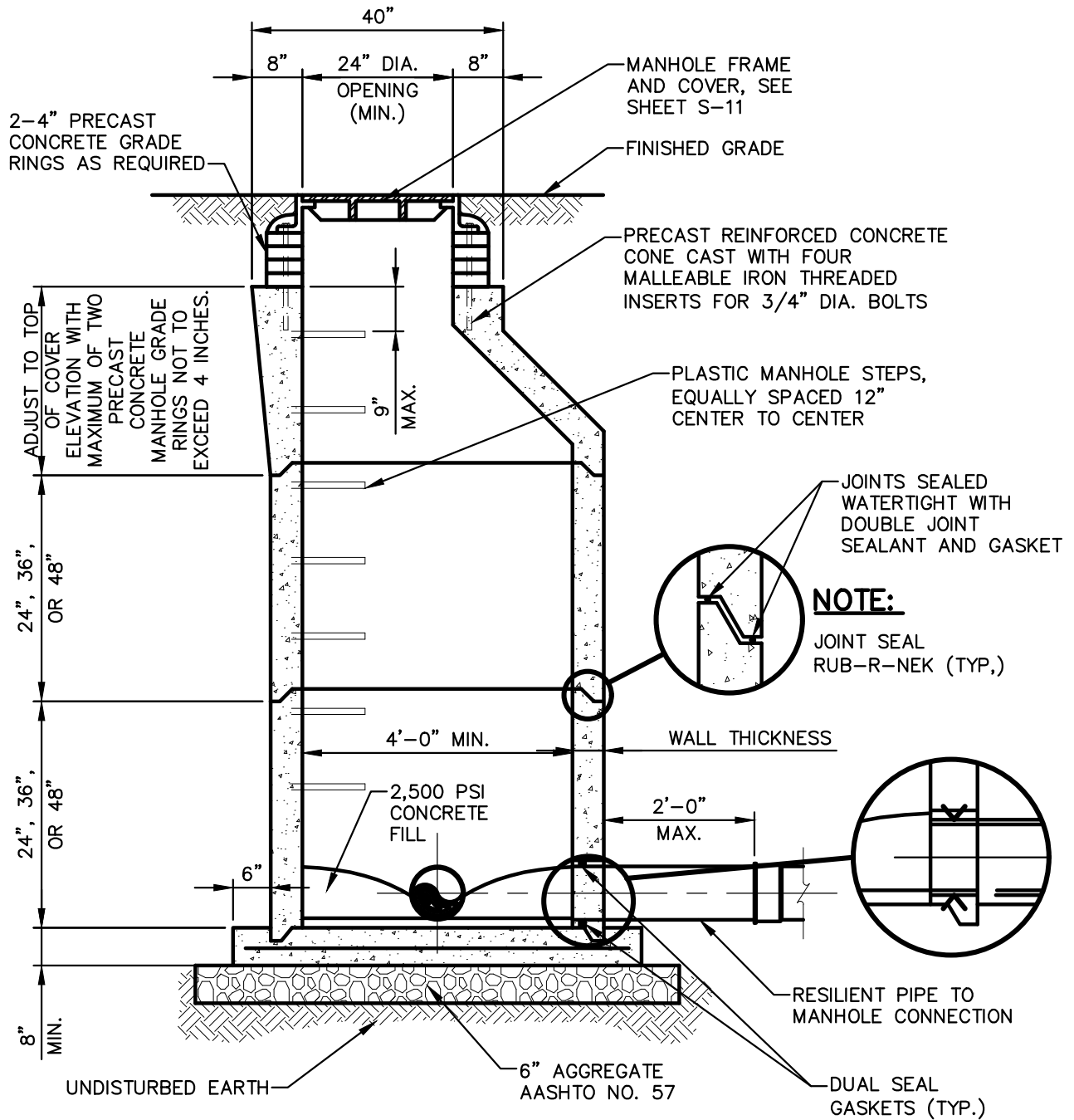
**STREAM CROSSING
AND PIPE
ENCASEMENT DETAIL**

STANDARD DETAIL NO.

S-9

NOT TO SCALE

JULY 2025



NOTE:
SEE SHEET S-10A FOR MANHOLE NOTES

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**PRECAST MANHOLE
WITH ECCENTRIC
TOP DETAIL**

STANDARD DETAIL NO.

S-10

NOT TO SCALE

JULY 2025

GENERAL NOTES:

1. CONCRETE MANHOLES AND BASES SHALL CONFORM TO ASTM C-478.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A-185.
3. FOR MANHOLES IN FLOODPLAINS AND/OR WHERE GROUNDWATER IS PRESENT, THE EXTERIOR SURFACE OF THE MANHOLE SHALL BE COATED WITH (2) TWO COATS OF A BITUMASTIC COATING SYSTEM, 8 MILS DFT PER COAT OF CARBOLINE 300M OR EQUAL.
4. FOR FORCE MAIN DISCHARGES AND TWO (2) DOWNSTREAM MANHOLES, THE ENTIRE INTERIOR SURFACE OF THE MANHOLE SHALL BE COATED WITH A MINIMUM 50 MIL DFT AROMATIC POLYUREA COATING SYSTEM, OBIC 1000 OR EQUAL.
5. ALL MANHOLE CONCRETE SHALL CONTAIN A 1% BY WEIGHT OF CEMENT CONCRETE WATERPROOFING ADMIXTURE, XYPEX C-1000 OR EQUAL.
6. MANHOLES FOR SEWER PIPE 24"-36" SHALL HAVE A 5'-0" MIN. INSIDE DIAMETER, AND POTENTIALLY SHALL BE USED IF ANGLE OF DEFLECTION DOES NOT PERMIT USE WITH A 4' MANHOLE.
7. FLOW CHANNELS SHALL PRECISELY ALIGN WITH THE ORIENTATION OF THE INCOMING/OUTGOING DISCHARGE SEWERS, FLOW CHANNEL RADIUS SHALL NOT EXCEED 90°. ALL LEDGES SHALL BE POSITIVELY SLOPED FROM MANHOLE WALL TO THE FLOW CHANNELS.

MANHOLE STEPS NOTES:

1. DISTANCE FROM RIM OF MANHOLE TO TOP OF STEP SHALL NOT EXCEED 30".
2. DISTANCE FROM BOTTOM STEP TO FLOOR OF MANHOLE SHALL NOT BE GREATER THAN 2 FEET.
3. DO NOT LOCATE STEPS OVER CHANNELS.

DROP CONNECTION NOTE:

AN INSIDE DROP CONNECTION SHALL BE INSTALLED WHEN THE PIPE INVERTS INTO THE MANHOLE ARE 2'-0" OR MORE ABOVE INVERT OUT OF THE MANHOLE. THE ENTIRE OUTER SURFACE AND CONCRETE ENCASEMENT AROUND THE MANHOLE AND THE CONNECTIONS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.

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**PRECAST MANHOLE
NOTES**

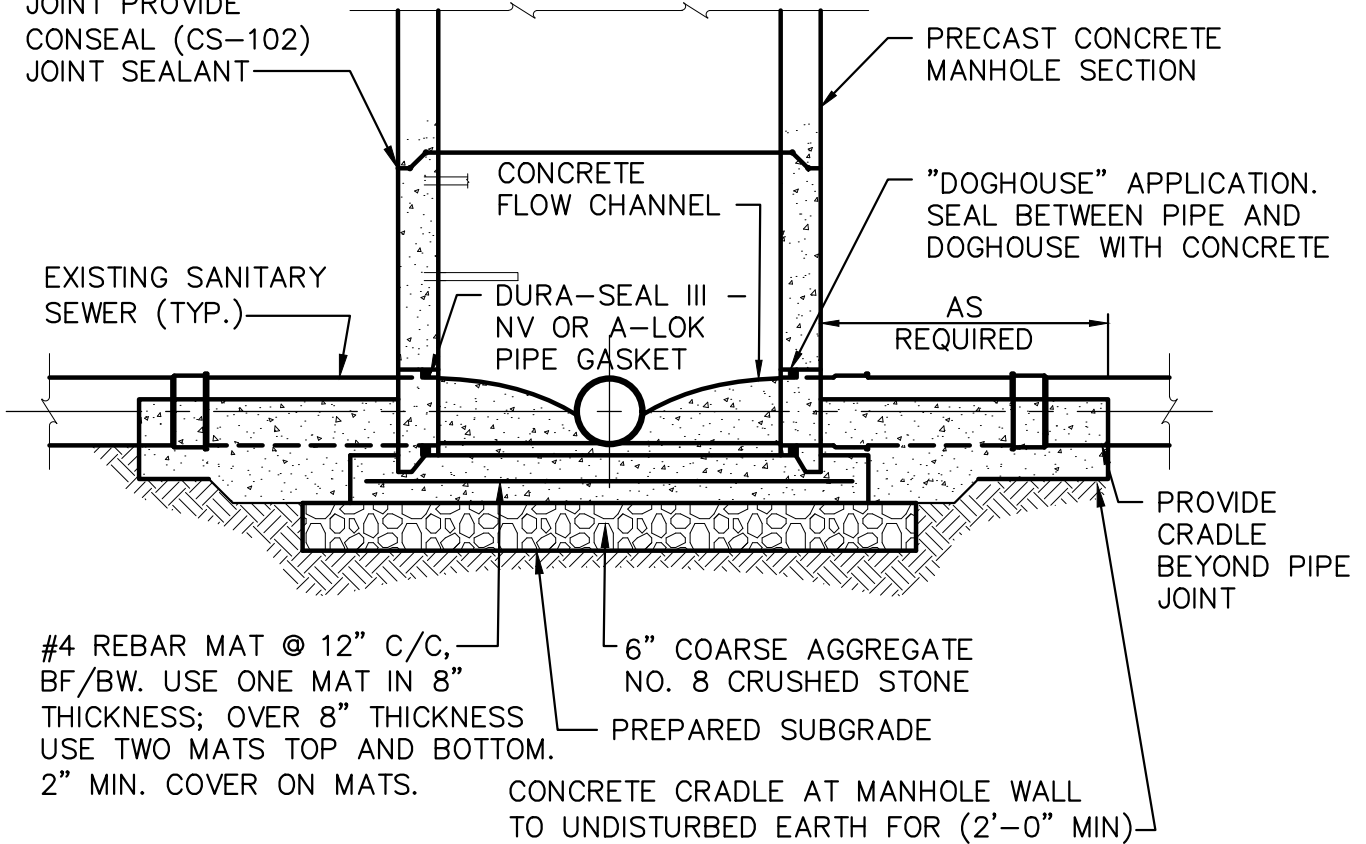
STANDARD DETAIL NO.

S-10A

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PRECAST WALL
SECTION; PRECISELY
SET IN CONCRETE
BASE FOR INTEGRAL
JOINT PROVIDE
CONSEAL (CS-102)
JOINT SEALANT



NOTES:

1. "DOGHOUSE" OPENINGS IN PRECAST CONCRETE MANHOLE SECTION SHALL BE SEALED WITH WATER PROOFING CEMENT MIXTURE ANNULAR SPACE TO BE COMPLETELY FILLED AND INTERIOR FINISH TO BE HAND TROWELED FLUSH AND SMOOTH.
2. WHERE CONDITIONS DICTATE AND AS DIRECTED BY THE BOARD, MANUAL "BREAK-IN" OF EXISTING MANHOLE WALL SHALL REQUIRE A FULL-CIRCUMFERENCE RUBBER GASKET SEAL FOR PROPOSED PIPE CONNECTION.

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**DOGHOUSE MANHOLE
FOR EXISTING SEWER
CONNECTIONS**

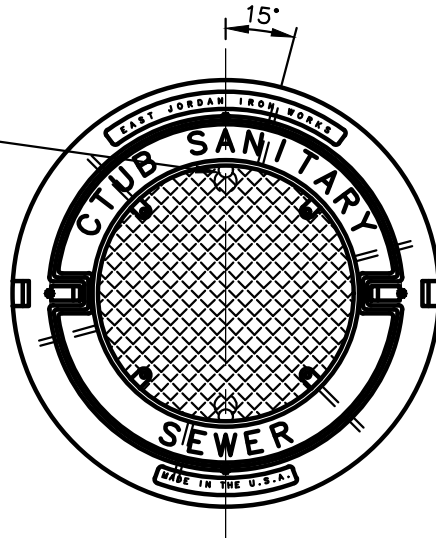
STANDARD DETAIL NO.

S-10B

NOT TO SCALE

JULY 2025

COVER PICK HOLE
(2) REQUIRED
EQUALLY SPACED



PLAN

COVER NOTES:

1. LETTERING ON COVERS SHALL DENOTE CTUB SANITARY SEWER AS APPLICABLE.
2. BOTTOM RIBS MAY BE DELETED FROM MANHOLE COVER CASTINGS.
3. SHOP DRAWINGS SHALL BE SUBMITTED IF DETAILS/DIMENSIONS VARY.
4. FRAME BOLT NOTE: DRILL FOUR 1" DIA. HOLES ON A 33" DIA. BOLT CIRCLE.
5. COVER BOLT NOTE: WATERTIGHT ONLY (2) REQUIRED MIN. (4) REQUIRED MAX. EQUALLY SPACED.

NOTES:

1. MANHOLE COVERS SHALL NOT HAVE VENT HOLES, UNLESS AIR RELEASE VALVE IS PRESENT.
2. DIMENSIONS ABOVE ARE FOR EAST JORDAN IRONWORKS PRODUCTS.
3. APPROVED SUPPLIERS:
 - EAST JORDAN IRON WORKS
 - HIGHWAY: FRAME – PROD. NO. 1045Z UNDIPPED
 - COVER – PROD. NO. 1040AGS UNDIPPED, SELF SEALING
 - WATERTIGHT: FRAME AND COVER – PROD. NO. 1045ZPT/1010APT, UNDIPPED
 - NEENAH
 - HIGHWAY: FRAME AND COVER R-1642, UNDIPPED, SELF SEALING
 - WATERTIGHT: FRAME AND COVER R-1916, UNDIPPED
4. FRAME AND COVER TO COMPLY WITH ASTM A48, CLASS 30 TENSILE STRENGTH.
5. USE THREADED STAINLESS STEEL STANDARD HEXAGON HEAD BOLTS TO ANCHOR FRAME AND COVER TO MANHOLE.
6. PROVIDE WATERPROOF MORTAR EXTENDED OVER FRAME.
7. PROVIDE FOUR MALLEABLE IRON THREADED INSERTS FOR 3/4" DIA. BOLTS ON 33" DIA. BOLT CIRCLE INSTALLED IN PRECAST CONC. MANHOLE CONE SECTIONS BY MANHOLE MANUFACTURER.

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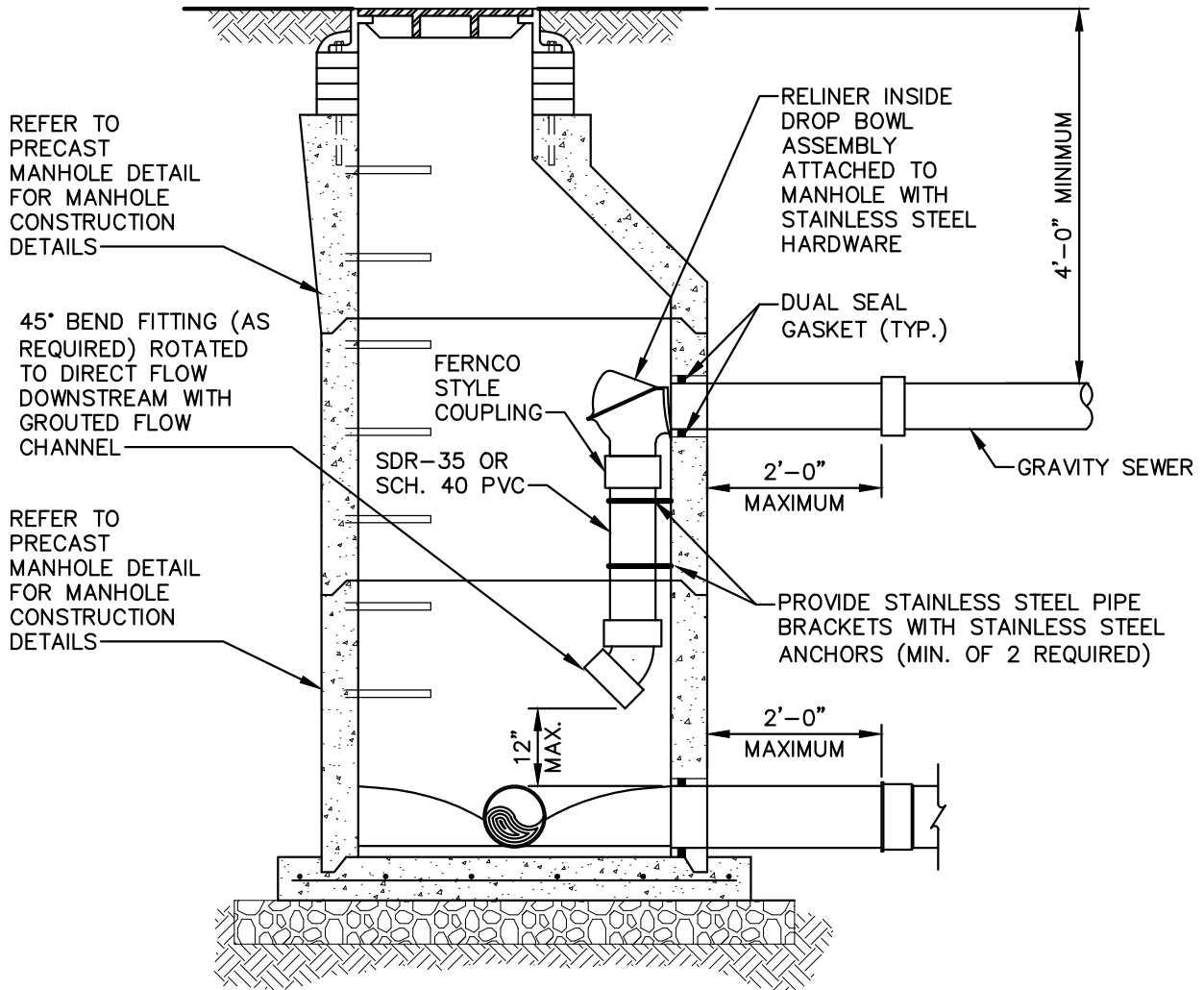
**MANHOLE FRAME
AND COVER DETAIL**

STANDARD DETAIL NO.

S-11

NOT TO SCALE

JULY 2025

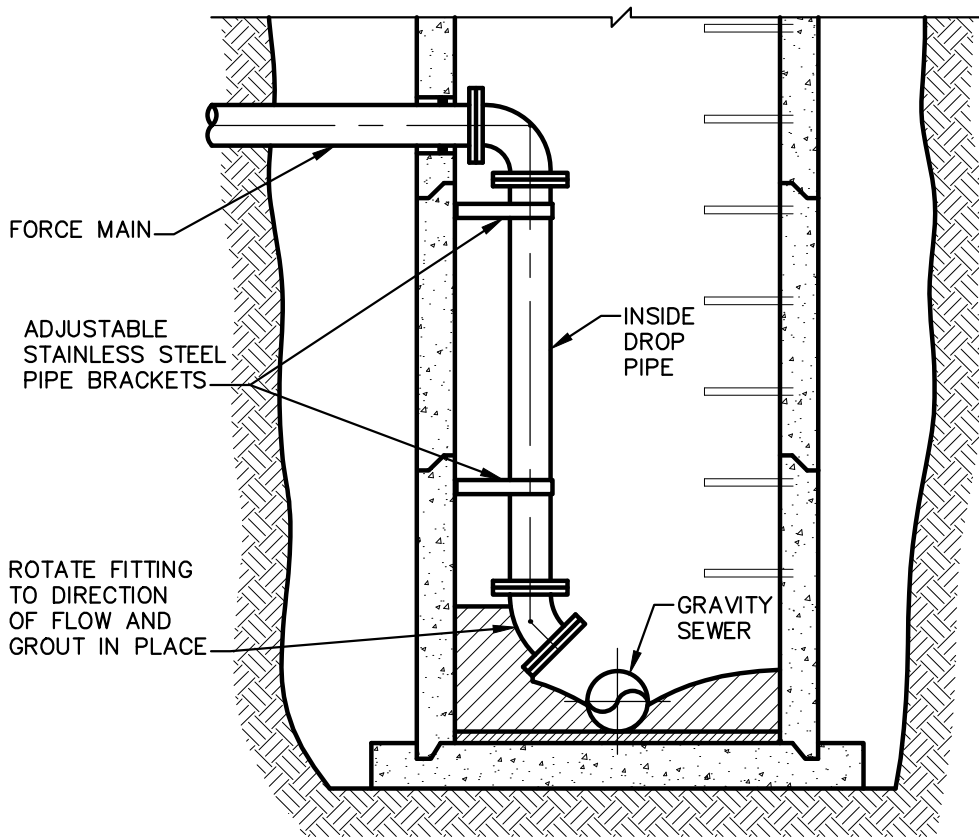


NOTE:
 1. OUTSIDE DROP MANHOLES ARE PROHIBITED.

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**INSIDE DROP
 MANHOLE DETAIL**

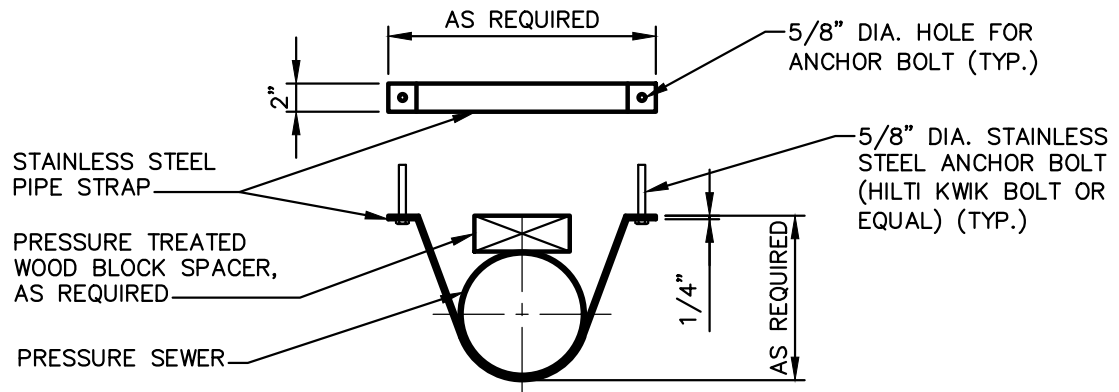
STANDARD DETAIL NO.
S-12
 NOT TO SCALE
 JULY 2025



FORCE MAIN MANHOLE

NOTES:

1. FORCE MAIN CONNECTIONS WITHIN MANHOLE SHALL BE RESTRAINED.
2. ANCHOR FORCE MAIN TO MANHOLE USING ADJUSTABLE STAINLESS STEEL PIPE BRACKETS. (2) BRACKETS MINIMUM AND 3' MAX. SPACING.
3. FOR IRREGULAR HOLES, SEAL PIPE ON BOTH SIDES WITH HYDRAULIC CEMENT.
4. ALL FORCE MAIN INLET MANHOLES SHALL RECEIVE SPECIAL COATING SYSTEM.



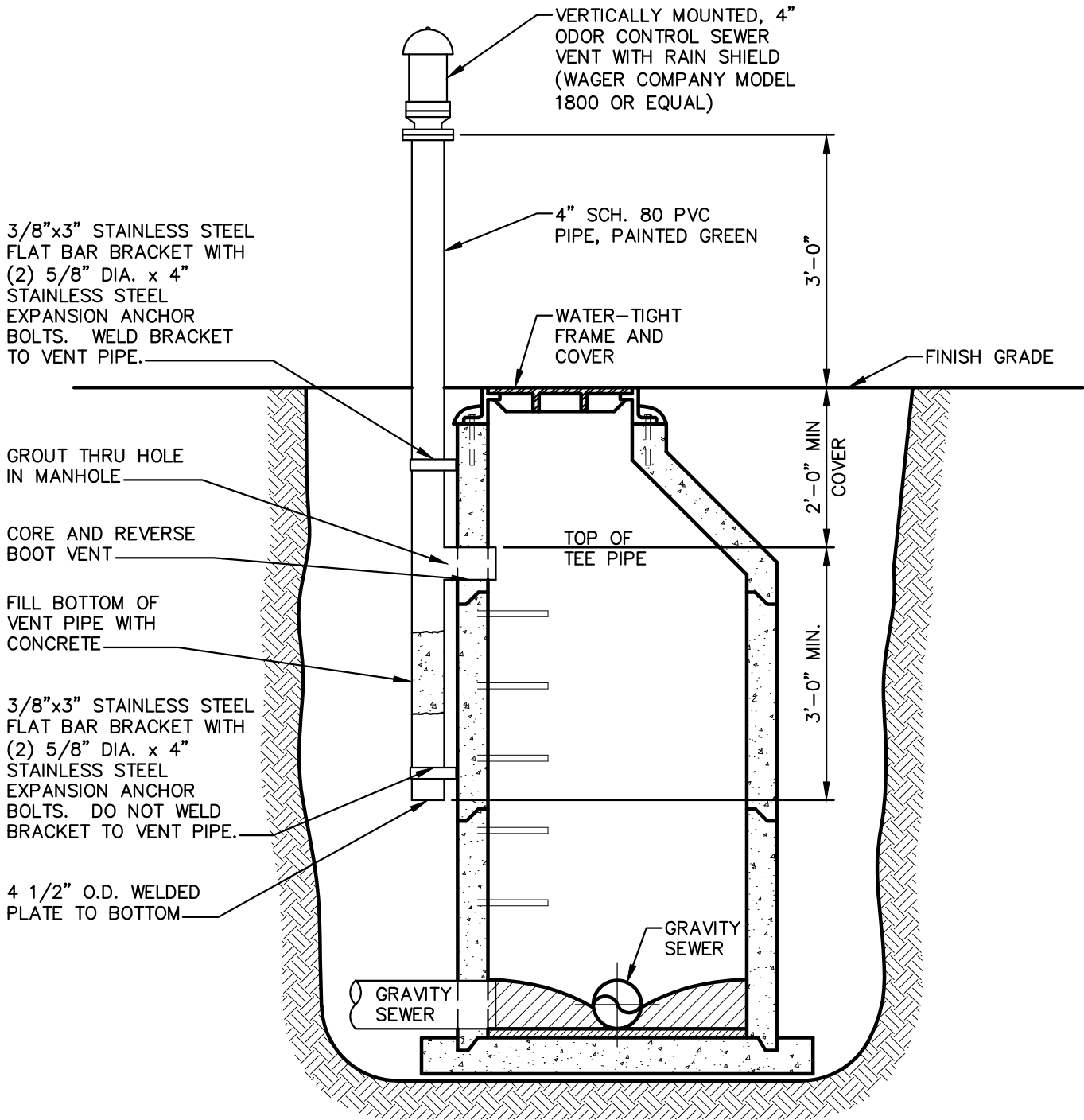
FORCE MAIN ANCHOR STRAP DETAIL

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**FORCE MAIN MANHOLE
 FORCE MAIN ANCHOR
 STRAP DETAIL**

STANDARD DETAIL NO.
S-13
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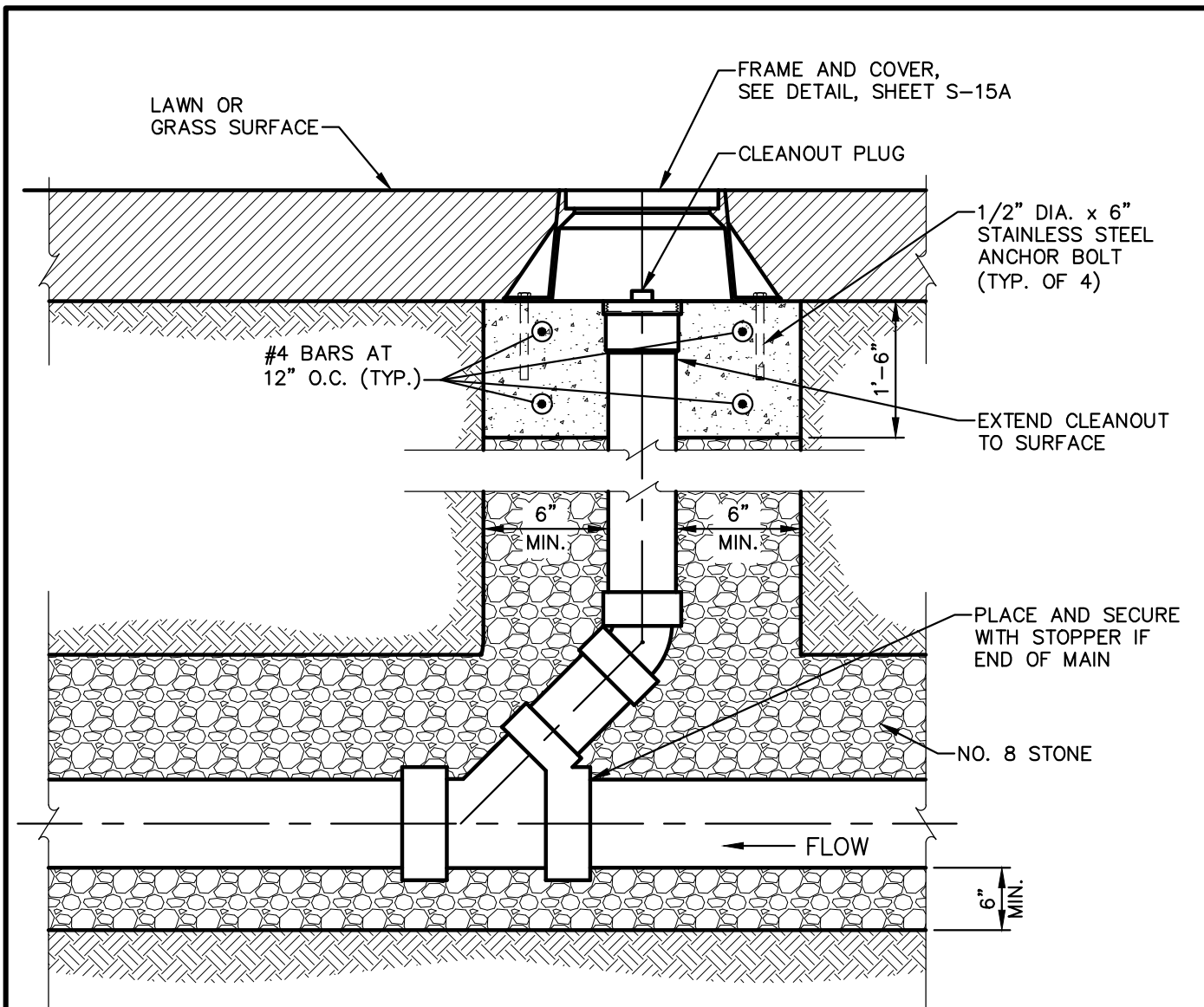
MANHOLE ODOR CONTROL VENT ASSEMBLY DETAIL

STANDARD DETAIL NO.

S-14

NOT TO SCALE

JULY 2025



NOTES:

1. CLEANOUT FRAME AND COVER SHALL BE INSTALLED SUCH THAT IT IS LEVEL TO 2" BELOW SURROUNDING SURFACE. CLEANOUTS PROJECTING ABOVE SURFACE ARE UNACCEPTABLE.
2. THIS DETAIL APPLIES TO NON-VEHICULAR TRAFFIC AREAS.
3. USE WYE AND PLUG FOR CLEANOUT AT END OF LINE.
4. FOR MAINLINE DIAMETER OF 8" OR GREATER, USE A MANHOLE.
5. FOR PIPE DIA. ≤ 6"

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**MAINLINE GRAVITY
 CLEANOUT DETAIL**

STANDARD DETAIL NO.

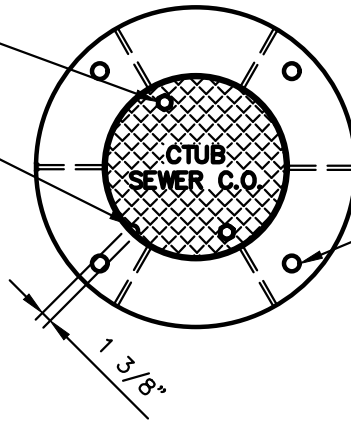
S-15

NOT TO SCALE

JULY 2025

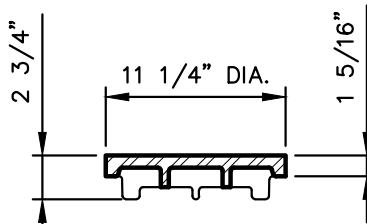
(2) 1/2" DIA. x 13x1
3/4 HEX HEAD
STAINLESS STEEL CAP
SCREWS AND RUBBER
AND ZINC WASHERS

(1) CLOSED PICKHOLE

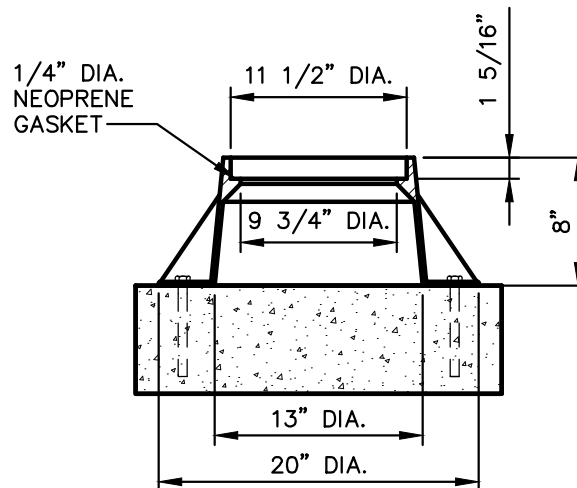


(4) 1" DIA. HOLES ON
17" DIA. BOLT CIRCLE

COVER PLAN



COVER SECTION



NOTES:

1. DIMENSIONS ABOVE ARE FOR EAST JORDAN IRONWORKS PRODUCTS
APPROVED SUPPLIERS:
EAST JORDAN IRON WORKS
FRAME AND COVER – PROD. NO. 157807, UNDIPTED

FRAME

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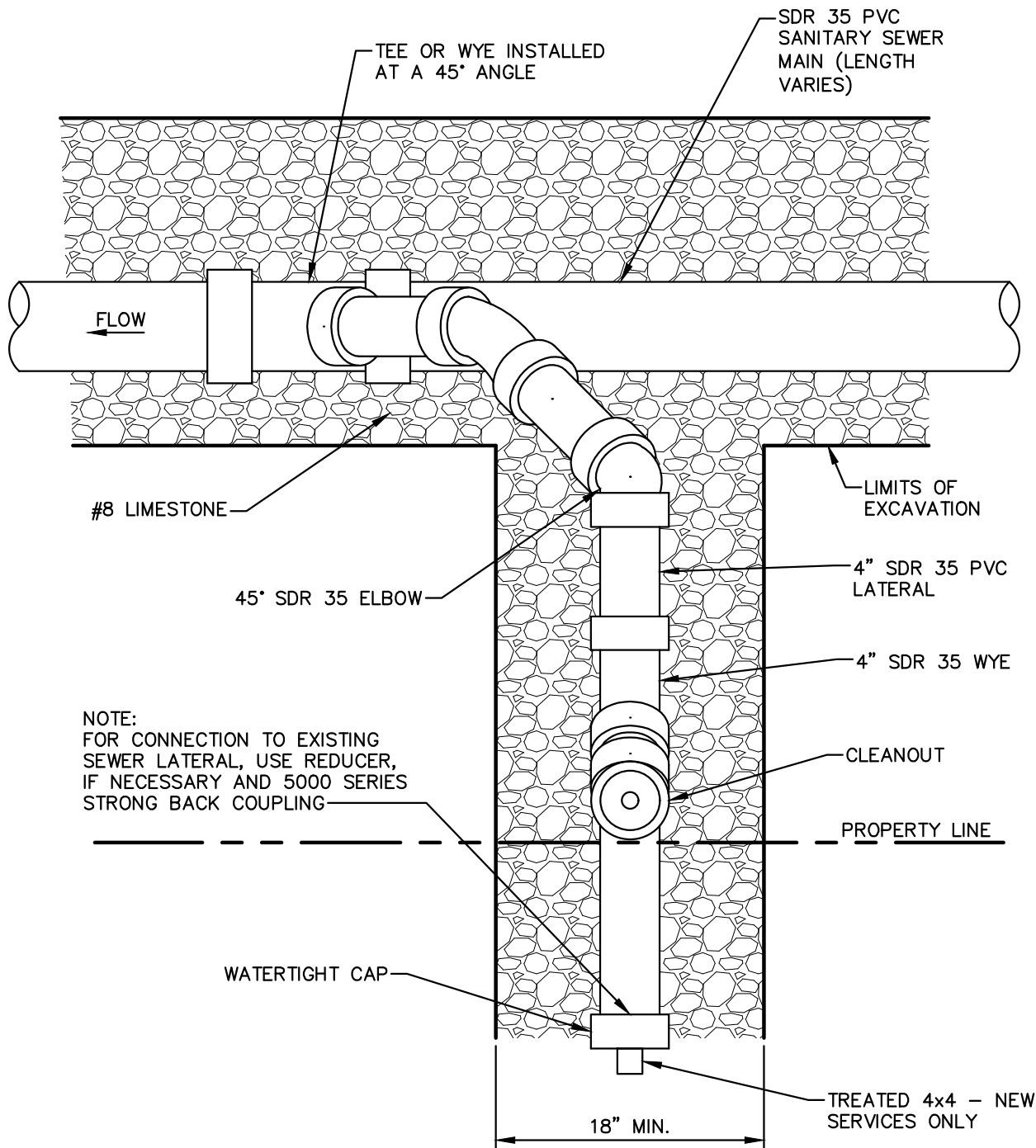
**CLEANOUT FRAME
AND COVER DETAIL**

STANDARD DETAIL NO.

S-15A

NOT TO SCALE

JULY 2025



PLAN

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**NEW SINGLE LATERAL
 CONNECTION DETAIL
 (PLAN)**

STANDARD DETAIL NO.

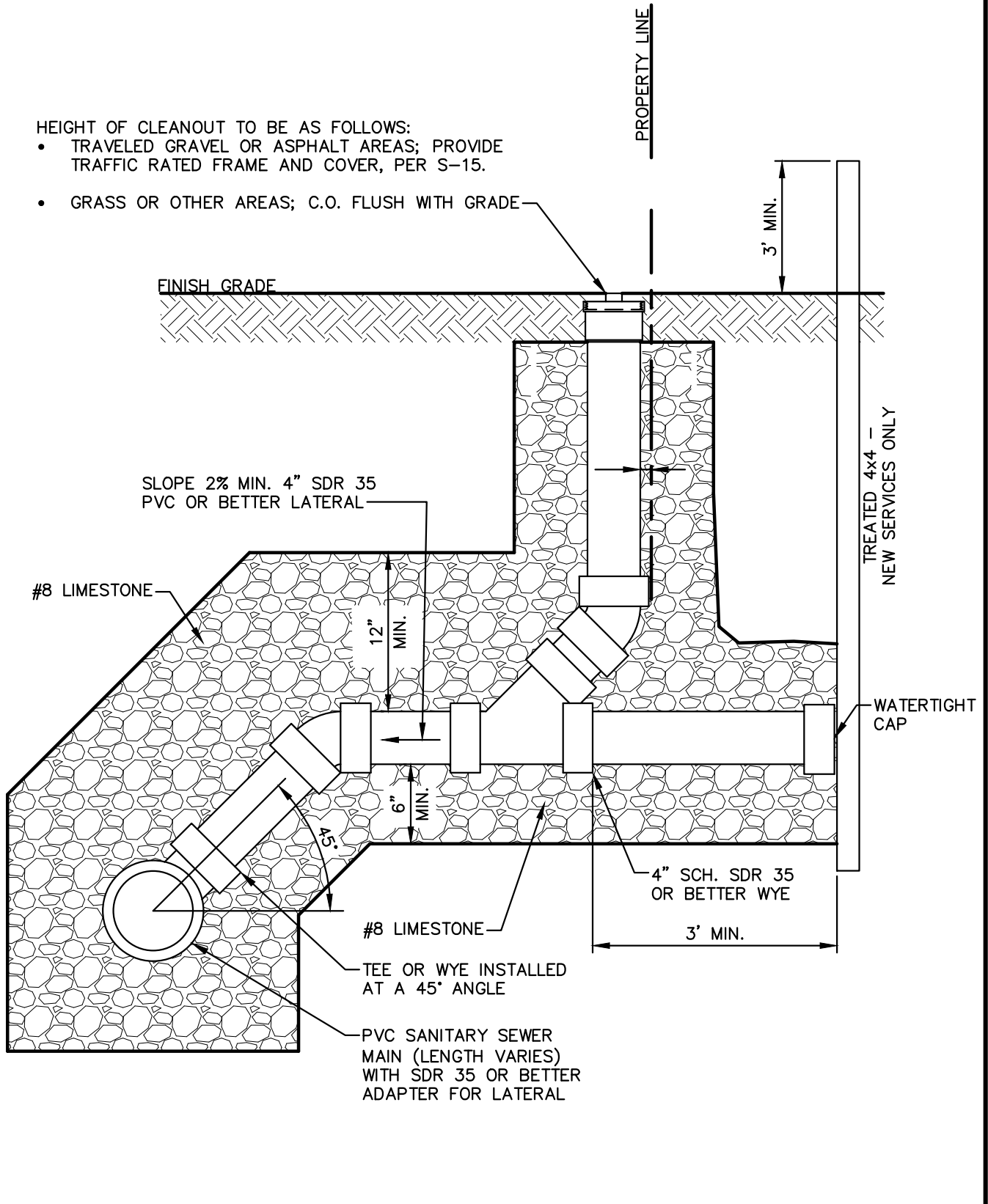
S-16

NOT TO SCALE

JULY 2025

HEIGHT OF CLEANOUT TO BE AS FOLLOWS:

- TRAVELED GRAVEL OR ASPHALT AREAS; PROVIDE TRAFFIC RATED FRAME AND COVER, PER S-15.
- GRASS OR OTHER AREAS; C.O. FLUSH WITH GRADE



ELEVATION

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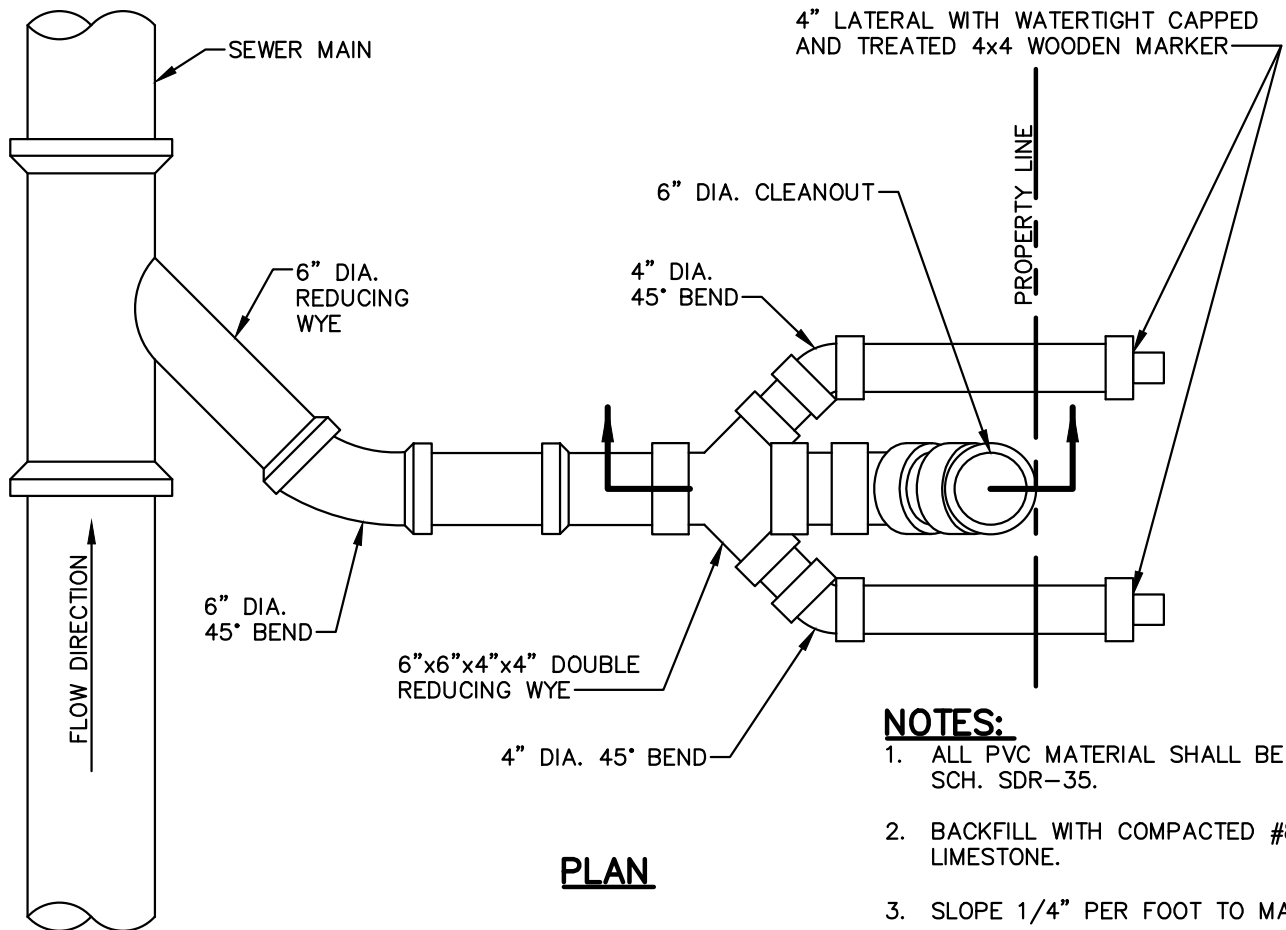
**NEW SINGLE LATERAL
 CONNECTION DETAIL
 (ELEVATION)**

STANDARD DETAIL NO.

S-16A

NOT TO SCALE

JULY 2025



PLAN

NOTES:

1. ALL PVC MATERIAL SHALL BE SCH. SDR-35.
2. BACKFILL WITH COMPACTED #8 LIMESTONE.
3. SLOPE 1/4" PER FOOT TO MAIN.

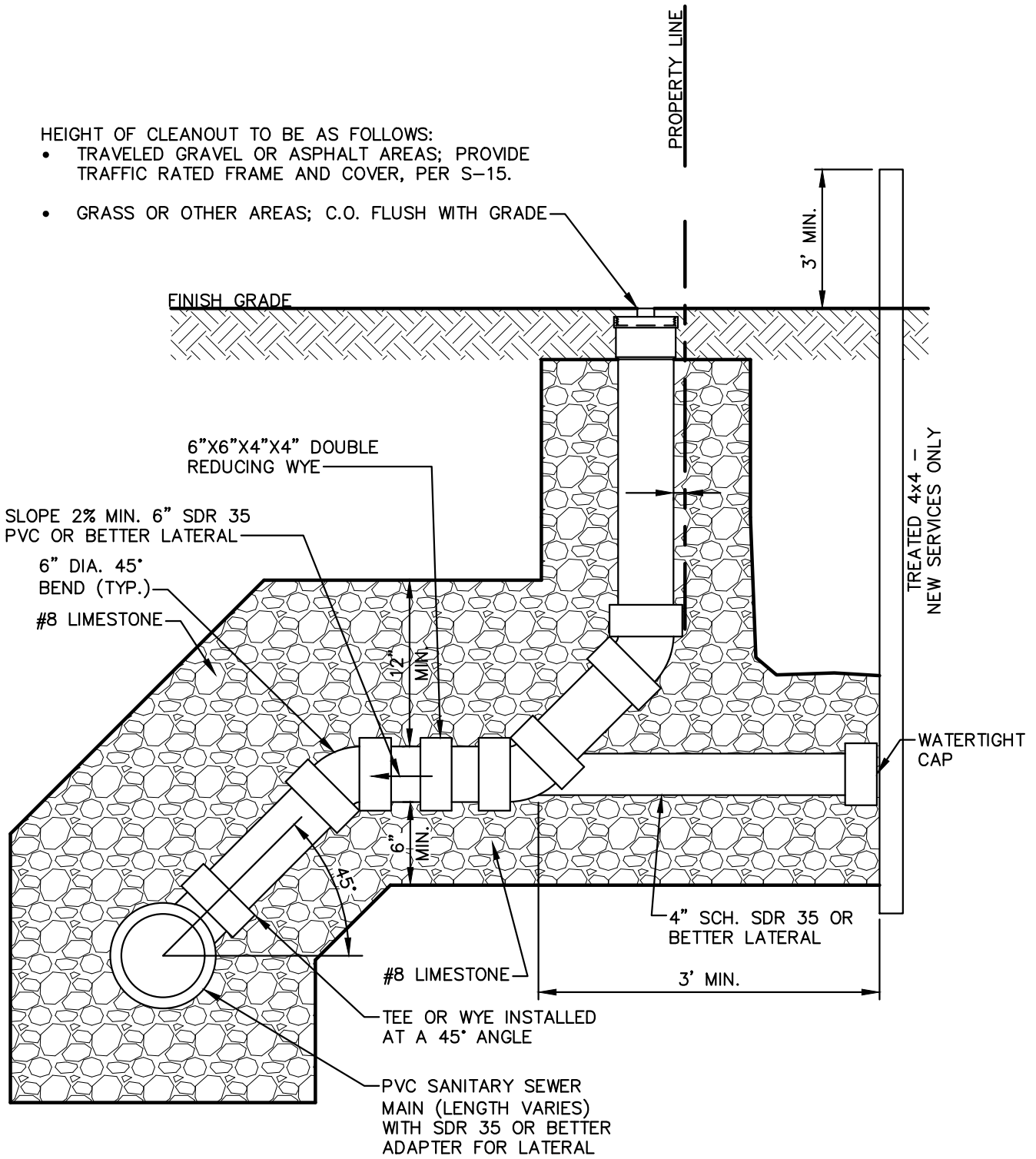
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**NEW DOUBLE LATERAL
 CONNECTION DETAIL
 (PLAN)**

STANDARD DETAIL NO.
S-17
 NOT TO SCALE
 JULY 2025

HEIGHT OF CLEANOUT TO BE AS FOLLOWS:

- TRAVELED GRAVEL OR ASPHALT AREAS; PROVIDE TRAFFIC RATED FRAME AND COVER, PER S-15.
- GRASS OR OTHER AREAS; C.O. FLUSH WITH GRADE



ELEVATION

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**NEW DOUBLE LATERAL
 CONNECTION DETAIL
 (ELEVATION)**

STANDARD DETAIL NO.

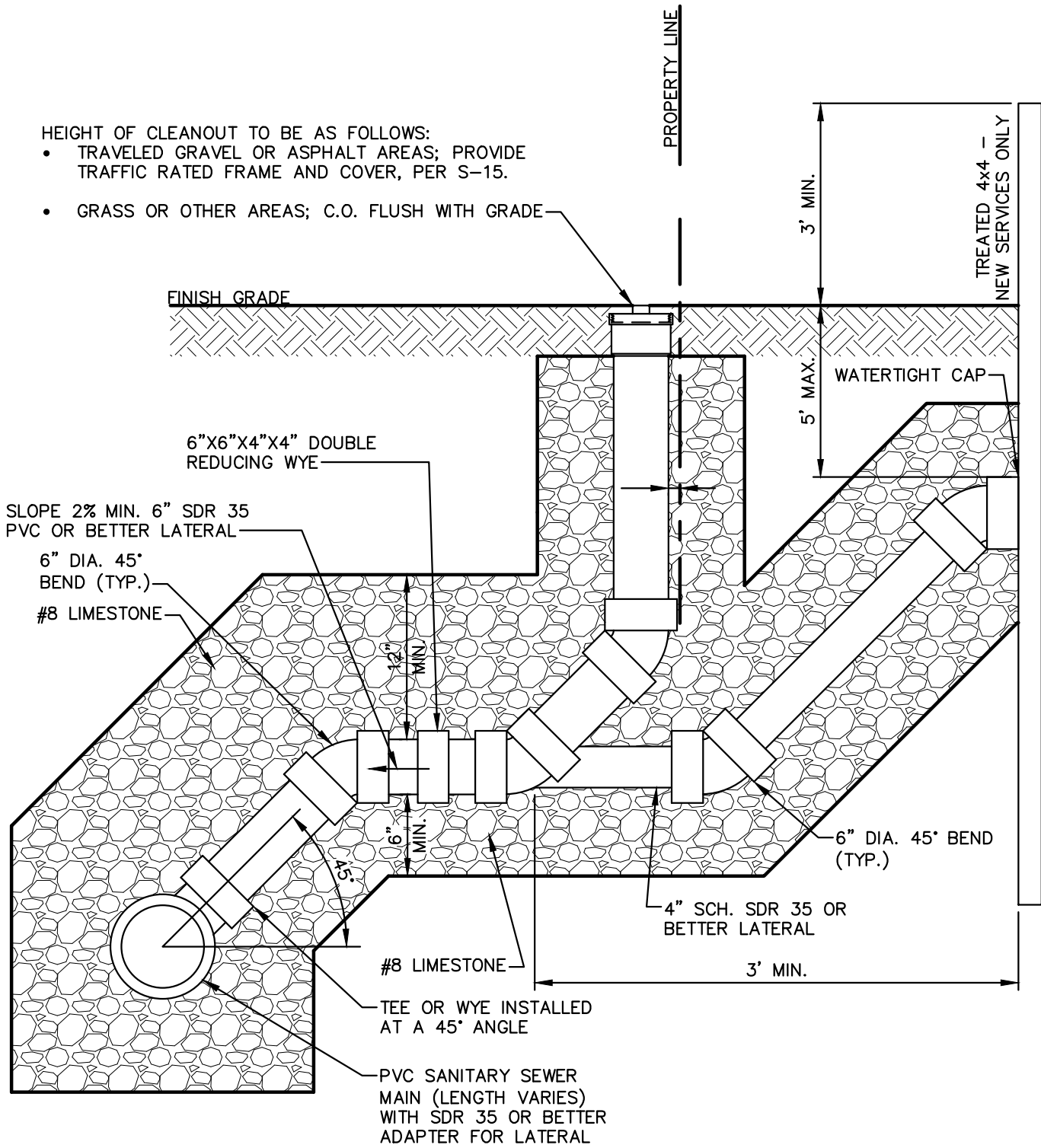
S-17A

NOT TO SCALE

JULY 2025

HEIGHT OF CLEANOUT TO BE AS FOLLOWS:

- TRAVELED GRAVEL OR ASPHALT AREAS; PROVIDE TRAFFIC RATED FRAME AND COVER, PER S-15.
- GRASS OR OTHER AREAS; C.O. FLUSH WITH GRADE



ELEVATION

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**NEW DEEP DOUBLE
 LATERAL CONNECTION
 DETAIL (ELEVATION)**

STANDARD DETAIL NO.

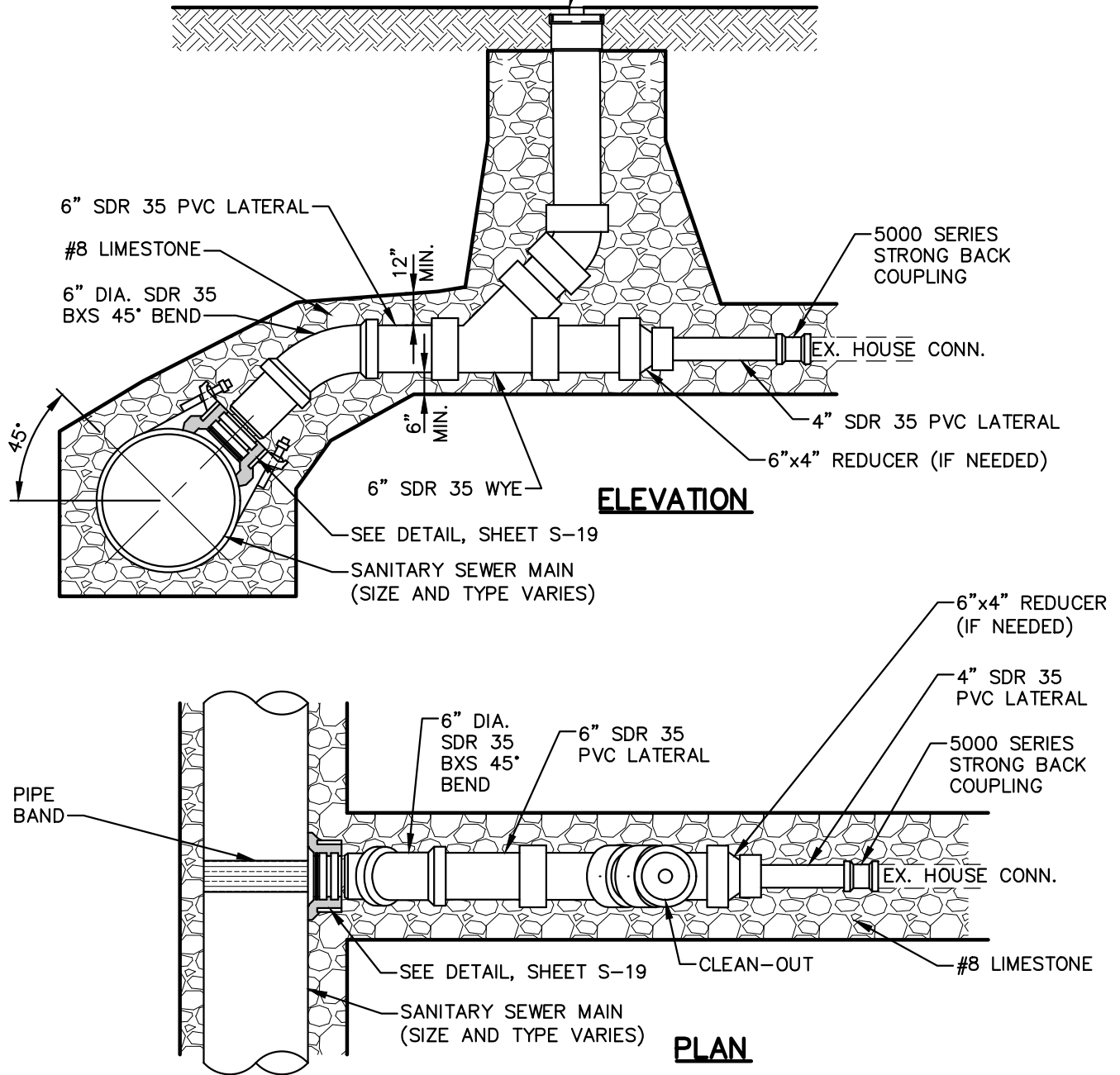
S-17B

NOT TO SCALE

JULY 2025

HEIGHT OF CLEANOUT TO BE AS FOLLOWS:

- TRAVELED GRAVEL OR ASPHALT AREAS; PROVIDE TRAFFIC RATED FRAME AND COVER, PER S-15.
- GRASS OR OTHER AREAS; C.O. FLUSH WITH GRADE



NOTES:

1. SLOPE LATERAL 1/4" PER FOOT TO MAIN.
2. SCHEDULE 40 PVC MAY BE USED INSTEAD OF SDR 35 FOR LATERAL PIPE WITH SDR 35 x SCH. 40 ADAPTER.
3. USE 6" SEWER SADDLE FOR REPLACEMENT OF EXISTING LATERAL CONNECTIONS.
4. USE 4" SEWER SADDLE FOR NEW 4" LATERAL CONNECTIONS ON EXISTING LINES.

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**REPLACEMENT
 LATERAL
 CONNECTION DETAIL**

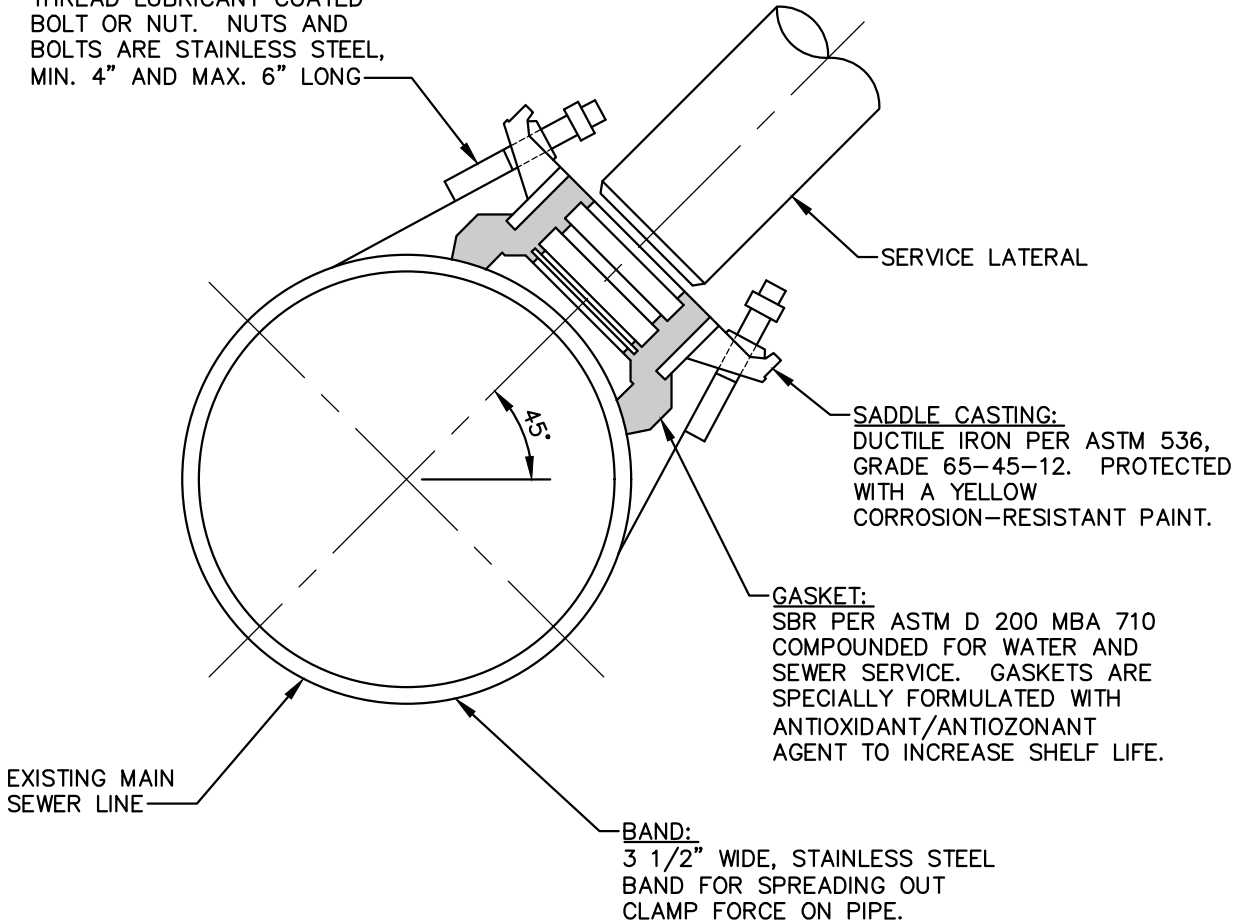
STANDARD DETAIL NO.

S-18

NOT TO SCALE

JULY 2025

ADJUSTABLE STRAP:
 BOLTS ARE 1/2" UNC ROLLED
 THREAD LUBRICANT COATED
 BOLT OR NUT. NUTS AND
 BOLTS ARE STAINLESS STEEL,
 MIN. 4" AND MAX. 6" LONG



NOTES:

1. SADDLE SHALL BE CAPABLE OF ATTACHING TO VARIOUS SIZES AND MATERIALS OF GRAVITY SEWER MAIN LINES. SADDLE SHALL BE INSTALLED SO SEWER LATERAL IS AT 45° FROM VERTICAL AT MAINLINE.
2. ROMAC ORIGINAL, STYLE "CB" SEWER SADDLE.
3. PIPE STOP CAPABLE OF WITHSTANDING 1000 POUNDS OF THRUST IS MOLDED INTO THE CB SADDLE GASKET. CARE MUST BE TAKEN DURING SYSTEM DESIGN AND INSTALLATION TO ASSURE THAT THIS THRUST LIMIT IS NOT EXCEEDED.
4. NEW LATERAL CONNECTIONS USE 4" SADDLE OR SIZE OF LATERAL IF LARGER.
5. FOR SEWER LATERAL REPLACEMENTS, USE 6" SADDLE AND USE PIPE REDUCER TO CONNECT TO LATERAL.
6. A PVC REDUCER IS REQUIRED FOR LOW PRESSURE SEWER MAINS.

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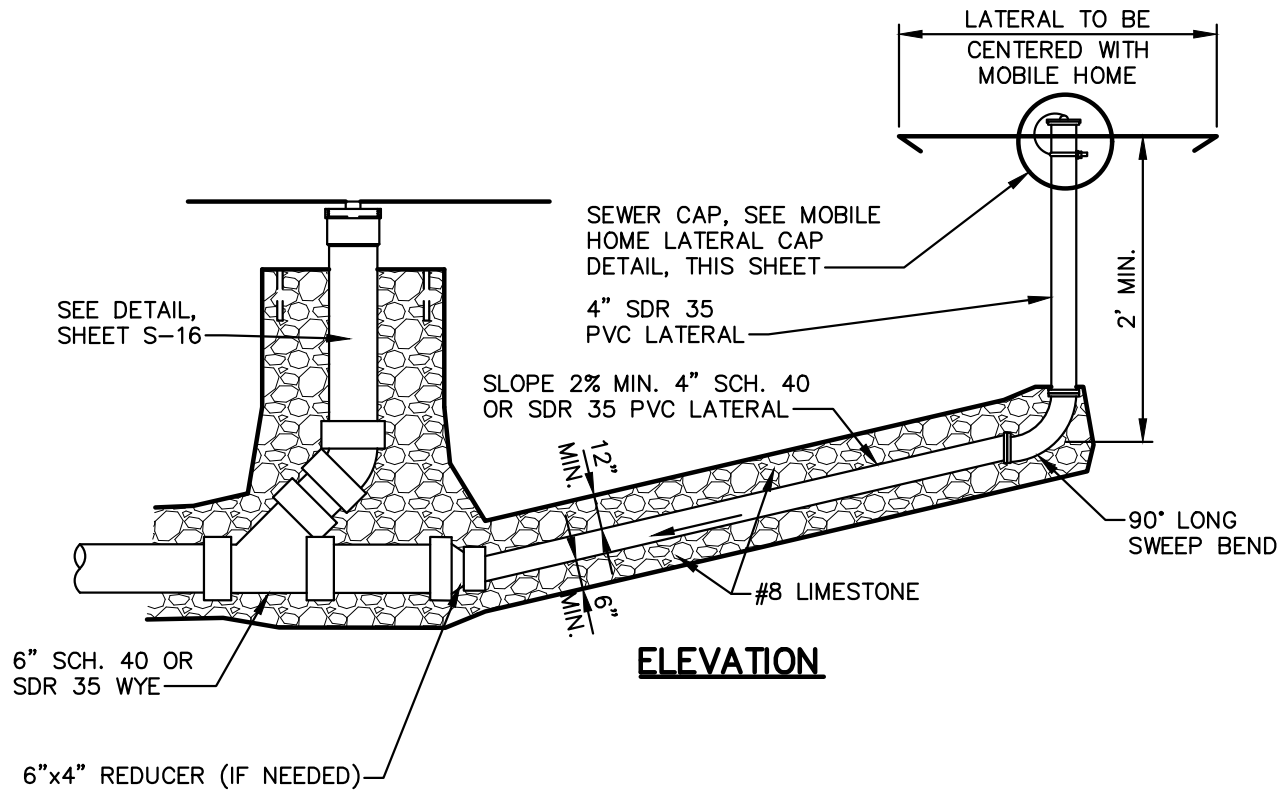
**SEWER SADDLE
 DETAIL**

STANDARD DETAIL NO.

S-19

NOT TO SCALE

JULY 2025

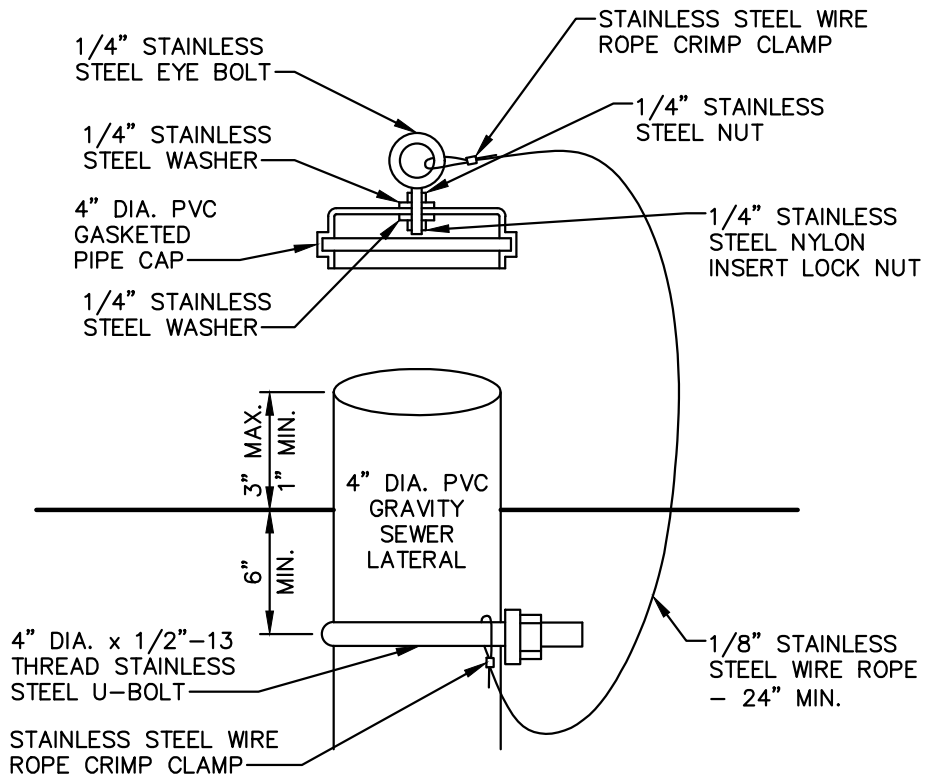


NOTES:

1. ALL METAL HARDWARE TO BE 304 STAINLESS STEEL.
2. SCHEDULE 40 PVC MAY BE USED INSTEAD OF SDR 35 FOR LATERAL PIPE WITH SDR 35 X SCH. 40 ADAPTER.

NOTE:

SCHEDULE 40 PVC MAY BE USED INSTEAD OF SDR 35 FOR LATERAL PIPE WITH SDR 35 x SCH. 40 ADAPTER.



MOBILE HOME LATERAL CAP DETAIL

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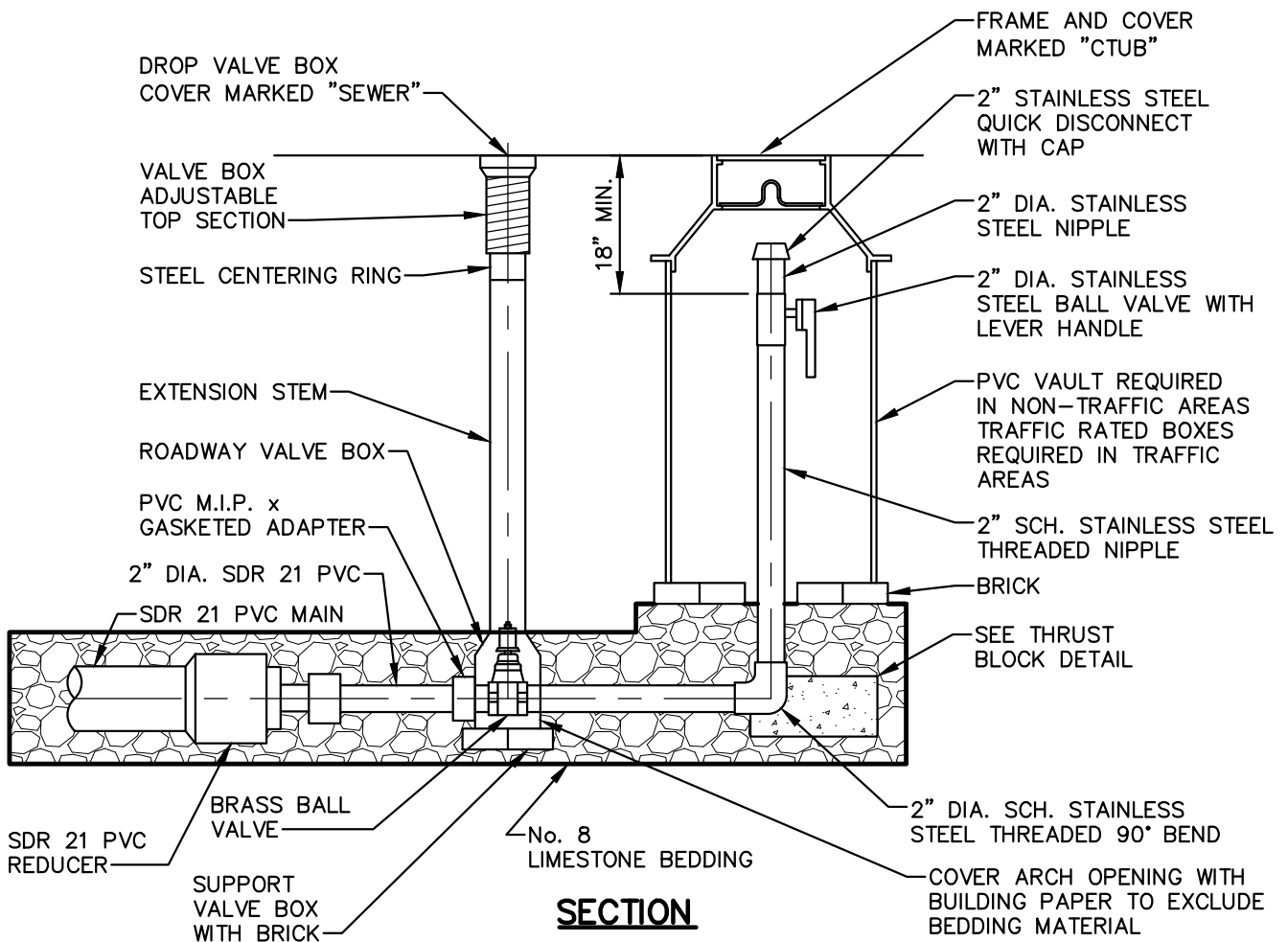
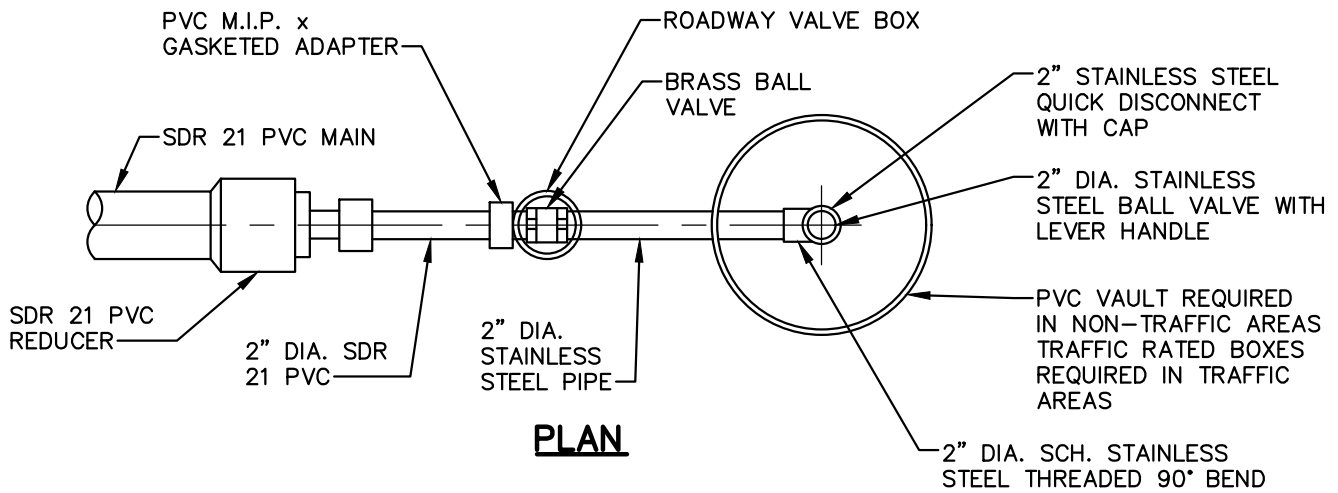
MOBILE HOME CONNECTION DETAIL

STANDARD DETAIL NO.

S-20

NOT TO SCALE

JULY 2025



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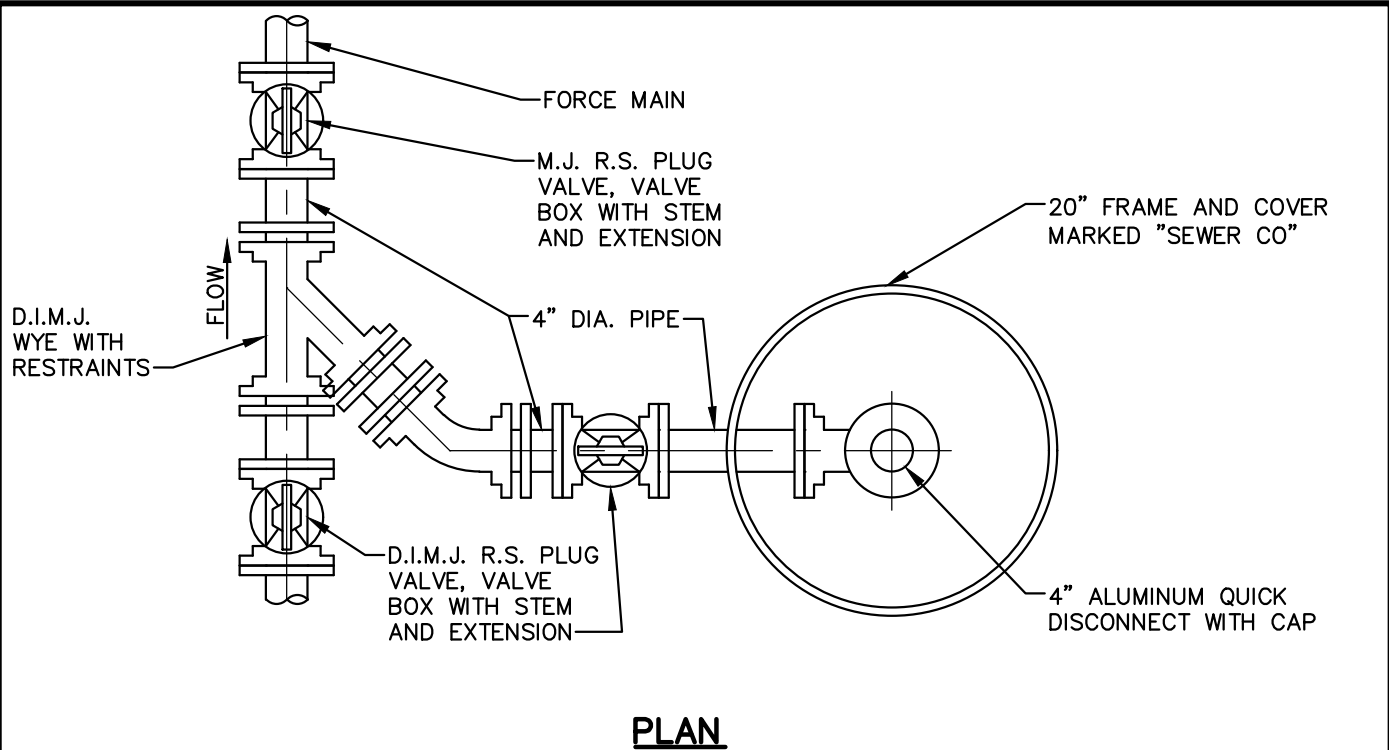
**FORCE MAIN
 3" DIA. OR LESS
 FLUSHING DETAIL**

STANDARD DETAIL NO.

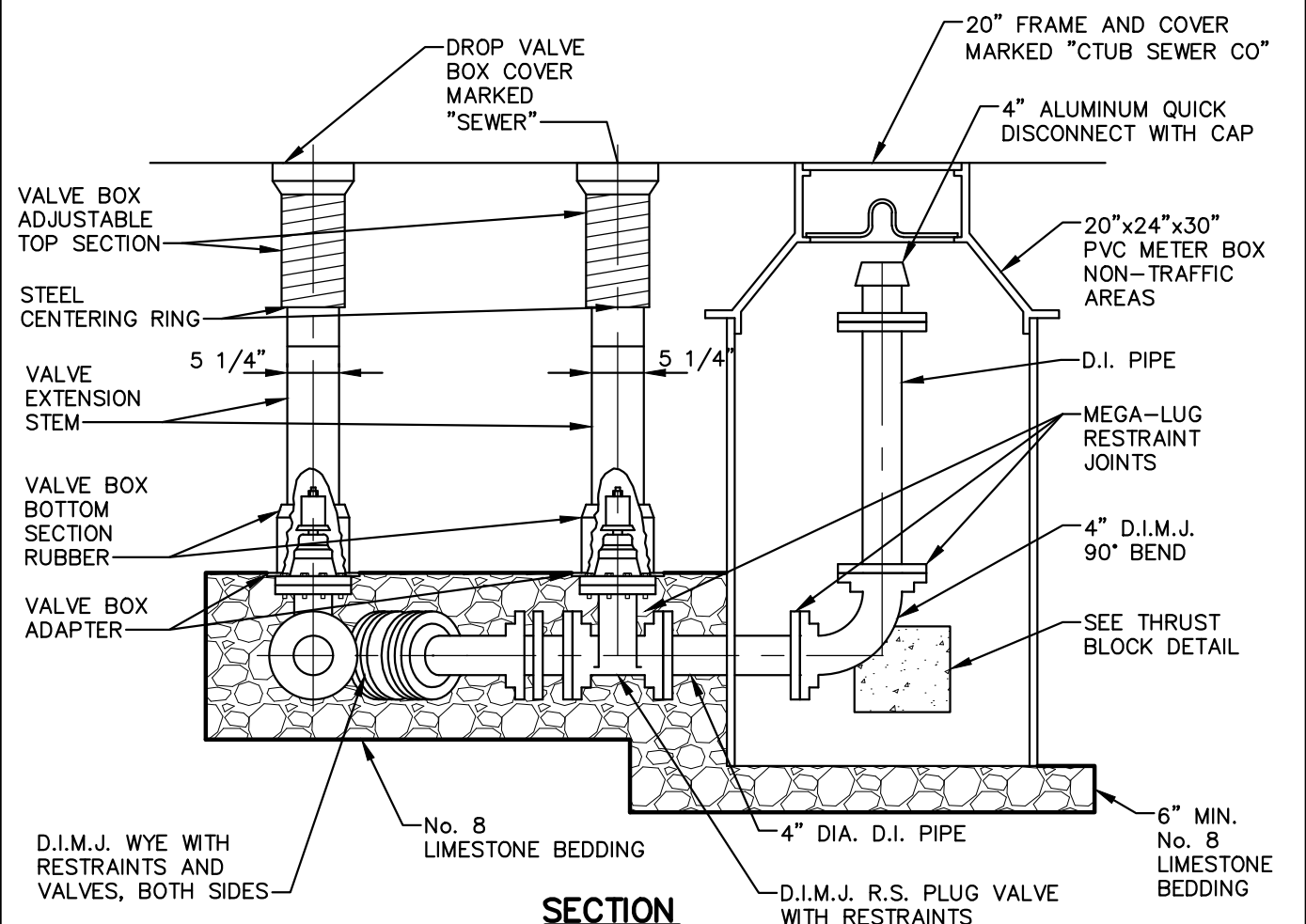
S-21

NOT TO SCALE

JULY 2025



PLAN



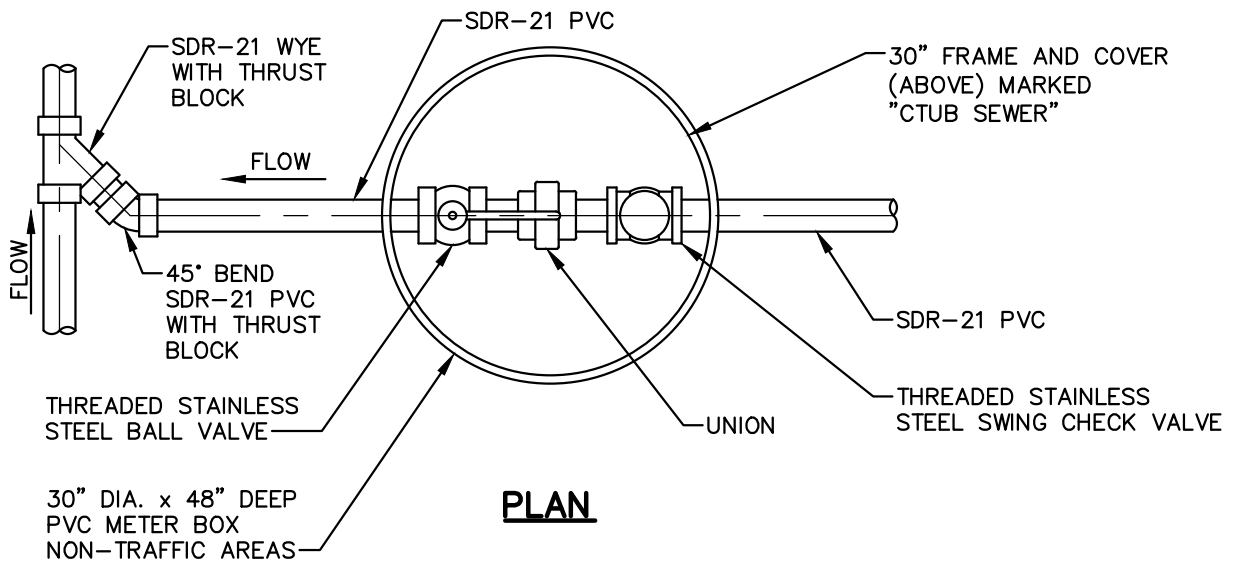
SECTION

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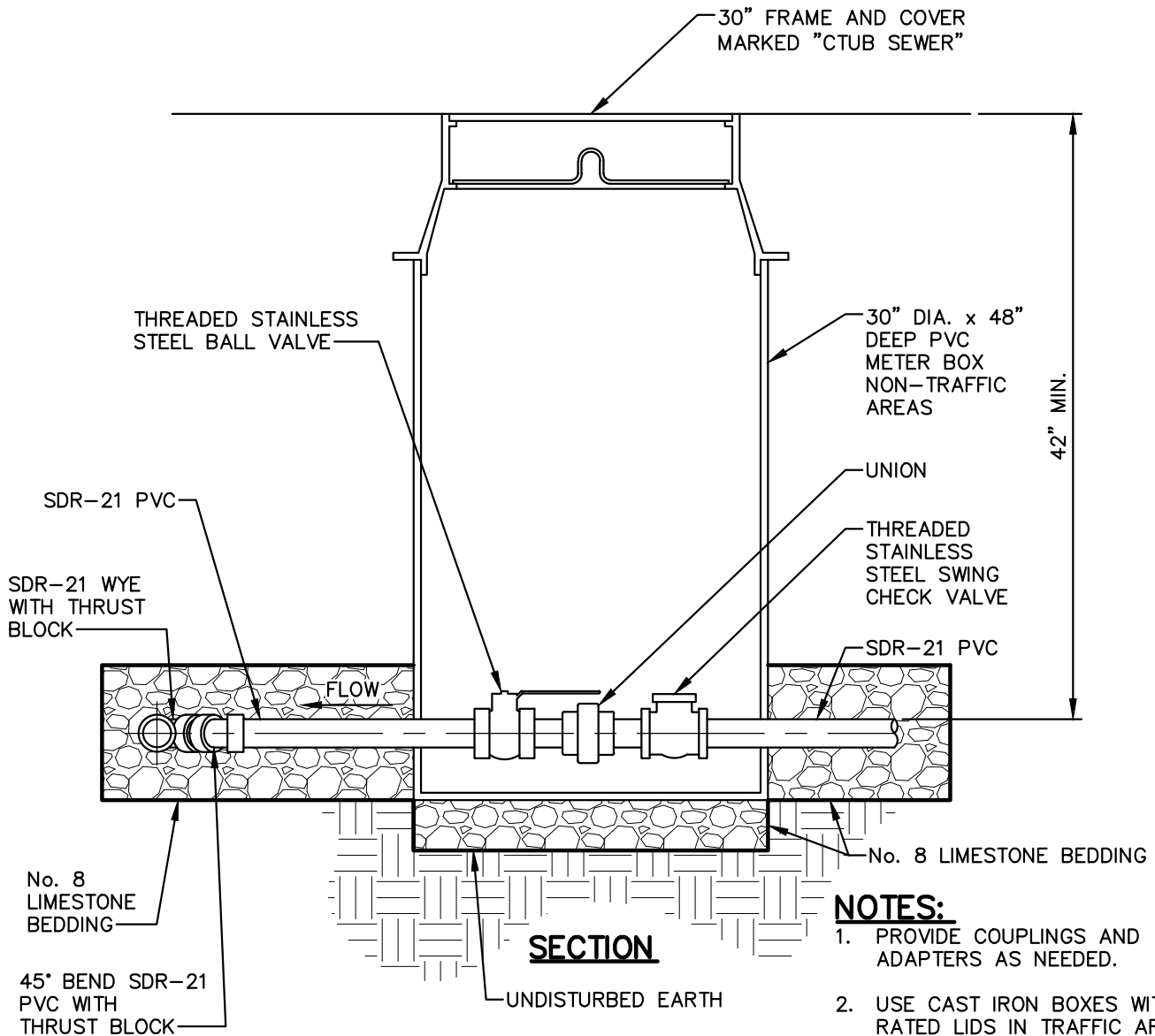
**FORCE MAIN
 FLUSHING 4"-16"
 LINE DETAIL**

STANDARD DETAIL NO.
S-22
NOT TO SCALE
JULY 2025

FILENAME: G:\GD&F\STANDARD DETAILS\CHARLES TOWN STANDARD DETAILS\S-22.DWG



PLAN



SECTION

NOTES:

1. PROVIDE COUPLINGS AND ADAPTERS AS NEEDED.
2. USE CAST IRON BOXES WITH RATED LIDS IN TRAFFIC AREAS.

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**FORCE MAIN LATERAL
 CONNECTION DETAIL**

STANDARD DETAIL NO.

S-23

NOT TO SCALE

JULY 2025

PROVIDE FIBERGLASS INDICATOR POST. THE POST SHALL BE GREEN, 66" HIGH, 4" WIDE, 3-SIDED AND SHALL HAVE LABELING TO INDICATE BOTH THE DIAMETER OF THE FORCEMAIN AND THE WORDS "PRESSURE SEWER - AIR RELEASE VALVE"

CAST IRON MANHOLE FRAME AND COVER, VENTED LID TYPE

PRECAST CONCRETE MANHOLE

PLASTIC MANHOLE STEPS

VALVE, QUICK DISCONNECT COUPLING AND BACKFLUSHING HOSE

AIR RELEASE OR COMBINATION AIR RELEASE AND AIR VACUUM VALVE

2" BLOW-OFF VALVE

2" STAINLESS STEEL BALL VALVE

2" STAINLESS STEEL CLOSE NIPPLE

PRESSURE SEWER LINE SEE PLANS FOR SIZE

6" CRUSHED STONE

UNDISTURBED SOIL

5'-0"

6" MIN.

MOUNTING PLATE FASTEN TO CONCRETE w/3/8" EXP. BOLTS (STAINLESS STEEL)

3/4" DIA. STAINLESS STEEL RODS w/THREADED ENDS (2 REQUIRED)

SOCKET CLAMP

4" FLOOR DRAIN w/INTERVAL BACKWATER VALVE

MANHOLE GASKET (TYP.)

REDUCING TEE, TYPE AND CONNECTIONS AS REQUIRED

CONCRETE PIPE SUPPORT

AS REQUIRED
SEE PLANS/PROFILES

NOTE:

1. VALVE SHALL BE VAL-MATIC SERIES 800 OR 48A/300 WITH ALL OPTIONS AS SHOWN. PROVIDE LOW DUROMETER SEAT IN LOW PRESSURE APPLICATIONS.

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**AIR RELEASE AND
VACUUM RELIEF
VALVE DETAIL**

STANDARD DETAIL NO.

S-24

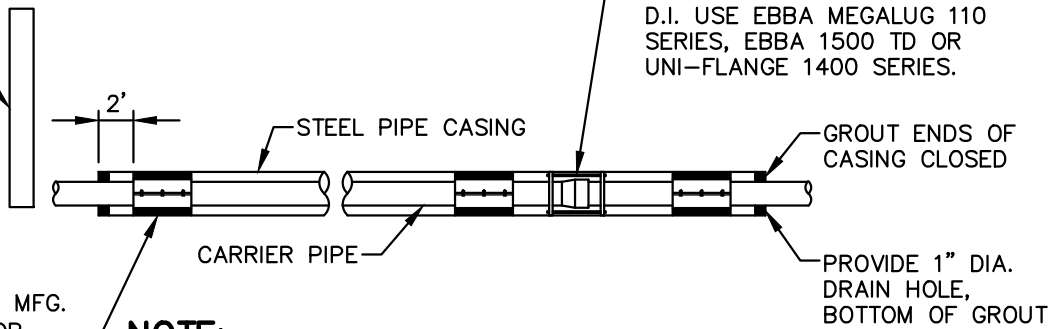
NOT TO SCALE

JULY 2025

CASING SCHEDULE

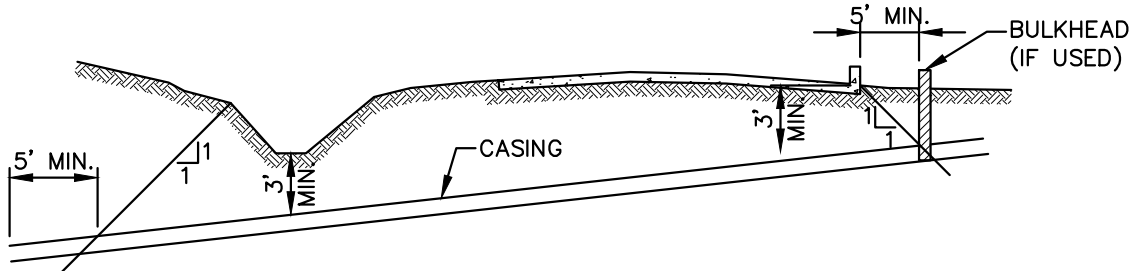
CARRIER PIPE DIA. (IN.)	CASING PIPE DIA. (IN.)	NOM. WALL THICKNESS
4	10	0.313
6	12	0.313
8	16	0.313
10	24	0.375
12	24	0.375
16	30	0.500
20	36	0.500
24	42	0.500
30	48	0.500
36	54	0.625
42	60	0.625
48	66	0.625

PROVIDE 4"x4" TREATED "END OF CASING" MARKER POSTS AT EACH END



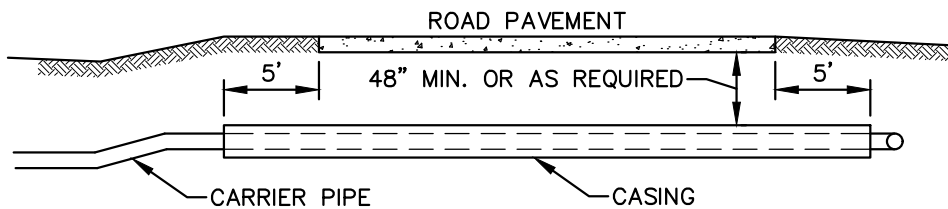
PIPE SPACER AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OR EQUAL. (1) FOR EVERY 10' OF CASING

NOTE:
SEE PLANS FOR CASING SIZE AND LENGTH.



NOTE:

PERMIT REQUIRED FROM WV DEPARTMENT OF HIGHWAYS IF CROSSING UNDER STATE ROAD. WVDOH PERMIT REQUIREMENTS SUPERCEDE WHAT IS SHOWN ON THIS DETAIL.



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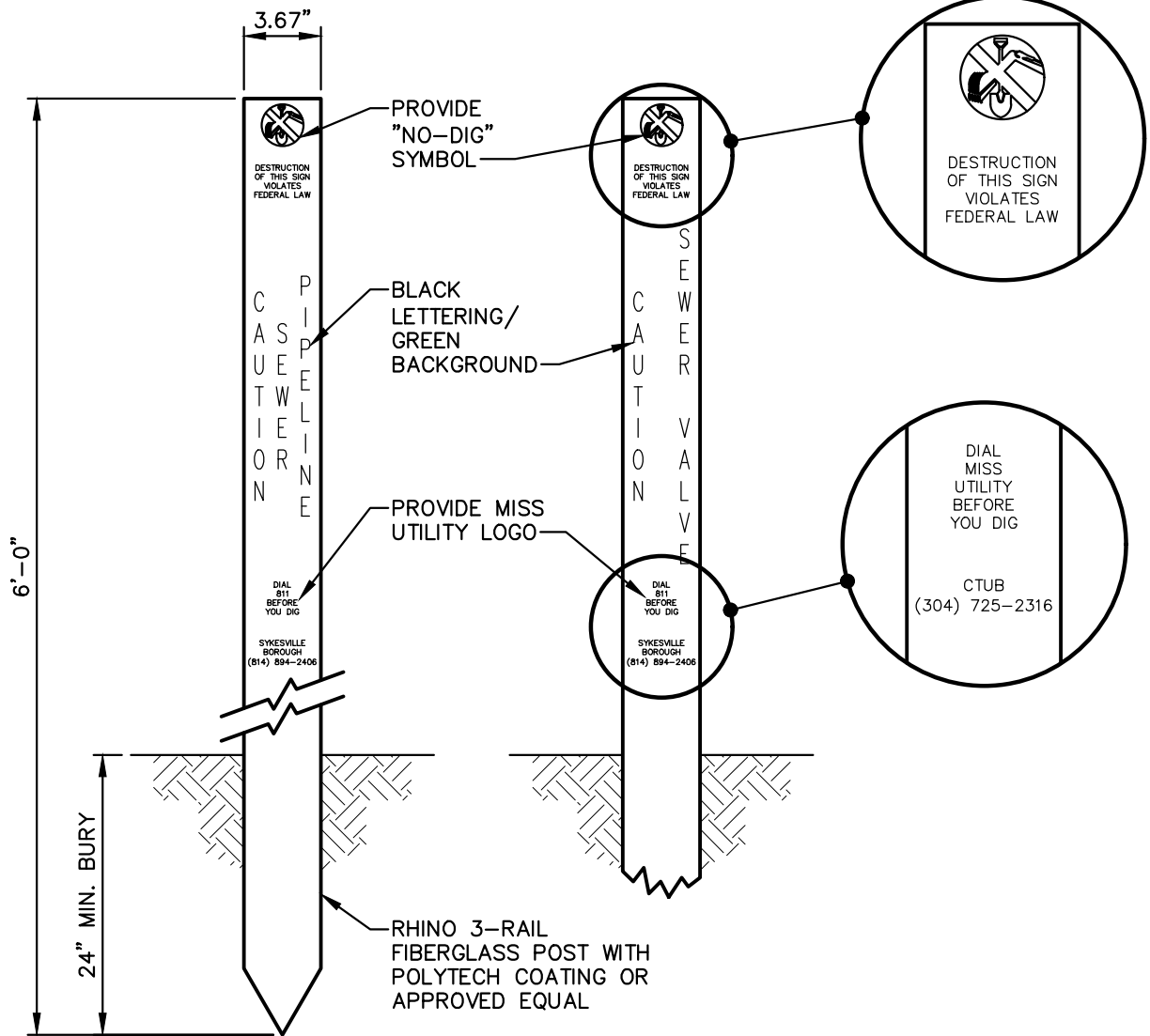
**PIPE CASING
DETAIL**

STANDARD DETAIL NO.

S-25

NOT TO SCALE

JULY 2025



NOTES:

1. ALL MARKER POSTS MUST BE SET TRUE (FACING THE FACILITY) AND PLUMB.
2. DO NOT SET MARKER POSTS IN TRAVELED WAY.
3. DO NOT SET MARKER POSTS ON PRIVATE PROPERTY.
4. IN SANDY LOOSE SOILS, PROVIDE AND INSTALL ANCHOR BARB KIT CONTAINING ONE METAL ANCHOR BARB AND TWO RIVETS AS REQUIRED.
5. WHEN PLACING "CAUTION SEWER PIPELINE" MARKERS IN RIGHT-OF-WAY TO IDENTIFY PIPE LOCATIONS, PLACE THE MARKERS EVERY 400 FT TO 500 FT OR WITHIN LINE OF SIGHT, AND PLACE AT SIGNIFICANT PIPE ALIGNMENT ANGLE POINTS AS NEEDED.

PROVIDE AND AFFIX THE APPROPRIATE UTILITY MARKER DECAL TO IDENTIFY THE FACILITY BEING INSTALLED, REPLACED OR INSPECTED AS NEEDED.

CAUTION SEWER PIPELINE

CAUTION SEWER VALVE

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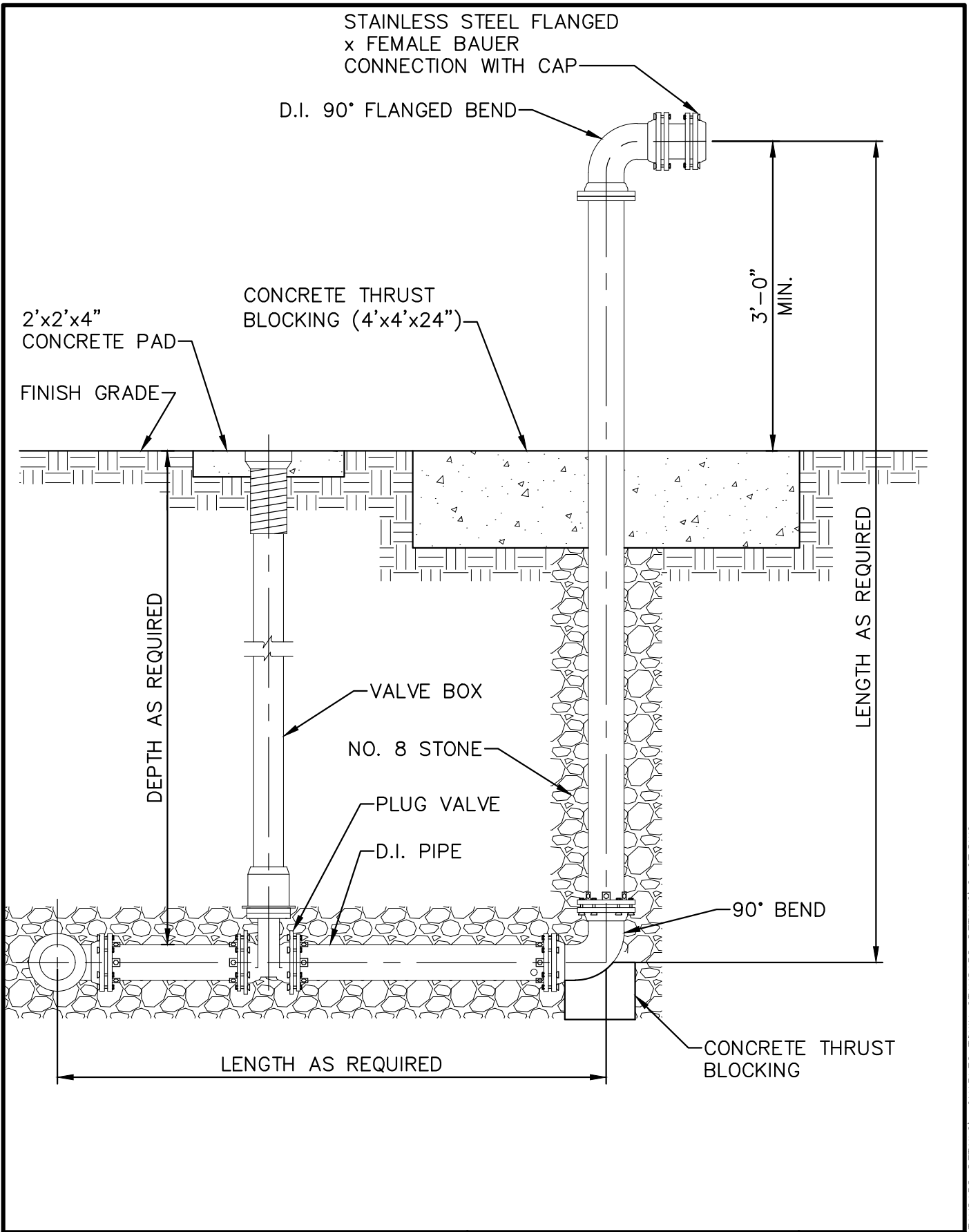
**PIPELINE MARKER
 POST DETAIL**

STANDARD DETAIL NO.

S-26

NOT TO SCALE

JULY 2025



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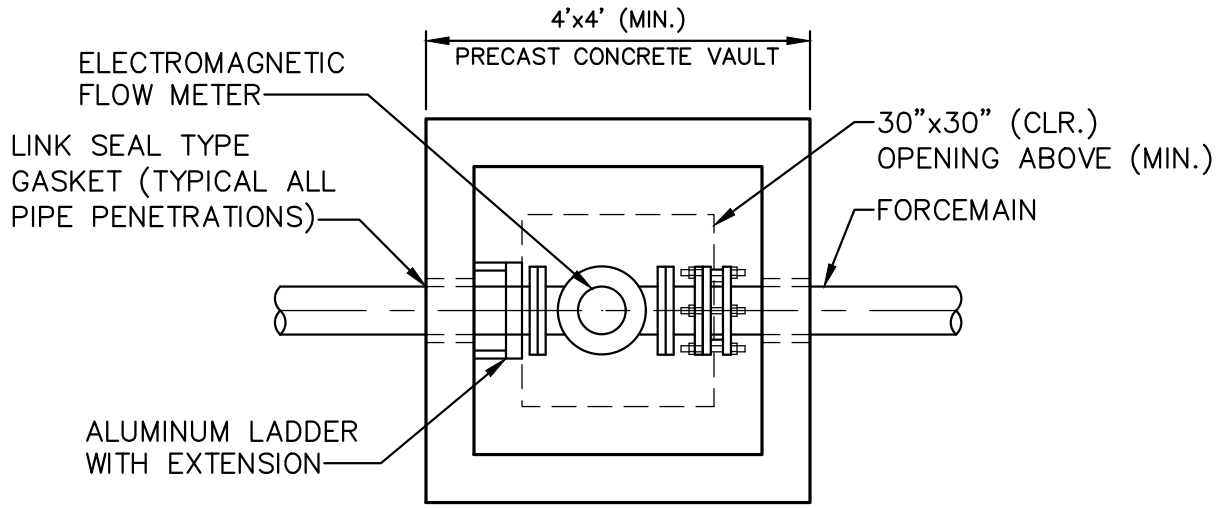
**EMERGENCY BYPASS
 CONNECTION DETAIL**

STANDARD DETAIL NO.

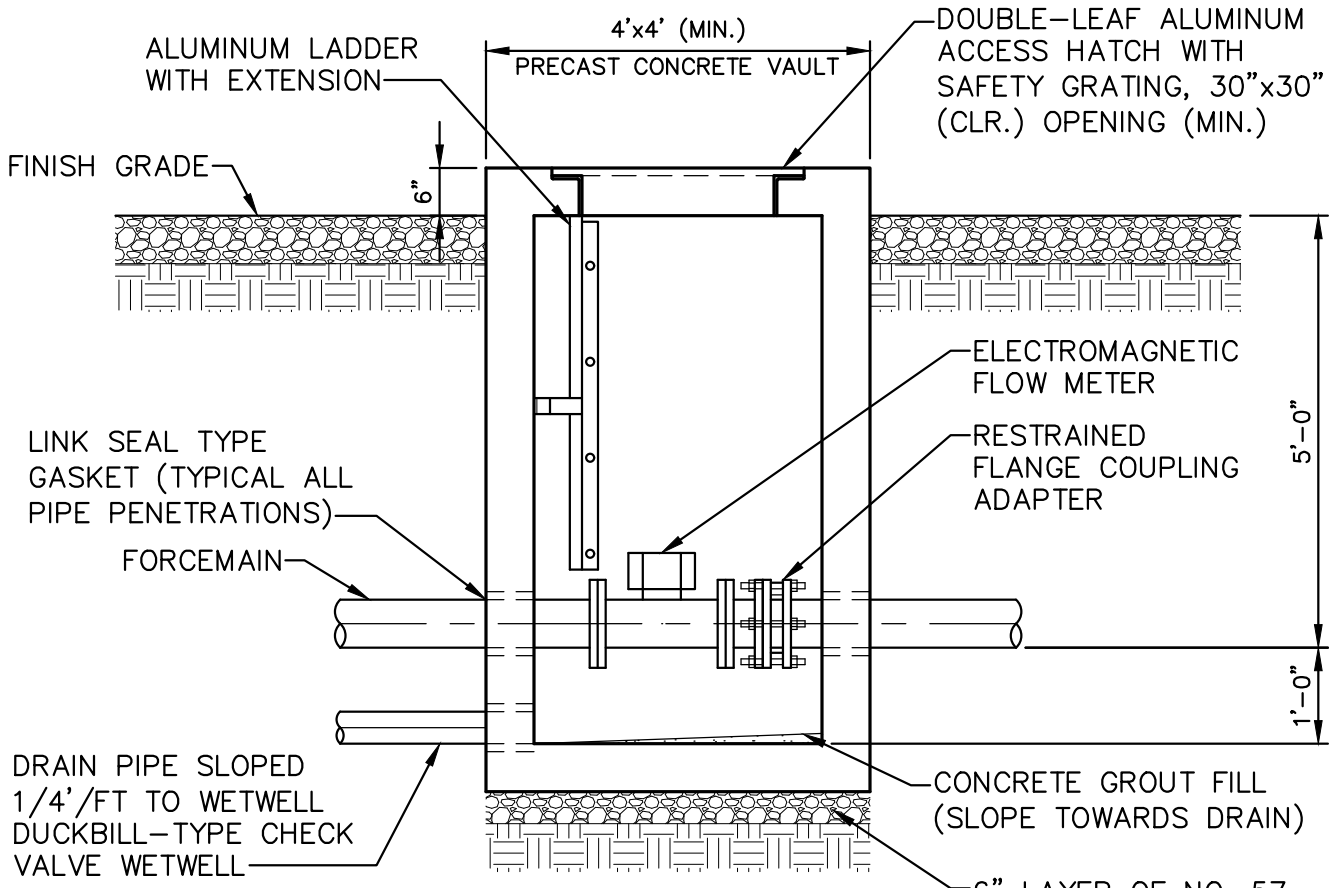
S-27

NOT TO SCALE

JULY 2025



PLAN VIEW



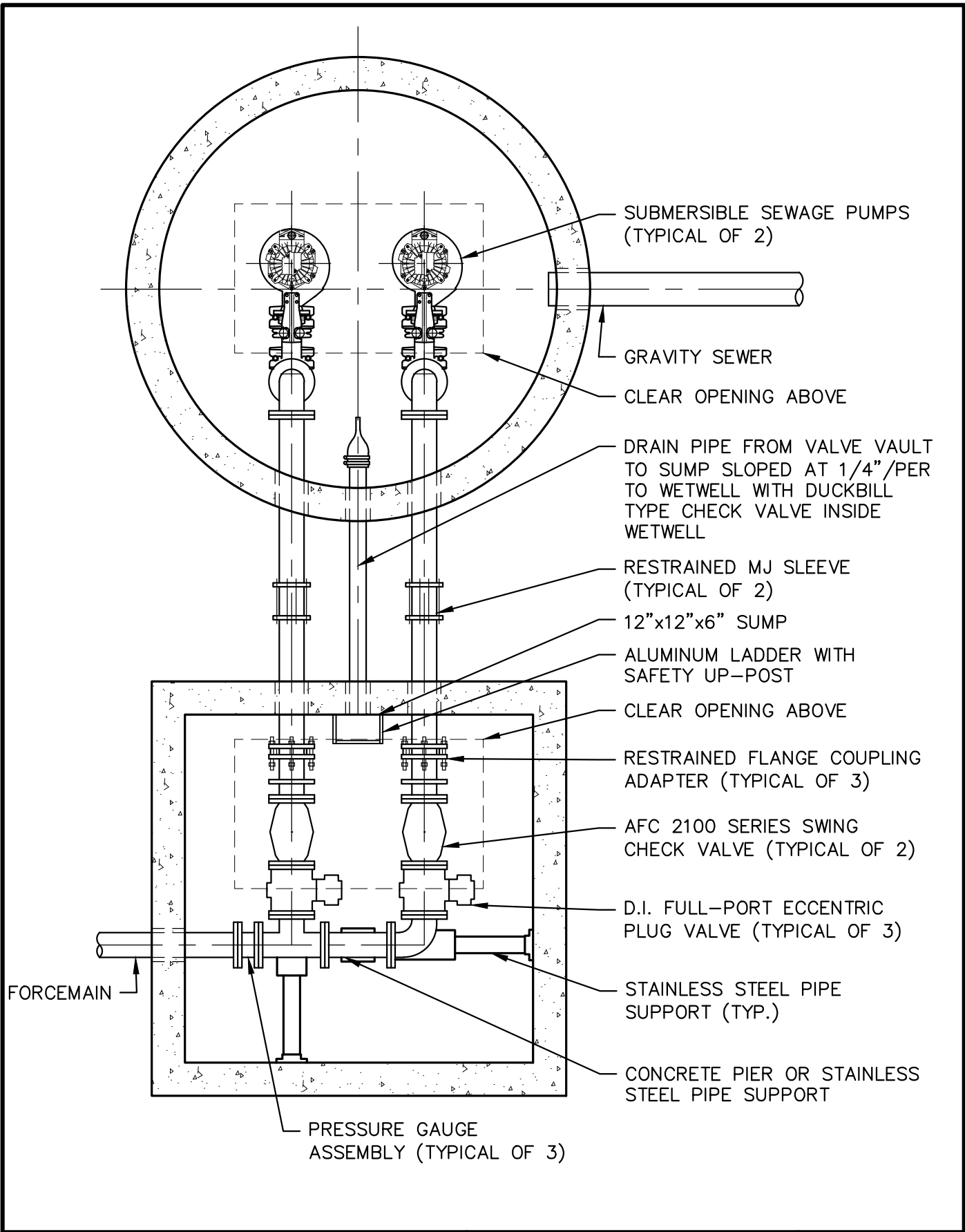
SECTION VIEW

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**FLOW METER VAULT
 PLAN AND SECTION
 VIEW**

STANDARD DETAIL NO.
S-28
NOT TO SCALE
JULY 2025

FILENAME: G:\GD&F\STANDARD DETAILS\CHARLES TOWN STANDARD DETAILS\S-28.DWG



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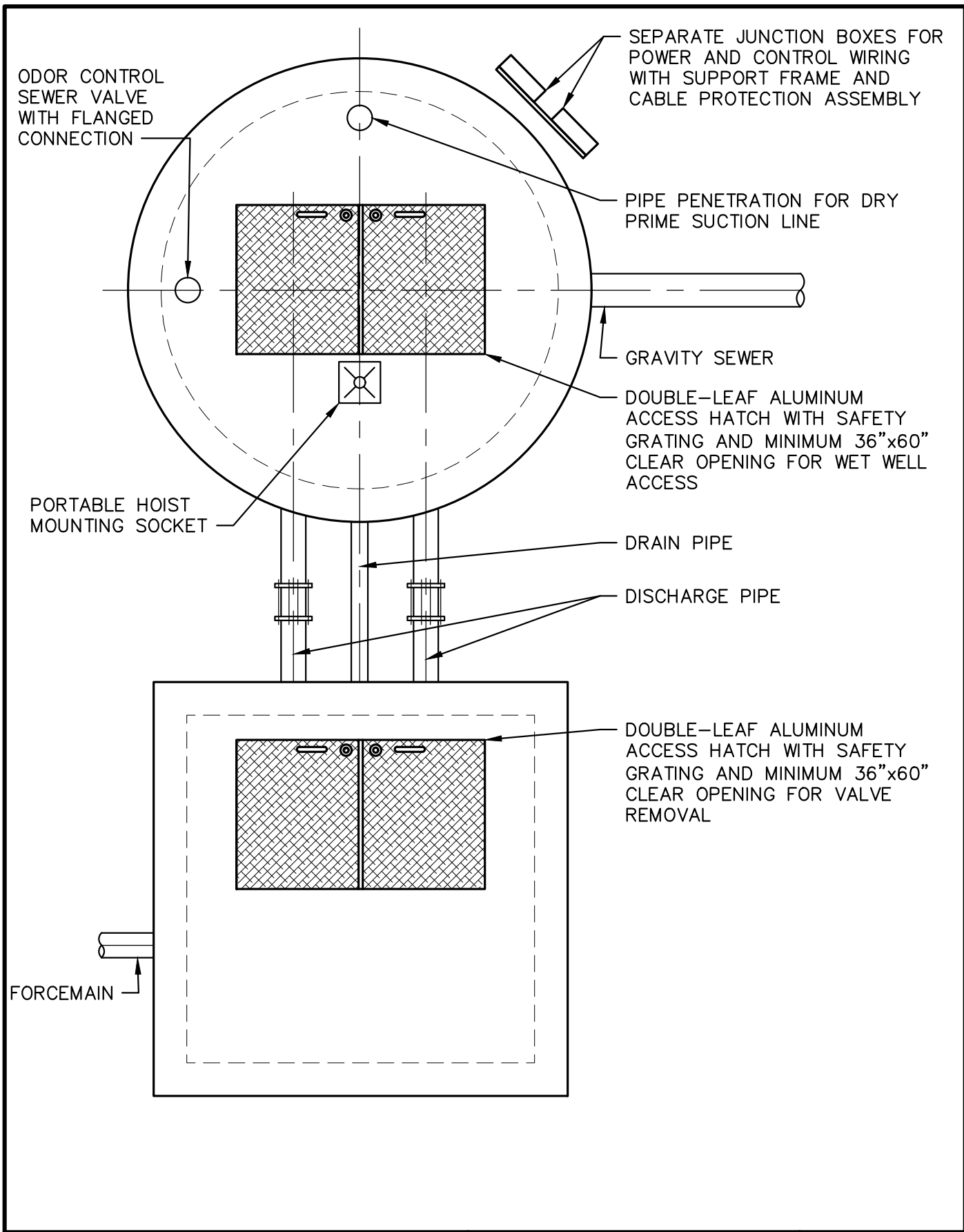
**PUMP STATION
 PLAN VIEW
 (BELOW SLAB)**

STANDARD DETAIL NO.

S-29

NOT TO SCALE

JULY 2025



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**PUMP STATION
 PLAN VIEW
 (TOP OF SLAB)**

STANDARD DETAIL NO.
S-30
NOT TO SCALE
JULY 2025

FILENAME: G:\GD&F\STANDARD DETAILS\CHARLES TOWN STANDARD DETAILS\S-30.DWG

PUMP STATION NOTES:

1. CONTRACTOR SHALL COORDINATE PUMP STATION ACCESS COVER LOCATION AND INSTALLATION WITH PUMP MANUFACTURER AND PRECAST CONCRETE MANUFACTURER/SUPPLIER.
2. WALL AND SLAB THICKNESS FOR THE PUMP STATION AND VALVE VAULT TO BE DETERMINED BY PRECAST CONCRETE MANUFACTURER/SUPPLIER.
3. CONTRACTOR SHALL COORDINATE VALVE VAULT ACCESS COVER SIZE AND INSTALLATION WITH PRECAST CONCRETE MANUFACTURER/SUPPLIER.
4. EXCAVATE AREA TO AN ELEVATION AT LEAST 6” BELOW THE BOTTOM OF NEW FOUNDATION MAT, THICKNESS TO BE DESIGNED BY THE PRECAST CONCRETE PUMP STATION MANUFACTURER, SUPPLIER OR CONTRACTOR.
5. STRUCTURAL DESIGN OF ENTIRE PUMP STATION AND VALVE VAULT SHALL BE BY THE MANUFACTURER, INCLUDING PRECAST TOP SLAB AND CONCRETE BASE MAT. UPLIFT RESISTANCE DUE TO POSSIBILITY OF HIGH GROUNDWATER AND EMPTY TANK SHALL BE ACCOUNTED FOR. USE 2,000 PSF ALLOWABLE SOIL BEARING PRESSURE.
6. PRECAST STRUCTURES SHALL BE MANUFACTURED PER ASTM C-478, 5000 PSI AT 28 DAYS.
7. ALL HARDWARE FOR PUMP STATION AND VALVE VAULT INCLUDING, BUT NOT LIMITED TO, BOLTS, NUTS, WASHERS, ETC., SHALL BE TYPE 304 OR 316 STAINLESS STEEL.
8. ALL PIPE PENETRATIONS SHALL HAVE STAINLESS STEEL SLEEVE WITH INTEGRAL WATERSTOP AND MODULAR ELASTOMER SEAL (LINK-SEAL).

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**PUMP STATION
NOTES**

STANDARD DETAIL NO.

S-31

NOT TO SCALE

JULY 2025

RIGHT-OF-WAY

ROAD OR SHOULDER EDGE

ROAD

HDPE OR CONCRETE STORM PIPING AS REQUIRED

DOUBLE SWING GATE

3' WIDE MAN GATE

ROAD OR SHOULDER EDGE

MINIMUM OF 12' WIDE STABILIZED OR PAVED ACCESS ROAD TO PUMP STATION

FORCEMAIN

FM FM FM FM FM

RIGHT-OF-WAY

LIGHT POLE AND FLOOD LIGHT ON SWITCH AND PHOTOCELL

STABILIZED OR PAVED AREA

GODWIN DRY-PRIME BACKUP PUMP ON CONCRETE PAD

SANITARY SEWER

MANHOLE (INSIDE FENCE)

WETWELL

FLEXIBLE SUCTION LINE

CHECK VALVE

NON FREEZE HYDRANT

PLUG VALVE

COUPLING

DRAIN TO WETWELL

FLOW METER VAULT

VALVE VAULT

EMERGENCY BYPASS CONNECTION

COUPLING

DISCHARGE LINE

5'-0" MIN.

8' HEIGHT BLACK VINYL CHAIN LINK FENCE WITH PLASTIC SLATS AND MOW STRIP, FENCE SHALL NOT BE CLOSER THAN 5' FROM ANY STRUCTURE OR PAD

CONCRETE PAD FOR EMERGENCY GENERATOR

CONCRETE PAD FOR ELECTRIC BACKBOARD AND ROOF STRUCTURES

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**PUMP STATION
SITE PLAN**

STANDARD DETAIL NO.

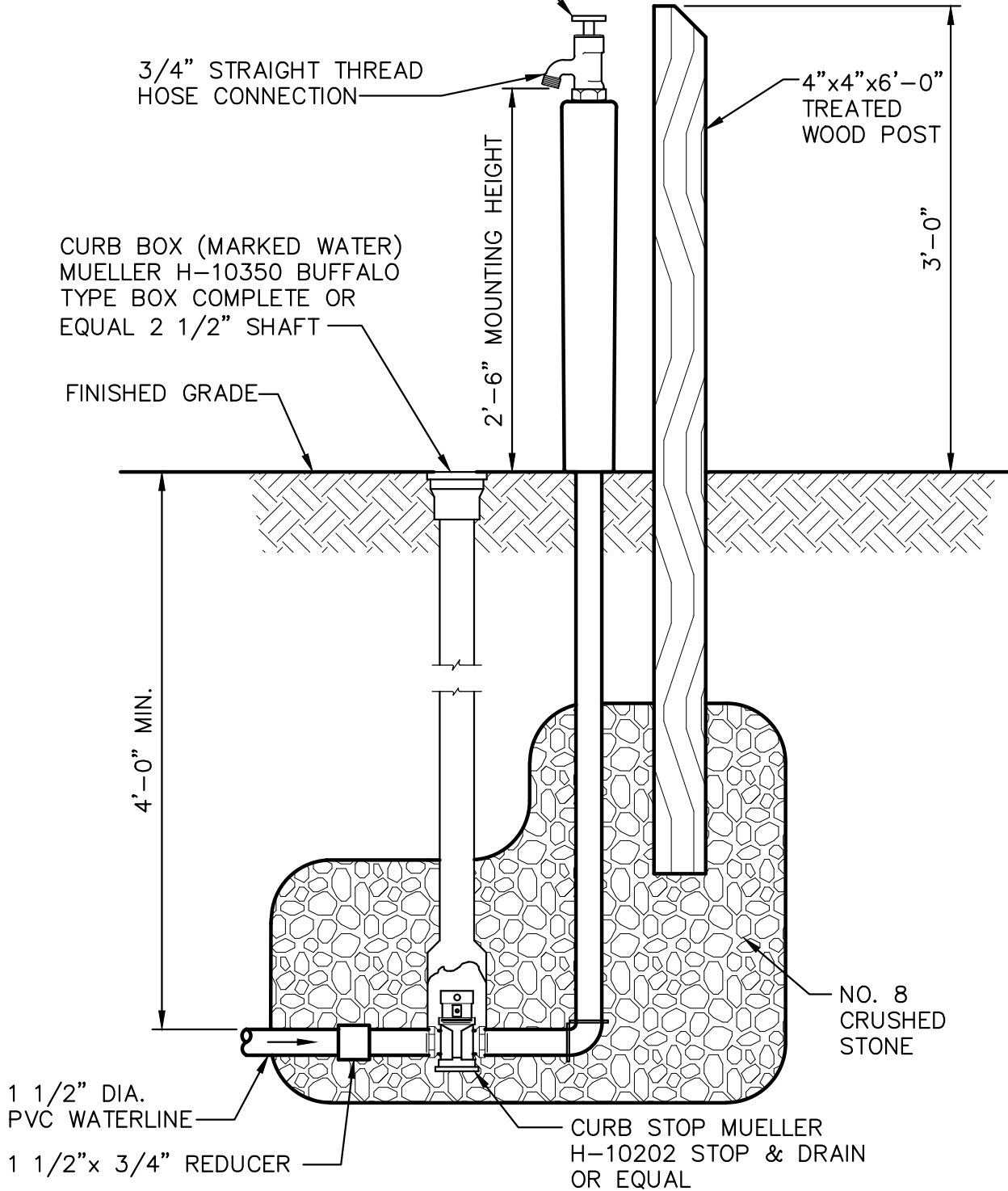
S-33

NOT TO SCALE

JULY 2025

FILENAME: G:\GD&F\STANDARD DETAILS\CHARLES TOWN STANDARD DETAILS\S-33.DWG

NON-FREEZE POST HYDRANT, ZURN MODEL NO. Z-1385 OR APPROVED EQUAL. ATTACH TO POST WITH STAINLESS STEEL CLAMPS AND HARDWARE



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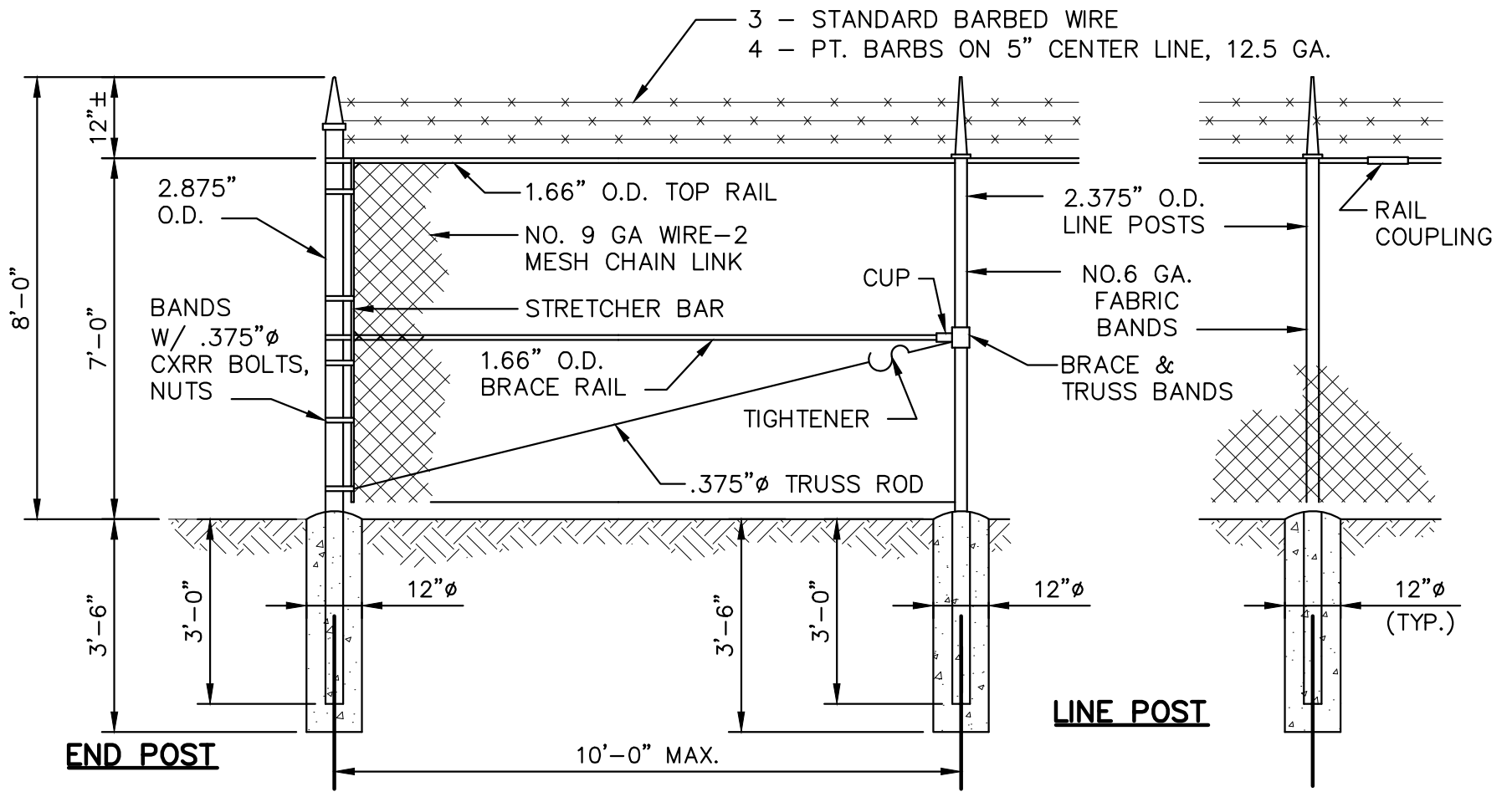
**NON-FREEZE YARD
 (POST) HYDRANT
 DETAIL**

STANDARD DETAIL NO.

S-34

NOT TO SCALE

JULY 2025

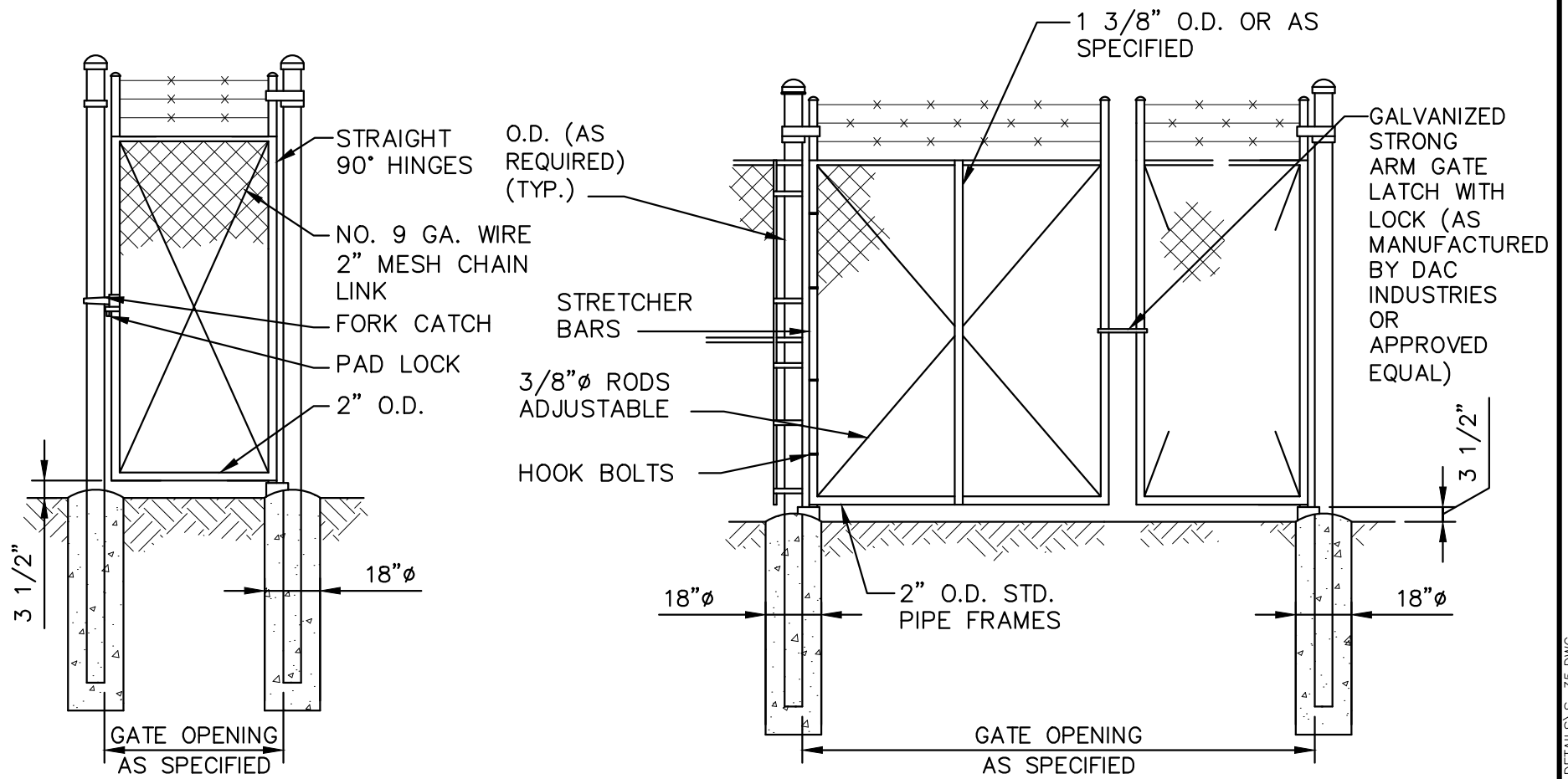


CORNER POST SIMILAR, WITH FITTINGS AND BRACING IN BOTH DIRECTIONS.

TYPICAL FENCE ELEVATION

NOTE:

FENCING SHALL BE BLACK VINYL COATED WITH VINYL SLATS FOR 80% OPACITY



TYPICAL SINGLE SWING GATE ELEVATION

TYPICAL DOUBLE SWING GATE ELEVATION

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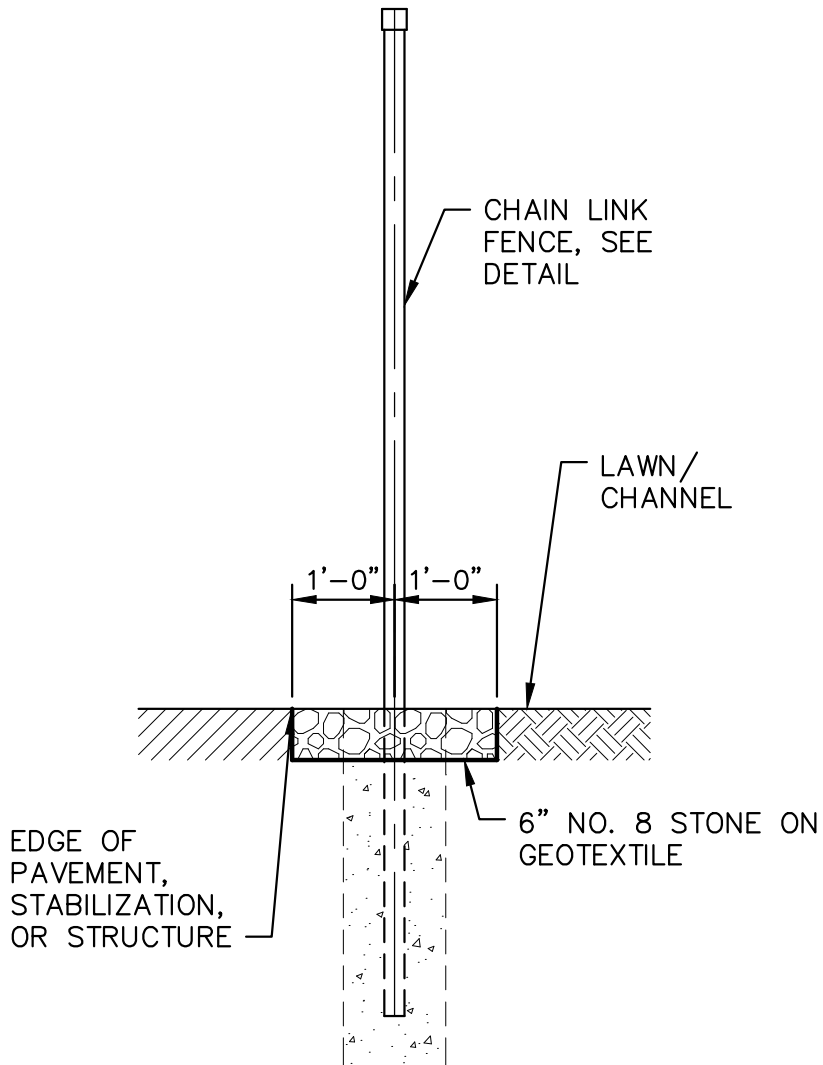
TYPICAL CHAIN-LINK FENCE DETAILS

STANDARD DETAIL NO.

S-35

NOT TO SCALE

JULY 2025



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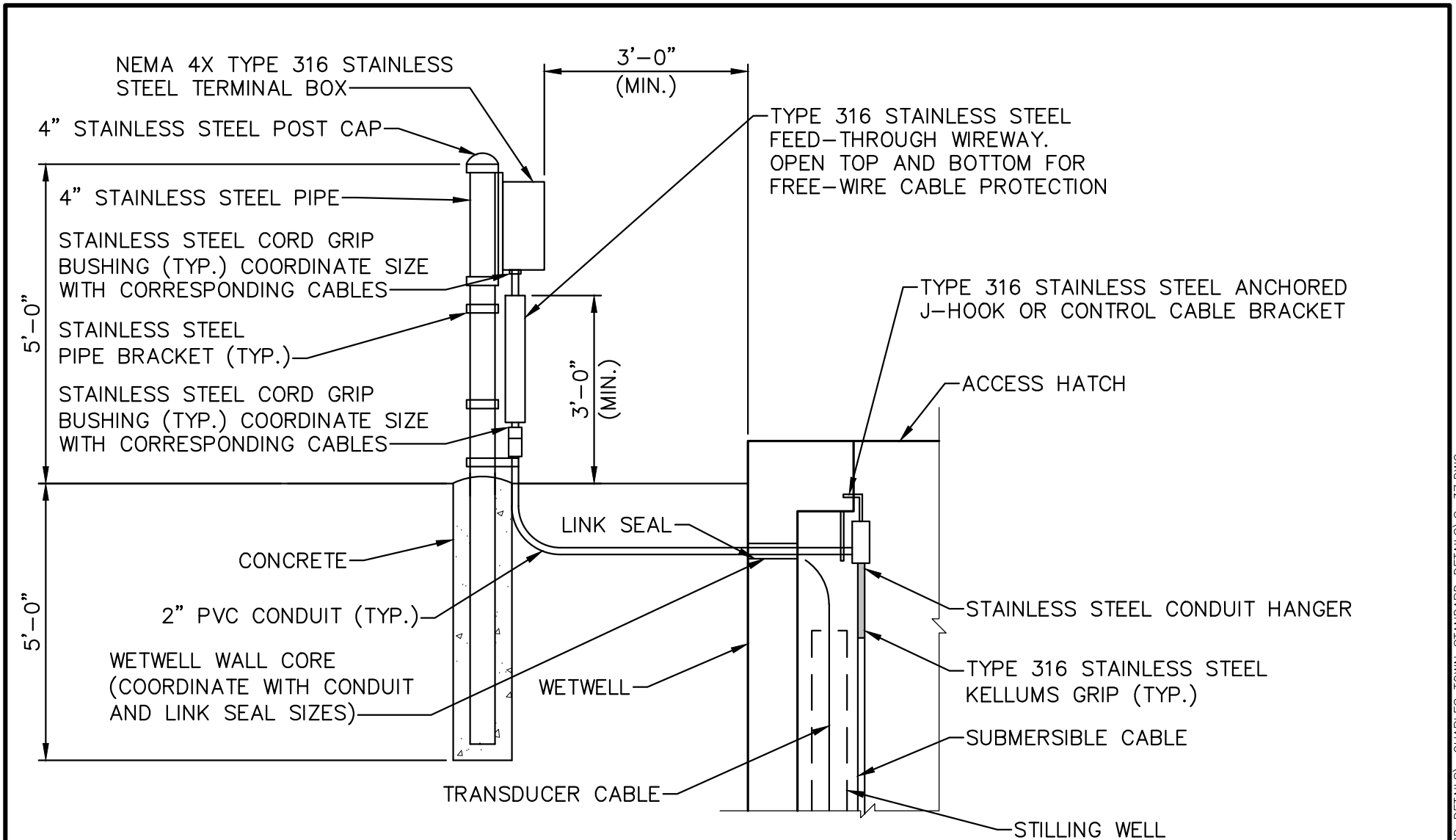
FENCE MOW STRIP

STANDARD DETAIL NO.

S-36

NOT TO SCALE

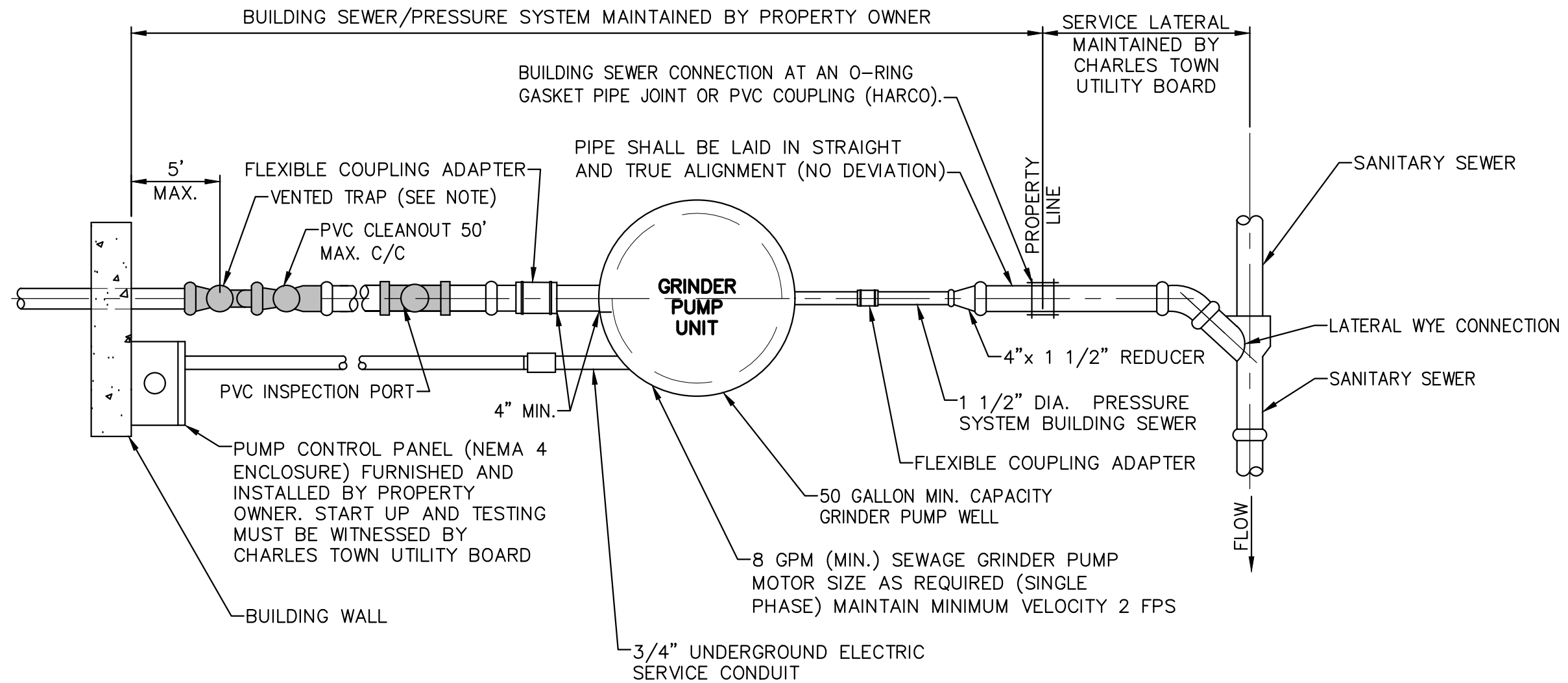
JULY 2025



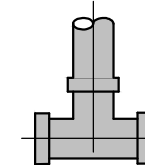
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**WETWELL
 JUNCTION/TERMINAL
 BOX DETAIL**

STANDARD DETAIL NO.
S-37
NOT TO SCALE
JULY 2025



LEGEND



ALL VERTICAL PIPE SECTIONS INCLUDING FITTINGS MUST BE SOLVENT-WELD SDR35 PVC.

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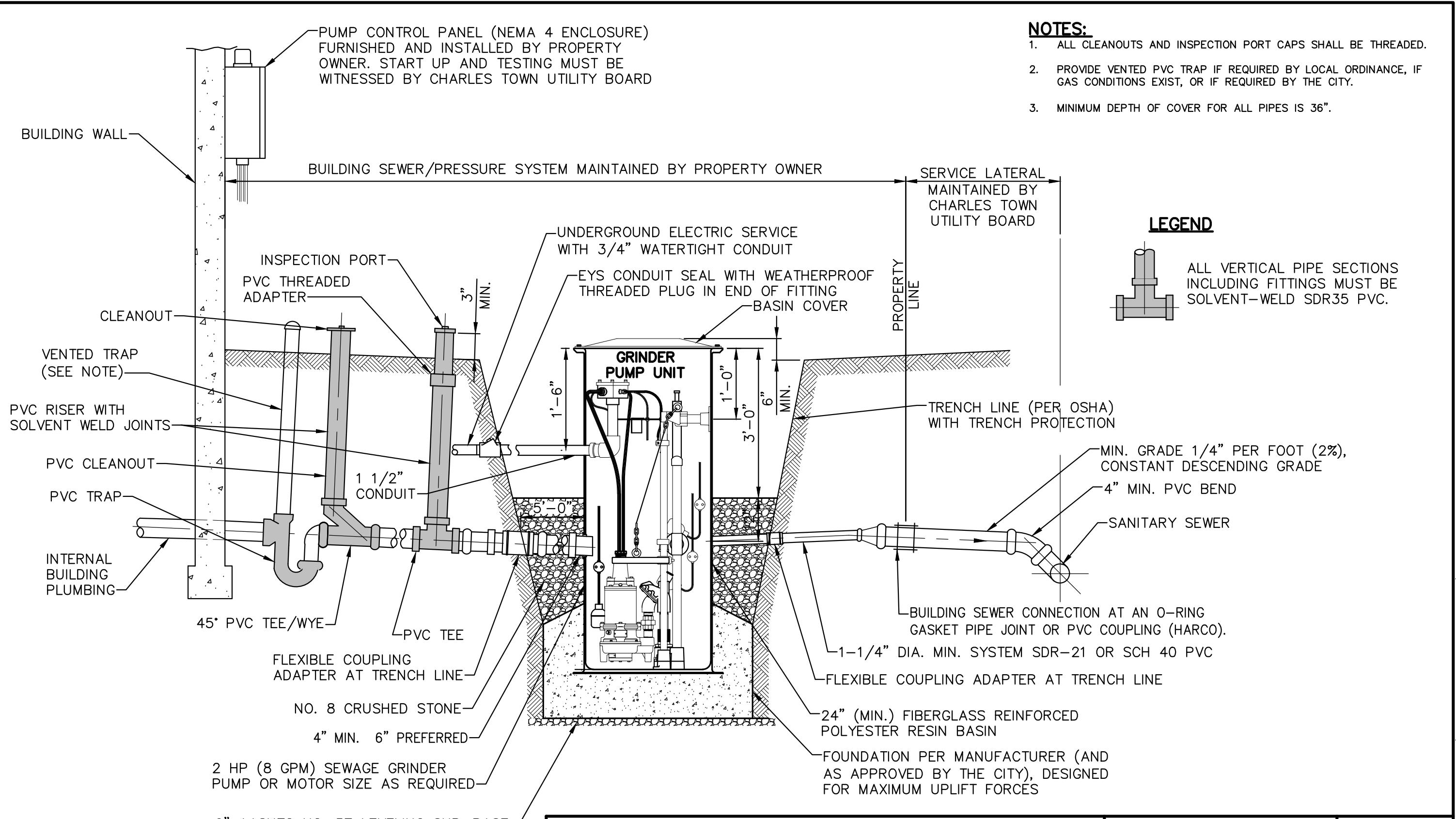
**PRESSURE SYSTEM
BUILDING SEWER
PLAN**

STANDARD DETAIL NO.

S-38

NOT TO SCALE

JULY 2025



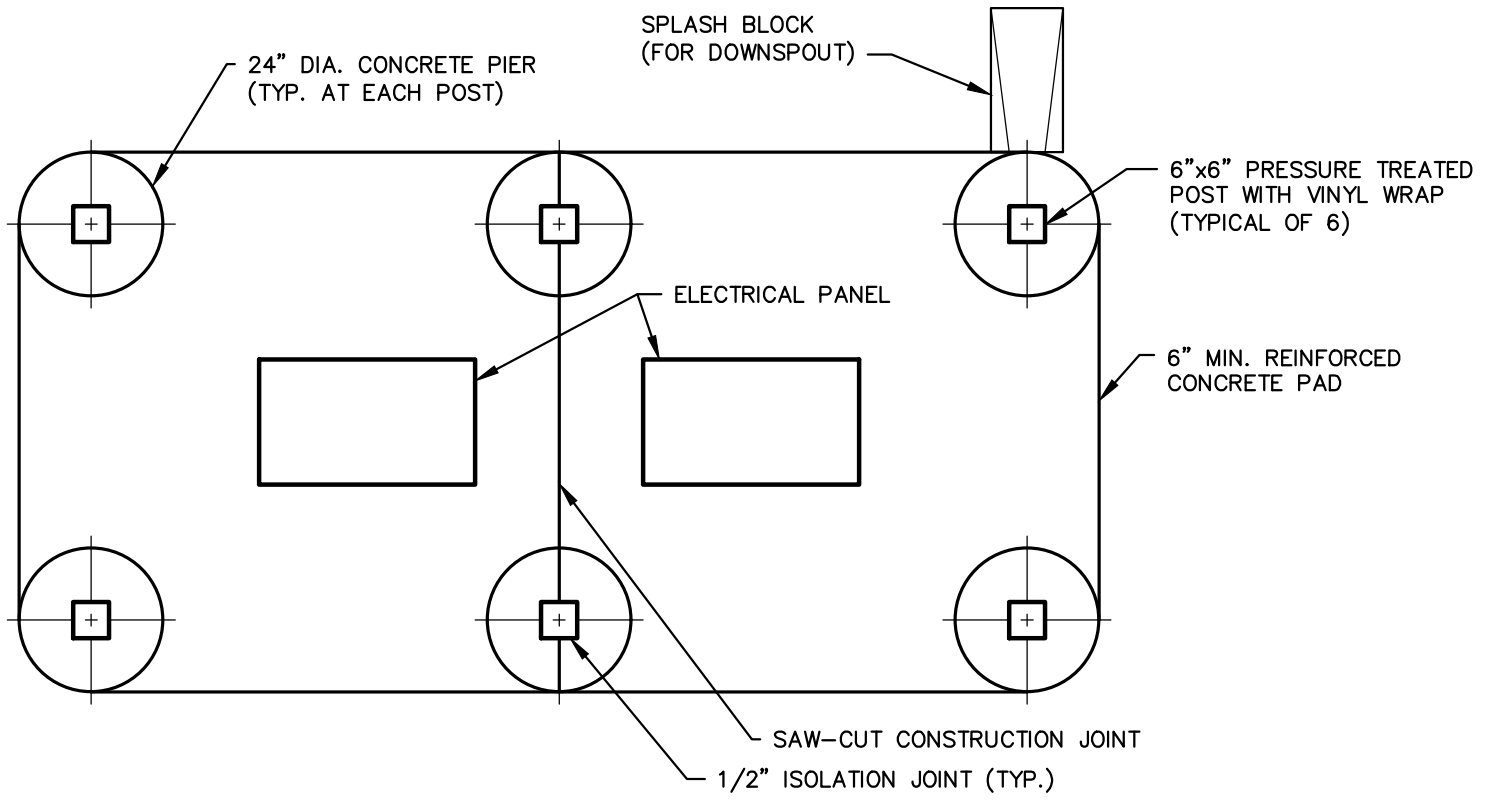
- NOTES:**
1. ALL CLEANOUTS AND INSPECTION PORT CAPS SHALL BE THREADED.
 2. PROVIDE VENTED PVC TRAP IF REQUIRED BY LOCAL ORDINANCE, IF GAS CONDITIONS EXIST, OR IF REQUIRED BY THE CITY.
 3. MINIMUM DEPTH OF COVER FOR ALL PIPES IS 36".

LEGEND

ALL VERTICAL PIPE SECTIONS INCLUDING FITTINGS MUST BE SOLVENT-WELD SDR35 PVC.

<p>Charles Town Utility Board</p> <p>661 S. GEORGE STREET, SUITE 101, CHARLES TOWN, WV 25414</p> <p>PHONE: (304) 725-2316 FAX: (304) 725-4313</p>	<p>PRESSURE SYSTEM BUILDING SEWER PROFILE</p>	<p>STANDARD DETAIL NO.</p> <p>S-39</p>
		<p>NOT TO SCALE</p>
		<p>JULY 2025</p>

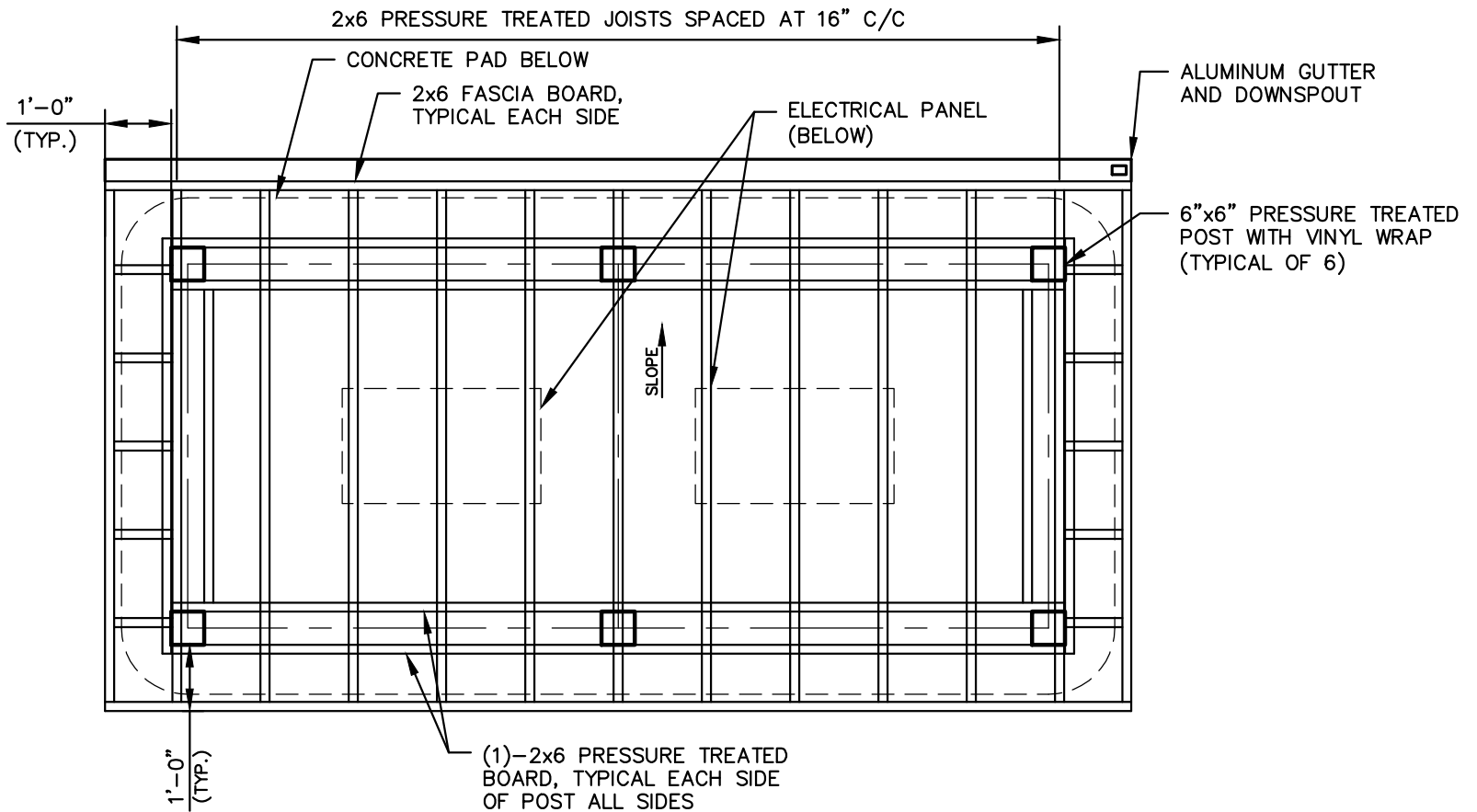
FILENAME: G:\GD&F\STANDARD DETAILS\CHARLES TOWN STANDARD DETAILS\S-39.DWG



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**CONTROL PANEL
 SHELTER
 STRUCTURAL FLOOR
 PLAN**

STANDARD DETAIL NO. S-40
NOT TO SCALE
JULY 2025



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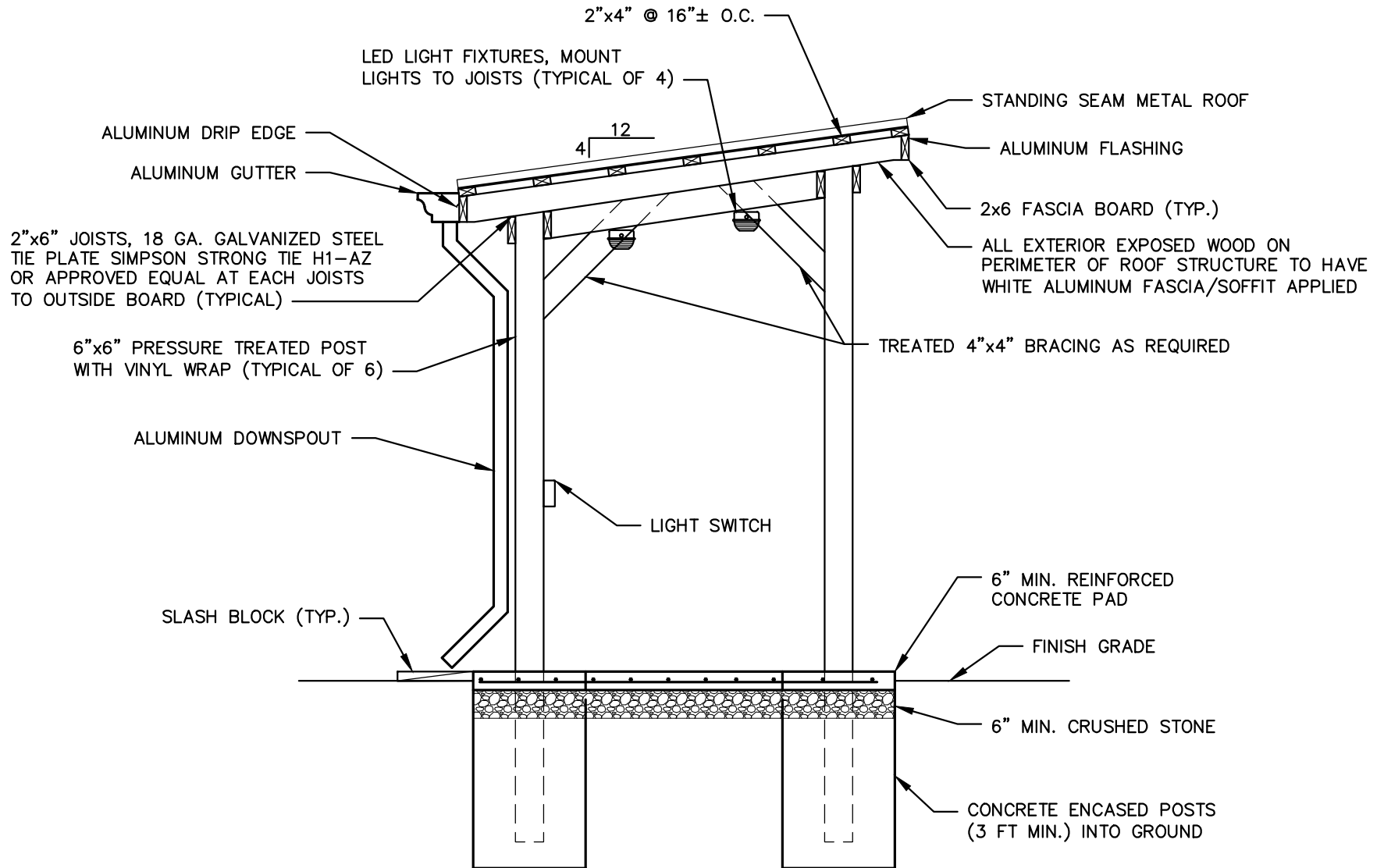
**CONTROL PANEL
 SHELTER ROOF
 FRAMING PLAN**

STANDARD DETAIL NO.

S-41

NOT TO SCALE

JULY 2025



Charles Town Utility Board

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**CONTROL PANEL
 SHELTER SECTION**

STANDARD DETAIL NO.

S-42

NOT TO SCALE

JULY 2025